

N60200.AR.005341  
NAS CECIL FIELD, FL  
5090.3a

FIRST SEMI-ANNUAL SECOND YEAR GROUNDWATER MONITORING LETTER REPORT  
FOR BUILDING 82 TANK G82 NAS CECIL FIELD FL  
1/8/2010  
TETRA TECH NUS INC



**TETRA TECH**

PITT-01-10-011

January 8, 2010

Project Number 112G02267

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

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

Subject: Groundwater Monitoring Report, 1<sup>st</sup> Semi-Annual, 2<sup>nd</sup> Year – October 2009  
Building 82, Tank G82  
Naval Air Station Cecil Field  
Jacksonville, Florida

Dear Mr. Grabka:

Tetra Tech NUS, Inc. (TtNUS) is pleased to submit this 1<sup>st</sup> Semi-Annual, 2<sup>nd</sup> Year Groundwater Monitoring Report for the referenced Contract Task Order for Building 82, Tank G82 at former Naval Air Station (NAS) Cecil Field, Jacksonville, Florida. This Groundwater Monitoring Report was prepared for the United States Navy, Naval Facilities Engineering Command Southeast (NAVFAC SE) under the Comprehensive Long-Term Environmental Action Navy (CLEAN) V Contract Number N62470-08-D-1001.

The primary objective of current activities at this site is to conduct semi-annual monitoring of groundwater associated with the shallow and intermediate zones of the surficial aquifer. The sampling program is being conducted in accordance with the revised Natural Attenuation Monitoring Plan (NAMP) submitted by CH2MHill to the Florida Department of Environmental Protection (FDEP) on May 29, 2008, based on Chapter 62-770.690, Florida Administrative Code (CH2MHill, 2008). The NAMP is provided in Attachment A. This report summarizes the field operations and analytical results for the sampling event conducted on October 22 and 23, 2009, at the subject site. The work was performed in general accordance with FDEP Standard Operating Procedures (SOPs) under DEP-SOP-001/01.

## **BACKGROUND**

Building 82 is the air traffic control tower, and associated underground storage tank (UST) G82 was used to store diesel fuel for emergency generators. Prior to UST removal in June 1997, the tank released an unknown volume of fuel into the surrounding environment, and soil and groundwater were adversely impacted. In 1998, a piezometer was sampled, and 1-methylnaphthalene and 2-methylnaphthalene were detected in the groundwater sample at concentrations greater than FDEP Groundwater Cleanup Target Levels (GCTLs). A confirmatory sampling investigation was performed in January 1999, and the Confirmatory Sampling Report recommended a Site Assessment (SA).

**Tetra Tech NUS, Inc.**

661 Andersen Drive, Pittsburgh, PA 15220-2745  
Tel 412.921.7090 Fax 412.921.4040 [www.ttnus.com](http://www.ttnus.com)



SA field activities were performed from October 1999 to July 2000. The SA Report (SAR) (TtNUS, 2000) recommended a Remedial Action Plan (RAP) for soil and Monitoring Only for Natural Attenuation (MONA) for groundwater. The FDEP approved the recommendation for the RAP but did not approve the MONA recommendations.

In October 2000, the Navy directed CH2MHill to remove the contaminated soil from the site. Because of piping and the proximity to Building 82, all of the contaminated soil could not be removed (CH2MHill, 2001). Additional sampling to evaluate the leachability of the contaminants remaining in the soil was performed to support a SAR Addendum (SARA). The SARA (TtNUS, 2001) concluded that xylenes, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene could leach from the soil and result in groundwater concentrations greater than GCTLs. The presence of the concrete slabs and runways limits the amount of precipitation that can leach through the soil; therefore, the recommendation was to leave the soil in place with institutional controls to maintain the slabs and to only allow industrial use of the site (contaminant concentrations in the soil met industrial criteria but not residential criteria).

In April 2002, soil samples were collected for total recoverable petroleum hydrocarbon (TRPH) subclassification in order to verify that the appropriate land use controls (LUCs) were in place at Tank G82. The results of the subclassification analyses showed that the residential Soil Cleanup Target Level was exceeded by only one fraction (C<sub>12</sub> – C<sub>16</sub> aliphatic) in one sample (CEF-G82-SU-203-06). The associated report (TtNUS, 2002) recommended a treatability study to evaluate the suitability of air sparging to address site contaminants. The Navy instructed CH2MHill to perform the treatability study.

In November 2006, monitoring wells were sampled and analyzed as a baseline for the treatability study. Only groundwater from wells CEF-G82-1S and CEF-G82-2S had constituents at levels exceeding GCTLs (isopropyl benzene, naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, benzo(a)anthracene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, and dibenz(a,h)anthracene). During the September 2007 Base Realignment and Closure (BRAC) Cleanup Team (BCT) meeting, FDEP agreed that based on the 2006 site-wide groundwater sampling results monitoring only with Land Use Controls was appropriate and no active remediation, such as air sparging, was needed at the Building 82, Tank G82 Site. This decision was based on the likelihood that natural attenuation was occurring and the concentration of the contaminants of concern had been decreasing in the absence of active remediation.

On May 29, 2008, CH2MHill submitted an updated NAMP for both Building 82 (Tank G82) and the adjacent BP Wells site based on the results of the November 2006 sampling event. The updated NAMP recommends that G82 wells be sampled for chemical parameters (volatile organic compounds (VOCs) and naphthalene, polynuclear aromatic hydrocarbons (PAHs), TRPH, as well as natural attenuation parameters (alkalinity, nitrate, nitrite, sulfate, sulfide and methane) on a quarterly basis for the first year, and semi-annually for the second year. The updated NAMP is currently pending official approval by FDEP upon arrival of sealed page from CH2M Hill. The work covered in this report is in accordance with verbal approval of the NAMP from FDEP during the July 2008, BCT meeting.

## **FIELD OPERATIONS**

Groundwater samples were collected from existing wells CEF-G82-1S, CEF-G82-2S, CEF-G82-2I, CEF-G82-3S, CEF-G82-4S, CEF-G82-5S, and CEF-G82-6S on October 22 and 23, 2009. Monitoring well locations are provided on Figure 1. The samples were placed on ice and subsequently via FedEx under chain of custody to Empirical Laboratories in Nashville, Tennessee, for analysis. The laboratory analytical report is included as Attachment B.

The laboratory analyzed the samples from CEF-G82-1S, CEF-G82-2S, CEF-G82-2I, and CEF-G82-3S for the following:



- VOCs including isopropyl benzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene using United States Environmental Protection Agency (USEPA) Method SW-846 8260B
- PAHs including 1-methylnaphthalene and 2-methylnaphthalene using USEPA Method 8270
- TRPH using the Florida Petroleum Range Organics (FL-PRO) method
- Sulfate, nitrate, and nitrite using USEPA Method 300.0
- Sulfide using Method SM4500-S2F
- Alkalinity using Method 310.2

The laboratory analyzed the samples from CEF-G82-4S, CEF-G82-5S, and CEF-G82-6S for the following:

- VOCs including isopropyl benzene, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene using USEPA Method SW-846 8260B.
- PAHs including 1-methylnaphthalene and 2-methylnaphthalene using USEPA Method 8270.
- TRPH using the FL-PRO method.

Prior to obtaining groundwater samples, synoptic water levels and total well depths were measured and recorded on a site-specific groundwater measurement sheet for all wells located around Building 82. On October 21, 2009, the depth to water ranged from 6.41 feet below top of casing (btoc) (CEF-G82-3S) to 9.89 feet below top of casing (btoc) (CEF-G82-6S). Depth to water measurements, top of casing elevations, and groundwater elevations are presented in Table 1. Attachment C includes the field log sheets. General sampling protocols were in accordance with FDEP SOPs and TtNUS SOP SA-1.1 – Groundwater Sample Acquisition and On-Site Water Quality Testing.

## RESULTS

The groundwater elevation data and flow direction for the shallow zone across the Tank G82 site are shown on Figure 2. Based on the data, the general direction of shallow zone groundwater flow is southeast.

Groundwater analytical results from this sampling event were compared to FDEP GCTLs and Natural Attenuation Default Concentrations (NADCs). The data and standards are presented in Table 2, and results since the 1<sup>st</sup> Quarter, 1<sup>st</sup> Year – July 2008 monitoring event are presented in Table 3 and on Figure 3. During the October 2009 event, concentrations of benzene, xylenes, isopropyl benzene, 1,2,4-trimethylbenzene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, and dibenzo(a,h)anthracene exceeded their respective GCTLs in source area well CEF-G82-2S. Isopropyl benzene was also detected at a concentration that exceeded its NADC in CEF-G82-2S. Isopropyl benzene was detected at a concentration exceeding its GCTL in CEF-G82-1S. In all of the other wells, analytes were either not detected or were detected at concentrations less than their GCTLs, including the intermediate well CEF-G82-2I.

Geochemical data were evaluated to determine if natural attenuation is occurring in the groundwater. Field-measured parameters include dissolved oxygen (DO), dissolved carbon dioxide, and alkalinity. The fixed-base laboratory-measured parameters included methane, nitrate/nitrite, sulfate/sulfide, and alkalinity, and the results are presented in Table 2. Low-flow pumping and adherence to FDEP SOPs



were carried out during these analyses. A discussion of the results for each geochemical parameter is presented below.

#### Dissolved Oxygen

Geochemical measurements of DO were made in the field using a CHEMetrics test kit (Model K-7501), which can obtain accurate determinations of DO between 0.05 and 12 milligrams per liter (mg/L). Field-measured DO concentrations in October 2009 ranged from 0.2 mg/L in CEF-G82-2S and CEF-G82-3S to 0.3 mg/L in CEF-G82-1S and CEF-G82-2I, suggesting anaerobic conditions that are not necessarily favorable for the reduction of petroleum hydrocarbons.

#### Dissolved Carbon Dioxide/Alkalinity

Dissolved carbon dioxide was measured in the field using CHEMetrics test kits (Models K-1910, K-1920, and K-1925). Field-measured dissolved carbon dioxide concentrations ranged from 60 mg/L (CEF-G82-2I) to 90 mg/L (CEF-G82-1S). Alkalinity is a measure of the acid-neutralizing capacity of water, usually expressed as mg/L of calcium carbonate ( $\text{CaCO}_3$ ). Laboratory-measured alkalinity values at the Tank G82 Site ranged from 0.2 mg/L (CEF-G82-6S) to 138 mg/L (CEF-G82-2S). Background concentrations are needed for comparison to determine if biodegradation processes are indicated by this data, but they are not currently available.

#### Methane

Methanogenesis is an anaerobic biodegradation process whereby methane-producing microbes utilize carbon dioxide as an electron acceptor and generate methane as a byproduct of fermentation. Concentrations of methane ranged from non-detect in CEF-G82-3S and intermediate well CEF-G82-2I to 9.34 mg/L in CEF-G82-2S. Comparison to background concentration would identify if this process is occurring, but background concentrations are not currently available.

#### Sulfate/Sulfide

Sulfate concentrations ranged from to non-detect (0.033 U mg/L) in the source well CEF-G82-2S to 19.7 mg/L in CEF-G82-3S. Concentrations of sulfate were greater in downgradient wells than in the source well. Sulfide concentrations ranged from was non-detect (0.678 U mg/L) in CEF-G82-3S to 1.9 J mg/L in CEF-G82-2S. Available sulfate with observed increase in sulfide is a potential indication of a favorable sulfate-reducing environment.

#### Nitrate/Nitrite

Nitrate concentrations ranged from non-detect (0.033 U mg/L) in CEF-G82-1S, CEF-G82-2S, and CEF-G82-2I to 1.3 mg/L in CEF-G82-3S. Nitrite was not detected in any of the four wells that were analyzed for nitrite. During nitrate reduction, bacteria can use nitrate as an electronic acceptor to degrade hydrocarbons, generating nitrite and carbon dioxide. The lack of nitrate and nitrite suggest that this degradation process may not be occurring.

### **CONCLUSIONS AND RECOMMENDATIONS**

The shallow groundwater flow direction in the area of Tank G82 site is to the southeast, which is consistent with previous measurements in the area.

During the October 2009 event, concentrations of benzene, xylenes, isopropyl benzene, 1,2,4-trimethylbenzene, 1-methylnaphthalene, 2-methylnaphthlene, naphthalene, and dibenzo(a,h)anthracene exceeded their respective GCTLs in CEF-G82-2S. Isopropyl benzene was detected at a concentration that exceeded its NADC in CEF-G82-2S. Isopropyl benzene was detected at a concentration exceeding its GCTL in CEF-G82-1S.



TETRA TECH

Mr. David Grabka  
FDEP  
January 8, 2010 – Page 5

No other analytes were detected in excess of their GCTLs in any of the other wells sampled per the NAMP. The isopropyl benzene exceedance in CEF-G82-2S, was the only analyte and only location where a NADC was exceeded. The concentrations of xylenes, isopropyl benzene, 1,2,4-trimethylbenzene, 1-methylnaphthalene, and 2-methylnaphthalene in CEF-G82-2S increased since the previous sampling event in April 2009; however, naphthalene and benzene concentrations decreased in CEF-G82-2S since the April 2009 sampling event. This sampling event was the first time xylenes and dibenzo(a,h)anthracene had been detected at levels exceeding their respective GCTLs since the long-term monitoring began. In addition, this sampling event was the first time isopropyl benzene was detected at a level exceeding its NADC.

Natural attenuation (NA) parameters were collected in accordance with the 2008 NAMP. NA data has been generally consistent with only marginally favorable conditions for degradation of petroleum hydrocarbons. The lack of background results is restricting interpretation of some of the data. The data collected to date provides sufficient information for current purposes and therefore it is recommended consideration be given to discontinuing the fixed base laboratory geochemical parameters analysis portion of the 2008 NAMP. Natural attenuation of the groundwater contamination due to other mechanisms such as dilution and dispersion will be monitored through analysis of the COCs.

The next semi-annual sampling event (excluding fixed base geochemical parameters) is scheduled for April 2010.

If you have any questions regarding this submittal, please feel free to contact me at (412) 921-8163 or Kara Wimble at (904) 730-4669, extension 217, or via e-mail at Kara.Wimble@tetratech.com.

Sincerely,

Handwritten signature of Robert F. Simcik.

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

Handwritten signature of Kara F. Wimble.

Kara F. Wimble  
Project Manager

Enclosures (6)

c: A. Sanford, NAVFAC SE (1 copy)  
M. Halil, CH2M Hill (electronic only)  
J. Trepanowski, TtNUS (CD)  
M. Speranza, TtNUS (letter only)  
M. Jonnet, TtNUS (Cecil DMS)  
R. Simcik, TtNUS (Bookcase File)  
J. Johnson, TtNUS (Information Repository)  
S. Currie/Tetra Tech NUS File JM09 (1 copy)



TETRA TECH

**CERTIFICATION**

The information contained herein is based on the investigation data and information obtained from previously submitted reports. If conditions are determined to exist that differ from those described, the undersigned engineer should be notified to evaluate the effects of any additional information on the information described in this report. This Semi-Annual Groundwater Monitoring Report, 1<sup>st</sup> Semi-Annual, 2<sup>nd</sup> Year, October 2009 was developed for Building 82, Tank G82, at Former Naval Air Station Cecil Field, Jacksonville, Florida. It should not be construed to apply to any other site.

