Appendix C

Table C-1
Fall 2003 Groundwater Sampling Program

Table C-1
Summary of Fall 2003 Groundwater Sampling Program
Yankee Nuclear Power Station
Rowe, MA

Well Designation	Nonradiological						
	VOC	SVOC	PCB	Herbicides	DRO	GRO	PP13 Metals
CB-3					X[1]	X[1]	
CB-4							X[2]
CW-2							X[2]
MW-5			X				
MW-102C							X[3]
MW-103B							X[3]
MW-105C DUP	X						
Total	**1**	**0**	**1**	**0**	**1**	**1**	**4**

Notes:
1 = Also analyzed for VPH/EPH
2 = Only analyzed for total and filtered silver
3 = Only analyzed for total and filtered lead

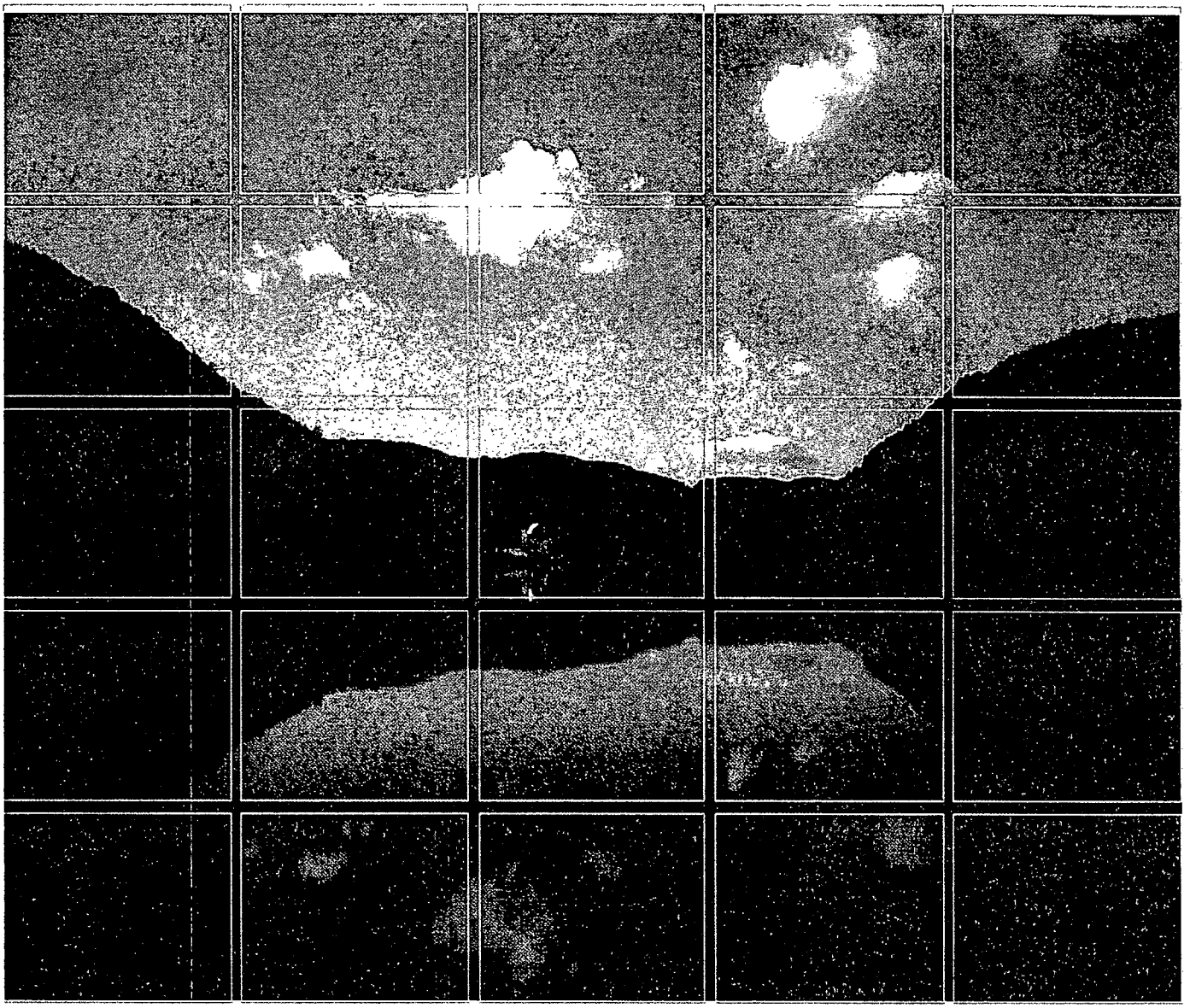
Table C-2

Table C-2
Summary of March (Winter) 2004 Groundwater Sampling Program
Yankee Nuclear Power Station
Rowe, MA

Well Designation	Nonradiological									
	VOC	SVOC	PCB	Herbicides	DRO	PP13 Metals	Lead	Silver	EPH/VPH	Boron
B-1										X
CB-1										X
CB-2										X
CB-3 DUP					X				X	X
CB-4								X		X
CB-6										X
CB-7										X
CB-8										X
CB-9									X	X
CB-12										X
CFW-1										X
CFW-2										X
CFW-7										X
CW-2								X		X
CW-3										X
CW-4										X
CW-6										X
CW-7										X
CW-8										X
CW-10									X	X
MW-1										X
MW-2										X
MW-5			X							X
MW-6									X	X
MW-101B										X
MW-101C									X	X
MW-102A									X	X
MW-102C							X		X	X
MW-103A										X
MW-103B							X		X	X
MW-103C									X	X
MW-104B 2 DUPS	X	X	X	X		X			X	X
MW-104C	X	X	X	X		X			X	X
MW-105B										X
MW-105C	X									X
MW-107B	X	X	X	X		X			X	X
MW-107C	X	X	X	X		X			X	X
MW-107D	X	X	X	X		X			X	X
OSR-1									X	X
Sherman Spring (SP001)										X
Facility Water Supply (DW001)										X
Visitor Center Water Supply Well (DW002)										X
Total	6	5	6	5	1	5	2	2	15	42

Notes:
Lead and Silver were collected as total and dissolved
PCBs were collected as total and dissolved
EPH/VPH sent to Alpha Laboratories

March 2004 Groundwater Field Sampling Plan



Revised March 2004
Groundwater Field Sampling Plan

Yankee Nuclear Power Station
Rowe, Massachusetts

15 March 2004

ERM
399 Boylston St.
Boston, MA 02116
(617) 267-8377

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TABLES

FIGURES

1.0 INTRODUCTION

1.1 BACKGROUND

On behalf of Yankee Atomic Electric Company (Yankee), Environmental Resources Management (ERM) has prepared this March 2004 Groundwater Field Sampling Plan (FSP) for the Yankee Nuclear Power Station (YNPS) located at 49 Yankee Road in Rowe, Massachusetts (Figure 1). The FSP has been prepared as a supplement to the *Draft Quality Assurance Project Plan, Site Closure, Yankee Nuclear Power Station, Rowe, Massachusetts* and the *Final Groundwater Sampling Plan, Yankee Nuclear Power Station, July 2003*. The FSP outlines the approach and methods for characterizing groundwater quality at the site as part of the overall site closure program. This FSP addresses only non-radiological groundwater characterization activities.

1.2 PURPOSE & SCOPE

The purpose of the March 2004 Groundwater FSP is to:

- establish the procedures and rationale for groundwater sampling activities in support of site closure;
- ensure that groundwater sampling data are consistent with applicable procedures;
- ensure that the Data Quality Objectives (DQOs) for site closure are met;
- provide data to support preparation of the License Termination Plan (as required by the Nuclear Regulatory Commission); and
- support the site characterization and closure activities.

The data generated under the FSP will be validated and input into the site database. The results from the baseline sampling round as well as subsequent sampling rounds will be used in conjunction with Data Usability reports that are being prepared regarding the historic data to determine the need for, and scope of, future groundwater sampling events. The data will also be used to support human health and ecological risk assessments that will be prepared as part of the site closure program.

The scope of the March 2004 Groundwater FSP includes sampling of wells listed in Table 2. See Table 1 for a summary of groundwater well information and location descriptions.

2.0 GROUNDWATER SAMPLING PROGRAM

2.1 STANDARD OPERATING PROCEDURES

Standard Operating Procedures (SOPs) applicable to the groundwater investigation include:

- DP-9745 Groundwater Level Measurement and Sampler Collection in Observation Wells
- DP-8123 Sample Security and Chain of Custody
- AP-8601 Ground and Well Water Monitoring Program for the Yankee Nuclear Power Station Site
- Water Level Measurements
- Groundwater Sample Collection from Wells Having Pump Systems in Place
- Multi-Parameter Water Quality Monitoring
- Surface Water and Sediment Sample Collection

All applicable SOPs can be found in the *Final Groundwater Sampling Plan, Yankee Nuclear Power Station, July 2003.*

2.2 SAMPLE LOCATIONS AND DESIGNATIONS

A list of locations to be sampled for groundwater is provided in Table 2. The groundwater sample locations are shown on Figure 2.

The groundwater samples will be identified using a unique sample identification. The sample designations will use the naming convention as detailed in the YNPS QAPP. The sample designations for the groundwater sampling program are detailed in Table 2.

2.3 SAMPLING PROCEDURES

2.3.1 *Monitoring Well Sampling*

All of the monitoring wells will be gauged prior to sampling in accordance with *DP-9745 Groundwater Level Measurement and Sampler*

Collection in Observation Wells. Water level measurements will be made using an electronic water level probe marked in 0.01-foot intervals.

After gauging, the monitoring wells will be sampled from the midpoint of the well screen using low-flow sampling techniques, as outlined in *DP-9745 Groundwater Level Measurement and Sampler Collection in Observation Wells*. Geochemical field parameters will be measured for wells sampled by low-flow sampling techniques at the time of sample collection, including: temperature, conductivity, pH, dissolved oxygen, turbidity, and oxidation-reduction potential. The field meters used during groundwater sampling will include a water quality instrument for collection of field parameters and a electric water level meter. In accordance with the QAPP, all equipment will be calibrated and operated in accordance with the manufacturer's recommended procedures.

Dedicated sampling equipment will be used where feasible. At wells where the depth to water is greater than 30 feet, a low-flow submersible or bladder pump will need to be used. All reused sampling equipment will be decontaminated prior to, and following, sample collection in accordance with the QAPP.

2.4 *ANALYTICAL PROGRAM*

2.4.1 *Non-radiological Parameters*

The groundwater analytical program is summarized in Table 2. The bottle requirements are detailed in Table 3. The groundwater investigation will include the analysis of one or more of the following non-radiological parameters:

- Volatile Organic Compounds (VOCs) by GC/MS, SW-846 Method 8260B VOCs;
- Semi-Volatile Organic Compounds (SVOCs) by GC/MS, SW-846 Method 8270C SVOCs;
- Polychlorinated Biphenyls (PCBs) dissolved and total by GC, SW-846 Method 8082PCBs;
- Chlorinated Herbicides by GC, SW-846 Method 8151;
- Diesel Range Organics (DRO) by GC, SW-846 Method 8015B;
- Lead dissolved and total by SW-846 6010B;
- Silver dissolved and total by SW-846 6010B;

- Extractable Petroleum Hydrocarbons (EPH) - Standard/Volatile Petroleum Hydrocarbons (VPH) - Standard by MADEP Methods MADEP-EPH-98-1 and MADEP-VPH-98-1 (standard analysis excludes target analytes);
- Priority Pollutant 13 Metals (PP13) Metals by SW-846 6010B

Each well will require a different suite of the above analyses as described in Table 2. Alpha Analytical Laboratories located in Westborough, MA will perform the EPH/VPH analysis when feasible based on radiological screening. Northeast Laboratory Services, located in Waterville, Maine, will conduct all other non-radiological analyses.

Samples requiring filtration include PCBs, lead, and silver. These samples will be collected into containers as described in Table 3 and sent to the laboratory within 24 hours, or as soon as possible. Sampling personnel will indicate on the COC which samples require filtration.

2.4.2 *Radiological Parameters*

Groundwater samples will also be collected for radiological site characterization activities. The radiological samples will be collected following the collection of non-radiological samples. Radiological sampling is not covered in this FSP. Framatome ANP Environmental Laboratory in Westborough, Massachusetts will conduct the radiological analyses.

2.5 *SAMPLE SECURITY AND CUSTODY*

Groundwater samples will be submitted to the laboratory under proper chain-of-custody procedures. Non-radiological samples will be preserved on ice or in a refrigerator. Sample handling will be documented using chain-of-custody protocols in accordance with *DP-8123, Sample Security and Chain of Custody.*

2.6 *MANAGEMENT OF INVESTIGATION DERIVED WASTES*

All purge water generated during well sampling activities will be containerized on-site. The fluids will be screened for radiological constituents. Following screening YNPS personnel will dispose of the wastes in accordance with the applicable YNPS procedures.

2.7 *SCHEDULE*

The groundwater sampling program is scheduled to begin on 1 March 2004.

3.0 QUALTIY ASSURANCE AND QUALTIY CONTROL

3.1 QUALITY ASSURANCE PROJECT PLAN

A QAPP has been prepared to provide a standard method of assuring that data collected during site characterization activities is of sufficient quality to support future decisions regarding decommissioning activities and or remedial actions at the site. The primary purpose of the QAPP is to describe the means by which data collected in the field will be validated against predetermined standards, ensuring that data meets minimum quality standards prior to being used for decision-making purposes. The flow of data is important to data quality, as it ensures that appropriate project personnel have adequate opportunities to review data with importance to future site decisions. As such, the QAPP specifies the methods and means for ensuring the data generated during site characterization activities serves the purpose of site closure and property transfer.

The following provides a list of the sections of the QAPP that are most relevant to the field sampling activities:

QAPP Section	*Topic*
9.1	Field Investigation and Documentation Procedures
9.2	Preparation of Sample Containers
9.3	Decontamination
9.4	Field Equipment Usage and Maintenance
10.1	Sample Tracking System
10.2	Sample Custody
13.1	Field Quality Control

3.2 CLEANING AND DECONTAMINATION OF EQUIPMENT

To the degree possible, dedicated and/or disposable sampling equipment will be used for sampling. Non-dedicated sampling equipment used to collect samples will be cleaned and decontaminated prior to its initial use, between each sampling location and after the final use. The following

general procedures will be adhered to concerning decontamination efforts:

1. If visual signs such as discoloration indicate that decontamination was insufficient, the equipment will again be decontaminated. If the situation persists, the equipment will be taken out of service until the situation can be corrected.

2. Verification of the non-dedicated sampling equipment cleaning procedures will be documented by the collection of field equipment rinsate blanks, at a frequency in accordance with the QAPP.

3. All properly decontaminated equipment will be stored in aluminum foil or plastic bags during storage and transport.

Decontamination protocols will be strictly adhered to in order to minimize the potential for cross-contamination between sampling locations and contamination of off-site areas. Liquids generated during the decontamination process will be collected, containerized and appropriately labeled for disposal. Waste liquids will be stored on site until determination of potential hazard class and final disposition.

Only pre-cleaned laboratory-certified sample containers will be used. The laboratory will also provide sample coolers, ice packs, trip blanks, and temperature blanks.

More specific decontamination procedures are outlined in the QAPP and SOPs.

3.3 *QUALITY ASSURANCE / QUALITY CONTROL SAMPLES*

The following Quality Assurance / Quality Control samples will be collected during the groundwater sampling for nonradiological samples:

- Trip blanks - One trip blank per each set of up to 20 sample containers to be analyzed for VOC and TPH-GRO. There must be at least one trip blank in every cooler used to ship samples to the laboratory for VOC and TPH-GRO analysis.
- Temperature blanks - One temperature blank per cooler. The temperature of the trip blank will be measured upon receipt of the cooler at the laboratory.
- Equipment rinsate blank - The majority of groundwater samples will be collected using dedicated sampling equipment. However, where

the depth to water is greater than 30 feet, a submersible pump will be used. A rinsate sample will be collected from the pump at a rate of one sample per 20 sampling locations. The rinsate blanks will be analyzed for the same parameters as the samples that were collected using the equipment.

- Field duplicates - Field duplicates will be collected at the rate of one duplicate per 20 samples. Samples locations where duplicates will be collected are listed in Table 2. Field duplicates will be submitted for the same analyses as the actual sample.
- Matrix spikes - Matrix spikes will be collected at the rate of one matrix spike and one matrix spike duplicate per 20 samples. Samples locations where matrix spikes will be collected are listed in Table 2. Matrix spikes/matrix spikes duplicates will be analyzed for the same analyses as the actual sample.

4.0 *PROJECT DOCUMENTATION*

Data management tasks pertinent to project documentation and records, laboratory deliverables, data reporting formats, data handling and management, and data review assessment are presented in the QAPP.

The following field sample collection records will be completed at the time of sample collection:

- Field logbook
- Groundwater sampling field logs
- Chain of custody forms
- Shipping records (airbills), if any
- Telephone logs, as appropriate

The project documentation will be provided to the Yankee Environmental Oversight Supervisor at the completion of each sampling event. In addition, any deviations from the FSP will be documented in a memorandum to the Yankee Environmental Oversight Supervisor.

Tables

Table 1 - Groundwater Sampling Locations
Field Sampling Plan
Yankee Nuclear Power Station
Rowe, MA

Well Designation	Location	Date Installed	Approximate Surface Elev. (plant datum) (ft)	Approximate Bottom Screen Interval (ft)
B-1	NE side Fuel Bldg. (RCA)	14-Dec-77	1022.7	973.7
CB-2	North of Office Bldg. (Secondary Side)	21-Apr-93	1014.2	989.7
CB-1	Inside Fuel Transfer Enclosure (RCA)	27-Apr-93	1021.1	996.1
CB-3	East of Fire Tank (RCA)	29-Apr-93	1034.3	1021.3
CB-4	Old Leach Field (PG&E Property)	5-May-93	978.8	959.8
CB-5	SCFA (South of Plant)	9-Sep-94	1070.4	1011.4
CB-6	Sherman Spring (PG&E Property)	13-Sep-94	1004.9	979.9
CB-9	Below VC Equipment Hatch (RCA)	19-Sep-94	1021.2	NA
CB-8	North of Old PCA Warehouse (RCA)	20-Sep-94	1035.2	1016.2
CB-7	PCA Warehouse at WDB wall (RCA)	7-Jan-97	1035.7	1018.7
CB-12	Ash Dewatering Pit-Waste Disposal Bldg. (RCA)	10-Dec-97	1028.6	1022.0
CB-11A	PAB Cubicle Corridor Trench (RCA)	18-Dec-97	1020.5	1001.5
CB-10	Ion Exchange Pit (RCA)	19-Dec-97	1021.0	1009.5
CW-6	W of Turbine Bldg (Secondary Side)	23-Apr-93	1018.8	996.8
CW-5	S of Service Bldg (RCA)	27-Apr-93	1021.0	1004.5
CW-2	W of Safety Injection Tanks (RCA)	29-Apr-93	1032.9	1012.9
CW-3	SE of Ion Exchange Pit (RCA)	3-May-93	1034.5	1011.5
CW-4	NW of PCA Warehouse (RCA)	4-May-93	1035.5	1018.5
CW-7	W of Service Bldg. (Secondary Side)	13-Sep-94	1022.2	991.2
CW-8	SW Turbine Bldg. interior (Secondary side)	14-Sep-94	1022.6	996.6
CW-10	N of Warehouse (Secondary Side)	8-Jun-98	1014.0	984.0
CW-11	PAB N side, LP Pump area down gradient of CB-11A	11-Jun-98	1022.5	1013.5
OSR-1	Old Shooting Range SE of ISFSI (South of plant)	22-Oct-97	1050.6	1037.3
MW-1	South wall PAB exterior (RCA)	24-Apr-98	1034.0	1014.0
MW-2	North wall of PAB exterior (RCA), under VC	24-Apr-98	1021.0	1004.0
MW-5	N of PAB (RCA), under VC	13-Oct-99	1021.0	NA
MW-6	NW of SI/DG Bldg, W of VC (RCA)	14-Oct-99	1021.0	NA
CFW-1	Southeast Construction Fill Area Well	13-Dec-99	1060.2	1052.2
CFW-4	Southeast Construction Fill Area Well	13-Dec-99	1074.5	1021.5
CFW-5	Southeast Construction Fill Area Well	14-Dec-99	1033.6	1028.6
CFW-6	Southeast Construction Fill Area Well	14-Dec-99	1029.6	1023.6
CFW-2	Southeast Construction Fill Area Well	15-Dec-99	1072.0	1052.0
CFW-3	Southeast Construction Fill Area Well	15-Dec-99	1070.1	1036.1
CFW-7	Southeast Construction Fill Area Well	3-Aug-01	1070.0	1040.0
MW-103B	Outside perimeter fence near Guardhouse	9-Jun-03	1003.3	708.4
MW-103C	Outside perimeter fence near Guardhouse	11-Jun-03	1002.3	877.3
MW-105B	W of Service Bldg. (Secondary Side)	18-Jun-03	1020.3	946.3
MW-105C	W of Service Bldg. (Secondary Side)	18-Jun-03	1020.3	983.3
MW-102B	Under Northwest Side of VC	13-Jul-03	1023.3	893.1
MW-103A	Outside perimeter fence near Guardhouse	16-Jul-03	1003.3	977.3
MW-102C	Under Northwest Side of VC	25-Jul-03	1023.3	924.3
MW-102A	Under Northwest Side of VC	30-Jul-03	1023.3	985.3
MW-100B	East of Alley	1-Aug-03	1020.3	977.4
MW-100A	East of Alley	5-Aug-03	1020.3	1000.3
MW-101B	Under South Side of VC	6-Aug-03	1024.3	872.3
MW-101C	Under South Side of VC	13-Aug-03	1024.3	925.3
MW-104B	In Road North of Turbine Building	22-Aug-03	1013.3	819.3
MW-104C	In Road North of Turbine Building	5-Sep-03	1013.3	916.3
MW-107B	Under Northeast Side of VC	12-Sep-03	1022.3	912.6
MW-107C	Under Northeast Side of VC	18-Sep-03	1022.3	996.3
MW-107D	Under Northeast Side of VC	20-Sep-03	1022.3	942.3

NA - Not Available

Table 1 - Groundwater Sampl
Field Sampling Plan
Yankee Nuclear Power Statio
Rowe, MA

Well Designation	Well Depth (ft)	Depth to Screen Top (ft)	Approximate Top Screen Interval (ft)	Depth to Screen Bottom (ft)	Approximate Well Depth Elevation (ft)
B-1	78.5	39.0	983.7	49	944.2
CB-2	25.0	14.5	999.7	24.5	989.2
CB-1	25.5	15.0	1006.1	25	995.6
CB-3	15.0	3.0	1031.3	13	1019.3
CB-4	20.0	9.0	969.8	19	958.8
CB-5	60.5	29.0	1041.4	59	1009.9
CB-6	26.0	15.0	989.9	25	978.9
CB-9	24.0	NA	NA	NA	997.2
CB-8	19.0	14.0	1021.2	19	1016.2
CB-7	17.0	7.0	1028.7	17	1018.7
CB-12	7.0	1.6	1027.0	6.6	1021.6
CB-11A	20.0	9.0	1011.5	19	1000.5
CB-10	11.5	6.5	1014.5	11.5	1009.5
CW-6	24.0	12.0	1006.8	22	994.8
CW-5	21.5	6.5	1014.5	16.5	999.5
CW-2	21.0	9.0	1023.9	20	1011.9
CW-3	23.0	8.0	1026.5	23	1011.5
CW-4	17.0	7.0	1028.5	17	1018.5
CW-7	31.0	21.0	1001.2	31	991.2
CW-8	26.0	16.0	1006.6	26	996.6
CW-10	30.5	15.0	999.0	30	983.5
CW-11	9.5	2.0	1020.5	9	1013.0
OSR-1	13.3	3.3	1047.3	13.3	1037.3
MW-1	21.0	10.0	1024.0	20	1013.0
MW-2	18.0	7.0	1014.0	17	1003.0
MW-5	20.0	NA	NA	NA	1001.0
MW-6	17.0	NA	NA	NA	1004.0
CFW-1	8.0	3.0	1057.2	8	1052.2
CFW-4	53.0	43.0	1031.5	53	1021.5
CFW-5	5.0	0.5	1033.1	5	1028.6
CFW-6	6.0	1.0	1028.6	6	1023.6
CFW-2	20.0	10.0	1062.0	20	1052.0
CFW-3	34.0	24.0	1046.1	34	1036.1
CFW-7	30.0	20.0	1050.0	30	1040.0
MW-103B	295.0	284.9	718.4	294.9	708.3
MW-103C	125.0	115.0	887.3	125.0	877.3
MW-105B	75.0	64.0	956.3	74.0	945.3
MW-105C	37.0	27.0	993.3	37.0	983.3
MW-102B	131.5	120.2	903.1	130.2	891.8
MW-103A	26.0	16.0	987.3	26.0	977.3
MW-102C	99.0	89.0	934.3	99.0	924.3
MW-102A	38.0	33.0	990.3	38.0	985.3
MW-100B	42.9	32.9	987.4	42.9	977.4
MW-100A	20.0	10.0	1010.3	20.0	1000.3
MW-101B	152.0	142.0	882.3	152.0	872.3
MW-101C	99.0	94.0	930.3	99.0	925.3
MW-104B	195.0	184.0	829.3	194.0	818.3
MW-104C	97.0	87.0	926.3	97.0	916.3
MW-107B	110.0	99.7	922.6	109.7	912.3
MW-107C	26.0	16.0	1006.3	26.0	996.3
MW-107D	80.0	75.0	947.3	80.0	942.3

NA - Not Available

Table 2 - Groundwater Analytical Program
Field Sampling Plan
Yankee Nuclear Power Station
Rowe, MA

Sample ID			Nonradiological									
Well Designation			VOC	SVOC	PCB	Herbicides	DRO	PP13 Metals	Lead	Silver	EPH/VPH	Boron
CB-4	CB-4									X		X
CB-6	CB-6											X
CB-2	CB-2											X
CW-6	CW-6											X
CW-7	CW-7											X
CW-8	CW-8											X
CW-10	CW-10										X	X
CW-5	CW-5											X
CB-1	CB-1											X
B-1	B-1											X
CB-9	CB-9										X	X
MW-2	MW-2											X
CB-10	CB-10											X
MW-5	MW-5				X							X
MW-6	MW-6										X	X
CW-11	CW-11											X
CB-11A	CB-11A											X
MW-1	MW-1											X
CW-3	CW-3											X
CB-12	CB-12											X
CB-7	CB-7											X
CW-2	CW-2									X		X
CB-8	CB-8											X
CW-4	CW-4											X
CB-3	CB-3						X				X	X
OSR-1	OSR-1										X	X
CFW-1	CFW-1											X
CFW-2	CFW-2											X
CFW-3	CFW-3											X
CFW-4	CFW-4											X
CFW-5	CFW-5											X
CFW-6	CFW-6											X
CFW-7	CFW-7											X
MW-100A	MW-100A										X	X
MW-100B	MW-100B											X
MW-101B	MW-101B											X
MW-101C	MW-101C										X	X
MW-102A	MW-102A										X	X
MW-102B	MW-102B											X
MW-102C	MW-102C								X		X	X
MW-103A	MW-103A											X
MW-103B	MW-103B								X		X	X
MW-103C	MW-103C										X	X
MW-104B	MW-104B		X	X	X	X		X			X	X
MW-104C	MW-104C		X	X	X	X		X			X	X
MW-105B	MW-105B											X
MW-105C	MW-105C		X									X
MW-107B	MW-107B		X	X	X	X		X			X	X
MW-107C	MW-107C		X	X	X	X		X			X	X
MW-107D	MW-107D		X	X	X	X		X			X	X
Total			6	5	6	5	1	5	2	2	16	50

NOTES:

Lead and Silver will be collected total and dissolved
PCBs will be collected total and dissolved
EPH/VPH sent to Alpha Laboratories
3 Field DUPS, 3 Matrix Spikes and 3 Matrix Spike Duplicates are needed
One of the DUPs, MSs, and MSDs needs to come from a 104 or a 107 well

Table 3 - Groundwater Analytical Program Bottle Requirements
Field Sampling Plan
Yankee Nuclear Power Station
Rowe, MA

Parameter	Sample Container	Preservation	Holding Time
Diesel Range Organics	(2) 1 liter amber glass	4 °C, HCl	7 days/40 days
Extractable Petroleum Hydrocarbons	(2) 1 liter amber glass	4 °C, HCl	7 days/40 days
Volatile Petroleum Hydrocarbons	(2) 40 ml VOA vials	4 °C, HCl	7 days/40 days
Herbicides	(2) 1 liter amber glass	4 °C	7 days/40 days
Lead and Silver Dissolved	(1) 500 ml polyethylene	4 °C	ERM requests that sample be received by laboratory within 48 hours - 28 days/6 months
Lead and Silver Total	(1) 500 ml polyethylene	4 °C/HNO3	28 days/6 months
Polychlorinated Biphenyls Total	(2) 1 liter amber glass	4 °C	7 days/40 days
Polychlorinated Biphenyls Dissolved	(2) 1 liter amber glass	4 °C	7 days/40 days
Priority Pollutant 13 Metals	(1) 500 ml polyethylene	4 °C/HNO3	28 days/6 months
Semi-volatile Organic Compounds	(2) 1 liter amber glass	4 °C	7 days/40 days
Volatile Organic Compounds	(3) 40 ml VOA vials	4 °C/ HCl	14 Days

Note: Dissolved samples will be filtered and preserved, if necessary, by laboratory.

Figures

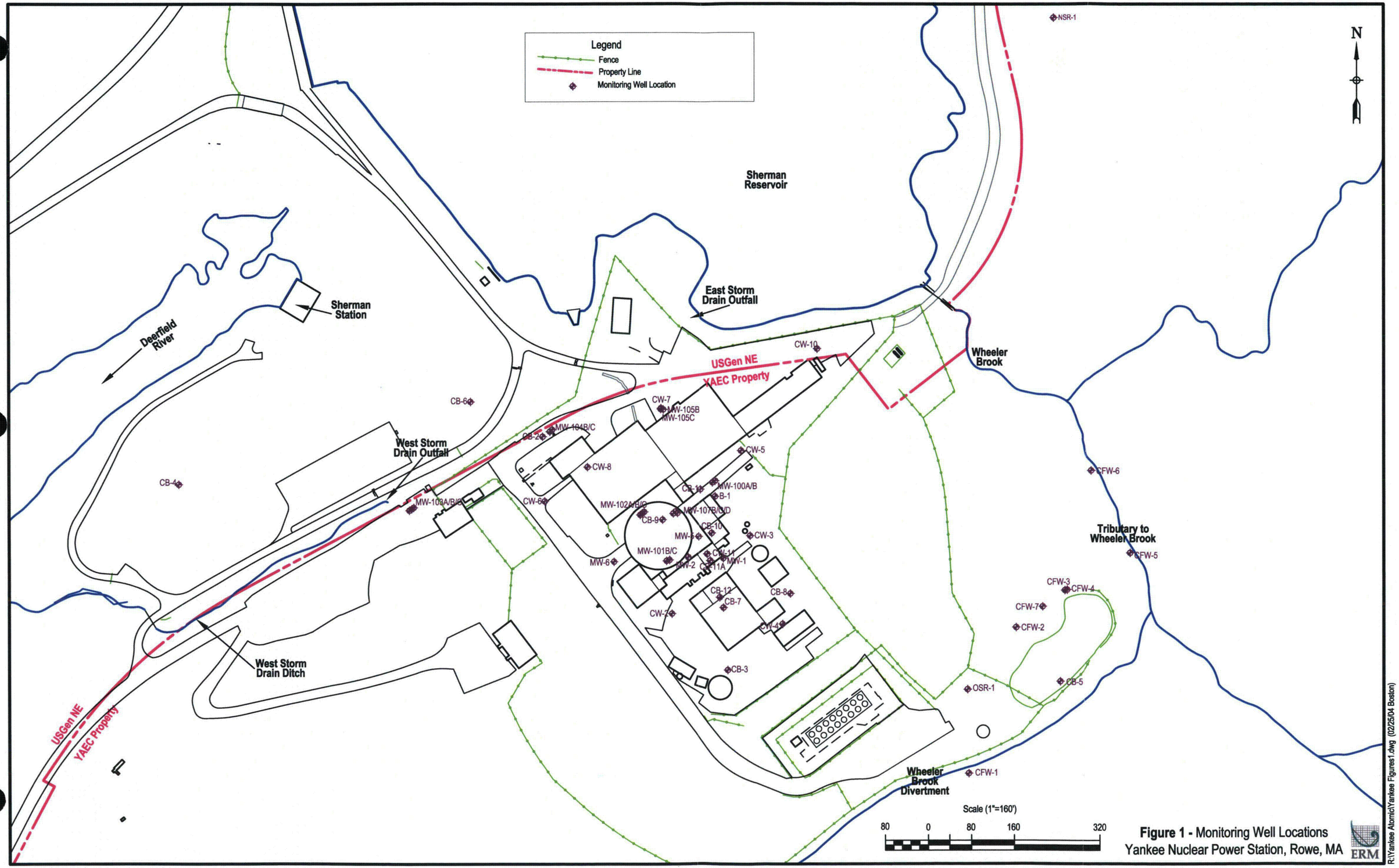


Figure 1 - Monitoring Well Locations
Yankee Nuclear Power Station, Rowe, MA

Appendix D

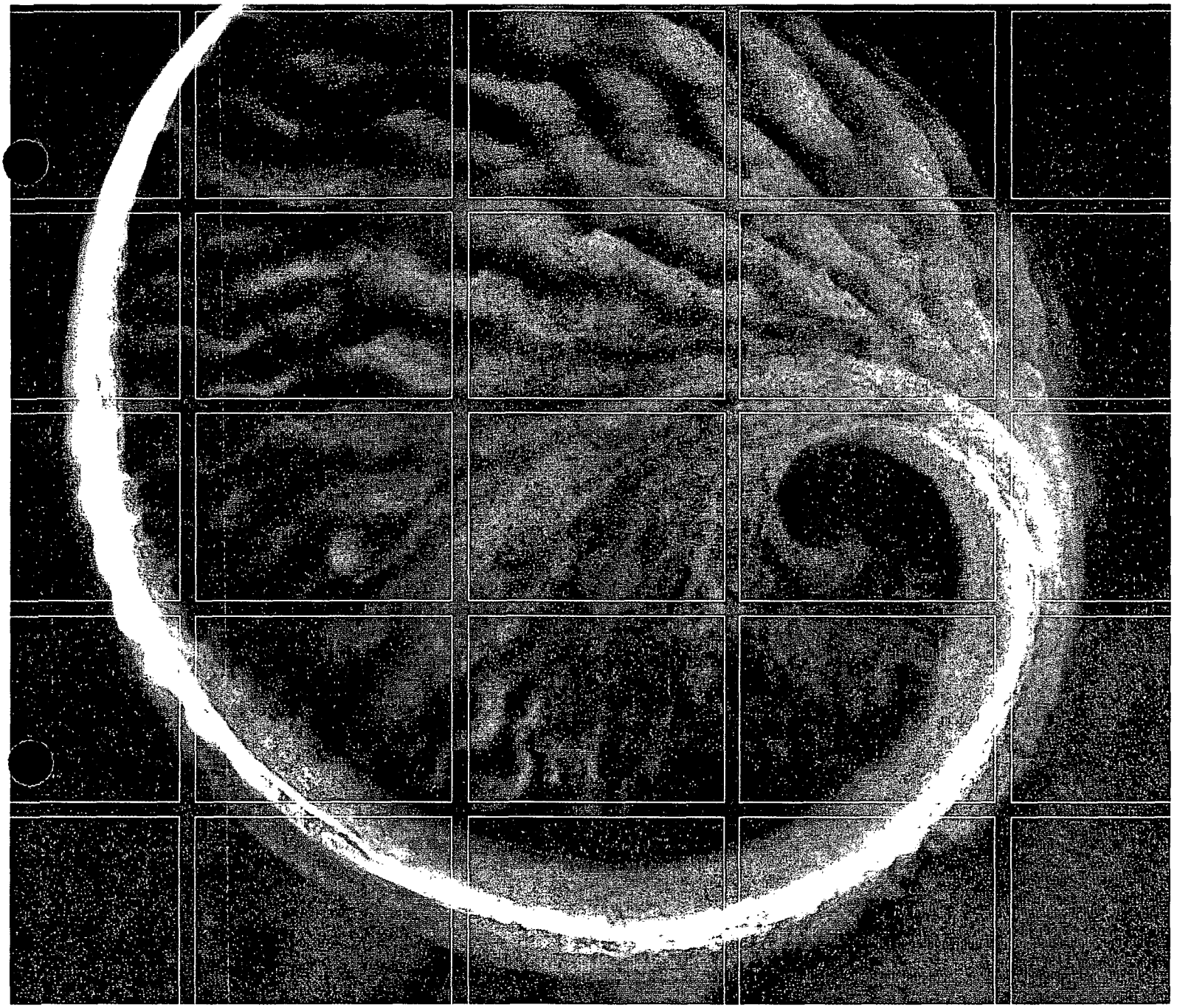
Table D-1

Table D-1
Summary of 2003 Sediment Sampling Program
Yankee Nuclear Power Station
Rowe, MA

Sample Designation	Depth Interval (inches)	Dist. from Shore (feet)	VOC	SVOC	PCB	DRO	GRO	PP13 Metals*	Boron, Lithium	Hydrazine	TOC
Sherman Reservoir											
SD-008-00-04-1	0-4	25			X	X		X	X	X	
SD-009-00-04-1	0-4	25			X	X		X			
SD-012-00-04-1	0-4	25			X	X		X			
SD-015-00-04-1	0-4	25			X	X		X			
SD-018-00-04-1	0-4	25			X	X		X			
SD-022-00-04-1	0-4	25			X	X		X			
MS/MSD 02 SD-022-00-04-1	0-4	25			X	X		X			
SD-025-00-04-1	0-4	25			X	X		X			
SD-028-00-04-1	0-4	25			X	X		X			
SD-030-00-04-1	0-4	25			X	X		X			
SD-002-00-04-1	0-4	50	X	X	X	X	X	X	X	X	X
SD-002-12-18-1	12-18	50	X	X	X	X	X	X	X	X	X
SD-011-00-04-1	0-4	50	X	X	X	X	X	X			
SD-011-12-18-1	12-18	50	X	X	X	X	X	X			
SD-014-00-04-1	0-4	50	X	X	X	X	X	X			
SD-014-12-18-1	12-18	50	X	X	X	X	X	X			
SD-017-00-04-1	0-4	50	X	X	X	X	X	X			
SD-017-12-18-1	12-18	50	X	X	X	X	X	X			
SD-021-00-04-1	0-4	50	X	X	X	X	X	X			
SD-021-08-14-1	12-18	50	X	X	X	X	X	X			
DUP 02 SD-021-08-14-1	12-18	50	X	X	X	X	X	X			
SD-024-00-04-1	0-4	50	X	X	X	X	X	X			
SD-024-12-18-1	12-18	50	X	X	X	X	X	X			
SD-027-00-04-1	0-4	50	X	X	X	X	X	X			
SD-027-12-18-1	12-18	50	X	X	X	X	X	X			
SD-029-00-04-1	0-4	50	X	X	X	X	X	X			
SD-029-12-18-1	12-18	50	X	X	X	X	X	X			
SD-004-00-04-1	0-4	100			X	X		X	X	X	
SD-010-00-04-1	0-4	100			X	X		X			
SD-013-00-04-1	0-4	100			X	X		X			
SD-016-00-04-1	0-4	100			X	X		X			
SD-019-00-04-1	0-4	100			X	X		X			
SD-020-00-04-1	0-4	100			X	X		X			
SD-023-00-04-1	0-4	100			X	X		X			
SD-026-00-04-1	0-4	100			X	X		X			X
SD-031-00-04-1	0-4	200			X	X		X			
SD-032-00-04-1	0-4	200			X	X		X			
SD-033-00-04-1	0-4	200			X	X		X			X
SD-034-00-04-1	0-4	200			X	X		X			
SD-035-00-04-1	0-4	200			X	X		X			
SD-036-00-04-1	0-4	200			X	X		X			
SD-037-00-04-1	0-4	200			X	X		X			
SD-038-00-04-1	0-4	500			X	X		X			
SD-039-00-04-1	0-4	500			X	X		X			X
SD-040-00-04-1	0-4	500			X	X		X			
SD-041-00-04-1	0-4	500			X	X		X			
Wheeler Brook											
SD-101-00-04-1	0-4	NA	X	X	X	X	X	X			X
SD-102-00-04-1	0-4	NA	X	X	X	X	X	X			
SD-103-00-04-1	0-4	NA	X	X	X	X	X	X			X
SD-104-00-04-1	0-4	NA	X	X	X	X	X	X			
SD-105-00-04-1	0-4	NA	X	X	X	X	X	X			
SD-106-00-04-1	0-4	NA	X	X	X	X	X	X			
Deerfield River											
SD-201-00-04-1	0-4	NA	X	X	X	X	X	X			X
MS/MSD 04 DUP 04 SD-202-00-04-1	0-4	NA	X	X	X	X	X	X			
SD-203-00-04-1	0-4	NA	X	X	X	X	X	X			X
SD-204-00-04-1	0-4	NA	X	X	X	X	X	X			
SD-205-00-04-1	0-4	NA	X	X	X	X	X	X			
SD-206-00-04-1	0-4	NA	X	X	X	X	X	X			
West Storm Drain											
SD-301-00-04-1	0-4	NA	X	X	X	X	X	X			
SD-302-00-04-1	0-4	NA	X	X	X	X	X	X			
SD-303-00-04-1	0-4	NA	X	X	X	X	X	X			
SD-304-00-04-1	0-4	NA	X	X	X	X	X	X			X
DUP 03 SD-304-00-04-1	0-4	NA	X	X	X	X	X	X			X
SD-305-00-04-1	0-4	NA	X	X	X	X	X	X			X
Background - Sherman Reservoir											
SD-401-00-04-1	0-4	NA	X	X	X	X	X	X			X
MS/MSD 03 SD-401-00-04-1	0-4	NA	X	X	X	X	X	X			X
SD-402-00-04-1	0-4	NA	X	X	X	X	X	X			
SD-403-00-04-1	0-4	NA	X	X	X	X	X	X			X
SD-404-00-04-1	0-4	NA	X	X	X	X	X	X			
SD-405-00-04-1	0-4	NA	X	X	X	X	X	X			
SD-406-00-04-1	0-4	NA	X	X	X	X	X	X			
TOTAL			42	42	71	71	42	71	4	4	15

Notes:
* Chromium species were identified if total chromium was detected.

