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NAS CECIL FIELD, FL
5090.3a

SECOND SEMI-ANNUAL YEAR 2 JULY 2010 EVENT GROUNDWATER MONITORING
LETTER REPORT FOR BUILDING 815 WASH RACK AREA NAS CECIL FIELD FL
10/08/2010
TETRA TECH NUS



TETRA TECH

PITT-10-10-015

October 8, 2010

Project Number 112G02267

Mr. David Grabka
Remedial Project Manager
Technical Review/Federal Facilities
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Reference: CLEAN V Contract Number N62470-08-D-1001
Contract Task Order JM09

Subject: Semi-Annual Groundwater Monitoring Report, 2nd Semi-Annual, Year 2-Event – July 2010
Building 815 Wash Rack Area
Naval Air Station Cecil Field
Jacksonville, Florida

Dear Mr. Grabka:

Tetra Tech NUS, Inc. (Tetra Tech) is pleased to submit this 2nd Semi-Annual, Year 2 Groundwater Monitoring Report for the Building 815 Wash Rack Area at Naval Air Station (NAS) Cecil Field. This report was prepared for the United States Navy, Naval Facilities Engineering Command Southeast (NAVFAC SE) under the Comprehensive Long-Term Environmental Action Navy (CLEAN) V Contract Number N62470-08-D-1001. This Semi-Annual Groundwater Monitoring Report summarizes the fieldwork and analytical results for the sampling event conducted in July 2010. The work was performed in general accordance with Tetra Tech and Florida Department of Environmental Protection (FDEP) Standard Operating Procedures (SOPs) under DEP-SOP-001/01.

BACKGROUND

Building 815 is an aircraft maintenance hangar located at the northern end of the flightline and eastern end of Lake Newman Street (formerly 6th Street) (see Figure 1). An aircraft wash rack is located north of the hangar. Naphthalene contamination in groundwater was identified in wells at the wash rack in the 1999 Sampling and Analysis Report (SAR) for Hangar 815. There are no tanks associated with this area of contamination. During the SAR, two shallow monitoring wells were installed in the area of the wash rack. In addition, an area of soil contamination and a storm water retention pond in the wash rack area were investigated during the SAR. The results of the investigations of this area are described in the Technical Memorandum for Potential Source of Contamination 56.

Site assessment occurred in 1999 and 2000, leading to a recommendation of long-term monitoring at the site. Based on the 2000 Natural Attenuation Monitoring Plan Approval Order (NAMPAO) issued by FDEP, semi-annual monitoring was conducted at the site from 2000 to 2003.

On January 12, 2004, Tetra Tech submitted the Groundwater Monitoring Report documenting results from the July 2003 sampling event. Based on these results, Tetra Tech concluded that naphthalene concentrations in monitoring well CEF-815-1S continued to exceed the annual milestone cleanup

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objectives defined in the NAMP AO. Tetra Tech recommended that the monitoring program be discontinued and that a Remedial Action Plan (RAP) be developed for the site. FDEP concurred with discontinuing the monitoring program and recommended that a soil assessment be conducted prior to preparation of a RAP. In January 2005, Tetra Tech collected soil samples in the 815 Wash Rack Area to determine if a continuing source of soil contamination was present in the vicinity of monitoring well CEF-815-1S. Eight samples were collected above the water table and capillary fringe from 2 to 4 feet below ground surface (bgs) and were analyzed for VOCs, polynuclear aromatic hydrocarbons (PAHs), and total recoverable petroleum hydrocarbons (TRPH). All soil assessment results were less than FDEP Soil Cleanup Target Levels (SCTLs), so the soil was determined to not be a continuing source of groundwater contamination.

As discussed during the February 2005 meeting, the NAS Cecil Field Base Realignment and Closure (BRAC) Cleanup Team (BCT) agreed to transfer the site from the Petroleum Program to the Installation Restoration (IR) Program so that site remediation could be conducted concurrently with adjacent Site 59. However, at the September 2007 BCT Meeting, it was decided that groundwater at the Building 815 Wash Rack Area would be transferred back to the Petroleum Program. Because nearly 2 years had passed since the last groundwater sampling event and because a RAP had not been prepared for the site since its transfer to the IR Program, a Site Assessment Report Addendum (SARA) was recommended. The monitoring wells sampled and the analyses (naphthalene and TRPH) conducted for the SARA were those designated in the 2000 NAMP AO.

During the initial SARA field event on November 5, 2007, Tetra Tech collected groundwater samples from wells CEF-815-1S and NG-12S to confirm the presence of naphthalene using United States Environmental Protection Agency (USEPA) Method 8270C and TRPH using the Florida Petroleum Range Organics (FL-PRO) method. Monitoring well CEF-815-1S had a naphthalene concentration of 89 micrograms per liter ($\mu\text{g/L}$), greater than the FDEP GCTL of 14 $\mu\text{g/L}$. TRPH was detected at a concentration less than its GCTL in CEF-815-1S. Concentrations in the groundwater sample collected from NG-12S during the SARA investigation were less than GCTLs.

During a second SARA field event in February 2008, one shallow monitoring well was installed using hollow-stem auger drilling techniques to delineate the extent of naphthalene contamination at the site. The well (CEF-815-5S) was installed approximately 30 feet southeast of CEF-815-1S and was screened from approximately 4 to 14 feet bgs. The location of CEF-815-5S is shown on Figure 2. Groundwater samples were collected from wells CEF-815-1S, CEF-815-5S, NG-12S, and nearby IR Site 59 well CEF-059-028-015 and analyzed for naphthalene using USEPA Method 8270C and for TRPH using the FL-PRO method. February 2008 samples from CEF-815-1S and CEF-815-5S had naphthalene concentrations of 69 and 37 $\mu\text{g/L}$, respectively. Although these results exceeded the FDEP GCTL of 14 $\mu\text{g/L}$, they were less than the Natural Attenuation Default Concentration (NADC) of 140 $\mu\text{g/L}$ and continued to demonstrate a consistent pattern of decreasing concentrations of naphthalene since the first sampling event performed in accordance with FDEP-approved semi-annual monitoring in 2000. TRPH concentrations have been less than its GCTL in all of the wells sampled at the site for more than ten years, which is why the wells are no longer sampled for TRPH. Naphthalene concentrations from NG-12S and CEF-059-028-015 were less than the FDEP GCTL.

Due to the decreasing trend in naphthalene concentrations in CEF-815-1S, the well at which the highest concentrations are consistently detected, and because the naphthalene concentration in this well was significantly less than the NADC of 140 $\mu\text{g/L}$, Tetra Tech recommended in the 2008 SARA that regular monitoring of wells CEF-815-1S, NG-12S, CEF-815-5S, and CEF-059-015 for naphthalene be conducted over a 5-year period. The proposed sampling frequency was quarterly for the first year, semi-annual for years two and three, and annual for years four and five. FDEP issued an updated NAMP AO in November 2008 that incorporated these recommendations and is included in Attachment A. The field activities and results from the 2nd Semi-Annual, Year 2 sampling event are detailed below.



FIELD ACTIVITIES

On July 1, 2010, Tetra Tech collected groundwater samples from wells CEF-815-1S, NG-12S, CEF-815-5S, and CEF-059-028-015 for analysis of naphthalene using USEPA Method 8270C. Monitoring well locations are shown on Figure 2. The depth-to-water measurements, top-of-casing elevations, and groundwater elevations are presented in Table 1. Low-flow purge sheets and groundwater sample log sheets from the July 2010 event are included as Attachment A. The samples were placed on ice immediately upon collection and delivered via FedEx under chain of custody to Empirical Laboratories, Inc., in Nashville, Tennessee.