No. 00061263

★

STATE OF

January 8, 2010

Robert Frank Cich

P.E. Number 00061263

PROFESSIONAL ENGINEER

FLORIDA

## TABLES

**Table 1**  
**Groundwater Elevation and Monitoring Well Construction Data**

1<sup>st</sup> Year, 4<sup>th</sup> Quarter Groundwater Monitoring Report  
 Building 82, Tank G82  
 Naval Air Station Cecil Field  
 Jacksonville, Florida

| Well Number | Total Depth of Well (feet btoc) | Top of Casing Elevation* (feet above NAVD) | July 24, 2008              |   | October 20, 2008           |   | January 26, 2009           |   | April 28, 2009             |   | October 21, 2009           |   |
|-------------|---------------------------------|--|----------------------------|---|----------------------------|---|----------------------------|---|----------------------------|---|----------------------------|---|
|             |                                 |  | Depth to Water (feet btoc) | Water Level Elevation (feet above NAVD) | Depth to Water (feet btoc) | Water Level Elevation (feet above NAVD) | Depth to Water (feet btoc) | Water Level Elevation (feet above NAVD) | Depth to Water (feet btoc) | Water Level Elevation (feet above NAVD) | Depth to Water (feet btoc) | Water Level Elevation (feet above NAVD) |
| CEF-G82-1S  | 15                              | 71.13                                      | 5.41                       | 65.72                                   | 6.20                       | 64.93                                   | 7.39                       | 63.74                                   | 6.59                       | 64.54                                   | 6.42                       | 59.30                                   |
| CEF-G82-2I  | 35                              | 71.28                                      | 5.68                       | 65.60                                   | 6.63                       | 64.65                                   | 8.05                       | 63.23                                   | 7.01                       | 64.27                                   | 6.92                       | 58.68                                   |
| CEF-G82-2S  | 14                              | 71.23                                      | 5.68                       | 65.55                                   | 6.45                       | 64.78                                   | 7.56                       | 63.67                                   | 6.80                       | 64.43                                   | 6.60                       | 58.95                                   |
| CEF-G82-3S  | 14                              | 71.20                                      | 5.27                       | 65.93                                   | 6.18                       | 65.02                                   | 7.42                       | 63.78                                   | 6.58                       | 64.62                                   | 6.41                       | 59.52                                   |
| CEF-G82-4S  | 15                              | 71.74                                      | 6.24                       | 65.50                                   | 7.05                       | 64.69                                   | 8.37                       | 63.37                                   | 7.41                       | 64.33                                   | 7.32                       | 58.18                                   |
| CEF-G82-5S  | 15                              | 71.53                                      | 6.87                       | 64.66                                   | 7.21                       | 64.32                                   | 8.16                       | 63.37                                   | 7.31                       | 64.22                                   | 7.26                       | 57.40                                   |
| CEF-G82-6S  | 15                              | 74.44                                      | 9.19                       | 65.25                                   | 9.92                       | 64.52                                   | 10.73                      | 63.71                                   | 10.16                      | 64.28                                   | 9.89                       | 55.36                                   |

\*Top-of-casing (toc) elevations for G82-1S, G82-2I, and G82-6S were resurveyed in February 2009. Water level elevations for all events shown on this table use the new TOC elevations.

msl = Mean sea level

btoc = Below top of casing

NAVD = North American Vertical Datum of 1988

**Table 2**  
**Summary of April 2009 Groundwater Data**

2<sup>nd</sup> Year, 1<sup>st</sup> Semi-Annual Groundwater Monitoring Report  
Building 82, Tank G82  
Naval Air Station Cecil Field  
Jacksonville, Florida

| Parameter                                   | FDEP Criteria |      | CEF-G82-1S | CEF-G82-2S   |                | CEF-G82-2I | CEF-G82-3S | CEF-G82-4S | CEF-G82-5S | CEF-G82-6S |
|---|---------------|------|------------|--------------|----------------|------------|------------|------------|------------|------------|
|   | GCTL          | NADC |            | 10/22/2009   |                |            |            |            |            |            |
|   |               |      | 10/22/2009 | Sample       | Duplicate      | 10/22/2009 | 10/22/2009 | 10/23/2009 | 10/23/2009 | 10/23/2009 |
| <b>VOCs (USEPA Method 8260B) (µg/L)</b>     |               |      |            |              |                |            |            |            |            |            |
| Benzene                                     | 1             | 10   | 0.12 U     | 0.97 J       | <b>1.0</b>     | 0.12 U     | 0.12 U     | 0.12 U     | 0.13 J     | 0.12 U     |
| Toluene                                     | 40            | 400  | 0.14 U     | 0.14 U       | 0.14 U         | 0.14 U     | 0.14 U     | 0.14 U     | 0.14 U     | 0.14 U     |
| Ethylbenzene                                | 30            | 300  | 2.0        | 25.0         | 25.0           | 0.10 U     | 0.10 U     | 0.10 U     | 0.14 J     | 0.10 U     |
| Total Xylenes                               | 20            | 200  | 1.5        | <b>24.0</b>  | <b>25.0</b>    | 0.21 U     |
| Isopropyl benzene                           | 0.8           | 8    | <b>1.2</b> | <b>9.6</b>   | <b>9.8</b>     | 0.11 U     | 0.11 U     | 0.11 U     | 0.44 J     | 0.11 U     |
| 1,2,4-Trimethylbenzene                      | 10            | 100  | 4.3        | <b>26.0</b>  | <b>26.0</b>    | 0.17 J     | 0.14 U     | 0.14 U     | 0.14 U     | 0.14 U     |
| 1,3,5-Trimethylbenzene                      | 10            | 100  | 1.4        | 6.4          | 6.8            | 0.10 U     |
| <b>PAHs (USEPA Method 8270C SIM) (µg/L)</b> |               |      |            |              |                |            |            |            |            |            |
| 1-Methylnaphthalene                         | 28            | 280  | 5.8        | <b>100.0</b> | <b>100.0</b>   | 0.46 U     | 0.46 U     | 0.71 J     | 5.2        | 0.46 U     |
| 2-Methylnaphthalene                         | 28            | 280  | 7.1        | <b>130.0</b> | <b>130.0</b>   | 0.46 U     | 0.46 U     | 0.46 U     | 2.9        | 0.46 U     |
| Naphthalene                                 | 14            | 140  | 4.6        | <b>66</b>    | <b>68</b>      | 0.46 U     |
| Acenaphthene                                | 20            | 200  | 0.46 U     | 4.9          | 4.8            | 0.46 U     |
| Acenaphthylene                              | 210           | 2100 | 0.018 U    | 2.6          | 2.4            | 0.018 U    | 0.018 U    | 0.018 U    | 0.12 U     | 0.026 U    |
| Benzo(a)pyrene                              | 0.2           | 2    | 0.018 U    | 0.018 U      | 0.035 U        | 0.018 U    | 0.018 U    | 0.018 U    | 0.018 U    | 0.018 U    |
| Benzo(a)anthracene                          | 0.05          | 5    | 0.018 U    | 0.018 U      | 0.047 U        | 0.018 U    | 0.018 U    | 0.018 U    | 0.018 U    | 0.018 U    |
| Dibenz(a,h)anthracene                       | 0.005         | 0.05 | 0.018 U    | 0.018 U      | <b>0.031 J</b> | 0.018 U    |
| Fluorene                                    | 280           | 2800 | 0.46 U     | 7.4          | 6.9            | 0.46 U     |
| Phenanthrene                                | 210           | 2100 | 0.083 U    | 5.4          | 5.0            | 0.027 U    | 0.026 U    | 0.032 U    | 0.018 U    | 0.056 U    |
| <b>Miscellaneous Parameters (mg/L)</b>      |               |      |            |              |                |            |            |            |            |            |
| TRPH  | 5             | 50   | 0.260 J    | 2.7          | 3.3            | 0.157 U    | 0.157 U    | 0.157 U    | 0.216 J    | 0.157 U    |
| Methane                                     | NA            | NA   | 1.8        | 7.2          | 9.34           | 4.64 U     | 1.0 U      | NS         | NS         | NS         |
| Sulfate                                     | 250           | NA   | 3.5        | 0.33 U       | 0.33 U         | 8.9        | 19.7       | NS         | NS         | NS         |
| Sulfide                                     | NA            | NA   | 1.4        | 1.89 J       | 1.93 J         | 1.8        | 0.678 U    | NS         | NS         | NS         |
| Nitrate as N                                | 10            | NA   | 0.033 U    | 0.033 U      | 0.033 U        | 0.033 U    | 1.3        | NS         | NS         | NS         |
| Nitrite                                     | 1             | NA   | 0.033 U    | 0.033 U      | 0.033 U        | 0.033 U    | 0.330 U    | NS         | NS         | NS         |
| Alkalinity                                  | NA            | NA   | 78.2       | 138.0        | 140            | 4.1        | 62.8       | NS         | NS         | NS         |
| Dissolved oxygen                            | NA            | NA   | 0.3        | 0.2          | NA             | 0.3        | 0.2        | NS         | NS         | NS         |
| Dissolved carbon dioxide                    | NA            | NA   | 90.0       | 80           | NA             | 60.0       | 70.0       | NS         | NS         | NS         |

GCTL = Groundwater Cleanup Target Level.  
NADC = Natural Attenuation Default Concentration.  
J - Estimated value.  
U = Not detected at detection limit shown.  
Shaded value indicates concentration greater than GCTL.  
µg/L = micrograms per liter.  
mg/L = Milligrams per liter.  
NS = Not sampled.  
NA = Not Analyzed  
VOCs - volatile organic compounds  
PAHs - polynuclear aromatic hydrocarbons  
TRPH - total recoverable petroleum hydrocarbons  
V = compound was also detected in the method blank and data should be interpreted with caution.

**Table 3**  
**Summary of Historical Groundwater Data**

2<sup>nd</sup> Year, 1<sup>st</sup> Semi-Annual Groundwater Monitoring Report  
Building 82, Tank G82  
Naval Air Station Cecil Field  
Jacksonville, Florida  
Page 1 of 4

| Parameter                                   | FDEP Criteria |      | CEF-G82-1S |            |            |           |            | CEF-G82-2S  |             |             |             |             |
|---|---------------|------|------------|------------|------------|-----------|------------|-------------|-------------|-------------|-------------|-------------|
|   | GCTL          | NADC | 7/22/2008  | 10/21/2008 | 1/27/2009  | 4/28/2009 | 10/22/2009 | 7/22/2008   | 10/20/2008  | 1/27/2009   | 4/28/2009   | 4/28/2009   |
|   |               |      |            |            |            |           |            |             |             |             | Sample      | Duplicate   |
| <b>VOCs (USEPA Method 8260B) (µg/L)</b>     |               |      |            |            |            |           |            |             |             |             |             |             |
| Benzene                                     | 1             | 10   | 0.23 U     | 1 U        | 0.4 U      | 0.40 U    | 0.12 U     | 0.69 I      | 1 U         | 0.4 U       | <b>2.2</b>  | <b>2.0</b>  |
| Toluene                                     | 40            | 400  | 0.28 U     | 1 U        | 0.35 U     | 0.35 U    | 0.14 U     | 0.28 U      | 1 U         | 0.35 U      | 0.35 U      | 0.35 U      |
| Ethylbenzene                                | 30            | 300  | 0.34 U     | 0.42 J     | 5          | 1.0       | 2.0        | 15          | 11          | 18.1        | 26.4        | 23.6        |
| Total Xylenes                               | 20            | 200  | 0.38 U     | 7          | 3          | 1.2 U     | 1.5        | 18          | 6.6         | 6.9         | 19.6        | 13.5        |
| Isopropyl benzene                           | 0.8           | 8    | 0.23 U     | 0.29 J     | <b>1.4</b> | 0.77 J    | <b>1.2</b> | <b>4.8</b>  | <b>6.3</b>  | <b>7.3</b>  | <b>7.8</b>  | <b>6.5</b>  |
| 1,2,4-Trimethylbenzene                      | 10            | 100  | 0.38 U     | 0.31 J     | <b>11</b>  | 2.7       | 4.3        | <b>21.0</b> | <b>18.0</b> | <b>13.3</b> | <b>21.1</b> | <b>13.7</b> |
| 1,3,5-Trimethylbenzene                      | 10            | 100  | 0.22 U     | 0.14 J     | 2          | 0.45 J    | 1.4        | 5.0         | 0.13 U      | 3.4         | 5.2         | 3.2         |
| <b>PAHs (USEPA Method 8270C SIM) (µg/L)</b> |               |      |            |            |            |           |            |             |             |             |             |             |
| 1-Methylnaphthalene                         | 28            | 280  | 0.04 J     | 1.5        | 14.7       | 4.9       | 5.8        | <b>44</b>   | <b>120</b>  | <b>82.6</b> | <b>58.6</b> | <b>41.5</b> |
| 2-Methylnaphthalene                         | 28            | 280  | 0.13       | 1.2        | 23         | 5.4       | 7.1        | <b>66</b>   | <b>140</b>  | <b>97</b>   | <b>65.0</b> | <b>60.3</b> |
| Naphthalene                                 | 14            | 140  | 1.2        | 0.8 J      | 39.9       | 10.8      | 4.6        | <b>65</b>   | <b>67</b>   | <b>115</b>  | <b>85.7</b> | <b>93.3</b> |
| Acenaphthene                                | 20            | 200  | 0.07 J     | 0.4        | 1.1        | 0.48 U    | 0.46 U     | 1.4         | 5.7         | 3.3         | 1.8         | 1.6         |
| Acenaphthylene                              | 210           | 2100 | 0.01 U     | 0.028 U    | 0.48 U     | 0.48 U    | 0.018 U    | 0.01 U      | 0.028 U     | 0.59 J      | 0.48 U      | 0.48 U      |
| Benzo(a)pyrene                              | 0.2           | 2    | 0.01 U     | 0.028 U    | 0.048 U    | 0.048 U   | 0.018 U    | 0.01 U      | 0.028 U     | 0.048 U     | 0.048 U     | 0.048 U     |
| Benzo(a)anthracene                          | 0.05          | 5    | 0.01 U     | 0.028 U    | 0.048 U    | 0.048 U   | 0.018 U    | 0.04 J      | 0.028 U     | 0.048 U     | 0.048 U     | 0.048 U     |
| Dibenz(a,h)anthracene                       | 0.005         | 0.05 | 0.02 U     | 0.018 U    | 0.048 U    | 0.048 U   | 0.018 U    | 0.02 U      | 0.018 U     | 0.048 U     | 0.048 U     | 0.048 U     |
| Fluorene                                    | 280           | 2800 | 0.08 J     | 0.38       | 1.5        | 0.48 U    | 0.46 U     | 1.6         | 8           | 4           | 3.4         | 2.9         |
| Phenanthrene                                | 210           | 2100 | 0.02 U     | 0.1 U      | 0.53 J     | 0.24 U    | 0.083 U    | 0.28        | 5.2         | 1.4         | 1.0         | 0.74        |
| <b>Miscellaneous Parameters (mg/L)</b>      |               |      |            |            |            |           |            |             |             |             |             |             |
| TRPH  | 5             | 50   | 0.042 U    | 0.460 U    | 0.752      | 0.163     | 0.260 J    | 0.926       | 2.3         | 2.21        | 1.37        | 1.82        |
| Methane                                     | NA            | NA   | 0.098      | 0.5        | 2.85       | 0.953     | 1.8        | 1.39        | 4.5         | 4.88        | 4.45        | 3.91        |
| Sulfate                                     | 250           | NA   | 7.3        | 3.1        | 5.4        | 6.2       | 3.5        | 3.8 J       | 2.3         | 1.4 J       | 1.6 J       | 2.1         |
| Sulfide                                     | NA            | NA   | 0.53 J     | 1.1        | 2.5        | 1.4       | 1.4        | 0.85 J      | 1.4         | 2.5         | 1.6         | 1.8         |
| Nitrate as N                                | 10            | NA   | 0.24 J     | 0.15 U     | 0.05 U     | 0.09 J    | 0.033 U    | 0.15 J      | 0.15 U      | 0.05 U      | 0.050 U     | 0.13        |
| Nitrite                                     | 1             | NA   | 0.002 U    | 0.25 U     | <b>1.6</b> | 0.05 U    | 0.033 U    | 0.002 U     | 0.300 U     | <b>2.6</b>  | 0.050 U     | 0.050 U     |
| Alkalinity                                  | NA            | NA   | 100        | 94.7       | 55*        | 75.7      | 78.2       | 150         | 124         | 130*        | 165         | 167         |
| Dissolved oxygen                            | NA            | NA   | 2          | 0.3        | 0.4        | 0.5       | 0.3        | 2           | 0.3         | 0.7         | 0.4         | N/S         |
| Dissolved carbon dioxide                    | NA            | NA   | 70         | 48         | 75         | 90        | 90         | 30          | 60          | 85          | 75.0        | N/S         |

