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SEMI-ANNUAL GROUNDWATER MONITORING REPORT FIRST SEMI-ANNUAL YEAR 3 EVENT JANUARY 2011 BUILDING 815 WASH RACK AREA NAS CECIL FIELD FL
05/23/2011
TETRA TECH NUS

TETRA TECH

PITT-05-11-044

May 23, 2011

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 Contract Number N62470-08-D-1001
Contract Task Order JM09

Subject: Semi-Annual Groundwater Monitoring Report, 1st Semi-Annual, Year 3 Event – January 2011
Building 815 Wash Rack Area
Naval Air Station Cecil Field
Jacksonville, Florida

Dear Mr. Grabka:

On behalf of the Navy, Tetra Tech NUS, Inc. (Tetra Tech) is pleased to submit this 1st Semi-Annual, Year 3 Groundwater Monitoring Report for the Building 815 Wash Rack Area at former 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) Contract Number N62470-08-D-1001.

The sampling program is being conducted in accordance with the Uniform Federal Policy – Sampling and Analysis Plan (UFP-SAP) submitted by Tetra Tech to the Florida Department of Environmental Protection (FDEP) on May 10, 2010, based on Chapter 62-770.690, Florida Administrative Code (Tetra Tech, 2010). Select worksheets of the UFP-SAP are provided in Attachment A. This Semi-Annual Groundwater Monitoring Report summarizes the fieldwork and analytical results for the January 2011 sampling event. The work was performed in general accordance with Tetra Tech Standard Operating Procedures (SOPs) and Florida Department of Environmental Protection (FDEP) 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 prepared by Harding Lawson Associates (HLA) (HLA, 1999). There are no tanks associated with this area of contamination. During the 1999 investigation documented in 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. The results of the investigations of this area are described in the Technical Memorandum for Potential Source of Contamination 56 (Tetra Tech, 2001).

Tetra Tech NUS, Inc.
661 Andersen Drive, Pittsburgh, PA 15220-2745
Tel 412.921.7090 Fax 412.921.4040 www.ttnus.com

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 (FDEP, 2000).

On January 12, 2004, Tetra Tech submitted the Groundwater Monitoring Report documenting results from the July 2003 sampling event (Tetra Tech, 2004). Based on these results, Tetra Tech concluded that naphthalene concentrations in monitoring well CEF-815-1S continued to exceed the annual milestone cleanup objectives defined in the NAMPAO. 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 volatile organic compounds (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 (Tetra Tech, 2005).

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 after it was transferred 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 NAMPAO.

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 (µg/L), which is greater than the FDEP Groundwater Cleanup Target Level (GCTL) of 14 µg/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 5 to 15 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 µg/L, respectively. Although these results exceeded the FDEP GCTL of 14 µg/L, they were less than the Natural Attenuation Default Concentration (NADC) of 140 µg/L. Furthermore, these results were consistent with the pattern of decreasing concentrations of naphthalene which had been observed since the first sampling event was performed in accordance with the FDEP-approved semi-annual monitoring plan in 2000. TRPH concentrations were less than the GCTL in all of the wells sampled at the site, and had been for more 10 years. Thus, it was agreed upon by the BCT that TRPH would no longer be analyzed at the site (Tetra Tech, 2008). Naphthalene concentrations from NG-12S and CEF-059-028-015 were less than the FDEP GCTL.

Because the naphthalene concentrations in CEF-815-1S (the well at which the highest concentrations had been consistently detected) were continuing to decrease and were significantly less than the NADC of 140 µg/L, Tetra Tech recommended in the 2008 SARA that regular monitoring of wells CEF-815-1S, NG-12S, CEF-815-5S, and CEF-059-028-015 for naphthalene be conducted over a 5-year period (Tetra Tech, 2008). The proposed sampling frequency was quarterly for the first year, semi-annually for years two and three, and annually for years four and five. FDEP issued an updated NAMPAO in November 2008 that incorporated these recommendations (FDEP, 2008); it is included in Attachment B. The field activities and results from the 1st Semi-Annual, Year 3 sampling event are detailed below.

FIELD ACTIVITIES

On January 18, 2011, 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. Low-flow purge sheets and groundwater sample log sheets from the January 2011 event are included as Attachment C. 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 also recorded on January 18, 2011, from wells CEF-815-1S, CEF-815-5S, NG-12S, and CEF-059-028-015, prior to sampling activities. Groundwater elevations ranged from 67.54 feet above mean sea level (msl) (CEF-059-028-015) to 67.79 feet above msl (CEF-815-1S). Depth to water measurements, top of casing elevations, and groundwater elevations are presented in Table 1.

RESULTS

The groundwater elevation data and flow directions in the shallow zone of the surficial aquifer are shown on Figure 3. Based on the data, shallow zone groundwater flow is to the southeast. These results are consistent with previous measurements and calculations for the site.

The naphthalene concentrations originally reported in groundwater samples from CEF-059-028-015 (31.5 µg/L) and CEF-815-5S (47.6 µg/L) collected on January 18, 2011 exceeded the GCTL of 14 µg/L. The naphthalene concentration originally reported in the groundwater sample from CEF-059-028-015 exceeded the GCTL at this location for the first time in the history of the groundwater sampling program at the site. The naphthalene concentration in the groundwater sample from source well CEF-815-1S was originally reported as non-detect after exhibiting exceedences in previous sampling events. Actions were taken to investigate these anomalies. The field paperwork was reviewed and the laboratory re-analyzed the two original samples from CEF-059-025-015 and CEF-815-1S, which resulted in similar concentrations being reported for the two wells. Monitoring well CEF-059-028-015, which is considered a downgradient well, was resampled on March 23, 2011. After review of field information and results from the resampling event, all information led to the conclusion that the groundwater samples from wells CEF-059-028-015 and CEF-815-1S had been switched by field personnel during the January 18, 2011 sampling event. The results were corrected in the database, as well as in Table 2 and on Figure 4, to reflect the actual conditions at the site. Based on the corrected information, the concentration observed in groundwater from well CEF-815-1S (31.5 µg/L) remained relatively unchanged since the most recent event in July 2010 (31.3 µg/L), but remained greater than the GCTL (14 µg/L). The naphthalene concentration in groundwater from well CEF-815-5S (46.7 µg/L) decreased since the previous event in July 2010 (110 µg/L), but was still greater than the GCTL. Naphthalene results in monitoring well CEF-059-028-015 and NG-12S were less than the GCTL. Naphthalene concentrations have been less than the GCTL in well NG-12S since the January 2006 sampling event. Laboratory analytical results from the January 2011 sampling event and March 2011 resampling event are summarized in Table 2 and illustrated on Figure 4. The laboratory analytical report is provided as Attachment D.

CONCLUSIONS AND RECOMMENDATIONS

During the January 2011 sampling event, the naphthalene concentration in groundwater from well CEF-815-1S remained relatively unchanged from the July 2010 concentration. The naphthalene concentration observed in groundwater from well CEF-815-5S was less that the July 2010 concentration. Naphthalene concentrations in both CEF-815-1S and CEF-815-5S remained greater than the GCTL. The naphthalene concentrations in groundwater from monitoring well NG-12S and downgradient well CEF-059-28-015 remained less than the GCTL.

Based on the results of the 1st Semi-Annual, Year 3 sampling event, Tetra Tech recommends continuing groundwater sampling on a semi-annual basis. The 2nd Semi-Annual, Year 3 sampling event is scheduled to be conducted during the week of July 13, 2011.

If you have any questions regarding this submittal, please feel free to contact me at (412) 921-8163, or via e-mail at Robert.Simcik@tetratech.com.

Sincerely,

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

RS/clm

Attachments (6)

c: A. Sanford, BRAC PMO SE (electronic copy)
M. Davidson, BRAC PMO SE (electronic copy)
S. Martin, NAVFAC Atlantic (electronic copy)
M. Halil, CH2M Hill (electronic copy)
M. Boerio, Tetra Tech (electronic copy)
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 or the information described in this report. This Semi-Annual Groundwater Monitoring Report, 1st Semi-Annual, Year 3 Event – January 2011, 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.

ROBERT FRANK SIMCIK
LICENSE
No. 00061263
STATE OF FLORIDA
PROFESSIONAL ENGINEER

May 23, 2011
Robert Simcik, P.E.
P.E. License Number 61263

REFERENCES

FDEP (Florida Department of Environmental Protection), 2000. Natural Attenuation Monitoring Plan Approval Order, Building 815 Wash Rack Area. Naval Air Station Cecil Field, Florida. August.

FDEP, 2008. Natural Attenuation Monitoring Plan Approval Order, Building 815 Wash Rack Area. Naval Air Station Cecil Field, Jacksonville, Florida. November.

HLA (Harding Lawson Associates), 1999. Sampling and Analysis Report, Hangar 815. Base Realignment and Closure, Zone D, Industrial Flight Line Area. Naval Air Station Cecil Field, Jacksonville, Florida. January.

Tetra Tech (Tetra Tech, NUS, Inc.), 2001. Technical Memorandum for No Further Action, Potential Source of Contamination 56, Stormwater Retention Pond. Naval Air Station Cecil Field, Jacksonville, Florida. February.

Tetra Tech, 2004. Groundwater Monitoring report, 2nd Semi-Annual, 3rd Year (July 2003), 815 Wash Rack Area. Naval Air Station Cecil Field, Jacksonville, Florida. January.

Tetra Tech, 2005. Supplemental Soil Assessment Letter Report, Building 815 Wash Rack Area. Naval Air Station Cecil Field, Jacksonville, Florida. August.

Tetra Tech, 2008. Site Assessment Report Addendum, Building 815 Wash Rack Area. Naval Air Station Cecil Field, Jacksonville, Florida. May.

Tetra Tech, 2010. Sampling and Analysis Plan for Petroleum Sites: North-South Apron; Building 82, Tank G82; BP Wells; and 815 Wash Rack. Naval Air Station Cecil Field, Jacksonville, Florida.

TABLES

Table 1
Groundwater Elevation Data

1st Semi-Annual, Year 3 Event – January 2011
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	NM	NM	NM	NM	NM	NM	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	NM	NM	NM	NM	NM	NM	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	69.19	6.66	68.89
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	69.06	6.89	68.76
NG-12S	13.40	75.69	6.60	69.09	5.14	70.55	6.81	68.88	4.78	70.91	6.68	69.01	6.91	68.78
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	72.23	7.54	68.51

Monitoring Well Identification	Well Depth (feet btoc)	TOC Elevation (feet above msl)	January 18, 2011	
			Depth to Water (feet btoc)	Water Level Elevation (feet above msl)
CEF-815-1S	13.10	75.55	7.76	67.79
CEF-815-5S	14.40	75.65	7.96	67.69
NG-12S	13.40	75.69	7.99	67.70
CEF-059-028-015	15.00	76.05	8.51	67.54

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

Table 2
Summary of Detections in Groundwater

1st Semi-Annual, Year 3 Event – January 2011
Building 815 Wash Rack Area
Naval Air Station Cecil Field
Jacksonville, Florida

Parameter	GCTL	NADC	CEF-815-1S										
			11/01/00	05/01/01	12/01/01	06/01/02	07/01/02	01/01/03	07/01/03	01/01/06	11/01/07	02/12/08	
												Sample	Duplicate
VOCs (µg/L)													
Naphthalene	14	140	**192**	**250**	**129**	**299**	**205**	**152**	**256**	**140**	**89**	**69**	**68**
Petroleum Hydrocarbons (mg/L)													
TRPH	5	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.1	0.88

Parameter	GCTL	NADC	CEF-815-1S (continued)										
			06/19/08		09/16/08		12/15/08		07/31/09	01/20/10		07/01/10	01/18/11
			Sample	Duplicate	Sample	Duplicate	Sample	Duplicate		Sample	Duplicate		
VOCs (µg/L)													
Naphthalene	14	140	**50**	**58**	**72 J**	**43 J**	**42.5**	**40.7**	**160**	**46**	**39**	**31.3**	**31.5**
Petroleum Hydrocarbons (mg/L)													
TRPH	5	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Parameter	GCTL	NADC	CEF-815-5S								NG-12S		
			02/12/08	06/19/08	09/15/08	12/15/08	07/31/09	01/20/10	07/01/10	1/18/2011	11/01/00	05/01/01	12/01/01
VOCs (µg/L)													
Naphthalene	14	140	**37.0**	**42**	**42.0**	**36**	**72**	**110**	**110**	**47.6**	9.2	8.2	7.1
Petroleum Hydrocarbons (mg/L)													
TRPH	5	50	0.48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 2
Summary of Detections in Groundwater

1st Semi-Annual, Year 3 Event – January 2011
Building 815 Wash Rack Area
Naval Air Station Cecil Field
Jacksonville, Florida

