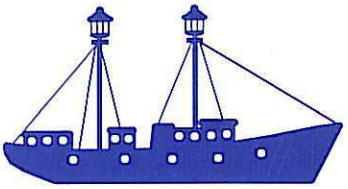
LIGHTSHIP
ENGINEERING
ENVIRONMENTAL & LAND-USE CONSULTANTS



LSP SERVICES • CIVIL ENGINEERING • ASSESSMENT • PERMITTING • REMEDIATION • CONSTRUCTION MANAGEMENT

August 13, 2008

George Papadopoulos
US Environmental Protection Agency
Industrial NPDES Permits (CIP),
1 Congress Street, Suite 1100
Boston, Massachusetts 02114

RE: EPA Remediation General Permit Notice of Intent
Bourne Mill Complex
844/ State Road/1 Shove Street
Tiverton, Rhode Island
RIDEM Case No. 2003-017
Lightship Eng. Project No. 600.9.2

Dear Mr. Papadopoulos:

On behalf of the EAF Bourne Mill, LLC, Lightship Engineering, LLC ("Lightship Engineering") is submitting the attached Notice of Intent ("NOI") for the Remediation General Permit ("RGP") to treat and discharge petroleum-impacted groundwater at the Bourne Mill Complex located in Tiverton, Rhode Island (the "Site"). A Site Locus Map is attached as Figure 1-1, Attachment A and a Site Map is attached as Figure 1-2, Attachment A of the permit. As indicated on Figure 1, Attachment A, portions of the Site are located within the City of Fall River, Massachusetts. The work is being conducted as part of *Remedial Action Work Plan* approve by the State of Rhode Island Department of Environmental Management ("RIDEM") under RIDEM's Rules and Regulations for the Investigation and Remediation of Hazardous Material Release.

Please find the attached Notice of Intent Submittal Form, Figure 1, Site Locus Map (Attachment A) showing the Site and discharge location, Figure 2, Site Map (Attachment A) showing the Site and sampling and discharge locations, and Figure 3, Treatment System Schematic (Attachment A) showing the proposed treatment and discharge process, Attachment B, a brief history of remedial action creating the proposed discharge, and laboratory analytical data packages (Attachment C).

A pump will be used to transfer groundwater into two 20,000-gallon fractionation ("frac") tanks for temporary storage and removal of settleable solids. The extracted groundwater will be treated through bag filters (35 to 50 micron), followed by two 2,000 lb. granular activated carbon ("GAC") vessels aligned in series. An estimated maximum of 1,000,000 gallons of groundwater is expected to be treated prior to discharge. The groundwater treatment system will be designed to treat and discharge groundwater at a maximum flow rate of 150 gallons per

minute ("gpm") and an average flow rate of 100 gpm. A schematic of the treatment system is provided as Figure 3, Attachment A.

The treated groundwater will be discharged to a drainage swale located at the Site, which ultimately discharges to Cook Pond located north of the Site as indicated on Figures 1 and 2, Attachment A. Cook Pond is located in Massachusetts.

The treated water will be sampled consistent with the RGP requirements from in-line influent, midfluent and effluent sample ports. The samples will be submitted to a Commonwealth of Massachusetts certified analytical laboratory on a 48-hour to 72-hour turnaround. The treatment system is expected to be operated for a period of eleven months.

Your assistance in processing this NOI is greatly appreciated. If you have any questions, please call Brian LaPierre or Timothy Condon at (508) 830-3344, extensions 150 and 120 respectively.

Very truly yours,

Lightship Engineering, LLC

Brian LaPierre, P.E.
Project Manager

Timothy Condon, P.E., LSP
Principal

Attachments

cc: Mr. Jake Upton, EAF Bourne Mills, LLC

NOTICE OF INTENT SUBMITTAL FORM

B. Suggested Form for Notice of Intent (NOI) for the Remediation General Permit

1. General site information. Please provide the following information about the site:

a) Name of **facility/site**: Bourne Mill Complex		**Facility/site** address:		
Location of **facility/site**: longitude: 71:10:39 latitude: 41:40:12	Facility SIC code(s): N/A	Street: 844 State Road/1 Shove Street		
b) Name of **facility/site owner:** EAF Bourne Mills, LLC		Town: Tiverton		
Email address of owner: N/A		State: RI	Zip: 02878	County: Newport
Telephone no.of facility/site **owner**: (781) 380-1675				
Fax no. of facility/site **owner**: (781) 380-1676		**Owner** is (check one): 1. Federal____ 2. State/Tribal_____ 3. Private__✔___ 4. other, if so, describe:		
Address of **owner** (if different from site): N/A				
Street: 536 Granite Street				
Town: Braintree	State: MA	Zip: 02184	County: Norfolk	
c) Legal name of **operator**: SITECON Corporation	**Operator** telephone no: (401) 944-2335			
	Operator fax no.: (401) 944-6999		**Operator** email: mike@siteconcorp.com	
Operator contact name and title: Michael W. Lema, Senior Project Manager				
Address of **operator** (if different from owner):	Street: 1430 Suite A Cranston Street			
Town: Cranston	State: RI	Zip: 02920	County: Providence	

d) Check "yes" or "no" for the following:
1. Has a prior NPDES permit exclusion been granted for the discharge? Yes___ No✔, if "yes," number:
2. Has a prior NPDES application (Form 1 & 2C) ever been filed for the discharge? Yes___ No✔, if "yes," date and tracking #:
3. Is the discharge a "new discharge"as defined by 40 CFR 122.2? Yes✔ No___
4. For sites in Massachusetts, is the discharge covered under the MA Contingency Plan (MCP) and exempt from state permitting? Yes__ No__ Not Applicable

e) Is site/facility subject to any State permitting or other action which is causing the generation of discharge? Yes ✔ No ___ If "yes," please list: 1. site identification # assigned by the state of NH or MA: Not Applicable 2. permit or license # assigned: RIDEM Case No. 2003-017 - See Attachment B 3. state agency contact information: name, location, and telephone number: RIDEM, Office of Waste Management, Jeffrey Crawford, 401-222-2797	f) Is the site/facility covered by any other EPA permit, including: 1. multi-sector storm water general permit? Y ___ N ✔, if Y, number: 2. phase I or II construction storm water general permit? Y ___ N ✔, if Y, number: 3. individual NPDES permit? Y ___ N ✔, if Y, number: 4. any other water quality related permit? Y ___ N ✔, if Y, number:

2. Discharge information. Please provide information about the discharge, (attaching additional sheets as needed) including:

a) Describe the discharge activities for which the owner/applicant is seeking coverage:

Excavation dewatering. No. 2 fuel oil impacted soil will be excavated at the Site as part of a Remedial Action Work Plan under the Rhode Island Department of Environmental Management (RIDEM) Remediation Regulations and approval of RIDEM. The excavation will extend below the water table, and as a result, groundwater will be pumped from the open excavation into frac tanks and temporarily stored on-Site. The water will then be treated through bag filters and granular activated carbon prior to discharge in a drainage swale located at the Site. The on-Site drainage swale discharges to Cook Pond.

b) Provide the following information about each discharge:	1) Number of discharge points: 1	2) What is the **maximum** and **average flow rate** of discharge (in cubic feet per second, ft3/s)? Max. flow 0.334 cfs Average flow 0.223 cfs Is maximum flow a **design value**? Y ✔ N ____ For average flow, include the units and appropriate notation if this value is a design value or estimate if not available. Average Flow: 0.223 cfs is a design value.

3) Latitude and longitude of each discharge within 100 feet: pt.1:long. 71:10:33.92 lat. 41:40:17.94; pt.2: long._____ lat._____; pt.3: long._____ lat._____; pt.4:long._____ lat._____; pt.5: long._____ lat._____; pt.6:long._____ lat._____; pt.7: long._____ lat._____; pt.8:long._____ lat._____; etc.

4) If hydrostatic testing, total volume of the discharge (gals): Not Applicable	5) Is the discharge intermittent ✔ or seasonal _____? Is discharge ongoing Yes ____ No ✔ ?

c) Expected dates of discharge (mm/dd/yy): start 08/15/08 end 07/16/09

d) Please attach a line drawing or flow schematic showing water flow through the facility including:
1. sources of intake water, 2. contributing flow from the operation, 3. treatment units, and 4. discharge points and receiving waters(s).

See Attached Figures 1 through 3, Attachment A

3. Contaminant information. In order to complete this section, the applicant will need to take a minimum of one sample of the untreated water and have it analyzed for **all** of the parameters listed in Appendix III. Historical data, (i.e., data taken no more than 2 years prior to the effective date of the permit) may be used if obtained pursuant to: i. Massachusetts' regulations 310 CMR 40.0000, the Massachusetts Contingency Plan ("Chapter 21E"); ii. New Hampshire's Title 50 RSA 485-A: Water Pollution and Waste Disposal or Title 50 RSA 485-C: Groundwater Protection Act; or iii. an EPA permit exclusion letter issued pursuant to 40 CFR 122.3, provided the data was analyzed with test methods that meet the requirements of this permit. Otherwise, a new sample shall be taken and analyzed.

a) Based on the analysis of the sample(s) of the untreated influent, the applicant must check the box of the sub-categories that the potential discharge falls within.

Gasoline Only	VOC Only	Primarily Metals	Urban Fill Sites	Contaminated Sumps	Mixed Contaminants	Aquifer Testing
Fuel Oils (and Other Oils) only	VOC with Other Contaminants	Petroleum with Other Contaminants ✔	Listed Contaminated Sites	Contaminated Dredge Condensates	Hydrostatic Testing of Pipelines/Tanks	Well Development or Rehabilitation

b) Based on the analysis of the untreated influent, the applicant must indicate whether each listed chemical is **believed present** or **believed absent** in the potential discharge. Attach additional sheets as needed.

PARAMETER	**Believe Absent**	**Believe Present**	**# of Samples (1 min-imum)**	**Type of Sample (e.g., grab)**	**Analytical Method Used (method #)**	**Minimum Level (ML) of Test Method**	**Maximum daily value**		**Avg. daily value**	
							concentration (ug/l)	**mass (kg)**	**concentration (ug/l)**	**mass (kg)**
1. Total Suspended Solids		✔	1	Grab	SM 2540 D	10 mg/L	14,000			
2. Total Residual Chlorine	✔		1	Grab	SM 4500-Cl G	0.2 mg/L				
3. Total Petroleum Hydrocarbons		✔	1	Grab	8015B	0.2 mg/L	6,300			
4. Cyanide		✔	1	Grab	9012A	0.01 mg/L	20			
5. Benzene	✔		1	Grab	Method 8260	10 ug/L				
6. Toluene	✔		1	Grab	Method 8260	10 ug/L				
7. Ethylbenzene	✔		1	Grab	Method 8260	10 ug/L				
8. (m,p,o) Xylenes	✔		1	Grab	Method 8260	10 ug/L				
9. Total BTEX[4]	✔		1	Grab	Method 8260	10 ug/L				

[4] BTEX = Sum of Benzene, Toluene, Ethylbenzene, total Xylenes.

PARAMETER	Believe Absent	Believe Present	# of Samples (1 min-imum)	Type of Sample (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Avg. daily value	
							concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
10. Ethylene Dibromide [5] (1,2- Dibromo-methane)	✔		1	Grab	Method 8260	10 ug/L				
11. Methyl-tert-Butyl Ether (MtBE)	✔		1	Grab	Method 8260	10 ug/L				
12. tert-Butyl Alcohol (TBA)	✔		1	Grab	Method 8260	10 ug/L				
13. tert-Amyl Methyl Ether (TAME)	✔		1	Grab	Method 8260	10 ug/L				
14. Naphthalene	✔		1	Grab	Method 8260	10 ug/L				
15. Carbon Tetra-chloride	✔		1	Grab	Method 8260	10 ug/L				
16. 1,4 Dichlorobenzene	✔		1	Grab	Method 8260	10 ug/L				
17. 1,2 Dichlorobenzene	✔		1	Grab	Method 8260	10 ug/L				
18. 1,3 Dichlorobenzene	✔		1	Grab	Method 8260	10 ug/L				
19. 1,1 Dichloroethane	✔		1	Grab	Method 8260	10 ug/L				
20. 1,2 Dichloroethane	✔		1	Grab	Method 8260	10 ug/L				
21. 1,1 Dichloroethylene	✔		1	Grab	Method 8260	10 ug/L				
22. cis-1,2 Dichloro-ethylene	✔		1	Grab	Method 8260	10 ug/L				
23. Dichloromethane (Methylene Chloride)	✔		1	Grab	Method 8260	10 ug/L				
24. Tetrachloroethylene	✔		1	Grab	Method 8260	10 ug/L				

[5] EDB is a groundwater contaminant at fuel spill and pesticide application sites in New England.

PARAMETER	Believe Absent	Believe Present	# of Samples (1 min-imum)	Type of Sample (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Avg. daily Value	
							concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
25. 1,1,1 Trichloroethane	✔		1	Grab	Method 8260	10 ug/L				
26. 1,1,2 Trichloroethane	✔		1	Grab	Method 8260	10 ug/L				
27. Trichloroethylene	✔		1	Grab	Method 8260	10 ug/L				
28. Vinyl Chloride	✔		1	Grab	Method 8260	10 ug/L				
29. Acetone	✔		1	Grab	Method 8260	200 ug/L				
30. 1,4 Dioxane	✔		1	Grab	Method 8260	10,000 ug/L				
31. Total Phenols	✔		1	Grab	Method 8270	5 ug/L				
32. Pentachlorophenol	✔		1	Grab	Method 8270	5 ug/L				
33. Total Phthalates [6] (Phthalate esthers)	✔		1	Grab	Method 8270	5 ug/L				
34. Bis (2-Ethylhexyl) Phthalate [Di-(ethylhexyl) Phthalate]	✔		1	Grab	Method 8270	5 ug/L				
35. Total Group I Polycyclic Aromatic Hydrocarbons (PAH)		✔	1	Grab	Method 8270	0.5 ug/L	2.0			
a. Benzo(a) Anthracene		✔	1	Grab	Method 8270	0.1 ug/L	0.4			
b. Benzo(a) Pyrene		✔	1	Grab	Method 8270	0.1 ug/L	0.4			
c. Benzo(b)Fluoranthene		✔	1	Grab	Method 8270	0.1 ug/L	0.6			
d. Benzo(k) Fluoranthene		✔	1	Grab	Method 8270	0.2 ug/L	0.1			
e. Chrysene		✔	1	Grab	Method 8270	0.1 ug/L	0.3			

[6] The sum of individual phthalate compounds.

PARAMETER	Believe Absent	Believe Present	# of Samples (1 min-imum)	Type of Sample (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Average daily value	
							concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
f. Dibenzo(a,h) anthracene	✔		1	Grab	Method 8270	0.1 ug/L				
g. Indeno(1,2,3-cd) Pyrene		✔	1	Grab	Method 8270	0.1 ug/L	0.2			
36. Total Group II Polycyclic Aromatic Hydrocarbons (PAH)		✔	1	Grab	Method 8270	0.5 ug/L	2.6			
h. Acenaphthene	✔		1	Grab	Method 8270	0.5 ug/L				
i. Acenaphthylene	✔		1	Grab	Method 8270	0.5 ug/L				
j. Anthracene		✔	1	Grab	Method 8270	0.5 ug/L	1.0			
k. Benzo(ghi) Perylene		✔	1	Grab	Method 8270	0.1 ug/L	0.2			
l. Fluoranthene		✔	1	Grab	Method 8270	0.5 ug/L	0.8			
m. Fluorene	✔		1	Grab	Method 8270	0.5 ug/L				
n. Naphthalene-	✔		1	Grab	Method 8270	0.5 ug/L				
o. Phenanthrene	✔		1	Grab	Method 8270	0.5 ug/L				
p. Pyrene		✔	1	Grab	Method 8270	0.5 ug/L	0.6			
37. Total Polychlorinated Biphenyls (PCBs)	✔		1	Grab	Method 8082	0.2 ug/L				
***3*8. Antimony**	✔		1	Grab	Method 6010B	0.06 mg/L				
39. Arsenic	✔		1	Grab	Method 6010B	0.01 mg/L				
40. Cadmium	✔		1	Grab	Method 6010B	0.004 mg/L				
41. Chromium III	✔		1	Grab	Method 6010B	0.01 mg/L				
42. Chromium VI	✔		1	Grab	Method 6010B	0.01 mg/L				

PARAMETER	Believe Absent	Believe Present	# of Samples (1 min-imum)	Type of Sample (e.g., grab)	Analytical Method Used (method #)	Minimum Level (ML) of Test Method	Maximum daily value		Avg. daily value	
							concentration (ug/l)	mass (kg)	concentration (ug/l)	mass (kg)
43. Copper		✔	1	Grab	Method 6010B	0.025 mg/L	41			
44. Lead		✔	1	Grab	Method 6010B	0.005 mg/L	310			
45. Mercury	✔		1	Grab	Method 7470A	0.0002 mg/L				
46. Nickel	✔		1	Grab	Method 6010B	0.04 mg/L				
47. Selenium	✔		1	Grab	Method 6010B	0.05 mg/L				
48. Silver	✔		1	Grab	Method 6010B	0.007 mg/L				
49. Zinc	✔		1	Grab	Method 6010B	0.2 mg/L				
50. Iron		✔	1	Grab	Method 200.7	0.1 mg/L	12,000			
Other (describe):										

c) For discharges where **metals** are believed present, please fill out the following:

Step 1: Do any of the metals in the influent have a **reasonable potential** to exceed the effluent limits in Appendix III (i.e., the limits set at zero to five dilutions)? Y[✔] N[ ]	If yes, which metals? Lead, Copper, Iron
Step 2: For any metals which have **reasonable potential** to exceed the **Appendix III** limits, calculate the **dilution factor (DF)** using the formula in Part I.A.3.c) (step 2) of the NOI instructions or as determined by the State prior to the submission of this NOI. What is the dilution factor for applicable metals? Metals: Lead, Copper, Iron DF: 1.20 DF = (Qd+Qs)/Qd = (0.334 cfs + 0.0696 cfs)/0.334cfs = 1.20 - Dilution Factor	Look up the limit calculated at the corresponding dilution factor in **Appendix IV.** Do any of the metals in the **influent** have the potential to exceed the corresponding **effluent** limits in Appendix IV (i.e., is the influent concentration above the limit set at the calculated dilution factor)? Y[✔] N[ ] If "Yes," list which metals: Lead, Copper, Iron

4. Treatment system information. Please describe the treatment system using separate sheets as necessary, including:

a) A description of the treatment system, including a schematic of the proposed or existing treatment system:						
b) Identify each applicable treatment unit (check all that apply):	Frac. tank ✔	Air stripper	Oil/water separator	Equalization tanks	Bag filter ✔	GAC filter ✔
	Chlorination	Dechlorination	Other (please describe):			
c) Proposed **average** and **maximum flow rates** (gallons per minute) for the discharge and the **design flow rate**(s) (gallons per minute) of the treatment system: Average flow rate of discharge 100 Maximum flow rate of treatment system 150 Design flow rate of treatment system 100						
d) A description of chemical additives being used or planned to be used (attach MSDS sheets): Not Applicable						

5. Receiving surface water(s). Please provide information about the receiving water(s), using separate sheets as necessary:

a) Identify the discharge pathway:	Direct_____	Within facility__	Storm drain____	River/brook____	Wetlands_____	Other (describe):✔
b) Provide a narrative description of the discharge pathway, including the name(s) of the receiving waters: Discharge to drainage swale which discharges to Cook Pond						
c) Attach a detailed map(s) indicating the site location and location of the outfall to the receiving water: 1. For multiple discharges, number the discharges sequentially. 2. For indirect dischargers, indicate the location of the discharge to the indirect conveyance and the discharge to surface water The map should also include the location and distance to the nearest sanitary sewer as well as the locus of nearby sensitive receptors (based on USGS topographical mapping), such as surface waters, drinking water supplies, and wetland areas. See Figures 1 & 2, Attachment A						
d) Provide the state water quality classification of the receiving water Not listed - Class B,						
e) Provide the reported or calculated seven day-ten year low flow (7Q10) of the receiving water 0.0696 cfs Please attach any calculation sheets used to support stream flow and dilution calculations.						
f) Is the receiving water a listed 303(d) water quality impaired or limited water? Yes____ No____✔ If yes, for which pollutant(s)? Is there a TMDL? Yes____ No____✔ If yes, for which pollutant(s)?						

6. Results of Consultation with Federal Services: Please provide the following information according to requirements of Part I.B.4 and Appendices II and VII.

a) Are any listed threatened or endangered species, or designated critical habitat, in proximity to the discharge? Yes___ No_✓_
Has any consultation with the federal services been completed ? Yes___ No_✓_ or is consultation underway? Yes____ No_✓_
What were the results of the consultation with the U.S. Fish and Wildlife Service and/or National Marine Fisheries Service (check one):
a "no jeopardy" opinion? ____or written concurrence____ on a finding that the discharges are not likely to adversely affect any endangered species or critical habitat?

b) Are any historic properties listed or eligible for listing on the National Register of Historic Places located on the facility or site or in proximity to the discharge?
Yes__✓__ No_____ Have any state or tribal historic preservation officer been consulted in this determination (Massachusetts only)? Yes_____ No_✓_____

7. Supplemental information. :

Please provide any supplemental information. Attach any analytical data used to support the application. Attach any certification(s) required by the general permit.

