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PRE-DESIGN INVESTIGATION DATA PACKAGE FOR OPERABLE UNIT 2 (OU 2) NSY PORTSMOUTH ME

07/01/2011

TETRA TECH NUS

Pre-Design Investigation Data Package for Operable Unit 2 at

Portsmouth Naval Shipyard

Kittery, Maine

Naval Facilities Engineering Command Mid-Atlantic

Contract Number N62470-08-D-1001
Contract Task Order WE43

July 2011

071109/P

PRE-DESIGN INVESTIGATION DATA PACKAGE FOR OPERABLE UNIT 2 AT PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE

COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
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CONTRACT NUMBER N62470-08-D-1001
CONTRACT TASK ORDER WE43

JULY 2011

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1.0 INTRODUCTION

The Pre-Design Investigation Data Package for Operable Unit (OU) 2 at Portsmouth Naval Shipyard (PNS) in Kittery, Maine, was prepared by Tetra Tech NUS, Inc. (Tetra Tech) for the United States Department of Navy, Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic, under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Program, Contract Number N62470-08-D-1001, Contract Task Order (CTO) WE43. OU2 is located in the south-central portion of PNS, as presented on Figure 1, and consists of Site 6 – The Defense Reutilization and Marketing Office (DRMO) Storage Yard, Site 29 – the Former Teepee Incinerator Site, and the DRMO Impact Area. Figure 2 presents the OU2 site layout.

Sampling for the OU2 Pre-Design Investigation was conducted to collect data to support the OU2 Remedial Design (RD) under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The OU2 Pre-Design Investigation was conducted to obtain soil data to define the limit of soil contamination on the western side of OU2, in the vicinity of Building 348 and John Paul Jones Avenue. Field activities were conducted in April 2011 and consisted of collecting surface and subsurface samples from 19 soil borings across the investigation area. Soil boring locations are identified on Figure 3. The sampling was conducted in accordance with the Sampling and Analysis Plan (SAP) for Operable Unit 2 Pre-Design Investigation (Tetra Tech, November 2010).

The results from the 2011 soil sampling for the Pre-Design Investigation are presented in this data package. The remainder of this data package provides a summary of the activities, results, and the associated data quality review (DQR). Section 2.0 provides a summary of the sampling investigation activities. Section 3.0 provides a summary of the analytical results, and Section 4.0 provides a summary of the DQR.

Support documentation provided in appendices is as follows:

- Appendix A contains field documentation including soil boring logs and field notes.
- Appendix B contains chain-of-custody forms for soil samples.
- Appendix C contains database printouts, data validation letters, and an electron version of the database on CD.
- Appendix D contains the DQR.
- Appendix E contains survey data.

2.0 SAMPLING INVESTIGATION

This section provides a summary of the OU2 Pre-Design Investigation field activities conducted in April 2011. The activities included surface and subsurface soil sampling at OU2 using direct-push technology (DPT). The soil sampling and analytical program is summarized in Table 2-1, and sampling locations are presented on Figure 3. Boring logs are provided in Appendix A. The 2011 analytical results are presented in Section 3.0. Minor deviations from the OU2 Pre-Design Investigation SAP (Tetra Tech, November 2010) are also discussed herein

2.1 SITE UTILITY CLEARANCE

Utility clearance activities were conducted prior to field activities, and no intrusive activities (i.e., drilling deeper than 6 inches) occurred until the areas intended for investigation were cleared. Before drilling commenced at the site, utility maps of the facility were obtained from the PNS Public Works Department and reviewed by the Field Operations Leader (FOL). Tetra Tech was responsible for marking sample locations and contacting Dig Safe[1] for a utility survey. PNS was responsible for conducting the utility survey and marking utility locations as necessary. Dig Safe was notified of site work on March 29, 2011 for ground intrusive activities, which took place on April 11 and 12, 2011.

Prior to utility clearance sample locations were measured using a tape measure from buildings and other permanent site features that were easily identified on site. There was one deviation in the location of soil borings (for OU2-417). The deviation is discussed further as part of the DQR discussion in Section 4.0.

2.2 SOIL SAMPLING

Nineteen soil borings (OU2-400 to OU2-418) were advanced using a Geoprobe® DPT rig, and soil samples were collected from the borings with Geoprobe® Macro-Core® samplers. Samples were collected at locations OU2-400 through OU2-418 from depths as shown on Table 2-1. In accordance with the SAP, samples were to be collected at 2-foot intervals from the surface to 10 feet bgs or sampler refusal is encountered, whichever is shallower. Only OU2-401 could be advanced to 10 feet and all of the targeted depth intervals [0 to 2 feet below ground surface (bgs), 2 to 4 feet bgs, 4 to 6, 6 to 8, and 8 to 10 feet bgs] could be collected at this boring. In the other borings refusal was generally encountered between 2 and 6 feet bgs. Multiple attempts were made at locations where refusal was encountered at depths shallower than 10 feet. Table 2-1 identifies the depths at which refusal was encountered at each soil boring location.

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1 Dig Safe is the State of Maine one-call utility clearance service.

Following advancement, all borings were backfilled with bentonite chips and patched with asphalt or surface soil, consistent with existing surface conditions.

2.3 FIELD QUALITY CONTROL SAMPLES

Field duplicate samples were collected for soil as indicated in Table 2-1.

2.4 SURVEY

Following boring advancement, the horizontal and vertical coordinates of each boring location were professionally surveyed by Doucet Surveying, a Maine licensed surveyor, to sub-meter accuracy. The survey of the boring locations was conducted as part of a larger topographic survey of OU2. Appendix E provides the survey data for the boring locations only.

TABLE 2-1

SUMMARY OF 2011 SOIL SAMPLING AND ANALYTICAL PROGRAM
OPERABLE UNIT 2
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Location	Sample ID	Sample Depth (feet bgs)	Analyses [1]	Comment
OU2-400	OU2-SS-400-0002	0 to 2	PCB Homologs, Cu, and Pb	EOB (refusal) at 4 feet bgs.
	OU2-SB-400-0204	2 to 4	Not Analyzed	
OU2-401	OU2-SS-401-0002	0 to 2	PCB Homologs, Cu, and Pb	EOB at 10 feet bgs.
	OU2-SB-401-0204	2 to 4	Pb	
	OU2-SB-401-0406	4 to 6	Pb	
	OU2-SB-401-0608	6 to 8	Pb	
	OU2-SB-401-0810	8 to 10	Pb	
OU2-402	OU2-SS-402-0002	0 to 2	PCB Homologs, Cu, and Pb	EOB (refusal) 6 feet bgs.
	OU2-SB-402-0204	2 to 4	Pb	
	OU2-SB-402-0406	4 to 6	Pb	
OU2-403	OU2-SS-403-0002	0 to 2	PCB Homologs, Cu, and Pb	EOB (refusal) 6 feet bgs.
	OU2-SB-403-0204	2 to 4	Not Analyzed	
	OU2-SB-403-0406	4 to 6	Not Analyzed	
OU2-404	OU2-SS-404-0002/ OU2-SS-404-D	0 to 2	PCB Homologs, Cu, and Pb	EOB (refusal) at 4 feet bgs.
	OU2-SB-404-0204	2 to 4	Not Analyzed	
OU2-405	OU2-SS-405-0002	0 to 2	PCB Homologs, Cu, and Pb	EOB (refusal) at 8 feet bgs.
	OU2-SB-405-0204	2 to 4	Not Analyzed	
	OU2-SB-405-0406	4 to 6	Not Analyzed	
	OU2-SB-405-0608	6 to 8	Not Analyzed	
OU2-406	OU2-SS-406-0002	0 to 2	PCB Homologs, Cu, and Pb	EOB (refusal) at 4 feet bgs.
	OU2-SB-406-0204	2 to 4	Not Analyzed	

TABLE 2-1

SUMMARY OF 2011 SOIL SAMPLING AND ANALYTICAL PROGRAM
OPERABLE UNIT 2
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

Location	Sample ID	Sample Depth (feet bgs)	Analyses [1]	Comment
OU2-407	OU2-SS-407-0002	0 to 2	PCB Homologs, Cu, and Pb	EOB (refusal) at 3 feet bgs.
	OU2-SB-407-0203/ OU2-SB-407-0203-D	2 to 3	Pb	
OU2-408	OU2-SS-408-0002	0 to 2	PCB Homologs, Cu, and Pb	EOB (refusal) at 3.5 feet bgs.
	OU2-SB-408-0204	2 to 4	Pb	
OU2-409	OU2-SS-409-0002	0 to 2	PCB Homologs, Cu, and Pb	EOB (refusal) at 2 feet bgs.
OU2-410	OU2-SS-410-0002	0 to 2	PCB Homologs, Cu, and Pb	EOB (refusal) at 2 feet bgs.
OU2-411	OU2-SS-411-0002	0 to 2	PCB Homologs, Cu, and Pb	EOB (refusal) at 2 feet bgs.
OU2-412	OU2-SS-412-0002	0 to 2	PCB Homologs, Cu, and Pb	EOB (refusal) at 3 feet bgs.
	OU2-SB-412-0203	2 to 3	Not Analyzed	
OU2-413	OU2-SS-413-0002	0 to 2	PCB Homologs, Cu, and Pb	EOB (refusal) at 2.5 feet bgs.
OU2-414	OU2-SS-414-0002/ OU2-SS-414-0002-D	0 to 2	PCB Homologs, Cu, and Pb	EOB (refusal) at 2 feet bgs.
OU2-415	OU2-SS-415-0002	0 to 2	PCB Homologs, Cu, and Pb	EOB (refusal) at 2 feet bgs.
OU2-416	OU2-SS-416-0002	0 to 2	PCB Homologs, Cu, and Pb	EOB (refusal) at 3.9 feet bgs.
	OU2-SB-416-0204	2 to 4	Pb	
OU2-417	OU2-SS-417-0002	0 to 2	PCB Homologs, Cu, and Pb	EOB (refusal) at 2 feet bgs.
OU2-418	OU2-SS-418-0002	0 to 2	PCB Homologs, Cu, and Pb	EOB (refusal) at 3.5 feet bgs.
	OU2-SB-418-0204	2 to 4	Not Analyzed	

bgs - Below ground surface
EOB - End of boring
Cu - Copper
Pb - Lead

Notes: All locations where refusal occurred were attempted 3 times.
1 - Samples were analyzed based on the decisions provided in the SAP and as discussed in Section 3.0.

3.0 SOIL ANALYTICAL RESULTS

This section provides the analytical results for soil samples collected during the OU2 Pre-Design Investigation sampling. Tables 3-1 and 3-2 present the frequencies of detection for target analytes in surface and subsurface soil, respectively. The laboratory analytical data were validated in accordance with the OU2 Pre-Design Investigation SAP; Appendix C contains a database printout of the 2011 soil data and data validation technical memoranda for the corresponding data (on CD).

The soil samples for the OU2 Pre-Design Investigation were analyzed by Mitkem Laboratories of Warwick, Rhode Island, for polychlorinated biphenyl (PCB) homologs, lead, and copper in accordance with the OU2 Pre-Design Investigation SAP. Soil samples were analyzed for PCBs via SW-846 Method 3510C/3550, prepared by Sonication and utilizing gas chromatography/mass spectrometry (GC/MS) instrumentation coupled with a selective ion monitoring (SIM) detector (EPA Method 680). Soil samples were analyzed for copper and lead via SW-846 Method 3005A/3010A/6010C utilizing inductively couple plasma (ICP) - atomic emission spectrometer (AES) instrumentation.

The soil sample analyses were conducted in phases based on analytical results of the surface and sub-surface soil samples. Soil samples were collected in 2-foot increments (0 to 2 feet, 2 to 4 feet, 4 to 6 feet, 6 to 8 feet, and 8 to10 feet) until a depth of 10 feet bgs was reached or refusal was encountered, whichever was shallower. As provided in the SAP, samples from the 0-to-2 foot interval were analyzed in the first phase, then if required at a particular soil boring location, the next phase included analysis of the 2-to-4-foot and 4–to-6-foot intervals. The last phase, if required, included the 6-to-8-foot and 8-to-10-foot intervals. Lead was the only chemical in surface soil samples (0 to 2 feet bgs) that exceeded Project Action Levels (PALs); therefore, the selected subsurface samples were only analyzed for lead. Table 2-1 identifies soil boring locations where subsurface soil samples were analyzed. In accordance with the SAP, subsurface soil samples for locations where the lead concentration in the surface soil sample exceeded 1,600 mg/kg were analyzed for lead. Subsurface soil samples indicated on Table 2-1 as “Not Analyzed” were not analyzed because the surface soil lead concentration for those locations were less than 1,600 mg/kg. Of the borings requiring subsurface soil lead analysis, boring OU2-401 was the only location that had samples collected below 6 feet bgs (6-to-8 foot and 8-to-10 foot intervals). Because of the limited number of samples and analysis, and to expedite completion of sample analysis, the two deeper subsurface soil samples were also analyzed during the second phase, without waiting for the results of the lead analysis for the two shallower subsurface soil samples at OU2-401.

TABLE 3-1

FREQUENCIES OF DETECTION FOR 2011 SURFACE SOIL SAMPLES
OPERABLE UNIT 2
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

CAS Number	Parameter	Frequency of Detection (1)	Range of Non-Detects	Range of Detects	Sample With Maximum Detection (2)
Inorganics (mg/kg)					
7440-50-8	COPPER	19/19	-	15.6 - 2190	OU2-SS-407-0002
7439-92-1	LEAD	19/19	-	24.2 - 29100	OU2-SS-416-0002
PCB Homologs (ug/kg)					
25512-42-9	DICHLOROBIPHENYLS	3/19	0.086 - 0.097	0.05 - 0.27	OU2-SS-412-0002-D
28655-71-2	HEPTACHLOROBIPHENYLS	11/19	0.26 - 0.29	0.23 - 7.9	OU2-SS-413-0002
26601-64-9	HEXACHLOROBIPHENYL	18/19	0.18 - 0.18	0.29 - 52	OU2-SS-402-0002
27323-18-8	MONOCHLOROBIPHENYLS	4/19	0.086 - 0.097	0.31 - 1.7	OU2-SS-416-0002
53742-07-7	NONACHLOROBIPHENYLS	6/19	0.43 - 0.049	0.41 - 10	OU2-SS-413-0002
TTNUS598	OCTACHLOROBIPHENYLS	2/19	0.26 - 0.29	0.5 - 0.65	OU2-SS-404-0002-D
2051-24-3	PCB-209	0/19	0.43-0.49	-	-
25429-29-2	PENTACHLOROBIPHENYLS	17/19	0.18 - 0.19	0.15 - 98	OU2-SS-402-0002
26914-33-0	TETRACHLOROBIPHENYLS	8/19	0.17 - 0.19	0.42 - 27	OU2-SS-402-0002
TTNUS565	TOTAL PCB HOMOLOGS (3)	19/19	-	0.15 - 180	OU2-SS-402-0002
TTNUS597	TRICHLOROBIPHENYLS	6/19	0.086 - 0.096	0.044 - 0.38	OU2-SS-410-0002

CAS - Chemical Abstract Service
mg/kg - milligram/kilogram
ug/kg - microgram/kilogram

1 - Sample and duplicate are counted as one sample when determining frequency of detection.
2 - Sample and duplicate are considered as two separate samples when determining maximum concentration.
3 - Laboratory summation of positive PCB homolog results per sample.

Associated Samples:

OU2-SS-400-0002	OU2-SS-410-0002
OU2-SS-401-0002	OU2-SS-411-0002
OU2-SS-402-0002	OU2-SS-412-0002
OU2-SS-403-0002	OU2-SS-412-0002-D
OU2-SS-404-0002	OU2-SS-413-0002
OU2-SS-404-0002-D	OU2-SS-414-0002
OU2-SS-405-0002	OU2-SS-415-0002
OU2-SS-406-0002	OU2-SS-416-0002
OU2-SS-407-0002	OU2-SS-417-0002
OU2-SS-408-0002	OU2-SS-418-0002
OU2-SS-409-0002	

TABLE 3-2

FREQUENCIES OF DETECTION FOR 2011 SUBSURFACE SOIL SAMPLES
OPERABLE UNIT 2
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

CAS Number	Parameter	Frequency Of Detection [1]	Range of Non-Detects	Range of Detects	Sample With Maximum Detection [2]
Inorganics (mg/kg)					
7439-92-1	LEAD	10/10	-	10.9 - 9790	OU2-SB-408-0204

CAS - Chemical Abstract Service
mg/kg - milligram/kilogram

1 - Sample and duplicate are counted as one sample when determining frequency of detection.
2 - Sample and duplicate are considered as two separate samples when determining maximum concentration.

Associated Samples:
OU2-SB-400-0204
OU2-SB-401-0204
OU2-SB-401-0406
OU2-SB-401-0608
OU2-SB-401-0810
OU2-SB-402-0204
OU2-SB-402-0406
OU2-SB-407-0203
OU2-SB-407-0203-D
OU2-SB-408-0204
OU2-SB-416-0204

4.0 DATA QUALITY SUMMARY

A DQR was conducted for the analytical laboratory data collected during the OU2 Pre-Design Investigation. The DQR reviewed the processes used to determine whether analytical laboratory data were of acceptable technical quality for use in decision making. The DQR (Appendix D) also evaluated the measures of data completeness, sensitivity, comparability, and representativeness. The following provides a summary of the data quality issues to be considered prior to data use.

The OU2 Pre-Design Investigation SAP (Tetra Tech, November 2010) and use of standardized sampling, sample handling, sample analysis, and data reporting procedures were designed so that the final data would be accurate representations of actual site conditions.

There was one deviation from the SAP in location of a soil boring. The SAP specified that a boring be installed between the previous samples SS-01-03 and OU2-124 to better delineate the remediation area (based on clean up levels for protection of industrial workers) within the current boundary of OU2. Boring OU2-417 was intended for this purpose; however, the actual sample location was installed near SS-01-03. This deviation from the SAP does not affect the data quality based on the elevated lead results in surrounding borings. The data will be used in the delineation of the remediation area as part of the RD.

No data were rejected during this review; therefore all data are considered acceptable for project use. Specific information can be found in the DQR, Appendix D.

REFERENCES

Tetra Tech NUS, Inc. (Tetra Tech), November 2010. Sampling and Analysis Plan for Operable Unit 2 Pre-Design Investigation, Portsmouth Naval Shipyard, Kittery, Maine. Tetra Tech, King of Prussia, Pennsylvania.

P:\GIS\PORTSMOUTH_NSY\MAPDOCS\MXD\OU2_VICINITY.MXD 07/22/11 SS

DRAWN BY	DATE	TETRA TECH	CONTRACT NUMBER	CTO NUMBER
S. STROZ	07/22/11		02229	WE43
CHECKED BY	DATE	PORTSMOUTH NAVAL SHIPYARD VICINITY MAP PORTSMOUTH NAVAL SHIPYARD KITTERY, MAINE	APPROVED BY	DATE
S. HILL	07/22/11		___	___
REVISED BY	DATE		APPROVED BY	DATE
___	___		___	___
SCALE			FIGURE NO.	REV
AS NOTED			1	0

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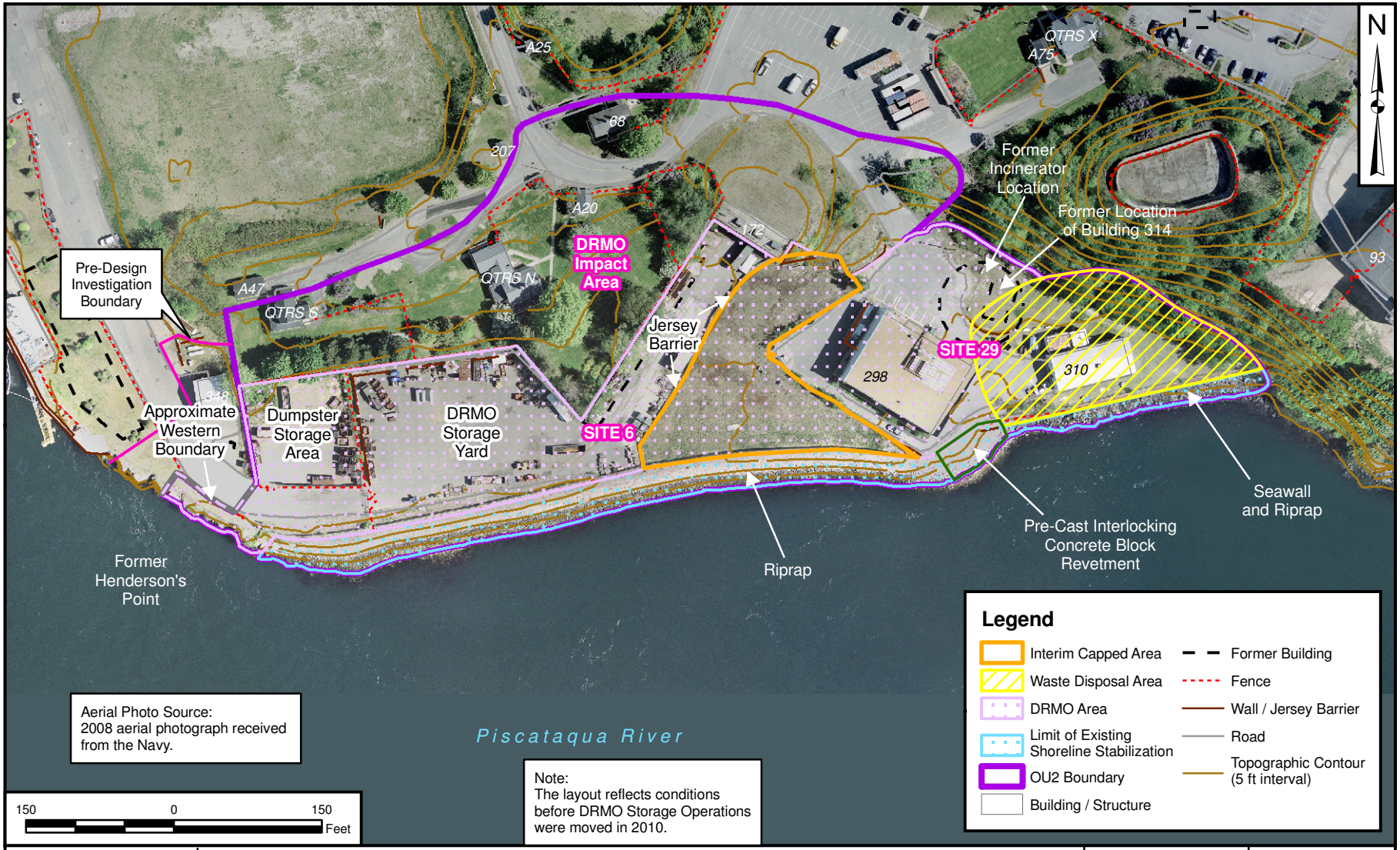

DRAWN BY	DATE	TETRA TECH	CONTRACT NUMBER	CTO NUMBER
J. ENGLISH	06/02/11		02229	WE43
CHECKED BY	DATE	OU2 LAYOUT MAP	APPROVED BY	DATE
S. HILL	07/15/11	OPERABLE UNIT 2 PRE-DESIGN INVESTIGATION	—	—
REVISED BY	DATE	PORTSMOUTH NAVAL SHIPYARD	APPROVED BY	DATE
—	—	KITTERY, MAINE	—	—
SCALE			FIGURE NO.	REV
AS NOTED			FIGURE 2	0

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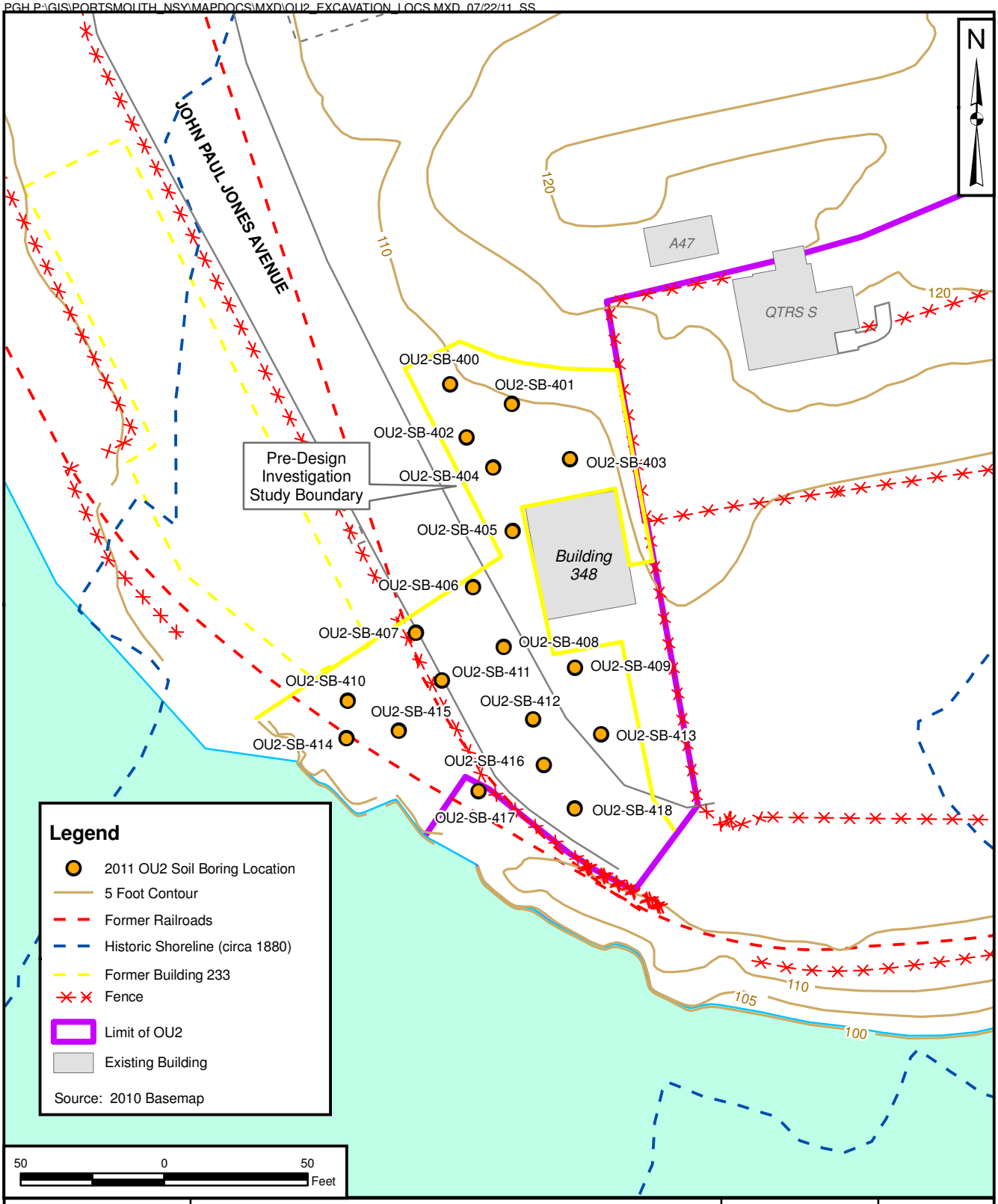

DRAWN BY	DATE	TETRA TECH	CONTRACT NUMBER	CTO NUMBER
S. STROZ	07/22/11		02229	WE43
CHECKED BY	DATE	PRE-DESIGN SAMPLING LOCATIONS	APPROVED BY	DATE
D. COHEN	07/25/11	OPERABLE UNIT 2 PRE-DESIGN INVESTIGATION	___	___
REVISED BY	DATE	PORTSMOUTH NAVAL SHIPYARD	APPROVED BY	DATE
___	___	KITTERY, MAINE	___	___
SCALE			FIGURE NO.	REV
AS NOTED			3	0

APPENDIX A

FIELD DOCUMENTATION

A.1 SOIL BORING LOGS

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2- 400
DATE: 4/12/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

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**	
			0.9/2		light brown and reddish brown		silty sand (f-m), little fine gravel	SM	moist					0905
					dark brown to black		silty sand (f-c), some gravel (f-c), trace clay	SM						
2			0.8/2		dark brown		silty sand (f-c), some gravel (f-c)	SM	pieces of wood moist					0910
					dark gray		gravel (f-c) (subangular)	GP						
					medium brown		clayey silt, trace fine gravel	~~CL~~ ML						
4				EOB										

* When rock coring, enter rock brokeness.

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

Drilling Area Background (ppm):

Remarks: refusal @ 4ft
refusal @ 4ft
refusal @ 4ft

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

samples at 0-2ft (0905)
2-4ft (0910)

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2-401
DATE: 4/12/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

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	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**	
			1.2/2		light	brown	sandy silt, trace fine gravel	ML	organic material moist					0930
					medium	brown	silty sand, some gravel (f-c) (subangular to angular)	SM						
									FGP					
2						gray	coarse angular gravel ~~pa~~ ~~Gvt~~		dry					
			0.7/2		dark	brown	sandy silt, some f-c gravel (angular)	ML	moist					0935
4														
			1.4/2		dark	brown	silty sand (f-c), some f-c gravel (subangular)	SM						0940
					light	gray	f-c gravel (angular), some silt, little sand (f-c)	GM	dry, some metal pieces					

* When rock coring, enter rock brokeness.

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

Drilling Area Background (ppm):

Remarks:

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

sample times: 0-2ft (0930)
2-4ft (0935)
4-6ft (0940)
6-8ft (0945) - MS/MSD
8-10ft (0950)

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2- 401
DATE: 4/12/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

	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**	
						light	gray	same as above	GM	dry					
						medium	brown	sandy silt and f-c	ML	moist					
								gravel (subangular),							
								trace clay							
								silt/clay ↓							
6				1.4/2		dark	brown	~~clayey~~ silt, some	CL						0945
								coarse gravel (angular)							
						medium	brown,	clayey silt, little	MH	damp					
						very	dense	sand (f-m), trace							
								gravel (subrounded)							
										saturated					
				1.8/2											
8				~~2/2~~		mottled, light		sandy silt (f), trace	ML		very dense				0950
						to medium		fine gravel							
						brown,									
						reddish or									
						gray									
						patches									
10															

* When rock coring, enter rock brokeness.

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

Drilling Area Background (ppm):

Remarks:

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

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2-402
DATE: 4/12/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

	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**	Time
				1.1/2		dark	brown	sandy silt, little fine gravel, some organic matter	ML	moist					0842
						dark brown to black		silty sand, some fine gravel	SM						
1															
						gray		fine gravel, trace coarse gravel, some fine-coarse sand, little silt	GM						
2				0.7/2		medium brown		silty sand, some fine gravel (angular), little coarse gravel (sub angular)	SM						0845
3															
4				1.3/2		gray		silty sand (f-c), little fine gravel	SM	dry					0850
						dark brown		sandy silt, little fine gravel, trace coarse gravel	ML	moist					

* When rock coring, enter rock brokeness.

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

Drilling Area Background (ppm):

Remarks: first attempt refusal @ 6ft
second @ 4.5 ft
third @ 5 ft

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

Sample times: 0-2ft @ 0842
2-4ft @ 0845
4-6ft @ 0850

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2-402
DATE: 4/12/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

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**
					medium to	dark brown	sandy silt, little fine	ML	moist				
							gravel, trace coarse						
							gravel		pieces of metal				
							↓		↓				
					light	gray	gravel (f-c), some silty sand	(f-c) GM					
6				EOB									

* When rock coring, enter rock brokeness.

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

Drilling Area Background (ppm):

Remarks:

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

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2- 403
DATE: 4/12/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

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**	
			1.1/2		dark brown		sandy silt, trace fine gravel	ML	damp, some organic matter					1015
						tan	f-m sand, trace gravel (f) ~~SW~~	SP	damp					
					dark brown		silty sand (f-c), little gravel							
						tan	f-m sand, little gravel (f, angular)	SM						
2			0.9/2			tan	f-m sand, trace gravel (f, angular) ~~SW~~	SP	moist					1020
					dark brown		silty sand (f-c), ~~some~~ little gravel (subangular)	SM	pieces of wood, moist					
					light gray		gravel (f-c, angular), some silty sand (f-c)	GM	dry					
4			1/2		dark brown to reddish brown		sandy silt, little gravel (fine, angular), little clay	SM	moist, saturated					1025

* When rock coring, enter rock brokeness.

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

Drilling Area Background (ppm):

Remarks: refusal at 6ft on all 3 attempts

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

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2- 403
DATE: 4/12/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

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**
					same as above			SM	saturated				
					light brown		silty sand (f-m),	SM					
							trace gravel						
6				EOB									
6				EOB									

* When rock coring, enter rock brokeness.

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

Remarks:

Drilling Area Background (ppm):

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

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2- 404
DATE: 4/12/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

	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**	Time
				12/2		dark brown		sandy silt, some roots and grass and organic material	ML	moist					0830
						light brown		silty sand (f-m), little fine gravel, trace coarse gravel	SM						
1						dark brown		silty sand (f-c), ~~little~~ some fine gravel	SM						
2						light brown		f-m sand, trace silt	SP						
				1/2		light gray		f-c gravel (angular), some f-c sand, little silt	GW	dry					0838
3															
						dark grayish brown		silty sand (f-c), some f-c gravel (angular)	SM	moist					
4					EOB										

* When rock coring, enter rock brokeness.

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

Drilling Area Background (ppm):

Remarks: first attempt refusal @ 4ft
second attempt refusal @ 4ft
third attempt refusal @ 3ft

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

sample times: 0-2ft @ 0830 - DUP 06
2-4ft @ 0838

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2-405
DATE: 4/11/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

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**	sample time
							asphalt (0-0.8ft)							
			1.8/2		light brown		silty sand (f-c), some f-c gravel (subrounded)	SM	damp					~~1400~~ 1600
1														
2			1.8/2			tan	fine-medium sand, poorly graded	SP						~~1405~~ 1605
3														
4			1.8/2											~~1410~~ 1610

* When rock coring, enter rock brokeness.

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

Drilling Area Background (ppm):

Remarks: first attempt @ 8ft
second attempt @ 7ft
third attempt @ 6.5 ft

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

samples: 0-2ft @ 1600
2-4ft @ 1605
4-6ft @ 1610 (DUP04)
6-8ft @ 1615 (DUP05)

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2-405
DATE: 4/11/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

	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	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**
							tan	fine-medium sand, poorly graded	SP	damp				
5														
							medium brown	silty clay and f-c gravel (subangular)	CL	moist, some pieces of brick				
6				1.4/2										
							dark brown	clay, little silt, little angular fine gravel	CH	wet				
7														
							black	silty clay	CL					
8					EOB									

tka ~~1415~~ 1615

* When rock coring, enter rock brokeness.

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

Remarks:

Drilling Area Background (ppm):

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

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2-406
DATE: 4/1/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

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	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**	
			1.3/2		dark brown, gray		asphalt (0-0.5ft)		dry					sample: 1550
					light brown to medium brown		silty sand, some angular gravel	SM						
1														
					black		sand (f-c), little subangular gravel, little silt	SW						
2			1.2/2		dark reddish brown		sandy silt, little f. gravel	ML	pieces of metal moist					1555
					black and gray		silty sand (f-c) and f. gravel	SM	pieces of slag moist					
3					light brown		fine sand, poorly graded	SP	moist					
					black		silty sand, little fine gravel	SM	pieces of silery material					
4					gray		fine-coarse gravel, some silty sand	GM	dry					
				EOB										

* When rock coring, enter rock brokeness.

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

Remarks: 3 attempts, refusal at 4ft at all of them

Drilling Area Background (ppm):

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

samples: 0-2 (1550)
2-4 (1555)

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2-407
DATE: 4/11/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

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**	
			1.7/2			gray	asphalt (0-0.7ft)		dry					1400
						black to dark brown	silty sand (f-c), little fine gravel (subangular)	SM	pieces of metal and wood moist					
1														
						light brown								
2			0.8/2			black	silty sand (f-c), little fine gravel	SM						1405
						light to dark brown	silty clay, trace sand (f), little angular fine gravel	CL	wet					
3				EOB										

* When rock coring, enter rock brokeness.

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

Drilling Area Background (ppm):

Remarks: 1st attempt 3 ft refusal
2nd attempt 2 ft
3rd attempt 2 ft

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

Samples: 0-2 ft (1400)
2-3 ft (1405) - DUP03

Moved boring location ≈2 ft South to avoid underground electrical line

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2-408
DATE: 4/11/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

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**	time
			1.8/2		grayish		asphalt (0-0.5ft)		dry					
														1315
					red		silty sand (f-c), some fine gravel (subangular)	SM						
1														
					brown		silty sand (f-m), some fine gravel (subrounded)	SM						
					black		silty sand (f-m), little coarse sand	SM						
2			1.5/1.5		black		silty sand (f-c), little fine gravel	SM	pieces of light, silvery metallic material, pieces of coal					1320
					light to dark brown		clayey silt	MH	moist					
3					light brown		silty sand (f-m)	SM	dry					
					whitish gray		silty sand (f-c), some gravel (f-c), some silt	SM						
				EOB (3.5')										

* When rock coring, enter rock brokeness.

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

Drilling Area Background (ppm): ____

Remarks: first attempt 3.5ft refusal
second attempt 3ft refusal
third attempt 3ft refusal

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

samples: (0-2ft) 1315
(2-4ft) 1320 (MS/MSD)

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2-409
DATE: 4/11/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER:

	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**
				1.4/2		light	gray	asphalt (0.0-0.6ft)						
								↓						
						medium	brown	f-m sand, some f-c gravel (subangular), trace silt	SW					
1														
								↓						
2					EOB									

sample time 1535

* When rock coring, enter rock brokeness.

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

Drilling Area Background (ppm):

Remarks: refusal at 1st attempt: 2ft
2nd: 2ft
3rd: 2ft

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

sample (0-2ft) - 1535

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2-410
DATE: 4/12/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

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**
			1.3/2		medium	brown	silty sand (f-m), trace fine gravel (subangular)	SM	moist, some organic matter (roots/grass)				
					grey		coarse gravel (angular)	GP	moist				
					dark brown to black		silty sand (f-c), some fine gravel	SM					
					light	brown	sandy silt (f-c), little fine gravel (angular)	ML					
				EOB									

1325

2

* When rock coring, enter rock brokeness.

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

Remarks: first attempt refusal @ 1.5ft, second and third attempt refusal @ 2ft

Drilling Area Background (ppm):

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

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2- 411
DATE: 4/11/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M- Kelly

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**	sample time
			1.3/2		light gray		asphalt		dry					1345
							silty sand, little gravel (f-c)(subangular)	SM						
1														
							gravel (f-c), little sand (f-c), some silt	GM						
2				EOB										

* When rock coring, enter rock brokeness.

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

Drilling Area Background (ppm):

Remarks: first attempt refusal @ 2 ft
second attempt 2 ft
third attempt 2 ft

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

sample: 0-2 ft @ 1345

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2- 412
DATE: 4/11/11
GEOLOGIST: ~~S. Hill~~ L Anderson
DRILLER: M. Kelly

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	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**	Time
			2/2 ~~1.4/2~~ zka				Asphalt (grey-black) (0-.5ft) f-c sand, some silt, trace gravel		dry					1200
1					dark brown, black		↓	SM						
					gray		gravel (angular), trace f-c sand, trace silt	GW						
2					black		f-c sand, little gravel, trace silt ~~t~~ zka	SW	Natural material -black, low density material with small holes					
2.5						reddish brown	↑	MH	↓					1210
			1/4 (05)	zka			clayey silt, little gravel, trace sand							
3		zka	~~1/1.5~~	EOB			EOB @ 3.5 zka							
4			1/1	~~EOB~~ zka			~~EOB @ 4'~~ (05)							
						gray white	gravel, some f-c sand, trace silt (2.8-3.0-ft)	GW						
							End of boring is at 3.0 ft							

* When rock coring, enter rock brokeness.

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

Drilling Area Background (ppm): ____

Remarks: first attempt refusal: 3 ft
second: 3 ft
third: 3.5 ft

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

Samples: 0-2 (1200) DUP02
2-3 (1210)

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2-413
DATE: 4/11/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: Matt Kelly

	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**	
				1.6/2			gray	asphalt							Time 1040
							dark brown	~~dr~~ gravel and fine-coarse sand, little silt	GW	moist					
1								↓							
							gray	gravel and fine-coarse sand, little silt	GW	dry					
								↓							
2.5					EOB										
5															
7.5															
10															

* When rock coring, enter rock brokeness.

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

Drilling Area Background (ppm): ____

Remarks: refusal at 2.5 ft, second attempt refusal at 2.5 ft, ~~refusal at 1.5 ft at third attempt, refusal at 1.5 ft fourth attempt~~

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

sample 0-2ft @ 1040

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2- 414
DATE: 4/12/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

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**
			1.3/2		medium	brown	silty sand (f-m)	SM	damp, roots and organic matter				
					light	brown	silty sand (f-c), little gravel (f, subangular)	SM	dry				
					black		sand (f-c), little gravel (f-c), little silt	SW	damp, glass in sample				
					light	brown	sandy silt, little fine gravel (subangular)	ML					
				EOB									

1335

2

* When rock coring, enter rock brokeness.

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

Drilling Area Background (ppm):

Remarks: first attempt refusal ~~2.5 ft~~ 1.5 ft
2nd attempt 1.5 ft
3rd attempt 2 ft

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

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2-~~416~~ 415
DATE: 4/12/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

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**
			1.3/2		medium	brown	silty sand (f-m), little fine gravel	SM	damp, organic matter (grass/roots)				
					black		silty sand (f-c) and gravel (f-c, subangular)	SM	damp				
					reddish	brown	silty sand (f-m), some gravel (f-c, subangular)	SM	moist				
2				EOB									

1320

* When rock coring, enter rock brokeness.

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

Drilling Area Background (ppm): ____

Remarks: refusal @ 2ft all 3 attempts

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

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2- 4/6
DATE: 4/11/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

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	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**	Time
0.5			2/2			black gray	asphalt (0'-4")	~~SW~~	dry,					1130
1						light gray,	fine to coarse sand, little gravel, trace	SW	occassional					
1.5						black brown	silt ↓		rubbery substance					
2														
2.5			1.9/1.9			greyish brown	f.-c. sand, little gravel, tr. silt	SW	dry					1140
3							↓							
4				EOB (3ft 11in)										

* When rock coring, enter rock brokeness.

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

Drilling Area Background (ppm):

Remarks: 1st attempt refusal: 3ft 11in
2nd attempt refusal: 3ft
3rd attempt refusal: 3ft 11in

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

samples: 0-2 1130 (MS/MSD)
2-4 1140

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2- 417
DATE: 4/12/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

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**
			1.8/2		medium brown		silty sand (f-m), trace fine gravel	SM	moist, organic matter				
					light brown		silty sand (f-c), some gravel (f-c, subangular)	SM	moist				
					reddish brown, mottled		sandy silt (f-c), trace fine gravel (subangular)	ML					
				EOB									

1310

2

4

* When rock coring, enter rock brokeness.

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

Remarks: refusal @ 2ft for all 3 attempts

Drilling Area Background (ppm): ____

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

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: PNS OU2
PROJECT NUMBER: 112G02229
DRILLING COMPANY: TDS
DRILLING RIG: DPT

BORING No.: OU2- 418
DATE: 4/11/11
GEOLOGIST: ~~S. Hill~~ L. Anderson
DRILLER: M. Kelly

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	Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS *	Remarks	PID/FID Reading (ppm) Sample	Sampler BZ	Borehole**	Driller BZ**	
			2/2			gray black	few inches of asphalt (0.3ft) fine-coarse sand and gravel,		rubbery material dry					time 1100
1						black	little silt	GW/SW						
						reddish brown	fine-coarse sand, some gravel, little clayey silt	SW	dry					
2			1.5/1.5											
2.5							silty clay, little f-c sand, trace gravel	CL	moist					1115
3.5							f-c sand, some fine gravel	SW	dry					
				EOB										

* When rock coring, enter rock brokeness.