Sediment Field Sampling Plan



Final

Sediment Field Sampling Plan

Yankee Nuclear Power Station
49 Yankee Road
Rowe, Massachusetts

August 2003

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Sediment Field Sampling Plan

August 2003

0002107

49 Yankee Road
Rowe, Massachusetts

John W. McTigue, P.G., LSP

Principal-in-Charge

Gregg A. Demers, P.E., LSP

Project Manager

Environmental Resources Management
399 Boylston Street, 6th Floor
Boston, Massachusetts 02116
T: 617-267-8377
F: 617-267-6447

TABLES

FIGURES

APPENDICES

1.0 INTRODUCTION

1.1 BACKGROUND

On behalf of Yankee Atomic Electric Company (Yankee), Environmental Resources Management (ERM) has prepared this Sediment Field Sampling Plan (FSP) for the Yankee Nuclear Power Station (YNPS) located at 49 Yankee Road in Rowe, Massachusetts (Figure 1). The FSP has been prepared as a supplement to the *Draft Quality Assurance Project Plan, Site Closure, Yankee Nuclear Power Station, Rowe, Massachusetts*. The FSP outlines the approach and methods for characterizing sediment quality at the site as part of the overall site closure program. Other media-specific FSPs will be prepared as the site closure activities proceed. This FSP addresses non-radiological sediment characterization activities. Radiological characterization of sediments is not planned at this time.

1.2 PURPOSE & SCOPE

The purpose of the Sediment FSP is to:

- establish the procedures and rationale for sediment sampling activities in support of site closure;
- ensure that sediment sampling data are consistent with applicable procedures;
- ensure that the Data Quality Objectives (DQOs) for site closure are met; and
- support the site characterization and closure activities.

Sediment sampling for polychlorinated biphenyls (PCBs) has been performed as part of the assessment of a release of PCB-containing paint chips. Two areas of sediment are currently targeted for remediation based on the assessment activities (see Figure 1). The data generated under the FSP will be used to assess the potential for impact to sediment by oil or hazardous materials beyond the proposed remedial areas where there are no current plans for remediation.

The data generated under the FSP will be validated and input into the site database. The results from the sampling round will be used in conjunction with Data Usability reports that are being prepared regarding the historic data to determine the need for, and scope of, future sediment

sampling events. The data will also be used to support human health and ecological risk assessments that will be prepared as part of the site closure program.

The scope of the Sediment FSP includes sampling of sediments in Sherman Reservoir, Wheeler Brook, West Storm Drain, and the Deerfield River (see Table 1 for a summary of sediment sampling locations).

2.0 SEDIMENT SAMPLING PROGRAM

2.1 STANDARD OPERATING PROCEDURES

YNPS Standard Operating Procedures (SOPs) applicable to the sediment investigation include:

- DP-8124 Collection of Pond Sediment Samples for Site Characterization
- DP-8123 Sample Security and Chain of Custody
- DP-8120 Collection of Site Characterization and Site Release Samples

Appendix A contains the YNPS SOPs applicable to this FSP.

2.2 SAMPLE LOCATIONS AND DESIGNATIONS

A list of locations to be sampled for sediment is provided in Table 1. The sediment sample locations are shown in Figure 1 and background locations are shown in Figure 2.

The sampling program was developed based on the location of the YNPS National Pollution Elimination System (NPDES) outfall locations and site topography. As shown in Figure 1, YNPS has three NPDES outfall locations:

Outfall	*Processes*	*Receiving Body*
003/005	Stormwater from eastern portion of YNPS	Sherman Reservoir
001/010	Discharge from circulating water system and service water system	Sherman Reservoir
002/004	Stormwater from western portion of YNPS	West Storm Drain

As noted in Section 1.2, areas that are currently targeted for sediment remediation due to the release of PCB-containing paint chips are shown in Figure 1. Since it is expected that those areas will be excavated, they were excluded from the sediment characterization program.

Within Sherman Reservoir, sediment cores will be collected to a depth of 18 inches. The sediment samples will be collected at five intervals from

the shoreline: 25 feet, 50 feet, 100 feet, 200 feet, and 500 feet. A sample will be submitted for analysis from the 0 to 4 inch interval from each location. A sample will also be collected for analysis at a depth of 12 to 18 inches along the 50-foot transect. The remaining core samples will be stored in a freezer at YNPS, pending the results of the initial round of analyses.

Six background samples will be collected from the northern end of Sherman Reservoir in depositional areas. A sample will be submitted for analysis from the 0 to 4 inch interval from each location. Approximate sample locations are shown on Figure 2, but may be adjusted based on field observations.

Within Wheeler Brook, six surficial sediment samples will be collected to assess sediment quality upstream and downstream of the Southeast Construction Fill Area. Within the West Storm Drain, five surficial samples will be collected approximately every 100 feet. Within the Deerfield River, six surficial samples will be collected from depositional areas. The Deerfield River samples will be collected both upstream and downstream of the discharge point of the West Storm Drain. Surface sediment samples will be collected for analysis from 0 to 4 inches in Wheeler Brook, the West Storm Drain, and the Deerfield River.

The sediment samples will be identified using unique sample identification. The sample designations will use the naming convention as detailed in the YNPS QAPP. The sample designations for the sediment sampling program are detailed in Table 1.

2.3 *SAMPLING PROCEDURES*

2.3.1 *Boat Sampling*

Sediment samples in Sherman Reservoir will be collected under ERM's oversight by TG&B Marine Services of Falmouth, MA. Samples will be collected in compliance with YNPS Procedure *DP-8124 Collection of Pond Sediment Samples for Site Characterization*. A boat-mounted Vibracore System will be used to direct push or vibrate the core sampler into the sediment. The core sampler consists of a two-foot stainless steel casing with a removable two-inch diameter polycarbonate sleeve. A plug is placed at the top of the polycarbonate sleeve to prevent sediment from extending above the sleeve height. After coring, the sleeve is removed from the casing, capped, labeled, and brought to shore for sampling. On shore, the portion of the core to be sampled will be extracted and the remaining core will be capped, placed in a sealed plastic bag, and stored

in a freezer at YNPS. The portion of the core to be submitted for laboratory analysis will be cut open to visually inspect and classify the sediment stratigraphy. Visual observations will be logged on sediment sampling forms.

Dedicated sampling equipment will be used where feasible. Reused sampling equipment will be decontaminated prior to, and following, sample collection in accordance with the YNPS QAPP.

2.3.2 *Manual Sampling*

Sediment samples will be collected manually from the Wheeler Brook, the West Storm Drain, and the Deerfield River. Samples will be collected in compliance with YNPS Procedure *DP-8120 Collection of Site Characterization and Site Release Samples*. A stainless steel trowel and/or hand auger will be used to obtain each sediment sample from a depth of 0 to 4 inches. Sampling will be performed at downstream locations first, working upstream to reduce the potential for suspended sediments to impact the sample results. Field observations, including sampling location descriptions, will be recorded in a field logbook.

2.4 *ANALYTICAL PROGRAM*

2.4.1 *Non-radiological Parameters*

The sediment analytical program is summarized in Table 1. The analytical parameters were selected based on the types of chemicals used at the plant as outlined in the QAPP. In the vicinity of Outfall 001/010, the list of compounds was expanded to include chemicals associated with the operation of the cooling water system (e.g., boron, lithium, and hydrazine).

The sediment investigation will include the analysis of sediment samples for the following non-radiological parameters:

- Volatile Organic Compounds (VOCs) by GC/MS, SW-846 Method 8260B (both low-level, deionized water-preserved, and medium-level, methanol preserved, sediment samples will be collected at each sample location in accordance with SW846 Method 5035 VOC sampling procedures;
- Semi-Volatile Organic Compounds (SVOCs) by GC/MS, SW-846 Method 8270C;
- Polychlorinated Biphenyls (PCBs) by GC, SW-846 Method 8082;

- Diesel Range Organics (DRO) by GC, SW-846 Method 8015B
- Gasoline Range Organics (GRO) by GC, SW-846 Method 8015B
- Priority Pollutant 13 Metals (PP13) Metals by SW-846 6010B and 7000 Series (for antimony, arsenic, lead, selenium, and thallium). Chromium species will be identified for detections;
- Boron and Lithium by SW-846 6010B;
- Hydrazine by Ion Chromatography (IC); and
- Total Organic Carbon

Northeast Laboratory Services, located in Waterville, Maine, will conduct the majority of the non-radiological analyses. Severn Trent Laboratory (STL)-Denver will perform the hydrazine analyses, and STL-Connecticut will perform TOC analyses.

2.4.2 *Radiological Parameters*

Yankee personnel will screen sediment samples on-site in accordance with YNPS screening procedures. Laboratory analysis for radiological constituents will not be performed on the sediment samples.

2.5 *SAMPLE SECURITY AND CUSTODY*

Sediment samples will be submitted to the laboratory under proper chain-of-custody procedures. Samples will be preserved on ice or in a refrigerator and sample handling will be documented using chain-of-custody protocols in accordance with *DP-8123, Sample Security and Chain of Custody.*

2.6 *MANAGEMENT OF INVESTIGATION DERIVED WASTES*

Sediment sampling waste will be containerized on-site. The wastes will be screened for radiological constituents. Following screening YNPS personnel will dispose of the wastes in accordance with the applicable YNPS procedures.

2.7 *SCHEDULE*

The sediment-sampling program is scheduled to begin on 12 August 2003. The completion schedule for the sampling activities is dependent on field

conditions, but is scheduled to be completed within two weeks of commencement.

3.0 QUALITY ASSURANCE AND QUALITY CONTROL

3.1 QUALITY ASSURANCE PROJECT PLAN

A QAPP has been prepared to provide a standard method of assuring that data collected during site characterization activities is of sufficient quality to support future decisions regarding decommissioning activities and or remedial actions at the site. The primary purpose of the QAPP is to describe the means by which data collected in the field will be validated against predetermined standards, ensuring that data meets minimum quality standards prior to being used for decision-making purposes. The flow of data is important to data quality, as it ensures that appropriate project personnel have adequate opportunities to review data with importance to future site decisions. As such, the QAPP specifies the methods and means for ensuring the data generated during site characterization activities is of a quality necessary to serve its intended purpose.

The following provides a list of the sections of the QAPP that are most relevant to the field sampling activities:

QAPP Section	*Topic*
9.1	Field Investigation and Documentation Procedures
9.2	Preparation of Sample Containers
9.3	Decontamination
9.4	Field Equipment Usage and Maintenance
10.1	Sample Tracking System
10.2	Sample Custody
13.1	Field Quality Control

3.2 CLEANING AND DECONTAMINATION OF EQUIPMENT

To the degree possible, dedicated and/or disposable sampling equipment will be used for sampling. Non-dedicated sampling equipment used to collect samples will be cleaned and decontaminated prior to its initial use, between each sampling location and after the final use. The following

general procedures will be adhered to concerning decontamination efforts:

1. If visual signs such as discoloration indicate that decontamination was insufficient, the equipment will again be decontaminated. If the situation persists, the equipment will be taken out of service until the situation can be corrected.

2. Verification of the non-dedicated sampling equipment cleaning procedures will be documented by the collection of field equipment rinsate blanks, at a frequency in accordance with the QAPP.

3. Properly decontaminated equipment will be stored in aluminum foil or plastic bags during storage and transport.

Decontamination protocols will be strictly adhered to in order to minimize the potential for cross-contamination between sampling locations and contamination of off-site areas. Liquids generated during the decontamination process will be collected, containerized and appropriately labeled for disposal. Waste liquids will be stored on site until determination of potential hazard class and final disposition.

Only pre-cleaned laboratory-certified sample containers will be used. The laboratories will also provide sample coolers, ice packs, trip blanks, and temperature blanks.

More specific decontamination procedures are outlined in the QAPP and SOPs.

3.3 *QUALITY ASSURANCE / QUALITY CONTROL SAMPLES*

The following Quality Assurance / Quality Control samples will be collected during the sediment sampling:

- Trip blanks – At least one trip blank per cooler containing VOC or GRO samples (a minimum of one trip blank per 20 samples). Separate trip blanks will be prepared and analyzed for low-level (deionized water-preserved) 8260B VOCs, medium-level (methanol preserved) 8260B VOCs, and GRO.
- Temperature blanks – One temperature blank per cooler. The temperature of the trip blank will be measured upon receipt of the cooler at the laboratory.

- Equipment rinsate blank – The majority of sediment samples will be collected using dedicated sampling equipment. However, manual sampling will be conducted using a stainless steel trowel. A rinsate sample will be collected from the stainless steel trowel at a rate of one sample per 20 sampling locations. The rinsate blanks will be analyzed for the same parameters as the samples that were collected using the equipment. Due to the short (48 hour) holding time for aqueous hydrazine analysis, samples will be sent directly to STL-Denver via overnight carrier so that the samples may be extracted as soon as possible following sampling.

- Field duplicates – Field duplicates will be collected at the rate of one duplicate per 20 samples. Samples locations where duplicates will be collected are listed in Table 1. Field duplicates will be submitted for the same analyses as the actual sample.

- Matrix spikes – Matrix spikes will be collected at the rate of one matrix spike per 20 samples. Samples locations where matrix spikes will be collected are listed in Table 1. Matrix spike/matrix spike duplicates (MS/MSDs) will be collected for organic parameters. Matrix spike/matrix duplicates (MS/MD) will be collected for inorganic and wet chemistry analyses.

Data management tasks pertinent to project documentation and records, laboratory deliverables, data reporting formats, data handling and management, and data review assessment are presented in the QAPP.

The following field sample collection records will be completed at the time of sample collection:

- Field logbook
- Sediment sampling field logs
- Chain of custody forms
- Shipping records (airbills), if any
- Telephone logs, as appropriate

The project documentation will be provided to the Yankee Environmental Oversight Supervisor at the completion of each sampling event. In addition, any deviations from the FSP will be documented in a memorandum to the Yankee Environmental Oversight Supervisor.

Tables

Table 1 - Sediment Analytical Program
Field Sampling Plan
Yankee Nuclear Power Station
Rowe, MA

Field Sample ID	Depth Interval (in)	Dist. from Shore (ft)	VOC	SVOC	PCB	DRO	GRO	PP13 Metals*	Boron, Lithium*	Hydrazine	TOC
Sherman Reservoir											
SD- 003 00 04 1	0-4	25			X	X		X	X	X	X
Dup 01 SD- 003 00 04 1	0-4	25			X	X		X	X	X	X
SD- 006 00 04 1	0-4	25			X	X		X	X	X	
SD- 008 00 04 1	0-4	25			X	X		X	X	X	
SD- 009 00 04 1	0-4	25			X	X		X			
SD- 012 00 04 1	0-4	25			X	X		X			
SD- 015 00 04 1	0-4	25			X	X		X			
SD- 018 00 04 1	0-4	25			X	X		X			
SD- 022 00 04 1	0-4	25			X	X		X			
MS/MSD 02 SD- 022 00 04 1	0-4	25			X	X		X			
SD- 025 00 04 1	0-4	25			X	X		X			
SD- 028 00 04 1	0-4	25			X	X		X			
SD- 030 00 04 1	0-4	25			X	X		X			
SD- 002 00 04 1	0-4	50	X	X	X	X	X	X	X	X	X
SD- 002 12 18 1	12-18	50	X	X	X	X	X	X	X	X	X
SD- 005 00 04 1	0-4	50	X	X	X	X	X	X	X	X	
SD- 005 12 18 1	12-18	50	X	X	X	X	X	X	X	X	
SD- 007 00 04 1	0-4	50	X	X	X	X	X	X	X	X	
SD- 007 12 18 1	12-18	50	X	X	X	X	X	X	X	X	
SD- 011 00 04 1	0-4	50	X	X	X	X	X	X			
SD- 011 12 18 1	12-18	50	X	X	X	X	X	X			
SD- 014 00 04 1	0-4	50	X	X	X	X	X	X			
SD- 014 12 18 1	12-18	50	X	X	X	X	X	X			
SD- 017 00 04 1	0-4	50	X	X	X	X	X	X			
SD- 017 12 18 1	12-18	50	X	X	X	X	X	X			
SD- 021 00 04 1	0-4	50	X	X	X	X	X	X			
SD- 021 12 18 1	12-18	50	X	X	X	X	X	X			
Dup 02 SD- 021 12 18 1	12-18	50	X	X	X	X	X	X			
SD- 024 00 04 1	0-4	50	X	X	X	X	X	X			
SD- 024 12 18 1	12-18	50	X	X	X	X	X	X			
SD- 027 00 04 1	0-4	50	X	X	X	X	X	X			
SD- 027 12 18 1	12-18	50	X	X	X	X	X	X			
SD- 029 00 04 1	0-4	50	X	X	X	X	X	X			
SD- 029 12 18 1	12-18	50	X	X	X	X	X	X			
SD- 001 00 04 1	0-4	100			X	X		X	X	X	
MS/MSD 001 SD- 001 00 04 1	0-4	100			X	X		X	X	X	
SD- 004 00 04 1	0-4	100			X	X		X	X	X	
SD- 010 00 04 1	0-4	100			X	X		X			
SD- 013 00 04 1	0-4	100			X	X		X			
SD- 016 00 04 1	0-4	100			X	X		X			
SD- 019 00 04 1	0-4	100			X	X		X			
SD- 020 00 04 1	0-4	100			X	X		X			
SD- 023 00 04 1	0-4	100			X	X		X			

Table 1 - Sediment Analytical Program
Field Sampling Plan
Yankee Nuclear Power Station
Rowe, MA

Field Sample ID	Depth Interval (in)	Dist. from Shore (ft)	VOC	SVOC	PCB	DRO	GRO	PP13 Metals*	Boron, Lithium	Hydrazine	TOC
SD- 026 00 04 1	0-4	100			X	X		X			X
SD- 031 00 04 1	0-4	200			X	X		X			
SD- 032 00 04 1	0-4	200			X	X		X			
SD- 033 00 04 1	0-4	200			X	X		X			X
SD- 034 00 04 1	0-4	200			X	X		X			
SD- 035 00 04 1	0-4	200			X	X		X			
SD- 036 00 04 1	0-4	200			X	X		X			
SD- 037 00 04 1	0-4	200			X	X		X			
SD- 038 00 04 1	0-4	500			X	X		X			
SD- 039 00 04 1	0-4	500			X	X		X			X
SD- 040 00 04 1	0-4	500			X	X		X			
SD- 041 00 04 1	0-4	500			X	X		X			
Wheeler Brook											
SD- 101 00 04 1	0-4	NA	X	X	X	X	X	X			X
SD- 102 00 04 1	0-4	NA	X	X	X	X	X	X			
SD- 103 00 04 1	0-4	NA	X	X	X	X	X	X			X
SD- 104 00 04 1	0-4	NA	X	X	X	X	X	X			
SD- 105 00 04 1	0-4	NA	X	X	X	X	X	X			
SD- 106 00 04 1	0-4	NA	X	X	X	X	X	X			
Deerfield River											
SD- 201 00 04 1	0-4	NA	X	X	X	X	X	X			X
SD- 202 00 04 1	0-4	NA	X	X	X	X	X	X			
SD- 203 00 04 1	0-4	NA	X	X	X	X	X	X			X
SD- 204 00 04 1	0-4	NA	X	X	X	X	X	X			
SD- 205 00 04 1	0-4	NA	X	X	X	X	X	X			
SD- 206 00 04 1	0-4	NA	X	X	X	X	X	X			
West Storm Drain											
SD- 301 00 04 1	0-4	NA	X	X	X	X	X	X			X
DUP 03 SD- 301 00 04 1	0-4	NA	X	X	X	X	X	X			X
SD- 302 00 04 1	0-4	NA	X	X	X	X	X	X			
SD- 303 00 04 1	0-4	NA	X	X	X	X	X	X			X
SD- 304 00 04 1	0-4	NA	X	X	X	X	X	X			
SD- 305 00 04 1	0-4	NA	X	X	X	X	X	X			
Background - Sherman Reservoir											
SD- 401 00 04 1	0-4	NA	X	X	X	X	X	X			X
MS/MSD 03 SD- 401 00 04 1	0-4	NA	X	X	X	X	X	X			X
SD- 402 00 04 1	0-4	NA	X	X	X	X	X	X			
SD- 403 00 04 1	0-4	NA	X	X	X	X	X	X			X
SD- 404 00 04 1	0-4	NA	X	X	X	X	X	X			
SD- 405 00 04 1	0-4	NA	X	X	X	X	X	X			
SD- 406 00 04 1	0-4	NA	X	X	X	X	X	X			
TOTAL			46	46	80	80	46	80	13	13	17

* Chromium species will be identified if total chromium is detected.

Legend
- Fence
- Property Line
- 2 Foot Contour
- 10 Foot Contour
- Edge of Water/Stream
- Areas Targeted for Sediment Remediation
- Proposed Sediment Sample

N

Re-Number Sample IDs

Sherman Reservoir

Reservoir

Culvert

Outfall 001/010

Outfall 002/004

Outfall 003/005

PG&E Property

Yankee Atomic Electric Company Property

Wheeler Brook

Wheeler Brook Divertment

Scale (1"=80')
40 0 20 40 80 160

Figure 1 - Proposed Sediment Sample Locations
Yankee Nuclear Power Station - Rowe, MA

ERM

Table 2 - Sediment Analytical Program Bottle Requirements
Field Sampling Plan
Yankee Nuclear Power Station
Rowe, MA

Locations	Parameter	Sample Container	Preservation	Holding Time
SD-011, SD-014, SD-017, SD-021, SD-024, SD-027, SD-029, Dup 02, SD-102, SD-104, SD-105, SD-106, SD-202, SD-204, SD-205, SD-206, SD-302, SD-304, SD-305, SD-402, SD-404, SD-405, SD-406	Volatile Organics	(5) VOA vials	4 °C, 3 with H20 and stirring bar, 1 with MeOH, 1 unpreserved	14 days
	TPH-Gasoline	(1) VOA vials	4 °C/5 mL MeOH	14 days
	TPH-DRO			14 days/40 days
	PCBs	(1) 8 oz soil jar	4 °C	14 days/40 days
	Semivolatile Organics			14 days/40 days
	PP(13) Metals			28 days/6 months
SD-101, SD-103, SD-201, SD-203, SD-301, Dup 03, SD-303, SD-401, MS/MSD-03, SD-403	Volatile Organics	(5) VOA vials	4 °C, 3 with H20 and stirring bar, 1 with MeOH, 1 unpreserved	14 days
	TPH-Gasoline	(1) VOA vials	4 °C/5 mL MeOH	14 days
	TOC	(1) 4 oz soil jar	4 °C	14 days
	TPH-DRO			14 days/40 days
	PCBs	(1) 8 oz soil jar	4 °C	14 days/40 days
	Semivolatile Organics			14 days/40 days
	PP(13) Metals			28 days/6 months
SD-005, SD-007	Volatile Organics	(5) VOA vials	4 °C, 3 with H20 and stirring bar, 1 with MeOH, 1 unpreserved	14 days
	TPH-Gasoline	(1) VOA vials	4 °C/5 mL MeOH	14 days
	Hydrazine	(1) 4oz soil jar	4 °C	None/48 hours
	TPH-DRO			14 days/40 days
	PCBs	(1) 8 oz soil jar	4 °C	14 days/40 days
	Semivolatile Organics			14 days/40 days
	PP(13) Metals (plus boron and lithium)			28 days/6 months

Note:

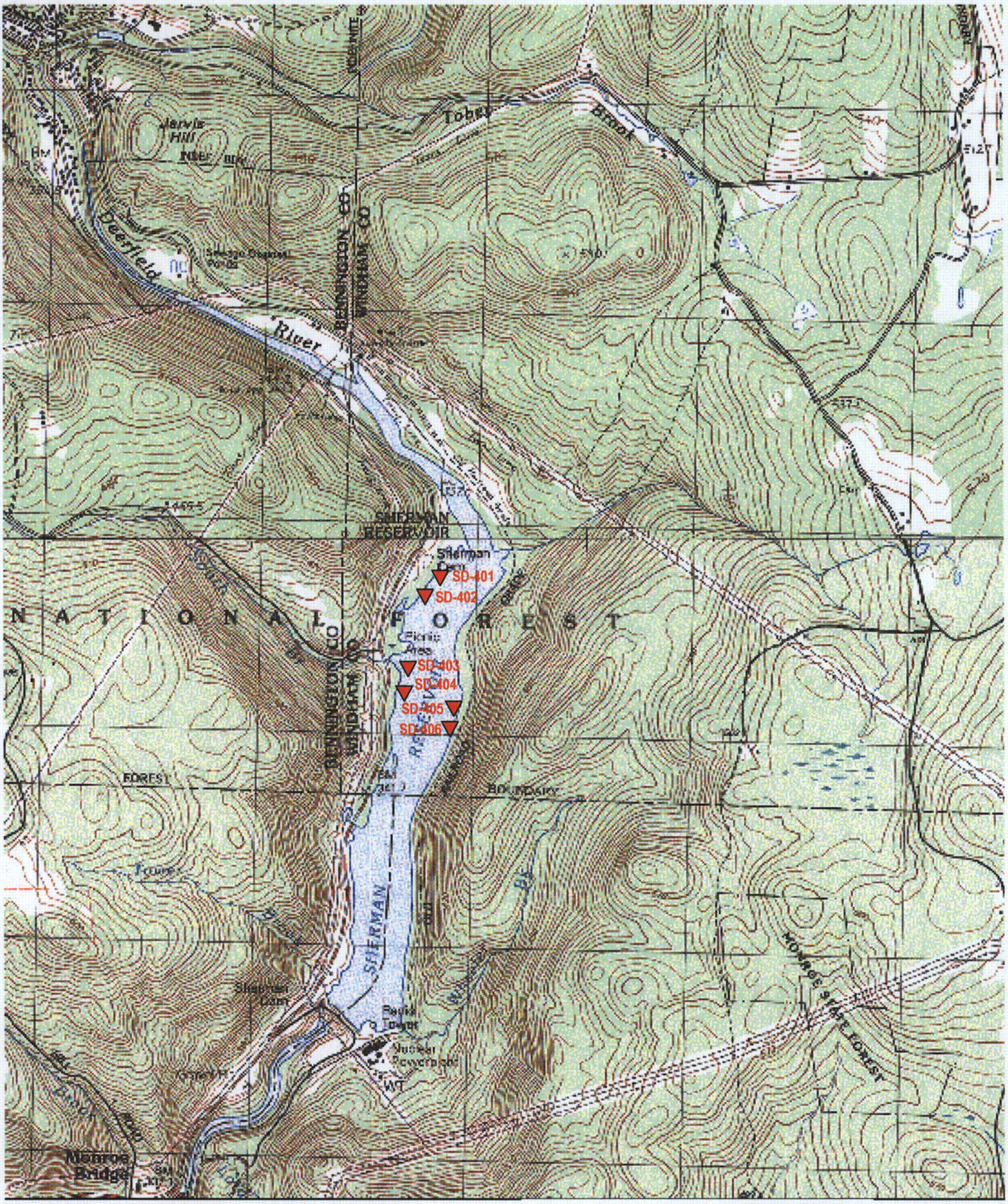
For each VOA soil sample, please add 5 grams of soil (1 terracore) to each of three vials preserved with H20 and 1 vial preserved with MeOH. Also please fill one unpreserved VOA vial for Total solids

For each TPH-GRO soil sample, please add 5 grams of soil (1 terracore) to 1 vial preserved with MeOH. The total solids for these samples will be taken from the 8 oz soil jar.

Table 2 - Sediment Analytical Program Bottle Requirements
Field Sampling Plan
Yankee Nuclear Power Station
Rowe, MA

Locations	Parameter	Sample Container	Preservation	Holding Time
SD-003	PCB	(1) 8 oz soil jar	4 °C	14 days/40 days
Dup-01	DRO			14 days/40 days
SD-001	PP 13 Metals (plus Boron and Lithium)	(1) 250 ml poly		28 days/6 months
SD-004	Hydrazine	(1) 4 oz soil jar		none/48 hours
	TOC	(1) 1 oz soil jar		14 days
SD-006	PCB	(1) 8 oz soil jar	4 °C	14 days/40 days
SD-008	DRO			14 days/40 days
	PP 13 Metals (plus Boron and Lithium)	(1)250 ml poly		28 days/6 months
	Hydrazine	(1)4 oz soil jar		none/48 hours
SD-009, SD-012, SD-015, SD-018, SD-022, MS/MSD- 02, SD-025, SD-028, SD-030, SD-010, SD-013, SD-016, SD-019, SD-020, SD-023, SD-031, SD-032, SD-034, SD-035, SD-036, SD-037, SD-038, SD-040, SD-	PCB	(1) 8 oz soil jar	4 °C	14 days/40 days
	DRO			14 days/40 days
	PP 13 Metals	(1)250 ml poly		28 days/6 months
SD-026, SD-033, SD-039	PCB	(1) 8 oz soil jar	4 °C	14 days/40 days
	DRO			14 days/40 days
	PP 13 Metals	(1)250 ml poly		28 days/6 months
	TOC	(1)4 oz soil jar		14 days
SD-002	Volatile Organics	(5) VOA vials	4 °C, 3 with H20 and stirring bar, 1 with MeOH, 1 unpreserved	14 days
	TPH-Gasoline	(1) VOA vials	4 °C/5 mL MeOH	14 days
	Hydrazine	(1) 4oz soil jar	4 °C	None/48 hours
	TOC	(1) 4 oz soil jar	4 °C	14 days
	TPH-DRO			14 days/40 days
	PCBs	(1) 8 oz soil jar	4 °C	14 days/40 days
	Semivolatile Organics			14 days/40 days
	PP(13) Metals (plus Boron and Lithium)			28 days/6 months

Figures



Legend

▼ Proposed Sediment Sampling Locations

Reference: Topo! Interactive Maps. 1999, Wildflower Production, San Francisco, CA.

Scale 1:25,000

0.5 km 0 500 m

0.5 mi 0 1,000 ft

Figure 2 - Sediment Background Sampling Locations
Yankee Nuclear Power Station - Rowe, MA

ERM

R:\Yankee\Fish and Sediment Sample Locs.fh11 (4-August-2003 Boston)

Appendix A
Sediment Sampling Procedures

DP – 8124

Collection of Pond Sediment Samples for Site Characterization

COLLECTION OF POND SEDIMENT SAMPLES FOR SITE CHARACTERIZATION

SCOPE

To describe a method for collecting sediment samples from the bottom of a pond for purposes of both radiological and non-radiological analyses for YNPS site characterization.

ENCLOSURES

DP-8124 - Pgs. 1-3
DPF-8124.1 - Rev. 3

REFERENCES

1. DP-8123, "Sample Security and Chain of Custody"
2. E-Lab 605 "E-LAB RECORD KEEPING AND RETENTION SAMPLE SUBMISSION FORM RECORDS," Framatome ANP Environmental Lab
3. AP-9601, "YNPS Site Characterization and Site Release QAPP for Non-Radiological Sample Data Quality"
4. AP-0626, "Job Hazard Assessment"

DISCUSSION

Sediment samples are collected as grab samples from the bottom of a pond, and should contain at least one kilogram of soil. Each sample is assigned a unique sample ID number.

The quality control program plan (QAPP) for non-radiological sample data quality is described in reference 3. Quality control measures are an integral part of all activities related to obtaining and testing of samples. These measures are intended to help assure the accuracy of all data. They include but are not limited to the following:

- Implementation of all work based on written procedures
- Activity direction and documentation by Assigned Site Personnel
    - Assigned Site Personnel means Safety Oversight personnel or designee
- Performance of key activities with experienced personnel
- Documentation of work in a permanent, bound field log book
- Prevention of the use of contaminated tools and materials
- Analysis of blind/duplicate samples
- Use of sample analysis labs with QA/QC programs
- Chain-of-custody documentation of samples
- DCC retention of all related documentation of samples

PREREQUISITES

Obtain the equipment/materials needed to perform the required task(s) from the following list prior to starting this procedure:

- Appropriate boat and marine safety equipment for sampling
- Chain of custody forms (DPF-8123.1).

- Permanently bound field logbook.
- Location marking supplies, buoys, line and weights; bright-colored spray paint, stakes, hammer.
- Sampling implement, ponar sampler or equal, or core sampler
- Paint cans (e.g. one gallon), zip-top poly bags (4-mil or thicker), poly core tubes with end caps, or other suitable containers for samples.
- Appropriate survey device to determine sample locations

PROCEDURE

1. Physically locate each sampling point using a depth finder to determine bottom suitability for sampling. If sampling at a location is not done immediately, mark the location with a buoy.
2. Install the appropriate sediment sampling device on the cable line of the winch.
3. Stabilize the boat at the chosen sampling location.
4. Assure proper sampler configuration prior to sampling attempt.
5. Deploy the sampler.
6. Retrieve the sampler and remove sediment sample. Repeat process as needed to obtain one kilogram of sediment, if possible, for each location. The sample may be stored in an appropriate container for shipment to the lab. If zip-top poly bags are used, double-bagging may be required.
7. Segment the sample as needed and place sample material in appropriate containers.
8. Document sample location with appropriate survey technique.
9. Label sample container with:
   - Sample I.D.
   - Date and Time
   - Initials of sampler
10. Record all appropriate information in a Permanently Bound Log Book and later transpose all pertinent information onto the sample log form, DPF-8124.1.
11. Provide a sample description for DPF-8124.1.
12. Prior to taking subsequent samples, rinse all sampling tools clean of sample material with ambient pond water.
13. Prepare chain of custody paper work, per Reference 1, for each sample.
14. Deliver samples to the YNPS Safety Oversight Department for analysis, or arrange for shipment to an alternate lab.
15. For samples submitted to the Framatome ANP Environmental Lab, form E-Lab 605.1 (Reference 2) will be filled out and sent with the samples.
16. Request a gamma isotopic analysis of the samples. Normally these samples will be analyzed to the environmental sediment lower limit of detection.

NOTE: If any of the samples contain plant related radioactivity, contact the Radwaste Coordinator for sample shipment to any off-site laboratory.

FINAL CONDITIONS

1. Collected samples and Chain-of-Custody paperwork have been delivered to the appropriate laboratory in accordance with this procedure.

2. DPF-8124.1 has been completed and filed.

3. For samples submitted to the Framatome ANP Environmental Lab, form E-Lab 605.1 will be filled out and sent with the samples.

YNPS Sediment Sampling Form

Wa[illegible]ody_____ Sampler(s)_____

[illegible]e I.D.	Date/ Time	Location (Description or Coordinates and Water Depth)	Sample Description

DP[illegible]124.1
Re[illegible]3

DP – 8123

Sample Security and Chain of Custody

SAMPLE SECURITY AND CHAIN OF CUSTODY

SCOPE

This procedure addresses sample security and chain of custody for samples collected under the procedures cited in References 1 - 7. This includes collecting radiological or non-radiological samples, site characterization samples, as well as other site samples. The sample security portion applies to all such samples. The chain of custody portions apply only to samples that are analyzed off-site.

ENCLOSURES

DP-8123 - Pgs. 1-6
DPF-8123.1 - Rev. 7

REFERENCES

1. DP-8120, "Collection of Site Characterization and Site Release Samples"

2. DP-8121, "In-Plant Radiological Surveys to Support the Characterization Program"

3. DP-8122, "Subsurface Soil Sampling and Monitoring Well Installation"

4. DP-8124, "Collection of Pond Sediment Samples for Site Characterization"

5. DP-9725, "Potable Water Quality Monitoring"

6. DP-9745, "Ground Water Level Measurement and Sample Collection in Observation Wells"

7. DP-8813, "Sample Receipt and Preparation"

DISCUSSION

To ensure the integrity of a sample and the defensibility of its analytical results, its chain of custody should be documented. For samples analyzed off-site, this is done with the chain of custody form. For samples analyzed at the YNPS site, this is done by logging samples in and out of each on-site facility (see DP-8813). Where a sample is tracked first on one system (e.g., the Sample Log), then on another (e.g., chain of custody form), the sample's custody should be traceable, without any gaps, across both systems.

Also important is to ensure the integrity of the sample's security. Proper security will prevent or minimize sample loss, tampering and inadvertent mishandling.

PROCEDURE

A. Initiation of Chain of Custody Form

1. A Chain of Custody Form (DPF-8123.1) shall be initiated by the sample collector for all site characterization and other site samples that are analyzed offsite. Multiple samples may be included on a single form.

2. The sample collector shall initiate the Chain of Custody Form (DPF-8123.1) at the time of collection. Radiological samples that have been tracked in accordance with DP-8813 [7] may have their Chain of Custody Form initiated just prior to shipment off-site.

3. The sample collector shall fill out DPF-8123.1, and sign and date the form, using the guidance found in Appendix A. Ensure that the information entered on the sample container is the same as that entered on DPF-8123.1.

4. Note the chain of custody form number (found at the top of DPF-8123.1,) in the Field Log Book (if one is used).

5. Once a Chain of Custody Form has been initiated, the original copy of the form shall stay with the sample(s), at least until such time as described in Step B.3.

6. When an additional chain of custody form is to be initiated for a sample that is already on a chain of custody form (e.g., the sample has been split and each aliquot is to be sent to a different analytical laboratory), a notation shall be made in the "Comment" column on each form cross-referencing the two form numbers.

B. Transfer of Sample Custody

NOTE: Relinquishing custody of a sample is not required when the sample is transferred among members within any laboratory or count room, or between Chemistry, HP, or Environmental sample collectors and the site countroom or laboratory analysis.