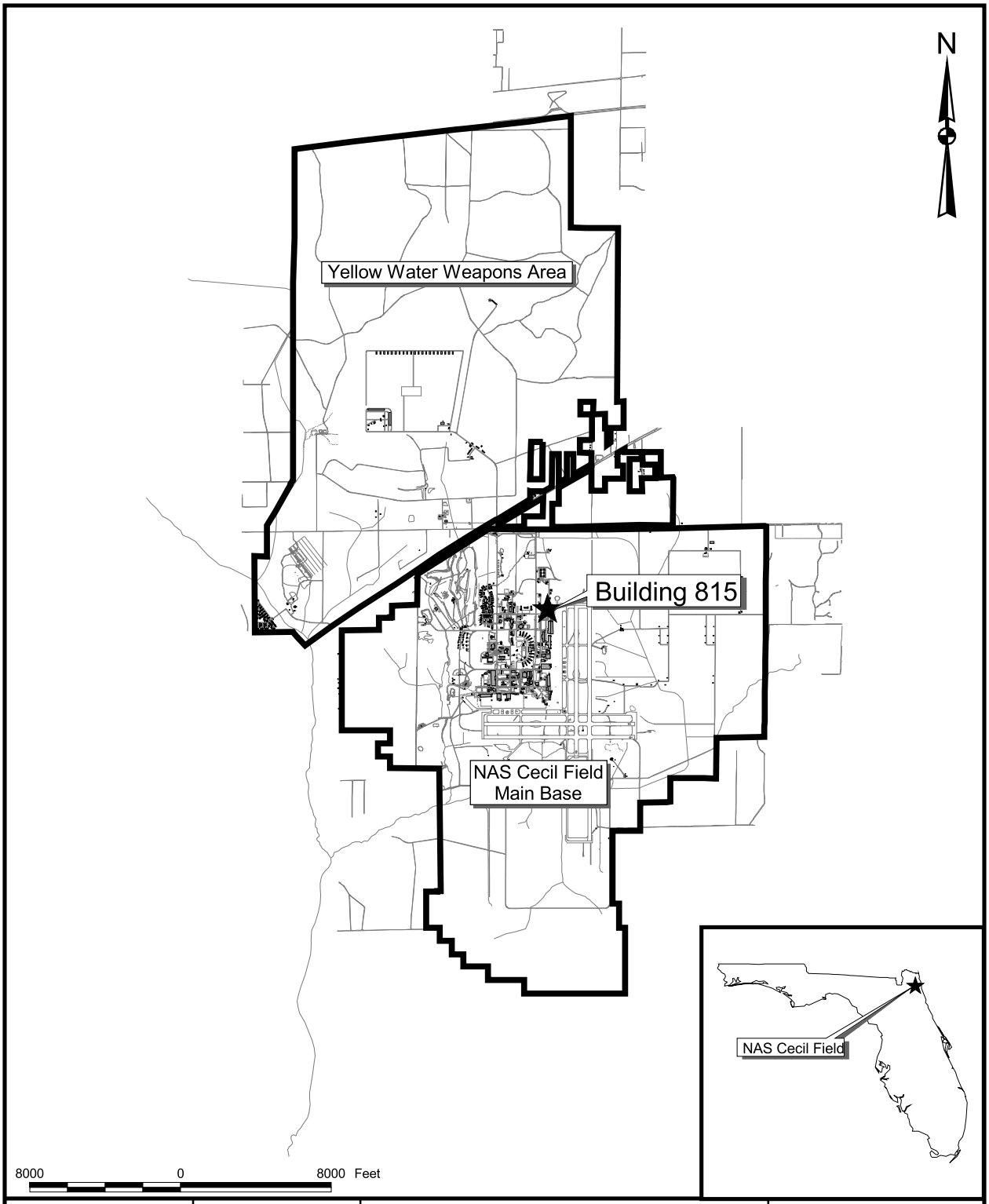
Parameter	GCTL	NADC	NG-12S (continued)										
			06/01/02	01/01/03	07/01/03	01/01/06	11/01/07	02/01/08	06/01/08	09/01/08	12/01/08	07/31/09	01/20/10
VOCs (µg/L)													
Naphthalene	14	140	3.4	13.2	**39.9**	13.6	4.7	3.3	2.2	0.51	0.53 J	0.11 J	4.3
Petroleum Hydrocarbons (mg/L)													
TRPH	5	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Parameter	GCTL	NADC	NG-12S (continued)			CEF-059-028-015							
			07/01/10	1/18/11		02/01/08	06/01/08	09/01/08	12/01/08	07/31/09	01/20/10	07/01/10	01/18/11
				Sample	Duplicate								
VOCs (µg/L)													
Naphthalene	14	140	0.0185 U	0.0235 I	0.0282 I	0.1 J	0.058	0.12	0.24 U	0.10 U	0.72 U	0.0185 U	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
			03/23/11
VOCs (µg/L)			
Naphthalene	14	140	0.0185 U
Petroleum Hydrocarbons (mg/L)			
TRPH	5	50	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



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COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 1 / REV 0

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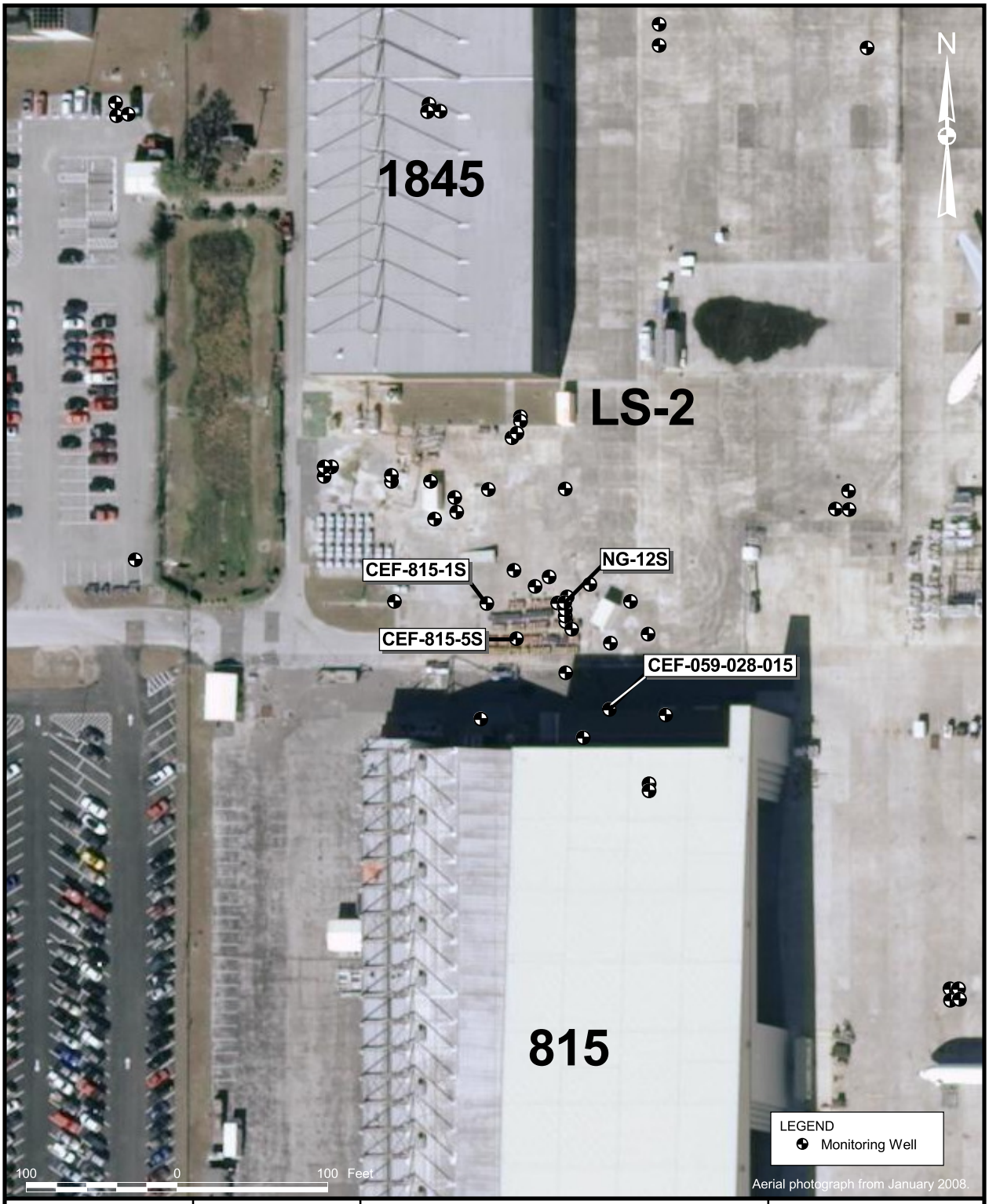

DRAWN BY MJJ	DATE 13Mar10	MONITORING WELL LOCATIONS BUILDING 815 WASH RACK AREA 1st SEMI-ANNUAL, YEAR 3 EVENT - JANUARY 2011 NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 2267
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COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 2 / REV 0

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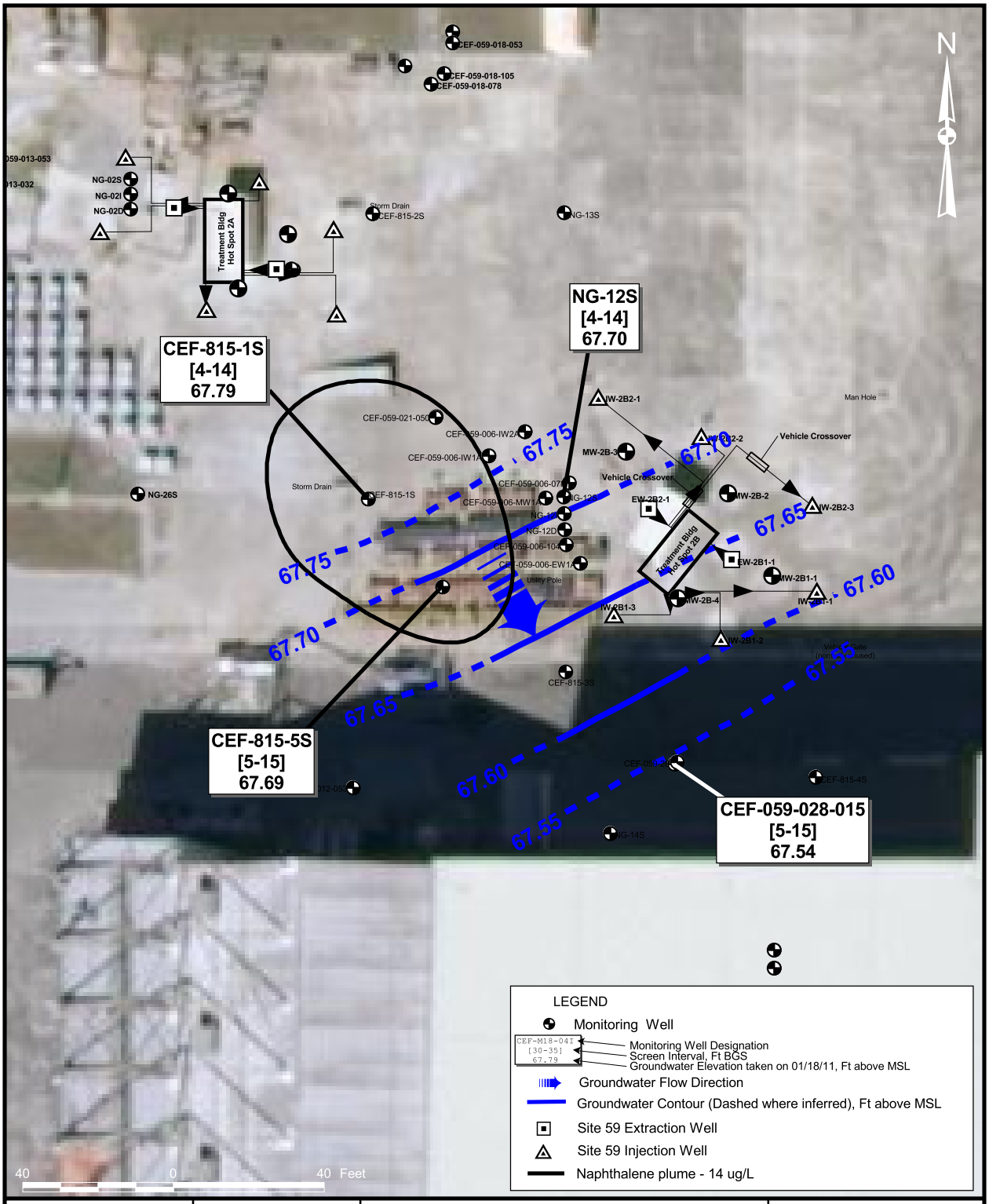

DRAWN BY MJJ	DATE 29Jan11	GROUNDWATER FLOW MAP BUILDING 815 WASH RACK AREA 1st SEMI-ANNUAL, YEAR 3 EVENT - JANUARY 2011 NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 2267
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 3 / REV 0

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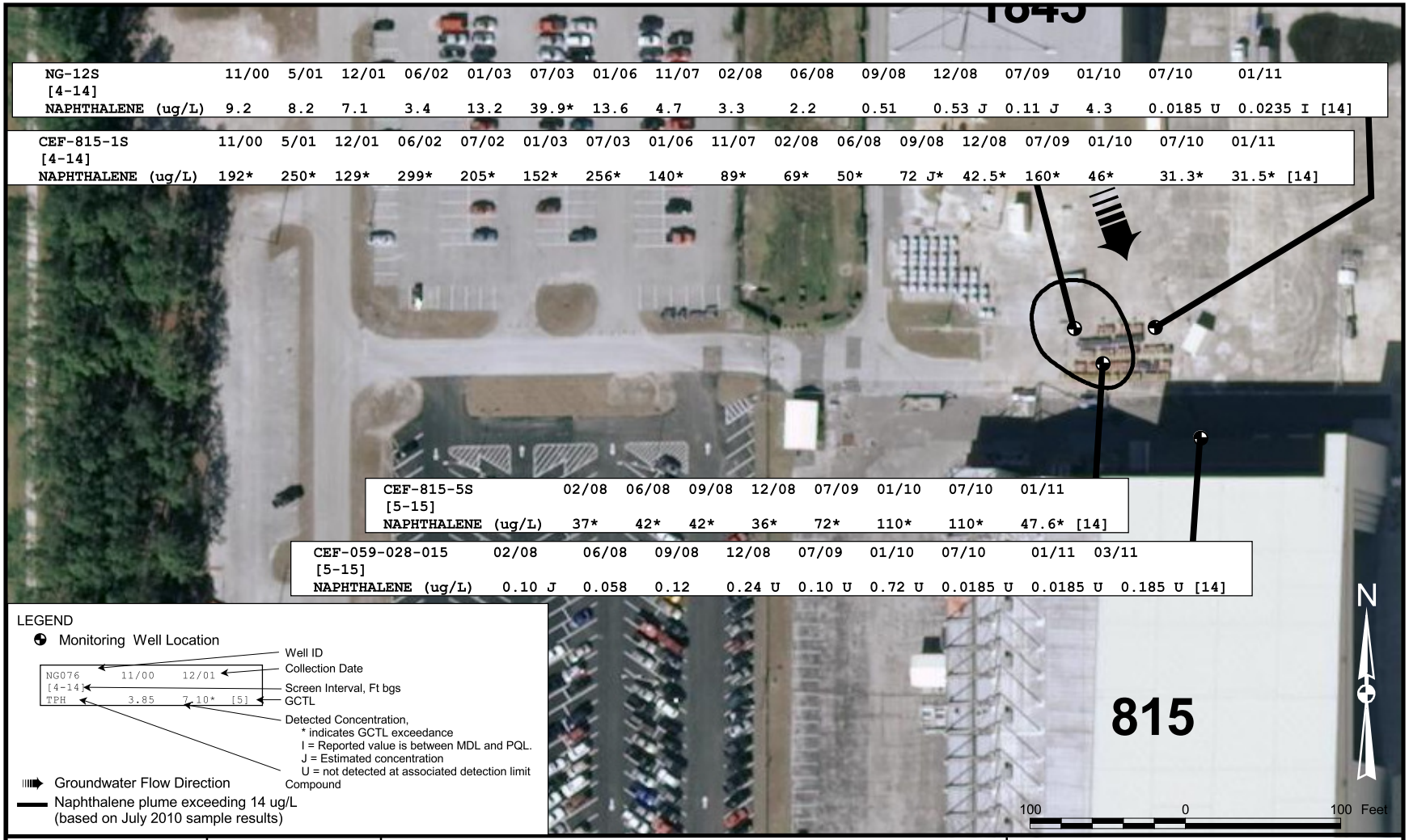

DRAWN BY	DATE
MJJ	13Mar10
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE	AS NOTED

NAVFAC

GROUNDWATER CONCENTRATIONS
BUILDING 815 WASH RACK AREA
1st SEMI-ANNUAL, YEAR 3 EVENT - JANUARY 2011
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NUMBER	
2267	
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DRAWING NO. FIGURE 4	REV 0

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ATTACHMENT A

SELECT UFP-SAP WORKSHEETS

Attachment A – 815 Wash Rack

The following was extracted from the UFP-SAP for 815 Wash Rack for information purposes and is not the complete approved document.