Water level measurements were recorded on July 1, 2010, from wells CEF-815-1S, CEF-815-5S, NG-12S, and CEF-059-028-015 prior to sampling activities. Depths to water ranged from 6.66 feet (CEF-815-1S) to 7.54 feet below top of casing (btoc) (CEF-059-028-015). General protocols were in accordance with FDEP SOPs and Tetra Tech SOP SA-1.1. Figure 2 shows that direction of groundwater flow was to the southeast in the shallow zone. These results are consistent with previous measurements and calculations for the site.

RESULTS

The naphthalene concentrations in CEF-815-1S (31.3 µg/L) and in CEF-815-5S (110 µg/L) exceeded the GCTL of 14 µg/L. The naphthalene concentration in CEF-815-1S decreased slightly since the most previous event in January 2010. The naphthalene concentration in CEF-815-5S remained the same concentration since the January 2010 sampling event. Naphthalene results in perimeter monitoring wells NG-12S and CEF-059-028-015 remained less than the GCTL, with both concentrations less than detection limits. Laboratory analytical results from the July 2010 sampling event are summarized in Table 2 and illustrated on Figure 4. The laboratory analytical report is provided as Attachment B.

CONCLUSIONS AND RECOMMENDATIONS

During the July 2010 sampling event, naphthalene concentrations in source wells CEF-815-1S and CEF-815-5S were greater the FDEP GCTL of 14 µg/L. The July 2010 naphthalene concentration in CEF-815-5S was the same as the January 2010 concentration, and the July 2010 naphthalene concentration in CEF-815-1S was less that the January 2010 concentration.

Based on the results of the 2nd Semi-Annual, Year 2 sampling event, Tetra Tech recommends that groundwater sampling continue on a semi-annual basis. If the FDEP approves this recommendation, the 1st Semi-Annual, Year 3 sampling event would be scheduled for January 2011.



TETRA TECH

If you have any questions regarding this submittal, please feel free to contact Kara Wimble at (904) 730-4669, extension 217, or via e-mail at Kara.Wimble@ttnus.com.

Sincerely,

Robert Simcik, P.E.
Task Order Manager
P.E. Number 61263

Kara F. Wimble
Project Scientist

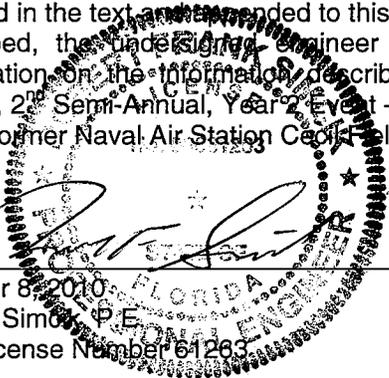
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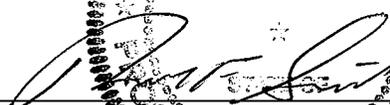
Attachments (4)

- c: A. Sanford, NAVFAC SE (1 copy)
- M. Davidson, NAVFAC SE (1 copy)
- M. Halil, CH2M Hill (electronic only)
- S. Currie, Tetra Tech CTO JM09 project file (1 copy, unbound)
- J. Trepanowski, Tetra Tech
- M. Jonnet, Tetra Tech (1 copy)
- J. Johnson, Tetra Tech (1 copy for Information Repository)

CERTIFICATION

The information contained herein is based on the geologic investigation and associated information detailed in the text and appended to this report. If conditions are determined to exist that differ from those described, the undersigned engineer should be notified to evaluate the effects of any additional information on the information described in this report. This Semi-Annual Groundwater Monitoring Report, 2nd Semi-Annual, Year 2 Event – July 2010, was developed for the Building 815 Wash Rack Area at the former Naval Air Station Cecil Field and should not be construed to apply to any other site.





 October 8, 2010
 Robert Simcik, P.E.
 P.E. License Number 61263

TABLES

TABLE 1
GROUNDWATER ELEVATION DATA
2nd YEAR, 2nd SEMI-ANNUAL SAMPLING EVENT
BUILDING 815 WASH RACK AREA
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

Monitoring Well Identification	Well Depth (feet btoc)	TOC Elevation (feet above msl)	May 1, 2001		December 17, 2001		June 19, 2002		January 9, 2003		July 24, 2003		February 12, 2008	
			Depth to Water (feet btoc)	Water Level Elevation (feet above msl)	Depth to Water (feet btoc)	Water Level Elevation (feet above msl)	Depth to Water (feet btoc)	Water Level Elevation (feet above msl)	Depth to Water (feet btoc)	Water Level Elevation (feet above msl)	Depth to Water (feet btoc)	Water Level Elevation (feet above msl)	Depth to Water (feet btoc)	Water Level Elevation (feet above msl)
CEF-815-1S	13.10	75.55	6.12	69.44	5.40	70.16	6.41	69.15	4.25	71.31	4.53	71.03	6.31	69.24
CEF-815-5S	14.40	75.65	NM	NM	6.56	69.09								
NG-12S	13.40	75.69	6.39	69.30	5.63	70.06	6.68	69.01	4.69	71.00	4.83	70.86	6.54	69.15
CEF-059-028-015	15.00	76.05	NM	NM	7.16	68.89								

Monitoring Well Identification	Well Depth (feet btoc)	TOC Elevation (feet above msl)	June 19, 2008		September 16, 2008		December 15, 2008		July 31, 2009		January 20, 2010		July 1, 2010	
			Depth to Water (feet btoc)	Water Level Elevation (feet above msl)	Depth to Water (feet btoc)	Water Level Elevation (feet above msl)	Depth to Water (feet btoc)	Water Level Elevation (feet above msl)	Depth to Water (feet btoc)	Water Level Elevation (feet above msl)	Depth to Water (feet btoc)	Water Level Elevation (feet above msl)	Depth to Water (feet btoc)	Water Level Elevation (feet above msl)
CEF-815-1S	13.10	75.55	6.40	69.15	4.86	70.69	6.54	69.01	4.46	71.09	6.36	62.79	6.66	64.03
CEF-815-5S	14.40	75.65	6.61	69.04	5.24	70.41	6.81	68.84	4.77	70.88	6.59	62.45	6.89	63.52
NG-12S	13.40	75.69	6.60	69.09	5.14	70.55	6.81	68.88	4.78	70.91	6.68	62.41	6.91	63.64
CEF-059-028-015	15.00	76.05	7.18	68.87	5.91	70.14	6.02	70.03	3.48	72.57	3.82	65.05	7.54	62.60

TOC = Top of casing.
btoc = Below top of casing.
msl = Mean sea level.
NM = Not measured.