1. When the sample collector turns the sample over to another individual (e.g., the Safety Oversight Department staff or the YNPS Sample Prep Trailer), that individual shall sign the first "Received by" block, including the date and time of receipt.

2. Each time the sample(s) changes custody, the relinquishing party and the receiving party shall sign and date the form within the next available location.

3. The analytical laboratory shall be instructed to return the white page of the completed Chain of Custody Form (DPF-8123.1) to the contact name on the form along with the analytical results.

4. The completed DPF-8123.1 shall be reviewed and filed by the contact person or his/her designee as part of the data package.

C. Use of Commercial Couriers

1. Just prior to turnover to a commercial courier, relinquish the samples by date and time of shipment and signature on DPF-8123.1.

2. Note in the "Sample Shipped Via" location on DPF-8123.1 the courier utilized if applicable and the Bill of Lading number which is printed at the top of each air bill in bold black numbers.

   NOTE: A "Received By" signature is not required until receipt by the analytical lab.

3. Remove and retain the rear-most carbon copy of DPF-8123.1.

4. Seal the original DPF-8123.1 in the container along with the samples.

5. When the original signed DPF-8123.1 returns from the analytical lab, attach the air bill and file with sample results.

6. The completed DPF-8123.1, with air bill and rear most carbon copy shall be reviewed and filed by the contact person or his/her designee as part of the data package.

D. On-Site Sample Security

1. Following sample collection, the sample collector shall do one of the following, in accordance with the transfer of custody requirements in this procedure:

   - Deliver the sample(s) to an on-site facility (e.g., sample preparation lab or count room);
   - Deliver the sample(s) to an off-site lab (either directly or by turning over to a courier);
   - Store the sample(s) in a secure manner (see below) until the sample(s) is delivered to the on-site sample preparation facility or count room, or until the sample(s) is sent to an off-site laboratory.

2. At any time following field collection, samples must be stored in a secure manner, which shall include one or more of the following:

   - Direct physical control or under direct visual observation by an individual;
   - Storage in a locked container, locked cabinet (e.g., refrigerator),or individual locked transport box (e.g. for concrete cores).
   - Storage in a locked room or building having limited access (e.g., the YNPS Sample Prep Trailer);
   - Tamper evident seal on the sample container. A single tamper evident seal may be used on a single container (e.g., cooler) containing multiple samples.

   NOTE: Smear samples shall be considered secure when loaded on a planchet rack in the Radiation Protection count room. (Tamper evident seals shall not be applied to planchet racks.) All samples shall be considered secure while on a detector in the Radiation Protection or Chemistry count room.

FINAL CONDITIONS

1. Original chain of custody forms (DPF-8123.1) have been completed and filed for all samples as identified in this procedure's "Scope". Ensure completed DPF-8123.1 is transferred to the applicable data package. Commercial courier receipts or bills of lading, if applicable, are also filed.

2. Samples that are on-site are stored in a secure manner.

APPENDIX A

FILLING OUT CHAIN OF CUSTODY FORMS

SCOPE

This appendix describes in detail the proper completion of the Chain of Custody Form (DPF-8123.1). The actual use of the form is described in the body of this procedure (DP-8123).

PROCEDURE

NOTE: All entries shall be made in black ink.

NOTE: Some entries on DPF-8123.1 may not apply to a particular sample. In such cases, an entry of "NA" (i.e., "Not Applicable") is acceptable.

NOTE: Multiple samples may be included on a single Chain of Custody form (DPF-8123.1). Multiple samples may be shipped in a single container with the only tamper evident seal(s) being on the outside of the container.

NOTE: Each chain of custody form has a unique number pre-printed in the upper right hand corner.

A. Fill out the following header information:

1. Project Name - For YNPS purposes, designate YNPS and project type. (Example for Site Characterization "YNPS S.C.")

2. YAEC Contact Name & Phone - Generally the lead or cognizant person. Use at least the first initial and full last name (e.g., "J. Smith, 413-424-XXXX").

3. Analytical Lab - The name of the analytical laboratory, with city and state. (For the Framatome/ANP Environmental Laboratory, Framatome ANP Environmental Lab may be entered (without the city and state).

4. Requested Testing Completion Date - Date to be provided by the lead or cognizant person. If standard turn around times (e.g., two weeks) have been established with outside lab, this may be left blank.

B. For each sample container, fill out each column on form DPF-8123.1. The columns include:

1. Sample Designation - Transcribe the unique sample identification number appearing on the sample container label in the space provided.

2. Date and Time - Transcribe the date (mm/dd/yyyy) and time (hhmm) the sample was collected as it appears on the container label.

3. Media Code - Enter the Media Type code from Table 1

4. Sample Type Code - Enter the Sample Type code from Table 1.

5. Container Size and Type Code - Enter the Container Size, along with the Container Type from Table 1.

   For example: a) a sample for metals analysis collected in an 8-ounce plastic container will be identified as "8 oz P"; b) a sample for radiological analysis collected in a 12"x18" ziplock plastic bag will be identified as "12x18 BP".

6. Analyses Requested - Enter the type of analyses to be performed on each sample. Use as many spaces as needed to indicate all requested analyses for a given sample.

7. Comment, Preservation - Enter any comments as necessary in this section including the preservation method used.

   For example, if the preservation method was acidification, identify the method in this section such as "Acidified pH<2, Nitric Acid," or "Acidified pH<2, HCl." If any sample requires cooling to 4 degrees centigrade, identify the preservation method as "Ice or 4°C".

8. Notes: Enter any other information felt to be pertinent to the collection or custody of the sample(s).

9. Signature Blocks -

   a. Complete the signature blocks as instructed in steps A and B of this procedure.

   b. In situations where a chain of custody form is initiated for an existing sample (For example, see step A.6. of the procedure), the first two signature blocks (#1 and #2) may be left blank.

10. Samples Shipped Via - Check off the method of shipment. If a commercial courier, enter the bill of lading number.

11. Lab Use Only -

NOTE: Instruction should be provided to the offsite analytical laboratory in the proper completion of the Laboratory "Lab Use Only" shaded section.

   a. Comments - made by the laboratory pertinent to the receipt and condition of samples.

   b. Lab Sample ID. - A unique laboratory tracking number.

   c. Internal Container Temp - Obtain on receipt the internal temperature of the sample container.

   NOTE: Instructions should be provided not to obtain temperature from sample media to avoid contamination. A separate temperature blank will be provided in each shipment.

   d. Custody Sealed - Note presence or absence of custody seals.

   e. Custody Seal Intact - Note integrity of custody seals.

TABLE 1

Sample Codes for the Chain of Custody Form (DPF-8123.1)

Media	Code
ground water	WG
surface water	WF
river water	WR
estuary water	WE
sea water	WS
effluent water	EW
soil	TS
sediment	SE
asphalt	AS
vegetation	TG
concrete	CT
smear	SM
other	(specify)

Sample Type	Code
grab	G
composite	C
core	CR
duplicate	D
split	S
field blank	FB
rinsate blank	RB
matrix spike	MS
matrix spike duplicate	MSD
other	(specify)

Container Type	Code
bag, plastic	BP
bag, cloth	BC
plastic	P
glass	G
amber glass	A
vial	V
steel can	SC
other	(specify)

Yankee Atomic Electric Company

49 Yankee Road, Rowe, MA 01367
413-424-5261

Chain of Custody Record

No

Project Name:

YAEC Contact Name & Phone:

Analytical Lab (Name, City, State):

Requested Testing Completion Date:

Sample Designation	Date	Time	Media Code	Sample Type Code	Container Size & Type Code	Analyses Requested						Lab Use Only: Comment, Preservation	Lab Use Only: Lab Sample ID

Lab Use Only

Comments:

NOTES:

Samples Shipped Via:

- ☐ Fed Ex
- ☐ UPS
- ☐ Hand
- ☐ Other _____

_____
Bill of Lading #

Internal Container Temp.: ____ Deg.

Custody Sealed?
Y ☐ N ☐

Custody Seal Intac
Y ☐ N ☐

1) Sampled By	Date/Time	2) Received By	Date/Time
3) Relinquished By	Date/Time	4) Received By	Date/Time
5) Relinquished By	Date/Time	6) Received By	Date/Time
7) Relinquished By	Date/Time	8) Received By	Date/Time

DPF-8123.1
Rev. 7

Adams Specialty & Printing
(413) 743-9101

DP – 8120

Collection of Site Characterization and Site Release Samples

COLLECTION OF SITE CHARACTERIZATION AND SITE RELEASE SAMPLES

SCOPE

To provide instructions for the collection of surface and subsurface soils, shoreline sediments, asphalt and liquids. This procedure also provides instruction for the collection of soil, asphalt and concrete from ongoing or completed excavations, and the decontamination of equipment used to collect the samples. This procedure is intended to be used during the decommissioning period for both radiological and nonradiological site characterization and site release sampling.

Concrete core sampling is addressed in Procedure DP-8121.
Split spoon sampling is addressed in Procedure DP-8122.
Pond sediment sampling is addressed in Procedure DP-8124.
Groundwater monitoring is addressed in Procedure DP-9745.

ENCLOSURES

DP-8120 Pgs. 1-10
Table 1 - Pg. 1 - Rev. 7
Appendix A - Pgs. 1-4 - Rev. 7
Appendix B - Pgs. 1-2 - Rev. 7
DPF-8120.1 - Rev. 7
DPF-8120.2 - Rev. 7

REFERENCES

1. DP-8121, "In-Plant Radiological Surveys to Support the Radiological Characterization Program"
2. DP-8123, "Sample Custody and Control"
3. Deleted
4. EPA/625/12-91/002 "Description and Sampling of Contaminated Soils - A Field Pocket Guide"
5. EPA/600/R-92/128 "Preparation of Soil Sampling Protocols: Sampling Techniques and Strategies"
6. 40 CFR Part 136
7. SW-846, "Test Methods for Evaluating Solid Waste", USEPA 3rd edition, March 1995.
8. OP-8100, "Establishing and Posting Radiological Areas"
9. DP-8813, "Sample Receipt and Preparation"
10. AP-0052, "Radiation Protection Release of Equipment, Material and Vehicles"
11. AP-0227, "Condition Reporting, Investigation and Self Assessment"
12. AP-0221, "Plant Record Management"

DISCUSSION

Environmental samples are collected from surface soils, subsurface soils, sediments, asphalt, and liquids to identify a media's contamination status for site characterization and site release purposes. Soil, asphalt and concrete stock piles will be sampled to determine their final disposition (e.g., soil for back fill or release, asphalt and concrete for free release). The type of sample to be collected (e.g., grab, composite, etc.) and the suite of contaminants for which it will be analyzed should be identified in the field sampling plan. All samples will be prepared for analysis in accordance with DP-8813 [9]. Free release of soil, asphalt and concrete will be in

accordance with AP-0052 [10]. This procedure addresses the steps to collect each type of sample.

Quality control measures will be an integral part of all activities related to obtaining and testing of samples. These measures are intended to help assure the accuracy of all data. They include:

- Implementation of all work based on written procedures
- Direction and documentation of all activities by a cognizant engineer
- Performance of key activities by individuals qualified to carry out such activities
- Precautions to prevent cross-contamination of samples
- Verification of analysis results by an independent laboratory
- Use of analytical laboratories with QA/QC programs
- Chain-of-custody documentation of samples

PRECAUTIONS

1. All samples collected from within the Radiological Control Area (RCA) will be initially handled as if contaminated. A GM frisker will be used to periodically screen equipment and newly-collected samples for gross contamination. If radioactivity is detected above background. Label the sample as "Caution Radioactive Material" in accordance with OP-8100 [8] and take the necessary precautions to prevent the contamination of other samples, equipment or personnel.

2. Latex, nitrile or equivalent gloves shall be worn when handling sample material collected from on site, and when cleaning tools that were used in the collection of those samples. Clean gloves shall be used at each new sampling site.

3. When collecting samples in the RCA, hands and feet should be periodically monitored for contamination with a GM frisker.

4. For safety purposes, holes in concrete floors, soil or asphalt shall be patched or filled as soon as practicable.

5. For major excavations a Job Hazards Checklist will be completed and reviewed with the Safety department.

6. Methanol is flammable, do not use in the presence of open flame or ignition sources.

PREREQUISITES

1. Each tool coming in contact with sampling media or any other potentially contaminated surface must be decontaminated prior to the collection of the next sample.

2. The type of sample being collected will determine which tools and materials are needed. Given below is a list of suggested tools and materials to choose from:

   - Site map
   - Chain of custody forms (DPF-8123.1)
   - Field Log Book
   - Location marking supplies, e.g., spray paint and stakes
   - 50 or 100-foot tape measure
   - Digging implements, e.g., trowel or shovel
   - Soil auger
   - Soil core sampler
   - Sample containers, e.g., "ZipTop" plastic bags or paint cans
   - Plastic bags (approx. 10 gal. size) for vegetation collection
   - Aluminum Foil
   - Hammer drill or demolition tool, with chisel or asphalt bits
   - Hearing and eye protection
   - Leather gloves

- Grass clippers
- Pruning shears
- Indelible pen
- Latex (or equivalent) gloves
- GM frisker

- Equipment cleaning supplies:

  Clean water
  Brushes
  Laboratory grade detergent (such as Alconox)
  Paper towels
  Trash bag for solid waste
  Methanol

- Concrete coring or cutting equipment:

  Drill rig, bits and extensions
  Hilti drill and bits
  Water hose
  Electrical extension cord, w/ GFCI
  Adjustable wrench, hammer
  Hearing and eye protection

PROCEDURE

A. SAMPLING CONTAINERS, PRESERVATION REQUIREMENTS, AND HOLDING TIMES FOR SOIL AND LIQUID SAMPLES

The type of sample container, volume required for analysis, and the maximum holding time for various constituents and media are presented in Appendix A.

B. SOIL and SEDIMENT SAMPLING

NOTE: These sampling techniques are not appropriate for soil and sediment collected for Volatile Organic Analysis (VOC). In addition, stainless steel tools or equivalent are to be used for the collection of samples for nonradiological analysis.

1. If soil is under a paved area or concrete floor, remove the asphalt or concrete.

   a. If an asphalt sample is to be collected, perform Section C before proceeding to step B.3.

   b. If a concrete sample is to be collected, refer to Reference 1.

2. If required, cut vegetation to approximately the soil surface level, and remove any "litter" on the ground surface (e.g., stones or dead/dry sticks and leaves that are not part of the soil humus layer).

   NOTE: If desired, cut vegetation may be saved for a separate analysis. In such a case, cut the vegetation over a measured area (e.g., one square meter), recording that area in the Field Log Book and place in a plastic bag.

3. Using a new or decontaminated (according to Section H of this procedure) stainless steel or equivalent tool (i.e. trowel, shovel, hand auger, etc.), remove soil or sediment at the selected sampling location (or locations for composite sampling) to the desired depth.

NOTE: Ideally enough soil should be collected to provide for a one liter sample after preparation.

NOTE: For soil samples collected outside of the Owner Controlled Area, dig a straight-sided hole with measured surface dimensions (e.g., 6" x 6") and record in the Field Log Book.

4. Place the sample into the appropriate container as specified in Appendix A. Ensure sufficient sample has been collected.

   a. If additional soil or sediment is required due to the number and volume of samples that must be collected, obtain the soil or sediment from a location immediately adjacent to the first by following steps 1 through 3 as necessary and remove a similar amount of sample.

   b. Composite samples collected for nonradiological analysis should be mixed in a stainless steel bowl or ziptop plastic bag.

5. Large sticks or rocks greater than approximately three inches in size should be discarded while digging the sample, unless otherwise instructed. Compensate for the lost volume at that depth by collecting additional sample from the same depth as the discarded rock/stick.

   NOTE: Where a large rock(s) prevents the collection of an adequate sample, the sampling point should be moved slightly to allow a better sample. In such a case, the movement and its reason should be noted in the Field Log Book.

   NOTE: Sticks and rocks less than three inches in size must remain in the sample. They will typically be removed at the laboratory during the sample preparation stage. Their weight will be accounted for at that time.

6. If required by Appendix A, preserve samples accordingly.

7. Close the container to prevent loss of material.

8. Label the container with the sample identification number (or bar code label), date of collection, time of collection, type of analysis (if non-rad), preservation method (if non-rad), and sampler's initials.

9. Ensure that the sample is secure and that the appropriate sample custody documentation (if required) is completed in accordance with DP-8123 [2] as soon as practicable.

C. ASPHALT SAMPLING

NOTE: Ideally enough asphalt should be collected to provide for a one liter sample after preparation.

1. Using a hammer drill or demolition tool (with the appropriate bit), a cold chisel, or any other appropriate tool, cut a circular hole in the asphalt through its entire thickness.

2. Break up the asphalt sample into small pieces with the hammer drill.

NOTE: Be careful when breaking up the asphalt pieces with a power tool so that excessive mixing of the asphalt rubble with the upper layer of soil does not occur.

3. Remove the asphalt pieces, taking care to minimize any dirt clinging to the pieces. Place in a suitable container.

4. If required by Appendix A, preserve accordingly.

5. Close the container.

6. Label the container with the sample identification number (or bar code label), date of collection, time of collection, and sampler's initials.

7. Ensure that the sample is secure and that the appropriate sample custody documentation (if required) is completed in accordance with DP-8123 [2] as soon as practicable.

D. LIQUID SAMPLING

1. Using the appropriate sample collection container as identified in the Table in Appendix A, collect the sample directly into the container without pre-rinsing from the liquid.

2. Submerge the lip of the sample container below the liquid surface, filling the container until a slight headspace is present. Remove from the liquid and cap.

3. Samples collected for volatile organic analysis (e.g. VOC, pesticides) must contain no headspace or air bubbles after capping. To collect these samples:

   a. Collect the sample in a separate unused container.

   b. Pour the water to the appropriate container using a continuous stream into a pre-preserved container; do not overflow.

   c. When the container is full and a meniscus is present, cap the container and turn the container upside down and inspect for bubbles.

   d. If bubbles are present, remove cap and add sample to re-establish meniscus prior to capping. Repeat as necessary.

4. If required by Appendix A, preserve accordingly if not previously provided.

5. Label the container with the sample identification number, date of collection, time of collection, and sampler's initials.

6. Ensure that the sample is secure and that the appropriate sample custody documentation (if required) is completed in accordance with DP-8123 [2] as soon as practicable.

E. IDENTIFICATION OF SAMPLING POINTS

1. If not already described in a sampling plan, describe the location of the sampling site in the Field Log Book by one of the following means:

- Distance measurements to two or more structures (or other identifiable points)
- Detailed drawings
- Reference to a grid coordinate system
- Global Positioning System (GPS) measurements
- Any other equivalent method.

2. Mark the sample location with a semi-permanent marker (e.g., wood stake) when one of the methods in step 1 can not be used to identify the sample location.

3. A revised sample location code for radiological samples will be effective with Rev 7 of this procedure. The Safety Oversite Manager or designee will assign the first nine characters in the Location Code for each survey unit material listed using Table 1, Survey Location Codes and Appendix B, Survey Area Description, as guidance. The Location Code is composed of a 12 character alpha numeric string as follows:

Characters 1-5 = Survey Area Identification

Character 6 = Survey Unit Code

Character 7 = Survey Unit Classification Code

Character 8 = Survey Type Code

Character 9 = Material Code

Characters 10 - 12 = Survey Point

F. SAMPLING SOIL, ASPHALT, AND CONCRETE FROM EXCAVATION STOCK PILES

1. STOCK PILE SEGREGATION AND IDENTIFICATION:

a. Ensure that individual piles of soil, asphalt, and concrete are segregated on the following bases:

1) Area of excavation - Soil, asphalt, and concrete excavated from any single area should be kept segregated from other piles until final disposition. Any pile consolidation must be documented.

2) Type of material - Soil should be segregated from asphalt, concrete should be segregated from soil or asphalt. Other materials (e.g., wood, rebar, metals, or construction debris) are not addressed in this procedure and should be separated from the soil, asphalt and concrete.

3) Contamination potential - Any soil, asphalt, or concrete known or suspected to be contaminated should be segregated; placed onto a poly tarp and sampled separately. This may be based on site characterization or other survey results, or on knowledge of the area's previous activities. Since site characterization surveys

have shown that soil contamination in the RCA is generally limited to the top six inches, initially, the top six-inch layer approximately should be segregated and sampled separately when excavating within the RCA.

b. The Safety Oversite Manager or designee will assign a unique number to each soil, asphalt, or concrete stock pile, log the number and other pertinent information on form DPF-8120.1, and provide the number to the RP Technician performing the sampling.

A revised pile numbering system will be effective with Rev. 7 of this procedure. The new system will consist of a 14 digit field starting with a P, designating Pile; followed by a 4 digit field for the year; a five digit field for the survey Area ID code; a two digit field for pile type (TS for soil, AS for Asphalt, CT for concrete); and a two digit sequential pile number. This method retains all of the features of the old system while adding the Survey Area ID so that the pile number identifies the origin of the excavated material.

For example;

P2000OG021TS04 is the fourth soil pile from survey area OG021 assigned in year 2000

P2000OG021AS01 is the first asphalt pile from survey area OG021 assigned in year 2000

NOTE: Form DPF-8120.1 will be controlled by the Safety Oversite Manager or his designee.

c. Prepare a suitable map to identify the location of each pile. Label the map with the pile number.

d. Write the pile number (obtained from the Safety Oversite Manager or designee) on two wooden stakes (with a Sharpie or other indelible pen) and drive the stakes solidly into the pile (front and back).

e. Cover each pile with a tarp to minimize the migration of potential contamination due to the forces of wind and rain, etc.

f. Where a pile is placed on a slope, place bales of hay or silt fence on the down-slope side to catch any run-off.

NOTE: In the event that piles are moved, the Safety Oversite Manager or designee should be notified so that the pile's location can be tracked, and to ensure that the pile is clearly labeled in its new location. The new location should be noted on Form DPF-8120.1.

2. SAMPLING FROM AN EXISTING PILE:

a. If the pile is large enough to make access to the inner volume of the pile difficult, split the pile into two or more sub-piles (e.g., with a backhoe) to allow access.

b. Collect approximately 30 samples of at least 100cc each, placing the samples into a plastic bag (more than one (1) plastic bag will be needed). In addition to the pile's unique number the plastic bags will be numbered "1 of ##" i.e., 1 of 2, 1 of 6, etc.

NOTE: A roughly determined grid should be used, and a shovel should be used to allow sampling at varying depths. The goal is to systematically (i.e., uniformly) sample throughout the entire pile volume. Use a Hilti drill as necessary to break up the asphalt and concrete into small pieces. Every effort should be made to ensure that one third of the samples collected are from the surface of the asphalt being excavated.

c. During sampling of soil piles, remove and return to the pile rocks and sticks greater than approximately ½ inch in size. For asphalt and concrete samples, such rocks bound up in the asphalt or concrete may be removed later during sample preparation.

NOTE: If any large man-made objects are encountered during sampling (e.g., barrel rings, sheet metal), remove them from the pile for separate monitoring. (Monitoring and disposition of this material is outside the scope of this procedure).

3. SAMPLING DURING EXCAVATION:

a. By talking to the excavating contractor, determine how often samples need to be collected to achieve 30 samples from each excavation/pile. A "pile" will consist of no more than approximately 15 cubic yards of soil, asphalt, or concrete.

NOTE: Multiple "piles" may result from a single excavation, based on the criteria in F.1.

b. At the frequency determined above, collect individual samples at least 100cc each directly from the bucket, placing all of these samples in a plastic bag (more than one (1) plastic bag will be needed). In addition to the stock pile's unique number the plastic bags will be numbered "1 of ##" i.e., 1 of 3, 1 of 5, etc.

NOTE: When the excavation is completed, 30 or more samples should have been collected from each stock pile. If not, collect enough additional samples from the stock pile (sample uniformly through the pile's volume) to achieve 30 samples.

c. During sampling, remove and return to the pile rocks and sticks greater than approximately ½ inch in size. For asphalt or concrete samples, such rocks bound up in the asphalt or concrete may be removed later during sample preparation.

NOTE: If any large man-made objects are encountered during sampling (e.g., barrel rings, sheet metal), remove them from the pile for separate monitoring. (Monitoring and disposition of this

material is outside the scope of this procedure).

G. SAMPLE DOCUMENTATION AND HANDLING

1. If the samples are part of site characterization:

   a. Record all appropriate information in the Field Log Book. As a minimum, include:

      - Sample date
      - Sample time
      - Sampler's name(s)
      - Sample location identification code/pile number
      - Sufficient description and/or measurements to allow the sampling site to be identified in the future.
      - map of area excavated and pile placement as appropriate.

   b. Any deviations from this procedure that are forced by field conditions (e.g., large rocks or ledge obstructing sampling, etc.) should be noted here.

   c. Record sampling information on DPF-8120.1 and DPF-8120.2 as appropriate.

2. If the samples are in support of site release, record sampling information in accordance with AP-0052 [10].

3. Deliver or arrange delivery of the samples to the designated sample prep or storage location, the DE&S Environmental Lab (DESEL) or another off-site analytical facility.

   a. Ensure that a tamper evident seal is affixed to each sample container. Seals shall be initialled and dated by the preparer.

   b. For samples submitted to the DESEL, complete form YELF 605.1 and send it with the samples.

   c. Fill out a chain of custody form in accordance with DP-8123 [2].

   d. Contact the Radwaste Coordinator for the shipment of any sample(s) containing plant-related radioactivity to any off-site facility.

H. DECONTAMINATION OF EQUIPMENT

NOTE: Decontamination is performed in three stages, generally by using three buckets as described below. The same method may be used in a sink, if available, as long as the same three-step process is used and the drain line is suitably connected for radioactively contaminated waste. The first container is used for removal of gross residue and scrubbing with detergent. The second container, half-filled with clean water, is used for the first rinse. The third container, initially empty, is used to collect the rinsate from a spray bottle, and is generally used only in areas where

contamination is suspected. Determine in advance whether the decontaminated tool is to be sprayed with methanol as a final step (non-radiological analysis only).

1. Set up three 5-gallon containers as follows:

   a. The first container is half filled with water and a small amount of laboratory grade detergent (such as Alconox).

   b. The second container is half-filled with clean water.

   c. The third container is initially empty. (This container is not needed in areas where contamination is not suspected, e.g., outside the Radiological Control Area.)

2. Don a new pair of latex, nitrile or equivalent gloves.

3. Remove any gross residue from the sampling tool, letting the material (e.g., soil) fall into the hole from which it was sampled. If the sampled hole is not immediately available, save the material for appropriate waste disposal. If the tool had last been used outside the Owner Controlled Fence, the material may simply fall onto the ground.

4. Place the used sampling tool in the first container and scrub with a brush.

5. Remove the tool from the first bucket and place the tool in the second bucket. Scrub with another brush.

6. Holding the tool over the third container (or over the ground if in an area where contamination is not suspected, e.g., outside the Radiological Control Area), completely rinse the tool with a squirt bottle of Methanol or clean water.

7. Wrap the cleaned tool in new aluminum foil.

8. Remove the gloves and dispose of appropriately.

9. Place the decontamination fluids into a container labeled "Decontamination Waste". Disposal should be based on a representative sample and analysis of the water, or as prescribed by the Radiation Protection Department.

FINAL CONDITIONS

1. Samples have been collected and delivered to the appropriate laboratory in accordance with this procedure.

2. At the discretion of the Sample Manager/Senior Chemist, the YAEC Condition Reporting System, as defined in AP-0227 [11], has been initiated to report and evaluate adverse conditions potentially affecting data quality and to track corrective actions through completion.

3. Documentation has been reviewed and retained in accordance with AP-0221 [12].

Table I - Survey Location Codes

1	2	3	4	5	6	7	8	9	10	11	12
X	X	#	#	#	X	X	X	X	#	#	#
Survey Area ID Code					Survey Unit Code	Survey Unit Classification Code	Survey Type Code	Survey Material Code	Survey Point		
See Survey Area List					A = Upper Walls/Ceiling B = Floors/Lower Walls C = Ceiling D = Sub Floor E = Equipment F = Floors G = Grounds L = Lower Walls P = Pile[3] S = System U = Upper Walls X = Structural Exterior	A = Affected N = Non-Suspect Affected S = Suspect Affected U = Unaffected 1 = Class 1 2 = Class 2 3 = Class 3 4 = Non-Impacted X = NA	C = Characterization F = Final Status G = General Information I = Investigation M = MARSSIM R = Free Release S = Special T = Turnover	A = Asphalt (Exterior) B = Poured Concrete Floor L1[1] C = Concrete D = Soil (Disturbed) E = Poured Concrete Wall[1] F = Poured Concrete Floor[1] G = Generic H = Block Wall[1] I = Ignored J = Generic[1] K = Generic[2] L = Sediment (Silt) M = Asphalt (Interior) N = Sediment (Sand) O = Other P = Porcelain Q = Acoustic Ceiling Tile R = Roof Material S = Poured Concrete Floor L2[1] T = Poured Concrete Floor L3[1] U = Soil (Undisturbed) V = Poured Concrete Ceiling L1[1] W = Water X = Poured Concrete Ceiling L2[1] Y = Poured Concrete Ceiling L3[1] Z = Generic L3[1]	Numbered Sequentially 900 Series Sample Numbers Reserved for QA Samples		

[1] Survey material codes used for the Turbine Building survey units
[2] Survey material code used for the interior surfaces of System survey areas
[3] Piles of Soil, Asphalt or Concrete

REQUIREMENTS FOR CONTAINERS, PRESERVATION TECHNIQUES, SAMPLE VOLUMES, AND HOLDING TIMES (Ref. 7)

Name	Container [a]	Preservation [b,c,d]	Minimum Sample Volume or Weight	Maximum Holding Time
Alkalinity	G	4°C	100 ml	14 days
Common anions	P,G	None Required	50 ml	28 Days for Br^- F^-, and SO_4^{-2}, 48 hours for NO_3^-, NO_2^-, and PO_4^{-3}
Cyanide, total and amenable to chlorination	P,G,T	4°C; NaOH to pH>12, 0.6g ascorbic acid	500 ml each	14 days (water and soil)
Filterable residue	P,G	4°C	100 ml	7 days
Nonfilterable residue	P,G	4°C	100 ml	7 days
Hydrogen ion (pH)	P,G	None required	N/A	Analyze immediately
Nitrogen, nitrate + nitrite	P,G	4°C, H_2SO_4 to pH <2	100 ml	28 days
Conductance	P,G	None required	100 ml	28 days
Temperature	P,G	None required	N/A	Analyze immediately
Dissolved oxygen	G	None required	500 ml	Analyze immediately
Turbidity	P,G	4°C	100 ml	48 hours
Settleable Solids	P,G	None required	1000 ml	48 hours
Total organic carbon	P,G,T	4°C, HCl or H_2SO_4 to pH <2	25 ml or 10 g	28 days (water and soil)
Chromium (VI)	P,G,T	4°C	200 g	24 hours (water and soil)[f]
Mercury	P,G,T	HNO_3 to pH <2, 4°C	100 ml or 10 g	28 days (water and soil)
Metals (except chromium (VI) and mercury) Includes Radiological [e]	P,G,T	HNO_3 to pH <2, 4°C	200 ml or 10 g (1 liter or 500 g for radiological)	180 days (water and soil)

a. Polyethylene (P); glass(G); brass sleeves in the sample barrel, sometimes called California brass (T).

b. No pH adjustment for soil.

c. Preservation with 0.008 percent $NA_2S_2O_3$ is only required when residual chlorine is present.

d. Samples collected for radiological analysis do not require cooling to 4°C.

e. Do not acidify solutions to be analyzed for isotopes of Carbon, Technicium and Iodine.

f. The maximum recommended holding time for completion of extraction into water is 48 hours. The extract shall be analyzed within 24 hours of completion of extraction.

Name	Container [a]	Preservation [b,c,d]	Minimum Sample Volume or Weight	Maximum Holding Time
Total petroleum hydrocarbons (TPH) - volatile	G, Teflon® - lined septum, T	4°C, HCl to pH<2	2 x 40 ml or 4 ounces	14 days (water and soil); 7 days if unpreserved by acid
Total petroleum hydrocarbons (TPH) - extractable	G, amber, T	4°C	1 liter or 8 ounces	7 days until extraction and 40 days after extraction (water); 14 days until extraction and 40 days after extraction (soil)
Volatile aromatics	G, Teflon® - lined septum, T	4°C, HCl to pH<2, 0.008% $Na_2S_2O_3$	2 x 40 ml or 4 ounces	14 days (water and soil); 7 days if unpreserved by acid
Halogenated volatiles	G, Teflon® - lined septum, T	4°C, HCl to pH<2, 0.008% $Na_2S_2O_3$	2 x 40 ml or 4 ounces	14 days (water and soil); 7 days if unpreserved by acid
Nitrosamines	G, Teflon® - lined cap, T	4°C	1 liter or 10 g	7 days until extraction and 40 days after extraction (water); 14 days until extraction and 40 days after extraction (soil)
Chlorinated herbicides	G, Teflon® - lined cap, T	4°C, pH 5-9	1 liter or 10 g	7 days until extraction and 40 days after extraction (water); 14 days until extraction and 40 days after extraction (soil)

a. Polyethylene (P); glass(G); brass sleeves in the sample barrel, sometimes called California brass (T).

b. No pH adjustment for soil.

c. Preservation with 0.008 percent $NA_2S_2O_3$ is only required when residual chlorine is present.

Name	Container [a]	Preservation [b,c,d]	Minimum Sample Volume or Weight	Maximum Holding Time
Organochlorine pesticides and polychlorinated biphenyls (PCBs)	G, Teflon® - lined cap, T	4°C, pH 5-9	1 liter or 30 g	7 days until extraction and 40 days after extraction (water); 14 days until extraction and 40 days after extraction (soil)
Organophosphorus pesticides/ compounds	G, Teflon® - lined cap, T	4°C, pH 5-9	1 liter or 8 ounces	7 days until extraction and 40 days after extraction (water); 14 days until extraction and 40 days after extraction (soil)
Semivolatile organics	G, Teflon® - lined cap, T	4°C, 0.008% $Na_2S_2O_3$	1 liter or 8 ounces	7 days until extraction and 40 days after extraction (water); 14 days until extraction and 40 days after extraction (soil)
Volatile organics	G, Teflon® - lined septum, T	4°C, 0.008% $Na_2S_2O_3$ (HCl to pH <2 for volatile aromatics by SW8240 and SW8260)[b]	2 x 40 ml or 4 ounces	14 days (water and soil); 7 days if unpreserved by acid.
Polynuclear aromatic hydrocarbons (PAHs)	G, Teflon® - lined cap, T	4°C, store in dark, 0.008% $Na_2S_2O_3$	1 liter or 10 g	7 days until extraction and 40 days after extraction (water); 14 days until extraction and 40 days after extraction (soil)

a. Polyethylene (P); glass(G); brass sleeves in the sample barrel, sometimes called California brass (T).

b. No pH adjustment for soil.

c. Preservation with 0.008 percent $NA_2S_2O_3$ is only required when residual chlorine is present.

Name	Container [a]	Preservation [b,c,d]	Minimum Sample Volume or Weight	Maximum Holding Time
Dioxins and furans	G,Teflon®- lined cap, T	4°C, 0.008% $Na_2S_2O_3$	1 liter or 10 g	30 days until extraction and 45 days after extraction (water and soil)
Ethylene dibromide (EDB)	G,Teflon®- lined cap, T	4°C, 0.008% $Na_2S_2O_3$	2 x 40 ml	28 days (water)
Explosive residues	P,G,T	Cool, 4°C	1 liter or 8 ounces	7 days to extraction (water), 14 days to extraction (soil); analyze-within 40 days after extraction
TCLP	G,Teflon®- lined cap, T	Cool, 4°C	1 liter or 250 g	14 days to TCLP extraction and 14 days after extraction (volatiles); 14 days to TCLP extraction and 40 days after extraction (semivolatiles); 28 days to TCLP extraction and 28 days after extraction (mercury);180 days to TCLP extraction and 180 days after extraction (metals).

a. Polyethylene (P); glass (G); brass sleeves in the sample barrel, sometimes called California brass (T).

b. No pH adjustment for soil.

c. Preservation with 0.008 percent $Na_2S_2O_3$ is only required when residual chlorine is present.