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

Drilling Area Background (ppm): ____

Remarks: first attempt, refusal at 3.5ft, second attempt refusal at 3ft, third attempt at 3ft

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

sample collected at 1100 (0-2ft)
1115 (2-3.5ft) and DUP1

A.2 SOIL SAMPLE LOGS

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-SS-400-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11 Time: 0905 Method: Monitor Reading (ppm): NA	0-2 ft	see	boring log

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs	4 oz glass jar - 1	Yes	
Copper and Lead	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

See Figure 5 in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

Sample ID No.: OU2-SS-401-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11 Time: 0930 Method: Monitor Reading (ppm): NA	0-2 ft	see	boring log

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs	1 4 oz glass jar	Yes	
Copper and Lead	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

See Figure 5 in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

Sample ID No.: OU2-SS-402-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11 Time: 0842 Method: Monitor Reading (ppm): NA	0-2 ft	see	boring log

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs	4 oz glass jar	Yes	
Copper and Lead	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

Sample ID No.: OU2-SS-403-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11 Time: 1015 Method: Monitor Reading (ppm): NA	0-2 ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figures in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-SS-404-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11 Time: 0830 Method: Monitor Reading (ppm): NA	0-2ft	see boring log	

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD: —

Duplicate ID No.: OU2-SS-DUP06-041211

Signature(s): Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

Sample ID No.: OU2-SS-405-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11 Time: 1600 Method: Monitor Reading (ppm): NA	0-2ft	see	boring log

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-SS-406-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Andersen
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11 Time: 1550 Method: Monitor Reading (ppm): NA	0-2ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figures in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Lori Andersen

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

Sample ID No.: OU2-SS-407-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11 Time: 1400 Method: Monitor Reading (ppm): NA	0-2ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figures in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

Sample ID No.: OU2-SS-4 08-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11 Time: 1315 Method: Monitor Reading (ppm): NA	0-2ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-SS-409-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11 Time: 1535 Method: Monitor Reading (ppm): NA	0-2ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figures in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

Sample ID No.: OU2-SS-4 10-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11	0-2ft	see boring log	
Time: 1325			
Method:			
Monitor Reading (ppm): NA			

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

Sample ID No.: OU2-SS-4 11-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11 Time: 1345 Method: Monitor Reading (ppm): NA	0-2 ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figures in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

Sample ID No.: OU2-SS-412-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11 Time: 1200 Method: Monitor Reading (ppm): NA	0-2ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD: —

Duplicate ID No.: OU2-SS-DUP02-041111

Signature(s): Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

Sample ID No.: OU2-SS-413-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11 Time: 1040 Method: Monitor Reading (ppm): NA	0-2ft	see boring log	

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

Sample ID No.: OU2-SS-414-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11 Time: 1335 Method: Monitor Reading (ppm): NA	0-2 ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

Sample ID No.: OU2-SS-415-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11 Time: 1320 Method: Monitor Reading (ppm): NA	0-2ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

Sample ID No.: OU2-SS-416-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11 Time: 1130 Method: Monitor Reading (ppm): NA	0-2 ft	see boring log	

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, and Lead	4 oz glass jar, 2	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD: Yes

Duplicate ID No.:

Signature(s): Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-SS-417-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11 Time: 1310 Method: Monitor Reading (ppm): NA	0-2ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring logs

MAP:

see Figures in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[X] Surface Soil
[] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-SS-418-0002
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11 Time: 1100 Method: Monitor Reading (ppm): NA	0-2 ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

See Figures in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SS~~ SB-400-0204
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11 Time: 0910 Method: Monitor Reading (ppm): NA	2-4 ft	see boring log	

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figures in SAP

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SS~~ SB-401-0204
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11 Time: 0935 Method: Monitor Reading (ppm): NA	2-4 ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

See Figures in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SS~~SB-4-02-0204
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11 Time: 0845 Method: Monitor Reading (ppm): NA	2-4 ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring logs

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SS~~ SB-403-0204
Sample Location: OU2-4
Sampled By: ~~S. Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11 Time: 1020 Method: Monitor Reading (ppm): NA	2-4 ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SS~~ SB-4 04-0204
Sample Location: OU2-4
Sampled By: ~~S. Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11 Time: 0838 Method: Monitor Reading (ppm): NA	2-4 ft	see	boring log

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SS~~ SB-4 05-0204
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11	2-4 ft	see boring log	
Time: 1605			
Method:			
Monitor Reading (ppm): NA			

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring logs

MAP:

see Figures in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SS~~ SB-406-0204
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11 Time: 1555 Method: Monitor Reading (ppm): NA	2-4 ft	see boring log	

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SG~~ SB-4 07-0203
Sample Location: OU2-4
Sampled By: ~~S. Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11 Time: 1405 Method: Monitor Reading (ppm): NA	2-3 ft	see boring log	

COMPOSITE SAMPLE DATA:

	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date:				
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD: ——

Duplicate ID No.: OU2-SB-DUP03-041111

Signature(s): Zori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SG~~SB-4 08-0204
Sample Location: OU2-4
Sampled By: ~~S. Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11 Time: 1320 Method: Monitor Reading (ppm): NA	2-4 ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	2 - 4 oz glass jar	Yes	
~~Copper and Lead~~	~~- 4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figures in SAP

Circle if Applicable:

MS/MSD: Yes

Duplicate ID No.:

Signature(s): Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SS~~ SB-4 12-0203
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11 Time: 1210 Method: Monitor Reading (ppm): NA	2-3 ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SS~~SB-4 16-0204
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11 Time: 1140 Method: Monitor Reading (ppm): NA	2-4 ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SS~~ SB-4 18-0204
Sample Location: OU2-4
Sampled By: ~~S. Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11 Time: 1115 Method: Monitor Reading (ppm): NA	2-4 ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figures in SAP

Circle if Applicable:

MS/MSD: ——

Duplicate ID No.: OU2-SB-DUP01-041111

Signature(s): Tori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SS~~ SB-401-0406
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11 Time: 0940 Method: Monitor Reading (ppm): NA	4-6 ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SS~~ SB-4 02-0406
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11 Time: 0850 Method: Monitor Reading (ppm): NA	4-6 ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figures in SAP

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	—

Signature(s): Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SS~~ SB-403-0406
Sample Location: OU2-4
Sampled By: ~~S. Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11 Time: 1025 Method: Monitor Reading (ppm): NA	4-6 ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Tori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SS~~ SB-4 05-0406
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11 Time: 1615 Method: Monitor Reading (ppm): NA	4-6 ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD: —

Duplicate ID No.: OU2-SB-DUP04-041111

Signature(s): Tori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SS~~-4 SB 01-0608
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11 Time: 0945 Method: Monitor Reading (ppm): NA	6-8 ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	2 - 4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figures in SAP

Circle if Applicable:

MS/MSD: Yes

Duplicate ID No.:

Signature(s):

Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SS~~ SB-401-0810
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/12/11 Time: 0950 Method: Monitor Reading (ppm): NA	8-10 ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See ~~log~~ boring log

MAP:

see Figures in SAP

Circle if Applicable:

MS/MSD

Duplicate ID No.:

Signature(s):

Lori Anderson

Tetra Tech NUS, Inc.

SOIL & SEDIMENT SAMPLE LOG SHEET

Project Site Name: PNS OU2
Project No.: 112G02229

[] Surface Soil
[X] Subsurface Soil
[] Sediment
[] Other:
[] QA Sample Type:

Sample ID No.: OU2-~~SS~~SB-4 05-0608
Sample Location: OU2-4
Sampled By: ~~S.Hill~~ L. Anderson
C.O.C. No.:

Type of Sample:
[] Low Concentration
[] High Concentration

GRAB SAMPLE DATA:

	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Date: 4/11/11 Time: 1615 Method: Monitor Reading (ppm): NA	6-8 ft	see boring log	

COMPOSITE SAMPLE DATA:

Date:	Time	Depth Interval	Color	Description (Sand, Silt, Clay, Moisture, etc.)
Method:				
Monitor Readings (Range in ppm):				

SAMPLE COLLECTION INFORMATION:

Analysis	Container Requirements	Collected	Other
PCB Homologs, Copper, Lead	4 oz glass jar	Yes	
~~Copper and Lead~~	~~4 oz glass jar~~		

OBSERVATIONS / NOTES:

See boring log

MAP:

see Figure 5 in SAP

Circle if Applicable:

MS/MSD —

Duplicate ID No.: OU2-SB-DUP05-041111

Signature(s):

Zoe Anderson

A.3 FIELD NOTES

Portsmouth Naval Shipyard
OU2 Pre-Design Investigation
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4/11/11

Personel: Lori Anderson (Tetra Tech) - TT
Jim Ropp (TT)
Dabra Seiken (TT)
Bill Doucet ~~(TT)~~ LA 4/11/11 (Doucet Survey)
Richard Matz (Doucet Survey)
Jeff Goldhnopt (Doucet Survey)
Matt Kelly (TDS)

0800 Lori Anderson (LA) arrive at pass office, meet Dabra Seiken (DS), Jim Ropp (JR), and surveyors (Bill Doucet (BD), Richard Matz (RM), Jeff Goldhnopt (JG)). Obtain passes and go through contractor gate
0830 Meet Matt Kelly (MA) inside the base, everyone meet at landfill parking lot to go over Health and Safety information.
0900 Go pick up drums and equipment from shed. Surveyors begin work.
0945 Arrive at OU2, begin setting up.
1300 Dabra Seiken leave site.
1715 MK leave site.
1845 LA leave site.

Lori Anderson 4/11/11

4/12/11

Personel: Lori Anderson (TT)
Matt Kelly (TDS)

0800 LA and MK meet at OU2 and begin drilling.
1400 DPT work completed, MK leave site. LA clean up site and make sure every location is marked and labelled.
LA ~~1600~~ 1830 LA leave base, after dropping off equipment, preparing samples for shipment, and labeling samples.

Lori Anderson 4/12/11

APPENDIX B

CHAIN-OF-CUSTODY FORMS

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 2

PROJECT NO: 112G02229	SITE NAME: FWS 042	PROJECT MANAGER AND PHONE NUMBER: Dan Witt 412-921-8259	LABORATORY NAME AND CONTACT: Edward Lawler/Mitkem Labs
SAMPLERS (SIGNATURE): Lori Anderson (L. Anderson 978-474-8451)		FIELD OPERATIONS LEADER AND PHONE NUMBER: ~~S. Hill 412-921-7090~~ 4/13/11	ADDRESS: 175 Metro Center Blvd
		CARRIER/WAYBILL NUMBER: 8723 6912 1378	CITY, STATE: Warwick, RI 02886

STANDARD TAT ☐ RUSH TAT ☐ ☐ 24 hr. ☐ 48 hr. ☒ 72 hr. ☐ 7 day ☐ 14 day * Phase I

CONTAINER TYPE PLASTIC (P) or GLASS (G): G

PRESERVATIVE USED: 4°C

TYPE OF ANALYSIS: PCB Homologs Cu & Pb

DATE YEAR 2011	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PCB Homologs Cu & Pb	COMMENTS
4/12	0905	042-SS-400-0002	SO	G	1	1	
4/12	0930	042-SS-401-0002			1	1	
4/12	0842	042-SS-402-0002			1	1	
4/12	1015	042-SS-403-0002			1	1	
4/12	0830	042-SS-404-0002			1	1	DUP06
4/11	1600	042-SS-405-0002			1	1	
4/11	1550	042-SS-406-0002			1	1	
4/11	1400	042-SS-407-0002			1	1	
4/11	1315	042-SS-408-0002			1	1	
4/11	1535	042-SS-409-0002			1	1	
4/12	1325	042-SS-410-0002			1	1	
4/11	1345	042-SS-411-0002			1	1	
4/11	1200	042-SS-412-0002			1	1	DUP02

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: Lori Anderson	4/13/11	1100	1. RECEIVED BY: FedEx Shipment	4/13/11	1100
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS: * Phase I → Analyze first then we will give direction for Phase II

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99

FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER | PAGE 2 OF 2

PROJECT NO: 112G02229	SITE NAME: PNS OU2	PROJECT MANAGER AND PHONE NUMBER: Dan Witt 412-921-8259	LABORATORY NAME AND CONTACT: Edward Lawler / Mitkem Labs
SAMPLERS (SIGNATURE): Lori Anderson	L. Anderson 978-474-8451	FIELD OPERATIONS LEADER AND PHONE NUMBER: ~~S. Hill 412-921-8870~~ 4/13/11	ADDRESS: 175 Metro Center Blvd
		CARRIER/WAYBILL NUMBER: 8723 6912 1378	CITY, STATE: Warwick, RI 02886

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☑ 72 hr. ☐ 7 day ☐ 14 day

*Phase I

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED: 4°C

TYPE OF ANALYSIS: PCB Homologs, Cu & Pb

DATE YEAR 2011	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PCB Homologs	Cu & Pb							COMMENTS
4/11	1040	OU2-SS-413-0002	SO	G	1	1								
4/12	1335	OU2-SS-414-0002			1	1								
4/12	1320	OU2-SS-415-0002			1	1								
4/11	1130	OU2-SS-416-0002			2	2								MS/MSD
4/12	1310	OU2-SS-417-0002			1	1								
4/11	1100	OU2-SS-418-0002			1	1								
4/11	0000	OU2-SS-DUP02-041111			1	1								OU2-SS-412-0002
4/12	0000	OU2-SS-DUP06-041211			1	1								OU2-SS-404-0002

1. RELINQUISHED BY: Lori Anderson	DATE 4/13/11	TIME 1100	1. RECEIVED BY: FedEx Shipment	DATE 4/13/11	TIME 1100
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS: *Phase I Samples -> Analyze first then we will give direction for Phase II

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 2

PROJECT NO: 112G02229	SITE NAME: PNS OU2	PROJECT MANAGER AND PHONE NUMBER: Dan Witt 412-921-8259	LABORATORY NAME AND CONTACT: Edward Lawler / Mitkem labs
SAMPLERS (SIGNATURE): Lori Anderson (L. Anderson 978-474-8451)		FIELD OPERATIONS LEADER AND PHONE NUMBER: ~~S. Witt 412-921-8876~~ 4/13/11	ADDRESS: 175 Metro Center Blvd
		CARRIER/WAYBILL NUMBER: 8723 6912 1378	CITY, STATE: Warwick, RI 02886

STANDARD TAT ☐ * Phase II see below
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☒ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED: 4°C

TYPE OF ANALYSIS: PCB Homologs, Cl & Pb

DATE YEAR 2011	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PCB Homologs	Cl & Pb	COMMENTS
4/12	0910	OU2-SB-400-0204	SO	G	1	1		HOLD
4/12	0935	OU2-SB-401-0204			1	1		
4/12	0845	OU2-SB-402-0204			1	1		
4/12	1020	OU2-SB-403-0204			1	1		
4/12	0838	OU2-SB-404-0204			1	1		
4/11	1605	OU2-SB-405-0204			1	1		
4/11	1555	OU2-SB-406-0204			1	1		
4/11	1405	OU2-SB-407-0203			1	1		DUP03
4/11	1320	OU2-SB-408-0204			2	2		MS/MSD
4/11	1210	OU2-SB-412-0203			1	1		
4/11	1140	OU2-SB-416-0204			1	1		
4/11	1115	OU2-SB-418-0204			1	1		DUP01
4/12	0940	OU2-SB-401-0406			1	1		

Phase II (2-4 and 4-6)

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: Lori Anderson	4/13/11	1100	1. RECEIVED BY: FedEx Shipment	4/13/11	1100
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS: * Phase II samples → analyze after direction is given from TtNUS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 2 OF 2

PROJECT NO:	SITE NAME:	PROJECT MANAGER AND PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G02229	PRIS OU2	Dan Witt 412-921-8259	Edward Lawler / Mitkem
SAMPLERS (SIGNATURE)	L. Anderson 978-474-8451	FIELD OPERATIONS LEADER AND PHONE NUMBER	ADDRESS
Tori Anderson		~~S. Hill 412-921-8876~~ 4/13/11	175 Metro Center Blvd
		CARRIER/WAYBILL NUMBER	CITY, STATE
		8723 6912 1378	Warwick, RI 02886

STANDARD TAT ☐ RUSH TAT ☐ ☐ 24 hr. ☐ 48 hr. ☒ 72 hr. ☐ 7 day ☐ 14 day

*Phase II see below

CONTAINER TYPE PLASTIC (P) or GLASS (G): G

PRESERVATIVE USED: 4°C

TYPE OF ANALYSIS: PCB Homologs, Cu & Pb

DATE YEAR 2011	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PCB Homologs	Cu & Pb	COMMENTS
4/12	0850	OU2-SB-402-0406	SO	G	1	1		HOLD
4/12	1025	OU2-SB-403-0406	↓	↓	1	1		↓
4/11	1615	OU2-SB-405-0406	↓	↓	1	1		DUP04
4/11	0000	OU2-SB-DUP01-041111	↓	↓	1	1		SB-418-0204
4/11	0000	OU2-SB-DUP03-041111	↓	↓	1	1		SB-407-0203
4/11	0000	OU2-SB-DUP04-041111	↓	↓	1	1		SB-405-0406

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY Tori Anderson	4/13/11	1100	1. RECEIVED BY FedEx shipment	4/13/11	1100
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS *Phase II samples → analyze after direction is given from TtNUS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

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FORM NO. TtNUS-001

TETRA TECH NUS, INC. | CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 1

PROJECT NO: 112G02229	SITE NAME: PXS OU2	PROJECT MANAGER AND PHONE NUMBER: Dan Witt 412-921-8259	LABORATORY NAME AND CONTACT: Edward Lawler / Mitkem Labs
SAMPLERS (SIGNATURE): Tori Anderson	L. Anderson 978-474-8451	FIELD OPERATIONS LEADER AND PHONE NUMBER: ~~S. Hitt 412-921-8876~~ 4/13/11	ADDRESS: 175 Metro Center Blvd
		CARRIER/WAYBILL NUMBER: 8723 6912 1378	CITY, STATE: Warwick, RI 02886

STANDARD TAT ☐ * Phase III see below
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☒ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED: 4°C

DATE YEAR 2011	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: RCB Hon o logs Cus 9 PB							COMMENTS
4/12	0945	OU2-SB-401-0608	SO	G	2	2					MS/MSD		HOLD
4/12	0950	OU2-SB-401-0810	↓	↓	1	1							↓
4/11	1615	OU2-SB-405-0608			1	1							DUP05
4/11	0000	OU2-SB-DUP05-041111	↓	↓	1	1					SB-405-0608		~~DUP~~

Phase III
(6-8 and 8-10)

1. RELINQUISHED BY: Tori Anderson	DATE 4/13/11	TIME 1100	1. RECEIVED BY: FedEx Shipment	DATE 4/13/11	TIME 1100
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS * Phase III sample → Analyze after direction is given from TtNUS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

APPENDIX C

ANALYTICAL DATA

C.1 SOIL DATABASE PRINTOUT

APPENDIX C.1

SOIL DATABASE PRINTOUT
OU2 PRE-DESIGN INVESTIGATION SOIL SAMPLING DATA PACKAGE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	OU2-400				OU2-401									
SAMPLE ID	OU2-SS-400-0002		OU2-SB-400-0204		OU2-SS-401-0002		OU2-SB-401-0204		OU2-SB-401-0406		OU2-SB-401-0608		OU2-SB-401-0810	
SAMPLE DATE	20110412		20110412		20110412		20110412		20110412		20110412		20110412	
LOCATION TYPE	SS		SB		SS		SB		SB		SB		SB	
EASTING	2800421.494		2800421.494		2800443.034		2800443.034		2800443.034		2800443.034		2800443.034	
NORTHING	88709.743		88709.743		88702.874		88702.874		88702.874		88702.874		88702.874	
SAMPLE INTERVAL	0 - 2		2 - 4		0 - 2		2 - 4		4 - 6		6 - 8		8 - 10	
INORGANICS (MG/KG)														
COPPER	48.5	J	NA		120	J	NA		NA		NA		NA	
LEAD	8320		1040	J	2000		641	J	72.7	J	12.8	J	10.9	J
MISCELLANEOUS PARAMETERS (%)														
PERCENT MOISTURE	10		11		9.4		10		7.3		18		17	
PCB HOMOLOGS (UG/KG)														
DICHLOROBIPHENYLS	0.091	U	NA		0.091	U	NA		NA		NA		NA	
HEPTACHLOROBIPHENYLS	0.23	J	NA		2		NA		NA		NA		NA	
HEXACHLOROBIPHENYL	0.49	J	NA		3.5		NA		NA		NA		NA	
MONOCHLOROBIPHENYLS	0.091	U	NA		0.091	U	NA		NA		NA		NA	
NONACHLOROBIPHENYLS	0.46	U	NA		0.46	U	NA		NA		NA		NA	
OCTACHLOROBIPHENYLS	0.27	U	NA		0.27	U	NA		NA		NA		NA	
PCB-209	0.46	U	NA		0.46	U	NA		NA		NA		NA	
PENTACHLOROBIPHENYLS	0.38	J	NA		1.7		NA		NA		NA		NA	
TETRACHLOROBIPHENYLS	0.18	U	NA		0.18	U	NA		NA		NA		NA	
TOTAL PCB HOMOLOGS	1.1		NA		7.2		NA		NA		NA		NA	
TRICHLOROBIPHENYLS	0.091	U	NA		0.091	U	NA		NA		NA		NA	

mg/kg - milligram/kilogram
ug/kg - microgram/kilogram
NA - Not analyzed
J - Adjusted
U - Non-Detect
SS - Surface soil
SB - Subsurface soil

APPENDIX C.1

SOIL DATABASE PRINTOUT
OU2 PRE-DESIGN INVESTIGATION SOIL SAMPLING DATA PACKAGE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	OU2-402						OU2-403		OU2-404					
SAMPLE ID	OU2-SS-402-0002		OU2-SB-402-0204		OU2-SB-402-0406		OU2-SS-403-0002		OU2-SS-404-0002		OU2-SS-404-0002-AVG		OU2-SS-404-0002-D	
SAMPLE DATE	20110412		20110412		20110412		20110412		20110412		20110412		20110412	
LOCATION TYPE	SS		SB		SB		SS		SS		SS		SS	
EASTING	2800427.265		2800427.265		2800427.265		2800463.254		2800436.505		2800436.505		2800436.505	
NORTHING	88691.294		88691.294		88691.294		88683.664		88680.694		88680.694		88680.694	
SAMPLE INTERVAL	0 - 2		2 - 4		4 - 6		0 - 2		0 - 2		0 - 2		0 - 2	
INORGANICS (MG/KG)														
COPPER	1370	J	NA		NA		56.3	J	36.1	J	43.65		51.2	J
LEAD	2030		111	J	346	J	269		838		1094		1350	
MISCELLANEOUS PARAMETERS (%)														
PERCENT MOISTURE	8.5		9.3		10		8.7		8.6		9.8		11	
PCB HOMOLOGS (UG/KG)														
DICHLOROBIPHENYLS	0.09	UJ	NA		NA		0.091	U	0.091	U	0.0915	U	0.092	U
HEPTACHLOROBIPHENYLS	7.9	J	NA		NA		3.6		1.1	J	1.95		2.8	
HEXACHLOROBIPHENYL	52	J	NA		NA		3.4		3.8		3.5		3.2	
MONOCHLOROBIPHENYLS	0.09	UJ	NA		NA		0.091	U	0.091	U	0.0915	U	0.092	U
NONACHLOROBIPHENYLS	0.45	UJ	NA		NA		0.46	U	0.46	U	0.46	U	0.46	U
OCTACHLOROBIPHENYLS	0.27	UJ	NA		NA		0.5	J	0.27	U	0.3925		0.65	J
PCB-209	0.45	UJ	NA		NA		0.46	U	0.46	U	0.46	U	0.46	U
PENTACHLOROBIPHENYLS	98	J	NA		NA		1.5		1.7	J	2.7		3.7	J
TETRACHLOROBIPHENYLS	27	J	NA		NA		0.42	J	0.18	U	0.18	U	0.18	U
TOTAL PCB HOMOLOGS	180	J	NA		NA		9.4		6.6		8.3		10	
TRICHLOROBIPHENYLS	0.09	UJ	NA		NA		0.052	J	0.091	U	0.0915	U	0.092	U

mg/kg - milligram/kilogram
ug/kg - microgram/kilogram
NA - Not analyzed
J - Adjusted
U - Non-Detect
SS - Surface soil
SB - Subsurface soil

APPENDIX C.1

SOIL DATABASE PRINTOUT
OU2 PRE-DESIGN INVESTIGATION SOIL SAMPLING DATA PACKAGE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	OU2-405		OU2-406		OU2-407								OU2-408			
SAMPLE ID	OU2-SS-405-0002		OU2-SS-406-0002		OU2-SS-407-0002		OU2-SB-407-0203		OU2-SB-407-0203-AVG		OU2-SB-407-0203-D		OU2-SS-408-0002		OU2-SB-408-0204	
SAMPLE DATE	20110411		20110411		20110411		20110411		20110411		20110411		20110411		20110411	
LOCATION TYPE	SS		SS		SS		SB		SB		SB		SS		SB	
EASTING	2800443.255		2800429.535		2800409.606		2800409.606		2800409.606		2800409.606		2800440.206		2800440.206	
NORTHING	88658.644		88639.114		88623.204		88623.204		88623.204		88623.204		88618.334		88618.334	
SAMPLE INTERVAL	0 - 2		0 - 2		0 - 2		2 - 3		2 - 3		2 - 3		0 - 2		2 - 4	
INORGANICS (MG/KG)																
COPPER	15.6	J	71.7	J	2190	J	NA		NA		NA		270	J	NA	
LEAD	40.4		1150		3380		3940	J	3800		3660	J	4870		9790	J
MISCELLANEOUS PARAMETERS (%)																
PERCENT MOISTURE	3.7		6.9		12		22		22		22		11		18	
PCB HOMOLOGS (UG/KG)																
DICHLOROBIPHENYLS	0.086	U	0.088	U	0.093	U	NA		NA		NA		0.092	U	NA	
HEPTACHLOROBIPHENYLS	0.26	U	0.27	U	0.28	U	NA		NA		NA		2.8		NA	
HEXACHLOROBIPHENYL	1.3		0.88		0.29	J	NA		NA		NA		6.3		NA	
MONOCHLOROBIPHENYLS	0.086	U	0.088	U	0.093	U	NA		NA		NA		0.092	U	NA	
NONACHLOROBIPHENYLS	0.43	U	0.44	U	0.47	U	NA		NA		NA		1.3	J	NA	
OCTACHLOROBIPHENYLS	0.26	U	0.27	U	0.28	U	NA		NA		NA		0.28	U	NA	
PCB-209	0.43	U	0.44	U	0.47	U	NA		NA		NA		0.46	U	NA	
PENTACHLOROBIPHENYLS	2.1		0.24	J	0.19	U	NA		NA		NA		0.52	J	NA	
TETRACHLOROBIPHENYLS	0.17	U	0.18	U	0.19	U	NA		NA		NA		0.18	U	NA	
TOTAL PCB HOMOLOGS	3.4		1.1		0.29	J	NA		NA		NA		11		NA	
TRICHLOROBIPHENYLS	0.086	U	0.088	U	0.093	U	NA		NA		NA		0.092	U	NA	

mg/kg - milligram/kilogram
ug/kg - microgram/kilogram
NA - Not analyzed
J - Adjusted
U - Non-Detect
SS - Surface soil
SB - Subsurface soil

APPENDIX C.1

SOIL DATABASE PRINTOUT
OU2 PRE-DESIGN INVESTIGATION SOIL SAMPLING DATA PACKAGE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	OU2-409		OU2-410		OU2-411		OU2-412						OU2-413	
SAMPLE ID	OU2-SS-409-0002		OU2-SS-410-0002		OU2-SS-411-0002		OU2-SS-412-0002		OU2-SS-412-0002-AVG		OU2-SS-412-0002-D		OU2-SS-413-0002	
SAMPLE DATE	20110411		20110412		20110411		20110411		20110411		20110411		20110411	
LOCATION TYPE	SS		SS		SS		SS		SS		SS		SS	
EASTING	2800465.025		2800385.847		2800418.636		2800450.456		2800450.456		2800450.456		2800474.076	
NORTHING	88611.12		88599.664		88606.614		88593.25		88593.25		88593.25		88588.08	
SAMPLE INTERVAL	0 - 2		0 - 2		0 - 2		0 - 2		0 - 2		0 - 2		0 - 2	
INORGANICS (MG/KG)														
COPPER	16.2	J	357	J	53.2	J	184	J	135.1		86.2	J	390	J
LEAD	24.2		1660		258		1550	J	1104		658	J	770	
MISCELLANEOUS PARAMETERS (%)														
PERCENT MOISTURE	6.5		10		6.4		8.2		7.95		7.7		7.6	
PCB HOMOLOGS (UG/KG)														
DICHLOROBIPHENYLS	0.088	U	0.05	J	0.088	UJ	0.084	J	0.177		0.27	J	0.12	J
HEPTACHLOROBIPHENYLS	0.26	U	5.3		0.27	UJ	0.86	J	0.74		0.62	J	7.9	
HEXACHLOROBIPHENYL	0.18	U	17		4.8	J	13		11.45		9.9		50	
MONOCHLOROBIPHENYLS	0.088	U	0.092	U	0.31	J	0.95		0.49725		0.089	U	0.39	
NONACHLOROBIPHENYLS	0.44	U	0.89	J	0.49	J	0.41	J	0.41	J	0.45	U	10	
OCTACHLOROBIPHENYLS	0.26	U	0.28	U	0.27	UJ	0.27	U	0.27	U	0.27	U	0.27	U
PCB-209	0.44	U	0.46	U	0.44	UJ	0.45	U	0.45	U	0.45	U	0.45	U
PENTACHLOROBIPHENYLS	0.15	J	11		3.6	J	8.7		9.35		10		75	
TETRACHLOROBIPHENYLS	0.18	U	0.18	U	0.18	UJ	0.8		1		1.2		13	
TOTAL PCB HOMOLOGS	0.15	J	34		9.2	J	24		23		22		160	
TRICHLOROBIPHENYLS	0.088	U	0.38		0.088	UJ	0.089	U	0.089	U	0.089	U	0.15	J

mg/kg - milligram/kilogram
ug/kg - microgram/kilogram
NA - Not analyzed
J - Adjusted
U - Non-Detect
SS - Surface soil
SB - Subsurface soil

APPENDIX C.1

SOIL DATABASE PRINTOUT
OU2 PRE-DESIGN INVESTIGATION SOIL SAMPLING DATA PACKAGE
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

LOCATION	OU2-414		OU2-415		OU2-416				OU2-417		OU2-418	
SAMPLE ID	OU2-SS-414-0002		OU2-SS-415-0002		OU2-SS-416-0002		OU2-SB-416-0204		OU2-SS-417-0002		OU2-SS-418-0002	
SAMPLE DATE	20110412		20110412		20110411		20110411		20110412		20110411	
LOCATION TYPE	SS		SS		SS		SB		SS		SS	
EASTING	2800385.447		2800403.597		2800454.166		2800454.166		2800431.457		2800464.926	
NORTHING	88586.534		88589.124		88577.37		88577.37		88568.235		88562.11	
SAMPLE INTERVAL	0 - 2		0 - 2		0 - 2		2 - 4		0 - 2		0 - 2	
INORGANICS (MG/KG)												
COPPER	338	J	410	J	75	J	NA		78.8	J	224	J
LEAD	924		1810		29100		44.6	J	434		311	
MISCELLANEOUS PARAMETERS (%)												
PERCENT MOISTURE	15		11		8.8		4		15		8.9	
PCB HOMOLOGS (UG/KG)												
DICHLOROBIPHENYLS	0.096	U	0.092	U	0.09	UJ	NA		0.097	U	0.09	U
HEPTACHLOROBIPHENYLS	0.45	J	2.1		0.27	UJ	NA		0.29	U	0.27	U
HEXACHLOROBIPHENYL	2.8		8.9		1.6	J	NA		2.5		15	
MONOCHLOROBIPHENYLS	0.096	U	0.092	U	1.7	J	NA		0.097	U	0.09	U
NONACHLOROBIPHENYLS	0.48	U	0.54	J	0.45	UJ	NA		0.49	U	0.45	U
OCTACHLOROBIPHENYLS	0.29	U	0.28	U	0.27	UJ	NA		0.29	U	0.27	U
PCB-209	0.48	U	0.46	U	0.45	UJ	NA		0.49	U	0.45	U
PENTACHLOROBIPHENYLS	3.7		5.8		0.18	UJ	NA		1.7		49	
TETRACHLOROBIPHENYLS	0.57	J	1.9		0.18	UJ	NA		0.45	J	3.6	
TOTAL PCB HOMOLOGS	7.5		19		3.4	J	NA		5.1		67	
TRICHLOROBIPHENYLS	0.096	U	0.092	U	0.13	J	NA		0.33	J	0.044	J

mg/kg - milligram/kilogram
ug/kg - microgram/kilogram
NA - Not analyzed
J - Adjusted
U - Non-Detect
SS - Surface soil
SB - Subsurface soil

C.2 DATA VALIDATION REPORTS / ELECTRONIC DATABASE (ON CD)

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**D. WITT**	**DATE:**	**JUNE 16, 2011**
FROM:	**EDWARD SEDLMYER**	**COPIES:**	**DV FILE**
SUBJECT:	**ORGANIC DATA VALIDATION – PCB HOMOLOGs PORTSMOUTH NSY, CTO WE43 SDG K0598**		
SAMPLES:	21 / Soil / PCBH		

OU2-SS-400-0002	OU2-SS-401-0002	OU2-SS-402-0002
OU2-SS-403-0002	OU2-SS-404-0002	OU2-SS-405-0002
OU2-SS-406-0002	OU2-SS-407-0002	OU2-SS-408-0002
OU2-SS-409-0002	OU2-SS-410-0002	OU2-SS-411-0002
OU2-SS-412-0002	OU2-SS-413-0002	OU2-SS-414-0002
OU2-SS-415-0002	OU2-SS-416-0002	OU2-SS-417-0002
OU2-SS-418-0002	OU2-SS-DUP02-41111	
OU2-SS-DUP06-041211		

Overview

The sample set for Portsmouth NSY, CTO WE43 SDG K0598 consisted of twenty-one (21) soil environmental samples. All samples were analyzed for polychlorinated biphenyl homologs (PCBH). There were two (2) field duplicate pairs associated with this sample delivery group (SDG), OU2-SS-404-0002 / OU2-SS-DUP06-041211 and OU2-SS-412-0002 / OU2-SS-DUP02-41111.

The samples were collected by Tetra Tech NUS on April 11 and 12, 2011 and were analyzed by Mitkem Laboratories. All of the samples were analyzed in accordance with USEPA Method 680 analytical method.

Data were evaluated based on the following parameters:

*	• Data Completeness
*	• Holding Times
*	• GC/MS Instrument Tuning and System Performance
*	• Initial and Continuing Calibration
*	• Blank Results
*	• Blank Spike Results
	• Surrogate Spike Recoveries
*	• Internal Standard Recoveries
	• Matrix Spike / Matrix Spike Duplicate Results
	• Field Duplicate Precision
*	• Compound Identification and Quantification
*	• Detection Limits

The asterisk (*) indicates that all quality control criteria were met for this parameter. Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B. Appendix C contains Region I worksheets, and Appendix D contains the

documentation to support the findings as discussed in this data validation report. The text of this report has been formulated to address only those problem areas affecting data quality.

SURROGATE RECOVERIES

The surrogate 3,3',4,4'-tetrachlorobiphenyl-C13 had percent recoveries less than the laboratory quality control limits of 60-140% for samples OU2-SS-402-0002, OU2-SS-411-0002, and OU2-SS-416-0002. The positive and nondetected results for the aforementioned samples have been qualified as estimated (J) and (UJ).

MATRIX SPIKE (MS) / MATRIX SPIKE DUPLICATE (MSD)

The MS and MSD performed on sample OU2-SS-416-0002 had percent recoveries for all PCBH compounds less than the quality control limit of 60%, but greater than 10%. The positive and nondetected results for sample OU2-SS-416-0002 have been qualified as estimated (J) and (UJ).

FIELD DUPLICATE PRECISION

The relative percent difference (RPD) was greater than the quality control limit for the field duplicate pair samples OU2-SS-404-0002 and OU2-SS-DUP06-041211 for pentachlorobiphenyls. The positive result for pentachlorobiphenyls was qualified estimated, (J), for samples OU2-SS-404-0002 and OU2-SS-DUP06-041211 due to field duplicate imprecision.

NOTES

The results were reported to the limit of detection (LOD). Positive results below the limit of quantitation (LOQ) and above the detection limit (DL) were qualified as estimated, (J), due to uncertainty near the detection limit.

The total ~~Aroclor~~ PCBs results reported in each sample is a sum of the detected results in each sample.
EW

EXECUTIVE SUMMARY

Laboratory Performance: Surrogate and matrix spike percent recovery noncompliances resulted in the qualification of data.

Other Factors Affecting Data Quality: Positive results reported below the LOQ but above the detection limit for the organic analyses were qualified as estimated, (J). There were field duplicate imprecision quality control exceedances that resulted in data qualifications.

The data for these analyses were reviewed with reference to the criteria for USEPA Method 680 listed in the project specific SAP, the "USEPA Region 1 Laboratory Data Validation Functional Guidelines – Part II" (12/96), and the Department of Defense (DOD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories" (April 2009).

Tetra Tech NUS
Edward Sedlmyer
Chemist/Data Validator

Tetra Tech NUS
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C – Regional Worksheets
4. Appendix D - Support Documentation

APPENDIX A

QUALIFIED LABORATORY RESULTS

Data Validation Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01 = GC/MS Tuning Noncompliance
D = MS/MSD Recovery Noncompliance
E = LCS/LCSD Recovery Noncompliance
F = Lab Duplicate Imprecision
G = Field Duplicate Imprecision
H = Holding Time Exceedance
I = ICP Serial Dilution Noncompliance
J = GFAA PDS - GFAA MSA's $r < 0.995$ / ICP PDS Recovery Noncompliance
K = ICP Interference - includes ICS % R Noncompliance
L = Instrument Calibration Range Exceedance
M = Sample Preservation Noncompliance
N = Internal Standard Noncompliance
N01 = Internal Standard Recovery Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (e.g. base-line drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; e.g. chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is greater than sample activity

PROJ_NO: 02229	NSAMPLE	OU2-SS-400-0002			OU2-SS-401-0002			OU2-SS-402-0002			OU2-SS-403-0002		
SDG: K0598	LAB_ID	K0598-01A			K0598-02A			K0598-03A			K0598-04A		
FRACTION: PCBH	SAMP_DATE	4/12/2011			4/12/2011			4/12/2011			4/12/2011		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	90.0			91.0			91.0			91.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
DICHLOROBIPHENYLS		0.091	U		0.091	U		0.09	UJ	R	0.091	U	
HEPTACHLOROBIPHENYLS		0.23	J	P	2			7.9	J	R	3.6		
HEXACHLOROBIPHENYL		0.49	J	P	3.5			52	J	R	3.4		
MONOCHLOROBIPHENYLS		0.091	U		0.091	U		0.09	UJ	R	0.091	U	
NONACHLOROBIPHENYLS		0.46	U		0.46	U		0.45	UJ	R	0.46	U	
OCTACHLOROBIPHENYLS		0.27	U		0.27	U		0.27	UJ	R	0.5	J	P
PCB-209		0.46	U		0.46	U		0.45	UJ	R	0.46	U	
PENTACHLOROBIPHENYLS		0.38	J	P	1.7			98	J	R	1.5		
TETRACHLOROBIPHENYLS		0.18	U		0.18	U		27	J	R	0.42	J	P
TOTAL ~~AROCLOR~~ PCBs EWS 7/21/11		1.1			7.2			180	J	R	9.4		
TRICHLOROBIPHENYLS		0.091	U		0.091	U		0.09	UJ	R	0.052	J	P

PROJ_NO: 02229	NSAMPLE	OU2-SS-404-0002			OU2-SS-405-0002			OU2-SS-406-0002			OU2-SS-407-0002		
SDG: K0598	LAB_ID	K0598-05A			K0598-06A			K0598-07A			K0598-08A		
FRACTION: PCBH	SAMP_DATE	4/12/2011			4/11/2011			4/11/2011			4/11/2011		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	91.0			96.0			93.0			88.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
DICHLOROBIPHENYLS		0.091	U		0.086	U		0.088	U		0.093	U	
HEPTACHLOROBIPHENYLS		1.1	J	P	0.26	U		0.27	U		0.28	U	
HEXACHLOROBIPHENYL		3.8			1.3			0.88			0.29	J	P
MONOCHLOROBIPHENYLS		0.091	U		0.086	U		0.088	U		0.093	U	
NONACHLOROBIPHENYLS		0.46	U		0.43	U		0.44	U		0.47	U	
OCTACHLOROBIPHENYLS		0.27	U		0.26	U		0.27	U		0.28	U	
PCB-209		0.46	U		0.43	U		0.44	U		0.47	U	
PENTACHLOROBIPHENYLS		1.7	J	G	2.1			0.24	J	P	0.19	U	
TETRACHLOROBIPHENYLS		0.18	U		0.17	U		0.18	U		0.19	U	
TOTAL ~~AROCLOR~~ PCBs EWS 7/2/11		6.6			3.4			1.1			0.29	J	P
TRICHLOROBIPHENYLS		0.091	U		0.086	U		0.088	U		0.093	U	

PROJ_NO: 02229	NSAMPLE	OU2-SS-408-0002			OU2-SS-409-0002			OU2-SS-410-0002			OU2-SS-411-0002		
SDG: K0598	LAB_ID	K0598-09A			K0598-10A			K0598-11A			K0598-12A		
FRACTION: PCBH	SAMP_DATE	4/11/2011			4/11/2011			4/12/2011			4/11/2011		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	89.0			94.0			90.0			94.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
DICHLOROBIPHENYLS		0.092	U		0.088	U		0.05	J	P	0.088	UJ	R
HEPTACHLOROBIPHENYLS		2.8			0.26	U		5.3			0.27	UJ	R
HEXACHLOROBIPHENYL		6.3			0.18	U		17			4.8	J	R
MONOCHLOROBIPHENYLS		0.092	U		0.088	U		0.092	U		0.31	J	PR
NONACHLOROBIPHENYLS		1.3	J	P	0.44	U		0.89	J	P	0.49	J	PR
OCTACHLOROBIPHENYLS		0.28	U		0.26	U		0.28	U		0.27	UJ	R
PCB-209		0.46	U		0.44	U		0.46	U		0.44	UJ	R
PENTACHLOROBIPHENYLS		0.52	J	P	0.15	J	P	11			3.6	J	R
TETRACHLOROBIPHENYLS		0.18	U		0.18	U		0.18	U		0.18	UJ	R
TOTAL ~~AROCLOR~~ PCBs EW 7/21/11		11			0.15	J	P	34			9.2	J	R
TRICHLOROBIPHENYLS		0.092	U		0.088	U		0.38			0.088	UJ	R

PROJ_NO: 02229 SDG: K0598 FRACTION: PCBH MEDIA: SOIL	NSAMPLE	OU2-SS-412-0002			OU2-SS-413-0002			OU2-SS-414-0002			OU2-SS-415-0002		
	LAB_ID	K0598-13A			K0598-14A			K0598-15A			K0598-16A		
	SAMP_DATE	4/11/2011			4/11/2011			4/12/2011			4/12/2011		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	92.0			92.0			85.0			89.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
DICHLOROBIPHENYLS		0.084	J	P	0.12	J	P	0.096	U		0.092	U	
HEPTACHLOROBIPHENYLS		0.86	J	P	7.9			0.45	J	P	2.1		
HEXACHLOROBIPHENYL		13			50			2.8			8.9		
MONOCHLOROBIPHENYLS		0.95			0.39			0.096	U		0.092	U	
NONACHLOROBIPHENYLS		0.41	J	P	10			0.48	U		0.54	J	P
OCTACHLOROBIPHENYLS		0.27	U		0.27	U		0.29	U		0.28	U	
PCB-209		0.45	U		0.45	U		0.48	U		0.46	U	
PENTACHLOROBIPHENYLS		8.7			75			3.7			5.8		
TETRACHLOROBIPHENYLS		0.8			13			0.57	J	P	1.9		
TOTAL ~~AROCLOR~~ PCBs EW 5/21/11		24			160			7.5			19		
TRICHLOROBIPHENYLS		0.089	U		0.15	J	P	0.096	U		0.092	U	

PROJ_NO: 02229	NSAMPLE	OU2-SS-416-0002			OU2-SS-417-0002			OU2-SS-418-0002			OU2-SS-DUP02-41111		
SDG: K0598	LAB_ID	K0598-17A			K0598-18A			K0598-19A			K0598-20A		
FRACTION: PCBH	SAMP_DATE	4/11/2011			4/12/2011			4/11/2011			4/11/2011		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/KG			UG/KG			UG/KG			UG/KG		
	PCT_SOLIDS	91.0			85.0			91.0			92.0		
	DUP_OF										OU2-SS-412-0002		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
DICHLOROBIPHENYLS		0.09	UJ	DR	0.097	U		0.09	U		0.27	J	P
HEPTACHLOROBIPHENYLS		0.27	UJ	DR	0.29	U		0.27	U		0.62	J	P
HEXACHLOROBIPHENYL		1.6	J	DR	2.5			15			9.9		
MONOCHLOROBIPHENYLS		1.7	J	DR	0.097	U		0.09	U		0.089	U	
NONACHLOROBIPHENYLS		0.45	UJ	DR	0.49	U		0.45	U		0.45	U	
OCTACHLOROBIPHENYLS		0.27	UJ	DR	0.29	U		0.27	U		0.27	U	
PCB-209		0.45	UJ	DR	0.49	U		0.45	U		0.45	U	
PENTACHLOROBIPHENYLS		0.18	UJ	DR	1.7			49			10		
TETRACHLOROBIPHENYLS		0.18	UJ	DR	0.45	J	P	3.6			1.2		
TOTAL ~~AROCLOR~~ PCBs EWS 7/21/11		3.4	J	DR	5.1			67			22		
TRICHLOROBIPHENYLS		0.13	J	DPR	0.33	J	P	0.044	J	P	0.089	U	

PROJ_NO: 02229	NSAMPLE	OU2-SS-DUP06-041211		
SDG: K0598	LAB_ID	K0598-21A		
FRACTION: PCBH	SAMP_DATE	4/12/2011		
MEDIA: SOIL	QC_TYPE	NM		
	UNITS	UG/KG		
	PCT_SOLIDS	89.0		
	DUP_OF	OU2-SS-404-0002		
PARAMETER		RESULT	VQL	QLCD
DICHLOROBIPHENYLS		0.092	U	
HEPTACHLOROBIPHENYLS		2.8		
HEXACHLOROBIPHENYL		3.2		
MONOCHLOROBIPHENYLS		0.092	U	
NONACHLOROBIPHENYLS		0.46	U	
OCTACHLOROBIPHENYLS		0.65	J	P
PCB-209		0.46	U	
PENTACHLOROBIPHENYLS		3.7	J	G
TETRACHLOROBIPHENYLS		0.18	U	
TOTAL ~~AROCLOR~~ PCBs EWS 7/21/11		10		
TRICHLOROBIPHENYLS		0.092	U	

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-400-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-01A

Sample wt/vol: 30.4 (g/mL) G Lab File ID: S5B1044.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 10 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/20/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.091	U	0.059	0.091	0.36
25512-42-9	Dichlorobiphenyl	0.091	U	0.034	0.091	0.36
25323-68-6	Trichlorobiphenyl	0.091	U	0.038	0.091	0.36
26914-33-0	Tetrachlorobiphenyl	0.18	U	0.072	0.18	0.72
25429-29-2	Pentachlorobiphenyl	0.38	J	0.076	0.18	0.72
26601-64-9	Hexachlorobiphenyl	0.49	J	0.065	0.18	0.72
28655-71-2	Heptachlorobiphenyl	0.23	J	0.11	0.27	1.1
55722-26-4	Octachlorobiphenyl	0.27	U	0.20	0.27	1.1
53742-07-7	Nonachlorobiphenyl	0.46	U	0.18	0.46	1.8
2051-24-3	Decachlorobiphenyl	0.46	U	0.18	0.46	1.8
1336-36-3	Total PCBs	1.1		0.034	0.091	0.36

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-401-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-02A