**Table 3**  
**Summary of Historical Groundwater Data**

2<sup>nd</sup> Year, 1<sup>st</sup> Semi-Annual Groundwater Monitoring Report  
G82 Wells  
Naval Air Station Cecil Field  
Jacksonville, Florida  
Page 2 of 4

| Parameter                                   | FDEP Criteria |      | CEF-G82-2S |           | CEF-G82-2I |            |           |           |            | CEF-G82-3S |           |            |           |
|---|---------------|------|------------|-----------|------------|------------|-----------|-----------|------------|------------|-----------|------------|-----------|
|   | GCTL          | NADC | Sample     | Duplicate | 7/22/2008  | 10/20/2008 | 1/27/2009 | 4/28/2009 | 10/22/2009 | Sample     | Duplicate | 10/21/2008 | 1/27/2009 |
|   |               |      |            |           |            |            |           |           |            |            |           |            |           |
|   |               |      |            |           |            |            |           |           |            |            |           |            |           |
| <b>VOCs (USEPA Method 8260B) (µg/L)</b>     |               |      |            |           |            |            |           |           |            |            |           |            |           |
| Benzene                                     | 1             | 10   | 0.97 J     | 1.0       | 0.23 U     | 1 U        | 0.4 U     | 0.4 U     | 0.12 U     | 0.23 U     | 0.23 U    | 1 U        | 0.4 U     |
| Toluene                                     | 40            | 400  | 0.14 U     | 0.14 U    | 0.28 U     | 1 U        | 0.35 U    | 0.35 U    | 0.14 U     | 0.28 U     | 0.28 U    | 1 U        | 0.35 U    |
| Ethylbenzene                                | 30            | 300  | 25         | 25        | 0.34 U     | 1 U        | 0.43 U    | 0.43 U    | 0.10 U     | 0.34 U     | 0.34 U    | 1 U        | 0.43 U    |
| Total Xylenes                               | 20            | 200  | 24         | 25        | 0.38 U     | 1 U        | 1.2 U     | 1.2 U     | 0.21 U     | 0.38 U     | 0.38 U    | 1 U        | 1.2 U     |
| Isopropyl benzene                           | 0.8           | 8    | 9.6        | 9.8       | 0.23 U     | 0.8 U      | 0.2 U     | 0.2 U     | 0.11 U     | 0.23 U     | 0.23 U    | 0.8 U      | 0.2 U     |
| 1,2,4-Trimethylbenzene                      | 10            | 100  | 26         | 26        | 0.38 U     | 0.10 U     | 0.22 U    | 0.22 U    | 0.17 J     | 0.38 U     | 0.38 U    | 0.14 U     | 0.22 U    |
| 1,3,5-Trimethylbenzene                      | 10            | 100  | 6.4        | 6.8       | 0.22 U     | 0.13 U     | 0.2 U     | 0.20 U    | 0.10 U     | 0.22 U     | 0.22 U    | 0.10 U     | 0.2 U     |
| <b>PAHs (USEPA Method 8270C SIM) (µg/L)</b> |               |      |            |           |            |            |           |           |            |            |           |            |           |
| 1-Methylnaphthalene                         | 28            | 280  | 100        | 100       | 0.01 U     | 0.046 U    | 0.24 U    | 0.24 U    | 0.46 U     | 0.04 J     | 0.01 U    | 0.0093 U   | 0.24 U    |
| 2-Methylnaphthalene                         | 28            | 280  | 130        | 130       | 0.02 U     | 0.0085 U   | 0.24 U    | 0.24 U    | 0.46 U     | 0.05 J     | 0.02 U    | 0.014 U    | 0.24 U    |
| Naphthalene                                 | 14            | 140  | 66         | 68        | 0.04 I     | 1 U        | 1 U       | 1.0 U     | 0.46 U     | 0.90 J     | 0.35 U    | 1 U        | 1 U       |
| Acenaphthene                                | 20            | 200  | 4.9        | 4.8       | 0.02 U     | 0.046 U    | 0.48 U    | 0.48 U    | 0.46 U     | 0.02 U     | 0.02 U    | 0.0097 U   | 0.48 U    |
| Acenaphthylene                              | 210           | 2100 | 2.6        | 2.4       | 0.01 U     | 0.028 U    | 0.48 U    | 0.48 U    | 0.018 U    | 0.01 U     | 0.01 U    | 0.028 U    | 0.48 U    |
| Benzo(a)pyrene                              | 0.2           | 2    | 0.018 U    | 0.035 U   | 0.01 U     | 0.028 U    | 0.048 U   | 0.048 U   | 0.018 U    | 0.01 U     | 0.01 U    | 0.0066 J   | 0.048 U   |
| Benzo(a)anthracene                          | 0.05          | 5    | 0.018 U    | 0.047 U   | 0.01 U     | 0.028 U    | 0.048 U   | 0.048 U   | 0.018 U    | 0.01 U     | 0.01 U    | 0.018 U    | 0.048 U   |
| Dibenz(a,h)anthracene                       | 0.005         | 0.05 | 0.018 U    | 0.031 J   | 0.02 U     | 0.018 U    | 0.048 U   | 0.048 U   | 0.018 U    | 0.02 U     | 0.02 U    | 0.0056 J   | 0.048 U   |
| Fluorene                                    | 280           | 2800 | 7.4        | 6.9       | 0.01 U     | 0.046 U    | 0.48 U    | 0.48 U    | 0.46 U     | 0.01 U     | 0.01 U    | 0.014 U    | 0.48 U    |
| Phenanthrene                                | 210           | 2100 | 5.4        | 5.0       | 0.02 U     | 0.012 U    | 0.24 U    | 0.24 U    | 0.027 U    | 0.02 U     | 0.02 U    | 0.035 U    | 0.24 U    |
| <b>Miscellaneous Parameters (mg/L)</b>      |               |      |            |           |            |            |           |           |            |            |           |            |           |
| TRPH  | 5             | 50   | 2.7        | 3.3       | 0.042 U    | 0.46 U     | 0.16 U    | 0.16 U    | 0.157 U    | 0.042 U    | 0.042 U   | 0.46 U     | 0.16 U    |
| Methane                                     | NA            | NA   | 7.2        | 9.34      | 0.001      | 0.0024 U   | 0.002     | 0.00152   | 4.64 U     | 0.004      | 0.001     | 0.00096 U  | 0.0005    |
| Sulfate                                     | 250           | NA   | 0.33 U     | 0.33 U    | 8.4        | 18.1       | 10.1      | 8.4       | 8.9        | 21         | 22        | 17.7       | 22.8      |
| Sulfide                                     | NA            | NA   | 1.9        | 1.93      | 0.53 J     | 2.1 U      | 0.970 J   | 0.60 U    | 1.8        | 0.45 U     | 0.45 U    | 2.1 U      | 0.6 U     |
| Nitrate as N                                | 10            | NA   | 0.033 U    | 0.033 U   | 0.004 U    | 0.15 U     | 0.05 U    | 0.050 U   | 0.033 U    | 1.3        | 1.7       | 0.61       | 1.4       |
| Nitrite                                     | 1             | NA   | 0.033 U    | 0.033 U   | 0.002 U    | 0.300 U    | 0.49      | 0.050 U   | 0.033 U    | 0.002 U    | 0.002 U   | 0.25 U     | 1.7       |
| Alkalinity                                  | NA            | NA   | 138        | 140       | 4.3 J      | 8.8        | 0*        | 2.8 J     | 4.1        | 130        | 120       | 102        | 50*       |
| Dissolved oxygen                            | NA            | NA   | 0.2        | NA        | 0.9        | 0.1        | 0.7       | 0.7       | 0.3        | 1.5        | 1.5       | 0.3        | 0.7       |
| Dissolved carbon dioxide                    | NA            | NA   | 80         | NA        | 60         | 37         | 32        | 55        | 60         | 80         | 80        | 60         | 70        |

**Table 3**  
**Summary of Historical Groundwater Data**

2<sup>nd</sup> Year, 1<sup>st</sup> Semi-Annual Groundwater Monitoring Report  
G82 Wells  
Naval Air Station Cecil Field  
Jacksonville, Florida  
Page 3 of 4

| Parameter   | FDEP Criteria |      | CEF-G82-3S |            | CEF-G82-4S |            |           |           |            | CEF-G82-5S |            |           |           |
|---|---------------|------|------------|------------|------------|------------|-----------|-----------|------------|------------|------------|-----------|-----------|
|   | GCTL          | NADC | 4/29/2009  | 10/22/2009 | 7/22/2008  | 10/21/2008 | 1/28/2009 | 4/29/2009 | 10/23/2009 | 7/22/2008  | 10/21/2008 | 1/27/2009 | 4/29/2009 |
|   |               |      |            |            |            |            |           |           |            |            |            |           |           |
| <b>BTEX/Naphthalene (USEPA Method 8260B) (µg/L)</b> |               |      |            |            |            |            |           |           |            |            |            |           |           |
| Benzene   | 1             | 10   | 0.40 U     | 0.12 U     | 0.23 U     | 1 U        | 0.4 U     | 0.40 U    | 0.12 U     | 0.23 U     | 1 U        | 0.4 U     | 0.4 U     |
| Toluene   | 40            | 400  | 0.35 U     | 0.14 U     | 0.28 U     | 1 U        | 0.35 U    | 0.35 U    | 0.14 U     | 0.28 U     | 1 U        | 0.35 U    | 0.35 U    |
| Ethylbenzene  | 30            | 300  | 0.43 U     | 0.10 U     | 0.34 U     | 1 U        | 0.43 U    | 0.43 U    | 0.10 U     | 0.34 U     | 1 U        | 0.43 U    | 0.43 U    |
| Total Xylenes                                       | 20            | 200  | 1.2 U      | 0.21 U     | 0.38 U     | 1 U        | 1.2 U     | 1.2 U     | 0.21 U     | 0.38 U     | 1 U        | 1.2 U     | 1.2 U     |
| Isopropyl benzene                                   | 0.8           | 8    | 0.20 U     | 0.11 U     | 0.23 U     | 0.8 U      | 0.2 U     | 0.20 U    | 0.11 U     | 0.23 U     | 0.19 J     | 0.25 J    | 0.2 U     |
| 1,2,4-Trimethylbenzene                              | 10            | 100  | 0.22 U     | 0.14 U     | 0.38 U     | 0.14 U     | 0.22 U    | 0.22 U    | 0.14 U     | 0.38 U     | 0.14 U     | 0.22 U    | 0.22 U    |
| 1,3,5-Trimethylbenzene                              | 10            | 100  | 0.20 U     | 0.10 U     | 0.22 U     | 0.10 U     | 0.2 U     | 0.20 U    | 0.10 U     | 0.22 U     | 0.10 U     | 0.2 U     | 0.2 U     |
| <b>PAHs (USEPA Method 8270C SIM) (µg/L)</b>         |               |      |            |            |            |            |           |           |            |            |            |           |           |
| 1-Methylnaphthalene                                 | 28            | 280  | 0.24 U     | 0.46 U     | 0.67       | 0.65       | 0.32 J    | 0.46 J    | 0.71 J     | 2.8        | 8.5        | 3.7       | 3.4       |
| 2-Methylnaphthalene                                 | 28            | 280  | 0.24 U     | 0.46 U     | 0.04 J     | 0.046 U    | 0.24 U    | 0.24 U    | 0.46 U     | 3.4        | 5.7        | 2.7       | 2.3       |
| Naphthalene   | 14            | 140  | 1.0 U      | 0.46 U     | 0.87 J     | 0.33 U     | 1 U       | 1.0 U     | 0.46 U     | 0.35 U     | 2.1        | 7.8       | 7.8       |
| Acenaphthene  | 20            | 200  | 0.48 U     | 0.46 U     | 0.28       | 0.18       | 0.48 U    | 0.48 U    | 0.46 U     | 0.28       | 0.6        | 0.48 U    | 0.24 U    |
| Acenaphthylene                                      | 210           | 2100 | 0.48 U     | 0.018 U    | 0.1 U      | 0.028 U    | 0.48 U    | 0.48 U    | 0.018 U    | 0.06 J     | 0.028 U    | 0.48 U    | 0.24 U    |
| Benzo(a)pyrene                                      | 0.2           | 2    | 0.048 U    | 0.018 U    | 0.01 U     | 0.028 U    | 0.048 U   | 0.048 U   | 0.018 U    | 0.01 U     | 0.0078 J   | 0.048 U   | 0.048 U   |
| Benzo(a)anthracene                                  | 0.05          | 5    | 0.048 U    | 0.018 U    | 0.01 U     | 0.028 U    | 0.048 U   | 0.048 U   | 0.018 U    | 0.01 U     | 0.027 U    | 0.048 U   | 0.048 U   |
| Dibenz(a,h)anthracene                               | 0.005         | 0.05 | 0.048 U    | 0.018 U    | 0.02 U     | 0.018 U    | 0.048 U   | 0.048 U   | 0.018 U    | 0.02 U     | 0.018 U    | 0.048 U   | 0.048 U   |
| Fluorene  | 280           | 2800 | 0.24 U     | 0.46 U     | 0.30       | 0.17       | 0.48 U    | 0.48 U    | 0.46 U     | 0.11       | 0.24       | 3.8       | 0.48 U    |
| Phenanthrene  | 210           | 2100 | 0.24 U     | 0.026 U    | 0.02 U     | 0.18       | 0.24 U    | 0.24 U    | 0.032 U    | 0.02 U     | 0.037 U    | 0.24 U    | 0.24 U    |
| <b>Other (mg/L)</b>                                 |               |      |            |            |            |            |           |           |            |            |            |           |           |
| TRPH  | 5             | 50   | 0.16 U     | 0.157 U    | 0.094 J    | 0.46 U     | 0.16 U    | 0.16 U    | 0.157 U    | 0.125 J    | 0.46 U     | 228 J     | 0.17 J    |
| Methane   | NA            | NA   | 0.00094    | 1.0 U      | NS         | NS         | NS        | NS        | NS         | NS         | NS         | NS        | NS        |
| Sulfate   | 250           | NA   | 20.3       | 19.7       | NS         | NS         | NS        | NS        | NS         | NS         | NS         | NS        | NS        |
| Sulfide   | NA            | NA   | 0.6 U      | 0.678 U    | NS         | NS         | NS        | NS        | NS         | NS         | NS         | NS        | NS        |
| Nitrate as N  | 10            | NA   | 1.0        | 1.3        | NS         | NS         | NS        | NS        | NS         | NS         | NS         | NS        | NS        |
| Nitrite   | 1             | NA   | 0.050 U    | 0.330 U    | NS         | NS         | NS        | NS        | NS         | NS         | NS         | NS        | NS        |
| Alkalinity  | NA            | NA   | 104        | 62.8       | NS         | NS         | NS        | NS        | NS         | NS         | NS         | NS        | NS        |
| Dissolved oxygen                                    | NA            | NA   | 1.5        | 0.2        | NS         | NS         | NS        | NS        | NS         | NS         | NS         | NS        | NS        |
| Dissolved carbon dioxide                            | NA            | NA   | 90         | 70         | NS         | NA         | NS        | NS        | NS         | NS         | NS         | NS        | NS        |