APPENDIX B

SURVEY AREA DESCRIPTION

Area	Survey Area Description
DG001	'A' Diesel Generator Room
DG002	'B' Diesel Generator Room
DG003	'C' Diesel Generator Room
DG004	MCC Switchgear Room
DG005	Battery Room
DG006	Safety Injection System Area
DG007	Accumulator Tank Room
DG008	Electrical Manhole
OB001	Maintenance Pole Building
OB002	Training Complex
OB003	YAEC Visitors Center
OB004	Gate House
OB005	Office Building
OB006	Pump House
OB007	Modular Office Building
OB008	Warehouse
OB009	South Trailer Complex
OB010	North Trailer Complex
OB011	Security Diesel Generator Building
OE001	Southwest Structural Exteriors
OE002	Northwest Structural Exteriors
OE003	North Structural Exteriors
OE004	Northeast Structural Exteriors
OE005	East Structural Exteriors
OE006	Warehouse Exterior
OG001	Northwest Buffers Zone
OG002	Northeast Buffers Zone
OG003	Southeast Buffers Zone
OG004	Southwest Buffers Zone
OG005	Switch Yard Area
OG006	Southwest Open Land Area
OG007	South Open Land Area
OG008	Southeast Construction Fill Area
OG009	East Open Land Area
OG010	Northeast Open Land Area
OG011	North Open Land Area
OG012	Northwest Open Land Area
OG013	East Storm Drain Outfall Area
OG014	Training Center Parking Lot
OG015	Primary Parking Lot
OG016	East Construction Fill Area
OG017	West Storm Drain Outfall
OG018	North Buffers Zone
OG019	Sherman Pond Outfall Area
OG020	South Buffer Zone
OG021	ISFSI Access Road
PA001	Charging / Purification Cubicles
PA009	PAB Sump/Gravity Drain Tank Cubicle
PA012	Primary Drain Collection Tank Room
PA013	Cubicle Corridor Pipe Trench
PA014	Vertical Pipe Chase
PA015	LPST / SDC Cubicles
PA020	CCW/EFW Pumps Area
PA021	Cubicle Corridor
PA022	South General Area
PA023	North General Area
PA024	Hydrogen Storage Room
PA025	CCW HTX/Surge Tank Room
PA026	Chem Sample/PASS Room
PA027	Valve Room
PA028	Low Pressure Surge Tank Room
PA029	Ventilation Equipment Room
PA030	Non-Radioactive Pipe Gallery
PA031	Radioactive Pipe Tunnel
PR001	YAEC Property Residuum
SB001	South Decontamination Room
SB002	North Decontamination Room
SB003	Hot Weld Shop
SB004	Maintenance Shop
SB005	Decon Room
SB006	Radiation Protection Counting Room
SB007	RCA Egress Area
SB008	RCA Access Area
SB009	RCA Dressout Area
SB010	Radiochemistry Laboratory
SB011	Locker Room
SB012	Body Count Room/Clean Facilities
SB013	Plant Laboratory
SB014	Service Building Main Corridor
SB015	Water Treatment Room
SB016	Radiation Protection Office Area
SB017	Clean Maintenance Shop Tool Crib
SB018	Clean Maintenance Shop
SB019	Clean Maintenance Shop Mezzanine 2nd Floor
SB020	Northeast Office Areas
SB021	Service Building East Corridor
SB022	Service Building Main Stores Area
SB023	Document Control Center
SB024	Instrumentation Calibration Laboratory
SB025	Service Building Southeast Stores Area
SB026	Service Building Lunch Room
SB027	Second Floor Corridor
SB028	Second Floor West Offices
SB029	Second Floor East Offices
SB030	Second Floor South Offices
SB031	Mechanical Equipment Room
SS003	Circulating Water/Service Water
SS010	Fire Protection and Detection
SS016	Turbine Building Floor Drains
SS027	Potable H2O
SS028	Roof Drains i/s OCA and o/s RCA
SS029	Roof Drains i/s RCA
SS030	Misc. Ventilation
TB001	Southwest Stairwell - Ground Floor
TB002	Boiler Feed Pump Area - West
TB003	Boiler Feed Pump Area - East
TB004	Turbine Building Elevator/Machine Room
TB005	Heating and Boiler Room
TB006	Ground Floor - Southeast General Area
TB007	Ground Floor - South Central General Area
TB008	Ground Floor - Southwest General Area
TB009	Ground Floor - Northwest General Area
TB010	Ground Floor - West Central General Area
TB011	Ground Floor - North Central General Area
TB012	Ground Floor - Central General Area
TB013	Ground Floor - East Central General Area
TB014	Ground Floor - Northeast General Area
TB015	Ground Floor - Lube Oil Room
TB016	Southwest Stairwell - Mezzanine Floor
TB017	Switchgear Room
TB018	Battery Rooms
TB019	Fan Room
TB020	Mezzanine Floor - Northeast General Area
TB021	Mezzanine Floor - Southeast General Area
TB022	Mezzanine Floor - Southwest General Area
TB023	Mezzanine Floor - Northwest General Area
TB024	Control Room Kitchen Area
TB025	Control Room
TB027	Operating Floor - Southeast Hallway
TB028	Operating Floor - Southeast General Area
TB029	Operating Floor - South Central General Area
TB030	Operating Floor - Southwest General Area
TB031	Operating Floor - Northwest General Area
TB032	Operating Floor - Modular Offices
TB033	Operating Floor - North Central General Area
TB035	Operating Floor - Northeast General Area
TB036	Operating Floor Crane
TB037	Operating Floor Ceiling
TB038	Cable Tray Room
UA907	Unaffected 75 Percent GLV
UG001	Under Primary Auxiliary Building
UG002	Under Waste Disposal Building

Area	Survey Area Description
UG004	Under PCA Storage Building #1
VC001	VC Skin Under BioShield - SW Quad
VC002	VC Skin Under BioShield - NW Quad
VC003	VC Skin Under BioShield - NE Quad
VC004	VC Skin Under BioShield - SE Quad
VC005	Underside of BioShield - SW Quad
VC006	Underside of BioShield - NW Quad
VC007	Underside of BioShield - NE Quad
VC008	Underside of BioShield - SE Quad
VC009	VC Skin Lower Section - SW Quad
VC010	VC Skin Lower Section - NW Quad
VC011	VC Skin Lower Section - NE Quad
VC012	VC Skin Lower Section - SE Quad
VC013	Lower Outer BioShield Wall - SW Quad
VC014	Lower Outer BioShield Wall - NW Quad
VC015	Lower Outer BioShield Wall - NE Quad
VC016	Lower Outer BioShield Wall - SE Quad
VC017	Brass Drain Box Sloped Floor Area - South
VC018	Brass Drain Box Sloped Floor Area - North
VC019	VC Equipment Hatch
VC020	Brass Drain Box Area
VC021	Loop #1 Mezzanine Area
VC022	Pressurizer Mezzanine Area
VC023	Loop #2 Mezzanine Area
VC024	Loop #3 Mezzanine Area
VC025	Loop #4 Mezzanine Area
VC026	Feed & Bleed HTX Room
VC027	Loop#1 Area
VC028	Pressurizer Area
VC029	Loop#2 Area
VC030	Loop#3 Area
VC031	Loop#4 Area
VC032	Shield Tank Cavity
VC033	Reactor Vessel Bioshield Concrete
VC034	Charging Floor - Loop#1 G/A
VC035	Charging Floor - Loop#2 G/A
VC036	Charging Floor - Loop#3 G/A
VC037	Charging Floor - Loop#4 G/A
VC038	Charging Floor - Central G/A
VC039	Upper Outer BioShield Wall - SW Quad
VC040	Upper Outer BioShield Wall - NW Quad
VC041	Upper Outer BioShield Wall - NE Quad
VC042	Upper Outer BioShield Wall - SE Quad
VC043	VC Skin Upper Section - SW Quad
VC044	VC Skin Upper Section - NW Quad
VC045	VC Skin Upper Section - NE Quad
VC046	VC Skin Upper Section - SE Quad
VC047	VC Skin Dome Area - SW Quad
VC048	VC Skin Dome Area - NW Quad
VC049	VC Skin Dome Area - NE Quad
VC050	VC Skin Dome Area - SE Quad
VC052	VC Airlock and Platform
VC900	Vapor Container Test
VC907	VC Weighted Mean
WD001	PCA Warehouse - West General Area
WD002	PCA Warehouse - East General Area
WD003	Waste Disposal Building Corridor
WD004	Drumming Pit
WD005	Drum Drying Area
WD006	Waste Compactor Building
WD007	North General Area
WD008	Waste Disposal Building Pipe Trenches
WD009	Liquid Waste Transfer Pump Room
WD010	Distillate Accumulator Cubicle
WD011	Evaporator Cubicle
WD012	Waste Gas Compressor Room
YE001	Turbine Building Exterior
YE002	Auxiliary Bay Exterior
YE003	Service Building Exterior
YE004	Vapor Container Exterior - Top Half
YE005	Vapor Container Exterior - Bottom Half
YE006	Diesel Generator Building Exterior
YE007	Primary Auxiliary Building Exterior
YE008	Primary Auxiliary Building Roof
YE009	Safe Shutdown System Building Exterior
YE010	Fire Water Storage Tank/Pumphouse Exterior
YE011	Waste Disposal Building Exterior
YE012	PCA Storage Building #2 Exterior
YE013	PCA Storage Building #1 Exterior
YE015	VC Elevator Structural Exterior
YE016	Small Activated Area on Top of VC
YE017	Exterior Surface of VC Below Equipment Hatch
YE018	Miscellaneous Yard Exteriors
YG001	Transformer Yard
YG002	Northwest Yard Area
YG003	Southwest Yard Area
YG004	South Yard Area
YG005	Southeast Yard Area
YG006	Northeast Yard Area
YG007	Central Yard Area
YG008	Tank Farm
YS001	Fire Water Pump House
YS002	Safe Shutdown System Building - South
YS003	Safe Shutdown System Building - Center
YS004	Safe Shutdown System Building - North
YS005	PCA Storage Building #2
YS006	PCA Storage Building #1
YS007	Waste Holdup Tank Moat
YS008	Activity Dilution Storage Tank Moat
YS009	Ion Exchange Pit Pipe Trench
YS010	Ion Exchange Pit
YS011	Vapor Container Elevator
YS012	Miscellaneous Yard Structures
YS013	Radioactive Laboratory Sump Cubicle

DECOMMISSIONING SOIL, ASPHALT, AND CONCRETE EXCAVATIONS

SAMPLE COLLECTION LOG

PILE NO.*	SAMPLE NOS.	SAMPLE DATE	LOCATION DESCRIPTION	COMMENTS	ANALYSES REQUESTED

* e.g., P2000OG021TS04 is the fourth soil pile from survey area OG021 assigned in year 2000
P2000OG021AS01 is the first asphalt pile from survey area OG021 assigned in year 2000

DECOMMISSIONING EXCAVATION
SAMPLE RESULTS AND PILE DESCRIPTION

Pile Number _____ Date/Time of Sample Collection _____/_____

Samplers Name_____

Soil [ ]
Asphalt [ ]
Concrete [ ]

Part 1: **LABORATORY RESULTS**

Sample Number	Spectrum Number	Net Positive Activity (pCi/g)		Fraction of Guideline[2] (Each Nuclide)	Sum of Fractions[2] (Total Sample)
		Nuclides	Concentration[1]		

[1] "ND" indicates no positive activity detected
[2] Soil only

Evaluation performed by_____Date_____

Part 2: **DISPOSITION OF MATERIAL**

The determination of acceptance of material for unconditional release is accomplished utilizing AP-0052.

Disposition of pile: _____Date:_____

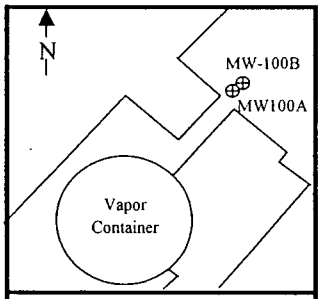
Final Review by: _____Date:_____
(RP Supervision)

Appendix E
Boring Logs

DRILLING LOG for Well #: MW-100A

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee L.T.P.	Project Number:	2107.01		
Client:	Yankee Atomic Electric Company	Logged by:	Michael Horesh		
Drilling Co:	D.L. Maher	Driller:	Bill Zammow		
Date Started:	5-Aug-03	Date Finished:	5-Aug-03		
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic		
Screen Diam:	2"	Length:	10'	Slot Size:	0.010"
Casing Diam:	2"	Length:	10'	Type:	Schedule 40, 2" PVC
Boring Depth:	20'	Well Depth:	20'	Boring Diam.:	5.5"
Surface Elev.:	NR	MP:	Ground Surface	Depth to GW:	8.55'
On-Site GW Analysis:	H-3, Co-60, Cs-134, Cs-137	Off-Site Non-radiological Laboratory:		Northeast Laboratories	



Notes: DTW measured on 11-Sep-03

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses

Well Construction Details:

0-1' : Cement, Protective Flushmount Roadbox
1'-6': Portland Cement/Bentonite Grout
6'-8.3': Bentonite Chip Seal
8.3'-20': #0 Silica Sand Filter Pack
0-10': Sched. 40 2" PVC Riser
10'-20': Sched. 40 2" PVC Screen
20': Bottom of Boring

Bottom of Boring at 20' bgs

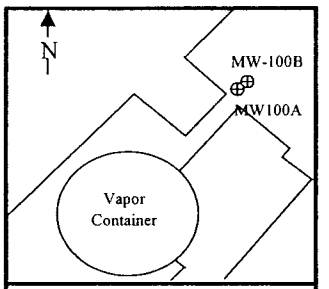
Key to Well Construction

Sandpack
Bentonite Seal
Well Screen
Cement
Grout

DRILLING LOG for Well #: MW-100B

ERM
399 Boylston Street, 6th Floor
ERM Boston, MA 02116

Project:	Yankee L.T.P.	Project Number:	2107.01		
Client:	Yankee Atomic Electric Company	Logged by:	Michael Horesh		
Drilling Co:	D.L. Maher	Driller:	Bill Zammow, Oiden Gonzales		
Date Started:	1-Aug-03	Date Finished:	5-Aug-03		
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic		
Screen Diam:	2"	Length:	10'	Slot Size:	0.010"
Casing Diam:	2"	Length:	32.9'	Type:	Schedule 40, 2" PVC
Boring Depth:	42.9'	Well Depth:	42.9'	Boring Diam.:	5.5"
Surface Elev.:	NR	MP:	Ground Surface	Depth to GW:	9.38'
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	Off-Site Non-radiological Laboratory:		Northeast Laboratories	



Notes: DTW measured on 9/11/03

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
1-2		SILT	2'	2'	Brown, loose to medium loose, poorly sorted SILT, some Clay, some to little Gravel, Cobbles, Boulders; dry.	0-2'	0.0	
3-5		SAND	3'	3'	Brown to Orange-Brown, loose, poorly sorted SAND, little Cobbles/Gravel, some to little Boulders; dry.	2'-5'	0.0	
6-10		SAND	5.5'	5.5'	Brown to Orange-Brown, loose, poorly sorted SAND, little Gravel, Cobbles, little Boulders (4-8" diameter); dry. 1/2" black layer at~4' (suggests fill).	5'-10.5'	0.0	
11		BOULDER	1'	1'	Gnessic Boulder (13" diameter).	10.5'-11.5'	NA	
12		BOULDER	1'	1'	Gray Gneissic Boulder, broken-up pulverized sections.	11.5'-12.5'	NA	
13-16		SAND	3.5'	3.5'	Brown, loose, poorly sorted SAND, some Silt, little Clay, little Cobbles, Boulders; dry, wet at bottom.	12.5'-16'	0.0	
17-21		SAND	5'	5'	Brown to Dark Gray, medium loose to dense fine to coarse SAND and Silt, some Clay, little Cobbles, little Boulders; grading downwards to coarser Sand with higher frequency of Cobbles at bottom of interval; wet.	16'-21'	0.0	**GW-1** VOC-8260B
22		SILT	2'	2'	Brown to Gray-Brown, dense, moderately well sorted SILT, little Gravel/Pebbles, trace Cobbles, trace Clay; dry.	21'-23'	0.6[1]	
23		SILT	1'	1'	Brown to Gray-Brown, dense, moderately well sorted SILT, little to trace Gravel/Pebbles, little Boulders; dry to moist.	23'-24'	1.2	
24-25		BOULDER	0.5'	0.5'	Black to Dark Gray-Light Gray gneissic rock/some pulverized material; dry.	24.5'-25'	NA	

NOTES:

[1] Similar or equal to background levels

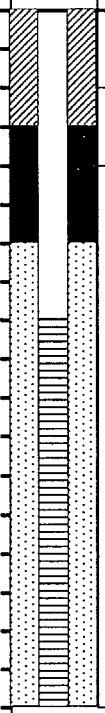
*Results of on-Site radiological screening <MDL unless otherwise noted

NA= Not Applicable

Key to Well Construction

Sandpack | Well Screen | Grout | Bentonite Seal | Cement

DRILLING LOG for Well #:	MW-100B	ERM 399 Boylston Street, 6th Floor Boston, MA 02116	Page 2 of 2

Depth	Boring Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
26		SAND	2'	1.5'	**0-1':** Broken-up gneiss boulder, quartz Cobbles; **1'-1.5':** Brown, loose, poorly sorted SAND, some Gravel/Cobbles; dry.	25'-27'	0.0	
27								
28		GNEISSIC ROCK	2'	2'	Light Gray, loose, well sorted pulverized rock (rock at tip of core barrel, top of bedrock at 27.5' bgs).	27'-29'	NA	
29								
30								
31								
32								
33								
34								
35								
36		BEDROCK	14'	12'	Black and White, strongly foliated gneiss with albite veins dipping at ~30° from horizontal; fracture surfaces bear discolored (reddish-brown) weathering rind; middle core highly fractured (noted by drillers by varying penetration rates) and highly broken-up; large fracture zone at 42'-43' along quartzite zone--moderate discoloration; other fracture zones at 29', 32', 40'.	29'-43'	NA	**GW-2** VOC-8260B
37								
38								
39								
40								
41								
42								
43								

Bottom of Boring at 42.9' bgs.

Well Construction Details:

0-1' : Cement, Protective Flushmount Roadbox
1'-28': Portland Cement/Bentonite Grout
28'-31': Bentonite Chip Seal
31'-42.9': #0 Silica Sand Filter Pack
0'-32.9': Sched. 40 2" PVC Riser
32.9'-42.9': Sched. 40 2" PVC Screen
42.9': Bottom of Boring

NOTES:
*Results of on-Site radiological screening <MDL unless otherwise noted

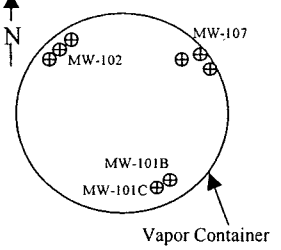
DRILLING LOG for Well #: MW-101C

ERM
399 Boylston Street, 6th Floor
ERM Boston, MA 02116

Project:	Yankee L.T.P.	Project Number:	2107.01		
Client:	Yankee Atomic Electric Company	Logged by:	Michael Horesh		
Drilling Co.:	D.L. Maher	Driller:	Bill Zammow		
Date Started:	13-Aug-03	Date Finished:	15-Aug-03		
Location:	Rowe, Massachuestts	Drilling Method:	Rotosonic		
Screen Diam.:	2.0"	Length:	5'	Slot Size:	0.010"
Casing Diam.:	2.0"	Length:	94'	Type:	Schedule 40, 2" PVC
Boring Depth.:	99'	Well Depth:	99'	Boring Diam.:	5.5"
Surface Elev.:	NR	MP:	Ground Surface	Depth to GW:	34.20'

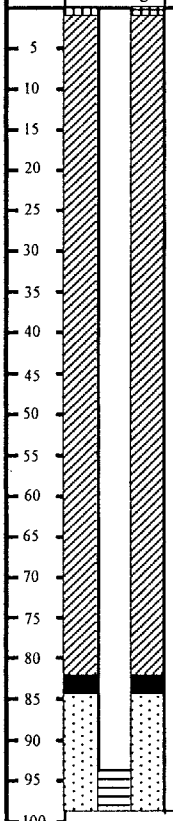
On-Site GW Analyses: H-3, Co-60, Cs-134, Cs-137 Off-Site Non-radiological Laboratory: Northeast Laboratories

SITE MAP



Notes: DTW measured on 12-Sep-03

Depth	Well Log	Stratigraphy	Penetration	Recovery	Split Spoon Description/Soil Classification	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses



Well Construction Details:

0-1': Cement, Protective Flushmount Roadbox
1'-90': Portland Cement/Bentonite Grout
90'-92.1': Bentonite Chip Seal
92.1'-99': #0 Silica Sand Filter Pack
0-94': Sched. 40 2" PVC Riser
94'-99': 0.010" Sched. 40 2" PVC Screen
99': Bottom of Boring

Bottom of Boring at 99' bgs

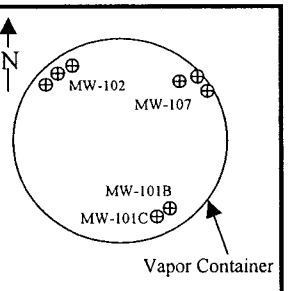
*Results of on-Site radiological activity <MDL unless otherwise noted

Key to Well Construction

DRILLING LOG for Well #: MW-101B

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee L.T.P.		Project Number:	2107.01	
Client:	Yankee Atomic Electric Company		Logged by:	Michael Horesh/Eugene Gabay	
Drilling Co:	D.L. Maher		Driller:	Chris Huther, Bill Zammow	
Date Started:	06-Aug-03		Date Finished:	13-Aug-03	
Location:	Rowe, Massachusetts		Drilling Method:	RotoSonic	
Screen Diam:	2.5"	Length:	10'	Slot Size:	0.010"
Casing Diam:	2.5"	Length:	142'	Type:	Schedule 80, 2.5" PVC
Boring Depth:	156'	Well Depth:	152'	Boring Diam.:	5.5"
Surface Elev.:	NR	MP:	Ground Surface	Depth to GW:	20.68'
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	Off-Site Non-radiological Laboratory:		Northeastern Laboratories	



Notes: DTW measured on 12-Sep-03

Depth	Well Log	Stratigraphy	Penetration	Recovery	Split Spoon Description/Soil Classification	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
1-5		SAND & GRAVEL	5'	2.5'	Brown to Dark Brown, loose, poorly sorted coarse SAND and GRAVEL, little Gravel at top 1' of interval, little Cobbles, little to trace Boulders; moist.	0-5'	0.0	
6-8		SILT	3'	3'	**0-1':** Brown to Dark Brown, medium loose, moderately well sorted SILT, some to little fine Sand, some to little Pebbles, trace Clay; moist to wet. **1'-3':** Brown-Gray, medium dense, moderately well to poorly sorted, SILT and Clay, trace Gravel, trace Pebbles; dry.	5'-8'	0.0	
9		BOULDER	1.5'	1.5'	Light Gray to Gray Boulder-broken into multiple pieces.	8'-9.5'	0.0	
10-11		SILT & CLAY	2'	2'	Brown to Gray Brown, dense to very dense, poorly sorted, broken-up CLAY, SILT, some Pebbles, some to little Boulders, trace Gravel.	9.5'-11.5'	N/A	
12-15		SAND & SILT	3.5'	3.5'	Brown to Dark Gray-Brown, loose, poorly sorted, medium SAND and SILT, little to some Cobbles, some Gravel, little Boulder; moist.	11.5'-15'	0.0	**GW-1** VOC 8260B
16-20		SILT & CLAY	5'	4.9'	Brown to Gray Brown, dense to very dense, poorly sorted SILT and CLAY, some to little, fine to medium angular Gravel, little Cobbles; moist to dry.	15'-20'	0.0	
21-24		SILT	4'	4'	Gray to Dark Gray-Brown, poorly sorted, very dense SILT, some Clay, little, fine to medium angular Gravel/Cobbles, trace Boulder; dry.	20'-24'	0.0	
25								

*Results of on-Site radiological screening <MDL unless otherwise noted

N/A=Not Applicable

Key to Well Construction

Sandpack | Well Screen | Grout | Bentonite Seal | Cement

DRILLING LOG for Well #: MW-101B

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth	Well Log	Stratigraphy	Penetration	Recovery	Split Spoon Description/Soil Classification	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
26-27-28		SILT & CLAY	4'	4'	Light Gray to Brown, very dense, poorly sorted SILT and CLAY, some Sand, little Gravel/Cobbles/Pebbles; dry.	24'-28'	0.0	
29-30-31-32-33-34-35		SILT	7'	7'	**0-1':** Black gneissic boulder with foliated quartz **1'-5':** Gray-Brown, dense, poorly sorted SILT and CLAY, little angular Pebbles/Gravel/Cobbles; dry. **5'-7':** Brown, dense to very dense, poorly sorted SILT and SAND, little to trace Clay; little Gravel/Pebbles/Cobbles; dry.	28'-35'	0.0	
36-37-38-39-40-41-42-43-44-45		SILT	10'	10'	**0-2':** Brown, poorly sorted, medium dense to medium loose, fine to medium SAND, little Pebbles/Cobbles; wet. **2'-10':** Gray to Gray-Brown, very dense, poorly sorted SILT, some CLAY, little Gravel, Pebbles (*Boulder at 6'-7'), trace Cobbles; dry.	35'-45'	0.0	**GW-2** VOC 8260B
46-47-48-49-50-51-52		SILT	7'	7'	**0-3.5':** Dark Gray-Brown, dense, poorly sorted SILT, some fine to medium Sand, little Clay, little Cobbles, Gravel, Pebbles; moist. **3.5'-7':** Light Brown, very dense, poorly sorted SILT, some to little Sand, little Clay, little Pebbles/Cobbles, dry.	45'-52'	0.0	
53-54-55-56-57		SILT	5'	5'	Dark Gray to Dark Brown, very dense, poorly sorted SILT, some Clay, some to little Gravel, little Pebbles, traced Cobbles; dry.	52'-57'	0.0	
58-59-60-61		SILT	4'	4'	Brown to Dark Brown to Dark Gray-Brown, very dense, poorly sorted SILT, some Clay, some Gravel/Pebbles, trace Cobbles; dry.	57'-61'	0.0	
62-63-64-65		SILT	4'	4'	**0-2':** Brown medium dense, poorly sorted SAND and SILT, some Pebbles, trace Cobbles, some to little Gravel; dry to moist. **2'-4':** Brown, well sorted, dense SILT, some to little Sand, some to little Clay, minor indications of varves; moist.	61'-65'	0.0	**GW-3** VOC 8260B

*Results of on-Site radiological screening <MDL unless otherwise noted

DRILLING LOG for Well #: MW-101B

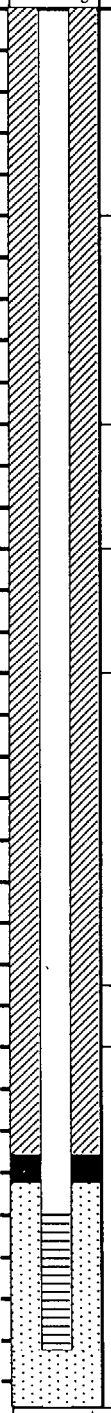
ERM
399 Boylston Street, 6th Floor
ERM Boston, MA 02116

Depth	Well Log	Stratigraphy	Penetration	Recovery	Split Spoon Description/Soil Classification	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
66		CLAY	5'	5'	**0-1':** Gray, Silty Till, some Gravel; moist. **1'-5':** Gray, very dense, silty Clay, some Cobbles/Boulders; dry.	65'-70'	0.0	
71		CLAY	5'	3'	Gray, very dense, Silty Clay, some Cobbles/Boulders; dry.	70'-73'	0.0	
74		SAND & SILT	4.5'	4.5'	Brown to gray-brown, dense to very dense, moderately well sorted fine Sand and Silt, little Clay, some to little Gravel, little Pebbles, trace Cobbles; moist.	73'-77.5'	0.0	
79		SAND	6.5'	6.5'	**0-2':** Brown fine to coarse, well sorted loose SAND; wet. **2'-4':** Olive, very fine SAND and Silt, poorly sorted, dense; wet. **4'-6.5':** Olive Silt, very dense and fine subangular Gravel, unsorted, 2-5mm stringers of fine Sand; moist.	77.5'-84'	0.0	**GW-4** VOC-8260B
86		SILT	7'	7'	**0-2':** Brown-Gray, medium loose to medium dense, coarse to fine SAND and SILT, some angular Gravel; wet. **2'-5.5':** Dark Gray-Blue, very dense, poorly sorted varved SILT, some Clay, some fine to angular Gravel; moist. **5.5'-7':** Varved Silt and Clay with 1-3mm gray Sand interbeds, trace fine Gravel, dense; moist.	85'-92'	0.0	**GW-5** VOC 8260B
93		SAND	3'	3'	**0-1':** Gray, loose, well sorted coarse SAND, some Gravel; moist to wet. **1'-3':** Gray, very coarse to coarse SAND, some Gravel some Cobbles; moist to wet.	92'-95'	0.0	
98		SAND & SILT	8'	8'	**1-3':** Gray-Blue, poorly sorted, dense fine SAND and SILT, some angular Gravel, some Cobbles; moist. **3'-8':** Gray-Blue, poorly sorted, very dense fine SAND and SILT, some angular Gravel and Cobbles, little Boulders; moist.	95'-103'	0.0	
103					SEE NEXT PAGE FOR LOGGING DETAILS			

*Results of on-Site radiological screening <MDL unless otherwise noted

DRILLING LOG for Well #: MW-101B

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth	Well Log	Stratigraphy	Penetration	Recovery	Split Spoon Description/Soil Classification	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
106-110		SAND & SILT	7'	7'	**0-4':** Brown-Gray, very dense fine SAND and SILT, little Cobbles; moist. **4'-10':** Gray varved Silt and Clay with some Sand, dense, fine to coarse angular Gravel, moderately well sorted; wet.	103'-110'	0.0	
111-115		SAND	5'	5'	Brown to Gray, medium loose to medium dense, well sorted fine to medium SAND; wet.	110'-115'	0.0	
116-118		SAND	3'	3'	Brown, loose, medium to fine SAND, little Gravel; wet.	115'-118'	0.0	
119-121		SILT	3'	3'	Brown to Gray, dense SILT, some Clay, some Boulders; dry.	118'-121'	0.0	**GW-6** VOC-8260B
122-128		SAND & SILT	7.5'	7.5'	**0-2':** Brown, dense, poorly sorted medium SAND and SILT, some angular Pebbles; wet. **2'-5':** Brown, loose coarse to fine SAND, some Silt, some angular Gravel, some Cobbles, wet. **5'-7.5':** Brown, dense, fine SAND and SILT, some Cobbles, , some angular Gravel, moist to wet.	121'-128.5'	0.0	
129-130		SAND & SILT	1.5'	1.5'	0-0.5': Brown to orange-brown, medium dense, fine to coarse SAND and SILT, some Gravel/Cobbles; wet. 0.5'-2': Weathered Schist Boulder.	128.5'-130'	0.0	GW-7 VOC-8260B
133-157		BEDROCK	25'	18.5'	**0-10':** Black to Dark Gray albite gneiss; highly broken-up/fractured (RQD<5%); reddish-brownish discoloration on rock surfaces (142'). **10'-13.5':** Black to Dark Gray albite Gneiss, higher competency (RQD>95%), higher incidence of quartz, strongly foliated. **13.5'-18.5':** Black to dark Gray albite Gneiss, strongly foliated, moderately competent (RQD >90%); some schistose zones--mostly gneissic.	130'-156'	0.0	**GW-8** VOC-8260B

Well Construction Details:

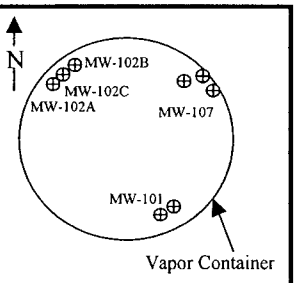
0-1': Cement, Protective Flushmount Roadbox
1'-138.2': Portland Cement/Bentonite Grout
138.2'-140.2': Bentonite Chip Seal
140.2'-156': #0 Silica Sand Filter Pack
0-142': Sched. 80 2.5" PVC Riser
142'-152': 0.010" Sched. 80 2.5" PVC Screen
156': Bottom of Boring
0-11.5': 8" Steel Casing Grouted in Place

*Results of on-Site radiological screening <MDL unless otherwise noted

DRILLING LOG for Well #: MW-102A

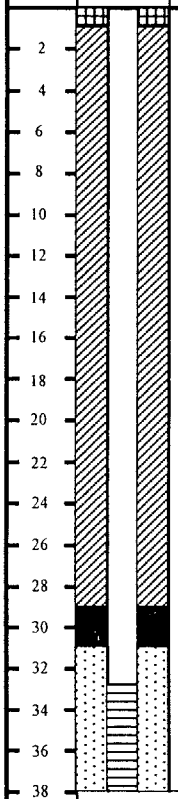
ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee L.T.P.	Project Number:	2107.01		
Client:	Yankee Atomic Electric Company	Logged by:	Michael Horesh		
Drilling Co:	D.L. Maher	Driller:	Bill Zammow		
Date Started:	30-Jul-03	Date Finished:	31-Jul-03		
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic		
Screen Diam:	2"	Length:	5'	Slot Size:	0.010"
Casing Diam:	2"	Length:	33'	Type:	Schedule 40, 2" PVC
Boring Depth:	38'	Well Depth:	38'	Boring Diam.:	5.5"
Surface Elev.:	NR	MP:	Ground Surface	Depth to GW:	13.7'
On-Site GW Analysis:	H-3, Co-60, Cs-134, Cs-137	Off-Site Non-radiological Laboratory:		Northeast Laboratories	



Notes: DTW measured on 18-Aug-03

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses



Well Construction Details:

0-1': Cement, Protective Flushmount Roadbox
1'-29': Portland Cement/Bentonite Grout
29'-31': Bentonite Chip Seal
31'-38': #0 Silica Sand Filter Pack
0-33': Sched. 40 2" PVC Riser
33'-38': 0.010" Sched. 40 2" PVC Screen
38': Bottom of Boring

Bottom of Boring at 38' bgs

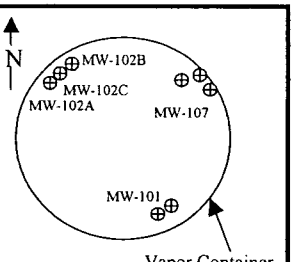
Key to Well Construction

Sandpack
Bentonite Seal
Well Screen
Cement
Grout

DRILLING LOG for Well #: MW-102C

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee L.T.P.	Project Number:	2107.01		
Client:	Yankee Atomic Electric Company	Logged by:	Michael Horesh		
Drilling Co:	D.L. Maher	Driller:	Bill Zammow		
Date Started:	25-Jul-03	Date Finished:	30-Jul-03		
Location:	Rowe, Massachuestts	Drilling Method:	Rotosonic		
Screen Diam:	2"	Length:	5'	Slot Size:	0.010"
Casing Diam:	2"	Length:	94'	Type:	Schedule 40, 2" PVC
Boring Depth:	99'	Well Depth:	99'	Boring Diam.:	5.5"
Surface Elev.:	NR	MP:	Ground Surface	Depth to GW:	35.8'
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	Off-Site Non-radiological Laboratory:	Northeast Laboratories		



Notes: DTW measured on 18-Aug-03

Depth	Well Log	Stratigraphy	Penetration	Recovery	Split Spoon Description/Soil Classification	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses
5 10 15 20 25 30 35 40						41		
45 50 55 60 65 70 75 80 85 90 95 100					**Well Construction Details:** 0-1': Cement, Protective Flushmount Roadbox 1'-91': Portland Cement/Bentonite Grout 91'-92.5': Bentonite Chip Seal 92.5'-99': #0 Silica Sand Filter Pack 0-94': Sched. 40 2" PVC Riser 94'-99': 0.010" Sched. 40 2" PVC Screen 99': Bottom of Boring			

Bottom of Boring at 99' bgs

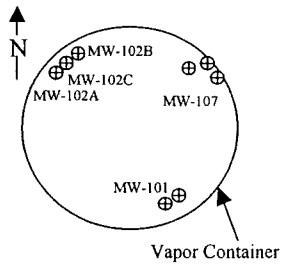
*Results of on-Site radiological activity <MDL unless otherwise noted

Key to Well Construction
Sandpack, Bentonite Seal, Well Screen, Cement, Grout

DRILLING LOG for Well #: MW-102B

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee L.T.P.	Project Number:	2107.01		
Client:	Yankee Atomic Electric Company	Logged by:	Michael Horesh		
Drilling Co:	D.L. Maher	Driller:	Bill Zammow, Oiden Gonzales		
Date Started:	17-Jul-03	Date Finished:	24-Jul-03		
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic		
Screen Diam:	2"	Length:	10'	Slot Size:	0.010"
Casing Diam:	2"	Length:	120.2'	Type:	Schedule 40 PVC
Boring Depth:	131.5'	Well Depth:	130.2'	Boring Diam.:	5.5"
Surface Elev.:	NR	MP:	Ground Surface	Depth to GW:	23.6'
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	Off-Site Non-radiological Laboratory:		Northeastern Laboratories	



Notes: DTW measured on 18-Aug-03

Depth	Boring Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
1-5		SAND & GRAVEL	5'	5'	**0-2':** Brown, loose to medium loose, poorly sorted medium to fine SAND, trace Gravel, little Pebbles, little Cobbles; moist. **2'-5':** Brown to Dark Brown, medium dense, poorly sorted rounded Cobbles, some Gravel, little Pebbles, little Silt; moist to very moist.	0-5'	0.0	
6-10		SAND	5'	5'	**0-2':** Brown to Dark Brown, loose, poorly sorted medium to coarse SAND, little Gravel, little Pebbles, trace to little Cobbles; moist. **2'-4.5':** Brown to Dark Brown, medium dense, poorly sorted, medium to coarse SAND, little to rounded Pebbles, little to some rounded Cobbles, trace Gravel; wet at ~7' **4.5'-5':** Brown, dense, poorly sorted SAND and SILT, Cobbles; moist to dry.	5'-10'	0.0	
11-15		COBBLES/ PEBBLES/ GRAVEL/SAND/ SILT	5'	5'	**0-0.5':** Brown, medium dense to dense, poorly sorted angular to rounded SAND, SILT, angular GRAVEL, COBBLES; moist. **0.5'-5':** Gray, very dense, poorly sorted, CLAY, SILT, PEBBLES, COBBLES; large Boulders at base of interval; dry.	10'-15'	0.0	**GW-1** VOC-8260B H-3=4,370 pCi/L
16-20		CLAY	5'	2.5'	Dark Brown, very dense, poorly sorted CLAY, some Cobbles, Boulders; very dry.	15'-20'	6.3[1]	
21-25		SILT & CLAY	5'	3.6'	Gray to Gray-Brown, very dense, poorly sorted SILT and CLAY, some rounded Cobbles and Boulders, fine to coarse Sand; dry.	20'-25'	6.1[1]	

NOTES:

[1] : Higher FID hits attributed to melted poly sleeve

*Results of on-Site radiological screening <MDL unless otherwise noted

Key to Well Construction

Sandpack | Bentonite Seal | Grout | Cement | Well Screen

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
26-29		SILT	5'	4.8'	Green-Gray to Gray-Brown, very dense, poorly sorted SILT, some to little Clay, some fine Sand, little rounded Pebbles, little Gravel; dry.	25'-30'	3.9[1]	
30-35		SAND & SILT	5'	4'	**0'-2':** Green-Gray to Dark Brown, very dense, poorly sorted SILT, some Clay, trace Gravel, trace Pebbles. **2'-4':** Dark Gray-Brown, loose, well sorted coarse SAND, little rounded Pebbles, trace Gravel; moist to wet.	30'-35'	0.0	**GW-2** VOC-8260B H-3=8,700 pCi/L
35-38		GNEISSIC BOULDERS	5'	2.5'	Light Gray, loose, poorly sorted Clay and crushed/broken Boulders (gneiss); dry.	35'-38'	0.0	
38-42		SILT	4'	4'	Dark Brown to Dark Gray-Brown, very dense to dense, poorly sorted SILT, little Gravel, little Pebbles, little Clay; dry (Top 2' slightly coarser with some wet Sand).	38'-42'	0.0	
42-48		SILT & CLAY	6'	6'	**0-2':** Brown Gray, medium dense to dense SILT and CLAY, some Gravel/Pebbles; moist. **2'-2.5':** Brown-Gray, medium loose, well sorted, coarse Sand, little Clay, little Silt; wet. **2.5'-6':** Blue-Gray, very dense, poorly sorted SILT and CLAY, some Gravel, some to little Cobbles, some to little Pebbles; dry.	42'-48'	0.0	**GW-3** VOC-8260B
48-53		SILT & CLAY	5'	5'	Dark Gray to Brown, very dense, poorly sorted SILT and CLAY, some to little angular to rounded Pebbles, trace rounded Cobbles; dry.	48'-53'	0.0	
53-56		SILT	3'	3'	Dark Gray to Brown, very dense, poorly sorted SILT, some Clay, some to little rounded Pebbles and Cobbles, trace to little angular Cobbles; dry.	53'-56'	0.0	
56-59		SILT	3'	3'	Dark Brown to Dark Gray, dense to very dense SILT, some Clay, little to trace rounded Pebbles, Cobbles; dry (moist at 56'-7' of interval).	56'-59'	0.0	
59-61		SILT & CLAY	2'	2'	Dark Brown to Dark Gray, medium dense to dense, poorly sorted SILT and CLAY, little angular Gravel, Pebbles, little angular to rounded Cobbles; moist.	59'-61'	0.0	
61-62		SILT	1'	1'	Dark Gray-Brown, dense, well sorted SILT, little to some Clay, little Gravel; moist to dry.	61'-62'	0.0	
62-65		SILT & CLAY	3'	3'	Dark Gray-Brown, medium dense, well sorted SILT and CLAY, trace Gravel, trace Pebbles, trace Boulder; dry.	62'-65'	0.0	

NOTES:

[1]: Higher FID hits attributed to melted poly sleeve

*Results of on-Site radiological screening <MDL unless otherwise noted

DRILLING LOG for Well #:	MW-102B	ERM 399 Boylston Street, 6th Floor Boston, MA 02116	Page 3 of 4

