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NWS EARLE  
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POST-EXCAVATION SAMPLE RESULTS SECOND ROUND SITE 12 FORMER BATTERY  
STORAGE AREA NWS EARLE NJ  
11/8/1999  
FOSTER WHEELER ENVIRONMENTAL CORPORATION

CONTRACTOR DRAWINGS & INFORMATION SUBMITTAL  
NORTHNAVFACENCOM 4335/3 (Rev. 6/80)

Prepare in quintuplicate (original and 4 copies)  
CONTROL NO 74

CONTRACT NO. <b>N62472-94-D-0398</b>	DELIVERY ORDER # <b>0034</b>	ACTIVITY LOCATION <b>Naval Weapons Station (NWS) @ Earle, Colts Neck, NJ</b>
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PROJECT TITLE:  
**BATTERY STORAGE AREA - SITE 12**

FROM: <b>Foster Wheeler Environmental Corp. Program QC Manager: Mark Miller</b>	DATE November 8, 1999
TO: <b>W FAUSTMAN (3 COPIES)</b>	DATE November 8, 1999

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FOR COMMANDING OFFICER, NORTHERN DIVISION NAVAL  
FACILITIES ENGINEERING COMMAND

DATE

ITEM NO.	SUBMITTAL DESCRIPTION	PREPARED/ SUBMITTED BY	APPROVED	DISAPPROVED	REMARKS
99	SD-12, Field Test Report; Confirmatory Soil Sample Report (2 <sup>nd</sup> Round)	M. Miller			

**SITE 12 -FORMER BATTERY STORAGE AREA  
SECOND ROUND  
POST-EXCAVATION SAMPLE RESULTS  
NAVAL WEAPONS STATION - EARLE  
COLTS NECK, NEW JERSEY**

*Issued:*

November 8, 1999

*Prepared for:*

**Naval Facilities Engineering Command  
10 Industrial Highway  
Lester, PA 19113**

*Prepared by:*

**FOSTER WHEELER ENVIRONMENTAL CORPORATION  
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Langhorne, PA 19047 - 1829**

**REMEDIAL ACTION CONTRACT N62472-94-D-0398  
DELIVERY ORDER NO. 0034**

<u>Revision</u>	<u>Date</u>	<u>Prepared By:</u>	<u>Approved By:</u>	<u>Pages Affected</u>
1	November 8, 1999	M. Heffron		All

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## **1.0 INTRODUCTION**

This report summarizes the analytical results of the second-round of confirmatory (post-excavation) soil samples obtained from Site 12. Site 12, a former battery storage area, is located at the Navy Weapons Station-Earle facility in Leonardo, New Jersey. Based on the first round of laboratory analytical results of the post excavation samples, additional excavation activities occurred at Site 12 on November 2, 1999.

The laboratory analyses of four confirmatory soil samples collected after the initial excavation revealed concentrations of arsenic above the New Jersey Department of Environmental Protection (NJDEP) Residential Clean-Up Criteria. Samples SS08-99-1, SS11D-99-1, SS12-99-1, and SS14-99-1 contained concentrations of arsenic ranging from 22.9 to 32.0 parts per million (ppm). The NJDEP Residential Cleanup Criteria for arsenic is 20 ppm. These areas were re-excavated and additional confirmatory soil samples were obtained and analyzed for metals.