8. Signature Requirements: The Notice of Intent must be signed by the operator in accordance with the signatory requirements of 40 CFR Section 122.22, including the following certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, I certify that the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I certify that I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Facility/Site Name: Bourne Mill Complex

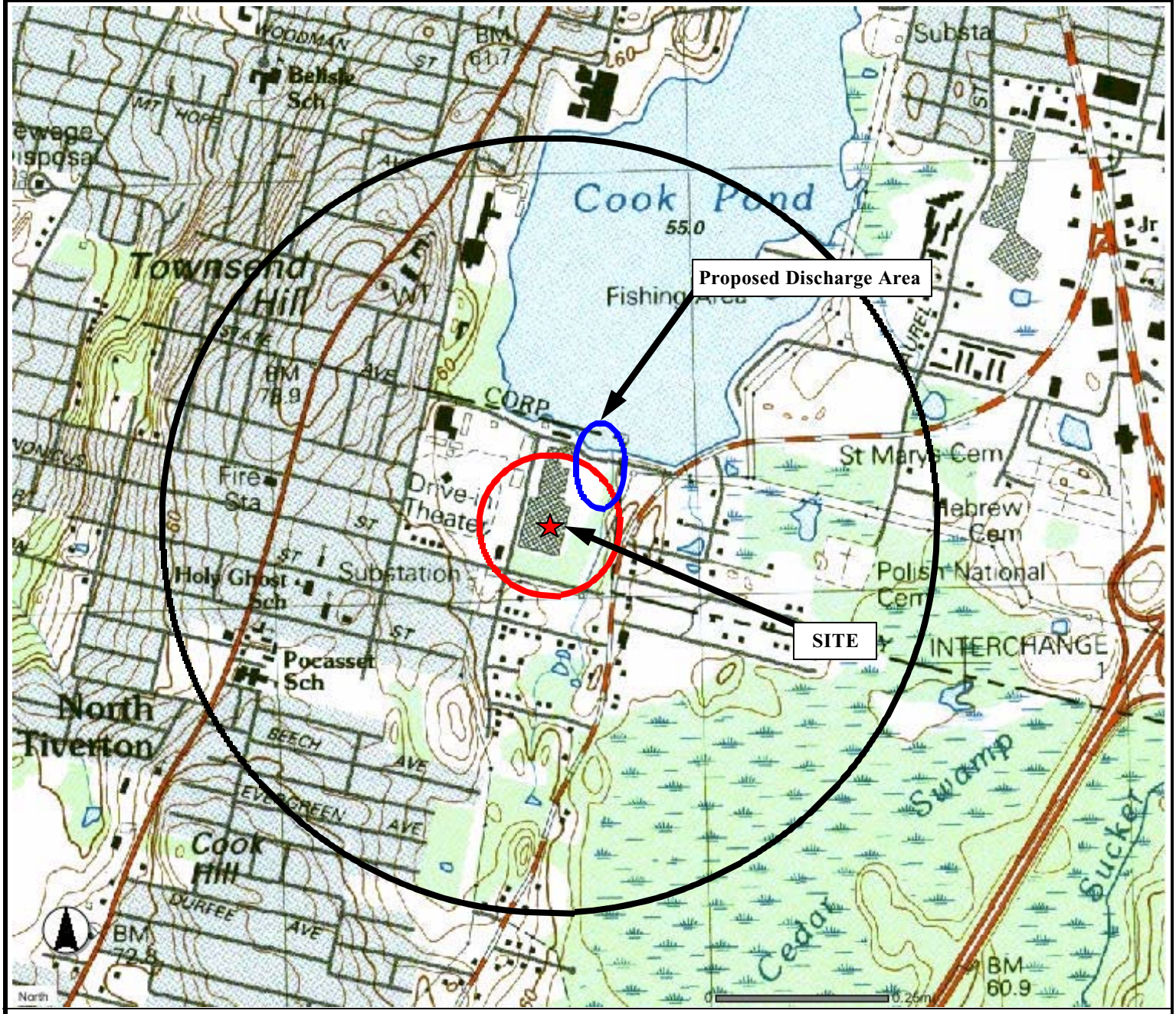
Operator signature: 

Title: Jake Upton on behalf of EAF Bourne Mill, LLC

Date: 08/11/08

Attachment A

Figures



SCALE: 1" ~ 1,000'
RADII: 500 feet and 1/2-mile

PREPARED FOR	PROJECT
EAF Bourne Mills, LLC 536 Granite Street Braintree, Massachusetts	Bourne Mill Complex 844 State Street Tiverton, Rhode Island

Source: MassGIS Online Data Viewer

FIGURE 1
Site Locus Map

LIGHTSHIP ENGINEERING
ENVIRONMENTAL & LAND-USE CONSULTANTS
39 Industrial Park Road? Unit C ? Plymouth, Massachusetts 02360 ? (508) 830-3344 ? Fax: (508) 830-3360

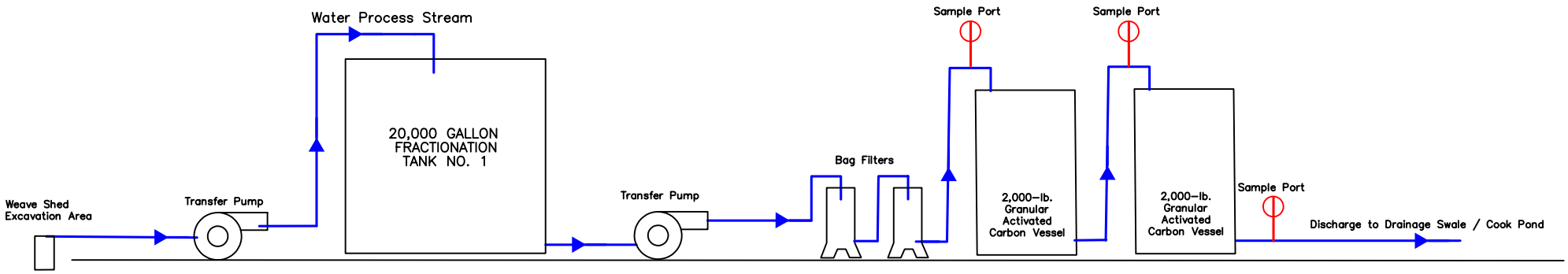
SCALE: 1" ~ 175'

PREPARED FOR	PROJECT
EAF Bourne Mills, LLC 536 Granite Street Braintree, Massachusetts	Bourne Mill Complex 844 State Street Tiverton, Rhode Island

Source: MassGIS Online Data Viewer

FIGURE 2
Site Map

LIGHTSHIP ENGINEERING
ENVIRONMENTAL & LAND-USE CONSULTANTS
39 Industrial Park Road • Unit C • Plymouth, Massachusetts 02360 • (508) 830-3344 • Fax: (508) 830-3360



Design Calculations on Expected Treatment Performance:

Total Petroleum Hydrocarbon ("TPH") concentration of water = 6.3 milligrams per liter ("mg/L")

6.3 mg/L of TPH = 0.0000526 lbs of TPH/gallon

Carbon Consumption Calculations Based on 500,000 gallons of TPH-Impacted Water and 5 % Efficiency of Liquid Phase Activated Carbon

(500,000 gallons of TPH Impacted Water) x (0.0000526 lbs of TPH/gallon) = 26.31 pounds of TPH.
(26.31 pounds of TPH) / 5% Efficiency of Liquid Phase Activated Carbon = **526.1 pounds of activated carbon required**.

Carbon Consumption Calculations Based on 1,000,000 gallons of TPH-Impacted Water and 5 % Efficiency of Liquid Phase Activated Carbon

(1,000,000 gallons of TPH Impacted Water) x (0.0000526 lbs of TPH/gallon) = 52.6 pounds of TPH .
(52.6 pounds of TPH) / 5% Efficiency of Liquid Phase Activated Carbon = **1,052 pounds of activated carbon required**.

SOURCE	REVISIONS			PROJECT	DRAWING TITLE	AutoCAD DRAWING INFORMATION			
Lightship Engineeirng	NO.	DATE	DESCRIPTION	Bourne Mill Complex 844 State Street Tiverton, Rhode Island	Figure 3 Description of Treatment System	DRAWN BY:	BRL	DATE:	07/7/08
	1	7/08	Groundwater Treatment System			REVIEW:	TC	DWG SCALE	NONE
						P:\Projects\600 \600.9 – Tiverton, RI\600.9.2			
				APPLICANT					
LIGHTSHIP REF. NUMBER				EAF Bourne Mills, LLC 536 Granite Street Braintree, Massachusetts 02814					
600.9.2									
SHEET NO: 1 OF 1									

LIGHTSHIP ENGINEERING
ENVIRONMENTAL & LAND-USE CONSULTANTS
39 Industrial Park Road • Unit C • Plymouth, Massachusetts 02360 • TEL:(508) 830-3344 • FAX:(508) 830-3360

Attachment B

Brief History of Remedial Action Creating the Discharge –

***Remedial Action Work Plan*, dated June 11, 2007, approved by the State of Rhode Island Department of Environmental Management ("RIDEM") on June 15, 2007.**

Section 4.9 – Weave Shed Parking Lot Construction, Page 15.

REMEDIAL ACTION WORK PLAN
BOURNE MILL COMPLEX
844 STATE AVENUE / 1 SHOVE STREET
TIVERTON, RHODE ISLAND
RIDEM CASE NO. 2003-017

June 11, 2007

Prepared for:

Bourne Mills, LLC
1570 Westminster Street
Providence, Rhode Island 02909

Prepared by:

ATC Lincoln Associates
333 Washington Highway
Smithfield, Rhode Island

TABLE OF CONTENTS

PLANS & FIGURES

APPENDICES

1.0 INTRODUCTION

ATC Lincoln Associates (ATC Lincoln) has prepared this Remedial Action Work Plan (RAWP) on behalf of Bourne Mills, LLC for the Bourne Mill Complex located at 844 State Avenue / 1 Shove Street in Tiverton, Rhode Island (the "Site"). This RAWP addresses the removal and on-Site treatment of metal, total petroleum hydrocarbon (TPH), and polynuclear aromatic hydrocarbon (PAH) impacted soil, construction of engineered barriers, and groundwater monitoring and/or treatment and fulfills the requirements under Section 9.00 of the Rhode Island Department of Environmental Management (RIDEM) *Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases* (Remediation Regulations) amended February 2004.

The Department's May 10, 2007 Remedial Decision Letter (RDL) states that a Site Investigation Report (SIR) consisting of the following documents has been submitted to the RIDEM:

- RIDEM Emergency Response Report #2003-177 dated March 23, 2003;
- ESS Laboratory soil sampling results dated and received by facsimile on April 2, 2003;
- ESS Laboratory soil sampling results dated April 4, 2003 and received April 17, 2003;
- Pre-Site Investigation Public Notice to Abutters and list of abutters dated May 28, 2003;
- *Emergency Short Term Action Report* dated September 20, 2004;
- *Site Investigation Report – Bourne Mill Complex* dated September 20, 2004;
- Additional Public Notice to abutters dated November 17, 2004;
- *Expanded Site Investigation Report* dated May 6, 2005;
- *Site Investigation Report – Addendum* dated October 13, 2006;
- *Site Investigation Report Checklist* dated October 19, 2006;
- Correspondence to RIDEM from Attorney John Boehnert of Partridge Snow & Hahn dated December 13, 2006;
- *Site Investigation Report Addendum #2* dated January 22, 2007;
- RIDEM Site Investigation Report Comments to Armory Revival Company dated February 15, 2007;

- Request to Verify Delineated Wetland Edge dated February 2007;
- Lincoln Environmental response to RIDEM comments dated February 19 and March 2, 2007; and
- Public Notice to Abutters dated April 10, 2007.

The RDL states that the Department approves the SIR and the conceptually approved remedy for the Site includes excavation and on-Site treatment of metals, TPH, and PAH impacted soils, construction of engineered barriers, establishment of institutional controls, and the implementation of a groundwater quality monitoring program and/or treatment program.

2.0 SITE BACKGROUND INFORMATION

2.1 Property Location and Local Land Use

The Site, a former textile manufacturing facility, is located at 844 State Avenue / 1 Shove Street in Tiverton, Rhode Island. The Site is identified by the Tiverton Tax Assessor's Office as Lot 1 on Plat Map 38. The area is zoned as commercial/industrial. The Site consists of a total of 19.82 acres of land of which five buildings currently occupy. The main and largest structure is a multi story brick building with a gross footage of approximately 260,000 square feet. Two smaller single story brick buildings also occupy the Site: a 4,000 square foot building and a 3,000 square foot building. The main building was constructed in 1881. The two smaller buildings were constructed in 1910. In addition, two other structures occupy the Site. No information was available regarding these structures. The existing buildings and Site features are depicted on **Figure 2.**

Based on a review of the Tiverton USGS quadrangle map of the Site area, the elevation at the Site is approximately 182 feet above mean sea level (MSL) at a latitude of 41:40:12 and a longitude of 71:10:39. The area abuts Cook Pond to the north on the Fall River, Massachusetts State Line. Site topography is relatively flat but appears to slope slightly toward the south/southwest. Asphalt pavement covers the areas around the existing Site buildings. Uncovered soil and natural vegetation cover the remaining portion of the Site. A Site Location Map is attached as **Figure 1.**

Area properties consist of various commercial business and residences. A summary of the surrounding land usage is discussed below:

Table 1
Surrounding Land Usage

Direction	Occupant (Apparent Usage)
North	Cook Pond
East	Bishop Mariano Boulevard and residences
South	Canonicus Street and residences
West	Ponta Delgada Club, commercial properties, Shove Street

2.2 Property Description

Textile manufacturing operations at the mill complex ceased in the 1960's and the building and property were vacated. The mill was heated by #2 heating oil stored above ground in what is believed to be 20,000-gallon steel storage tanks. One of these tanks still exists on the Site. Coal was also used in the operation of the mill, but no specific date of use is known. It is not known what wastes were generated during the textile manufacturing process. The existing buildings and Site features are depicted on **Figure 2**.

In 2003, petroleum impacted soil was discovered at the Site during the repair of a water main break. A total of 131.53 tons of petroleum impacted soil was excavated between October 2 and October 8, 2003 and shipped off-Site for disposal.

Lincoln completed three subsurface investigations at the Site in 2004, 2005, and 2006 to further define the petroleum release identified on the eastern and northeastern portions of the Site and conduct a Site wide investigation. The results of the investigations were detailed in a SIR dated September 20, 2004, an Expanded SIR dated May 6, 2005, and a Site Investigation Report Addendum dated January 22, 2007. Metals (antimony, arsenic, beryllium, and lead), PAHs, and

TPH concentrations in soil were reported above the applicable Rhode Island Department of Environmental Management (RIDEM) Remediation Regulations Direct Exposure Criteria. Lead, naphthalene, and TPH detected in soil also exceeded the Remediation Regulations GA Leachability Criteria (GA-L). Benzo(a)pyrene, lead, and naphthalene were reported in the groundwater exceeding the GA Groundwater Objectives.

The Site will be developed for use as a mixed residential and commercial complex. A Site Plan depicting the proposed Site buildings is included as **Figure 3.**

2.3 Geology

Based on a review of the 1994 USGS Bedrock Geology map of Rhode Island, the Site area is underlain by a pink to gray, coarse-grained granite, comprised predominantly of the minerals: microcline, perthite, plagioclase, quartz, biotite, sphene, zircon, and opaque minerals. Secondary minerals include chlorite and muscovite. The rock is generally massive, but locally it is foliated and lineated. Bedrock out croppings were observed in the vicinity of the Site.

According to the USDA Soil Survey for Rhode Island, soil at the Site is classified as Udorthents-Urban Land Complex and Mansfield mucky silt loam. The Mansfield mucky silt loam exists on the eastern and southern most portions of the site and consists of very poorly drained soil with high water tables. The remaining portion of the site is classified as the Urban Land Complex which consists of soils which are moderately well drained to excessively drained soil which has been disturbed by cutting or filling and areas that are covered by buildings and pavement.

2.4 Groundwater Classification

According to a review of RIDEM's groundwater classification map for the Site area, the Site and surrounding area are located within an area with a "GA" groundwater classification. GA groundwater is defined as groundwater that is suitable for drinking water use without pretreatment. The Site and surrounding area are serviced by municipal water. The nearest drinking water source

area is Stafford Pond which lies approximately 3.5 miles to the southwest. Stafford Pond is the surface water supply reservoir for the town of Tiverton. A copy of the RIDEM Environmental Resource Map is included as **Figure 9**.

2.5 Environmental Receptors

There are no wellhead protection areas on or in the vicinity of the Site. Cook Pond, which abuts the northern portion of the Site, drains southward through several unnamed tributaries into the Pocasset Cedar Swamp, located approximately 1,000 feet from the Site. Cook Pond is designated as a Class B surface water body. Class B surface waters are designated for fish and wildlife habitat and primary and secondary contact recreational activities and are suitable for compatible industrial processes and cooling, hydropower, aquacultural uses, navigation, and irrigation and other agricultural uses.

3.0 REMEDIAL OBJECTIVE

Soil and groundwater remedial objectives can be found in RIDEM's Rules and Regulations for the Investigation and Remediation of Hazardous Material Releases (Remediation Regulations), amended February 2004. The Remedial Action Work Plan for the Site will address the metals, TPH, and PAHs in soil exceeding the RIDEM Method 1 R-DEC and I/C-DEC, SPLP lead, naphthalene and TPH in soil exceeding the RIDEM Method 1 GA-L, and benzo(a)pyrene, lead, and naphthalene in groundwater above the RIDEM Method 1 GA Groundwater Objectives.

3.1 Groundwater Objective

The groundwater objective for the Site will be the RIDEM Remediation Regulations Method 1 GA Groundwater Objectives, as outlined in Table 4 of these Regulations.

3.2 Soil Objective

Soil that is not compliant with the Regulations will be addressed in accordance with Sections 8.02 and 8.09 of the Remediation Regulations. Impacted soil at the Site will be remediated to meet the residential direct exposure criteria and the GA-L. Soil with concentrations of TPH, metals, and PAHs exceeding the GA-L and lead exceeding the I/C-DEC will be excavated and treated/stabilized on-Site for reuse as fill material in the Weave Shed foundation and capped with an engineered barrier. Soil with TPH, metals, and PAH concentrations exceeding the residential direct exposure criteria which are compliant with the GA-L will be capped with an engineered barrier consisting of clean fill material, asphalt pavement, concrete sidewalks, and landscaped areas.

4.0 PROPOSED REMEDIAL ACTION

The Site development plan was incorporated in the remedial plan chosen for this Site. The chosen remedial alternative includes the following:

- Excavation of metals, PAH, and petroleum impacted soil and on-Site treatment of the impacted soil (Area of Concern #1). The treated soils will be reused below the proposed weave shed parking lot that will serve as engineered barrier;
- Excavation and the on-Site treatment and reuse of impacted soil for the construction of the new building foundation east of Building No. 10;
- Removal of the 25,000-gallon aboveground storage tank located on the eastern portion of the Site;
- Excavation and possible on-Site treatment of on-Site soil for construction of the access road to Bishop Mariano Boulevard. The treated soil and/or impacted soil will be reused below an engineered barrier;
- Excavation of metals, PAH, and petroleum impacted soil and on-Site treatment of the impacted soil (Area of Concern #2). The treated soils will be reused below the proposed Site weave shed parking lot that will serve as engineered barriers;
- Construction of on-Site engineered barrier for access road to State Street;

- Excavation and removal of the 3,000-gallon underground storage tank located on the western portion of the Site;
- Construction of engineered barriers south the weave shed (Area of Concern #3);
- Removal and treatment of water contained within the weave shed located on the southern portion of the Site and construction of engineered barriers;
- Demolition of buildings No. 4, 9, 12, 13, 17 and 18;
- Implementation of a groundwater monitoring program to address the GA groundwater non-compliance; and
- Filing of an Environmental Land Usage Restriction (ELUR) and Soil Management Plan (SMP) requiring yearly inspection and maintenance of the engineered barriers.

The Areas of Concern are depicted on **Figure 2A.** The proposed remedies are described in the **Sections 4.1 through 4.12.**

4.1 Impacted Soil Excavation, On-Site Treatment, and Capping – Area of Concern #1

Soil that is not compliant with the Remediation Regulations Method 1 lead I/C-DEC, and the metals, PAH, TPH, and naphthalene GA-L will be excavated and treated on-Site with a soil stabilization process. The proposed soil excavation areas are depicted on the Proposed Remedial Plan included as **Figure 4.** Soil will excavated east of Buildings 2, 6, 7, 10, 15, 16 and the former Weave Shed area east to the 50 foot wetlands perimeter setback line. A small portion of the area to be excavated will extend within the 50 foot wetlands setback area.

Soil will also be excavated from the southwest corner of Building 24 where sample SS-23 was collected. The SS-23 arsenic concentration was 120 mg/kg.

ATC Lincoln anticipates that soil will be excavated to a maximum depth of two feet below grade. Soil excavation will not proceed below the groundwater table except when soil concentrations exceed the GA-L and groundwater exceeds the GA Groundwater Objectives for the same

contaminant at that location. Soil excavations of greater than 2 feet below grade are anticipated to the north and east of the proposed building to be constructed east of Building #10.

Soil samples will be field screened for VOCs using a photoionization detector. One confirmatory soil sample will be collected every 50 linear feet from the impacted soil excavation's sidewalls and bottom area. The confirmatory soil samples will be submitted for laboratory analysis for TPH, SVOCs, the Priority Pollutant 13 metals, and TCLP/SPLP lead. If VOCs are detected at a concentration of 10 ppmv in the soil samples field screened, the soil samples will also be submitted for laboratory analysis for VOCs.

The treated soils will be tested to confirm compliance with the GA-L criteria. The treated soil will be analyzed at a frequency of 1 sample every 500 cubic yards. The soil will be submitted for laboratory analysis for PAHs, TCLP/SPLP lead and TPH. The GA-L compliant treated soils will then be used as backfill material in the weave shed foundation and capped with an engineered barrier consisting of an asphalt paved parking lot. Treated soils that are not compliant with the GA-L will be retreated and tested to confirm compliance with the GA-L.

Asphalt, concrete surfaces, and paver surfaces constructed for use as an engineered barrier will be completed in accordance with the following procedures. Asphalt roadways that will be used as a cap will be constructed with a minimum of 6-inches of clean fill underlying a four-inch thick asphalt pavement. Concrete sidewalks acting as a cap will be constructed with six-inches of clean fill underlying a four-inch thick concrete layer. Concrete paver capped areas will be constructed with either eight-inches of clean fill underlying the minimum 2-inch thick concrete pavers or six-inches of clean fill covered with a minimum four-inch thick concrete pavers. Asphalt and concrete surfacing will be completed in accordance with the following procedures.

Two capping options will be used in the landscaped areas and the future exercise trail. The first capping option would require a geotextile barrier with a minimum puncture strength of 120 pounds and a burst strength of 400 psi. and one-foot of clean fill material. Two feet of clean fill material placed over existing soil or the bottom of the excavated areas is the second capping option.

The clean fill material will be analyzed at a frequency of one arsenic sample every 500 cubic yards with one quarter of the samples to be submitted for laboratory analyzed for VOCs, TPH, SVOCs, and the Priority Pollutant 13 metals to determine its compliance with the Remediation Regulations Method 1 R-DEC and GA-L prior to its use on-Site. The clean fill and loam laboratory analytical data and information on the source of the material will be forwarded to RIDEM for review. RIDEM will verbally approve the clean fill material for use prior to its being transported to the Site.

Fencing will be installed along the 50 foot wetlands setback perimeter to deter access to any non-compliant areas that were not excavated or capped under this RAWP. Additional fencing will be installed to the east of the future exercise trail to deter access to areas which are non-compliant or have not been capped with an engineered barrier. Reconfiguring of the fencing along the 50 foot wetlands setback perimeter may be necessary following the construction of the future exercise trail primarily if the exercise trail is constructed along the 50 foot wetlands setback and abutting those areas which have been capped in accordance with this plan.

4.2 New Building Foundation Excavation

A new building will be constructed east of Building Number 10. Soil excavated for the building foundation will be treated on-Site and reused on-Site as proposed in **Section 4.1.** Confirmatory soil samples will be collected from the foundation excavation sidewalls and bottom area and field screened for VOCs using a photoionization detector. One confirmatory soil sample will be collected every 50 linear feet from the impacted soil excavation's sidewalls and bottom area. The confirmatory soil samples will be submitted for laboratory analysis for TPH, SVOCs, the Priority Pollutant 13 metals, and TCLP/SPLP lead. If VOCs are detected at a concentration of 10 ppmv in the soil samples field screened, the soil samples will also be submitted for laboratory analysis for VOCs.

4.3 Aboveground Storage Tank Removal

One 25,000-gallon fuel oil aboveground storage tank remains to the east of the Weave Shed's northeast corner just north of SS-19/MW-13. Number 6 fuel oil utilized to power the boilers was

stored in this tank. The tank, along with associated piping from the tank to the former boiler room will be closed. RIDEM's Office of Compliance and Inspection will be contacted prior to this closure. The tank will be cleaned and transported for off-Site disposal. Piping removed as part of the closure will be transported for off-Site disposal. Soil excavated during the piping closure will be treated and reused on-Site as proposed in **Section 4.1**. Confirmatory soil samples will be collected from the piping excavation sidewalls and bottom area and submitted for laboratory analysis for TPH. This area will be capped in accordance with the capping methods proposed in **Section 8.3**.