11D 815 WASH RACK

11D.1 PROBLEM DEFINITION – 815 WASH RACK

Naphthalene exceeded the action levels (GCTLs and NADCs) in groundwater in the area of the former wash rack to the north of Building 815. Long-term monitoring indicates that contaminant concentrations are increasing; however contaminant migration currently does not appear to be occurring. Natural attenuation was the selected remedy for the site, so groundwater monitoring is required to determine whether natural attenuation is occurring at the site or other actions should be taken.

11D.2 INFORMATION INPUTS

Requirements for groundwater sampling and analysis methods are described below. Additional detail (e.g., the exact methods and SOPs to be used) is provided in Worksheet #s 15, 19, and 21.

Required Analyses

Matrix	VOCs	Purpose
Groundwater	Naphthalene only	Long-term monitoring

Analytical Methods

Analytical methods were selected to be the same as those used previously or at least comparable to previously used analytical methods with respect to PARCCS parameters. See Worksheets Nos. 20 and 23 for a list of the analytical methods applicable to each site.

Sampling Methods

Sampling methods were selected to be the same as those used previously or to at least be consistent with the representativeness and comparability of data for each media being sampled at each site. See Worksheet No. 21 for a list of sampling methods.

Action Levels

The groundwater data will be screened against the FDEP GCTLs and NADCs. A full list of PALs which, in this case are the lower of the NADC and GCTL for each parameter, is included within Worksheet 15. The BCT has ensured that the selected laboratory LOQs are generally low enough to measure constituent concentrations in site media that are less than the PALs in order to conduct comparisons of site data to the PALs. The LOQ for naphthalene is less than the PAL, and the MDL is less than the LOQ.

11D.3 STUDY BOUNDARIES

The 815 Wash Rack area covers approximately 0.5 acre between Buildings 1845 and 815, as shown on Figure 10D-1. The vertical boundary for the groundwater plume is between 5 ft and 15 ft bgs. The contaminated groundwater is the population of interest and constitutes the spatial decision unit. The temporal decision unit is each round of monitoring when determined whether an exceedance of GCTL has occurred and it is two consecutive monitoring rounds when determining whether parameters or wells may be eliminated from monitoring.

11D.4 ANALYTIC APPROACH

A direct comparison of measured concentrations within the groundwater will be made against the appropriate PAL. The PAL for naphthalene is detailed in Worksheet No. 15. Additionally, if none of the measured naphthalene concentrations within any groundwater sample exceed criteria after two consecutive rounds of monitoring, then the monitoring program will be discontinued after coordination with the BCT. The following decision rules govern data use for the monitoring programs at 815 Wash Rack.

Decision Rule #1: If the measured naphthalene concentration is greater than its GCTL in any non-compliance/source well sample, then continue long-term monitoring until levels of naphthalene are below the GCTL for two consecutive sampling rounds.

Decision Rule #2: If any sample taken from the compliance wells has a measured naphthalene concentration greater than the GCTL, then conduct additional delineation of groundwater contamination. An FTMR would be issued to govern the delineation.

Decision Rule #3: If any measured naphthalene concentration in any sample exceeds the GCTL but no migration is detected outside of the compliance wells for four consecutive monitoring events, then a permanent groundwater restriction will be evaluated for RMO III (62-780.680, F.A.C.). This will indicate that contamination exists and the contaminated area is defined. RMO III will put a restriction on the use of the groundwater, but allow it to remain onsite.

Decision Rule #4: If measured naphthalene concentrations in all groundwater samples are less than action levels for two consecutive quarters in all wells at the site, then recommend NFA.

Decision Rule #5: Throughout the groundwater monitoring, if any particular measured COC concentration is less than its GCTL for two consecutive sampling rounds or all measured COC concentrations in any particular well are less than GCTLs for at least two consecutive sampling rounds, then the BCT will discuss the elimination of the well or COC from the monitoring program, in accordance with the Navy guidance on groundwater monitoring well optimization. The well (or COC) will be eliminated unless the well is a compliance well, or the BCT determines that the inclusion of the well (or COC) provides useful information on evaluating the overall program and should not be removed.

11D.5 PERFORMANCE CRITERIA

Refer to Section 11A.5.

11D.6 PLAN FOR OBTAINING DATA

The plan for obtaining data at the 815 Wash Rack area is described in detail on Worksheet #17 along with the sampling designs and rationales.

SAP Worksheet #15D -- Reference Limits for Groundwater – 815 Wash Rack

Matrix: Groundwater
Analytical Group: PAHs

Analyte	CAS Number	PAL [1] (µg/L)	PAL Reference	Project QL Goal (µg/L)	Empirical[2]		
					LOQ (µg/L)	LOD (µg/L)	MDL (µg/L)
Naphthalene	91-20-3	14	FDEP GCTL	4.6	0.10	0.040	0.013

1 FDEP GCTLs. Groundwater Cleanup Target Levels F.A.C. 62-777 Table I, April 2005.
2 Empirical MDLs are current as of May 2009.

SAP Worksheet #18D -- Sampling Locations and Methods/SOP Requirements Table – 815 Wash Rack

Sampling Location / Identification Number	Matrix	Screen Interval	Analytical Group	Number of Samples (identify field duplicates)(1)	Sampling SOP Reference(2)
CEF-815-01S, CEF-815-05S, NG-12S, CEF-059-028-015	Groundwater	5 to 15 feet bgs or 4 to 14 feet bgs	PAHs (naphthalene only)	4 plus 1 duplicate	FDEP FS 2200, 2008; TtNUS, SA-1.1, April 2008

1 Field duplicates may be consolidated across sites at FOL's discretion so as to yield one field duplicate per 10 environmental samples.
2 SOP that describes the sample collection procedures.

SAP Worksheet #20D -- Field QC Sample Summary Table – 815 Wash Rack

Matrix	Analytical Group	Number of Sampling Locations	Number of Field Duplicates	Number of MS/MSD	Number of Rinsate Blanks	Number of Equipment Blanks	Number of (VOA) Trip Blanks	Number of Proficiency Testing Samples	Total Number of Samples to Lab
Groundwater	PAHs	4	1	0	1	0	1	0	7

ATTACHMENT B

FDEP NAMPAO

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 PMO SE
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, P.G.
Remedial Project Manager

DAVID P. GRABKA
LICENSE
NO. 2192
STATE OF
FLORIDA
PROFESSIONAL GEOLOGIST

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 JJC ESN ESN

ATTACHMENT C

FIELD LOG SHEETS

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: 815 Wash Rack
Project No.: 112G02267
Location: NAS Cecil Field
Personnel: JK
Weather Conditions: Partly Cloudy 55°
Measuring Device:
Tidally Influenced: Yes ___ No _X_
Remarks:

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
CEF-815-1S	1/19/11	1026	75.56	13.10	7.76			
NG-12S		1021	75.69	13.40	7.99			
CEF-815-5S		1024	75.75	14.37	7.96			
CEF-059-028-015	1/19/11	1015	75.92	15.00	8.51			

* All measurements to the nearest 0.01 foot

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NAS Cecil Field	SITE LOCATION: 815 Wash Rack
WELL NO: CEF-NG-12S	SAMPLE ID: CEF-NG-12S-20110~~19~~ 18
DATE: 01/~~19~~ 18/2011	

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 5 feet to 15 feet	STATIC DEPTH TO WATER (feet): 7.99	PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
4.24 L = (15 – 7.99 = 7.01 feet – feet) X .605 gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 9	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 9	PURGING INITIATED AT: 1025	PURGING ENDED AT: 1051	TOTAL VOLUME PURGED (gallons): 5.2

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1025	—	—	200	7.99	—						
1045	4.0	4.0	200	8.04	5.23	19.60	103	1.08	6.53	81.3	clear
1048	.6	4.6	200	8.04	5.21	19.61	104	1.07	6.22	75.4	clear
1051	.6	5.2	200	8.04	5.21	19.61	104	1.07	6.21	70.5	clear
1101	Sample time										

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jeff Krone TtNUS	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1101	SAMPLING ENDED AT: 1115
PUMP OR TUBING DEPTH IN WELL (feet): 9	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: (Y) N	o ms/msD

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION					
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
1	~~3~~ 2	~~CG~~ AG	~~40~~ 1L	HCL	120		Naphthalene only (SW 846 8270C)	RFPP	

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)

SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. **The above do not constitute all of the information required by Chapter 62-160, F.A.C.**
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NAS Cecil Field	SITE LOCATION: 815 Wash Rack	
WELL NO: CEF-815-05S	SAMPLE ID: CEF-815-05S-20110~~19~~ 18	DATE: 01~~19~~ 18 /2011

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 5 feet to 15 feet	STATIC DEPTH TO WATER (feet): 7.96	PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
4.25 L = (15-7.96 = 7.04 x .605 = 4.25 feet – feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 9	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 9	PURGING INITIATED AT: 1035	PURGING ENDED AT: 1141	TOTAL VOLUME PURGED (gallons): 6.6

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1035	—	—	100	7.96	—						
1135	6.0	6.0	100	8.00	4.38	20.87	111	0.20	5.05	-65.4	clear
1138	.3	6.3	100	8.00	4.37	20.96	111	0.21	4.93	-65.3	clear
1141	.3	6.6	100	7.99	4.36	20.91	111	0.20	4.91	-65.3	clear
1144	Sample time										

WELL CAPACITY (Gallons Per Foot): **0.75"** = 0.02; **1"** = 0.04; **1.25"** = 0.06; **2"** = 0.16; **3"** = 0.37; **4"** = 0.65; **5"** = 1.02; **6"** = 1.47; **12"** = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): **1/8"** = 0.0006; **3/16"** = 0.0014; **1/4"** = 0.0026; **5/16"** = 0.004; **3/8"** = 0.006; **1/2"** = 0.010; **5/8"** = 0.016
PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jeff Krone TtNUS	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1144	SAMPLING ENDED AT: 1155
PUMP OR TUBING DEPTH IN WELL (feet): 9	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION					
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
1	~~3~~ 2	~~CG~~ PE	~~40~~ 1L	~~HCL~~	120		Naphthalene only (SW 846 8270C)	RFPP	

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)

pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NAS Cecil Field	SITE LOCATION: 815 Wash Rack	
WELL NO: CEF-815-01S	SAMPLE ID: CEF-815-01S-20110~~119~~18	DATE: 01/~~19~~18/2011

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 5 feet to 15 feet	STATIC DEPTH TO WATER (feet): 7.76	PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) 4.38L = (15-7.76 = 7.24 feet – feet) X 4.38 gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 8	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 8	PURGING INITIATED AT: 1115	PURGING ENDED AT: 1211	TOTAL VOLUME PURGED (gallons): 5.6

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1115	—	—	100	7.76	—	—	—	—	—	—	—
1205	5.0	5.0	100	7.91	5.65	19.47	284	0.19	2.46	-93.8	clear
1208	.3	5.3	100	7.90	5.64	19.44	286	0.20	2.33	-94.2	clear
1211	.3	5.6	100	7.90	5.64	19.43	285	0.19	1.54	-94.0	clear
1222	Sample time										

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jeff Krone TtNUS	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1222	SAMPLING ENDED AT: 1230
PUMP OR TUBING DEPTH IN WELL (feet): 8	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
1	~~3~~ 2	~~CG~~ AG	~~40~~ 1L	HCL	120		Naphthalene only (SW 846 8270C)	RFPP	

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NAS Cecil Field	SITE LOCATION: 815 Wash Rack
WELL NO: CEF-059-028-015	SAMPLE ID: CEF-059-028-015-201101~~14~~ 18 — DATE: 01/~~19~~ 18/2011

PURGING DATA

WELL DIAMETER (inches): ~~2~~ 1.25	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: 5 feet to 15 feet	STATIC DEPTH TO WATER (feet): 8.50	PURGE PUMP TYPE OR BAILER: PP

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable) 3.93L = (feet – 15 - 8.50 = 6.5 X ~~.393~~ .006 = .0039 X 3.785 feet) X gallons/foot = gallons

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= gallons + (gallons/foot X feet) + gallons = gallons

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 9	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 9	PURGING INITIATED AT: 1215	PURGING ENDED AT: 1356	TOTAL VOLUME PURGED (gallons): 8.2

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1215	—	—	200	8.50							
1350	7.0	7.0	200	8.63	4.88	18.72	89	0.37	9.44	-64.1	cloudy
1353	.6	7.6	200	8.63	4.87	18.72	89	0.38	9.24	-64.1	clear
1356	.6	8.2	200	8.62	4.87	18.71	88	0.38	8.85	-63.8	clear
1402	Sample time										

WELL CAPACITY (Gallons Per Foot): 0.75" = 0.02; 1" = 0.04; 1.25" = 0.06; 2" = 0.16; 3" = 0.37; 4" = 0.65; 5" = 1.02; 6" = 1.47; 12" = 5.88
TUBING INSIDE DIA. CAPACITY (Gal./Ft.): 1/8" = 0.0006; 3/16" = 0.0014; 1/4" = 0.0026; 5/16" = 0.004; 3/8" = 0.006; 1/2" = 0.010; 5/8" = 0.016
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Jeff Kronc TINUS	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1402	SAMPLING ENDED AT: 1415
PUMP OR TUBING DEPTH IN WELL (feet): 9	TUBING MATERIAL CODE: PE	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N) (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION					
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH	INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
1	~~3~~ 2	~~CG~~ AG	~~40~~ 1L	HCL	120		Naphthalene only (SW 846 8270C)	RFPP	

REMARKS:

MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

Revision Date: February 12, 2009

Tetra Tech NUS, Inc.