**Table 3**  
**Summary of Historical Groundwater Data**

2<sup>nd</sup> Year, 1<sup>st</sup> Semi-Annual Groundwater Monitoring Report  
G82 Wells  
Naval Air Station Cecil Field  
Jacksonville, Florida  
Page 4 of 4

| Parameter   | FDEP Criteria |      | CEF-G82-5S | CEF-G82-6S |            |           |           |         |           |           |
|---|---------------|------|------------|------------|------------|-----------|-----------|---------|-----------|-----------|
|   | GCTL          | NADC |            | 10/23/2009 | 7/28/2008  | Sample    | Duplicate | Sample  | Duplicate | 4/29/2009 |
|   |               |      |            |            | 10/21/2008 | 1/28/2009 |           |         |           |           |
| <b>BTEX/Naphthalene (USEPA Method 8260B) (µg/L)</b> |               |      |            |            |            |           |           |         |           |           |
| Benzene   | 1             | 10   | 0.13 J     | 0.23 U     | 1 U        | 1 U       | 0.4 U     | 0.4 U   | 0.4 U     | 0.12 U    |
| Toluene   | 40            | 400  | 0.14 U     | 0.28 U     | 1 U        | 1 U       | 0.35 U    | 0.35 U  | 0.35 U    | 0.14 U    |
| Ethylbenzene  | 30            | 300  | 0.14 J     | 0.34 U     | 1 U        | 1 U       | 0.43 U    | 0.43 U  | 0.43 U    | 0.10 U    |
| Total Xylenes                                       | 20            | 200  | 0.21 U     | 0.38 U     | 1 U        | 1 U       | 1.2 U     | 1.2 U   | 1.2 U     | 0.21 U    |
| Isopropyl benzene                                   | 0.8           | 8    | 0.44 J     | 0.23 U     | 0.8 U      | 0.8 U     | 0.2 U     | 0.2 U   | 0.2 U     | 0.11 U    |
| 1,2,4-Trimethylbenzene                              | 10            | 100  | 0.14 U     | 0.38 U     | 0.14 U     | 0.14 U    | 0.22 U    | 0.22 U  | 0.22 U    | 0.14 U    |
| 1,3,5-Trimethylbenzene                              | 10            | 100  | 0.10 U     | 0.22 U     | 0.10 U     | 0.10 U    | 0.2 U     | 0.2 U   | 0.2 U     | 0.10 U    |
| <b>PAHs (USEPA Method 8270C SIM) (µg/L)</b>         |               |      |            |            |            |           |           |         |           |           |
| 1-Methylnaphthalene                                 | 28            | 280  | 5.2        | 0.01 U     | 0.031 U    | 0.013 U   | 0.24 U    | 0.24 U  | 0.24 U    | 0.46 U    |
| 2-Methylnaphthalene                                 | 28            | 280  | 2.9        | 0.02 U     | 0.043 U    | 0.016 U   | 0.24 U    | 0.24 U  | 0.24 U    | 0.46 U    |
| Naphthalene   | 14            | 140  | 0.46 U     | 0.35 U     | 1 U        | 1 U       | 1 U       | 1 U     | 1 U       | 0.46 U    |
| Acenaphthene  | 20            | 200  | 0.46 U     | 0.02 U     | 0.012 U    | 0.02 U    | 0.48 U    | 0.48 U  | 0.24 U    | 0.46 U    |
| Acenaphthylene                                      | 210           | 2100 | 0.12 U     | 0.01 U     | 0.028 U    | 0.013 J   | 0.48 U    | 0.48 U  | 0.24 U    | 0.026 U   |
| Benzo(a)pyrene                                      | 0.2           | 2    | 0.018 U    | 0.01 U     | 0.028 U    | 0.022 J   | 0.048 U   | 0.048 U | 0.048 U   | 0.018 U   |
| Benzo(a)anthracene                                  | 0.05          | 5    | 0.018 U    | 0.01 U     | 0.014 U    | 0.043 U   | 0.048 U   | 0.048 U | 0.048 U   | 0.018 U   |
| Dibenz(a,h)anthracene                               | 0.005         | 0.05 | 0.018 U    | 0.02 U     | 0.018 U    | 0.018 U   | 0.048 U   | 0.048 U | 0.048 U   | 0.018 U   |
| Fluorene  | 280           | 2800 | 0.46 U     | 0.01 U     | 0.018 U    | 0.025 U   | 0.48 U    | 0.48 U  | 0.48 U    | 0.46 U    |
| Phenanthrene  | 210           | 2100 | 0.018 U    | 0.06 J     | 0.032 U    | 0.046 U   | 0.24 U    | 0.24 U  | 0.24 U    | 0.056 U   |
| <b>Other (mg/L)</b>                                 |               |      |            |            |            |           |           |         |           |           |
| TRPH  | 5             | 50   | 0.216 J    | 0.035 U    | 0.46 U     | 0.46 U    | 0.16 U    | 0.16 U  | 0.16 U    | 0.157 U   |
| Methane   | NA            | NA   | NS         | NS         | NS         | NS        | NS        | NS      | NS        | NS        |
| Sulfate   | 250           | NA   | NS         | NS         | NS         | NS        | NS        | NS      | NS        | NS        |
| Sulfide   | NA            | NA   | NS         | NS         | NS         | NS        | NS        | NS      | NS        | NS        |
| Nitrate as N  | 10            | NA   | NS         | NS         | NS         | NS        | NS        | NS      | NS        | NS        |
| Nitrite   | 1             | NA   | NS         | NS         | NS         | NS        | NS        | NS      | NS        | NS        |
| Alkalinity  | NA            | NA   | NS         | NS         | NS         | NS        | NS        | NS      | NS        | NS        |
| Dissolved oxygen                                    | NA            | NA   | NS         | NS         | NS         | NS        | NS        | NS      | NS        | NS        |
| Dissolved carbon dioxide                            | NA            | NA   | NS         | NS         | NS         | NS        | NS        | NS      | NS        | NS        |

Notes:

\* = due to laboratory error, the alkalinity could not be laboratory analyzed; therefore, these readings are field-based results.

GCTL = Groundwater Cleanup Target Level.

NADC = Natural Attenuation Default Concentration

J - Estimated value.

U = Not detected at detection limit shown.

Shaded value indicates concentration greater than GCTL.

µg/L = micrograms per liter.

mg/L = Milligrams per liter.

NS = Not sampled.

NA = Not Available.

## FIGURES



**LEGEND**  
 Monitoring Well

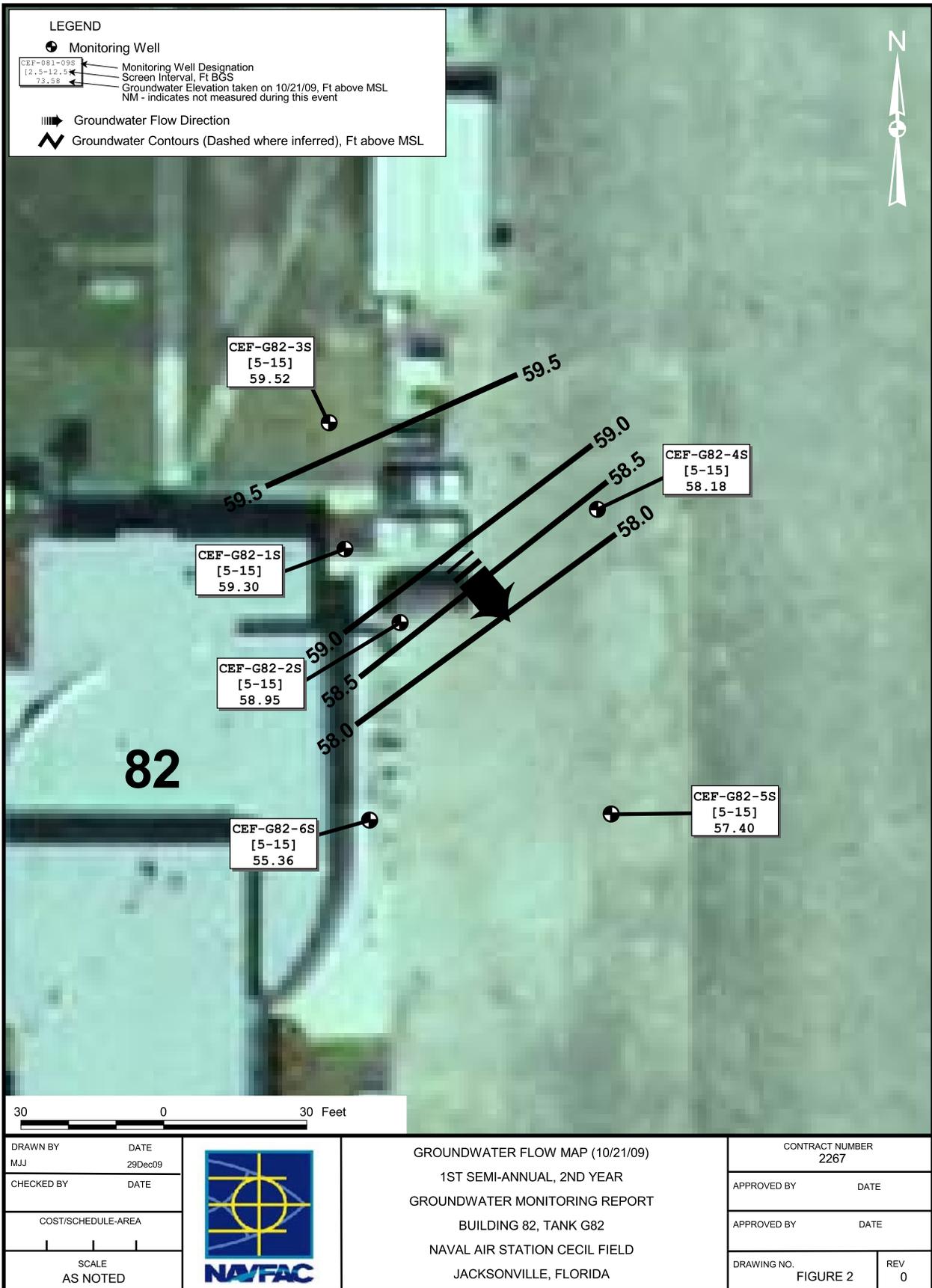


|                    |                 |
|--------------------|-----------------|
| DRAWN BY<br>MJJ    | DATE<br>29Dec09 |
| CHECKED BY         | DATE            |
| COST/SCHEDULE-AREA |                 |
| SCALE<br>AS NOTED  |                 |



MONITORING WELL LOCATION MAP  
 1ST SEMI-ANNUAL, 2ND YEAR  
 GROUNDWATER MONITORING REPORT  
 BUILDING 82, TANK G82  
 NAVAL AIR STATION CECIL FIELD  
 JACKSONVILLE, FLORIDA

|                         |          |
|-------------------------|----------|
| CONTRACT NUMBER<br>2267 |          |
| APPROVED BY             | DATE     |
| APPROVED BY             | DATE     |
| DRAWING NO.<br>FIGURE 1 | REV<br>0 |



|                    |                 |
|--------------------|-----------------|
| DRAWN BY<br>MJJ    | DATE<br>29Dec09 |
| CHECKED BY         | DATE            |
| COST/SCHEDULE-AREA |                 |
| SCALE<br>AS NOTED  |                 |

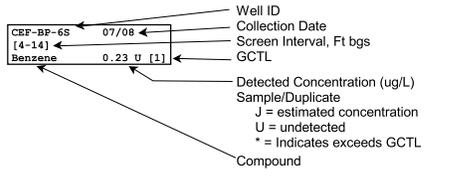


GROUNDWATER FLOW MAP (10/21/09)  
 1ST SEMI-ANNUAL, 2ND YEAR  
 GROUNDWATER MONITORING REPORT  
 BUILDING 82, TANK G82  
 NAVAL AIR STATION CECIL FIELD  
 JACKSONVILLE, FLORIDA

|                         |          |
|-------------------------|----------|
| CONTRACT NUMBER<br>2267 |          |
| APPROVED BY             | DATE     |
| APPROVED BY             | DATE     |
| DRAWING NO.<br>FIGURE 2 | REV<br>0 |

**Legend**

**Monitoring Well**



| CEF-G82-3S<br>[4-14]   | 10/08    | 01/09   | 04/09   | 10/09   |         |
|------------------------|----------|---------|---------|---------|---------|
| Benzene                | 1 U      | 0.4 U   | 0.4 U   | 0.12 U  | [1]     |
| 1-Methylnaphthalene    | 0.0093 U | 0.24 U  | 0.24 U  | 0.46 U  | [28]    |
| 2-Methylnaphthalene    | 0.014 U  | 0.24 U  | 0.24 U  | 0.46 U  | [28]    |
| Naphthalene            | 1.0 U    | 1 U     | 1.0 U   | 0.46 U  | [14]    |
| Isopropyl benzene      | 0.8 U    | 0.2 U   | 0.20 U  | 0.11 U  | [0.8]   |
| 1,2,4-Trimethylbenzene | 0.14 U   | 0.22 U  | 0.22 U  | 0.14 U  | [10]    |
| Dibenzo(a,h)anthracene | 0.0056*  | 0.048 U | 0.048 U | 0.018 U | [0.005] |
| Xylenes                | 1 U      | 1.2 U   | 1.2 U   | 0.21 U  | [20]    |

| CEF-G82-1S<br>[5-15]   | 10/08   | 01/09   | 04/09   | 10/09   |         |
|------------------------|---------|---------|---------|---------|---------|
| Benzene                | 1 U     | 0.4 U   | 0.4 U   | 0.12 U  | [1]     |
| 1-Methylnaphthalene    | 1.5     | 14.7    | 4.9     | 5.8     | [28]    |
| 2-Methylnaphthalene    | 1.2     | 23      | 5.4     | 7.1     | [28]    |
| Naphthalene            | 0.83 J  | 39.9*   | 10.8    | 4.6     | [14]    |
| Isopropyl benzene      | 0.29 J  | 1.4*    | 0.77 J  | 1.2*    | [0.8]   |
| 1,2,4-Trimethylbenzene | 0.31 J  | 11*     | 2.7     | 4.3     | [10]    |
| Dibenzo(a,h)anthracene | 0.018 U | 0.048 U | 0.048 U | 0.018 U | [0.005] |
| Xylenes                | 7.0     | 3.0     | 1.2 U   | 1.5     | [20]    |

| CEF-G82-2S<br>[4-14]   | 10/08   | 01/09   | 04/09           | 10/09            |         |
|------------------------|---------|---------|-----------------|------------------|---------|
| Benzene                | 1 U     | 0.4 U   | 2.2*/2.0*       | 0.97 J/1.0*      | [1]     |
| 1-Methylnaphthalene    | 120*    | 82.6*   | 58.6*/41.5*     | 100*/100*        | [28]    |
| 2-Methylnaphthalene    | 140*    | 97*     | 65.0*/60.3*     | 130*/130*        | [28]    |
| Naphthalene            | 67*     | 115*    | 85.7*/95.3*     | 66*/68*          | [14]    |
| Isopropyl benzene      | 6.3*    | 7.3*    | 7.8*/6.5*       | 9.6*/9.8*        | [0.8]   |
| 1,2,4-Trimethylbenzene | 18*     | 13.3*   | 21.1*/13.7*     | 26*/26*          | [10]    |
| Dibenzo(a,h)anthracene | 0.018 U | 0.048 U | 0.048 U/0.048 U | 0.018 U/0.031 J* | [0.005] |
| Xylenes                | 6.6     | 6.9     | 19.6/13.5       | 24*/25*          | [20]    |

| CEF-G82-4S<br>[5-15]   | 10/08   | 01/09   | 04/09   | 10/09   |         |
|------------------------|---------|---------|---------|---------|---------|
| Benzene                | 1 U     | 0.4 U   | 0.4 U   | 0.12 U  | [1]     |
| 1-Methylnaphthalene    | 0.65    | 0.32 J  | 0.46 J  | 0.71 J  | [28]    |
| 2-Methylnaphthalene    | 0.046 U | 0.24 U  | 0.24 U  | 0.46 U  | [28]    |
| Naphthalene            | 0.33 U  | 1 U     | 1 U     | 0.46 U  | [14]    |
| Isopropyl benzene      | 0.8 U   | 0.20 U  | 0.20 U  | 0.11 U  | [0.8]   |
| 1,2,4-Trimethylbenzene | 0.14 U  | 0.22 U  | 0.22 U  | 0.14 U  | [10]    |
| Dibenzo(a,h)anthracene | 0.018 U | 0.048 U | 0.048 U | 0.018 U | [0.005] |
| Xylenes                | 1 U     | 1.2 U   | 1.2 U   | 0.21 U  | [20]    |

| CEF-G82-2I<br>[30-35]  | 10/08    | 01/09   | 04/09   | 10/09   |         |
|------------------------|----------|---------|---------|---------|---------|
| Benzene                | 1 U      | 0.4 U   | 0.4 U   | 0.12 U  | [1]     |
| 1-Methylnaphthalene    | 0.046 U  | 0.24 U  | 0.24 U  | 0.46 U  | [28]    |
| 2-Methylnaphthalene    | 0.0085 U | 0.24 U  | 0.24 U  | 0.46 U  | [28]    |
| Naphthalene            | 1.0 U    | 1 U     | 1 U     | 0.46 U  | [14]    |
| Isopropyl benzene      | 0.8 U    | 0.2 U   | 0.2 U   | 0.11 U  | [0.88]  |
| 1,2,4-Trimethylbenzene | 0.10 U   | 0.22 U  | 0.22 U  | 0.17 J  | [10]    |
| Dibenzo(a,h)anthracene | 0.018 U  | 0.048 U | 0.048 U | 0.018 U | [0.005] |
| Xylenes                | 1 U      | 1.2 U   | 1.2 U   | 0.21 U  | [20]    |