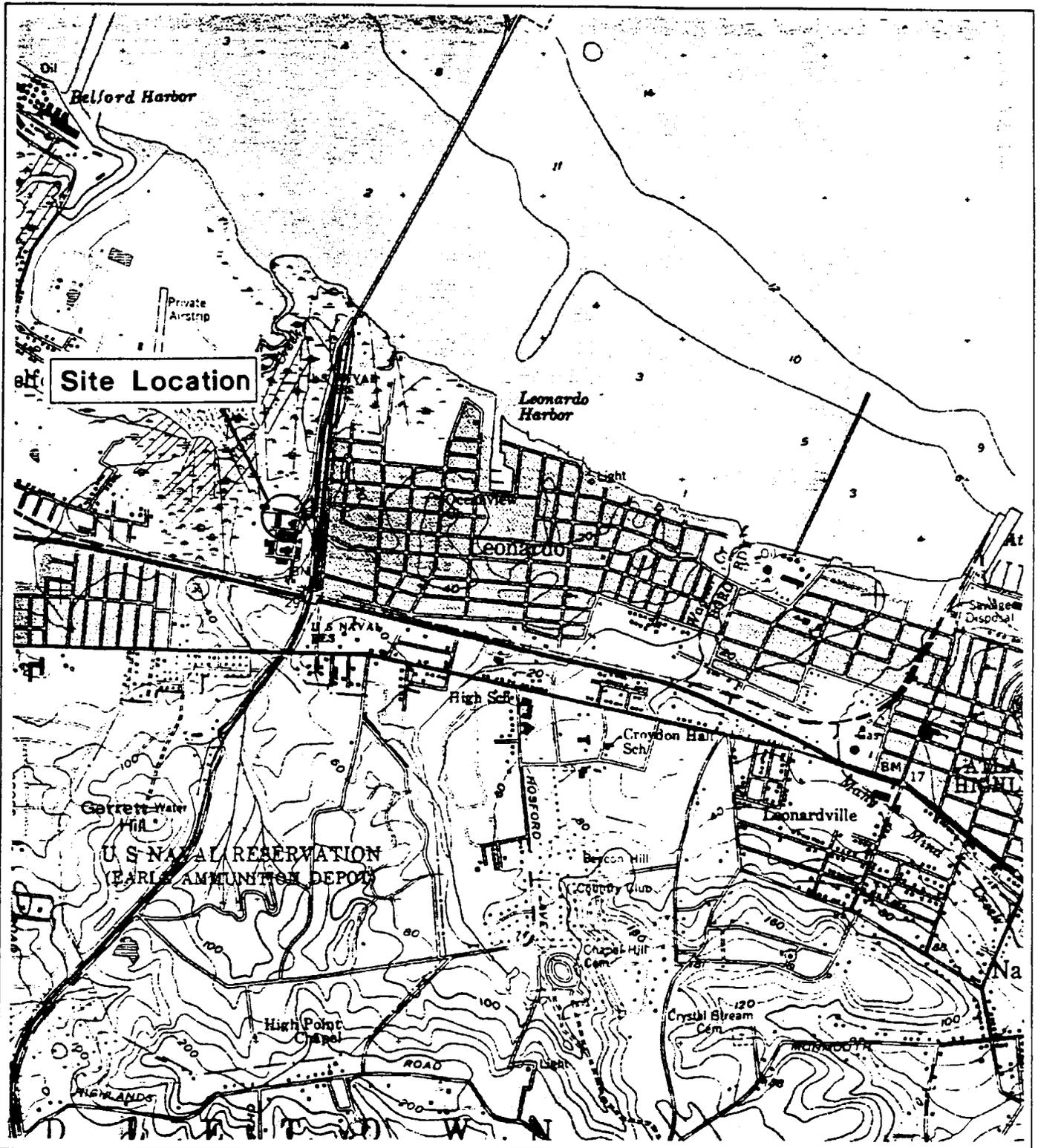
The original confirmatory soil samples collected were also analyzed for TPH. While all the sample concentrations were below the NJDEP Cleanup Criteria for TPH of 10,000 ppm, Sample 12SS08-99-1 had a concentration of 1,100 ppm. As per the New Jersey Technical Requirements for Site Remediation require, a sample must be collected and analyzed for Volatile Organic Compounds (VOCs) if a sample from the location in question exceeds 1,000 ppm for TPH. This area was re-excavated, for the arsenic concentrations discussed above, and the soil was also sampled for VOCs.

The location of Site 12 on the facility is shown on Figure 1, Site Location Map. Figure 2, Site Layout Map, details Site 12. The limits of excavation and the locations of the soil samples are shown on Figure 3.