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
66		VARVED SILT & CLAY	4'	4'	**0-1.5':** Dark Brown, medium dense, well sorted varved SILT and CLAY, little Gravel **1.5'-3':** Gray to Dark Brown SILT and CLAY, little Gravel, little Pebbles/Boulders. **3'-4':** Dark Gray to Dark Brown SILT and CLAY, little fine Sand lenses (varves), moderately plastic unit.	65'-69'	0.0	
69		SILT	1'	1'	Brown to Dark Brown, medium dense, poorly sorted SILT, some Clay, little angular Gravel/Pebbles; moist.	69'-70'	1.1[2]	
70		VARVED SILT & CLAY	2.5'	2.5'	Dark Brown to Dark Gray, dense, well sorted SILT and CLAY, some to little dark Gray medium Sand varves throughout section; moist.	70'-72.5'	0.9[2]	
73		SILT	2'	2'	Dark Brown, dense to very dense, poorly sorted SILT, some Clay, little angular Gravel, Pebbles; moist.	72.5'-74.5'	1.1[2]	
75		SILT	5.5'	3.5'	Dark Brown, medium loose to loose, moderately well sorted SILT, little to trace angular Gravel/Pebbles, trace Clay; moist to wet	74.5'-80'	1.2[2]	
80		SILT	5'	4.5'	**0-1':** Dark Brown, medium loose to loose, moderately to poorly sorted SILT, little angular Gravel/Pebbles, trace Clay, moist to wet. **1'-4':** Dark Brown, dense, moderately well sorted SILT, little Gravel/Pebbles, trace Clay, moist. **4'-4.':** Medium Gray to Dark Gray -Brown, very dense, poorly sorted SILT and Clay, some to little Cobbles and Boulders; dry.	80'-85'	1.4[2]	
85		SILT	1'	1'	Brown, dense to very dense, poorly sorted SILT, some fine Sand, some to little Boulders/Cobbles; moist to dry.	85'-86'	6.3[1]	
86		SILT	2'	1.9'	Brown to Gray, very dense, poorly sorted SILT, some Clay, some rounded Boulders/Cobbles; dry.	86'-88'	4.9[1]	**MW-102B: 90'** VOC (low, med.), Total Solids, TPH-GRO, TPH-DRO, PCB's, SVOC, PP13 Metals
88		SILT & BOULDER	2'	2'	**0-1':** Brown, medium loose to medium dense, poorly sorted SILT, some Clay, some round Cobbles, trace Gravel **1'-2':** Light Gray Boulder (albite gneiss)--pulverized.	88'-90'	**7.1**	
90		SILT & BOULDERS	5'	5'	Dark Gray-Blue, very dense, poorly sorted SILT, some to little Clay, some angular Gravel, Pebbles, little to trace Cobbles; quartzite Boulder 2' into section (4" diameter); albite gneiss Boulder at bottom of section (8" diameter); dry.[3]	90'-95'	0.7	
95		SAND, SILT & CLAY	5'	5'	**0-3':** Brown to Brown Gray, loose, moderately well-sorted, coarse to medium SAND, little angular Pebbles, trace Clay, moist to wet. **3'-5':** Dark Gray, very dense, poorly sorted SILT and CLAY, some angular Cobbles/Pebbles; dry.	95'-100'	2.4	**GW-4** VOC-8260B H-3= 14,800 pCi/L
100		SAND & SILT	5'	2.5'	**0-1.5':** Gray to dark Gray-Brown, loose, moderately poorly sorted SILT, little rounded Pebbles, Cobbles, little Boulders; wet. **1.5'-2.5':** Brown to Gray-Brown, loose, well sorted, coarse SAND, little to trace Clay, trace angular Cobbles; wet.	100'-105'	4.1	
105								

NOTES:

[1]: Higher FID hits attributed to melted poly sleeve

[2]: Similar or equal to background levels

[3]: Eberline Frisker yielded reading of ~250 cpm--further analysis attributed activity to naturally-occurring Actinium-228

*Results of on-Site radiological screening <MDL unless otherwise noted

DRILLING LOG for Well #:	MW-102B	ERM 399 Boylston Street, 6th Floor Boston, MA 02116	Page 4 of 4

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
106		SILT & CLAY	2'	1.8'	Brown, medium dense to dense, poorly sorted SILT and CLAY, some to little Gravel and Pebbles, little to trace Cobble; moist.	105'-107'	NR	
107								
108								
109								
110		SILT & CLAY	6'	6'	**0-1':** Dark Gray, very dense, poorly sorted SILT and CLAY, some angular Gravel, Pebbles, little Cobbles. **1'-6':** Dark Gray to Brown, dense to broken-up loose, poorly sorted SILT and CLAY, some Pebbles, some to little Boulders @ 111', 112', 113'; moist to dry.	107'-113'	2.7	
111								
112								
113								
114		SILT & CLAY	2.5'	2.5'	**0-1':** Dark Gray, very dense, poorly sorted SILT and CLAY, some angular Pebbles, little Cobbles; moist to dry. **1'-2.5':** Dark Gray to Dark Brown, dense (broken-up), poorly sorted SILT, little Clay, some Pebbles, Cobbles; moist to dry.	113'-115.5'	0.2	
115								
116								
117								
118								
119								
120								
121								
122		BEDROCK	16'	11.5'	Black to light gray-white, coarse-grained albite gneiss; moderately to strongly foliated; fracture zone at upper 1.5' of section; fracture zone with yellowish discoloration at 5.5'-7.5'; some pieces exhibit natural fractures within competent bedrock. Large quartz cobble at 1' with large albite crystals; quartz veins within bedrock dip at ~30° from horizontal.	115.5'-131.5'	NR	**GW-5** VOC-8260B
123								
124								
125								
126								
127								
128								
129								
130								
131		Bottom of Boring at 130.2' bgs						
132								

Well Construction Details:

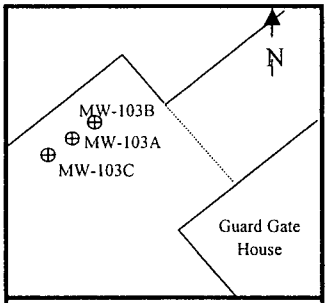
0-1': Cement, Protective Flushmount Roadbox
1'-116': Portland Cement/Bentonite Grout
116'-117.9': Bentonite Chip Seal
117.9'-130.2': #0 Silica Sand Filter Pack
0-120.2': Sched. 40 2" PVC Riser
120.2'-130.2': 0.010" Sched. 40 2" PVC Screen
130.2': Bottom of Boring
0-15': 8" Steel Casing Grouted in Place

*Results of on-Site radiological screening <MDL unless otherwise noted
NR = Not Recorded

DRILLING LOG for Well #: MW-103A

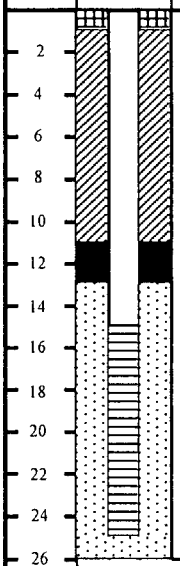
ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee L.T.P.	Project Number:	2107.01		
Client:	Yankee Atomic Electric Company	Logged by:	Michael Horesh		
Drilling Co:	D.L. Maher	Driller:	Oiden Gonzales		
Date Started:	16-Jul-03	Date Finished:	16-Jul-03		
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic		
Screen Diam:	2"	Length:	10'	Slot Size:	0.010"
Casing Diam:	2"	Length:	15'	Type:	Schedule 40 PVC
Boring Depth:	26'	Well Depth:	25'	Boring Diam.:	5.5"
Surface Elev.:	NR	MP:	Ground Surface	Depth to GW:	18.58'
On-Site GW Analyses: H-3, Co-60, Cs-134, Cs-137		Off-Site Non-radiological Laboratory:		Northeastern Laboratories	



Notes: GW measured on 8-Sep-03

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) spoon/HS	Lab Sample # & Analyses



Well Construction Details:

0-1': Cement, Protective Flushmount Roadbox
1'-11': Portland Cement/Bentonite Grout
11'-13': Bentonite Chip Seal
13'-26': #0 Silica Sand Filter Pack
1-15': Sched. 40 2" PVC Riser
15'-25': 0.010" Sched. 40 2" PVC Screen
26': Bottom of Boring

Bottom of Boring at 26' bgs

*Results of on-Site radiological activity <MDL unless otherwise noted

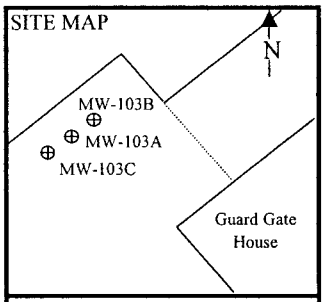
Key to Well Construction
Sandpack
Bentonite Seal
Well Screen
Cement
Grout

DRILLING LOG for Well #: MW-103C

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee L.T.P.	Project Number:	2107.01		
Client:	Yankee Atomic Electric Company	Logged by:	Michael Horesh		
Drilling Co:	D.L. Maher	Driller:	Bill Zammow		
Date Started:	11-Jun-03	Date Finished:	16-Jul-03		
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic		
Screen Diam:	2"	Length:	10'	Slot Size:	0.010"
Casing Diam:	2"	Length:	115'	Type:	Schedule 40 PVC
Boring Depth:	125'	Well Depth:	125'	Boring Diam.:	5"
Surface Elev.:	NR	MP:	Ground Surface	Depth to GW:	76.80'
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	Off-Site Non-radiological Laboratory		Northeastern Laboratories	

SITE MAP



Notes: DTW measured on 17-Jul-03

Depth	Well Log	Stratigraphy	Penetration	Recovery	Split-Spoon Description/Soil Classification	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses
5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125								65' bgs GW-1 VOC-8260B

Well Construction Details:

0-1': Cement, Protective Flushmount Roadbox
1'-110.5': Portland Cement/Bentonite Grout
110.5'-112.3': Bentonite Chip Seal
112.3'-125': #0 Silica Sand Filter Pack
0-115': Sched. 40 2" PVC Riser
115'-125': 0.010" Sched. 40 2" PVC Screen
125': Bottom of Boring

Bottom of Boring at 125' bgs

*Results of on-Site radiological activity <MDL unless otherwise noted

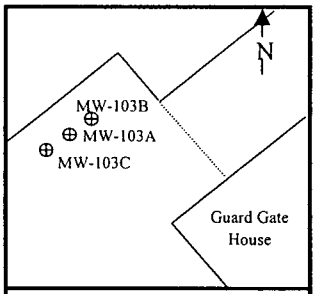
Key to Well Construction

Sandpack | Well Screen | Grout
Bentonite Seal | Cement

DRILLING LOG for Well #: MW-103B

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee L.T.P.	Project Number:	2107.01		
Client:	Yankee Atomic Electric Company	Logged by:	Michael Horesh		
Drilling Co:	D.L. Maher	Driller:	Bill Zammow, Oiden Gonzales		
Date Started:	9-Jun-03	Date Finished:	9-Jul-03		
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic		
Screen Diam:	2.5"	Length:	10'	Slot Size:	0.010"
Casing Diam:	2.5"	Length:	284.5'	Type:	Schedule 80 PVC
Boring Depth:	294.5'	Well Depth:	294.5'	Boring Diam.:	5.5"
Surface Elev.:	NR	MP:	Ground Surface	Depth to GW:	37.90'
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	Off-Site Non-radiological Laboratory:		Northeastern Laboratories	



Notes: DTW measured on 9-Sep-03

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
1-5		SAND & GRAVEL	5'	4.9'	**0-1.3':** Brown to Orange Brown, loose, poorly sorted coarse SAND and GRAVEL, little Pebbles, trace Cobbles/Boulders;dry. **1.3'-4.9':** Brown to Red Brown, loose, poorly sorted coarse SAND (mica), little Pebbles, trace Cobbles/Boulders; dry.	0-5'	0.5	
6-14		SAND	10'	9.5'	Dark Brown to Gray Brown, loose, poorly sorted, coarse to fine SAND, some rounded Cobbles/Boulders, little rounded Pebbles; Dark Brown banded interval from 1.8'-2.0', Gray-Tan interval w/ Pebbles and Boulders from 3.8'-4.0'; dry.	5'-15'	0.0	
15-25		SAND	10'	5.5'	**0-2.5':** Brown to Orange Brown, loose, moderately well-sorted coarse to medium SAND, some rounded Pebbles, trace rounded Boulders, Clay, dry. **2.5'-3.5':** Light Brown to Gray, loose, poorly sorted fine to medium SAND, little rounded Gravel, some rounded Boulders, trace Pebbles, moist. **3.5'-5.5':** Brown to Orange Brown, loose, moderately well-sorted coarse to medium SAND, some to little rounded Pebbles, wet.	15'-25'	0.0	

NOTES:
*Results of on-Site radiological screening <MDL unless otherwise noted

Key to Well Construction
Sandpack | Well Screen | Grout
Bentonite Seal | Cement

DRILLING LOG for Well #: MW-103B

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth	Boring Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
26-29		SAND, SILT & CLAY	4.0'	4'	**0-1':** Light Tan to Yellow tan, dense, poorly sorted SILT, SAND and rounded Pebbles, Cobbles; dry. **1'-4':** Gray-Brown to Brown, dense, poorly sorted, SAND, CLAY, SILT and rounded Gravel, Pebbles and Cobbles; dry to moist.	25'-29'	0.0	**GW-1** VOC-8260B
30-32		SAND, SILT & PEBBLES	3.0'	2.8'	**0-8", 2-2.8':** Brown to Red Brown, very dense, poorly sorted SILT, SAND, PEBBLES, trace rounded Boulder;dry. **0.8'-2.0':** Light Gray, medium dense medium SAND, little Pebbles/Cobbles, trace Boulders; dry.	29'-32'	0.0	
33-35		SAND & SILT	3.0'	2.0'	Brown to Red Brown, loose to dense, poorly sorted SAND and SILT, some to little rounded Pebbles, rounded Boulders; dry.	32'-35'	0.0	
36-38		SAND & SILT	4.0'	3.8'	Dark Gray-Brown, very dense, moderately well sorted fine SAND and SILT, little to trace rounded Cobbles/Pebbles, semi-rounded schist Boulder at base of interval; dry.	35'-39'	2.2[1]	
39-41		SAND & SILT	2.0'	2.0'	Dark Gray-Brown to Red-Brown, very dense, poorly sorted SILT and fine to coarse SAND, rounded schist Pebbles w/ talc, garnet; some zones of yellowish-reddish oxidation; moist.	39'-41'	0.0	
42-45		SAND & SILT	4.0'	4.0'	**0-0.5':** Dark Brown, medium dense, well sorted fine SAND, trace rounded Gravel/Pebbles; moist. **0.5'-2.8':** Dark Brown to Dark Gray, very dense, well sorted SILT, trace rounded Pebbles; dry. **2.8'-4.0':** Dark Brown, medium loose, well sorted medium to coarse SAND, trace Gravel, little Pebbles; wet.	41'-45'	0.0	
46-48		SAND & SILT	4.0'	3.0'	**0-2.4':** Dark Gray-Brown to Dark Brown, dense to very dense, moderately well sorted SILT and fine SAND, some coarse SAND, little Pebbles, trace Cobbles; dry. **2.4'-3.0':** Light Tan to Greenish Brown, very dense SILT and fine SAND, some to little rounded Talc Cobbles, little Pebbles/Boulders; dry.	45'-49'	0.0	
49-51		SAND & SILT	2.0'	2.0'	Medium Brown to Reddish Brown, very dense, moderately well sorted SILT and SAND, trace rounded Gravel, gneissic-schist broken-up/massive Boulder; dry.	49'-51'	0.0	
52-54		SAND & SILT	4.0'	4.0'	**0-3.5':** Dark Gray Brown to Yellowish Brown very dense, well to poorly sorted SILT and fine SAND, some rounded Pebbles, rounded gneissic-schist Boulder; dry. **3.5'-4.0':** Dark Gray-Brown, very dense, moderately well sorted fine SAND and SILT, little rounded schist Pebbles and Cobbles; dry.	51'-55'	0.0	
56-58		SAND & SILT	3.0'	3.0'	Gray-Brown to Green, very dense to dense, poorly sorted fine SAND and SILT, some to little rounded schist Cobbles, trace to little Clay, trace medium Sand, trace Gravel/Pebbles; dry.	55'-58'	0.0	
59-65		SAND & SILT	6.0'	6.0'	Dark Gray-Brown, very dense to dense, very well sorted, interbedded (1/16"-1/8") medium to very fine SAND and SILT; wet.	59'-65'	0.0	**GW-2** VOC-8260B

NOTES:

[1]: Headspace reading not repeatable

*Results of on-Site radiological screening <MDL unless otherwise noted

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
66		SILT	3.0'	3.0'	Dark Brown to Dark Reddish-Brown, very dense, moderately well sorted SILT, little highly-oxidized Talc Pebbles/Cobbles, some to little fine Sand; moist.	65'-68'	0.0	
67								
68								
69		SAND & SILT	3.0'	2.8'	Brown-Green-Gray, very dense, well sorted fine SAND and SILT, trace rounded schist Cobbles, little rounded Gravel; dry.	68'-71'	0.0	
70								
71								
72		SAND & SILT	4.0'	4.0'	Orange-Brown to dark Gray Brown, very dense, poorly sorted fine SAND and SILT, some rounded schist Cobbles/Pebbles, trace Clay, little rounded schist Boulders; dry.	71'-75'	0.0	
73								
74								
75								
76		SILT	3.0'	3.0'	Dark Gray-Brown, very dense to dense, well sorted SILT, little fine Sand, little to trace rounded Pebbles, multiple zones of yellowish staining, trace angular to rounded Gravel; moist.	75'-78'	0.0	
77								
78								
79		SILT	3.0'	3.0'	Dark Gray-Brown, very dense, well sorted SILT, some fine Sand, some Clay, little rounded Talc, Cobbles; moist.	78'-81'	0.0	
80								
81								
82		SILT	2.0'	2.0'	Dark Brown-Gray, dense to very dense, well sorted SILT, little rounded Pebbles--large orange-yellow quartzite boulder at bottom of interval; dry.	81'-83'	0.0	
83								
84		SAND	2.0'	2.0'	Dark Brown-Gray, very dense, moderately well sorted fine SAND, some Silt, little to some Boulders, trace Clay; dry.	83'-85'	0.0	
85								
86		SAND & SILT	3.0'	3.0'	Dark Brown, very dense, moderately well sorted SAND, some SILT, some Talc Pebbles/Cobbles, some whitish-yellowish discoloration at bottom of interval; dry.	85'-88'	0.0	
87								
88								
89		SAND & SILT	4.0'	4.0'	Dark Brown-Gray, very dense, poorly sorted very fine SAND and SILT, some rounded Pebbles, little rounded Cobbles; dry.	88'-92'	0.0	
90								
91								
92		SAND & SILT	4.0'	2.8'	**0-2.2':** Brown to Dark Brown, medium dense, well sorted SILT, little Clay, little Pebbles, trace Gravel. **2.2'-2.8':** Brown to gray brown fine SAND, some Silt, little rounded Cobbles, trace Gravel/Pebbles; dry.	92'-95'	0.0	
93								
94								
95		SAND & SILT	5.0'	5.0'	Dark Brown to Gray Brown fine, very dense, moderately well sorted. SAND and SILT, some medium SAND, little rounded Pebbles, little to trace Cobbles; dry.	95'-100'	0.0	
96								
97								
98								
99								
100								
101		SILT	5.0'	3.5'	Dark Brown to Gray Brown, medium dense to dense, poorly sorted SILT, some Clay, little angular Gravel, little angular Boulders; Orange rind in 4" Sand zone; dry.	100'-105'	3.2	
102								
103								
104								
105								

NOTES:
*Results of on-Site radiological screening <MDL unless otherwise noted

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
106		CLAY	5'	5'	Medium Brown and Dark Gray dense, well sorted CLAY, some Silt, some fine Sand (micas); medium stiff; miost (varves).	105'-110'	1.3[2]	
107								
108								
109								
110								
111		CLAY	5'	5'	Brown to Bluish-Green Gray, dense, well sorted CLAY, some Silt, trace Sand (mica) stringers, medium stiff; moist to wet (varves).	110'-115'	1.7[2]	
112								
113								
114								
115								
116		CLAY	10'	10'	Bluish-Green Gray, very stiff, well sorted CLAY and very fine micaceous SAND (varves)	115'-125'	2.0[2]	
117								
118								
119								
120								
121								
122								
123								
124								
125		CLAY	10'	10'	Brown to Dark Brown, very stiff, well sorted CLAY with Dark Gray to Gray micaceous very fine Sand interbeds (varves--1mm to several cm in thickness); wet.	125'-135'	1.4[2]	
126								
127								
128								
129								
130								
131								
132								
133								
134								
135		CLAY	10'	10'	Brown to Dark Brown, stiff to very stiff, well sorted CLAY, trace Gray Clay with Dark Gray very fine micaceous Sand varves; trace Gravel (Talc?); wet.	135'-145'	2.0[2]	
136								
137								
138								
139								
140								
141								
142								
143								
144								
145								

NOTES:

[2]: Similar or equal to background levels

*Results of on-Site radiological screening <MDL unless otherwise noted

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
146		CLAY	4.0'	3.8'	Brown to Dark Brown, very stiff CLAY with some Silt, grading downward to Clay and Gravel, grading downward into Clay/Sand/Cobbles/Gravel; wet.	145'-149'	0.0	
150		CLAY	6.0'	5.5'	**0-1':** Gray Brown, very dense SILT, some fine to medium subangular Gravel, little fine to medium Sand; moist. **1'-6':** Brown to Gray Brown, dense, moderately well sorted CLAY with little micaceous Sand varves (no grain size greater than medium Sand).	149'-155'	0.2	**GW-4** VOC-8260B
156		CLAY	5.0'	5.0'	Brown to Dark Brown, dense, moderately well sorted to well sorted Clay with medium to coarse Sand varves, interval coarsening downwards, oxidized Talc (?) Cobble; bottom 6" consists of fine Sand, trace Silt; wet.	155'-160'	1.1[2]	
161		SILT	5.0'	4.5'	Dark Brown to Dark Brown-Gray, medium dense, poorly sorted SILT and some Clay, some to little angular, fine to coarse Gravel, little Pebbles; wet.	160'-165'	0.6	
166		SAND	5.0'	5.0'	Dark Brown-Gray, dense to medium dense, poorly sorted medium to fine SAND, little rounded Pebbles, trace rounded Cobble, little Silt (at top of interval).	165'-170'	2.0	**GW-5** VOC-8260B
171		SAND	15.0'	15.0'	**0-5':** Dark Brown to medium Gray, medium dense to loose, well sorted fine SAND and Silt, trace Clay; wet. **5'-10':** Dark Brown to medium Gray, medium dense to loose, well sorted medium to fine SAND, trace Silt; wet. **10'-15':** Dark Brown to medium Gray, medium dense, well sorted SILT, some to little fine Sand, trace Clay; wet.	170'-185'	2.0[1,2]	**GW-6** VOC-8260B
185								

NOTES:

[1]: Headspace reading not repeatable

[2]: Similar or equal to background levels

*Results of on-Site radiological screening <MDL unless otherwise noted

DRILLING LOG for Well #: MW-103B	ERM 399 Boylston Street, 6th Floor Boston, MA 02116	Page 6 of 8

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
186–194		SAND	9.0'	9.0'	Gray-Brown, medium loose to medium dense, well sorted coarse to fine SAND, little fine SAND and Silt--grades downward at 7' to Silt and Clay, trace fine SAND; wet.	185'-194'	1.9	
194–195		SAND	1.0'	1.0'	Gray-Brown, medium loose, well sorted fine SAND; wet.	194'-195'	2.2	
196–215		SAND & SILT	20'	20'	**0-7':** Gray-Brown, medium loose, well sorted medium SAND, some fine Sand, little to trace coarse Sand; wet. **7'-11':** Brown to Dark Gray Brown, very stiff, well sorted Clay, little gray Silty interbeds (varves), trace angular Pebbles, little to trace angular Gravel; wet. **11'-17.5':** Brown to Dark Gray Brown, medium dense, well sorted SILT, some fine SAND, little to some Clay; wet. **17.5'-20':** Brown to Dark Gray Brown, medium dense to medium loose, well sorted fine SAND grading downwards to medium SAND; wet.	195'-215'	N/A	
216–225		SAND	15'	15'	**215'-218':** Dark Gray Brown, medium dense to medium loose, well sorted coarse to fine SAND fining downwards to Clay, some Silt; wet. **218'-224':** Dark Gray Brown, medium dense, well sorted fine SAND and Silt; wet. **224'-228':** Dark Gray Brown, well sorted, medium loose, medium to fine SAND, little Silt; wet. **228'-230':** Dark Gray to Brown, dense, well sorted Silt, some Clay with Gray fine SAND interbeds (varves); wet.	215'-230'	0.0	

NOTES:
*Results of on-Site radiological screening <MDL unless otherwise noted

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
226					SEE PREVIOUS PAGE FOR LOGGING DETAILS			
230		SAND & SILT	20'	15'	**0-7':** Gray to Dark Gray-Brown, medium loose, well sorted fine SAND and SILT; wet. **7'-9':** Gray to Dark Gray-Brown, stiff, well sorted Clay, little Silt varves; moist. **9'-15':** Gray to Dark Gray-Brown, medium dense to medium loose, well sorted fine SAND and SILT, grading into dominantly Clay with Silt varves; moist.	230'-245'	0.0	
245		SILT & CLAY	20'	20'	**0-7':** Dark to Medium Gray-Brown, medium dense, well sorted SILT, some CLAY. **7'-13':** Medium Gray-Brown, dense, well sorted SILT and CLAY, little very fine Sand varves, trace Gravel, trace rounded Pebbles, angular Gravel (unit shears along very fine SAND and SILT beds). **13'-18':** Medium Gray-Brown, dense, well sorted SILT and CLAY, little very fine Sand. **18'-20':** Medium Gray-Brown, dense, well sorted SILT and CLAY, trace very fine Sand and Silt varves.	245'-265'	0.0	

NOTES:
*Results of on-Site radiological sceening <MDL unless otherwise noted

DRILLING LOG for Well #: MW-103B

ERM
399 Boylston Street, 6th Floor
ERM Boston, MA 02116

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
266		SAND & SILT	1'	1	Medium Brown, medium dense, well sorted SILT, some Clay, coarsening downward to coarse to fine SAND, trace Silt.	265'-267'	2.5	
267								
268								
269		SCHIST BOULDER	4'	4'	**0-1.5':** Weathered Black gneissic-schist boulder, large, potentially albite crystals. **1.5-4':** Highly weathered, Black, Tan, Orange, Brown Schist with trace lodged rounded Pebbles, some Gravel, weathered to coarse Sand-sized grains.	267'-271'	2.0	
270								
271								
272		SAND	3.5'	3.5'	Dark Brown-Gray, medium dense, moderately well-sorted, coarse SAND, some Silt and Clay, cored boulder (gneissic) at 2.5'-3.5', trace rounded cobbles at base of interval; wet.	271'-274'	1.7	
273								
274								
275		BOULDERS	2'	2'	**0-0.5':** Multi-colored, loose, poorly sorted SAND & GRAVEL and medium dense fine Sand and Silt **0.5'-2':** Very Gray to Black weathered Schistic-Gneiss Boulders.	275'-277'	3.5 [2]	GW-7 (Sample too Silty for Submittal)
276								
277								
278		BOULDERS	2'	1.5'	Very Dark Gray to Black weathered Cobbles to Boulders.	277'-279'	0.0	
279		SILT	1'	1'	Dark Gray to Dark Gray Brown, poorly sorted, dense SILT, little to some Clay, some rounded Cobbles, trace Gravel, trace Pebbles.	279'-280'	0.0	
280		BEDROCK	15'	15'	Black to Light Gray/White Gneiss, strongly foliated, some associated Talc (Garnet?), horneblende, mica, foliation at ~35° to horizontal; competent rock with several drillers' breaks, few natural fractures.	280'-295'	N/A	**GW-8** VOC-8260B
281								
282								
283								
284								
285								
286								
287								
288								
289								
290								
291								
292								
293								
294								
295								

Bottom of Boring at 294.5' bgs

Well Construction Details:

0-1': Cement, Protective Flushmount Roadbox
1'-279': Portland Cement/Bentonite Grout
279'-282': Bentonite Chip Seal
282'-295': #0 Silica Sand Filter Pack
0-284.5': Sched. 80 2.5" PVC Riser
284.5'-294.5': 0.010" Sched. 80 2.5" PVC Screen
294.5': Bottom of Boring
0-30': 8" Steel Casing Grouted in Place

NOTES:

[2]: Similar or equal to background levels

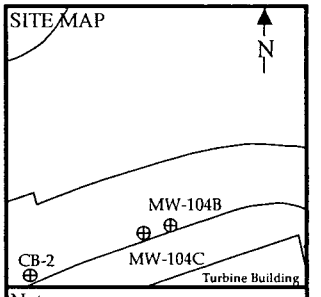
*Results of on-Site radiological screening <MDL unless otherwise noted

DRILLING LOG for Well #: MW-104C

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee L.T.P.	Project Number:	2107.01		
Client:	Yankee Atomic Electric Company	Logged by:	Michael Horesh		
Drilling Co.:	D.L. Maher	Driller:	Bill Zammow		
Date Started:	5-Sep-03	Date Finished:	10-Sep-03		
Location:	Rowe, Massachuestts	Drilling Method:	Rotosonic		
Screen Diam.:	2.5"	Length:	10'	Slot Size:	0.010"
Casing Diam.:	2.5"	Length:	87'	Type:	Schedule 40, 2" PVC
Boring Depth.:	97'	Well Depth:	97'	Boring Diam.:	5.5"
Surface Elev.:	NR	MP:	Ground Surface	Depth to GW:	NR
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	Off-Site Non-radiological Laboratory:		Northeast Laboratories	

SITE MAP



Notes:

Depth	Well Log	Stratigraphy	Penetration	Recovery	Split Spoon Description/Soil Classification	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses
5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100								

Well Construction Details:

0-1': Cement, Protective Flushmount Roadbox
1'-82.8': Portland Cement/Bentonite Grout
82.8'-84.8': Bentonite Chip Seal
84.8'-97': #0 Silica Sand Filter Pack
0-87': Sched. 40 2" PVC Riser
87'-97': 0.010" Sched. 40 2" PVC Screen
97': Bottom of Boring

Bottom of Boring at 97' bgs

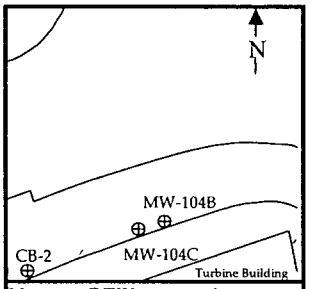
Key to Well Construction

Sandpack | Bentonite Seal | Well Screen | Cement | Grout

DRILLING LOG for Well #: MW-104B

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee L.T.P.	Project Number:	2107.01		
Client:	Yankee Atomic Electric Company	Logged by:	Michael Horesh		
Drilling Co:	D.L. Maher	Driller:	Bill Zammow, Oiden Gonzales		
Date Started:	22-Aug-03	Date Finished:	04-Sep-03		
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic		
Screen Diam:	2.5"	Length:	10'	Slot Size:	0.010"
Casing Diam:	2.5"	Length:	184'	Type:	Schedule 80 PVC
Boring Depth:	194.5'	Well Depth:	194'	Boring Diam.:	5.5"
Surface Elev.:	NR	MP:	Ground Surface	Depth to GW:	23.60'
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	Off-Site Non-radiological Laboratory:		Northeastern Laboratories	



Notes: DTW measured on 18-Aug-03

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
1-5		SAND & GRAVEL	2'	2'	Brown to Dark Brown, loose, moderately sorted medium SAND and fine to coarse, well rounded GRAVEL, some to little rounded Pebbles, little to trace rounded Boulders, Cobbles, trace angular Gravel; dry.	0-2'	2.4[1]	
3-5		SAND & GRAVEL	3'	3'	Brown to Dark Brown, loose to moderately loose, poorly sorted medium SAND and fine to coarse, well rounded GRAVEL, some to little rounded Pebbles, Cobbles, trace to little Silt, trace Clay; moist (beginning at ~3' bgs).	2'-5'	0.6[1]	
6-15		SAND & GRAVEL	10'	10'	**0-5'**: Brown-Orange Brown, loose, poorly sorted medium to coarse SAND, some angular Gravel/Pebbles, little rounded Cobbles; moist. **5'-7'**: Brown to Dark Gray-Brown, loose, poorly sorted, medium to coarse SAND, some angular Gravel/Pebbles, little rounded Cobbles;moist **7'-10'**: Brown to Dark Orange Brown, loose, poorly sorted, medium to coarse SAND, little angular Gravel, some rounded Cobbles, little to trace Clay; moist to wet (wet at ~14.5')	5'-15'	0.0	
15-20		SAND & GRAVEL	5'	5'	**0-2'**: Dark Brown to Reddish Brown, loose to moderately loose, poorly sorted medium to coarse SAND and fine to coarse GRAVEL, some rounded to angular Pebbles/Cobbles, trace to little Silt Clay **2'-5'**: Dark Gray Brown, medium dense, fine to coarse SAND, little to some Clay, trace Boulders, Cobbles; dry.	15'-20'	0.0	
20-25		SILT	5'	5'	**0-2.5'**: Dark Gray Brown, very dense, moderately sorted SILT, some to little Clay, little rounded Pebbles, little rounded schist Cobble; dry. **2.5'-5.0'**: Dark Gray Brown, very dense, poorly sorted SILT, some Clay, some angular rounded Pebbles, little Boulder; dry.	20'-25'	0.0	**GW-1** VOC-8260B

NOTES:
1 : Similar or equal to background levels
*Results of on-Site radiological screening <MDL unless otherwise noted

Key to Well Construction
Sandpack
Bentonite Seal
Well Screen
Cement
Grout

DRILLING LOG for Well #: MW-104B

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth	Well	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
26-29		SILT	4'	4'	Bluish Gray, dense to very dense, moderately well sorted SILT, little Clay, little to trace Gravel, trace Pebbles; dry.	25'-29'	0.0	
30-33		SAND	3'	3'	**0-1'**: Gray-Brown, dense, well sorted Silt, trace coarse SAND, trace Gravel/Pebbles (angular); moist. **1'-3'**: Gray-Gray Brown, medium dense, well sorted fine SAND, trace Silt; moist.	29'-32'	0.0	
32-33		SAND & SILT	2'	2'	Dark Brown to Gray, medium dense, well sorted fine SAND and SILT, little to trace angular Pebbles, trace Gravel; moist.	32'-34'	0.0	
34-35		SILT	1'	1'	Brown to Gray Brown, medium dense, poorly sorted SILT, some fine Sand, little Pebbles/Gravel; moist (boulder at tip of core).	34'-35'	0.2	
36-42		SAND	8'	8'	**0-3'**: Brown to Gray, medium dense, poorly sorted fine SAND and Silt, some to little Pebbles, little angular Gravel, little to trace Cobbles; moist (dry boulder at 37'). **3'-8'**: Brown, medium loose, well sorted medium SAND, trace Cobbles, trace Silt; wet.	35'-43'	0.0	**GW-2** VOC-8260B H-3=6,270 pCi/L
43-50		SAND & SILT	7'	7'	**0-1'**: Brown, loose, well sorted coarse SAND; wet. **1'-2'**: Brown, very dense, moderately sorted SILT, little angular Gravel; moist. **2'-5'**: Brown, medium dense to medium loose, poorly sorted SAND, GRAVEL, PEBBLES, SILT, trace Clay; dry. **5'-7'**: Brown to Gray Brown, very dense, poorly sorted SILT, Cobbles, some to little Clay, little medium SAND; dry.	43'-50'	0.0	
50-55		SILT	5'	5'	**0-2.5'**: Gray to Dark Gray-Blue, very dense, poorly sorted SILT, some angular Cobbles, some to little Clay, little Gravel; dry. **2.5'-5'**: Gray-Blue to Dark Gray, very dense, poorly sorted SILT, some Clay, little angular Pebbles/Gravel, minor indications of varving; dry.	50'-55'	0.0	
55-59		SAND & SILT	4'	5'	Dark Gray-Brown to Gray, medium dense to dense, poorly sorted fine SAND and SILT, some to little Clay, some angular Gravel/Pebbles; moist to dry.	55'-59'	0.0	
59-65		SILT & CLAY	6'	6'	**0-5'**: Dark Brown-Gray, dense to very dense, poorly sorted SILT and CLAY, some to little angular to rounded Gravel, trace Pebbles, dry to moist. **5'-6'**: Brown to dark Brown fine Sand and SILT, trace Gravel, trace Pebbles; moist.	59'-65'	0.9	

NOTES:
*Results of on-Site radiological screening <MDL unless otherwise noted

DRILLING LOG for Well #:	MW-104B	ERM 399 Boylston Street, 6th Floor Boston, MA 02116	Page 3 of 6

Depth	Boring Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
66 67 68		SILT & CLAY	4'	4'	Dark Brown to dark Brown-Gray, medium dense to dense, well to moderately well sorted SILT and CLAY, little to trace angular Gravel/Pebbles, trace Cobbles, varved intervals throughout; moist (LACUSTRINE?).	65'-69'	2.2	
69 70		SILT	1'	1'	Dark Brown, medium dense, poorly sorted SILT, some Clay, some to little angular Pebbles/Gravel, trace fine Sand, some varving, moist.	69'-70'	0.0	
71 72		SILT	2'	2'	Dark Brown, dense to very dense, poorly sorted SILT, some Clay, some Gravel/Pebbles (angular), trace Cobbles; moist.	70'-72'	0.0	
73 74 75		SILT and CLAY	3'	3'	**0-1.5':** Medium Brown, very dense, poorly sorted SILT and CLAY, little angular Gravel/Pebbles; dry. **1.5'-3':** Pulverized boulder (black gneissic schist); dry.	72'-75'	0.0	
76 77 78 79		SILT	5'	5'	Dark Gray-Brown to Gray, medium dense, poorly sorted SILT, some Clay, little fine Sand, some to little angular Gravel/Pebbles; moist to dry.	75'-80'	0.0	
80 81 82 83 84		SILT	5'	5'	Dark Brown to Dark Brown-Gray, dense, poorly sorted SILT, some to little fine Sand, little angular Gravel/Pebbles, trace Cobbles, little to trace Clay; dry to moist.	80'-85'	0.0	
85 86 87 88 89		SILT	5'	5'	Dark Brown, medium dense, poorly sorted SILT , little Clay, little fine Sand, little Pebbles, trace Cobbles; moist to dry.	85'-90'	0.6	
90 91 92 93 94		SILT	5'	4.5'	**0-2.5':** Dark Brown to dark Gray-Brown, medium dense, poorly sorted SILT, little Clay, little angular Gravel/rounded Pebbles; dry. **2.5'-4':** Dark Brown, loose to medium loose, moderately sorted SILT, some to little Clay, trace Gravel; moist to wet. **4'-4.5':** Brown to Dark Brown, dense, poorly sorted SILT, little fine Sand, little Cobbles, little Pebbles/Gravel; dry.	90'-95'	0.6	
95 96 97 98 99 100 101 102 103		SILT	9'	9'	**0-1':** Brown, well sorted, loose medium SAND and SILT, trace Gravel/Pebbles/Cobbles, little Clay; wet. **1'-3':** Brown, moderately well sorted, medium dense SILT, some Clay with varved Sandy interbeds; moist. **3'-9':** Brown, poorly sorted, dense SILT, some Cobbles, some Gravel/Pebbles, little Clay, little to trace Sand; dry.	95'-104'	0.0	GW-3 /VOC-8260B H-3=7,290 pCi/L
104 105								

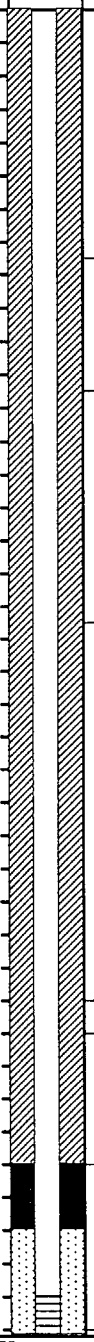
NOTES:
*Results of on-Site radiological screening <MDL unless otherwise noted

DRILLING LOG for Well #:	MW-104B	ERM 399 Boylston Street, 6th Floor Boston, MA 02116	Page 4 of 6