| CEF-G82-5S<br>[5-15]   | 10/08   | 01/09   | 04/09   | 10/09   |         |
|------------------------|---------|---------|---------|---------|---------|
| Benzene                | 1 U     | 0.4 U   | 0.4 U   | 0.13 J  | [1]     |
| 1-Methylnaphthalene    | 8.5     | 3.7     | 3.4     | 5.2     | [28]    |
| 2-Methylnaphthalene    | 5.7     | 2.7     | 2.3     | 2.9     | [28]    |
| Naphthalene            | 2.1     | 7.8     | 7.8     | 0.46 U  | [14]    |
| Isopropyl benzene      | 0.19 J  | 0.25 J  | 0.2 U   | 0.44 J  | [0.8]   |
| 1,2,4-Trimethylbenzene | 0.14 U  | 0.22 U  | 0.22 U  | 0.14 U  | [10]    |
| Dibenzo(a,h)anthracene | 0.018 U | 0.048 U | 0.048 U | 0.018 U | [0.005] |
| Xylenes                | 1 U     | 1.2 U   | 1.2 U   | 0.21 U  | [20]    |

| CEF-G82-6S<br>[5-15]   | 10/08   | 01/09   | 04/09   | 10/09   |         |
|------------------------|---------|---------|---------|---------|---------|
| Benzene                | 1 U     | 0.4 U   | 0.4 U   | 0.12 U  | [1]     |
| 1-Methylnaphthalene    | 0.031 U | 0.24 U  | 0.24 U  | 0.46 U  | [28]    |
| 2-Methylnaphthalene    | 0.043 U | 0.24 U  | 0.24 U  | 0.46 U  | [28]    |
| Naphthalene            | 1.0 U   | 1 U     | 1 U     | 0.46 U  | [14]    |
| Isopropyl benzene      | 0.8 U   | 0.2 U   | 0.2 U   | 0.11 U  | [0.8]   |
| 1,2,4-Trimethylbenzene | 0.14 U  | 0.22 U  | 0.22 U  | 0.14 U  | [10]    |
| Dibenzo(a,h)anthracene | 0.018 U | 0.048 U | 0.048 U | 0.018 U | [0.005] |
| Xylenes                | 1 U     | 1.2 U   | 1.2 U   | 0.21 U  | [20]    |



|                    |                 |
|--------------------|-----------------|
| DRAWN BY<br>MJJ    | DATE<br>29Dec09 |
| CHECKED BY         | DATE            |
| COST/SCHEDULE-AREA |                 |
| SCALE<br>AS NOTED  |                 |



**ANALYTICAL RESULTS**  
 1ST SEMI-ANNUAL, 2ND YEAR  
**GROUNDWATER MONITORING REPORT**  
 BUILDING 82, TANK G82  
 NAVAL AIR STATION CECIL FIELD  
 JACKSONVILLE, FLORIDA

|                         |          |
|-------------------------|----------|
| CONTRACT NUMBER<br>2267 |          |
| APPROVED BY             | DATE     |
| APPROVED BY             | DATE     |
| DRAWING NO.<br>FIGURE 3 | REV<br>0 |

## REFERENCES

CH2MHill (CH2MHill Constructors, Inc.), 2001. Source Removal Report, Excavation and Disposal of Petroleum Contaminated Soil at Building 82. Naval Air Station Cecil Field, Jacksonville, Florida. Prepared for Naval Facilities Engineering Command, Southeast. March.

CH2MHill, 2008. Natural Attenuation Monitoring Work Plan, Building G-82 (Tank G-82) and BP Wells Sites, Former Naval Air Station Cecil Field, Jacksonville Florida. Prepared for Cecil Field Base Cleanup Team. May.

FDEP (Florida Department of Environmental Protection), 2005. Groundwater Cleanup Target Levels and Soil Cleanup Target Levels. FAC Chapter 62-777. April.

FDEP, 2005. Table V. Natural Attenuation Default Concentrations. FAC Chapter 62-777. April.

TtNUS (Tetra Tech NUS, Inc.), 2000. Site Assessment Report for Building 82, Tank G82. Naval Air Station Cecil Field, Jacksonville, Florida. Prepared for Naval Facilities Engineering Command, Southeast. August.

TtNUS, 2001. Site Assessment Report Addendum for Building 82, Tank G82. Naval Air Station Cecil Field, Jacksonville, Florida. Prepared for Naval Facilities Engineering Command, Southeast. March.

TtNUS, 2002. TRPH Subclassification, Tank G82. Naval Air Station Cecil Field, Jacksonville, Florida. Prepared for Naval Facilities Engineering Command, Southeast. June.

**ATTACHMENT A**  
**NATURAL ATTENUATION MONITORING PLAN**

# Natural Attenuation Monitoring Work Plan, Building G-82 (Tank G-82) and BP Wells Sites, Former Naval Air Station Cecil Field, Jacksonville, Florida

PREPARED FOR: Cecil Field Base Cleanup Team  
PREPARED BY: CH2M HILL Project Team  
DATE: May 29, 2008  
PROJECT NUMBER: 271591

## 1.0 Introduction

This technical memorandum outlines the long-term monitored natural attenuation (MNA) program requirements to be implemented at the Building G-82 (Tank G-82) and the BP Wells Sites at the former Naval Air Station (NAS) Cecil Field, Jacksonville, Florida. Figure 1 shows the location of the sites within NAS Cecil Field.

CH2M HILL Constructors, Inc. (CH2M HILL) conducted a site-wide groundwater sampling event during November 2006. Geochemical data were evaluated to determine if natural attenuation was occurring in groundwater at the two sites and if parameter concentrations were decreasing in response to naturally occurring degradation processes. The evaluation involved comparing geochemical data from source area and downgradient monitoring wells to background values measured in upgradient wells. Based on these results, a long-term monitoring program for natural attenuation parameters was developed for implementation, as described below.

### 1.1 Site Background

The MNA program focuses on the Building G-82 and BP Wells Sites.

#### 1.1.1 Building G-82 Site

The Building G-82 Site comprised an air traffic control tower and underground storage tank (UST) G-82 located at the former NAS Cecil Field in Jacksonville, Florida. Tank G-82 was used to store diesel fuel for emergency generators. Tank G-82 was removed in June 1997. Soil and groundwater have been impacted near the UST as a result of leaks originating from Tank G-82. The leaking tank released an unknown volume of fuel to the environment.

Following the removal of Tank G-82, a piezometer (CEF-G-82-1S, see Figure 2) was installed near the former location of the tank in January 1998. The hydrocarbon compounds 1-methylnaphthalene and 2-methylnaphthalene were detected in groundwater samples collected from CEF-G-82-1S at concentrations that exceeded Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels (GCTLs). In January 1999, Harding Lawson Associates (HLA) performed additional sampling and prepared a

Confirmatory Sampling Report (CSR) recommending the completion of additional site assessment (SA) to determine the extent of hydrocarbons in the soil and groundwater.

Between October 1999 and July 2000, Tetra Tech NUS, Inc. (TtNUS) conducted the SA at Building G-82. Five shallow monitoring wells (CEF-G-82-2S through 6S) and one intermediate monitoring well (CEF-G-82-2I) were installed, and samples were collected to determine the extent of hydrocarbons in the soil and groundwater. TtNUS recommended excavation of 280 cubic yards (yd<sup>3</sup>) of soil that contained volatile organic compounds (VOCs) and polynuclear aromatic hydrocarbons (PAHs) that exceeded FDEP Soil Cleanup Target Levels (SCTLs). Following soil removal, TtNUS recommended MNA as the remedial approach for groundwater.

During 2001, CH2M HILL was contracted by Southern Division Naval Facilities Engineering Command (NAVFAC) to perform the soil excavation work. The objective of the work was to excavate and dispose of the soil exceeding the FDEP SCTLs. Soil removal continued until either headspace readings using an organic vapor analyzer (OVA) were below 10 parts per million (ppm) or predetermined excavation boundaries (foundation boundaries and concrete aircraft apron) were reached. Approximately 148 tons of petroleum-impacted soil was removed. Following completion of the excavation activities, confirmation samples were collected from the north and south excavation walls to verify that remaining soil met the SCTLs. The analytical results from these samples indicated that the north and south excavation extent was complete. However, OVA readings from the east and west excavation walls indicated headspace concentrations exceeded 10 ppm, suggesting petroleum-impacted soil with concentrations above the SCTLs likely remained outside the limits of excavation. However, due to the close proximity of the excavation to the foundation of Building G-82 and the aircraft apron, excavation activities were terminated to prevent potential damage to the infrastructure.

Following the removal action in October 2001, TtNUS performed a supplemental assessment of the site. The results of the supplemental assessment and the associated sampling were presented in the Site Assessment Report Addendum (SARA) (TtNUS, 2001).

As part of the SARA, subsurface soil samples were collected from six locations along Building G-82 and along the flightline apron. These samples were collected outside the excavation area to evaluate residual contamination following the removal action. The samples were collected at a depth of 5 to 6 feet below land surface and were analyzed for VOCs, PAHs, and Total Recoverable Petroleum Hydrocarbons (TRPH). Based on the results of the original six samples, Synthetic Precipitation Leaching Procedure (SPLP) analyses were also performed. The SARA concluded that approximately 49 yd<sup>3</sup> of contaminated soil remained along Building G-82 and the flightline apron. TRPH was present above its SCTLs. Xylenes, naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were detected in the leachate of the SPLP samples at concentrations that exceed their respective GCTLs.

In April, 2002, the Base Realignment and Closure (BRAC) team (BCT) recommended sampling of subsurface soil for the purpose of identifying the TRPH subclassification. Three samples were collected; however, one sample contained TRPH below the SCTLs and was not subclassified. Of the two samples that were analyzed for TRPH hydrocarbon-chain speciation, one sample contained concentrations of one fraction (C12 - C16, aliphatic) that exceeded its subclassification SCTLs. Based on these results, TtNUS recommended a

pilot-scale air sparging treatability study for the site. These findings were presented to the BCT at the May 15, 2002, meeting. The BCT agreed that an air sparging treatability pilot study should be performed.

No action was taken until a site-wide groundwater sampling event in November 2006. The results of the sampling event (discussed in Section 1.2) indicated that natural attenuation was occurring and the concentration of the contaminants of concern had been decreasing in the absence of active remediation.

A technical memorandum presenting the groundwater sampling results was prepared by CH2M HILL and presented to FDEP (CH2M HILL, 2007). A copy of this technical memorandum is included in Attachment 1. During the September 2007 BCT meeting, FDEP agreed that, based on the 2006 site-wide groundwater sampling results, no active remediation, such as air sparging, was needed at the Building G-82 Site.

### 1.1.2 BP Wells Site

The BP Wells Site is located on the north-south flightline, southeast of Building 880, on the west edge of the flightline apron. From 1999 to 2000, assessment activities were performed to determine the extent of hydrocarbons in soil and groundwater beneath the BP Wells Site. A due diligence investigation was conducted by Golder Associates, Inc. (1999) for the new property tenants (Jacksonville Airport Authority and Air Kaman). Four shallow wells (CEF-BP-1S through 4S, and CEF-BP-6S) and one intermediate well (CEF-BP-5I) were installed at the site (Figure 2). The reported results indicated the presence of hydrocarbons in groundwater beneath the site.

Subsequently, the Navy directed TtNUS to conduct an SA. The SA confirmed the presence of contaminated groundwater and identified the groundwater flow direction to the southeast. A Site Assessment Report (SAR) (2000) was submitted to the FDEP recommending that a natural attenuation monitoring plan be implemented at the site. The FDEP approved the plan and issued a Natural Attenuation Monitoring Plan Approval Order (NAMPAO) on August 31, 2000. In accordance with the NAMPAO, TtNUS performed the first two semiannual groundwater sampling events in April and October of 2001. Because the hydrocarbon concentrations at the source well were greater than the applicable natural attenuation default concentrations (NADCs) and because the contaminant concentrations appeared to be increasing, the second monitoring report recommended that the semiannual monitoring program be suspended and that a Remedial Action Plan (RAP) be prepared for the site. On February 20, 2002, the FDEP agreed that a RAP was warranted. Subsequently, TtNUS recommended that a treatability study be performed to evaluate the effectiveness of in-situ enhanced bioremediation at the site. In-situ Submerged Oxygen Curtain (iSOC™) technology was to be evaluated to perform this test. In April 2004, TtNUS submitted an Enhanced Natural Attenuation Treatability Study (ENATS) Work Plan for the BP Wells Site.

Similar to the Building G-82 Site, no action was taken until a site-wide groundwater sampling event was conducted in November 2006. The results of the sampling event, discussed in Section 1.2, indicate that natural attenuation was occurring at the site and the concentration of the contaminants of concern had been decreasing.

### 1.1.3 Remedial Action Objectives

The remedial action objective for the Building G-82 and BP Wells Sites is to achieve cleanup of groundwater contaminant concentrations to levels below the Florida GCTLs with a short-term remedial action objective to achieve reduction of contaminant concentrations to below the Florida NADCs.

## 1.2 Natural Attenuation Monitoring

### 1.2.1 Groundwater Contamination Summary

In November 2006, the following monitoring wells were sampled for contaminant characterization:

- Building G-82 Site: CEF-G82-1S, CEF-G82-2I, CEF-G82-2S, CEF-G82-3S, CEF-G82-4S, CEF-G82-5S, and CEF-G82-6S.
- BP Wells Site: CEF-BP-1S, CEF-BP-2S, CEF-BP-3S, CEF-BP-4S, CEF-BP-5I, and CEF-BP-6S.

Groundwater samples from both sites were analyzed for VOCs (U.S. Environmental Protection Agency [EPA] Method 8260B), PAHs (EPA Method 8310), and TRPH (Florida Petroleum Residual Organic [FL-PRO] Method).

#### *Building G-82 Site*

In November 2006, the following compounds were detected at concentrations exceeding the GCTLs: isopropylbenzene (cumene), naphthalene, and 1-methylnaphthalene in wells CEF-G82-1S and CEF-G82-2S; 2-methylnaphthalene in well CEF-G82-2S; and benzo(a)pyrene and dibenz(a,h)anthracene in well CEF-G82-1S. The benzo(a)pyrene detection of 7.95 micrograms per liter ( $\mu\text{g}/\text{L}$ ) and the dibenz(a,h)anthracene detection of 35.9  $\mu\text{g}/\text{L}$  in well CEF-G82-1S also exceeded NADC criteria of 2  $\mu\text{g}/\text{L}$  and 0.05  $\mu\text{g}/\text{L}$ , respectively.

Only groundwater sampled from wells CEF-G82-1S and CEF-G82-2S contained constituents at levels exceeding GCTLs during the November 2006 sampling event. Groundwater sampled from the surrounding monitoring wells (CEF-G82-3S, CEF-G82-4S, CEF-G82-5S, and CEF-G82-6S) and the well screened below the shallow monitoring wells (CEF-G82-2I) did not contain constituents of concern at elevated levels.

The following parameters were historically detected at concentrations above the GCTLs in well CEF-BP-2S: benzene, ethylbenzene, total xylenes, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene. In general, the concentrations of VOCs (benzene, ethylbenzene, and total xylenes) in well CEF-G82-2S decreased in concentration when compared to previous sampling events, suggesting that biodegradation of these compounds is occurring. Concentrations of the PAH compounds 1-methylnaphthalene, 2-methylnaphthalene, benzo(a)pyrene, and dibenz(a,h)anthracene increased slightly compared to historical results. However, because PAHs are less mobile and tend to be more persistent than VOCs, it is expected that future monitoring will indicate that PAHs decrease over time, similarly to the VOCs, at this site. A summary of the historical analytical results from the Building G-82 Site is presented as the third attachment in Attachment 1.

### ***BP Wells Site***

In November 2006, the following compounds were detected at concentrations exceeding the GCTLs: isopropylbenzene (cumene), ethylbenzene, total xylenes, 1,3,5-trimethylbenzene, and 1,2,4-trimethylbenzene. All exceedances occurred in well CEF-BP-1S; however, one of these detections exceeded NADC criteria. The remaining wells at the BP Wells Site did not show any exceedances of either the GCTLs or NADC criteria.