Sample wt/vol: 30.2 (g/mL) G Lab File ID: S5B1045.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 9.0 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/20/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.091	U	0.059	0.091	0.36
25512-42-9	Dichlorobiphenyl	0.091	U	0.034	0.091	0.36
25323-68-6	Trichlorobiphenyl	0.091	U	0.038	0.091	0.36
26914-33-0	Tetrachlorobiphenyl	0.18	U	0.072	0.18	0.72
25429-29-2	Pentachlorobiphenyl	1.7		0.075	0.18	0.72
26601-64-9	Hexachlorobiphenyl	3.5		0.064	0.18	0.72
28655-71-2	Heptachlorobiphenyl	2.0		0.11	0.27	1.1
55722-26-4	Octachlorobiphenyl	0.27	U	0.20	0.27	1.1
53742-07-7	Nonachlorobiphenyl	0.46	U	0.17	0.46	1.8
2051-24-3	Decachlorobiphenyl	0.46	U	0.17	0.46	1.8
1336-36-3	Total PCBs	7.2		0.034	0.091	0.36

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-402-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-03A

Sample wt/vol: 30.4 (g/mL) G Lab File ID: S5B1046.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 9.0 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/20/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.090	U	0.059	0.090	0.36
25512-42-9	Dichlorobiphenyl	0.090	U	0.034	0.090	0.36
25323-68-6	Trichlorobiphenyl	0.090	U	0.038	0.090	0.36
26914-33-0	Tetrachlorobiphenyl	27		0.072	0.18	0.72
25429-29-2	Pentachlorobiphenyl	98		0.075	0.18	0.72
26601-64-9	Hexachlorobiphenyl	52		0.064	0.18	0.72
28655-71-2	Heptachlorobiphenyl	7.9		0.11	0.27	1.1
55722-26-4	Octachlorobiphenyl	0.27	U	0.20	0.27	1.1
53742-07-7	Nonachlorobiphenyl	0.45	U	0.17	0.45	1.8
2051-24-3	Decachlorobiphenyl	0.45	U	0.17	0.45	1.8
1336-36-3	Total PCBs	180		0.034	0.090	0.36

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-403-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-04A

Sample wt/vol: 30.1 (g/mL) G Lab File ID: S5B1047.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 9.0 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/20/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.091	U	0.059	0.091	0.36
25512-42-9	Dichlorobiphenyl	0.091	U	0.034	0.091	0.36
25323-68-6	Trichlorobiphenyl	0.052	J	0.038	0.091	0.36
26914-33-0	Tetrachlorobiphenyl	0.42	J	0.072	0.18	0.72
25429-29-2	Pentachlorobiphenyl	1.5		0.076	0.18	0.72
26601-64-9	Hexachlorobiphenyl	3.4		0.065	0.18	0.72
28655-71-2	Heptachlorobiphenyl	3.6		0.11	0.27	1.1
55722-26-4	Octachlorobiphenyl	0.50	J	0.20	0.27	1.1
53742-07-7	Nonachlorobiphenyl	0.46	U	0.18	0.46	1.8
2051-24-3	Decachlorobiphenyl	0.46	U	0.18	0.46	1.8
1336-36-3	Total PCBs	9.4		0.034	0.091	0.36

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-404-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-05A

Sample wt/vol: 30.1 (g/mL) G Lab File ID: S5B1048.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 9.0 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/20/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.091	U	0.059	0.091	0.36
25512-42-9	Dichlorobiphenyl	0.091	U	0.034	0.091	0.36
25323-68-6	Trichlorobiphenyl	0.091	U	0.038	0.091	0.36
26914-33-0	Tetrachlorobiphenyl	0.18	U	0.072	0.18	0.72
25429-29-2	Pentachlorobiphenyl	1.7		0.076	0.18	0.72
26601-64-9	Hexachlorobiphenyl	3.8		0.065	0.18	0.72
28655-71-2	Heptachlorobiphenyl	1.1	J	0.11	0.27	1.1
55722-26-4	Octachlorobiphenyl	0.27	U	0.20	0.27	1.1
53742-07-7	Nonachlorobiphenyl	0.46	U	0.18	0.46	1.8
2051-24-3	Decachlorobiphenyl	0.46	U	0.18	0.46	1.8
1336-36-3	Total PCBs	6.6		0.034	0.091	0.36

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-405-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-06A

Sample wt/vol: 30.2 (g/mL) G Lab File ID: S5B1049.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 4.0 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/20/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.086	U	0.056	0.086	0.34
25512-42-9	Dichlorobiphenyl	0.086	U	0.032	0.086	0.34
25323-68-6	Trichlorobiphenyl	0.086	U	0.036	0.086	0.34
26914-33-0	Tetrachlorobiphenyl	0.17	U	0.068	0.17	0.68
25429-29-2	Pentachlorobiphenyl	2.1		0.071	0.17	0.68
26601-64-9	Hexachlorobiphenyl	1.3		0.061	0.17	0.68
28655-71-2	Heptachlorobiphenyl	0.26	U	0.10	0.26	1.0
55722-26-4	Octachlorobiphenyl	0.26	U	0.19	0.26	1.0
53742-07-7	Nonachlorobiphenyl	0.43	U	0.17	0.43	1.7
2051-24-3	Decachlorobiphenyl	0.43	U	0.17	0.43	1.7
1336-36-3	Total PCBs	3.4		0.032	0.086	0.34

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-406-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-07A

Sample wt/vol: 30.3 (g/mL) G Lab File ID: S5B1050.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 7.0 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/20/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.088	U	0.057	0.088	0.35
25512-42-9	Dichlorobiphenyl	0.088	U	0.033	0.088	0.35
25323-68-6	Trichlorobiphenyl	0.088	U	0.037	0.088	0.35
26914-33-0	Tetrachlorobiphenyl	0.18	U	0.070	0.18	0.70
25429-29-2	Pentachlorobiphenyl	0.24	J	0.073	0.18	0.70
26601-64-9	Hexachlorobiphenyl	0.88		0.063	0.18	0.70
28655-71-2	Heptachlorobiphenyl	0.27	U	0.11	0.27	1.1
55722-26-4	Octachlorobiphenyl	0.27	U	0.19	0.27	1.1
53742-07-7	Nonachlorobiphenyl	0.44	U	0.17	0.44	1.8
2051-24-3	Decachlorobiphenyl	0.44	U	0.17	0.44	1.8
1336-36-3	Total PCBs	1.1		0.033	0.088	0.35

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-407-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-08A

Sample wt/vol: 30.4 (g/mL) G Lab File ID: S5B1051.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 12 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/20/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.093	U	0.061	0.093	0.37
25512-42-9	Dichlorobiphenyl	0.093	U	0.035	0.093	0.37
25323-68-6	Trichlorobiphenyl	0.093	U	0.039	0.093	0.37
26914-33-0	Tetrachlorobiphenyl	0.19	U	0.074	0.19	0.74
25429-29-2	Pentachlorobiphenyl	0.19	U	0.077	0.19	0.74
26601-64-9	Hexachlorobiphenyl	0.29	J	0.066	0.19	0.74
28655-71-2	Heptachlorobiphenyl	0.28	U	0.11	0.28	1.1
55722-26-4	Octachlorobiphenyl	0.28	U	0.20	0.28	1.1
53742-07-7	Nonachlorobiphenyl	0.47	U	0.18	0.47	1.9
2051-24-3	Decachlorobiphenyl	0.47	U	0.18	0.47	1.9
1336-36-3	Total PCBs	0.29	J	0.035	0.093	0.37

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-408-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-09A

Sample wt/vol: 30.5 (g/mL) G Lab File ID: S5B1052.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 11 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/21/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.092	U	0.060	0.092	0.36
25512-42-9	Dichlorobiphenyl	0.092	U	0.034	0.092	0.36
25323-68-6	Trichlorobiphenyl	0.092	U	0.039	0.092	0.36
26914-33-0	Tetrachlorobiphenyl	0.18	U	0.073	0.18	0.73
25429-29-2	Pentachlorobiphenyl	0.52	J	0.076	0.18	0.73
26601-64-9	Hexachlorobiphenyl	6.3		0.065	0.18	0.73
28655-71-2	Heptachlorobiphenyl	2.8		0.11	0.28	1.1
55722-26-4	Octachlorobiphenyl	0.28	U	0.20	0.28	1.1
53742-07-7	Nonachlorobiphenyl	1.3	J	0.18	0.46	1.8
2051-24-3	Decachlorobiphenyl	0.46	U	0.18	0.46	1.8
1336-36-3	Total PCBs	11		0.034	0.092	0.36

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-409-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-10A

Sample wt/vol: 30.2 (g/mL) G Lab File ID: S5B1053.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 6.0 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/21/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.088	U	0.057	0.088	0.35
25512-42-9	Dichlorobiphenyl	0.088	U	0.033	0.088	0.35
25323-68-6	Trichlorobiphenyl	0.088	U	0.037	0.088	0.35
26914-33-0	Tetrachlorobiphenyl	0.18	U	0.070	0.18	0.70
25429-29-2	Pentachlorobiphenyl	0.15	J	0.073	0.18	0.70
26601-64-9	Hexachlorobiphenyl	0.18	U	0.062	0.18	0.70
28655-71-2	Heptachlorobiphenyl	0.26	U	0.11	0.26	1.1
55722-26-4	Octachlorobiphenyl	0.26	U	0.19	0.26	1.1
53742-07-7	Nonachlorobiphenyl	0.44	U	0.17	0.44	1.8
2051-24-3	Decachlorobiphenyl	0.44	U	0.17	0.44	1.8
1336-36-3	Total PCBs	0.15	J	0.033	0.088	0.35

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-410-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-11A

Sample wt/vol: 30.2 (g/mL) G Lab File ID: S5B1061.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 10 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/21/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.092	U	0.060	0.092	0.36
25512-42-9	Dichlorobiphenyl	0.050	J	0.034	0.092	0.36
25323-68-6	Trichlorobiphenyl	0.38		0.039	0.092	0.36
26914-33-0	Tetrachlorobiphenyl	0.18	U	0.073	0.18	0.73
25429-29-2	Pentachlorobiphenyl	11		0.076	0.18	0.73
26601-64-9	Hexachlorobiphenyl	17		0.065	0.18	0.73
28655-71-2	Heptachlorobiphenyl	5.3		0.11	0.28	1.1
55722-26-4	Octachlorobiphenyl	0.28	U	0.20	0.28	1.1
53742-07-7	Nonachlorobiphenyl	0.89	J	0.18	0.46	1.8
2051-24-3	Decachlorobiphenyl	0.46	U	0.18	0.46	1.8
1336-36-3	Total PCBs	34		0.034	0.092	0.36

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-411-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-12A

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S5B1062.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 6.0 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/21/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.31	J	0.057	0.088	0.35
25512-42-9	Dichlorobiphenyl	0.088	U	0.033	0.088	0.35
25323-68-6	Trichlorobiphenyl	0.088	U	0.037	0.088	0.35
26914-33-0	Tetrachlorobiphenyl	0.18	U	0.070	0.18	0.70
25429-29-2	Pentachlorobiphenyl	3.6		0.073	0.18	0.70
26601-64-9	Hexachlorobiphenyl	4.8		0.063	0.18	0.70
28655-71-2	Heptachlorobiphenyl	0.27	U	0.11	0.27	1.1
55722-26-4	Octachlorobiphenyl	0.27	U	0.19	0.27	1.1
53742-07-7	Nonachlorobiphenyl	0.49	J	0.17	0.44	1.8
2051-24-3	Decachlorobiphenyl	0.44	U	0.17	0.44	1.8
1336-36-3	Total PCBs	9.2		0.033	0.088	0.35

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-412-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-13A

Sample wt/vol: 30.3 (g/mL) G Lab File ID: S5B1063.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 8.0 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/21/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.95		0.058	0.089	0.36
25512-42-9	Dichlorobiphenyl	0.084	J	0.033	0.089	0.36
25323-68-6	Trichlorobiphenyl	0.089	U	0.038	0.089	0.36
26914-33-0	Tetrachlorobiphenyl	0.80		0.071	0.18	0.71
25429-29-2	Pentachlorobiphenyl	8.7		0.074	0.18	0.71
26601-64-9	Hexachlorobiphenyl	13		0.063	0.18	0.71
28655-71-2	Heptachlorobiphenyl	0.86	J	0.11	0.27	1.1
55722-26-4	Octachlorobiphenyl	0.27	U	0.19	0.27	1.1
53742-07-7	Nonachlorobiphenyl	0.41	J	0.17	0.45	1.8
2051-24-3	Decachlorobiphenyl	0.45	U	0.17	0.45	1.8
1336-36-3	Total PCBs	24		0.033	0.089	0.36

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-413-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-14A

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S5B1058.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 8.0 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/21/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.39		0.059	0.090	0.36
25512-42-9	Dichlorobiphenyl	0.12	J	0.034	0.090	0.36
25323-68-6	Trichlorobiphenyl	0.15	J	0.038	0.090	0.36
26914-33-0	Tetrachlorobiphenyl	13		0.072	0.18	0.72
25429-29-2	Pentachlorobiphenyl	75		0.075	0.18	0.72
26601-64-9	Hexachlorobiphenyl	50		0.064	0.18	0.72
28655-71-2	Heptachlorobiphenyl	7.9		0.11	0.27	1.1
55722-26-4	Octachlorobiphenyl	0.27	U	0.20	0.27	1.1
53742-07-7	Nonachlorobiphenyl	10		0.17	0.45	1.8
2051-24-3	Decachlorobiphenyl	0.45	U	0.17	0.45	1.8
1336-36-3	Total PCBs	160		0.034	0.090	0.36

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-414-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-15A

Sample wt/vol: 30.4 (g/mL) G Lab File ID: S5B1059.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 15 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/21/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.096	U	0.063	0.096	0.38
25512-42-9	Dichlorobiphenyl	0.096	U	0.036	0.096	0.38
25323-68-6	Trichlorobiphenyl	0.096	U	0.041	0.096	0.38
26914-33-0	Tetrachlorobiphenyl	0.57	J	0.077	0.19	0.77
25429-29-2	Pentachlorobiphenyl	3.7		0.080	0.19	0.77
26601-64-9	Hexachlorobiphenyl	2.8		0.068	0.19	0.77
28655-71-2	Heptachlorobiphenyl	0.45	J	0.12	0.29	1.2
55722-26-4	Octachlorobiphenyl	0.29	U	0.21	0.29	1.2
53742-07-7	Nonachlorobiphenyl	0.48	U	0.19	0.48	1.9
2051-24-3	Decachlorobiphenyl	0.48	U	0.19	0.48	1.9
1336-36-3	Total PCBs	7.5		0.036	0.096	0.38

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-415-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-16A

Sample wt/vol: 30.4 (g/mL) G Lab File ID: S5B1060.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 11 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/21/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.092	U	0.060	0.092	0.37
25512-42-9	Dichlorobiphenyl	0.092	U	0.034	0.092	0.37
25323-68-6	Trichlorobiphenyl	0.092	U	0.039	0.092	0.37
26914-33-0	Tetrachlorobiphenyl	1.9		0.073	0.19	0.73
25429-29-2	Pentachlorobiphenyl	5.8		0.077	0.19	0.73
26601-64-9	Hexachlorobiphenyl	8.9		0.065	0.19	0.73
28655-71-2	Heptachlorobiphenyl	2.1		0.11	0.28	1.1
55722-26-4	Octachlorobiphenyl	0.28	U	0.20	0.28	1.1
53742-07-7	Nonachlorobiphenyl	0.54	J	0.18	0.46	1.8
2051-24-3	Decachlorobiphenyl	0.46	U	0.18	0.46	1.8
1336-36-3	Total PCBs	19		0.034	0.092	0.37

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-416-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-17A

Sample wt/vol: 30.4 (g/mL) G Lab File ID: S5B1066.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 9.0 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/21/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	1.7		0.059	0.090	0.36
25512-42-9	Dichlorobiphenyl	0.090	U	0.034	0.090	0.36
25323-68-6	Trichlorobiphenyl	0.13	J	0.038	0.090	0.36
26914-33-0	Tetrachlorobiphenyl	0.18	U	0.072	0.18	0.72
25429-29-2	Pentachlorobiphenyl	0.18	U	0.075	0.18	0.72
26601-64-9	Hexachlorobiphenyl	1.6		0.064	0.18	0.72
28655-71-2	Heptachlorobiphenyl	0.27	U	0.11	0.27	1.1
55722-26-4	Octachlorobiphenyl	0.27	U	0.20	0.27	1.1
53742-07-7	Nonachlorobiphenyl	0.45	U	0.17	0.45	1.8
2051-24-3	Decachlorobiphenyl	0.45	U	0.17	0.45	1.8
1336-36-3	Total PCBs	3.4		0.034	0.090	0.36

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-417-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-18A

Sample wt/vol: 30.1 (g/mL) G Lab File ID: S5B1056.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 15 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/21/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.097	U	0.063	0.097	0.39
25512-42-9	Dichlorobiphenyl	0.097	U	0.036	0.097	0.39
25323-68-6	Trichlorobiphenyl	0.33	J	0.041	0.097	0.39
26914-33-0	Tetrachlorobiphenyl	0.45	J	0.077	0.20	0.77
25429-29-2	Pentachlorobiphenyl	1.7		0.081	0.20	0.77
26601-64-9	Hexachlorobiphenyl	2.5		0.069	0.20	0.77
28655-71-2	Heptachlorobiphenyl	0.29	U	0.12	0.29	1.2
55722-26-4	Octachlorobiphenyl	0.29	U	0.21	0.29	1.2
53742-07-7	Nonachlorobiphenyl	0.49	U	0.19	0.49	1.9
2051-24-3	Decachlorobiphenyl	0.49	U	0.19	0.49	1.9
1336-36-3	Total PCBs	5.1		0.036	0.097	0.39

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-418-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-19A

Sample wt/vol: 30.5 (g/mL) G Lab File ID: S5B1069.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 9.0 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/21/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.090	U	0.058	0.090	0.36
25512-42-9	Dichlorobiphenyl	0.090	U	0.034	0.090	0.36
25323-68-6	Trichlorobiphenyl	0.044	J	0.038	0.090	0.36
26914-33-0	Tetrachlorobiphenyl	3.6		0.071	0.18	0.71
25429-29-2	Pentachlorobiphenyl	49		0.075	0.18	0.71
26601-64-9	Hexachlorobiphenyl	15		0.064	0.18	0.71
28655-71-2	Heptachlorobiphenyl	0.27	U	0.11	0.27	1.1
55722-26-4	Octachlorobiphenyl	0.27	U	0.19	0.27	1.1
53742-07-7	Nonachlorobiphenyl	0.45	U	0.17	0.45	1.8
2051-24-3	Decachlorobiphenyl	0.45	U	0.17	0.45	1.8
1336-36-3	Total PCBs	67		0.034	0.090	0.36

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-DUP02-411 11

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-20A

Sample wt/vol: 30.5 (g/mL) G Lab File ID: S5B1071.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 8.0 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/21/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.089	U	0.058	0.089	0.35
25512-42-9	Dichlorobiphenyl	0.27	J	0.033	0.089	0.35
25323-68-6	Trichlorobiphenyl	0.089	U	0.037	0.089	0.35
26914-33-0	Tetrachlorobiphenyl	1.2		0.071	0.18	0.71
25429-29-2	Pentachlorobiphenyl	10		0.074	0.18	0.71
26601-64-9	Hexachlorobiphenyl	9.9		0.063	0.18	0.71
28655-71-2	Heptachlorobiphenyl	0.62	J	0.11	0.27	1.1
55722-26-4	Octachlorobiphenyl	0.27	U	0.19	0.27	1.1
53742-07-7	Nonachlorobiphenyl	0.45	U	0.17	0.45	1.8
2051-24-3	Decachlorobiphenyl	0.45	U	0.17	0.45	1.8
1336-36-3	Total PCBs	22		0.033	0.089	0.35

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-DUP06-041211

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-21A

Sample wt/vol: 30.5 (g/mL) G Lab File ID: S5B1057.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 11 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/21/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.092	U	0.060	0.092	0.36
25512-42-9	Dichlorobiphenyl	0.092	U	0.034	0.092	0.36
25323-68-6	Trichlorobiphenyl	0.092	U	0.039	0.092	0.36
26914-33-0	Tetrachlorobiphenyl	0.18	U	0.073	0.18	0.73
25429-29-2	Pentachlorobiphenyl	3.7		0.076	0.18	0.73
26601-64-9	Hexachlorobiphenyl	3.2		0.065	0.18	0.73
28655-71-2	Heptachlorobiphenyl	2.8		0.11	0.28	1.1
55722-26-4	Octachlorobiphenyl	0.65	J	0.20	0.28	1.1
53742-07-7	Nonachlorobiphenyl	0.46	U	0.18	0.46	1.8
2051-24-3	Decachlorobiphenyl	0.46	U	0.18	0.46	1.8
1336-36-3	Total PCBs	10		0.034	0.092	0.36

APPENDIX C

REGIONAL WORKSHEETS

Site Name _____
Reference No. _____

REGION I ORGANIC DATA VALIDATION

The following data package has been validated:

Lab Name MitKem
Case/Project No. _____
SDG No. K0598
No. of Samples/Matrix 21

SOW/Method No. EPA 680
Sampling Date(s) 4/11 and 4/12
Shipping Date(s) _____
Date Rec'd by lab _____

Traffic Report Sample Nos. See DV Report

Trip Blank No. _____
Equipment Blank No. _____
Bottle Blank No. _____
Field Duplicate Nos. _____

PES Nos. _____

The Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, revision #2 was used to evaluate the data and/or approved modifications to the EPA-NE Functional Guidelines were used to evaluate the data and are attached to this cover page: (attach modified criteria from EPA approved QAPjP or amendment to QAPjP).

A Tier II or Tier III evaluation was used to validate the data (circle one). If a Tier II validation with a partial Tier III was used, then identify samples, parameters, etc. that received partial Tier III validation _____

The data were evaluated based upon the following parameters:

- Overall Evaluation of Data
- Data Completeness (CSF Audit - Tier I)
- Preservation & Technical Holding Times
- GC/MS & GC/ECD Instrument Performance Check
- Initial & Continuing Calibrations
- Blanks
- Surrogate Compounds
- Internal Standards
- Matrix Spike/Matrix Spike Duplicate
- Field Duplicates
- Sensitivity Check
- PE Samples/Accuracy Check
- Target Compound Identification
- Compound Quantitation and Reported Quantitation Limits
- TICs
- Semivolatile and Pesticide/PCB Cleanup
- System Performance

Region I Definitions and Qualifiers:

A - Acceptable Data
J - Numerical value associated with compound is an estimated quantity.
R - The data are rejected as unusable. The R replaces the numerical value or sample quantitation limit.
U - Compound not detected at that numerical sample quantitation limit.
UJ - The sample quantitation limit is an estimated quantity.
TB, BB, EB - Compound detected in aqueous trip blank, aqueous bottle blank, or aqueous equipment blank associated with soil/sediment samples.

Validator's Name Edward Sullivan Company Name Tetratech Phone Number 921-412-8704
Date Validation Started 5/12/11
Date Validation Completed 5/18/11

Data Validation Worksheet Cover Page - Page 2

Check if all criteria are met and no hard copy worksheet provided. Indicate NA if worksheet is not applicable to analytical method. Note: there is no standard worksheet for System Performance, however, the validator must document all system performance issues in the Data Validation Memorandum.

VOA/SV worksheets:

VOA/SV-Pest/PCB	COMPLETE SDG FILE (CSF) AUDIT	
VOA/SV-Pest/PCB-I	PRESERVATION AND HOLDING TIMES	____
VOA/SV-II	GC/MS INSTRUMENT PERFORMANCE CHECK (TUNING)	____
VOA/SV-III	INITIAL CALIBRATION	____
VOA/SV-IV	CONTINUING CALIBRATION	____
VOA/SV-Pest/PCB-V-A	BLANK ANALYSIS	____
VOA/SV-Pest/PCB-V-B	BLANK ANALYSIS	____
VOA-VI	VOA SURROGATE SPIKE RECOVERIES	____
SV-VI	SV SURROGATE SPIKE RECOVERIES	____
VOA/SV-VII	INTERNAL STANDARD PERFORMANCE	____
VOA/SV-Pest/PCB-VIII	MATRIX SPIKE/MATRIX SPIKE DUPLICATE	____
VOA/SV-Pest/PCB-IX	FIELD DUPLICATE PRECISION	____
VOA/SV-Pest/PCB-X	SENSITIVITY CHECK	____
VOA/SV-Pest/PCB-XI	ACCURACY CHECK	____
VOA/SV-Pest/PCB-XII	TARGET COMPOUND IDENTIFICATION	____
VOA/SV-Pest/PCB-XIII	SAMPLE QUANTITATION	____
VOA/SV-XIV	TENTATIVELY IDENTIFIED COMPOUNDS	____
VOA/SV-XV	SEMIVOLATILE CLEANUP	____
TABLE II-WORKSHEET	OVERALL EVALUATION OF DATA	____

Pest/PCB worksheets:

VOA/SV-Pest/PCB	COMPLETE SDG FILE (CSF) AUDIT	
VOA/SV-Pest/PCB-I	PRESERVATION AND HOLDING TIMES	____
Pest/PCB-IIA	GC/ECD INSTRUMENT PERFORMANCE CHECK-RESOLUTION	____
Pest/PCB-IIB	GC/ECD INSTRUMENT PERFORMANCE CHECK-RETENTION TIMES	____
Pest/PCB-IIC	GC/ECD INSTRUMENT PERFORMANCE CHECK-ACCURACY CHECK OF INITIAL CALIBRATION	____
Pest/PCB-IID	GC/ECD INSTRUMENT PERFORMANCE CHECK-PESTICIDE DEGRADATION	____
Pest/PCB-III	INITIAL CALIBRATION	____
Pest/PCB-IV	CONTINUING CALIBRATION	____
VOA/SV-Pest/PCB-V-A	BLANK ANALYSIS	____
VOA/SV-Pest/PCB-V-B	BLANK ANALYSIS	____
Pest/PCB-VI	SURROGATE COMPOUNDS: SPIKE RECOVERIES AND RETENTION TIME SHIFT	____
Pest/PCB-VII	PESTICIDE CLEANUP	____
VOA/SV-Pest/PCB-VIII	MATRIX SPIKE/MATRIX SPIKE DUPLICATE	____
VOA/SV-Pest/PCB-IX	FIELD DUPLICATE PRECISION	____
VOA/SV-Pest/PCB-X	SENSITIVITY CHECK	____
VOA/SV-Pest/PCB-XI	ACCURACY CHECK	____
Pest/PCB-XII	COMPOUND IDENTIFICATION	____
VOA/SV-Pest/PCB-XIII	SAMPLE QUANTITATION	____
TABLE II-WORKSHEET	OVERALL EVALUATION OF DATA	____

I certify that all criteria were met for the worksheets checked above

Signature: Edward Sedlmyer

Name: Edward Sedlmyer

Date: 5/18/11

The data validator generates a Data Validation Report, applicable to Data Validation Tiers II and III, that consists of the following components in the order specified below: (Refer to Section 11 for a description of each of the Data Validation Report components).

1. Organic Regional Data Assessment/Inorganic Regional Data Assessment (ORDA/IRDA) Form
2. Data Validation Memorandum
   a. Narrative
   b. Table I-Qualifier Recommendation Summary Table
   c. Table II-Overall Evaluation of Data
   d. Table III-Tentatively Identified Compounds
   e. Data Summary Tables
3. Standard Data Validation Worksheets
   a. Manual
   b. Automated Data Review Reports (i.e., CADRE)
4. Support Documentation
   a. Copy of non-CLP analytical method, e.g., DAS methods, modified EPA methods
   b. Copies of PES Score Reports/Vendor PES QC Acceptance Limits
   c. Copies of Telephone Logs/Communication Forms for:
      - RSCC communications
      - Requests for laboratory data resubmissions/clarifications
      - Communications with samplers resolving sampling problems
      - Communications with TPO/Lead Chemist to report contractually-deficient data for rejection/reduced payment
      - Communications with EPA Site Manager concerning possible data rejection
      - EPA Site Manager authorization for alternate DV tier
   d. Copies of data supporting recommendations for reduced payment resulting from CSF Audit and/or PE sample result evaluation
   e. Original data to support recommendations for data rejection/non-payment identified from Tier II or Tier III data validation
   f. Copies of field sampling notes and/or field report supplied by field sampler
   g. Copies of EPA-approved amendments to QAPjP and/or SAP describing modified criteria to be used for validating site data
5. CSF Completeness Evidence Audit
6. DQO Summary Form

The data validator is responsible for implementing all corrective actions required by the contractor Lead Chemist in response to EPA-NE data validation oversight findings.

EPA-NE - Data Validation Worksheet
Overall Evaluation of Data - Data Validation Memorandum - Table II

See DV Report

VOLATILE ORGANICS					
DQO (list all DQOs)	Sampling and/or Analytical Method Appropriate Yes or No	Measurement Error		Sampling Variability**	Potential Usability Issues
		Analytical Error	Sampling Error*		

* The evaluation of "sampling error" cannot be completely assessed in data validation.

** Sampling variability is not assessed in data validation.

Validator: Edward Sedlmyer

Date: 5/18/11

EPA-NE - Data Validation Worksheet
Overall Evaluation of Data - Data Validation Memorandum - Table II

See DV Report

SEMIVOLATILE ORGANICS					
DQO (list all DQOs)	Sampling and/or Analytical Method Appropriate Yes or No	Measurement Error		Sampling Variability**	Potential Usability Issues
		Analytical Error	Sampling Error*		

* The evaluation of "sampling error" cannot be completely assessed in data validation.

** Sampling variability is not assessed in data validation.

Validator: Edward Sudlow

Date: 5/18/11

COMPLETE SDG FILE (CSF) AUDIT

Organic Fractions: PCB Homologs

Missing Information	Date Lab Contacted	Date Received

Validator Edward Sedlmyer Date: 8/18/11

EPA-NE - Data Validation
VOA/SV - Pest/PCB-1

See DV Report

Sampler: _____ Company: _____ Contacted: Yes No Date: _____

I. PRESERVATION AND HOLDING TIMES -

Circle sample numbers with exceeded technical holding times or omitted preservation.
List all required preservation codes and circle omitted preservation codes.
Circle all exceeded technical holding times.
Identify extraction technique after "# of Days"/(*Extraction Code).

Sample No (TR No.)	Matrix	Pres Code	Date Sampled	VOA			BNA					PEST/PCB				
				Date Analyzed	# of Days from Samp. to Anal.	Action	Date Extracted	# of Days from Samp. to Extr./(*)	Date Analyzed	# of Days from Extr. to Anal.	Action	Date Extracted	# of Days from Samp. to Extr./(*)	Date Analyzed	# of Days from Extr. to Anal.	Act

Preservation Code:
1. Cool @ 4°C (± 2°)
2. Preserve with HCl to at least pH 2
3. Protect from light
4. Freeze
5. Room Temperature (Avoid excessive heat)

(*Extraction Code:)
L/L - Liquid/Liquid
SON - Sonication
SEP - Separatory Funnel
SOX - Soxhlet
SPE - Solid Phase Extraction

Action Code:
J - Estimate (J) Detected Values
UJ - Estimate (UJ) Non-Detected Values
R - Reject (R) Non-Detected Values

Validator: Edward Ladlow

Date: 5/18/11

See DV Report

II. GC/MS INSTRUMENT PERFORMANCE CHECK (TUNING)

List all Instrument Performance Checks that are outside method QC tuning acceptance criteria.

Volatile Instrument Performance Check (Compound Name)	Analysis Date and Time	Instrument	Ion(s) Affected	Percent Relative Abundance	QC Limits	Samples Affected	Action
Comments							

Semivolatile Instrument Performance Check (Compound Name)	Analysis Date and Time	Instrument	Ion(s) Affected	Percent Relative Abundance	QC Limits	Samples Affected	Action
Comments							

If tuning compounds and criteria are different from those specified in CLP SOW OLM03.1, then the validator should include a copy of the method-specific tuning criteria with this worksheet.

Validator: Edward Sedlmyer

Date: 8/18/11

EPA-NE - Data Validation Worksheet
VOA/SV-III

See DV Report

III. INITIAL CALIBRATION - List all analytes that are outside calibration criteria.

Date of ICAL	Instrument	Parameter	Matrix	Compound	% RSD	$\overline{RRF}$	Samples Affected	Action

Comments:

Validator: Edward Hedlayer

Date: 5/18/11

EPA-NE - Data Validation Worksheet
VOA/SV-IV

See DV Report

IV. CONTINUING CALIBRATION - List all analytes that are outside calibration criteria.

Date of ICAL	Date of CCAL	Instrument	Parameter	Matrix	Compound	%D	RRF	Samples Affected	Action

Comments

Validator: Edward Hedley

Date: 5/18/14

EPA-NE - Data Validation Worksheet
VOA/SV - Pest/PCB-V-A

See DV Report

V. BLANK ANALYSIS

List the blank contamination below.

Sampler: _____ Company: _____

Concentration Level: _____

Contacted: Yes No Date: _____

1. Laboratory: Method, Storage and Instrument Blanks

Date Extracted	Date Analyzed	Parameter/ Matrix	Sample No. (Blank Type)	Instrument/ Column	Compound	Conc. (units)

2. Field: Equipment (Rinsate), Trip and Bottle Blanks

Date Extracted	Date Analyzed	Parameter/ Matrix	Sample No. (Blank Type)	Instrument/ Column	Compound	Conc. (units)

Validator: Edward Wedlinger

Date: 8/18/11

See DV Report

3. Blank Actions - List the maximum concentrations of blank compounds.

Compound	Type of Blank	Date Blank Sampled/Originated	Max. Conc. (units)	Action Level (units)	Sample QL	Samples Affected	Action

Comments: _____

Validator: _____

Date: _____

EPA-NE - Data Validation Worksheet
VOA-VI

See DV Report

VI. VOA SURROGATE SPIKE RECOVERIES - List all surrogate compound recoveries that are outside method QC acceptance criteria.

Method	Volatile Method QC Acceptance Criteria				
OLM03.2	Toluene-d_8 Water 88-110 Soil 84-138	BFB Water 86-115 Soil 59-113	DCE-d_4 Water 76-114 Soil 70-121	Other:	
OLC02.1	NA	80-120	NA		
Other:					
Sample Number/Matrix	% Recovery	% Recovery	% Recovery	% Recovery	Action

Validator: Edward Sedlayer

Date: 5/18/11

EPA-NE - Data Validation Worksheet
SV-VI

See DV Report

VI. SV SURROGATE SPIKE RECOVERIES - List all surrogate compound recoveries that are outside method QC acceptance criteria.

Method	Base/Neutral Method QC Acceptance Criteria					
OLM03.2	NBZ-d_5	2-FBP	TPH-d_{14}	1,2-DCB-d_4*	Other:	
	Water Soil	Water Soil	Water Soil	Water Soil		
OLC02.1	35-114 23-120	43-116 30-115	33-141 18-137	16-110 20-130		
Other:	40-110	30-110	20-140	NA		
Sample Number/Matrix	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	Action

Method	Acid Method QC Acceptance Criteria					
OLM03.2	Phenol-d_5	2-FP	2,4,6-TBP	2-CP-d_4*	Other:	
	Water Soil	Water Soil	Water Soil	Water Soil		
OLC02.1	10-110 24-113	21-110 25-121	10-123 19-122	33-110 20-130		
Other:	15-115	15-110	15-130	NA		
Sample Number/Matrix	% Recovery	% Recovery	% Recovery	% Recovery	% Recovery	Action

* Advisory Surrogates - OLM03.2

Validator: Edward Sedlmayer

Date: 5/18/11

See DV Report

EPA-NE - Data Validation Worksheet
VOA/SV-VII

VII. INTERNAL STANDARD PERFORMANCE

List the internal standards that are outside the area count and retention time method QC acceptance criteria.
IS Area Count method QC acceptance criteria: _____
IS Retention Time method QC acceptance criteria: _____

Sample Number (TR#)	Date and Time Analyzed	Instrument	Parameter	IS Outside Area Count and/or RT Criteria	IS Area	RT Shift	Acceptable Range (IS area or RT shift)	Action

Validator: Edward Sedlayr

Date: 5/18/11

See DV Report

EPA-NE - Data Validation Worksheet
VOA/SV - Pest/PCB-VIII

VIII. MATRIX SPIKE/MATRIX SPIKE DUPLICATE - List all MS/MSD analytes that are outside method QC acceptance criteria. Use a separate worksheet for each MS/MSD pair.

Sample # _____ Matrix _____ Concentration Level _____

Parameter	Compound	MS %Rec	MSD %Rec	RPD	Method QC Limits		Concentration			% RSD	Action
					% Rec	RPD	Unspiked Sample	MS	MSD		

Validator: Edward Kadlyn

Date: 5/18/11

EPA-NE - Data Validation Worksheet
VOA/SV - Pest/PCB-IX

See DV Report

IX. FIELD DUPLICATE PRECISION - List all field duplicate analytes that are outside criteria.

Use a separate worksheet for each field duplicate pair.

Sample Number _____ Duplicate Sample Number _____ Matrix _____

Parameter	Compound	Sample Conc.	Sample QL		Duplicate Conc.	Duplicate QL		RPD	QC Acceptance Criteria RPD or NA*	Action
			SQL	2xSQL		SQL	2xSQL			

* For instances where one duplicate result is ND (or reported less than the sample QL).

Does the MS/MSD data indicate acceptable laboratory precision? Y N

Comments: _____

Sampler Name: _____ Contractor Name: _____

Reason for Contact and resolution obtained: _____ Date Contacted: _____

Validator: Edward Dedlyn Date: 5/18/01

EPA-NE - Data Validation Worksheet
VOA/SV - Pest/PCB-X

See DV Report

X. SENSITIVITY CHECK (Method Detection Limit Study)

List all compounds, surrogates, and internal standards that are outside the MDL criteria.

- Has an appropriate MDL study been submitted with seven replicates for each compound and matrix of interest? Y N
- Date of Preparation/Analysis: _____ Within 1 year? Y N
- Instrument I.D.: _____ Same as samples? Y N
- Column I.D.: _____ Same as samples? Y N

Matrix	Compound	MDL > QL	Method QC Limits < 80% or > 120%	IS Outside Area Count and/or RT Criteria	RSD > 20%	Samples Affected	Action

If an MDL study has not been submitted, use only the LFB results to evaluate data.

(Laboratory Fortified Blank) - List all LFB compounds, surrogates and internal standards that are outside criteria.

- Has an appropriate and complete LFB been submitted at the proper frequency? Y N
- Does it contain all target compounds at the method-required QLs? Y N
- Was the LFB spiked with a standard from a source (vendor) independent of the calibration standard? Y N

Matrix	Compound	Method QC Limits < 60% or > 140% Other:	IS Outside Area Count and/or RT Criteria	Samples Affected	Action

Validator: Edward Sedlar

Date: 5/18/11

EPA-NE - Data Validation Worksheet
VOA/SV - Pest/PCB-XI

See DV Report

XI. ACCURACY CHECK (Performance Evaluation Results) - List all analytes that are outside criteria.

SDG No: _____ CASE: _____

Are more than one-half of the PES analytes within criteria for each parameter. Y N

PE Sample Number	Ampule Number	Parameter	Type of PES	Matrix	Analyte	Conc.	Region I EPA PES Scores*	Non-EPA PES Scores**	Samples Affected	Action

* For Region I PESs indicate the Region I PES Score Report Result: Action High; Action Low; TCL MISS; TCL CONTAMINANT; TIC HIT TIC MISS; TIC CONTAMINANT

** For Non-EPA PESs indicate the Non-EPA PES Score: PES COMPOUND MISS; PES COMPOUND CONTAMINANT; PES COMPOUND HIT (% Recovery Limits)

Validator: Edward Redlinger Date: 5/18/11

EPA-NE - Data Validation Worksheet
VOA/SV - Pest/PCB-XII

See DV Report

XII. TARGET COMPOUND IDENTIFICATION - List the analytes that are outside the acceptance criteria.

Sample Number	Compound	___MS Ions	____RRT	Action

Validator: Edward Kellogg

Date: 5/18/11

EPA-NE - Data Validation Worksheet
VOA/SV - Pest/PCB-XIII

See DV Report

XIII. SAMPLE QUANTITATION

Recalculate, from the raw data, the concentrations for one positive detect and one reported sample quantitation limit for a non-detect in a diluted sample or soil sample per fraction. (Note: Although Section XIII, C.1.a, requires that one calculation for each fraction in each sample be performed, the validator is only required to reproduce an examp for each fraction, of one positive detect and one sample quantitation limit calculation on this worksheet.)

Do all soil/sediment samples have % solids greater than 30%? Y N
If no, list sample numbers_____

Fraction		Calculation
VOA		
Sample No.:		
Reported Compound:		
Reported Value:		
Not Detected Compound:		
Reported Quantitation Limit:		
BNA		
Sample No.:		
Reported Compound:		
Reported Value:		
Not Detected Compound:		
Reported Quantitation Limit:		
Pesticide/PCB		
Sample No.:		
Reported Compound:		
Reported Value:		
Not Detected Compound:		
Reported Quantitation Limit:		

Validator: Edward Sudlow

Date: 5/18/11

NA

XIV. TENTATIVELY IDENTIFIED COMPOUNDS (TICs)

List the 5 TICs having the highest concentration for each sample parameter.

Sample Number	Parameter	Compound	RRT	Est. Conc.	Action

Validator: Edward Sedlyar

Date: 5/18/11

EPA-NE - Data Validation Worksheet
VOA/SV-XV

NA

XV. SEMIVOLATILE CLEANUP - List all analytes that are outside method cleanup QC criteria.

Cleanup Procedure	Instrument # or Lot #	Date/Time GPC Calibrated or Check Solution Analyzed	Compound	% Rec	QC Limits	Samples Affected	Action

Did the GPC column meet; resolution requirements? Y or N
peak shape requirements? Y or N
retention time shift requirements? Y or N

Was the GPC calibration, Silica Gel cleanup checked at the method required frequency with correct compounds and concentrations? Y or N

Were all compounds less than QL for the GPC/Silica Gel/Acid-Partition blank? Y or N

Did the blank surrogate recoveries and IS area counts and RTs (if added) meet method QC acceptance criteria? Y or N

Comments: _____

Validator: Edward Sedlmyer

Date: 5/18/11

APPENDIX D

SUPPORT DOCUMENTATION

HOLDTIME

SDG K0598

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
M	MG/KG	OU2-SS-413-0002	K0598-14A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-416-0002	K0598-17A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-405-0002	K0598-06A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-406-0002	K0598-07A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-407-0002	K0598-08A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-407-0002	K0598-08A	NM	04/11/2011	04/15/2011	04/17/2011	4	2	6
M	MG/KG	OU2-SS-408-0002	K0598-09A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-408-0002	K0598-09A	NM	04/11/2011	04/15/2011	04/17/2011	4	2	6
M	MG/KG	OU2-SS-409-0002	K0598-10A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-410-0002	K0598-11A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4
M	MG/KG	OU2-SS-400-0002	K0598-01A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4
M	MG/KG	OU2-SS-403-0002	K0598-04A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4
M	MG/KG	OU2-SS-412-0002	K0598-13A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-402-0002	K0598-03A	NM	04/12/2011	04/15/2011	04/17/2011	3	2	5
M	MG/KG	OU2-SS-414-0002	K0598-15A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
M	MG/KG	OU2-SS-415-0002	K0598-16A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4
M	MG/KG	OU2-SS-DUP06-041211	K0598-21A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4
M	MG/KG	OU2-SS-DUP02-41111	K0598-20A	NM	04/11/2011	04/15/2011	04/17/2011	4	2	6
M	MG/KG	OU2-SS-DUP02-41111	K0598-20A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-418-0002	K0598-19A	NM	04/11/2011	04/15/2011	04/17/2011	4	2	6
M	MG/KG	OU2-SS-418-0002	K0598-19A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-417-0002	K0598-18A	NM	04/12/2011	04/15/2011	04/17/2011	3	2	5
M	MG/KG	OU2-SS-417-0002	K0598-18A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4
M	MG/KG	OU2-SS-416-0002	K0598-17A	NM	04/11/2011	04/15/2011	04/17/2011	4	2	6
M	MG/KG	OU2-SS-411-0002	K0598-12A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-402-0002	K0598-03A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4
M	MG/KG	OU2-SS-401-0002	K0598-02A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4
M	MG/KG	OU2-SS-400-0002	K0598-01A	NM	04/12/2011	04/15/2011	04/17/2011	3	2	5
M	MG/KG	OU2-SS-404-0002	K0598-05A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4
PMOIS	%	OU2-SS-407-0002	K0598-08A	NM	04/11/2011	04/14/2011	04/14/2011	3	0	3
PMOIS	%	OU2-SS-DUP02-41111	K0598-20A	NM	04/11/2011	04/14/2011	04/14/2011	3	0	3
PMOIS	%	OU2-SS-418-0002	K0598-19A	NM	04/11/2011	04/14/2011	04/14/2011	3	0	3
PMOIS	%	OU2-SS-417-0002	K0598-18A	NM	04/12/2011	04/14/2011	04/14/2011	2	0	2

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
PMOIS	%	OU2-SS-416-0002	K0598-17A	NM	04/11/2011	04/14/2011	04/14/2011	3	0	3
PMOIS	%	OU2-SS-415-0002	K0598-16A	NM	04/12/2011	04/14/2011	04/14/2011	2	0	2
PMOIS	%	OU2-SS-414-0002	K0598-15A	NM	04/12/2011	04/14/2011	04/14/2011	2	0	2
PMOIS	%	OU2-SS-413-0002	K0598-14A	NM	04/11/2011	04/14/2011	04/14/2011	3	0	3
PMOIS	%	OU2-SS-412-0002	K0598-13A	NM	04/11/2011	04/14/2011	04/14/2011	3	0	3
PMOIS	%	OU2-SS-411-0002	K0598-12A	NM	04/11/2011	04/14/2011	04/14/2011	3	0	3
PMOIS	%	OU2-SS-410-0002	K0598-11A	NM	04/12/2011	04/14/2011	04/14/2011	2	0	2
PMOIS	%	OU2-SS-408-0002	K0598-09A	NM	04/11/2011	04/14/2011	04/14/2011	3	0	3
PMOIS	%	OU2-SS-406-0002	K0598-07A	NM	04/11/2011	04/14/2011	04/14/2011	3	0	3
PMOIS	%	OU2-SS-405-0002	K0598-06A	NM	04/11/2011	04/14/2011	04/14/2011	3	0	3
PMOIS	%	OU2-SS-DUP06-041211	K0598-21A	NM	04/12/2011	04/14/2011	04/14/2011	2	0	2
PMOIS	%	OU2-SS-404-0002	K0598-05A	NM	04/12/2011	04/14/2011	04/14/2011	2	0	2
PMOIS	%	OU2-SS-403-0002	K0598-04A	NM	04/12/2011	04/14/2011	04/14/2011	2	0	2
PMOIS	%	OU2-SS-402-0002	K0598-03A	NM	04/12/2011	04/14/2011	04/14/2011	2	0	2
PMOIS	%	OU2-SS-401-0002	K0598-02A	NM	04/12/2011	04/14/2011	04/14/2011	2	0	2
PMOIS	%	OU2-SS-400-0002	K0598-01A	NM	04/12/2011	04/14/2011	04/14/2011	2	0	2
PMOIS	%	OU2-SS-409-0002	K0598-10A	NM	04/11/2011	04/14/2011	04/14/2011	3	0	3
PCBH	UG/KG	OU2-SS-407-0002	K0598-08A	NM	04/11/2011	04/14/2011	04/20/2011	3	6	9

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
PCBH	UG/KG	OU2-SS-411-0002	K0598-12A	NM	04/11/2011	04/14/2011	04/21/2011	3	7	10
PCBH	UG/KG	OU2-SS-DUP06-041211	K0598-21A	NM	04/12/2011	04/14/2011	04/21/2011	2	7	9
PCBH	UG/KG	OU2-SS-DUP02-41111	K0598-20A	NM	04/11/2011	04/14/2011	04/21/2011	3	7	10
PCBH	UG/KG	OU2-SS-418-0002	K0598-19A	NM	04/11/2011	04/14/2011	04/21/2011	3	7	10
PCBH	UG/KG	OU2-SS-417-0002	K0598-18A	NM	04/12/2011	04/14/2011	04/21/2011	2	7	9
PCBH	UG/KG	OU2-SS-416-0002	K0598-17A	NM	04/11/2011	04/14/2011	04/21/2011	3	7	10
PCBH	UG/KG	OU2-SS-415-0002	K0598-16A	NM	04/12/2011	04/14/2011	04/21/2011	2	7	9
PCBH	UG/KG	OU2-SS-414-0002	K0598-15A	NM	04/12/2011	04/14/2011	04/21/2011	2	7	9
PCBH	UG/KG	OU2-SS-405-0002	K0598-06A	NM	04/11/2011	04/14/2011	04/20/2011	3	6	9
PCBH	UG/KG	OU2-SS-412-0002	K0598-13A	NM	04/11/2011	04/14/2011	04/21/2011	3	7	10
PCBH	UG/KG	OU2-SS-400-0002	K0598-01A	NM	04/12/2011	04/14/2011	04/20/2011	2	6	8
PCBH	UG/KG	OU2-SS-410-0002	K0598-11A	NM	04/12/2011	04/14/2011	04/21/2011	2	7	9
PCBH	UG/KG	OU2-SS-409-0002	K0598-10A	NM	04/11/2011	04/14/2011	04/21/2011	3	7	10
PCBH	UG/KG	OU2-SS-408-0002	K0598-09A	NM	04/11/2011	04/14/2011	04/21/2011	3	7	10
PCBH	UG/KG	OU2-SS-406-0002	K0598-07A	NM	04/11/2011	04/14/2011	04/20/2011	3	6	9
PCBH	UG/KG	OU2-SS-404-0002	K0598-05A	NM	04/12/2011	04/14/2011	04/20/2011	2	6	8
PCBH	UG/KG	OU2-SS-403-0002	K0598-04A	NM	04/12/2011	04/14/2011	04/20/2011	2	6	8
PCBH	UG/KG	OU2-SS-402-0002	K0598-03A	NM	04/12/2011	04/14/2011	04/20/2011	2	6	8

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
PCBH	UG/KG	OU2-SS-401-0002	K0598-02A	NM	04/12/2011	04/14/2011	04/20/2011	2	6	8
PCBH	UG/KG	OU2-SS-413-0002	K0598-14A	NM	04/11/2011	04/14/2011	04/21/2011	3	7	10

PORTSMOUTH NSY
SOIL DATA
K0598

FRACTION	CHEMICAL	OU2-SS-404-0002	UNITS	OU2-SS-DUP06-041211	RPD	D	
PCBH	HEPTACHLOROBIPHENYLS	1.1 J	UG/KG	2.8	87.18	1.70	o.K. <2xRL
PCBH	HEXACHLOROBIPHENYL	3.8	UG/KG	3.2	17.14	0.60	
PCBH	OCTACHLOROBIPHENYLS	ND	UG/KG	0.65 J	200.00	0.65	o.K. <2xRL
PCBH	PENTACHLOROBIPHENYLS	1.7	UG/KG	3.7	74.07	2.00	J
PCBH	TOTAL AROCLOR	6.6	UG/KG	10	40.96	3.40	

Current RPD Quality Control Limit: 50 %.
Shaded cells indicate RPDs that exceed the applicable quality control limit.