EQUIPMENT CALIBRATION LOG

PROJECT NAME : NAS Cecil Field

SITE NAME: 815 Wash Rack

PROJECT No.: 112G02267

INSTRUMENT NAME/MODEL: Lamotte 2020 Turbidimeter

MANUFACTURER: Lamotte

SERIAL NUMBER: ME 11480

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-calibration	Post-calibration	Pre-calibration	Post-calibration		
1/~~14~~ 18/11	ME 11480	JK	1.0NTU 10.0NTUs	1.0NTU 10.0NTUs	10.27	10.00		
			~~1.0NTU~~ 10.0NTUs	~~1.0NTU~~ 10.0NTUs	0.41	1.00		
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				
			1.0NTU 10.0NTUs	1.0NTU 10.0NTUs				

Tetra Tech NUS, Inc.

YSI EQUIPMENT CALIBRATION SHEET

PROJECT NAME : NAS Cecil Field

INSTRUMENT NAME/MODEL: YSI 556 MPS

SITE NAME: 815 Wash Rack

MANUFACTURER: YSI

PROJECT No.: 112G02267

SERIAL NUMBER: 10J100598

		Date of Calibration	Person Performing Calibration	Machine Serial No.	Machine Settings	Instrument Readings		Calibration Standard (Lot#/Expiration Date)	Comments
		(mm/dd/yy)	(Name)			Pre-cal	Post-cal		
pH (4)	(S.U.)	01/18/11	X	10J100598		2.96	4.00	Lot# 2803109 Exp.Date: 6/11	
pH (10)	(S.U.)					10.56	10.00	Lot# 1002035 Exp.Date: 7/11	
D.O.	100%							Lot# Exp.Date:	
Cond.	(mS/cm) 1413				1413	1270	1413	Lot# 7807 Exp.Date: 3/11	
Temp.	°C							Lot# Exp.Date:	
ORP	(mV)				240	221.7	240	Lot# 2232 Exp.Date: 3/15	
								Lot# Exp.Date:	
pH (4)	(S.U.)							Lot# Exp.Date:	
pH (10)	(S.U.)							Lot# Exp.Date:	
D.O.	%							Lot# Exp.Date:	
Cond.	(mS/cm)							Lot# Exp.Date:	
Temp.	°C							Lot# Exp.Date:	
ORP	(mV)							Lot# Exp.Date:	

112602267 NAS Cecil Field Groundwater Sampling 815 Wash Rack 18 Jan 11

Personnel: Jeff Krone
Truck: 2006 F-250
PPE: Level D
Weather: Partly Cloudy 55°
Objective: Groundwater Sampling at Site 815 Wash Rack

0740 Departed home for Cecil Field
0900 Arrived at Cecil Field, obtained Contractor Pass and headed to Site
0915 Onsite began uncapping wells and calibration of monitoring equipment
1030 Completed calibration and measurement of groundwater on NADEP Side. See table below for details on sampling event.
1100 Contacted Kara and explained that there wasn't enough bottleware

Well ID	Sample ID	Start	Stop	Sample time	Analyses
NG 12$	no MS/MSD* CEF-NG-12$-20110118	1025	1051	1101	Naphthalene
815-05$	CEF-815-05$-20110118	1035	1141	1144	Naphthalene
815-01$	CEF-815-01$-20110118	1115	1211	1222	Naphthalene
059-028	CEF-059-028-015-20110118	1315	1356	1402	Naphthalene

* Duplicate sample CEF-815-DUP01-20110118
All samples cooled to 4° C

1430 Completed sampling event. Unable to collect MS/MSD due to lack of bottle ware. Contacted Kim Kostzer and Kara Wimble.
1450 Departed Site
1500 Met with Zach Scribner to assist with sampling at BP wells and pack samples for transport
1700 Completed packing samples, gave IDW to Zach for disposal, departed Cecil Field
1815 Relinquished Samples to Emplrical Labs via FEDEX Airbill 8660 1730 2300.

Rite in the Rain

Form FD 9000-24

GROUNDWATER SAMPLING LOG

SITE NAME: NAS CECIL FIELD	SITE LOCATION: Building / Site B15
WELL NO: CEF-059-028-015	SAMPLE ID: CEF-059-028-015-20110323 / DATE 3/23/11

PURGING DATA

WELL DIAMETER (inches): 2 / 1.25	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 7.05	PURGE PUMP TYPE OR BAILER: Peristaltic Pump

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (15.06 feet – 7.05 feet) X 0.227 liters/foot = 1.82 liters

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)
= liters + (liters/foot X feet) + liters = liters

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 8.5	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 7.5	PURGING INITIATED AT: 1515	PURGING ENDED AT: 1545	TOTAL VOLUME PURGED (liters): 9.0

TIME	VOLUME PURGED (~~gallons~~) Liter	CUMUL. VOLUME PURGED (~~gallons~~) Liter	PURGE RATE (~~gpm~~) mL/m	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) µmhos/cm or µS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1515	—	—	300	7.05	—	—	—	—	9.39	clear	n/a
1530	4.5	4.5	300	7.11	3.90	19.86	109	0.72	6.44	clear	n/a
1536	1.8	6.3	300	7.09	3.84	19.94	110	0.68	6.41	clear	n/a
1539	0.9	7.2	300	7.09	3.84	19.94	109	0.69	6.40	clear	n/a
1542	0.9	8.1	300	7.09	3.88	19.80	109	0.68	6.33	clear	n/a
1545	0.9	9.0	300	7.09	3.88	19.93	110	0.68	6.31	clear	n/a
				All Readings Stable							

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.0757; **1"** = 0.151; **1.25"** = 0.227; **2"** = 0.605; **3"** = 0.37; **4"** = 1.40; **5"** = 3.861; **6"** = 5.564; **12"** = 22.25
TUBING INSIDE DIA. CAPACITY (Ltr./Ft.): **1/8"** = 0.00227; **3/16"** = 0.00529; **1/4"** = 0.00984; **5/16"** = 0.0151; **3/8"** = 0.0227; **1/2"** = 0.0378; **5/8"** = 0.0605

PURGING EQUIPMENT CODES: **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP** = Peristaltic Pump; **O** = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: T. Thumbull /TtNUS	SAMPLER(S) SIGNATURE(S): [signature]	SAMPLING INITIATED AT: 1550	SAMPLING ENDED AT: 1600
PUMP OR TUBING DEPTH IN WELL (feet): 7.5	TUBING MATERIAL CODE: Teflon Poly (circle one)	FIELD-FILTERED: Y (N) Filtration Equipment Type:	FILTER SIZE: ____ µm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y N (replaced)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
–	2	AG	1L	—	—	3.88	SVOCs 8270	APP	300

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; T = Teflon; **O** = Other (Specify)

SAMPLING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **O** = Other (Specify)

NOTES: 1. The above do not constitute all of the information required by Chapter 62-160, F.A.C.
2. STABILIZATION CRITERIA FOR RANGE OF VARIATION OF LAST THREE CONSECUTIVE READINGS (SEE FS 2212, SECTION 3)
pH: ± 0.2 units **Temperature:** ± 0.2 °C **Specific Conductance:** ± 5% **Dissolved Oxygen:** all readings ≤ 20% saturation (see Table FS 2200-2); optionally, ± 0.2 mg/L or ± 10% (whichever is greater) **Turbidity:** all readings ≤ 20 NTU; optionally ± 5 NTU or ± 10% (whichever is greater)

TETRA TECH NUS, INC.

CHAIN OF CUSTODY

NUMBER № 2187

PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G00746	SITE 815	DAVID SIEFKEN	904-636-6125	Empirical Laboratories / Brian Richard
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		TOD TRUMBULL	904-636-6125	621 MAINSTREAM DRIVE Suite 270
		CARRIER/WAYBILL NUMBER		CITY, STATE
		-		NASHVILLE TN 37228

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

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

PRESERVATIVE USED: 4°C N/A

TYPE OF ANALYSIS: * PAH 8270 SELECT

DATE YEAR 2011	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	* PAH 8270 SELECT								COMMENTS
3/23	1550	CGF-059-028-015-20110323	815	-	15	GW	G	2	X								* SELECT NAPHTHALENE ONLY

1. RELINQUISHED BY	DATE 3/24/11	TIME 1400	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

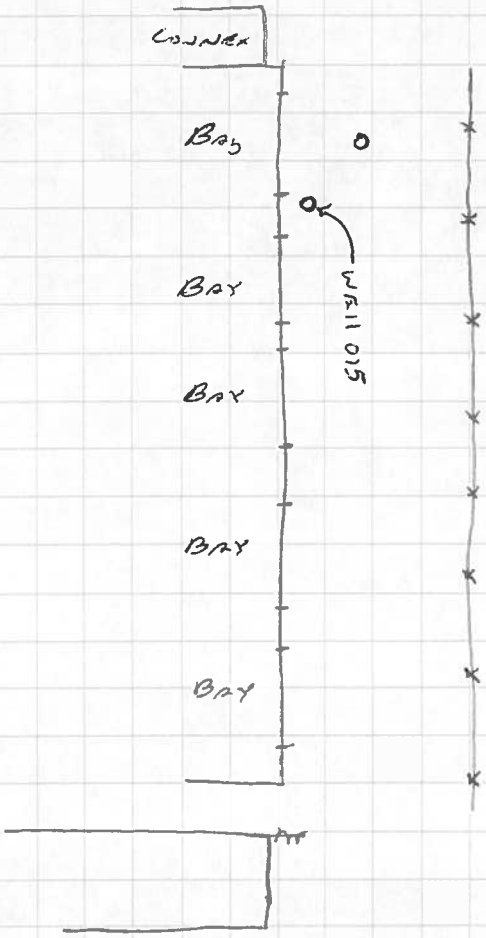
COMMENTS

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

4/02R
FORM NO. TtNUS-001

TETRA TECH NUS, INC. **CALCULATION WORKSHEET** PAGE _____ OF _____

CLIENT		JOB NUMBER	
SUBJECT			
BASED ON		DRAWING NUMBER	
BY	CHECKED BY	APPROVED BY	DATE



1126000746

Cecil Field BZ, 502 + 815 3/23/11

Personnel: Tod Trumbull
Truck: 2001 F-250
Weather: Sunny 85°
Objective: Sampling 502 + 815 wells

0835 Arrive at operations office to get pass, no one available for Contractor pass - back to wait till 0930 for Lisha to arrive.

0945 On site at 502 to begin prep activities for Sampling - calibrate all equipment - obtain water levels/depths as follows:

Well ID	Depth to WS	Depth to bottom
CEF-502-3S	4.95	13.20
CEF-502-4S	4.96	12.38
CEF-502-6S	5.53	14.83
CEF-502-8S	5.84	13.60
CEF-502-9S	5.95	14.90

Samples Gathered as follows:

Sample ID	Date	Time	Comments
CEF-502-3S-20110323	3/23/11	1100	+ MS/MSD
CEF-502-6S-20110323	3/23/11	1145	+ Dup
CEF-502-9S-20110323	3/23/11	1240	—
CEF-502-4S-20110323	3/23/11	1325	[WAVE DRY/RCH + sample]

Moved to site 815 to Gather Sample

Sample ID	Date	Time	Comments
CEF-059-028-015-20110323	3/23/11	1550	—

Transport water to IDW area

1700 Off site

3/23/11

ATTACHMENT D

LABORATORY ANALYTICAL REPORT

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**R. SIMCIK**	**DATE:**	**APRIL 27, 2011**
FROM:	**MICHELLE ALLEN**	**COPIES:**	**DV FILE**
SUBJECT:	**ORGANIC DATA VALIDATION – NAPHTHALENE CTO JM09, NAS CECIL FIELD SDG CTOJM09CF_11**		
SAMPLES:	5/Aqueous /SVOC		

CEF-059-028-015-20110119 CEF-815-01S-20110119 CEF-815-05S-20110119
CEF-815-DUP01-20110119 CEF-NG-12S-20110119

OVERVIEW

The sample set for NAS Cecil Field SDG CTOJM09CF_11 consisted of five (5) aqueous environmental samples. The samples were analyzed for naphthalene. One field duplicate pair was associated with this Sample Delivery Group (SDG); CEF-815-DUP-01-20110119/CEF-NG-12S-20110119.

The samples were collected by TetraTech NUS on January 19, 2011 and analyzed by Empirical Laboratories, LLC. All analyses were conducted in accordance with SW-846 Method 8270C analytical and reporting protocols.

The data contained in this SDG were validated with regard to the following parameters:

* • Data Completeness
* • Holding Times/Sample Preservation
* • Initial/Continuing Calibrations
* • Laboratory Method Blank Results
* • Field Duplicate Results
* • Detection Limits

The symbol (*) indicates that quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

The text of this report is formatted to address only gross non-compliances resulting in the rejection of data and the elimination of false positives.

SVOC

No issues were identified.

NOTES

Positive results reported below the Limit of Quantitation (LOQ) but above the Method Detection Limit (MDL) were qualified as estimated, (J).

It is suspected that samples CEF-815-01S-20110119 and CEF-059-028-015-20110119 were switched by the field sampler. This suspicion is based on the historical data from the sampling sites. The laboratory re-

analyzed sample CEF-059-028-015-20110119 to confirm that the laboratory did not accidentally switch sample bottles prior to analysis. The re-analysis confirmed the naphthalene detection in the initial analysis. Sample location CEF-059-028-015 was re-sampled on March 23, 2011 and the sample, CEF-059-015-028-20110323, was validated on April 28, 2011 (SDG 1103219). Naphthalene was not detected in the sample. It is the conclusion that field sampler inadvertently switched sample bottles in the initial sampling event. The laboratory Form Is for both samples CEF-815-01S-20110119 and CEF-059-028-015-20110119 and their subsequent database results have been adjusted to reflect this conclusion.

