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Groundwater Sampling Report

Site 7 Landfill South of "P" Barricades

Naval Weapons Station Earle
Colts Neck, New Jersey

Naval Facilities Engineering Command
Mid-Atlantic

Contract No. N62472-03-D-0057
Contract Task Order 059

September 2009

TETRA TECH

PHIL-23134

GROUNDWATER SAMPLING REPORT
SITE 7 LANDFILL SOUTH OF "P" BARRICADES

NAVAL WEAPONS STATION EARLE
COLTS NECK, NEW JERSEY

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Prepared for:
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CONTRACT NO. N62472-03-D-0057
CONTRACT TASK ORDER 059

September 2009

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1.0 INTRODUCTION

1.1 OVERVIEW

This Groundwater Sampling Report was prepared for the Naval Facilities Engineering Command Mid-Atlantic (NAVFAC MIDLANT) as part of Contract Task Order (CTO) 059 under the Comprehensive Long-Term Environmental Action Navy (CLEAN) contract number N62472-03-D-0057. This report summarizes the methodology and results of the discreet interval groundwater sampling conducted by the Navy at Site 7, Landfill South of “P” Barricades, on July 7 and 8, 2009. The sampling was conducted in response to New Jersey Department of Environmental Protection (NJDEP) concerns about the potential for downward vertical migration in the groundwater of certain organic contaminants. Tetra Tech NUS, Inc. (Tetra Tech) was tasked to conduct the field effort to collect discreet groundwater samples, at selected vertical intervals downgradient of Site 7, specifically for the volatile organic compounds (VOCs) benzene, chlorobenzene, chloroform and 1, 1, 2-trichloroethane.

2.0 BACKGROUND

2.1 SITE DESCRIPTION

Site 7 (Figure 2-1) is located in the Chapel Hill portion of the Waterfront Area and is approximately five acres in size. About 3.6 acres of the site were used for disposal of domestic refuse, dunnage and shop wastes (i.e., glass, wood, and small quantities of paint, thinners, and solvents) between 1965 and 1977. Site 7 is currently unused.

Regional geological mapping and the boring logs of the on-site monitoring wells place Site 7 within the outcrop area of the Red Bank Sand Formation, which in turn is underlain by the Navesink Formation. Groundwater beneath Site 7 occurs under unconfined conditions and the formations are interpreted to be hydraulically interconnected (Brown & Root, 1996). The direction of shallow groundwater flow in the aquifer is towards the north. Figure 2-2 shows the locations of the existing Site 7 monitoring wells and the groundwater flow direction interpreted from water level measurements collected in April 2005 (Tetra Tech, 2005).

Historical groundwater sampling has indicated the presence of low concentrations of the organic compounds chlorobenzene, benzene, chloroform, and 1,1,2-trichloroethane in one or more Site 7 monitoring wells. The existing Site 7 monitoring wells are shallow; screened depths range between 19 feet and 39 feet below ground surface (bgs). None of the existing Site 7 monitoring wells penetrated through a black silt layer (likely the Navesink Formation) that underlies the site at a depth estimated to be between 18 feet and 35 feet bgs (Brown & Root, 1996).

NJDEP has indicated that the vertical extent of VOCs is not completely defined and that further groundwater sampling is required (NJDEP, 2009). The Navy agreed to conduct additional groundwater sampling to delineate the vertical extent of selected VOCs, specifically, chlorobenzene, benzene, chloroform, and 1,1,2-trichloroethane which have been detected previously in groundwater at the site.

3.0 GROUNDWATER SAMPLING

3.1 SAMPLING METHODOLOGY

To address NJDEP's concerns, Tetra Tech, and its subcontractor Environmental Field Services, conducted vertical discreet interval groundwater sampling downgradient of the existing monitoring wells at Site 7. One soil boring and two groundwater sampling borings were constructed using direct push technology (DPT). Boring locations, sampling methodology, and laboratory analyses were done in accordance with the July 2009 Sampling and Analysis Plan for Site 7 Groundwater Sampling, (Tetra Tech, 2009) that was reviewed and approved by the Navy, NJDEP, and the U.S. Environmental Protection Agency (EPA).

On July 7, 2009 a DPT boring (07GP1) was continuously sampled, in increments of four feet (ft), at the location shown on Figure 2-2, to profile the material encountered, depth to the top of the water table, the depth to the top of the black silt layer, and the depth to the bottom of the black silt layer (if penetrated) or identify the type of material at a depth of 50 feet. The DPT boring was necessary because the HydroPunch® procedure does not provide any information, other than penetration rate and material relative density, regarding the material being penetrated.

The boring log for 07GP1 is provided in Appendix A and indicates that the subsurface materials present immediately downgradient of existing monitoring wells MW07-02 and MW07-05 are similar to those described in the boring logs for the Site 7 monitoring wells (loose to firm brown very fine-grained sand and then dense black silt with varying degrees of clay, mica flakes and very fine sand). The dense black silt was encountered at a depth of approximately 15.5 feet below ground surface (bgs) and extended to the depth of boring 07GP1 (approximately 48 ft bgs), so the thickness of the black silt is unknown.

A photoionization detector (PID) was used to screen the breathing zone, the borehole and the soil subsurface material samples for VOCs. As detailed in the 07GP1 boring log (Appendix A), VOCs were not detected anywhere and there were no odors from the samples.

Two HydroPunch® borings (07HP1 and 07HP2), at the locations shown on Figure 2-2, were installed to depths of 50 and 48 (penetration refusal) feet respectively below ground. The HydroPunch® sampler was driven to the target groundwater sampling depth then the outer casing of the sampler was retracted to expose approximately three feet of stainless steel screen. Groundwater was allowed to enter the screen and then withdrawn with a disposable bailer consisting of Teflon® tubing and a check valve. After the groundwater sample was retrieved, the sampler was withdrawn, reassembled and driven down to the next zone to be sampled.

The groundwater sampling sequence differed from that described in the Sampling and Analysis Plan for Site 7 Groundwater Sampling because the underlying black silt layer was encountered at a shallower depth (approximately 13 feet bgs) and was much thicker than anticipated. In addition, the DPT boring indicated that the saturated conditions were deeper than anticipated (between 16 feet and 27 feet bgs). Based on the field observations, samples were collected from the following intervals; just above the black silt layer, in the visually most saturated portion of the silt layer and the deepest portion of each boring.

Therefore, discreet groundwater samples were collected from each HydroPunch® boring at the intervals described below:

- 07HP1: Discrete groundwater samples were collected at 19 feet, 38 feet, and 50 feet below ground on July 8, 2009.

- 07HP2: Discrete groundwater samples were collected at 15 feet, 29 feet, and 48 feet below ground on July 7, 2009.

The HydroPunch® groundwater samples were placed in laboratory-prepared sample containers and stored at 4º C. When sampling was completed the samples were packaged and shipped to Empirical Laboratories LLC, in Nashville, Tennessee, a New Jersey-certified laboratory, for analysis following proper chain-of-custody procedures. Groundwater sampling logs for each interval are provided in Appendix B.

Given the density of the fine-grained materials encountered in the DPT boring, the intervals sampled had very low yields and the water samples were turbid. Field parameters, including pH, conductivity, temperature, etc., were measured for each groundwater sample (see the sampling logs in Appendix B). Table 3-1 summarizes the field-measured values for pH, conductivity and dissolved oxygen. There was a noticeable difference in pH between the shallow groundwater sample and the deeper samples (see Table 3-1). The shallow samples had lower pH than the deeper groundwater samples.

3.2 QUALITY CONTROL SAMPLE COLLECTION

Quality control samples were collected, as detailed in the approved sampling and analysis plan, to ensure that procedures followed were adequate to protect sample integrity. These included:

- Trip blank - laboratory-grade water in sealed sample containers that accompany each shipping container to identify potential cross-contamination between sealed sample containers.

- Duplicate - split sample shipped “blind” to the laboratory to assess laboratory precision.

- A Matrix Spike (MS) and a Matrix Spike Duplicate (MSD) were collected to assess analytical precision and accuracy.

3.3 LABORATORY ANALYSIS AND DATA REVIEW

The HydroPunch® groundwater samples were analyzed for benzene, chlorobenzene, chloroform and 1, 1, 2-trichloroethane following EPA SW-846 Method 8260B. The laboratory analytical data packages for each sample are provided in Appendix C.

Analytical data were reviewed in accordance with data validation guidance described in the Sampling and Analysis Plan for Site 7 Groundwater Sampling, Worksheets 35 and 36. The data review results indicated that all samples and analytes were successfully analyzed, and there were no major problems with data quality. The data validation review reports are provided in Appendix D.

4.0 FINDINGS OF THE INVESTIGATION

4.1 ANALYTICAL DATA SUMMARY

Table 4-1 summarizes the analytical results of the discrete interval groundwater sampling at Site 7. With the exception of benzene and chloroform, the compounds analyzed for were not detected. Benzene was detected in HydroPunch® boring 07HP1 at discrete sample intervals of 19 feet, 38 feet, and 50 feet below ground at estimated concentrations ranging from 0.16J micrograms per liter (µg/l) to 0.27J µg/l. The "J" designation indicates an estimated concentration because the concentration was greater than the method detection limit (0.11 µg/l), but less than the reporting limit (1.0 µg/l). Chloroform was detected in 07HP1 at the interval depth of 19 feet at an estimated concentration of 0.32J µg/l.

Benzene was detected in HydroPunch® boring 07HP2 at the discrete sample interval of 48 feet below ground at an estimated concentration of 0.21J µg/l.

All the detected estimated concentrations of benzene and chloroform are less than their respective NJDEP Groundwater Quality Standards (GWQSs) (1 µg/l and 70 µg/l, respectively).

The estimated concentrations of benzene and chloroform are also less than their respective EPA Maximum Contaminant Levels (MCLs) of 5 µg/l for benzene and 100 µg/l for chloroform.

As described on Worksheet 11 of the Sampling and Analysis Plan for Site 7 Groundwater Sampling, the project screening level is the more stringent of either the NJDEP GWQS or the EPA MCL for a given parameter. In every case, the NJDEP GWQS is the more stringent criterion. Screening criteria were not exceeded by any of the samples.

5.0 CONCLUSIONS AND RECOMMENDATION

5.1 CONCLUSIONS

The DPT boring (07GP1) indicates that the black silt layer, detected in the existing Site 7 monitoring well borings, is extensive and thick. The black silt was detected in 07GP1 at a depth of approximately 15.5 feet below ground surface, approximately 250 feet north of the approximate landfill boundary (see Figure 2-2), and was still present at a depth of 50 feet bgs.

Benzene was detected in trace amounts, at estimated concentrations well below the NJDEP GWQS, in all three of the HydroPunch® samples collected at 07HP1, downgradient from MW07-05. Benzene was also detected in a trace amount in 07HP2 at a depth of 48 feet, but not in any of the other 07HP2 groundwater samples.