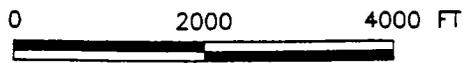
## **2.0 ADDITIONAL SOIL EXCAVATION**

Additional soils were excavated in and around the four areas that contained arsenic concentrations above the NJDEP Residential Cleanup Criteria. Approximately one ton of soil was removed from the areas around soil sample locations: 12SS08, 12SS11, 12SS12, and 12SS14. These soils were excavated and stockpiled with the other soils. The area at 12SS08 was excavated an additional 6-feet to the east down to a depth of approximately 2-feet. The area by 12SS11 was excavated from the original 2-foot depth to 4 feet below grade. The area by 12SS12 was excavated from the original 2.5-foot depth to 4-feet below grade. The area by 12SS14 was excavated an additional 2-feet to the north at the original depth of 2-feet.

Additional confirmatory soil samples were collected at the areas immediately after re-excavation.



Site Location



Source: U.S.G.S. Topographic Maps (7.5 Minute)  
Sandy Hook, NJ Quadrangle

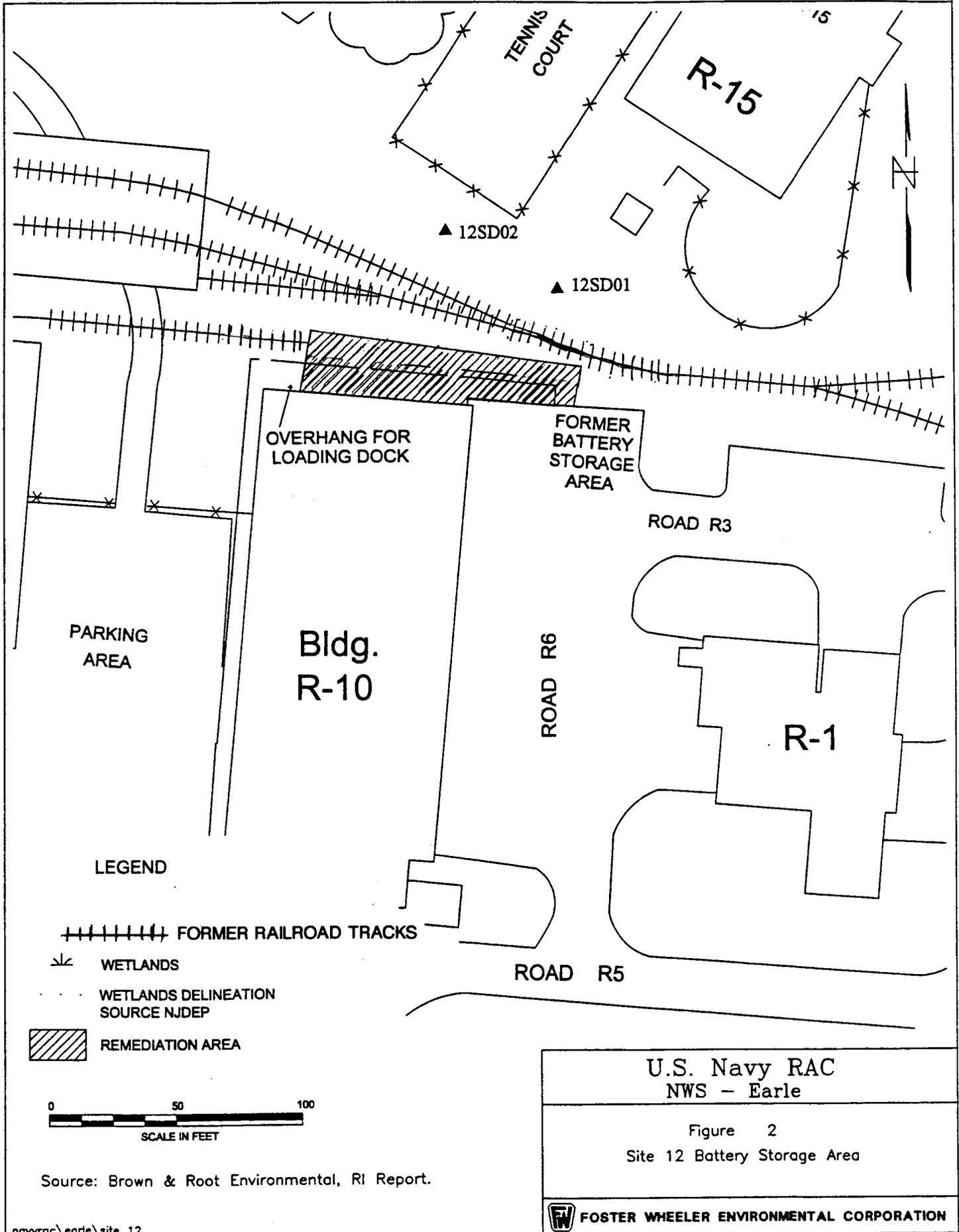


QUADRANGLE  
LOCATION

NWS - Earle  
Colts Neck, N.J.

Figure 1  
Site 12

**F** FOSTER WHEELER ENVIRONMENTAL CORPORATION



Source: Brown & Root Environmental, RI Report.



### **3.0 SAMPLE COLLECTION and ANALYSIS**

The second round of confirmatory soil samples were obtained after the additional excavation activities were complete. The soil samples were labeled to depict the second round sampling at that location (12SS08-99-02). The ...99-02 portion of the sample identifier signifies that this was the second sample taken at this location.

Refer to Appendix A for samples descriptions and analytical results. All samples were sent to ChemTech Laboratory, Englewood, New Jersey. Appendix A includes the laboratory analytical data for the confirmatory samples discussed in this report.