Comparison of the November 2006 test data with historical sampling data collected in 2003 (2003 data is presented as the second attachment in Attachment 1) indicates that hydrocarbon concentrations in groundwater beneath the BP Wells Site have decreased in concentration.

### **1.2.2 Future Remedial Action**

Future remedial action at the Building G-82 and BP Wells Sites includes long-term monitoring of natural attenuation in groundwater for an initial period of 3 years. Additional monitoring requirements will be evaluated at the end of the third year of monitoring.

## **1.3 Long-Term Monitoring for Natural Attenuation**

### **1.3.1 Objectives**

The objective of long-term monitoring for natural attenuation at the Building G-82 and BP Wells Sites is to collect the physical and chemical data necessary to monitor changes in dissolved hydrocarbon concentrations and verify that conditions continue to be favorable for natural attenuation to occur. Remediation for groundwater will be complete when dissolved hydrocarbon concentrations naturally attenuate to concentration below the Florida GCTLs.

### **1.3.2 Significance of Natural Attenuation Parameters for Long-Term Monitoring**

Monitoring key natural attenuation parameters will help determine if water quality conditions remain favorable for biological degradation of hydrocarbons to occur and if parameter concentrations continue to decrease in response to the degradation processes. The following parameters will be evaluated during each sampling event: dissolved oxygen (DO), Oxidation Reduction Potential (ORP), pH, nitrates/nitrite, sulfate, sulfide, and methane. Groundwater quality in background wells will be compared to wells containing parameters in exceedance of GCTLs. A discussion of the MNA measurements made during the November 2006 sampling event is provided below.

#### ***Dissolved Oxygen (DO)***

DO measurements were made to determine the distribution of DO in groundwater relative to the distribution of dissolved hydrocarbons. In the absence of hydrocarbons, DO concentrations in groundwater typically range from 1.0 to 1.5 milligrams per liter (mg/L) depending on water temperature (i.e., DO concentrations are higher in cold water and lower in warm water). DO is often depleted in groundwater contaminated with hydrocarbons as a result of in-situ biodegradation. Oxygen is consumed and carbon dioxide is produced in the biodegradation process.

In groundwater beneath the Building G-82 Site, DO concentrations ranged from 0.36 mg/L (CEF-G82-2I) to 0.84 mg/L (CEF-G82-5S). The DO concentrations measured in wells CEF-G82-1S, CEF-G82-2I, CEF-G82-2S, CEF-G82-4S, and CEF-G82-6S were below those in the background well CEF-G82-3S. These data suggest that subsurface conditions are

suboptimal for aerobic hydrocarbon biodegradation. However, general reductions in VOC concentrations over time suggest that anaerobic biodegradation of contaminants may be occurring.

DO concentrations at the BP Wells Site ranged from 0.6 mg/L (CEF-BP-1S) to 1.50 mg/L (CEF-BP-3S) as measured using the Chemetrics® field test kits during the November 2006 sampling event. The DO concentration of 0.6 mg/L in well CEF-BP-1S was slightly below the DO measured in the upgradient (background) well CEF-BP-2S at 0.8 mg/L. With the exception of well CEF-BP-1S, which showed slightly elevated VOCs, the DO readings at the site were generally similar to background levels. These data suggest that subsurface conditions are suboptimal for aerobic hydrocarbon biodegradation. However, contaminant concentration reductions suggest that anaerobic biodegradation of contaminants may be occurring.

#### *Oxidation Reduction Potential (ORP)*

ORP is a measure of the relative tendency of ions in solution to transfer electrons. As electron acceptors are utilized, the ORP of the groundwater decreases. As DO is consumed, the ORP will decline and perhaps become negative.

ORP across the BP Wells Site ranged from -126.0 millivolts (mV) to 186.7 mV. Negative ORP levels were measured at only two well locations: CEF-BP-1S (-117.9 mV) and CEF-BP-6S (-126.0 mV). The negative ORP detected in groundwater sampled from these locations suggests that reducing conditions are prevalent in the vicinity of well CEF-BP-1S. This was the only well with parameter concentrations above GCTLs.

ORP across the Building G-82 Site ranged from -127.2 mV to 233.8 mV. ORP levels were similar in wells CEF-G82-1S (-127.2 mV) and CEF-G82-2S (-126.0 mV). These were the only monitoring wells with significantly negative ORP, and they were also the only wells with contaminant concentrations above GCTLs. Similar to the BP Wells Site, these results suggest that reducing conditions are prevalent in the vicinity of the wells showing elevated contaminant concentrations in groundwater.

#### *pH*

The pH of groundwater has an effect on the presence and activity of microbial populations in groundwater. Microbes capable of degrading petroleum hydrocarbons generally prefer pH values varying from 6 to 8 standard units.

At the BP Wells Site, groundwater pH values ranged from 5.13 (CEF-BP-5I) to 6.49 (CEF-BP-1S) with a background value of 6.37 (CEF-BP-2S), generally within the preferred range of values for microbial activity. Further, pH in groundwater sampled from monitoring well CEF-BP-1S, the only well with parameter concentrations above GCTLs, was 6.49.

At the Building G-82 Site, the pH values ranged from 4.97 (CEF-G82-4S) to 6.02 (CEF-G82-2S) with a background value of 5.81 (CEF-G82-3S), indicating that optimal pH conditions for microbial activity were not present at all locations at this site. However, pH values in the vicinity of CEF-G82-1S and CEF-G82-2S (the two wells with contaminant concentrations exceeding GCTLs) were 5.96 and 6.02, respectively, indicating that in this area of the site, pH is generally within the range optimal for microbial activity.

### *Nitrates/Nitrite*

After DO has been depleted, biodegradation of hydrocarbons may continue anaerobically using total nitrate/nitrite as electron acceptors (denitrification). Nitrate/nitrite concentrations will be lower in the wells containing hydrocarbons (such as benzene, toluene, ethylbenzene, and xylenes [BTEX]), if biodegradation is occurring. Nitrate and nitrite were detected in seven of the eight monitoring wells in which the parameters were analyzed.

At the BP Wells Site, nitrate and nitrite were detected in three of the four monitoring wells in which the parameter was analyzed. The nitrate and nitrite concentrations, ranging from non-detect to 561 µg/L in the downgradient wells, were lower than the concentration of the background well CEF-BP-2S (733 µg/L). No nitrate/nitrite was detected in groundwater sampled from CEF-BP-1S, the only monitoring well with contaminant concentrations exceeding GCTLs, suggesting that reducing conditions are favorable for denitrification in this area.

At the Building G-82 Site, the nitrate and nitrite concentrations ranging from 44 to 66 µg/L in the downgradient wells were similar to the concentration in background well CEF-G82-3S (72 µg/L). The presence of nitrate and nitrite in the areas of impacted groundwater suggests that conditions are unfavorable for denitrification..

### *Sulfate/Sulfide*

After DO and total nitrogen have been depleted in the aquifer, sulfate may be used as an electron acceptor for anaerobic biodegradation. This process is termed sulfate reduction, and results in the production of sulfide. Portions of the hydrocarbon plume undergoing anaerobic biodegradation may have depleted sulfate concentrations and caused elevated sulfide concentrations. Sulfate reducing conditions are favorable at redox potentials of -200 mV and pH of 7.

Sulfate was detected in each of the four wells that were monitored for the parameter at the BP Wells Site. The concentrations of sulfate were higher in the downgradient wells than in the background well. The presence of sulfate in the areas of impacted groundwater at concentrations higher than background and low sulfide concentrations suggest that conditions favorable for sulfate reduction are not present.

Sulfate was detected in two of the four wells that were monitored for the parameter at the Building G-82 Site. The concentrations of sulfate were lower in the downgradient wells than the background well. Sulfate was not present in groundwater sampled from CEF-G82-1S, (the area of highest levels of contaminants of concern) and was detected at levels below those detected in the background sample in groundwater sampled from CEF-G82-2S (the only other site monitoring well to contain contaminants at levels exceeding GCTLs); additionally, sulfide was detected in groundwater sampled from CEF-G82-1S and CEF-G82-2S at levels exceeding those detected in the background sample. The absence or limited presence of sulfate in the areas of impacted groundwater at concentrations lower than background, coupled with the presence of sulfide at concentrations higher than background, suggests that subsurface conditions at the site may be favorable for sulfate reduction in these areas.

### *Methane*

The presence of methane in groundwater at concentrations above background is a good indicator that methanogenesis is occurring. During methanogenesis, carbon dioxide is used as an electron acceptor and methane is formed. The presence of methane in groundwater is also indicative of strong reducing conditions.

Dissolved methane was detected in three of the four wells analyzed at the BP Wells Site. The concentration of methane exceeded background concentrations in wells CEF-BP-1S, CEF-BP-5I, and CEF-BP-6S. The presence of methane above background concentrations may be indicative of anaerobic microbial degradation of hydrocarbons occurring at the site.

Dissolved methane was detected in each of the four wells analyzed at the Building G-82 Site. The concentration of methane exceeded background (estimated 1.63 µg/L) significantly in wells CEF-G82-1S (1,340 µg/L) and CEF-G82-2S (estimated 680 µg/L), suggesting anaerobic microbial degradation of hydrocarbons is occurring in these source areas.

## 2.0 Sampling and Analysis Plan for Natural Attenuation Monitoring

This section describes the sampling procedures that will be followed during execution of the work scope. Analytical methods, data quality objectives, protocol for equipment decontamination, and procedures used for the collection of samples for waste characterization are discussed in this section.

### 2.1 Sampling Objectives

The objective of long-term monitoring for natural attenuation at the Building G-82 and BP Wells Sites is to collect the physical and chemical data necessary to monitor changes in dissolved hydrocarbon concentrations and verify that conditions continue to be favorable for natural attenuation to occur. Remediation for groundwater will be complete when dissolved hydrocarbon concentrations naturally attenuate to concentration below the Florida GCTLs. In order to achieve these objectives, the following tasks will be performed:

- Measure water levels quarterly to obtain the data required to prepare potentiometric surface maps and to evaluate fluctuations in groundwater elevation.
- Collect the following water quality measurements from 13 wells (CEF-BP-1S, CEF-BP-2S, CEF-BP-3S, CEF-BP-4S, CEF-BP-5I, CEF-BP-6S, CEF-G82-1S, CEF-G82-2I, CEF-G82-2S, CEF-G82-3S, CEF-G82-4S, CEF-G82-5S, and CEF-G82-6S) during the well purging process to evaluate the physical parameters of the aquifer: pH, conductivity, turbidity, DO, ORP, and temperature.
- Collect groundwater samples from 13 wells (CEF-BP-1S, CEF-BP-2S, CEF-BP-3S, CEF-BP-4S, CEF-BP-5I, CEF-BP-6S, CEF-G82-1S, CEF-G82-2I, CEF-G82-2S, CEF-G82-3S, CEF-G82-4S, CEF-G82-5S, and CEF-G82-6S) for the analysis of BTEX and naphthalene by EPA Method 8260B, PAHs (16 PAHs including both 1-methylnaphthalene and 2-methylnaphthalene) by EPA Method 8270SIM, and TPH by the FL-PRO Method.
- Collect groundwater samples from eight wells (CEF-BP-1S, CEF-BP-2S, CEF-BP-5I, CEF-BP-6S, CEF-G82-1S, CEF-G82-2I, CEF-G82-2S, and CEF-G82-3S) for the analysis of sulfate/sulfide, alkalinity, nitrate/nitrite, and methane.

Details regarding completion of these tasks are described below.

### 2.2 Monitoring Well Network

The following eight wells will be analyzed for the MNA parameters: dissolved methane (Method RSK 175), nitrate/nitrite and sulfate (EPA Method 300.0), and sulfide (Method SM4500-S<sub>2</sub> F):

- BP Wells Site: CEF-BP-1S, CEF-BP-2S, CEF-BP-5I, and CEF-BP-6S.
- Building G-82 Site: CEF-G82-1S, CEF-G82-2I, CEF-G82-2S, and CEF-G82-3S.

The following 13 wells will be analyzed for BTEX and naphthalene by EPA Method 8260B, PAHs (including 1-methylnaphthalene and 2-methylnaphthalene) by EPA Method 8270SIM, and TRPH by the FL-PRO Method:

- BP Wells Site: CEF-BP-1S, CEF-BP-2S, CEF-BP-3S, CEF-BP-4S, CEF-BP-5I, and CEF-BP-6S.
- Building G-82 Site: CEF-G82-1S, CEF-G82-2I, CEF-G82-2S, CEF-G82-3S, CEF-G82-4S, CEF-G82-5S, and CEF-G82-6S.

Requirements for sample collection, preservation, and analysis are listed in Table 1.

### 2.3 Frequency of Monitoring

Based on discussions during the January 2008 NASCF BCT Meeting, groundwater will be monitored on a quarterly basis for the first year of long-term monitoring for the Building G-82 Site and on a semiannually basis for the BP Wells Site. During the second year, semiannual groundwater will be performed at both sites. During the third year, annual groundwater monitoring will performed at both sites. After the completion of the third year of monitoring, the natural attenuation progress will be evaluated to determine if additional monitoring is necessary.

### 2.4 Data Quality Levels for Measurement Data

The samples will be collected in accordance with the EPA Region IV Field Branches Quality System and Technical Procedures, November 2007, and the FDEP Standard Operating Procedures (SOPs).

The sampling team will be qualified under the Navy Installation Restoration Chemical Data Quality Manual (IRCDQM), 1999 sampling requirements. A Navy-, U.S. Army Corps of Engineers (USACE)-, or Air Force Center for Engineering and the Environment (AFCEE)- and FDEP-approved laboratory will be used for all sample analyses.

TABLE 1  
 Requirements for Sample Collection, Preservation, and Analysis

| Sample Task                 | Sample Point   | Matrix | Sampling Frequency (Note 1)  | Approx Sample No                                 | Sampling Method | Sampling Equipment | TAT     | DQO Level/ Data Package Reqmnt | Required Analysis                      | Analytical Method | Holding Time                    | Sample Preservation                              | Containers          |
|-----------------------------|--|--------|--|--|-----------------|--------------------|---------|--------------------------------|--|-------------------|---------------------------------|--|---------------------|
| <b>Groundwater Sampling</b> |  |        |  |  |                 |                    |         |                                |  |                   |                                 |  |                     |
| Groundwater Sampling        | Monitoring Wells (6 wells – BP Wells Site; 7 wells – Bldg G-82 Site) | Water  | 1 <sup>st</sup> & 3 <sup>rd</sup> Quarter – 1 <sup>st</sup> yr;<br>Semiannually 2 <sup>nd</sup> yr;<br>Annually 3 <sup>rd</sup> yr | 13 + 2 DUP + 1 MS/MSD = 17 (per event); 85 total | Grab            | Hand Bailer        | 14 days | DQO Level IV,<br>CCI Level C   | BTEX and naphthalene                   | 8260B             | 14 days                         | HCl pH< 2;<br>Cool to 4°C                        | (2) 40 mL vials     |
|                             | Monitoring Wells (7 wells – Bldg G-82 Site)                          |        | 2 <sup>nd</sup> & 4 <sup>th</sup> Quarter – 1 <sup>st</sup> yr;  | 7 + 1 DUP + 1 MS/MSD = 10; 20 total              |                 |                    |         |                                | PAH including 1- & 2-methylnaphthalene | 8270SIM           | 7 days ext;<br>40-days analysis | Cool to 4°C                                      | (2) 1-L amber glass |
|                             |  |        |  |  |                 |                    |         |                                | TRPH                                   | FL-PRO            | 7 days ext;<br>40-days analysis | HCl pH< 2;<br>Cool to 4°C                        | (2) 1-L amber glass |
|                             | Monitoring Wells (4 wells – BP Wells Site; 4 wells – Bldg G-82 Site) | Water  | 1 <sup>st</sup> & 3 <sup>rd</sup> Quarter – 1 yr;<br>Semiannually 2 <sup>nd</sup> yr;<br>Annually 3 <sup>rd</sup> yr               | 8 + 1 DUP + 1 MS/MSD = 11 (per event) – 55 total | Grab            | Hand Bailer        | 14 days |                                | Sulfate                                | 300.0 / 300.1     | 28 days                         | Cool to 4°C                                      | (1) 500-mL plastic  |
|                             | Monitoring Wells (4 wells – Bldg G-82 Site)                          |        | 2 <sup>nd</sup> & 4 <sup>th</sup> Quarter – 1 <sup>st</sup> yr;  | 4 + 1 DUP + 1 MS/MSD = 7; 14 total               |                 |                    |         |                                | Sulfide                                | SM 4500-S2-F      | 7 days                          | Cool to 4°C,<br>pH>9 w/NaOH;<br>add Zinc Acetate | (1) 1000-mL plastic |
|                             |  |        |  |  |                 |                    |         |                                | Nitrate                                | 300.0             | 48 hours                        | Cool to 4°C                                      | (1) 500-mL plastic  |
|                             |  |        |  |  |                 |                    |         |                                | Nitrite                                | 300.0             | 48 hours                        | Cool to 4°C                                      | (1) 500-mL plastic  |
|                             |  |        |  |  |                 |                    |         |                                | Methane                                | RSK-175           | 14 days                         | Cool to 4°C, pH <2 w/HCl, no headspace           | (2) 40 mL vials     |