Depth	Well Log	Well Log	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
106		SILT & CLAY	11'	7.5'	Brown to dark Gray-Brown, dense, well sorted SILT and CLAY with Sandy varves throughout section; dry (LACUSTRINE?)	104'-115'	0.0	
115		SILT	8'	10'	**0-3.5':** Dark Brown to Dark Gray Brown, loose to medium loose, moderately well sorted coarse SAND, fining downwards into fine SAND, little Silt, little to trace Clay; wet. **3.5'-7':** Dark Gray-Brown, dense to very dense SILT, some Clay little angular Gravel, fining downwards into dense, till-like unit with little Pebbles/Gravel; dry. **7-10':** Dark Gray-Brown SILT and CLAY with little Sandy varves; dry.	115'-123'	0.0	**GW-4** VOC-8260B H-3=6,170 pCi/L
123		SILT	3'	3'	0-0.5': Quartzite Boulder 0.5'-2.5': Dark Brown to dark Gray-Brown, medium dense to dense, poorly sorted SILT, little angular Gravel/Pebbles, little fine Sand, little Clay, moist (varved interval at bottom 0.5'). 2'-3': Gray to light Gray, dense, poorly sorted SILT, some Pebbles, little Clay; dry.	123'-126'	1.2	
126		SILT	4'	4'	Dark Brown-Gray, very dense, poorly sorted SILT, some Clay, little rounded Gravel/Pebbles, minor indications of stratification; dry.	126'-131'	0.0	
131		SILT	4'	4'	**0-3':** Dark Brown-Gray, medium dense, moderately sorted SILT, little Clay, little Gravel, little Pebbles; dry. **3'-4':** Brown, dense, poorly sorted SILT and Boulder, little Gravel/Pebbles; dry.	131'-135'	2.1	
136		SILT	5	5	**0-3':** Dark Gray-Brown, medium loose, well to moderately sorted SILT, some medium Sand, little rounded Gravel/Pebbles, trace Boulders; moist to wet at top of interval, dry at bottom. **3'-5':** Dark Gray-Brown, very dense SILT and fine angular GRAVEL, unsorted, little angular Cobbles; dry.	136'-139.5'	4.1	**GW-5** VOC-8260B H-3=4,810 pCi/L
141		SILT	4'	4'	Dark Brown-Gray, dense, well sorted SILT, some to little fine Sand, little Clay, minor indications of stratification throughout interval, trace angular Gravel/Pebbles, varving more pronounced at bottom of interval; dry to moist (TRANSITION ZONE?)	141'-145'	0.0	
145								

*Results of on-Site radiological screening <MDL unless otherwise noted

DRILLING LOG for Well #:	MW-104B	ERM 399 Boylston Street, 6th Floor Boston, MA 02116	Page 5 of 6

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
146		SAND & SILT	7.5'	7.5'	Gray-Brown to Brown, medium dense to dense, well sorted fine SAND and SILT with some varving throughout the section, some to little Clay, trace Gravel; dry.	145'-152.5'	0.0	
147								
148								
149								
150								
151								
152								
153		SILT	4'	4'	Brown-Gray, medium dense, poorly sorted SILT, little to trace Clay, little Gravel/Pebbles, little Cobble (at 157.5'); dry.	152.5'-156.5'	4.1	
154								
155								
156								
157		SILT	7'	5'	Dark Gray-Brown, medium dense to medium loose, poorly sorted SILT, little angular Gravel/Pebbles, trace fine Sand, trace to little Clay; dry (NOT TILL).	156.5'-163.5'	0	
158								
159								
160								
161								
162								
163								
164		SAND	11.5'	11.5'	**0-3.5'**: Brown, loose, fine SAND and SILT, little Gravel; saturated. **3.5'-6'**: Brown, loose, poorly sorted coarse SAND, some Silt, little Cobbles, some to little Pebbles; wet. **6'-11.5'**: Brown, medium dense to medium loose, well sorted Silt, some to little fine Sand, fining downwards; wet.	163.5'-175'	**5.4**	**MW-104B: 163'- 175', MW-104B: 176'-179'** VOC (low, med.), Total Solids, TPH-GRO, TPH-DRO, PCB's, SVOC, PP13 Metals **GW-6** VOC-8260B H-3=8,770 pCi/L
165								
166								
167								
168								
169								
170								
171								
172								
173								
174								
175		SAND & SILT	1'	1'	Dark Brown-Gray, dense, poorly sorted fine SAND and SILT, some rounded Gravel/Pebbles; moist.	175'-176'	4.1	
176								
177		SAND & SILT	4'	3.5'	**0-3'**: Dark Gray, well sorted, loose, fine SAND and SILT, little Clay, trace angular Gravel, saturated. **3'-3.5'**: Dark Gray, loose to dense, poorly sorted fine SAND and SILT, some weathered gneissic Cobbles; wet.	176'-180'	7.0[1]	
178								
179								
180								
181		BEDROCK	14.5'	11.5'	Light Gray Gneiss; moderately foliated; metamorphic grade appears to increase with depth; fracture zones at 194.5', 183'-184' and 181' bgs (reddish discoloration); RQD for entire section ~75%; more highly fractured between 184'-192' (RQD=40%); foliation dips ~30° below horizontal.	180'-185'	N/A	
182								
183								
184								
185								

NOTES:

[1] Higher FID hits attributed to melted poly sleeve

*Results of on-Site radiological screening <MDL unless otherwise noted

DRILLING LOG for Well #:	MW-104B	ERM 399 Boylston Street, 6th Floor Boston, MA 02116	Page 6 of 6

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
186					See Previous Page for Bedrock Core Description			GW-7 VOC-8260B
187								
188								
189								
190								
191								
192								
193								
194								
195								

Bottom of Boring at 194.5' bgs

Well Construction Details:

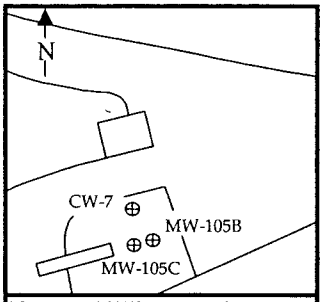
0-1': Cement, Protective Flushmount Roadbox
1'-180': Portland Cement/Bentonite Grout
180'-182': Bentonite Chip Seal
182'-194.5': #0 Silica Sand Filter Pack
0-184: Sched. 80 2.5" PVC Riser
184'-194': 0.010" Sched. 80 2.5" PVC Screen
194.5': Bottom of Boring
0-25': 8" Steel Casing Grouted in Place

NOTES:
*Results of on-Site radiological screening <MDL unless otherwise noted

DRILLING LOG for Well #: MW-105C

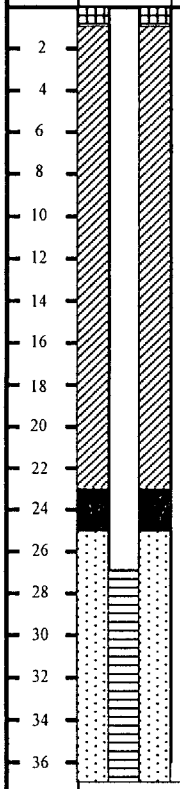
ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee L.T.P.	Project Number:	2107.01		
Client:	Yankee Atomic Electric Company	Logged by:	Michael Horesh		
Drilling Co:	D.L. Maher	Driller:	Bill Zammow		
Date Started:	18-Jun-03	Date Finished:	20-Aug-03		
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic		
Screen Diam:	2"	Length:	10'	Slot Size:	0.010"
Casing Diam:	2"	Length:	27'	Type:	Schedule 40, 2" PVC
Boring Depth:	37'	Well Depth:	37'	Boring Diam.:	5.5"
Surface Elev.:	NR	MP:	Ground Surface	Depth to GW:	17.56'
On-Site GW Analysis:	H-3, Co-60, Cs-134, Cs-137	Off-Site Non-radiological Laboratory:		Northeast Laboratories	



Notes: DTW measured on 08-Sep-03

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses



Well Construction Details:

0-1': Cement, Protective Flushmount Roadbox

1'-23.1: Portland Cement/Bentonite Grout

23.1'-25.1': Bentonite Chip Seal

25.1'-37': #0 Silica Sand Filter Pack

0-27': Sched. 40 2" PVC Riser

27'-37': 0.010" Sched. 40 2" PVC Screen

37': Bottom of Boring

Bottom of Boring at 37' bgs

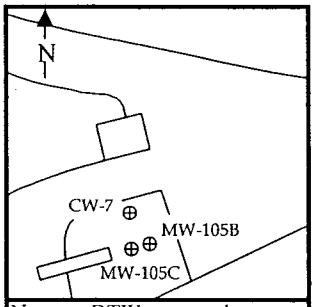
Key to Well Construction

Sandpack | Bentonite Seal | Well Screen | Cement | Grout

DRILLING LOG for Well #: MW-105B

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee L.T.P.		Project Number:	2107.01	
Client:	Yankee Atomic Electric Company		Logged by:	Horesh, Regan, Picard	
Drilling Co:	D.L. Maher		Driller:	Bill Zammow	
Date Started:	18-Jun-03		Date Finished:	20-Aug-03	
Location:	Rowe, Massachusetts		Drilling Method:	RotoSonic	
Screen Diam:	2"	Length:	10'	Slot Size:	0.010"
Casing Diam:	2"	Length:	64'	Type:	Schedule 40, 2" PVC
Boring Depth:	75'	Well Depth:	74'	Boring Diam.:	5.5"
Surface Elev.:	NR	MP:	Ground Surface	Depth to GW:	20.49'
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	Off-Site Non-radiological Laboratory:		Northeastern Laboratories	



Notes: DTW measured on 9-Sep-03

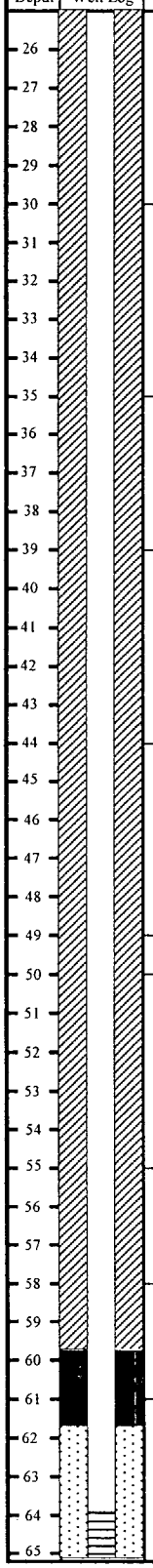
Depth	Well Log	Stratigraphy	Penetration	Recovery	Split Spoon Description/Soil Classification	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
1-5		SAND	5'	5'	Dark brown to brown, loose, poorly sorted medium SAND, some coarse Sand, some fine to coarse rounded Gravel, little Cobbles; dry.	0-5'	0.0	
6-12		SAND	7'	7'	Brown to orange-brown, loose, poorly sorted medium to coarse SAND, some fine to coarse fine to coarse subangular to angular Gravel, some Cobbles; dry.	5'-12'	0.0	
13-15		SAND	3'	3'	Brown to dark brown, loose, poorly sorted medium to coarse SAND, little angular to subangular Gravel, some rounded Cobbles, little rounded fine Gravel; dry.	12'-15'	0.0	
16-20		SAND	5'	5'	Brown to dark brown, loose, poorly sorted coarse SAND, some to little medium Sand, trace Silt, little Clay, little to some Cobbles, Note: top of denser material (till?) at 19', water table at 16.5'; moist.	15'-20'	0.0	
21-25		SILT & CLAY	5'	4'11"	Dark brown to gray-brown, dense, poorly sorted CLAY and SILT, some rounded fine Gravel, little rounded Cobbles; dry.	20'-25'	0.8	**GW-1** VOC-8260B

*Results of on-Site radiological screening <MDL unless otherwise noted Key to Well Construction

Sandpack | Well Screen | Grout
Bentonite Seal | Cement

DRILLING LOG for Well #: MW-105B

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth	Well Log	Stratigraphy	Penetration	Recovery	Split Spoon Description/Soil Classification	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
26-30		SILT & CLAY	5'	5'	**0-3':** Olive, very dense, greenish-gray SILT with CLAY, some to little angular Cobbles; moist. **3'-5':** Dark brown to gray-brown, dense, poorly sorted SILT, some to little Clay, some rounded fine Gravel, little rounded Pebbles/Cobbles; moist.	25'-30'	0.0	
31-35		SILT & CLAY	5'	5'	Dark brown to gray-brown, very dense, poorly sorted SILT, some to little Clay, little rounded Pebbles, trace Gravel/Cobble; dry.	30'-35'	0.0	
36-39		BOULDER/SILT	4'	4'	**0-2.5':** Boulder (Albite gneiss) grindings and dust. **2.5-4':** Olive greenish-gray, dense, SILT with Clay and angular Cobbles, trace fine Sand; moist.	35'-39'	0.0	
40-44		NR	5'	0'	No recovery (core barrel is wet; presume loose, saturated sand)	39'-44'	NA	**GW-2** VOC-8260B H-3=7,720 pCi/L
45-49		SILT	5'	5'	**0-5':** Greenish gray, very dense, moderately well sorted SILT, little Clay and angular Cobbles, little to trace coarse Gravel; dry.	44'-49'	0.0	
49-50		SILT	1'	1'	Greenish gray, very dense, moderately well sorted SILT, little Clay, little coarse Gravel, trace fine Sand (1" at 49'); dry.	49'-50'	0.0	
51-55		SILT	5'	5'	Greenish gray, very dense, moderately well sorted SILT, little Clay and angular Cobbles, little coarse Gravel; dry.	50'-55'	0.0	
56-58		BOULDER	3'	5'	**0-2':** Very dense, poorly sorted SILT, some to little Clay, some Gravel/Pebbles, trace Cobbles; dry. **2'-3':** Pulverized Bedrock.	55'-58'	0.0	
59-61		BEDROCK	3'	3'	Bedrock	58'-61'	0.0	
62-65			14'	11.5'	SEE FOLLOWING PAGE FOR LOGGING DETAILS	61'-75'	0.0	

*Results of on-Site radiological screening <MDL unless otherwise noted

DRILLING LOG for Well #: MW-105B

ERM
399 Boylston Street, 6th Floor
ERM Boston, MA 02116

Depth	Well Log	Stratigraphy	Penetration	Recovery	Split Spoon Description/Soil Classification	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
66 67 68 69 70 71 72 73 74 75		BEDROCK	14'	11.5'	Albite Gneiss Bedrock, foliation dips at ~35o to horizontal, rust colored fractures at 64', 65' 66.5', 70'-71', and 74'-75'	61'-75'	0.0	**GW-3** VOC-8260B H-3=6,030 pCi/L

Bottom of Boring at 75' bgs.

Well Construction Details:

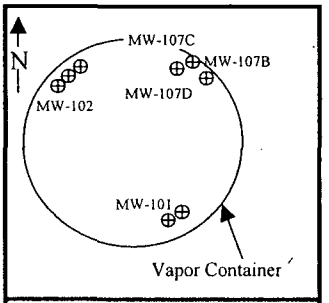
0-1': Cement, Protective Flushmount Roadbox
1'-59.7': Portland Cement/Bentonite Grout
59.7'-61.8': Bentonite Chip Seal
61.8'-75': #0 Silica Sand Filter Pack
0-64': Sched. 40 2" PVC Riser
64'-75': 0.010" Sched. 40 2" PVC Screen
75': Bottom of Boring
0-25': 8" Steel Casing Grouted in Place

*Results of on-Site radiological screening <MDL unless otherwise noted

DRILLING LOG for Well #: MW-107C

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee L.T.P.	Project Number:	2107.01		
Client:	Yankee Atomic Electric Company	Logged by:	Michael Horesh		
Drilling Co:	D.L. Maher	*Driller:*	*Oiden Gonzales*		
Date Started:	18-Sep-03	Date Finished:	19-Sep-03		
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic		
Screen Diam:	2"	Length:	5'	Slot Size:	0.010"
Casing Diam:	2"	Length:	27'	Type:	Schedule 40, 2" PVC
Boring Depth:	32'	Well Depth:	32'	Boring Diam.:	5.5"
Surface Elev.:	NR	MP:	Ground Surface	Depth to GW:	NR
On-Site GW Analyses: H-3, Co-60, Cs-134, Cs-137		Off-Site Non-radiological Laboratory: Northeastern Laboratories			



Notes:

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) spoon/HS	Lab Sample # & Analyses
						8'		GW-1 VOC-8260B

Well Construction Details:

0-1': Cement, Protective Flushmount Roadbox
1'-23': Portland Cement/Bentonite Grout
23'-25': Bentonite Chip Seal
25'-32': #0 Silica Sand Filter Pack
1'-27': Sched. 40 2" PVC Riser
27'-32': 0.010" Sched. 40 2" PVC Screen
32': Bottom of Boring

Bottom of Boring at 32' bgs

*Results of on-Site radiological activity <MDL unless otherwise noted

Key to Well Construction
Sandpack
Bentonite Seal
Well Screen
Cement
Grout

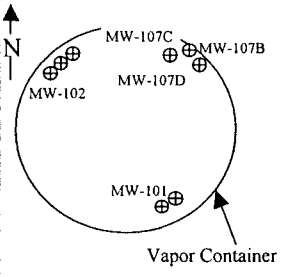
DRILLING LOG for Well #: MW-107D

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee L.T.P.	Project Number:	2107.01
Client:	Yankee Atomic Electric Company	Logged by:	Michael Horesh
Drilling Co:	D.L. Maher	Driller:	Oiden Gonzales
Date Started:	20-Sep-03	Date Finished:	23-Sep-03
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic

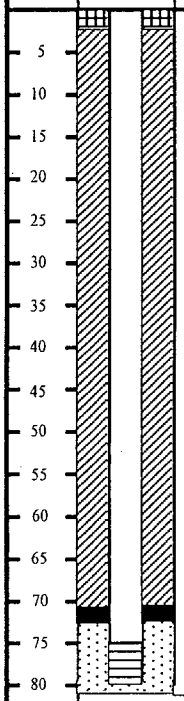
Screen Diam:	2"	Length:	5'	Slot Size:	0.010"
Casing Diam:	2"	Length:	76.2'	Type:	Schedule 40, 2" PVC
Boring Depth:	81.2'	Well Depth:	81.2'	Boring Diam.:	5.5"
Surface Elev.:	NR	MP:	Ground Surface	Depth to GW:	NR

On-Site GW Analyses: H-3, Co-60, Cs-134, Cs-137 Off-Site GW Analytical Laboratory: Northeastern Laboratories



Notes:

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) spoon/HS	Lab Sample # & Analyses



Well Construction Details:

0-1': Cement, Protective Flushmount Roadbox
1'-71.1': Portland Cement/Bentonite Grout
71.1'-73': Bentonite Chip Seal
73'-81.2': #0 Silica Sand Filter Pack
1-75': Sched. 40 2" PVC Riser
75'-80': 0.010" Sched. 40 2" PVC Screen
81.2': Bottom of Boring

Bottom of Boring at 81.2' bgs

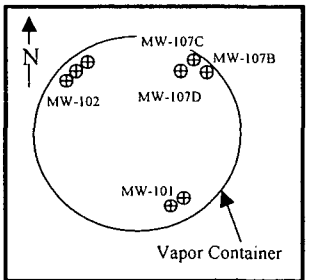
Key to Well Construction

Sandpack
Bentonite Seal
Well Screen
Cement
Grout

DRILLING LOG for Well #: MW-107B

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee L.T.P.	Project Number:	2107.01		
Client:	Yankee Atomic Electric Company	Logged by:	D. Scott, E. Gabbay		
Drilling Co:	D.L. Maher	Driller:	Bill Zammow		
Date Started:	12-Sep-03	Date Finished:	17-Sep-03		
Location:	Rowe, Massachusetts	Drilling Method:	Rotosonic		
Screen Diam:	2.5"	Length:	10'	Slot Size:	0.010"
Casing Diam:	2.5"	Length:	99.7'	Type:	Schedule 80, 2.5" PVC
Boring Depth:	109.7'	Well Depth:	109.7'	Boring Diam.:	5.5"
Surface Elev.:	NR	MP:	Ground Surface	Depth to GW:	NR
On-Site GW Analyses:	H-3, Co-60, Cs-134, Cs-137	Off-Site Non-radiological Laboratory:		Northeastern Laboratories	



Notes:

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
1-5		SAND & GRAVEL	5'	5'	Brown, loose, rounded, poorly sorted fine to coarse SAND and GRAVEL, little Silt; wet (2.5')	0-5'	NR	
6-10		SAND	5'	5'	**0-1':** Brown, medium dense, poorly sorted fine to coarse SAND and GRAVEL, little Silt; wet. **1'-2.5':** Olive to dark brown, medium dense, poorly sorted fine to coarse SAND and GRAVEL, little Silt; wet. **2.5'-5':** Light brown, very dense, poorly sorted very fine SAND and SILT, trace coarse subangular Gravel; dry.	5'-10'	NR	
11-12								
13-15		SAND & SILT	5'	2.5'	**0-1':** Olive, medium dense, sorted, interbedded very fine SAND and SILT, trace coarse Gravel; wet. **1'-2.5':** Olive, very dense, poorly sorted SILT, some fine to coarse subangular Gravel, trace fine Sand; dry.	12.5'-15'	NR	
16-18		SILT	3'	3'	Olive, very dense, poorly sorted SILT with fine to coarse subangular Gravel, trace very fine Sand; dry.	15'-18'	NR	
19-20		SILT	2.5'	2.5'	Olive, very dense, poorly sorted SILT with fine to coarse subangular Gravel, trace very fine Sand; dry.	18'-20.5'	NR	
21-23		SILT	2.5'	2.5'	Olive, very dense, poorly sorted SILT with fine to coarse subangular Gravel, trace very fine Sand; damp.	20.5'-23'	NR	
24-25		SILT	4'	4'	**0-3':** Olive, very dense, poorly sorted SILT with fine to coarse subangular Gravel, trace very fine Sand; dry.	23'-27'	NR	

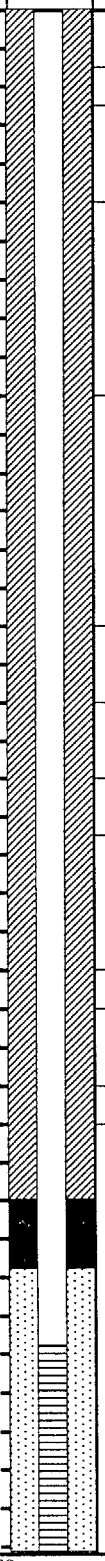
NOTES:
*Results of on-Site radiological screening <MDL unless otherwise noted

Key to Well Construction
Sandpack | Well Screen | Grout
Bentonite Seal | Cement

Depth	Boring Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
26		SAND & SILT	4'	4'	**3'-4':** Olive, very dense, sorted, interlayered very fine SAND and SILT, trace fine subangular Gravel; damp.	23'-27'	NR	
27								
28		SAND & SILT	5'	5'	**0-2':** Olive, dense, sorted, interbedded very fine to fine SAND and SILT, trace fine subangular gravel; wet. **2'-5':** Olive, very dense, poorly sorted SILT with fine to coarse subangular Gravel, trace very fine Sand; dry.	27'-32'	NR	
29								
30								
31								
32								
33		BOULDER & SILT	9'	9'	**0-1':** Albite Gneiss Boulder **1'-3.5':** Olive, very dense, poorly sorted SILT with fine to coarse subangular Gravel, trace very fine Sand; dry. **3.5'-9':** Olive, very dense, poorly sorted SILT, fine to coarse subangular Gravel, trace very fine Sand; dry.	32'-33'	NR	
34								
35								
36								
37								
38								
39								
40								
41								
42		SAND & GRAVEL	4'	4'	Olive, medium dense, unsorted, fine to coarse rounded SAND and GRAVEL , some SILT, few fist sized rounded Cobbles; wet.	41'-45'	NR	**GW-2** VOC-8260B H-3= 34,200 pCi/L
43								
44								
45								
46		SAND & GRAVEL	4'	4'	**0-2':** Olive, loose, unsorted coarse to fine SAND, little coarse to medium subrounded Gravel, trace Silt; wet. 2'-4': Olive, very dense, unsorted, SILT and subangular fine GRAVEL, some fist-sized Cobbles, trace fine Sand, trace Clay; dry.	47'-49'	NR	
47								
48								
49		SAND & SILT	1'	1'	Olive, very dense, SILT and unsorted fine GRAVEL, some fist-sized Cobbles, trace fine Sand/Clay; dry.	49'-50'	NR	
50								
51		SILT	5'	5'	**0'-3':** Olive, very dense, unsorted SILT and fine angular GRAVEL, some Clay, some coarse to medium subangular Gravel, trace Sand, trace Cobbles; damp. **3'-5':** Olive, unsorted, stiff, varved SILT and gray CLAY, some fine angular, unsorted Gravel; damp.	50'-55'	NR	
52								
53								
54								
55								
56		SILT	4.5'	4.5'	0-1.5': Olive, unsorted, stiff varved SILT and gray CLAY, some fine angular, unsorted Gravel; damp. 1.5'-4.5': Olive, very dense, unsorted SILT and fine angular GRAVEL, some Clay, some coarse to medium subangular Gravel, trace Sand, trace Cobbles; damp.	55'-61'	NR	
57								
58								
59								
60								
61		BOULDER	1'	1'	Albite Gneiss, with 1/8" garnet x'tals	61'-62'	NR	
62								
63		BOULDER	3'	3'	Garnetiferous albite gneiss	62'-65'	NR	
64								
65								

NOTES:
*Results of on-Site radiological screening <MDL unless otherwise noted

DRILLING LOG for Well #:	MW-107B	ERM 399 Boylston Street, 6th Floor Boston, MA 02116	Page 3 of 4

Depth	Well Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
66					See previous page for description			
67		SILT AND CLAY	1'	1'	Olive, dense, unsorted SILT and fine angular GRAVEL, some Clay, some medium subangular Gravel, trace Sand, trace Cobbles; damp.	66.5'-67.5'	NR	
68		BOULDER	2.5'	2.5'	Pulverized rock + 8" of Albite Gneiss.	67.5'-70'	NR	
69								
70								
71			5'	1.5'	(BLOW-IN FROM ABOVE)	70'-75'	NR	
72								
73								
74								
75								
76		GRAVEL & SILT	6'	6'	**0-2.5':** Olive, very dense, unsorted, fine angular Gravel and SILT, trace coarse to medium Gravel, trace Clay; damp. **2.5'-6':** Brown, medium dense, sorted medium to fine SAND, little coarse to medium subangular Gravel, trace Silt; wet.	75'-81'	NR	**GW-3** VOC-8260B H-3=6,740 pCi/L
77								
78								
79								
80								
81								
82		SAND	2'	2'	0-1.5': Olive, medium sorted, medium dense fine SAND, some coarse to fine subangular Gravel, some Silt; wet. 1.5'-2': Brown, medium dense, unsorted Silt and severely weathered schist; dry.	81'-83'	NR	
83								
84		BOULDER	2'	2'	0-0.5': Brown, loose, unsorted Silt and severely weathered schist; dry. 0.5'-2': Pulverized albite gneiss, little brown Silt, severely weathered micaceous schist.	83'-85'	0.0	
85								
86		BOULDER	1.5'	1.5'	0-0.2': Albite gneiss Cobble. 0.2'-1.2': Dark Brown, loose, stratified SILT (infill?); dry. 1.2'-1.5': Albite gneiss.	85'-86.5'	3.5	
87								
88		BOULDER & SILT	3.5'	3'	**0-2.5':** Brown, dense micaceous SILT; dry. **2.5'-3':** Albite gneiss Cobble **2.5'-3':** Brown, loose, micaceous SILT with weathered micaceous schist fragments; dry.	86.5'-90'	0.0	
89								
90								
91		GRAVEL/SAND/SILT	1'	1'	0'-0.5': Olive, loose, well sorted fine to medium SAND; Silt; wet. 0.5'-1': Olive, dense, unsorted SILT and GRAVEL (pulverized schist).	90'-91'	NR	GW-4 VOC-8260B
92		SAND	2'	2'	0-1.5': Olive, medium dense, well sorted fine to medium SAND, trace Silt; wet. 1.5'-2': Olive, loose, unsorted medium to fine SAND, and fine subangular Gravel, trace Silt; wet.	91'-93'	NR	
93								
94		GRAVEL & SILT	1'	1'	0-0.5': Olive, dense, unsorted SILT and fine subangular GRAVEL; damp. 0.5'-1': Pulerized albite gneiss.	93'-94'	NR	
95								
96								
97								
98								
99		BEDROCK	16'	16'	Albite Gneiss, only 3 machine breaks, coarse-grained foliation (defined by 1/4" layers of albite dips at ~30o), few small garnets (1/8"); fracture zones at 109'-110' and 105'-106'.	94'-110'	NR	**GW-5** VOC-8260B
100								
101								
102								
103								
104								
105								

NOTES:
*Results of on-Site radiological screening <MDL unless otherwise noted

DRILLING LOG for Well #: MW-107B	ERM 399 Boylston Street, 6th Floor Boston, MA 02116	Page 4 of 4

Depth	Boring Log	Stratigraphy	Penetration	Recovery	Soil Core Description	Depth	FID Conc. (ppm) HS	Lab Sample # & Analyses*
106 107 108 109 110					SEE PREVIOUS PAGE FOR LOGGING DETAILS			GW-5 VOC-8260B

Bottom of Boring at 109.7' bgs.

Well Construction Details:

0-1': Cement, Protective Flushmount Roadbox
1'-96': Portland Cement/Bentonite Grout
96'-97.8': Bentonite Chip Seal
97.8'-109.7': #0 Silica Sand Filter Pack
0-99.7': Sched. 80 2.5" PVC Riser
99.7'-109.7': 0.010" Sched. 80 2" PVC Screen
109.7': Bottom of Boring
0-12.5': 8" Steel Casing Grouted in Place

NOTES:
*Results of on-Site radiological screening <MDL unless otherwise noted

Appendix F
Soil Sampling Logs

Soil Log for Sample ID: SB-001

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	22-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	lt. gray, silt, uniform, soft, sl. Moist, tr. Round cobbles (ML)		SB-0010006I 1015
7–12			
13–14			
15–24	med. Brown, soft, silt with some fine sand, rounded gravel to 1 inch diam., sl. Moist, (ML)		SB-0010102F 1020

Analysis:			
VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)	x	Boron and Lithium (6010B)	
PCBs (8082)	x	Hydrazine by IC	
TPH-GRO (8015B)	x	TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-002

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	22-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	silt with fine to coarse gravel, subrounded, tr. Fine sand, med. Brown, soft, sl. Moist (ML)		SB-0020006I 1035
2			
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12			
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21			
22			
23			
24			

Analysis:			
	VOCs (8260B)		PP13 metals (6010B) x
	SVOCs (8270C)		Boron and Lithium (6010B)
	PCBs (8082)	x(upper)	Hydrazine by IC
	TPH-GRO (8015B)		TOC
	TPH-DRO(8015B)	x	Dioxin

Soil Log for Sample ID: SB-002

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26	2-3 ft: med brown/gray, silt with fine sand, some subrounded fine gravel, soft, sl. Moist (ML)		SB-0020203F 1040
27			
28			
29			
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55			

Soil Log for Sample ID: SB-003

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	22-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	med brown silt, trace co. gravel, subrounded, soft, sl. Moist (ML)		SB-00300061 1115
7–24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	x(upper)	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	X	Dioxin	

Soil Log for Sample ID: SB-003

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26–55	2-3 ft: same description as above (ML)		SB-0030203F 1120

Soil Log for Sample ID: SB-004

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	22-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	lt. brown sandy silt, some fine sand, trace fine gravel, soft, sl. Moist (ML)		SB-0040006I 0957
7–12			
13–14			
15–24	soft, sl moist, med sand with some silt, trace fine gravel (SM)		SB-0040102F 1000

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	x(upper)	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x(upper)		

Soil Log for Sample ID: SB-008

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	22-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	lt. brown, sand to sandy silt, well graded, loose, trace angular fine gravel (ML), dry		SB-0080006I 1125
12–15	brown sandy silt, trace coarse subrounded gravel, med-fine sand (ML)		SB-0080102F 1130

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	x(upper)	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-009

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	20-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	2 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: orange brown to dark brown, poorly graded, medium dense, silt, some clay, some sand, moist (ML)		SB-00900061
2	1-2 ft: light brown, poorly graded, medium dense silt, some sand, moist, (ML) groundwater at 1.5 ft bgs		SB-0090102F
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			

Analysis:			
	VOCs (8260B)		PP13 metals (6010B) x
	SVOCs (8270C)		Boron and Lithium (6010B)
	PCBs (8082)	x (upper)	Hydrazine by IC
	TPH-GRO (8015B)		TOC
	TPH-DRO(8015B)	x	

Soil Log for Sample ID: SB-012

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	22-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	3 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: dark brown to black organic silt, root fibers, 15% fine sand, moist, soft (OL/ML)		SB-01200061 1705
2	2-3 ft: orange brown, silt, poorly graded, trace rounded fine gravel, roots/wood, loose/soft, moist, (ML)		SB-0120203F 1710
3			
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12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	x(upper)	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-013

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	20-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	3 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: light brown to orange brown, well graded, loose to medium dense, sand with some silt, trace root fibers / organics, dry (SM)		SB-0130006I
2			
3	2-3 ft: orange brown to gray brown, well graded, loose sand with angular fine gravel, dry (SW)		SB-0130203F
4			
5			
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14			
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16			
17			
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19			
20			
21			
22			
23			
24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	x (upper)	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-018

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	22-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	dark brown to orange, sl. Moist to dry, poorly graded silt, little root fibers (ML)	0	SB-0180006I 1647

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)	x	Boron and Lithium (6010B)	
PCBs (8082)	x	Hydrazine by IC	
TPH-GRO (8015B)	x	TOC	
TPH-DRO(8015B)	x	Dioxin	

Soil Log for Sample ID: SB-018

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26	2-3 ft: orange/brown, silt, poorly graded, trace round fine gravel, roots/wood, soft, miost (ML)		SB-0180203F 1710
27			
28			
29			
30			
31			
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Soil Log for Sample ID: SB-019

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	20-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	2 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: black, organic humis with root fibers, dry (PT)		SB-01900061
2	1-2 ft: light brown, poorly graded, loose to medium dense sand and silt, trace root fibers, dry (SM), refusal at 2 ft		SB-0190102F
3			
4			
5			
6			
7			
8			
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12			
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17			
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20			
21			
22			
23			
24			

Analysis:				
	VOCs (8260B)		PP13 metals (6010B)	x
	SVOCs (8270C)		Boron and Lithium (6010B)	
	PCBs (8082)	x (upper)	Hydrazine by IC	
	TPH-GRO (8015B)		TOC	
	TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-020

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	22-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	medium brown silt with trace fine sand, roots/organics, trace fine gravel, rounded, sl moist, soft (ML)		SB-0200006I 0927
7–24			

Analysis:				
	VOCs (8260B)		PP13 metals (6010B)	x
	SVOCs (8270C)		Boron and Lithium (6010B)	
	PCBs (8082)	x(upper)	Hydrazine by IC	
	TPH-GRO (8015B)		TOC	
	TPH-DRO(8015B)	x	Dioxin	x

Soil Log for Sample ID: SB-020

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26			
27			
28	2-3 ft: silt with fine sand, trace round co. gravel to 1" diameter, soft, med. Brown, trace fine gravel, sl. Moist (ML)		SB-0200203F 0930
29			FD205102203 2400
30			
31			
32			
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Soil Log for Sample ID: SB-022

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	20-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	2 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: light brown, poorly graded, loose to medium dense sand, 20% clay, root fibers / organic material,, dry (SM/SC)		SB-0220006I; FD202102003
2	1-2 ft: brown, poorly graded, medium dense fine sand and silt, dry, 15% clay (SM)		SB-0220102F
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
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19			
20			
21			
22			
23			
24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)	x	Boron and Lithium (6010B)	
PCBs (8082)	x	Hydrazine by IC	
TPH-GRO (8015B)	x	TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-025

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	22-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	orange poorly graded silt, uniform, soft, sl. Moist (ML)		SB-0250006I 1620
7–24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	x(upper)	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x	Dioxin	

Soil Log for Sample ID: SB-025

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26–36	2-3 ft: same description as upper sample		SB-0250203F 1625
37–55			

Soil Log for Sample ID: SB-026

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	22-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	dark brown to black, organic silt, roots, uniform, soft, sl. Moist (OL)	0	SB-0260006I 1520

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)	X	Boron and Lithium (6010B)	
PCBs (8082)	X	Hydrazine by IC	
TPH-GRO (8015B)	X	TOC	
TPH-DRO(8015B)	X	Dioxin	

Soil Log for Sample ID: SB-026

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26	2-3 ft: same description as above, but with some subrounded fine to coarse gravel (OL)	0	SB-0260203F 1525
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Soil Log for Sample ID: SB-027

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	22-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	med. Brown, silty medium sand, moist, soft, 5% subangular coarse gravel, 10% fine subangular gravel (SM)		SB-0270006I 0920
7–12			
13–14			
15–24	same description as above, water table encountered at 24 inches		SB-0270102F 0925

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	x	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-030

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	22-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	black to brown/orange, poorly graded silts, organics, roots, some sand (30%), sl. Moist, soft (ML)		SB-0300006I 1555
12–24	orange/brown silt, soft, 15% fine sand, 10% round fine gravel, sl. Moist (ML)		SB-0300102F 1600

Analysis:			
	VOCs (8260B)		PP13 metals (6010B) x
	SVOCs (8270C)		Boron and Lithium (6010B)
	PCBs (8082)	x(upper)	Hydrazine by IC
	TPH-GRO (8015B)		TOC
	TPH-DRO(8015B)	x	

Soil Log for Sample ID: SB-031

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	22-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	med. Brown/orange, organic silt with some rounded cobbles, some to little fine sand, trace rounded f. gravel, slightly moist, soft (OL)		SB-0310006I 1445
7–12			
13–14			
15–24	same description as above (OL)		SB-0310102F 1450

Analysis:			
	VOCs (8260B)		PP13 metals (6010B) x
	SVOCs (8270C)		Boron and Lithium (6010B)
	PCBs (8082)	x(upper)	Hydrazine by IC
	TPH-GRO (8015B)		TOC
	TPH-DRO(8015B)	x	

Soil Log for Sample ID: SB-032

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	26-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	2'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: dark brown to black, poorly graded, medium dense sand with some silt, <5% angular fine gravel, dry (SM/SC)		SB-03200061
2	1-2 ft: dark gray to black, poorly graded, medium dense sand with 20% clay, <5% angular fine gravel,dry (SM/SC)		SB-0320102F
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x (all)
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	x (0-6 in)	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x (all)		

Soil Log for Sample ID: SB-033

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	22-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	lt. gray, soft, sl moist silt, 5% fine and co. gravel, rounded, trace cobble to 3 inch diameter (ML)		SB-0330006I 0900
7–12			
13–14			
15–24	same as above, but some medium sand component, (ML)		SB-0330102F 0910

Analysis:			
VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	X	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	X		

Soil Log for Sample ID: SB-035

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	20-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	2 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches:light brown, well graded, loose sand, 20% rounded fine to coarse gravel, 15% silt, dry (SM)		SB-0350006I
2	1-2 ft: light brown, well graded, loose sand, 20% rounded fine to coarse gravel, 15% silt, dry (SM)		SB-0350102F
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Analysis:				
	VOCs (8260B)		PP13 metals (6010B)	x
	SVOCs (8270C)	X	Boron and Lithium (6010B)	
	PCBs (8082)	X	Hydrazine by IC	
	TPH-GRO (8015B)	X	TOC	
	TPH-DRO(8015B)	X		

Soil Log for Sample ID: SB-048

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	30-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	5'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: brown to light brown, medium dense to dense, well graded medium to coarse sand, some angular fine gravel, trace angular coarse gravel, moist	89.7	SB-04800061
2	2-3 ft: same description as above sample, but strong hydrocarbon smell toward bottom of 0-5 ft collection interval	89.7	SB-0480203F
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23			
24			

Analysis:				
	VOCs (8260B)	x (2-3 ft)	PP13 metals (6010B)	x (all)
	SVOCs (8270C)	x (all)	Boron and Lithium (6010B)	
	PCBs (8082)	x (all)	Hydrazine by IC	
	TPH-GRO (8015B)	x (all)	TOC	
	TPH-DRO(8015B)	x (all)		

Soil Log for Sample ID: SB-049

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	30-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	3'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: orange-brown to brown, well graded medium dense fine to medium sand, some subrounded fine to coarse gravel, moist (SW)	0	SB-0490006I
2	2-3 ft: same description as above sample	0	SB-0490203F
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x (all)
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	x (all)	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x (all)		