Naphthalene exceeded the instrument's linear calibration range in the initial analyses of samples CEF-815-01S-20110119 and CEF-815-05S-20110119. The results from the re-analyses of these samples were used in the data validation.

EXECUTIVE SUMMARY

Laboratory Performance Issues: There were no laboratory issues.

Other Factors Affecting Data Quality: Positive results reported below the LOQ but above the MDL were qualified as estimated, (J).

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (10/99), SW-846 Method 8270C analytical and reporting protocols, 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
Chemist/Data Validator

TetraTech NUS
Joseph A. Samchuck
Data Validation Quality Assurance Officer

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 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: 02267	NSAMPLE	CEF-059-028-015-20110119			CEF-815-01S-20110119			CEF-815-05S-20110119RE			CEF-815-DUP01-20110119		
SDG: CTOJM09CF_11	LAB_ID	1101074-05			1101074-04			1101074-03RE1			1101074-02		
FRACTION: OS	SAMP_DATE	1/19/2011			1/19/2011			1/19/2011			1/19/2011		
MEDIA: WATER	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-NG-12S-20110119		
PARAMETER		RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD
NAPHTHALENE		0.0185	U		31.5			47.6			0.0282	J	P

PROJ_NO: 02267	NSAMPLE	CEF-NG-12S-20110119		
SDG: CTOJM09CF_11	LAB_ID	1101074-01		
FRACTION: OS	SAMP_DATE	1/19/2011		
MEDIA: WATER	QC_TYPE	NM		
	UNITS	UG/L		
	PCT_SOLIDS	0.0		
	DUP_OF			
PARAMETER		RESULT	VQL	QLCD
NAPHTHALENE		0.0235	J	P

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

ANALYSIS DATA SHEET

~~CEF-815-01S-20110119~~

CEF-DS1-028-015-20110119
MA 4/12/11

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOJM09CF_011
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTO JM09 Washrack 815_2010
Matrix:	Ground Water	Laboratory ID:	1101074-04	File ID:	0107404.D
Sampled:	01/18/11 12:22	Prepared:	01/24/11 09:48	Analyzed:	01/26/11 16:51
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 1A23004 Sequence: 1A02804 Calibration: 1017001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
91-20-3	Naphthalene		0.0185	0.0370	0.0926	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	46.30	19.46	42.0	34 - 167	
Terphenyl-d14	46.30	6.886	14.9	34 - 167	*

ANALYSIS DATA SHEET

~~CEF-059-038-015-20110119~~

CEF-815-015-20110119
MA
4/28/11

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOJM09CF_011
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTO JM09 Washrack 815_2010
Matrix:	Ground Water	Laboratory ID:	1101074-05	File ID:	0107405.D
Sampled:	01/18/11 14:02	Prepared:	01/24/11 09:48	Analyzed:	01/26/11 17:24
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 1A23004 Sequence: 1A02804 Calibration: 1017001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
91-20-3	Naphthalene	21.3	0.0185	0.0370	0.0926	L

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	46.30	21.56	46.6	34 - 167	
Terphenyl-d14	46.30	22.61	48.8	34 - 167	

ANALYSIS DATA SHEET

~~CEF-059-038-015-20110110~~

CEF-815-015-20110119
MA
4/28/11

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOJM09CF_011	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTO JM09 Washrack 815_2010	
Matrix:	Ground Water	Laboratory ID:	1101074-05RE1	File ID:	0107405D.D
Sampled:	01/18/11 14:02	Prepared:	01/24/11 09:48	Analyzed:	01/28/11 13:28
Solids:		Preparation:	EXT_3510	Dilution:	5

Batch: 1A23004 Sequence: 1A02807 Calibration: 1017001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
91-20-3	Naphthalene	31.5	0.0926	0.185	0.463	

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	46.30	27.30	59.0	34 - 167	
Terphenyl-d14	46.30	17.38	37.5	34 - 167	

ANALYSIS DATA SHEET

CEF-815-05S-20110119

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOJM09CF_011
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTO JM09 Washrack 815_2010
Matrix:	Ground Water	Laboratory ID:	1101074-03	File ID:	0107403.D
Sampled:	01/18/11 11:44	Prepared:	01/24/11 09:48	Analyzed:	01/26/11 16:18
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 1A23004 Sequence: 1A02804 Calibration: 1017001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
91-20-3	Naphthalene	28.0	0.0185	0.0370	0.0926	L

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	46.30	21.60	46.6	34 - 167	
Terphenyl-d14	46.30	5.133	11.1	34 - 167	*

ANALYSIS DATA SHEET

CEF-815-05S-20110119

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOJM09CF_011	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTO JM09 Washrack 815_2010	
Matrix:	Ground Water	Laboratory ID:	1101074-03RE1	File ID:	0107403D.D
Sampled:	01/18/11 11:44	Prepared:	01/24/11 09:48	Analyzed:	01/28/11 12:54
Solids:		Preparation:	EXT_3510	Dilution:	5

Batch: 1A23004 Sequence: 1A02807 Calibration: 1017001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
91-20-3	Naphthalene	47.6	0.0926	0.185	0.463	

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	46.30	24.67	53.3	34 - 167	
Terphenyl-d14	46.30	3.949	8.53	34 - 167	*

ANALYSIS DATA SHEET

CEF-815-DUP01-20110119

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOJM09CF_011
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTO JM09 Washrack 815_2010
Matrix:	Ground Water	Laboratory ID:	1101074-02	File ID:	0107402.D
Sampled:	01/18/11 00:00	Prepared:	01/24/11 09:48	Analyzed:	01/26/11 15:45
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 1A23004 Sequence: 1A02804 Calibration: 1017001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
91-20-3	Naphthalene	0.0282	0.0185	0.0370	0.0926	I

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	46.30	21.65	46.8	34 - 167	
Terphenyl-d14	46.30	9.592	20.7	34 - 167	*

ANALYSIS DATA SHEET

CEF-NG-12S-20110119

Laboratory:	Empirical Laboratories, LLC			SDG:	CTOJM09CF_011
Client:	Tetra Tech NUS, Inc. (T010)			Project:	CTO JM09 Washrack 815_2010
Matrix:	Ground Water	Laboratory ID:	1101074-01	File ID:	0107401.D
Sampled:	01/18/11 11:01	Prepared:	01/24/11 09:48	Analyzed:	01/26/11 15:12
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 1A23004 Sequence: 1A02804 Calibration: 1017001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
91-20-3	Naphthalene	0.0235	0.0185	0.0370	0.0926	I

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	46.30	20.22	43.7	34 - 167	
Terphenyl-d14	46.30	9.199	19.9	34 - 167	*

APPENDIX C

SUPPORT DOCUMENTATION

SDG CTOJM09CF_

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
OS	UG/L	CEF-NG-12S-20110119	1101074-01	SUR	01/18/2011	01/24/2011	01/26/2011	6	2	8
OS	UG/L	CEF-NG-12S-20110119	1101074-01	NM	01/18/2011	01/24/2011	01/26/2011	6	2	8
OS	UG/L	CEF-815-DUP01-2011011	1101074-02	SUR	01/18/2011	01/24/2011	01/26/2011	6	2	8
OS	UG/L	CEF-815-DUP01-2011011	1101074-02	NM	01/18/2011	01/24/2011	01/26/2011	6	2	8
OS	UG/L	CEF-815-05S-20110119	1101074-03RE1	NM	01/18/2011	01/24/2011	01/28/2011	6	4	10
OS	UG/L	CEF-815-05S-20110119	1101074-03	SUR	01/18/2011	01/24/2011	01/26/2011	6	2	8
OS	UG/L	CEF-815-05S-20110119	1101074-03	NM	01/18/2011	01/24/2011	01/26/2011	6	2	8
OS	UG/L	CEF-815-01S-20110119	1101074-04	SUR	01/18/2011	01/24/2011	01/26/2011	6	2	8
OS	UG/L	CEF-815-01S-20110119	1101074-04	NM	01/18/2011	01/24/2011	01/26/2011	6	2	8
OS	UG/L	CEF-059-028-015-201101	1101074-05RE1	NM	01/18/2011	01/24/2011	01/28/2011	6	4	10
OS	UG/L	CEF-059-028-015-201101	1101074-05	SUR	01/18/2011	01/24/2011	01/26/2011	6	2	8
OS	UG/L	CEF-059-028-015-201101	1101074-05	NM	01/18/2011	01/24/2011	01/26/2011	6	2	8

Allen, Michelle

From: Rick Davis [rdavis@empirlabs.com]
Sent: Thursday, March 17, 2011 12:59 PM
To: brichard@empirlabs.com; Samchuck, Joseph
Subject: Cecil Field sample 1074-05 naphthlene

Brian / Joe,

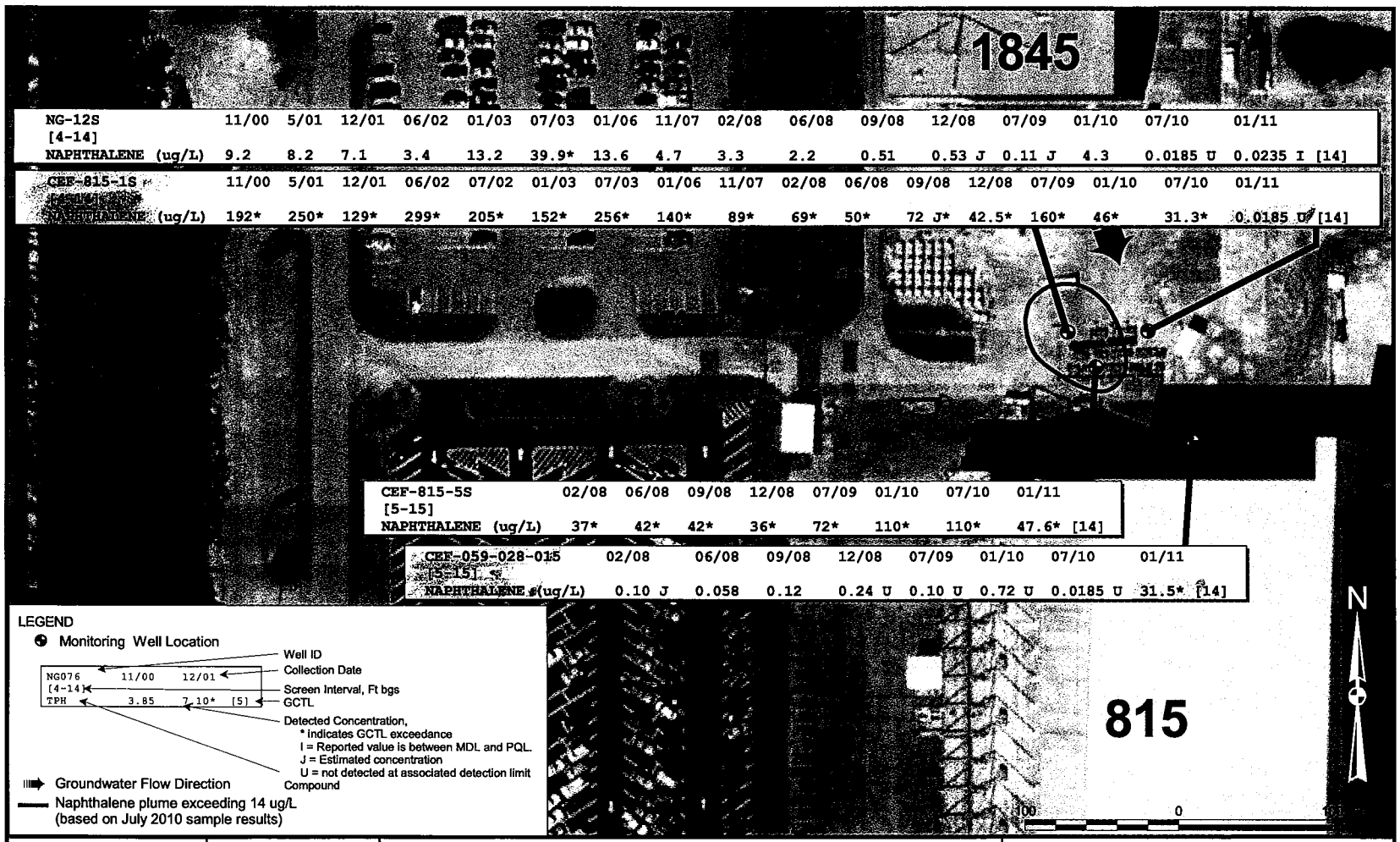
We ran the sample by 8260 from the spare liter bottle and got 78 ug/l.

Let me know if you need anything else.

Thanks,

Rick Davis
Vice President / Laboratory Director
Empirical Laboratories, LLC
"Your National Small Business Partner"
621 Mainstream Drive, Suite 270 I Nashville, TN 37228 I www.empirlabs.com
Main: 615.345.1115 ext. 245 I Toll free: 877.345.1113 I Cell: 615.828.9478 I Fax: 866.417.0548

Celebrating over 40 years of excellence, Empirical Laboratories is certified as a Woman-Owned Small Business and a Small Disadvantaged Business. Come visit our website at www.empirlabs.com today.