TABLE 1  
 Requirements for Sample Collection, Preservation, and Analysis

| Sample Task   | Sample Point                            | Matrix | Sampling Frequency (Note 1)              | Approx Sample No | Sampling Method   | Sampling Equipment            | TAT     | DQO Level/ Data Package Reqmnt | Required Analysis                      | Analytical Method | Holding Time                 | Sample Preservation                        | Containers          |
|---|---|--------|--|------------------|-------------------|-------------------------------|---------|--------------------------------|--|-------------------|------------------------------|--|---------------------|
|   | Equipment Rinsate Blank                 | Water  | 1 per 10% of sampling                    | 1 per event      | Prepared in Field | Analyte-free water, SS funnel | 14 days |                                | BTEX and naphthalene                   | 8260B             | 14 days                      | HCl pH< 2; Cool to 4°C                     | (2) 40 mL vials     |
|   |   |        |  |                  |                   |                               |         |                                | PAH including 1- & 2-methylnaphthalene | 8270SIM           | 7 days ext; 40-days analysis | Cool to 4°C                                | (2) 1-L amber glass |
|   |   |        |  |                  |                   |                               |         |                                | TRPH                                   | FL-PRO            | 7 days ext; 40-days analysis | HCl pH< 2; Cool to 4°C                     | (2) 1-L amber glass |
|   |   |        |  |                  |                   |                               |         |                                | Sulfate                                | 300.0 / 300.1     | 28 days                      | Cool to 4°C                                | (1) 500-mL plastic  |
|   |   |        |  |                  |                   |                               |         |                                | Sulfide                                | SM 4500-S2-F      | 7 days                       | Cool to 4°C, pH>9 w/NaOH; add Zinc Acetate | (1) 1000-mL plastic |
|   |   |        |  |                  |                   |                               |         |                                | Nitrate                                | 300.0 / 300.1     | 48 hours                     | Cool to 4°C                                | (1) 500-mL plastic  |
|   |   |        |  |                  |                   |                               |         |                                | Nitrite                                | 300.0 / 300.1     | 48 hours                     | Cool to 4°C                                | (1) 500-mL plastic  |
|   |   |        |  |                  |                   |                               |         |                                | Methane                                | RSK-175           | 14 days                      | Cool to 4°C, pH <2 w/HCl, no headspace     | (2) 40 mL vials     |
|   | Trip Blank                              | Water  | 1 per cooler containing volatile samples | 7                | Prepared by Lab   | N/A                           | 14 days |                                | BTEX and naphthalene                   | 8260B             | 14 days                      | HCl pH< 2; Cool to 4°C                     | (2) 40 mL vials     |
| <b>Waste Characterization Sampling</b>                            |   |        |  |                  |                   |                               |         |                                |  |                   |                              |  |                     |
| Disposal of Liquid Waste from well development, purge water, etc. | 55-gallon drums containing liquid waste | Water  | One per event                            | 7                | Grab              | Drum thief or dip jar         | 7 days  | DQO Level III, CCI Level B     | TCL Volatiles                          | 8260B             | 14 days                      | HCl pH< 2; Cool to 4°C                     | (2) 40 ml vial      |
|   |   |        |  |                  |                   |                               |         |                                | TCL Semi-volatiles                     | 8270C             | 7 days ext; 40-days analysis | Cool to 4°C                                | (2) 1-L amber glass |

TABLE 1  
 Requirements for Sample Collection, Preservation, and Analysis

| Sample Task | Sample Point | Matrix | Sampling Frequency (Note 1) | Approx Sample No | Sampling Method | Sampling Equipment | TAT | DQO Level/ Data Package Reqmnt | Required Analysis | Analytical Method | Holding Time                 | Sample Preservation                 | Containers          |
|-------------|--------------|--------|-----------------------------|------------------|-----------------|--------------------|-----|--------------------------------|-------------------|-------------------|------------------------------|-------------------------------------|---------------------|
|             |              |        |                             |                  |                 |                    |     |                                | TCL Pesticides    | 8081A             | 7 days ext; 40-days analysis |                                     | (2) 1-L amber glass |
|             |              |        |                             |                  |                 |                    |     |                                | Herbicides        | 8151A             | 7 days ext; 40-days analysis |                                     | (2) 1-L amber glass |
|             |              |        |                             |                  |                 |                    |     |                                | PCBs              | 8082              | 7 days ext; 40-days analysis |                                     | (2) 1-L amber glass |
|             |              |        |                             |                  |                 |                    |     |                                | TAL Metals        | 6010B/7470 A      | 180 days; Hg = 28 days       | HNO <sub>3</sub> pH< 2; Cool to 4°C | (1) 500ml HDPE      |
|             |              |        |                             |                  |                 |                    |     |                                | Ignitability      | 1010A/1030        | ASAP                         | Cool to 4°C                         | (1) 500ml HDPE      |
|             |              |        |                             |                  |                 |                    |     |                                | Corrosivity       | 9040B             | ASAP                         |                                     |                     |

Note 1: BTEX + Naphthalene, PAHs, TRPH, and MNA parameters will be collected from wells at both sites during the 1<sup>st</sup> and 3<sup>rd</sup> quarterly events in the first year; during both semiannual events in the second year; and annually during the 3<sup>rd</sup> year. Only the wells at the Building G-82 Site will be collected for these parameters during the 2<sup>nd</sup> and 4<sup>th</sup> quarterly events in the first year.

DQO – Data Quality Objective  
 MS/MSD – Matrix Spike/Matrix Spike Duplicate  
 PCBs – polychlorinated biphenyls  
 TAL – Target Analyte List  
 TCL – Target Compound List

## 2.5 Groundwater Sampling and Analyses

Samples will be collected from all BP Wells Site and Building G-82 Site wells and analyzed for BTEX and naphthalene, PAHs, and TRPH. In addition, samples will be collected from four wells at each site (eight total) for MNA analyses. Groundwater samples will be collected following the EPA's procedures for low-flow groundwater sampling. The procedure outlined below is based on the EPA's report entitled, "Ground Water Issue: Low-Flow (Minimal-Drawdown) Ground-Water Sampling Procedures," (EPA, 1996) and is as follows:

1. Slowly lower the decontaminated pump or pump intake to the middle of the screened interval to minimize excessive mixing of the stagnant water in the casing above the screen with water within screened zone and to minimize re-suspension of solids that may have accumulated at the bottom of the well.
2. Once the pump is positioned in the well, an airtight flow-through cell (equipped with a YSI-type water quality meter) will be connected to the water discharge line.
3. A water level meter will then be lowered into the well to monitor changes in water level during pumping. Once purging begins, water level measurements will be monitored, and pumping rates will be adjusted so that the rate is between 0.1 to 0.3 liter per minute (L/min) to maintain minimal drawdown.
4. While purging, field parameters (DO, pH, temperature, conductivity, salinity, turbidity, and ORP) will be measured every 3 to 5 minutes using a YSI-type meter and will be recorded until all parameters have stabilized for 3 consecutive readings. Once field parameter stabilization is achieved, the sample bottles will be filled.
5. Water samples will be collected by directing the groundwater discharge stream from the pump so that it runs down the inside of the sample bottle with a minimum amount of splashing. To minimize VOC loss, samples to be analyzed for BTEX and naphthalene will be collected first, followed by the analyses for PAHs, TRPH, sulfate/sulfide, alkalinity, nitrate/nitrite, total organic carbon, and ferrous iron. The sample bottles for each analysis are as follows:
  - BTEX and naphthalene by EPA Method 8260B: Three 40-milliliter (mL) volatile organic analytic (VOA) vials containing a hydrochloric acid (HCl) preservative. Fill bottles so there is no headspace within the bottles.
  - PAHs by EPA Method 8270SIM: Two 1-liter amber bottles. Fill to the top of the bottle.
  - TRPH by the FL-PRO Method: Two 1-liter amber bottles containing either hydrochloric acid (HCl) or sulfuric acid (H<sub>2</sub>SO<sub>4</sub>) preservative. Fill to the top of the bottle.
  - Sulfide by Method SM 4500S<sub>2</sub>-F: One 1,000-mL bottle containing sodium hydroxide (NaOH) and zinc acetate preservative for sulfide. Fill to the top of each bottle.
  - Nitrate, nitrite, and sulfate by EPA Method 300.0: One 1000-mL plastic bottle. Fill to the top of the bottle.

- Methane by RSK-175: Two 40-mL VOA vials or amber glass bottle containing either HCl preservative. Fill with no headspace.
6. Cap each bottle and affix label to the bottle. Label information will include laboratory, project name and number, sample identification, station identification, preservative, analysis, sampler's initials, sample date, and time. Place samples in appropriate containers and pack with ice in coolers.

Requirements for sample collection, preservation, and analysis are listed in Table 1. Samples will be delivered to the laboratory as soon as possible to allow the samples to be analyzed within the specified holding times. Requirements for quality assurance/quality control (QA/QC) samples are listed in Table 1.

Residual purge water collected during sampling will be transferred to a 55-gallon drum and will be characterized in accordance with this Sampling and Analysis Plan and disposed of based on the results of sampling analyses.

## 2.6 Waste Characterization and Incidental Waste Stream Sampling and Analyses

Waste characterization samples will be collected to evaluate the handling and treatment and disposal requirements of accumulated decontamination water and purge water. Water characterization samples will be collected from containment drums prior to disposal. One composite sample (and one grab for VOC analysis) will be collected per event. Water samples will be collected as follows and analyzed for the parameters listed in Table 1:

1. Use a bailer or dip jar and collect a water sample from its containment.
2. Fill the sample containers for volatile analyses first (grab sample). The 40-mL vials will be filled so that there is no headspace in each vial.
3. Then fill the sample containers for the remaining analyses.
4. Label and package the samples for shipment to the laboratory.

## 2.7 Equipment Decontamination

Sampling methods and equipment have been selected to minimize decontamination requirements and the possibility of cross-contamination. The following procedure will be used for all sampling equipment used to collect routine samples undergoing trace organic or inorganic analyses.

Reusable sampling equipment will be decontaminated before the initial sample is collected and between sampling locations using the following procedure:

1. Clean with potable water and Alconox® or equivalent laboratory grade detergent using a brush, if necessary, to remove particulate matter and surface films.
2. Rinse thoroughly with potable water.
3. Rinse thoroughly with analyte-free water.
4. Rinse thoroughly with isopropanol (pesticide-grade). Do not rinse polyvinyl chloride or plastic items with isopropanol.

5. Rinse thoroughly with organic/analyte-free water.
6. Allow equipment to air dry completely.

## 2.8 Sample Documentation

Sampling documentation will include the following:

- Numbered Chain-of-Custody Forms
- Sample log book, which includes the following information:
  - Name of laboratories and contacts to which the samples were sent, turnaround time requested, and data results, when possible
  - Termination of a sample point or parameter and reasons
  - Unusual appearance or odor of a sample
  - Measurements, volume of flow, temperature, and weather conditions
  - Details of QC samples obtained
  - Field analytical equipment, and equipment utilized to make physical measurements
  - Calculations, results, and calibration data for field sampling, field analytical, and field physical measurement equipment
  - Sampling station identification
  - Date and time of sample collection
  - Sampler(s)' name(s) and company
  - How the sample was collected
  - Weather conditions that may affect the sample (e.g., rain, extreme heat or cold, wind, etc.)
- Sample Labels
- Custody Seals

## 2.9 Field Quality Control

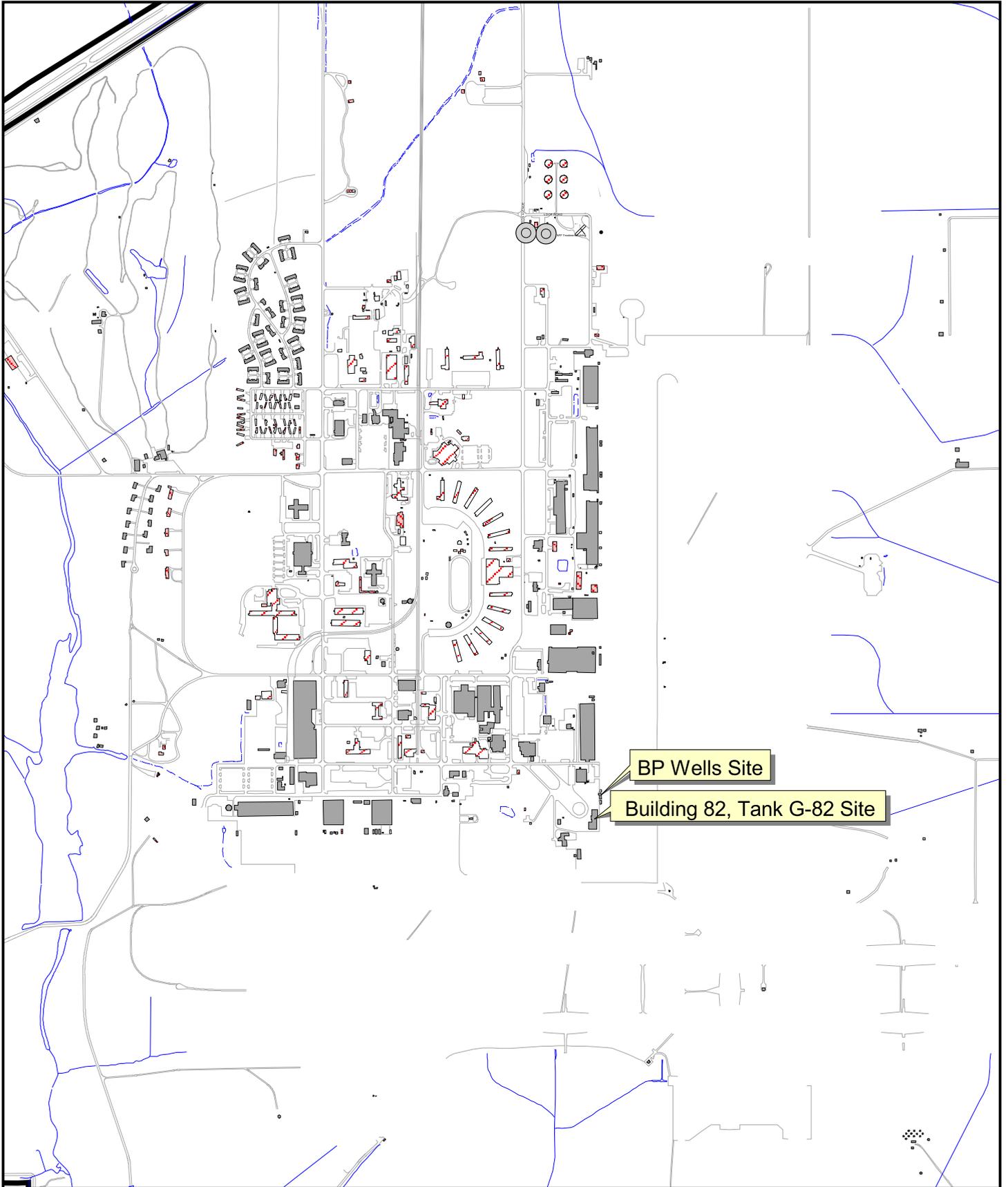
Field duplicate samples and equipment blank samples will be collected at a minimum frequency of 10 percent times the total number of samples (rounded to nearest whole number) collected for an analysis. One trip blank sample will be provided at a frequency of one per sample cooler containing volatile samples. MS/MSDs will be required at a frequency of one per sample event or a minimum of 5 percent of the total number (rounded to nearest whole number) of samples collected for an analysis. QC samples are not required for waste characterization. Quantity and frequency are detailed in Table 1.