Chloroform was detected in a trace amount in 07HP1 at a depth of 19 feet below ground. None of the other 07HP1 groundwater samples had detectable concentrations of chloroform.

The groundwater analytical results indicate that benzene concentrations do not increase or vary significantly with increasing depth below ground.

The detected compounds were found at only estimated concentrations, slightly above the method detection limit, and are less than their respective EPA MCLs and NJDEP GWQSs. Therefore, additional groundwater sampling and analysis at Site 7 for organic compounds is not warranted.

5.2 RECOMMENDATION

Based on the sampling and analytical results and comparison to current NJDEP GWQSs, EPA MCLs and the project quality objectives outlined in the Sampling and Analysis Plan for Site 7 Groundwater Sampling, no further sampling for organic compounds is recommended.

REFERENCES

Brown & Root (Brown & Root Environmental), 1996. Remedial Investigation Report for Naval Weapons Station (NWS) Earle, Colts Neck, New Jersey, Section 10.

Tetra Tech (Tetra Tech NUS, Inc.), 2009. Sampling and Analysis Plan for Site 7 Groundwater Sampling, Naval Weapons Station Earle, Colts Neck, New Jersey, June.

Jablonski, L.A., 1968, "Ground-Water Resources of Monmouth County, New Jersey", Special Report No. 23, U.S. Geological Survey.

NJDEP (New Jersey Department of Environmental Protection), 2009. E-mail from E. Bergman to R. Pagtalunan (US Navy). February 4.

New Jersey Geological Survey. "New Jersey Ambient Groundwater Quality Monitoring Network: Status of Shallow Ground-Water Quality, 1999-2004". Information Circular.

TABLES

TABLE 3-1
SELECTED FIELD PARAMETERS IN DISCRETE INTERVAL GROUNDWATER SAMPLES
AT SITE 7
NAVAL WEAPONS STATION EARLE,
COLTS NECK, NEW JERSEY

Sample ID	**pH**	**Conductivity** (mS/cm)	**Dissolved Oxygen** (mg/l)
07HP1-19-20090708	4.8	0.188	7.7
07HP1-38-20090708	6.27	0.312	10.79
07HP1-50-20090708	6.42	0.382	0.24
07HP2-15-20090707	4.24	0.246	12.79
07HP2-29-20090707	6.5	0.391	1.5
07HP2-48-20090707	6.46	0.485	0.40

Note: Sample ID: 07HP1-19-20090708
07HP1 - Site 7 HydroPunch® Boring 1
19 - Sample depth below ground
20090708 - Sample Date = July 8, 2009
mS/cm - milliSiemens per centimeter
mg/l - milligrams per liter

TABLE 4-1
OCCURRENCE AND DISTRIBUTION OF SELECTED ORGANIC COMPOUNDS IN DISCRETE INTERVAL GROUNDWATER SAMPLES AT SITE 7
NAVAL WEAPONS STATION EARLE,
COLTS NECK, NEW JERSEY

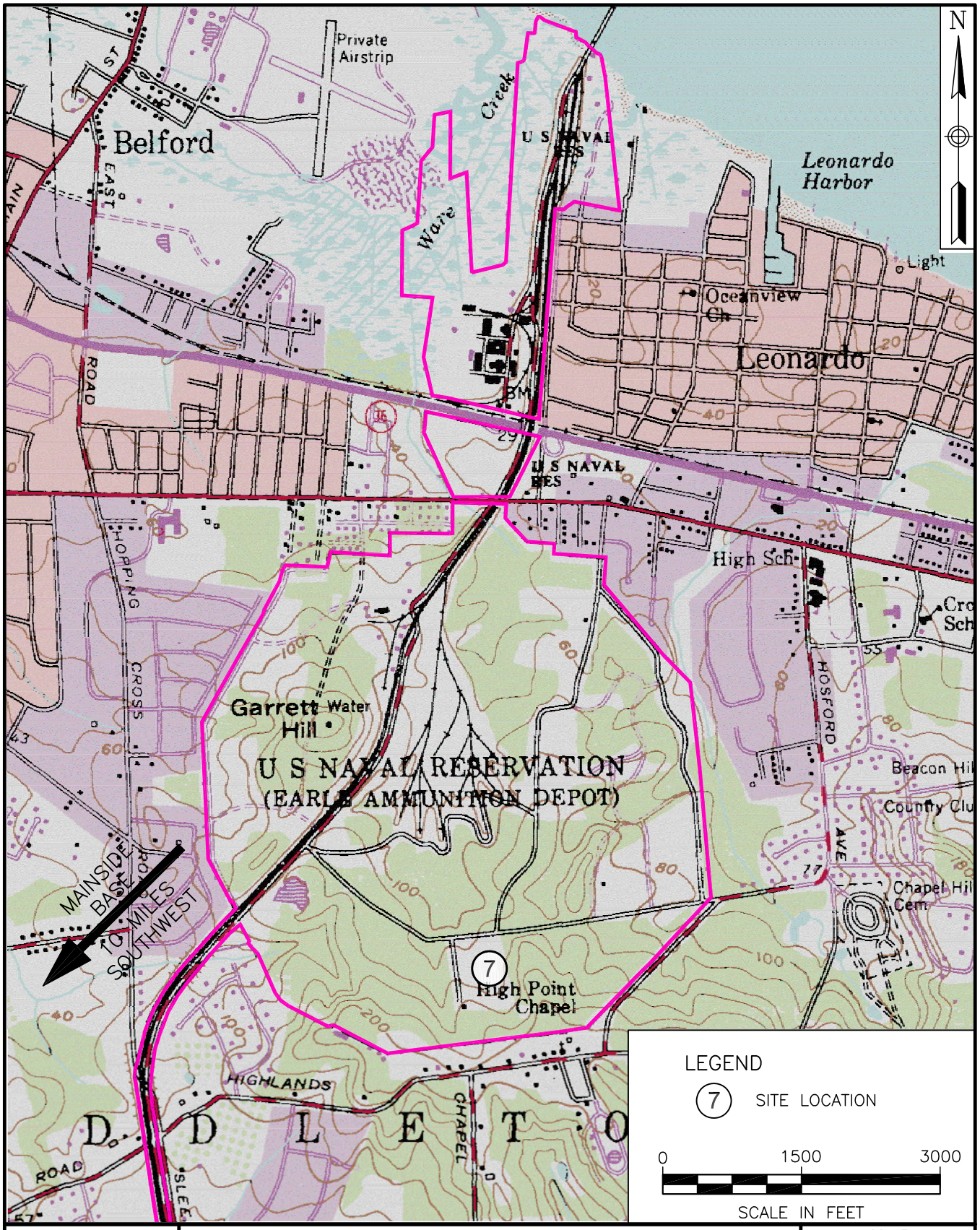
	Benzene	**Chlorobenzene**	**Chloroform**	**1,1,2-Trichloroethane**
NJDEP GWQS	1	50	70	30
EPA MCL	5	100	100	5
Sample ID				
07HP1-19-20090708	0.16J	ND	0.32J	ND
07HP1-38-20090708	0.27J	ND	ND	ND
07HP1-50-20090708	0.19J	ND	ND	ND
07HP2-15-20090707	ND	ND	ND	ND
07HP2-29-20090707	ND	ND	ND	ND
DUP-01 (duplicate of 07HP2-29-20090707)	ND	ND	ND	ND
07HP2-48-20090707	0.21J	ND	ND	ND

Notes: All concentration values in µg/l
Sample ID: 07HP1-19-20090708
07HP1 – Site 7 HydroPunch® Boring 1
19 – Sample depth below ground
20090708 - Sample Date = July 8, 2009
J – Estimated Value

NJDEP GWQS – New Jersey Department of Environmental Protection Groundwater Quality Standard

FIGURES

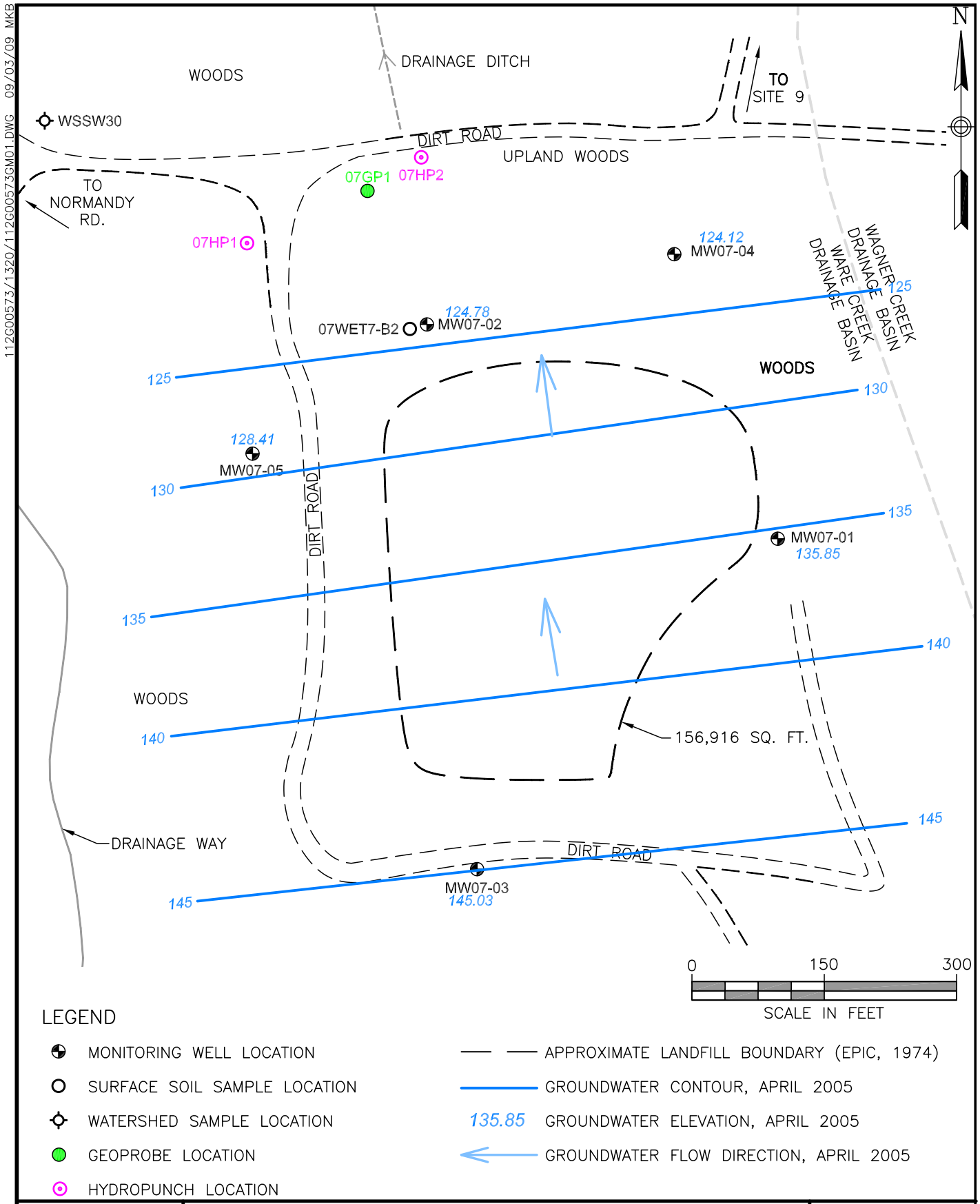
112G00573/1320/112G00573CM01.DWG 07/30/09 MKB



TETRA TECHNUS, INC.