NG-12S [4-14]	11/00	5/01	12/01	06/02	01/03	07/03	01/06	11/07	02/08	06/08	09/08	12/08	07/09	01/10	07/10	01/11
NAPHTHALENE (ug/L)	9.2	8.2	7.1	3.4	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	0.0235 I [14]

CEF-815-1S [4-14]	11/00	5/01	12/01	06/02	07/02	01/03	07/03	01/06	11/07	02/08	06/08	09/08	12/08	07/09	01/10	07/10	01/11
NAPHTHALENE (ug/L)	192*	250*	129*	299*	205*	152*	256*	140*	89*	69*	50*	72 J*	42.5*	160*	46*	31.3*	0.0185 U [14]

CEF-815-5S [5-15]	02/08	06/08	09/08	12/08	07/09	01/10	07/10	01/11
NAPHTHALENE (ug/L)	37*	42*	42*	36*	72*	110*	110*	47.6* [14]

CEF-059-028-015 [5-15]	02/08	06/08	09/08	12/08	07/09	01/10	07/10	01/11
NAPHTHALENE (ug/L)	0.10 J	0.058	0.12	0.24 U	0.10 U	0.72 U	0.0185 U	31.5* [14]

LEGEND

Monitoring Well Location

NG076	11/00	12/01
[4-14]		
TPH	3.85	7.10* [5]

- Well ID
- Collection Date
- Screen Interval, Ft bgs
- GCTL
- Detected Concentration,
  - * Indicates GCTL exceedance
  - I = Reported value is between MDL and PQL.
  - J = Estimated concentration
  - U = not detected at associated detection limit
- Compound

Groundwater Flow Direction

Naphthalene plume exceeding 14 ug/L (based on July 2010 sample results)

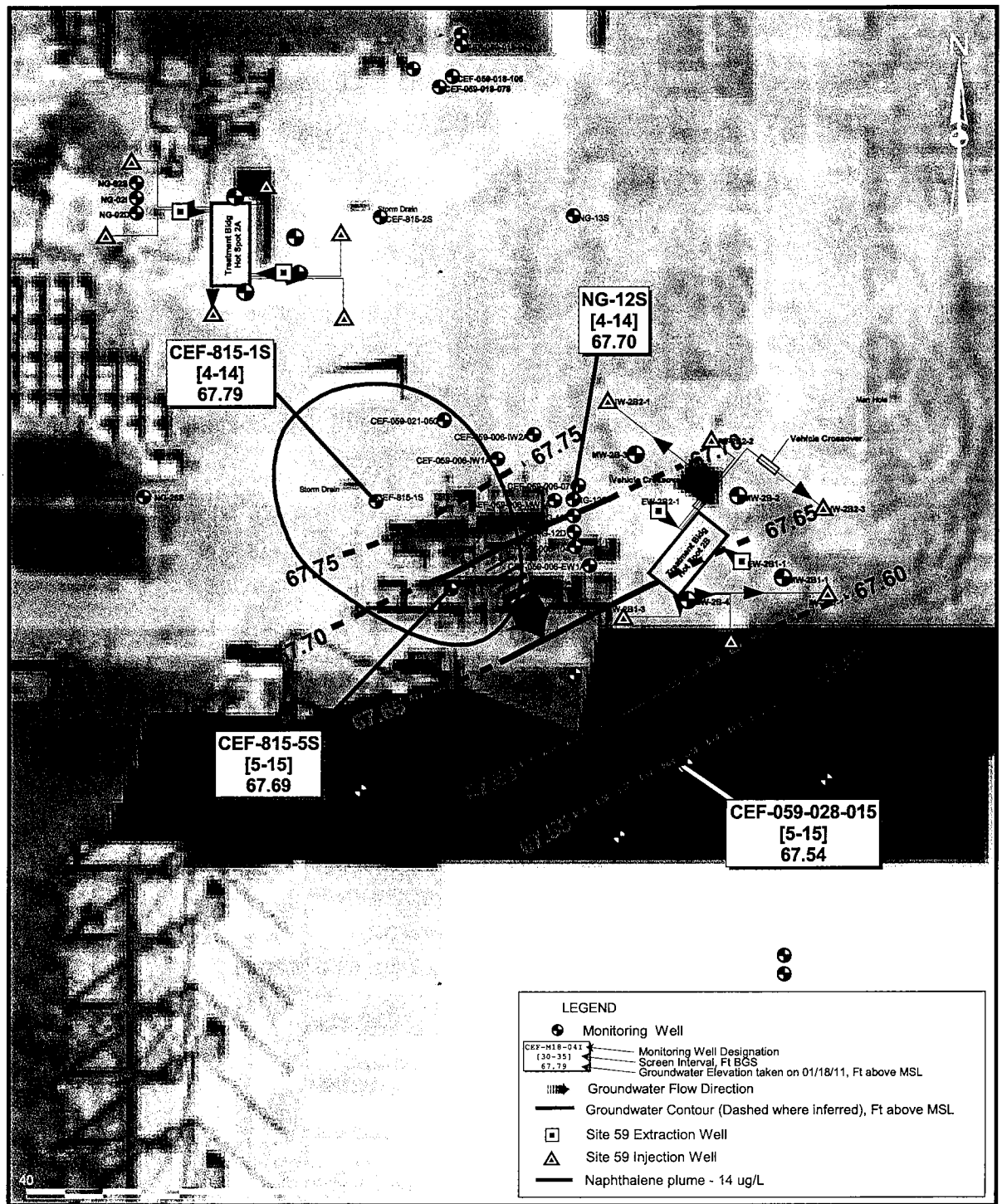
DRAWN BY	DATE
MJJ	13Mar10
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE	AS NOTED

NAVFAC

GROUNDWATER CONCENTRATIONS
BUILDING 815 WASH RACK AREA
1st SEMI-ANNUAL, YEAR 3 EVENT - JANUARY 2011
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

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

:\GIS\NAS_CecilField\Site-59_0815_20110100.apr 12Mar11 MJJ Layout002



DRAWN BY MJJ	DATE 29Jan11	GROUNDWATER FLOW MAP BUILDING 815 WASH RACK AREA 1st SEMI-ANNUAL, YEAR 3 EVENT - JANUARY 2011 NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 2267
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED		NAVFAC	DRAWING NO. FIGURE 3 / REV 0

:\GIS\NAS_CecilField\Site-59_0815_20110100.apr 14Mar11 MJJ Layout004

NAS CECIL FIELD
SOIL DATA
CTOJM09CF_11

FRACTION	CHEMICAL	CEF-NG-12S-20110119	UNITS	EF-815-DUP01-2011011	RPD	D
OS	NAPHTHALENE	0.0235 I	UG/L	0.0282 I	18.18	0.00

Current RPD Quality Control Limit: 30 %.
Shaded cells indicate RPDs that exceed the applicable quality control limit.

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER № 2134 | PAGE 1 OF 1

PROJECT NO: 112G08067	FACILITY: Cecil Field 815 Wash Rack	PROJECT MANAGER Rob Simcik	PHONE NUMBER 442 921 8163	LABORATORY NAME AND CONTACT: Empirical Labs / Kim Kostzer
SAMPLERS (SIGNATURE) Jeff Krone		FIELD OPERATIONS LEADER Jeff Krone	PHONE NUMBER 904 699.7473	ADDRESS 621 Mainstream Drive Suite 270
		CARRIER/WAYBILL NUMBER FEDEX Airbill 8660 1730 2300		CITY, STATE Nashville, TN 37228

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

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

DATE YEAR 2011	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	TYPE OF ANALYSIS: ~~VOCs~~ Naphthalene only (SW846 8260C)							COMMENTS
1/19	1101	CEF-N6-12$-20110119				GW	G	2	X	110107	4-01					Cool to 4°C
1/19	0000	CEF-815-DUP01-20110119				GW	G	2	X		-02					
1/19	1144	CEF-815-05$-20110119				GW	G	2	X		-03					
1/19	1202	CEF-815-01$-20110119				GW	G	2	X		-04					
1/19	1402	CEF-059-028-015-20110119				GW	G	2	X		-05					

1. RELINQUISHED BY	DATE 1/19/11	TIME 1700	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY 1.0°C	DATE 1/19/11	TIME 08:30

COMMENTS

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

4/02R
FORM NO. TtNUS-001

8

CTOJM09CF_011 Summ Package

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.

Changes to the Revision
This is an original submittal of the final report package.

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.

SW8270C:
The surrogate Terphenyld-14 exceeded criteria with a negative bias in sample 1101074-01, -02, -03, -03RE1 and -04.

Due to an analyst error, the matrix spikes associated to sample 1101074-01 were extracted 13 days after the parent sample was sampled. All recoveries and relative percent differences were within criteria.

No additional anomalies or deviations are noted and the proper data qualifiers have been applied.

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.

*****: An exceeding 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.

H3: The sample for this analyte was received 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 "I".**

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 inorganics, it 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 exceeded limits in the associated Blank Spike and/or Blank Spike Duplicate.

S: The associated internal standard failed criteria.

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.

Z: The parameter shows lack of confirmation/detection, which may be due to a negative bias in the ICV or CCV which exceeds the lower control limit.

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

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOJM09CF_011

Client: Tetra Tech NUS, Inc. (T010) Project: CTO JM09 Washrack 815_2010

Batch: 1A23004 Batch Matrix: Water Preparation: EXT_3510

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
CEF-NG-12S-20110119	1101074-01	01/24/11 09:48	1,080.00	1.00
CEF-815-DUP01-20110119	1101074-02	01/24/11 09:48	1,080.00	1.00
CEF-815-05S-20110119	1101074-03	01/24/11 09:48	1,080.00	1.00
CEF-815-05S-20110119	1101074-03RE1	01/24/11 09:48	1,080.00	1.00
CEF-815-01S-20110119	1101074-04	01/24/11 09:48	1,080.00	1.00
CEF-059-028-015-20110119	1101074-05	01/24/11 09:48	1,080.00	1.00
CEF-059-028-015-20110119	1101074-05RE1	01/24/11 09:48	1,080.00	1.00
Blank	1A23004-BLK1	01/24/11 09:48	1,000.00	1.00
LCS	1A23004-BS1	01/24/11 09:48	1,000.00	1.00
LCS Dup	1A23004-BSD1	01/24/11 09:48	1,000.00	1.00

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOJM09CF_011

Client: Tetra Tech NUS, Inc. (T010) Project: CTO JM09 Washrack 815_2010

Batch: 1A31001 Batch Matrix: Water Preparation: EXT_3510

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
Blank	1A31001-BLK1	01/31/11 14:00	1,000.00	1.00
LCS	1A31001-BS1	01/31/11 14:00	1,000.00	1.00
LCS Dup	1A31001-BSD1	01/31/11 14:00	1,000.00	1.00
CEF-NG-12S-20110119	1A31001-MS1	01/31/11 14:00	500.00	1.00
CEF-NG-12S-20110119	1A31001-MSD1	01/31/11 14:00	500.00	1.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOJM09CF_011	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTO JM09 Washrack 815_2010	
Matrix:		Laboratory ID:	1A23004-BLK1	File ID:	A23004B1.D
Sampled:		Prepared:		Analyzed:	01/26/11 11:56
Solids:		Preparation:	EXT_3510	Dilution:	

Batch: 1A23004 Sequence: 1A02804 Calibration: 1017001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
91-20-3	Naphthalene		0.0200	0.0400	0.100	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	50.00	28.80	57.6	34 - 167	
Terphenyl-d14	50.00	29.42	58.8	34 - 167	

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	CTOJM09CF_011	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	CTO JM09 Washrack 815_2010	
Matrix:		Laboratory ID:	1A31001-BLK1	File ID:	A31001B1.D
Sampled:		Prepared:		Analyzed:	01/31/11 17:32
Solids:		Preparation:	EXT_3510	Dilution:	

Batch: 1A31001 Sequence: 1B03203 Calibration: 1017001 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
91-20-3	Naphthalene		0.0200	0.0400	0.100	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	50.00	29.02	58.0	34 - 167	
Terphenyl-d14	50.00	35.02	70.0	34 - 167	

ANALYSIS SEQUENCE SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Washrack 815_2010
Sequence:	1A01702	Instrument:	MS-BNA4
Calibration:	1017001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	1A01702-TUN1	SEQ-TUN1.D	01/13/11 14:40
Cal Standard	1A01702-CAL1	SEQ-CAL1.D	01/13/11 15:18
Cal Standard	1A01702-CAL2	SEQ-CAL2.D	01/13/11 15:51
Cal Standard	1A01702-CAL3	SEQ-CAL3.D	01/13/11 16:24
Cal Standard	1A01702-CAL4	SEQ-CAL4.D	01/13/11 16:56
Cal Standard	1A01702-CAL5	SEQ-CAL5.D	01/13/11 17:29
Cal Standard	1A01702-CAL6	SEQ-CAL6.D	01/13/11 18:01
Cal Standard	1A01702-CAL7	SEQ-CAL7.D	01/13/11 18:34
Cal Standard	1A01702-CAL8	SEQ-CAL8.D	01/13/11 19:07
Cal Standard	1A01702-CAL9	SEQ-CAL9.D	01/13/11 19:39
Cal Standard	1A01702-CALA	SEQ-CALA.D	01/13/11 20:12
Cal Standard	1A01702-CALB	SEQ-CALB.D	01/13/11 20:44
Initial Cal Check	1A01702-ICV1	SEQ-ICV1.D	01/13/11 21:16

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Washrack 815_2010
Lab File ID:	SEQ-TUN1.D	Injection Date:	01/13/11
Instrument ID:	MS-BNA4	Injection Time:	14:40
Sequence:	1A01702	Lab Sample ID:	1A01702-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	52.1	PASS
68	Less than 2% of 69	1.49	PASS
69	Less than 200% of 198	46.3	PASS
70	Less than 2% of 69	0.519	PASS
127	40 - 60% of 198	54.4	PASS
197	Less than 1% of 198	0.813	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.65	PASS
275	10 - 30% of 198	27.9	PASS
365	1 - 200% of 198	4.48	PASS
441	0.001 - 100% of 443	82.3	PASS
442	40 - 200% of 198	169	PASS
443	17 - 23% of 442	19.7	PASS

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Washrack 815_2010
Calibration:	1017001	Instrument:	MS-BNA4
Matrix:	Water	Calibration Date:	1/13/2011 2:40:26PM