4.4 Proposed Access Road Construction to Bishop Mariano Boulevard

A new access road will be constructed from Bishop Mariano Boulevard in Fall River, Massachusetts to the Site's northeast corner. Soil excavated from the eastern boundary of the Site west to the access road's terminus east of Buildings 6 and 7 will be field screened for VOCs using a photoionization detector. The excavated soil will be stockpiled on and covered with six-mil polyethylene. Soil samples from the stockpile will be collected at a frequency of one sample for every 500 cubic yards and will be submitted for laboratory analysis of TPH, PAHs, metals (antimony, arsenic, beryllium, and lead), and TCLP/SPLP lead to determine its compliance with the Remediation Regulations Method 1 R-DEC and GA-L. If field screening data indicates VOC concentrations of 10 ppmv or greater, soil samples will also be submitted for laboratory analysis for VOCs.

RIDEM will verbally approve the on-Site reuse of the excavated soil stockpile prior to its on-Site reuse. If the excavated soil is not suitable for on-Site reuse without treatment, the soil will be treated on-Site and capped with an engineered barrier consisting of six inches of clean fill material and four inches of asphalt pavement or concrete. Impacted soil not requiring treatment will also be capped with an engineered barrier consisting of six inches of clean fill material and four inches of asphalt pavement or concrete.

4.5 Impacted Soil Excavation, On-Site Treatment, and Capping – Area of Concern #2

Soil that is not compliant with the Remediation Regulations Method 1 lead I/C-DEC, and the metals, PAH, TPH, and naphthalene GA-L will be excavated and treated on-Site with an asphalt batching process. The proposed soil excavation areas are shown on the plan included as **Figure 4.** Soil will be excavated from the proposed asphalt driveway east of the south side of Building 22 and the proposed asphalt paved parking area south of Building 22. Soil excavation will be confined to the limits of disturbance required for the driveway and asphalt paved parking area construction.

Soil will be excavated to a maximum depth of two feet below grade. Soil excavation will not proceed below the groundwater table. Depth to groundwater is relatively shallow over a majority of the Site. The proposed two foot excavation depth will likely extend to the groundwater table in most of the excavated areas.

Confirmatory soil samples from the limits of the excavation will be field screened using a photoionization detector. One confirmatory soil sample will be collected every 50 linear feet from the impacted soil excavation's sidewalls and bottom area. The confirmatory soil samples will be submitted for laboratory analysis for TPH, SVOCs, the Priority Pollutant 13 metals, and TCLP/SPLP lead. If VOCs are detected at a concentration of 10 ppmv or greater in the soil samples field screened, the soil samples will also be submitted for laboratory analysis for VOCs.

The treated soils will be tested to confirm compliance with the GA-L criteria. The GA-L compliant treated soils will then be used as backfill material in the weave shed and capped with an engineered barrier consisting of an asphalt paved parking lot. Treated soils that are not compliant with the GA-L will be retreated and tested to confirm compliance with the GA-L. Treated soil confirmatory sampling will be completed at a frequency of one sample for every 500 cubic yards of treated soil and submitted for laboratory analysis for PAHs, TCLP/SPLP lead and TPH.

The area west of Buildings 1 and 3, north of Building 22, and south of Building 22 will be developed as a combination of asphalt paved driveways, concrete walkways, and landscaped areas. Asphalt, concrete surfacing, and concrete paver surfacing will be completed in accordance with the following procedures. Asphalt roadways that will be used as a cap will be constructed with a minimum of 6-inches of clean fill underlying a four-inch thick asphalt pavement. Concrete sidewalks acting as a cap will be constructed with six-inches of clean fill underlying a four-inch thick concrete layer. Concrete paver capped areas will be constructed with either eight-inches of clean fill underlying the minimum 2-inch thick concrete pavers or six-inches of clean fill covered with a minimum four-inch thick concrete pavers.

Two capping options will be used in the landscaped areas or the future exercise trail. The first capping option would require a geotextile barrier with a minimum puncture strength of 120 pounds and a burst strength of 400 psi. and one-foot of clean fill material. Two feet of clean fill material placed over existing soil or the bottom of the excavated areas is the second capping option.

The clean fill material will be analyzed at a frequency of one arsenic sample every 500 cubic yards with one quarter of the samples to be submitted for laboratory analyzed for VOCs, TPH, SVOCs, and the Priority Pollutant 13 metals to determine its compliance with the Remediation Regulations Method 1 R-DEC and GA-L prior to its use on-Site. The clean fill and loam laboratory analytical data and information on the source of the material will be forwarded to RIDEM for review. RIDEM will verbally approve the clean fill material for use prior to its being transported to the Site.

Fencing will be installed along the 50 foot wetlands setback perimeter to deter access to any non-compliant areas that were not excavated or capped under this RAWP. Additional fencing will be installed to the east of the future exercise trail to deter access to areas which are non-compliant or have not been capped with an engineered barrier. Reconfiguring of the fencing along the 50 foot wetlands setback perimeter may be necessary following the construction of the future exercise trail primarily if the exercise trail is constructed along the 50 foot wetlands setback and abutting those areas which have been capped in accordance with this plan. The ELUR filed for this property will include a provision for the maintenance of the fencing.

4.6 State Avenue, Tiverton Access Road Construction

The Site can currently be accessed from State Avenue in Tiverton, Rhode Island. The existing asphalt paved access road will be repaved as part of the development process. The existing on-Site asphalt pavement will be removed and a new minimum four-inch thick asphalt paved surface installed over the existing subbase. Any areas where the subbase must be removed will require backfilling with six-inches of clean fill and surfacing a minimum of four-inches of asphalt pavement will be used for the access road repaving. Asphalt pavement removed from the existing access road will be disposed off-Site. Subbase material removed from the existing access road will be stockpiled on and covered with six-mil polyethylene. The stockpiled soil will also be field screened using a photoionization detector. Soil samples collected from the subbase soil stockpile will be collected at a frequency of one sample for every 500 cubic yards and submitted for laboratory analysis of TPH, PAHs, metals (antimony, arsenic, beryllium, and lead), and TCLP/SPLP lead to determine its compliance with the Remediation Regulations Method 1 R-DEC and GA-L. If VOCs are detected at a concentration of 10 ppmv or greater in the soil samples field screened, the soil samples will also be submitted for laboratory analysis for VOCs.

RIDEM will verbally approve the on-Site reuse of the subbase soil stockpile prior to its on-Site reuse. If the subbase soil stockpile is not suitable for on-Site reuse it will be treated on-Site and reused in accordance with the **Section 4.1** provisions.

Remedial Area #2 includes the proposed pavement and concrete areas on the northwestern and northeastern portions of the Site and the area of former building #4. Soils in these areas exceed the R-DEC and can be capped. To maintain the appropriate grade at these locations, approximately 6-inches of soil will be removed from Remedial Area #2 and placed in the Weave Shed foundation. Six inches of clean fill or gravel will be placed in Remedial Area #2 and capped with 4-inches of concrete and/or asphalt pavement.

As part of this remedial option, the wetland areas east of the proposed excavation, south of the Weave Shed and along the western most portion of the Site will not be capped with an engineered barrier.

4.7 Underground Storage Tank Closure

One 3,000-gallon underground storage tank is located to the west of Building # 1's northwest corner. This underground storage tank will be closed in accordance with the RIDEM's Underground Storage Tank Regulations. Following the removal of the underground storage tank, confirmatory soil samples will be collected from the sidewalls and bottom of the excavation and submitted for analysis for TPH. Soil excavated during the tank/piping closure will be treated and reused on-Site as proposed in **Section 4.1.** The underground storage tank location is in a proposed asphalt parking lot. The underground storage tank excavation will be capped in accordance with the asphalt paved area capping requirements. Copies of reports submitted to RIDEM's Underground Storage Tank Program will also be forwarded to RIDEM's Site Remediation Program.

4.8 Engineered Barrier Construction - Area of Concern #3

Area of Concern #3 is located to the south of the Weave Shed. This area is primarily a wetlands area. A future exercise trail may run immediately south of the Weave Shed's southern exterior wall. Two capping options will be used to construct the future exercise trail in this area. The first capping option would require a geotextile barrier with a minimum puncture strength of 120 pounds and a burst strength of 400 psi. and one-foot of clean fill material. Two feet of clean fill material placed over existing soil or the bottom of the excavated areas is the second capping option.

The clean fill material will be analyzed at a frequency of one arsenic sample every 500 cubic yards with one quarter of the samples to be submitted for laboratory analyzed for VOCs, TPH, SVOCs, and the Priority Pollutant 13 metals to determine its compliance with the Remediation Regulations Method 1 R-DEC and GA-L prior to its use on-Site. RIDEM will verbally approve the clean fill material for use prior to its being transported to the Site.

4.9 Weave Shed Parking Lot Construction

The former Weave Shed footprint will be redeveloped as the facility's main parking area. Several actions will be required to accomplish the parking lot construction in the Weave Shed footprint.

Approximately one million gallons of water may exist in the former weave shed footprint. Initial testing of the water in 2005 revealed the presence of elevated TPH concentrations. Dewatering of the Weave Shed footprint will likely be required during the parking lot construction process. The 2005 TPH concentrations would require treatment prior to discharge to the drainage swale on the eastern portion of the Site. A Rhode Island Discharge Elimination System (RIPDES) permit will be obtained from the RIDEM-OWR. Discharge permit compliance monitoring will be completed as required in the permit.

Solid waste primarily consisting of building rubble is present in the Weave Shed footprint. This solid waste will be disposed at a licensed solid waste disposal facility.

Portions of the Weave Shed's granite exterior walls remain standing and the Weave Shed's foundation remains in place. Granite blocks from the exterior walls and foundation will be reused on-Site or sold for reuse as building materials. Any remaining granite, concrete, or brick building materials will be crushed on-Site for potential reuse as fill material.

The Weave Shed's former basement floor elevation may be below the groundwater table. Soil excavated form the Site which have been treated on-Site for reuse will be placed in the Weave Shed footprint. Treated soils and clean fill material will be used to bring the Weave Shed footprint grade up to asphalt base elevation. A minimum of four-inches of asphalt pavement over a minimum of 6-inches of clean fill will be used to bring the Weave Shed parking lot grade up to finish grade elevation.

Landscaped islands are shown in the parking lot. Clean fill will be used to bring this area up to finish grade. The landscape island will be constructed with two feet of clean fill material serving as the cap.

4.10 Building Demolition

Buildings 4, 9, 12, 13, 17, and 18 will be demolished as part of the Site's redevelopment. Solid waste generated during the building demolition will be disposed at a licensed solid waste disposal facility. Granite blocks from the exterior walls and foundation will be reused on-Site or sold for reuse as building materials. Any remaining granite, concrete, or brick building materials will be crushed on-Site for potential reuse as fill material.

The Building 4 area will be developed as an asphalt parking area with landscaped islands. The area will graded with clean fill material. A minimum of six-inches of clean fill and four-inches of asphalt pavement will be used to construct the asphalt parking lot. Landscaped islands will be constructed by using the following two capping options. The first capping option would require a geotextile barrier with a minimum puncture strength of 120 pounds and a burst strength of 400 psi and one-foot of clean fill material. Two feet of clean fill material placed over existing soil or the bottom of the excavated areas is the second capping option.

A courtyard that consists of landscaped areas and a walkway will be constructed in the area where Buildings 9, 12, and 13 are demolished. The courtyard's walkway will be constructed in accordance with the concrete and/or concrete paver capping option detailed in **Section 8.3**. Landscaped areas will be constructed by using either a geotextile barrier with a minimum puncture strength of 120 pounds and a burst strength of 400 psi. and one-foot of clean fill material or two feet of clean fill material placed over existing soil or the bottom of the excavated areas.

Confirmatory soil samples will be collected beneath the foundations of the demolished buildings and field screened for VOCs using a photoionization detector. The confirmatory soil samples will be submitted for laboratory analysis for TPH, SVOCs, the Priority Pollutant 13 metals, and TCLP/SPLP

lead. If VOCs are detected at a concentration of 10 ppmv or greater in the soil samples field screened, the soil samples will also be submitted for laboratory analysis for VOCs.

4.11 Groundwater Monitoring Program

Groundwater monitoring will be necessary as part of this remedial option. GA non-compliant lead concentrations were identified east of the Weave Shed (MW-18), west of Building 3 (MW-16), and at the southeast corner of Building 22 (MW-17). Naphthalene concentrations above its GA groundwater objective were identified east of the Weave Shed (MW-13). Benzo[a]pyrene non-compliance with its GA groundwater objective was identified east of the Weave Shed's northeast corner (MW-6 and MW-14) and east of Building 10 (MW-2). These seven monitor wells will be reinstalled at the completion of the Site development. Groundwater flow is to the northeast. Two additional monitor wells will be installed on the east side of the property northeast of MW-2 and MW-13. One additional well will be installed northeast of MW-16 in a landscape island in the proposed asphalt paved parking area adjacent to Building 1's northwest corner. These three wells will serve as downgradient compliance monitoring locations.

The initial groundwater sampling data will be evaluated to determine if groundwater treatment is necessary at this Site. A letter will be prepared and submitted to RIDEM discussing the findings of the initial groundwater sampling event and recommendations. The primary goal for this Site will be to achieve compliance with the GA Groundwater Objectives.

4.12 Environmental Land Usage Restriction (ELUR)

An ELUR will be filed for this Site. An annual inspection and maintenance program for the landscaped areas would be required in the ELUR. The soil and asphalt cap areas and the fencing would be inspected to annually to confirm that the cap is intact. An annual inspection report would be forwarded to the RIDEM Office of Waste Management. A Soil Management Plan will be appended to the ELUR. The ELUR would be filed with the Town of Tiverton Land Evidence Records in accordance with Section 8.09 of the RIDEM Remediation Regulations.

5.0 POINTS OF COMPLIANCE

Confirmatory soil sampling and groundwater monitoring will be performed to determine compliance with the Remediation Regulations. Soil in excess of the Method I lead I/C-DEC and the metals, PAH, TPH and naphthalene GA Leachability Criteria will be excavated and treated/stabilized on-Site. The treated soils will be analyzed to determine compliance with the GA-L. Treated soil compliant with the GA-L will be reused on-Site as fill material in the weave shed and capped with an engineered barrier consisting of an asphalt paved parking area.

Soils exceeding the R-DEC or I/C-DEC will be encapsulated using an engineered barrier to limit direct exposure.

Groundwater monitoring will be performed quarterly and sample results compared to the GA Groundwater Objectives. Groundwater monitoring will cease upon achieving compliance with the GA Groundwater Objectives over three consecutive sampling events.

5.1 Groundwater

GA non-compliant lead concentrations were identified east of the Weave Shed (MW-18), west of Building 3 (MW-16), and at the southeast corner of Building 22 (MW-17). Naphthalene concentrations above its GA groundwater objective were identified east of the Weave Shed (MW-13). Benzo[a]pyrene non-compliance with its GA groundwater objective was identified east of the Weave Shed's northeast corner (MW-6 and MW-14) and east of Building 10 (MW-2). These seven monitor wells will be reinstalled at the completion of the Site development.

Groundwater flow is to the northeast. Two additional monitor wells will be installed on the east side of the property northeast of MW-2 and MW-13. One additional well will be installed northeast of MW-16 in a landscape island in the proposed asphalt paved parking area adjacent to Building 1's northwest corner. These three wells will serve as downgradient compliance monitoring locations. A monitoring well typical is presented in **Appendix 1**. The proposed locations of the monitoring wells are depicted on **Figure 4A**.

The groundwater samples from the newly installed wells will be collected using low-flow sampling. The groundwater samples from these wells will be submitted for laboratory analysis by a Rhode Island certified laboratory for VOCs via EPA method 8260, total metals and PAHs via EPA method 8270.

The initial groundwater sampling data will be evaluated to determine if groundwater treatment is necessary at this Site. A letter will be prepared and submitted to RIDEM discussing the findings of the initial groundwater sampling event and recommendations. The primary goal for this Site will be to achieve compliance with the GA Groundwater Objectives.

A petition to RIDEM to reduce the sampling frequency of the Site monitoring may be made based on one year of quarterly monitoring and/or the constituents of concern are decreasing or compliant with the RIDEM GA Groundwater Objectives. Groundwater sampling and analysis will cease upon attaining compliance with the GA Groundwater Objectives over three consecutive sampling events. The initial quarterly groundwater monitoring report will be submitted with the RAWP Closure Report. Quarterly groundwater monitoring reports will be submitted to the RIDEM within 30 days of the sampling event. All pertinent monitor wells destroyed during Site development activities will be replaced and sampled in accordance with the sampling schedule.

5.2 Soil

Confirmatory soil sampling will be performed following the excavation of metals, TPH, and PAH impacted soil from Areas of Concern #1 and #2 and the new building foundation east of Building #10. Soil samples will be field screened for VOCs using photoionization detector. One confirmatory soil sample will collected every 50 linear feet from the sidewalls and bottom of the excavations unless field observations dictate that additional sample is necessary. The confirmatory soil samples will be submitted for analysis for TPH, SVOCs, the Priority Pollutant 13 Metals, and TCLP/SPLP lead. If VOCs are detected at a concentration of greater than 10 ppmv, the confirmatory soil samples will also be analyzed for VOCs. All confirmatory soil data will be compared to the Method 1 R-DEC, I/C-DEC and GA Leachability Criteria and used as the excavation area specific remedial goal.

Metals, TPH, and PAH impacted soil treated on-Site will be sampled for TPH, PAHs, and TCLP/SPLP lead prior to reuse to determine compliance with the GA-L. The soil will be retreated until compliance with the GA-L is achieved and reused beneath the engineered barriers.

If on-Site soil is excavated as part of the construction of the State Avenue access Road and/or the access road to Bishop Mariano Boulevard, the on-Site soil will be stockpiled and analyzed for TPH, PAHs, metals (antimony, arsenic, beryllium, and lead), and TCLP/SPLP Lead. The data will be compared to the Method 1 R-DEC, I/C-DEC and GA Leachability Criteria to determine if on-site treatment of the soil will be necessary. If the excavated soil is not suitable for on-Site reuse without treatment, the soil will be treated on-Site and capped with an engineered barrier consisting of six inches of clean fill material and four inches of asphalt pavement or concrete. Impacted soil not requiring treatment will also be capped with an engineered barrier consisting of six inches of clean fill material and four inches of asphalt pavement or concrete.

Following the demolition of Buildings #9, 12, and 13 for the construction of the new courtyard, a bottom sample will be collected and submitted for analysis for VOCs, TPH, SVOCs, the Priority Pollutant 13 Metals, and TCLP/SPLP metals. The data will be compared to the Method 1 R-DEC, I/C-DEC and GA Leachability Criteria.

Following the demolition of Buildings #4, 17, and 18, a soil sample will be collected from the foot print of these buildings and submitted for analysis for TPH, SVOCs, the Priority Pollutant 13 Metals, and TCLP/SPLP lead. Soil samples will be field screened using a photoionization detector. If VOCs are detected in the soil at a concentration of 10 ppmv or greater, the soil samples will also be submitted for laboratory analysis for VOCs via EPA method 8260. The data will be compared to the Method 1 R-DEC, I/C-DEC and GA Leachability Criteria.

Confirmatory soil samples will be collected from the sidewalls and bottom of the excavation following the removal of the 3,000-gallon underground storage tank and the excavation to remove piping associated with the 25,000-gallon above ground storage tank. The soil samples will be submitted for analysis for TPH via the EPA method 8100M. The TPH soil data will be compared to the R-DEC, I/C-DEC, and GA-L.

An engineered cap constructed in accordance with the RIDEM requirements will be used at the Site to prevent direct exposure to soils that exceed the RIDEM R-DEC and I/C-DEC. An impermeable cap consisting of asphalt or concrete will be utilized when residual concentrations exceed the GA Leachability Criteria. In addition, the ELUR will be recorded and require yearly monitoring and maintenance of the engineered caps.

5.2.1 Fill Material

All clean fill material and loam utilized on Site will be sampled at a frequency of one sample per 500 yards of fill prior to delivery and submitted to a Rhode Island certified laboratory for arsenic analysis. One quarter of the total number of clean fill material and loam compliance samples will be

submitted for laboratory analysis for the Priority Pollutant 13 Metals, SVOCs by EPA Method 8270, TPH by EPA Method 8100M, and VOCs by EPA Method 8260. The fill material soil samples will be collected as grab samples. No fill materials will be accepted that contain concentrations of Priority Pollutant 13 metals, SVOCs, TPH or VOCs exceeding Rhode Island Method 1 Residential Direct Exposure Criteria.

The clean fill and loam laboratory analytical data and information on the source of the material will be provided to RIDEM via facsimile, email or by hand delivery prior to placement. Verbal approval to use the fill material and loam will be granted by RIDEM prior to use. Clean fill will be stockpiled on and covered with polyethylene sheeting prior to use.

5.3 Reporting

All analytical data obtained during the Site assessment activities will be forwarded to RIDEM for evaluation. Site work in the areas of the assessment activities will not be permitted until authorized by RIDEM.

The clean fill or loam laboratory analytical data and information on the source of the material will be provided to RIDEM via facsimile, email or by hand delivery prior to placement. Verbal approval to use the fill material and loam will be granted by RIDEM prior to use.

Informal, weekly updates regarding the status of the work conducted at the Site and the Construction Operation Logs will be submitted to RIDEM via email and will include supporting photographs, if applicable. The clean fill material or loam laboratory analytical data will be faxed to the RIDEM prior to its use. Verbal approval to use the clean fill material or loam must be received from the Department prior to its use on-Site.

A formal Closure Report will be prepared and submitted to RIDEM at the completion of the remedial activities at this Site. The report will include a summary of the soil removal activities, analytical data, disposal records and manifests, Construction Operation Logs, and details regarding

the construction of the engineered caps. In addition, a statement from the facility providing the fill material and loam of the materials origin and suitability will be included in the Closure Report. Inaccessible soil in exceedence of the GA Leachability Criteria will be capped with an impermeable area, as noted in this RAWP, and documented in the Closure Report. The Closure Report will be certified by a State of Rhode Island Registered Professional Engineer.

Quarterly Groundwater Monitoring reports will be prepared and submitted to RIDEM for review. The initial quarterly groundwater monitoring report will be submitted with the RAWP Closure Report. The remaining quarterly groundwater monitoring reports will be submitted to the RIDEM within 30 days of the sampling event. Each quarterly report will include a summary table of groundwater analytical results with the appropriate RIDEM Method 1 GA Groundwater Objectives listed for comparison, a Site plan showing the sample locations, and a groundwater contour map.

5.4 Data Evaluation

Confirmatory soil sample laboratory analytical data from the soil excavations at the site will be compared to their respective remedial objectives. Groundwater analytical data will be used to evaluate the concentrations of lead, benzo(a)pyrene, and naphthalene detected in the groundwater at the Site. Remedial activities will be evaluated based on the groundwater data.

6.0 SCHEDULE

The proposed schedule for this RAWP is presented below in **Table 2:**

Table 2

Project Schedule and Timeline

Activity	Date (MM/DD/YY)		Deliverable	Deliverable Due Date
	Anticipated Date of Initiation	Anticipated Date of Completion		
Removal of underground and aboveground storage tanks	08/01/07	09/01/07	UST Closure Report	09/01/07
Building demolition	09/01/07	10/01/07	Status Reports	weekly
Soil excavation & on-Site treatment	09/01/07	12/01/07	Status Report	weekly
Weave shed water treatment	09/01/07	10/01/07	Status Reports	weekly
Site development and capping	10/01/07	02/01/09	Status Reports	weekly
Groundwater Monitoring Program	12/01/09	12/01/2010	Quarterly Monitoring Reports	03/01/2010 06/01/2010 09/01/2010 12/01/2010
RAWP Closure Report	02/01/09	12/01/2010	Closure Report	12/01/2010
ELUR & SMP	12/01/2010	01/01/2011	ELUR/SMP	01/01/2011

7.0 CONTRACTORS AND/OR CONSULTANTS

The construction contractor will be responsible for coordinating and performing the Site development activities to be completed in accordance with the RAWP. Bourne Mills LLC will hire a contractor to complete the soil excavation and Site developments activities at this Site. ATC Lincoln, the environmental consultant, will supervise the excavation of impacted soil, installation of soil borings and monitor wells, and construction of the engineered barriers. The environmental consultant will also be responsible for the collection of confirmatory soil samples, field screening of soil, inspection and maintenance of the engineered barriers, the collection of quarterly groundwater samples for laboratory analysis, and preparation of the quarterly groundwater monitoring reports and the closure report.