SITE LOCATION
WATERFRONT AREA
NAVAL WEAPONS STATION
COLTS NECK, NEW JERSEY

SCALE	AS NOTED
FILE	112G00573CM01
REV 0	DATE 07/30/09
FIGURE NUMBER	FIGURE 2-1



LEGEND

- MONITORING WELL LOCATION
- SURFACE SOIL SAMPLE LOCATION
- WATERSHED SAMPLE LOCATION
- GEOPROBE LOCATION
- HYDROPUNCH LOCATION
- APPROXIMATE LANDFILL BOUNDARY (EPIC, 1974)
- GROUNDWATER CONTOUR, APRIL 2005
- 135.85 GROUNDWATER ELEVATION, APRIL 2005
- GROUNDWATER FLOW DIRECTION, APRIL 2005

TETRA TECHNUS, INC.

GROUNDWATER MONITORING LOCATIONS
SITE 7 – LANDFILL SOUTH OF "P" BARRICADES
NAVAL WEAPONS STATION EARLE
COLTS NECK, NEW JERSEY

SCALE	AS NOTED
FILE	112G00573GM01
REV	0
DATE	09/03/09
FIGURE NUMBER	FIGURE 2–2

APPENDIX A

GEOPROBE® BORING LOG

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: Site 7 Groundwater Sampling
PROJECT NUMBER: 112G00573.
DRILLING COMPANY: Environmental Field Services, Inc.
DRILLING RIG: GEOPROBE 6620 DT

BORING No.: 07GP1
DATE: 7/7/09
GEOLOGIST: J. S. Tomalavage
DRILLER: T. WYSOCKI

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm): Sample	Sampler BZ	Borehole**	Driller BZ**
				0									
1	0-5		4.5/5		LOOSE	10YR 4/4	DRK BRN SILT LOAM 0-0.1'	SM		0	0	0	0
						10YR 6/6	LT. BRN V.F. SAND W/T SILT						
2	5-9		3/4		FIRM	10YR 6/6	LT. BRN SILTY V.F SAND 0.1'-1.2'	SM	DAMP MICA FLAKES	0			
3	9-12		4/4	10	FIRM	10YR 6/8	ORG. BRN SILT W/T CLAY & SAND 1.2-1.5'	SM		0			
4	13-17		4/4		FIRM	10YR 2/8	BLK SILT w/MICA & CLAY	ML	MOIST/WET @ 1.6'	0			
5	17-21		4/4	20	FIRM	"	" " "						
6	21-25		4/4		DENSE	"	BLK SILT w/SOME CLAY MICA & T/VF SAND	ML	SATURATED 2.7'-2.9'	0			
7	25-29		4/4		"		" " "						
8	29-31		2/4	30	DENSE	10YR 2/8	BLK SILT W/T SAND & MED WHITE ROUNDED GRAVEL		REFUSAL @ 31'	0			
									SWITCHED FROM 3 1/4" TO 2 1/4" SAMPLER				
9	31-32		2/2		"	"	" "						
10	32-36		4/4		DENSE	"	BLK SILT W/SOME V.F. SAND & T/CLAY			0			
11	36-40		4/4	40	"	"	" "			0			
12	40-44		4/4							0			
13	44-48		3/4		"	"	" "		END OF BORING REFUSAL SAMPLER DAMAGED STAMED	0			
				50									

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks: NO DETECTABLE VOC'S, NO ODOR

Drilling Area Background (ppm): 0

Converted to Well: Yes ____ No X Well I.D. #: ____

APPENDIX B

HYDROPUNCH® SAMPLING LOGS

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Site 7 Groundwater Sampling
Project No.: 112G00573

[] Domestic Well Data
[] Monitoring Well Data
[X] Other Well Type:
[] QA Sample Type:

Sample ID No.: 07HP1-19-20090708
Sample Location: SITE 7 HP1
Sampled By: J S Tomalavage
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other ORP
Date: 7/8/09								
Time: 1010								
Method: GRAB/BAILER	Brown	4.8	0.188	14.9	—	7.70	0	132

PURGE DATA:

Date: NA	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

HYDROPUNCH SAMPLE @ 19' BELOW GROUND IN HP1

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): JS Tomalavage

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Site 7 Groundwater Sampling
Project No.: 112G00573

[] Domestic Well Data
[] Monitoring Well Data
[X] Other Well Type:
[] QA Sample Type:

Sample ID No.: 07HPI-38-20090708
Sample Location: SITE 7 HPI
Sampled By: J S Tomalavage
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Date: 7/8/09								
Time: 1210								ORP
Method: GRAB/BAILER	MUDDY	6.27	.312	18.3	—	10.79	0.0	-44

PURGE DATA:

Date: NA	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

HYDROPUNCH SAMPLE @ 38' IN HPI AND MS/MSD

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s): J S Tomalavage

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Site 7 Groundwater Sampling
Project No.: 112G00573

[] Domestic Well Data
[] Monitoring Well Data
[X] Other Well Type:
[] QA Sample Type:

Sample ID No.: 07HP1-50-20090708
Sample Location: SITE 7 HP1
Sampled By: J S Tomalavage
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Date: 7/8/09								
Time: 1255	(Visual)	(S.U.)	(mS/cm)	(^{0}C)	(NTU)	(mg/l)	(%)	ORP
Method: GRAB/BAILER	Gray	6.42	.382	18.6	0	0.24	0	-98

PURGE DATA:

Date: N/A	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected

OBSERVATIONS / NOTES:

HYDROPUNCH SAMPLE @ 50' IN HP 1

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): J S Tomalavage

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Site 7 Groundwater Sampling
Project No.: 112G00573

[] Domestic Well Data
[] Monitoring Well Data
[X] Other Well Type:
[] QA Sample Type:

Sample ID No.: 07HP2-15-20090707
Sample Location: SITE 7 HP2
Sampled By: J S Tomalavage
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other ORP
Date: 7/7/2009								
Time: 1410								
Method: BAILER	BROWN	4.24	0.246	15.40	—	12.79	—	238

PURGE DATA: ~~BAILER~~

Date:	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: NA								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCl	3 x 40ml GLASS	✓

OBSERVATIONS / NOTES:

HYDROPUNCH SAMPLED @ ~15' IN 7HP2
SAMPLE MUDDY

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): J S Tomalavage

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Site 7 Groundwater Sampling
Project No.: 112G00573

[] Domestic Well Data
[] Monitoring Well Data
[X] Other Well Type:
[] QA Sample Type:

Sample ID No.: 07HP2-29-20090707
Sample Location: SITE 7 HP2
Sampled By: J S Tomalavage
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other ORP
Date: 7/7/09								
Time: 1445								
Method: GRAB/BAILER	CLOUDY	6.50	.391	20.7	956	1.50	0.0	-87

PURGE DATA:

Date: NA	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method:								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HCl	3 x 40 ml GLASS	✓

OBSERVATIONS / NOTES:

HYDROPUNCH SAMPLE @ 29' IN HP2, SAMPLE CLOUDY BLACK
COLLECTED DUP-01
SEDIMENT SETTLES QUICKLY

Circle if Applicable:

MS/MSD	Duplicate ID No.: DUP-01

Signature(s): JS Tomalavage

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: Site 7 Groundwater Sampling
Project No.: 112G00573

[] Domestic Well Data
[] Monitoring Well Data
[X] Other Well Type:
[] QA Sample Type:

Sample ID No.: 07HP2-~~18~~ 48-20090707
Sample Location: SITE 7 HP2
Sampled By: J S Tomalavage
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[] High Concentration

SAMPLING DATA:

	Color (Visual)	pH (S.U.)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (mg/l)	Salinity (%)	Other
Date: 7/8/09								
Time: 0900								
Method: GRAB/BAILER	BLK	6.46	.485	16.7	71000	0.90	0	-77

PURGE DATA:

Date:	Volume	pH	S.C.	Temp.	Turbidity	DO	Salinity	Other
Method: NA								
Monitor Reading (ppm):								
Well Casing Diameter & Material								
Type:								
Total Well Depth (TD):								
Static Water Level (WL):								
One Casing Volume(gal/L):								
Start Purge (hrs):								
End Purge (hrs):								
Total Purge Time (min):								
Total Vol. Purged (gal/L):								

SAMPLE COLLECTION INFORMATION:

Analysis	Preservative	Container Requirements	Collected
VOC	HC	3 x 40 ml GLASS	

OBSERVATIONS / NOTES:

HYDROPUNCH SAMPLE @ ~~18~~ 48' IN HP2

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): J S Tomalavage

APPENDIX C

GROUNDWATER ANALYTICAL DATA

ORGANIC CASE NARRATIVE
Tetra Tech NUS, Inc./ NWS Earle CTO 59
Work Order: 0907064

Collected	Received	Lab ID	Client ID
07/07/09	07/09/09	0907064-01	07HP2-15-20090707
07/07/09	07/09/09	0907064-02	07HP2-29-20090707
07/07/09	07/09/09	0907064-03	DUP-01
07/08/09	07/09/09	0907064-04	07HP2-48-20090708
07/08/09	07/09/09	0907064-05	07HP1-19-20090708
07/08/09	07/09/09	0907064-06	07HP1-38-20090708
07/08/09	07/09/09	0907064-07	07HP1-50-20090708
07/07/09	07/09/09	0907064-08	TB-20090707

Volatiles

Method: The samples were analyzed for a client specified analyte list by USEPA SW-846 Methods 5030B/8260B (purge and trap then capillary column GC/MS) for waters upon receipt to the laboratory in satisfactory condition.
Comments: The volatile analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following note:

- Note: Samples were analyzed for the client specified list of benzene, chlorobenzene, chloroform, and 1,1,2-trichloroethane, only.

I certify that, to the best of my knowledge and based upon my inquiry of those individuals immediately responsible for obtaining the information, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.

Marcia K. McGinnity
Senior Project Manager

ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

MDL: The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.

EQL: The estimated quantitation limit (EQL), also known as the reporting limit (RL), is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.

U: The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.