PORTSMOUTH NSY
SOIL DATA
K0598

FRACTION	CHEMICAL	OU2-SS-412-0002	UNITS	OU2-SS-DUP02-41111	RPD	D	
PCBH	DICHLOROBIPHENYLS	0.084 J	UG/KG	0.27 J	105.08	0.19	0.1 < 2xRL
PCBH	HEPTACHLOROBIPHENYLS	0.86 J	UG/KG	0.62 J	32.43	0.24	
PCBH	HEXACHLOROBIPHENYL	13	UG/KG	9.9	27.07	3.10	
PCBH	MONOCHLOROBIPHENYLS	0.95	UG/KG	ND	200.00	0.95	< 2xRL
PCBH	NONACHLOROBIPHENYLS	0.41 J	UG/KG	ND	200.00	0.41	< xRL
PCBH	PENTACHLOROBIPHENYLS	8.7	UG/KG	10	13.90	1.30	
PCBH	TETRACHLOROBIPHENYLS	0.8	UG/KG	1.2	40.00	0.40	
PCBH	TOTAL AROCLOR	24	UG/KG	22	8.70	2.00	

Current RPD Quality Control Limit: 50 %.
Shaded cells indicate RPDs that exceed the applicable quality control limit.

Report Date:
28-Apr-11 16:09

☑ Final Report
☐ Re-Issued Report
☐ Revised Report

MITKEM LABORATORIES

A DIVISION OF SPECTRUM ANALYTICAL, INC. Featuring HANIBAL TECHNOLOGY

Laboratory Report

Tetra Tech NUS, Inc.
661 Andersen Drive, Foster Plaza #7
Pittsburgh, PA 15220

Attn: Tobrena Skeen

Work Order: K0598
Project : CTO-WE-43, PNS OU-2
Project #: PHASE 1 (ANALYZE)

Laboratory ID	Client Sample ID	Matrix	Date Sampled	Date Received
K0598-01	OU2-SS-400-0002	Soil	12-Apr-11 09:05	14-Apr-11 08:47
K0598-02	OU2-SS-401-0002	Soil	12-Apr-11 09:30	14-Apr-11 08:47
K0598-03	OU2-SS-402-0002	Soil	12-Apr-11 08:42	14-Apr-11 08:47
K0598-04	OU2-SS-403-0002	Soil	12-Apr-11 10:15	14-Apr-11 08:47
K0598-05	OU2-SS-404-0002	Soil	12-Apr-11 08:30	14-Apr-11 08:47
K0598-06	OU2-SS-405-0002	Soil	11-Apr-11 16:00	14-Apr-11 08:47
K0598-07	OU2-SS-406-0002	Soil	11-Apr-11 15:50	14-Apr-11 08:47
K0598-08	OU2-SS-407-0002	Soil	11-Apr-11 14:00	14-Apr-11 08:47
K0598-09	OU2-SS-408-0002	Soil	11-Apr-11 13:15	14-Apr-11 08:47
K0598-10	OU2-SS-409-0002	Soil	11-Apr-11 15:35	14-Apr-11 08:47
K0598-11	OU2-SS-410-0002	Soil	12-Apr-11 13:25	14-Apr-11 08:47
K0598-12	OU2-SS-411-0002	Soil	11-Apr-11 13:45	14-Apr-11 08:47
K0598-13	OU2-SS-412-0002	Soil	11-Apr-11 12:00	14-Apr-11 08:47
K0598-14	OU2-SS-413-0002	Soil	11-Apr-11 10:40	14-Apr-11 08:47
K0598-15	OU2-SS-414-0002	Soil	12-Apr-11 13:35	14-Apr-11 08:47
K0598-16	OU2-SS-415-0002	Soil	12-Apr-11 13:20	14-Apr-11 08:47
K0598-17	OU2-SS-416-0002	Soil	11-Apr-11 11:30	14-Apr-11 08:47
K0598-18	OU2-SS-417-0002	Soil	12-Apr-11 13:10	14-Apr-11 08:47
K0598-19	OU2-SS-418-0002	Soil	11-Apr-11 11:00	14-Apr-11 08:47
K0598-20	OU2-SS-DUP02-41111	Soil	11-Apr-11 00:00	14-Apr-11 08:47
K0598-21	OU2-SS-DUP06-041211	Soil	12-Apr-11 00:00	14-Apr-11 08:47

I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. The results relate only to the samples(s) as received. This report may not be reproduced, except in full, without written approval from Mitkem Laboratories.

All applicable NELAC or USEPA CLP requirments have been meet.

Mitkem Laboratories is accredited under the National Environmental Laboratory Approval Program (NELAP) and is certified by several States, as well as USEPA and US Department of Defense. The current list of our laboratory approvals and certifications is available on the Certifications page on our web site at www.mitkem.com.

Please contact the Laboratory or Technical Director at 401-732-3400 with any questions regarding the data contained in the laboratory report.

Department of Defense	N/A
Connecticut	PH-0153
Delaware	N/A
Maine	2007037
Massachusetts	M-RI907
New Hampshire	2631
New Jersey	RI001
New York	11522
North Carolina	581
Pennsylvania	68-00520
Rhode Island	LAI00301
Texas	T104704422-08-TX
USDA	P330-08-00023
USEPA - ISM	EP-W-09-039
USEPA - SOM	EP-W-05-030

Authorized by:

Yihai Ding
Laboratory Director

MITKEM LABORATORIES

* Data Summary Pack *

REPORT NARRATIVE

Mitkem Laboratories, a Division of Spectrum Analytical, Inc.

Client : Tetra Tech NUS, Inc.

Project: CTO-WE-43, PNS OU-2

Laboratory Workorder / SDG #: K0598

EPA 680 Modified, Homologs of Polychlorinated Biphenyls by GC/MS

I. SAMPLE RECEIPT

No exceptions or unusual conditions were encountered.

Samples were also submitted for Analysis Phase 2 and Phase 3, which are "on-hold" pending review of the results for the enclosed "Phase 1" analyses. Results for the analyses performed on Phase 2 or Phase 3 samples will be submitted under separate cover.

II. HOLDING TIMES

A. Sample Preparation:

All samples were prepared within the method-specified holding times.

B. Sample Analysis:

All samples were analyzed within the method-specified holding times.

III. METHODS

Samples were analyzed following procedures in laboratory test code: EPA 680 Modified.

IV. PREPARATION

Soil Samples were prepared following procedures in laboratory test code SW3550B.

V. INSTRUMENTATION

The following instrumentation was used:

Instrument Code: S5
Instrument Type: GCMS-SEMI
Description: HP7890A / CTC LEAP
Manufacturer: Agilent
Model: 7890A / CTC LEAP

VI. ANALYSIS

A. Calibration:

Calibrations met the method/SOP acceptance criteria.

B. Blanks:

All method blanks were within the acceptance criteria.

C. Surrogates:

Surrogate standard percent recoveries were within the QC limits with the following exceptions. The recoveries listed below are outside of the advisory criteria of 60% - 140% recovery, but all are within the recovery action limits of 30% -150% for sediment samples.

OU2-SS-402-0002 (K0598-03A), recovery is below criteria for 3,3′,4,4′-tetraCB-C13 at 55% with criteria of (60-140).

OU2-SS-411-0002 (K0598-12A), recovery is below criteria for 3,3′,4,4′-tetraCB-C13 at 48% with criteria of (60-140).

OU2-SS-416-0002 (K0598-17A), recovery is below criteria for 3,3′,4,4′-tetraCB-C13 at 49% with criteria of (60-140).

OU2-SS-416-0002 (K0598-17AMS), recovery is below criteria for 3,3′,4,4′-tetraCB-C13 at 54% with criteria of (60-140).

OU2-SS-416-0002 (K0598-17AMSD), recovery is below criteria for 3,3′,4,4′-tetraCB-C13 at 53% with criteria of (60-140).

D. Spikes:

1. Laboratory Control Spikes (LCS):

Percent recoveries for lab control samples were within the QC

limits.

2. Matrix Spike / Matrix Spike Duplicate (MS/MSD):

Matrix spikes were performed on sample: OU2-SS-416-0002 (K0598-17AMS/MSD).

Percent recoveries were within the 60% - 140% QC limits with the following exceptions:

OU2-SS-416-0002 (K0598-17AMS)Percent Recovery is outside QC Limits, recovery is below criteria for Decachlorobiphenyl at 59%, Dichlorobiphenyl at 46%, Heptachlorobiphenyl at 57%, Hexachlorobiphenyl at 47%, Monochlorobiphenyl at 47%, Octachlorobiphenyl at 57%, Pentachlorobiphenyl at 55%, Tetrachlorobiphenyl at 51%, Total PCBs at 54% and Trichlorobiphenyl at 54%.

OU2-SS-416-0002 (K0598-17AMSD)Percent Recovery is outside QC Limits, recovery is below criteria for Decachlorobiphenyl at 45%, Dichlorobiphenyl at 41%, Heptachlorobiphenyl at 52%, Hexachlorobiphenyl at 44%, Monochlorobiphenyl at 38%, Octachlorobiphenyl at 52%, Pentachlorobiphenyl at 49%, Tetrachlorobiphenyl at 47%, Total PCBs at 47% and Trichlorobiphenyl at 40%.

Replicate RPDs were all within the advisory QC limits.

The relatively low spike recovery indicates matrix effect, since the associated laboratory control samples had excellent recoveries.

E. Internal Standards:

Internal standard peak areas were within the QC limits.

F. Dilutions:

No sample in this SDG required analysis at dilution.

G. Samples:

No other unusual occurrences were noted during sample analysis.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Mitkem, both technically and for

completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Signed: Edward [illegible]

Date: 4/28/11

REPORT NARRATIVE

Mitkem Laboratories, a Division of Spectrum Analytical, Inc.

Client : Tetra Tech NUS, Inc.

Project: CTO-WE-43, PNS OU-2

Laboratory Workorder / SDG #: K0598

SW846 6010C

I. SAMPLE RECEIPT

No exceptions or unusual conditions were encountered.

Samples were also submitted for Analysis Phase 2 and Phase 3, which are "on-hold" pending review of the results for the enclosed "Phase 1" analyses. Results for the analyses performed on Phase 2 or Phase 3 samples will be submitted under separate cover.

II. HOLDING TIMES

A. Sample Preparation:

All samples were prepared within the method-specified holding times.

B. Sample Analysis:

All samples were analyzed within the method-specified holding times.

III. METHODS

Samples were analyzed following procedures in laboratory test code: SW846 6010C

IV. PREPARATION

Soil Samples were prepared following procedures in laboratory test code: SW3050

V. INSTRUMENTATION

The following instrumentation was used to perform
Instrument Code: OPTIMA3
Instrument Type: ICP
Description: Optima ICP-OES
Manufacturer: Perkin-Elmer
Model: 4300 DV

VI. ANALYSIS

A. Calibration:

Calibrations met the method/SOP acceptance criteria.

B. Blanks:

All method blanks were within the acceptance criteria.

C. Spikes:

1. Laboratory Control Spikes (LCS):

   Percent recoveries for lab control samples were within the QC limits.

2. Matrix spike (MS):

   Matrix spike analysis was performed on sample: OU2-SS-416-0002 (K0598-17AMS).

   Percent recoveries were within the QC limits with the following exceptions:

   OU2-SS-416-0002 (K0598-17AMS), Spike sample recovery is above criteria for Copper at 126% with criteria of (75-125).

D. Post Digestion/Distillation Spike (PDS):

Post-digestion spike analysis was performed on sample: OU2-SS-

416-0002 (K0598-17APDS) for Copper. Percent recovery remained elevated at 127%.

E. Duplicate sample:

Duplicate analyses were performed on sample: OU2-SS-416-0002 (K0598-17ADUP).

Relative percent differences were within the QC limits.

F. Serial Dilution (SD):

Serial Dilution analyses were performed on sample: OU2-SS-416-0002 (K0598-17ASD).

Percent differences were within the QC limits.

G. Samples:

No other unusual occurrences were noted during sample analysis.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Mitkem, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Signed Edward W. Lewis

Date: 4/28/11

2K - FORM II SV-4

SOIL SEMIVOLATILE DEUTERATED MONITORING COMPOUND RECOVERY

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Level: (LOW/MED) LOW

	CLIENT SAMPLE NO.	SDMC1 (STCB) #	SDMC2 (SOCB) #							TOT OUT
01	LCS-58609	85	92							0
02	LCSD-58609	78	84							0
03	MB-58608	98	106							0
04	LCS-58608	90	101							0
05	OU2-SS-400-0002	90	110							0
06	OU2-SS-401-0002	75	90							0
07	OU2-SS-402-0002	55 *	78							1
08	OU2-SS-403-0002	105	122							0
09	OU2-SS-404-0002	79	93							0
10	OU2-SS-405-0002	88	103							0
11	OU2-SS-406-0002	73	86							0
12	OU2-SS-407-0002	83	96							0
13	OU2-SS-408-0002	80	108							0
14	OU2-SS-409-0002	85	101							0
15	OU2-SS-417-0002	81	89							0
16	OU2-SS-DUP06-041211	91	104							0
17	OU2-SS-413-0002	90	122							0

			QC LIMITS
SDMC1	(STCB)	3,3′,4,4′-tetraCB-C13	(60-140)
SDMC2	(SOCB)	2,2′,3,3′,4,4′,5,5′-octaCB-C13	(60-140)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D DMC diluted out

som11.03.17.A

2K - FORM II SV-4

SOIL SEMIVOLATILE DEUTERATED MONITORING COMPOUND RECOVERY

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Level: (LOW/MED) LOW

	CLIENT SAMPLE NO.	SDMC1 (STCB) #	SDMC2 (SOCB) #							TOT OUT
18	OU2-SS-414-0 002	85	96							0
19	OU2-SS-415-0 002	61	84							0
20	OU2-SS-410-0 002	83	98							0
21	OU2-SS-411-0 002	48 *	68							1
22	OU2-SS-412-0 002	75	103							0
23	OU2-SS-416-0 002	49 *	79							1
24	OU2-SS-416-0 002MS	54 *	62							1
25	OU2-SS-416-0 002MSD	53 *	68							1
26	OU2-SS-418-0 002	69	77							0
27	OU2-SS-DUP02 -41111	65	70							0
28	MB-58609	94	108							0

			QC LIMITS
SDMC1	(STCB)	3,3´,4,4´-tetraCB-C13	(60-140)
SDMC2	(SOCB)	2,2´,3,3´,4,4´,5,5´-octaCB-C13	(60-140)

Column to be used to flag recovery values

* Values outside of contract required QC limits

~~D DMC diluted out~~

som11.03.17.A

U.S. EPA - CLP

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PREPARATION LOG

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Preparation Method: 3050B Batch ID: 58641

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	04/15/2011	1.00	50
OU2-SS-400-0002	04/15/2011	1.23	50
OU2-SS-401-0002	04/15/2011	1.93	50
OU2-SS-402-0002	04/15/2011	2.00	50
OU2-SS-403-0002	04/15/2011	1.69	50
OU2-SS-404-0002	04/15/2011	1.55	50
OU2-SS-405-0002	04/15/2011	1.31	50
OU2-SS-406-0002	04/15/2011	1.38	50
OU2-SS-407-0002	04/15/2011	1.57	50
OU2-SS-408-0002	04/15/2011	1.45	50
OU2-SS-409-0002	04/15/2011	1.08	50
OU2-SS-410-0002	04/15/2011	1.27	50
OU2-SS-411-0002	04/15/2011	1.35	50
OU2-SS-412-0002	04/15/2011	1.21	50
OU2-SS-413-0002	04/15/2011	1.16	50
OU2-SS-414-0002	04/15/2011	1.66	50
OU2-SS-415-0002	04/15/2011	1.34	50
OU2-SS-416-0002	04/15/2011	1.83	50
OU2-SS-416-0002D	04/15/2011	1.88	50
OU2-SS-416-0002S	04/15/2011	1.84	50
OU2-SS-417-0002	04/15/2011	1.51	50
OU2-SS-418-0002	04/15/2011	1.47	50
OU2-SS-DUP02-41111	04/15/2011	1.21	50
PBS	04/15/2011	1.00	50

Comments:

3D - FORM III SV-2

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix Spike - EPA Sample No.: OU2-SS-416-0002

COMPOUND	SPIKE ADDED (µg/Kg)	SAMPLE CONCENTRATION (µg/Kg)	MS CONCENTRATION (µg/Kg)	MS %REC	#	QC. LIMITS REC.
Monochlorobiphenyl	9.0074	1.7304	5.9199	47	*	60-140
Dichlorobiphenyl	9.0074	0.0000	4.1332	46	*	60-140
Trichlorobiphenyl	9.0074	0.1296	5.0261	54	*	60-140
Tetrachlorobiphenyl	18.0148	0.0000	9.1920	51	*	60-140
Pentachlorobiphenyl	18.0148	0.0000	9.8862	55	*	60-140
Hexachlorobiphenyl	18.0148	1.5508	9.9716	47	*	60-140
Heptachlorobiphenyl	27.0222	0.0000	15.4288	57	*	60-140
Octachlorobiphenyl	27.0222	0.0000	15.2788	57	*	60-140
Decachlorobiphenyl	45.0369	0.0000	26.3769	59	*	60-140
Total PCBs	180.1477	3.4108	101.2134	54	*	60-140

COMPOUND	SPIKE ADDED (µg/Kg)	MSD CONCENTRATION (µg/Kg)	MSD %REC	#	%RPD	#	QC LIMITS RPD	QC LIMITS REC.
Monochlorobiphenyl	9.0668	5.1819	38	*	20		0-40	60-140
Dichlorobiphenyl	9.0668	3.7592	41	*	10		0-40	60-140
Trichlorobiphenyl	9.0668	3.7268	40	*	31		0-40	60-140
Tetrachlorobiphenyl	18.1337	8.4406	47	*	9		0-40	60-140
Pentachlorobiphenyl	18.1337	8.8495	49	*	12		0-40	60-140
Hexachlorobiphenyl	18.1337	9.4399	44	*	7		0-40	60-140
Heptachlorobiphenyl	27.2005	14.0906	52	*	10		0-40	60-140
Octachlorobiphenyl	27.2005	14.0097	52	*	9		0-40	60-140
Decachlorobiphenyl	45.3342	20.3398	45	*	26		0-40	60-140
Total PCBs	181.3368	87.8379	47	*	15		0-40	60-140

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

* Values outside of QC limits

RPD: 0 out of 10 outside limits

Spike Recovery: 20 out of 20 outside limits

COMMENTS:

U.S. EPA - CLP

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PREPARATION LOG

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Preparation Method: 3050B Batch ID: 58642

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	04/15/2011	1.00	50
OU2-SS-DUP06-041211	04/15/2011	1.61	50
PBS	04/15/2011	1.00	50

Comments:

4C - FORM IV SV

SEMIVOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

MB-58609

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Lab File ID: S5B1074.D Lab Sample ID: MB-58609

Instrument ID: S5 Date Extracted: 04/14/2011

Matrix: (SOIL/SED/WATER) SOIL Date Analyzed: 04/21/2011

Level: (LOW/MED) LOW Time Analyzed: 13:57

Extraction: (Type) SONC GPC Cleanup: (Y/N) N

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	LCS-58609	LCS-58609	S5B1040.D	04/20/2011
02	LCSD-58609	LCSD-58609	S5B1041.D	04/20/2011
03	OU2-SS-DUP06-041211	K0598-21A	S5B1057.D	04/21/2011

COMMENTS:

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MB-58609

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: MB-58609

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S5B1074.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: Decanted: (Y/N) Date Received:

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/21/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.083	U	0.054	0.083	0.33
25512-42-9	Dichlorobiphenyl	0.083	U	0.031	0.083	0.33
25323-68-6	Trichlorobiphenyl	0.083	U	0.035	0.083	0.33
26914-33-0	Tetrachlorobiphenyl	0.17	U	0.066	0.17	0.66
25429-29-2	Pentachlorobiphenyl	0.17	U	0.069	0.17	0.66
26601-64-9	Hexachlorobiphenyl	0.17	U	0.059	0.17	0.66
28655-71-2	Heptachlorobiphenyl	0.25	U	0.10	0.25	1.0
55722-26-4	Octachlorobiphenyl	0.25	U	0.18	0.25	1.0
53742-07-7	Nonachlorobiphenyl	0.42	U	0.16	0.42	1.7
2051-24-3	Decachlorobiphenyl	0.42	U	0.16	0.42	1.7
1336-36-3	Total PCBs	0.083	U	0.031	0.083	0.33

3 - FORM III
SOIL LABORATORY CONTROL
SAMPLE RECOVERY

CLIENT SAMPLE NO.

LCS-58609

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Lab Sample ID: LCS-58609 LCS Lot No.: CE-2286

Date Extracted: 04/14/2011 Date Analyzed (1): 04/20/2011

COMPOUND	SPIKE ADDED	SAMPLE CONCENTRATION	LCS CONCENTRATION	LCS %REC	#	QC. LIMITS REC.
Monochlorobiphenyl	8.3333	0.0000	7.3091	88		60 - 140
Dichlorobiphenyl	8.3333	0.0000	7.2245	87		60 - 140
Trichlorobiphenyl	8.3333	0.0000	7.2233	87		60 - 140
Tetrachlorobiphenyl	16.6667	0.0000	14.6879	88		60 - 140
Pentachlorobiphenyl	16.6667	0.0000	15.3207	92		60 - 140
Hexachlorobiphenyl	16.6667	0.0000	14.0623	84		60 - 140
Heptachlorobiphenyl	25.0000	0.0000	21.8785	88		60 - 140
Octachlorobiphenyl	25.0000	0.0000	22.0289	88		60 - 140
Decachlorobiphenyl	41.6667	0.0000	38.7289	93		60 - 140
Total PCBs	166.6667	0.0000	148.4642	89		60 - 140

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

* Values outside of QC limits

Spike Recovery: 0 out of 10 outside limits

COMMENTS:

3 - FORM III
SOIL LABORATORY CONTROL
SAMPLE DUPLICATE RECOVERY

EPA SAMPLE NO.

LCSD-58609

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Lab Sample ID: LCSD-58609 LCS Lot No.: CE-2286

COMPOUND	SPIKE ADDED	LCSD CONCENTRATION	LCSD %REC	#	%RPD	#	QC LIMITS RPD	QC LIMITS REC.
Monochlorobiphenyl	8.3333	6.9158	83		6		40	60 - 140
Dichlorobiphenyl	8.3333	6.7134	81		7		40	60 - 140
Trichlorobiphenyl	8.3333	6.6448	80		8		40	60 - 140
Tetrachlorobiphenyl	16.6667	13.6163	82		7		40	60 - 140
Pentachlorobiphenyl	16.6667	14.0070	84		9		40	60 - 140
Hexachlorobiphenyl	16.6667	12.8892	77		9		40	60 - 140
Heptachlorobiphenyl	25.0000	20.1207	80		10		40	60 - 140
Octachlorobiphenyl	25.0000	20.1696	81		8		40	60 - 140
Decachlorobiphenyl	41.6667	35.5769	85		9		40	60 - 140
Total PCBs	166.6667	136.6537	82		8		40	60 - 140

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

* Values outside of QC limits

RPD: 0 out of 10 outside limits

Spike Recovery: 0 out of 10 outside limits

COMMENTS:

4C - FORM IV SV

SEMIVOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

MB-58608

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Lab File ID: S5B1042.D Lab Sample ID: MB-58608

Instrument ID: S5 Date Extracted: 04/14/2011

Matrix: (SOIL/SED/WATER) SOIL Date Analyzed: 04/20/2011

Level: (LOW/MED) LOW Time Analyzed: 17:54

Extraction: (Type) SONC GPC Cleanup: (Y/N) N

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED
01	LCS-58608	LCS-58608	S5B1043.D	04/20/2011
02	OU2-SS-400-0002	K0598-01A	S5B1044.D	04/20/2011
03	OU2-SS-401-0002	K0598-02A	S5B1045.D	04/20/2011
04	OU2-SS-402-0002	K0598-03A	S5B1046.D	04/20/2011
05	OU2-SS-403-0002	K0598-04A	S5B1047.D	04/20/2011
06	OU2-SS-404-0002	K0598-05A	S5B1048.D	04/20/2011
07	OU2-SS-405-0002	K0598-06A	S5B1049.D	04/20/2011
08	OU2-SS-406-0002	K0598-07A	S5B1050.D	04/20/2011
09	OU2-SS-407-0002	K0598-08A	S5B1051.D	04/20/2011
10	OU2-SS-408-0002	K0598-09A	S5B1052.D	04/21/2011
11	OU2-SS-409-0002	K0598-10A	S5B1053.D	04/21/2011
12	OU2-SS-417-0002	K0598-18A	S5B1056.D	04/21/2011
13	OU2-SS-413-0002	K0598-14A	S5B1058.D	04/21/2011
14	OU2-SS-414-0002	K0598-15A	S5B1059.D	04/21/2011
15	OU2-SS-415-0002	K0598-16A	S5B1060.D	04/21/2011
16	OU2-SS-410-0002	K0598-11A	S5B1061.D	04/21/2011

COMMENTS:

4C - FORM IV SV

SEMIVOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

MB-58608

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Lab File ID: S5B1042.D Lab Sample ID: MB-58608

Instrument ID: S5 Date Extracted: 04/14/2011

Matrix: (SOIL/SED/WATER) SOIL Date Analyzed: 04/20/2011

Level: (LOW/MED) LOW Time Analyzed: 17:54

Extraction: (Type) SONC GPC Cleanup: (Y/N) N

17	OU2-SS-411-0002	K0598-12A	S5B1062.D	04/21/2011
18	OU2-SS-412-0002	K0598-13A	S5B1063.D	04/21/2011
19	OU2-SS-416-0002	K0598-17A	S5B1066.D	04/21/2011
20	OU2-SS-416-0002MS	K0598-17AMS	S5B1067.D	04/21/2011
21	OU2-SS-416-0002MSD	K0598-17AMSD	S5B1068.D	04/21/2011
22	OU2-SS-418-0002	K0598-19A	S5B1069.D	04/21/2011
23	OU2-SS-DUP02-41111	K0598-20A	S5B1071.D	04/21/2011

COMMENTS:

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

MB-58608

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: MB-58608

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S5B1042.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: Decanted: (Y/N) Date Received:

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/20/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.083	U	0.054	0.083	0.33
25512-42-9	Dichlorobiphenyl	0.083	U	0.031	0.083	0.33
25323-68-6	Trichlorobiphenyl	0.083	U	0.035	0.083	0.33
26914-33-0	Tetrachlorobiphenyl	0.17	U	0.066	0.17	0.66
25429-29-2	Pentachlorobiphenyl	0.17	U	0.069	0.17	0.66
26601-64-9	Hexachlorobiphenyl	0.17	U	0.059	0.17	0.66
28655-71-2	Heptachlorobiphenyl	0.25	U	0.10	0.25	1.0
55722-26-4	Octachlorobiphenyl	0.25	U	0.18	0.25	1.0
53742-07-7	Nonachlorobiphenyl	0.42	U	0.16	0.42	1.7
2051-24-3	Decachlorobiphenyl	0.42	U	0.16	0.42	1.7
1336-36-3	Total PCBs	0.083	U	0.031	0.083	0.33

3 - FORM III
SOIL LABORATORY CONTROL
SAMPLE RECOVERY

CLIENT SAMPLE NO.

LCS-58608

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Lab Sample ID: LCS-58608 LCS Lot No.: CE-2286

Date Extracted: 04/14/2011 Date Analyzed (1): 04/20/2011

COMPOUND	SPIKE ADDED	SAMPLE CONCENTRATION	LCS CONCENTRATION	LCS %REC	#	QC. LIMITS REC.
Monochlorobiphenyl	8.3333	0.0000	7.2093	87		60 - 140
Dichlorobiphenyl	8.3333	0.0000	7.2279	87		60 - 140
Trichlorobiphenyl	8.3333	0.0000	7.2283	87		60 - 140
Tetrachlorobiphenyl	16.6667	0.0000	14.8945	89		60 - 140
Pentachlorobiphenyl	16.6667	0.0000	15.9817	96		60 - 140
Hexachlorobiphenyl	16.6667	0.0000	15.8382	95		60 - 140
Heptachlorobiphenyl	25.0000	0.0000	23.0491	92		60 - 140
Octachlorobiphenyl	25.0000	0.0000	23.6707	95		60 - 140
Decachlorobiphenyl	41.6667	0.0000	42.9953	103		60 - 140
Total PCBs	166.6667	0.0000	158.0951	95		60 - 140

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

* Values outside of QC limits

Spike Recovery: 0 out of 10 outside limits

COMMENTS:

Injection Log

AQ: SS-680FS, SS-680SM
GT: SS7680_EQ

Directory: O:\S5.I\110420.B

INLET MAINT: CLEAN SOURCE INLET PUT ON A CLEANED COLUMN

ICAL 6989

Line	Vial	FileName	Multiplier	SampleName	Misc Info	Injected
1	1	S5b1030.d	1.	SSTDWIN5A,SSTDWIN5A SP0711021K	E680 WINDOW 2.5...	20 Apr 2011 10:06
2	2	S5b1031.d	1.	SSTDL35E,SSTDL35E SW 1008IZC	E680 CCAL L3 25...	20 Apr 2011 10:52
3	3	S5b1032.d	1.	SSTDL15E,SSTDL15E A	E680 ICAL L1 5-...	20 Apr 2011 11:44
4	4	S5b1033.d	1.	SSTDL25E,SSTDL25E B	E680 ICAL L2 50...	20 Apr 2011 12:21
5	5	S5b1034.d	1.	SSTDL45E,SSTDL45E D	E680 ICAL L4 10...	20 Apr 2011 12:58
6	6	S5b1035.d	1.	SSTDL55E,SSTDL55E E	E680 ICAL L5 25...	20 Apr 2011 13:35
7	7	S5b1036.d	1.	SICVL35E,SICVL35E F	E680 ICV 250-12...	20 Apr 2011 14:12
8	1	S5b1037.d	1.	SSTDWIN5F,SSTDWIN5F	E680 WINDOW 2.5...	20 Apr 2011 14:49
9	2	S5b1038.d	1.	SSTDL35F,SSTDL35F	E680 CCAL L3 25...	20 Apr 2011 15:26
10	9	S5b1039.d	1.	MB-58609,,58609 RR	E680	20 Apr 2011 16:03
11	10	S5b1040.d	1.	LCS-58609,,58609	E680	20 Apr 2011 16:40
12	11	S5b1041.d	1.	LCSD-58609,,58609	E680	20 Apr 2011 17:17
13	12	S5b1042.d	1.	MB-58608,,58608	E680	20 Apr 2011 17:54
14	13	S5b1043.d	1.	LCS-58608,,58608	E680	20 Apr 2011 18:31
15	14	S5b1044.d	1.	K0598-01A,,58608 SS1 53	E680	20 Apr 2011 19:07
16	15	S5b1045.d	1.	K0598-02A,,58608	E680	20 Apr 2011 19:44
17	16	S5b1046.d	1.	K0598-03A,,58608	E680	20 Apr 2011 20:21
18	17	S5b1047.d	1.	K0598-04A,,58608	E680	20 Apr 2011 20:58
19	18	S5b1048.d	1.	K0598-05A,,58608	E680	20 Apr 2011 21:35
20	19	S5b1049.d	1.	K0598-06A,,58608	E680	20 Apr 2011 22:12
21	20	S5b1050.d	1.	K0598-07A,,58608	E680	20 Apr 2011 22:49
22	21	S5b1051.d	1.	K0598-08A,,58608	E680	20 Apr 2011 23:26
23	22	S5b1052.d	1.	K0598-09A,,58608	E680	21 Apr 2011 00:04
24	23	S5b1053.d	1.	K0598-10A,,58608	E680	21 Apr 2011 00:41
25	1	S5b1054.d	1.	SSTDWIN5G,SSTDWIN5G	E680 WINDOW 2.5...	21 Apr 2011 01:18
26	2	S5b1055.d	1.	SSTDL35G,SSTDL35G	E680 CCAL L3 25...	21 Apr 2011 01:56
27	24	S5b1056.d	1.	K0598-18A,,58608	E680	21 Apr 2011 02:33
28	25	S5b1057.d	1.	K0598-21A,,58609	E680	21 Apr 2011 03:10
29	26	S5b1058.d	1.	K0598-14A,,58608	E680	21 Apr 2011 03:48
30	27	S5b1059.d	1.	K0598-15A,,58608	E680	21 Apr 2011 04:25
31	28	S5b1060.d	1.	K0598-16A,,58608	E680	21 Apr 2011 05:02
32	29	S5b1061.d	1.	K0598-11A,,58608	E680	21 Apr 2011 05:40
33	30	S5b1062.d	1.	K0598-12A,,58608 SS1 48	E680	21 Apr 2011 06:17
34	31	S5b1063.d	1.	K0598-13A,,58608	E680	21 Apr 2011 06:54
35	1	S5b1064.d	1.	SSTDWIN5H,SSTDWIN5H	E680 WINDOW 2.5...	21 Apr 2011 07:42
36	2	S5b1065.d	1.	SSTDL35H,SSTDL35H	E680 CCAL L3 25...	21 Apr 2011 08:19
37	32	S5b1066.d	1.	K0598-17A,,58608 SS1 48	E680	21 Apr 2011 08:57
38	33	S5b1067.d	1.	K0598-17AMS,,58608 SS1 54	E680	21 Apr 2011 09:33
39	34	S5b1068.d	1.	K0598-17AMSD,,58608 SS1 52	E680	21 Apr 2011 10:10
40	35	S5b1069.d	1.	K0598-19A,,58608	E680	21 Apr 2011 10:47
41	36	S5b1070.d	1.	wrong vial NA	E680	21 Apr 2011 11:24
42	36	S5b1071.d	1.	K0598-20A,,58608	E680	21 Apr 2011 12:01
43	2	S5b1072.d	1.	SSTDL35I,SSTDL35I NA	E680 CCAL L3 25...	21 Apr 2011 12:43
44	2	S5b1073.d	1.	SSTDL35I,SSTDL35I NA	E680 CCAL L3 25...	21 Apr 2011 13:20
45	9	S5b1074.d	1.	MB-58609,,58609	E680	21 Apr 2011 13:57
46	2	S5b1075.d	1.	SSTDL35J,SSTDL35J	E680 CCAL L3 25...	21 Apr 2011 14:34
47	98	S5b1076.d	1.	AR1660 NA	E680	21 Apr 2011 15:11
48	98	S5b1077.d	1.	AR1660	E680	21 Apr 2011 15:48

Do not report SSTDL35I - still within the 12 hour window - OK

LL 4/22/11

22 Apr 2011 11:48

0574

6E - FORM VI SV-1

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Instrument ID: S5 Calibration Date(s): 04/20/2011 04/20/2011

Calibration Time(s): 10:52 13:35

LAB FILE ID: RRFL15 = S5B1032.D RRFL25 = S5B1033.D

RRFL35 = S5B1031.D RRFL45 = S5B1034.D RRFL55 = S5B1035.D

COMPOUND	RRFL15	RRFL25	RRFL35	RRFL45	RRFL55	$\overline{RRF}$	%RSD
Monochlorobiphenyl	2.517	2.348	2.769	2.412	2.398	2.489	6.8
Dichlorobiphenyl	2.161	2.001	2.006	1.785	1.711	1.933	9.4
Trichlorobiphenyl	1.600	1.505	1.497	1.355	1.313	1.454	8.1
Tetrachlorobiphenyl	1.066	0.954	0.951	0.885	0.878	0.947	8.0
Pentachlorobiphenyl	0.925	0.866	0.863	0.808	0.810	0.855	5.6
Hexachlorobiphenyl	0.966	0.941	0.914	0.834	0.823	0.896	7.2
Heptachlorobiphenyl	0.969	0.850	0.853	0.818	0.857	0.869	6.7
Octachlorobiphenyl	0.848	0.752	0.780	0.722	0.740	0.768	6.4
Nonachlorobiphenyl	0.460	0.440	0.471	0.368	0.429	0.434	9.3
Decachlorobiphenyl	0.460	0.440	0.471	0.368	0.429	0.434	9.3

6F - FORM VI SV-2

SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Instrument ID: S5 Calibration Date(s): 04/20/2011 04/20/2011

Calibration Time(s): 10:52 13:35

LAB FILE ID: RRFL15 = S5B1032.D RRFL25 = S5B1033.D

RRFL35 = S5B1031.D RRFL45 = S5B1034.D RRFL55 = S5B1035.D

COMPOUND	RRFL15	RRFL25	RRFL35	RRFL45	RRFL55	$\overline{RRF}$	%RSD
3,3´,4,4´-tetraCB-C13	1.465	1.281	1.337	1.259	1.229	1.314	7.1
2,2´,3,3´,4,4´,5,5´-octaCB-C13	0.627	0.596	0.676	0.617	0.646	0.633	4.8

Method 680 Homolog Tune Report

Datafile: S5B1038.D

Homolog	Ions		Ratio	Limit
Monochlorobiphenyl	188	190	3.00	2.50 to 3.50
Dichlorobiphenyl	222	224	1.53	1.30 to 1.70
Trichlorobiphenyl	256	258	1.02	0.80 to 1.20
Tetrachlorobiphenyl	292	290	1.31	1.10 to 1.50
Pentachlorobiphenyl	326	324	1.61	1.40 to 1.80
Hexachlorobiphenyl	360	362	1.23	1.00 to 1.40
Heptachlorobiphenyl	394	396	1.02	0.90 to 1.20
Octachlorobiphenyl	430	428	1.12	0.90 to 1.30
Decachlorobiphenyl	498	496	1.44	1.20 to 1.60

7E - FORM VII SV-1

SEMIVOLATILE CONTINUING CALIBRATION DATA

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Instrument ID: S5 Calibration Date: 04/20/2011 Time: 15:26

Lab File ID: S5B1038.D Init. Calib. Date(s): 04/20/2011 04/20/2011

EPA Sample No.(SSTD020##) SSTDL35F Init. Calib. Time(s): 10:52 13:35

GC Column: Rxi-5sil MS ID: 0.25 (mm)

COMPOUND	RRF	RRFL35	MIN RRF	%D	MAX %D
Monochlorobiphenyl	2.489	2.595	0.010	4.3	20.0
Dichlorobiphenyl	1.933	2.016	0.010	4.3	20.0
Trichlorobiphenyl	1.454	1.508	0.010	3.7	20.0
Tetrachlorobiphenyl	0.947	0.956	0.010	1.0	20.0
Pentachlorobiphenyl	0.855	0.866	0.010	1.4	20.0
Hexachlorobiphenyl	0.896	0.893	0.010	-0.3	20.0
Heptachlorobiphenyl	0.869	0.851	0.010	-2.0	20.0
Octachlorobiphenyl	0.768	0.780	0.010	1.5	20.0
Nonachlorobiphenyl	0.434	0.460	0.010	6.0	20.0
Decachlorobiphenyl	0.434	0.460	0.010	6.0	20.0

7F - FORM VII SV-2

SEMIVOLATILE CONTINUING CALIBRATION DATA

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Instrument ID: S5 Calibration Date: 04/20/2011 Time: 15:26

Lab File ID: S5B1038.D Init. Calib. Date(s): 04/20/2011 04/20/2011

EPA Sample No.(SSTD020##) SSTDL35F Init. Calib. Time(s): 10:52 13:35

GC Column: Rxi-5sil MS ID: 0.25 (mm)

COMPOUND	$\overline{RRF}$	RRFL35	MIN RRF	%D	MAX %D
3,3´,4,4´-tetraCB-C13	1.314	1.325	0.010	0.9	20.0
2,2´,3,3´,4,4´,5,5´-octaCB-C13	0.633	0.669	0.010	5.7	20.0

Method 680 Homolog Tune Report

Datafile: S5B1055.D

Homolog	Ions		Ratio	Limit
Monochlorobiphenyl	188	190	2.99	2.50 to 3.50
Dichlorobiphenyl	222	224	1.52	1.30 to 1.70
Trichlorobiphenyl	256	258	1.02	0.80 to 1.20
Tetrachlorobiphenyl	292	290	1.31	1.10 to 1.50
Pentachlorobiphenyl	326	324	1.63	1.40 to 1.80
Hexachlorobiphenyl	360	362	1.23	1.00 to 1.40
Heptachlorobiphenyl	394	396	1.03	0.90 to 1.20
Octachlorobiphenyl	430	428	1.12	0.90 to 1.30
Decachlorobiphenyl	498	496	1.44	1.20 to 1.60

7E - FORM VII SV-1

SEMIVOLATILE CONTINUING CALIBRATION DATA

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Instrument ID: S5 Calibration Date: 04/21/2011 Time: 1:56

Lab File ID: S5B1055.D Init. Calib. Date(s): 04/20/2011 04/20/2011

EPA Sample No.(SSTD020##) SSTDL35G Init. Calib. Time(s): 10:52 13:35

GC Column: Rxi-5sil MS ID: 0.25 (mm)