Impacted soil generated at the Site has been outlined in this RAWP. Petroleum impacted soil will be treated on-Site via an on-Site soil treatment/stabilization operated by United Retek.

Site contractor and consultants information is presented **Table 3** below:

Table 3

Contractors & Consultants

Contractor	Name / Address	Contact / Phone
General Contractor - TBD	TBD	TBD
Environmental Consultant	ATC Lincoln Associates 333 Washington Hwy Smithfield, RI 02917	Beth Correira / 401-232-3353
On-Site Soil Treatment/Stabilization Contractor	United Retek 21 Trotter Drive Medway, MA 02053	Mark Noack/ 508-478-5500
Site Design & Engineering	Pare Corporation 8 Blackstone Valley Place Lincoln, RI 02865	Scott Lindgren, PE / 401-334-4100

8.0 DESIGN STANDARDS AND TECHNICAL SPECIFICATIONS

8.1 Soil Excavation, Treatment, and Reuse

Areas of soil at the site requiring excavation and on-site treatment/stabilization are depicted on **Figure 4** and discussed in detail in **Sections 4.1, 4.2, 4.4, 4.4, 4.5,** and **4.10** of this RAWP. The lead I/C-DEC and TPH, PAH, naphthalene, and metals GA-L non-compliant soil will be excavated and stockpiled on and covered with six-mil polyethylene sheeting prior to treatment using an on-site soil stabilization process. The on-site soil stabilization process utilizes proprietary fixatives of magnesium oxide and calcium phosphate as well as Portland cement to render soil contaminants insoluble compounds and preventing leaching to the groundwater. Technical specifications and profile are presented in **Appendix 7** of this report.

Following curing of the stockpiles after treatment, the treated soil will be sampled at a frequency of one sample for every 500 cubic yards of treated soil and submitted for laboratory analysis for TPH, PAHs, and TCLP/SPLP lead to determine compliance with the GA-L. Treated soil not meeting the GA-L will be retreated. The treated compliant with the GA-L will be utilized as backfill in the weave shed foundation and capped with an asphalt paved parking area. Details regarding the capping requirements are discussed in **Section 8.3.**

8.2 Solid Waste Disposal/Reuse

Solid waste primarily consisting of building rubble is present in the Weave Shed footprint. This solid waste will be disposed at a licensed solid waste disposal facility.

Portions of the Weave Shed's granite exterior walls remain standing and the Weave Shed's foundation remains in place. Granite blocks from the exterior walls and foundation will be reused on-Site or sold for reuse as building materials. Any remaining granite, concrete, or brick building materials will be crushed on-Site for potential reuse as fill material.

Buildings 4, 9, 12, 13, 17, and 18 will be demolished as part of the Site's redevelopment. Solid waste generated during the building demolition will be disposed at a licensed solid waste disposal facility. Granite blocks from the exterior walls and foundation will be reused on-Site or sold for reuse as building materials. Any remaining granite, concrete, or brick building materials will be crushed on-Site for potential reuse as fill material.

8.3 Engineered Barriers

8.3.1 Engineered Barriers -Asphalt, Concrete, and Paver Surfaced Area Cap

The asphalt, concrete, and concrete paver caps will be utilized as an engineered barrier to prevent direct exposure to impacted soil at the Site. The asphalt pavement for the roadways will be four inches thick and underlain by a minimum of six inches of clean gravel fill. Concrete sidewalks will

consist of four inches of concrete underlain by six inches of clean gravel fill. Concrete paver capped areas will be constructed with either eight-inches of clean fill underlying the minimum 2-inch thick concrete pavers or six-inches of clean fill covered with a minimum four-inch thick concrete pavers. Areas of the Site proposed to be capped with engineered barriers are depicted on **Figure 4**. A typical of the asphalt parking areas and concrete sidewalks are depicted on **Figure 5**. A typical of the paver surfaces are depicted on **Figure 7**.

8.3.2 Engineered Barrier -Landscaped Area Cap

The engineered cap proposed for the landscaped areas of the Site will consist of either a minimum of one foot of clean fill underlain by a RIDEM approved Geotextile fabric or two feet of clean fill placed over the noncompliant soil. If two feet of clean fill is utilized, a marker (i.e snow fencing) will be utilized demarcate the clean fill material from the non-compliant soil. The geotextile fabric proposed to be used will have minimum puncture strength of 120 pounds and a minimum burst strength of 400 psi. Propex nonwoven environmental Geotex 861 meets the specified criteria. Specifications of the geotextile fabric proposed to be used at the Site are included in **Appendix 2**. Areas of the Site proposed to be capped in this manner are depicted on **Figure 4**. A landscape surfaced area typical is depicted on **Figure 6**.

Shrub beds will be planted above the geotextile fabric with care not to disturb the material. In the landscaped areas of the Site, the geotextile fabric will be overlaid by off-Site backfill and a planting soil mixture. Trees will be installed to a depth that will fall below the geotextile barrier. The geotextile material will be cut along the tree excavation area. Soil excavated from below the geotextile material will either be used on-Site below the geotextile barrier or proposed engineered cap to bring these areas to grade, disposed of off-Site, or analyzed to determine compliance with the RIDEM R-DEC.

8.4 Weave Shed Water Treatment

Approximately one million gallons of water may exist in the former weave shed footprint. Initial testing of the water in 2005 revealed the presence of elevated TPH concentrations. Dewatering of the Weave Shed footprint will likely be required during the parking lot construction process. The 2005 TPH concentrations would require treatment prior to discharge to the drainage swale on the eastern portion of the Site. A Rhode Island Discharge Elimination System (RIPDES) permit will be obtained from the RIDEM-OWR. If it is determined that treatment of the water is necessary, the water will be pumped through a train of two, 2,000-pound liquid phase carbon vessels will be necessary to treat the water prior to discharge. Discharge permit compliance monitoring will be sampled at the frequency required in the permit.

8.5 Fencing Installation

Fencing will be installed along the 50 foot wetlands setback perimeter to deter access to any non-compliant areas that were not excavated or capped under this RAWP. Additional fencing will be installed to the east of the future exercise trail to deter access to areas which are non-compliant or have not been capped with an engineered barrier. Reconfiguring of the fencing along the 50 foot wetlands setback perimeter may be necessary following the construction of the future exercise trail primarily if the exercise trail is constructed along the 50 foot wetlands setback and abutting those areas which have been capped in accordance with this plan. The ELUR filed for this property will include a provision for the maintenance of the proposed fencing.

8.6 Fill Material Standards

All fill material and loam utilized on Site will be sampled at a frequency of one sample per 500 yards of fill prior to delivery and submitted to a Rhode Island certified laboratory for analysis for arsenic. One quarter of the total number of compliance samples of fill and loam will be submitted for laboratory analysis for the Priority Pollutant 13 Metals, SVOCs by EPA Method 8270, TPH by EPA Method 8100M, and VOCs by EPA Method 8260. The samples will be grab samples. The clean fill

material or loam laboratory analytical data and information on the source of the material will be faxed to the RIDEM. Verbal approval to use the clean fill material or loam must be received from the Department prior to its use on-Site. The analytical data and a statement from the facility providing the fill material and loam of the materials origin and suitability will be included in the Closure Report. No fill materials will be accepted that contain concentrations of Priority Pollutant 13 metals, SVOCs, TPH or VOCs exceeding Rhode Island Method 1 Residential Direct Exposure Criteria. Clean fill will be stockpiled on and covered with polyethylene sheeting prior to use.

8.7 Aboveground Storage Tank Removal

ATC Lincoln will contact RIDEM's Office of Compliance and Inspection prior to the closure of the 25,000-gallon aboveground storage tank located on the eastern portion of the Site. Details of the removal of the aboveground storage tank are specified in **Section 4.3** of this RAWP.

8.8 Underground Storage Tank Removal

The 3,000-gallon fuel oil underground storage tank will be closed in accordance with the RIDEM's Underground Storage Tank Regulations. A UST Closure Application will be filed with RIDEM prior to removal of the underground storage tank. An Underground Storage Tank Closure Report will be completed and submitted to RIDEM's Office of Waste Management Underground Storage Tank Program and Site Remediation Program. Details of the underground storage tank removal are specified in **Section 4.7** of this RAWP.

9.0 SET-UP PLANS

9.1 Permitting and Construction Methods

Bourne Mills LLC will obtain all necessary permits, inspections, and other approval related items from RIDEM. Methods and materials used in the construction of the engineered barrier will conform to the current construction standards and specifications established by RIDEM. Dig Safe® will be

notified of any required excavation activities and all known underground utilities will be clearly marked prior to excavation.

9.2 Erosion Control and Stormwater Maintenance Program

The contractor will install and maintain erosion and sedimentation control devices prior to all Site/earth work in accordance with Section 206 of the Rhode Island Standard Specifications. Layout of erosion control devices are shown on **Figure 8** (Erosion Control Plan by Pare). The erosion and sediment control devices will be inspected at the end of each working day, after each storm event and at least daily during prolonged rainfall. Repair and replacement of erosion and sediment control devices will be made promptly as needed. Temporary vegetative cover or mulch will be applied to disturbed areas that have not reached finished grade as soon as possible but not more than fourteen days after construction activity in that area has ceased, unless the recommended activity will resume within 21 days. Mulches will be inspected periodically, in particular after rain storms, to check for fill erosion. Additional mulch will be applied where fill erosion is evident.

Dust suppression techniques will be employed at all times during soil handling and soil disturbing activities at the Site to reduce the generation of fugitive dust.

10.0 WASTE MANAGEMENT

Remediation wastes generated during solid waste removal activities will be managed in accordance with the RIDEM approved Soil Management Plan and all applicable RIDEM and USEPA solid and hazardous waste regulations. Additional waste management activities are discussed in **Section 4.9** and **4.10** of this plan.

11.0 CONTINGENCY PLAN

A Health and Safety Plan will be prepared for the construction and implementation of the comprehensive remedial actions described within the RAWP. The Health and Safety and Contingency Plans will remain on Site during construction activities. A draft Health and Safety Plan for this Site is presented in **Appendix 3.**

The Contingency Plan will include the names and phone numbers of those parties to be contacted in the event of an emergency during construction activities.

In the event of an emergency at the Site, RIDEM's project manager, Mr. Jeffrey Crawford can be contacted at 401-222-2797. The RIDEM's 24 hour emergency response number is 401-222-3070. In the event of an emergency at the Site after construction activities are completed, Ms. Jan Brodie of Bourne Mills LLC can be contacted at 401-272-2720.

12.0 OPERATION, MAINTENANCE AND MONITORING PLAN

12.1 Construction/Site Development Monitoring

Site development, including excavation in accordance with the Site's Soil Management Plan and construction of the engineered barriers in accordance with this RAWP, will be recorded in a Construction Operation Log. The recording of the Site development activities in this log will be the responsibility of the Site contractor. The Construction Operating Log will include the following information: Time period; Records of any analysis conducted as part of the remedial action; Instances of the implementation of the Contingency Plan and/or Health and Safety Plan; and an inspection plan designed to insure the proper installation of the proposed engineering controls. The Construction Operating Logs will be posted at the Site and will be included in the Closure Report at the completion of the remedial work. Operations logs of Site activities will be forwarded to RIDEM via email on a weekly basis. A copy of the Construction Operation Log is included in **Appendix 4.**

12.2 Soil Excavation Monitoring

Non-compliant soil requiring excavation and on-site treatment is depicted on **Figure 4**. Soil excavation has been proposed to avoid encroachment into the 50 foot buffer of the wetlands. Soil samples from the limits of the excavation will be field screened for VOCs using a photoionization detector. One confirmatory soil sample will be collected every 50 linear feet from the limits of the excavation sidewalls and bottom of Areas of Concern #1 and #2 and the foundation excavation east of Building #10. The soil samples will be submitted for analysis for TPH, SVOCs, the Priority Pollutant 13 Metals, and TCLP/SPLP lead. If field screening data indicates a VOC reading of 10 ppmv or greater, a soil sample will be collected for laboratory analysis for VOCs.

Soil excavated on-Site for the construction of the access road for Bishop Mariano Boulevard from the Site boundary west to the access road's terminus east of Buildings 6 and 7 will be field screened for VOCs using a photoionization detector. The excavated soil will be stockpiled and analyzed for TPH, PAHs, metals (antimony, arsenic, beryllium, and lead), and TCLP/SPLP Lead. If field screening data indicates a VOC reading of 10 ppmv or greater, a soil sample from the stockpile will be collected for laboratory analysis for VOCs.

If on-Site soil removal is required for the construction of the State Avenue access road, the on-Site soil will be stockpiled and samples submitted for laboratory analysis for TPH, PAHs, metals (antimony, arsenic, beryllium, and lead), and TCLP/SPLP Lead. The soil will also be field screened for VOCs using a photoionization detector. If field screening data indicates a VOC reading of 10 ppmv or greater, a soil sample from the stockpile will be collected for laboratory analysis for VOCs.

Field screening of soil will be performed during the removal of the 3,000-gallon underground storage tank and the piping associated with the existing 25,000-gallon aboveground storage tank. Soil samples will be collected during these excavations and periodically field screened using a photoionization detector (PID) and PetroFlag.

Exposed soil following the demolition of Buildings #9, 12, and 13 will be sampled. Following the excavation of soil in this area to preserve the correct grade, a bottom sample will be collected and submitted for laboratory analysis for VOCs, TPH, SVOCs, the Priority Pollutant 13 metals, and TCLP/SPLP Metals.

Following the demolition of Buildings #4, 17, and 19, soil samples will be collected from the footprint and submitted for laboratory analysis for TPH, SVOCs, the Priority Pollutant 13 metals, and TCLP/SPLP lead. The soil samples will also be field screened using a photoionization detector. If VOCs are detected in the soil samples at a concentration of 10 ppmv or greater, a soil sample will be collected for laboratory analysis for VOCs via EPA method 8260.

12.3 Fill Material Monitoring

All fill material and loam utilized on Site will be sampled at a frequency of one sample per 500 yards of fill prior to delivery and submitted to a Rhode Island certified laboratory for analysis for arsenic. One quarter of the total number of compliance samples of fill and loam will be submitted for laboratory analysis for the Priority Pollutant 13 Metals, SVOCs by EPA Method 8270, TPH by EPA Method 8100M, and VOCs by EPA Method 8260. The soil samples will be collected as grab samples. The clean fill material or loam laboratory analytical data and information on the source of the material will be faxed to the RIDEM. Verbal approval to use the clean fill material or loam must be received from the Department prior to its use on-Site. The analytical data and a statement from the facility providing the fill material and loam of the materials origin and suitability will be included in the Closure Report. No fill materials will be accepted that contain concentrations of Priority Pollutant 13 metals, SVOCs, TPH or VOCs exceeding Remediation Regulations Method 1 Residential Direct Exposure Criteria. The clean fill and loam laboratory analytical data will be provided to RIDEM via facsimile, email or by hand delivery prior to placement.

12.4 Maintenance and Monitoring of Engineered Capped Portions of the Site

As described in the Environmental Land Usage Restriction, an officer or director of the company with direct knowledge of past and present conditions of the property (the "Company Representative") or a qualified environmental professional will, on behalf of the Grantor or future holder of any interest in the Property, evaluate the compliance status of the Property on an annual basis. Upon completion of the evaluation, the Company Representative or environmental professional will prepare and simultaneously submit to the Department and to the Grantor or future holder of any interest in the Property an evaluation report detailing the findings of the inspection, and noting any compliance violations at the Property.

If the Property is determined to be out of compliance with the terms of the ELUR, the Grantor or future holder of any interest in the Property shall submit a corrective action plan in writing to the Department within ten (10) days of receipt of the evaluation report, indicating the plans to bring the Property into compliance with the ELUR, including, at a minimum, a schedule for implementation of the plan.

12.5 Groundwater Monitoring Program

The groundwater samples from the newly installed wells will be collected using a low-flow sampling technique. The groundwater samples from these wells will be submitted for laboratory analysis by a Rhode Island certified laboratory for VOCs via EPA method 8260, total metals, and PAHs via EPA method 8270.

The initial groundwater sampling data will be evaluated to determine if groundwater treatment is necessary at this Site. A letter will be prepared and submitted to RIDEM discussing the findings of the initial groundwater sampling event and recommendations. The primary goal for this Site will be to achieve compliance with the GA Groundwater Objectives.

A petition to RIDEM to reduce the sampling frequency of the Site monitoring may be made based on one year of quarterly monitoring and/or the constituents of concern are decreasing or compliant with the RIDEM GA Groundwater Objectives. Groundwater sampling and analysis will cease upon attaining compliance with the GA Groundwater Objectives over three consecutive sampling events. The initial quarterly groundwater monitoring report will be submitted with the RAWP Closure Report. Quarterly groundwater monitoring reports will be submitted to the RIDEM within 30 days of the sampling event. All pertinent monitor wells destroyed during Site development activities will be replaced and sampled in accordance with the sampling schedule.

13.0 SECURITY PROCEDURES

Construction personnel will prevent unauthorized persons from entering the Site while the daily construction activities are taking place. The construction Site supervisor will be responsible for identifying unauthorized persons and removing them from the Site. Perimeter fencing will be installed by the contractor and secured at the end of each workday as part of the daily shutdown procedures. A sign will be placed on the perimeter fencing to deter unauthorized access.

14.0 CLOSURE AND POST-CLOSURE REQUIREMENTS

Monitoring data collected in accordance with **Sections 12.2, 12.3,** and **12.5** of this RAWP will be used to determine compliance with the applicable remedial objectives as outlined in **Section 5.0.** of this plan. As previously stated, the groundwater objective is to meet the RIDEM Remediation Regulations GA groundwater standards.

A formal Closure Report will be prepared and submitted to RIDEM at the completion of the remedial activities at this Site. The report will include a summary of the soil excavation and treatment activities, analytical data, Construction Operation Logs, and details regarding the construction of the engineered barriers. In addition, a statement from the facility providing the fill material and loam of the materials origin and suitability will be included in the Closure Report. Inaccessible soil in exceedence of the GA Leachability Criteria will be capped with an impermeable

area, as noted in this RAWP, and documented in the Closure Report. A draft ELUR and SMP will be submitted with the Closure Report. The Closure Report will be certified by a State of Rhode Island Registered Professional Engineer.

Upon completion of the remedial activities at this Site, an RIDEM approved ELUR will be recorded with the Town of Tiverton within 30 days of RIDEM's approval of the Closure Report. A copy of the ELUR will be submitted to RIDEM within 15 days of the date it is entered into the Town of Tiverton Land Evidence Records. The ELUR will require annual inspection and maintenance of the engineered barriers, prohibit the use of the Site's groundwater as a potable water source, and require Department notification of soil excavation activities. Further information is included in **Section 15.0** of this RAWP.

The groundwater monitoring activities discussed above will be conducted in accordance with Section 8.10 of the RIDEM Remediation Regulations to determine whether or not additional monitoring activities are required at the Site. In addition, termination of groundwater monitoring at the facility will be conducted following achieving compliance with the GA Groundwater Objectives over three consecutive sampling events. All monitor wells will be decommissioned in accordance with Appendix 1 of the Groundwater Quality Regulations.

15.0 INSTITUTIONAL CONTROLS AND NOTICES

15.1 Environmental Land Usage Restriction (ELUR)

The ELUR will require annual inspection and maintenance of the engineered barriers and fencing, prohibit the use of the Site's groundwater as a potable water source, and require Department notification of soil excavation activities. A copy of the proposed ELUR is attached as **Appendix 5.**

A Soil Management Plan (SMP) has also been prepared for the Site. Soil disturbed during future Site activities will be required to be managed in accordance with a RIDEM approved SMP. A proposed SMP is attached as **Appendix 6.**

15.2 Public Notice

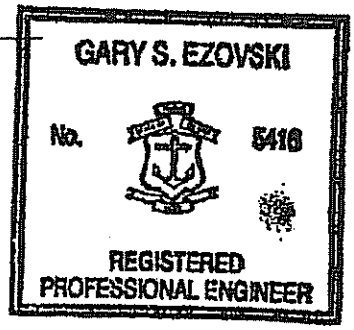
In accordance with the RIDEM Remediation Regulations, public notice was sent to the Site abutters on April 9, 2007 at the completion of the Site Investigation Report. The notices included the remedial actions proposed in this RAWP.

16.0 CERTIFICATION

Statement of Certification By The
Remedial Action Work Plan Preparer
Bourne Mill Complex
844 State Avenue/1 Shove Street
Tiverton, Rhode Island

I hereby certify and attest that the information provided is true and accurate to the best of our knowledge.

Signature: _____
Gary Ezovski, PE, LSP, LEP



Business Name: ATC Lincoln Associates
Business Address: 333 Washington Highway
Smithfield, Rhode Island 02917

Statement of Certification by the Performing Party
Bourne Mill Complex
844 State Avenue / 1 Shove Street
Tiverton, Rhode Island

I hereby certify and attest that the information provided is a complete and accurate representation of the Site and the release and contains all known facts surrounding the release to the best of my knowledge.

Signature: _____
Ms. Jan Brodie

Business Name: Bourne Mills LLC
Business Address: 1570 Westminster Street
Providence, Rhode Island 02909

Attachment C

Laboratory Analytical Data Package

Sample – LE-Weave Shed 2 – August 7, 2008

GROUNDWATER ANALYTICAL

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August 12, 2008

Mr. Brian LaPierre
Lightship Engineering
39 Industrial Park Road
Unit C
Plymouth, MA 02360

LABORATORY REPORT

Project: **Tiverton/600.9.2**
Lab ID: **119193**
Received: **08-07-08**

Dear Brian:

Enclosed are the analytical results for the above referenced project. The project was processed for Rush 3 Business Day turnaround.

This letter authorizes the release of the analytical results, and should be considered a part of this report. This report contains a sample receipt report detailing the samples received, a project narrative indicating project changes and non-conformances, a quality control report, and a statement of our state certifications.

The analytical results contained in this report meet all applicable NELAC or NVLAP standards, except as may be specifically noted, or described in the project narrative. The analytical results relate only to the samples received. This report may only be used or reproduced in its entirety.

I attest under the pains and penalties of perjury that, based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Should you have any questions concerning this report, please do not hesitate to contact me.