Soil Log for Sample ID: SB-054

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	30-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	15'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: light brown to tan brown, well graded, loose medium sand, some angular gravel/asphalt, dry (SW)	0	SB-0540006I
2			
3	2-3 ft: light brown to tan, poorly graded fine to medium sand, little to trace angular fine to coarse gravel, dry (SP)	0	SB-0540203F
4			
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13			
14			
15	14-15 ft: light brown poorly graded to graded, loose fine to medium sand, little angular fine gravel, little angular coarse gravel/cobbles, dry (SW/SP)	0	SB-0541415F
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23			
24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x (all)
SVOCs (8270C)	x (all)	Boron and Lithium (6010B)	
PCBs (8082)	x (all)	Hydrazine by IC	
TPH-GRO (8015B)	x (all)	TOC	
TPH-DRO(8015B)	x (all)		

Soil Log for Sample ID: SB-057

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	30-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	15'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: brown, poorly graded, soft silt, little fine sand, some grass at top, moist (ML)	0	SB-0570006I
2			
3	2-3 ft: brown to light brown, graded, loose medium to fine sand, little angular fine gravel, trace angular coarse gravel, mosit (SW-SP)	0	SB-0570203F
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12			
13			
14	14-15 ft: gray brown to tannish white, well graded, loose medium to coarse sand, some to little angular gravel, crushed cobbles, dry	0	SB-0571415F
15			FD-208
16			
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23			
24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x (all)
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	x (upper)	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x (all)		

Soil Log for Sample ID: SB-058

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	30-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	6'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: brown to light brown, well graded, loose to medium dense, fine to coarse sand, some angular gravel, little silt, dry to 2 ft, (SW)	0	SB-0580006I
2	2-3 ft: same as above description	0	SB-0580203F
3			
4			
5	5-6 ft: light brown to very light brown, well graded, loose to very loose coarse and medium sand, some angular gravel, dry, water at approx 6 ft (SW)	0	SB-0580506F
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x (all)
SVOCs (8270C)	x (all)	Boron and Lithium (6010B)	
PCBs (8082)	x (all)	Hydrazine by IC	
TPH-GRO (8015B)	x (all)	TOC	
TPH-DRO(8015B)	x (all)		

Soil Log for Sample ID: SB-059

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	30-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	15'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: light brown, well graded, medium dense, medium to coarse sand, some subrounded fine gravel, dry to moist (SW)	0	SB-05900061
2	2-3 ft: same description as above sample	0	SB-0590203F
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11			
12			
13			
14	14-15 ft: light brown, well graded, loose to medium dense sand, some angular fine gravel, dry (SW)	0	SB-0591415F
15			
16			
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19			
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22			
23			
24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x (all)
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	x (0-6 in)	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x (all)		

Soil Log for Sample ID: SB-060

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	30-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	5'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: brown to light brown, well graded, loose to medium dense sand, some angular fine gravel, little to trace subangular coarse gravel, dry to moist (SW)	0	SB-06000061
2	2-3 ft: same description as above sample	0	SB-0600203F
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x (all)
SVOCs (8270C)		Boron and Lithium (6010B)	x (all)
PCBs (8082)	x (all)	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x (all)		

Soil Log for Sample ID: SB-061

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	30-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	15'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: brown to light brown, medium dense, well graded medium to coarse sand, some angular fine gravel (asphalt at top 2 iches), dry (SW)	0	SB-06100061
2	2-3 ft: same description as above sample	0	SB-0610203F
14	14-15 ft: brown to light brown, well graded, loose fine to coarse sand, some to little rounded fine gravel, trace coarse gravel, dry (SW)	0	SB-0611415F

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x (14-15 ft)
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)	x (all)	TOC	
TPH-DRO(8015B)	x (14-15 ft)		

Soil Log for Sample ID: SB-062

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	30-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	10'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: black to brown to gray, well graded angular fine gravel and sand, dry (GM)	0	SB-06200061
2	2-3 ft: same description as above sample	0	SB-0620203F
3			
4			
5	5-6 ft: brown to light brown, well graded, loose to medium dense sand, some angular fine gravel, little subrounded coarse gravel, dry to moist, (SW)	0	SB-0620203F
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x (5-6 ft)
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)	x (all)	TOC	
TPH-DRO(8015B)	x (5-6 ft)		

Soil Log for Sample ID: SB-068

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	29-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	9'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: well graded, loose to dense sand, some angular fine gravel, dry (SW)		SB-0680006I
2	2-3 ft: same as above		SB-0680203F
3			
4			
5			
6			
7			
8	8-9 ft: light brown to orange brown, well graded loose sand, some angular fine gravel, dry, water at 9 ft.		SB-0680809F
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x (deepest only)
SVOCs (8270C)	x (upper 2)	Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x (all)		

Soil Log for Sample ID: SB-069

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	30-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	15'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: light brown to tan brown, well graded loose sand, some angular to subangular fine gravel, broken-up coarse gravel, dry (SW)	0	SB-0690006I
2	2-3 ft: same as above	0	SB-0690203F
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13			
14	14-15 ft: light brown to tan, poorly to well graded, loose silt and fine sand, some to little broken-up cobbles, dry (SW-SP)	0	SB-0691415F
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23			
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x (deepest only)
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x (all)		

Soil Log for Sample ID: SB-083

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	30-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	3'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: dark brown to gray, well graded sand and gravel, mosit, medium dense, cobble at 3' (refusal)	0	SB-0830006I
2	2-3 ft: same description as above sample	0	SB-0830203F
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x (all)
SVOCs (8270C)	x (all)	Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x (all)		

Soil Log for Sample ID: SB-088

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	20-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	2 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: light brown to brown, well graded, loose, med to fine sand, 10%-15% round fine to coarse gravel, dry, 50% rounded boulders, some silt, trace clay (SW)		SB-0880006I
2	1-2 ft: light brown, well graded loose med to fine sand, 10% rounded fine gravel, 20% fines, dry (SW)		SB-0880102F
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Analysis:			
	VOCs (8260B)		PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
	PCBs (8082)	X	Hydrazine by IC
	TPH-GRO (8015B)		TOC
	TPH-DRO(8015B)	X	

Soil Log for Sample ID: SB-089

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	20-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	2 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: dark brown, well graded, very loose fine gravel and coarse sand, angular to rounded gravel, <5% root fibers, dry (GW)		SB-0890006I
2	1-2 ft: brown, poorly graded, loose, med to coarse sand, 10% rounded fine gravel and angular gravel, dry (SP)		SB-0890102F
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Analysis:			
	VOCs (8260B)		PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
	PCBs (8082)	X	Hydrazine by IC
	TPH-GRO (8015B)		TOC
	TPH-DRO(8015B)	X	

Soil Log for Sample ID: SB-089

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	20-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	2 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches:light brown, well graded, loose to very loose med-coarse sand, 15% fines, 50% rounded cobbles, 30% angular gravel, dry, (GW)		SB-0890006I
2	1-2 ft: light brown to gray brown, poorly graded, loose to very loose medium coarse sand, 20% angular fine gravel, dry (SP)		SB-0890102F
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Analysis:			
	VOCs (8260B)		PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
	PCBs (8082)	X	Hydrazine by IC
	TPH-GRO (8015B)		TOC
	TPH-DRO(8015B)	X	

Soil Log for Sample ID: SB-090

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	20-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	2 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches:light brown to brown, well graded, loose to very loose sand, 15% coarse to fine gravel, dry (SW)		SB-0900006I
2	1-2 ft: light brown, graded, loose, moderate to coarse sand, 5% fine gravel, dry (SW/SP)		SB-0900102F
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	X	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	X		

Soil Log for Sample ID: SB-100

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	21-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	med. Brown, soft, sandy silt , med sand size, little rounded fine gravel, sl moist (ML)		SB-1000006I 1540
7–12			
13–14			
15–24	med. Brown, silty sand, (SM), soft, some subrounded fine gravel up to 1.5 inches, some/trace roots, moist		SB-1000102F 1545

Analysis:			
	VOCs (8260B)		PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
	PCBs (8082)	x(upper)	Hydrazine by IC
	TPH-GRO (8015B)		TOC
	TPH-DRO(8015B)	x	

Soil Log for Sample ID: SB-101

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	21-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	brown to gray/brown, poorly graded, loose to med dense, fine sand and silt, some root fibers/organics, dry (SM)	0.3	SB-1010006I 1130
7–12			
13–14			
15–24	same except little fine gravel (SM)	0	SB-1010102F 1140

Analysis:			
	VOCs (8260B)		PP13 metals (6010B)
	SVOCs (8270C)	X	Boron and Lithium (6010B)
	PCBs (8082)	X	Hydrazine by IC
	TPH-GRO (8015B)	X	TOC
	TPH-DRO(8015B)	X	

Soil Log for Sample ID: SB-102

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	21-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	med brown, fine sand, some silt, poorly graded, soft, sl. Moist, roots (SM)		SB-1020006I 1115
7–12			
13–14			
15–24	same as above except trace of fine gravel (SM)		SB-1020102F 1120

Analysis:			
	VOCs (8260B)		PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
	PCBs (8082)	x(upper)	Hydrazine by IC
	TPH-GRO (8015B)		TOC
	TPH-DRO(8015B)	x	

Soil Log for Sample ID: SB-103

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	21-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	dk brown, moist, soft, organic silt, uniform, micaceous material and roots (OL)		SB-1030006I 1035
7–12			
13–14			
15–24	same description as above		SB-1030102F 1040

Analysis:

VOCs (8260B)		PP13 metals (6010B)	
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	x(upper)	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-104

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	21-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	m. brown, sand and silt, med sand, some darker organic matter, loose/soft, roots, sl moist, 5% subrounded fine to coarse gravel to 1" (SM)		SB-1040006I 1100
7–12			
13–14			
15–24	same as above except: cobbles rounded to 5" diameter, soft, sl moist, m. brown (SM)		SB-1040102F 1105

Analysis:			
	VOCs (8260B)		PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
	PCBs (8082)	x(upper)	Hydrazine by IC
	TPH-GRO (8015B)		TOC
	TPH-DRO(8015B)	x	

Soil Log for Sample ID: SB-105

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	21-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Sediment Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	lt. brown, soft, sl moist, silt, some subangular fine to co. gravel to 1 inch, 5% cobbles rounded to 4 in diameter (ML)	0	SB-1050006I 0850 FD203102103 2400
7–12			
13–14			
15–24	light brown, loose med. To course sand, some fine gravel (10%), some silt (15%), 5% subrounded cobbles, moist (SM)	0.7	SB-1050102F 0900

Analysis:			
	VOCs (8260B)		PP13 metals (6010B) x
	SVOCs (8270C)	X	Boron and Lithium (6010B)
	PCBs (8082)	X	Hydrazine by IC
	TPH-GRO (8015B)	X	TOC
	TPH-DRO(8015B)	X	

Soil Log for Sample ID: SB-106

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	21-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Sediment Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	sl. Moist, soft with organics, silt with co. sand and 5% fine gravel, orange/brown color, fine gravel is subrounded, trace coarse gravel, rounded		SB-1060006I 0835
14–15	same description as above		SB-1060102F 0840

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	x(upper)	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-107

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	21-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Sediment Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	med. Brown, silt, some micaceous material, some organics/roots, some fine gravel, subrounded, some co. gravel and cobbles, subrounded, sl moist, soft (ML)		SB-1070006I 0820
7–13			
14–24	lt. brown, silt (ML), some fine gravel and co. gravel, subrounded, soft, sl moist		SB-1070102F 0830

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	x(upper)	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-108

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	21-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Sediment Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	light brown, poorly graded, loose sand and silt, 5 percent rounded coarse gravel, <5% angular/rounded fine gravel, root fibers, dry (SM)		SB-1080006I 0800
7–24			

Analysis:			
	VOCs (8260B)		PP13 metals (6010B) x
	SVOCs (8270C)		Boron and Lithium (6010B)
	PCBs (8082)	x(upper)	Hydrazine by IC
	TPH-GRO (8015B)		TOC
	TPH-DRO(8015B)	x	

Soil Log for Sample ID: SB-108

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26–36	lt brown, sl. Moist, silt with trace fine sand, trace gravel (rounded) to one inch diameter, soft, (ML)		SB-1080203F 0810
37–55			

Soil Log for Sample ID: SB-109

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	20-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Sediment Classification	FID Screen (ppm)	Sample ID(s) & Time
1–5	slightly moist, soft, med brown, silt with some to trace fine sand, fairly uniform except trace cobbles, rounded to 4-5 in diameter (ML), root fibers present, mostly inorganic silt with micaceous grains		SB-1090006I 1500
14–15	same description except trace subrounded gravel to .75 inch diameter, refusal on cobbles		SB-1090102F 1515

Analysis:				
	VOCs (8260B)		PP13 metals (6010B)	x
	SVOCs (8270C)	x	Boron and Lithium (6010B)	
	PCBs (8082)	x(upper)	Hydrazine by IC	
	TPH-GRO (8015B)	x	TOC	
	TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-110

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	20-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Sediment Classification	FID Screen (ppm)	Sample ID(s) & Time
1–5	moist, med brown, sandy silt, sand is medium, soft, some rounded gravel to 2-3 inches, trace rounded cobble to 4", some organic matter (ML); location is on rip-rap dam fill, grassy area		SB-1100006I 1420
6–12			
13–14			
15	same as above description		SB-1100102F 1430
16–24			

Analysis:			
	VOCs (8260B)		PP13 metals (6010B) x
	SVOCs (8270C)		Boron and Lithium (6010B)
	PCBs (8082)	x(upper)	Hydrazine by IC
	TPH-GRO (8015B)		TOC
	TPH-DRO(8015B)	x	

Soil Log for Sample ID: SB-111

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	20-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Sediment Classification	FID Screen (ppm)	Sample ID(s) & Time
1–5	sl. Moist, med to light brown, sandy, gravelly silt with trace cobbles, soft, organic matter, sand is medium, gravel/pebbles rounded, rounded cobbles (ML); gravel size 2-3 in., cobble to 5"		SB-1110006I 1350
6–12			
13–14			
15–17	moist, med to coarse sand, loose with gravel (rounded), trace cobble, sand is subrounded, med. Brown, cobbles are rounded, trace silt (SP)		SB-1110102F 1400
18–24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	x(upper)	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-112

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	20-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Sediment Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	sl. Moist, med. Brown, soft, loose, med. Sandy silt with trace to little subrounded to subangular gravel to 1.5 inch diameter, trace cobbles (rounded) (ML)		SB-1120006I 1545
7–12			
13–14			
15–17	inorganic silt with some med. Sand, trace gravel to one inch, some/trace cobble (refusal), rounded, med to lt brown color, sl. Moist, soft, (ML)		SB-1120102F 1555
18–24			

Analysis:			
	VOCs (8260B)		PP13 metals (6010B) x
	SVOCs (8270C)		Boron and Lithium (6010B)
	PCBs (8082)	x(upper)	Hydrazine by IC
	TPH-GRO (8015B)		TOC
	TPH-DRO(8015B)	x	

Soil Log for Sample ID: SB-113

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	20-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Sediment Classification	FID Screen (ppm)	Sample ID(s) & Time
1–5	sl. Moist, med brown, silty organic soil, friable, soft, some sand, trace fine to med sand (OL), some gravel rounded to 1.5 inches, trace occasional cobble	0	SB-1130006I 1300 FD-201102003 1300
6–12			
13–14			
15–24	sl. Moist, med to light brown silt with fine gravel, some sand, trace gravel and cobbles (ML)	0	SB-1130102F 1330

Analysis:				
	VOCs (8260B)		PP13 metals (6010B)	x
	SVOCs (8270C)		Boron and Lithium (6010B)	
	PCBs (8082)	x(upper)	Hydrazine by IC	
	TPH-GRO (8015B)		TOC	
	TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-114

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	16-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	3 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: gray-brown, well graded, very loose fine gravel and sand, <10% silt, dry (GW)		SB-1140006I
2	2-3 ft: light brown, poorly graded, loose, 5% fine gravel, dry (SP)		SB-1140203F
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)	x	Boron and Lithium (6010B)	
PCBs (8082)	x	Hydrazine by IC	
TPH-GRO (8015B)	x	TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-115

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	16-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	2 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: brown/gray, well graded, very loose, fine gravel to coarse sand, 10% coarse gravel, <10% silt, dry (GW)		SB-1150006I
2	1-2 ft: brown to dark brown, poorly graded, very loose, <5% subangular fine gravel, dry (SW)		SB-1150102F
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Analysis:			
	VOCs (8260B)		PP13 metals (6010B) x
	SVOCs (8270C)	X	Boron and Lithium (6010B)
	PCBs (8082)	X	Hydrazine by IC
	TPH-GRO (8015B)	X	TOC
	TPH-DRO(8015B)	X	

Soil Log for Sample ID: SB-116

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	15-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	light brown to gray brown, graded, loose sand (med to coarse), moist (SM)		SB-1160006I
7–24			

Analysis:			
	VOCs (8260B)		PP13 metals (6010B) x
	SVOCs (8270C)	x(lower)	Boron and Lithium (6010B)
	PCBs (8082)	x	Hydrazine by IC
	TPH-GRO (8015B)	x(lower)	TOC
	TPH-DRO(8015B)	x	Dioxin

Soil Log for Sample ID: SB-116

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26	2-3 ft: dark brown, welll graded, loose, well graded sand with fines, dry, some wood pieces, (SM)		SB-1160203F
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Soil Log for Sample ID: SB-117

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	15-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	gray-brown well graded loose sand - fine to medium, 30% rounded cobbles, some silt/clay, moist (SC), water table at 2 ft bgs		SB-1170006I
14–15	same as above descriptions, water table at 2 ft bgs		SB-1170102F

Analysis:				
	VOCs (8260B)		PP13 metals (6010B)	x
	SVOCs (8270C)	x(lower)	Boron and Lithium (6010B)	
	PCBs (8082)	x	Hydrazine by IC	
	TPH-GRO (8015B)	x(lower)	TOC	
	TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-118

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	15-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	dark gray-brown, graded, loose sand, 5% fine gravel, 10% silt, dry (SW)		SB-1180006I
7–12			
13–24	dark gray-brown, graded, loose med to coarse sand, 20% silt, dry (SP), water table at 2'		SB-1180102F

Analysis:			
	VOCs (8260B)		PP13 metals (6010B) x
	SVOCs (8270C)	x(lower)	Boron and Lithium (6010B)
	PCBs (8082)	x	Hydrazine by IC
	TPH-GRO (8015B)	x(lower)	TOC
	TPH-DRO(8015B)	x	

Soil Log for Sample ID: SB-122

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	28-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	15'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches:light brown to orange brown, graded to well graded, medium loose sand, some angular fine and dry gravel (SW)	0	SB-1220006I
2	2-3 ft: same as above description; water table at 4 ft bgs	0	SB-1220203F
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14	12-15 ft: light brown to white, well graded and dense to medium loose pulverized rock and dry sand (SW)	0	SB-1221415F
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x (all)
SVOCs (8270C)	x (14-15ft)	Boron and Lithium (6010B)	
PCBs (8082)	x (14-15ft)	Hydrazine by IC	
TPH-GRO (8015B)	x (14-15ft)	TOC	
TPH-DRO(8015B)	x (all)		

Soil Log for Sample ID: SB-123

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	28-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	4'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: light brown, well graded, loose to medium loose medium sand, some angular fine gravel, dry (SW)	0	SB-12300061
2	2-3 ft: same as above description	0	SB-1230203F
3	3-3.5 ft: same as above description; 3.5-4 ft: orange brown, poorly graded, dense fine sand and silt (more silt), moist, (ML) groundwater at four feet bgs	0	SB-1230506F
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x (all)
SVOCs (8270C)	x (2-3ft)	Boron and Lithium (6010B)	
PCBs (8082)	x (2-3ft)	Hydrazine by IC	
TPH-GRO (8015B)	x (3-4ft)	TOC	
TPH-DRO(8015B)	x (all)		

Soil Log for Sample ID: SB-124

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	28-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	10'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches:brown to light brown to gray brown, medium sand, some silt, well graded, loose to dense, some angular to subrounded fine gravel, dry (SW)	0	SB-1240006I
2	2-3 ft: same as above, then gray weathered schist	0	SB-1240203F
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8			
9	9-10 ft: light brown to tan-brown to tan, loose to very dense, well graded, medium sand, some subrounded firm to coarse gravel, dry to moist, (SW)	0	SB-1240910F
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x (all)
SVOCs (8270C)	x (9-10ft)	Boron and Lithium (6010B)	
PCBs (8082)	x (9-10ft)	Hydrazine by IC	
TPH-GRO (8015B)	x (9-10ft)	TOC	
TPH-DRO(8015B)	x (all)		

Soil Log for Sample ID: SB-125

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	28-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	10'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches:brown, loose, well graded sand, some angular fine gravel, root fibers, grass, dry (SW)	0	SB-1250006I
2	2-3 ft: brown to light brown, medium dense to loose, well graded sand (medium to fine), pulverized gravel, some to little rounded fine gravel, dry (SW)	0	SB-1250203F
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7			
8			
9	9-10 ft: light brown to gray to white, well graded, crushed gravel, loose, dry (SW)	0	SB-1250910F
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x (all)
SVOCs (8270C)	x (9-10ft)	Boron and Lithium (6010B)	
PCBs (8082)	x (9-10ft)	Hydrazine by IC	
TPH-GRO (8015B)	x (9-10ft)	TOC	
TPH-DRO(8015B)	x (all)		

Soil Log for Sample ID: SB-126

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	28-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	6'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: light brown to orange brown, graded to well graded medium dense silt, some fine sand (ML) moist, some angular fine gravel	0	SB-1260006I
2	2-3 ft: same as above description, except more dry and gravelly in this lower interval	0	SB-1260203F
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x (all)
SVOCs (8270C)	x (2-3ft)	Boron and Lithium (6010B)	
PCBs (8082)	x (2-3ft)	Hydrazine by IC	
TPH-GRO (8015B)	x (2-3ft)	TOC	
TPH-DRO(8015B)	x (all)		

Soil Log for Sample ID: SB-127

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	28-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	2'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches:light brown, graded to poorly graded silt, little angular fine gravel, moist	0	SB-1270006I
2	1-2 ft: same except gravel is larger beginning at 1.5 ft depth, water table estimated at 2' bgs	0	SB-1270102F
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x (all)
SVOCs (8270C)	x (1-2ft)	Boron and Lithium (6010B)	
PCBs (8082)	x (1-2ft)	Hydrazine by IC	
TPH-GRO (8015B)	x (1-2ft)	TOC	
TPH-DRO(8015B)	x (all)		

Soil Log for Sample ID: SB-128

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	14-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	Light brown, coarse grained clean sand, very loose, 15% gravel-rounded, dry (SW)		SB-1280006I
7–24			

Analysis:			
	VOCs (8260B)		PP13 metals (6010B) x
	SVOCs (8270C)		Boron and Lithium (6010B)
	PCBs (8082)	x(upper)	Hydrazine by IC
	TPH-GRO (8015B)		TOC
	TPH-DRO(8015B)	X	Dioxin

Soil Log for Sample ID: SB-128

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26	2-3 ft: reddish-brown, poorly sorted, co. gravel to med sand, loose,dry, (SW)		SB-1280203F
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Soil Log for Sample ID: SB-129

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	14-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	Light to dark brown, sorted, loose, fine to med. Sand, 10% subangular gravel, dry (SP)		SB-1290006I
7–12			
13–14			
15–17	light brown to orange-brown, loose, sorted, fine to med sand, 10% subangular gravel, moist (SP); water at 1.5' bgs, sample actually 1-1.5 ft depth		SB-1290102F
18–24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	x(upper)	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-130

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	14-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	light brown, sorted, medium dense, fine silt to fine sand, 10% coarse to fine gravel, moist to dry (SM)		SB-1300006I
7–24			

Analysis:			
	VOCs (8260B)		PP13 metals (6010B) x
	SVOCs (8270C)	x(upper)	Boron and Lithium (6010B)
	PCBs (8082)	x(upper)	Hydrazine by IC
	TPH-GRO (8015B)	x(upper)	TOC
	TPH-DRO(8015B)	x	Dioxin

Soil Log for Sample ID: SB-130

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26	2-3 ft: light brown to gray-brown, sorted, medium dense fine silt to fine sand, 5% fine gravel, moist to wet (SC)		SB-1300203F
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Soil Log for Sample ID: SB-131

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	14-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	light brown to gray brown, well graded, loose coarse sand and fine gravel, dry (GW)		SB-1310006I
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Analysis:			
	VOCs (8260B)		PP13 metals (6010B) x
	SVOCs (8270C)	x(upper)	Boron and Lithium (6010B)
	PCBs (8082)	x(upper)	Hydrazine by IC
	TPH-GRO (8015B)	x(upper)	TOC
	TPH-DRO(8015B)	x	Dioxin

Soil Log for Sample ID: SB-131

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26			
27	2-3 ft: light brown to gray brown, well graded, loose medium to coarse sand and fine gravel, 25% coarse gravel, dry (GW)		SB-1310203F
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Soil Log for Sample ID: SB-132

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	21-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Sediment Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	sl. Moist, med to coarse sand, some fine to coarse rounded gravel (5%), trace cobble to 2.5 inches, soft, tan to lt brown (SP)		SB-1320006I 0935
7–24			

Analysis:

VOCs (8260B)	PP13 metals (6010B) x
SVOCs (8270C)	Boron and Lithium (6010B)
PCBs (8082)	Hydrazine by IC
TPH-GRO (8015B)	TOC
TPH-DRO(8015B)	

Soil Log for Sample ID: SB-132

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26	tan coarse sand, sl. Moist, trace fine <5% rounded gravel, soft (SP)		SB-1320203F 0945
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Soil Log for Sample ID: SB-133

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	21-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	lt gray / lt brown, fine sand, trace fine gravel rounded to 0.5 inches, soft/friable, some silt w/micaceous material, sl moist (SP)		SB-1330006I 1000
12–24	fine to med sand, med brown, 5-10% fine gravel to 0.75 inches, rounded, sl moist, soft (SP)		SB-1330102F 1005

Analysis:

VOCs (8260B)	PP13 metals (6010B)	x
SVOCs (8270C)	Boron and Lithium (6010B)	
PCBs (8082)	Hydrazine by IC	
TPH-GRO (8015B)	TOC	
TPH-DRO(8015B)		

Soil Log for Sample ID: SB-134

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	22-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1			
2	med. Brown silt with some subangular coarse gravel to 1.5 inches, sl. Moist, soft, roots (ML)		SB-1340006I 1050
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)		Dioxin	

Soil Log for Sample ID: SB-134

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26 27 28 29 30 31 32 33 34 35 36	2-3 ft: same as above except trace cobble to 3" diameter, angular, trace fine gravel also, subrounded		SB-1340203F 1055
37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55			

Soil Log for Sample ID: SB-135

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	22-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	medium brown silt, sl. Moist, soft, some to little fine gravel, subangular, roots/organics (ML)		SB-1350006I 1105
7–24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)		Dioxin	

Soil Log for Sample ID: SB-135

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26–55	2-3 ft: gray/brown silt with little fine subangular to subrounded gravel, trace co. gravel, sl moist, soft (ML)		SB-1350203F 1110

Soil Log for Sample ID: SB-136

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	23-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	2 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time	
1	0-6 inches: med. Brown, sandy silt with 30% rounded coarse gravel, trace fine gravel-rounded, trace cobble to 3" diameter, sl. Moist, soft (ML)		SB-1360006I	1050
2	1-2 ft: medium brown, soft, slightly moist, fine sand, some silt, 30% rounded gravel, trace rounded cobbles (refusal) (SW)		SB-1360102F	1055
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-137

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	16-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	2 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: brown to dark brown, well graded, loose fine sand, 5% angular coarse gravel, 20% rounded cobbles, dry (SW)		SB-1370006I
2	1-1.5 ft: same description as above, refusal at 1.5 ft.		SB-1370102F
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	X		

Soil Log for Sample ID: SB-139

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	23-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	3 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: med. Brown, soft. Sl. Moist, silt, co. sand, fine angular gravel (SM), trace rounded cobble to 6" diameter	0	SB-1390006I 1020
2	2-3 ft: light brown, silt, soft, sl. Moist, trace rounded cobble, (ML)	0	SB-1390203F 1025
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)	x	Boron and Lithium (6010B)	
PCBs (8082)	x	Hydrazine by IC	
TPH-GRO (8015B)	x	TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-140

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	23-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	3 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: med. Brown, sandy silt, sand is medium, roots, some fine subangular fill gravel, some coarse rounded gravel, soft, sl. Moist (ML)		SB-1400006I 0950
2			
3	2-3 ft: medium brown, med to fine sand, well graded, 30% subrounded to angular fine gravel, some silt, sl. Moist, soft (SW)		SB-1400203F 0955
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24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	x (upper)	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-141

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	16-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	3 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: gray brown, well graded, loose, clean med to fine sand, 5% fine angular gravel, dry (SW)		SB-1410006I
2	2-3 ft: gray brown, graded, loose fine sand with little silt, 15% fine gravel, some wood/roots, dry (SM)		SB-1410203F
3			
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23			
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Analysis:				
	VOCs (8260B)		PP13 metals (6010B)	x
	SVOCs (8270C)	x	Boron and Lithium (6010B)	
	PCBs (8082)	x(lower)	Hydrazine by IC	
	TPH-GRO (8015B)	x	TOC	
	TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-142

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	16-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	2 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: brown well graded, loose to very loose, med to coarse sand with little fines, 15% fine to coarse subangular gravel, root fibers, dry (SW)		SB-14200061
2	1-2 ft: light brown, poorly graded, silt with some clay (CL)		SB-1420102F
3			
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23			
24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-143

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	16-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	2 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: brown-gray, well graded, very loose, med/coarse sand, 15% angular fine gravel, dry, root fibers (SW)		SB-1430006I
2	1-2 ft: light brown, poorly graded, very loose fine to medium sand, 5% subrounded gravel, dry (SP)		SB-1430102F
3			
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)	x	Boron and Lithium (6010B)	
PCBs (8082)	x	Hydrazine by IC	
TPH-GRO (8015B)	x	TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-144

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	23-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	2 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time	
1	0-6 inches: medium to dark brown, medium sand with some fine angular gravel, trace coarse gravel, rounded to 1.5" diameter, soft, sl. Moist (SP)		SB-1440006I	1115
2	1-2 ft: same description as above sample		SB-1440102F	1120
3				
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23				
24				

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-145

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	23-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	2 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time	
1	0-6 inches: soft, medium brown, medium sand with little silt, trace round coarse and fine gravel, sl. Moist (SP)	0	SB-1450006I	0800
2	1-2 ft: same description as above sample	0	SB-1450102F	0820
3			FD206102303	2400
4				
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22				
23				
24				

Analysis:			
VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)	x	Boron and Lithium (6010B)	
PCBs (8082)	x	Hydrazine by IC	
TPH-GRO (8015B)	x	TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-146

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	23-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	2 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time	
1	0-6 inches: medium brown, medium sand, trace silt, little fine to coarse gravel, rounded, soft, sl. Moist (SP)		SB-14600061	0915
2	1-2 ft: same description as above sample		SB-1460102F	0920
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Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-147

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	21-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	orange brown silt with little fine sand, soft, sl moist, roots, (ML), poorly graded		SB-1470006I 1650
2			
3			
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Analysis:

VOCs (8260B)	PP13 metals (6010B)	
SVOCs (8270C)	Boron and Lithium (6010B)	
PCBs (8082)	Hydrazine by IC	
TPH-GRO (8015B)	TOC	
TPH-DRO(8015B)	Herbicides	X

Soil Log for Sample ID: SB-147

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26			
27	2-3 ft: same description as above		SB-1470203F 1655
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Soil Log for Sample ID: SB-148

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	21-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	orange/brown, silt with clay, soft, 5% angular fine gravel, moist (ML)		
2			SB-1480006I 1640
3			
4			
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23			
24			

Analysis:			
	VOCs (8260B)	PP13 metals (6010B)	
	SVOCs (8270C)	Boron and Lithium (6010B)	
	PCBs (8082)	Hydrazine by IC	
	TPH-GRO (8015B)	TOC	
	TPH-DRO(8015B)	Herbicides	X

Soil Log for Sample ID: SB-148

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26			
27	2-3 ft: brown/orange to gray/brown, med sand with silt, 10-15% angular fine gravel, 10% subrounded coarse gravel, moist, soft, sl. Graded (SM)		SB-1480203F 1645
28			
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Soil Log for Sample ID: SB-149

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	21-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	brown/orange, fine sand and silt, poorly graded, moist to dry, soft, trace subangular fine gravel, roots (SM)		SB-1490006I 1625
7–24			

Analysis:

VOCs (8260B)	PP13 metals (6010B)	
SVOCs (8270C)	Boron and Lithium (6010B)	
PCBs (8082)	Hydrazine by IC	
TPH-GRO (8015B)	TOC	
TPH-DRO(8015B)	Herbicides	X

Soil Log for Sample ID: SB-149

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26	2-3 ft: brown/orange, same but slightly more fine gravel, sl. More silt than sand, trace angular coarse gravel, soft, sl. Moist (SM)		SB-1490203F 1630
27			
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Soil Log for Sample ID: SB-150

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	21-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	med brown silt, some roots, soft, moist (ML)		SB-1500006I 1615
7–24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)		Herbicides	X

Soil Log for Sample ID: SB-150

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26	2-3 ft: moist silt with some fine sand, soft, med brown (ML)		SB-1500203F 1620
27			
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Soil Log for Sample ID: SB-151

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	15-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	gray/brown, well graded, loose sand, 25% coarse gravel and fine gravel, moist (GM)		SB-1510006I
7–12			
13–14			
15–24	gray/brown, well graded, loose fine to coarse sand, 40% cobbles at depth		SB-1510102F

Analysis:			
	VOCs (8260B)	PP13 metals (6010B)	x
	SVOCs (8270C)	Boron and Lithium (6010B)	
	PCBs (8082)	Hydrazine by IC	
	TPH-GRO (8015B)	TOC	
	TPH-DRO(8015B) x		

Soil Log for Sample ID: SB-152

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	15-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	light brown, well graded loose sand, (med to coarse), moist (SM)		SB-1520006I
7–12			
13–14			
15–24	light brown to orange-brown, graded, loose sand, 5% fine gravel, (SM)		SB-1520102F

Analysis:			
VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)	x	Boron and Lithium (6010B)	
PCBs (8082)	x	Hydrazine by IC	
TPH-GRO (8015B)	x	TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-153

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	15-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	light brown to gray brown, graded, loose sand (med to coarse), moist (SM)		SB-1530006I
7–24			

Analysis:			
	VOCs (8260B)		PP13 metals (6010B) x
	SVOCs (8270C)		Boron and Lithium (6010B)
	PCBs (8082)	X	Hydrazine by IC
	TPH-GRO (8015B)		TOC
	TPH-DRO(8015B)	X	Dioxin

Soil Log for Sample ID: SB-153

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26	2-3 ft: gray brown, poorly graded, 10% fines - silt, clean gravels (fine), wet/moist (GW)		SB-1530203F
27			
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Soil Log for Sample ID: SB-154

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	15-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	light brown to gray-brown, graded, loose sand med to coarse, moist (SM)		SB-1540006I
14–16	light brown graded to well graded loose gravels with fines, 25% rounded cobbles (GC), water table at 1.5 ft.		SB-1540102F

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)	x	Boron and Lithium (6010B)	
PCBs (8082)	x	Hydrazine by IC	
TPH-GRO (8015B)	x	TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-155

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	15-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	light brown to gray, graded, loose medium to coarse sand, moist (SM)		SB-1550006I
12–24	light brown, well-graded, loose rounded fine gravels with fines, 15% coarse gravel, moist (GM)		SB-1550102F

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)	x		

Soil Log for Sample ID: SB-156

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	28-Oct-03	Drilling Method:	Geoprobe - GeoSearch
Boring Depth:	7'	Boring Diam.:	2 inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: light brown, poorly graded, medium loose to medium dense sand and silt (more sand), dry to moist (SW/SP)	0	SB-1560006I
2			
3	2-3 ft: orange brown, silt, poorly graded, trace rounded fine gravel, roots/wood, loose/soft, moist, (ML)	180	SB-1560203F
4			
5	5-5.5 ft: black organic, soft, poorly graded, silt, moist (ML)		
6	5.5-6 ft: tan-brown to gray-brown, well graded, loose, medium sand and gravel, some coarse sand, dry (SW)	199.8	SB-1560506F
7	6-6.8 ft: same as description directly above, water table at about 7'	0 (6-6.8 ft)	SB-1560607F
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Analysis:

VOCs (8260B)	x (2-3',5-6')	PP13 metals (6010B)	x (0-6",6-6.8')
SVOCs (8270C)	x (0-6",6-6.8')	Boron and Lithium (6010B)	
PCBs (8082)	x (0-6")	Hydrazine by IC	
TPH-GRO (8015B)	x (2-3',5-6')	TOC	
TPH-DRO(8015B)	x (0-6")		

Soil Log for Sample ID: SB-157

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	28-Oct-03	Drilling Method:	GeoProbe - GeoSearch
Boring Depth:	72"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	light brown to orange brown, well graded, loose medium sand with some angular fine gravel, little coarse sand, dry (SW)	0	SB-1570006I
7–24			

Analysis:				
	VOCs (8260B)	x(0'-0.5')	PP13 metals (6010B)	x
	SVOCs (8270C)	x(0'-0.5';2'-3')	Boron and Lithium (6010B)	
	PCBs (8082)	x(0'-0.5')	Hydrazine by IC	
	TPH-GRO (8015B)		TOC	
	TPH-DRO(8015B)	x	Dioxin	

Soil Log for Sample ID: SB-157

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26			
27	2-3 ft: 2'-3': gray brown, well graded, loose to medium dense fine sand, little angular fine gravel, little angular co. gravel, dry, (SW)	2	SB-1570203F
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Soil Log for Sample ID: SB-157

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
56			
57			
58			
59			
60			
61	dark brown, well graded, medium loose medium sand, some to little angular fine gravel, dry to 5.5', then water table (SW)	0	SB-1570506F
62			
63			
64			
65			
66			
67			
68			
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85			

Soil Log for Sample ID: SB-158

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	28-Oct-03	Drilling Method:	GeoProbe - GeoSearch
Boring Depth:	72"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	brown to tan/brown, well to poorly graded loose sand, some to little angular fine gravel, dry (SW/SP)	0	SB-1580006I
7–24			

Analysis:				
	VOCs (8260B)		PP13 metals (6010B)	x
	SVOCs (8270C)	x(0'-0.5')	Boron and Lithium (6010B)	
	PCBs (8082)	x(0'-0.5')	Hydrazine by IC	
	TPH-GRO (8015B)		TOC	
	TPH-DRO(8015B)	x	Dioxin	

Soil Log for Sample ID: SB-158

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26	2-3 ft: dark brown, well graded, dense to medium dense silt with some fine sand, some to little angular gravel, moist to dry (SM)	0	SB-1580203F FD207
27			
28			
29			
30			
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Soil Log for Sample ID: SB-158

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
56			
57			
58			
59			
60			
61	dark brown to orange brown, poorly sorted, medium loose, medium and coarse sand, some angular fine gravel, dry, (SW), water table at 6 ft.	0	SB-1580506F
62			
63			
64			
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66			
67			
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85			

Soil Log for Sample ID: SB-159

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	28-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	orange-brown to gray-brown, graded to well graded fine sand and silt, medium dense to dense, little angular fine to coarse gravel, moist to dry (SW)		
2			SB-1590006I
3			
4			
5			
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14			
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22			
23			
24			

Analysis:				
	VOCs (8260B)		PP13 metals (6010B)	x
	SVOCs (8270C)	x(upper)	Boron and Lithium (6010B)	
	PCBs (8082)	x(upper)	Hydrazine by IC	
	TPH-GRO (8015B)		TOC	
	TPH-DRO(8015B)	x	Dioxin	

Soil Log for Sample ID: SB-159

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26			
27	2-3 ft: same description as above		SB-1590203F
28			
29			
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31			
32			
33			
34			
35			
36			
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Soil Log for Sample ID: SB-160

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	21-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	med to dark brown, soft organic silt, some to trace med sand, sl. Moist (OL)		SB-1600006I 1525
7–24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)	x	Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)		Dioxin	x

