ADDENDUM TO FINAL PRE-DESIGN INVESTIGATION REPORT
CAUSEWAY AND DIKE NCRA
STRATFORD ARMY ENGINE PLANT
Stratford, Connecticut

1.0 Introduction

Foster Wheeler Environmental Corporation (Foster Wheeler) and Harding Lawson Associates (HLA) have been contracted through the U.S. Army Corps of Engineers – New England District (USACE) to complete a Non-time Critical Removal Action (NCRA) for the Causeway and Dike Area at the Stratford Army Engine Plant (SAEP) under Task Order No. 020 of Contract No. DACW33-94-D-0002. The objectives of this task are to: 1) complete additional field activities necessary to characterize physical and chemical subsurface conditions on the Causeway and Dike, 2) summarize the results of field activities in a report, and 3) document the decision process for selection of a removal action for the Causeway and Dike area in an Engineering Evaluation/Cost Analysis (EE/CA) and a Removal Action Memorandum (RAM).

Results of field investigation activities intended to address items 1 and 2 listed above, conducted by Foster Wheeler and HLA during the summer and fall of 1999, are presented in the Final Causeway and Dike NCRA Pre-Design Investigation Report (Foster Wheeler/HLA, 2000a). Specific to the Causeway, a number of soil samples collected and analyzed during the field investigations indicated concentrations of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and vanadium exceeding criteria presented in the Connecticut Department of Environmental Protection (CTDEP) Remediation Standard Regulations (RSRs). The criteria exceeded include Direct Exposure Criteria (DEC) for soil (residential scenario), and GB Pollutant Mobility Criteria (PMC) for subsurface soil from above the water table. Discussions with the CTDEP identified data needs relative to SPLP analysis of soils exceeding the PMC. A Supplemental Work Plan (Foster Wheeler/HLA, 2000b) was prepared to address those additional data needs. Specifically, if it could be demonstrated that areas with PMC exceedances be reevaluated to demonstrate that SPLP results were less than 10 times the CTDEP Groundwater Protection Criteria, then the CTDEP RSRs would allow installation of a permeable soil cover on the Causeway, rather than an engineered barrier to prevent infiltration.

This Addendum to the Pre-Design Investigation Report (Foster Wheeler/HLA, 2000a) describes the fieldwork, and presents the results of additional sampling conducted on the Causeway during May 2000.

2.0 Field Program

Results of soil sampling and analyses conducted on the Causeway identified a number of samples with concentrations that exceed the CTDEP PMC (Foster Wheeler/HLA, 2000a). Of these, only the soils at or above 4.5-feet bgs (the approximate water table at high tide) were resampled, and only for those parameters already found to exceed the CTDEP PMC criteria.

Ten (10) previously sampled exploration locations were resampled on the Causeway to collect additional subsurface soil samples. For these samples, SPLP analyses were requested for those parameters that were previously detected at concentrations above the PMC. Exploration locations are listed on Table 1, and are shown on Figure 1. All resampled exploration locations were completed on May 3, 2000 using a backhoe, and employed test-pitting techniques. Soil sample descriptions and sampling information were written on test pits logs, included in Appendix A.

Soil samples were collected using stainless steel spatulas and spoons. VOC samples were collected in 4-ounce soil jars with airtight silicon septa, and completely filled to minimize headspace in the jar. SVOC and vanadium samples were homogenized and placed into 8-ounce soil jars. All samples were delivered to the off-site laboratory on the day they were collected, and SPLP extractions were performed within 48 hours of sample collection. Table 2 lists the CTDEP SPLP PMCs, and the minimum required reporting limits for the SPLP analyses. Additionally, USACE quality assurance (QA) split samples were collected for the analyses, as shown on Table 1. These were shipped to the USACE laboratory, AMRO Environmental Laboratories in Merrimack, New Hampshire, on the day they were collected.

3.0 Results

SPLP soil analytical data with concentrations exceeding the CTDEP RSR PMC are shown on Figure 2. Complete analytical data are presented in Appendix B. For polluted soils in a GB area, or an area encompassing a non-potable groundwater aquifer, the CTDEP RSRs state, "A substance other than total petroleum hydrocarbons in soil above the seasonal high water table in a GB area may be remediated to a level at which the results of a TCLP or SPLP analysis of such soil does not exceed the ground-water protection criterion for any such substance multiplied by 10…. " These criteria are also shown on Figure 2 for each analyte exceedance.

Of the eight locations sampled for VOCs, only one location, TP-DEP-12, exhibited concentrations above the SPLP PMC for VOCs. Vinyl chloride was detected at a concentration of 35 µg/L, and trichloroethene (TCE) was detected at a concentration of 160 µg/L (see Figure 1).

At the two locations that were resampled for vanadium, TP-DEP-11 and TP-DEP-12, SPLP results were both below the PMC of 500 µg/L (see Appendix B).

A total of five locations were sampled for SVOCs. Of these, only two locations (TP-99-10 and CB-99-15) recorded exceedances above the RSR SPLP PMC. These are shown on Figure 2.

Summary and Conclusions

- Excavation and removal of soil is likely required at the locations where laboratory results indicate exceedances of the SPLP PMC.

- The Causeway EE/CA will present proposed removal actions, and a plan for confirmation sampling following any removal actions.

References

Foster Wheeler Environmental Corporation/Harding Lawson Associates (Foster Wheeler/HLA), 2000. Final Pre-Design Investigation Report for the Non-Time Critical Removal Action for the Causeway and Dike. Prepared for the U.S. Army Corps of Engineers, April 2000.

LEGEND

MWCD-99-01A — EXISTING HLA CAUSEWAY/DIKE MONITORING WELLS

TP-99-22 — EXISTING HLA TEST PIT LOCATIONS

CB-99-01 — EXISTING HLA CAUSEWAY BORING

B–53 — BUILDING DESIGNATIONS

CHAINLINK FENCE

LIMITS OF PRE–DESIGN INVESTIGATION

TP-99-10 — EXPLORATIONS SAMPLED FOR SPLP ANALYSIS

NOTES:

1. MAP IS IN CONNECTICUT STATE PLANE COORDINATES.
2. BASE MAP SOURCE: ALLIEDSIGNAL, INC.
3. ALL ELEVATION CONTOURS ARE INTERPRETIVE AND APPROXIMATE. CONTOUR INTERVAL IS 1 FOOT.

TIDAL FLATS

CONCRETE PAD & CHAIN LINK FENCE

CONCRETE RAMP (BADLY DETERIORATED)

MWCD-99-02B

MWCD-99-02A

TP-DEP-17

SIGN

CB-99-15

CB-99-17

CB-99-14

CB-99-13

CB-99-16

TP-DEP-15

CB-99-12

TP-99-10

FENCE

CB-99-11

SIGN

TP-DEP-12

TP-99-26

CB-99-08

TP-DEP-11

CAUSEWAY

TP-99-06

CB-99-07

FILL AREA

SIGN

TP-99-24

CB-99-05

CB-99-04

CB-99-03

CB-99-02

END OF DIKE RIPRAP

MWCD-99-01A

MWCD-99-01B

CB-99-09

TP-99-23

TP-99-22

TP-99-25

B–59

BLACKTOP PATHWAY

CB-99-01

B–16

B–40

BLACKTOP PATHWAY

DIKE RIPRAP

B–33

B–34

B–19

B–4

B–69

0 40 80 160 FEET

SCALE: 1"=80'

FIGURE 1
EXPLORATIONS SAMPLED FOR SPLP ANALYSES
ADDENDUM TO PRE-DESIGN INVESTIGATION
STRATFORD ARMY ENGINE PLANT
Harding Lawson Associates

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LEGEND

MWCD-99-01A	EXISTING HLA CAUSEWAY/DIKE MONITORING WELLS
TP-99-22	EXISTING HLA TEST PIT LOCATIONS
CB-99-01	EXISTING HLA CAUSEWAY BORING
B-53	BUILDING DESIGNATIONS
	CHAINLINK FENCE
	LIMITS OF PRE-DESIGN INVESTIGATION
TP-99-10	EXPLORATIONS SAMPLED FOR SPLP ANALYSIS
BGS	BELOW GROUND SURFACE

NOTES:

1. MAP IS IN CONNECTICUT STATE PLANE COORDINATES.
2. BASE MAP SOURCE: ALLIEDSIGNAL, INC.
3. ALL ELEVATION CONTOURS ARE INTERPRETIVE AND APPROXIMATE. CONTOUR INTERVAL IS 1 FOOT.