Confirmatory samples were analyzed for TAL Metals. Confirmatory sample results for Metals were compared to the NJDEP Residential Direct Contact Soil Cleanup Criteria (NJDEP Cleanup Criteria). Two of the four areas re-excavated and sampled still revealed concentrations of arsenic above the NJDEP Cleanup Criteria. Soil sample 12SS12-99-02 contained arsenic at a concentration of 27.67 ppm, and soil sample 12SS08-99-02 contained arsenic at a concentration of 25.69 ppm. The NJDEP Cleanup Criteria for arsenic is 20 ppm.

The other two areas re-excavated and sampled revealed arsenic concentrations below the NJDEP Cleanup Criteria. Soil sample 12SS1-99-02 contained arsenic at a concentration of 19.19 and soil sample 12SS14-99-02 contained an arsenic concentration of 12.56 ppm. Appendix A contains the complete laboratory report.

The VOC analyses of soil sample 12SS08-99-02 revealed no concentrations of volatile organics. Appendix A contains the complete laboratory data sheet. This area was sampled for VOCs since the original confirmatory soil sample (12SS08-99-01) had a TPH concentration greater than 1,000 ppm.

### **4.0 CONCLUSION**

The analytical data indicate that two areas still contain concentrations of arsenic above the NJDEP Residential Cleanup Criteria. The two soil samples were lithologically different, but appeared to be naturally occurring soils with no visible contamination. Soil sample 12SS08-99-02 was a light brown sandy soil with some clay and sample 12SS12-99-02 was a dense, dark-gray clay. Since the other soils in the excavation contained concentrations of arsenic below 20 ppm, it is assumed that if additional soils are excavated and the area re-sampled the arsenic levels can be lowered to below the NJDEP Cleanup Criteria. The additional soils shall be excavated and the soils re-sampled upon Navy concurrence.

**APPENDIX A**

**LABORATORY ANALYTICAL DATA**

Foster Wheeler Environmental Corporation  
NWS-Earle  
Site 12 Soil Sample Description

SAMPLE ID	date collected	time	SAMPLE TYPE	APPROXIMATE DEPTH (feet bgs)	SOIL DECRPTION
12SS08-99-02	11/2/99	10:15	SIDEWALL	2.5	Light brown, silty sand with some clay
12SS11-99-02	11/2/99	10:48	BOTTOM	4.0	Dense, dark-gray clay
12SS12-99-02	11/2/99	11:05	SIDEWALL	4.0	Dense, dark-gray clay
12SS14-99-02	11/2/99	11:20	SIDEWALL	2.0	brown silty fine sand