Table 2
Summary of Detections in Groundwater

2nd Semi-Annual, Year 2 Event – July 2010
Building 815 Wash Rack Area
Naval Air Station Cecil Field
Jacksonville, Florida
Page 2 of 2

Parameter	GCTL	NADC	NG-12S										
			01/01/03	07/01/03	01/01/06	11/01/07	02/01/08	06/01/08	09/01/08	12/01/08	07/31/09	01/20/10	07/01/10
VOCs (µg/L)													
Naphthalene	14	140	13.2	39.9	13.6	4.7	3.3	2.2	0.51	0.53 J	0.11 J	4.3	0.0185 U
Petroleum Hydrocarbons (mg/L)													
TRPH	5	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Parameter	GCTL	NADC	CEF-059-028-015						
			02/01/08	06/01/08	09/01/08	12/01/08	07/31/09	01/20/10	07/01/10
VOCs (µg/L)									
Naphthalene	14	140	0.1 J	0.058	0.12	0.24 U	0.10 U	0.72 U	0.0185 U
Petroleum Hydrocarbons (mg/L)									
TRPH	5	50	NA	NA	NA	NA	NA	NA	NA

GCTL = Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels from Chapter 62-777, Florida Administrative Code (F.A.C.).

NADC = Natural Attenuation Default Concentrations from Chapter 62-777, F.A.C.

VOCs = Volatile organic compounds.

µg/L = Micrograms per liter.

Bold indicates concentration greater than FDEP GCTL.

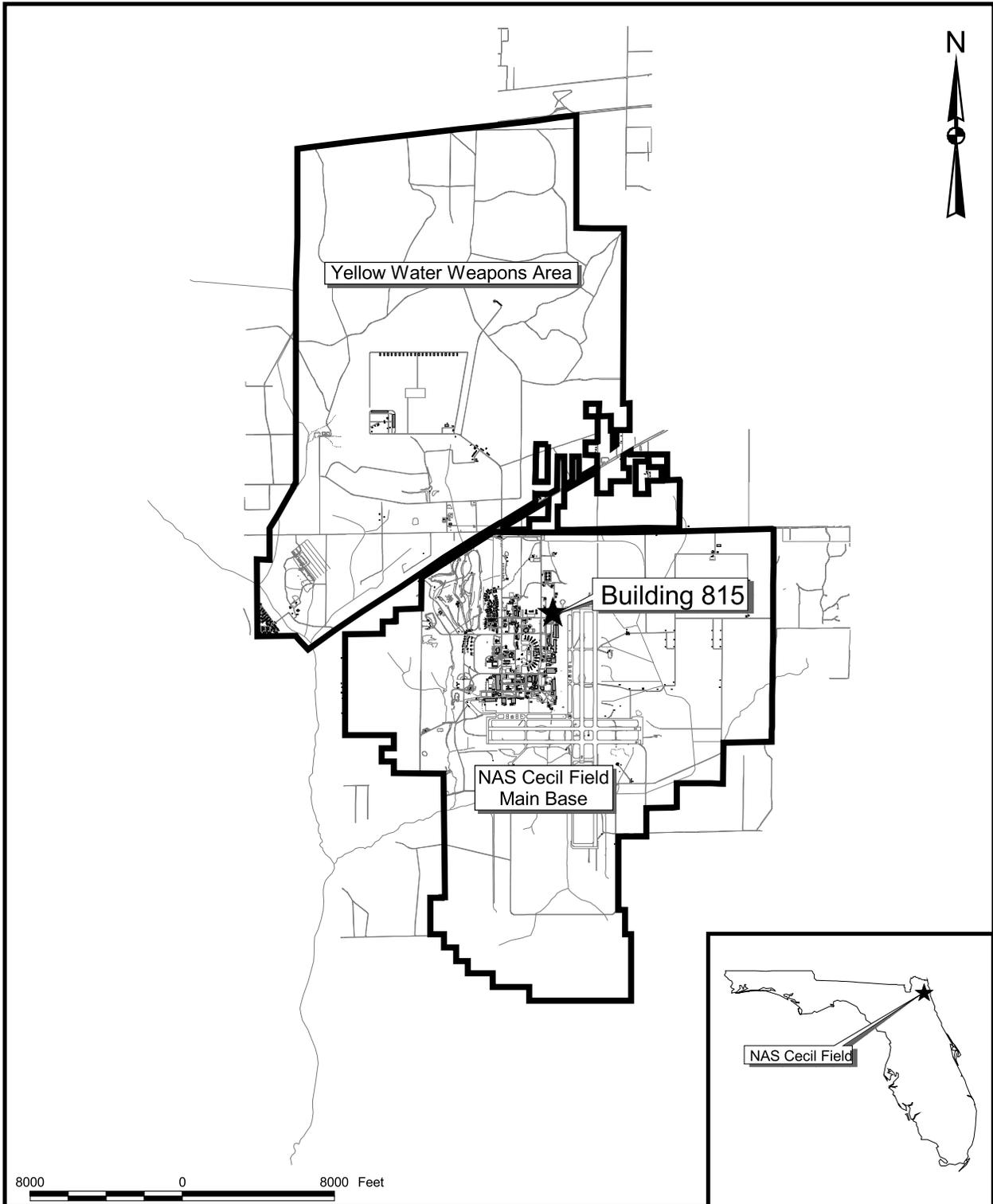
U = Not detected at detection limit shown.

I = Reported value is between laboratory method detection limit and laboratory practical quantitation limit.

J = Estimated value.

NA= Not analyzed.