LOCATION IDENTIFIER → TP-DEP-12 | 2′ ← SAMPLING INTERVAL (BGS)
COMPOUND → Vinyl Chloride | 20 | 35 ← CONCENTRATION (µg/L)
SPLP POLLUTANT MOBILITY CRITERIA

CB-99-15

		2′
Benzo(a)Anthracene	0.6	9.7
Benzo(b)Fluoranthene	0.8	7.2
Benzo(k)Fluoranthene	5	6.7
Benzo(a)Pyrene	2	8.0

TP-99-10

		3′
Benzo(a)Anthracene	0.6	3.1
Benzo(b)Fluoranthene	0.8	2.7
Benzo(a)Pyrene	2	3.1

TP-DEP-12

		2′
Vinyl Chloride	20	35
Trichloroethene	50	160

TIDAL FLATS

TIDAL FLATS

TIDAL FLATS

CONCRETE PAD & CHAIN LINK FENCE
CONCRETE RAMP (BADLY DETERIORATED)
MWCD-99-02B
MWCD-99-02A
CONCENTRATION SIGN
TP-DEP-17
CB-99-17
CB-99-14
CB-99-13
CB-99-16
TP-DEP-15
CB-99-12
FENCE
CB-99-11
SIGN
CAUSEWAY
TP-99-06
CB-99-07
TP-99-26
CB-99-08
FILL AREA
TP-DEP-11
SIGN
TP-99-24
CB-99-05
CB-99-04
CB-99-03
CB-99-02
MWCD-99-01A
MWCD-99-01B
CB-99-09
TP-99-23
TP-99-22
TP-99-25
END OF DIKE RIPRAP
END OF DIKE RIPRAP
B-59
BLACKTOP PATHWAY
CB-99-01
BLACKTOP PATHWAY
DIKE RIPRAP
B-40
B-16
B-34
B-33
B-19
B-4
B-69
6 7 8 9 10 11

0 40 80 160 FEET
SCALE: 1"=80'

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FIGURE 2
EXPLORATIONS WITH SPLP RESULTS GREATER THAN SPLP POLLUTANT MOBILITY CRITERIA
ADDENDUM TO PRE-DESIGN INVESTIGATION
STRATFORD ARMY ENGINE PLANT
Harding Lawson Associates

TABLE 1
SUMMARY OF OFF-SITE ANALYTICAL SAMPLING

ADDENDUM TO THE PRE-DESIGN INVESTIGATION REPORT CAUSEWAY AND DIKE NON-TIME CRITICAL REMOVAL ACTION
STRATFORD ARMY ENGINE PLANT
STRATFORD, CONNECTICUT

EXPLORATION LOCATION	SAMPLE DEPTH (feet bgs)	ANALYTICAL PARAMETER AND METHOD	QA SPLIT SAMPLES
CB-99-01	1’	SPLP for VOCs by 1312/8260B	
CB-99-03	3’	SPLP for VOCs by 1312/8260B	
CB-99-04	2’	SPLP for VOCs by 1312/8260B	
CB-99-08	2’	SPLP for VOCs by 1312/8260B	
CB-99-11	2’	SPLP for VOCs by 1312/8260B	
		SPLP for SVOCs by 1312/ Modified 8270 SIM	
CB-99-14	2’	SPLP for SVOCs by 1312/Modified 8270 SIM	
CB-99-15	2’	SPLP for SVOCs by 1312/Modified8270 SIM	SVOCs
TP-99-10	3.5’	SPLP for VOCs by 1312/8260B	
		SPLP for SVOCs by 1312/Modified 8270 SIM	
TP-DEP-11	1’	SPLP for VOCs by 1312/8260B	VOCs
		SPLP for SVOCs by 1312/Modified 8270 SIM	SVOCs
		SPLP for Vanadium by 1312/6010B	Vanadium
TP-DEP-12	1.5’	SPLP for VOCs by 1312/8260B	
		SPLP for Vanadium by 1312/6010B	

Notes:

QA = Quality Assurance Split Samples sent to USACE Laboratory
SIM = Selective Ion Monitoring
SPLP = Synthetic Precipitation Leaching Procedure
SVOC = Semivolatile Organic Compounds
VOC = Volatile Organic Compounds

TABLE 2
SPLP ANALYSES MINIMUM REQUIRED REPORTING LIMITS

ADDENDUM TO PRE-DESIGN INVESTIGATION REPORT CAUSEWAY AND DIKE NON-TIME CRITICAL REMOVAL ACTION
STRATFORD ARMY ENGINER PLANT
STRATFORD, CONNECTICUT

	CTDEP Groundwater Protection Criteria (ug/l)	SPLP Pollutant Mobility Criteria (Groundwater Protection Criteria x10 (µg/l)	Required Reporting Limit for SPLP Analyses (µg/l)
VOCs			
Acetone	700	7000	3500
Acrylonitrile	0.5	5	2.5
Benzene	1	10	5
Bromform	4	40	20
2-Butanon (MEK)	400	4000	2000
Carbon Tetrachloride	5	50	25
Chlorobenzene	100	1000	500
Chloroform	6	60	30
Dibromochloromethane	0.5	5	2.5
1,2-Dichlorobenzene	600	6000	3000
1,3-Dichlorobenzene	600	6000	3000
1,4-Dichlorobenzene	75	750	375
1,1-Dichloroethane	70	700	350
1,2-Dichloroethane	1	10	5
1,1-Dichloroethylene	7	70	35
Cis-1,2-Dichloroethylene	70	700	350
Trans-1,2-Dichloroethylene	100	1000	500
1,2-Dichloropropane	5	50	25
1,3-Dichloropropene	0.5	5	2.5
Ethylbenzene	700	7000	3500
Methyl-Tert-Butyl-Ether	100	1000	500
Methyl Isobutyl Ketone	350	3500	1750
Methylene Chloride	5	50	25
Styrene	100	1000	500
1,1,1,2-Tetrachloroethane	1	10	5
1,1,2,2-Tetrachloroethane	0.5	5	2.5
Tetrachloroethylene	5	50	25
Toluene	1000	10000	5000
1,1,1-Trichloroethane	200	2000	1000
1,1,2-Trichloroethane	5	50	25
Trichloroethylene	5	50	25
Vinyl Chloride	2	20	10
Xylenes	530	5300	2650

TABLE 2
SPLP ANALYSES MINIMUM REQUIRED REPORTING LIMITS

ADDENDUM TO PRE-DESIGN INVESTIGATION REPORT CAUSEWAY AND DIKE NON-TIME CRITICAL REMOVAL ACTION
STRATFORD ARMY ENGINER PLANT
STRATFORD, CONNECTICUT

	CTDEP Groundwater Protection Criteria (ug/l)	SPLP Pollutant Mobility Criteria (Groundwater Protection Criteria x10 (µg/l)	Required Reporting Limit for SPLP Analyses (µg/l)
SVOCs			
Acenaphthylene	420	4200	2100
Anthracene	2000	20000	10000
Benzo(A)Anthracene	0.06	0.6	0.3
Benzo(B)Fluoranthene	0.08	0.8	0.4
Benzo(K)Fluoranthene	0.5	5	2.5
Benzo(A)Pyrene	0.2	2	1
Fluoranthene	280	2800	140
Fluorene	280	2800	1400
Naphthalene	280	2800	1400
Phenanthrene	200	2000	1000
Pyrene	200	2000	1000

		CTDEP GB Pollutant Mobility Criteria (µg/l)	Required Reporting Limit for SPLP Analyses (µg/L)
Vanadium		500	500

Notes:

CTDEP = Connecticut Departmetn of Environmental Protection
VOCs = volatile organic compounds
SVOCs = semivolatile organic compounds
µg/L = micrograms per liter
SPLP = Synthetic Precipitate Leaching Procedures

TEST PIT LOGS

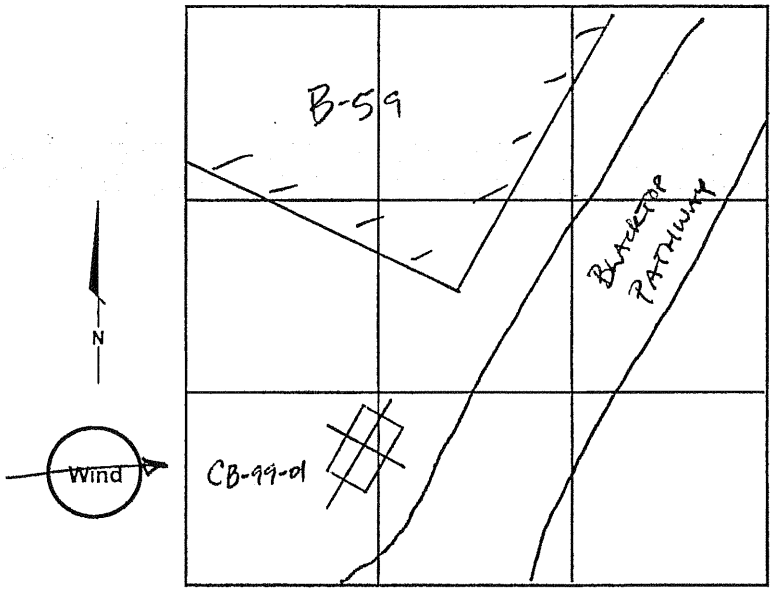
TEST PIT RECORD

Site: Stratford Army Engine Plant - Causeway

Project No.: 47254-21054 - ADDENDUM TO PDIR Date: 5-3-00

Test Pit ID: CB-99-01

Sketch Map of Test Pit Site:



Scale: 1"= _____ ft.