B: The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero.

D: When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".

E: The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound.

J: The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the EQL. One should feel confident that the result is greater than zero and less than the EQL.

P: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported.

M: The presence of an "M" to the right of an analytical result indicates that the sample matrix interfered with the quantitation of the analyte. In GC and HPLC, results are reported from the column with the lower concentration.

I: The presence of an "I" to the right of an analytical result that the presence of a qualitative interference could have caused a false positive or over estimation of the analyte. In GC and HPLC, results are reported from the column with the lower concentration.

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07HP2-15
-20090707

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix: (soil/water) WATER Lab Sample ID: 0907064-01

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0706401

Level: (low/med) LOW Date Sampled: 07/07/09 14:10

% Moisture: not dec. _____ Date Analyzed: 07/14/09 00:14

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
71-43-2	Benzene	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
67-66-3	Chloroform	0.11	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07HP2-29
-20090707

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix: (soil/water) WATER Lab Sample ID: 0907064-02

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0706402

Level: (low/med) LOW Date Sampled: 07/07/09 14:45

% Moisture: not dec. _____ Date Analyzed: 07/14/09 00:44

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
71-43-2	Benzene	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
67-66-3	Chloroform	0.11	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

DUP-01

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix: (soil/water) WATER Lab Sample ID: 0907064-03

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0706403

Level: (low/med) LOW Date Sampled: 07/07/09 18:00

% Moisture: not dec. _____ Date Analyzed: 07/14/09 01:14

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
71-43-2	Benzene	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
67-66-3	Chloroform	0.11	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07HP2-48
-20090708

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix: (soil/water) WATER Lab Sample ID: 0907064-04

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0706404

Level: (low/med) LOW Date Sampled: 07/08/09 09:00

% Moisture: not dec. _____ Date Analyzed: 07/14/09 01:43

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
71-43-2	Benzene	0.11	1.0	0.21	J
108-90-7	Chlorobenzene	0.10	1.0		U
67-66-3	Chloroform	0.11	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07HP1-19
-20090708

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix: (soil/water) WATER Lab Sample ID: 0907064-05

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0706405

Level: (low/med) LOW Date Sampled: 07/08/09 10:10

% Moisture: not dec. _____ Date Analyzed: 07/14/09 02:13

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
71-43-2	Benzene	0.11	1.0	0.16	J
108-90-7	Chlorobenzene	0.10	1.0		U
67-66-3	Chloroform	0.11	1.0	0.32	J
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07HP1-38
-20090708

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix: (soil/water) WATER Lab Sample ID: 0907064-06

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0706406

Level: (low/med) LOW Date Sampled: 07/08/09 12:10

% Moisture: not dec. _____ Date Analyzed: 07/14/09 02:43

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
71-43-2	Benzene	0.11	1.0	0.27	J
108-90-7	Chlorobenzene	0.10	1.0		U
67-66-3	Chloroform	0.11	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07HP1-50
-20090708

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix: (soil/water) WATER Lab Sample ID: 0907064-07

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0706407

Level: (low/med) LOW Date Sampled: 07/08/09 12:55

% Moisture: not dec. _____ Date Analyzed: 07/14/09 03:12

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
71-43-2	Benzene	0.11	1.0	0.19	J
108-90-7	Chlorobenzene	0.10	1.0		U
67-66-3	Chloroform	0.11	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB-20090707

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix: (soil/water) WATER Lab Sample ID: 0907064-08

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0706408

Level: (low/med) LOW Date Sampled: 07/07/09 16:00

% Moisture: not dec. _____ Date Analyzed: 07/13/09 23:44

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
71-43-2	Benzene	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
67-66-3	Chloroform	0.11	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U

FORM 2
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

	CLIENT SAMPLE NO.	SMC1 (DFM) #	SMC2 (DCE) #	SMC3 (TOL) #	SMC4 (BFB) #	TOT OUT
01	V3BLK0713LCS	102	102	99	99	0
02	V3BLK0713	116	111	105	100	0
03	TB-20090707	119	116	103	94	0
04	07HP2-15-200	116	108	104	95	0
05	07HP2-29-200	119	116	104	95	0
06	DUP-01	117	111	105	96	0
07	07HP2-48-200	117	113	105	95	0
08	07HP1-19-200	116	113	106	96	0
09	07HP1-38-200	118	110	106	95	0
10	07HP1-50-200	115	110	104	93	0
11	07HP1-38-200	101	96	96	98	0
12	07HP1-38-200	99	92	96	97	0
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

		EL QC LIMITS	SPIKE CONC (ug/L)
SMC1 (DFM)	= Dibromofluoromethane	(85-120)	30
SMC2 (DCE)	= 1,2-Dichloroethane-d4	(80-135)	30
SMC3 (TOL)	= Toluene-d8	(85-115)	30
SMC4 (BFB)	= Bromofluorobenzene	(85-120)	30

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogate results reported from a diluted analysis

FORM 3
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix Spike - Client Sample No.: V3BLK0713

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC #	QC. LIMITS REC.
Benzene	50.00	0.0000	55.49	111	80-120
Chlorobenzene	50.00	0.0000	54.14	108	80-120
Chloroform	50.00	0.0000	48.41	97	65-135
1,1,2-Trichloroethane	50.00	0.0000	51.02	102	75-125

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 0 outside limits
Spike Recovery: 0 out of 4 outside limits

COMMENTS: _____

FORM 3
WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix Spike - Client Sample No.: 07HP1-38-2009070 Lab Sample ID: 0907064-06

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
Benzene	50.00	0.2716	53.29	106	80-120
Chlorobenzene	50.00	0.0000	51.64	103	80-120
Chloroform	50.00	0.0000	47.18	94	65-135
1,1,2-Trichloroethane	50.00	0.0000	48.35	97	75-125

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Benzene	50.00	55.83	111	5	30	80-120
Chlorobenzene	50.00	53.18	106	3	30	80-120
Chloroform	50.00	48.84	98	3	30	65-135
1,1,2-Trichloroethane	50.00	48.56	97	0	30	75-125

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 4 outside limits
Spike Recovery: 0 out of 8 outside limits

COMMENTS: _____

FORM 4
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

V3BLK0713

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Lab File ID: V3BLK01 Lab Sample ID: 9G14020-BLK1

Date Analyzed: 07/13/09 Time Analyzed: 2016

Column: RTX-VRX ID: 0.25 (mm) Heated Purge: (Y/N) N

Instrument ID: VOA3

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS and MSD:

	SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
01	V3BLK0713LCS	9G14020-BS1	V3LCS01	1819
02	TB-20090707	0907064-08	0706408	2344
03	07HP2-15-200	0907064-01	0706401	0014
04	07HP2-29-200	0907064-02	0706402	0044
05	DUP-01	0907064-03	0706403	0114
06	07HP2-48-200	0907064-04	0706404	0143
07	07HP1-19-200	0907064-05	0706405	0213
08	07HP1-38-200	0907064-06	0706406	0243
09	07HP1-50-200	0907064-07	0706407	0312
10	07HP1-38-200	0907064-06MS	0706406M	0342
11	07HP1-38-200	0907064-06MSD	0706406S	0412
12				
13				
14				
15				
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COMMENTS:

FORM IV VOA

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V3BLK0713

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix: (soil/water) WATER Lab Sample ID: 9G14020-BLK1

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V3BLK01

Level: (low/med) LOW Date Sampled: _____

% Moisture: not dec. _____ Date Analyzed: 07/13/09 20:16

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
71-43-2	Benzene	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
67-66-3	Chloroform	0.11	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD

SHIP TO: 621 Mainstream Drive, Suite 270 ♦ Nashville, TN 37228 ♦ 615-345-1115 ♦ (fax) 615-846-5426

6601

Send Results to:

Name MARY MANG
Company TETRA TECH NUS
Address 234 MALL BLVD.
City KING of PRUSSIA
State, Zip PA 19406
Phone 610-382-1174
Fax 610-491-9645
E-mail MARY.MANG@TETRATECH.COM

Send Invoice to:

Name SAME
Company
Address
City
State, Zip
Phone
Fax
E-mail

Project No./Name: 112G00573 SITE 7

Sampler's (Signature): Joseph S Tomalavage

Analysis Requirements: BENZENE, CHLOROBENZENE, CHLOROFORM, 1,1,2-TRICHLOROETHANE

Lab Use Only:

VOA Headspace	Y	N	NA
Field Filtered	Y	N	NA
Correct Containers	Y	N	NA
Discrepancies	Y	N	NA
Cust. Seals Intact	Y	N	NA
Containers Intact	Y	N	NA

Airbill #: 0860

CAR #: –

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	BENZENE	CHLOROBENZENE	CHLOROFORM	1,1,2-TRICHLOROETHANE	Comments	No. of Bottles	Lab Use Only Containers/Pres.
0907064-01	7/7/09 1410	07HP2-15-20090707	GW	X	X	X	X	HIGH TURBIDITY	3	3S-HY
-02	11/1445	07HP2-29-20090707							3	
-03	11/1800	DUP-01							3	
-04	7/8/09/0900	07HP2-48-20090708							3	
-05	11/1010	07HP1-19-20090708							3	
-06	11/1250	07HP1-38-20090708							3	
-07	11/1250	07HP1-50-20090708							3	
-06	11/1200	HP1MS							3	
↓	11/1200	HP1MSD							3	✓
-08	7/7/10/1600	TRIP BLANK	W	X	X	X	X		2	2S-HY

Sample Kit Prep'd by: (Signature)	Date/Time	Received By: (Signature)
Relinquished by: (Signature) Joseph S Tomalavage	Date/Time 7/8/09/1800	Received By: (Signature)
Relinquished by: (Signature)	Date/Time	Received By: (Signature)
Received for Laboratory by: (Signature)	Date/Time 7/9/09	Temperature 2.8°C

REMARKS:

Details:

Page 1 of 1

Cooler No. 1 of 1

Date Shipped 7/8/07

Shipped By

Turnaround STD

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

08:15

EMPIRICAL LABORATORIES
COOLER RECEIPT FORM

LIMS Number: 0907064 Number of Coolers: 1 of 1

Client: Tetra Tech NUS Project: 112600573 Site 7

Date/Time Received: **07/09/09 08:15** Date cooler(s) opened: **07/09/09**

Opened By (print): **WILLIAM SCHWAB** (signature): [signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered

EL Courier Other: _____

If applicable, enter airbill number here: 0860

2. Were custody seals on outside of cooler(s)? ..... Yes No

How many: 1 Seal date: 7/8/09 Seal Initials: ?