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	1.064587	14.69008	10.64264	3.018197E-02			CCC (30)	
Acenaphthylene	1.738125	12.64186	10.4318	3.455132E-02			15	
Anthracene	1.39437	13.33867	12.55209	5.444971E-02			15	
Benzo(a)anthracene	0.9603081	11.52618	15.9373	6.716114E-02			15	
Benzo(a)pyrene	1.450046	7.620801	18.71518	9.290077E-02			CCC (30)	
Benzo(b)fluoranthene	1.628094	6.601661	18.00182	8.407371E-02			15	
Benzo(g,h,i)perylene	1.447688	10.22999	21.96927	0.1108766			15	
Benzo(k)fluoranthene	1.755158	10.54425	18.06073	9.946353E-02			15	
Chrysene	0.9621793	12.63864	16.0013	7.042101E-02			15	
Dibenz(a,h)anthracene	1.386916	8.958084	21.38564	0.1044225			15	
Fluoranthene	1.330654	14.33717	13.9608	3.637571E-02			CCC (30)	
Fluorene	1.035571	12.19163	11.28836	3.200913E-02			15	
2-Fluorobiphenyl	1.132059	11.98818	9.763455	6.055318E-02			15	
Indeno(1,2,3-cd)pyrene	1.721918	9.00371	21.34118	0.126876			15	
1-Methylnaphthalene	1.061797	12.79651	9.426182	6.849264E-02			15	
2-Methylnaphthalene	1.095514	10.9101	9.301545	6.291415E-02			15	
Naphthalene	7.214082	11.7661	8.451778	4.622356E-02			15	
Phenanthrene	1.410267	14.18051	12.4847	3.322328E-02			15	
Pyrene	1.337161	14.92941	14.2449	3.444772E-02			15	
Terphenyl-d14	0.5337225	14.20642	14.42236	3.831439E-02			15	

INITIAL CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Washrack 815_2010
Instrument ID:	MS-BNA4	Calibration:	1017001
Lab File ID:	SEQ-ICV1.D	Calibration Date:	01/13/11 14:40
Sequence:	1A01702	Injection Date:	01/13/11
Lab Sample ID:	1A01702-ICV1	Injection Time:	21:16

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Naphthalene	A	5.000	4.894	7.214082	7.060505		-2.1	20
2-Fluorobiphenyl	A	5.000	5.128	1.132059	1.160996		2.6	20
Terphenyl-d14	A	5.000	4.891	0.5337225	0.5220806		-2.2	20

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

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Washrack 815_2010
Sequence:	1A02804	Instrument:	MS-BNA4
Calibration:	1017001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	1A02804-TUN1	SEQ-TUN1.D	01/26/11 10:10
Calibration Check	1A02804-CCV1	SEQ-CCV1.D	01/26/11 10:33
Blank	1A23004-BLK1	A23004B1.D	01/26/11 11:56
LCS	1A23004-BS1	A23004L1.D	01/26/11 14:07
LCS Dup	1A23004-BSD1	A23004L2.D	01/26/11 14:40
CEF-NG-12S-20110119	1101074-01	0107401.D	01/26/11 15:12
CEF-815-DUP01-20110119	1101074-02	0107402.D	01/26/11 15:45
CEF-815-05S-20110119	1101074-03	0107403.D	01/26/11 16:18
CEF-815-01S-20110119	1101074-04	0107404.D	01/26/11 16:51
CEF-059-028-015-20110119	1101074-05	0107405.D	01/26/11 17:24

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Washrack 815_2010
Lab File ID:	SEQ-TUN1.D	Injection Date:	01/26/11
Instrument ID:	MS-BNA4	Injection Time:	10:10
Sequence:	1A02804	Lab Sample ID:	1A02804-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	49.3	PASS
68	Less than 2% of 69	1.62	PASS
69	Less than 200% of 198	44.9	PASS
70	Less than 2% of 69	0.409	PASS
127	40 - 60% of 198	53.1	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.91	PASS
275	10 - 30% of 198	26.7	PASS
365	1 - 200% of 198	3.61	PASS
441	0.001 - 100% of 443	78.2	PASS
442	40 - 200% of 198	122	PASS
443	17 - 23% of 442	19.8	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Washrack 815_2010
Instrument ID:	MS-BNA4	Calibration:	1017001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	01/13/11 14:40
Sequence:	1A02804	Injection Date:	01/26/11
Lab Sample ID:	1A02804-CCV1	Injection Time:	10:33

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Naphthalene	A	5.000	4.155	7.214082	5.995238		-16.9	20
2-Fluorobiphenyl	A	5.000	4.553	1.132059	1.030853		-8.9	20
Terphenyl-d14	A	5.000	5.738	0.5337225	0.6125357		14.8	20

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

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Washrack 815_2010
Sequence:	1A02807	Instrument:	MS-BNA4
Calibration:	1017001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	1A02807-TUN1	SEQ-TUN1.D	01/28/11 10:37
Calibration Check	1A02807-CCV1	SEQ-CCV1.D	01/28/11 11:03
CEF-815-05S-20110119	1101074-03RE1	0107403D.D	01/28/11 12:54
CEF-059-028-015-20110119	1101074-05RE1	0107405D.D	01/28/11 13:28

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Washrack 815_2010
Lab File ID:	SEQ-TUN1.D	Injection Date:	01/28/11
Instrument ID:	MS-BNA4	Injection Time:	10:37
Sequence:	1A02807	Lab Sample ID:	1A02807-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	53.7	PASS
68	Less than 2% of 69	1.62	PASS
69	Less than 200% of 198	50.2	PASS
70	Less than 2% of 69	0.459	PASS
127	40 - 60% of 198	58.3	PASS
197	Less than 1% of 198	0.558	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.82	PASS
275	10 - 30% of 198	27.9	PASS
365	1 - 200% of 198	4.37	PASS
441	0.001 - 100% of 443	84.8	PASS
442	40 - 200% of 198	162	PASS
443	17 - 23% of 442	19.4	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Washrack 815_2010
Instrument ID:	MS-BNA4	Calibration:	1017001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	01/13/11 14:40
Sequence:	1A02807	Injection Date:	01/28/11
Lab Sample ID:	1A02807-CCV1	Injection Time:	11:03

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Naphthalene	A	5.000	4.883	7.214082	7.044808		-2.3	20
2-Fluorobiphenyl	A	5.000	4.964	1.132059	1.123954		-0.7	20
Terphenyl-d14	A	5.000	5.165	0.5337225	0.551336		3.3	20

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

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Washrack 815_2010
Sequence:	1B03203	Instrument:	MS-BNA4
Calibration:	1017001		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	1B03203-TUN1	SEQ-TUN2.D	01/31/11 15:55
Calibration Check	1B03203-CCV1	SEQ-CCV1.D	01/31/11 16:14
Blank	1A31001-BLK1	A31001B1.D	01/31/11 17:32
LCS	1A31001-BS1	A31001L1.D	01/31/11 18:04
LCS Dup	1A31001-BSD1	A31001L2.D	01/31/11 18:36
CEF-NG-12S-20110119	1A31001-MS1	0107401M.D	01/31/11 22:57
CEF-NG-12S-20110119	1A31001-MSD1	0107401S.D	01/31/11 23:30

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Washrack 815_2010
Lab File ID:	SEQ-TUN2.D	Injection Date:	01/31/11
Instrument ID:	MS-BNA4	Injection Time:	15:55
Sequence:	1B03203	Lab Sample ID:	1B03203-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	49	PASS
68	Less than 2% of 69	1.58	PASS
69	Less than 200% of 198	45.4	PASS
70	Less than 2% of 69	0.428	PASS
127	40 - 60% of 198	54	PASS
197	Less than 1% of 198	0.574	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.58	PASS
275	10 - 30% of 198	27.2	PASS
365	1 - 200% of 198	4.29	PASS
441	0.001 - 100% of 443	83.6	PASS
442	40 - 200% of 198	168	PASS
443	17 - 23% of 442	19.5	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	CTOJM09CF_011
Client:	Tetra Tech NUS, Inc. (T010)	Project:	CTO JM09 Washrack 815_2010
Instrument ID:	MS-BNA4	Calibration:	1017001
Lab File ID:	SEQ-CCV1.D	Calibration Date:	01/13/11 14:40
Sequence:	1B03203	Injection Date:	01/31/11
Lab Sample ID:	1B03203-CCV1	Injection Time:	16:14

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Naphthalene	A	5.000	4.518	7.214082	6.518599		-9.6	20
2-Fluorobiphenyl	A	5.000	4.490	1.132059	1.016597		-10.2	20
Terphenyl-d14	A	5.000	5.637	0.5337225	0.6016688		12.7	20

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

* Values outside of QC limits

HOLDING TIME SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC

SDG: CTOJM09CF_011

Client: Tetra Tech NUS, Inc. (T010)

Project: CTO JM09 Washrack 815_2010

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
CEF-NG-12S-20110119	01/18/11 11:01	01/19/11 08:05	01/24/11 09:48	5.99	7.00	01/26/11 15:12	2.23	40.00	
CEF-815-DUP01-20110119	01/18/11 00:00	01/19/11 08:05	01/24/11 09:48	6.45	7.00	01/26/11 15:45	2.25	40.00	
CEF-815-05S-20110119	01/18/11 11:44	01/19/11 08:05	01/24/11 09:48	5.96	7.00	01/26/11 16:18	2.27	40.00	
CEF-815-05S-20110119	01/18/11 11:44	01/19/11 08:05	01/24/11 09:48	5.96	7.00	01/28/11 12:54	4.13	40.00	
CEF-815-01S-20110119	01/18/11 12:22	01/19/11 08:05	01/24/11 09:48	5.93	7.00	01/26/11 16:51	2.29	40.00	
CEF-059-028-015-20110119	01/18/11 14:02	01/19/11 08:05	01/24/11 09:48	5.87	7.00	01/26/11 17:24	2.32	40.00	
CEF-059-028-015-20110119	01/18/11 14:02	01/19/11 08:05	01/24/11 09:48	5.87	7.00	01/28/11 13:28	4.15	40.00	

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**R. SIMCIK**	**DATE:**	**APRIL 27, 2011**
FROM:	**MICHELLE ALLEN**	**COPIES:**	**DV FILE**
SUBJECT:	**ORGANIC DATA VALIDATION – NAPHTHALENE CTO JM09, NAS CECIL FIELD SDG 1103219**		
SAMPLES:	1/Aqueous /Naphthalene CEF-059-028-015-20110323		

OVERVIEW

The sample set for NAS Cecil Field SDG 1103219 consisted of one (1) aqueous environmental sample. The sample was analyzed for naphthalene. No field duplicate pair was associated with this Sample Delivery Group (SDG).

The sample was collected by TetraTech NUS on March 23, 2011 and analyzed by Empirical Laboratories, LLC. All analyses were conducted in accordance with SW-846 Method 8270C analytical and reporting protocols.

The data contained in this SDG were validated with regard to the following parameters:

* • Data Completeness
* • Holding Times/Sample Preservation
* • Initial/Continuing Calibrations
• Laboratory Method Blank Results
* • Detection Limits

The symbol (*) indicates that quality control criteria were met for this parameter. Problems affecting data quality are discussed below; documentation supporting these findings is presented in Appendix C. Qualified Analytical results are presented in Appendix A. Results as reported by the laboratory are presented in Appendix B.

The text of this report is formatted to address only gross non-compliances resulting in the rejection of data and the elimination of false positives.

SVOC

No issues were noted.

NOTES

The following contaminant was detected in the laboratory method blank at the following maximum concentration:

Analyte	Maximum Conc. µg/L	Action Level µg/L
Naphthalene [1]	0.022	0.11

1 Maximum concentration detected in the laboratory method blank, IC28023-BLK1, associated with preparation batch 1C28023, affecting sample CEF-059-028-015-

20110323.

An action level of 5X the maximum level for the contaminant, naphthalene, was used to evaluate the affected sample for blank contamination. Sample aliquot and dilution factors, if applicable, were taken into consideration when evaluating for blank contamination. No action was necessary because naphthalene was not detected in the affected sample.

The laboratory mislabeled the Form I and associated quality control forms with the wrong project. The data validator manually corrected the Form I.

EXECUTIVE SUMMARY

Laboratory Performance Issues: Naphthalene was detected in the laboratory method blank.

Other Factors Affecting Data Quality: There were no issues.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (10/99), SW-846 Method 8270C analytical and reporting protocols, 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
Chemist/Data Validator

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 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: 02267	NSAMPLE	CEF-059-028-015-20110323		
SDG: 1103219	LAB_ID	1103219-01		
FRACTION: PAH	SAMP_DATE	3/23/2011		
MEDIA: WATER	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

ANALYSIS DATA SHEET

CEF-059-028-015-20110323

Cecil Field CTO JM09 4/27/11

Laboratory:	Empirical Laboratories, LLC			SDG:	1103219
Client:	Tetra Tech NUS, Inc. (T010)			Project:	~~Mayport CTOJM32 SWMUs 6 & 7~~
Matrix:	Ground Water	Laboratory ID:	1103219-01	File ID:	0321901.D
Sampled:	03/23/11 15:50	Prepared:	03/29/11 13:24	Analyzed:	04/04/11 16:03
Solids:		Preparation:	EXT_3510	Dilution:	1

Batch: 1C28023 Sequence: 1D09509 Calibration: 1061004 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
91-20-3	Naphthalene		0.0185	0.0370	0.185	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	46.30	27.48	59.3	34 - 167	
Terphenyl-d14	46.30	28.66	61.9	34 - 167	

APPENDIX C

SUPPORT DOCUMENTATION

TETRA TECH NUS, INC.

CHAIN OF CUSTODY

NUMBER № 2187

PAGE 1 OF 1

PROJECT NO: 112G00746	FACILITY: SITE 815	PROJECT MANAGER: DAVID SIEFKEN	PHONE NUMBER: 904-136-6125	LABORATORY NAME AND CONTACT: Empirical Laboratories / Brian Richard
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER: TOD TRUMBULL	PHONE NUMBER: 904-136-6125	ADDRESS: 621 Mainstream Drive Suite 270
		CARRIER/WAYBILL NUMBER: -		CITY, STATE: NASHVILLE TN 37228

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

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

DATE YEAR 2011	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	TYPE OF ANALYSIS: * PAH 8270 SELECT								COMMENTS 1103219
3/23	1550	CBF-059-028-015-20110323	815	-	7.5	GW	G	2	X								* SELECT Naphthalene only

1. RELINQUISHED BY	DATE 3/24/11	TIME 1400	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY Reginald Talley	DATE 3.25.11	TIME 0830

COMMENTS

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

4/02R
FORM NO. TtNUS-001

8

1103219

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.

Changes to the Revision
This is an original submittal of the final report package.

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.

SW8270C:
The method blank 1C28023-BLK1 has a positive result for Naphthalene; however, no positive result for Naphthalene was detected in the associated sample.

No additional anomalies or deviations are noted and the proper data qualifiers have been applied.

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.

*****: An exceeding 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.

H3: The sample for this analyte was received 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 "I".**

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 inorganics, it 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 exceeded limits in the associated Blank Spike and/or Blank Spike Duplicate.