FIGURES

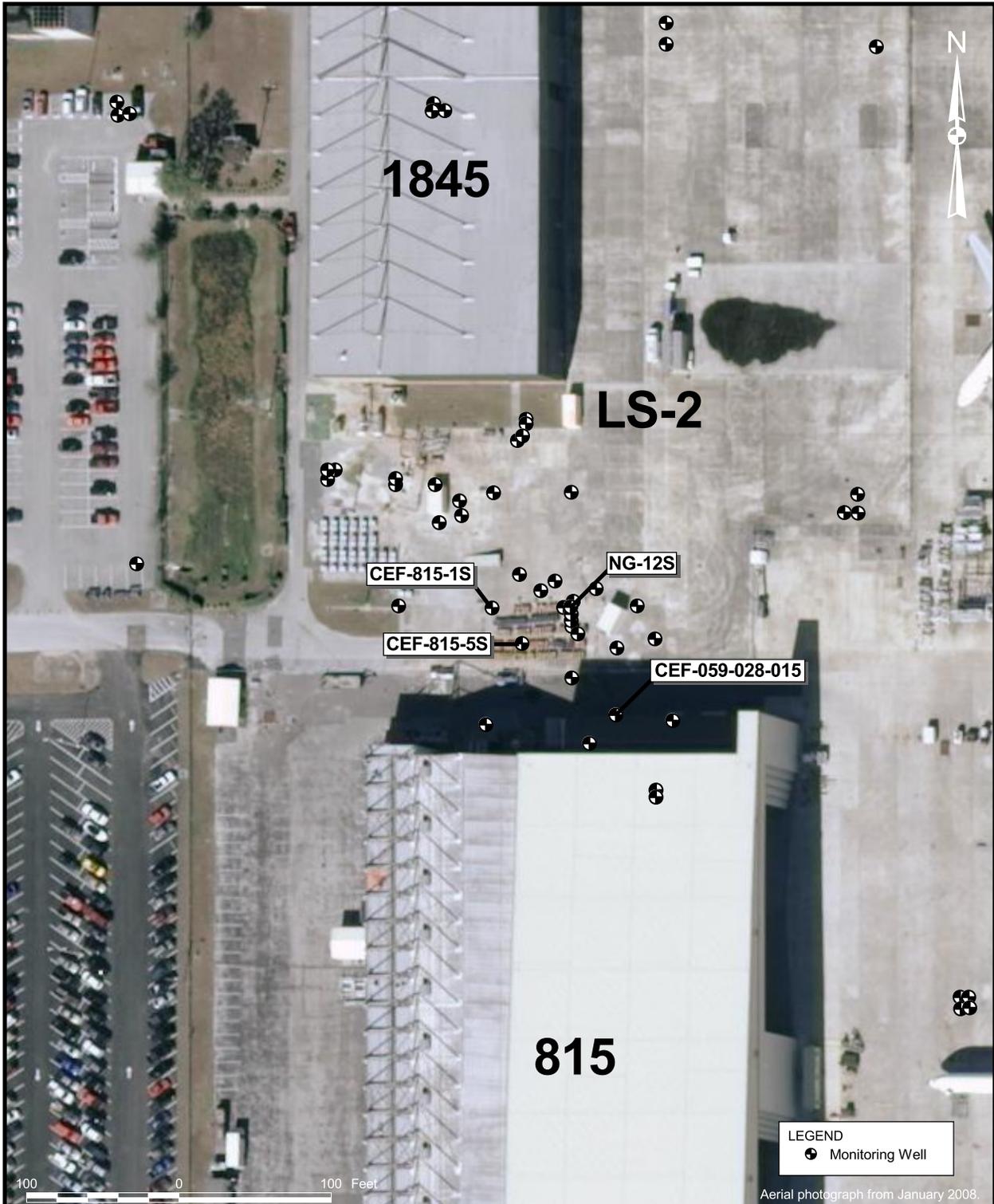


DRAWN BY MJJ	DATE 22Oct09
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	



GENERAL LOCATION MAP
 BUILDING 815 WASH RACK AREA
 2nd SEMI-ANNUAL, YEAR 2 EVENT - JULY 2010
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 2267	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 1	REV 0

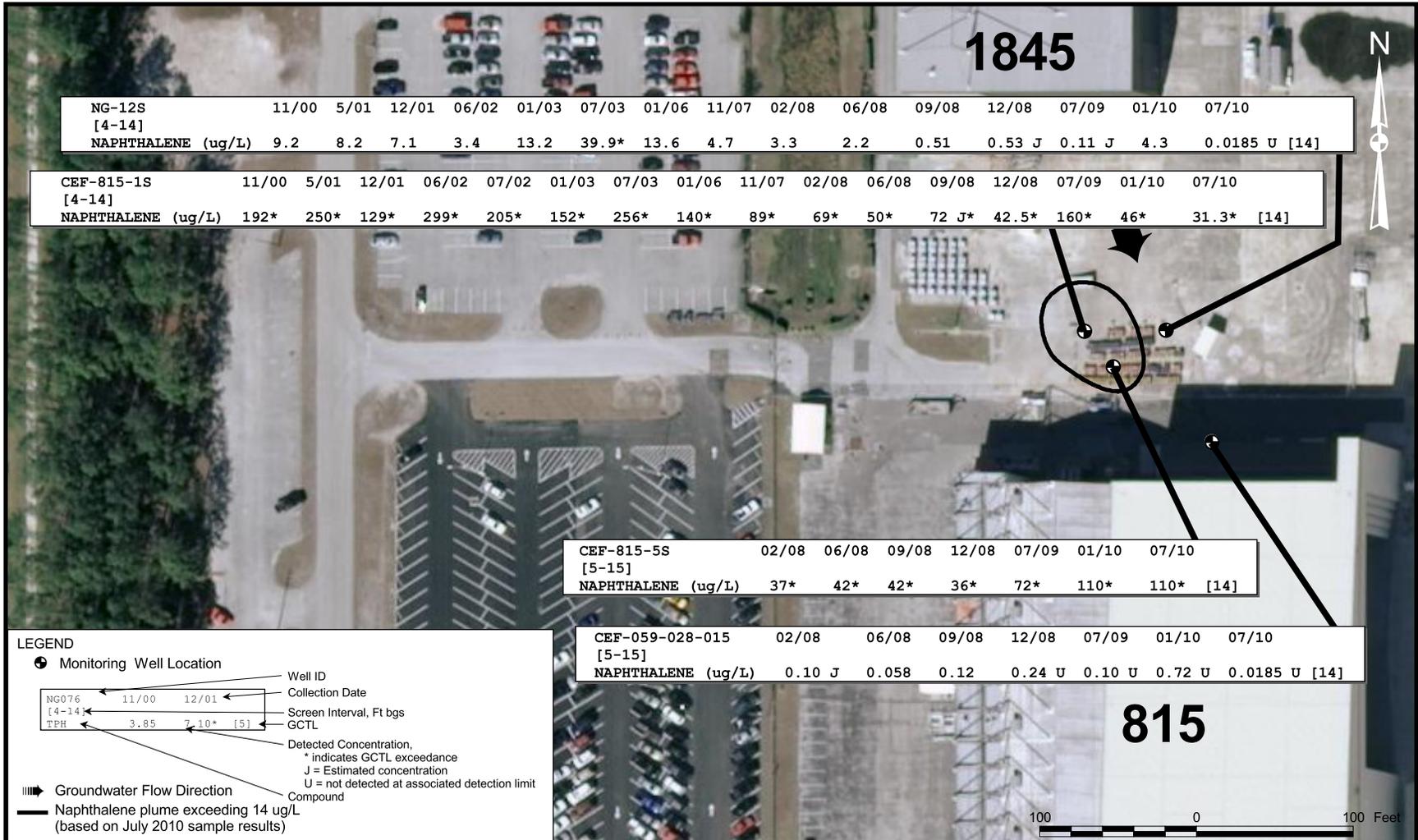


DRAWN BY MJJ	DATE 13Mar10
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	



MONITORING WELL LOCATIONS
BUILDING 815 WASH RACK AREA
 2nd SEMI-ANNUAL, YEAR 2 EVENT - JULY 2010
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 2267	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 2	REV 0



DRAWN BY	DATE
MJJ	13Mar10
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE	
AS NOTED	



GROUNDWATER CONCENTRATIONS
BUILDING 815 WASH RACK AREA
2nd SEMI-ANNUAL, YEAR 2 EVENT - JULY 2010
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NUMBER 2267	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 4	REV 0

ATTACHMENT A
FDEP NAMP AO



Florida Department of Environmental Protection

Bob Martinez Center
2600 Blairstone Road
Tallahassee, Florida 32399-2400

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

Site Assessment
Report

CTO 209

November 6, 2008

BRAC PMOSE
Attn: Mr. Art Sanford
4130 Faber Place Drive
Suite 202
North Charleston, SC 29405

RE: Natural Attenuation Monitoring Plan, Building 815 Wash Rack Area, Naval Air Station Cecil Field, Jacksonville, Florida

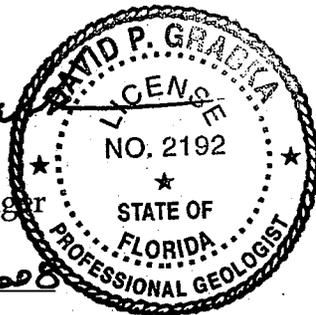
Dear Mr. Art Sanford:

I have completed my review of the Site Assessment Report Addendum and Natural Attenuation Monitoring Plan, Building 815 Wash Rack Area, Naval Air Station Cecil Field, dated May 15, 2008 (received May 16, 2008), prepared and submitted by Tetra Tech NUS, Inc. Based upon my review, the enclosed Natural Attenuation Monitoring Plan Approval Order (NAMPAO) was signed by Mr. Doug Jones, Chief, Bureau of Waste Cleanup.