TABLE 2

Foster Wheeler Environmental Corporation  
NWS-EARLE  
Site 12 Confirmatory Soil Sample Analytical Results  
TAL Metals

SAMPLE ID		12SS08-99-02	12SS11-99-02	12SS12-99-02	12SS14-99-02
LAB ID	Residential	92499	92500	92501	92502
DATE COLLECTED	Direct Contact	11/2/1999	11/2/1999	11/2/1999	11/2/1999
LOCATION	Soil Cleanup	SIDEWALL	BOTTOM	SIDEWALL	SIDEWALL
MATRIX	Criteria	soil	soil	soil	soil
UNITS	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
DEPTH BGS (ft)		2.5	4.0	4.0	2.0
COMMENTS		POST-EX	POST-EX	POST-EX	POST-EX
Aluminum	NA	N/A	N/A	N/A	N/A
Antimony	14	N/A	U	N/A	N/A
Arsenic	20	25.69	19.19	27.67	12.56
Barium	700	26.05	ND	19.3	14.88
Beryllium	2	N/A	N/A	N/A	N/A
Cadmium	39	ND	U	ND	N/A
Calcium	NA	N/A	N/A	N/A	N/A
Chromium	240	36.61	42.3	12.62	28.95
Cobalt	NA	N/A	N/A	N/A	N/A
Copper	600	3.6	7.58	10.44	29.07
Iron	NA	N/A	N/A	N/A	N/A
Lead	400	8.16	12.22	18.81	14.42
Magnesium	NA	N/A	N/A	N/A	N/A
Manganese	NA	N/A	N/A	N/A	N/A
Mercury	14	0.048	U	0.073	0.07
Nickel	250	7.2	7.58	5.2	4.07
Potassium	NA	N/A	N/A	N/A	N/A
Selenium	63	0.48	1.1	1.46	0.81
Silver	110	ND	U	ND	ND
Sodium	NA	N/A	N/A	N/A	N/A
Thallium	2	N/A	U	N/A	N/A
Vanadium	370	N/A	N/A	N/A	N/A
Zinc	1500	31.69	34.84	24.39	34.19

U-concentration is less than detection limit.  
NA-not applicable

# CHEMTECH

## CHAIN OF CUSTODY RECORD

110 Route 4  
Englewood, NJ 07631  
(201) 567-6868  
Fax (201) 567-1333

205 Campus Plaza 1  
Edison, NJ 08837  
(732) 225-4111  
Fax (732) 225-4110

515 Route 9 South  
Barnegat, NJ 08005  
(609) 698-0199  
Fax (609) 698-0910

CHEMTECH JOB NO.:

15460NJ

CHEMTECH QUOTE NO.:

### CLIENT INFORMATION

REPORT TO BE SENT TO:

COMPANY: FOSTER WHEELER ENVIRON. CO.  
ADDRESS: ONE OXFORD VALLEY, SUITE 200  
CITY: LANGHORNE STATE: PA ZIP: 19047  
ATTENTION: MIKE HEFFRON  
(615) (615)  
PHONE: 703-4015 FAX: 703-4045

### PROJECT INFORMATION

PROJECT NAME: NAVAL WEAPONS ST. EARLE  
PROJECT NO.: SITE 12; BATTERY STORAGE  
PROJECT MANAGER: MIKE HEFFRON  
LOCATION: LEONARDO, N.J.  
(615)  
PHONE: \_\_\_\_\_ FAX: \_\_\_\_\_

### BILLING INFORMATION

BILL TO: \_\_\_\_\_ PO #: 020513  
ADDRESS: \_\_\_\_\_  
CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_  
ATTENTION: \_\_\_\_\_ PHONE: \_\_\_\_\_

### DATA TURNAROUND INFORMATION

FAX: 3 DAYS \*  
HARD COPY: 14 DAYS \*  
EDD: 14 DAYS \*  
\* TO BE APPROVED BY CHEMTECH  
\*\* NORMAL TURNAROUND TIME - 14 DAYS