COMPOUND	RRF	RRFL35	MIN RRF	%D	MAX %D
Monochlorobiphenyl	2.489	2.488	0.010	0.0	20.0
Dichlorobiphenyl	1.933	2.022	0.010	4.6	20.0
Trichlorobiphenyl	1.454	1.533	0.010	5.4	20.0
Tetrachlorobiphenyl	0.947	0.975	0.010	3.0	20.0
Pentachlorobiphenyl	0.855	0.879	0.010	2.9	20.0
Hexachlorobiphenyl	0.896	0.943	0.010	5.3	20.0
Heptachlorobiphenyl	0.869	0.866	0.010	-0.3	20.0
Octachlorobiphenyl	0.768	0.787	0.010	2.5	20.0
Nonachlorobiphenyl	0.434	0.483	0.010	11.3	20.0
Decachlorobiphenyl	0.434	0.483	0.010	11.3	20.0

7F - FORM VII SV-2

SEMIVOLATILE CONTINUING CALIBRATION DATA

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Instrument ID: S5 Calibration Date: 04/21/2011 Time: 1:56

Lab File ID: S5B1055.D Init. Calib. Date(s): 04/20/2011 04/20/2011

EPA Sample No.(SSTD020##) SSTDL35G Init. Calib. Time(s): 10:52 13:35

GC Column: Rxi-5sil MS ID: 0.25 (mm)

COMPOUND	$\overline{RRF}$	RRFL35	MIN RRF	%D	MAX %D
3,3´,4,4´-tetraCB-C13	1.314	1.339	0.010	1.9	20.0
2,2´,3,3´,4,4´,5,5´-octaCB-C13	0.633	0.753	0.010	19.1	20.0

Method 680 Homolog Tune Report

Datafile: S5B1065.D

Homolog	Ions		Ratio	Limit
Monochlorobiphenyl	188	190	3.01	2.50 to 3.50
Dichlorobiphenyl	222	224	1.53	1.30 to 1.70
Trichlorobiphenyl	256	258	1.03	0.80 to 1.20
Tetrachlorobiphenyl	292	290	1.30	1.10 to 1.50
Pentachlorobiphenyl	326	324	1.61	1.40 to 1.80
Hexachlorobiphenyl	360	362	1.23	1.00 to 1.40
Heptachlorobiphenyl	394	396	1.03	0.90 to 1.20
Octachlorobiphenyl	430	428	1.11	0.90 to 1.30
Decachlorobiphenyl	498	496	1.44	1.20 to 1.60

7E - FORM VII SV-1

SEMIVOLATILE CONTINUING CALIBRATION DATA

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Instrument ID: S5 Calibration Date: 04/21/2011 Time: 8:19

Lab File ID: S5B1065.D Init. Calib. Date(s): 04/20/2011 04/20/2011

EPA Sample No.(SSTD020##) SSTDL35H Init. Calib. Time(s): 10:52 13:35

GC Column: Rxi-5sil MS ID: 0.25 (mm)

COMPOUND	$\overline{RRF}$	RRFL35	MIN RRF	%D	MAX %D
Monochlorobiphenyl	2.489	2.480	0.010	-0.3	20.0
Dichlorobiphenyl	1.933	2.009	0.010	4.0	20.0
Trichlorobiphenyl	1.454	1.514	0.010	4.1	20.0
Tetrachlorobiphenyl	0.947	0.958	0.010	1.2	20.0
Pentachlorobiphenyl	0.855	0.865	0.010	1.3	20.0
Hexachlorobiphenyl	0.896	0.926	0.010	3.3	20.0
Heptachlorobiphenyl	0.869	0.861	0.010	-0.9	20.0
Octachlorobiphenyl	0.768	0.778	0.010	1.3	20.0
Nonachlorobiphenyl	0.434	0.469	0.010	8.1	20.0
Decachlorobiphenyl	0.434	0.469	0.010	8.1	20.0

7F - FORM VII SV-2

SEMIVOLATILE CONTINUING CALIBRATION DATA

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Instrument ID: S5 Calibration Date: 04/21/2011 Time: 8:19

Lab File ID: S5B1065.D Init. Calib. Date(s): 04/20/2011 04/20/2011

EPA Sample No.(SSTD020##) SSTDL35H Init. Calib. Time(s): 10:52 13:35

GC Column: Rxi-5sil MS ID: 0.25 (mm)

COMPOUND	$\overline{RRF}$	RRFL35	MIN RRF	%D	MAX %D
3,3´,4,4´-tetraCB-C13	1.314	1.307	0.010	-0.5	20.0
2,2´,3,3´,4,4´,5,5´-octaCB-C13	0.633	0.740	0.010	16.9	20.0

Method 680 Homolog Tune Report

Datafile: S5B1075.D

Homolog	Ions		Ratio	Limit
Monochlorobiphenyl	188	190	3.03	2.50 to 3.50
Dichlorobiphenyl	222	224	1.52	1.30 to 1.70
Trichlorobiphenyl	256	258	1.02	0.80 to 1.20
Tetrachlorobiphenyl	292	290	1.30	1.10 to 1.50
Pentachlorobiphenyl	326	324	1.61	1.40 to 1.80
Hexachlorobiphenyl	360	362	1.23	1.00 to 1.40
Heptachlorobiphenyl	394	396	1.03	0.90 to 1.20
Octachlorobiphenyl	430	428	1.12	0.90 to 1.30
Decachlorobiphenyl	498	496	1.44	1.20 to 1.60

7E - FORM VII SV-1

SEMIVOLATILE CONTINUING CALIBRATION DATA

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Instrument ID: S5 Calibration Date: 04/21/2011 Time: 14:34

Lab File ID: S5B1075.D Init. Calib. Date(s): 04/20/2011 04/20/2011

EPA Sample No.(SSTD020##) SSTDL35J Init. Calib. Time(s): 10:52 13:35

GC Column: Rxi-5sil MS ID: 0.25 (mm)

COMPOUND	$\overline{RRF}$	RRFL35	MIN RRF	%D	MAX %D
Monochlorobiphenyl	2.489	2.436	0.010	-2.1	20.0
Dichlorobiphenyl	1.933	1.963	0.010	1.6	20.0
Trichlorobiphenyl	1.454	1.490	0.010	2.4	20.0
Tetrachlorobiphenyl	0.947	0.948	0.010	0.2	20.0
Pentachlorobiphenyl	0.855	0.860	0.010	0.6	20.0
Hexachlorobiphenyl	0.896	0.918	0.010	2.5	20.0
Heptachlorobiphenyl	0.869	0.852	0.010	-2.0	20.0
Octachlorobiphenyl	0.768	0.768	0.010	-0.1	20.0
Nonachlorobiphenyl	0.434	0.424	0.010	-2.4	20.0
Decachlorobiphenyl	0.434	0.424	0.010	-2.4	20.0

7F - FORM VII SV-2

SEMIVOLATILE CONTINUING CALIBRATION DATA

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Instrument ID: S5 Calibration Date: 04/21/2011 Time: 14:34

Lab File ID: S5B1075.D Init. Calib. Date(s): 04/20/2011 04/20/2011

EPA Sample No.(SSTD020##) SSTDL35J Init. Calib. Time(s): 10:52 13:35

GC Column: Rxi-5sil MS ID: 0.25 (mm)

COMPOUND	$\overline{RRF}$	RRFL35	MIN RRF	%D	MAX %D
3,3´,4,4´-tetraCB-C13	1.314	1.276	0.010	-2.9	20.0
2,2´,3,3´,4,4´,5,5´-octaCB-C13	0.633	0.694	0.010	9.8	20.0

8C - FORM VIII SV-1

SEMIVOLATILE INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

GC Column: Rxi-5sil MS ID: 0.25 (mm) Init. Calib. Date(s): 04/20/2011 04/20/2011

EPA Sample No.(SSTD020##) SSTDL35F Date Analyzed: 04/20/2011

Lab File ID (Standard): S5B1038.D Time Analyzed: 15:26

Instrument ID: S5

		IS1 (TCB) AREA	#	RT	#	AREA	#	RT	#	AREA	#	RT	#
	12 HOUR STD	1418449		17.278									
	UPPER LIMIT	2836898		17.445									
	LOWER LIMIT	709225		17.111									
	SAMPLE NO.												
01	LCS-58609	1856005		17.278									
02	LCSD-58609	1797127		17.278									
03	MB-58608	1656274		17.278									
04	LCS-58608	1695856		17.278									
05	OU2-SS-400-0002	1712082		17.278									
06	OU2-SS-401-0002	1880014		17.278									
07	OU2-SS-402-0002	1968674		17.284									
08	OU2-SS-403-0002	1887953		17.284									
09	OU2-SS-404-0002	1938120		17.278									
10	OU2-SS-405-0002	1809229		17.278									
11	OU2-SS-406-0002	1831920		17.284									

IS1 (TCB) = 2,2′,5,5′-tetraCB-C13

AREA UPPER LIMIT = 200% of internal standard area

AREA LOWER LIMIT = 50% of internal standard area

RT UPPER LIMIT = +0.50 minutes of internal standard RT

RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag values outside contract required QC limits with an asterisk.

8C - FORM VIII SV-1

SEMIVOLATILE INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

GC Column: Rxi-5sil MS ID: 0.25 (mm) Init. Calib. Date(s): 04/20/2011 04/20/2011

EPA Sample No.(SSTD020##) SSTDL35F Date Analyzed: 04/20/2011

Lab File ID (Standard): S5B1038.D Time Analyzed: 15:26

Instrument ID: S5

		IS1 (TCB) AREA	#	RT	#	AREA	#	RT	#	AREA	#	RT	#
	12 HOUR STD	1418449		17.278									
	UPPER LIMIT	2836898		17.445									
	LOWER LIMIT	709225		17.111									
	SAMPLE NO.												
12	OU2-SS-407-0002	1879549		17.278									
13	OU2-SS-408-0002	1994866		17.284									
14	OU2-SS-409-0002	1951954		17.284									

IS1 (TCB) = 2,2′,5,5′-tetraCB-C13

AREA UPPER LIMIT = 200% of internal standard area
AREA LOWER LIMIT = 50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag values outside contract required QC limits with an asterisk.

8C - FORM VIII SV-1

SEMIVOLATILE INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

GC Column: Rxi-5sil MS ID: 0.25 (mm) Init. Calib. Date(s): 04/20/2011 04/20/2011

EPA Sample No.(SSTD020##) SSTDL35G Date Analyzed: 04/21/2011

Lab File ID (Standard): S5B1055.D Time Analyzed: 1:56

Instrument ID: S5

		IS1 (TCB) AREA	#	RT	#	AREA	#	RT	#	AREA	#	RT	#
	12 HOUR STD	1504828		17.284									
	UPPER LIMIT	3009656		17.451									
	LOWER LIMIT	752414		17.117									
	SAMPLE NO.												
01	OU2-SS-417-0002	1689241		17.278									
02	OU2-SS-DUP06-041211	1853655		17.284									
03	OU2-SS-413-0002	2033995		17.290									
04	OU2-SS-414-0002	1692132		17.290									
05	OU2-SS-415-0002	1928052		17.289									
06	OU2-SS-410-0002	1937625		17.295									
07	OU2-SS-411-0002	2439585		17.318									
08	OU2-SS-412-0002	1822389		17.301									

IS1 (TCB) = 2,2′,5,5′-tetraCB-C13

AREA UPPER LIMIT = 200% of internal standard area
AREA LOWER LIMIT = 50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag values outside contract required QC limits with an asterisk.

8C - FORM VIII SV-1

SEMIVOLATILE INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

GC Column: Rxi-5sil MS ID: 0.25 (mm) Init. Calib. Date(s): 04/20/2011 04/20/2011

EPA Sample No.(SSTD020##) SSTDL35H Date Analyzed: 04/21/2011

Lab File ID (Standard): S5B1065.D Time Analyzed: 8:19

Instrument ID: S5

		IS1 (TCB) AREA	#	RT	#	AREA	#	RT	#	AREA	#	RT	#
	12 HOUR STD	1443936		17.301									
	UPPER LIMIT	2887872		17.468									
	LOWER LIMIT	721968		17.134									
	SAMPLE NO.												
01	OU2-SS-416-0002	1919573		17.346									
02	OU2-SS-416-0002MS	1859981		17.335									
03	OU2-SS-416-0002MSD	2035279		17.346									
04	OU2-SS-418-0002	2151427		17.341									
05	OU2-SS-DUP02-41111	1620653		17.323									
06	MB-58609	1712783		17.318									

IS1 (TCB) = 2,2′,5,5′-tetraCB-C13

AREA UPPER LIMIT = 200% of internal standard area
AREA LOWER LIMIT = 50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

Column used to flag values outside contract required QC limits with an asterisk.

SAMPLE ID OU2-SS-401-0002

SAMPLE CALC

IS AREA	DILUTION	COMPOUND OF INTEREST	IS AMOUNT (NG/M	Final Extract Volume (UL)	AVE RRF	CONCENTRATION PPB
1880014	1	102581	800	2000	0.8960	3.55

% Solids	Amt. Inj. (UL)	Sample Volume (Grams)
0.91	1	30.2

Hexachlorobiphenyl = 3.5 ug/kg

1D - FORM I SV-1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

OU2-SS-401-0002

Lab Name: MITKEM LABORATORIES Contract:

Lab Code: MITKEM Case No.: K0598 Mod. Ref No.: SDG No.: SK0598

Matrix: (SOIL/SED/WATER) SOIL Lab Sample ID: K0598-02A

Sample wt/vol: 30.2 (g/mL) G Lab File ID: S5B1045.D

Level: (LOW/MED) LOW Extraction: (Type) SONC

% Moisture: 9.0 Decanted: (Y/N) N Date Received: 04/14/2011

Concentrated Extract Volume: 2000 (uL) Date Extracted: 04/14/2011

Injection Volume: 1.0 (uL) GPC Factor: 1.00 Date Analyzed: 04/20/2011

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION: µG/KG	Q	DL	LOD	LOQ
27323-18-8	Monochlorobiphenyl	0.091	U	0.059	0.091	0.36
25512-42-9	Dichlorobiphenyl	0.091	U	0.034	0.091	0.36
25323-68-6	Trichlorobiphenyl	0.091	U	0.038	0.091	0.36
26914-33-0	Tetrachlorobiphenyl	0.18	U	0.072	0.18	0.72
25429-29-2	Pentachlorobiphenyl	1.7		0.075	0.18	0.72
26601-64-9	Hexachlorobiphenyl	3.5		0.064	0.18	0.72
28655-71-2	Heptachlorobiphenyl	2.0		0.11	0.27	1.1
55722-26-4	Octachlorobiphenyl	0.27	U	0.20	0.27	1.1
53742-07-7	Nonachlorobiphenyl	0.46	U	0.17	0.46	1.8
2051-24-3	Decachlorobiphenyl	0.46	U	0.17	0.46	1.8
1336-36-3	Total PCBs	7.2		0.034	0.091	0.36

Quantitation Report (QT Reviewed)

Data Path : O:\S5.I\110420.B\
Data File : S5B1045.D
Acq On : 20 Apr 2011 19:44
Operator : TM
Lab Smp Id: K0598-02A,,58608
Misc : | E680
ALS Vial : 15 Sample Multiplier: 1

Quant Time: Apr 22 10:37:30 2011
Quant Method : O:\S5.I\QMETHODS\S5680_EQ.M
Quant Title : Method 680
QLast Update : Thu Apr 21 08:33:59 2011
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
1) 2,2',5,5'-TetraCB-C13	17.28	304	1880014	800.00 ng/mL	0.00
System Monitoring Compounds					
2) 3,3',4,4'-TetraCB-C13	20.48	304	2324126	752.52 ng/mL	0.01
Spiked Amount 1000.000			Recovery =	75.25%	
3) 2,2',3,3',4,4',5,5'-OctaCB	26.01	442	1360406	903.98 ng/mL	0.04
Spiked Amount 1000.000			Recovery =	90.40%	
Target Compounds					Qvalue
4) Monochlorobiphenyl	0.00	188	0	N.D. d	
5) Dichlorobiphenyl	0.00	222	0	N.D. d	
6) Trichlorobiphenyl	0.00	256	0	N.D. d	
7) Tetrachlorobiphenyl	0.00	292	0	N.D. d	
8) Pentachlorobiphenyl	20.16	326	47325	23.57 ng/mL	
9) Hexachlorobiphenyl	20.39	360	102581	48.74 ng/mL	
10) Heptachlorobiphenyl	21.36	394	54733	26.80 ng/mL	
11) Octachlorobiphenyl	0.00	430	0	N.D. d	
12) Nonachlorobiphenyl	0.00	464	0	N.D.	
13) Decachlorobiphenyl	0.00	498	0	N.D. d	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**D. WITT**	**DATE:**	**June 16, 2011**
FROM:	**MEGAN CARSON**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION – COPPER AND LEAD**
CTO WE43, NSY PORTSMOUTH
SAMPLE DELIVERY GROUP (SDG) – K0598

SAMPLES: 21/Soils

OU2-SS-400-0002	OU2-SS-401-0002
OU2-SS-402-0002	OU2-SS-403-0002
OU2-SS-404-0002	OU2-SS-405-0002
OU2-SS-406-0002	OU2-SS-407-0002
OU2-SS-408-0002	OU2-SS-409-0002
OU2-SS-410-0002	OU2-SS-411-0002
OU2-SS-412-0002	OU2-SS-413-0002
OU2-SS-414-0002	OU2-SS-415-0002
OU2-SS-416-0002	OU2-SS-417-0002
OU2-SS-418-0002	OU2-SS-DUP02-41111
OU2-SS-DUP06-041211	

Overview

The sample set for NSY Portsmouth, CTO WE43, SDG K0598, consists of twenty one (21) soil samples. This SDG contained two field duplicate pairs: OU2-SS-DUP02-41111/OU2-SS-412-0002 and OU2-SS-DUP06-041211/OU2-SS-404-0002.

All samples were analyzed for copper and lead. The samples were collected by Tetra Tech NUS on April 11th and 12th, 2011 and analyzed by Mitkem Laboratories under Naval Facilities Engineering Service Center (NFESC) Quality Assurance / Quality Control (QA/QC) criteria. Antimony and lead analyses were conducted using SW-846 method 6010.

These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • Initial and Continuing Calibration Verification Results
* • Laboratory Method / Preparation Blank Analyses
* • ICP Interference Results
* • Laboratory Duplicate Results
* • Laboratory Control Standard Results
• Matrix Spike Recoveries
• Field Duplicate Precision
* • ICP Serial Dilution
* • Detection Limits
* • Analyte Quantitation

* - All quality control criteria were met for this parameter.

Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B. Appendix C contains Region I worksheets. Appendix D contains the documentation to support the findings as discussed in this validation report.

Matrix spike:

The matrix spike had a percent recovery > 120% for copper. All samples were affected. Positive copper results were qualified as estimated (J).

Field Duplicate Results

Field duplicate pair OU2-SS-DUP02-41111/OU2-SS-412-0002 had relative percent difference > 50% for copper and lead. Cooper and lead results for samples OU2-SS-DUP02-41111 and OU2-SS-412-0002 were qualified as estimated (J) as the other field duplicate pair was within quality control limits.

Notes

The following contaminants were detected in the laboratory method/preparation blanks at the following maximum concentrations:

Analyte	Maximum Concentration	Action Level
Lead (1)	0.397 mg/kg	1.98 mg/kg
Lead (2)	0.287 mg/kg	1.4 mg/kg
Lead (2)	8.6 ug/L	2.15 mg/kg

(1) Maximum concentration present in preparation blank 58642.
(2) Maximum concentration present in preparation blank 58641.
(3) Maximum concentration found in calibration blank analyzed on 4/16/11.

An action level of 5X the maximum contaminant level has been used to evaluate sample data for blank contamination. Sample aliquot, percent solids and dilution factors, if applicable, were taken into consideration when evaluating for blank contamination. No validation action was warranted as sample results were greater than the blank action level.

Executive Summary

Laboratory Performance: Field duplicate pair OU2-SS-DUP02-41111/OU2-SS-412-0002 were qualified for copper and lead non-compliances.

Other Factors Affecting Data Quality: Matrix spike non-compliances for copper resulted in the qualification of sample results.

The data for these analyses were reviewed with reference to the Region 1 EPA-NE Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses, Part VI, November 2008 and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories", April, 2009.

The text of this report has been formulated to address only those problem areas affecting data quality.

Tetra Tech NUS
Megan Carson
Chemist 1/ Data Validator

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C – Region I Worksheets
4. Appendix D – Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Data Validation Qualifier Codes:

A	=	Lab Blank Contamination
B	=	Field Blank Contamination
C	=	Calibration Noncompliance (e.g. % RSDs, %Ds, ICVs, CCVs, RRFs, etc.)
C01	=	GC/MS Tuning Noncompliance
D	=	MS/MSD Recovery Noncompliance
E	=	LCS/LCSD Recovery Noncompliance
F	=	Lab Duplicate Imprecision
G	=	Field Duplicate Imprecision
H	=	Holding Time Exceedance
I	=	ICP Serial Dilution Noncompliance
J	=	GFAA PDS - GFAA MSA's $r < 0.995$
K	=	ICP Interference - includes ICS % R Noncompliance
L	=	Instrument Calibration Range Exceedance
M	=	Sample Preservation Noncompliance
N	=	Internal Standard Noncompliance
N01	=	Internal Standard Recovery Noncompliance Dioxins
N02	=	Recovery Standard Noncompliance Dioxins
N03	=	Clean-up Standard Noncompliance Dioxins
O	=	Poor Instrument Performance (e.g. base-line drifting)
P	=	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q	=	Other problems (can be any number of issues; e.g. poor chromatography,interferences, etc.)
R	=	Surrogates Recovery Noncompliance
S	=	Pesticide/PCB Resolution
T	=	% Breakdown Noncompliance for DDT and Endrin
U	=	% Difference between columns/detectors >25% for positive results determined via GC/HPLC
V	=	Non-linear calibrations; correlation coefficient $r < 0.995$
W	=	EMPC result
X	=	Signal to noise response drop
Y	=	Percent solids <30%
Z	=	Uncertainty at 2 sigma deviation is greater than sample activity

PROJ_NO: 02229	NSAMPLE	OU2-SS-400-0002			OU2-SS-400-0002DL			OU2-SS-401-0002			OU2-SS-402-0002		
SDG: K0598	LAB_ID	K0598-01A			K0598-01A			K0598-02A			K0598-03A		
FRACTION: M	SAMP_DATE	4/12/2011			4/12/2011			4/12/2011			4/12/2011		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/KG			MG/KG			MG/KG			MG/KG		
	PCT_SOLIDS	90.0			90.0			91.0			91.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
COPPER		48.5	J	D				120	J	D			
LEAD					8320			2000			2030		

PROJ_NO: 02229	NSAMPLE	OU2-SS-402-0002DL			OU2-SS-403-0002			OU2-SS-404-0002			OU2-SS-405-0002		
SDG: K0598	LAB_ID	K0598-03A			K0598-04A			K0598-05A			K0598-06A		
FRACTION: M	SAMP_DATE	4/12/2011			4/12/2011			4/12/2011			4/11/2011		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/KG			MG/KG			MG/KG			MG/KG		
	PCT_SOLIDS	91.0			91.0			91.0			96.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
COPPER		1370	J	D	56.3	J	D	36.1	J	D	15.6	J	D
LEAD					269			838			40.4		

PROJ_NO: 02229	NSAMPLE	OU2-SS-406-0002			OU2-SS-407-0002			OU2-SS-407-0002DL			OU2-SS-408-0002		
SDG: K0598	LAB_ID	K0598-07A			K0598-08A			K0598-08A			K0598-09A		
FRACTION: M	SAMP_DATE	4/11/2011			4/11/2011			4/11/2011			4/11/2011		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/KG			MG/KG			MG/KG			MG/KG		
	PCT_SOLIDS	93.0			88.0			88.0			89.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
COPPER		71.7	J	D				2190	J	D	270	J	D
LEAD		1150			3380								

PROJ_NO: 02229	NSAMPLE	OU2-SS-408-0002DL			OU2-SS-409-0002			OU2-SS-410-0002			OU2-SS-411-0002		
SDG: K0598	LAB_ID	K0598-09A			K0598-10A			K0598-11A			K0598-12A		
FRACTION: M	SAMP_DATE	4/11/2011			4/11/2011			4/12/2011			4/11/2011		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/KG			MG/KG			MG/KG			MG/KG		
	PCT_SOLIDS	89.0			94.0			90.0			94.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
COPPER					16.2	J	D	357	J	D	53.2	J	D
LEAD		4870			24.2			1660			258		

PROJ_NO: 02229	NSAMPLE	OU2-SS-412-0002			OU2-SS-413-0002			OU2-SS-414-0002			OU2-SS-415-0002		
SDG: K0598	LAB_ID	K0598-13A			K0598-14A			K0598-15A			K0598-16A		
FRACTION: M	SAMP_DATE	4/11/2011			4/11/2011			4/12/2011			4/12/2011		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/KG			MG/KG			MG/KG			MG/KG		
	PCT_SOLIDS	92.0			92.0			85.0			89.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
COPPER		184	J	DG	390	J	D	338	J	D	410	J	D
LEAD		1550	J	G	770			924			1810		

PROJ_NO: 02229	NSAMPLE	OU2-SS-416-0002			OU2-SS-416-0002DL			OU2-SS-417-0002			OU2-SS-417-0002RE		
SDG: K0598	LAB_ID	K0598-17A			K0598-17A			K0598-18A			K0598-18A		
FRACTION: M	SAMP_DATE	4/11/2011			4/11/2011			4/12/2011			4/12/2011		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/KG			MG/KG			MG/KG			MG/KG		
	PCT_SOLIDS	91.0			91.0			85.0			85.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
COPPER		75	J	D				78.8	J	D			
LEAD					29100						434		

PROJ_NO: 02229	NSAMPLE	OU2-SS-418-0002			OU2-SS-418-0002RE			OU2-SS-DUP02-41111			OU2-SS-DUP02-41111RE		
SDG: K0598	LAB_ID	K0598-19A			K0598-19A			K0598-20A			K0598-20A		
FRACTION: M	SAMP_DATE	4/11/2011			4/11/2011			4/11/2011			4/11/2011		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/KG			MG/KG			MG/KG			MG/KG		
	PCT_SOLIDS	91.0			91.0			92.0			92.0		
	DUP_OF							OU2-SS-412-0002			OU2-SS-412-0002		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
COPPER		224	J	D				86.2	J	DG			
LEAD					311						658	J	G

PROJ_NO: 02229	NSAMPLE	OU2-SS-DUP06-041211		
SDG: K0598	LAB_ID	K0598-21A		
FRACTION: M	SAMP_DATE	4/12/2011		
MEDIA: SOIL	QC_TYPE	NM		
	UNITS	MG/KG		
	PCT_SOLIDS	89.0		
	DUP_OF	OU2-SS-404-0002		
PARAMETER		RESULT	VQL	QLCD
COPPER		51.2	J	D
LEAD		1350		

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-400-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-01

Level (low/med): MED Date Received: 04/14/2011

% Solids: 90.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	48.5		N	P	0.099	0.23	1.4
7439-92-1	Lead	8320			P	3.1	4.5	9.0

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-401-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-02

Level (low/med): MED Date Received: 04/14/2011

% Solids: 91.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	120		N	P	0.063	0.14	0.85
7439-92-1	Lead	2000			P	0.097	0.14	0.28

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-402-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-03

Level (low/med): MED Date Received: 04/14/2011

% Solids: 91.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	1370		N	P	1.2	2.7	16.0
7439-92-1	Lead	2030			P	0.093	0.14	0.27

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-403-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-04

Level (low/med): MED Date Received: 04/14/2011

% Solids: 91.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	56.3		N	P	0.072	0.16	0.98
7439-92-1	Lead	269			P	0.11	0.16	0.33

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-404-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-05

Level (low/med): MED Date Received: 04/14/2011

% Solids: 91.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	36.1		N	P	0.078	0.18	1.1
7439-92-1	Lead	838			P	0.12	0.18	0.35

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-405-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-06

Level (low/med): MED Date Received: 04/14/2011

% Solids: 96.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	15.6		N	P	0.087	0.20	1.2
7439-92-1	Lead	40.4			P	0.14	0.20	0.40

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-406-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-07

Level (low/med): MED Date Received: 04/14/2011

% Solids: 93.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	71.7		N	P	0.086	0.19	1.2
7439-92-1	Lead	1150			P	0.13	0.19	0.39

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-407-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-08

Level (low/med): MED Date Received: 04/14/2011

% Solids: 88.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	2190		N	P	1.6	3.6	22.0
7439-92-1	Lead	3380			P	0.12	0.18	0.36

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-408-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-09

Level (low/med): MED Date Received: 04/14/2011

% Solids: 89.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	270		N	P	0.085	0.19	1.2
7439-92-1	Lead	4870			P	2.6	3.9	7.7

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-409-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-10

Level (low/med): MED Date Received: 04/14/2011

% Solids: 94.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	16.2		N	P	0.11	0.25	1.5
7439-92-1	Lead	24.2			P	0.17	0.25	0.49

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-410-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-11

Level (low/med): MED Date Received: 04/14/2011

% Solids: 90.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	357		N	P	0.096	0.22	1.3
7439-92-1	Lead	1660			P	0.15	0.22	0.44

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-411-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-12

Level (low/med): MED Date Received: 04/14/2011

% Solids: 94.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	53.2		N	P	0.087	0.20	1.2
7439-92-1	Lead	258			P	0.13	0.20	0.39

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-412-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-13

Level (low/med): MED Date Received: 04/14/2011

% Solids: 92.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	184		N	P	0.099	0.22	1.3
7439-92-1	Lead	1550			P	0.15	0.22	0.45

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-413-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-14

Level (low/med): MED Date Received: 04/14/2011

% Solids: 92.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	390		N	P	0.10	0.23	1.4
7439-92-1	Lead	770			P	0.16	0.23	0.47

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-414-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-15

Level (low/med): MED Date Received: 04/14/2011

% Solids: 85.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	338		N	P	0.078	0.18	1.1
7439-92-1	Lead	924			P	0.12	0.18	0.35

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-415-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-16

Level (low/med): MED Date Received: 04/14/2011

% Solids: 89.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	410		N	P	0.092	0.21	1.3
7439-92-1	Lead	1810			P	0.14	0.21	0.42

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-416-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-17

Level (low/med): MED Date Received: 04/14/2011

% Solids: 91.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	75.0		N	P	0.066	0.15	0.90
7439-92-1	Lead	29100			P	2.0	3.0	6.0

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-417-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-18

Level (low/med): MED Date Received: 04/14/2011

% Solids: 85.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	78.8		N	P	0.086	0.19	1.2
7439-92-1	Lead	434			P	0.13	0.19	0.39

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-418-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-19

Level (low/med): MED Date Received: 04/14/2011

% Solids: 91.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	224		N	P	0.082	0.19	1.1
7439-92-1	Lead	311			P	0.13	0.19	0.37

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-DUP02-41111

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-20

Level (low/med): MED Date Received: 04/14/2011

% Solids: 92.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	86.2		N	P	0.099	0.22	1.3
7439-92-1	Lead	658			P	0.15	0.22	0.45

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SS-DUP06-041211

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Lab Sample ID: K0598-21

Level (low/med): MED Date Received: 04/14/2011

% Solids: 89.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7440-50-8	Copper	51.2			P	0.077	0.17	1.0
7439-92-1	Lead	1350			P	0.12	0.17	0.35

Comments:

APPENDIX C

REGIONAL WORKSHEETS

REGION I, EPA-NE INORGANIC REGIONAL DATA ASSESSMENT (IRDA)*

CASE #: _____

LAB NAME: Mitkem

SDG #: K0598

SOW #/CONTRACT #: _____

EPA-NE DV TIER LEVEL: _____

PO: **ACTION _____ FYI _____

SITE NAME: NSY Portsmouth

OF SAMPLES/MATRIX: 21 / Soil

VALIDATION CONTRACTOR: _____

VALIDATOR'S NAME: Megan Carson

DATE DP REC'D BY EPA-NE: _____

DV COMPLETION DATE: _____

ANALYTICAL DATA QUALITY SUMMARY

See DV Report

		ICP-AES	ICP- MS	HG	CN
I.	Preservation and Technical Holding Times				
II.	ICP-MS Tune				
III.	Calibrations				
IV.	Blanks				
V.	ICP-AES Interference Check Sample (ICS)				
VI.	ICP-MS Interference Check Sample (ICS)				
VII.	ICP-MS Internal Standards				
VIII.	Matrix Spikes				
IX.	Laboratory Duplicate Samples				
X.	Field Duplicates				
XI.	ICP Serial Dilutions				
XII.	Sensitivity Check				
XIII.	Performance Evaluation Samples/Accuracy Check				
XIV.	Analyte Quantitation and Reported Quantitation Limits				
XV.	System Performance				
XVI.	Overall Evaluation of Data				

o = Data had no problems or were qualified due to minor contractual problems.
m = Data were qualified due to major contractual problems.
z = Data were rejected as unusable due to major contractual problems.

ACTION ITEMS: (z items) _____

AREAS OF CONCERN: (m items) _____

COMMENTS: _____

* This form assesses the analytical data quality in terms of contractual compliance only. It does not assess sampling errors and/or non-contractual analytical issues that affect data quality.

** Check "ACTION" only if contractual defects resulted in reduced payment/data rejection recommendations.

Validator: Megan Carson

Date: 5/18/11

INSTRUCTIONS ON REVERSE SIDE

DRAFT 11/08

EPA-NE
Data Validation Worksheet Cover Page - Page 1

Site Name _____
Reference No. _____

REGION I INORGANIC DATA VALIDATION

The following data package has been validated:

Lab Name MitKem
Case/Project No.
SDG No. K04598
No. of Samples/Matrix 21/Soil

SOW/Method No. _____
Sampling Date(s) _____
Shipping Date(s) _____
Date Rec'd by lab _____

Traffic Report Sample Nos. See DV Report

Equipment Blank No. _____
Bottle Blank No. _____
Field Duplicate Nos. _____
PES Nos. _____

The Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, revision _____ was used to evaluate the data and/or approved modifications to the EPA-NE Functional Guidelines were used to evaluate the data and are attached to this cover page: (attach modified criteria from EPA approved QAPP or amendment to QAPP).

A Tier II or Tier III evaluation was used to validate the data (circle one). If a Tier II validation with a partial Tier III was used, then identify samples, parameters, etc., that received partial Tier III validation.

The data were evaluated based upon the following parameters:

- Overall Evaluation of Data
- Data Completeness (CSF Audit - Tier I)
- Preservation and Technical Holding Times
- ICP-MS Tune
- Calibrations
- Blanks
- ICP-AES Interference Check Sample (ICS)
- ICP-MS Interference Check Sample (ICS)
- ICP-MS Internal Standards
- Matrix Spikes
- Laboratory Duplicate Samples
- Field Duplicates
- ICP Serial Dilutions
- Sensitivity Check
- Performance Evaluation Samples/Accuracy Check
- Analyte Quantitation and Reported Quantitation Limits
- System Performance

Region I Definitions and Qualifiers:

A - Acceptable Data
J - Numerical value associated with analyte is an estimated quantity.
R - The data are rejected as unusable. The R replaces the numerical value or sample quantitation limit.
U - Analyte not detected at that numerical sample quantitation limit.
UJ - The sample quantitation limit is an estimated quantity.
BB, EB - Analyte detected in aqueous bottle blank or aqueous equipment blank associated with soil/sediment samples.

Validator's Name Megan Carson Company Name Tetra Tech Phone Number _____

Date Validation Started _____ Date Validation Completed _____

EPA-NE - Data Validation Worksheet
INORG-I

See DU Report

I. PRESERVATION AND HOLDING TIMES

Circle sample numbers with exceeded technical holding times or omitted preservation.
Circle all exceeded technical holding times.

Sample No.	Matrix	Pres. Code		Date Sampled	Metals		Hg		CN		Action
		Metals	CN		Date Analyzed	# of Days from Samp. to Analysis	Date Analyzed	# of Days from Samp. to Analysis	Date Analyzed	# of Days from Samp. to Analysis	

Preservation Code:

1. Cool (≤ 6°C)
2. pH < 2 with HNO_3
3. pH > 12 with NaOH
4. Room Temperature
5. Freeze
6. Reducing agent (for oxidants)
7. Treated for sulfides
8. Other - _____

Action Code:

J - Estimate (J) Detected Values
UJ - Estimate (UJ) Non-Detected Values
R - Reject (R) Non-Detected Values

Sampler:_____ Company:_____ Contacted: Y N Date:_____

Validator:_____

Date:_____

DRAFT 11/08

EPA-NE - Data Validation Worksheet
INORG-II

See DV Report

II. ICP-MS TUNE

List all Tunes that are outside method QC acceptance criteria.

Method:_____

Method QC acceptance criteria for mass calibration:_____

Method QC acceptance criteria for resolution check/peak width:_____ at_____% peak height.

Method QC acceptance criteria for % RSD:_____

Analysis Date and Time	Analyte	Mass Calibration			Mass Resolution		% RSD of Absolute Signals	Analyte/Samples Affected	Action
		True Mass (amu)	Measured Mass (amu)	Absolute Difference of Masses (amu)	Peak Width (amu)	% Peak Height			
Comments:									

Validator:_____

Date:_____

DRAFT 11/08

See DV Report

EPA-NE - Data Validation Worksheet
INORG-III-A/B/C

III. CALIBRATIONS

A. Instrument Calibration - List all calibration correlation coefficients that are outside the method QC acceptance criteria.
Calibration correlation QC acceptance criteria: _____ Calibration Type: _____

Date/Time	Instr.	Analyte	Corr. Coef.	Samples Affected	Action

B. Initial and Continuing Calibration Verifications - List all ICV and CCV analyte recoveries that are outside the method QC acceptance criteria.
ICV method QC acceptance criteria: _____ CCV method QC acceptance criteria: _____

Date	Instr.	Analyte	ICV/CCV #	% R	Samples Affected	Action

C. Quantitation Limit Check Standard - List all QL Check Standard analytes that are outside method QC acceptance criteria.
QL Check Standard method QC acceptance criteria: _____

Date	Instr.	Analyte	QL Check Std. #	% R	Affected Range	Samples Affected	Action

Comments: _____

Validator: _____

Date: _____

DRAFT 11/08

EPA-NE - Data Validation Worksheet
INORG-IV-A/B

See DV Report

IV. BLANKS - List the blank contamination and negative blank results below.

Sampler: _____ Company: _____ Contacted: Y N Date: _____

A. Laboratory: Preparation (Method) and Calibration (Instrument) Blanks

Date Prepared	Date Analyzed	Blank Type (ICB/CCB#/Prep Blank)	Matrix	Instrument	Analyte	Conc. (units)

B. Field: Equipment (Rinsate) and Bottle Blanks

Date Sampled	Date Analyzed	Sample No. (Blank Type)	Matrix	Instrument	Analyte	Conc. (units)

Were the proper number of blanks analyzed at the proper frequency? Y N

For ICP MS - Are internal standard responses in all blanks within method QC acceptance criteria? Y N

Comments: _____

Validator: _____

Date: _____

EPA-NE - Data Validation Worksheet
INORG-IV-C.1
IV. BLANKS

See DV Report

C.1 Blank Contamination Worksheet

Circle the highest concentration of each contaminant.

Analyte	Date Analyzed	ICB	CCB							PBW	PBS	EB	BB	Max. Conc.	Action Level
			1	2	3	4	5	6	7						
Aluminum															
Antimony															
Arsenic															
Barium															
Beryllium															
Cadmium															
Calcium															
Chromium															
Cobalt															
Copper															
Iron															
Lead															
Magnesium															
Manganese															
Mercury															
Nickel															
Potassium															
Selenium															
Silver															
Sodium															
Thallium															
Vanadium															
Zinc															
Cyanide															

Validator: _____

Date: _____

DRAFT 11/08

IV. BLANKS

See DV Report

C.2 **Blank Actions** - List the maximum concentrations of each analyte among all blanks associated with each sample.

Analyte	Type of Blank	Date Blank Originated	Max. Conc. (units)	Blank Action Level (units)	Sample QL	Samples Affected	Action

Comments:

Validator: ______________________

Date: ________

EPA NE - Data Validation Worksheet
INORG-V-A

See DV Report

V. A. ICP-AES INTERFERENCE CHECK SAMPLE - ICSAB

1. List all analytes in the ICSAB that are outside ICSAB percent recovery criteria.

Date	Analyte	%R	Conc. of Interferents Observed in ICSAB (ug/L)				Samples Affected	Action
			Al	Ca	Fe	Mg		
Comments:								

Validator:_____

Date:_____

DRAFT 11/08

EPA NE - Data Validation Worksheet
INORG-V-B.1

See DV Report

V. B.1 ICP-AES INTERFERENCE CHECK SAMPLE - ICSA

1. List all analytes in the ICSA that are outside ICSA criteria.

Date	Analyte	MDL (ug/L)	ICSA Observed Conc. (ug/L)	ICSA True Value (ug/L)	Criteria: 80-120% R or TV±2xMDL	Conc. of Interferents Observed in ICSA (ug/L)				Associated Samples
						Al	Ca	Fe	Mg	
Comments:										

Validator:_____

Date:_____

DRAFT 11/08

EPA NE - Data Validation Worksheet
INORG-V-B.2

See DV Report

V. B.2 ICP-AES INTERFERENCE CHECK SAMPLE - ICSA

2. List all affected sample results.

Affected Sample	Interferent	Conc. in Sample (ug/L)	Analyte	Conc. in Sample (ug/L)	Estimated Interference in Sample (ug/L)	Action
Comments:						

Validator:_____

Date:_____

DRAFT 11/08

EPA NE - Data Validation Worksheet
INORG-VI-A

See DV Report

VI. A. ICP-MS INTERFERENCE CHECK SAMPLE - ICSAB

List all analytes that are outside ICSAB criteria of 80-120% R.

Date	Analyte	%R	Samples Affected	Action
Comments:				

Validator:_____

Date:_____

DRAFT 11/08

EPA NE - Data Validation Worksheet
INORG-VI-B

See DV Report

VI. B. ICP-MS INTERFERENCE CHECK SAMPLE - ICSA

List all analytes that are outside ICSA criteria.

Date	Analyte	MDL (ug/L)	ICSA Observed Conc. (ug/L)	ICSA True Value (ug/L)	Criteria: 80-120% R or TV ± 2xMDL	Samples Affected	Action
Comments:							

Validator:_____

Date:_____

DRAFT 11/08

EPA-NE - Data Validation Worksheet
INORG-VII

See DV Report

VII. ICP-MS INTERNAL STANDARDS

List all internal standards that are outside method QC acceptance criteria.

IS method QC acceptance criteria: _____

Sample Number	Date and Time Analyzed	IS, amu	% RI	Analytes Affected (amu)	Action
Comments:					

Validator: _____

Date: _____

DRAFT 11/08

EPA-NE - Data Validation Worksheet
INORG-VIII

See DV Report

VIII. MATRIX SPIKES - List all matrix spike analytes that are outside method QC acceptance criteria.

Use a separate worksheet for each matrix spike sample.

Sample No.: _____ Matrix: _____

Method	Analyte	Spiked Sample Result	Sample Result	Amount of Spike Added	MS % Recovery	Method QC Limits % Recovery	Post-Digest Spike % Recovery	Action
Comments:								

Validator: _____

Date: _____

DRAFT 11/08

EPA-NE - Data Validation Worksheet
INORG-IX

See DV Report

IX. LABORATORY DUPLICATE SAMPLES - List all analytes that are outside method QC acceptance criteria for the specific matrix.

Use a separate worksheet for each laboratory duplicate sample.

Sample No.:_____ Duplicate Sample No.:_____ Matrix:_____

Laboratory duplicate sample method QC acceptance criteria:_____

Method	Analyte	Sample Conc.	Sample		Duplicate Conc.	Duplicate		RPD or Abs. Diff.	QC Acceptance Criteria (RPD or Abs. Diff.)	Action
			SQL	5xSQL		SQL	5xSQL			

Do the field duplicate sample data indicate acceptable field precision? Y N

Comments:_____

Validator:_____

Date:_____

DRAFT 11/08

EPA-NE - Data Validation Worksheet
INORG-X

Site DV Report

X. FIELD DUPLICATES - List all field duplicate analytes that are outside criteria.

Use a separate worksheet for each field duplicate pair.

Sample No.:_____ Duplicate Sample No.:_____ Matrix:_____

Method	Analyte	Sample Conc.	Sample		Duplicate Conc.	Duplicate		RPD or Abs. Diff.	QC Acceptance Criteria (RPD or Abs. Diff.)	Action
			SQL	5xSQL		SQL	5xSQL			

Do the laboratory duplicate sample data indicate acceptable laboratory precision? Y N

Comments: _____

Sampler Name: _____ Contractor Name: _____ Date Contacted: _____

Reason for contact and resolution obtained: _____

Validator: _____

Date: _____

DRAFT 11/08

EPA-NE - Data Validation Worksheet
INORG-XI

See DV Report

XI. ICP SERIAL DILUTIONS

Use a separate worksheet for each serial dilution sample.

Sample No.:_____ Matrix:_____ Method:_____

List all serial dilution analytes that are outside method QC acceptance criteria.

% Difference method QC acceptance criteria: _____

Minimum concentration required to apply the % D criteria (e.g., 50x MDL): _____

Analyte	MDL	Min. Conc. Required	Sample Result	Serial Dilution Sample Result (corrected for dilution)	% D	Action
Comments:						

Validator:_____

Date:_____

DRAFT 11/08

EPA-NE - Data Validation Worksheet
INORG-XII-A/B

See DV Report

XII. SENSITIVITY CHECK

A. Method Detection Limit Study - List all analytes that are outside the MDL criteria.

- Has an appropriate MDL study been submitted with seven replicates for each analyte and matrix of interest? Y N
- Were samples analyzed within one year of the MDL study and on the same instrument? Y N

Matrix	Analyte	MDL	MDL > QL	Samples Affected	Action

If an MDL study has not been submitted, use only the LFB results to evaluate data.