Soil Log for Sample ID: SB-160

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26	2-3 ft: m.brown, soft, silt, trace fine sand and fine gravel (subangular), moist (ML)		SB-1600203F 1530
27			
28			
29			
30			
31			
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Soil Log for Sample ID: SB-161

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	21-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	organic silt, uniform, sl. Moist, dk brown, roots, soft (OL)		SB-1610006I 1505
2			
3			
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23			
24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)	x	Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)			

Soil Log for Sample ID: SB-161

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26			
27	2-3 ft: med brown, soft silt with little med sand, trace fine gravel, rounded and friable, more gray with depth (ML), moist		SB-1610203F 1510
28			
29			
30			
31			
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55			

Soil Log for Sample ID: SB-162

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Frazier
Date:	21-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	soft, organic, silt, dk brown, moist, uniform (OL)		SB-1620006I 1440 FD204102103 2400
7–12			
13–14			
15–24	water table at 2 feet; med brown, moist silt with some coarse sand (10%), soft, (ML)		SB-1620102F 1450

Analysis:			
	VOCs (8260B)	PP13 metals (6010B)	x
	SVOCs (8270C)	Boron and Lithium (6010B)	
	PCBs (8082)	Hydrazine by IC	
	TPH-GRO (8015B)	TOC	
	TPH-DRO(8015B)		

Soil Log for Sample ID: SB-163

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	16-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	2 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: dark brown to black peat, dry (PT)		SB-16300061
2	1-2 ft: light brown, poorly graded loose sand, little silt (SP)		SB-1630102F
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23			
24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)			

Soil Log for Sample ID: SB-164

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	16-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	3 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: dark brown to black, poorly graded loose sand and silt, some clay, 10% roots, dry (PT)		SB-16400061 FD20100061
2	2-3 ft: greenish gray to light gray, poorly graded, loose, fine to medium sand, root fibers and organics, moist to dry (SP)		SB-1640203F
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21			
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23			
24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)	x	Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)			

Soil Log for Sample ID: SB-165

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	14-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	black humus, dry (PT)		SB-1650006I
7–13			
14–24	light brown, poorly graded, medium stiff, silt and clay, some roots and organic material, dry (OH)		SB-1650102F

Analysis:

	VOCs (8260B)	PP13 metals (6010B)	x
	SVOCs (8270C)	Boron and Lithium (6010B)	
	PCBs (8082)	Hydrazine by IC	
	TPH-GRO (8015B)	TOC	
	TPH-DRO(8015B)		

Soil Log for Sample ID: SB-166

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	15-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	24"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1–6	black to dark brown, poorly graded, med dense sand and silt, some clay, dry (SC)		SB-1660006I
14–15	dark brown, poorly sorted silty clay, root fibers (OL)		SB-1660102F

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)			

Soil Log for Sample ID: SB-167

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	15-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	36"	Boring Diam.:	2+ inches

Depth (in)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	brown, poorly graded, loose sand, dry, some roots (SP)		
2			SB-1670006I
3			FD2000006I
4			
5			
6			
7			
8			
9			
10			
11			
12			
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14			
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17			
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19			
20			
21			
22			
23			
24			

Analysis:			
	VOCs (8260B)		PP13 metals (6010B) x
	SVOCs (8270C)	X	Boron and Lithium (6010B)
	PCBs (8082)		Hydrazine by IC
	TPH-GRO (8015B)		TOC
	TPH-DRO(8015B)		Dioxin

Soil Log for Sample ID: SB-167

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Depth (in)	Soil Classification	FID screen (ppm)	Sample ID(s) and Time
26–55	2-3 ft: brown, poorly graded, loose sand, some very clean fine sand, dry (SP)		SB-1670203F

Soil Log for Sample ID: SB-168

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	16-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	3 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6": dark brown to black, poorly graded, loose silt and clay, 15% rounded coarse gravel with wood pieces/root fibers, highly organic, dry (PT)		SB-1680006I
2	2-3 ft: light gray to light brown, poorly graded, soft silt and clay, highly plastic, 3% fine subangular gravel, dry (CH)		SB-1680203F
3			
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5			
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8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			

Analysis:			
	VOCs (8260B)	PP13 metals (6010B)	x
	SVOCs (8270C)	Boron and Lithium (6010B)	
	PCBs (8082)	Hydrazine by IC	
	TPH-GRO (8015B)	TOC	
	TPH-DRO(8015B)		

Soil Log for Sample ID: SB-169

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M. Horesh
Date:	16-Oct-03	Drilling Method:	Hand Auger or Shovel
Boring Depth:	3 ft	Boring Diam.:	2+ inches

Depth (ft)	Soil Classification	FID Screen (ppm)	Sample ID(s) & Time
1	0-6 inches: dark brown to black, poorly graded loose silt, some clay, 10% root fibers, highly organic, dry (PT)		SB-16900061
2	2-3 ft: greenish gray to light gray, poorly graded, loose, fine to medium sand, <1% root fibers, organics, moist to dry, (SP)		SB-1690203F
3			
4			
5			
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18			
19			
20			
21			
22			
23			
24			

Analysis:

VOCs (8260B)		PP13 metals (6010B)	x
SVOCs (8270C)		Boron and Lithium (6010B)	
PCBs (8082)		Hydrazine by IC	
TPH-GRO (8015B)		TOC	
TPH-DRO(8015B)			

Appendix G
Sediment Sampling Logs

Sediment Log for Sample ID: No Recovery

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	2107
Client:	YAEC: Ken Dow	Logged by:	
Drilling Co:	TG&B	Driller:	
Date:		Drilling Method:	Boat Vibracore System
Dist from Shore:		Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: NO RECOVERY

Depth (in)	Sediment Classification	Sample ID & Depth
1	SD-001	
2	SD-003	
3	SD-005	
4	SD-006	
5	SD-007	
6		
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19		
20		
21		
22		
23		
24		

Analysis:
- VOCs (8260B)
- SVOCs (8270C)
- PCBs (8082)
- TPH-GRO (8015B)
- TPH-DRO(8015B)
- PP13 metals (6010B)
- Boron and Lithium (6010B)
- Hydrazine by IC
- TOC

Sediment Log for Sample ID: SD-002

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	14-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	50'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 3"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–3	0-3" brown fine to med SAND, trace gravel	SD-002-00-04-I 13:30
4–24		

Analysis:	X	VOCs (8260B)	X	PP13 metals (6010B)
	X	SVOCs (8270C)	X	Boron and Lithium (6010B)
	X	PCBs (8082)	X	Hydrazine by IC
	X	TPH-GRO (8015B)	X	TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-004

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	14-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	100'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 2" homogenized multiple 2" samples in platic bag at this location

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1	0-2" brown fine to med SAND	SD-004-00-04-I 12:30
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
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16		
17		
18		
19		
20		
21		
22		
23		
24		

Analysis:

	VOCs (8260B)	X	PP13 metals (6010B)
	SVOCs (8270C)	X	Boron and Lithium (6010B)
X	PCBs (8082)	X	Hydrazine by IC
	TPH-GRO (8015B)		TOC
X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-008

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	12-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	75'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 12"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1	0-4"	Dark brown Organic Debri, Olive SILT, some f. sand, trace gravel	SD-008-00-04-I 13:00
2			
3			
4			
5	4-12"	Olive SILT, some f. sand	HELD
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			

Analysis:				
		VOCs (8260B)	X	PP13 metals (6010B)
		SVOCs (8270C)	X	Boron and Lithium (6010B)
	X	PCBs (8082)	X	Hydrazine by IC
		TPH-GRO (8015B)		TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-009

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	12-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	75'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 1'4"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–7	0-7.5" partially decayed wood and sticks some Dark brown silt	
8–12	7.5-12-.5 Dark brown m. SAND, trace coarse sand, trace silt, trace org. matter	SD-009-00-04-I 13:30
13–16	12.5-15.5 Olive, fine SAND and SILT	HELD
17–24		

Analysis:				
		VOCs (8260B)	x	PP13 metals (6010B)
		SVOCs (8270C)		Boron and Lithium (6010B)
	x	PCBs (8082)		Hydrazine by IC
		TPH-GRO (8015B)		TOC
	x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-010

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	12-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	100'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 13.5"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–4	0-2" dark brown, saturated, fine SILT trace organic material 2-4" Dark brown, fine SAND and SILT, trace org material	SD-010-00-04-I 15:40
5–8	4-8.5" Brown fine SAND and SILT	
9–12	8.5-12" Brown fine SAND	HELD
13–14	12-13.5" Dark brown SILT, trace clay	
15–24		

Analysis:				
		VOCs (8260B)	X	PP13 metals (6010B)
		SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
		TPH-GRO (8015B)		TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-011

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	12-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	50'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 9"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1–4	0-4"	Dark brown fine to med SAND, some silt, some gravel trace organics	SD-011-00-04-I 15:00
5	4-5"	Dark brown fine SILT sand SAND	
6–9	5-9"	Brown medium SAND and GRAVEL, trace silt, small-med cobbles	SD-011-05-09-I 15:30
10–24			

Analysis:	X	VOCs (8260B)	X	PP13 metals (6010B)
	X	SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
	X	TPH-GRO (8015B)		TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-012

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	12-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	25'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 5"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1	0-.5" Dark brown fine SAND, some silt	SD-012-00-04-I
2	.5-5" Dark brown poorly sorted coarse SAND, some med-large gravel	13:54
3	trace fine sand and silt	
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		

Analysis:

	VOCs (8260B)	X	PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
X	PCBs (8082)		Hydrazine by IC
	TPH-GRO (8015B)		TOC
X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-013

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	12-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	100'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 5"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1	0-5" Brown fine SAND and SILT, trace fine gravel	SD-013-00-04-I
2	some organic debris and leaves	18:05
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		

Analysis:

	VOCs (8260B)	X	PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
X	PCBs (8082)		Hydrazine by IC
	TPH-GRO (8015B)		TOC
X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-014

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	12-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	50'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 12"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1–7	0-7"	Dark brown SILT, some very fine sand , some organic material	SD-014-00-04-I 17:40
7–12	7-12"	Brown fine to med SAND, trace silt, little coarse sand and fine gravel	SD-014-06-12-I 17:50

Analysis:

X	VOCs (8260B)	X	PP13 metals (6010B)
X	SVOCs (8270C)		Boron and Lithium (6010B)
X	PCBs (8082)		Hydrazine by IC
X	TPH-GRO (8015B)		TOC
X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-015

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	12-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	25'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 5"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1	0-2"	Dark brown fine to med SAND and SILT, organic material	SD-015-00-04-I 17:17
2			
3	2-5"	Dark brown fine to med SAND, trace silt, trace gravel	
4			
5			HELD
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			

Analysis:

	VOCs (8260B)	x	PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
x	PCBs (8082)		Hydrazine by IC
	TPH-GRO (8015B)		TOC
x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-016

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	13-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	100'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 12"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1–7	0-7"	Dark grayish brown fine to med SILT and SAND, trace small gravel little organic material (top 1" more organic than the rest)	SD-016-00-04-I 10:25
7–10	7-10"	Dark grayish brown fine to med SAND and SILT, 3 large cobbles at 7"	HELD
10–12	10-12"	Black ORGANIC (sticks, roots), decay odor, silt little fine sand little small to med gravel	

Analysis:

	VOCs (8260B)	x	PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
x	PCBs (8082)		Hydrazine by IC
	TPH-GRO (8015B)		TOC
x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-017

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	13-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	50'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 8"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–3	0-3" Dark brown very fine SAND AND SILT, organic material (leaves, sticks)	SD-017-00-04-I 9:45
4–6	3-6" Brown fine to med SAND and GRAVEL, some silt, big stick and cobble at 4"	SD-017-04-08-I 10:00
7–8	6-8" Brown fine to coarse SAND and small to large GRAVEL little organic material, few large cobbles	
9–24		

Analysis:	x	VOCs (8260B)	x	PP13 metals (6010B)
	x	SVOCs (8270C)		Boron and Lithium (6010B)
	x	PCBs (8082)		Hydrazine by IC
	x	TPH-GRO (8015B)		TOC
	x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-018

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	13-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	25'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 15"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1–3	0-3"	Dark brown very fine SAND AND SILT a lot of organic material (leaves)	SD-018-00-04-I 9:10
4–8	3-8"	Olive gray very fine SAND, some silt one large white cobble	
9–10	8-10"	Dark brown/black very fine SAND and SILT a lot of organic material (leaves, sticks)	
11–15	10-15"	Brown very fine SAND and SILT, trace small to med gravel little organic material (sticks)	HELD
16–24			

Analysis:

	VOCs (8260B)	X	PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
X	PCBs (8082)		Hydrazine by IC
	TPH-GRO (8015B)		TOC
X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-019

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	13-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	100'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 11"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1–6	0-6"	Dark brown fine SAND AND SILT, trace small to med gravel some organic material (sticks)	SD-019-00-04-I 11:35
6–11	6-11"	Dark brown med to coarse SAND and small to large GRAVEL some silt, track organic material, trace small cobbles	HELD
12–24			

Analysis:

	VOCs (8260B)	x	PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
x	PCBs (8082)		Hydrazine by IC
	TPH-GRO (8015B)		TOC
x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-020

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	13-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	100'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 14"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
0-10"	Dark brown fine SAND AND SILT very organic material (leaves, sticks)	SD-020-00-04-I 11:50
10-14"	Dark brown fine SAND and SILT, some organic material (sticks, roots) some large cobbles near 14"	HELD

Analysis:

	VOCs (8260B)	x	PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
x	PCBs (8082)		Hydrazine by IC
	TPH-GRO (8015B)		TOC
x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-021

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	13-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	50'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: Core1: 14" Core2: 15.5"

Depth (in)	Sediment Classification		Sample ID & Depth &Time
1	Core 1	Core 2	
2	0-4" Dark brown SILT	0-4" Dark brown SILT	SD-021-00-04-I
3	little fine to med sand	little fine to med sand	12:07
4	trace small gravel	trace small gravel	
5	4-13" Dark brown SILT	4-13" Dark brown SILT, trace small	
6	trace fine sand, little organic	to medium gravel,	
7	material (sticks),	trace fine sand, little organic	
8	fine layers of black silt and	material (sticks),	
9	light brown silt	fine layers of black silt and	SD-021-08-14-I
10		light brown silt	DUP-02-SD-021-08-14-I
11			12:30
12			
13			
14	14" large cobble	12-15.5" Dark brown SILT, some brown	
15		fine sand, trace gravel	
16			
17			
18			
19			
20	All VOA vials taken from Core1, all others samples were taken from a		
21	homogenized sample of both cores		
22			
23			
24			

Analysis:	x	VOCs (8260B)	x	PP13 metals (6010B)
	x	SVOCs (8270C)		Boron and Lithium (6010B)
	x	PCBs (8082)		Hydrazine by IC
	x	TPH-GRO (8015B)		TOC
	x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-022

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	13-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	25'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: Core1: 17" Core2: 13"

Depth (in)	Sediment Classification			Sample ID & Depth &Time
	Core 1		Core 2	SD-022-00-04-I
1	0-5"	Dark brown fine to med SAND	0-2" Same as Core 1	MS-02-SD-022-00-04-I
2		some silt, small gravel	2-4" Gray very fine SAND some silt	MSD-02-SD-022-00-04-I
3		very organic material (sticks)		13:00
4				
5			4-8" Dark brown very fine SAND and	
6	5-9"	Dark brown fine SAND and	SILT, trace small to med gravel,	
7		SILT, trace organic material,	organic material (roots, leaves)	
8		trace small gravel		
9			8-9" Black ORGANIC and SILT	
10	9-11"	Brown fine to med SAND,	9-13" Brown/dark gray SILT,	
11		little silt, trace gravel	little fine sand, trace small gravel,	
12	11-15"	Brown fine to coarse SAND,	trace organic material	HELD from
13		and GRAVEL, some small		Core 1
14		to med cobbles, trace silt		
15				
16	15-17"	Brown fine to med SAND,		
17		little silt, organic material		
18				
19	samples were taken from a homogenized sample of both cores			
20				
21				
22				
23				
24				

Analysis:				
		VOCs (8260B)	x	PP13 metals (6010B)
		SVOCs (8270C)		Boron and Lithium (6010B)
	x	PCBs (8082)		Hydrazine by IC
		TPH-GRO (8015B)		TOC
	x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-023

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	13-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	100'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 17"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1	0-3"	Organic material (leaves)	
2			
3			
4	3-9"	Dark brown fine SILT, some sand, a lot of organic material (leaves)	SD-023-00-04-I 14:20
5			
6			
7			
8			
9			
10	9-17"	Dark brown fine SILT, some sand, little organic material	
11			
12			HELD
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			

Analysis:				
		VOCs (8260B)	X	PP13 metals (6010B)
		SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
		TPH-GRO (8015B)		TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-024

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	13-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	50'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 18"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1	0-3"	Organic material (leaves)	
2			
3			
4	3-11"	Dark brown/black very fine SAND, some silt,	SD-024-00-04-I
5		a lot of organic material (leaves)	15:05
6			
7			
8			
9			
10			
11			
12	11-18"	Dark brown/black very fine SILT, some sand, little organic material	SD-024-12-18-I
13		1/2" layer of black organic material at 14.5"	15:20
14			
15			
16			
17			
18			
19			
20		Tried to prevent larger leave/organic materialfrom getting in sample	
21			
22			
23			
24			

Analysis:	X	VOCs (8260B)	X	PP13 metals (6010B)
	X	SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
	X	TPH-GRO (8015B)		TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-025

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	13-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	25'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 12"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1–4	0-4"	Organic material (leaves), some black fine silt, some sand	
5–7	4-7"	Black fine SILT, some sand, some organic material	SD-025-00-04-I 14:35
8–12	7-12"	Dark black very fine SILT, some sand, some organic material large cobble at 12"	HELD
13–24		Tried to prevent larger leave/organic materialfrom getting in sample	

Analysis:		VOCs (8260B)	X	PP13 metals (6010B)
		SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
		TPH-GRO (8015B)		TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-026

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	13-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	100'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 8.5"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–8	0-8.5" Brown med to coarse SAND, loose, no organic material	SD-026-00-04-I 15:45
1–8		HELD
9–24		

Analysis:

	VOCs (8260B)	X	PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
X	PCBs (8082)		Hydrazine by IC
	TPH-GRO (8015B)	X	TOC
X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-027

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer, E Gabay
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	13-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	50'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 14"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
0-4"	Brown fine to med SAND, loose, some organic material (sticks)	SD-027-00-04-I 15:30
4-14"	Brown med to coarse SAND, some angular pebbles	SD-027-08-14-I 15:40

Analysis:	X	VOCs (8260B)	X	PP13 metals (6010B)
	X	SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
	X	TPH-GRO (8015B)		TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-028

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer, E Gabay
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	13-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	25'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 10"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1	0-6"	Brown med to coarse SAND, loose, some small to med angular pebbles no organic material	SD-028-00-04-I 15:55
6	6-10"	Brown fine SAND and SILT, some organic material (wood, roots)	HELD
10			
24			

Analysis:				
		VOCs (8260B)	x	PP13 metals (6010B)
		SVOCs (8270C)		Boron and Lithium (6010B)
	x	PCBs (8082)		Hydrazine by IC
		TPH-GRO (8015B)		TOC
	x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-029

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M Horesh
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	14-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	50'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 14"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–2	0-2.5" Black medium loose, poorly sorted SILT and Organic material	SD-029-00-04-I 11:50
3–8	2.5-8.5" Gray to multicolored, loose, moderately sorted, med to coarse SAND, trace gravel, trace silt	
9–14	8.5-14" Multicolored loose, poorly sorted fine to med SAND, and GRAVEL, some pebbles, litte to trace cobbles, trace silt	SD-029-08-14-I 12:00
15–24		

Analysis:				
	x	VOCs (8260B)	x	PP13 metals (6010B)
	x	SVOCs (8270C)		Boron and Lithium (6010B)
	x	PCBs (8082)		Hydrazine by IC
	x	TPH-GRO (8015B)		TOC
	x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-030

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M Horesh
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	14-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	25'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 14"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–4	0-4" Brown to dark gray, loose moderately sorted fine to coarse SAND, little organic material, trace to little silt	SD-030-00-04-I 12:10
5–14	4-14" Brown to Gray, loose, poorly sorted, med to coarse SAND, little angular gravel, little organics (leaves, roots), trace silt	HELD
15–24		

Analysis:		VOCs (8260B)	X	PP13 metals (6010B)
		SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
		TPH-GRO (8015B)		TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-031

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	14-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	200'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: ~4" (in a bag)

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–4	0-4" Dark brown, loose SILT, little very fine sand, trace organics	SD-031-00-04-I 9:16
5–24	Instead of using the grabbing device (used for deep water samples), collected ~4" into the core and put that in a bag. Classification and sampling performed from the bag. nothing held because no extra recovery	

Analysis:				
	VOCs (8260B)		x	PP13 metals (6010B)
	SVOCs (8270C)			Boron and Lithium (6010B)
	x	PCBs (8082)		Hydrazine by IC
		TPH-GRO (8015B)		TOC
	x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-032

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	14-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	200'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: ~4" in a bag

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–4	0-4" Dark brown, loose SILT, little fine sand, some organics (sticks)	SD-032-00-04-I 8:25
5–24	Using a grabbing device to collect the top 4" of soil/organics because water too deep for coring device to reach down and recover sample. Grabber sample is collected in a bag and classification and sampling performed from the bag. nothing held because no extra recovery	

Analysis:

	VOCs (8260B)	X	PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
X	PCBs (8082)		Hydrazine by IC
	TPH-GRO (8015B)		TOC
X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-033

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	14-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	200'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: ~4" in a bag

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–4	0-4" Dark brown, loose SILT, trace very fine sand, little organics	SD-033-00-04-I 8:40

Using a grabbing device to collect the top 4" of soil/organics because water too deep for coring device to reach down and recover sample. Grabber sample is collected in a bag and classification and sampling performed from the bag.

nothing held because no extra recovery

Analysis:				
	VOCs (8260B)		x	PP13 metals (6010B)
	SVOCs (8270C)			Boron and Lithium (6010B)
	x	PCBs (8082)		Hydrazine by IC
	TPH-GRO (8015B)		x	TOC
	x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-034

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	13-Aug-04	Drilling Method:	Boat Vibracore System
Dist from Shore:	200'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 15"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–5	0-5" Dark brown, loose fine SAND and SILT, some organic material	SD-034-00-04-I 16:30
5–10	5-10" Gray fine SAND and SILT	
10–15	10-15" Dark brow, loose, fine SAND and SILT, organic material (sticks)	HELD
15–24		

Analysis:

	VOCs (8260B)	X	PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
X	PCBs (8082)		Hydrazine by IC
	TPH-GRO (8015B)		TOC
X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-035

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer, E. Gebay
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	13-Aug-04	Drilling Method:	Boat Vibracore System
Dist from Shore:	200'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 7"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
0-7"	Dark brown, loose SILT, some fine sand, some organic material (leaves)	SD-035-00-04-I 17:00
		HELD

Analysis:

	VOCs (8260B)	X	PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
X	PCBs (8082)		Hydrazine by IC
	TPH-GRO (8015B)		TOC
X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-036

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer, E. Gebay
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	13-Aug-04	Drilling Method:	Boat Vibracore System
Dist from Shore:	200'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 12"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
0-6"	Dark brown, very loose SILT, some organic material	SD-036-00-04-I 17:05
6-12"	Gray to dark brown, loose, SILT	HELD

Analysis:

	VOCs (8260B)	X	PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
X	PCBs (8082)		Hydrazine by IC
	TPH-GRO (8015B)		TOC
X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-037

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer, E. Gebay
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	13-Aug-04	Drilling Method:	Boat Vibracore System
Dist from Shore:	200'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 15"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
0-10"	Dark brown, wet, loose, SILT, trace organic material	SD-037-00-04-I 16:50
10-15"	Dark brown SILT, some fine sand, oragnic material (leaves, sticks)	HELD

Analysis:

	VOCs (8260B)	X	PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
X	PCBs (8082)		Hydrazine by IC
	TPH-GRO (8015B)		TOC
X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-038

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	14-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	500'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 26"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1–4	0-4"	Dark brown, very loose, SILT, trace organic material	SD-038-00-04-I 10:40
4–18	4-26"	Dark brown, loose SILT, little organic material	HELD
18–24		↓ to 26"	

Analysis:

	VOCs (8260B)	x	PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
x	PCBs (8082)		Hydrazine by IC
	TPH-GRO (8015B)		TOC
x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-039

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	14-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	500'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 11"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1–4	0-4"	Dark brown, loose, fine to coarse SAND and SILT, trace organic material piece of wood at 4"	SD-039-00-04-I 11:15
5–10	4-10"	Medium to dark brown, fine to coarse SAND some silt, some organic material (roots)	HELD
11	10-11"	Dark brown SILT, some sand	
12–24			

Analysis:				
	VOCs (8260B)		X	PP13 metals (6010B)
	SVOCs (8270C)			Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
	TPH-GRO (8015B)		X	TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-040

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	14-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	500'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 24"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1–4		0-4" Dark brown, loose, SILT	SD-040-00-04-I 11:25
5–18		4-18" Dark brown SILT, trace fine sand, trace organic material (roots, leaves)	HELD
19–24		18-24" Gray/brown SILT and CLAY	

Analysis:

	VOCs (8260B)	X	PP13 metals (6010B)
	SVOCs (8270C)		Boron and Lithium (6010B)
X	PCBs (8082)		Hydrazine by IC
	TPH-GRO (8015B)		TOC
X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-041

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Auer
Drilling Co:	TG&B	Driller:	R Reynolds
Date:	14-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	500'	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 26"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1–4	0-4"	Dark brown, loose, SILT, little organic material	SD-041-00-04-I 11:35
5–22	4-22"	Dark brown, loose, SILT, some organic material	HELD
23–24	22-26"	Brown fine to med SAND, trace gravel, little silt, small pebbles ↓ to 26"	

Analysis:				
		VOCs (8260B)	X	PP13 metals (6010B)
		SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
		TPH-GRO (8015B)		TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-101

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	E. Gabay
Drilling Co:		Driller:	
Date:	13-Aug-03	Drilling Method:	
Dist from Shore:	Wheeler Brook	Boring Diam.:	
Boring Depth:	4"		
Depth of Surface water:			

RECOVERY: 4"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–4		SD-101-00-04-I SD-101-00-04-I-MS SD-101-00-04-I-MSD 9:20
5–24		

Analysis:	X	VOCs (8260B)	X	PP13 metals (6010B)
	X	SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
	X	TPH-GRO (8015B)	X	TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-102

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	E. Gabay
Drilling Co:		Driller:	
Date:	13-Aug-03	Drilling Method:	
Dist from Shore:	Wheeler Brook	Boring Diam.:	
Boring Depth:	4"		
Depth of Surface water:			

RECOVERY: 4"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–4		SD-102-00-04-I 9:45
5–24		

Analysis:

X	VOCs (8260B)	X	PP13 metals (6010B)
X	SVOCs (8270C)		Boron and Lithium (6010B)
X	PCBs (8082)		Hydrazine by IC
X	TPH-GRO (8015B)		TOC
X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-103

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	E. Gabay
Drilling Co:		Driller:	
Date:	13-Aug-03	Drilling Method:	
Dist from Shore:	Wheeler Brook	Boring Diam.:	
Boring Depth:	4"		
Depth of Surface water:			

RECOVERY: 4"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–4		SD-103-00-04-I 10:05
5–24		

Analysis:

x	VOCs (8260B)	x	PP13 metals (6010B)
x	SVOCs (8270C)		Boron and Lithium (6010B)
x	PCBs (8082)		Hydrazine by IC
x	TPH-GRO (8015B)	x	TOC
x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-104

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	E. Gabay
Drilling Co:		Driller:	
Date:	13-Aug-03	Drilling Method:	
Dist from Shore:	Wheeler Brook	Boring Diam.:	
Boring Depth:	4"		
Depth of Surface water:			

RECOVERY: 4"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–4		SD-104-00-04-I 10:27
5–24		

Analysis:

X	VOCs (8260B)	X	PP13 metals (6010B)
X	SVOCs (8270C)		Boron and Lithium (6010B)
X	PCBs (8082)		Hydrazine by IC
X	TPH-GRO (8015B)		TOC
X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-105

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	E. Gabay
Drilling Co:		Driller:	
Date:	13-Aug-03	Drilling Method:	
Dist from Shore:	Wheeler Brook	Boring Diam.:	
Boring Depth:	4"		
Depth of Surface water:			

RECOVERY: 4"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1		SD-105-00-04-I
2		10:40
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		

Analysis:				
	X	VOCs (8260B)	X	PP13 metals (6010B)
	X	SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
	X	TPH-GRO (8015B)		TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-106

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	E. Gabay
Drilling Co:		Driller:	
Date:	13-Aug-03	Drilling Method:	
Dist from Shore:	Wheeler Brook	Boring Diam.:	
Boring Depth:	4"		
Depth of Surface water:			

RECOVERY: 4"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–4		SD-106-00-04-I
5–24		

Analysis:

X	VOCs (8260B)	X	PP13 metals (6010B)
X	SVOCs (8270C)		Boron and Lithium (6010B)
X	PCBs (8082)		Hydrazine by IC
X	TPH-GRO (8015B)		TOC
X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-201

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M Horesh
Drilling Co:		Driller:	
Date:	24-Sep-03	Drilling Method:	
Dist from Shore:	Deerfield River	Boring Diam.:	
Boring Depth:	4"		
Depth of Surface water:			

RECOVERY: 4"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–4	0-4" Poorly sorted, coarse SAND, trace fine gravel	SD-201-00-04-I 16:46
5–24		

Analysis:				
	x	VOCs (8260B)	x	PP13 metals (6010B)
	x	SVOCs (8270C)		Boron and Lithium (6010B)
	x	PCBs (8082)		Hydrazine by IC
	x	TPH-GRO (8015B)	x	TOC
	x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-202

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M Horesh
Drilling Co:		Driller:	
Date:	24-Sep-03	Drilling Method:	
Dist from Shore:	Deerfield River	Boring Diam.:	
Boring Depth:	4"		
Depth of Surface water:			

RECOVERY: 4"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–4	0-4" Poorly sorted, coarse SAND, trace fine gravel	SD-202-00-04-I DUP-04-SD-202-00-04-I MS-04-SD-202-00-04-I MSD-04-SD-202-00-04-I
5–24		16:25

Analysis:				
	X	VOCs (8260B)	X	PP13 metals (6010B)
	X	SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
	X	TPH-GRO (8015B)		TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-203

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M Horesh
Drilling Co:		Driller:	
Date:	24-Sep-03	Drilling Method:	
Dist from Shore:	Deerfield River	Boring Diam,:	
Boring Depth:	4"		
Depth of Surface water:			

RECOVERY: 4"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–4	0-4" Fine to medium SAND	SD-203-00-04-I 14:40
5–24		

Analysis:

x	VOCs (8260B)	x	PP13 metals (6010B)
x	SVOCs (8270C)		Boron and Lithium (6010B)
x	PCBs (8082)		Hydrazine by IC
x	TPH-GRO (8015B)	x	TOC
x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-204

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M Horesh
Drilling Co:		Driller:	
Date:	24-Sep-03	Drilling Method:	
Dist from Shore:	Deerfield River	Boring Diam.:	
Boring Depth:	4"		
Depth of Surface water:			

RECOVERY: 4"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–4	0-4" Fine to medium SAND	SD-204-00-04-I 14:08
5–24		

Analysis:

X	VOCs (8260B)	X	PP13 metals (6010B)
X	SVOCs (8270C)		Boron and Lithium (6010B)
X	PCBs (8082)		Hydrazine by IC
X	TPH-GRO (8015B)		TOC
X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-205

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M Horesh
Drilling Co:		Driller:	
Date:	24-Sep-03	Drilling Method:	
Dist from Shore:	Deerfield River	Boring Diam.:	
Boring Depth:	4"		
Depth of Surface water:			

RECOVERY: 4"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1	0-4"	Fine to medium SAND	SD-205-00-04-I 14:00
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			

Analysis:				
	X	VOCs (8260B)	X	PP13 metals (6010B)
	X	SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
	X	TPH-GRO (8015B)		TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-206

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	M Horesh
Drilling Co:		Driller:	
Date:	24-Sep-03	Drilling Method:	
Dist from Shore:	Deerfield River	Boring Diam.:	
Boring Depth:	4"		
Depth of Surface water:			

RECOVERY: 4"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1	0-4" Fine to medium SAND	SD-206-00-04-I 13:52
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		

Analysis:				
	X	VOCs (8260B)	X	PP13 metals (6010B)
	X	SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
	X	TPH-GRO (8015B)		TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-301

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Regan
Drilling Co:		Driller:	
Date:	12-Aug-03	Drilling Method:	hand shovel
Dist from Shore:	WSD	Boring Diam.:	
Boring Depth:	4"		
Depth of Surface water:			

RECOVERY: 4"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–4	0-4" Brown, poorly sorted, fine to coarse SAND, trace fine gravel, some organic material (leaves)	SD-301-00-04-I 16:30
5–24	couldn't find any finer sediment within the top 4" in multiple locations tried	

Analysis:				
	X	VOCs (8260B)	X	PP13 metals (6010B)
	X	SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
	X	TPH-GRO (8015B)		TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-302

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C. Regan
Drilling Co:		Driller:	
Date:	12-Aug-03	Drilling Method:	hand shovel
Dist from Shore:	WSD	Boring Diam.:	
Boring Depth:	4"		
Depth of Surface water:			

RECOVERY: 4"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–4	0-4" Fine to coarse SAND, trace silt	SD-302-00-04-I 16:40
5–24		

Analysis:

X	VOCs (8260B)	X	PP13 metals (6010B)
X	SVOCs (8270C)		Boron and Lithium (6010B)
X	PCBs (8082)		Hydrazine by IC
X	TPH-GRO (8015B)		TOC
X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-303

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Picard, E. Gebay
Drilling Co:		Driller:	
Date:	12-Aug-03	Drilling Method:	hand shovel
Dist from Shore:	WSD	Boring Diam.:	
Boring Depth:	4"		
Depth of Surface water:			

RECOVERY: 4"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1	0-4"	Fine to coarse SAND, trace silt	SD-303-00-04-I 14:35
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			

Analysis:				
	x	VOCs (8260B)	x	PP13 metals (6010B)
	x	SVOCs (8270C)		Boron and Lithium (6010B)
	x	PCBs (8082)		Hydrazine by IC
	x	TPH-GRO (8015B)		TOC
	x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-304

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Picard, E. Gebay
Drilling Co:		Driller:	
Date:	12-Aug-03	Drilling Method:	hand shovel
Dist from Shore:	WSD	Boring Diam.:	
Boring Depth:	4"		
Depth of Surface water:			

RECOVERY: 4"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1	0-4"	Fine to coarse SAND, trace silt	SD-304-00-04-I DUP-03-SD-304-00-04-I 14:15
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			

Analysis:				
	x	VOCs (8260B)	x	PP13 metals (6010B)
	x	SVOCs (8270C)		Boron and Lithium (6010B)
	x	PCBs (8082)		Hydrazine by IC
	x	TPH-GRO (8015B)	x	TOC
	x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-305

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	J. Picard, E. Gebay
Drilling Co:		Driller:	
Date:	12-Aug-03	Drilling Method:	hand shovel
Dist from Shore:	WSD	Boring Diam.:	
Boring Depth:	4"		
Depth of Surface water:			

RECOVERY: 4"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–4	0-4" Fine to coarse SAND, trace silt	SD-305-00-04-I 14:00
5–24		

Analysis:

X	VOCs (8260B)	X	PP13 metals (6010B)
X	SVOCs (8270C)		Boron and Lithium (6010B)
X	PCBs (8082)		Hydrazine by IC
X	TPH-GRO (8015B)	X	TOC
X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-401

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C Auer
Drilling Co:	TG&B	Driller:	Rob Reynolds
Date:	14-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	NA	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: Core1: 20" Core2: 21"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1–4	0-4"	Dark brown, very loose SILT	SD-401-00-04-I MS-03-SD-401-00-04-I MSD-03-SD-401-00-04-I 14:00
5–15	4-15"	Dark brown, loose, SILT, trace fine sand, organic material	HELD
16–21	15-21"	Dark brown SILT, some fine sand	
22–24		took all VOA samples from Core1, homogenized Core1 and Core2 for rest of samples	

Analysis:				
	X	VOCs (8260B)	X	PP13 metals (6010B)
	X	SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
	X	TPH-GRO (8015B)	X	TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-402

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C Auer
Drilling Co:	TG&B	Driller:	Rob Reynolds
Date:	14-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	NA	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 16"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–3	0-3" Dark brown, very loose SILT	SD-402-00-04-I 15:05
3–9	3-9" Dark brown, loose SILT, little fine sand, some organic material	
9–16	9-16" Brown fine to med SAND, little silt, trace organics	HELD
16–24		

Analysis:				
	X	VOCs (8260B)	X	PP13 metals (6010B)
	X	SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
	X	TPH-GRO (8015B)		TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-403

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C Auer
Drilling Co:	TG&B	Driller:	Rob Reynolds
Date:	14-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	NA	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 18"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1	0-3"	Organic material (grass), trace fines	SD-403-00-04-I 15:25
2			
3			
4	3-18"	Gray/brown fine to coarse SAND and GRAVEL moves towards med pebbles, no organic material	
5			
6			
7			
8			
9			
10			
11			
12			HELD
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			

Analysis:	X	VOCs (8260B)	X	PP13 metals (6010B)
	X	SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
	X	TPH-GRO (8015B)	X	TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-404

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C Auer
Drilling Co:	TG&B	Driller:	Rob Reynolds
Date:	14-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	NA	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 26"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–3	0-3" Dark brown, very loose SILT, organic material throughout	SD-404-00-04-I 15:40
3–26	3-26" Dark brown, loose SILT, organic material throughout slight decay odor	HELD
24	↓ to 26"	

Analysis:	X	VOCs (8260B)	X	PP13 metals (6010B)
	X	SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
	X	TPH-GRO (8015B)		TOC
	X	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-405

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C Auer
Drilling Co:	TG&B	Driller:	Rob Reynolds
Date:	14-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	NA	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 14"

Depth (in)	Sediment Classification	Sample ID & Depth &Time
1–8	0-8" Dark brown, loose SILT, trace sand, trace organic material	SD-405-00-04-I 16:00
8–14	8-14" Dark brown to black SILT, some fine sand, trace small pebbles a lot of organic material, trace gray coarse sand	HELD
15–24		

Analysis:				
	x	VOCs (8260B)	x	PP13 metals (6010B)
	x	SVOCs (8270C)		Boron and Lithium (6010B)
	x	PCBs (8082)		Hydrazine by IC
	x	TPH-GRO (8015B)		TOC
	x	TPH-DRO(8015B)		

Sediment Log for Sample ID: SD-406

ERM
399 Boylston Street, 6th Floor
Boston, MA 02116

Project:	Yankee-LTP	Project Number:	15181
Client:	YAEC: Ken Dow	Logged by:	C Auer
Drilling Co:	TG&B	Driller:	Rob Reynolds
Date:	14-Aug-03	Drilling Method:	Boat Vibracore System
Dist from Shore:	NA	Boring Diam.:	2 5/8"
Boring Depth:	18"		
Depth of Surface water:			

RECOVERY: 15"

Depth (in)		Sediment Classification	Sample ID & Depth &Time
1	0-3"	Dark brown,very loose SILT, trace fine sand, some organic material trace small cobbles	SD-406-00-04-I 16:15
2			
3			
4	3-15"	Dark brown, loose SILT, some fine sand, trace small cobbles, some organic material tends towards more organic material (black)	
5			
6			
7			
8			
9			HELD
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			

Analysis:				
	X	VOCs (8260B)	X	PP13 metals (6010B)
	X	SVOCs (8270C)		Boron and Lithium (6010B)
	X	PCBs (8082)		Hydrazine by IC
	X	TPH-GRO (8015B)		TOC
	X	TPH-DRO(8015B)		