NOT TO SCALE

Crew Members:

1. TOM LONGLEY - HLA
2. STEFAN SMITH - NFE
3. JOHN FLEMING - WE MANAGE
4. _____
5. _____
6. _____

Monitor Equipment:

PI Meter	(Y)	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	Y	N

Other: _____

LUDLUM PANCAKE PROBE (GEIGER-MUELLER)

Notes:

RESAMPLING EXPLORATIONS FOR SPLP ANALYSES

EXCAVATED TO 1.5' SAMPLE COLLECTED @ 1' bgs ON N. SIDE OF PREVIOUS EXCAVATION

SOIL IS GRAVELLY SAND - NO PID readings.

PANCAKE PROBE = 50-TO-80 counts per minute (CPM)

DRY

COLLECTED VOC SAMPLE

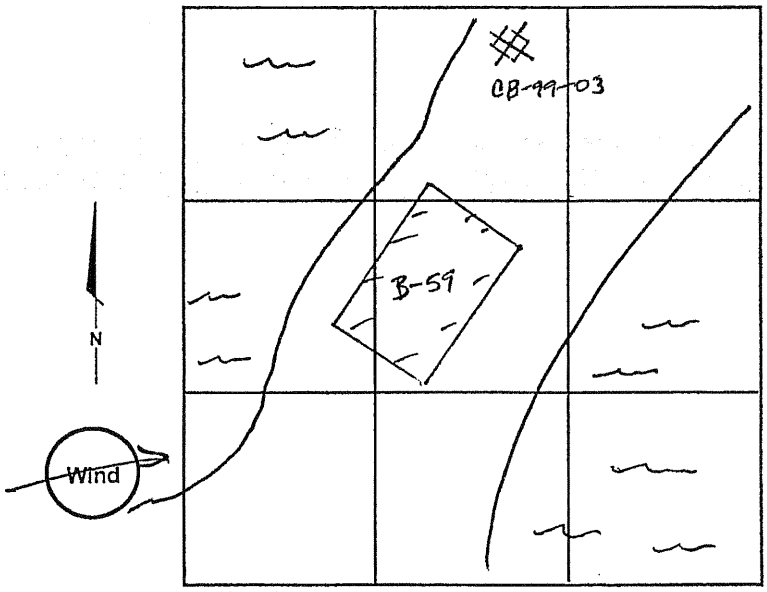
TEST PIT RECORD

Site: Stratford Army Engine Plant - Causeway

Project No.: 47254-21054 - ADDENDUM TO PDIR Date: 5-3-00

Test Pit ID: CB-99-03

Sketch Map of Test Pit Site:



Scale: 1"= _____ ft.

NOT TO SCALE

Crew Members:

1. TOM LONGLEY - HLA
2. STEFAN SMITH - NFE
3. JOHN FLEMING - WE MANAGE
4. _____
5. _____
6. _____

Monitor Equipment:

PI Meter	(Y)	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	Y	N

Other: _____

LUDLUM PANCAKE PROBE (GEIGER-MUELLER)

Notes:

RESAMPLING EXPLORATIONS FOR SPLP ANALYSES

EXCAVATED TO 4'

AT 3', COUNTS = 40-TO-60 CPM PID=0 ppm

SAMPLE AT 3' FROM AN AREA JUST SW OF ORIGINAL CB-99-03 boring.

TAN, WELL-SORTED, LOOSE FINE SAND, DRY & CLEAN LOOKING

Collected VOC Sample

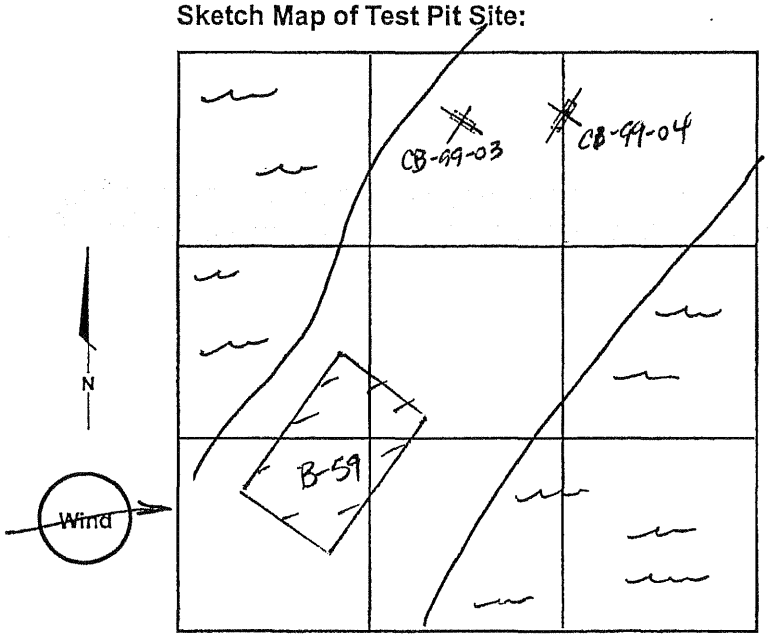
TEST PIT RECORD

Site: Stratford Army Engine Plant - Causeway

Project No.: 47254-21054 - ADDENDUM TO PDIR Date: 5-3-00

Test Pit ID: CB-99-04

Sketch Map of Test Pit Site:



Scale: 1"= _____ ft.

NOT TO SCALE

Crew Members:

1. TOM LONGLEY - HLA
2. STEFAN SMITH - NFE
3. JOHN FLEMING - WE MANAGE
4. _____
5. _____
6. _____

Monitor Equipment:

PI Meter	(Y)	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	Y	N

Other: _____

LUDLUM PANCAKE PROBE (GEIGER-MUELLER)

Notes:

RESAMPLING EXPLORATIONS FOR SPLP ANALYSES

LOCATION IS JUST SOUTH OF ORIGINAL CB-99-04 EXPLORATION

PANCAKE PROBE @ 2" = 70-to-90 cpm (Background = ~60 cpm)

PID = 0 ppm

SAMPLE AT 2' bgs. GRAVELLY SAND, TAN, LOOSE-TO-FIRM, MOSTLY CLEAN BUT W/ SOME brick pieces & cobbles - ROOTS TO 12"

Collected VOC Sample

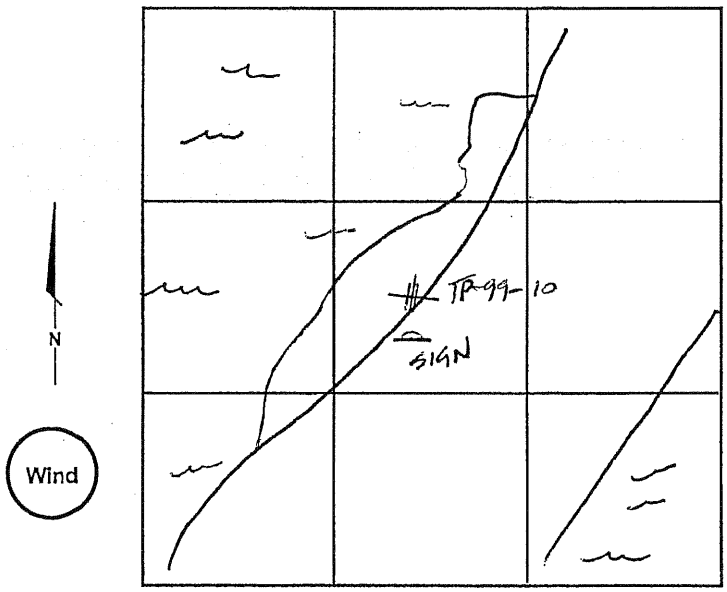
TEST PIT RECORD

Site: Stratford Army Engine Plant - Causeway

Project No.: 47254-21054 - ADDENDUM TO PDIR Date: 5-3-00

Test Pit ID: TP-99-10

Sketch Map of Test Pit Site:



Scale: 1"= _____ ft.

NOT TO SCALE

Crew Members:

1. TOM LONGLEY - HLA
2. STEFAN SMITH - NFE
3. JOHN FLEMING - WE MANAGE
4. _____
5. _____
6. _____

Monitor Equipment:

PI Meter	(Y)	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	Y	N

Other: _____

LUDLUM PANCAKE PROBE (GEIGER-MUELLER)

Notes:

RESAMPLING EXPLORATIONS FOR SPLP ANALYSES

EXCAVATED TO ~ 4' bgs.

PANCAKE Probe @ 3' = 110-to-150 cpm

Background = 20-to-30 cpm

NEAR LARGE CONCRETE Blocks w/ higher

READINGS NOTED AT These. PID=0

BROWN FILL OF CONCRETE, TAR, Bricks, GRAVEL,

SAND -NO ODORS- ~~Dry~~ to DAMP, Roots to 2.5'

SAMPLE AT 3.5' just South of original

Sample LOCATION - SOME CRUDE LAYERING OF

FILL w/ SLIGHT COLOR CHANGES NOTED —

also SOME SLAG.