If you have any concerns regarding this letter, please contact me at (850) 245-8997.

Sincerely,

David P. Grabka
David P. Grabka, P.G.
Remedial Project Manager



30 October 2008
Date

- CC: Doyle Brittain, USEPA, Atlanta
- John Flowe, City of Jacksonville
- ~~Mark Speranza~~, TtNUS, Pittsburgh
- Mike Halil, CH2M Hill, Jacksonville
- Mike Fitzsimmons, FDEP, Northeast District
- Mark Peterson, TtNUS, Jacksonville

JJC *ESN* ESN

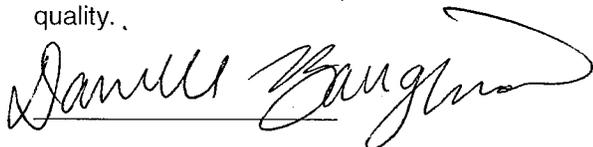
ATTACHMENT B
LABORATORY ANALYTICAL REPORT

EXECUTIVE SUMMARY

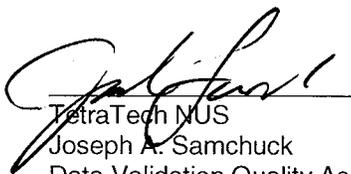
Laboratory Performance Issues: None to report.

Other Factors Affecting Data Quality: None to report.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (10/99) and the Department of Defense (DoD) Quality Systems Manual (QSM) (January 2006). The text of this report has been formulated to address only those problem areas affecting data quality.



Tetra Tech NUS
Danielle Baughman
Project Engineer



TetraTech NUS
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

- Appendix A – Qualified Analytical Results
- Appendix B – Results as Reported by the Laboratory
- Appendix C – 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 $r < 0.995$ / 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 ($< 2 \times$ 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 DOT 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: 02267 SDG: CTOJM09CF005 FRACTION: OV MEDIA: WATER	NSAMPLE	CEF-M18-04I-20100702			CEF-M18-05I-20100702			CEF-M18-09I-20100702			CEF-M18-DUPLICATE-01-2010		
	LAB_ID	1007025-04			1007025-02			1007025-03			1007025-01		
	SAMP_DATE	7/2/2010			7/2/2010			7/2/2010			7/2/2010		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
	DUP_OF										CEF-M18-05I-20100702		
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
BENZENE	2.79			0.3	U		0.3	U		0.3	U		

PROJ_NO: 02267 SDG: CTOJM09CF005 FRACTION: OV MEDIA: WATER	NSAMPLE	TRIPBLANK_20100702		
	LAB_ID	1007025-05		
	SAMP_DATE	7/2/2010		
	QC_TYPE	NM		
	UNITS	UG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER	RESULT	VQL	QLCD	
BENZENE	0.3	U		

PROJ_NO: 02267 SDG: CTOJM09CF005 FRACTION: OS MEDIA: WATER	NSAMPLE	CEF-059-028-015-20100701			CEF-815-05S-20100701			CEF-815-1S-20100701			CEF-815-DUPLICATE01-20100		
	LAB_ID	1007021-01			1007021-04			1007021-03			1007021-02		
	SAMP_DATE	7/1/2010			7/1/2010			7/1/2010			7/1/2010		
	QC_TYPE	NM			NM			NM			NM		
	UNITS	UG/L			UG/L			UG/L			UG/L		
	PCT_SOLIDS	0.0			0.0			0.0			0.0		
DUP_OF										CEF-059-028-015-20100701			
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
NAPHTHALENE	0.0185	U		110			31.3			0.0185	U		

PROJ_NO: 02267 SDG: CTOJM09CF005 FRACTION: OS MEDIA: WATER	NSAMPLE	CEF-815-NG-12S-20100701		
	LAB_ID	1007021-05		
	SAMP_DATE	7/1/2010		
	QC_TYPE	NM		
	UNITS	UG/L		
	PCT_SOLIDS	0.0		
DUP_OF				
PARAMETER	RESULT	VQL	QLCD	
NAPHTHALENE	0.0185	U		

APPENDIX B
RESULTS AS REPORTED BY THE LABORATORY

APPENDIX C
SUPPORT DOCUMENTATION

Sample Delivery Group Assignment Form

CLIENT: Tetra Tech NUS, Inc. (T010)
 PROJECT NAME: CTO JM09_2010
 SDG #: CTOJM09CF_005
 MATRIX: Water

QC LEVEL: EDD/IVQS
 Report Due: 7/19/2010
 Client Sample Count:

Sample Type	Sampled	Received	Lab ID	Client ID	SW8260B	SW8270C
Client Sample	7/1/2010	7/2/2010	1007021-01	CEF-059-028-015-20100701		X
Client Sample	7/1/2010	7/2/2010	1007021-02	CEF-815-DUPLICATE01-20100701		X
Client Sample	7/1/2010	7/2/2010	1007021-03	CEF-815-1S-20100701		X
Client Sample	7/1/2010	7/2/2010	1007021-04	CEF-815-05S-20100701		X
Client Sample	7/1/2010	7/2/2010	1007021-05	CEF-815-NG-12S-20100701		X
Trip Blank	7/1/2010	7/2/2010	1007021-06	TRIP BLANK		Cancelled
Client Sample	7/2/2010	7/3/2010	1007025-01	CEF-M18-DUPLICATE-01-20100702	X	
Client Sample	7/2/2010	7/3/2010	1007025-02	CEF-M18-05I-20100702	X	
Client Sample	7/2/2010	7/3/2010	1007025-03	CEF-M18-09I-20100702	X	
Client Sample	7/2/2010	7/3/2010	1007025-04	CEF-M18-04I-20100702	X	
Trip Blank	7/2/2010	7/3/2010	1007025-05	TRIP BLANK	X	

Sample Delivery Group Case Narrative

Receipt Information

The samples were received within the preservation guidelines for the associated methods. The information associated with sample receipt and the Sample Delivery Group (SDG) are included within section 4 of this package, which also provides information on the link between the client sample ID listed on the COC and laboratory's assigned unique sample ID or WorkOrder #. The sample is tracked through the laboratory for all analysis via the assigned WorkOrder #.

All samples that were received were analyzed and none of the samples were placed on hold without analyses. There were no subcontracted analyses for this SDG.

A sample labeled Trip Blank was received in the shipment sent on 7/1/10 and was marked on the CoC as requiring SW8270C for Naphthalene only. As per the client, the Trip Blank was not to be analyzed for SW8270C.

Changes to the Revision

The package was revised to include Analysis Data Sheets that reported the Detection Limit, Limit of Detection and Limit of Quantitation. Only the Analysis Data Sheets were replaced.

Analytical Information

All samples were prepped (where applicable) and analyzed within the standard allowed holding times, unless noted within the exceptions listed below. The laboratory analyzed all samples within the program and method guidelines. The following information is provided specific to individual methods:

Chromatographic Flags for Manual Integration:

The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

- A:** The peak was manually integrated as it was not integrated in the original chromatogram.
- B:** The peak was manually integrated due to resolution or coelution issues in the original chromatogram.
- C:** The peak was manually integrated to correct the baseline from the original chromatogram.
- D:** The peak was manually integrated to identify the correct peak as the wrong peak was identified in the original chromatogram.
- E:** The peak was manually integrated to include the entire peak as the original chromatogram only integrated part of the peak.