Sincerely,

Eric H. Jensen
Operations Manager

EHJ/elm
Enclosures

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Sample Receipt Report

Project: **Tiverton/600.9.2**
Client: **Lightship Engineering**
Lab ID: **119193**

Delivery: **Hand**
Airbill: **n/a**
Lab Receipt: **08-07-08**

Temperature: **5.2ºC**
Chain of Custody: **Present**
Custody Seal(s): **n/a**

Lab ID	Field ID		Matrix	Sampled	Method				Notes
119193-1	Weave Shed 2		Aqueous	8/7/08 9:40	EPA 8260B Volatile Organics with Oxygenates				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C1074476	40 mL VOA Vial	Proline	BX30956	HCL	R-5500D	07-01-08	08-06-08		
C1074475	40 mL VOA Vial	Proline	BX30956	HCL	R-5500D	07-01-08	08-06-08		
C1074474	40 mL VOA Vial	Proline	BX30956	HCL	R-5500D	07-01-08	08-06-08		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
119193-2	Weave Shed 2		Aqueous	8/7/08 9:40	EPA 8270C Semivolatile Organics (Low Level)				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C1091784	1 L Amber Glass	Proline	BX31119	None	n/a	n/a	08-06-08		
C1091780	1 L Amber Glass	Proline	BX31119	None	n/a	n/a	08-06-08		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
119193-3	Weave Shed 2		Aqueous	8/7/08 9:40	EPA 8082 PCBs				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C1091785	1 L Amber Glass	Proline	BX31119	None	n/a	n/a	08-06-08		
C1091783	1 L Amber Glass	Proline	BX31119	None	n/a	n/a	08-06-08		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
119193-4	Weave Shed 2		Aqueous	8/7/08 9:40	EPA 6010B Ag As Be Cd Cr Cu Fe Ni Pb Sb Se Tl Zn Total EPA 7470A Mercury by CVAA Total				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C1119067	500 mL Plastic	n/a	n/a	HNO3	n/a	n/a	n/a		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
119193-5	Weave Shed 2		Aqueous	8/7/08 9:40	TPH by GC EPA 8015B Mod				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C1121241	1 L Amber Glass	Proline	BX31278	H2SO4	R-5615A	08-01-08	08-06-08		
C1121240	1 L Amber Glass	Proline	BX31278	H2SO4	R-5615A	08-01-08	08-06-08		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
119193-6	Weave Shed 2		Aqueous	8/7/08 9:40	SM 2540 D Total Suspended Solids				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C1150060	1L Plastic	Industrial	BX31363	None	n/a	n/a	08-06-08		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
119193-7	Weave Shed 2		Aqueous	8/7/08 9:40	EPA 9012A Total Cyanide				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C1095863	500 mL Plastic	Proline	BX30683	NaOH	R-5632A	06-04-08	08-06-08		

Lab ID	Field ID		Matrix	Sampled	Method				Notes
119193-8	Weave Shed 2		Aqueous	8/7/08 9:40	SM 4500-Cl G Total Residual Chlorine				
Con ID	**Container**	**Vendor**	**QC Lot**	**Preserv**	**QC Lot**	**Prep**	**Ship**		
C1039727	250 mL Glass	Proline	BX29513	None	n/a	n/a	08-06-08		

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EPA Method 8260B
Volatile Organics by GC/MS

Field ID:	**Weave Shed 2**	Matrix:	**Aqueous**
Project:	**Tiverton/600.9.2**	Container:	**40 mL VOA Vial**
Client:	**Lightship Engineering**	Preservation:	**HCl/ Cool**
Laboratory ID:	**119193-1**	QC Batch ID:	**VM5-3785-W**
Sampled:	**08-07-08 09:40**	Instrument ID:	**MS-5 HP 6890**
Received:	**08-07-08 11:40**	Sample Volume:	**25 mL**
Analyzed:	**08-11-08 12:30**	Dilution Factor:	**20**
Analyst:	**LMG**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
75-71-8	Dichlorodifluoromethane	BRL		ug/L	10
74-87-3	Chloromethane	BRL		ug/L	10
75-01-4	Vinyl Chloride	BRL		ug/L	10
74-83-9	Bromomethane	BRL		ug/L	10
75-00-3	Chloroethane	BRL		ug/L	10
75-69-4	Trichlorofluoromethane	BRL		ug/L	10
60-29-7	Diethyl Ether	BRL		ug/L	40
75-35-4	1,1-Dichloroethene	BRL		ug/L	10
76-13-1	1,1,2-Trichlorotrifluoroethane	BRL		ug/L	100
67-64-1	Acetone	BRL		ug/L	200
75-15-0	Carbon Disulfide	BRL		ug/L	100
75-09-2	Methylene Chloride	BRL		ug/L	50
156-60-5	*trans*-1,2-Dichloroethene	BRL		ug/L	10
1634-04-4	Methyl *tert*-butyl Ether (MTBE)	BRL		ug/L	10
75-34-3	1,1-Dichloroethane	BRL		ug/L	10
594-20-7	2,2-Dichloropropane	BRL		ug/L	10
156-59-2	*cis*-1,2-Dichloroethene	BRL		ug/L	10
78-93-3	2-Butanone (MEK)	BRL		ug/L	100
74-97-5	Bromochloromethane	BRL		ug/L	10
109-99-9	Tetrahydrofuran (THF)	BRL		ug/L	100
67-66-3	Chloroform	BRL		ug/L	10
71-55-6	1,1,1-Trichloroethane	BRL		ug/L	10
56-23-5	Carbon Tetrachloride	BRL		ug/L	10
563-58-6	1,1-Dichloropropene	BRL		ug/L	10
71-43-2	Benzene	BRL		ug/L	10
107-06-2	1,2-Dichloroethane	BRL		ug/L	10
79-01-6	Trichloroethene	BRL		ug/L	10
78-87-5	1,2-Dichloropropane	BRL		ug/L	10
74-95-3	Dibromomethane	BRL		ug/L	10
75-27-4	Bromodichloromethane	BRL		ug/L	10
123-91-1	1,4-Dioxane	BRL		ug/L	10,000
10061-01-5	*cis*-1,3-Dichloropropene	BRL		ug/L	8
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL		ug/L	100
108-88-3	Toluene	BRL		ug/L	10
10061-02-6	*trans*-1,3-Dichloropropene	BRL		ug/L	8
79-00-5	1,1,2-Trichloroethane	BRL		ug/L	10
127-18-4	Tetrachloroethene	BRL		ug/L	10
142-28-9	1,3-Dichloropropane	BRL		ug/L	10
591-78-6	2-Hexanone	BRL		ug/L	100
124-48-1	Dibromochloromethane	BRL		ug/L	10
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/L	10
108-90-7	Chlorobenzene	BRL		ug/L	10
630-20-6	1,1,1,2-Tetrachloroethane	BRL		ug/L	10
100-41-4	Ethylbenzene	BRL		ug/L	10
108-38-3/106-42-3	*meta*-Xylene and *para*-Xylene	BRL		ug/L	10
95-47-6	*ortho*-Xylene	BRL		ug/L	10

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EPA Method 8260B (Continued)
Volatile Organics by GC/MS

Field ID:	**Weave Shed 2**	Matrix:	**Aqueous**
Project:	**Tiverton/600.9.2**	Container:	**40 mL VOA Vial**
Client:	**Lightship Engineering**	Preservation:	**HCl/ Cool**
Laboratory ID:	**119193-1**	QC Batch ID:	**VM5-3785-W**
Sampled:	**08-07-08 09:40**	Instrument ID:	**MS-5 HP 6890**
Received:	**08-07-08 11:40**	Sample Volume:	**25 mL**
Analyzed:	**08-11-08 12:30**	Dilution Factor:	**20**
Analyst:	**LMG**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
100-42-5	Styrene	BRL		ug/L	10
75-25-2	Bromoform	BRL		ug/L	10
98-82-8	Isopropylbenzene	BRL		ug/L	10
108-86-1	Bromobenzene	BRL		ug/L	10
79-34-5	1,1,2,2-Tetrachloroethane	BRL		ug/L	10
96-18-4	1,2,3-Trichloropropane	BRL		ug/L	10
103-65-1	*n*-Propylbenzene	BRL		ug/L	10
95-49-8	2-Chlorotoluene	BRL		ug/L	10
108-67-8	1,3,5-Trimethylbenzene	BRL		ug/L	10
106-43-4	4-Chlorotoluene	BRL		ug/L	10
98-06-6	*tert*-Butylbenzene	BRL		ug/L	10
95-63-6	1,2,4-Trimethylbenzene	BRL		ug/L	10
135-98-8	*sec*-Butylbenzene	BRL		ug/L	10
541-73-1	1,3-Dichlorobenzene	BRL		ug/L	10
99-87-6	4-Isopropyltoluene	BRL		ug/L	10
106-46-7	1,4-Dichlorobenzene	BRL		ug/L	10
95-50-1	1,2-Dichlorobenzene	BRL		ug/L	10
104-51-8	*n*-Butylbenzene	BRL		ug/L	10
96-12-8	1,2-Dibromo-3-chloropropane	BRL		ug/L	10
120-82-1	1,2,4-Trichlorobenzene	BRL		ug/L	10
87-68-3	Hexachlorobutadiene	BRL		ug/L	10
91-20-3	Naphthalene	BRL		ug/L	10
87-61-6	1,2,3-Trichlorobenzene	BRL		ug/L	10
75-65-0	*tert*-Butyl Alcohol (TBA)	BRL		ug/L	400
108-20-3	Di-isopropyl Ether (DIPE)	BRL		ug/L	10
637-92-3	Ethyl *tert*-butyl Ether (ETBE)	BRL		ug/L	10
994-05-8	*tert*-Amyl Methyl Ether (TAME)	BRL		ug/L	10

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Dibromofluoromethane	10	9	**91** %	70 - 130 %
1,2-Dichloroethane-d_4	10	9	**86** %	70 - 130 %
Toluene-d_8	10	9	**90** %	70 - 130 %
4-Bromofluorobenzene	10	10	**99** %	70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample preparation performed by EPA Method 5030B.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

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EPA Method 8270C
Semivolatile Organics by GC/MS (Part 1)

Field ID:	**Weave Shed 2**	Matrix:	**Aqueous**
Project:	**Tiverton/600.9.2**	Container:	**1 L Amber Glass**
Client:	**Lightship Engineering**	Preservation:	**Cool**
Laboratory ID:	**119193-02**	QC Batch ID:	**SV-2286-F**
Sampled:	**08-07-08 09:40**	Instrument ID:	**MS-12 Agilent 6890**
Received:	**08-07-08 11:40**	Sample Volume:	**960 mL**
Extracted:	**08-11-08 08:00**	Final Volume:	**1 mL**
Analyzed:	**08-11-08 16:08**	Dilution Factor:	**1**
Analyst:	**MJB**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
62-75-9	N-Nitrosodimethylamine	BRL		ug/L	5
110-86-1	Pyridine	BRL		ug/L	5
108-95-2	Phenol	BRL		ug/L	5
62-53-3	Aniline	BRL		ug/L	5
111-44-4	Bis(2-chloroethyl) ether	BRL		ug/L	5
95-57-8	2-Chlorophenol	BRL		ug/L	5
541-73-1	1,3-Dichlorobenzene	BRL		ug/L	5
106-46-7	1,4-Dichlorobenzene	BRL		ug/L	5
100-51-6	Benzyl Alcohol	BRL		ug/L	5
95-50-1	1,2-Dichlorobenzene	BRL		ug/L	5
95-48-7	2-Methylphenol	BRL		ug/L	5
108-60-1	Bis(2-chloroisopropyl) ether	BRL		ug/L	5
108-39-4/106-44-5	3 and 4-Methylphenol *	BRL		ug/L	5
621-64-7	N-Nitrosodi-n-propylamine	BRL		ug/L	5
98-86-2	Acetophenone	BRL		ug/L	5
67-72-1	Hexachloroethane	BRL		ug/L	5
98-95-3	Nitrobenzene	BRL		ug/L	5
78-59-1	Isophorone	BRL		ug/L	5
88-75-5	2-Nitrophenol	BRL		ug/L	5
105-67-9	2,4-Dimethylphenol	BRL		ug/L	5
111-91-1	Bis(2-chloroethoxy) methane	BRL		ug/L	5
120-83-2	2,4-Dichlorophenol	BRL		ug/L	5
120-82-1	1,2,4-Trichlorobenzene	BRL		ug/L	5
106-47-8	4-Chloroaniline	BRL		ug/L	5
87-68-3	Hexachlorobutadiene	BRL		ug/L	5
59-50-7	4-Chloro-3-methylphenol	BRL		ug/L	5
77-47-4	Hexachlorocyclopentadiene	BRL		ug/L	5
88-06-2	2,4,6-Trichlorophenol	BRL		ug/L	5
95-95-4	2,4,5-Trichlorophenol	BRL		ug/L	5
91-58-7	2-Chloronaphthalene	BRL		ug/L	5
88-74-4	2-Nitroaniline	BRL		ug/L	5
100-25-4	1,4-Dinitrobenzene	BRL		ug/L	5
131-11-3	Dimethyl phthalate	BRL		ug/L	5
99-65-0	1,3-Dinitrobenzene	BRL		ug/L	5
606-20-2	2,6-Dinitrotoluene	BRL		ug/L	5
528-29-0	1,2-Dinitrobenzene	BRL		ug/L	5
99-09-2	3-Nitroaniline	BRL		ug/L	5
51-28-5	2,4-Dinitrophenol	BRL		ug/L	10
100-02-7	4-Nitrophenol	BRL		ug/L	5
132-64-9	Dibenzofuran	BRL		ug/L	5
121-14-2	2,4-Dinitrotoluene	BRL		ug/L	5
84-66-2	Diethyl phthalate	BRL		ug/L	5
7005-72-3	4-Chlorophenyl phenyl ether	BRL		ug/L	5
100-01-6	4-Nitroaniline	BRL		ug/L	5
534-52-1	4,6-Dinitro-2-methylphenol	BRL		ug/L	5

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EPA Method 8270C (Continued)
Semivolatile Organics by GC/MS (Part 1)

Field ID:	**Weave Shed 2**	Matrix:	**Aqueous**
Project:	**Tiverton/600.9.2**	Container:	**1 L Amber Glass**
Client:	**Lightship Engineering**	Preservation:	**Cool**
Laboratory ID:	**119193-02**	QC Batch ID:	**SV-2286-F**
Sampled:	**08-07-08 09:40**	Instrument ID:	**MS-12 Agilent 6890**
Received:	**08-07-08 11:40**	Sample Volume:	**960 mL**
Extracted:	**08-11-08 08:00**	Final Volume:	**1 mL**
Analyzed:	**08-11-08 16:08**	Dilution Factor:	**1**
Analyst:	**MJB**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
86-30-6	N-Nitrosodiphenylamine †	BRL		ug/L	5
122-66-7	1,2-Diphenylhydrazine ◊	BRL		ug/L	5
101-55-3	4-Bromophenyl phenyl ether	BRL		ug/L	5
86-74-8	Carbazole	BRL		ug/L	5
84-74-2	Di-*n*-butyl phthalate	BRL		ug/L	5
85-68-7	Butyl benzyl phthalate	BRL		ug/L	5
91-94-1	3,3'-Dichlorobenzidine	BRL		ug/L	5
117-81-7	Bis(2-ethylhexyl) phthalate	BRL		ug/L	5
117-84-0	Di-*n*-octyl phthalate	BRL		ug/L	5

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2-Fluorophenol	21	8	**37** %	15 - 110 %
Phenol-d5	21	7	**34** %	15 - 110 %
Nitrobenzene-d5	10	7	**70** %	30 - 130 %
2-Fluorobiphenyl	10	8	**75** %	30 - 130 %
2,4,6-Tribromophenol	21	18	**87** %	15 - 110 %
Terphenyl-d14	10	8	**78** %	30 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3510C.

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

* Analyzed as 4-Methylphenol.

† Reported as sum of N-Nitrosodiphenylamine and Diphenylamine.

◊ Analyzed as Azobenzene.

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EPA Method 8270C
Semivolatile Organics by GC/MS-SIM (Part 2)

Field ID:	**Weave Shed 2**	Matrix:	**Aqueous**
Project:	**Tiverton/600.9.2**	Container:	**1 L Amber Glass**
Client:	**Lightship Engineering**	Preservation:	**Cool**
Laboratory ID:	**119193-02**	QC Batch ID:	**SV-2286-F**
Sampled:	**08-07-08 09:40**	Instrument ID:	**MS-6 HP 6890**
Received:	**08-07-08 11:40**	Sample Volume:	**960 mL**
Extracted:	**08-11-08 08:00**	Final Volume:	**1 mL**
Analyzed:	**08-11-08 18:09**	Dilution Factor:	**1**
Analyst:	**MJB**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/L	0.5
91-57-6	2-Methylnaphthalene	BRL		ug/L	0.5
208-96-8	Acenaphthylene	BRL		ug/L	0.5
83-32-9	Acenaphthene	BRL		ug/L	0.5
86-73-7	Fluorene	BRL		ug/L	0.5
85-01-8	Phenanthrene	BRL		ug/L	0.5
120-12-7	Anthracene	**1.0**		ug/L	0.5
206-44-0	Fluoranthene	**0.8**		ug/L	0.5
129-00-0	Pyrene	**0.6**		ug/L	0.5
56-55-3	Benzo[a]anthracene	**0.4**		ug/L	0.1
218-01-9	Chrysene	**0.3**		ug/L	0.1
205-99-2	Benzo[b]fluoranthene	**0.6**		ug/L	0.1
207-08-9	Benzo[k]fluoranthene	**0.2**		ug/L	0.1
50-32-8	Benzo[a]pyrene	**0.4**		ug/L	0.1
193-39-5	Indeno[1,2,3-c,d]pyrene	**0.2**		ug/L	0.1
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/L	0.1
191-24-2	Benzo[g,h,i]perylene	**0.2**		ug/L	0.1
87-68-3	Hexachlorobutadiene	BRL		ug/L	0.5
118-74-1	Hexachlorobenzene	BRL		ug/L	0.5
87-86-5	Pentachlorophenol	BRL		ug/L	1.0

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2-Fluorophenol	21	8.2	**39** %	15 - 110 %
Phenol-d5	21	7.6	**37** %	15 - 110 %
Nitrobenzene-d5	10	8.5	**81** %	30 - 130 %
2-Fluorobiphenyl	10	6.4	**61** %	30 - 130 %
2,4,6-Tribromophenol	21	19	**89** %	15 - 110 %
Terphenyl-d14	10	7.8	**75** %	30 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Sample extraction performed by EPA Method 3510C.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

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EPA Method 8082
Polychlorinated Biphenyls (PCBs) by GC/ECD

Field ID:	**Weave Shed 2**	Matrix:	**Aqueous**
Project:	**Tiverton/600.9.2**	Container:	**1 L Amber Glass**
Client:	**Lightship Engineering**	Preservation:	**Cool**
Laboratory ID:	**119193-03**	QC Batch ID:	**PB-2468-F**
Sampled:	**08-07-08 09:40**	Instrument ID:	**GC-13 Agilent 6890**
Received:	**08-07-08 11:40**	Sample Weight:	**960 mL**
Extracted:	**08-08-08 17:00**	Final Volume:	**1 mL**
Cleaned Up:	**08-08-08 20:45**	Dilution Factor:	**1**
Analyzed:	**08-10-08 19:54**		
Analyst:	**JXS**		

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/L	0.2
11104-28-2	Aroclor 1221	BRL		ug/L	0.2
11141-16-5	Aroclor 1232	BRL		ug/L	0.2
53469-21-9	Aroclor 1242	BRL		ug/L	0.2
12672-29-6	Aroclor 1248	BRL		ug/L	0.2
11097-69-1	Aroclor 1254	BRL		ug/L	0.2
11096-82-5	Aroclor 1260	BRL		ug/L	0.2
37324-23-5	Aroclor 1262 †	BRL		ug/L	0.2
11100-14-4	Aroclor 1268 †	BRL		ug/L	0.2

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	0.21	0.14	**67** %	30 - 150 %
Column	Decachlorobiphenyl	0.21	0.17	**79** %	30 - 150 %
Second	Tetrachloro-*m*-xylene	0.21	0.16	**75** %	30 - 150 %
Column	Decachlorobiphenyl	0.21	0.15	**70** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3510C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

GROUNDWATER ANALYTICAL

Trace Metals

Field ID:	**Weave Shed 2**	Matrix:	**Aqueous**
Project:	**Tiverton, RI/600.9.2**	Container:	**500 mL Plastic**
Client:	**Lightship Engineering**	Preservation:	**HNO3 / Cool**
Laboratory ID:	**119193-4**	Preserved:	**08-07-08 09:40**
Sampled:	**08-07-08 09:40**		
Received:	**08-07-08 11:40**		

Analysis Method	QC Batch ID	Prep Method	Prepared	Sample Volume	Instrument ID	Analyst
EPA 6010B[1]	MB-3409-W	EPA 3010A	08-08-08 08:12	50 mL	ICP-1 PE 3000	MWR
EPA 7470A[2]	MP-2124-W	EPA 7470A	08-11-08 09:30	25 mL	CVAA-1 PE FIMS	DET

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit	DF	Analyzed	Method
7440-36-0	Antimony, Total	BRL		mg/L	0.06	1	08-11-08 13:24	EPA 6010B[1]
7440-38-2	Arsenic, Total	BRL		mg/L	0.01	1	08-11-08 13:24	EPA 6010B[1]
7440-41-7	Beryllium, Total	BRL		mg/L	0.004	1	08-11-08 13:23	EPA 6010B[1]
7440-43-9	Cadmium, Total	BRL		mg/L	0.004	1	08-11-08 13:24	EPA 6010B[1]
7440-47-3	Chromium, Total	BRL		mg/L	0.01	1	08-11-08 13:23	EPA 6010B[1]
7440-50-8	Copper, Total	**0.041**		mg/L	0.025	1	08-11-08 13:23	EPA 6010B[1]
7439-89-6	Iron, Total	**12**		mg/L	0.1	1	08-11-08 13:23	EPA 6010B[1]
7439-92-1	Lead, Total	**0.31**		mg/L	0.01	1	08-11-08 13:24	EPA 6010B[1]
7439-97-6	Mercury, Total	BRL		mg/L	0.0002	1	08-11-08 12:55	EPA 7470A[2]
7440-02-0	Nickel, Total	BRL		mg/L	0.04	1	08-11-08 13:24	EPA 6010B[1]
7782-49-2	Selenium, Total	BRL		mg/L	0.05	1	08-11-08 13:24	EPA 6010B[1]
7440-22-4	Silver, Total	BRL		mg/L	0.007	1	08-12-08 12:59	EPA 6010B[1]
7440-28-0	Thallium, Total	BRL		mg/L	0.03	1	08-12-08 12:59	EPA 6010B[1]
7440-66-6	Zinc, Total	BRL		mg/L	0.2	1	08-11-08 13:23	EPA 6010B[1]

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

DF Dilution Factor.