B. Laboratory Fortified Blank - List all LFB analytes that are outside the LFB criteria.

- Has an appropriate and complete LFB been submitted at the proper frequency? Y N
- Does the LFB contain all target analytes at their QLs? Y N

Matrix	Method	Analyte	% R	Method QC Limits % R	Samples Affected	Action

Comments:_____

Validator:_____

Date:_____

EPA-NE - Data Validation Worksheet
INORG-XIII-A

See DV Report

XIII. PERFORMANCE EVALUATION SAMPLES/ACCURACY CHECK

A. Laboratory Control Samples - List all analytes that are outside criteria.

SDG No.:_____ Case:_____

Are more than one-half of the LCS analytes within criteria for each parameter and method? Y N

Date Prepared	Date Analyzed	Parameter/ Method	Matrix	Analyte	% Recovery (or Observed Conc.)	Method QC Acceptance Criteria	Samples Affected	Action

Comments:

Validator:_____

Date:_____

DRAFT 11/08

EPA-NE - Data Validation Worksheet
INORG-XIII-B

See DV Report

XIII. PERFORMANCE EVALUATION SAMPLES/ACCURACY CHECK

B. Performance Evaluation Results - List all analytes that are outside criteria.

SDG No.:_____ Case:_____

Indicate the source of the PES: Region 1 EPA PES Non-EPA PES

Are more than one-half of the PES analytes within criteria for each parameter and method? Y N

PE Sample Number	Ampule Number	Parameter/ Method	Type of PES	Matrix	Analyte	Conc.	PES Score*	Samples Affected	Action

* For Region I PESs indicate the Region I PES Score Report Result: Action High, Action Low, Analyte Missed, Contaminant.
For Non-EPA PESs indicate the Non-EPA PES Score: PES Analyte Missed; PES Analyte Contaminant; PES Analyte Hit (% Recovery Limits).

Comments:_____

Validator:_____

Date:_____

DRAFT 11/08

EPA-NE - Data Validation Worksheet
INORG-XIV

See DV Report

XIV. ANALYTE QUANTITATION AND REPORTED QUANTITATION LIMITS

Recalculate, from the raw data, the concentrations for one positive detect and one reported sample quantitation limit for a non-detect in a diluted sample or soil sample per analytical method. (Note: Although Section XIV, C.2.a, requires that one calculation for each method in each sample be performed, the validator is only required to reproduce an example, for each method, of one positive detect and one sample quantitation limit calculation on this worksheet.)

Do all soil/sediment samples have % solids greater than 30%? Y N

- If no, were any steps employed to address the high moisture content? _____
- Indicate the action and list the affected sample nos.: _____

Method		Calculation
ICP-AES		
Sample No.:		
Reported Analyte:		
Reported Value:		
Non-Detected Analyte:		
Reported Quantitation Limit:		
ICP-MS		
Sample No.:		
Reported Analyte:		
Reported Value:		
Non-Detected Analyte:		
Reported Quantitation Limit:		
Mercury		
Sample No.:		
Reported Value:		
Sample No.:		
Reported Quantitation Limit:		
Cyanide		
Sample No.:		
Reported Value:		
Sample No.:		
Reported Quantitation Limit:		

Validator: _____

Date: _____

APPENDIX D

SUPPORT DOCUMENTATION

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 2

PROJECT NO: 112G00229
SITE NAME: PNS 042
PROJECT MANAGER AND PHONE NUMBER: Dan Witt 412-921-8259
LABORATORY NAME AND CONTACT: Edward Lawler/MitKm Labs
SAMPLERS (SIGNATURE): Tori Anderson (L. Anderson 978-474-8451)
FIELD OPERATIONS LEADER AND PHONE NUMBER: ~~S. Hill 412-921-7690~~ 4/13/11
ADDRESS: 175 Metro Center Blvd
CARRIER/WAYBILL NUMBER: 8723 6912 1378
CITY, STATE: Warwick, RI 02886

STANDARD TAT ☐ RUSH TAT ☐ ☐ 24 hr. ☐ 48 hr. ☒ 72 hr. ☐ 7 day ☐ 14 day * Phase I

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED: 4°C

	DATE YEAR 2011	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	PCB	Homologs	Cu + Pb	COMMENTS
1	4/12	0905	042-SS-400-0002	SO	G	1	1			
2	4/12	0930	042-SS-401-0002			1	1			
3	4/12	0842	042-SS-402-0002			1	1			
4	4/12	1015	042-SS-403-0002			1	1			
5	4/12	0830	042-SS-404-0002			1	1			
6	4/11	1600	042-SS-405-0002			1	1			
7	4/11	1550	042-SS-406-0002			1	1			
8	4/11	1400	042-SS-407-0002			1	1			
9	4/11	1315	042-SS-408-0002			1	1			
10	4/11	1535	042-SS-409-0002			1	1			
11	4/12	1325	042-SS-410-0002			1	1			
12	4/11	1345	042-SS-411-0002			1	1			
13	4/11	1200	042-SS-412-0002			1	1			

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: Tori Anderson	4/13/11	1100	1. RECEIVED BY: Fed Ex Shipment	4/13/11	1100
2. RELINQUISHED BY: Fedex	4/14/11	0811	2. RECEIVED BY: [signature]	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS: * Phase I → Analyze first then we will give direction for Phase II

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

FORM NO. TtNUS-001 3/99

0812

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 2 OF 2

PROJECT NO: 112G02229
SITE NAME: PNS 042
PROJECT MANAGER AND PHONE NUMBER: Dan Witt 412-921-8259
LABORATORY NAME AND CONTACT: Edward Lawler / Mitkem Labs
SAMPLERS (SIGNATURE): Lori Anderson
L. Anderson 978-474-8451
FIELD OPERATIONS LEADER AND PHONE NUMBER: ~~S. Hill 412-921-8876~~ 4/13/11
ADDRESS: 175 Metro Center Blvd
CARRIER/WAYBILL NUMBER: 8723 6912 1378
CITY, STATE: Warwick, RI 02886

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☒ 72 hr. ☐ 7 day ☐ 14 day
*Phase I

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED: 4°C

	DATE YEAR 2011	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: PCB Homologs Cu & Pb							COMMENTS
14	4/11	1040	042-SS-413-0002	SO	G	1	1							
15	4/12	1335	042-SS-414-0002	↓	↓	1	1							
16	4/12	1320	042-SS-415-0002			1	1							
17	4/11	1130	042-SS-416-0002			2	2							MS/MSD
18	4/12	1310	042-SS-417-0002			1	1							
19	4/11	1100	042-SS-418-0002			1	1							
20	4/11	0000	042-SS-DUP02-041111			1	1							
21	4/12	0000	042-SS-DUP06-041211			1	1							

1. RELINQUISHED BY: Lori Anderson	DATE 4/13/11	TIME 1100	1. RECEIVED BY: Fed Ex Shipment	DATE 4/13/11	TIME 1100
2. RELINQUISHED BY: Fedex	DATE 4/14/11	TIME 08:47	2. RECEIVED BY: [signature]	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS: *Phase I samples → Analyze first then we will give direction for Phase II

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

0013

MITKEM LABORATORIES
Sample Condition Form

Page 1 of 1

Received By: Daniel Mitkem	Reviewed By: [illegible]	Date: 4/14/11	Mitkem Work Order #: K0598
Client Project: Tetra Navy		Client: Tetra Tech	

		Lab Sample ID		Preservation (pH) HNO_3	H_2SO_4	HCl	NaOH	H_3PO_4	VOA Matrix	Soil Headspace or Air Bubble ≥ 1/4"
1) Cooler Sealed	Yes / No	K0598	01							
			02							
2) Custody Seal(s)	Present / Absent		03							
	Coolers / Bottles		04							
	Intact / Broken		05							
			06							
3) Custody Seal Number(s)	N/A		07							
	/		08							
			09							
			10							
			11							
4) Chain-of-Custody	Present / Absent		12							
			13							
5) Cooler Temperature	4.5°C, 3.5°C		14							
IR Temp Gun ID	MT-8		15							
Coolant Condition	iced		16							
			17							
6) Airbill(s)	Present / Absent		18							
Airbill Number(s)	Fedex		19							
	8723 6912 1378		20							
	8723 6912 1389	K0598	21							
	/									
7) Samples Bottles	Intact / Broken / Leaking									
8) Date Received	4/14/11									
9) Time Received	8:47									

DRM 4/14/11

Preservative Name/Lot No.:

VOA Matrix Key:

US = Unpreserved Soil	A = Air
UA = Unpreserved Aqueous	H = HCl
M = MeOH	E = Encore
N = NaHSO4	F = Freeze

See Sample Condition Notification/Corrective Action Form yes / no

Form ID: QAF.0006

Rad OK yes / no

Y:\Controlled Forms\QAF.0006 sample condition form.xls

U.S.EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

SOW No.: SW846

EPA Sample No.	Lab Sample ID
OU2-SS-400-0002	K0598-01
OU2-SS-401-0002	K0598-02
OU2-SS-402-0002	K0598-03
OU2-SS-403-0002	K0598-04
OU2-SS-404-0002	K0598-05
OU2-SS-405-0002	K0598-06
OU2-SS-406-0002	K0598-07
OU2-SS-407-0002	K0598-08
OU2-SS-408-0002	K0598-09
OU2-SS-409-0002	K0598-10
OU2-SS-410-0002	K0598-11
OU2-SS-411-0002	K0598-12
OU2-SS-412-0002	K0598-13
OU2-SS-413-0002	K0598-14
OU2-SS-414-0002	K0598-15
OU2-SS-415-0002	K0598-16
OU2-SS-416-0002	K0598-17
OU2-SS-416-0002D	K0598-17DUP
OU2-SS-416-0002S	K0598-17MS
OU2-SS-417-0002	K0598-18
OU2-SS-418-0002	K0598-19
OU2-SS-DUP02-41111	K0598-20
OU2-SS-DUP06-041211	K0598-21

Were ICP interelement corrections applied?	Yes/No	Yes
Were background corrections applied?	Yes/No	Yes
If yes-were raw data generated before application of background corrections?	Yes/No	No

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature

Signature: Name: Huiyan Zhao

Date: 04/21/2011 Title:

REPORT NARRATIVE

Mitkem Laboratories, a Division of Spectrum Analytical, Inc.

Client : Tetra Tech NUS, Inc.

Project: CTO-WE-43, PNS OU-2

Laboratory Workorder / SDG #: K0598

SW846 6010C

I. SAMPLE RECEIPT

No exceptions or unusual conditions were encountered.

Samples were also submitted for Analysis Phase 2 and Phase 3, which are "on-hold" pending review of the results for the enclosed "Phase 1" analyses. Results for the analyses performed on Phase 2 or Phase 3 samples will be submitted under separate cover.

II. HOLDING TIMES

A. Sample Preparation:

All samples were prepared within the method-specified holding times.

B. Sample Analysis:

All samples were analyzed within the method-specified holding times.

III. METHODS

Samples were analyzed following procedures in laboratory test code: SW846 6010C

IV. PREPARATION

Soil Samples were prepared following procedures in laboratory test code: SW3050

V. INSTRUMENTATION

The following instrumentation was used to perform
Instrument Code: OPTIMA3
Instrument Type: ICP
Description: Optima ICP-OES
Manufacturer: Perkin-Elmer
Model: 4300 DV

VI. ANALYSIS

A. Calibration:

Calibrations met the method/SOP acceptance criteria.

B. Blanks:

All method blanks were within the acceptance criteria.

C. Spikes:

1. Laboratory Control Spikes (LCS):

Percent recoveries for lab control samples were within the QC limits.

2. Matrix spike (MS):

Matrix spike analysis was performed on sample: OU2-SS-416-0002 (K0598-17AMS).

Percent recoveries were within the QC limits with the following exceptions:

OU2-SS-416-0002 (K0598-17AMS), Spike sample recovery is above criteria for Copper at 126% with criteria of (75-125).

D. Post Digestion/Distillation Spike (PDS):

Post-digestion spike analysis was performed on sample: OU2-SS-

416-0002 (K0598-17APDS) for Copper. Percent recovery remained elevated at 127%.

E. Duplicate sample:

Duplicate analyses were performed on sample: OU2-SS-416-0002 (K0598-17ADUP).

Relative percent differences were within the QC limits.

F. Serial Dilution (SD):

Serial Dilution analyses were performed on sample: OU2-SS-416-0002 (K0598-17ASD).

Percent differences were within the QC limits.

G. Samples:

No other unusual occurrences were noted during sample analysis.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Mitkem, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Signed _____

Date: 4/28/11

PORTSMOUTH NSY
SOIL DATA
K0598

FRACTION	CHEMICAL	OU2-SS-DUP02-41111	UNITS	OU2-SS-412-0002	RPD	D
M	COPPER	86.2	MG/KG	184	72.39	97.80
~~M~~	~~LEAD~~	~~ND~~	~~MG/KG~~	~~1550~~	~~200.00~~	~~1550.00~~

Current RPD Quality Control Limit: 50 %.
Shaded cells indicate RPDs that exceed the applicable quality control limit.

PORTSMOUTH NSY
SOIL DATA
K0598

FRACTION	CHEMICAL	OU2-SS-DUP02-41111RE	UNITS	OU2-SS-412-0002	RPD	D
~~M~~	~~COPPER~~	~~ND~~	~~MG/KG~~	~~184~~	~~200.00~~	~~184.00~~
M	LEAD	658	MG/KG	1550	80.80	892.00

Current RPD Quality Control Limit: 50 %.
Shaded cells indicate RPDs that exceed the applicable quality control limit.

PORTSMOUTH NSY
SOIL DATA
K0598

FRACTION	CHEMICAL	OU2-SS-DUP06-041211	UNITS	OU2-SS-404-0002	RPD	D
M	COPPER	51.2	MG/KG	36.1	34.59	15.10
M	LEAD	1350	MG/KG	838	46.80	512.00

Current RPD Quality Control Limit: 50 %.
Shaded cells indicate RPDs that exceed the applicable quality control limit.

Ni 231.604†	-0.1	-0.00001 mg/L	0.000257	-0.00001 mg/L	0.000257	>999.9%
Pb 220.353†	0.8	0.00019 mg/L	0.001685	0.00019 mg/L	0.001685	868.43%
Tl 190.801†	2.4	0.00220 mg/L	0.001853	0.00220 mg/L	0.001853	84.34%
V 292.402†	21.0	0.00043 mg/L	0.001005	0.00043 mg/L	0.001005	233.54%
Ti 334.940†	158.5	0.00033 mg/L	0.000051	0.00033 mg/L	0.000051	15.65%
Ca 227.546†	2.1	0.01392 mg/L	0.071092	0.01392 mg/L	0.071092	510.69%

Sequence No.: 3
Sample ID: K0598-09A-OU2-SS-408-000
Analyst:
Initial Sample Wt:
Dilution:

20xP0

Autosampler Location: 44
Date Collected: 4/17/2011 11:56:17 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: K0598-09A-OU2-SS-408-000

Analyte	Mean Corrected Intensity	Calib. Conc.	Calib. Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Y 360.073	847785.9	101.36	%	0.684				0.67%
Lu 291.139	257573.2	100.36	%	0.472				0.47%
Al 308.215†	169183.4	9.4529	mg/L	0.00849	9.4529	mg/L	0.00849	0.09%
Cr 267.716†	1478.6	0.04428	mg/L	0.000453	0.04428	mg/L	0.000453	1.02%
Cu 324.752†	51565.6	0.31875	mg/L	0.002829	0.31875	mg/L	0.002829	0.89%
Fe 273.955†	362281.7	20.008	mg/L	0.0062	20.008	mg/L	0.0062	0.03%
Mg 279.077†	82426.0	6.3021	mg/L	0.06208	6.3021	mg/L	0.06208	0.99%
Mn 257.610†	110012.1	0.29006	mg/L	0.000227	0.29006	mg/L	0.000227	0.08%
Ni 231.604†	838.8	0.07654	mg/L	0.000238	0.07654	mg/L	0.000238	0.31%
Pb 220.353†	25994.1	6.2899	mg/L	0.05624	6.2899	mg/L	0.05624	0.89%
Tl 190.801†	-12.2	-0.00643	mg/L	0.000691	-0.00643	mg/L	0.000691	10.74%
V 292.402†	1488.1	0.03130	mg/L	0.000652	0.03130	mg/L	0.000652	2.08%
Ti 334.940†	270590.5	0.56105	mg/L	0.000523	0.56105	mg/L	0.000523	0.09%
Ca 227.546†	1804.8	12.605	mg/L	0.1269	12.605	mg/L	0.1269	1.01%

Sequence No.: 4
Sample ID: K0598-17A-OU2-SS-416-000
Analyst:
Initial Sample Wt:
Dilution:

20xP0

Autosampler Location: 45
Date Collected: 4/17/2011 11:59:47 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: K0598-17A-OU2-SS-416-000

Analyte	Mean Corrected Intensity	Calib. Conc.	Calib. Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Y 360.073	843213.0	100.81	%	1.383				1.37%
Lu 291.139	255279.3	99.466	%	0.9337				0.94%
Al 308.215†	174812.3	9.7674	mg/L	0.03042	9.7674	mg/L	0.03042	0.31%
Cr 267.716†	1450.3	0.04341	mg/L	0.000635	0.04341	mg/L	0.000635	1.46%
Cu 324.752†	18500.9	0.11633	mg/L	0.000582	0.11633	mg/L	0.000582	0.50%
Fe 273.955†	899698.4	49.687	mg/L	0.1234	49.687	mg/L	0.1234	0.25%
Mg 279.077†	100526.3	7.6863	mg/L	0.02393	7.6863	mg/L	0.02393	0.31%
Mn 257.610†	152770.0	0.40270	mg/L	0.001659	0.40270	mg/L	0.001659	0.41%
Ni 231.604†	709.7	0.06458	mg/L	0.001192	0.06458	mg/L	0.001192	1.85%
Pb 220.353†	200230.4	48.447	mg/L	0.1095	48.447	mg/L	0.1095	0.23%
Tl 190.801†	-11.1	-0.00576	mg/L	0.003113	-0.00576	mg/L	0.003113	54.02%
V 292.402†	1778.8	0.03938	mg/L	0.000410	0.03938	mg/L	0.000410	1.04%
Ti 334.940†	187257.9	0.38850	mg/L	0.001558	0.38850	mg/L	0.001558	0.40%
Ca 227.546†	4790.8	33.287	mg/L	0.4429	33.287	mg/L	0.4429	1.33%

Sequence No.: 5
Sample ID: K0598-17ADUP-OU2-SS-416-
Analyst:
Initial Sample Wt:
Dilution:

20xP6

Autosampler Location: 46
Date Collected: 4/17/2011 12:03:11 PM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: K0598-17ADUP-OU2-SS-416-

Analyte	Mean Corrected Intensity	Calib. Conc.	Calib. Units	Std.Dev.	Sample Conc.	Sample Units	Std.Dev.	RSD
Y 360.073	870129.2	104.03	%	0.824				0.79%

$$48.447\frac{mg}{L} \times \frac{0.05L}{1.83g} \times \frac{1000g}{1Kg} \times 20DF \times \frac{1}{0.91\%S} = \boxed{29092.0\ mg/Kg}$$

reported as 29100 mg/Kg

0723

HOLDTIME

SDG K0598

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
M	MG/KG	OU2-SS-413-0002	K0598-14A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-416-0002	K0598-17A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-405-0002	K0598-06A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-406-0002	K0598-07A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-407-0002	K0598-08A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-407-0002	K0598-08A	NM	04/11/2011	04/15/2011	04/17/2011	4	2	6
M	MG/KG	OU2-SS-408-0002	K0598-09A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-408-0002	K0598-09A	NM	04/11/2011	04/15/2011	04/17/2011	4	2	6
M	MG/KG	OU2-SS-409-0002	K0598-10A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-410-0002	K0598-11A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4
M	MG/KG	OU2-SS-400-0002	K0598-01A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4
M	MG/KG	OU2-SS-403-0002	K0598-04A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4
M	MG/KG	OU2-SS-412-0002	K0598-13A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-402-0002	K0598-03A	NM	04/12/2011	04/15/2011	04/17/2011	3	2	5
M	MG/KG	OU2-SS-414-0002	K0598-15A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
M	MG/KG	OU2-SS-415-0002	K0598-16A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4
M	MG/KG	OU2-SS-DUP06-041211	K0598-21A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4
M	MG/KG	OU2-SS-DUP02-41111	K0598-20A	NM	04/11/2011	04/15/2011	04/17/2011	4	2	6
M	MG/KG	OU2-SS-DUP02-41111	K0598-20A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-418-0002	K0598-19A	NM	04/11/2011	04/15/2011	04/17/2011	4	2	6
M	MG/KG	OU2-SS-418-0002	K0598-19A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-417-0002	K0598-18A	NM	04/12/2011	04/15/2011	04/17/2011	3	2	5
M	MG/KG	OU2-SS-417-0002	K0598-18A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4
M	MG/KG	OU2-SS-416-0002	K0598-17A	NM	04/11/2011	04/15/2011	04/17/2011	4	2	6
M	MG/KG	OU2-SS-411-0002	K0598-12A	NM	04/11/2011	04/15/2011	04/16/2011	4	1	5
M	MG/KG	OU2-SS-402-0002	K0598-03A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4
M	MG/KG	OU2-SS-401-0002	K0598-02A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4
M	MG/KG	OU2-SS-400-0002	K0598-01A	NM	04/12/2011	04/15/2011	04/17/2011	3	2	5
M	MG/KG	OU2-SS-404-0002	K0598-05A	NM	04/12/2011	04/15/2011	04/16/2011	3	1	4
PMOIS	%	OU2-SS-407-0002	K0598-08A	NM	04/11/2011	04/14/2011	04/14/2011	3	0	3
PMOIS	%	OU2-SS-DUP02-41111	K0598-20A	NM	04/11/2011	04/14/2011	04/14/2011	3	0	3
PMOIS	%	OU2-SS-418-0002	K0598-19A	NM	04/11/2011	04/14/2011	04/14/2011	3	0	3
PMOIS	%	OU2-SS-417-0002	K0598-18A	NM	04/12/2011	04/14/2011	04/14/2011	2	0	2

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METHOD DETECTION LIMITS (ANNUALLY)

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Instrument Type: P InstrumentID: OPTIMA3 Date: 03/03/2010

Preparation Method: 3005A

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Wavelength /Mass	CRDL	MDL
Copper	324.75	30	3.6
Lead	220.35	10	4.2

Comments:

U.S. EPA - CLP

10

METHOD DETECTION LIMITS (ANNUALLY)

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Instrument Type: P InstrumentID: OPTIMA3 Date: 06/03/2010

Preparation Method: 3050B

Concentration Units (ug/L or mg/kg): mg/Kg

Analyte	Wavelength /Mass	CRDL	MDL
Copper	324.75	1.5	0.11
Lead	220.35	0.50	0.17

Comments:

U.S. EPA - CLP

11A

ICP INTERELEMENT CORRECTION FACTORS (BIANNUALLY)

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

ICP ID Number: OPTIMA3 Date: 03/17/2011

Analyte	Wave-length (nm)	Interelement Correction Factors for: Al	Ca	Fe	Mg	Cr
Aluminum	308.21		0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.83	0.0548458	0.0019692	0.0402283	0.0119694	18.0976000
Arsenic	188.97	0.0241052	-0.0179703	-0.0502240	-0.0108453	-5.3626600
Barium	233.52	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Beryllium	313.10	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Cadmium	226.50	0.0000000	0.0000000	0.1165300	0.0000000	0.0000000
Calcium	227.54	-0.3951530		-53.4983000	0.1370440	-2.4637200
Chromium	267.71	0.0000000	0.0000000	0.0000000	0.0044220	
Cobalt	228.61	0.0000000	0.0000000	0.0342838	0.0000000	-0.0770625
Copper	324.75	0.0000000	0.0000000	-0.0466325	0.0029665	-0.0749057
Iron	273.95	0.0000000	0.0000000		0.0000000	-4.2926900
Lead	220.35	-0.0376433	-0.0020174	0.0000000	0.0000000	0.0000000
Magnesium	279.07	0.0000000	0.0000000	0.0000000		0.0000000
Manganese	257.61	0.0000000	0.0000000	0.0060664	0.0303744	0.0000000
Nickel	231.60	0.0000000	0.0000000	0.0068563	0.0029325	0.0000000
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.02	-0.0230022	0.0344876	-0.3266930	-0.0115824	-0.1016280
Silver	328.06	0.0000000	0.0000000	-0.0195341	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	-0.0035055	-0.0281063	-0.0065002	0.2697230
Titanium	334.94	0.0000000	-0.0127604	0.0000000	0.0155639	0.1077440
Vanadium	292.40	0.0000000	0.0000000	-0.0646350	0.0000000	-1.5918000
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	-2.7465900

Comments:

U.S. EPA - CLP

11B

ICP INTERELEMENT CORRECTION FACTORS (BIANNUALLY)

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

ICP ID Number: OPTIMA3 Date: 03/17/2011

Analyte	Wave-length (nm)	Interelement Correction Factors for: Cu	Mn	Ni	Tl	Ti
Aluminum	308.21	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Antimony	206.83	0.2323840	0.0000000	0.0219824	0.0879220	1.1106900
Arsenic	188.97	-0.1211030	-0.0818075	-0.0385500	0.0000000	-0.7705050
Barium	233.52	0.0000000	0.0000000	0.0338339	0.0000000	0.0000000
Beryllium	313.10	0.0000000	0.0000000	0.0000000	0.0000000	-1.9571600
Cadmium	226.50	0.0000000	0.0000000	0.0000000	0.0000000	0.1051920
Calcium	227.54	5.8225100	0.0000000	28.4899000	3.5969000	5.3831000
Chromium	267.71	0.0000000	0.1940960	0.0000000	0.0000000	0.0000000
Cobalt	228.61	0.0000000	0.0000000	0.2228410	0.0000000	1.2071700
Copper	324.75		0.0000000	0.0000000	0.0000000	0.0000000
Iron	273.95	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Lead	220.35	0.3749550	0.1018340	-0.1299870	-0.0630506	-0.5488580
Magnesium	279.07	0.0000000	-4.8641600	0.0000000	0.0000000	0.0000000
Manganese	257.61	0.0000000		0.0420350	0.0000000	0.0000000
Nickel	231.60	0.0000000	0.0000000		0.2792550	0.4816400
Potassium	766.49	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Selenium	196.02	-0.0422333	0.5763650	0.0000000	-0.1188130	0.2916260
Silver	328.06	0.0422486	0.0000000	0.0000000	0.0000000	0.0000000
Sodium	589.59	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000
Thallium	190.80	0.0000000	0.0000000	-0.0495957		-7.3156200
Titanium	334.94	0.0000000	0.0000000	0.0000000	0.1659360	
Vanadium	292.40	0.2183960	-0.0806874	0.0000000	0.0000000	0.8845330
Zinc	206.20	0.0000000	0.0000000	0.0000000	0.0000000	0.0000000

Comments:

U.S. EPA - CLP

11B

ICP INTERELEMENT CORRECTION FACTORS (BIANNUALLY)

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

ICP ID Number: OPTIMA3 Date: 03/17/2011

Analyte	Wave-length (nm)	Interelement Correction Factors for: V				
Aluminum	308.21	12.0696000				
Antimony	206.83	-2.5893500				
Arsenic	188.97	0.0000000				
Barium	233.52	-1.1190600				
Beryllium	313.10	-0.0336399				
Cadmium	226.50	0.0000000				
Calcium	227.54	30.3214000				
Chromium	267.71	-0.3004160				
Cobalt	228.61	0.0000000				
Copper	324.75	-0.1475070				
Iron	273.95	-30.2263000				
Lead	220.35	-0.0588981				
Magnesium	279.07	0.0000000				
Manganese	257.61	0.0000000				
Nickel	231.60	0.0000000				
Potassium	766.49	0.0000000				
Selenium	196.02	-0.1688320				
Silver	328.06	-0.8565220				
Sodium	589.59	0.0000000				
Thallium	190.80	-0.8892970				
Titanium	334.94	0.0299746				
Vanadium	292.40					
Zinc	206.20	0.0000000				

Comments:

U.S. EPA - CLP

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ICP LINEAR RANGES (BIANNUALLY)

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

ICP ID Number: OPTIMA3 Date: 03/17/2011

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	M
Copper	0.20	50000	P
Lead	0.20	100000	P

Comments:

U.S. EPA - CLP

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PREPARATION LOG

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Preparation Method: 3050B Batch ID: 58641

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	04/15/2011	1.00	50
OU2-SS-400-0002	04/15/2011	1.23	50
OU2-SS-401-0002	04/15/2011	1.93	50
OU2-SS-402-0002	04/15/2011	2.00	50
OU2-SS-403-0002	04/15/2011	1.69	50
OU2-SS-404-0002	04/15/2011	1.55	50
OU2-SS-405-0002	04/15/2011	1.31	50
OU2-SS-406-0002	04/15/2011	1.38	50
OU2-SS-407-0002	04/15/2011	1.57	50
OU2-SS-408-0002	04/15/2011	1.45	50
OU2-SS-409-0002	04/15/2011	1.08	50
OU2-SS-410-0002	04/15/2011	1.27	50
OU2-SS-411-0002	04/15/2011	1.35	50
OU2-SS-412-0002	04/15/2011	1.21	50
OU2-SS-413-0002	04/15/2011	1.16	50
OU2-SS-414-0002	04/15/2011	1.66	50
OU2-SS-415-0002	04/15/2011	1.34	50
OU2-SS-416-0002	04/15/2011	1.83	50
OU2-SS-416-0002D	04/15/2011	1.88	50
OU2-SS-416-0002S	04/15/2011	1.84	50
OU2-SS-417-0002	04/15/2011	1.51	50
OU2-SS-418-0002	04/15/2011	1.47	50
OU2-SS-DUP02-41111	04/15/2011	1.21	50
PBS	04/15/2011	1.00	50

Comments:

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5A

SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

OU2-SS-416-0002S

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Level (low/med): MED

% Solids for Sample: 91.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Copper	75-125	117		75.0		33.7	126	N	P
Lead		36100		29100		13.6	51885		P

Comments:

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5B

POST DIGEST SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

OU2-SS-416-0002A

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Level (low/med): MED

Concentration Units (ug/L or mg/kg dry weight): ug/L

Analyte	Control Limit %R	Spike Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Copper		3930.13		2497.56		1130.0	127		P

Comments:

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DUPLICATES

EPA SAMPLE NO.

OU2-SS-416-0002D

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Level (low/med): MED

% Solids for Sample: 91.0 % Solids for Duplicate: 91.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Copper		74.9883		77.8197		3.7		P
Lead		29092.2779		32688.4630		11.6		P

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LABORATORY CONTROL SAMPLE

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Solid LCS Source: LCS(D) ID:

Aqueous LCS Source: LCS-58641

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/Kg) True	Found	C	Limits		%R
Copper				56.5	57.7		45.2	67.8	102.1
Lead				22.8	23.7		18.2	27.3	103.9

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ICP SERIAL DILUTIONS

EPA SAMPLE NO.

OU2-SS-416-0002

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Matrix (soil/water): SOIL Level (low/med): MED

Concentration Units (ug/L or mg/kg dry weight): ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Copper	2497.56		2531.56		1		P
Lead	48447.37		50055.41		3		P

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PREPARATION LOG

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Preparation Method: 3050B Batch ID: 58642

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	04/15/2011	1.00	50
OU2-SS-DUP06-041211	04/15/2011	1.61	50
PBS	04/15/2011	1.00	50

Comments:

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LABORATORY CONTROL SAMPLE

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Solid LCS Source:

Aqueous LCS Source:

LCS(D) ID:
LCS-58642

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/Kg) True	Found	C	Limits		%R
Copper				56.5	56.7		45.2	67.8	100.4
Lead				22.8	23.0		18.2	27.3	100.9

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ANALYSIS RUN LOG

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Instrument ID Number: OPTIMA3 Method: P

Start Date: 04/16/2011 End Date: 04/16/2011

OPTIMA3_110416A

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CO	CR	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
S0	1.0	1557											X		X												
S1	1.0	1601											X		X												
S2	1.0	1604											X		X												
S3	1.0	1608											X		X												
ICV	1.0	1611											X		X												
ICB	1.0	1615											X		X												
ZZZZZZ	1.0	1619																									
ICSA	1.0	1622											X		X												
ICSAB	1.0	1626											X		X												
PBS	1.0	1630											X		X												
LCSS	1.0	1634											X		X												
OU2-SS-DUP06-041211	1.0	1637											X		X												
ZZZZZZ	1.0	1641																									
ZZZZZZ	1.0	1645																									
ZZZZZZ	1.0	1649																									
ZZZZZZ	5.0	1652																									
CCV	1.0	1656											X		X												
CCB	1.0	1700											X		X												
ZZZZZZ	1.0	1703																									
ZZZZZZ	1.0	1707																									
ZZZZZZ	1.0	1711																									
ZZZZZZ	1.0	1715																									
ZZZZZZ	1.0	1718																									
ZZZZZZ	1.0	1722																									
ZZZZZZ	1.0	1726																									
ZZZZZZ	20.0	1731																									
CCV	1.0	1735											X		X												
CCB	1.0	1738											X		X												
ZZZZZZ	1.0	1742																									
ZZZZZZ	1.0	1746																									
ZZZZZZ	1.0	1749																									

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ANALYSIS RUN LOG

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Instrument ID Number: OPTIMA3 Method: P

Start Date: 04/16/2011 End Date: 04/16/2011

OPTIMA3_110416A

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CO	CR	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	1.0	1753																									
ZZZZZZ	1.0	1757																									
ZZZZZZ	1.0	1801																									
ZZZZZZ	1.0	1805																									
ZZZZZZ	1.0	1808																									
CCV	1.0	1812											X		X												
CCB	1.0	1816											X		X												
ZZZZZZ	1.0	1820																									
ZZZZZZ	1.0	1824																									
ZZZZZZ	1.0	1828																									
ZZZZZZ	1.0	1831																									
ZZZZZZ	1.0	1835																									
ZZZZZZ	1.0	1839																									
ZZZZZZ	1.0	1843																									
ZZZZZZ	1.0	1846																									
ZZZZZZ	1.0	1850																									
ZZZZZZ	1.0	1854																									
CCV	1.0	1858											X		X												
CCB	1.0	1902											X		X												
ZZZZZZ	1.0	1906																									
ZZZZZZ	1.0	1909																									
ZZZZZZ	1.0	1913																									
ZZZZZZ	1.0	1917																									
ZZZZZZ	1.0	1921																									
ZZZZZZ	1.0	1925																									
ZZZZZZ	1.0	1929																									
ZZZZZZ	5.0	1932																									
CCV	1.0	1936											X		X												
CCB	1.0	1940											X		X												
ZZZZZZ	1.0	1943																									
ZZZZZZ	20.0	1947																									
ZZZZZZ	20.0	1951																									

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ANALYSIS RUN LOG

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Instrument ID Number: OPTIMA3 Method: P

Start Date: 04/16/2011 End Date: 04/16/2011

OPTIMA3_110416A

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CO	CR	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
ZZZZZZ	20.0	1954																									
ZZZZZZ	20.0	1958																									
ZZZZZZ	20.0	2002																									
ZZZZZZ	20.0	2006																									
ZZZZZZ	20.0	2009																									
ZZZZZZ	20.0	2013																									
CCV	1.0	2017											X		X												
CCB	1.0	2020											X		X												
ZZZZZZ	20.0	2024																									
ZZZZZZ	20.0	2027																									
ZZZZZZ	20.0	2031																									
ZZZZZZ	20.0	2035																									
ZZZZZZ	20.0	2039																									
ZZZZZZ	20.0	2042																									
ZZZZZZ	20.0	2046																									
ZZZZZZ	20.0	2050																									
ZZZZZZ	100.0	2053																									
CCV	1.0	2057											X		X												
CCB	1.0	2101											X		X												
PBS	1.0	2104											X		X												
LCSS	1.0	2108											X		X												
OU2-SS-400-0002	1.0	2112											X														
OU2-SS-401-0002	1.0	2115											X		X												
OU2-SS-402-0002	1.0	2119													X												
OU2-SS-403-0002	1.0	2123											X		X												
OU2-SS-404-0002	1.0	2127											X		X												
OU2-SS-405-0002	1.0	2131											X		X												

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ANALYSIS RUN LOG

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Instrument ID Number: OPTIMA3 Method: P

Start Date: 04/16/2011 End Date: 04/16/2011

OPTIMA3_110416A

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CO	CR	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
OU2-SS-406-0002	1.0	2135											X		X												
CCV	1.0	2139											X		X												
CCB	1.0	2142											X		X												
OU2-SS-407-0002	1.0	2146													X												
OU2-SS-408-0002	1.0	2150											X														
OU2-SS-409-0002	1.0	2154											X		X												
OU2-SS-410-0002	1.0	2157											X		X												
OU2-SS-411-0002	1.0	2201											X		X												
OU2-SS-412-0002	1.0	2205											X		X												
OU2-SS-413-0002	1.0	2209											X		X												
OU2-SS-414-0002	1.0	2213											X		X												
OU2-SS-415-0002	1.0	2216											X		X												
CCV	1.0	2220											X		X												
CCB	1.0	2224											X		X												
OU2-SS-416-0002	1.0	2228											X														
OU2-SS-416-0002D	1.0	2231											X														
OU2-SS-416-0002S	1.0	2235											X														
OU2-SS-416-0002L	5.0	2239											X														
OU2-SS-416-0002A	1.0	2243											X														

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ANALYSIS RUN LOG

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Instrument ID Number: OPTIMA3 Method: P

Start Date: 04/16/2011 End Date: 04/16/2011

OPTIMA3_110416A

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CO	CR	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
OU2-SS-417-0002	1.0	2247											X														
OU2-SS-418-0002	1.0	2251											X														
OU2-SS-DUP02-41111	1.0	2255											X														
CCV	1.0	2258											X														
CCB	1.0	2302											X														

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2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Initial Calibration Source:

Continuing Calibration Source:

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Copper	1250.0	1242.59	99.4	1250.0	1269.47	101.6	1285.80	102.9	P
Lead	500.0	493.17	98.6	500.0	501.84	100.4	505.45	101.1	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Initial Calibration Source:

Continuing Calibration Source:

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Copper				1250.0	1262.96	101.0	1251.38	100.1	P
Lead				500.0	495.20	99.0	507.32	101.5	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Initial Calibration Source:

Continuing Calibration Source:

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Copper				1250.0	1280.99	102.5	1281.22	102.5	P
Lead				500.0	512.04	102.4	504.25	100.9	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Initial Calibration Source:

Continuing Calibration Source:

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Copper				1250.0	1257.88	100.6	1207.10	96.6	P
Lead				500.0	504.23	100.8	493.42	98.7	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Initial Calibration Source:

Continuing Calibration Source:

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Copper				1250.0	1290.02	103.2	1249.16	99.9	P
Lead				500.0	505.87	101.2			P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Preparation Blank Matrix (soil/water): SOIL Method Blank ID: MB-58642

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

OPTIMA3_110416A

	Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		
Analyte		C	1	C	2	C	3	C		C	M
Copper	3.6	U	3.6	U	3.6	U	3.6	U	0.110	U	P
Lead	4.2	U	4.2	U	4.2	U	4.2	U	0.397	B	P

1615 1700 1738 1816

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Preparation Blank Matrix (soil/water): SOIL Method Blank ID: MB-58641

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

OPTIMA3_110416A

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Copper			3.6	U	3.6	U	3.6	U	0.110	U	P
Lead			4.2	U	6.4	B	4.2	U	0.287	B	P

1900 1940 2020

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Preparation Blank Matrix (soil/water): Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg):

OPTIMA3_110416A

	Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		
Analyte		C	1	C	2	C	3	C		C	M
Copper			3.6	U	3.6	U	3.6	U			P
Lead			4.2	U	5.4	B	8.6	B			P

2101 2142 2224

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Preparation Blank Matrix (soil/water): Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg):

OPTIMA3_110416A

	Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L) 2302						Preparation Blank		
Analyte		C	1	C	2	C	3	C		C	M
Copper			3.6	U							P

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4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

ICP ID Number: OPTIMA3 ICS Source:

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	Initial Found %R	Final Found Sol. A	Final Found %R	Final Found Sol. AB	Final Found %R
Copper	0	500	-2	537.3	107.5				
Lead	0	500	-16	475.5	95.1				

U.S. EPA - CLP

14

ANALYSIS RUN LOG

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Instrument ID Number: OPTIMA3 Method: P

Start Date: 04/17/2011 End Date: 04/17/2011

OPTIMA3_110417A

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CO	CR	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
S0	1.0	1021											X		X												
S1	1.0	1024											X		X												
S2	1.0	1028											X		X												
S3	1.0	1031											X		X												
ICV	1.0	1035											X		X												
ICB	1.0	1038											X		X												
ZZZZZZ	1.0	1042																									
ICSA	1.0	1045											X		X												
ICSAB	1.0	1049											X		X												
ZZZZZZ	1.0	1052																									
ZZZZZZ	1.0	1056																									
ZZZZZZ	1.0	1059																									
ZZZZZZ	1.0	1103																									
ZZZZZZ	1.0	1106																									
ZZZZZZ	1.0	1110																									
CCV	1.0	1113											X		X												
CCB	1.0	1117											X		X												
OU2-SS-417-0002	1.0	1120													X												
OU2-SS-418-0002	1.0	1124													X												
OU2-SS-DUP02-41111	1.0	1128													X												
OU2-SS-400-0002	20.0	1131													X												
OU2-SS-402-0002	20.0	1135											X														
OU2-SS-407-0002	20.0	1138											X														
ZZZZZZ	1.0	1142																									
ZZZZZZ	1.0	1145																									
CCV	1.0	1149											X		X												
CCB	1.0	1152											X		X												

U.S. EPA - CLP

14

ANALYSIS RUN LOG

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Instrument ID Number: OPTIMA3 Method: P

Start Date: 04/17/2011 End Date: 04/17/2011

OPTIMA3_110417A

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CO	CR	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
OU2-SS-408-0002	20.0	1156													X												
OU2-SS-416-0002	20.0	1159													X												
OU2-SS-416-0002D	20.0	1203													X												
OU2-SS-416-0002S	20.0	1206													X												
OU2-SS-416-0002L	100.0	1210													X												
CCV	1.0	1213													X												
CCB	1.0	1217													X												

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2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Initial Calibration Source:

Continuing Calibration Source:

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Copper	1250.0	1311.33	104.9	1250.0	1304.41	104.4	1292.92	103.4	P
Lead	500.0	522.36	104.5	500.0	517.10	103.4	513.43	102.7	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Initial Calibration Source:

Continuing Calibration Source:

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Lead				500.0	521.10	104.2			P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

Preparation Blank Matrix (soil/water): Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg):

OPTIMA3_110417A

Analyte	Initial Calibration Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Preparation Blank	C	M
Copper	3.6	U	3.6	U	3.6	U					P
Lead	4.2	U	4.2	U	4.2	U	4.2	U			P

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4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0598

ICP ID Number: OPTIMA3 ICS Source:

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	%R	Final Found Sol. A	%R	Final Found Sol. AB	%R
Copper	0	500	-5	544.2	108.8				
Lead	0	500	-12	476.8	95.4				

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**D. WITT**	**DATE:**	**JUNE 15, 2011**
FROM:	**MICHELLE L. ALLEN**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION – LEAD**
CTO WE43, NAVAL SHIPYARD (NSY) PORTSMOUTH
SAMPLE DELIVERY GROUPS (SDGs) – K0600 & K0601

SAMPLES: 11/Soil/

OU2-SB-400-0204	OU2-SB-401-0204	OU2-SB-401-0406
OU2-SB-402-0204	OU2-SB-402-0406	OU2-SB-407-0203
OU2-SB-408-0204	OU2-SB-416-0204	OU2-SB-DUP03-041111
OU2-SB-401-0608	OU2-SB-401-0810	

Overview

The sample set for NSY Portsmouth, CTO WE43, SDGs K0600 &K0601, consisted of eleven (11) soil samples. All eleven (11) samples were analyzed for lead. One field duplicate pair was included in this SDG: OU2-SB-407-0203/OU2-SB-DUP03-041111.

The samples were collected by Tetra Tech NUS on April 11 and 12, 2011 and analyzed by Mitkem Laboratories under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. The lead analyses were conducted in accordance with SW-846 Method 6010C analytical and reporting protocols. The data was evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • Initial and Continuing Calibration Verification Results
* • Laboratory Method/Preparation Blank Analyses
* • ICP Interference Results
* • Laboratory Duplicate Results
• Laboratory Control Sample Results
• Matrix Spike Recovery
* • Field Duplicate Precision
• ICP Serial Dilution
* • Detection Limits
* • Analyte Quantitation

* - All quality control criteria were met for this parameter.

Qualified (if applicable) analytical results are summarized in Appendix A. Results as reported by the laboratory are presented in Appendix B. Appendix C contains Region I worksheets. Appendix D contains the documentation to support the findings as discussed in this validation report.

LABORATORY DUPLICATE RESULTS

The Relative Percent Difference (RPD) between the sample, OU2-SB-408-0204, and its duplicate, OU2-SB-408-0204D, exceeded the 35% quality control limit. All samples are affected. The positive results reported for lead in the affected samples are qualified as estimated, (J).

ICP SERIAL DILUTION

The Percent Difference (%D) for ICP serial dilution of sample OU2-SB-407-0203 exceeded the 10% quality control limit. All samples are affected except OU2-SB-408-0204. Only positive results were reported for lead in the affected samples and these positive results are qualified as estimated, (J).

NOTES

The Matrix Spike (MS) sample had a negative Percent Recovery (%R) for lead. No action was taken because the concentration of lead in the environmental sample was 4X greater than the spike concentration.

EXECUTIVE SUMMARY

Laboratory Performance: The RPD quality control limit was exceeded in the laboratory duplicate analyses. The ICP serial dilution %D was exceeded affecting ten samples.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the Region 1 EPA-NE Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses, Part VI, November 2008 and the Department of Defense (DoD) document entitled "Quality Systems Manual (QSM) for Environmental Laboratories", April, 2009.

The text of this report has been formulated to address only those problem areas affecting data quality.