SW8260B (Benzene):

No anomalies or deviations are noted.

SW8270C (Naphthalene):

No anomalies or deviations are noted.

Data Qualifiers

As applicable and where required, the following general qualifiers are associated with the sample results. Additional qualifiers will be specified within the reporting sections of the data package or within the body of the Case Narrative.

Analytical Report Terms and Qualifiers

- MDL:** The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix. For DoD QSM 4.1 reporting purposes, this definition is also applied to the reported Detection Limit (DL).
- LOD:** The Limit of Detection is an estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. This definition is further clarified in the DoD QSM 4.1 revisions as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.
- LOQ:** The Limit of Quantitation is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. This term is further clarified within the DoD QSM 4.1 as the lowest concentration that produces a quantitative result within specified limits of precision and bias.
- *:** A failing quality control criteria is associated with the reported result.
- B:** The presence of a "B" to the right of an analytical value indicates that this compound was also detected in the method blank and the data should be interpreted with caution. One should consider the possibility that the correct sample result might be less than the reported result and, perhaps, zero. **For Florida DEP reports this qualifier is "V".**
- D:** When a sample (or sample extract) is rerun diluted because one of the compound concentrations exceeded the highest concentration range for the standard curve, all of the values obtained in the dilution run will be flagged with a "D".
- E:** The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound. **For Florida DEP reports this qualifier is "L".**
- H1:** The result was analyzed outside of the EPA recommended holding time.

- H2:** The result was extracted outside of the EPA recommended holding time
- J:** The presence of a "J" to the right of an analytical result indicates that the reported result is estimated. The mass spectral data pass the identification criteria showing that the compound is present, but the calculated result is less than the EQL. One should feel confident that the result is greater than zero and less than the EQL. **For Florida DEP reports this qualifier is "J".**
- M:** Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In metals, the qualifier indicates that the parameters MDL/RL has been raised.
- N:** The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.
- P:** The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.
- Q:** The RPD and/or percent recovery failed in the associated Blank Spike and/or Blank Spike Duplicate.
- R:** The RPD and/or percent recovery failed in the associated Matrix Spike and/or Matrix Spike Duplicate.
- U:** The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the DL.
- X:** The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.
- Y:** The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

LIMS Definitions / Naming Conventions:

The following are general naming conventions that are used throughout the laboratory; however, on a method by method basis, there are additional QAQC items that are named in a consistent format.

- BLK:** LIMS assigns a unique identifier to the Method Blank by naming it as the letters BLK appended to the Batch ID. A Method Blank is an analyte-free matrix to which all reagents are added in the same volumes or proportions as used in sample processing. The Method Blank is used to assess for possible

contamination during preparation and/or analysis steps. Method Blanks within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.

- BS:** LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally. A duplicate Blank Spike will be designated as a BSD.
- MS:** The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.
- IDs:** The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And "RE" implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

Statement of Data Authenticity:

I certify that, based upon my inquiry of those individuals immediately responsible for obtaining the information and to the best of my knowledge, the data package is in compliance with the terms and conditions of the contract, both technically and for completeness, with the exception of the conditions detailed in this Case Narrative, as verified by my signature below. During absences, Ms. Marcia K. McGinnity is authorized to sign this Statement of Data Authenticity.



Mr. Rick D. Davis
Laboratory Technical Director / VP Operations



PROJECT NO: <u>112602867</u>	FACILITY: <u>Cecil Field N/S Apron</u>	PROJECT MANAGER <u>Rob Simcik</u>	PHONE NUMBER <u>412 921-8163</u>	LABORATORY NAME AND CONTACT: <u>Empirical Labs / Kim Kostzer</u>
SAMPLERS (SIGNATURE) 		FIELD OPERATIONS LEADER <u>Jeff Krone</u>	PHONE NUMBER <u>904 699-7423</u>	ADDRESS <u>621 Mainstream Dr Suite 270</u>
CARRIER/WAYBILL NUMBER <u>8660 17302790</u>			Fedex Airbill	CITY, STATE <u>Nashville, TN 37208</u>

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

DATE YEAR	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD (GRAB (G) COMP (C))	No. OF CONTAINERS	CONTAINER TYPE (PLASTIC (P) or GLASS (G))	PRESERVATIVE USED	COMMENTS
7/2 2010	0000	CEF-M18-Duplicate #1-20100702					G	3	X		Cool to 4° C -01
7/2	1006	CEF-M18-05I-20100702				GW	G	3	X		1067025 -02
7/2	1232	CEF-M18-09I-20100702				GW	G	3	X		-03
7/2	1307	CEF-M18-04I-20100702				GW	G	3	X		-04
		Trip Blank ✓				QC		2	X		-05

TYPE OF ANALYSIS
VOCs 8260 Hct G

1. RELINQUISHED BY 	DATE <u>7/2/10</u>	TIME <u>1100</u>	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE <u>7-3-10</u>	TIME <u>0930</u>
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY 	DATE	TIME

COMMENTS



PROJECT NO: <u>112602267</u>	FACILITY: <u>Cecil Field</u> <u>815 Wash Back</u>	PROJECT MANAGER <u>Rob Simcik</u>	PHONE NUMBER <u>412 921-8163</u>	LABORATORY NAME AND CONTACT: <u>Empirical Labs/ Kim Kostzer</u>
SAMPLERS (SIGNATURE) 		FIELD OPERATIONS LEADER <u>Jeff Krone</u>	PHONE NUMBER <u>904 699-7473</u>	ADDRESS <u>(62) Mainstream Drive Suite 270</u>
CARRIER/WAYBILL NUMBER <u>8660 1730 27 89</u>			CITY, STATE <u>Nashville, TN 37208</u>	

DATE YEAR	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)		PRESERVATIVE USED	COMMENTS
7/1	1041	CEF-054-028-015-20100701				GW	G	2	X			Cool to 4°C -01
7/1	0000	CEF-815-Duplicate #1-20100701				GW	G	2	X			1007021-02
7/1	1208	CEF-815-18-15-20100701				GW	G	2	X			.03
7/1	1249	CEF-815-055-20100701				GW	G	2	X			-04
7/1	1318	CEF-815-NG-125-20100701				GW	G	2	X			-05
7/1		Trip blank				QC	G	2	X			-06

TYPE OF ANALYSIS
METALS BY CMT
SW 816/8270C

1. RELINQUISHED BY 	DATE <u>7/1/10</u>	TIME <u>1630</u>	1. RECEIVED BY 	DATE <u>7/2/10</u>	TIME <u>1230</u>
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