COLLECTED VOC & SVOC

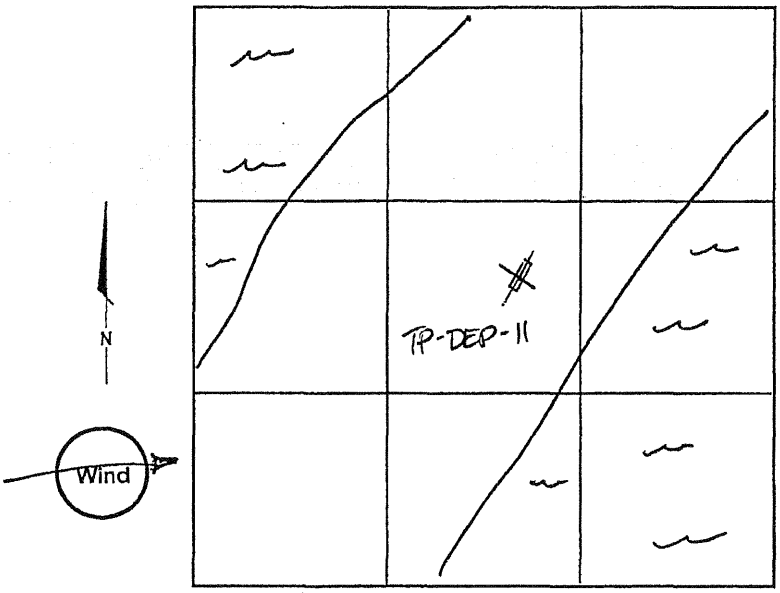
TEST PIT RECORD

Site: Stratford Army Engine Plant - Causeway

Project No.: 47254-21054 - ADDENDUM TO PDIR Date: 5-3-00

Test Pit ID: TP-DEP-11

Sketch Map of Test Pit Site:



Scale: 1"= _____ ft.

NOT TO SCALE

Crew Members:

1. TOM LONGLEY - HLA
2. STEFAN SMITH - NFE
3. JOHN FLEMING - WE MANAGE
4. _____
5. _____
6. _____

Monitor Equipment:

PI Meter	(Y)	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	Y	N

Other: LUDLUM PANCAKE PROBE (GEIGER-MUELLER)

Notes:

RESAMPLING EXPLORATIONS FOR SPLP ANALYSES

PANCAKE PROBE = 100 cpm w/ bgk. = 40-50 cpm

PID = 0 ppm

NOSE ODOR OF FUELS & HYDROCARBONS

BLACK- to: VERY DARK BROWN w/

RUSTY zone OF GRAVEL, SLAG, CONCRETE

Debris, SAND, etc. - DAMP-to- DRY

LOT OF BY RUBBLE here

SAMPLED @ 1' bgs - just South of REMOVAL AREA

Collected VOC, SVOC, VANADIUM

ALSO COLLECTED VOC, SVOC, VANADIUM

for USACE SPLIT SAMPLES.

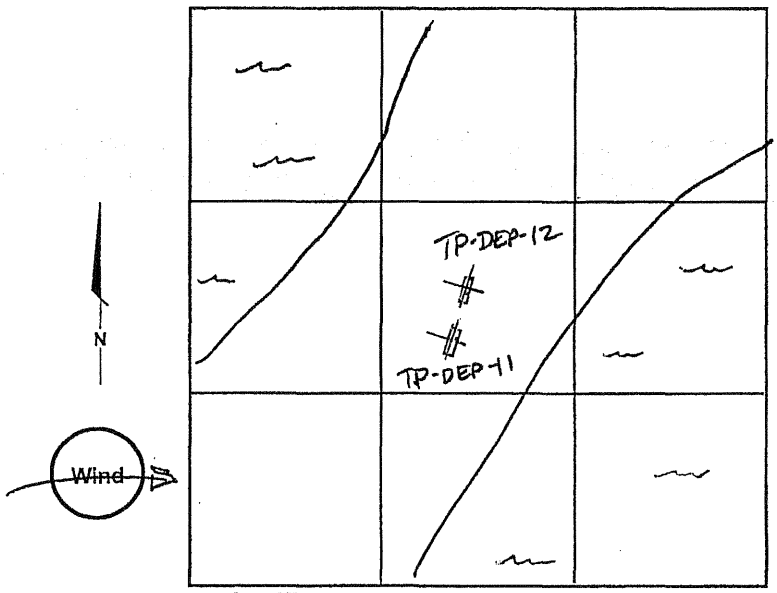
TEST PIT RECORD

Site: Stratford Army Engine Plant - Causeway

Project No.: 47254-21054 - ADDENDUM TO PDIR Date: 5-3-00

Test Pit ID: TP-DEP-12

Sketch Map of Test Pit Site:



Scale: 1"= _____ ft. NOT TO SCALE

Crew Members:

1. TOM LONGLEY - HLA
2. STEFAN SMITH - NFE
3. JOHN FLEMING - WE MANAGE
4. _____
5. _____
6. _____

Monitor Equipment:

PI Meter	(Y)	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	Y	N

Other: LUDLUM PANCAKE PROBE (GEIGER-MUELLER)

Notes:

RESAMPLING EXPLORATIONS FOR SPLP ANALYSES

Probe = 100 cpm

PID = 0 ppm

Sample @ 1.5' bgs

BRICKS, CONCRETE, CINDERS, GRAVEL, SAND, MOIST-TO-DRY

ALL RUBBLE w/ little SAND

COLLECTED VOC & VANADIUM

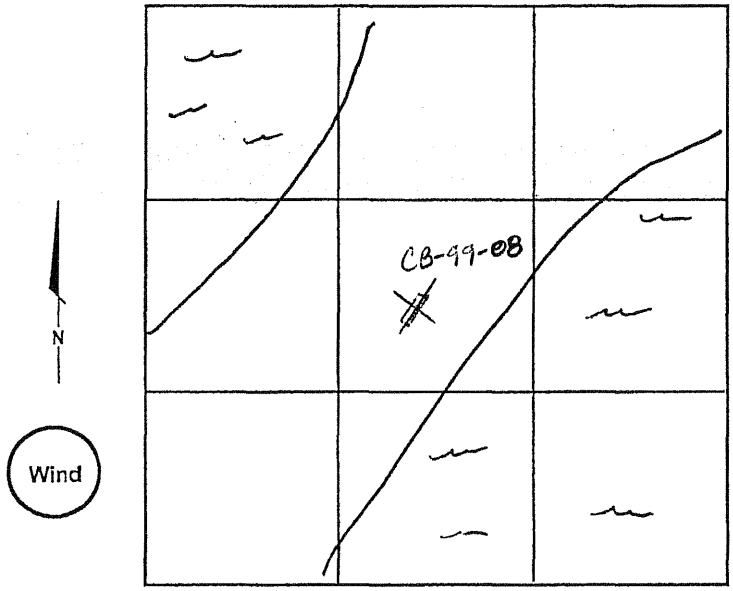
TEST PIT RECORD

Site: Stratford Army Engine Plant - Causeway

Project No.: 47254-21054 - ADDENDUM TO PDIR Date: 5-3-00

Test Pit ID: CB-99-08

Sketch Map of Test Pit Site:



Scale: 1"= _____ ft.

NOT TO SCALE

Crew Members:

1. TOM LONGLEY - HLA
2. STEFAN SMITH - NFE
3. JOHN FLEMING - WE MANAGE
4. _____
5. _____
6. _____

Monitor Equipment:

PI Meter	(Y)	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	Y	N

Other: _____

LUDLUM PANCAKE PROBE (GEIGER-MUELLER)

Notes:

RESAMPLING EXPLORATIONS FOR SPLP ANALYSES

LOCATION IS JUST OFF OF TP-DEP-11/12 AREA. HAS BACKTOP ROADWAY UNDER ≈ 6" OF FILL.

PROBE = 40-60 CPM @ 2' bgs, PID=0

NOT MUCH SOIL HERE - CEMENTED MASS OF BRICKS, TAR & CINDERS/ASH MATERIAL

BACKHOE HAS DIFFICULTY EXCAVATING THIS MATERIAL.

COLLECTED SAMPLE JUST EAST OF ORIGINAL EXPLORATION LOCATION - SAMPLE IS OF PULVERIZED MATERIAL

COLLECTED VOC

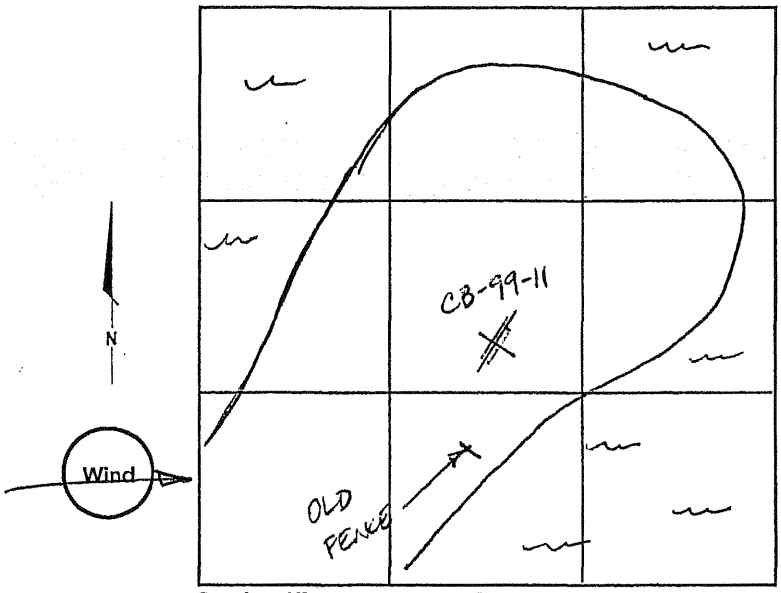
TEST PIT RECORD

Site: Stratford Army Engine Plant - Causeway

Project No.: 47254-21054 - ADDENDUM TO PDIR Date: 5-3-00

Test Pit ID: CB-99-11

Sketch Map of Test Pit Site:



Scale: 1"= _____ ft.