Tetra Tech NUS
Michelle L. Allen
Data Validator

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C – Region I Worksheets
4. Appendix D – Support Documentation

APPENDIX A

QUALIFIED LABORATORY RESULTS

PROJ_NO: 02229	NSAMPLE	OU2-SB-400-0204			OU2-SB-401-0204			OU2-SB-401-0406			OU2-SB-402-0204		
SDG: K0600	LAB_ID	K0600-01B			K0600-02B			K0600-13B			K0600-03B		
FRACTION: M	SAMP_DATE	4/12/2011			4/12/2011			4/12/2011			4/12/2011		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/KG			MG/KG			MG/KG			MG/KG		
	PCT_SOLIDS	89.0			90.0			93.0			91.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
LEAD		1040	J	FI	641	J	FI	72.7	J	FI	111	J	FI

PROJ_NO: 02229	NSAMPLE	OU2-SB-401-0608			OU2-SB-401-0810		
SDG: K0601	LAB_ID	K0601-01B			K0601-02B		
FRACTION: M	SAMP_DATE	4/12/2011			4/12/2011		
MEDIA: SOIL	QC_TYPE	NM			NM		
	UNITS	MG/KG			MG/KG		
	PCT_SOLIDS	82.0			83.0		
	DUP_OF						
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD
LEAD		12.8	J	FI	10.9	J	FI

PROJ_NO: 02229	NSAMPLE	OU2-SB-400-0204			OU2-SB-401-0204			OU2-SB-401-0406			OU2-SB-402-0204		
SDG: K0600	LAB_ID	K0600-01B			K0600-02B			K0600-13B			K0600-03B		
FRACTION: M	SAMP_DATE	4/12/2011			4/12/2011			4/12/2011			4/12/2011		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/KG			MG/KG			MG/KG			MG/KG		
	PCT_SOLIDS	89.0			90.0			93.0			91.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
LEAD		1040	J	FI	641	J	FI	72.7	J	FI	111	J	FI

PROJ_NO: 02229	NSAMPLE	OU2-SB-402-0406			OU2-SB-407-0203			OU2-SB-408-0204			OU2-SB-416-0204		
SDG: K0600	LAB_ID	K0600-14B			K0600-08B			K0600-09B			K0600-11B		
FRACTION: M	SAMP_DATE	4/12/2011			4/11/2011			4/11/2011			4/11/2011		
MEDIA: SOIL	QC_TYPE	NM			NM			NM			NM		
	UNITS	MG/KG			MG/KG			MG/KG			MG/KG		
	PCT_SOLIDS	90.0			78.0			82.0			96.0		
	DUP_OF												
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
LEAD		346	J	FI	3940	J	FI	9790	J	F	44.6	J	FI

PROJ_NO: 02229	NSAMPLE	OU2-SB-DUP03-041111		
SDG: K0600	LAB_ID	K0600-18B		
FRACTION: M	SAMP_DATE	4/11/2011		
MEDIA: SOIL	QC_TYPE	NM		
	UNITS	MG/KG		
	PCT_SOLIDS	78.0		
	DUP_OF	OU2-SB-407-0203		
PARAMETER		RESULT	VQL	QLCD
LEAD		3660	J	FI

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SB-400-0204

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Matrix (soil/water): SOIL Lab Sample ID: K0600-01

Level (low/med): MED Date Received: 04/14/2011

% Solids: 89.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7439-92-1	Lead	1040		E	P	0.15	0.22	0.43

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SB-401-0204

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Matrix (soil/water): SOIL Lab Sample ID: K0600-02

Level (low/med): MED Date Received: 04/14/2011

% Solids: 90.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7439-92-1	Lead	641		E	P	0.10	0.15	0.31

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SB-401-0406

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Matrix (soil/water): SOIL Lab Sample ID: K0600-13

Level (low/med): MED Date Received: 04/14/2011

% Solids: 93.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7439-92-1	Lead	72.7		E	P	0.12	0.18	0.36

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SB-402-0204

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Matrix (soil/water): SOIL Lab Sample ID: K0600-03

Level (low/med): MED Date Received: 04/14/2011

% Solids: 91.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7439-92-1	Lead	111		E	P	0.10	0.15	0.30

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SB-402-0406

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Matrix (soil/water): SOIL Lab Sample ID: K0600-14

Level (low/med): MED Date Received: 04/14/2011

% Solids: 90.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7439-92-1	Lead	346		E	P	0.11	0.17	0.33

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SB-407-0203

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Matrix (soil/water): SOIL Lab Sample ID: K0600-08

Level (low/med): MED Date Received: 04/14/2011

% Solids: 78.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7439-92-1	Lead	3940		E	P	0.14	0.20	0.40

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SB-408-0204

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Matrix (soil/water): SOIL Lab Sample ID: K0600-09

Level (low/med): MED Date Received: 04/14/2011

% Solids: 82.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7439-92-1	Lead	9790		*	P	7.2	11.0	21.0

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SB-416-0204

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Matrix (soil/water): SOIL Lab Sample ID: K0600-11

Level (low/med): MED Date Received: 04/14/2011

% Solids: 96.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7439-92-1	Lead	44.6		E	P	0.12	0.17	0.34

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SB-DUP03-041111

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Matrix (soil/water): SOIL Lab Sample ID: K0600-18

Level (low/med): MED Date Received: 04/14/2011

% Solids: 78.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7439-92-1	Lead	3660		E	P	0.13	0.19	0.39

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SB-401-0608

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Matrix (soil/water): SOIL Lab Sample ID: K0601-01

Level (low/med): MED Date Received: 04/14/2011

% Solids: 82.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7439-92-1	Lead	12.8		E	P	0.17	0.25	0.51

Comments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

OU2-SB-401-0810

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Matrix (soil/water): SOIL Lab Sample ID: K0601-02

Level (low/med): MED Date Received: 04/14/2011

% Solids: 83.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	MDL	LOD	PQL
7439-92-1	Lead	10.9		E	P	0.11	0.16	0.33

Comments:

APPENDIX C

REGIONAL WORKSHEETS

EPA-NE
Data Validation Worksheet Cover Page - Page 1

Site Name NSY Portsmouth
Reference No. _____

REGION I INORGANIC DATA VALIDATION

The following data package has been validated:

Lab Name Mitkem Laboratories
Case/Project No. CTO WE43
SDG No. K06001 K06001
No. of Samples/Matrix 11 / Soil

SOW/Method No SW 6010
Sampling Date(s) 4/11-12/11
Shipping Date(s) 4/13/11
Date Rec'd by lab 4/14/11

Traffic Report Sample Nos. _____

Equipment Blank No. See DV letter
Bottle Blank No. _____
Field Duplicate Nos. _____
PES Nos. _____

The Region I, EPA-NE Data Validation Functional Guidelines for Evaluating Environmental Analyses, revision _____ was used to evaluate the data and/or approved modifications to the EPA-NE Functional Guidelines were used to evaluate the data and are attached to this cover page: (attach modified criteria from EPA approved QAPP or amendment to QAPP).

A Tier II or Tier III evaluation was used to validate the data (circle one). If a Tier II validation with a partial Tier III was used, then identify samples, parameters, etc., that received partial Tier III validation.

_____

The data were evaluated based upon the following parameters:

- Overall Evaluation of Data
- Data Completeness (CSF Audit - Tier I)
- Preservation and Technical Holding Times
- ICP-MS Tune
- Calibrations
- Blanks
- ICP-AES Interference Check Sample (ICS)
- ICP-MS Interference Check Sample (ICS)
- ICP-MS Internal Standards
- Matrix Spikes
- Laboratory Duplicate Samples
- Field Duplicates
- ICP Serial Dilutions
- Sensitivity Check
- Performance Evaluation Samples/Accuracy Check
- Analyte Quantitation and Reported Quantitation Limits
- System Performance

Region I Definitions and Qualifiers:

A - Acceptable Data
J - Numerical value associated with analyte is an estimated quantity.
R - The data are rejected as unusable. The R replaces the numerical value or sample quantitation limit.
U - Analyte not detected at that numerical sample quantitation limit.
UJ - The sample quantitation limit is an estimated quantity.
BB, EB - Analyte detected in aqueous bottle blank or aqueous equipment blank associated with soil/sediment samples.

Validator's Name Michelle Allen Company Name _____ Phone Number _____

Date Validation Started _____ Date Validation Completed _____

Check if all criteria are met and no hard copy worksheet is provided. Indicate NA if worksheet is not applicable to the analytical method. Note: there is no standard worksheet for System Performance; however, the validator must document all system performance issues in the Data Validation Memorandum.

INORG Worksheets:

INORG	COMPLETE SDG FILE (CSF) AUDIT	_____
INORG-I	PRESERVATION AND TECHNICAL HOLDING TIMES	_____
INORG-II	ICP-MS TUNE	_____
INORG-III-A/B	CALIBRATIONS	_____
INORG-IV-A/B	BLANKS	_____
INORG-IV-C.1	BLANKS	_____
INORG-IV-C.2	BLANKS	_____
INORG-V-A	ICP-AES INTERFERENCE CHECK SAMPLE - ICSAB	_____
INORG-V-B.1	ICP-AES INTERFERENCE CHECK SAMPLE - ICSA	_____
INORG-V-B.2	ICP-AES INTERFERENCE CHECK SAMPLE - ICSA	_____
INORG-VI-A	ICP-MS INTERFERENCE CHECK SAMPLE - ICSAB	_____
INORG-VI-B	ICP-MS INTERFERENCE CHECK SAMPLE - ICSA	_____
INORG-VII	ICP-MS INTERNAL STANDARDS	_____
INORG-VIII	MATRIX SPIKES	_____
INORG-IX	LABORATORY DUPLICATE SAMPLES	_____
INORG-X	FIELD DUPLICATES	_____
INORG-XI	ICP SERIAL DILUTIONS	_____
INORG-XII-A/B	SENSITIVITY CHECK	_____
INORG-XIII-A	PE SAMPLES/ACCURACY CHECK- LCS	_____
INORG-XIII-B	PE SAMPLES/ACCURACY CHECK- PE RESULTS	_____
INORG-XIV	ANALYTE QUANTITATION AND REPORTED QUANTITATION LIMITS	_____
TABLE II-WORKSHEET	OVERALL EVALUATION OF DATA	_____

I certify that all criteria were met for the worksheets checked above.

Signature: _____ Name: _____

Date: _____

EPA-NE - Data Validation Worksheet

Overall Evaluation of Data - Data Validation Memorandum - Table II

Site:_____ Case:_____ SDG:_____

see DV letter

INORGANICS					
DQO (List all DQOs)	Sampling and/or Analytical Method Appropriate? (Yes or No)	Measurement Error		Sampling Variability**	Potential Usability Issues
		Analytical Error	Sampling Error*		

* The evaluation of "sampling error" cannot be completely assessed in data validation.

** Sampling variability is not assessed in data validation.

Validator:_____ Date:_____

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EPA-NE - Data Validation Worksheet
INORG

COMPLETE SDG FILE (CSF) AUDIT

Inorganic Parameters:_____ N/A

Missing Information	Date Lab Contacted	Date Received

Validator: _____ Date: _____

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EPA-NE - Data Validation Worksheet
INORG-I

I. PRESERVATION AND HOLDING TIMES

Circle sample numbers with exceeded technical holding times or omitted preservation.
Circle all exceeded technical holding times.

Sample No.	Matrix	Pres. Code		Date Sampled	Metals		Hg		CN		Action
		Metals	CN		Date Analyzed	# of Days from Samp. to Analysis	Date Analyzed	# of Days from Samp. to Analysis	Date Analyzed	# of Days from Samp. to Analysis	

See DV letter

Preservation Code:
1. Cool (≤ 6°C)
2. pH < 2 with HNO_3
3. pH > 12 with NaOH
4. Room Temperature
5. Freeze
6. Reducing agent (for oxidants)
7. Treated for sulfides
8. Other - _____

Action Code:
J - Estimate (J) Detected Values
UJ - Estimate (UJ) Non-Detected Values
R - Reject (R) Non-Detected Values

Sampler:_____ Company:_____ Contacted: Y N Date:_____

Validator:_____ Date:_____

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EPA-NE - Data Validation Worksheet
INORG-II

II. ICP-MS TUNE

List all Tunes that are outside method QC acceptance criteria.

Method:_____

Method QC acceptance criteria for mass calibration:_____

Method QC acceptance criteria for resolution check/peak width:_____ at_____% peak height.

Method QC acceptance criteria for % RSD:_____

Analysis Date and Time	Analyte	Mass Calibration			Mass Resolution		% RSD of Absolute Signals	Analyte/Samples Affected	Action
		True Mass (amu)	Measured Mass (amu)	Absolute Difference of Masses (amu)	Peak Width (amu)	% Peak Height			

Comments:

Validator:_____ See DV letter Date:_____

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EPA-NE - Data Validation Worksheet
INORG-III-A/B/C

III. CALIBRATIONS

A. Instrument Calibration - List all calibration correlation coefficients that are outside the method QC acceptance criteria.
Calibration correlation QC acceptance criteria: _____ Calibration Type: _____

Date/Time	Instr.	Analyte	Corr. Coef.	Samples Affected	Action

B. Initial and Continuing Calibration Verifications - List all ICV and CCV analyte recoveries that are outside the method QC acceptance criteria.
ICV method QC acceptance criteria: _____ CCV method QC acceptance criteria: _____

Date	Instr.	Analyte	ICV/CCV #	% R	Samples Affected	Action

C. Quantitation Limit Check Standard - List all QL Check Standard analytes that are outside method QC acceptance criteria.
QL Check Standard method QC acceptance criteria: _____

Date	Instr.	Analyte	QL Check Std. #	% R	Affected Range	Samples Affected	Action

Comments: _____

Validator: _____ See DV letter Date: _____

EPA-NE - Data Validation Worksheet
INORG-IV-A/B

IV. BLANKS - List the blank contamination and negative blank results below.

Sampler: _____ Company: _____ Contacted: Y N Date: _____

A. Laboratory: Preparation (Method) and Calibration (Instrument) Blanks

Date Prepared	Date Analyzed	Blank Type (ICB/CCB#/Prep Blank)	Matrix	Instrument	Analyte	Conc. (units)

B. Field: Equipment (Rinsate) and Bottle Blanks

Date Sampled	Date Analyzed	Sample No. (Blank Type)	Matrix	Instrument	Analyte	Conc. (units)

Were the proper number of blanks analyzed at the proper frequency? Y N

For ICP MS - Are internal standard responses in all blanks within method QC acceptance criteria? Y N

Comments: _____

Validator: _____ See DV letter Date: _____

DRAFT 11/08

EPA-NE - Data Validation Worksheet
INORG-IV-C.1
IV. BLANKS

C.1 Blank Contamination Worksheet

Circle the highest concentration of each contaminant.

Analyte	Date Analyzed	ICB	CCB							PBW	PBS	EB	BB	Max. Conc.	Action Level
			1	2	3	4	5	6	7						
Aluminum															
Antimony															
Arsenic															
Barium															
Beryllium															
Cadmium															
Calcium															
Chromium															
Cobalt															
Copper															
Iron															
Lead															
Magnesium															
Manganese															
Mercury															
Nickel															
Potassium															
Selenium															
Silver															
Sodium															
Thallium															
Vanadium															
Zinc															
Cyanide															

Validator: _____ See DV letter Date: _____

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EPA-NE - Data Validation Worksheet
INORG-IV-C.2

IV. BLANKS

C.2 Blank Actions - List the maximum concentrations of each analyte among all blanks associated with each sample.

Analyte	Type of Blank	Date Blank Originated	Max. Conc. (units)	Blank Action Level (units)	Sample QL	Samples Affected	Action

Comments:

Validator: _____ See DV letter Date: _____

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V. A. ICP-AES INTERFERENCE CHECK SAMPLE - ICSAB

1. List all analytes in the ICSAB that are outside ICSAB percent recovery criteria.

Date	Analyte	%R	Conc. of Interferents Observed in ICSAB (ug/L)				Samples Affected	Action
			Al	Ca	Fe	Mg		

Comments:

Validator: see DV letter

Date:

V. B.1 ICP-AES INTERFERENCE CHECK SAMPLE - ICSA

1. List all analytes in the ICSA that are outside ICSA criteria.

Date	Analyte	MDL (ug/L)	ICSA Observed Conc. (ug/L)	ICSA True Value (ug/L)	Criteria: 80-120% R or TV±2xMDL	Conc. of Interferents Observed in ICSA (ug/L)				Associated Samples
						Al	Ca	Fe	Mg	

Comments:

Validator:_____ See DV letter Date:_____

V. B.2 ICP-AES INTERFERENCE CHECK SAMPLE - ICSA

2. List all affected sample results.

Affected Sample	Interferent	Conc. in Sample (ug/L)	Analyte	Conc. in Sample (ug/L)	Estimated Interference in Sample (ug/L)	Action

Comments:

Validator:_____ See DV letter Date:_____

VI. A. ICP-MS INTERFERENCE CHECK SAMPLE - ICSAB

List all analytes that are outside ICSAB criteria of 80-120% R.

Date	Analyte	%R	Samples Affected	Action

Comments:

Validator:_____ see DV letter Date:_____

VI. B. ICP-MS INTERFERENCE CHECK SAMPLE - ICSA

List all analytes that are outside ICSA criteria.

Date	Analyte	MDL (ug/L)	ICSA Observed Conc. (ug/L)	ICSA True Value (ug/L)	Criteria: 80-120% R or TV ± 2xMDL	Samples Affected	Action

Comments:

Validator:_____ See DV letter Date:_____

EPA-NE - Data Validation Worksheet
INORG-VII

VII. ICP-MS INTERNAL STANDARDS

List all internal standards that are outside method QC acceptance criteria.

IS method QC acceptance criteria: _____

Sample Number	Date and Time Analyzed	IS, amu	% RI	Analytes Affected (amu)	Action

Comments:

Validator: _____ see DV letter Date: _____

DRAFT 11/08

EPA-NE - Data Validation Worksheet
INORG-VIII

VIII. MATRIX SPIKES - List all matrix spike analytes that are outside method QC acceptance criteria.

Use a separate worksheet for each matrix spike sample.

Sample No.: _____ Matrix: _____

Method	Analyte	Spiked Sample Result	Sample Result	Amount of Spike Added	MS % Recovery	Method QC Limits % Recovery	Post-Digest Spike % Recovery	Action
Comments:								

Validator: _____ Date: _____

see DV letter

DRAFT 11/08

IX. LABORATORY DUPLICATE SAMPLES - List all analytes that are outside method QC acceptance criteria for the specific matrix.

Use a separate worksheet for each laboratory duplicate sample.

Sample No.:_____ Duplicate Sample No.:_____ Matrix:_____

Laboratory duplicate sample method QC acceptance criteria:_____

Method	Analyte	Sample Conc.	Sample		Duplicate Conc.	Duplicate		RPD or Abs. Diff.	QC Acceptance Criteria (RPD or Abs. Diff.)	Action
			SQL	5xSQL		SQL	5xSQL			

Do the field duplicate sample data indicate acceptable field precision? Y N

Comments:_____

Validator:_____ see DV letter Date:_____

EPA-NE - Data Validation Worksheet
INORG-X

X. FIELD DUPLICATES - List all field duplicate analytes that are outside criteria.

Use a separate worksheet for each field duplicate pair.

Sample No.:_____ Duplicate Sample No.:_____ Matrix:_____

Method	Analyte	Sample Conc.	Sample		Duplicate Conc.	Duplicate		RPD or Abs. Diff.	QC Acceptance Criteria (RPD or Abs. Diff.)	Action
			SQL	5xSQL		SQL	5xSQL			

Do the laboratory duplicate sample data indicate acceptable laboratory precision? Y N

Comments: _____

Sampler Name: _____ Contractor Name: _____ Date Contacted: _____

Reason for contact and resolution obtained: _____

Validator: _____ Date: _____

See DV letter

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XI. ICP SERIAL DILUTIONS

Use a separate worksheet for each serial dilution sample.

Sample No.:_____ Matrix:_____ Method:_____

List all serial dilution analytes that are outside method QC acceptance criteria.

% Difference method QC acceptance criteria: _____
Minimum concentration required to apply the % D criteria (e.g., 50x MDL): _____

Analyte	MDL	Min. Conc. Required	Sample Result	Serial Dilution Sample Result (corrected for dilution)	% D	Action

Comments:

Validator:_____ Date:_____

see DV letter

XII. SENSITIVITY CHECK

A. Method Detection Limit Study - List all analytes that are outside the MDL criteria.

- Has an appropriate MDL study been submitted with seven replicates for each analyte and matrix of interest? Y N
- Were samples analyzed within one year of the MDL study and on the same instrument? Y N

Matrix	Analyte	MDL	MDL > QL	Samples Affected	Action

If an MDL study has not been submitted, use only the LFB results to evaluate data.

B. Laboratory Fortified Blank - List all LFB analytes that are outside the LFB criteria.

- Has an appropriate and complete LFB been submitted at the proper frequency? Y N
- Does the LFB contain all target analytes at their QLs? Y N

Matrix	Method	Analyte	% R	Method QC Limits % R	Samples Affected	Action

Comments:_____

Validator:_____ see DV letter Date:_____

EPA-NE - Data Validation Worksheet
INORG-XIII-A

XIII. PERFORMANCE EVALUATION SAMPLES/ACCURACY CHECK

A. Laboratory Control Samples - List all analytes that are outside criteria.

SDG No.:_____ Case:_____

Are more than one-half of the LCS analytes within criteria for each parameter and method? Y N

Date Prepared	Date Analyzed	Parameter/ Method	Matrix	Analyte	% Recovery (or Observed Conc.)	Method QC Acceptance Criteria	Samples Affected	Action

Comments:

Validator:_____ See DV letter Date:_____

DRAFT 11/08

EPA-NE - Data Validation Worksheet
INORG-XIII-B

XIII. PERFORMANCE EVALUATION SAMPLES/ACCURACY CHECK

B. Performance Evaluation Results - List all analytes that are outside criteria.

SDG No.:_____ Case:_____

Indicate the source of the PES: Region 1 EPA PES Non-EPA PES

Are more than one-half of the PES analytes within criteria for each parameter and method? **Y** **N**

PE Sample Number	Ampule Number	Parameter/ Method	Type of PES	Matrix	Analyte	Conc.	PES Score*	Samples Affected	Action

* For Region I PESs indicate the Region I PES Score Report Result: Action High, Action Low, Analyte Missed, Contaminant.
For Non-EPA PESs indicate the Non-EPA PES Score: PES Analyte Missed; PES Analyte Contaminant; PES Analyte Hit (% Recovery Limits).

Comments:_____

Validator:_____ See DV letter Date:_____

DRAFT 11/08

EPA-NE - Data Validation Worksheet
INORG-XIV

XIV. ANALYTE QUANTITATION AND REPORTED QUANTITATION LIMITS

Recalculate, from the raw data, the concentrations for one positive detect and one reported sample quantitation limit for a non-detect in a diluted sample or soil sample per analytical method. (Note: Although Section XIV, C.2.a, requires that one calculation for each method in each sample be performed, the validator is only required to reproduce an example, for each method, of one positive detect and one sample quantitation limit calculation on this worksheet.)

Do all soil/sediment samples have % solids greater than 30%? **Y** **N**

- If no, were any steps employed to address the high moisture content? _____
- Indicate the action and list the affected sample nos.: _____

Method		Calculation
ICP-AES		
Sample No.:		
Reported Analyte:		
Reported Value:		
Non-Detected Analyte:		
Reported Quantitation Limit:		
ICP-MS		
Sample No.:		
Reported Analyte:		
Reported Value:		
Non-Detected Analyte:		
Reported Quantitation Limit:		
Mercury		
Sample No.:		
Reported Value:		
Sample No.:		
Reported Quantitation Limit:		
Cyanide		
Sample No.:		
Reported Value:		
Sample No.:		
Reported Quantitation Limit:		

Validator: _____ see DV letter Date: _____

APPENDIX D

SUPPORT DOCUMENTATION

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE 1 OF 1

CLIENT NSY Portsmouth		JOB NUMBER 02229, CTO WE43	
SUBJECT Lead Sample Calculation			
BASED ON		DRAWING NUMBER	
BY Michelle Allen	CHECKED BY	APPROVED BY	DATE 6/1/11

Sample: 002-SB-400-0204 % solid = 89%

Lead

extraction: $\frac{1.3\,g}{50\,ml} = \frac{1.3\,g}{0.05\,L}$

$$\frac{24.027\,mg}{1\,L} \times \frac{0.05\,L}{1.3\,g} \times \frac{1000\,g}{1\,Kg} \times \frac{1}{0.89} = 1038.3\ mg/Kg$$

Ti 334.940†	207.1	0.0003 mg/L	0.00005	0.0003 mg/L	0.00005	17.12%
Ca 227.546†	17.5	0.0378 mg/L	0.02915	0.0378 mg/L	0.02915	77.13%

Sequence No.: 16
Sample ID: LCS-58969~LCS
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 55
Date Collected: 5/5/2011 10:36:51 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: LCS-58969~LCS

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Y 360.073	2413329.1	95.39	%	0.859				0.90%
Lu 261.542	2236243.9	97.46	%	0.867				0.89%
Al 308.215†	229530.2	8.8395	mg/L	0.03180	8.8395	mg/L	0.03180	0.36%
Cr 267.716†	166725.4	0.9050	mg/L	0.00583	0.9050	mg/L	0.00583	0.64%
Cu 324.752†	357332.9	1.1308	mg/L	0.00347	1.1308	mg/L	0.00347	0.31%
Fe 273.955†	143273.9	4.6332	mg/L	0.02287	4.6332	mg/L	0.02287	0.49%
Mg 279.077†	772893.1	22.682	mg/L	0.1545	22.682	mg/L	0.1545	0.68%
Mn 257.610†	1192303.9	2.3219	mg/L	0.00809	2.3219	mg/L	0.00809	0.35%
Ni 231.604†	109959.6	2.3419	mg/L	0.00936	2.3419	mg/L	0.00936	0.40%
Pb 220.353†	6580.4	0.4606	mg/L	0.00374	0.4606	mg/L	0.00374	0.81%
Tl 190.801†	1217.9	0.4624	mg/L	0.00487	0.4624	mg/L	0.00487	1.05%
V 292.402†	367407.3	2.2424	mg/L	0.01357	2.2424	mg/L	0.01357	0.60%
Ti 334.940†	279.5	0.0003	mg/L	0.00003	0.0003	mg/L	0.00003	12.60%
Ca 227.546†	10193.1	21.935	mg/L	0.1337	21.935	mg/L	0.1337	0.61%

Sequence No.: 17
Sample ID: K0600-01A~OU2-SB-400-020
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 56
Date Collected: 5/5/2011 10:39:58 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: K0600-01A~OU2-SB-400-020

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Y 360.073	2428271.5	95.98	%	1.123				1.17%
Lu 261.542	2121282.3	92.45	%	1.233				1.33%
Al 308.215†	10005413.4	385.76	mg/L	4.292	385.76	mg/L	4.292	1.11%
Cr 267.716†	288319.5	1.5664	mg/L	0.00806	1.5664	mg/L	0.00806	0.51%
Cu 324.752†	320461.3	1.0359	mg/L	0.00751	1.0359	mg/L	0.00751	0.72%
Fe 273.955†	18018018.1	573.80	mg/L	0.991	573.80	mg/L	0.991	0.17%
Concentration greater than upper limit for Fe 273.955.								
Mg 279.077†	9330200.3	273.84	mg/L	2.887	273.84	mg/L	2.887	1.05%
Mn 257.610†	6255812.1	12.178	mg/L	0.0341	12.178	mg/L	0.0341	0.28%
Ni 231.604†	76752.6	1.6395	mg/L	0.01000	1.6395	mg/L	0.01000	0.61%
Pb 220.353†	344251.0	24.027	mg/L	0.0712	24.027	mg/L	0.0712	0.30%
Tl 190.801†	-102.8	0.0122	mg/L	0.01535	0.0122	mg/L	0.01535	126.05%
V 292.402†	154202.5	0.9709	mg/L	0.00461	0.9709	mg/L	0.00461	0.47%
Ti 334.940†	9722975.5	14.574	mg/L	0.0304	14.574	mg/L	0.0304	0.21%
Ca 227.546†	78561.1	169.44	mg/L	1.173	169.44	mg/L	1.173	0.69%

Sequence No.: 18
Sample ID: K0600-02A~OU2-SB-401-020
Analyst:
Initial Sample Wt:
Dilution:

Autosampler Location: 57
Date Collected: 5/5/2011 10:42:38 AM
Data Type: Original
Initial Sample Vol:
Sample Prep Vol:

Mean Data: K0600-02A~OU2-SB-401-020

Analyte	Mean Corrected Intensity	Conc.	Calib. Units	Std.Dev.	Sample Conc.	Units	Std.Dev.	RSD
Y 360.073	2503391.0	98.95	%	0.470				0.47%
Lu 261.542	2132509.7	92.94	%	0.763				0.82%
Al 308.215†	9913292.0	382.20	mg/L	3.637	382.20	mg/L	3.637	0.95%
Cr 267.716†	350888.7	1.9060	mg/L	0.01191	1.9060	mg/L	0.01191	0.63%

PORTSMOUTH NSY
SOIL DATA
K0600

FRACTION	CHEMICAL	OU2-SB-407-0203	UNITS	OU2-SB-DUP03-041111	RPD	D
M	LEAD	3940	MG/KG	3660	7.37	280.00

Current RPD Quality Control Limit: 50 %.
Shaded cells indicate RPDs that exceed the applicable quality control limit.

Percent Moisture and Percent Solids Report

Mitkem Sample ID	Client Sample ID	Analyzed	Percent Moisture	Percent Solids	Validated
K0600-01A	OU2-SB-400-0204	05/04/2011	11	89	Yes
K0600-02A	OU2-SB-401-0204	05/04/2011	10	90	Yes
K0600-03A	OU2-SB-402-0204	05/04/2011	9	91	Yes
K0600-08A	OU2-SB-407-0203	05/04/2011	22	78	Yes
K0600-09A	OU2-SB-408-0204	05/04/2011	18	82	Yes
K0600-11A	OU2-SB-416-0204	05/04/2011	4	96	Yes
K0600-13A	OU2-SB-401-0406	05/04/2011	7	93	Yes
K0600-14A	OU2-SB-402-0406	05/04/2011	10	90	Yes
K0600-18A	OU2-SB-DUP03-04111	05/04/2011	22	78	Yes

Percent Moisture and Percent Solids Report

Mitkem Sample ID	Client Sample ID	Analyzed	Percent Moisture	Percent Solids	Validated
K0601-01A	OU2-SB-401-0608	05/04/2011	18	82	Yes
K0601-02A	OU2-SB-401-0810	05/04/2011	17	83	Yes

HOLDTIME

SDG K0600

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
M	MG/KG	OU2-SB-DUP03-041111	K0600-18B	NM	04/11/2011	05/04/2011	05/05/2011	23	1	24
M	MG/KG	OU2-SB-401-0204	K0600-02B	NM	04/12/2011	05/04/2011	05/05/2011	22	1	23
M	MG/KG	OU2-SB-401-0406	K0600-13B	NM	04/12/2011	05/04/2011	05/05/2011	22	1	23
M	MG/KG	OU2-SB-401-0608	K0601-01B	NM	04/12/2011	05/04/2011	05/05/2011	22	1	23
M	MG/KG	OU2-SB-401-0810	K0601-02B	NM	04/12/2011	05/04/2011	05/05/2011	22	1	23
M	MG/KG	OU2-SB-402-0204	K0600-03B	NM	04/12/2011	05/04/2011	05/05/2011	22	1	23
M	MG/KG	OU2-SB-402-0406	K0600-14B	NM	04/12/2011	05/04/2011	05/05/2011	22	1	23
M	MG/KG	OU2-SB-407-0203	K0600-08B	NM	04/11/2011	05/04/2011	05/05/2011	23	1	24
M	MG/KG	OU2-SB-408-0204	K0600-09B	NM	04/11/2011	05/09/2011	05/10/2011	28	1	29
M	MG/KG	OU2-SB-400-0204	K0600-01B	NM	04/12/2011	05/04/2011	05/05/2011	22	1	23
M	MG/KG	OU2-SB-416-0204	K0600-11B	NM	04/11/2011	05/04/2011	05/05/2011	23	1	24
PMOIS	PCT	OU2-SB-DUP03-041111	K0600-18A	NM	04/11/2011	05/04/2011	05/04/2011	23	0	23
PMOIS	PCT	OU2-SB-401-0204	K0600-02A	NM	04/12/2011	05/04/2011	05/04/2011	22	0	22
PMOIS	PCT	OU2-SB-401-0406	K0600-13A	NM	04/12/2011	05/04/2011	05/04/2011	22	0	22
PMOIS	PCT	OU2-SB-401-0608	K0601-01A	NM	04/12/2011	05/04/2011	05/04/2011	22	0	22

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
PMOIS	PCT	OU2-SB-401-0810	K0601-02A	NM	04/12/2011	05/04/2011	05/04/2011	22	0	22
PMOIS	PCT	OU2-SB-402-0204	K0600-03A	NM	04/12/2011	05/04/2011	05/04/2011	22	0	22
PMOIS	PCT	OU2-SB-402-0406	K0600-14A	NM	04/12/2011	05/04/2011	05/04/2011	22	0	22
PMOIS	PCT	OU2-SB-407-0203	K0600-08A	NM	04/11/2011	05/04/2011	05/04/2011	23	0	23
PMOIS	PCT	OU2-SB-408-0204	K0600-09A	NM	04/11/2011	05/04/2011	05/04/2011	23	0	23
PMOIS	PCT	OU2-SB-416-0204	K0600-11A	NM	04/11/2011	05/04/2011	05/04/2011	23	0	23
PMOIS	PCT	OU2-SB-400-0204	K0600-01A	NM	04/12/2011	05/04/2011	05/04/2011	22	0	22

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 2

PROJECT NO: 112G02229
SITE NAME: PNS OU2
PROJECT MANAGER AND PHONE NUMBER: Dan Witt 412-921-8259
LABORATORY NAME AND CONTACT: Edward Bowker / Mitkem labs
SAMPLERS (SIGNATURE): Tori Anderson
L. Anderson 978-474-8451
FIELD OPERATIONS LEADER AND PHONE NUMBER: ~~S Hill 412-921-8846~~ 4/13/11
ADDRESS: 175 Metro Center Blvd
CARRIER/WAYBILL NUMBER: 8723 6912 1378
CITY, STATE: Warwick, RI 02886

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☒ 72 hr. ☐ 7 day ☐ 14 day
** Phase II see below

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED: 4°C

	DATE YEAR 2011	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: RCB Homologs	Cu & Pb							COMMENTS
1	4/12	0910	OU2-SB-400-0204	SO	G	1	1								HOLD
2	4/12	0935	OU2-SB-401-0204			1	1								
3	4/12	0845	OU2-SB-402-0204			1	1								
4	4/12	1020	OU2-SB-403-0204			1	1								
5	4/12	0838	OU2-SB-404-0204			1	1								
6	4/11	1605	OU2-SB-405-0204			1	1								
7	4/11	1555	OU2-SB-406-0204			1	1								
8	4/11	1405	OU2-SB-407-0203			1	1								
9	4/11	1320	OU2-SB-408-0204			2	2								MS/MSD
10	4/11	1210	OU2-SB-412-0203			1	1								
11	4/11	1140	OU2-SB-416-0204			1	1								
12	4/11	1115	OU2-SB-418-0204			1	1								
13	4/12	0940	OU2-SB-401-0406			1	1								

1. RELINQUISHED BY: Tori Anderson	DATE 4/13/11	TIME 1100	1. RECEIVED BY: FedEx Shipment	DATE 4/13/11	TIME 1100
2. RELINQUISHED BY: FedEx	DATE 4/14/11	TIME 0910	2. RECEIVED BY: [signature]	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS: *Phase II samples → analyze after direction is given from TtNUS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 2 OF 2

PROJECT NO: 112G02229	SITE NAME: PNS OU2	PROJECT MANAGER AND PHONE NUMBER: Dan Wirth 412-921-8259	LABORATORY NAME AND CONTACT: Edward Lawler / MitKem
SAMPLERS (SIGNATURE): Tori Anderson	L. Anderson 978-474-8451	FIELD OPERATIONS LEADER AND PHONE NUMBER: ~~S. Hill 412-921-8876~~ 4/13/11	ADDRESS: 175 Metro Center Blvd
		CARRIER/WAYBILL NUMBER: 8723 6912 1378	CITY, STATE: Warwick, RI 02886

STANDARD TAT ☐
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☒ 72 hr. ☐ 7 day ☐ 14 day

*Phase II see below

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED: 4°C

	DATE YEAR 2011	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: PCB	TYPE OF ANALYSIS: Homologs Cu + Pb	COMMENTS
14	4/12	0850	OU2-SB-402-0406	SO	G	1	1		HOLD
15	4/12	1025	OU2-SB-403-0406	↓	↓	1	1		↓
16	4/11	1615	OU2-SB-405-0406			1	1		
17	4/11	0000	OU2-SB-DUP01-041111			1	1		
18	4/11	0000	OU2-SB-DUP03-041111			1	1		
19	4/11	0000	OU2-SB-DUP04-041111			1	1		

1. RELINQUISHED BY: Tori Anderson	DATE: 4/13/11	TIME: 1100	1. RECEIVED BY: FedEx Shipment	DATE: 4/13/11	TIME: 1100
2. RELINQUISHED BY: FedEx	DATE: 4/14/11	TIME: 0?:47	2. RECEIVED BY: [signature]	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS: *Phase II samples → analyze after direction is given from TtNUS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

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FORM NO. TtNUS-001

00010

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 1

PROJECT NO: 112G02229	SITE NAME: PNS 042	PROJECT MANAGER AND PHONE NUMBER: Dan Witt 412-921-8259	LABORATORY NAME AND CONTACT: Edward Lawler / Mitkem Labs
SAMPLERS (SIGNATURE): Tori Anderson	L. Anderson 978-474-8451	FIELD OPERATIONS LEADER AND PHONE NUMBER: ~~S. Hill 412-921-8876~~ 4/13/11	ADDRESS: 175 Metro Center Blvd
		CARRIER/WAYBILL NUMBER: 8723 6912 1378	CITY, STATE: Warwick, RI 02886

STANDARD TAT ☐ [redacted]
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☒ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G
PRESERVATIVE USED: 4°C

DATE YEAR 2011	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: RCB Homologs Cu & Pb							COMMENTS
4/12	0945	042-SB-401-0608	SO	G	2	2					MS/MSD		HOLD
4/12	0950	042-SB-401-0810	↓	↓	1	1							↓
4/11	1615	042-SB-405-0608			1	1							
4/11	0000	042-SB-DUP05-041111			1	1							

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: Tori Anderson	4/13/11	1100	1. RECEIVED BY: FedEx Shipment	4/13/11	1100
2. RELINQUISHED BY: Fedex	4/14/11	0817	2. RECEIVED BY: [signature]	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS: ~~[redacted] samples~~ analyze after direction is given from TtNUS.

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

3/99
FORM NO. TtNUS-001

00011

4.5

Edward Lawler [Mitkem]

From: Witt, Daniel [Daniel.Witt@tetratech.com]
Sent: Wednesday, April 27, 2011 3:05 PM
To: Edward Lawler [Mitkem]; Kraus, Matthew
Subject: RE: PNS OU2 schedule

Ed,

Thank you for that question. We only need to analyze for Lead. (PCBs and Copper were below our action levels). Yes please hold the unanalyzed samples for now.

Thanks

Dan

From: Edward Lawler [Mitkem] [mailto:elawler@mitkem.com]
Sent: Wednesday, April 27, 2011 2:56 PM
To: Witt, Daniel; Kraus, Matthew
Subject: RE: PNS OU2 schedule

Dan—

Do you need us to perform both PCBs and metals on these 11 samples? We will select one from this group for MS/MSD lab QC.

We typically hold samples for 60 days from the date the report is submitted to the customer. We can hold these for up to a year if you want. We had a cost in our proposal for bottles,login, disposal for samples that were not analyzed. We can include "hold for up to a year" in this cost (I believe it was $25/sample), so it won't cost you any more.

--Ed

From: Witt, Daniel [mailto:Daniel.Witt@tetratech.com]
Sent: Wednesday, April 27, 2011 2:21 PM
To: Edward Lawler [Mitkem]; Kraus, Matthew
Subject: RE: PNS OU2 schedule

Ed,

We got the go ahead to analyze select samples from the Phase II and Phase III groups of data.

The samples are:

OU2-SB-400-0204
OU2-SB-401-0204
OU2-SB-402-0204
OU2-SB-407-0203
OU2-SB-408-0204
OU2-SB-416-0204
OU2-SB-401-0406
OU2-SB-402-0406
OU2-SB-DUP03-041111

OU2-SB-401-0608
OU2-SB-401-0810

This will likely be the only samples that will need to be analyzed, however, the Navy would like the possibility to comeback and analyze some of the remaining samples if the regulators change their mind. The hold times are 180 days for the metals and 365 for the PCBs. How long will you hold the unanalyzed samples?

Let me know if you have any questions.

Thanks

Dan

From: Edward Lawler [Mitkem] [mailto:elawler@mitkem.com]
Sent: Friday, April 22, 2011 2:37 PM
To: Witt, Daniel; Kraus, Matthew
Subject: RE: PNS OU2 schedule

Hello Dan, Matt—

Attached are data from the reanalyses of the PCB Homolog sample extracts. For these, the instrument was working fine, both at the start and at the end of the analytical sequence.

These results are generally a bit higher than the previous analysis results—I believe the highest went from a Total PCB of 160 to a Total PCB of 180ppb. Most samples have very low concentrations of several homologs. Only one sample had a lower concentration in the reanalysis—(SS-416-0002 went from a total of 28ppb down to a total of 3.4ppb). There is one surrogate recovery low for this one, so it may be a matrix interference issue. We are taking another look at it.

If you have any questions, please don't hesitate to contact me. If you want us to go ahead and analyze any of the Phase 2 (or Phase 3) samples, let me know.

Thanks

-_Ed

From: Witt, Daniel [mailto:Daniel.Witt@tetratech.com]
Sent: Tuesday, April 19, 2011 11:18 AM
To: Kraus, Matthew; Edward Lawler [Mitkem]
Subject: RE: PNS OU2 schedule

Hi Ed,

You should have received all the samples last week from the OU2 pre-design investigation. The samples were grouped into three phases with the first phase to be analyzed and the second two phases to be analyzed only after the we see the results for the previous phase. I know Matt had mentioned that you were real busy and the 3-day TAT might be a problem. When do you anticipate we will see the initial sample results from the first phase?

Thanks

Dan

Daniel C. Witt, PE | Project Manager/Civil Engineer

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COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

SOW No.: SW846

EPA Sample No.	Lab Sample ID
OU2-SB-400-0204	K0600-01
OU2-SB-401-0204	K0600-02
OU2-SB-401-0406	K0600-13
OU2-SB-401-0608	K0601-01
OU2-SB-401-0810	K0601-02
OU2-SB-402-0204	K0600-03
OU2-SB-402-0406	K0600-14
OU2-SB-407-0203	K0600-08
OU2-SB-408-0204	K0600-09
OU2-SB-408-0204D	K0600-09DUP
OU2-SB-408-0204S	K0600-09MS
OU2-SB-416-0204	K0600-11
OU2-SB-DUP03-041111	K0600-18

Were ICP interelement corrections applied? Yes/No Yes

Were background corrections applied? Yes/No Yes

If yes-were raw data generated before application of background corrections? Yes/No No

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature

Signature: Dawne E Smart Name: Dawne E Smart

Date: 5/17/11 Title:

REPORT NARRATIVE

Mitkem Laboratories, a Division of Spectrum Analytical, Inc.

Client : Tetra Tech NUS, Inc.

Project: CTO-WE-43, PNS OU-2, Phases 2, 3

Laboratory Workorder / SDG #: K0600, K0601

SW846 6010C

I. SAMPLE RECEIPT

Samples were designated as "Phase 1, 2 or 3" on the Chain of Custody form. Phase 1 samples were immediately analyzed. The results of these analyses have been previously reported as Mitkem SDG K0598. Samples designated as Phases 2 and 3 were "on-hold" awaiting the results of the Phase 1 samples.

Per authorization from the client, selected Phase 2 and 3 samples were taken off-hold and analyzed for total lead. The results of these analyses are enclosed.

Per request of the client, the remaining samples in Phases 2 and 3 are being held for up to one additional year in case further analyses are requested. Unless further analyses are requested, these samples will be properly disposed in May, 2012.

II. HOLDING TIMES

A. Sample Preparation:

All samples were prepared within the method-specified holding times.

B. Sample Analysis:

All samples were analyzed within the method-specified holding times.

III. METHODS

Samples were analyzed following procedures in laboratory test code: SW846 6010C

IV. PREPARATION

Soil Samples were prepared following procedures in laboratory test code: SW3050

V. INSTRUMENTATION

The following instrumentation was used to perform

Instrument Code: OPTIMA2
Instrument Type: ICP
Description: Optima 3100 XL
Manufacturer: Perkin-Elmer
Model: 3100 XL

Instrument Code: OPTIMA3
Instrument Type: ICP
Description: Optima ICP-OES
Manufacturer: Perkin-Elmer
Model: 4300 DV

VI. ANALYSIS

A. Calibration:

Calibrations met the method/SOP acceptance criteria.

B. Blanks:

All method blanks were within the acceptance criteria.

C. Spikes:

1. **Laboratory Control Spikes (LCS):**

   Percent recoveries for laboratory control samples were within the QC limits.

2. **Matrix spike (MS):**

Matrix spike analysis was performed on sample: OU2-SB-408-0204 (K0600-09BMS).

Percent recovery limit does not apply, as the concentration of Lead in the native sample exceeds four times the spike concentration, which tends to obscure the measurement of percent recovery.

D. **Duplicate sample:**

Duplicate analyses were performed on sample: OU2-SB-408-0204 (K0600-09BDUP).

OU2-SB-408-0204 (K0600-09BDUP), Duplicate analysis exceeded the QC limit for Lead.

E. **Serial Dilution (SD):**

Serial Dilution analyses were performed on samples: OU2-SB-407-0203 (K0600-08BSD) and OU2-SB-408-0204 (K0600-09BSD).

Percent difference exceeded the QC limit for sample OU2-SB-407-0203 (K0600-08BSD), and was within the QC limit for sample OU2-SB-408-0204 (K0600-09BSD)

F. **Samples:**

No other unusual occurrences were noted during sample analysis.

I certify that this data package is in compliance with the terms and conditions agreed to by the client and Mitkem, both technically and for completeness, except for the conditions noted above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or designated person, as verified by the following signature.