CTOJM09CF_005

HOLD TIME

SDG CTOJM09CF0

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
	UG/L	CEF-815-NG-12S-201007	1007021-05	NM	07/01/2010	07/06/2010	07/06/2010	5	0	5
	UG/L	CEF-815-DUPLICATE01-2	1007021-02	NM	07/01/2010	07/06/2010	07/06/2010	5	0	5
	UG/L	CEF-815-1S-20100701	1007021-03	NM	07/01/2010	07/06/2010	07/06/2010	5	0	5
	UG/L	CEF-815-05S-20100701	1007021-04RE1	NM	07/01/2010	07/06/2010	07/07/2010	5	1	6
	UG/L	CEF-815-05S-20100701	1007021-04	NM	07/01/2010	07/06/2010	07/06/2010	5	0	5
	UG/L	CEF-059-028-015-201007	1007021-01	NM	07/01/2010	07/06/2010	07/06/2010	5	0	5
OV	UG/L	TRIP BLANK	1007025-05	NM	07/02/2010	07/08/2010	07/09/2010	6	1	7
OV	UG/L	CEF-M18-DUPLICATE-01-	1007025-01	NM	07/02/2010	07/08/2010	07/09/2010	6	1	7
OV	UG/L	CEF-M18-09I-20100702	1007025-03	NM	07/02/2010	07/08/2010	07/09/2010	6	1	7
OV	UG/L	CEF-M18-05I-20100702	1007025-02	NM	07/02/2010	07/08/2010	07/09/2010	6	1	7
OV	UG/L	CEF-M18-04I-20100702	1007025-04	NM	07/02/2010	07/08/2010	07/09/2010	6	1	7

ANALYSIS SEQUENCE SUMMARY

SW8270D

Laboratory: Empirical Laboratories, LLC

SDG: CTOJM09CF_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTO JM09 2010

Sequence: 0F18028

Instrument: MS-BNA4

Calibration: 0180002

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0F18028-TUN1	SEQ-TUN1.D	06/28/10 13:05
Cal Standard	0F18028-CAL1	SEQ-CAL1.D	06/28/10 13:23
Cal Standard	0F18028-CAL2	SEQ-CAL2.D	06/28/10 13:57
Cal Standard	0F18028-CAL3	SEQ-CAL3.D	06/28/10 14:32
Cal Standard	0F18028-CAL4	SEQ-CAL4.D	06/28/10 15:06
Cal Standard	0F18028-CAL5	SEQ-CAL5.D	06/28/10 15:41
Cal Standard	0F18028-CAL6	SEQ-CAL6.D	06/28/10 16:15
Cal Standard	0F18028-CAL7	SEQ-CAL7.D	06/28/10 16:50
Cal Standard	0F18028-CAL8	SEQ-CAL8.D	06/28/10 17:24
Cal Standard	0F18028-CAL9	SEQ-CAL9.D	06/28/10 17:58
Cal Standard	0F18028-CALA	SEQ-CALA.D	06/28/10 18:32
Cal Standard	0F18028-CALB	SEQ-CALB.D	06/28/10 19:06
Initial Cal Check	0F18028-ICV1	SEQ-ICV1.D	06/28/10 19:40

INITIAL CALIBRATION DATA (Continued)

SW8270D

Laboratory: Empirical Laboratories, LLC

SDG: CTOJM09CF_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTO JM09_2010

Calibration: 0180002

Instrument: MS-BNA4

Matrix: Water

Calibration Date: 6/28/2010 1:21:33PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.6843662	4.089875	9.098727	0.1235025			CCC (30)	
Acenaphthylene	1.03395	5.426133	8.716819	0.1278145			15	
Anthracene	0.9753837	5.42048	12.969	0.1080631			15	
Benzo(a)anthracene	0.8407703	11.41209	20.39036	7.739572E-02			15	
Benzo(a)pyrene	0.99216	7.147693	24.45936	7.256003E-02			CCC (30)	
Benzo(b)fluoranthene	1.090184	7.02488	23.61173	0.1151915			15	
Benzo(g,h,i)perylene	1.070497	5.555724	26.80146	7.817751E-02			15	
Benzo(k)fluoranthene	1.095974	5.741823	23.70809	0.1299211			15	
Chrysene	0.8368241	7.631494	20.48909	8.649425E-02			15	
Dibenz(a,h)anthracene	1.007054	6.830493	26.42427	5.976237E-02			15	
Fluoranthene	1.015998	6.024858	16.20245	7.774786E-02			CCC (30)	
Fluorene	0.7092772	4.40414	10.32818	0.1206732			15	
2-Fluorobiphenyl	0.7723392	5.16539	7.676909	0.1212934			15	
2-Fluorophenol							15	
Indeno(1,2,3-cd)pyrene	1.002614	8.296918	26.37036	6.493991E-02			15	
1-Methylnaphthalene	0.6415101	5.849649	7.190182	9.074068E-02			15	
2-Methylnaphthalene	0.7209612	4.438382	7.029636	5.474195E-02			15	
Naphthalene	1.119336	3.941696	6.027364	0.1044206			15	
Nitrobenzene-d5							15	
Phenanthrene	1.001893	4.414811	12.82673	0.1013149			15	
Phenol-d6							15	
Pyrene	1.043553	6.463486	16.82373	8.083199E-02			15	
Terphenyl-d14	0.7240882	6.643793	17.50091	5.789483E-02			15	
2,4,6-Tribromophenol	0.119438	22.23675	10.94855	0.1332675	0.9995851		0.995	
Acenaphthene-d10							15	
Chrysene-d12							15	

INITIAL CALIBRATION CHECK

SW8270D

Laboratory: <u>Empirical Laboratories, LLC</u>	SDG: <u>CTOJM09CF_005</u>
Client: <u>Tetra Tech NUS, Inc. (T010)</u>	Project: <u>CTO JM09 2010</u>
Instrument ID: <u>MS-BNA4</u>	Calibration: <u>0180002</u>
Lab File ID: <u>SEQ-ICV1.D</u>	Calibration Date: <u>06/28/10 13:21</u>
Sequence: <u>0F18028</u>	Injection Date: <u>06/28/10</u>
Lab Sample ID: <u>0F18028-ICV1</u>	Injection Time: <u>19:40</u>

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Naphthalene	A	5.000	4.962	1.119336	1.110799		-0.8	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270D

Laboratory: Empirical Laboratories, LLC

SDG: CTOJM09CF_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTO JM09_2010

Sequence: 0G18803

Instrument: MS-BNA4

Calibration: 0180002

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	0G18803-TUN1	SEQ-TUN1.D	07/06/10 14:25
Calibration Check	0G18803-CCV1	SEQ-CCV1.D	07/06/10 14:42
Blank	0G06014-BLK2	G06014B1.D	07/06/10 15:51
LCS	0G06014-BS2	G06014L1.D	07/06/10 16:25
LCS Dup	0G06014-BSD2	G06014L2.D	07/06/10 17:00
CEF-059-028-015-20100701	1007021-01	0702101.D	07/06/10 17:34
CEF-815-1S-20100701	1007021-03	0702103.D	07/06/10 18:43
CEF-815-05S-20100701	1007021-04	0702104.D	07/06/10 19:17
CEF-815-NG-12S-20100701	1007021-05	0702105.D	07/06/10 19:51
CEF-815-DUPLICATE01-20100701	1007021-02	0702102.D	07/06/10 20:26

CONTINUING CALIBRATION CHECK

SW8270D

Laboratory: <u>Empirical Laboratories, LLC</u>	SDG: <u>CTOJM09CF_005</u>
Client: <u>Tetra Tech NUS, Inc. (T010)</u>	Project: <u>CTO JM09_2010</u>
Instrument ID: <u>MS-BNA4</u>	Calibration: <u>0180002</u>
Lab File ID: <u>SEQ-CCV1.D</u>	Calibration Date: <u>06/28/10 13:21</u>
Sequence: <u>0G18803</u>	Injection Date: <u>07/06/10</u>
Lab Sample ID: <u>0G18803-CCV1</u>	Injection Time: <u>14:42</u>