NOT TO SCALE

Crew Members:

1. TOM LONGLEY - HLA
2. STEFAN SMITH - NFE
3. JOHN FLEMING - WE MANAGE
4. _____
5. _____
6. _____

Monitor Equipment:

PI Meter	(Y)	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	Y	N

Other: _____

LUDLUM PANCAKE PROBE (GEIGER-MUELLER)

Notes:

RESAMPLING EXPLORATIONS FOR SPLP ANALYSES

PROBE = 5 cpm @ 2' bgs

PID = 0 ppm

SAMPLE @ 2' below tarred roadway, in CEMENTED BLACK ASH/SLAG.

VERY HARD & CEMENTED (AS IN CB-99-08)

Whitish when pulverized, But BLACK otherwise

COLLECTED VOC & SVOC

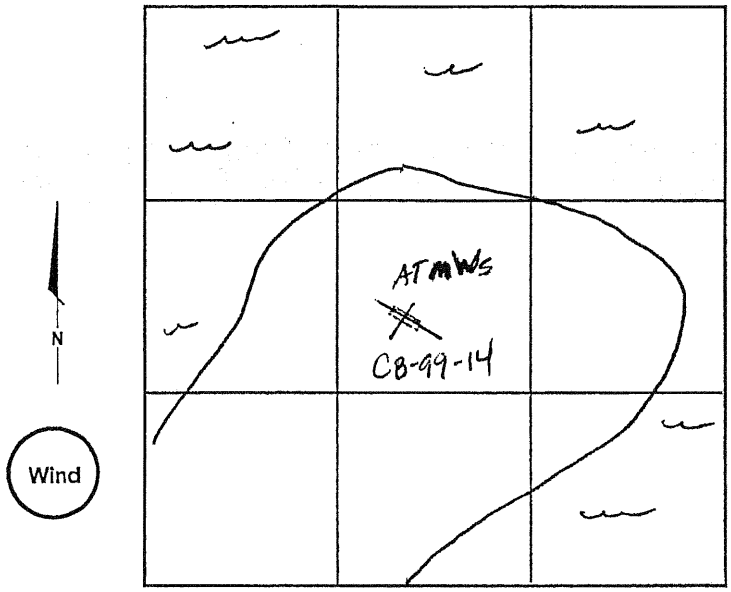
TEST PIT RECORD

Site: Stratford Army Engine Plant - Causeway

Project No.: 47254-21054 - ADDENDUM TO PDIR Date: 5-3-00

Test Pit ID: CB-99-14

Sketch Map of Test Pit Site:



Scale: 1"= _____ ft.

NOT TO SCALE

Crew Members:

1. TOM LONGLEY - HLA
2. STEFAN SMITH - NFE
3. JOHN FLEMING - WE MANAGE
4. _____
5. _____
6. _____

Monitor Equipment:

PI Meter	(Y)	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	Y	N

Other: LUDLUM PANCAKE PROBE (GEIGER-MUELLER)

Notes:

RESAMPLING EXPLORATIONS FOR SPLP ANALYSES

DUG JUST SOUTH OF THE MONITORING WELLS (MWCD-99-02A,B)

BRIGHT YELLOW BROWN, SAND, CLEAN FILL, DRY, LOOSE-TO-FIRM

COLLECTED SVOC

PROBE = 5-TO-9 CPM

PID = 0 ppm

SAMPLE @ 2'

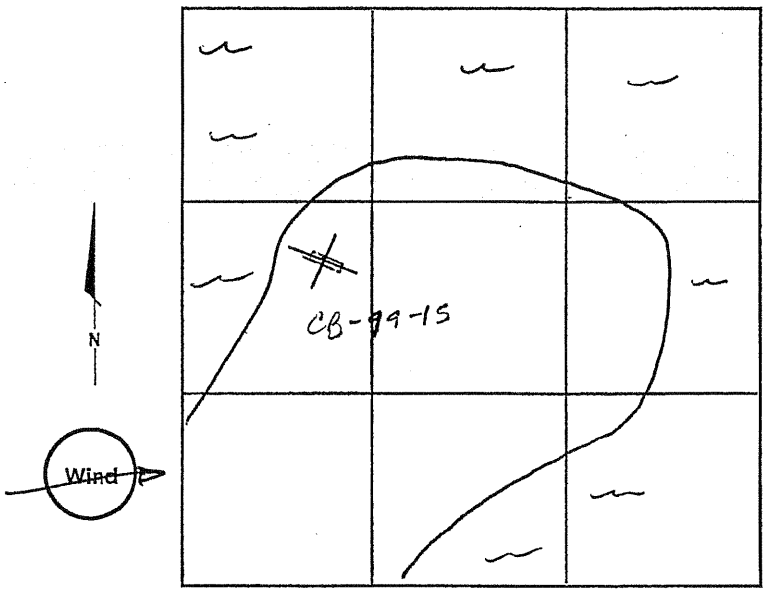
TEST PIT RECORD

Site: Stratford Army Engine Plant - Causeway

Project No.: 47254-21054 - ADDENDUM TO PDIR Date: 5-3-00

Test Pit ID: CB-99-15

Sketch Map of Test Pit Site:



Scale: 1"= _____ ft.

NOT TO SCALE

Crew Members:

1. TOM LONGLEY - HLA
2. STEFAN SMITH - NFE
3. JOHN FLEMING - WE MANAGE
4. _____
5. _____
6. _____

Monitor Equipment:

PI Meter	(Y)	N
Explosive Gas	Y	N
Avail. Oxygen	Y	N
OVA	Y	N

Other: _____

LUDLUM PANCAKE PROBE (GEIGER-MUELLER)

Notes:

RESAMPLING EXPLORATIONS FOR SPLP ANALYSES

PROBE = 40-TO-50 cpm

PID = 0 ppm

DARK BROWN GRAVELLY, BLOCKY, SANDY, LOOSE, DRY - FILL w/ ASPHALT pieces, etc.

Collect Sample @ 2' for SVOC

ALSO COLLECTED USACE SPLIT SVOC

OFF-SITE ANALYTICAL RESULTS

Committed To *Your* Success

May 17, 2000

Severn Trent Laboratories
128 Long Hill Cross Road
Shelton CT 06484
Tel: (203) 929-8140
Fax: (203) 929-8142
www.stl-inc.com

Mr. Chris Ricardi
FOSTER WHEELER ENVIRONMENTAL
C/O Harding Lawson Associates
511 Congress St. Po Box 7050
Portland, ME 04112

Dear Mr. Ricardi :

Please find enclosed the analytical results of 10 sample(s) received at our laboratory on May 3, 2000. This report contains sections addressing the following information at a minimum:

- sample summary
- analytical methodology
- state certifications
- definition of data qualifiers and terminology
- analytical results
- chain-of-custody

STL Report #7000-0859A	Purchase Order #004602.0007
Project ID: STRATFORD ARMY ENGINE PLAN	

Copies of this analytical report and supporting data are maintained in our files for a minimum of five years unless special arrangements have been made. Unless specifically indicated, all analytical testing was performed at this laboratory location and no portion of the testing was subcontracted.

We appreciate your selection of our services and welcome any questions or suggestions you may have relative to this report. Please contact your customer service representative at (203) 929-8140 for any additional information. Thank you for utilizing our services; we hope you will consider us for your future analytical needs.

I have reviewed and approved the enclosed data for final release.

Very truly yours,

Jeffrey C. Curran
Laboratory Manager

JCC

7000-0859A
FOSTER WHEELER ENVIRONMENTAL

Case Narrative

Sample Receipt – All samples were received in good condition.

The following analyses were subcontracted out to the indicated laboratories:

SPLP-PAH's sent to STL – Pittsburgh (PA), 450 William Pitt Way, Building 6, Pittsburgh, PA 15238. Refer to Subcontracted SPLP PAH Data Package for results.

Classical Chemistry - Listed below are the wet chemistry analyte methods and references for all samples analyzed in this SDG. No analytical problems were encountered and all holding times were met.