GROUNDWATER ANALYTICAL

EPA Method 8015B (Modified)
Total Petroleum Hydrocarbons by GC/FID

Field ID:	**Weave Shed 2**	Matrix:	**Aqueous**
Project:	**Tiverton/600.9.2**	Container:	**1 L Amber Glass**
Client:	**Lightship Engineering**	Preservation:	**H2SO4/ Cool/Cool**
Laboratory ID:	**119193-5**	QC Batch ID:	**HF-2056-F**
Sampled:	**08-07-08 09:40**	Instrument ID:	**GC4 HP 5890**
Received:	**08-07-08 11:40**	Sample Volume:	**960 mL**
Extracted:	**08-08-08 01:00**	Final Volume:	**1 mL**
Analyzed:	**08-08-08 19:19**	Dilution Factor:	**1**
Analyst:	**CL**		

Analyte	Concentration	Notes	Units	Reporting Limit
Total Petroleum Hydrocarbons	**6.3**		mg/L	0.2

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho -Terphenyl	0.042	0.029	**71** %	60 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified to quantify total petroleum hydrocarbons in the range n-C 9 through n-C 36. Results are quantified on the basis of a series of aromatic and aliphatic hydrocarbons, using 5-alpha-androstane as an internal standard.
Sample extraction performed by EPA Method 3510C.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Inorganic Chemistry

Field ID: **Weave Shed 2**
Project: **Tiverton/600.9.2**
Client: **Lightship Engineering**

Matrix: **Aqueous**
Received: **08-07-08 11:40**

Lab ID: **119193-06** Sampled: **08-07-08 09:40** Container: **1L Plastic** Preservation: **Cool**

Analyte	Result	Units	RL	DF	Volume	Analyzed	QC Batch	Method	Inst	Analyst
Solids, Total Suspended	**14**	mg/L	10	5	100 mL	08-08-08 12:44	TSS-1511-W	SM 2540 D	3	PD

Lab ID: **119193-07** Sampled: **08-07-08 09:40** Container: **500 mL Plastic** Preservation: **NaOH/Cool**

Analyte	Result	Units	RL	DF	Volume	Analyzed	QC Batch	Method	Inst	Analyst
Cyanide, Total	**0.02**	mg/L	0.01	1	50 mL	08-09-08 09:27	TCN-1437-W	EPA 9012A	1	OMNION USER

Lab ID: **119193-08** Sampled: **08-07-08 09:40** Container: **250 mL Glass** Preservation: **Cool**

Analyte	Result	Units	RL	DF	Volume	Analyzed	QC Batch	Method	Inst	Analyst
Chlorine, Total Residual	BRL	mg/L	0.2	1	5 mL	08-07-08 18:00	TRC-0686-W	SM 4500-Cl G	2	LD

Method Reference: Methods for Chemical Analysis of Water and Wastes, US EPA, EPA-600/4-790-020 (Revised 1983), and Methods for the Determination of Inorganic Substances in Environmental Samples, US EPA, EPA/600/R-93/100 (1993), and Standard Methods for the Examination of Water and Wastewater, APHA, Twentieth Edition (1998), and Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

RL Reporting Limit.

DF Dilution Factor.

1 Instrument ID: Lachat 8000 Autoanalyzer

2 Instrument ID: Thermo Electron Genesys 20

3 Instrument ID: Mettler AT 200 Balance

GROUNDWATER ANALYTICAL

Project Narrative

Project:	**Tiverton/600.9.2**	Lab ID:	**119193**
Client:	**Lightship Engineering**	Received:	**08-07-08 11:40**

A. Documentation and Client Communication

The following documentation discrepancies, and client changes or amendments were noted for this project:

1 . No documentation discrepancies, changes, or amendments were noted.

B. Method Modifications, Non-Conformances and Observations

The sample(s) in this project were analyzed by the references analytical method(s), and no method modifications, non-conformances or analytical issues were noted, except as indicated below:

1 . EPA 8260B Note: Sample 119193-1. Sample was diluted prior to analysis. Dilution was required due to observed foaming characteristics of sample. Sample foaming interferes with purge and trap sample concentration.

2 . EPA 8270C Non-conformance: Laboratory control sample (LCS) analyte 3,3'-Dichlorobenzidine was above recommended recovery limits for QC batch SV-2282-F.

3 . EPA 8270C PAH Non-conformance: Laboratory control sample (LCS) analyte Hexachlorobutadiene was below recommended recovery limits for QC batch SV-2286-F.

4 . EPA 8260B Non-conformance: Laboratory control sample (LCS) analytes Methylene Chloride and 1,1,2-Trichlorotrifluoroethane were above recommended recovery limits for QC batch VM5-3785-W.

5 . EPA 8260B Non-conformance: Laboratory control sample (LCS) analyte Methylene Chloride had an RPD recovery outside recommended limits for QC batch VM5-3785-W.

GROUNDWATER ANALYTICAL

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CHAIN-OF-CUSTODY RECORD AND WORK ORDER

№ 217538

Project Name: Tiverton	Firm: Lighthip Engineering
Project Number: 600.9.2	Address: 39 Industrial Park Rd Unit C
Sampler Name: Nick Abreu	City / State / Zip: Plymouth MA 02360
Project Manager: Brian LaPierre	Telephone: (508) 830 - 3344

INSTRUCTIONS: Use separate line for each container (except replicates).

TURNAROUND

- ☐ STANDARD (10 Business Days)
- ☐ PRIORITY (5 Business Days)
- ☑ RUSH (RAN- _____) 72hr
  (Rush requires Rush Authorization Number)
- ☑ Please Email to: Bcpierce@lighthipengineering.com
- ☐ Please FAX to: _____

BILLING

- ☑ Purchase Order No.: 600.9.2
- ☐ Third Party Billing: _____
- ☐ GWA Quote: _____

ANALYSIS REQUEST

OPTIONS: ☐ TIC Search
Volatiles: ☐ 524.2-MTBE
Semivolatiles: ☐ Add Only ☐ B/N Only ☐ TIC Search; ☐ 625.2
Pest/Herb/PCBs Extractable: ☐ 505 ☐ 508
Pest/Herb/PCBs Vol.: ☐ 531.1 ☐ 515.1 ☐ 504.1 EDB/DCP
Metals: Specify For Water Samples: ☑ Total ☐ Dissolved; ☐ Lead and Copper

NPDES: ☐ 624; ☐ 602-MTBE; ☐ 601; ☐ 601/602-MTBE; ☐ 625; ☐ 625 PAHs only; ☐ 608 Pesticides; ☐ 608 PCBs; ☐ 612; ☐ 615; ☑ 13 Priority Pollutant

RCRA/21E: ☐ 8260B TCL-MTBE; ☐ 8260B NH PETRO-EUM; ☑ 8260B; ☐ 8021B Aromatics; ☐ 8021B Halocarbons; ☐ 8021B; ☑ 8270C; ☐ 8270C PAHs only; ☐ 8081A Pesticides; ☑ 8082 PCBs; ☐ 8151A Herbicides; ☐ 8011 EDB/DBCP; ☐ 8 RCRA; ☐ 5 RCRA; ☐ MA List Metals; ☐ 23 TAL; ☑ Specify Iron

Petroleum Hydrocarbon Ext. TPH: ☐ TPH-8R; ☐ Diesel Range Organics (DRO) ☐ ME DRO; ☐ CT ETPH; ☐ MA DEP EPH w/all targets ☐ EPH Carbon Ranges only ☐ EPH w/8 PAHs; ☐ Hydrocarbon Fingerprint (GC/FID by ASTM D3328-00 Mod.)
Petroleum Hydrocarbon Vol. TPH: ☑ Vol. by GC/FID (601/8015 Mod.) Quantitative Only; ☐ Gasoline Range Organics (GRO) ☐ ME GRO; ☐ MA DEP VPH w/all targets ☐ VPH Carbon ranges only

Haz. Waste: ☐ TCLP ☐ SPLP ☐ 8 Metals ☐ Pb only ☐ VOA ☐ Semi VOA ☐ Pesticides ☐ Herbicides; ☐ Corrosivity (as pH) ☐ Reactivity ☐ Ignitability (as Flashpoint) ☐ Paint Filter; ☐ MA Basic Disposal Criteria (8260B, TPH by GC, PCBs, 8 Metals, Corrosivity, Ignitability, Reactivity)

General Chemistry: ☐ Nitrate ☐ Chloride ☐ Fluoride ☐ Sulfate; ☐ Dissolved Phosphorus; ☐ Ammonia ☐ TKN ☐ Total Phosphorus ☐ Total N (as NO2/NO3/TKN); ☐ Oil & Grease; ☐ COD ☐ TOC; ☐ BOD ☐ TDS ☑ TSS ☐ Alkalinity; ☑ Cyanide, Total ☐ Cyanide, Physiologically Available; ☐ pH ☐ Dissolved Oxygen ☐ Turbidity

Other: ☐ Total Coliform ☐ Fecal Coliform ☐ HPC; ☑ Total Residual chlorine

Sampling DATE	Sampling TIME	SAMPLE IDENTIFICATION	Matrix	Type	Container(s)	Preservation	Filtered	LABORATORY NUMBER (Lab Use Only)
8/7/08	0940	Weave Shed 2	GROUNDWATER X	COMPOSITE	NUMBER 13	HCl 3	YES	
				GRAB X	40mL VOA Vial 3	HNO3 1	NO X	
					60mL/2 oz Glass	H2SO4 2		
					120mL/4 oz Amber Glass	NaOH 1		
					250mL/8 oz Glass 1	Methanol		
					500mL/16 oz Glass 6	Sodium Bisulfate		
					250mL/8 oz Plastic	ICE X		
					500mL/16 oz Plastic 2			
					1L/32 oz Plastic 1			
					120mL Shrink			

REMARKS / SPECIAL INSTRUCTIONS

MA DEP MCP Data Enhancement Affirmation

- ☑ YES ☐ NO MCP Data Certification required.
- ☐ YES ☑ NO MCP Drinking Water Sample included.

(Require collection of contingent duplicate sample. Trip blanks are also required, if VOA sample collected).

Signature: _____

DATA QUALITY OBJECTIVES

Regulatory Program

State	Standard	Deliverables
☐ CT	☑ MCP GW-1/S-1	☐ PWS Form
☐ ME	☐ MCP GW-2/S-2	☐ MWRA
☑ MA	☐ NY STARS	☐ _____
☐ NH	☐ Drinking Water	
☐ NY	☐ Wastewater	
☐ RI	☐ Waste Disposal	
☐ VT	☐ Dredge Material	
☐ ___	☐ _____	

Project Specific QC

Many regulatory programs and EPA methods require project specific QC. Project specific QC includes Sample Duplicates, Matrix Spikes, and/or Matrix Spike Duplicates. Laboratory QC is not project specific unless prearranged. Project specific QC samples are charged on a per sample basis. **Each MS, MSD and Sample Duplicate requires an additional sample aliquot.**

Project Specific QC Required
- ☐ Sample Duplicate
- ☐ Matrix Spike
- ☐ Matrix Spike Duplicate

Selection of QC Sample
- ☐ Please use sample: _____

CHAIN-OF-CUSTODY RECORD

NOTE: All samples submitted subject to Standard Terms and Conditions on reverse hereof.

Relinquished by Sampler:	Date	Time	Received by:	Receipt Temperature:
[signature]	8/7	11:40	[signature]	☐ Ice ☐ Refrigerated 2-6°C Recommended 5.2
Relinquished by:	Date	Time	Received by:	Container Count:
Relinquished by:	Date	Time	Received by Laboratory:	Shipping/Airbill Number:

Method of Shipment: ☐ GWA Courier ☐ Express Mail ☐ Federal Express ☐ UPS ☐ Hand ☐ _____

Custody Seal Number:

Quality Assurance/Quality Control

A. Program Overview

Groundwater Analytical conducts an active Quality Assurance program to ensure the production of high quality, valid data. This program closely follows the guidance provided by *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans,* US EPA QAMS-005/80 (1980), and *Test Methods for Evaluating Solid Waste,* US EPA, SW-846, Update III (1996).

Quality Control protocols include written Standard Operating Procedures (SOPs) developed for each analytical method. SOPs are derived from US EPA methodologies and other established references. Standards are prepared from commercially obtained reference materials of certified purity, and documented for traceability.

Quality Assessment protocols for most organic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. All samples, standards, blanks, laboratory control samples, matrix spikes and sample duplicates are spiked with internal standards and surrogate compounds. All instrument sequences begin with an initial calibration verification standard and a blank; and excepting GC/MS sequences, all sequences close with a continuing calibration standard. GC/MS systems are tuned to appropriate ion abundance criteria daily, or for each 12 hour operating period, whichever is more frequent.

Quality Assessment protocols for most inorganic analyses include a minimum of one laboratory control sample, one method blank, one matrix spike sample, and one sample duplicate for each sample preparation batch. Standard curves are derived from one reagent blank and four concentration levels. Curve validity is verified by standard recoveries within plus or minus ten percent of the curve.

B. Definitions

Batches are used as the basic unit for Quality Assessment. A Batch is defined as twenty or fewer samples of the same matrix which are prepared together for the same analysis, using the same lots of reagents and the same techniques or manipulations, all within the same continuum of time, up to but not exceeding 24 hours.

Laboratory Control Samples are used to assess the accuracy of the analytical method. A Laboratory Control Sample consists of reagent water or sodium sulfate spiked with a group of target analytes representative of the method analytes. Accuracy is defined as the degree of agreement of the measured value with the true or expected value. Percent Recoveries for the Laboratory Control Samples are calculated to assess accuracy.

Method Blanks are used to assess the level of contamination present in the analytical system. Method Blanks consist of reagent water or an aliquot of sodium sulfate. Method Blanks are taken through all the appropriate steps of an analytical method. Sample data reported is not corrected for blank contamination.

Surrogate Compounds are used to assess the effectiveness of an analytical method in dealing with each sample matrix. Surrogate Compounds are organic compounds which are similar to the target analytes of interest in chemical behavior, but which are not normally found in environmental samples. Percent Recoveries are calculated for each Surrogate Compound.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Sample

Category:	**EPA 8015B Mod TPH**	Instrument ID:	**GC4 HP 5890**
QC Batch ID:	**HF-2056-F**	Extracted:	**08-08-08 01:00**
Matrix:	**Aqueous**	Analyzed:	**08-08-08 13:56**
Units:	**mg/L**	Analyst:	**CL**

Analyte	Spiked	Measured	Recovery	QC Limits
Fuel Oil No. 2	2.0	1.5	**75** %	60 - 140 %

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho-Terphenyl	0.040	0.035	**87** %	60 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified to quantify total petroleum hydrocarbons in the range n-C 9 through n-C 36. Results are quantified on the basis of a series of aromatic and aliphatic hydrocarbons, using 5-alpha-androstane as an internal standard.
Sample extraction performed by EPA Method 3510C.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category:	**EPA 8015B Mod TPH**	Instrument ID:	**GC4 HP 5890**
QC Batch ID:	**HF-2056-F**	Extracted:	**08-08-08 01:00**
Matrix:	**Aqueous**	Analyzed:	**08-08-08 13:01**
		Analyst:	**CL**

Analyte	Concentration	Notes	Units	Reporting Limit
Total Petroleum Hydrocarbons	BRL		mg/L	0.2

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
ortho -Terphenyl	0.040	0.028	**70** %	60 - 140 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified to quantify total petroleum hydrocarbons in the range n-C 9 through n-C 36. Results are quantified on the basis of a series of aromatic and aliphatic hydrocarbons, using 5-alpha-androstane as an internal standard.
Sample extraction performed by EPA Method 3510C.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Laboratory Control Samples

Category: **Inorganics**
Matrix: **Aqueous**
Units: **mg/L**

Sample Type	Method	QC Batch ID	Prep Method	Prepared	Analyzed	Instrument ID	Analyst
LCS	EPA 9012A	TCN-1437-W	EPA 9012A	8/9/2008 0:00	8/9/2008 9:25	Lachat 8000 Autoanalyzer	JR
LCSD	EPA 9012A	TCN-1437-W	EPA 9012A	8/9/2008 0:00	8/9/2008 9:25	Lachat 8000 Autoanalyzer	JR

Analyte	LCS			LCS Duplicate				QC Limits		Method
	Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	LCS	RPD	
Cyanide, Total	0.45	0.49	**110%**	0.45	0.52	**116%**	**3 %**	80-120%	20 %	EPA 9012A

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, Revised (1983), and Methods for the Determination of Metals in Environmental Samples, Supplement I, EPA-600/R-94-111, (1994), and 40 C.F.R. 136, Appendix C (1990).

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Sample

Category: **Inorganic Chemistry**
Matrix: **Aqueous**

Analyte	Units	Spiked	Measured	Recovery	QC Limits	Analyzed	QC Batch	Method	Inst	Analyst
Solids, Total Suspended	mg/L	84	86	**102 %**	80 - 120 %	08-08-08 00:00	TSS-1511-W	SM 2540 D	3	PD
Chlorine, Total Residual	mg/L	1.0	1.1	**105 %**	80 - 120 %	08-07-08 00:00	TRC-0686-W	SM 4500-Cl G	2	LD

Method Reference: Methods for Chemical Analysis of Water and Wastes, US EPA, EPA-600/4-790-020 (Revised 1983), and Methods for the Determination of Inorganic Substances in Environmental Samples, US EPA, EPA/600/R-93/100 (1993), and Standard Methods for the Examination of Water and Wastewater, APHA, Twentieth Edition (1998), and Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

1 Instrument ID: Lachat 8000 Autoanalyzer

2 Instrument ID: Thermo Electron Genesys 20

3 Instrument ID: Mettler AT 200 Balance

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category: **Inorganic Chemistry**
Matrix: **Aqueous**

Analyte	Result	Units	RL	Analyzed	QC Batch	Method	Inst	Analyst
Solids, Total Suspended	BRL	mg/L	2	08-08-08 00:00	TSS-1511-W	SM 2540 D	3	PD
Chlorine, Total Residual	BRL	mg/L	0.2	08-07-08 00:00	TRC-0686-W	SM 4500-Cl G	2	LD
Cyanide, Total	BRL	mg/L	0.01	08-09-08 00:00	TCN-1437-W	EPA 9012A	1	JR

Method Reference: Methods for Chemical Analysis of Water and Wastes, US EPA, EPA-600/4-790-020 (Revised 1983), and Methods for the Determination of Inorganic Substances in Environmental Samples, US EPA, EPA/600/R-93/100 (1993), and Standard Methods for the Examination of Water and Wastewater, APHA, Twentieth Edition (1998), and Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations:

BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

RL Reporting Limit.

1 Instrument ID: Lachat 8000 Autoanalyzer

2 Instrument ID: Thermo Electron Genesys 20

3 Instrument ID: Mettler AT 200 Balance

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	**EPA 8082**	Instrument ID:	**GC-13 Agilent 6890**	Instrument ID:	**GC-13 Agilent 6890**
QC Batch ID:	**PB-2468-F**	Extracted:	**08-08-08 17:00**	Extracted:	**08-08-08 17:00**
Matrix:	**Aqueous**	Cleaned Up:	**08-08-08 20:45**	Cleaned Up:	**08-08-08 20:45**
Units:	**ug/L**	Analyzed:	**08-10-08 19:07**	Analyzed:	**08-10-08 19:31**
		Analyst:	**JXS**	Analyst:	**JXS**

CAS Number	Analyte	LCS					LCS Duplicate							QC Limits	
		Spiked	Measured		Recovery		Spiked	Measured		Recovery		RPD			
			1st Col	2nd Col	1st Col	2nd Col		1st Col	2nd Col	1st Col	2nd Col	1st Col	2nd Col	Spike	RPD
12674-11-2	Aroclor 1016	5.0	4.7	5.0	**94%**	**99%**	5.0	4.2	4.4	**85%**	**88%**	**10 %**	**12 %**	40 - 140%	30 %
11096-82-5	Aroclor 1260	5.0	5.3	4.9	**106%**	**98%**	5.0	5.2	4.7	**104%**	**95%**	**2 %**	**3 %**	40 - 140%	30 %

QC Surrogate Compound	Surrogate Recovery											QC Limits
Tetrachloro-*m* -xylene	0.20	0.16	0.17	**79%**	**83%**	0.20	0.14	0.15	**71%**	**75%**		30 - 150 %
Decachlorobiphenyl	0.20	0.19	0.16	**96%**	**82%**	0.20	0.19	0.16	**94%**	**81%**		30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3510C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category:	**EPA Method 8082**	Instrument ID:	**GC-13 Agilent 6890**
QC Batch ID:	**PB-2468-F**	Extracted:	**08-08-08 17:00**
Matrix:	**Aqueous**	Cleaned Up:	**08-08-08 20:45**
		Analyzed:	**08-10-08 18:43**
		Analyst:	**JXS**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
12674-11-2	Aroclor 1016	BRL		ug/L	0.2
11104-28-2	Aroclor 1221	BRL		ug/L	0.2
11141-16-5	Aroclor 1232	BRL		ug/L	0.2
53469-21-9	Aroclor 1242	BRL		ug/L	0.2
12672-29-6	Aroclor 1248	BRL		ug/L	0.2
11097-69-1	Aroclor 1254	BRL		ug/L	0.2
11096-82-5	Aroclor 1260	BRL		ug/L	0.2
37324-23-5	Aroclor 1262 †	BRL		ug/L	0.2
11100-14-4	Aroclor 1268 †	BRL		ug/L	0.2

QC Surrogate Compound		Spiked	Measured	Recovery	QC Limits
First	Tetrachloro-*m*-xylene	0.20	0.16	**80** %	30 - 150 %
Column	Decachlorobiphenyl	0.20	0.19	**93** %	30 - 150 %
Second	Tetrachloro-*m*-xylene	0.20	0.19	**94** %	30 - 150 %
Column	Decachlorobiphenyl	0.20	0.16	**82** %	30 - 150 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3510C. Cleanup performed by EPA Method 3660B and EPA Method 3665A.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

† Non-target analyte. Result is based on a single mid-range calibration standard.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

Category: **Metals**
Matrix: **Aqueous**
Units: **mg/L**

Sample Type	Method	QC Batch ID	Prep Method	Prepared	Analyzed	Instrument ID	Analyst
LCS	EPA 6010B	MB-3409-WL	EPA 3010A	08-08-08 08:12	08-11-08 13:14	ICP-1 PE 3000	MWR
LCS	EPA 7470A	MP-2124-WL	EPA 7470A	08-11-08 09:30	08-11-08 12:36	CVAA-1 PE FIMS	DT
LCSD	EPA 6010B	MB-3409-WL	EPA 3010A	08-08-08 08:12	08-11-08 13:19	ICP-1 PE 3000	MWR
LCSD	EPA 7470A	MP-2124-WL	EPA 7470A	08-11-08 09:30	08-11-08 12:39	CVAA-1 PE FIMS	DT

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits		Method
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	LCS	RPD	
7440-36-0	Antimony	5.0	5.1	**102%**	5.0	5.2	**104%**	**1 %**	80-120 %	20 %	EPA 6010B
7440-38-2	Arsenic	5.0	5.1	**102%**	5.0	5.2	**104%**	**1 %**	80-120 %	20 %	EPA 6010B
7440-41-7	Beryllium	1.0	1.0	**100%**	1.0	1.0	**100%**	**0 %**	80-120 %	20 %	EPA 6010B
7440-43-9	Cadmium	1.0	1.0	**95%**	1.0	1.0	**98%**	**2 %**	80-120 %	20 %	EPA 6010B
7440-47-3	Chromium	1.0	1.0	**95%**	1.0	1.0	**98%**	**2 %**	80-120 %	20 %	EPA 6010B
7440-50-8	Copper	1.0	1.0	**102%**	1.0	1.0	**104%**	**1 %**	80-120 %	20 %	EPA 6010B
7439-89-6	Iron	5.0	5.0	**101%**	5.0	5.2	**104%**	**1 %**	80-120 %	20 %	EPA 6010B
7439-92-1	Lead	5.0	4.9	**98%**	5.0	5.1	**102%**	**2 %**	80-120 %	20 %	EPA 6010B
7439-97-6	Mercury	0.0010	0.0010	**102%**	0.0010	0.0010	**98%**	**2 %**	80-120 %	20 %	EPA 7470A
7440-02-0	Nickel	1.0	1.0	**102%**	1.0	1.1	**105%**	**1 %**	80-120 %	20 %	EPA 6010B
7782-49-2	Selenium	5.0	5.0	**101%**	5.0	5.1	**103%**	**1 %**	80-120 %	20 %	EPA 6010B
7440-22-4	Silver	1.0	1.0	**102%**	1.0	1.0	**101%**	**0 %**	80-120 %	20 %	EPA 6010B
7440-28-0	Thallium	5.0	4.9	**98%**	5.0	5.0	**100%**	**1 %**	80-120 %	20 %	EPA 6010B
7440-66-6	Zinc	1.0	0.9	**94%**	1.0	1.0	**96%**	**1 %**	80-120 %	20 %	EPA 6010B