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A
4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A
5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A
6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A
7. Was project identifiable from custody papers? ..... Yes No N/A
8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 2-8°C

Dates samples were logged-in: **07/09/09**

9. Initial this form to acknowledge login of sample(s): (Name): **WILLIAM SCHWAB** (Initial): WS
10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A
11. Did all bottles arrive unbroken? ..... Yes No N/A
12. Was all required bottle label information complete? ..... Yes No N/A
13. Did all bottle labels agree with custody papers? ..... Yes No N/A
14. Were correct containers used for the analyses indicated? ..... Yes No N/A
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A
18. Was headspace present in any included VOA vials? ..... Yes No N/A

If Non-Conformance issues were present, list by sample ID: _____

_____ CAR#: _____

APPENDIX D

ANALYTICAL DATA VALIDATION REPORT

TETRA TECH NUS

PHIL-23099

TO:	**MARY MANG**	**DATE:**	**JULY 20, 2009**
FROM:	**MEGAN N. RITCHIE**	**COPIES:**	**FILE**

SUBJECT: **ORGANIC DATA VALIDATION – VOLATILES**
NWS EARLE SITE 7, COLTS NECK, NEW JERSEY
SDG NO. 0907064

SAMPLES: **8/Aqueous/**

07HP1-19-20090708	07HP2-15-20090707	DUP-01
07HP1-38-20090708	07HP2-29-20090707	TB-20090707
07HP1-50-20090708	07HP2-48-20090707	

OVERVIEW

The sample set for the NWS Earle Site 7– Colts Neck, New Jersey, SDG 0907064 consists of seven (7) aqueous environmental samples (designated 07HP1-, 07HP2-, and DUP-) and one (1) field quality control (QC) blank (designated TB-). Sample 07HP1-38-20090708 was designated for matrix spike/matrix spike duplicate (MS/MSD) analyses. One field duplicate pair (07HP2-29-20090707 and DUP-01) was included in this sample set. All samples were analyzed for select Volatile Organic Compounds (VOCs) including chloroform, benzene, 1,1,2-trichloroethane, and chlorobenzene.

The samples were collected by Tetra Tech NUS on July 7 and 8, 2009 and analyzed by Empirical Laboratories, LLC of Nashville, Tennessee.

The analyses were conducted using EPA SW-846 Method 8260B.

The data was evaluated according to the following parameters:

* • Data completeness
* • Holding Times
* • Laboratory method and field quality control blank results
* • Initial and continuing calibrations
* • Surrogate spike recoveries
* • Internal Standard Areas
* • Matrix Spike/Matrix Spike Duplicate results
* • Field Duplicate Precision
* • Blank Spike recoveries
* • Compound identification
* • Compound quantitation
  • Detection Limits

The symbol (*) indicates that all quality control criteria were met for this parameter. Qualified analytical results are presented in Appendix A, results as reported by the laboratory are presented in Appendix B, Region II data validation forms are presented in Appendix C, and supporting documentation is presented in Appendix D.

Detection Limits

- Positive results at concentrations less than the reporting limits (RLs) were qualified as estimated (J).

Notes

No contaminants were detected in either the field QC blanks or the laboratory blanks.

The field duplicate pair (07HP2-29-20090707 and DUP-01) exhibited duplicate precision within QC criteria. There were no detections for either sample.

All data are acceptable as reported by the laboratory.

EXECUTIVE SUMMARY

Laboratory Performance: None.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (June 2008), USEPA Region 2 SOP HW-24 Revision 2 Validating Volatile Organic Compounds by SW-846 Method 8260B (October 2006), and the NFESC guidelines "Navy Installation Restoration Chemical Data Quality Manual" (September 1999).

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP).

Megan Ritchie

Megan Ritchie
Chemist

Russell Sloboda

Tetra Tech NUS, Inc.
Russell Sloboda
Data Validation Quality Assurance Officer

Attachments:

1. Appendix A – Qualified Analytical Results
2. Appendix B – Results as Reported by the Laboratory
3. Appendix C – Region II Data Validation Forms
4. Appendix D – Support Documentation

APPENDIX A

Qualified Analytical Results

PROJ_NO: 00573

SDG: 0907064 MEDIA: WATER DATA FRACTION: OV

nsample	07HP1-19-20090708	nsample	07HP1-38-20090708	nsample	07HP1-50-20090708
samp_date	7/8/2009 10:10:00	samp_date	7/8/2009 12:10:00	samp_date	7/8/2009 12:55:00
lab_id	0907064-05	lab_id	0907064-06	lab_id	0907064-07
qc_type	NM	qc_type	NM	qc_type	NM
units	UG/L	units	UG/L	units	UG/L
Pct_Solids	0.0	Pct_Solids	0.0	Pct_Solids	0.0
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,2-TRICHLOROETHANE	1	U	
BENZENE	0.16	J	P
CHLOROBENZENE	1	U	
CHLOROFORM	0.32	J	P

Parameter	Result	Val Qual	Qual Code
1,1,2-TRICHLOROETHANE	1	U	
BENZENE	0.27	J	P
CHLOROBENZENE	1	U	
CHLOROFORM	1	U	

Parameter	Result	Val Qual	Qual Code
1,1,2-TRICHLOROETHANE	1	U	
BENZENE	0.19	J	P
CHLOROBENZENE	1	U	
CHLOROFORM	1	U	

PROJ_NO: 00573

SDG: 0907064 MEDIA: WATER DATA FRACTION: OV

nsample	07HP2-15-20090707	nsample	07HP2-29-20090707	nsample	07HP2-48-20090708
samp_date	7/7/2009 14:10:00	samp_date	7/7/2009 14:45:00	samp_date	7/8/2009 09:00:00
lab_id	0907064-01	lab_id	0907064-02	lab_id	0907064-04
qc_type	NM	qc_type	NM	qc_type	NM
units	UG/L	units	UG/L	units	UG/L
Pct_Solids	0.0	Pct_Solids	0.0	Pct_Solids	0.0
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,2-TRICHLOROETHANE	1	U	
BENZENE	1	U	
CHLOROBENZENE	1	U	
CHLOROFORM	1	U	

Parameter	Result	Val Qual	Qual Code
1,1,2-TRICHLOROETHANE	1	U	
BENZENE	1	U	
CHLOROBENZENE	1	U	
CHLOROFORM	1	U	

Parameter	Result	Val Qual	Qual Code
1,1,2-TRICHLOROETHANE	1	U	
BENZENE	0.21	J	P
CHLOROBENZENE	1	U	
CHLOROFORM	1	U	

PROJ_NO: 00573

SDG: 0907064 MEDIA: WATER DATA FRACTION: OV

nsample	DUP-01	nsample	TB-20090707
samp_date	7/7/2009 18:00:00	samp_date	7/7/2009 16:00:00
lab_id	0907064-03	lab_id	0907064-08
qc_type	FD	qc_type	TB
units	UG/L	units	UG/L
Pct_Solids	0.0	Pct_Solids	0.0
DUP_OF:	07HP2-29-20090707	DUP_OF:	

Parameter	Result	Val Qual	Qual Code
1,1,2-TRICHLOROETHANE	1	U	
BENZENE	1	U	
CHLOROBENZENE	1	U	
CHLOROFORM	1	U	

Parameter	Result	Val Qual	Qual Code
1,1,2-TRICHLOROETHANE	1	U	
BENZENE	1	U	
CHLOROBENZENE	1	U	
CHLOROFORM	1	U	

Qualifier Codes:

a	=	Lab Blank Contamination
b	=	Field Blank Contamination
c	=	Calibration (i.e., %RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
d	=	MS/MSD Noncompliance
e	=	LSC/LSCD Noncompliance
f	=	Laboratory Duplicate Imprecision
g	=	Field Duplicate Imprecision
h	=	Holding Time Exceedance
i	=	ICP Serial Dilution Noncompliance
j	=	GFAA PDS – GFAA MSA's r<0.995 (correlation coefficient)
k	=	ICP Interference – include ICSAB %Rs
l	=	Instrument Calibration Range Exceedance
m	=	Sample Preservation
n	=	Internal Standard Noncompliance
o	=	Poor Instrument Performance (i.e. baseline drifting)
p	=	Uncertainty Near Detection Limit (<2 x IDL for inorganics and < CRQL for organics)
q	=	Other Problems (can encompass of number of issues)
r	=	Surrogates Recovery Noncompliance
s	=	Pesticide/PCB Resolution
t	=	% Breakdown Noncompliance for DDT and Endrin
u	=	Pesticide/PCB % Difference Between Columns for Positive Results
v	=	Non-linear Calibrations, Tuning r <0.995 (correlation coefficient)

APPENDIX B

Results as Reported by the Laboratory

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07HP2-15
-20090707

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix: (soil/water) WATER Lab Sample ID: 0907064-01

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0706401

Level: (low/med) LOW Date Sampled: 07/07/09 14:10

% Moisture: not dec. _____ Date Analyzed: 07/14/09 00:14

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
71-43-2	Benzene	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
67-66-3	Chloroform	0.11	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07HP2-29
-20090707

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix: (soil/water) WATER Lab Sample ID: 0907064-02

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0706402

Level: (low/med) LOW Date Sampled: 07/07/09 14:45

% Moisture: not dec. _____ Date Analyzed: 07/14/09 00:44

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
71-43-2	Benzene	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
67-66-3	Chloroform	0.11	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

DUP-01

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix: (soil/water) WATER Lab Sample ID: 0907064-03

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0706403

Level: (low/med) LOW Date Sampled: 07/07/09 18:00

% Moisture: not dec. _____ Date Analyzed: 07/14/09 01:14

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
71-43-2	Benzene	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
67-66-3	Chloroform	0.11	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07HP2-48
-20090708

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix: (soil/water) WATER Lab Sample ID: 0907064-04

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0706404

Level: (low/med) LOW Date Sampled: 07/08/09 09:00

% Moisture: not dec. _____ Date Analyzed: 07/14/09 01:43

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
71-43-2	Benzene	0.11	1.0	0.21	J
108-90-7	Chlorobenzene	0.10	1.0		U
67-66-3	Chloroform	0.11	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07HP1-19
-20090708

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix: (soil/water) WATER Lab Sample ID: 0907064-05

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0706405

Level: (low/med) LOW Date Sampled: 07/08/09 10:10

% Moisture: not dec. _____ Date Analyzed: 07/14/09 02:13

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
71-43-2	Benzene	0.11	1.0	0.16	J
108-90-7	Chlorobenzene	0.10	1.0		U
67-66-3	Chloroform	0.11	1.0	0.32	J
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07HP1-38
-20090708

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix: (soil/water) WATER Lab Sample ID: 0907064-06

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0706406

Level: (low/med) LOW Date Sampled: 07/08/09 12:10

% Moisture: not dec. _____ Date Analyzed: 07/14/09 02:43

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
71-43-2	Benzene	0.11	1.0	0.27	J
108-90-7	Chlorobenzene	0.10	1.0		U
67-66-3	Chloroform	0.11	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