Signed: Edward R. Lewis

Date: 5/17/11

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ANALYSIS RUN LOG

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Instrument ID Number: OPTIMA2 Method: P

Start Date: 05/05/2011 End Date: 05/05/2011

OPTIMA2_110505A

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CO	CR	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
S0	1.0	0911													X												
S1	1.0	0914													X												
S2	1.0	0916													X												
S3	1.0	0919													X												
ICV	1.0	0922													X												
ICB	1.0	0924													X												
ZZZZZZ	1.0	0927																									
ICSA	1.0	0931													X												
ICSAB	1.0	0933													X												
ZZZZZZ	1.0	0936																									
ZZZZZZ	1.0	0939																									
ZZZZZZ	1.0	0942																									
ZZZZZZ	1.0	0945																									
ZZZZZZ	1.0	0949																									
ZZZZZZ	1.0	0952																									
ZZZZZZ	1.0	0955																									
CCV	1.0	0959													X												
CCB	1.0	1001													X												
ZZZZZZ	1.0	1004																									
ZZZZZZ	1.0	1008																									
ZZZZZZ	1.0	1011																									
ZZZZZZ	5.0	1014																									
ZZZZZZ	1.0	1017																									
ZZZZZZ	1.0	1021																									
ZZZZZZ	1.0	1024																									
CCV	1.0	1027													X												
CCB	1.0	1030													X												
PBS	1.0	1033													X												
LCSS	1.0	1036													X												
OU2-SB-400-0204	1.0	1039													X												

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ANALYSIS RUN LOG

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Instrument ID Number: OPTIMA2 Method: P

Start Date: 05/05/2011 End Date: 05/05/2011

OPTIMA2_110505A

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CO	CR	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
OU2-SB-401-0204	1.0	1042													X												
OU2-SB-402-0204	1.0	1045													X												
OU2-SB-407-0203	1.0	1048													X												
OU2-SB-407-0203L	5.0	1051													X												
CCV	1.0	1053													X												
CCB	1.0	1056													X												
OU2-SB-416-0204	1.0	1059													X												
OU2-SB-401-0406	1.0	1102													X												
OU2-SB-402-0406	1.0	1105													X												
OU2-SB-DUP03-041111	1.0	1107													X												
ZZZZZZ	1.0	1110																									
OU2-SB-401-0810	1.0	1113													X												
OU2-SB-401-0608	1.0	1118													X												
CCV	1.0	1121													X												
CCB	1.0	1123													X												

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ANALYSIS RUN LOG

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Instrument ID Number: OPTIMA3 Method: P

Start Date: 05/10/2011 End Date: 05/10/2011

OPTIMA3_110510A

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CO	CR	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
S0	1.0	1208													X												
S1	1.0	1212													X												
S2	1.0	1216													X												
S3	1.0	1219													X												
ICV	1.0	1223													X												
ICB	1.0	1227													X												
ZZZZZZ	1.0	1230																									
ICSA	1.0	1234													X												
ICSAB	1.0	1238													X												
PBS	1.0	1241													X												
LCSS	1.0	1245													X												
ZZZZZZ	1.0	1249																									
ZZZZZZ	2.0	1253																									
ZZZZZZ	1.0	1257																									
ZZZZZZ	1.0	1301																									
ZZZZZZ	20.0	1305																									
ZZZZZZ	20.0	1309																									
CCV	1.0	1313													X												
CCB	1.0	1317													X												
ZZZZZZ	1.0	1320																									
ZZZZZZ	1.0	1324																									
ZZZZZZ	1.0	1328																									
ZZZZZZ	5.0	1332																									
OU2-SB-408-0204	50.0	1336													X												
OU2-SB-408-0204D	50.0	1339													X												
OU2-SB-408-0204S	50.0	1343													X												
OU2-SB-408-0204L OK	250.0	1347													X												
CCV	1.0	1350													X												
CCB	1.0	1354													X												

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PREPARATION LOG

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Preparation Method: 3050B Batch ID: 58969

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	05/04/2011	1.00	50
OU2-SB-400-0204	05/04/2011	1.30	50
OU2-SB-401-0204	05/04/2011	1.82	50
OU2-SB-401-0406	05/04/2011	1.48	50
OU2-SB-401-0608	05/04/2011	1.20	50
OU2-SB-401-0810	05/04/2011	1.85	50
OU2-SB-402-0204	05/04/2011	1.83	50
OU2-SB-402-0406	05/04/2011	1.67	50
OU2-SB-407-0203	05/04/2011	1.59	50
OU2-SB-416-0204	05/04/2011	1.52	50
OU2-SB-DUP03-041111	05/04/2011	1.66	50
PBS	05/04/2011	1.00	50

Comments:

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PREPARATION LOG

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Preparation Method: 3050B Batch ID: 59048

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	05/09/2011	1.00	50
OU2-SB-408-0204	05/09/2011	1.44	50
OU2-SB-408-0204D	05/09/2011	1.38	50
OU2-SB-408-0204S	05/09/2011	1.41	50
PBS	05/09/2011	1.00	50

Comments:

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Initial Calibration Source:

Continuing Calibration Source:

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Lead	500.0	489.64	97.9	500.0	492.38	98.5	500.91	100.2	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Initial Calibration Source:

Continuing Calibration Source:

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Lead				500.0	510.24	102.0	504.24	100.8	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Initial Calibration Source:

Continuing Calibration Source:

Concentration Units: ug/L

	Initial Calibration			Continuing Calibration					
Analyte	True	Found	%R(1)	True	Found	%R(1)	Found	%R(1)	M
Lead	500.0	511.86	102.4	500.0	495.82	99.2	487.05	97.4	P

(1) Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Preparation Blank Matrix (soil/water): SOIL Method Blank ID: **MB-58969**

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

OPTIMA2_110505A

Analyte	Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		
		C	1	C	2	C	3	C		C	M
Lead	4.2	U	4.2	U	4.2	U	5.5	B	0.250	U	P

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Preparation Blank Matrix (soil/water): Method Blank ID:

Preparation Blank Concentration Units (ug/L or mg/kg):

OPTIMA2_110505A

	Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		
Analyte		C	1	C	2	C	3	C		C	M
Lead			4.2	U							P

U.S. EPA - CLP

3

BLANKS

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Preparation Blank Matrix (soil/water): SOIL Method Blank ID: **MB-59048**

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

OPTIMA3_110510A

	Initial Calibration Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		
Analyte		C	1	C	2	C	3	C		C	M
Lead	4.2	U	4.2	U	4.2	U			0.250	U	P

U.S. EPA - CLP

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

ICP ID Number: OPTIMA2 ICS Source:

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	%R	Final Found Sol. A	%R	Final Found Sol. AB	%R
Lead	0	500	-1	469	93.8				

U.S. EPA - CLP

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

ICP ID Number: OPTIMA3 ICS Source:

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	%R	Final Found Sol. A	%R	Final Found Sol. AB	%R
Lead	0	500	-5	479.1	95.8				

U.S. EPA - CLP

7

LABORATORY CONTROL SAMPLE

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Solid LCS Source: LCS(D) ID:

Aqueous LCS Source: **LCS-58969**

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/Kg) True	Found	C	Limits		%R
Lead				22.8	23.0		18.2	27.3	100.9

U.S. EPA - CLP

7

LABORATORY CONTROL SAMPLE

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Solid LCS Source: LCS(D) ID:

Aqueous LCS Source: **LCS-59048**

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/Kg) True	Found	C	Limits		%R
Lead				22.8	22.9		18.2	27.3	100.4

U.S. EPA - CLP

9

ICP SERIAL DILUTIONS

EPA SAMPLE NO.

OU2-SB-407-0203

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Matrix (soil/water): SOIL Level (low/med): MED

Concentration Units (ug/L or mg/kg dry weight): ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Lead	97724.11		109864.83		12	E	P

U.S. EPA - CLP

9

ICP SERIAL DILUTIONS

EPA SAMPLE NO.

OU2-SB-408-0204

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Matrix (soil/water): SOIL Level (low/med): MED

Concentration Units (ug/L or mg/kg dry weight): ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Lead	4623.22		4550.98		2		P

U.S. EPA - CLP

6

DUPLICATES

EPA SAMPLE NO.

OU2-SB-408-0204D

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Matrix (soil/water): SOIL Level (low/med): MED

% Solids for Sample: 82.0 % Solids for Duplicate: 82.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Lead		9788.3184		6608.3897		38.8		P

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

OU2-SB-408-0204S

Lab Name: Mitkem Laboratories Contract: 1045445, 07

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Matrix (soil/water): SOIL Level (low/med): MED

% Solids for Sample: 82.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Lead		8380		9790		19.7	-7164		P

Comments:

U.S. EPA - CLP

10

METHOD DETECTION LIMITS (ANNUALLY)

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Instrument Type: P InstrumentID: OPTIMA2 Date: 03/03/2010

Preparation Method: 3005A

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Wavelength /Mass	CRDL	MDL
Lead	220.35	10	4.2

Comments:

ISM_002

FORM X - IN SW846

U.S. EPA - CLP

10

METHOD DETECTION LIMITS (ANNUALLY)

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Instrument Type: P InstrumentID: OPTIMA2 Date: 06/03/2010

Preparation Method: 3050B

Concentration Units (ug/L or mg/kg): mg/Kg

Analyte	Wavelength /Mass	CRDL	MDL
Lead	220.35	0.50	0.17

Comments:

U.S. EPA - CLP

10

METHOD DETECTION LIMITS (ANNUALLY)

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Instrument Type: P InstrumentID: OPTIMA3 Date: 03/03/2010

Preparation Method: 3005A

Concentration Units (ug/L or mg/kg): ug/L

Analyte	Wavelength /Mass	CRDL	MDL
Lead	220.35	10	4.2

Comments:

U.S. EPA - CLP

10

METHOD DETECTION LIMITS (ANNUALLY)

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

Instrument Type: P InstrumentID: OPTIMA3 Date: 06/03/2010

Preparation Method: 3050B

Concentration Units (ug/L or mg/kg): mg/Kg

Analyte	Wavelength /Mass	CRDL	MDL
Lead	220.35	0.50	0.17

Comments:

U.S. EPA - CLP

12

ICP LINEAR RANGES (BIANNUALLY)

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

ICP ID Number: OPTIMA3 Date: 03/17/2011

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	M
Lead	0.20	100000	P

Comments:

U.S. EPA - CLP

12

ICP LINEAR RANGES (BIANNUALLY)

Lab Name: Mitkem Laboratories Contract: 1045445, 07-CTO WE43, 112G02229

Lab Code: MITKEM Case No.: SAS No.: SDG No.: SK0600

ICP ID Number: OPTIMA2 Date: 11/11/2010

Analyte	Integ. Time (Sec.)	Concentration (ug/L)	M
Lead	0.20	100000	P

Comments:

APPENDIX D

DATA QUALITY REVIEW

APPENDIX D
ANALYTICAL DATA QUALITY REVIEW
SAMPLING AND ANALYSIS PLAN FOR OU2 PRE-DESIGN INVESTIGATION
PORTSMOUTH NAVAL SHIPYARD, KITTERY, MAINE

A description of the data review processes used to determine whether analytical laboratory data were of acceptable technical quality for use in decision making is presented in this data quality review (DQR). The review began with data verification and validation. Verification is a process used to ensure that contractual requirements were satisfied. Validation is a comparison of data quality indicators (DQIs) against prescribed acceptance criteria to assess analytical method performance. The DQIs used are measures to assess the bias and precision of the analytical calibrations and sample analyses. Together, verification and validation are the first steps in evaluating data completeness, accuracy, sensitivity, comparability, and representativeness. The data review process culminates with a data usability assessment during which the final usability of the data is established relative to the intended data use. Following is the data usability assessment for the Pre-Design Investigation for Operable Unit 2.

1.0 DATA VALIDATION PROCESS

All of the results from analytical laboratory samples were validated according to several specifications. Assignment of data qualification flags conformed to rules established in USEPA Region 1 Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses – Part II (December 1996), USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses (November 2008), and Department of Defense (DoD) document entitled Quality Systems Manual (QSM) for Environmental Laboratories (April 2009) to the greatest extent practicable for non-contract laboratory program data. Numerical criteria used in conjunction with these rules were specified in the SAP for OU2 Pre-Design Investigation (Tetra Tech, November, 2010).

If no qualifier is assigned to a result that has been validated, the data user is assured that no analytical performance deficiencies were identified during validation. The qualification flags used are defined below:

U – Indicates that the chemical was not detected at the numerical detection limit noted. Non-detected results are reported with a “U” qualifier when received from the laboratory. Additionally, a “U” qualifier is added to a result (reported by the laboratory) if the detected concentration is determined to be attributable to contamination introduced during field sampling or laboratory analysis.

UJ – Indicates that the chemical was not detected. However, the detection limit (sample-specific quantitation limit) is considered to be estimated based on problems encountered during laboratory analysis. The associated numerical detection limit is regarded as inaccurate.

J – Indicates that the chemical was detected. However, the associated numerical result is not an accurate representation of the amount that is actually present in the sample. The laboratory reported concentration is considered to be an estimate of the true concentration.

UR – Indicates that the chemical may or may not be present. The non-detected analytical result reported by the laboratory is considered to be unreliable and unusable. The “UR” qualifier is applied in cases of gross technical deficiencies (i.e., holding times missed by a factor of two times the specified time limit, severe calibration noncompliances, and extremely low quality control [QC] recoveries).

R – Indicates that the chemical may or may not be present. The analytical result reported by the laboratory is considered to be unreliable and unusable. The “R” qualifier is applied in cases of gross technical deficiencies (i.e., holding times missed by a factor of two times the specified time limit, severe calibration noncompliances, and extremely low QC recoveries).

The preceding data qualifiers may be categorized as indicative of major or minor problems. Major problems are defined as issues that result in the rejection of data and qualification with “UR” or “R” data validation qualifiers. Rejected data are considered invalid and are not used for decision making purposes unless used in a qualitative way and the use is justified and documented. Less severe deficiencies, associated with “U”, “J”, and “UJ” data validation qualifiers, are defined as issues resulting in the estimation of data. Estimated analytical results are considered to be suitable for decision-making purposes unless the data use requirements are very stringent and the qualifier indicates a deficiency that is incompatible with the intended data use. Also, a “U” qualifier does not necessarily indicate that a data deficiency exists because all non-detect values are flagged with the “U” qualifier regardless of whether a quality deficiency has been detected.

No data were rejected during evaluation of sample results for the OU2 Pre-Design Investigation. Qualified data and the reason for qualification during OU2 Pre-Design Investigation are presented in Table D-1. Any data impacts based on the results of the data evaluation are discussed in the remainder of this review.

2.0 DATA VALIDATION OUTPUTS

After laboratory data were validated, a list was developed of non-conformities requiring data qualifier flags that were used to alert the data user to inaccurate or imprecise data. For situations in which several QC

criteria were out of specification, the data validator made professional judgments and or comments on the validity of the overall data package. The reviewer then prepared a technical memorandum presenting qualification of the data, if necessary, and the rationale for making such qualifications. The net result was a data package that had been carefully reviewed for its adherence to prescribed technical requirements. Data validators incorporated data qualifiers into the electronic database and submitted the information to the Tetra Tech NUS, Inc. (Tetra Tech) data management group. A complete printout of the data results with validation flags is presented in Appendix C. Pertinent quality estimates are summarized in a more quantitative format in the following sections.

3.0 GENERAL DATA QUALITY REVIEW

The DQR provided herein is designed to provide an overall quantitative measure of analytical performance not provided by data validation. The analytical performance quantitative evaluations are frequently analyte-specific and reflect deficiencies such as biases associated with the quantification of particular analytes in a particular sample matrix. The data user must be aware that different chemicals in the same analytical fraction (e.g. lead and copper in the metals fraction) may exhibit different degrees of quality.

3.1 Completeness

Completeness is a measure of the number of valid samples or measurements that are available relative to the number of samples or measurements that were intended to be generated. For this project, completeness was measured on two different bases: samples collected and laboratory measurements.

- Sample completeness was a measure of the usable samples collected as compared to those intended to be collected.

- Laboratory measurement completeness was a measure of the amount of usable, valid laboratory measurements per matrix obtained for each target analyte.

Usable, valid samples (or results) were those judged, after data assessment, to represent the sampling populations and to have not been disqualified for use through data validation or additional data review. Completeness was determined using the following equation:

$$\%C = \frac{V}{T} \times 100$$

where %C = percent completeness

V	=	number of samples (or results) determined to be valid
T	=	total number of planned samples (or results)

As described in the SAP (Tetra Tech, November 2010) soil boring samples were collected in 2-foot increments (0 to 2 feet, 2 to 4 feet, 4 to 6 feet, 6 to 8 feet, and 8 to10 feet) until a depth of 10 feet bgs is reached or shallower refusal was encountered. The soil sample analyses were conducted in phases based on analytical results of the surface and subsurface soil samples. Samples from the 0-to-2 foot interval were analyzed in the first phase, then if required at a particular soil boring location; the next phase would include the 2 to 4 foot interval and the 4 to 6 foot interval. The last phase, if required, would include the 6 to 8 foot interval and the 8 to 10 foot interval. Lead was the only contaminant in surface soil samples (0 to 2 feet bgs) that exceeded Project Action Levels (PALs) therefore subsurface samples were analyzed for lead only as described in the SAP. All surface soil samples proposed for the Pre-Design Investigation sampling were collected and subsurface soil samples were analyzed in accordance with this sampling plan; therefore, the sample percent completeness for the Pre-Design Investigation is 100 percent.

The percent completeness for laboratory measurements was 100 percent for all fractions as all samples sent to the laboratory were analyzed for the appropriate fractions.

In summary, sample completeness for this project is 100 percent. Laboratory completeness for this project was 100 percent. The percent completeness goal for this project is 95 percent as defined in the SAP; therefore, completeness goals for this sampling round were met.

3.2 Sensitivity

Analytical sensitivity was sufficient to meet (equal to or less than) the project specific action levels provided in the SAP, which were based on the OU2 Preliminary Remediation Goals (PRGs) for copper, lead, and PCBs (Tetra Tech, November 2010). The method detection limits (MDLs) reported by the laboratory were less than the screening levels specified in the laboratory scope-of-work. Table D-2 lists all MDLs and the corresponding minimum screening level developed in the SAP.

3.3 Laboratory Accuracy

Accuracy in the laboratory was measured through the comparison of a spiked sample or laboratory control sample/laboratory control sample duplicate (LCS/LCSD) result to a known or calculated value and is expressed as a percent recovery (%R). Accuracy was also assessed by monitoring the analytical recovery of select surrogate compounds added to samples that are analyzed by organic chromatographic methods and the analytical recovery of calibration standards for all analyses. LCSs were used to assess

the accuracy of laboratory operations with minimal sample matrix effects. Matrix spike/matrix spike duplicate (MS/MSD) and surrogate compound analyses measure the combined accuracy effects of the sample matrix, sample preparation, and sample measurement. LCS and MS analyses were performed at a frequency of one per 20 associated samples of like matrix. Laboratory accuracy was assessed by comparing calculated %R values to accuracy control limits specified by the laboratory using the appropriate SW-846 Method.

Percent recovery is calculated using the following equation:

$$\%R = \frac{Ss - So}{S} \times 100$$

where	%R	=	percent recovery
	Ss	=	result of spiked sample
	So	=	result of non-spiked sample
	S	=	concentration of spiked amount.

The inductively coupled plasma (ICP) Interference Check Sample (ICS) is evaluated to verify the laboratory's inter-element and background correction factors, and to account for potential spectral overlaps and stray light interferences caused by the interfering analytes aluminum, calcium, iron, and magnesium. ICP ICS interference can affect the accuracy of analyte results and is therefore also evaluated in this section.

One hundred percent (21 of 21) of the copper results were qualified as estimated (J) for high percent recovery in a MS/MSD. The MS/MSD noncompliance was not egregious enough to qualify affected data as rejected therefore the data are considered acceptable for project use; however, data users should be aware that MS/MSD %Rs were greater than the quality control limit which indicates copper results are biased high.

Five percent (11 of 231) of the polychlorinated biphenyl homolog (PCBH) results were qualified as estimated (J and UJ) for low percent recovery in a MS/MSDs. The MS/MSD noncompliances were not egregious enough to qualify affected data as rejected therefore the data are considered acceptable for project use; however, data users should be aware that MS/MSD %Rs were less than the quality control limit which indicates PCBH results are biased low.

Thirty percent (10 of 32) lead results were qualified as estimated (J) due to ICP serial dilution non-compliances. ICP serial dilution is evaluated to determine if chemical intereference exists in the sample

matrix. The ICP serial dilution standard noncompliance was not egregious enough to qualify affected data as rejected; therefore the data are considered acceptable for project use.

Fourteen percent (33 of 231) of the PCBH results were qualified as estimated (J) for surrogate recovery noncompliances. Percent difference noncompliances were not egregious enough to qualify affected data as rejected therefore the data are considered acceptable for project use; however, data users should be aware that QC data indicates qualified results are biased high.

3.4 Laboratory Precision

Precision is a measure of the degree to which two or more measurements are in agreement and describes the reproducibility of measurements of the same parameter for samples analyzed under similar conditions.

Precision for chemical parameters is expressed as a Relative Percent Difference (RPD), which is defined as the ratio of the difference to the mean for the two values being evaluated. RPDs, typically expressed as percentages, are used to evaluate both field and laboratory duplicate precision and are calculated as follows:

$$RPD = \frac{|V1 - V2|}{(V1 + V2)/2} \times 100$$

where RPD = relative percent difference

V1, V2 = two results obtained by analyzing duplicate samples

The precision estimates obtained from duplicate field samples encompass the combined uncertainty associated with sample collection, homogenization, splitting, handling, laboratory and field storage (as applicable), preparation for analysis, and analysis. In contrast, precision estimates obtained from analyzing duplicate laboratory samples incorporate only homogenization, sub sampling, preparation for analysis, laboratory storage (if applicable), and analysis uncertainties.

Seventeen percent (4 of 23) of the metals results were qualified as estimated (J) for field duplicates percent recoveries being outside the quality control limits. Field duplicates are analyzed to evaluate homogenization, splitting, handling, laboratory and field storage (as applicable), preparation for analysis, and analysis uncertainties. The field duplicate noncompliance was not egregious enough to qualify affected data as rejected; therefore the data are considered acceptable for project use.

One percent (2 of 231) of the PCBH results was qualified as estimated (J) for field duplicates percent recoveries being outside the quality control limits. Field duplicates are analyzed to evaluate homogenization, splitting, handling, laboratory and field storage (as applicable), preparation for analysis, and analysis uncertainties. The field duplicate noncompliance was not egregious enough to qualify affected data as rejected; therefore the data are considered acceptable for project use.

Thirty four percent (11 of 32) of the lead results were qualified as estimated (J) for laboratory duplicates %Rs being outside the quality control limits. Laboratory duplicates are analyzed to evaluate homogenization, sub sampling, preparation for analysis, laboratory storage and analyses uncertainties. The laboratory duplicate noncompliance was not egregious enough to qualify affected data as rejected; therefore the data are considered acceptable for project use.

Several detected PCBH results were qualified as estimated due to uncertainty near the detection limit. Those results were reported as detections at concentrations less than 2 times the corresponding analyte MDL. Positive results qualified due to uncertainty near the detection limit are considered imprecise and are qualified as estimated because relative error increases as analyte concentrations approach corresponding MDLs. However, such non-compliances are not egregious enough to quality the affected data as rejected according to data validation guidelines used for this project; therefore, data precision is not considered unacceptable due to those data points qualified because of uncertainty near the detection limit.

3.5 Comparability

Comparability is defined as the confidence with which one data set can be compared with another (e.g., among sampling points and among sampling events). Comparability was achieved by using standardized sampling and analysis methods, as well as standardized data reporting formats. Comparability of laboratory measurements was achieved primarily through the use and documentation of standard sampling and analytical methods. Results were reported in units that ensured comparability with previous data and with current state and federal standards and guidelines. Comparability of laboratory measurements was assessed primarily through the use of QC samples and through adherence to the quality assurance (QA) plan.

3.6 Representativeness

Representativeness is an expression of the degree to which data accurately and precisely depict the actual characteristics of a population or environmental condition existing at the site. The SAP for OU2 Pre-Design Investigation (Tetra Tech, November, 2010) and the use of standardized sampling, sample

handling, sample analysis, and data reporting procedures were designed so that the final data would be accurate representations of actual site conditions.

As provided in the SAP, borings in the Pre-Design Investigation boundary were intended to be spaced approximately 25 feet apart across the study boundary to provide spatial data to delineate remediation areas as part of the Remedial Design (RD). Borings OU2-400 through OU2-402, OU2-404 through OU2-416, and OU2-418 were installed for this purpose and provide spatial data for the targeted area. The SAP specified that a boring be located near the former location of sample SS-02. Boring OU2-403 was advanced near the former location of sample SS-02. There was one deviation from the SAP in locating soil boring. The SAP specified that a boring be installed between the previous samples SS-01-03 and OU2-124 to better delineate the remediation area (based on clean up levels for protection of industrial workers) within the current boundary of OU2. Boring OU2-417 was intended for this purpose; however, the actual sample location was installed near SS-01-03. This deviation from the SAP does not affect the data quality based on the elevated lead results in surrounding borings. The data will be used in the delineation of the remediation area as part of the RD.

4.0 DATA DEFICIENCIES

No data were rejected during evaluation of sample results for the OU2 Pre-Design Investigation; therefore, all data are considered acceptable for project use. The deviation in the location of boring OU2-417 does not affect the delineation of remediation areas based on the data from the surrounding borings.

5.0 REFERENCES

Tetra Tech NUS, Inc. (Tetra Tech), November 2010. Sampling and Analysis Plan for Operable Unit 2 Pre-Design Investigation, Portsmouth Naval Shipyard, Kittery, Maine. Tetra Tech,, King of Prussia, Pennsylvania.

USEPA, December 1996. Region 1 EPA-New England, Data Validation Functional Guidelines for Evaluating Organic Analyses (Part II).

USEPA, November 2008. Region 1 EPA-New England, Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analyses (Part IV).

DoD (Department of Defense), April 2009. Department of Defense Quality Systems Manual (QSM) for Environmental Laboratories. Version 4.1.

Table D-1
Qualified Data Table
OU2 Pre-Design Investigation
Portsmouth Naval Shipyard
Kittery, Maine

Sample Number	PARAMETER [1]	ANALYTICAL FRACTION	SAMPLE RESULT	VALUE QUALIFIER	QUALIFICATION CODE	UNITS	REASON FOR QUALIFICATION
OU2-SB-400-0204	LEAD	M	1040	J	FI	MG/KG	Lab Duplicate Imprecision, ICP Serial Dilution Noncompliance
OU2-SB-401-0204	LEAD	M	641	J	FI	MG/KG	Lab Duplicate Imprecision, ICP Serial Dilution Noncompliance
OU2-SB-401-0406	LEAD	M	72.7	J	FI	MG/KG	Lab Duplicate Imprecision, ICP Serial Dilution Noncompliance
OU2-SB-401-0608	LEAD	M	12.8	J	FI	MG/KG	Lab Duplicate Imprecision, ICP Serial Dilution Noncompliance
OU2-SB-401-0810	LEAD	M	10.9	J	FI	MG/KG	Lab Duplicate Imprecision, ICP Serial Dilution Noncompliance
OU2-SB-402-0204	LEAD	M	111	J	FI	MG/KG	Lab Duplicate Imprecision, ICP Serial Dilution Noncompliance
OU2-SB-402-0406	LEAD	M	346	J	FI	MG/KG	Lab Duplicate Imprecision, ICP Serial Dilution Noncompliance
OU2-SB-407-0203	LEAD	M	3940	J	FI	MG/KG	Lab Duplicate Imprecision, ICP Serial Dilution Noncompliance
OU2-SB-407-0203-D	LEAD	M	3660	J	FI	MG/KG	Lab Duplicate Imprecision, ICP Serial Dilution Noncompliance
OU2-SB-408-0204	LEAD	M	9790	J	F	MG/KG	Lab Duplicate Imprecision
OU2-SB-416-0204	LEAD	M	44.6	J	FI	MG/KG	Lab Duplicate Imprecision, ICP Serial Dilution Noncompliance
OU2-SS-400-0002	COPPER	M	48.5	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-401-0002	COPPER	M	120	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-402-0002	COPPER	M	1370	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-403-0002	COPPER	M	56.3	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-404-0002	COPPER	M	36.1	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-404-0002-D	COPPER	M	51.2	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-405-0002	COPPER	M	15.6	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-406-0002	COPPER	M	71.7	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-407-0002	COPPER	M	2190	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-408-0002	COPPER	M	270	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-409-0002	COPPER	M	16.2	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-410-0002	COPPER	M	357	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-411-0002	COPPER	M	53.2	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-412-0002	COPPER	M	184	J	DG	MG/KG	MS/MSD Recovery Noncompliance, Field Duplicate Imprecision
OU2-SS-412-0002	LEAD	M	1550	J	G	MG/KG	Field Duplicate Imprecision
OU2-SS-412-0002-D	COPPER	M	86.2	J	DG	MG/KG	MS/MSD Recovery Noncompliance, Field Duplicate Imprecision
OU2-SS-412-0002-D	LEAD	M	658	J	G	MG/KG	Field Duplicate Imprecision
OU2-SS-413-0002	COPPER	M	390	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-414-0002	COPPER	M	338	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-415-0002	COPPER	M	410	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-416-0002	COPPER	M	75	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-417-0002	COPPER	M	78.8	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-418-0002	COPPER	M	224	J	D	MG/KG	MS/MSD Recovery Noncompliance
OU2-SS-400-0002	HEPTACHLOROBIPHENYLS	PCBH	0.23	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-400-0002	HEXACHLOROBIPHENYL	PCBH	0.49	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-400-0002	PENTACHLOROBIPHENYLS	PCBH	0.38	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-402-0002	DICHLOROBIPHENYLS	PCBH	0.09	UJ	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-402-0002	HEPTACHLOROBIPHENYLS	PCBH	7.9	J	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-402-0002	HEXACHLOROBIPHENYL	PCBH	52	J	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-402-0002	MONOCHLOROBIPHENYLS	PCBH	0.09	UJ	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-402-0002	NONACHLOROBIPHENYLS	PCBH	0.45	UJ	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-402-0002	OCTACHLOROBIPHENYLS	PCBH	0.27	UJ	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-402-0002	PCB-209	PCBH	0.45	UJ	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-402-0002	PENTACHLOROBIPHENYLS	PCBH	98	J	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-402-0002	TETRACHLOROBIPHENYLS	PCBH	27	J	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-402-0002	TOTAL PCB HOMOLOGS	PCBH	180	J	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-402-0002	TRICHLOROBIPHENYLS	PCBH	0.09	UJ	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-403-0002	OCTACHLOROBIPHENYLS	PCBH	0.5	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-403-0002	TETRACHLOROBIPHENYLS	PCBH	0.42	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-403-0002	TRICHLOROBIPHENYLS	PCBH	0.052	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-404-0002	HEPTACHLOROBIPHENYLS	PCBH	1.1	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-404-0002	PENTACHLOROBIPHENYLS	PCBH	1.7	J	G	UG/KG	Field Duplicate Imprecision
OU2-SS-404-0002-D	OCTACHLOROBIPHENYLS	PCBH	0.65	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-404-0002-D	PENTACHLOROBIPHENYLS	PCBH	3.7	J	G	UG/KG	Field Duplicate Imprecision
OU2-SS-406-0002	PENTACHLOROBIPHENYLS	PCBH	0.24	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-407-0002	HEXACHLOROBIPHENYL	PCBH	0.29	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)

Table D-1
Qualified Data Table
OU2 Pre-Design Investigation
Portsmouth Naval Shipyard
Kittery, Maine

Sample Number	PARAMETER [1]	ANALYTICAL FRACTION	SAMPLE RESULT	VALUE QUALIFIER	QUALIFICATION CODE	UNITS	REASON FOR QUALIFICATION
OU2-SS-407-0002	TOTAL PCB HOMOLOGS	PCBH	0.29	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-408-0002	NONACHLOROBIPHENYLS	PCBH	1.3	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-408-0002	PENTACHLOROBIPHENYLS	PCBH	0.52	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-409-0002	PENTACHLOROBIPHENYLS	PCBH	0.15	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-409-0002	TOTAL PCB HOMOLOGS	PCBH	0.15	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-410-0002	DICHLOROBIPHENYLS	PCBH	0.05	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-410-0002	NONACHLOROBIPHENYLS	PCBH	0.89	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-411-0002	DICHLOROBIPHENYLS	PCBH	0.088	UJ	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-411-0002	HEPTACHLOROBIPHENYLS	PCBH	0.27	UJ	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-411-0002	HEXACHLOROBIPHENYL	PCBH	4.8	J	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-411-0002	MONOCHLOROBIPHENYLS	PCBH	0.31	J	PR	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics), Surrogates Recovery Noncompliance
OU2-SS-411-0002	NONACHLOROBIPHENYLS	PCBH	0.49	J	PR	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics), Surrogates Recovery Noncompliance
OU2-SS-411-0002	OCTACHLOROBIPHENYLS	PCBH	0.27	UJ	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-411-0002	PCB-209	PCBH	0.44	UJ	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-411-0002	PENTACHLOROBIPHENYLS	PCBH	3.6	J	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-411-0002	TETRACHLOROBIPHENYLS	PCBH	0.18	UJ	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-411-0002	TOTAL PCB HOMOLOGS	PCBH	9.2	J	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-411-0002	TRICHLOROBIPHENYLS	PCBH	0.088	UJ	R	UG/KG	Surrogates Recovery Noncompliance
OU2-SS-412-0002	DICHLOROBIPHENYLS	PCBH	0.084	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-412-0002	HEPTACHLOROBIPHENYLS	PCBH	0.86	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-412-0002	NONACHLOROBIPHENYLS	PCBH	0.41	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-412-0002-D	DICHLOROBIPHENYLS	PCBH	0.27	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-412-0002-D	HEPTACHLOROBIPHENYLS	PCBH	0.62	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-413-0002	DICHLOROBIPHENYLS	PCBH	0.12	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-413-0002	TRICHLOROBIPHENYLS	PCBH	0.15	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-414-0002	HEPTACHLOROBIPHENYLS	PCBH	0.45	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-414-0002	TETRACHLOROBIPHENYLS	PCBH	0.57	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-415-0002	NONACHLOROBIPHENYLS	PCBH	0.54	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-416-0002	DICHLOROBIPHENYLS	PCBH	0.09	UJ	DR	UG/KG	MS/MSD Recovery Noncompliance, Surrogates Recovery Noncompliance
OU2-SS-416-0002	HEPTACHLOROBIPHENYLS	PCBH	0.27	UJ	DR	UG/KG	MS/MSD Recovery Noncompliance, Surrogates Recovery Noncompliance
OU2-SS-416-0002	HEXACHLOROBIPHENYL	PCBH	1.6	J	DR	UG/KG	MS/MSD Recovery Noncompliance, Surrogates Recovery Noncompliance
OU2-SS-416-0002	MONOCHLOROBIPHENYLS	PCBH	1.7	J	DR	UG/KG	MS/MSD Recovery Noncompliance, Surrogates Recovery Noncompliance
OU2-SS-416-0002	NONACHLOROBIPHENYLS	PCBH	0.45	UJ	DR	UG/KG	MS/MSD Recovery Noncompliance, Surrogates Recovery Noncompliance
OU2-SS-416-0002	OCTACHLOROBIPHENYLS	PCBH	0.27	UJ	DR	UG/KG	MS/MSD Recovery Noncompliance, Surrogates Recovery Noncompliance
OU2-SS-416-0002	PCB-209	PCBH	0.45	UJ	DR	UG/KG	MS/MSD Recovery Noncompliance, Surrogates Recovery Noncompliance
OU2-SS-416-0002	PENTACHLOROBIPHENYLS	PCBH	0.18	UJ	DR	UG/KG	MS/MSD Recovery Noncompliance, Surrogates Recovery Noncompliance
OU2-SS-416-0002	TETRACHLOROBIPHENYLS	PCBH	0.18	UJ	DR	UG/KG	MS/MSD Recovery Noncompliance, Surrogates Recovery Noncompliance
OU2-SS-416-0002	TOTAL PCB HOMOLOGS	PCBH	3.4	J	DR	UG/KG	MS/MSD Recovery Noncompliance, Surrogates Recovery Noncompliance
OU2-SS-416-0002	TRICHLOROBIPHENYLS	PCBH	0.13	J	DPR	UG/KG	MS/MSD Recovery Noncompliance, Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics), Surrogates Recovery Noncompliance
OU2-SS-417-0002	TETRACHLOROBIPHENYLS	PCBH	0.45	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-417-0002	TRICHLOROBIPHENYLS	PCBH	0.33	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
OU2-SS-418-0002	TRICHLOROBIPHENYLS	PCBH	0.044	J	P	UG/KG	Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)

1 - Total PCB Homologs were calculated by the laboratory for each sample by summing all positive detections of the individual homologs in the sample.

M - Metals
PCBH - Polychlorinated biphenyl homologs
J - Adjusted
U - Non-Detect
I - ICP Serial Dilution Noncompliance
F - Lab Duplicate Imprecision
D - MS/MSD Recovery Noncompliance
G - Field Duplicate Imprecision

P - Uncertainty near detection limit
R - Surrogates Recovery Noncompliance
MG/KG - Milligram/Kilogram
UG/KG - Microgram/Kilogram
ICP - Inductively Couple Plasma
MS/MSD - Matrix Spike/Matrix Spike Duplicate
CRQL - Contract Required Detection Limit
IDL - Instrument Detection Limit

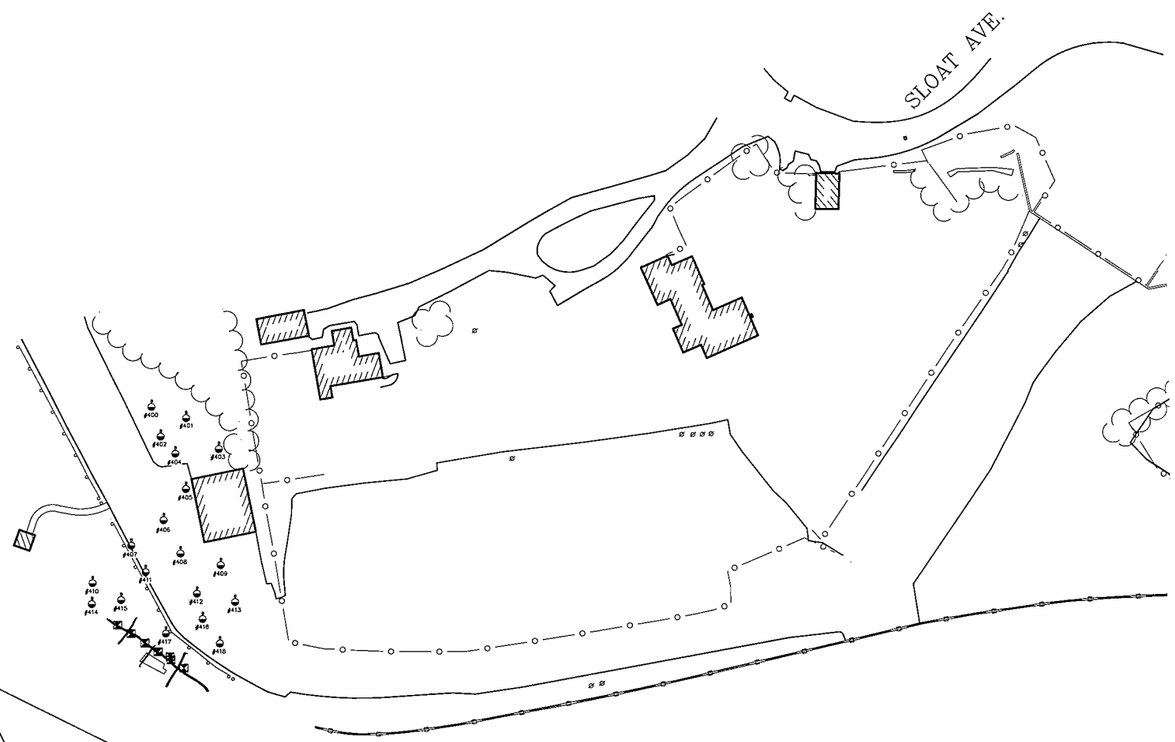
Table D-2
PAL Exceedances
OU2 Pre-Design Investigation
Portsmouth Naval Shipyard
Kittery, Maine

Parameter	Frequency of Detection	Minimum Non-Detect	Maximum Non-Detect	Minimum Screening Level	Number Non-Detects Exceeding Screening Level	Percent of Non-Detects Exceeding Screening Level	Screening Level Basis
Inorganics (mg/kg)							
COPPER	19/19	NA	NA	7300	0	0	OU2 Residential PRG
LEAD	29/29	NA	NA	400	0	0	OU2 Residential PRG
Miscellaneous (%)							
PERCENT MOISTURE	29/29	NA	NA	NA	NA	NA	NA
PCB Homologs (ug/kg)							
DICHLOROBIPHENYLS	3/19	0.086	0.097	1000	0	0	OU2 Residential PRG
HEPTACHLOROBIPHENYLS	11/19	0.26	0.29	1000	0	0	OU2 Residential PRG
HEXACHLOROBIPHENYL	18/19	0.18	0.18	1000	0	0	OU2 Residential PRG
MONOCHLOROBIPHENYLS	4/19	0.086	0.097	1000	0	0	OU2 Residential PRG
NONACHLOROBIPHENYLS	6/19	0.43	0.49	1000	0	0	OU2 Residential PRG
OCTACHLOROBIPHENYLS	2/19	0.26	0.29	1000	0	0	OU2 Residential PRG
PCB-209	0/19	0.43	0.49	1000	0	0	OU2 Residential PRG
PENTACHLOROBIPHENYLS	17/19	0.18	0.19	1000	0	0	OU2 Residential PRG
TETRACHLOROBIPHENYLS	8/19	0.17	0.19	1000	0	0	OU2 Residential PRG
TOTAL PCB HOMOLOGs [1]	19/19	NA	NA	1000	0	0	OU2 Residential PRG
TRICHLOROBIPHENYLS	6/19	0.086	0.096	1000	0	0	OU2 Residential PRG

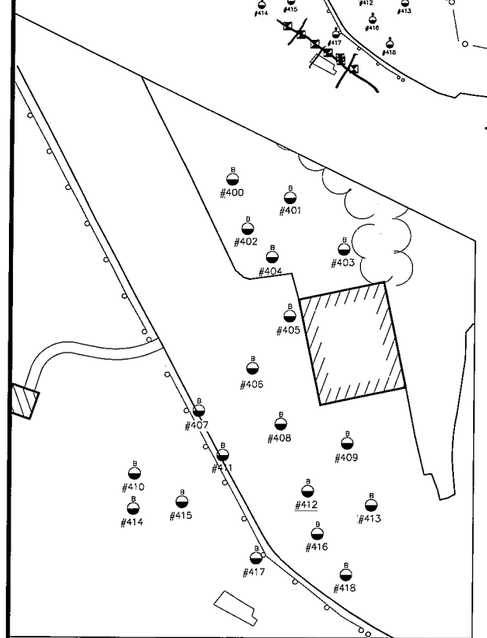
1 - Total PCB Homologs were calculated by the laboratory for each sample by summing all positive detections of the individual homologs in the sample.
PCB - Polychlorinated biphenyl
MG/KG - Milligram/Kilogram
UG/KG - Microgram/Kilogram
NA - Not Applicable
PRG - Preliminary Remediation Goals
PAL - Project Action Levels

APPENDIX E

SURVEY DATA



OU2 Boring coordinates from May 17 2011					
	Point no.	North	East	Elevation	Boring
	1029	88677.27	347532.6	109.75	BOR/400
	1021	88670.4	347554.2	109.98	BOR/401
	1028	88658.82	347538.4	109.6	BOR/402
	1012	88651.19	347574.4	109.86	BOR/403
	1027	88648.22	347547.6	109.71	BOR/404
	1041	88626.17	347554.4	109.85	BOR/405
	1043	88606.64	347540.7	109.05	BOR/406
	1047	88590.73	347520.7	108.46	BOR/407
	1048	88585.86	347551.3	109.14	BOR/408
	1049	88578.65	347576.1	109.29	BOR/409
	1118	88567.19	347497	108.19	BOR/410
	1388	88574.14	347529.8	108.77	BOR/411
	1361	88560.78	347561.6	109.13	BOR/412
	1362	88555.61	347585.2	109.34	BOR/413
	1290	88554.06	347496.6	108.24	BOR/414
	1291	88556.65	347514.7	108.64	BOR/415
	1360	88544.9	347565.3	109.36	BOR/416
	1310	88535.76	347542.6	109.39	BOR/417
	1359	88529.64	347576	109.46	BOR/418
Maine State Plane coordinate system, west zone NAD 27					
Vertical datum (P.N.S. 2002 vertical datum)					



BORING LOCATIONS (1"=30')

Survey of the pre-design investigation soil borings was conducted as part of a larger topographic survey of Operable Unit 2 that will be provided in the remedial design for OU2. The pre-design investigation borings (#400 to #418) are shown on this figure along with a table of the survey data for these locations.

NO.	DATE	DESCRIPTION	BY

NOTE:
ALL ELECTRIC, GAS, TEL, WATER, SEWER AND DRAIN SERVICES ARE SHOWN IN SCHEMATIC FASHION, THEIR LOCATIONS ARE NOT PRECISE OR NECESSARILY ACCURATE. NO WORK WHATSOEVER SHALL BE UNDERTAKEN ON THIS SITE USING THIS PLAN TO LOCATE THE ABOVE SERVICES. CONSULT WITH THE PROPER AUTHORITIES CONCERNED WITH THE SUBJECT SERVICE LOCATIONS FOR INFORMATION REGARDING SUCH. CALL DIG-SAFE AT 1-888-DIG-SAFE.

BORINGS LOCATED
AT
OPERABLE UNIT #2
FOR
TETRA TECH NUS, INC.
PORTSMOUTH NAVAL SHIPYARD
KITTERY, MAINE

DRAWN BY:	J.A.G.	DATE:	MAY, 17, 2011
CHECKED BY:	W.J.D.	DRAWING NO.:	3252(OU2)
JOB NO.:	3252	SHEET	1 OF 1

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