Analyte	Method	Reference
SPLP-PREP	1312	1

References:

1. Test Methods for the Evaluation of Solid Waste, SW846, 3rd edition, 1986.

Volatile Organics – Volatile organics were determined by purge and trap GC/MS using guidance provided in Method 5030B/8260B. The instrumentation used was a Tekmar Model 2000/2016 Concentrator interfaced with a Hewlett Packard Model 5970A GC/MS/DS.

The following percent recoveries were outside the criteria limits in the 020PPB_QCS sample:
1,2-dichloroethane, 1,1,1-trichloroethane, carbon tetrachloride, bromodichloromethane and dibromochloromethane.

No problems were encountered.

Metals – ICAP metals were determined using a JA61E trace ICAP following guidance provided in SW846 according to methods 3010A/6010B.

No problems occurred during analysis. All appropriate protocols were employed. All data appears to be consistent.

TABLE VO-1.0
7000-0859A
FOSTER WHEELER ENVIRONMENTAL
VOLATILE ORGANICS (SPLP)

Aqueous

All values are ug/L.

Client Sample I.D.	Method Blank	CB9904002XX	CB9901002XX	Quant. Limits with no Dilution
Lab Sample I.D.	VBLKKE	000859A-01	000859A-02	
Method Blank I.D.	VBLKKE	VBLKKE	VBLKKE	
Quant. Factor	1.00	1.00	1.00	
Chloromethane	U	U	U	10
Bromomethane	U	U	U	10
Vinyl Chloride	U	U	U	10
Chloroethane	U	U	U	10
Methylene Chloride	U	3J	1J	5.0
Acetone	U	U	9J	10
Carbon Disulfide	U	U	U	5.0
Vinyl Acetate	U	U	U	10
1,1-Dichloroethene	U	U	U	5.0
1,1-Dichloroethane	U	U	U	5.0
cis-1,2-Dichloroethene	U	U	U	5.0
trans-1,2-Dichloroethene	U	U	U	5.0
Chloroform	U	U	U	5.0
1,2-Dichloroethane	U	U	U	5.0
2-Butanone	U	U	U	10
1,1,1-Trichloroethane	U	U	U	5.0
Carbon Tetrachloride	U	U	U	5.0
Bromodichloromethane	U	U	U	5.0
1,2-Dichloropropane	U	U	U	5.0
cis-1,3-Dichloropropene	U	U	U	5.0
Trichloroethene	U	.7J	U	5.0
Dibromochloromethane	U	U	U	5.0
1,1,2-Trichloroethane	U	U	U	5.0
Benzene	U	U	U	5.0
trans-1,3-Dichloropropene	U	U	U	5.0
Bromoform	U	U	U	5.0
4-Methyl-2-Pentanone	U	U	U	10
2-Hexanone	U	U	U	10
Tetrachloroethene	U	.6J	U	5.0
Toluene	U	U	U	5.0
1,1,2,2-Tetrachloroethane	U	U	U	5.0
Chlorobenzene	U	U	U	5.0
Ethylbenzene	U	U	U	5.0
Styrene	U	U	U	5.0
Xylene (total)	U	U	U	5.0
Date Received		05/03/00	05/03/00	
Date Extracted	N/A	N/A	N/A	
Date Analyzed	05/09/00	05/09/00	05/09/00	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE VO-1.1
7000-0859A
FOSTER WHEELER ENVIRONMENTAL
VOLATILE ORGANICS (SPLP)

Aqueous

All values are ug/L.

Client Sample I.D.	CB9908002XX	CB9908002XX FMS	CB9903003XX	Quant. Limits with no Dilution
Lab Sample I.D.	000859A-03	000859A-03 FMS	000859A-04	
Method Blank I.D.	VBLKKE	VBLKKE	VBLKKE	
Quant. Factor	1.00	1.00	1.00	
Chloromethane	U	40X	U	10
Bromomethane	U	45X	U	10
Vinyl Chloride	U	45X	U	10
Chloroethane	U	45X	U	10
Methylene Chloride	3J	51X	10	5.0
Acetone	11	64X	16	10
Carbon Disulfide	U	41X	U	5.0
Vinyl Acetate	U	2JX	U	10
1,1-Dichloroethene	U	47X	U	5.0
1,1-Dichloroethane	U	54X	U	5.0
cis-1,2-Dichloroethene	1J	46	U	5.0
trans-1,2-Dichloroethene	U	44	U	5.0
Chloroform	U	54X	U	5.0
1,2-Dichloroethane	U	62X	U	5.0
2-Butanone	U	67X	U	10
1,1,1-Trichloroethane	U	57X	U	5.0
Carbon Tetrachloride	U	61X	U	5.0
Bromodichloromethane	U	61X	U	5.0
1,2-Dichloropropane	U	56X	U	5.0
cis-1,3-Dichloropropene	U	56X	U	5.0
Trichloroethene	7	81X	U	5.0
Dibromochloromethane	U	62X	U	5.0
1,1,2-Trichloroethane	U	57X	U	5.0
Benzene	U	54X	U	5.0
trans-1,3-Dichloropropene	U	58X	U	5.0
Bromoform	U	65X	U	5.0
4-Methyl-2-Pentanone	U	80X	U	10
2-Hexanone	U	83X	U	10
Tetrachloroethene	1J	52X	1J	5.0
Toluene	U	51X	U	5.0
1,1,2,2-Tetrachloroethane	U	30X	U	5.0
Chlorobenzene	U	48X	U	5.0
Ethylbenzene	U	56X	U	5.0
Styrene	U	56X	U	5.0
Xylene (total)	U	160X	U	5.0
Date Received	05/03/00	05/03/00	05/03/00	
Date Extracted	N/A	N/A	N/A	
Date Analyzed	05/09/00	05/09/00	05/09/00	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE VO-1.2
7000-0859A
FOSTER WHEELER ENVIRONMENTAL
VOLATILE ORGANICS (SPLP)

Aqueous

All values are ug/L.

Client Sample I.D.	TP9910003XX	CB9911002XX	TPDEP12002XX	Quant. Limits with no Dilution
Lab Sample I.D.	000859A-06	000859A-08	000859A-09	
Method Blank I.D.	VBLKKE	VBLKKE	VBLKKE	
Quant. Factor	1.00	1.00	1.00	
Chloromethane	U	U	U	10
Bromomethane	U	U	U	10
Vinyl Chloride	U	U	35	10
Chloroethane	U	U	U	10
Methylene Chloride	4J	14	8	5.0
Acetone	13	16	11	10
Carbon Disulfide	U	U	U	5.0
Vinyl Acetate	U	U	U	10
1,1-Dichloroethene	U	U	U	5.0
1,1-Dichloroethane	U	U	U	5.0
cis-1,2-Dichloroethene	U	U	70	5.0
trans-1,2-Dichloroethene	U	U	2J	5.0
Chloroform	U	U	U	5.0
1,2-Dichloroethane	U	U	U	5.0
2-Butanone	U	5J	4J	10
1,1,1-Trichloroethane	U	U	U	5.0
Carbon Tetrachloride	U	U	U	5.0
Bromodichloromethane	U	U	U	5.0
1,2-Dichloropropane	U	U	U	5.0
cis-1,3-Dichloropropene	U	U	U	5.0
Trichloroethene	1J	1J	160	5.0
Dibromochloromethane	U	U	U	5.0
1,1,2-Trichloroethane	U	U	U	5.0
Benzene	U	U	U	5.0
trans-1,3-Dichloropropene	U	U	U	5.0
Bromoform	U	U	U	5.0
4-Methyl-2-Pentanone	U	U	U	10
2-Hexanone	U	U	U	10
Tetrachloroethene	U	1J	2J	5.0
Toluene	U	U	1J	5.0
1,1,2,2-Tetrachloroethane	U	U	U	5.0
Chlorobenzene	U	U	U	5.0
Ethylbenzene	U	U	U	5.0
Styrene	U	U	U	5.0
Xylene (total)	U	U	U	5.0
Date Received	05/03/00	05/03/00	05/03/00	
Date Extracted	N/A	N/A	N/A	
Date Analyzed	05/09/00	05/09/00	05/09/00	

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE VO-1.3
7000-0859A
FOSTER WHEELER ENVIRONMENTAL
VOLATILE ORGANICS (SPLP)

Aqueous

All values are ug/L.