07HP1-50
-20090708

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix: (soil/water) WATER Lab Sample ID: 0907064-07

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0706407

Level: (low/med) LOW Date Sampled: 07/08/09 12:55

% Moisture: not dec. _____ Date Analyzed: 07/14/09 03:12

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
71-43-2	Benzene	0.11	1.0	0.19	J
108-90-7	Chlorobenzene	0.10	1.0		U
67-66-3	Chloroform	0.11	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U

FORM 1
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TB-20090707

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: TET.V07064

Matrix: (soil/water) WATER Lab Sample ID: 0907064-08

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 0706408

Level: (low/med) LOW Date Sampled: 07/07/09 16:00

% Moisture: not dec. _____ Date Analyzed: 07/13/09 23:44

GC Column: RTX-VRX ID: 0.25 (mm) Dilution Factor: 1.0

Soil Extract Volume:_____(uL) Soil Aliquot Volume: _____(uL)

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	MDL	RL	CONC	Q
71-43-2	Benzene	0.11	1.0		U
108-90-7	Chlorobenzene	0.10	1.0		U
67-66-3	Chloroform	0.11	1.0		U
79-00-5	1,1,2-Trichloroethane	0.10	1.0		U

APPENDIX C

Regional Worksheets

YES NO N/A

I. PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: 0907064 LAB: Empirical Labs, LLC

SITE NAME: NWS Earle, Site 7

1.0 Data Completeness and Deliverables

1.1 Has all data been submitted in CLP deliverable format or CLP Forms Equivalent? [✓] ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

2.0 Cover Letter, SDG Narrative

2.1 Is a laboratory narrative, and/or cover letter signed release present? [✓] ___ ___

2.2 Are case number and SDG number(s) contained in the narrative or cover letter? [✓] ___ ___

ACTION: If not, note the effect on review of the data in the Data Assessment narrative.

II. VOLATILE ANALYSES

1.0 Traffic Reports and Laboratory Narrative

1.1 Are the Traffic Reports, and/or Chain of Custodies from the field samplers present for all samples sign release present? [✓] ___ ___

ACTION: If no, contact the laboratory/sampling team for replacement of missing or illegible copies.

1.2 Is a sampling trip report present (if required)? [ ] ___ [✓]

1.3 Sample Conditions/Problems

YES NO N/A

1.3.1 Do the Traffic Reports, Chain of Custodies, or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special notations affecting the quality of the data? ___ ✓ ___

ACTION: If all the VOA vials for a sample have air bubbles or the VOA vial analyzed had air bubbles, flag all positive results "J" and all non-detects "R". N/A

ACTION: If any sample analyzed as a soil, other than TCLP, contains 50%-90% water, all data should be flagged as estimated ("J"). If a soil sample, other than TCLP, contains more than 90% water, flag all positive results "J" and all non-detects "R". N/A

ACTION: If samples were not iced or if the ice was melted upon receipt at the laboratory and the temperature of the cooler was elevated (>10°C), flag all positive results "J" and all non-detects non"UJ". N/A

2.0 Holding Times

2.1 Have any volatile holding times, determined from date of collection to date of analysis, been exceeded? ___ ✓ ___

The maximum holding time for aqueous samples is 14 days.

The maximum holding time for soils non aqueous samples is 14 days.

NOTE: If unpreserved, aqueous samples maintained at 4°C for aromatic hydrocarbons analysis must be analyzed within 7 days. If preserved with HCL acid to a pH<2 and stored at 4°C, then aqueous samples must be analyzed within 14 days from time of collection. For non-aqueous samples for volatile components that are frozen (less than 7°C) or are properly cooled (4°C ± 2°C) and perserved with $NaHSO_4$, the maximum holding time is 14 days from sample collection. If

YES NO N/A

uncertain about preservation, contact the laboratory /sampling team to determine whether or not samples were preserved.

ACTION: Qualify sample results according to Table 1:

Table 1. Holding Time Actions for Trace Volatile Analysis

Matrix	Preserved	Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Aqueous	No	≤7 days	No qualifications	
	No	- 7 days	J	R
	Yes	≤14 days	No qualifications	
	Yes	- 14 days	J	R
Non Aqueous	No	≤ 14 days	J	R
	Yes	≤ 14 days	No qualifications	
	Yes/No	- 14 days	J	R

3.0 Surrogate Recovery (CLP Form II Equivalent)

3.1 Have the volatile surrogate recoveries been listed on Surrogate Recovery forms for each of the following matrices:

a. Water [✓] ___ ___

b. Soil [ ] ___ ✓

3.2 If so, are all the samples listed on the appropriate Surrogate Recovery forms for each matrix:

a. Water [✓] ___ ___

b. Soil [ ] ___ ✓

ACTION: If large errors exist, deliverables are unavailable or information is missing, document the effect(s) in Data

YES NO N/A

Assessments and contact the laboratory/project officer/appropriate official for an explanation /resubmittal,make any necessary corrections and document effect in the Data Assessment.

3.3 Were the surrogate recovery limits followed per Table 2. If Table 2 criteria were not followed, the laboratory may use in-house performance criteria (per SW-846, Method 8000C, sectiom 9.7). Other compounds may be used as surrogates, depending upon the analysis requirements. [✓] ___ ___

Table 2. Surrogate Spike Recovery Limits for Water and Soil/Sediments

DMC	Recovery Limits (%)Water	Recovery Limits Soil/Sediment
4-Bromofluorobenzene	80-120	70-130
Dibromofluoromethane	80-120	70-130
Toluene-d_8	80-120	70-130
Dichloroethane-d_4	80-120	70-130

Note: Use above table if laboratory did not provide in house recovery criteria.

Note: Other compounds may be used as surrogated depending upon the analysis requirements.

3.4 Were outliers marked correctly with an asterisk? [ ] ___ ✓

ACTION: Circle all outliers with a red pencil.

3.5 Were one or more volatile surrogate recoveries out of specification for any sample or method blank. Table 2. [ ] ✓ ___

If yes, were samples reanalyzed? [ ] ___ ✓

Were method blanks reanalyzed? [ ] ___ ✓

YES NO N/A

ACTION: If all surrogate recoveries are > 10% but 1 or more compounds do not meet method specifications:

1. Flag all positive results as estimated ("J").
2. Flag all non-detects as estimated detection limits ("UJ") when recoveries are less than the lower acceptance limit.
3. If recoveries are greater than the upper acceptance limit, do not qualify non-detects, but qualify positive results as estimated "J".

If any surrogate has a recovery of < 10%:

1. Positive results are qualified with ("J").
2. Non-detects for that should be qualified as unusable ("R").

NOTE: Professional judgement should be used to qualify data that have method blank surrogate recoveries out of specification in both original and reanalyses. The basic concern is whether the blank problems represent an isolated problem with the blank alone or whether there is a fundamental problem with the analytical process. If one or more samples in the batch show acceptable surrogate recoveries, the reviewer may choose the blank problem to be an isolated occurrence.

3.6 Are there any transcription/calculation errors between raw data and reported data? [ ] [✓] ___

ACTION: If large errors exist, take action as specified in section 3.2 above.

4.0 Laboratory Control Sample(Form III/Equivalent)

4.1 Is the LCS prepared, extracted, analyzed, and reported once for every 20 field samples of a similar matrix, per SDG. [✓] ___ ___

YES NO N/A

Note: LCS consists of an aliquot of a clean (control) matrix similar to the sample matrix and of the same weight or volume.

ACTION: If any Laboratory Control Sample data are missing, call the lab for explanation /resubmittals. Make note in the data assessment.

4.2 Were the Laboratory Control Samples analyzed at the required frequency for each of the following matrices:

		YES	NO	N/A
A.	Water	[✓]	___	___
B.	Soil	[ ]	___	✓
C.	Med Soil	[ ]	___	✓

Note: The LCS is spiked with the same analytes at the same concentrations as the matrix spike (SW-846 8000C, Section 9.5). If different make note in data assessment. Matrix/LCS spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigating. At a minimum, the matrix spike should include 1,1-dichloroethene, trichloroethene, chlorobenzene, toluene, and benzene.

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

4.3 Have in house LCS recovery limits been developed (Method 8000C, Sect 9.7). [✓] ___ ___

4.4 If in house limits are not developed, are LCS acceptance recovery limits between 70 - 130% (Method 8000c Sect 9.5)? [ ] ___ ✓

4.5 Were one or more of the volatile LCS recoveries outside the in house laboratory recovery criteria for spiked analytes? If in house limits are not present use 70 - 130% recovery limits. [ ] ✓ ___

YES NO N/A

Table 3. LCS Actions for Volatile Analysis

Criteria	Action	
	Detected Spiked Compounds	**Non-Detected Spiked Compounds**
%R > Upper Acceptance Limit	J	No Qualifiers
%R < Lower Acceptance Limit	J	UJ
Lower Acceptance Limit ≤ %R	No Qualifications	

5.0 Matrix Spikes(Form III or equivalent)

5.1 Are all data for matrix spike and matrix duplicate or matrix spike duplicate (MS/MD or MS/MSD) present and complete for each matrix? [✓] ___ ___

NOTE: The laboratory should use one matrix spike and a duplicate analysis of an unspiked field sample if target analytes are expected in the sample. If the sample is not expected to contain target analytes, a MS/MSD should be analyzed (SW-846, Method 8260B, Sect 8.4.2).

5.2 Have MS/MD or MS/MSD results been summarized on modified CLP Form III? [✓] ___ ___

ACTION: If any data are missing take action as specified in section 3.2 above.

5.3 Were matrix spikes analyzed at the required frequency for each of the following matrices? (One MS/MD, MS/MSD or laboratory replicate must be performed for every 20 samples

YES NO N/A

of similar matrix or concentration level. Laboratories analyzing one to ten samples per month are required to analyze at least one MS per month [page 8000C, section 9.5.])

		YES	NO	N/A
a.	Water	[✓]	___	___
b.	Waste	[ ]	___	✓
c.	Soil/Solid	[ ]	___	✓

Note: The LCS is spiked with the same analytes at the same concentrations as the matrix spike (SW-846 8000C, Section 9.5). If different make note in data assessment. Matrix/LCS spiking standards should be prepared from volatile organic compounds which are representative of the compounds being investigating. At a minimum, the matrix spike should include 1,1-dichloroethene, trichloroethene, chlorobenzene, toluene, and benzene. The concentration of the LCS should be determined as described SW-Method 8000C Section 9.5.

ACTION: If any MS/MD, MS/MSD or replicate data are missing, take the action specified in 3.2 above.

5.4 Have in house MS recovery limits been developed (Method 8000C, Sect 9.7) for each matrix. [✓] ___ ___

5.5 Were one or more of the volatile MS/MSD recoveries outside of the in-house laboratory recovery criteria for spiked analytes? If none are present, then use 70-130% recovery as per SW-846, 8000C, Sect. 9.5.4. [ ] ✓ ___

ACTION: Circle all outliers with a red pencil.