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category: **Metals**
Matrix: **Aqueous**

Analysis Method	QC Batch ID	Prep Method	Prepared	Sample Volume	Instrument ID	Analyst
EPA 6010B	MB-3409-WB	EPA 3010A	08-08-08 08:12	50 mL	ICP-1 PE 3000	MWR
EPA 7470A	MP-2124-WB	EPA 7470A	08-11-08 09:30	25 mL	CVAA-1 PE FIMS	DT

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit	DF	Analyzed	Method
7440-36-0	Antimony	BRL		mg/L	0.06	1	08-11-08 13:10	EPA 6010B
7440-38-2	Arsenic	BRL		mg/L	0.01	1	08-11-08 13:10	EPA 6010B
7440-41-7	Beryllium	BRL		mg/L	0.004	1	08-11-08 13:10	EPA 6010B
7440-43-9	Cadmium	BRL		mg/L	0.005	1	08-11-08 13:10	EPA 6010B
7440-47-3	Chromium	BRL		mg/L	0.01	1	08-11-08 13:10	EPA 6010B
7440-50-8	Copper	BRL		mg/L	0.025	1	08-11-08 13:10	EPA 6010B
7439-89-6	Iron	BRL		mg/L	0.1	1	08-11-08 13:10	EPA 6010B
7439-92-1	Lead	BRL		mg/L	0.013	1	08-11-08 13:10	EPA 6010B
7439-97-6	Mercury	BRL		mg/L	0.0002	1	08-11-08 12:36	EPA 7470A
7440-02-0	Nickel	BRL		mg/L	0.04	1	08-11-08 13:10	EPA 6010B
7782-49-2	Selenium	BRL		mg/L	0.05	1	08-11-08 13:10	EPA 6010B
7440-22-4	Silver	BRL		mg/L	0.007	1	08-12-08 12:46	EPA 6010B
7440-28-0	Thallium	BRL		mg/L	0.03	1	08-11-08 13:10	EPA 6010B
7440-66-6	Zinc	BRL		mg/L	0.2	1	08-11-08 13:10	EPA 6010B

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

DF Dilution Factor.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	**EPA Method 8260B**	Instrument ID:	**MS-5 HP 6890**	Instrument ID:	**MS-5 HP 6890**
QC Batch ID:	**VM5-3785-W**	Analyzed:	**08-11-08 09:56**	Analyzed:	**08-11-08 10:37**
Matrix:	**Aqueous**	Analyst:	**LMG**	Analyst:	**LMG**
Units:	**ug/L**				

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
75-71-8	Dichlorodifluoromethane	10	8.0	**80** %	10	8.5	**85** %	**7** %	70 - 130 %	25%
74-87-3	Chloromethane	10	9.0	**90** %	10	9.2	**92** %	**3** %	70 - 130 %	25%
75-01-4	Vinyl Chloride	10	10	**103** %	10	11	**105** %	**2** %	70 - 130 %	25%
74-83-9	Bromomethane	10	9.4	**94** %	10	9.6	**96** %	**2** %	70 - 130 %	25%
75-00-3	Chloroethane	10	10	**100** %	10	10	**100** %	**0** %	70 - 130 %	25%
75-69-4	Trichlorofluoromethane	10	11	**110** %	10	11	**114** %	**3** %	70 - 130 %	25%
60-29-7	Diethyl Ether	20	17	**83** %	20	18	**88** %	**5** %	70 - 130 %	25%
75-35-4	1,1-Dichloroethene	10	11	**106** %	10	11	**110** %	**3** %	70 - 130 %	25%
76-13-1	1,1,2-Trichlorotrifluoroethane	20	25	**126** %	20	28	**138** % q	**9** %	70 - 130 %	25%
67-64-1	Acetone	20	16	**80** %	20	17	**85** %	**7** %	70 - 130 %	25%
75-15-0	Carbon Disulfide	20	17	**86** %	20	17	**86** %	**1** %	70 - 130 %	25%
75-09-2	Methylene Chloride	10	21	**212** % q	10	11	**112** %	**62** % q	70 - 130 %	25%
156-60-5	*trans*-1,2-Dichloroethene	10	10	**104** %	10	10	**100** %	**4** %	70 - 130 %	25%
1634-04-4	Methyl *tert*-butyl Ether (MTBE)	10	8.9	**89** %	10	9.1	**91** %	**2** %	70 - 130 %	25%
75-34-3	1,1-Dichloroethane	10	10	**100** %	10	9.6	**96** %	**5** %	70 - 130 %	25%
594-20-7	2,2-Dichloropropane	10	9.7	**97** %	10	11	**110** %	**13** %	70 - 130 %	25%
156-59-2	*cis*-1,2-Dichloroethene	10	9.5	**95** %	10	9.7	**97** %	**2** %	70 - 130 %	25%
78-93-3	2-Butanone (MEK)	20	18	**90** %	20	19	**94** %	**4** %	70 - 130 %	25%
74-97-5	Bromochloromethane	10	9.4	**94** %	10	9.8	**98** %	**4** %	70 - 130 %	25%
109-99-9	Tetrahydrofuran (THF)	20	17	**86** %	20	18	**88** %	**2** %	70 - 130 %	25%
67-66-3	Chloroform	10	9.5	**95** %	10	9.7	**97** %	**1** %	70 - 130 %	25%
71-55-6	1,1,1-Trichloroethane	10	10	**104** %	10	11	**106** %	**2** %	70 - 130 %	25%
56-23-5	Carbon Tetrachloride	10	11	**109** %	10	11	**108** %	**1** %	70 - 130 %	25%
563-58-6	1,1-Dichloropropene	10	10	**100** %	10	10	**102** %	**1** %	70 - 130 %	25%
71-43-2	Benzene	10	9.8	**98** %	10	9.8	**98** %	**0** %	70 - 130 %	25%
107-06-2	1,2-Dichloroethane	10	9.9	**99** %	10	9.8	**98** %	**1** %	70 - 130 %	25%
79-01-6	Trichloroethene	10	9.9	**99** %	10	9.4	**94** %	**5** %	70 - 130 %	25%
78-87-5	1,2-Dichloropropane	10	9.5	**95** %	10	9.5	**95** %	**0** %	70 - 130 %	25%
74-95-3	Dibromomethane	10	9.2	**92** %	10	9.2	**92** %	**0** %	70 - 130 %	25%
75-27-4	Bromodichloromethane	10	9.9	**99** %	10	10	**101** %	**1** %	70 - 130 %	25%
123-91-1	1,4-Dioxane	200	180	**92** %	200	200	**101** %	**10** %	70 - 130 %	25%
10061-01-5	*cis*-1,3-Dichloropropene	10	8.9	**89** %	10	9.1	**91** %	**2** %	70 - 130 %	25%
108-10-1	4-Methyl-2-Pentanone (MIBK)	20	18	**88** %	20	18	**92** %	**4** %	70 - 130 %	25%
108-88-3	Toluene	10	9.8	**98** %	10	9.9	**99** %	**1** %	70 - 130 %	25%
10061-02-6	*trans*-1,3-Dichloropropene	10	8.9	**89** %	10	9.3	**93** %	**5** %	70 - 130 %	25%
79-00-5	1,1,2-Trichloroethane	10	9.2	**92** %	10	9.8	**98** %	**7** %	70 - 130 %	25%
127-18-4	Tetrachloroethene	10	10	**104** %	10	11	**105** %	**1** %	70 - 130 %	25%
142-28-9	1,3-Dichloropropane	10	9.5	**95** %	10	9.8	**98** %	**3** %	70 - 130 %	25%
591-78-6	2-Hexanone	20	19	**95** %	20	20	**99** %	**5** %	70 - 130 %	25%
124-48-1	Dibromochloromethane	10	9.3	**93** %	10	9.8	**98** %	**6** %	70 - 130 %	25%
106-93-4	1,2-Dibromoethane (EDB)	10	9.4	**94** %	10	9.9	**99** %	**5** %	70 - 130 %	25%
108-90-7	Chlorobenzene	10	9.8	**98** %	10	10	**101** %	**2** %	70 - 130 %	25%
630-20-6	1,1,1,2-Tetrachloroethane	10	9.2	**92** %	10	9.7	**97** %	**5** %	70 - 130 %	25%
100-41-4	Ethylbenzene	10	10	**103** %	10	11	**106** %	**2** %	70 - 130 %	25%
108-38-3/106-42-3	*meta*-Xylene and *para*-Xylene	20	21	**103** %	20	21	**104** %	**1** %	70 - 130 %	25%
95-47-6	*ortho*-Xylene	10	9.8	**98** %	10	10	**102** %	**3** %	70 - 130 %	25%
100-42-5	Styrene	10	9.8	**98** %	10	10	**102** %	**3** %	70 - 130 %	25%
75-25-2	Bromoform	10	9.6	**96** %	10	10	**100** %	**4** %	70 - 130 %	25%
98-82-8	Isopropylbenzene	10	9.5	**95** %	10	9.4	**94** %	**1** %	70 - 130 %	25%

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	**EPA Method 8260B**	Instrument ID:	**MS-5 HP 6890**	Instrument ID:	**MS-5 HP 6890**
QC Batch ID:	**VM5-3785-W**	Analyzed:	**08-11-08 09:56**	Analyzed:	**08-11-08 10:37**
Matrix:	**Aqueous**	Analyst:	**LMG**	Analyst:	**LMG**
Units:	**ug/L**				

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
108-86-1	Bromobenzene	10	10	**101** %	10	10	**100** %	**1** %	70 - 130 %	25%
79-34-5	1,1,2,2-Tetrachloroethane	10	9.2	**92** %	10	9.7	**97** %	**5** %	70 - 130 %	25%
96-18-4	1,2,3-Trichloropropane	10	10	**103** %	10	10	**104** %	**1** %	70 - 130 %	25%
103-65-1	*n*-Propylbenzene	10	11	**108** %	10	11	**107** %	**2** %	70 - 130 %	25%
95-49-8	2-Chlorotoluene	10	10	**101** %	10	9.9	**99** %	**2** %	70 - 130 %	25%
108-67-8	1,3,5-Trimethylbenzene	10	10	**103** %	10	10	**102** %	**1** %	70 - 130 %	25%
106-43-4	4-Chlorotoluene	10	10	**100** %	10	10	**100** %	**1** %	70 - 130 %	25%
98-06-6	*tert*-Butylbenzene	10	10	**104** %	10	10	**102** %	**1** %	70 - 130 %	25%
95-63-6	1,2,4-Trimethylbenzene	10	10	**104** %	10	10	**102** %	**1** %	70 - 130 %	25%
135-98-8	*sec*-Butylbenzene	10	11	**107** %	10	11	**108** %	**1** %	70 - 130 %	25%
541-73-1	1,3-Dichlorobenzene	10	9.9	**99** %	10	9.9	**99** %	**1** %	70 - 130 %	25%
99-87-6	4-Isopropyltoluene	10	11	**107** %	10	11	**108** %	**0** %	70 - 130 %	25%
106-46-7	1,4-Dichlorobenzene	10	9.8	**98** %	10	9.9	**99** %	**1** %	70 - 130 %	25%
95-50-1	1,2-Dichlorobenzene	10	9.7	**97** %	10	9.8	**98** %	**1** %	70 - 130 %	25%
104-51-8	*n*-Butylbenzene	10	11	**108** %	10	11	**111** %	**3** %	70 - 130 %	25%
96-12-8	1,2-Dibromo-3-chloropropane	10	8.9	**89** %	10	9.6	**96** %	**7** %	70 - 130 %	25%
120-82-1	1,2,4-Trichlorobenzene	10	9.8	**98** %	10	10	**103** %	**4** %	70 - 130 %	25%
87-68-3	Hexachlorobutadiene	10	10	**102** %	10	11	**106** %	**4** %	70 - 130 %	25%
91-20-3	Naphthalene	10	9.7	**97** %	10	10	**102** %	**5** %	70 - 130 %	25%
87-61-6	1,2,3-Trichlorobenzene	10	9.9	**99** %	10	10	**103** %	**4** %	70 - 130 %	25%
75-65-0	*tert*-Butyl Alcohol (TBA)	200	150	**73** %	200	160	**82** %	**12** %	70 - 130 %	25%
108-20-3	Di-isopropyl Ether (DIPE)	10	8.4	**84** %	10	8.6	**86** %	**2** %	70 - 130 %	25%
637-92-3	Ethyl *tert*-butyl Ether (ETBE)	10	8.0	**80** %	10	8.2	**82** %	**3** %	70 - 130 %	25%
994-05-8	*tert*-Amyl Methyl Ether (TAME)	10	8.0	**80** %	10	8.3	**83** %	**3** %	70 - 130 %	25%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery		QC Limits
Dibromofluoromethane	10	9	**85** %	10	9	**86** %		70 - 130 %
1,2-Dichloroethane-d_4	10	8	**83** %	10	9	**85** %		70 - 130 %
Toluene-d_8	10	9	**86** %	10	9	**87** %		70 - 130 %
4-Bromofluorobenzene	10	9	**95** %	10	9	**94** %		70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Sample preparation performed by EPA Method 5030B.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

q Recovery outside recommended limits.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category: **EPA Method 8260B**
QC Batch ID: **VM5-3785-W**
Matrix: **Aqueous**

Instrument ID: **MS-5 HP 6890**
Analyzed: **08-11-08 11:17**
Analyst: **LMG**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
75-71-8	Dichlorodifluoromethane	BRL		ug/L	0.5
74-87-3	Chloromethane	BRL		ug/L	0.5
75-01-4	Vinyl Chloride	BRL		ug/L	0.5
74-83-9	Bromomethane	BRL		ug/L	0.5
75-00-3	Chloroethane	BRL		ug/L	0.5
75-69-4	Trichlorofluoromethane	BRL		ug/L	0.5
60-29-7	Diethyl Ether	BRL		ug/L	2
75-35-4	1,1-Dichloroethene	BRL		ug/L	0.5
76-13-1	1,1,2-Trichlorotrifluoroethane	BRL		ug/L	5
67-64-1	Acetone	BRL		ug/L	10
75-15-0	Carbon Disulfide	BRL		ug/L	5
75-09-2	Methylene Chloride	BRL		ug/L	3
156-60-5	*trans*-1,2-Dichloroethene	BRL		ug/L	0.5
1634-04-4	Methyl *tert*-butyl Ether (MTBE)	BRL		ug/L	0.5
75-34-3	1,1-Dichloroethane	BRL		ug/L	0.5
594-20-7	2,2-Dichloropropane	BRL		ug/L	0.5
156-59-2	*cis*-1,2-Dichloroethene	BRL		ug/L	0.5
78-93-3	2-Butanone (MEK)	BRL		ug/L	5
74-97-5	Bromochloromethane	BRL		ug/L	0.5
109-99-9	Tetrahydrofuran (THF)	BRL		ug/L	5
67-66-3	Chloroform	BRL		ug/L	0.5
71-55-6	1,1,1-Trichloroethane	BRL		ug/L	0.5
56-23-5	Carbon Tetrachloride	BRL		ug/L	0.5
563-58-6	1,1-Dichloropropene	BRL		ug/L	0.5
71-43-2	Benzene	BRL		ug/L	0.5
107-06-2	1,2-Dichloroethane	BRL		ug/L	0.5
79-01-6	Trichloroethene	BRL		ug/L	0.5
78-87-5	1,2-Dichloropropane	BRL		ug/L	0.5
74-95-3	Dibromomethane	BRL		ug/L	0.5
75-27-4	Bromodichloromethane	BRL		ug/L	0.5
123-91-1	1,4-Dioxane	BRL		ug/L	500
10061-01-5	*cis*-1,3-Dichloropropene	BRL		ug/L	0.4
108-10-1	4-Methyl-2-Pentanone (MIBK)	BRL		ug/L	5
108-88-3	Toluene	BRL		ug/L	0.5
10061-02-6	*trans*-1,3-Dichloropropene	BRL		ug/L	0.4
79-00-5	1,1,2-Trichloroethane	BRL		ug/L	0.5
127-18-4	Tetrachloroethene	BRL		ug/L	0.5
142-28-9	1,3-Dichloropropane	BRL		ug/L	0.5
591-78-6	2-Hexanone	BRL		ug/L	5
124-48-1	Dibromochloromethane	BRL		ug/L	0.5
106-93-4	1,2-Dibromoethane (EDB)	BRL		ug/L	0.5
108-90-7	Chlorobenzene	BRL		ug/L	0.5
630-20-6	1,1,1,2-Tetrachloroethane	BRL		ug/L	0.5
100-41-4	Ethylbenzene	BRL		ug/L	0.5
108-38-3/106-42-3	*meta*-Xylene and *para*-Xylene	BRL		ug/L	0.5
95-47-6	*ortho*-Xylene	BRL		ug/L	0.5
100-42-5	Styrene	BRL		ug/L	0.5
75-25-2	Bromoform	BRL		ug/L	0.5
98-82-8	Isopropylbenzene	BRL		ug/L	0.5

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category: **EPA Method 8260B**
QC Batch ID: **VM5-3785-W**
Matrix: **Aqueous**
Instrument ID: **MS-5 HP 6890**
Analyzed: **08-11-08 11:17**
Analyst: **LMG**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
108-86-1	Bromobenzene	BRL		ug/L	0.5
79-34-5	1,1,2,2-Tetrachloroethane	BRL		ug/L	0.5
96-18-4	1,2,3-Trichloropropane	BRL		ug/L	0.5
103-65-1	*n*-Propylbenzene	BRL		ug/L	0.5
95-49-8	2-Chlorotoluene	BRL		ug/L	0.5
108-67-8	1,3,5-Trimethylbenzene	BRL		ug/L	0.5
106-43-4	4-Chlorotoluene	BRL		ug/L	0.5
98-06-6	*tert*-Butylbenzene	BRL		ug/L	0.5
95-63-6	1,2,4-Trimethylbenzene	BRL		ug/L	0.5
135-98-8	*sec*-Butylbenzene	BRL		ug/L	0.5
541-73-1	1,3-Dichlorobenzene	BRL		ug/L	0.5
99-87-6	4-Isopropyltoluene	BRL		ug/L	0.5
106-46-7	1,4-Dichlorobenzene	BRL		ug/L	0.5
95-50-1	1,2-Dichlorobenzene	BRL		ug/L	0.5
104-51-8	*n*-Butylbenzene	BRL		ug/L	0.5
96-12-8	1,2-Dibromo-3-chloropropane	BRL		ug/L	0.5
120-82-1	1,2,4-Trichlorobenzene	BRL		ug/L	0.5
87-68-3	Hexachlorobutadiene	BRL		ug/L	0.5
91-20-3	Naphthalene	BRL		ug/L	0.5
87-61-6	1,2,3-Trichlorobenzene	BRL		ug/L	0.5
75-65-0	*tert*-Butyl Alcohol (TBA)	BRL		ug/L	0.5
108-20-3	Di-isopropyl Ether (DIPE)	BRL		ug/L	20
637-92-3	Ethyl *tert*-butyl Ether (ETBE)	BRL		ug/L	0.5
994-05-8	*tert*-Amyl Methyl Ether (TAME)	BRL		ug/L	0.5

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
Dibromofluoromethane	10	9	**89** %	70 - 130 %
1,2-Dichloroethane-d_4	10	9	**88** %	70 - 130 %
Toluene-d_8	10	9	**90** %	70 - 130 %
4-Bromofluorobenzene	10	10	**100** %	70 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample preparation performed by EPA Method 5030B.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	**EPA 8270C (Part 2)**	Instrument ID:	**MS-6 HP 6890**	Instrument ID:	**MS-6 HP 6890**
QC Batch ID:	**SV-2286-F**	Extracted:	**08-11-08 08:00**	Extracted:	**08-11-08 08:00**
Matrix:	**Aqueous**	Analyzed:	**08-11-08 15:28**	Analyzed:	**08-11-08 16:08**
Units:	**ug/L**	Analyst:	**MJB**	Analyst:	**MJB**

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
91-20-3	Naphthalene	5.0	2.8	**56** %	5.0	2.6	**51** %	**8** %	40 - 140 %	25%
91-57-6	2-Methylnaphthalene	5.0	2.5	**50** %	5.0	2.3	**46** %	**7** %	40 - 140 %	25%
208-96-8	Acenaphthylene	5.0	3.0	**60** %	5.0	2.7	**55** %	**9** %	40 - 140 %	25%
83-32-9	Acenaphthene	5.0	2.9	**57** %	5.0	2.6	**53** %	**8** %	40 - 140 %	25%
86-73-7	Fluorene	5.0	3.0	**60** %	5.0	2.7	**54** %	**10** %	40 - 140 %	25%
85-01-8	Phenanthrene	5.0	2.9	**59** %	5.0	2.7	**54** %	**8** %	40 - 140 %	25%
120-12-7	Anthracene	5.0	3.3	**66** %	5.0	3.0	**61** %	**8** %	40 - 140 %	25%
206-44-0	Fluoranthene	5.0	3.1	**62** %	5.0	2.9	**58** %	**7** %	40 - 140 %	25%
129-00-0	Pyrene	5.0	3.2	**64** %	5.0	3.0	**61** %	**6** %	40 - 140 %	25%
56-55-3	Benzo[a]anthracene	5.0	3.5	**70** %	5.0	3.3	**66** %	**7** %	40 - 140 %	25%
218-01-9	Chrysene	5.0	3.4	**67** %	5.0	3.1	**63** %	**7** %	40 - 140 %	25%
205-99-2	Benzo[b]fluoranthene	5.0	3.6	**72** %	5.0	3.4	**67** %	**7** %	40 - 140 %	25%
207-08-9	Benzo[k]fluoranthene	5.0	3.6	**72** %	5.0	3.4	**67** %	**7** %	40 - 140 %	25%
50-32-8	Benzo[a]pyrene	5.0	3.7	**73** %	5.0	3.4	**69** %	**6** %	40 - 140 %	25%
193-39-5	Indeno[1,2,3-c,d]pyrene	5.0	3.6	**72** %	5.0	3.4	**68** %	**6** %	40 - 140 %	25%
53-70-3	Dibenzo[a,h]anthracene	5.0	3.6	**71** %	5.0	3.3	**66** %	**8** %	40 - 140 %	25%
191-24-2	Benzo[g,h,i]perylene	5.0	3.5	**69** %	5.0	3.2	**65** %	**6** %	40 - 140 %	25%
87-68-3	Hexachlorobutadiene	5.0	2.0	**41** %	5.0	1.9	**37** % q	**8** %	40 - 140 %	25%
118-74-1	Hexachlorobenzene	5.0	2.8	**56** %	5.0	2.6	**51** %	**10** %	40 - 140 %	25%
87-86-5	Pentachlorophenol	5.0	3.6	**73** %	5.0	3.4	**68** %	**6** %	30 - 130 %	25%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery		QC Limits
2-Fluorophenol	20	10	**51** %	20	8.9	**45** %		15 - 110 %
Phenol-d5	20	8.9	**45** %	20	7.8	**39** %		15 - 110 %
Nitrobenzene-d5	10	7.2	**72** %	10	6.6	**66** %		30 - 130 %
2-Fluorobiphenyl	10	5.9	**59** %	10	5.2	**52** %		30 - 130 %
2,4,6-Tribromophenol	20	15	**75** %	20	14	**68** %		15 - 110 %
Terphenyl-d14	10	6.3	**63** %	10	5.8	**58** %		30 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3510C.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

q Recovery outside recommended limits.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category:	**EPA Method 8270C (Part 2)**	Instrument ID:	**MS-6 HP 6890**
QC Batch ID:	**SV-2286-F**	Extracted:	**08-11-08 08:00**
Matrix:	**Aqueous**	Analyzed:	**08-11-08 16:49**
		Analyst:	**MJB**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
91-20-3	Naphthalene	BRL		ug/L	0.5
91-57-6	2-Methylnaphthalene	BRL		ug/L	0.5
208-96-8	Acenaphthylene	BRL		ug/L	0.5
83-32-9	Acenaphthene	BRL		ug/L	0.5
86-73-7	Fluorene	BRL		ug/L	0.5
85-01-8	Phenanthrene	BRL		ug/L	0.5
120-12-7	Anthracene	BRL		ug/L	0.5
206-44-0	Fluoranthene	BRL		ug/L	0.5
129-00-0	Pyrene	BRL		ug/L	0.5
56-55-3	Benzo[a]anthracene	BRL		ug/L	0.1
218-01-9	Chrysene	BRL		ug/L	0.1
205-99-2	Benzo[b]fluoranthene	BRL		ug/L	0.1
207-08-9	Benzo[k]fluoranthene	BRL		ug/L	0.1
50-32-8	Benzo[a]pyrene	BRL		ug/L	0.1
193-39-5	Indeno[1,2,3-c,d]pyrene	BRL		ug/L	0.1
53-70-3	Dibenzo[a,h]anthracene	BRL		ug/L	0.1
191-24-2	Benzo[g,h,i]perylene	BRL		ug/L	0.1
87-68-3	Hexachlorobutadiene	BRL		ug/L	0.5
118-74-1	Hexachlorobenzene	BRL		ug/L	0.5
87-86-5	Pentachlorophenol	BRL		ug/L	1.0

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2-Fluorophenol	20	8.6	**43** %	15 - 110 %
Phenol-d5	20	8.0	**40** %	15 - 110 %
Nitrobenzene-d5	10	6.3	**63** %	30 - 130 %
2-Fluorobiphenyl	10	5.3	**53** %	30 - 130 %
2,4,6-Tribromophenol	20	16	**81** %	15 - 110 %
Terphenyl-d14	10	7.0	**71** %	30 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Method modified by use of selected ion monitoring (SIM) in accordance with Section 7.5.5 of the method.
Sample extraction performed by EPA Method 3510C.