S: The associated internal standard failed criteria.

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.

Z: The parameter shows lack of confirmation/detection, which may be due to a negative bias in the ICV or CCV which exceeds the lower control limit.

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

HOLDTIME

SDG 1103219

SORT	UNITS	NSAMPLE	LAB_ID	QC_TYPE	SAMP_DATE	EXTR_DATE	ANAL_DATE	SMP_EXTR	EXTR_ANL	SMP_ANL
OV	UG/L	Trip Blank-9404	1103218-06	NM	03/23/2011	03/29/2011	03/29/2011	6	0	6
OV	UG/L	CEF-502-DUP-01-201103	1103218-05	NM	03/23/2011	03/29/2011	03/30/2011	6	1	7
OV	UG/L	CEF-502-9S-20110323	1103218-03	NM	03/23/2011	03/29/2011	03/29/2011	6	0	6
OV	UG/L	CEF-502-6S-20110323	1103218-02	NM	03/23/2011	03/29/2011	03/29/2011	6	0	6
OV	UG/L	CEF-502-4S-20110323	1103218-04	NM	03/23/2011	03/29/2011	03/30/2011	6	1	7
OV	UG/L	CEF-502-3S-20110323	1103218-01	NM	03/23/2011	03/29/2011	03/29/2011	6	0	6
SIM	UG/L	CEF-059-028-015-201103	1103219-01	SUR	03/23/2011	03/29/2011	04/04/2011	6	6	12
SIM	UG/L	CEF-059-028-015-201103	1103219-01	NM	03/23/2011	03/29/2011	04/04/2011	6	6	12

PREPARATION BATCH SUMMARY

SW8270C

Laboratory: Empirical Laboratories, LLC SDG: 1103219

Client: Tetra Tech NUS, Inc. (T010) Project: Mayport CTOJM32 SWMUs 6 & 7

Batch: 1C28023 Batch Matrix: Water Preparation: EXT_3510

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
CEF-059-028-015-20110323	1103219-01	03/29/11 13:24	1,080.00	1.00
Blank	1C28023-BLK1	03/29/11 13:24	1,000.00	1.00
LCS	1C28023-BS1	03/29/11 13:24	1,000.00	1.00
LCS Dup	1C28023-BSD1	03/29/11 13:24	1,000.00	1.00

ANALYSIS DATA SHEET

Blank

Laboratory:	Empirical Laboratories, LLC		SDG:	1103219	
Client:	Tetra Tech NUS, Inc. (T010)		Project:	Mayport CTOJM32 SWMUs 6 & 7	
Matrix:		Laboratory ID:	1C28023-BLK1	File ID:	C2823B1R.D
Sampled:		Prepared:		Analyzed:	04/05/11 12:27
Solids:		Preparation:	EXT_3510	Dilution:	

Batch: 1C28023 Sequence: 1D09607 Calibration: 1061004 Instrument: MS-BNA4

CAS NO.	COMPOUND	CONC. (ug/L)	DL	LOD	LOQ	Q
91-20-3	Naphthalene	0.0220	0.0200	0.0400	0.200	I

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
2-Fluorobiphenyl	50.00	41.87	83.7	34 - 167	
Terphenyl-d14	50.00	46.74	93.5	34 - 167	

HOLDING TIME SUMMARY
SW8270C

Laboratory: Empirical Laboratories, LLC SDG: 1103219

Client: Tetra Tech NUS, Inc. (T010) Project: Mayport CTOJM32 SWMUs 6 & 7

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
CEF-059-028-015-20110323	03/23/11 15:50	03/25/11 08:30	03/29/11 13:24	5.90	7.00	04/04/11 16:03	6.11	40.00	

ANALYSIS SEQUENCE SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	1103219
Client:	Tetra Tech NUS, Inc. (T010)	Project:	Mayport CTOJM32 SWMUs 6 & 7
Sequence:	1C06115	Instrument:	MS-BNA4
Calibration:	1061004		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	1C06115-TUN1	SEQ-TUN1.D	02/28/11 19:40
Cal Standard	1C06115-CAL1	SEQ-CAL1.D	02/28/11 19:58
Cal Standard	1C06115-CAL2	SEQ-CAL2.D	02/28/11 20:24
Cal Standard	1C06115-CAL3	SEQ-CAL3.D	02/28/11 20:50
Cal Standard	1C06115-CAL4	SEQ-CAL4.D	02/28/11 21:16
Cal Standard	1C06115-CAL5	SEQ-CAL5.D	02/28/11 21:42
Cal Standard	1C06115-CAL6	SEQ-CAL6.D	02/28/11 22:08
Cal Standard	1C06115-CAL7	SEQ-CAL7.D	02/28/11 22:35
Cal Standard	1C06115-CAL8	SEQ-CAL8.D	02/28/11 23:01
MS Tune	1C06115-TUN2	SEQ-TUN1.D	03/01/11 12:01
Initial Cal Check	1C06115-ICV1	SEQ-ICV1.D	03/01/11 12:19

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	1103219
Client:	Tetra Tech NUS, Inc. (T010)	Project:	Mayport CTOJM32 SWMUs 6 & 7
Lab File ID:	SEQ-TUN1.D	Injection Date:	02/28/11
Instrument ID:	MS-BNA4	Injection Time:	19:40
Sequence:	1C06115	Lab Sample ID:	1C06115-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	54	PASS
68	Less than 2% of 69	1.39	PASS
69	Less than 200% of 198	52.7	PASS
70	Less than 2% of 69	0.407	PASS
127	40 - 60% of 198	57.4	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.79	PASS
275	10 - 30% of 198	25.3	PASS
365	1 - 200% of 198	3.37	PASS
441	0.001 - 100% of 443	81.8	PASS
442	40 - 200% of 198	103	PASS
443	17 - 23% of 442	20.3	PASS

INITIAL CALIBRATION DATA (Continued)

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	1103219
Client:	Tetra Tech NUS, Inc. (T010)	Project:	Mayport CTOJM32 SWMUs 6 & 7
Calibration:	1061004	Instrument:	MS-BNA4
Matrix:	Water	Calibration Dates:	2/28/11 19:58 2/28/11 23:01

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Acenaphthene	0.8277096	5.964029	9.633875	8.915397E-02			CCC (30)	
Acenaphthylene	1.235702	11.26304	9.425	6.665902E-02			15	
Anthracene	1.13295	3.786272	11.52837	6.266625E-02			15	
Benzo(a)anthracene	0.8691476	15.11626	14.71213	5.462316E-02	0.9952477		0.995	
Benzo(a)pyrene	1.056815	4.183578	16.4705	5.396188E-02			CCC (30)	
Benzo(b)fluoranthene	1.338014	9.966544	16.07662	5.173099E-02			15	
Benzo(g,h,i)perylene	0.9482109	13.88728	18.45625	7.723512E-02			15	
Benzo(k)fluoranthene	1.2951	6.235241	16.108	5.845528E-02			15	
Chrysene	0.8791148	11.31297	14.76	4.591394E-02			15	
Dibenz(a,h)anthracene	0.8237431	7.540873	18.024	5.675539E-02			15	
Fluoranthene	1.197097	5.749219	12.9345	5.235663E-02			CCC (30)	
Fluorene	0.7884623	4.944379	10.27338	6.435991E-02			15	
2-Fluorobiphenyl	0.8894126	7.367129	8.767375	5.071162E-02			15	
Indeno(1,2,3-cd)pyrene	1.067942	5.744412	18.02163	5.897508E-02			15	
1-Methylnaphthalene	0.8735331	12.15937	8.4405	5.284201E-02			15	
2-Methylnaphthalene	0.8753044	13.10583	8.321125	5.827663E-02			15	
Naphthalene	1.363682	13.39317	7.482125	3.967633E-02			15	
Phenanthrene	1.17432	1.744274	11.461	5.511778E-02			15	
Pyrene	1.206692	5.463181	13.21437	5.315315E-02			15	
Terphenyl-d14	0.7416898	8.59253	13.40512	3.369558E-02			15	
2,4,6-Tribromophenol	0.1674143	4.178063	10.5764	9.131494E-02			15	
1,4-Dichlorobenzene-d4							15	

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	1103219
Client:	Tetra Tech NUS, Inc. (T010)	Project:	Mayport CTOJM32 SWMUs 6 & 7
Lab File ID:	SEQ-TUN1.D	Injection Date:	03/01/11
Instrument ID:	MS-BNA4	Injection Time:	12:01
Sequence:	1C06115	Lab Sample ID:	1C06115-TUN2

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	52.6	PASS
68	Less than 2% of 69	1.55	PASS
69	Less than 200% of 198	50.4	PASS
70	Less than 2% of 69	0.486	PASS
127	40 - 60% of 198	56.1	PASS
197	Less than 1% of 198	1	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.03	PASS
275	10 - 30% of 198	25.6	PASS
365	1 - 200% of 198	3.45	PASS
441	0.001 - 100% of 443	82.1	PASS
442	40 - 200% of 198	103	PASS
443	17 - 23% of 442	19.8	PASS

INITIAL CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	1103219
Client:	Tetra Tech NUS, Inc. (T010)	Project:	Mayport CTOJM32 SWMUs 6 & 7
Instrument ID:	MS-BNA4	Calibration:	1061004
Lab File ID:	SEQ-ICV1.D	Calibration Date:	02/28/11 19:58
Sequence:	1C06115	Injection Date:	03/01/11
Lab Sample ID:	1C06115-ICV1	Injection Time:	12:19

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN (#)	ICV	LIMIT (#)
Naphthalene	A	5.000	5.217	1.363682	1.422778		4.3	20
2-Fluorobiphenyl	A	5.000	5.477	0.8894126	0.974327		9.5	20
Terphenyl-d14	A	5.000	5.816	0.7416898	0.8626973		16.3	20

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

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY
SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	1103219
Client:	Tetra Tech NUS, Inc. (T010)	Project:	Mayport CTOJM32 SWMUs 6 & 7
Sequence:	1D09509	Instrument:	MS-BNA4
Calibration:	1061004		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	1D09509-TUN1	SEQ-TUN1.D	04/04/11 11:32
Calibration Check	1D09509-CCV1	SEQ-CCV1.D	04/04/11 14:11
LCS	1C28023-BS1	C28023L1.D	04/04/11 14:39
LCS Dup	1C28023-BSD1	C28023L2.D	04/04/11 15:07
CEF-059-028-015-20110323	1103219-01	0321901.D	04/04/11 16:03

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	1103219
Client:	Tetra Tech NUS, Inc. (T010)	Project:	Mayport CTOJM32 SWMUs 6 & 7
Lab File ID:	SEQ-TUN1.D	Injection Date:	04/04/11
Instrument ID:	MS-BNA4	Injection Time:	11:32
Sequence:	1D09509	Lab Sample ID:	1D09509-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	33.7	PASS
68	Less than 2% of 69	1.51	PASS
69	Less than 200% of 198	35.6	PASS
70	Less than 2% of 69	0.482	PASS
127	40 - 60% of 198	47.9	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.4	PASS
275	10 - 30% of 198	29.1	PASS
365	1 - 200% of 198	4.48	PASS
441	0.001 - 100% of 443	83.7	PASS
442	40 - 200% of 198	150	PASS
443	17 - 23% of 442	19.8	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	1103219
Client:	Tetra Tech NUS, Inc. (T010)	Project:	Mayport CTOJM32 SWMUs 6 & 7
Instrument ID:	MS-BNA4	Calibration:	1061004
Lab File ID:	SEQ-CCV1.D	Calibration Date:	02/28/11 19:58
Sequence:	1D09509	Injection Date:	04/04/11
Lab Sample ID:	1D09509-CCV1	Injection Time:	14:11

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Naphthalene	A	5.000	4.386	1.363682	1.196311		-12.3	20
2-Fluorobiphenyl	A	5.000	4.904	0.8894126	0.8723796		-1.9	20
Terphenyl-d14	A	5.000	5.267	0.7416898	0.7813099		5.3	20

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

* Values outside of QC limits

ANALYSIS SEQUENCE SUMMARY

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	1103219
Client:	Tetra Tech NUS, Inc. (T010)	Project:	Mayport CTOJM32 SWMUs 6 & 7
Sequence:	1D09607	Instrument:	MS-BNA4
Calibration:	1061004		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	1D09607-TUN1	SEQ-TUN1.D	04/05/11 11:10
Calibration Check	1D09607-CCV1	SEQ-CCV1.D	04/05/11 11:31
Blank	1C28023-BLK1	C2823B1R.D	04/05/11 12:27

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	1103219
Client:	Tetra Tech NUS, Inc. (T010)	Project:	Mayport CTOJM32 SWMUs 6 & 7
Lab File ID:	SEQ-TUN1.D	Injection Date:	04/05/11
Instrument ID:	MS-BNA4	Injection Time:	11:10
Sequence:	1D09607	Lab Sample ID:	1D09607-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
51	30 - 60% of 198	50	PASS
68	Less than 2% of 69	1.5	PASS
69	Less than 200% of 198	48.8	PASS
70	Less than 2% of 69	0.489	PASS
127	40 - 60% of 198	53.7	PASS
197	Less than 1% of 198	0.662	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.71	PASS
275	10 - 30% of 198	28.6	PASS
365	1 - 200% of 198	4.25	PASS
441	0.001 - 100% of 443	79.5	PASS
442	40 - 200% of 198	158	PASS
443	17 - 23% of 442	20.2	PASS

CONTINUING CALIBRATION CHECK

SW8270C

Laboratory:	Empirical Laboratories, LLC	SDG:	1103219
Client:	Tetra Tech NUS, Inc. (T010)	Project:	Mayport CTOJM32 SWMUs 6 & 7
Instrument ID:	MS-BNA4	Calibration:	1061004
Lab File ID:	SEQ-CCV1.D	Calibration Date:	02/28/11 19:58
Sequence:	1D09607	Injection Date:	04/05/11
Lab Sample ID:	1D09607-CCV1	Injection Time:	11:31

		CONC. (ug/mL)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Naphthalene	A	5.000	4.793	1.363682	1.307124		-4.1	20
2-Fluorobiphenyl	A	5.000	5.292	0.8894126	0.9412943		5.8	20
Terphenyl-d14	A	5.000	5.088	0.7416898	0.7548253		1.8	20

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

* Values outside of QC limits