Client Sample I.D.	TPDEP11001XX			Quant. Limits with no Dilution
Lab Sample I.D.	000859A-10			
Method Blank I.D.	VBLKKE			
Quant. Factor	1.00			
Chloromethane	U			10
Bromomethane	U			10
Vinyl Chloride	U			10
Chloroethane	U			10
Methylene Chloride	30			5.0
Acetone	13			10
Carbon Disulfide	U			5.0
Vinyl Acetate	U			10
1,1-Dichloroethene	U			5.0
1,1-Dichloroethane	U			5.0
cis-1,2-Dichloroethene	1J			5.0
trans-1,2-Dichloroethene	U			5.0
Chloroform	U			5.0
1,2-Dichloroethane	U			5.0
2-Butanone	U			10
1,1,1-Trichloroethane	U			5.0
Carbon Tetrachloride	U			5.0
Bromodichloromethane	U			5.0
1,2-Dichloropropane	U			5.0
cis-1,3-Dichloropropene	U			5.0
Trichloroethene	7			5.0
Dibromochloromethane	U			5.0
1,1,2-Trichloroethane	U			5.0
Benzene	U			5.0
trans-1,3-Dichloropropene	U			5.0
Bromoform	U			5.0
4-Methyl-2-Pentanone	U			10
2-Hexanone	U			10
Tetrachloroethene	1J			5.0
Toluene	U			5.0
1,1,2,2-Tetrachloroethane	U			5.0
Chlorobenzene	U			5.0
Ethylbenzene	U			5.0
Styrene	U			5.0
Xylene (total)	U			5.0
Date Received	05/03/00			
Date Extracted	N/A			
Date Analyzed	05/09/00			

See Appendix for qualifier definitions
Note: Compound detection limit = quantitation limit x quantitation factor
Quant. Factor = a numerical value which takes into account any variation in sample weight/volume, % moisture and sample dilution.

TABLE AS-1.0 Aqueous
7000-0859A
FOSTER WHEELER ENVIRONMENTAL
MISCELLANEOUS ATOMIC SPECTROSCOPY (SPLP)

All values are ug/L.

Client Sample I.D.	TPDEP12002XX	TPDEP11001XX		
Lab Sample I.D.	000859A-09	000859A-10		
Vanadium	415.	164.		

See Appendix for qualifier definitions

ORGANICS APPENDIX

U - Indicates that the compound was analyzed for but not detected.

J - Indicates that the compound was analyzed for and determined to be present in the sample. The mass spectrum of the compound meets the identification criteria of the method. The concentration listed is an estimated value, which is less than the specified minimum detection limit but is greater than zero.

B - This flag is used when the analyte is found in the blanks as well as the sample. It indicates possible sample contamination and warns the data user to use caution when applying the results of this analyte.

N - Indicates that the compound was analyzed for but not requested as an analyte. Value will not be listed on tabular result sheet.

S - Estimated due to surrogate outliers.

X - Matrix spike compound.

(1) - Cannot be separated.

(2) - Decomposes to azobenzene. Measured and calibrated as azobenzene.

A - This flag indicates that a TIC is a suspected aldol condensation product.

E - Indicates that it exceeds calibration curve range.

D - This flag identifies all compounds identified in an analysis at a secondary dilution factor.

C - Confirmed by GC/MS.

T - Compound present in TCLP blank.

P - This flag is used for a pesticide/aroclor target analyte when there is a greater than 25 percent difference for detected concentrations between the two GC columns (see Form X).

Committed To Your Success

INORGANICS APPENDIX

C - Concentration qualifiers

U - Indicates analyte was not detected at method reporting limit.

B - Indicates analyte result between IDL and contract required detection limit (CRDL)

Q - QC qualifiers

E - Reported value is estimated because of the presence of interference

M - Duplicate injection precision not met

N - Spiked sample recovery not within control limits

S - The reported value was determined by the method of standard additions (MSA)

W - Post-digest spike recovery furnace analysis was out of 85-115 percent control limit, while sample absorbance was less than 50 percent of spike absorbance

* - Duplicate analysis not within control limit

+ - Correlation coefficient for MSA is less than 0.995

M - Method codes

P - ICP

A - Flame AA

F - Furnace AA

CV - Cold vapor AA (manual)

C - Cyanide

NR - Not Required

NC - Not Calculated as per protocols

STATE CERTIFICATIONS

In some instances it may be necessary for environmental data to be reported to a regulatory authority with reference to a certified laboratory. For your convenience, the laboratory identification numbers for the STL-Connecticut laboratory are provided in the following table. Many states certify laboratories for specific parameters or tests within a category (i.e. method 325.2 for wastewater). The information in the following table indicates the lab is certified in a general category of testing such as drinking water or wastewater analysis. The laboratory should be contacted directly if parameter-specific certification information is required.

STL-Connecticut
Certification Summary (as of April 2000)

State	Responsible Agency	Certification	Lab Number
Connecticut	Department of Health Services	Drinking Water, Wastewater	PH-0497
Maine	Department of Health and Environmental Services	Drinking Water, Wastewater/Solid, Hazardous Waste	CT023
Massachusetts	Department of Environmental Protection	Potable/Non-Potable Water	CT023
New Hampshire	Department of Environmental Services	Drinking Water, Wastewater	2528
New Jersey	Department of Environmental Protection	Drinking Water, Wastewater	46410
New York	Department of Health	CLP, Drinking Water, Wastewater, Solid/ Hazardous Waste	10602
North Carolina	Division of Environmental Management	Wastewater	388
Rhode Island	Department of Health	Chemistry...Non-Potable Water and Wastewater	A43
Washington	Department of Ecology	Wastewater/Hazardous Waste	C231
Wisconsin	Department of Natural Resources	Wastewater	998355710

7000-0859A
FOSTER WHEELER ENVIRONMENTAL
SAMPLE SUMMARY

CLIENT ID	LAB ID	MATRIX	DATE COLLECTED	DATE RECEIVED
CB9904002XX	000859A-01	SOIL	05/03/00	05/03/00
CB9901002XX	000859A-02	SOIL	05/03/00	05/03/00
CB9908002XX	000859A-03	SOIL	05/03/00	05/03/00
CB9903003XX	000859A-04	SOIL	05/03/00	05/03/00
CB9914002XX	000859A-05	LEACHATE	05/03/00	05/03/00
TP9910003XX	000859A-06	LEACHATE	05/03/00	05/03/00
CB9915002XX	000859A-07	LEACHATE	05/03/00	05/03/00
CB9911002XX	000859A-08	LEACHATE	05/03/00	05/03/00
TPDEP12002XX	000859A-09	SOIL	05/03/00	05/03/00
TPDEP11001XX	000859A-10	LEACHATE	05/03/00	05/03/00

IEA-CT ANALYTICAL SUMMARY

Client ID: CB9901002XX, CB9903003XX, CB9904002XX, CB9908002XX, CB9911002XX, CB9914002XX, CB9915002XX, TP9910003XX, TPDEP11001XX, TPDEP12002XX

Job Number: 7000-0859A

Date: 5/18/100

Qty	Matrix	Analysis	Description
5	LEACHATE	BN-L8270C-MISC	Miscellaneous Base-N
2	LEACHATE	V-LSW846	Vanadium (TCLP)
8	LEACHATE	VOA-L8260B-TCL	Volatile Organics (T
1	None	DISK	Diskette Prep.
5	SOIL	BNA-1312-PREP	SPLP BNA Leach
2	SOIL	MET-1312-PREP	SPLP Metals Leach
8	SOIL	VOA-1312-PREP	SPLP Volatiles Leach

GC/MS SEMIVOLATILE SUMMARY

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER
Method: SW846 SW846 8270C SIM
8270C (SIM)

Lab Sample ID: C0E060119 001

Sample WT/Vol: 1000 / mL
Work Order: DCVF6101
Dilution factor: 1
Moisture %: NA

Date Received: 05/06/00
Date Extracted: 05/08/00
Date Analyzed: 05/10/00

QC Batch: 0130111

Client Sample Id: CB9914002XX

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
83-32-9	Acenaphthene	1.0	U
208-96-8	Acenaphthylene	0.080	J
120-12-7	Anthracene	0.29	
56-55-3	Benzo(a)anthracene	0.083	J
205-99-2	Benzo(b)fluoranthene	0.042	J
207-08-9	Benzo(k)fluoranthene	0.034	J
191-24-2	Benzo(ghi)perylene	0.20	U
50-32-8	Benzo(a)pyrene	0.033	J
218-01-9	Chrysene	0.082	J
206-44-0	Fluoranthene	0.85	
86-73-7	Fluorene	0.46	
193-39-5	Indeno(1,2,3-cd)pyrene	0.20	U
91-57-6	2-Methylnaphthalene	0.046	J
91-20-3	Naphthalene	~~1.0~~ 0.032	J ~~U~~ DMS 5/16/00
85-01-8	Phenanthrene	1.9	
129-00-0	Pyrene	0.45	
53-70-3	Dibenzo(a,h)anthracene	0.20	U
86-74-8	Carbazole	0.21	J

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER
Method: SW846 SW846 8270C SIM
8270C (SIM)

Lab Sample ID: C0E060119 002

Sample WT/Vol: 1000 / mL
Work Order: DCVF8101
Dilution factor: 1
Moisture %: NA

Date Received: 05/06/00
Date Extracted: 05/08/00
Date Analyzed: 05/10/00

QC Batch: 0130111

Client Sample Id: TP9910003XX

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
83-32-9	Acenaphthene	0.46	J
208-96-8	Acenaphthylene	1.6	
120-12-7	Anthracene	1.6	
56-55-3	Benzo(a)anthracene	3.1	
205-99-2	Benzo(b)fluoranthene	2.7	
207-08-9	Benzo(k)fluoranthene	2.3	
191-24-2	Benzo(ghi)perylene	2.6	
50-32-8	Benzo(a)pyrene	3.1	
218-01-9	Chrysene	3.2	
206-44-0	Fluoranthene	9.2	
86-73-7	Fluorene	1.6	
193-39-5	Indeno(1,2,3-cd)pyrene	2.1	
91-57-6	2-Methylnaphthalene	1.2	
91-20-3	Naphthalene	6.8	
85-01-8	Phenanthrene	7.7	
129-00-0	Pyrene	7.1	
53-70-3	Dibenzo(a,h)anthracene	0.71	
86-74-8	Carbazole	1.4	