Report Notations: BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	**EPA 8270C (Part 1)**	Instrument ID:	**MS-12 Agilent 6890**	Instrument ID:	**MS-12 Agilent 6890**
QC Batch ID:	**SV-2286-F**	Extracted:	**08-11-08 08:00**	Extracted:	**08-11-08 08:00**
Matrix:	**Aqueous**	Analyzed:	**08-11-08 11:46**	Analyzed:	**08-11-08 12:30**
Units:	**ug/L**	Analyst:	**MJB**	Analyst:	**MJB**

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
62-75-9	N-Nitrosodimethylamine	50	34	**68** %	50	33	**66** %	**4** %	40 - 140 %	25%
110-86-1	Pyridine	50	34	**68** %	50	31	**63** %	**9** %	40 - 140 %	25%
108-95-2	Phenol	50	32	**63** %	50	30	**60** %	**5** %	30 - 130 %	25%
62-53-3	Aniline	50	44	**88** %	50	41	**82** %	**7** %	40 - 140 %	25%
111-44-4	Bis(2-chloroethyl) ether	50	42	**84** %	50	40	**80** %	**5** %	40 - 140 %	25%
95-57-8	2-Chlorophenol	50	42	**84** %	50	40	**80** %	**4** %	30 - 130 %	25%
541-73-1	1,3-Dichlorobenzene	50	37	**74** %	50	37	**73** %	**1** %	40 - 140 %	25%
106-46-7	1,4-Dichlorobenzene	50	38	**76** %	50	37	**74** %	**2** %	40 - 140 %	25%
100-51-6	Benzyl Alcohol	50	45	**91** %	50	44	**88** %	**3** %	30 - 130 %	25%
95-50-1	1,2-Dichlorobenzene	50	39	**77** %	50	38	**76** %	**2** %	40 - 140 %	25%
95-48-7	2-Methylphenol	50	44	**89** %	50	42	**85** %	**4** %	30 - 130 %	25%
108-60-1	Bis(2-chloroisopropyl) ether	50	42	**84** %	50	40	**80** %	**5** %	40 - 140 %	25%
106-44-5	4-Methylphenol	50	38	**77** %	50	38	**75** %	**2** %	30 - 130 %	25%
621-64-7	N-Nitrosodi-n-propylamine	50	47	**93** %	50	46	**92** %	**2** %	40 - 140 %	25%
98-86-2	Acetophenone	50	45	**90** %	50	43	**87** %	**3** %	40 - 140 %	25%
67-72-1	Hexachloroethane	50	37	**74** %	50	36	**72** %	**3** %	40 - 140 %	25%
98-95-3	Nitrobenzene	50	43	**85** %	50	41	**82** %	**4** %	40 - 140 %	25%
78-59-1	Isophorone	50	47	**94** %	50	47	**94** %	**1** %	40 - 140 %	25%
88-75-5	2-Nitrophenol	50	45	**90** %	50	44	**87** %	**3** %	30 - 130 %	25%
105-67-9	2,4-Dimethylphenol	50	43	**86** %	50	42	**84** %	**2** %	30 - 130 %	25%
111-91-1	Bis(2-chloroethoxy) methane	50	45	**89** %	50	44	**87** %	**2** %	40 - 140 %	25%
120-83-2	2,4-Dichlorophenol	50	45	**91** %	50	44	**88** %	**3** %	30 - 130 %	25%
120-82-1	1,2,4-Trichlorobenzene	50	40	**80** %	50	39	**78** %	**2** %	40 - 140 %	25%
106-47-8	4-Chloroaniline	50	48	**95** %	50	46	**91** %	**4** %	40 - 140 %	25%
87-68-3	Hexachlorobutadiene	50	39	**77** %	50	38	**76** %	**2** %	40 - 140 %	25%
59-50-7	4-Chloro-3-methylphenol	50	50	**99** %	50	50	**99** %	**0** %	30 - 130 %	25%
77-47-4	Hexachlorocyclopentadiene	50	42	**83** %	50	39	**79** %	**6** %	40 - 140 %	25%
88-06-2	2,4,6-Trichlorophenol	50	51	**102** %	50	51	**102** %	**0** %	30 - 130 %	25%
95-95-4	2,4,5-Trichlorophenol	50	52	**104** %	50	53	**106** %	**2** %	30 - 130 %	25%
91-58-7	2-Chloronaphthalene	50	48	**97** %	50	47	**95** %	**2** %	40 - 140 %	25%
88-74-4	2-Nitroaniline	50	53	**107** %	50	52	**105** %	**1** %	40 - 140 %	25%
100-25-4	1,4-Dinitrobenzene	50	54	**109** %	50	54	**109** %	**0** %	40 - 140 %	25%
131-11-3	Dimethyl phthalate	50	53	**105** %	50	52	**104** %	**1** %	40 - 140 %	25%
99-65-0	1,3-Dinitrobenzene	50	54	**109** %	50	54	**108** %	**0** %	40 - 140 %	25%
606-20-2	2,6-Dinitrotoluene	50	53	**107** %	50	52	**105** %	**2** %	40 - 140 %	25%
528-29-0	1,2-Dinitrobenzene	50	51	**103** %	50	50	**101** %	**2** %	40 - 140 %	25%
99-09-2	3-Nitroaniline	50	58	**116** %	50	57	**115** %	**1** %	40 - 140 %	25%
51-28-5	2,4-Dinitrophenol	50	37	**74** %	50	41	**81** %	**9** %	30 - 130 %	25%
100-02-7	4-Nitrophenol	50	37	**75** %	50	37	**75** %	**0** %	30 - 130 %	25%
132-64-9	Dibenzofuran	50	50	**99** %	50	49	**99** %	**1** %	40 - 140 %	25%
121-14-2	2,4-Dinitrotoluene	50	56	**112** %	50	56	**111** %	**1** %	40 - 140 %	25%
84-66-2	Diethyl phthalate	50	53	**106** %	50	53	**105** %	**1** %	40 - 140 %	25%
7005-72-3	4-Chlorophenyl phenyl ether	50	50	**99** %	50	49	**99** %	**1** %	40 - 140 %	25%
100-01-6	4-Nitroaniline	50	63	**125** %	50	62	**124** %	**1** %	40 - 140 %	25%
534-52-1	4,6-Dinitro-2-methylphenol	50	45	**90** %	50	47	**95** %	**5** %	30 - 130 %	25%
86-30-6	N-Nitrosodiphenylamine †	50	62	**123** %	50	62	**124** %	**1** %	40 - 140 %	25%
122-66-7	1,2-Diphenylhydrazine à	50	50	**101** %	50	51	**103** %	**2** %	40 - 140 %	25%
101-55-3	4-Bromophenyl phenyl ether	50	50	**101** %	50	51	**102** %	**1** %	40 - 140 %	25%

GROUNDWATER ANALYTICAL

Quality Control Report
Laboratory Control Samples

		LCS		LCSD	
Category:	**EPA 8270C (Part 1)**	Instrument ID:	**MS-12 Agilent 6890**	Instrument ID:	**MS-12 Agilent 6890**
QC Batch ID:	**SV-2286-F**	Extracted:	**08-11-08 08:00**	Extracted:	**08-11-08 08:00**
Matrix:	**Aqueous**	Analyzed:	**08-11-08 11:46**	Analyzed:	**08-11-08 12:30**
Units:	**ug/L**	Analyst:	**MJB**	Analyst:	**MJB**

CAS Number	Analyte	LCS			LCS Duplicate				QC Limits	
		Spiked	Measured	Recovery	Spiked	Measured	Recovery	RPD	Spike	RPD
86-74-8	Carbazole	50	55	**110** %	50	56	**113** %	**3** %	40 - 140 %	25%
84-74-2	Di-*n*-butyl phthalate	50	51	**102** %	50	52	**103** %	**1** %	40 - 140 %	25%
85-68-7	Butyl benzyl phthalate	50	54	**108** %	50	54	**108** %	**1** %	40 - 140 %	25%
91-94-1	3,3'-Dichlorobenzidine	50	71	**143** % q	50	72	**145** % q	**1** %	40 - 140 %	25%
117-81-7	Bis(2-ethylhexyl) phthalate	50	54	**108** %	50	55	**110** %	**2** %	40 - 140 %	25%
117-84-0	Di-*n*-octyl phthalate	50	51	**102** %	50	52	**104** %	**1** %	40 - 140 %	25%

QC Surrogate Compound	Spiked	Measured	Recovery	Spiked	Measured	Recovery		QC Limits
2-Fluorophenol	20	12	**62** %	20	12	**58** %		15 - 110 %
Phenol-d5	20	11	**56** %	20	11	**53** %		15 - 110 %
Nitrobenzene-d5	10	8.1	**81** %	10	7.7	**77** %		30 - 130 %
2-Fluorobiphenyl	10	9.2	**92** %	10	9.0	**90** %		30 - 130 %
2,4,6-Tribromophenol	20	20	**98** %	20	19	**96** %		15 - 110 %
Terphenyl-d14	10	9.4	**94** %	10	9.4	**94** %		30 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996). Sample extraction performed by EPA Method 3510C.

Report Notations: All calculations performed prior to rounding. Quality Control Limits are defined by the methodology, or alternatively based upon the historical average recovery plus or minus three standard deviation units.

† Reported as sum of N-Nitrosodiphenylamine and Diphenylamine.

◊ Analyzed as Azobenzene.

q Recovery outside recommended limits.

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category: **EPA Method 8270C (Part 1)**
QC Batch ID: **SV-2286-F**
Matrix: **Aqueous**

Instrument ID: **MS-12 Agilent 6890**
Extracted: **08-11-08 08:00**
Analyzed: **08-11-08 13:13**
Analyst: **MJB**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
62-75-9	N-Nitrosodimethylamine	BRL		ug/L	5
110-86-1	Pyridine	BRL		ug/L	5
108-95-2	Phenol	BRL		ug/L	5
62-53-3	Aniline	BRL		ug/L	5
111-44-4	Bis(2-chloroethyl) ether	BRL		ug/L	5
95-57-8	2-Chlorophenol	BRL		ug/L	5
541-73-1	1,3-Dichlorobenzene	BRL		ug/L	5
106-46-7	1,4-Dichlorobenzene	BRL		ug/L	5
100-51-6	Benzyl Alcohol	BRL		ug/L	5
95-50-1	1,2-Dichlorobenzene	BRL		ug/L	5
95-48-7	2-Methylphenol	BRL		ug/L	5
108-60-1	Bis(2-chloroisopropyl) ether	BRL		ug/L	5
108-39-4/106-44-5	3 and 4-Methylphenol *	BRL		ug/L	5
621-64-7	N-Nitrosodi-n-propylamine	BRL		ug/L	5
98-86-2	Acetophenone	BRL		ug/L	5
67-72-1	Hexachloroethane	BRL		ug/L	5
98-95-3	Nitrobenzene	BRL		ug/L	5
78-59-1	Isophorone	BRL		ug/L	5
88-75-5	2-Nitrophenol	BRL		ug/L	5
105-67-9	2,4-Dimethylphenol	BRL		ug/L	5
111-91-1	Bis(2-chloroethoxy) methane	BRL		ug/L	5
120-83-2	2,4-Dichlorophenol	BRL		ug/L	5
120-82-1	1,2,4-Trichlorobenzene	BRL		ug/L	5
106-47-8	4-Chloroaniline	BRL		ug/L	5
87-68-3	Hexachlorobutadiene	BRL		ug/L	5
59-50-7	4-Chloro-3-methylphenol	BRL		ug/L	5
77-47-4	Hexachlorocyclopentadiene	BRL		ug/L	5
88-06-2	2,4,6-Trichlorophenol	BRL		ug/L	5
95-95-4	2,4,5-Trichlorophenol	BRL		ug/L	5
91-58-7	2-Chloronaphthalene	BRL		ug/L	5
88-74-4	2-Nitroaniline	BRL		ug/L	5
100-25-4	1,4-Dinitrobenzene	BRL		ug/L	5
131-11-3	Dimethyl phthalate	BRL		ug/L	5
99-65-0	1,3-Dinitrobenzene	BRL		ug/L	5
606-20-2	2,6-Dinitrotoluene	BRL		ug/L	5
528-29-0	1,2-Dinitrobenzene	BRL		ug/L	5
99-09-2	3-Nitroaniline	BRL		ug/L	5
51-28-5	2,4-Dinitrophenol	BRL		ug/L	10
100-02-7	4-Nitrophenol	BRL		ug/L	5
132-64-9	Dibenzofuran	BRL		ug/L	5
121-14-2	2,4-Dinitrotoluene	BRL		ug/L	5
84-66-2	Diethyl phthalate	BRL		ug/L	5
7005-72-3	4-Chlorophenyl phenyl ether	BRL		ug/L	5
100-01-6	4-Nitroaniline	BRL		ug/L	5
534-52-1	4,6-Dinitro-2-methylphenol	BRL		ug/L	5

GROUNDWATER ANALYTICAL

Quality Control Report
Method Blank

Category: **EPA Method 8270C (Part 1)**
QC Batch ID: **SV-2286-F**
Matrix: **Aqueous**

Instrument ID: **MS-12 Agilent 6890**
Extracted: **08-11-08 08:00**
Analyzed: **08-11-08 13:13**
Analyst: **MJB**

CAS Number	Analyte	Concentration	Notes	Units	Reporting Limit
86-30-6	N-Nitrosodiphenylamine †	BRL		ug/L	5
122-66-7	1,2-Diphenylhydrazine ◊	BRL		ug/L	5
101-55-3	4-Bromophenyl phenyl ether	BRL		ug/L	5
86-74-8	Carbazole	BRL		ug/L	5
84-74-2	Di-*n*-butyl phthalate	BRL		ug/L	5
85-68-7	Butyl benzyl phthalate	BRL		ug/L	5
91-94-1	3,3'-Dichlorobenzidine	BRL		ug/L	5
117-81-7	Bis(2-ethylhexyl) phthalate	BRL		ug/L	5
117-84-0	Di-*n*-octyl phthalate	BRL		ug/L	5

QC Surrogate Compound	Spiked	Measured	Recovery	QC Limits
2-Fluorophenol	20	9	**44** %	15 - 110 %
Phenol-d5	20	8	**42** %	15 - 110 %
Nitrobenzene-d5	10	6	**60** %	30 - 130 %
2-Fluorobiphenyl	10	7	**65** %	30 - 130 %
2,4,6-Tribromophenol	20	14	**69** %	15 - 110 %
Terphenyl-d14	10	9	**91** %	30 - 130 %

Method Reference: Test Methods for Evaluating Solid Waste, US EPA, SW-846, Third Edition, Update III (1996).
Sample extraction performed by EPA Method 3510C.

Report Notations:
BRL Indicates concentration, if any, is below reporting limit for analyte. Reporting limit is the lowest concentration that can be reliably quantified under routine laboratory operating conditions. Reporting limits are adjusted for sample size and dilution.

* Analyzed as 4-Methylphenol.

† Reported as sum of N-Nitrosodiphenylamine and Diphenylamine.

◊ Analyzed as Azobenzene.

GROUNDWATER ANALYTICAL

Certifications and Approvals

Groundwater Analytical maintains environmental laboratory certification in a variety of states.
Copies of our current certificates may be obtained from our website:

http://www.groundwateranalytical.com/qualifications.htm

MASSACHUSETTS

Department of Environmental Protection, M-MA-103 — Potable Water and Non-Potable Water
http://public.dep.state.ma.us/labcert/labcert.aspx

Department of Labor,
Division of Occupational Safety, AA000195 — Asbestos Analytical Services, Class A
http://www.mass.gov/dos/forms/la-rpt list aa.pdf

NEW YORK

Department of Health, 11754 — Potable Water, Non-Potable Water, Solid and Hazardous Waste
http://www.wadsworth.org/labcert/elap/comm.html

NIST NATIONAL VOLUNTARY LABORATORY ACCREDITATION PROGRAM (NVLAP)

NVLAP Lab Code 200751-1 — Bulk Asbestos Fiber Analysis (PLM)
http://ts.nist.gov/Standards/scopes/plmtm.htm

RHODE ISLAND

Department of Health,
Division of Laboratories, LAO00054 — Potable and Non-Potable Water Microbiology, Organic and Inorganic Chemistry
http://www.health.ri.gov/labs/outofstatelabs.pdf

U.S. DEPARTMENT OF AGRICULTURE

USDA, Soil Permit, S-53921 — Foreign soil import permit

GROUNDWATER ANALYTICAL

Certifications and Approvals

MASSACHUSETTS **Department of Environmental Protection, M-MA-103**

Groundwater Analytical maintains MassDEP environmental laboratory certification for only the methods and analytes listed below. Analyses for certified analytes are conducted in accordance with MassDEP certification standards, except as may be specifically noted in the project narrative.

Potable Water (Drinking Water)

Analyte	Method
1,2-Dibromo-3-Chloropropane	EPA 504.1
1,2-Dibromoethane	EPA 504.1
Alkalinity, Total	SM 2320-B
Antimony	EPA 200.9
Arsenic	EPA 200.9
Barium	EPA 200.7
Beryllium	EPA 200.7
Cadmium	EPA 200.7
Calcium	EPA 200.7
Chlorine, Residual Free	SM 4500-CL-G
Chromium	EPA 200.7
Copper	EPA 200.7
Cyanide, Total	Lachat 10-204-00-1-A
E. Coli (Treatment and Distribution)	EC-MUG SM 9221-F
E. Coli (Treatment and Distribution)	Enz. Sub. SM 9223
E. Coli (Treatment and Distribution)	NA-MUG SM 9222-G
Fecal Coliform (Source Water)	MF SM 9222-D
Fluoride	EPA 300.0
Fluoride	SM 4500-F-C
Heterotrophic Plate Count (Source Water)	SM 9215-B
Lead	EPA 200.9
Mercury	EPA 245.1
Nickel	EPA 200.7
Nitrate-N	EPA 300.0
Nitrate-N	Lachat 10-107-04-1-C
Nitrite-N	EPA 300.0
Nitrite-N	Lachat 10-107-04-1-C
pH	SM 4500-H-B
Selenium	EPA 200.9
Silver	EPA 200.7
Sodium	EPA 200.7
Sulfate	EPA 300.0
Thallium	EPA 200.9
Total Coliform (Treatment and Distribution)	Enz. Sub. SM 9223
Total Coliform (Treatment and Distribution)	MF SM 9222-B
Total Dissolved Solids	SM 2540-C
Trihalomethanes	EPA 524.2
Turbidity	SM 2130-B
Volatile Organic Compounds	EPA 524.2

Non-Potable Water (Wastewater)

Analyte	Method
Aldrin	EPA 608
Alkalinity, Total	Lachat 10-303-31-1-A
Aluminum	EPA 200.7
Ammonia-N	Lachat 10-107-06-1-B
Antimony	EPA 200.7
Antimony	EPA 200.9
Arsenic	EPA 200.7
Arsenic	EPA 200.9
Beryllium	EPA 200.7
Biochemical Oxygen Demand	SM 5210-B
Cadmium	EPA 200.7
Calcium	EPA 200.7

Non-Potable Water (Wastewater)

Analyte	Method
Chemical Oxygen Demand	SM 5220-D
Chlordane	EPA 608
Chloride	EPA 300.0
Chlorine, Total Residual	SM 4500-CL-G
Chromium	EPA 200.7
Cobalt	EPA 200.7
Copper	EPA 200.7
Copper	EPA 200.9
Cyanide, Total	Lachat 10-204-00-1-A
DDD	EPA 608
DDE	EPA 608
DDT	EPA 608
Dieldrin	EPA 608
Fluoride	EPA 300.0
Hardness (CaCO3), Total	EPA 200.7
Hardness (CaCO3), Total	SM 2340-B
Heptachlor	EPA 608
Heptachlor Epoxide	EPA 608
Iron	EPA 200.7
Kjeldahl-N	Lachat 10-107-06-02-D
Lead	EPA 200.7
Lead	EPA 200.9
Magnesium	EPA 200.7
Manganese	EPA 200.7
Mercury	EPA 245.1
Molybdenum	EPA 200.7
Nickel	EPA 200.7
Nitrate-N	EPA 300.0
Nitrate-N	Lachat 10-107-04-1-C
Non-Filterable Residue	SM 2540-D
Oil and Grease	EPA 1664
Orthophosphate	Lachat 10-115-01-1-A
pH	SM 4500-H-B
Phenolics, Total	EPA 420.4
Phenolics, Total	Lachat 10-210-00-1-B
Phosphorus, Total	Lachat 10-115-01-1-C
Phosphorus, Total	SM 4500-P-B,E
Polychlorinated Biphenyls (Oil)	EPA 600/4-81-045
Polychlorinated Biphenyls (Water)	EPA 608
Potassium	EPA 200.7
Selenium	EPA 200.7
Selenium	EPA 200.9
Silver	EPA 200.7
Sodium	EPA 200.7
Specific Conductivity	SM 2510-B
Strontium	EPA 200.7
Sulfate	EPA 300.0
Thallium	EPA 200.7
Thallium	EPA 200.9
Titanium	EPA 200.7
Total Dissolved Solids	SM 2540-C
Total Organic Carbon	SM 5310-B
Vanadium	EPA 200.7
Volatile Aromatics	EPA 602
Volatile Aromatics	EPA 624
Volatile Halocarbons	EPA 624
Zinc	EPA 200.7