NOTE: If any individual % recovery in the MS (or MSD) falls outside the designated range for recovery the reviewer should determine if there is a matrix effect. A matrix effect is indicated if the LCS data are within limits but the MS data exceeds the limits.

YES NO N/A

NOTE: No qualification of data is necessary on MS and MSD data alone. However, using informed professional judgement, the data reviewer may use MS and MSD resuts in conjunction with other QC criteria to determine the need for some qualificatios.

Note: The data reviewer should first try to determine to what extent the results of the MS and MSD affect the associated data. This determination should be made with regard to he MS and MSD sample itself, as welll as specific analytes for all samples associated with the MS and MSD.

Note: In those instances where it can be determned that the results of the MS and MSD affect only the sample spiked, limit qualification to this sample only. However, it may be determined through the MS and MSD results that a laboratory is having a systematic problem in the analysis of one or more analytes that affect all associated samples, and the reviewer must use professional judgement to qualify the data from all associated samples.

Note: The reviewer must use professional judgement to determine the need for qualification of non-spiked compounds.

ACTION: Follow criteria in Table 4 when professional judgement deems qualification of sample.

Table 4. Matrix Spike/Matrix Spike Duplicate (MS/MSD) Actions for Volatile Analysis

Criteria	Action	
	Detected Spiked Compounds	**Non-Detected Spiked Compounds**
%R > Upper Acceptance Limit	J	No Qualifiers
%R < Lower Acceptance Limit	J	UJ
Lower Acceptance Limit ≤ %R	No Qualifications	

	YES	NO	N/A
6.0 Blank (CLP Form IV Equivalent)			
6.1 Is the Method Blank Summary form present?	[✓]	___	___
6.2 Frequency of Analysis: Has a method blank been analyzed for every 20 (or less) samples of similar matrix or concentration or each extraction batch?	[✓]	___	___
6.3 Has a method blank been analyzed for each GC/MS system used ?	[✓]	___	___

ACTION: If any blank data are missing, take action as specified above (section 3.2). If blank data is not available, reject (R) all associated positive data. However, using professional judgement, the data reviewer may substitute field blank data for missing method blank data.

6.4 Chromatography: review the blank raw data - chromatograms, quant reports or data system printouts.			
Is the chromatographic performance (baseline stability) for each instrument acceptable for volatile organic compounds?	[✓]	___	___

7.0 Contamination			

NOTE: "Water blanks", "drill blanks" and "distilled water blanks" are validated like any other sample and are not used to qualify the data. Do not confuse them with the other QC blanks discussed below.

7.1 Do any method/instrument/reagent blanks have positive results for target analytes and/or TICs? When applied as described below, the contaminant concentration in these blanks are multiplied by the sample dilution factor and corrected for percent moisture where necessary.	[ ]	✓	___

	YES	NO	N/A
7.2 Do any field/rinse blanks have positive volatile organic compound results?	___	✓	___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated to a particular group of samples (may exceed one per case or one per day) may be used to qualify data. Blanks may not be qualified because of contamination in another blank. Field blanks must be qualified forsurrogate, or calibration QC problems.

ACTION: Follow the directions in Table 5 below to qualify sample results due to contamination. Use the largest value from all the associated blanks.

Table 5. Volatile Organic Analysis Blank Contamination Criteria

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Storage, Field, Trip, Instrument**	Detects	Not detected	No qualification
	< CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL	Use professional judgement
	> CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL and < blank contamination	Report the concentration for the sample with a U, or quanity the data as unusable R
		≥ CRQL and ≥ blank contamination	Use professional judgement
	= CRQL*	< CRQL	Report CRQL value with a U
		≥ CRQL	Use professional judgement
	Gross contam-ination	Detects	Qualify results as unusable R

* 2x the CRQL for methylene chloride, 2-butanone, and acetone

** Qualifications based on instrument blank results affect only the sample analyzed immediately after the sample that has target compounds that exceed the calibration range or non-target compounds that exceed 100 ug/L.

NOTE: If gross blank contamination exists(e.g., saturated peaks, "hump-o-grams," "junk" peaks), all affected positive compounds in the associated samples should be qualified as unusable "R", due to interference. Non-detected volatile organic target compounds do not require qualification unless the contamination is so high that it interferes with the analyses of non-detected compounds.

	YES	NO	N/A
7.3 Are there field/rinse/equipment blanks associated with every sample?	[✓]	___	___

ACTION: For low level samples, note in data assessment that there is no associated field/rinse/equipment blank. Exception: samples taken from a drinking water tap do not have associated field blanks.

8.0 GC/MS Apparatus and Materials

8.1 Did the lab use the proper gas chromatographic column(s) for analysis of volatiles by Method 8260B? Check raw data, instrument logs or contact the lab to determine what type of column(s) was (were) used. Restek RTX-VRX 60m x 0.25mm	[✓]	___	___

NOTE: For the analysis of volatiles, the method requires requires the use of 60 m. x 0.75 mm capillary column, coated with VOCOL(Supelco) or equivalent column. (see SW-846, page 8260B-7, section 4.9.2)

ACTION: If the specified column, or equivalent, was not used, document the effects in the Data Assessment. Use professional judgement to determine the acceptability of the data.

9.0 GC/MS Instrument Performance Check (CLP Form V Equivalent)

9.1 Are the GC/MS Instrument Performance Check forms present for Bromofluorobenzene (BFB), and do these forms list the associated samples with date/time analyzed?	[✓]	___	___
9.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the BFB provided for each twelve hour shift?	[✓]	___	___

9.3 Has an instrument performance check solution (BFB)

YES NO N/A

been analyzed for every twelve hours of sample analysis per instrument?(see Table 4, SW-846, page 8260B-36) [✓] ___ ___

ACTION: List date, time, instrument ID, and sample analyses for which no associated GC/MS GC/MS tuning data are available.

ACTION: If the laboratory/project officer cannot provide missing data, reject ("R") all data generated outside an acceptable twelve hour calibration interval.

ACTION: If mass assignment is in error, flag all associated sample data as unusable, "R".

9.4 Have the ion abundances been normalized to m/z 95? [✓] ___ ___

9.5 Have the ion abundance criteria been met for each instrument used? [✓] ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

ACTION: If ion abundance criteria are not met, take action as specified in section 3.2.

9.6 Are there any transcription/calculation errors between mass lists and reported values? (Check at least two values but if errors are found, check more.) ___ [✓] ___

9.7 Have the appropriate number of significant figures (two) been reported? [✓] ___ ___

ACTION: If large errors exist, take action as specified in section 3.2.

9.8 Are the spectra of the mass calibration compounds acceptable. [✓] ___ ___

ACTION: Use professional judgement to determine wheather associated data should be accepted, qualified, or rejected.

YES NO N/A

10.0 Target Analytes (CLP Form I Equivalent)

10.1 Are the Organic Analysis reporting forms present with required header information on each page, for each of the following:

		YES	NO	N/A
a.	Samples and/or fractions as appropriate	[✓]	___	___
b.	Matrix spikes and matrix spike duplicates	[✓]	___	___
c.	Blanks	[✓]	___	___
d.	Laboratory Control Samples	[✓]	___	___

10.2 Are the reconstructed Ion Chromatograms, mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following?

		YES	NO	N/A
a.	Samples and/or fractions as appropriate	[✓]	___	___
b.	Matrix spikes and matrix spike duplicates (Mass spectra not required)	[✓]	___	___
c.	Blanks	[✓]	___	___
d.	Laboratory Control Samples	[✓]	___	___

ACTION: If any data are missing, take action specified in 3.2 above.

10.3 Is chromatographic performance acceptable with respect to:

	YES	NO	N/A
Baseline stability?	[✓]	___	___

	YES	NO	N/A
Resolution?	[✓]	___	___
Peak shape?	[✓]	___	___
Full-scale graph (attenuation)?	[✓]	___	___

Other:_____

ACTION: Use professional judgement to determine the acceptability of the data.

10.4 Are the lab-generated standard mass spectra of identified volatile compounds present for each sample? [✓] ___ ___

ACTION: If any mass spectra are missing, take action specified in 3.2 above. If the lab does not generate their own standard spectra, make a note in the Data Assessment. If spectra are missing, contact the lab.

10.5 Is the RRT of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration? [✓] ___ ___

10.6 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? [✓] ___ ___

10.7 Do the relative intensities of the characteristic ions in the sample agree within ± 30% of the corresponding relative intensities in the reference spectrum? [✓] ___ ___

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected ("R"), flagged ("N") - Presumptive evidence of the presence of the compound) or changed to non detected ("U") at the calculated detection limit. In order to be

YES NO N/A

positively identified, the data must comply with the criteria listed in 9.6, 9.7, and 9.8.

ACTION: When sample carry-over is a possibility, professional judgement should be used to determine if instrument cross-contamination has affected any positive compound identification.

11.0 Tentatively Identified Compounds (TIC) (CLP Form I/TIC Equivalent)

11.1 If Tentatively Identified Compound were required for this project, are all Tentatively Identified Compound reporting forms present; and do listed TICs include scan number or retention time, estimated concentration and a qualifier? [ ] ___ ✓

NOTE: Add "N" qualifier to all TICs which have CAS number, if missing.

NOTE: Have the project officer/appropriate official check the project plan to determine if lab was required to identify non-target analytes (SW-846, page 8260B-23, Sect. 7.6.2).

11.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:

a. Samples and/or fractions as appropriate [ ] ___ ✓

b. Blanks [ ] ___ ✓

ACTION: If any TIC data are missing, take action specified in 3.2 above.

ACTION: Add "JN" qualifier only to analytes identified by a CAS#.

NOTE: If TICs are present in the associated blanks take action as specified in section 3.2 above.

YES NO N/A

11.3 Are any priority pollutants listed as TIC compounds (i.e., an BNA compound listed as a VOA TIC)? [ ] ___ ✓

ACTION: 1. Flag with "R" any target compound listed as a TIC.

2. Make sure all rejected compounds are properly reported if they are target compounds.

11.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% (of the most abundant ion) also present in the sample mass spectrum? [ ] ___ ✓

11.5 Do TIC and "best match" standard relative ion intensities agree within ± 20%? [ ] ___ ✓

ACTION: Use professional judgement to determine acceptability of TIC identifications. If it is determined that an incorrect identification was made, change the identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate. Also, when a compound is not found in any blank, but is a suspected artifact of a common laboratory contaminant, the result should be qualified as unusable, "R". (Common lab contaminants: CO_2(M/E 44), Siloxanes (M/E 73), Hexane, Aldol Condensation Products, Solvent Preservatives, and related byproducts).