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER
Method: SW846 SW846 8270C SIM
8270C (SIM)

Lab Sample ID: C0E060119 003

Sample WT/Vol: 1000 / mL
Work Order: DCVF9101
Dilution factor: 1
Moisture %: NA

Date Received: 05/06/00
Date Extracted: 05/08/00
Date Analyzed: 05/10/00

QC Batch: 0130111

Client Sample Id: CB9911002XX

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
83-32-9	Acenaphthene	1.0	U
208-96-8	Acenaphthylene	1.0	U
120-12-7	Anthracene	0.032	J
56-55-3	Benzo(a)anthracene	0.042	J
205-99-2	Benzo(b)fluoranthene	0.20	U
207-08-9	Benzo(k)fluoranthene	0.20	U
191-24-2	Benzo(ghi)perylene	0.20	U
50-32-8	Benzo(a)pyrene	0.20	U
218-01-9	Chrysene	0.035	J
206-44-0	Fluoranthene	0.21	
86-73-7	Fluorene	0.037	J
193-39-5	Indeno(1,2,3-cd)pyrene	0.20	U
91-57-6	2-Methylnaphthalene	0.060	J
91-20-3	Naphthalene	0.27	J
85-01-8	Phenanthrene	0.22	
129-00-0	Pyrene	0.20	
53-70-3	Dibenzo(a,h)anthracene	0.20	U
86-74-8	Carbazole	1.0	U

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER
Method: SW846 SW846 8270C SIM
8270C (SIM)

Lab Sample ID:C0E060119 004

Sample WT/Vol: 1000 / mL
Work Order: DCVFA101
Dilution factor: 1
Moisture %:NA

Date Received: 05/06/00
Date Extracted:05/08/00
Date Analyzed: 05/10/00

QC Batch: 0130111

Client Sample Id: CB9915002XX

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
83-32-9	Acenaphthene	4.3	
208-96-8	Acenaphthylene	0.21	J
120-12-7	Anthracene	7.8	
56-55-3	Benzo(a)anthracene	9.7	
205-99-2	Benzo(b)fluoranthene	7.2	
207-08-9	Benzo(k)fluoranthene	6.7	
191-24-2	Benzo(ghi)perylene	5.6	
50-32-8	Benzo(a)pyrene	8.0	
218-01-9	Chrysene	9.4	
206-44-0	Fluoranthene	31	E
86-73-7	Fluorene	6.1	
193-39-5	Indeno(1,2,3-cd)pyrene	5.5	
91-57-6	2-Methylnaphthalene	0.76	J
91-20-3	Naphthalene	1.4	
85-01-8	Phenanthrene	27	E
129-00-0	Pyrene	21	E
53-70-3	Dibenzo(a,h)anthracene	2.3	
86-74-8	Carbazole	9.6	

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER Lab Sample ID: C0E060119 004
Method: SW846 SW846 8270C SIM
8270C (SIM)

Sample WT/Vol: 1000 / mL Date Received: 05/06/00
Work Order: DCVFA201 Date Extracted: 05/08/00
Dilution factor: 4 Date Analyzed: 05/10/00
Moisture %: NA

QC Batch: 0130111

Client Sample Id: CB9915002XX -RE 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
83-32-9	Acenaphthene	3.6	J
208-96-8	Acenaphthylene	0.18	J
120-12-7	Anthracene	6.6	
56-55-3	Benzo(a)anthracene	8.4	
205-99-2	Benzo(b)fluoranthene	7.0	
207-08-9	Benzo(k)fluoranthene	5.1	
191-24-2	Benzo(ghi)perylene	4.8	
50-32-8	Benzo(a)pyrene	6.9	
218-01-9	Chrysene	8.4	
206-44-0	Fluoranthene	29	
86-73-7	Fluorene	5.0	
193-39-5	Indeno(1,2,3-cd)pyrene	4.5	
91-57-6	2-Methylnaphthalene	0.66	J
91-20-3	Naphthalene	1.3	J
85-01-8	Phenanthrene	24	
129-00-0	Pyrene	19	
53-70-3	Dibenzo(a,h)anthracene	1.9	
86-74-8	Carbazole	8.1	

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER
Method: SW846 SW846 8270C SIM
8270C (SIM)

Lab Sample ID:C0E060119 005

Sample WT/Vol: 1000 / mL
Work Order: DCVFC101
Dilution factor: 1
Moisture %:NA

Date Received: 05/06/00
Date Extracted:05/08/00
Date Analyzed: 05/10/00

QC Batch: 0130111

Client Sample Id: TPDEP11001XX

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
83-32-9	Acenaphthene	0.063	J
208-96-8	Acenaphthylene	1.0	U
120-12-7	Anthracene	0.089	J
56-55-3	Benzo(a)anthracene	0.072	J
205-99-2	Benzo(b)fluoranthene	0.060	J
207-08-9	Benzo(k)fluoranthene	0.052	J
191-24-2	Benzo(ghi)perylene	0.048	J
50-32-8	Benzo(a)pyrene	0.054	J
218-01-9	Chrysene	0.072	J
206-44-0	Fluoranthene	0.31	
86-73-7	Fluorene	0.075	J
193-39-5	Indeno(1,2,3-cd)pyrene	0.040	J
91-57-6	2-Methylnaphthalene	0.080	J
91-20-3	Naphthalene	0.11	J
85-01-8	Phenanthrene	0.42	
129-00-0	Pyrene	0.20	
53-70-3	Dibenzo(a,h)anthracene	0.20	U
86-74-8	Carbazole	0.11	J

STL Monroe
CHECK SAMPLE COMPOUNDS

Lab Name: Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER
Method: SW846 SW846 8270C SIM
8270C (SIM)

Lab Sample ID: C0E090000 111

Sample WT/Vol: 1000 / mL
Work Order: DCWWV102
Dilution factor: 1
Moisture %: NA

Date Received: 05/06/00
Date Extracted: 05/08/00
Date Analyzed: 05/10/00

QC Batch: 0130111

Client Sample Id: CHECK SAMPLE

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
83-32-9	Acenaphthene	3.49	
208-96-8	Acenaphthylene	3.40	
120-12-7	Anthracene	3.99	
56-55-3	Benzo(a)anthracene	4.04	
205-99-2	Benzo(b)fluoranthene	3.91	
207-08-9	Benzo(k)fluoranthene	3.71	
191-24-2	Benzo(ghi)perylene	3.54	
50-32-8	Benzo(a)pyrene	3.39	
218-01-9	Chrysene	3.98	
53-70-3	Dibenzo(a,h)anthracene	3.47	
206-44-0	Fluoranthene	4.44	
86-73-7	Fluorene	3.69	
193-39-5	Indeno(1,2,3-cd)pyrene	3.47	
91-57-6	2-Methylnaphthalene	3.52	
91-20-3	Naphthalene	3.56	
85-01-8	Phenanthrene	3.99	
129-00-0	Pyrene	4.10	
86-74-8	Carbazole	4.28	

STL Monroe
CHECK SAMPLE DUPLICATE COMPOUNDS

Lab Name:Severn Trent Laboratories, Inc. SDG Number:

Matrix: (soil/water) WATER
Method: SW846 SW846 8270C SIM
8270C (SIM)

Lab Sample ID:C0E090000 111

Sample WT/Vol: 1000 / mL
Work Order: DCWWV103
Dilution factor: 1
Moisture %:NA

Date Received: 05/06/00
Date Extracted:05/08/00
Date Analyzed: 05/10/00

QC Batch: 0130111

Client Sample Id: DUPLICATE CHECK

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
83-32-9	Acenaphthene	3.54	
208-96-8	Acenaphthylene	3.44	
120-12-7	Anthracene	3.99	
56-55-3	Benzo(a)anthracene	4.02	
205-99-2	Benzo(b)fluoranthene	4.15	
207-08-9	Benzo(k)fluoranthene	3.57	
191-24-2	Benzo(ghi)perylene	3.50	
50-32-8	Benzo(a)pyrene	3.38	
218-01-9	Chrysene	3.96	
206-44-0	Fluoranthene	4.53	
86-73-7	Fluorene	3.75	
193-39-5	Indeno(1,2,3-cd)pyrene	3.44	
91-57-6	2-Methylnaphthalene	3.52	
91-20-3	Naphthalene	3.58	
85-01-8	Phenanthrene	4.04	
129-00-0	Pyrene	4.11	
53-70-3	Dibenzo(a,h)anthracene	3.45	
86-74-8	Carbazole	4.34	