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Naphthalene	A	5.000	5.018	1.119336	1.123263		0.4	20
2-Fluorobiphenyl	A	5.000	5.383	0.7723392	0.8315318		7.7	20
Terphenyl-d14	A	5.000	5.557	0.7240882	0.8047855		11.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8270D

Laboratory: <u>Empirical Laboratories, LLC</u>	SDG: <u>CTOJM09CF_005</u>
Client: <u>Tetra Tech NUS, Inc. (T010)</u>	Project: <u>CTO JM09_2010</u>
Instrument ID: <u>MS-BNA4</u>	Calibration: <u>0180002</u>
Lab File ID: <u>SEQ-CCV1.D</u>	Calibration Date: <u>06/28/10 13:21</u>
Sequence: <u>0G18806</u>	Injection Date: <u>07/07/10</u>
Lab Sample ID: <u>0G18806-CCV1</u>	Injection Time: <u>12:03</u>

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Naphthalene	A	5.000	5.122	1.119336	1.146713		2.4	20
2-Fluorobiphenyl	A	5.000	5.517	0.7723392	0.8522103		10.3	20
Terphenyl-d14	A	5.000	5.467	0.7240882	0.7917319		9.3	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

Field Duplicate Calculations

Parameters	Original Sample	Duplicate Sample	RPD
	CEF-059-028-015-2010070: 20100		
NAPHTHALENE	0.0926	0.0926	0.00

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: CTOJM09CF_005

Client: Tetra Tech NUS, Inc. (T010)

Project: CTO JM09 2010

Calibration: 0176003

Instrument: MS-VOA3

Matrix: Water

Calibration Date: 6/25/2010 9:59:36AM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acetone	7.253642E-02	18.95544	5.621	8.050008E-02	0.9987883		0.995	
Acrolein	4.204751E-02	5.646703	5.446333	3.690176E-02			15	
Acrylonitrile	9.964702E-02	5.519988	6.325	6.542213E-02			15	
Benzene	0.8891624	5.855588	12.334	9.620145E-03			15	
Bromobenzene	0.6124253	5.291253	17.38767	1.611948E-02			15	
Bromochloromethane	0.1279747	4.742927	10.04244	6.325874E-02			15	
Tert-Amyl Methyl Ether	0.6260509	11.25287	12.668	3.235534E-02			15	
Bromodichloromethane	0.2839346	6.942077	13.311	2.023993E-02			15	
Bromoform	0.3130452	19.49766	16.67644	2.075329E-02	0.9992913		SPCC (0.1)	
Bromomethane	0.1520118	16.78038	4.587445	7.488093E-02		0.999775	0.99	
Bromofluorobenzene	0.8343518	3.974044	17.215	2.234535E-02			15	
n-Butylbenzene	1.286954	10.75476	18.582	1.827712E-02			15	
2-Butanone	0.095236	10.95653	9.2825	0.3732811	0.9997827		0.995	
sec-Butylbenzene	1.65336	11.16434	18.12489	7.224488E-03			15	
tert-Butylbenzene	1.514307	5.889765	18.253	0.0175468			15	
Carbon disulfide	0.6399809	5.472097	6.885667	4.510075E-02			15	
Carbon tetrachloride	0.2481609	12.4516	12.29578	1.783201E-02			15	
Chlorobenzene	1.4152	11.48369	16.27	1.629381E-02			SPCC (0.3)	
Chloroethane	0.1466068	10.27688	4.757334	6.590424E-02			15	
Chloroform	0.4141635	9.074872	10.18978	3.215137E-02			CCC (20)	
2-Chloroethyl vinyl ether	0.1196553	28.07579	13.89178	5.532227E-02	0.9988268		0.995	
Chloromethane	0.2208697	16.66918	3.910667	0.155472		0.9998537	SPCC (0.1)	
1-Chlorohexane	0.5584774	6.748727	16.22933	8.219464E-03			15	
2-Chlorotoluene	1.442478	7.079318	17.60678	1.477394E-02			15	
4-Chlorotoluene	1.486733	7.248058	17.663	1.394193E-02			15	
Cyclohexane	0.2847172	12.85866	12.19175	2.950494E-02			15	
Dibromochloromethane	0.4698346	9.514434	15.26533	1.323839E-02			15	
1,2-Dibromo-3-chloropropane	0.1243549	22.95406	18.94167	6.468553E-03	0.9975687		0.995	
1,2-Dibromoethane (EDB)	0.509507	4.080081	15.49711	1.255806E-02			15	
Dibromomethane	0.1618893	5.455831	13.13633	9.443551E-03			15	
1,2-Dichlorobenzene	1.048073	5.188883	18.55722	1.294672E-02			15	
1,3-Dichlorobenzene	1.120096	8.423402	18.21033	5.496229E-03			15	

INITIAL CALIBRATION CHECK

SW8260B

Laboratory: <u>Empirical Laboratories, LLC</u>	SDG: <u>CTOJM09CF_005</u>
Client: <u>Tetra Tech NUS, Inc. (T010)</u>	Project: <u>CTO JM09_2010</u>
Instrument ID: <u>MS-VOA3</u>	Calibration: <u>0176003</u>
Lab File ID: <u>SEQ-ICV1.D</u>	Calibration Date: <u>06/25/10 09:59</u>
Sequence: <u>0F17504</u>	Injection Date: <u>06/23/10</u>
Lab Sample ID: <u>0F17504-ICV1</u>	Injection Time: <u>16:56</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Benzene	A	100.0	103.1	0.8891624	0.9169227		3.1	20
Bromofluorobenzene	A	30.00	29.47	0.8343518	0.8194904		-1.8	20
Dibromofluoromethane	A	30.00	29.12	0.2731964	0.2651368		-3.0	20
1,2-Dichloroethane-d4	A	30.00	29.85	5.966788E-02	5.937004E-02		-0.5	20
Toluene-d8	A	30.00	29.31	2.168887	2.119274		-2.3	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory: <u>Empirical Laboratories, LLC</u>	SDG: <u>CTOJM09CF_005</u>
Client: <u>Tetra Tech NUS, Inc. (T010)</u>	Project: <u>CTO JM09_2010</u>
Instrument ID: <u>MS-VOA3</u>	Calibration: <u>0176003</u>
Lab File ID: <u>SEQ-CCVE.D</u>	Calibration Date: <u>06/25/10 09:59</u>
Sequence: <u>0G19103</u>	Injection Date: <u>07/08/10</u>
Lab Sample ID: <u>0G19103-CCV1</u>	Injection Time: <u>19:41</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Benzene	A	100.0	100.5	0.8891624	0.8940369		0.5	20
Bromofluorobenzene	A	30.00	30.39	0.8343518	0.8451155		1.3	20
Dibromofluoromethane	A	30.00	28.44	0.2731964	0.2590432		-5.2	20
1,2-Dichloroethane-d4	A	30.00	28.14	5.966788E-02	5.597697E-02		-6.2	20
Toluene-d8	A	30.00	27.31	2.168887	1.974267		-9.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

Field Duplicate Calculations

Parameters	Original Sample	Duplicate Sample	RPD
	CEF-M18-05I-20100702	CEF-M18-DUPLICATE-01-2010	
BENZENE	1	1	0.00