### DATA DELIVERABLE INFORMATION

RESULTS ONLY  USEPA CLP  
 RESULTS + QC  NYS ASP "B"  
 NJ REDUCED  NYS ASP "A"  
 NJ CLP  EDD  
 EDD FORMAT: \_\_\_\_\_

**TAL METALS**  
**TCL VOCs**

1	2	3	4	5	6	7	8	9
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### PRESERVATIVES

### COMMENTS

CHEMTECH SAMPLE ID	SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE		SAMPLE COLLECTION		# OF BOTTLES	PRESERVATIVES									COMMENTS			
			COMP	DRAB	DATE	TIME		E	HMT	F	G	H	I	J	K	L				
																		1	2	3
192499	12SS08-99-2 83-3	Soil	X		11-2-99	1015	3	X	X											72 Hr
192500	12SS11-99-2	Soil	X		11-2-99	1048	1	X												TURNAROUND
192501	12SS12-99-2	Soil	X		11-2-99	1105	1	X												
192502	12SS14-99-2	Soil	X		11-2-99	1130	1	X												
5.																				
6.																				
7.																				
8.																				

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY: 1. <u>[Signature]</u>	DATE/TIME: <u>11-2-99 3:15</u>	RECEIVED BY: 1. <u>[Signature]</u>	Conditions of bottles or coolers at receipt: <input type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Temp. of Cooler _____
RELINQUISHED BY: 2. <u>[Signature]</u>	DATE/TIME: <u>11/2/99 4:00</u>	RECEIVED BY: 2. <u>[Signature]</u>	Comments:
RELINQUISHED BY: 3. _____	DATE/TIME: <u>11/2/99 16:00</u>	RECEIVED FOR LAB BY: 3. <u>Sunny Pato</u>	Page <u>1</u> of <u>1</u> Shipment Complete: Yes _____ No _____

DRY WEIGHT CONVERTER				
SAMPLE ID:	L5460	92499	FOSTER WHEELER	
TOTAL SOLIDS	83.3	12SS08-99-2		
				DATE
	Wet Weight (g.)		Digestate Vol.( mL.)	11/4,5/99
ICP DIGESTION:	1.00		100	
Hg DIGESTION:	0.50		100	
METALS	Wet Wgt. (mg/L)	Wet Wgt. MDL (mg/L)	Dry Wgt. (mg/Kg)	Dry Wgt. MDL (mg/Kg)
ARSENIC	0.214	0.006	25.69	0.72
BARIUM	0.217	0.005	26.05	0.60
CADMIUM	0	0.005	0.00	0.60
CHROMIUM	0.305	0.005	36.61	0.60
COPPER	0.03	0.005	3.60	0.60
LEAD	0.068	0.004	8.16	0.48
MERCURY	0.0002	0.0002	0.048	0.048
NICKEL	0.06	0.005	7.20	0.60
SELENIUM	0.004	0.004	0.48	0.48
SILVER	0	0.005	0.00	0.60
ZINC	0.264	0.020	31.69	2.40



DRY WEIGHT CONVERTER				
SAMPLE ID:	L5460	92500	FOSTER WHEELER	
TOTAL SOLIDS	81.8	12SS11-99-2		
				DATE
	Wet Weight (g.)		Digestate Vol.( mL.)	11/4,5/99
ICP DIGESTION:	1.00		100	
Hg DIGESTION:	0.50		100	
METALS	Wet Wgt. (mg/L)	Wet Wgt. MDL (mg/L)	Dry Wgt. (mg/Kg)	Dry Wgt. MDL (mg/Kg)
ARSENIC	0.157	0.006	19.19	0.73
BARIUM	0.263	0.005	32.15	0.61
CADMIUM	0	0.005	0.00	0.61
CHROMIUM	0.346	0.005	42.30	0.61
COPPER	0.062	0.005	7.58	0.61
LEAD	0.1	0.004	12.22	0.49
MERCURY	0.0003	0.0002	0.073	0.049
NICKEL	0.062	0.005	7.58	0.61
SELENIUM	0.009	0.004	1.10	0.49
SILVER	0	0.005	0.00	0.61
ZINC	0.285	0.020	34.84	2.44