12.0 Compound Quantitation and Reported Detection Limits

12.1 Are there any transcription/calculation errors in organic analysis reporting form results? Check at least two positive values. Verify that the correct internal standard, quantitation ion, and average initial RRF/CF were used to calculate organic analysis reporting form result. Were any errors found? [ ] ✓ ___

NOTE: Structural isomers with similar mass spectra, but insufficient GC resolution (i.e. percent valley between the two peaks > 25%) should be

YES NO N/A

reported as isomeric pairs. The reviewer should check the raw data to ensure that all such isomers were included in the quantitation (i.e., add the areas of the two coeluting peaks to calculate the total concentration).

12.2 Are the method CRQL's adjusted to reflect sample dilutions and, for soils, sample moisture? [ ] ___ ✓

ACTION: If errors are large, take action as specified in section 3.2 above.

ACTION: When a sample is analyzed at more than one dilution, the lowest detection limits are used (unless a QC exceedance dictates the use of the higher detection limit from the diluted sample data). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and it's associated value on the original reporting form (if present) and substituting the data from the analysis of the diluted sample. Specify which organic analysis reporting form is to be used, then draw a red "X" across the entire page of all reporting forms that should not be used, including any in the summary package.

13.0 Standards Data (GC/MS)

13.1 Are the Reconstructed Ion Chromatograms, and data system printouts (Quant Reports) present for initial and continuing calibration? [✓] ___ ___

ACTION: If any calibration standard data are missing, take action specified in section 3.2 above.

14.0 GC/MS Initial Calibration (CLP Form VI Equivalent)

YES NO N/A

14.1 Are the Initial Calibration reporting forms present and complete for the volatile fraction? [✓] ___ ___

ACTION: If any calibration forms or standard raw data are missing, take action specified in section 3.2 above.

ACTION: If the percent relative standard deviation (% RSD) is > 20%, (8000C-39)qualify positive results for that analyte "J". When % RSD > 90%,. Qualify all positive results for that analyte "J" and all non-detects results for that analyte "R".

14.2 Are all average RRFs > 0.050? [✓] ___ ___

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be ≥ the values in the following list. If individual RRF values reported are below the listed values document in the Data Assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with red pencil.

ACTION: For any target analyte with average RRF < 0.05, or for the requirements for the 5 compounds in 14.2 above, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

14.3 Are response factors stable over the concentration range of the calibration. [✓] ___ ___

NOTE: (Method Requirement) For the following CCC compounds, the %RSD values must be ≤ 30.0%. If %RSD values reported are > 30.0% document in the Data Assessment.

YES NO N/A

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

ACTION: Circle all outliers with a red pencil.

ACTION: If the % RSD is > 20.0%, or > 30% for the 6 compounds in 14.3 above, qualify positive results for that analyte "J" and non-detects using professional judgement. When RSD > 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

NOTE: Analytes previously qualified "U" due to blank contamination are still considered as "hits" when qualifying for calibration criteria.

14.4 Was the % RSD determined using RRF or CF? [✓] ___ ___

If no, what method was used to determine the linearity of the initial calibration? Document any effects to the case in the Data Assessment.

14.5 Are there any transcription/calculation errors in the reporting of RRF or % RSD? (Check at least two values but if errors are found, check more.) [ ] [✓] ___

ACTION: Circle errors with a red pencil.

ACTION: If errors are large, take action as specified in section 3.2 above.

15.0 GC/MS Calibration Verification (CLP Form VII Equivalent)

	YES	NO	N/A
15.1 Are the Calibration Verification reporting forms present and complete for all compounds of interest?	[✓]	___	___
15.2 Has a calibration verification standard been analyzed for every twelve hours of sample analysis per instrument?	[✓]	___	___

ACTION: List below all sample analyses that were not within twelve hours of a calibration verification analysis for each instrument used.

_____

ACTION: If any forms are missing or no calibration verification standard has been analyzed twelve hours prior to sample analysis, take action as specified in section 3.2 above. If calibration verification data are not available, flag all associated sample data as unusable ("R").

15.3 Was the % D determined from the calibration verification determined using RRF or CF?	[✓]	___	___

If no, what method was used to determine the calibration verification? Document any effects to the case in the Data Assessment.

15.4 Do any volatile compounds have a % D (difference or drift) between the initial and continuing RRF or CF which exceeds 20% (SW-846, page 8260B-19, section 7.4.5.2).	[ ]	[✓]	___

NOTE: (Method Requirement) For the following CCC compounds, the %D values must be ≤ 20.0%. If %D values reported are > 20.0% document in the Data Assessment.

1,1-Dichloroethene
Chloroform
1,2-Dichloropropane
Toluene
Ethylbenzene
Vinyl chloride

YES NO N/A

ACTION: Circle all outliers with a red pencil.

ACTION: Qualify both positive results and non-detects for the outlier compound(s) as estimated, "J". When %D is above 90%, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

15.5 Do any volatile compounds have a RRF < 0.05? [ ] [✓] ___

NOTE: (Method Requirement) For SPCC compounds, the individual RRF values must be ≥ the values in the following list for each calibration verification. If average RRF values reported are below the listed values document in the data assessment.

Chloromethane	0.10
1,1-Dichloroethane	0.10
Bromoform	0.10
Chlorobenzene	0.30
1,1,2,2-Tetrachloroethane	0.30

ACTION: Circle all outliers with a red pencil.

ACTION: If RRF < 0.05, or < the the requirements for the 5 compounds is section 15.5 above, qualify all positive results for that analyte "J" and all non-detect results for that analyte "R".

NOTE: The above data qualification action applies regardless of method requirements.

16.0 Internal Standards (CLP Form VIII Equivalent)

16.1 Are the internal standard (IS) areas on the internal standard reporting forms of every sample and blank within the upper and lower limits (-50% to + 100%) for each initial mid-point calibration (SW-846, 8260B-20, Sect. 7.4.7)? [✓] ___ ___

YES NO N/A

ACTION: If errors are large or information is missing, take action as specified in section 3.2 above.

ACTION: List each outlying internal standard below.

Sample ID	IS #	Area Lower Limit	Area Upper Limit

(Attach additional sheets if necessary.)

ACTION:

1. If the internal standard area count is outside the upper or lower limit, flag with "J" all positive results quantitated with this internal standard.

2. Do not qualify non-detects when the associated IS are counts area > + 100%.

3. If the IS area is below the lower limit (< -50%), qualify all associated non-detects (U-values) "J".

4. If extremely low area counts are reported (< -25%) or if performance exhibits a major abrupt drop off, flag all associated non-detects as unusable "R" and positive results as estimated "J".

16.2 Are the retention times of all internal standards within 30 seconds of the associated initial mid-point calibration standard (SW-846, 8260B-20, Sect. 7.4.6)? N/A ___ ___

ACTION: Professional judgement should be used to qualify data if the retention times differ by more than 30 seconds.

YES NO N/A

17.0 Field Duplicates

17.1 Were any field duplicates submitted for volatile analysis? [✓] ___ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between field duplicate results must be addressed in the Data Assessment. However, if large differences exist, take action specified in section 3.2 above.

APPENDIX D

Support Documentation

ORGANIC CASE NARRATIVE
Tetra Tech NUS, Inc./ NWS Earle CTO 59
Work Order: 0907064

Collected	Received	Lab ID	Client ID
07/07/09	07/09/09	0907064-01	07HP2-15-20090707
07/07/09	07/09/09	0907064-02	07HP2-29-20090707
07/07/09	07/09/09	0907064-03	DUP-01
07/08/09	07/09/09	0907064-04	07HP2-48-20090708
07/08/09	07/09/09	0907064-05	07HP1-19-20090708
07/08/09	07/09/09	0907064-06	07HP1-38-20090708
07/08/09	07/09/09	0907064-07	07HP1-50-20090708
07/07/09	07/09/09	0907064-08	TB-20090707

Volatiles

Method: The samples were analyzed for a client specified analyte list by USEPA SW-846 Methods 5030B/8260B (purge and trap then capillary column GC/MS) for waters upon receipt to the laboratory in satisfactory condition.
Comments: The volatile analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following note:

- Note: Samples were analyzed for the client specified list of benzene, chlorobenzene, chloroform, and 1,1,2-trichloroethane, only.

I certify that, to the best of my knowledge and based upon my inquiry of those individuals immediately responsible for obtaining the information, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in the case narrative, as verified by the following signature.

Marcia K. McGinnity
Senior Project Manager

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD

6601

SHIP TO: 621 Mainstream Drive, Suite 270 ♦ Nashville, TN 37228 ♦ 615-345-1115 ♦ (fax) 615-846-5426

Send Results to:

Name MARY MANG
Company TETRA TECH NUS
Address 234 MALL BLVD.
City KING of PRUSSIA
State, Zip PA 19406
Phone 610-382-1174
Fax 610-491-9645
E-mail MARY.MANG@TETRATECH.COM

Send Invoice to:

Name SAME
Company
Address
City
State, Zip
Phone
Fax
E-mail

Project No./Name: 112G00173 SITE 7

Sampler's (Signature): Joseph S Tomalavage

Analysis Requirements: BENZENE; CHLORO BENZENE; CH LOROFORM; 1,1,2-TRICHLOROETHANE

Lab Use Only:

VOA Headspace	Y	N	NA
Field Filtered	Y	N	NA
Correct Containers	Y	N	NA
Discrepancies	Y	N	NA
Cust. Seals Intact	Y	N	NA
Containers Intact	Y	N	NA

Airbill #: 0860

CAR #: –

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix	BENZENE	CHLORO BENZENE	CH LOROFORM	1,1,2-TRICHLOROETHANE	Comments	No. of Bottles	Lab Use Only Containers/Pres.
0907064-01	7/7/09/1410	07HP2-15-20090707	GW	X	X	X	X	HIGH TURBIDITY	3	3S-HY
-02	11/1445	07HP2-29-20090707							3	
-03	11/1800	DUP-01							3	
-04	7/8/09/0900	07HP2-48-20090708							3	
-05	11/1010	07HP1-19-20090708							3	
-06	11/1200	07HP1-38-20090708							3	
-07	11/1250	07HP1-50-20090708							3	
-06	11/1200	HP1MS							3	
↓	11/1200	HP1MSD							3	↓
-08	7/7/10/1600	TRIP BLANK	W	X	X	X	X		2	2S-HY

Sample Kit Prep'd by: (Signature)	Date/Time	Received By: (Signature)
Relinquished by: (Signature) Joseph S Tomalavage	Date/Time 7/8/09/1800	Received By: (Signature)
Relinquished by: (Signature)	Date/Time	Received By: (Signature)
Received for Laboratory by: (Signature)	Date/Time 7/9/09 08:15	Temperature 2.8°C

REMARKS:

Details:

Page 1 of 1

Cooler No. 1 of 1

Date Shipped 7/8/07

Shipped By

Turnaround STD

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.