		DRY WEIGHT CONVERTER			
SAMPLE ID:	L5460	92501		FOSTER WHEELER	
TOTAL SOLIDS	82.4	12SS12-99-2			
				DATE	
	Wet Weight (g.)		Digestate Vol.( mL.)	11/4,5/99	
ICP DIGESTION:	1.00		100		
Hg DIGESTION:	0.50		100		
METALS	Wet Wgt. (mg/L)	Wet Wgt. MDL (mg/L)		Dry Wgt. (mg/Kg)	Dry Wgt. MDL (mg/Kg)
ARSENIC	0.228	0.006		27.67	0.73
BARIUM	0.159	0.005		19.30	0.61
CADMIUM	0	0.005		0.00	0.61
CHROMIUM	0.104	0.005		12.62	0.61
COPPER	0.086	0.005		10.44	0.61
LEAD	0.155	0.004		18.81	0.49
MERCURY	0.0003	0.0002		0.073	0.049
NICKEL	0.043	0.005		5.22	0.61
SELENIUM	0.012	0.004		1.46	0.49
SILVER	0	0.005		0.00	0.61
ZINC	0.201	0.020		24.39	2.43



1A  
VOLATILE ORGANICS ANALYSIS DATA SHEET

12SS08-99-2

Lab Name: CHEMTECH Contract: FOSTER WHEELER  
 Project No.: L5460 Site: NAVAL WE Location: NJ Group: 5970-VOA  
 Matrix: (soil/water) SOIL Lab Sample ID: O92499  
 Sample wt/vol: 11.4 (g/mL) G Lab File ID: E6664.D  
 Level: (low/med) MED Date Received: 11/2/99  
 % Moisture: not dec. 17 Date Analyzed: 11/4/99  
 GC Column: DB624 ID: 0.53 (mm) Dilution Factor: 1.0  
 Soil Extract Volume: 25000 (uL) Soil Aliquot Volume: 100 (uL)

CAS No.	Compound	Concentration Units:		Q
		(ug/L or ug/Kg)	<u>ug/Kg</u>	
74-87-3	Chloromethane	260	U	U
75-01-4	Vinyl Chloride	260	U	U
74-83-9	Bromomethane	260	U	U
75-00-3	Chloroethane	260	U	U
75-35-4	1,1-Dichloroethene	260	U	U
67-64-1	Acetone	260	U	U
75-15-0	Carbon Disulfide	260	U	U
75-09-2	Methylene Chloride	260	U	U
156-60-5	trans-1,2-Dichloroethene	260	U	U
75-34-3	1,1-Dichloroethane	260	U	U
78-93-3	2-Butanone	260	U	U
156-59-2	cis-1,2-Dichloroethene	260	U	U
74-97-5	Bromochloromethane	260	U	U
67-66-3	Chloroform	260	U	U
71-55-6	1,1,1-Trichloroethane	260	U	U
569-58-6	1,1-Dichloropropene	260	U	U
56-23-5	Carbon Tetrachloride	260	U	U
71-43-2	Benzene	260	U	U
107-06-2	1,2-Dichloroethane	260	U	U
79-01-6	Trichloroethene	260	U	U
78-87-5	1,2-Dichloropropane	260	U	U
74-95-3	Dibromomethane	260	U	U
75-27-4	Bromodichloromethane	260	U	U
108-10-1	4-Methyl-2-Pentanone	260	U	U
108-88-3	Toluene	260	U	U
110-75-8	2-Chloroethyl vinyl ether	260	U	U
10061-02-6	1-1,3-Dichloropropene	260	U	U
10061-01-5	cis-1,3-Dichloropropene	260	U	U
79-00-5	1,1,2-Trichloroethane	260	U	U
591-78-6	2-Hexanone	260	U	U
124-48-1	Dibromochloromethane	260	U	U
127-18-4	Tetrachloroethene	260	U	U
108-90-7	Chlorobenzene	260	U	U