## 2.10 Reporting

A report will be compiled at the completion of each of the monitoring events. Each performance monitoring report will include a description of the field sampling event, field data, updated potentiometric surface maps, validated analytical data from the monitoring event, a discussion of the MNA parameters, and charts showing trends of contaminants of concern concentrations over the period of the MNA long-term monitoring.

# Figures

NOTE: Original figure created in color



BP Wells Site

Building 82, Tank G-82 Site

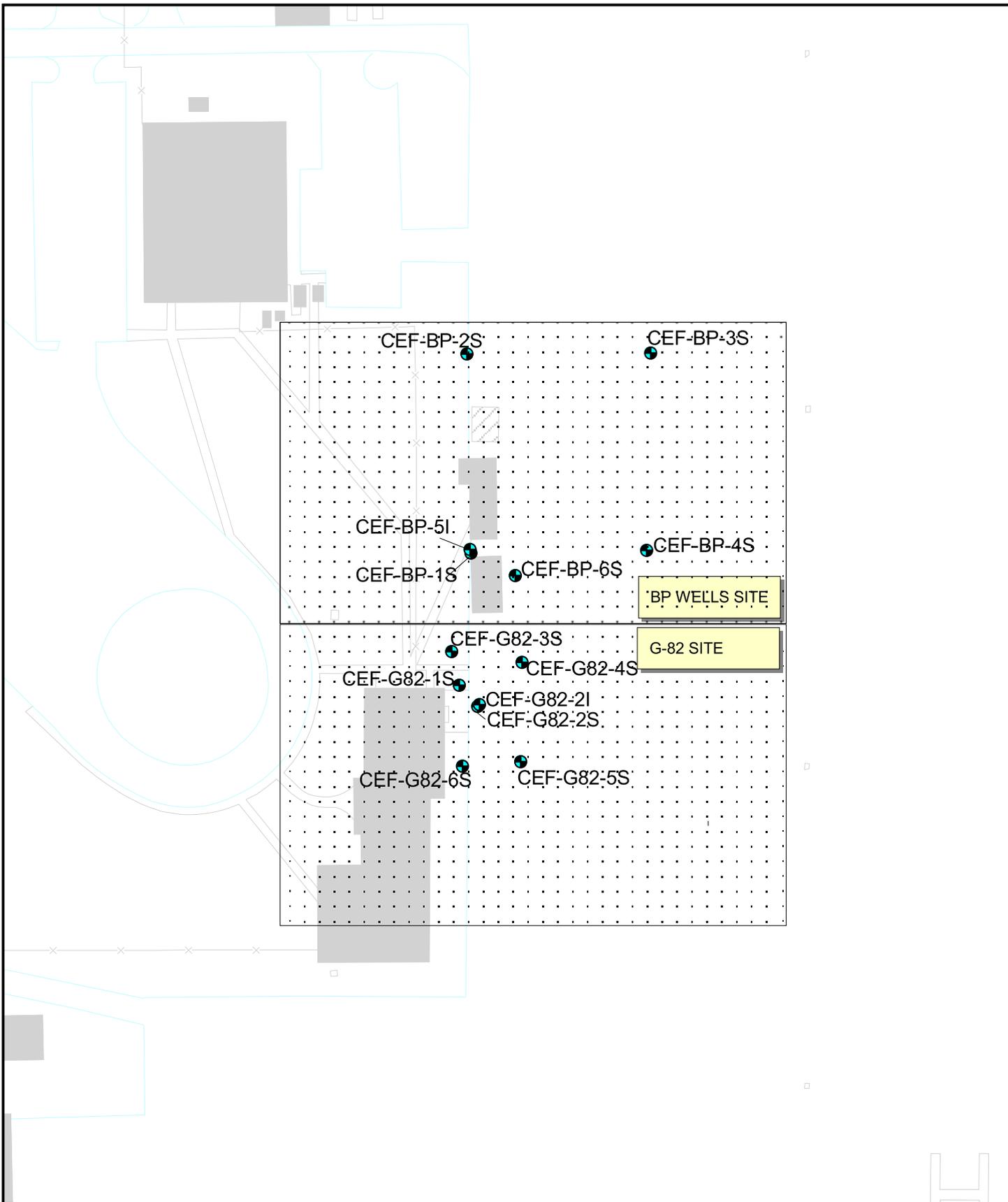


0 1000 2000 Feet

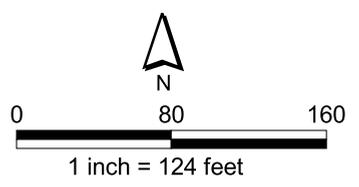
1 inch = 1376.99 feet

**Figure 1**  
Site Location  
Bldg. G-82 and BP Wells Sites  
Former NAS Cecil Field, Jacksonville, FL

**CH2MHILL**



**Figure 2**  
 Locations of Groundwater Monitoring Wells  
 Building G-82 and BP Wells Sites  
 Former NAS Cecil Field, Jacksonville, FL



# Attachment 1

2007 CH2M HILL Technical Memorandum

# Evaluation of Groundwater Analytical Results from BP Wells Site and Building 82 (Tank G82) Former Naval Air Station Cecil Field, Jacksonville, Florida

PREPARED FOR: Mark Davidson/BRAC PMO-SE  
David Grabka/FDEP

PREPARED BY: David Beverly/CH2M HILL

COPIES: Sam Naik/CH2M HILL  
CTO 0086 Project File

DATE: April 27, 2007

## 1.0 Introduction

This technical memorandum summarizes the findings from the sitewide groundwater monitoring conducted by CH2M HILL Constructors, Inc. (CH2M HILL) at the BP Wells Site and Building 82 Site (Tank G-82) at the former Naval Air Station (NAS) Cecil Field, Jacksonville, Florida. This site-wide groundwater monitoring effort was conducted to assess current groundwater quality conditions and to evaluate whether natural attenuation of site contaminants is occurring at these two sites. This work was conducted based on the methodology described in the *Work Plan Addendum No. 18, CTO 86, NAS Cecil Field, Jacksonville, Florida* (CH2M HILL, November 2006).

## 2.0 Groundwater Monitoring

Figure 1 shows the locations of the BP Wells site and the Building G-82 site. Figure 2 shows the locations of the monitoring wells at these two sites.

The following monitoring wells at the BP well site and the Building G-82 Site were sampled in November 2006 for contaminant characterization:

- **BP Wells Site:** CEF-BP-1S, CEF-BP -2S, CEF-BP -3S, CEF-BP -4S, CEF-BP -5I, and -6S
- **Building G82 Site:** CEF-G82-1S, CEF-G82 -2I, CEF-G82-2S, CEF-G82-3S, CEF-G82-4S, CEF-G82-5I, and CEF-G82-6S

The groundwater samples from both sites were analyzed for the following parameters: volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method 8260B, polycyclic aromatic hydrocarbons (PAHs) by EPA Method 8310, and total recoverable petroleum hydrocarbons (TRPH) by the Florida Petroleum Residual Organic (FL PRO) method. The analytical results of these samples are summarized in Table 1.

The following groundwater monitoring wells were sampled for the monitored natural attenuation (MNA) parameters:

- **BP Wells Site:** CEF-BP-1S, CEF-BP -2S, CEF-BP -5I, and CEF-BP -6S
- **Building G82 Site:** CEF-G82-1S, CEF-G82-2I, CEF-G82-2S, and CEF-G82-3S

The groundwater samples were analyzed for the following MNA parameters: dissolved methane by EPA Method 8315, nitrate and nitrite by EPA Method 353.2, sulfate by EPA Method 375.4, sulfide by EPA Method 376.2, total organic carbon (TOC) by EPA Method 415.1 and total inorganic carbon (TIC) by EPA Method 415.1. The MNA groundwater analytical results are summarized in Table 2.

The groundwater in each monitoring well was tested in the field for pH, conductivity, turbidity, dissolved oxygen (DO), oxidation reducing potential (ORP) and temperature, as part of the sampling protocol. The results of the field tests are included in Table 2. The analytical laboratory and data validation reports for the groundwater sampling event are included in Attachment 1.

## 3.0 Summary of Findings from Groundwater Sampling

### 3.1 Contaminant Characterization Sampling Results

#### BP Wells Site

The following parameters were detected concentrations above the Florida Groundwater Cleanup Target Levels (GCTLs) during the November 2006 sampling event: isopropylbenzene (cumene), ethylbenzene, total xylenes, 1,3,5-trimethylbenzene, and 1,2,4-trimethylbenzene. All reported exceedances were in well CEF-BP-1S. None of these detections exceeded the Florida Natural Attenuation Default Concentration (NADC) criteria. The remaining wells at the BP Wells site did not show any exceedances of either the GCTLs or NADC criteria.

A summary of the 2003 historical analytical results from the BP Well Site is included in Attachment 2. The following parameters were detected historically at concentrations above the GCTLs in well CEF-BP-1S: ethylbenzene, total xylenes, 1,3,5-trimethylbenzene, and 1,2,4-trimethylbenzene. In general, these site groundwater constituents at the BP Wells Site have decreased in concentrations when compared to the previous sampling events conducted during 2003.

#### Building G-82 Site

The following parameters were detected at concentrations above the GCTLs during the November 2006 monitoring well sampling event: isopropylbenzene (cumene), naphthalene and 1-methylnaphthalene in wells CEF-G82-1S and CEF-G82-2S; 2-methylnaphthalene in well CEF-G82-2S; and benzo(a)pyrene and dibenz(a,h)anthracene in well CEF-G82-1S. The benzo(a)pyrene detection of 7.95 micrograms per liter ( $\mu\text{g}/\text{L}$ ) and the dibenz(a,h)anthracene detection of 35.9  $\mu\text{g}/\text{L}$  in well CEF-G82-1S also exceeded NADC standards of 2  $\mu\text{g}/\text{L}$  and 0.05  $\mu\text{g}/\text{L}$ , respectively.

A summary of the historical analytical results from the Building 82 Site is presented in Attachment 3. No parameters were detected historically at concentrations above the GCTLs in well CEF-G82-1S. The following parameters were historically detected at concentrations above the GCTLs in well CEF-BP-2S: benzene, ethylbenzene, total xylenes, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene. In general, the concentrations of VOCs (benzene, ethylbenzene, and total xylenes) in well CEF-G82-2S from the November 2006 sampling event decreased in concentrations when compared to the previous sampling events. However, the concentrations of PAHs 1-methylnaphthalene, 2-methylnaphthalene, benzo(a)pyrene and dibenz(a,h)anthracene increased slightly when compared with historical results.

## 3.2 MNA Analytical Results

Geochemical data were evaluated to determine if natural attenuation is continuing to occur in groundwater at the two sites and if parameter concentrations are decreasing in response to naturally-occurring degradation processes. The evaluation involves comparing geochemical data from source area and downgradient monitoring wells to background values measured in upgradient wells. The parameters evaluated included DO, ORP, pH, nitrate and nitrite, sulfate and sulfide, and dissolved methane. A discussion of the results of each parameter is presented below.

### 3.2.1 BP Wells Site

#### Dissolved Oxygen

DO measurements were recorded in each monitoring well during the November 2006 groundwater sampling event. Typically, DO concentrations below 1.0 milligram per liter (mg/L) indicate conditions are anoxic and a reducing environment is present. DO concentrations at the BP Wells Site ranged from 0.6 mg/L (CEF-BP-1S) to 1.50 mg/L (CEF-BP-3S) as measured using the Chemetrics® field test kits. The DO concentration of 0.6 mg/L in well CEF-BP-1S was slightly below the DO measured in the upgradient (background) well CEF-BP-2S at 0.8 mg/L. With the exception of well CEF-BP-1S, which showed slightly elevated VOCs, the DO readings at the site are generally similar to background levels. These data suggest that subsurface conditions are suboptimal for aerobic hydrocarbon biodegradation. However, contaminant concentration reductions indicate that anaerobic biodegradation of contaminants could be occurring.

#### Oxidation/Reduction Potential (Redox potential)

Redox potential is a measure of the relative tendency of ions in solution to transfer electrons. As electron acceptors are utilized, the redox potential of the groundwater decreases. As DO is consumed, the redox potential will decline and become negative. Redox potentials across the BP Well Site ranged from -126 millivolts (mV) to 186.7 mV. The lowest redox level was measured in CEF BP-6S. Negative redox potentials were also measured in source area monitoring well CEF-BP-1S, which suggests that reducing conditions are favorable for biodegradation in the vicinity of CEF-BP-1S. This is the only well with parameter concentrations above GCTLs.

## pH

The pH of groundwater has an effect on the presence and activity of microbial populations in groundwater. Microbes capable of degrading petroleum hydrocarbons generally prefer pH values varying from 6 to 8 standard units. The pH values range from 5.13 (CEF-BP-5I) to 6.49 (CEF-BP-1S) with a background value of 6.37 (CEF-BP-2S), generally within the preferred range of values for microbial activity.

## Nitrate/Nitrite

After DO has been depleted, biodegradation of hydrocarbons may continue anaerobically using total nitrate and nitrite as electron acceptors (denitrification). Nitrate and nitrite concentrations will be lower in the wells containing hydrocarbons if biodegradation is occurring. Nitrate and nitrite were detected in three of the four monitoring wells in which the parameter was analyzed. The nitrate and nitrite concentrations, ranging from non-detect to 561 ug/L in the downgradient wells, were lower than the concentrations of the background well CEF-BP-2S (733 ug/L). The presence of nitrate/nitrite in the areas of impacted groundwater suggests that reducing conditions favorable for denitrification are not present.

## Sulfate/Sulfide

After DO and total nitrogen have been depleted in the aquifer, sulfate may be used as an electron acceptor for anaerobic biodegradation. This process is termed sulfate reduction and results in the production of sulfide. Portions of the plume containing hydrocarbons and undergoing anaerobic biodegradation may have depleted the sulfate concentrations and elevated the sulfide concentrations. Sulfate reducing conditions are favorable at redox potentials of -200 mV and pH of 7. Sulfate was detected in each of the four wells that were monitored for the parameter. The concentrations of sulfate were higher in the downgradient wells than in the background well. The presence of sulfate in the areas of impacted groundwater at concentrations higher than background and low sulfide concentrations suggest that conditions favorable for sulfate reduction are not present.

## Dissolved Methane

The presence of methane in groundwater at concentrations above background is a good indicator that methanogenesis is occurring. During methanogenesis, carbon dioxide is used as an electron acceptor and methane is formed. The presence of methane in groundwater is indicative of strong reducing conditions. Methane was detected in three of the four wells analyzed. The concentration of methane exceeded background concentrations in wells CEF-BP-1S, CEF-BP-5I, and CEF-BP-6S. The presence of methane above background concentrations may be indicative of anaerobic microbial degradation of hydrocarbons occurring at the site.

### 3.2.2 Building G-82 Site

#### Dissolved Oxygen

DO concentrations in groundwater at the Building G-82 site ranged from 0.36 mg/L (in well CEF-G82-2I) to 0.84 mg/L (in well CEF-G82-5S). The DO concentrations measured in wells CEF-G82-1S, CEF-G82-2I, CEF-G82-2S, CEF-G82-4S, and CEF-G82-6S were below those in

the background well CEF-G82-3S. These data suggest that subsurface conditions are suboptimal for aerobic hydrocarbon biodegradation. However, general reductions in VOC concentrations over time indicate that biological degradation of contaminants is occurring.

### **Oxidation/Reduction Potential**

Redox potentials across the Building G-82 Site ranged from -127.2 mV to 233.8 mV. The lowest redox level was measured in well CEF-G82-2S at -127.2 mV. Significantly negative redox potentials were measured only in monitoring wells CEF-G82-1S and CEF-G82-2I, suggesting that reducing conditions are prevalent in the vicinity of these wells, which are the only wells with contaminant concentrations above GCTLs.

### **pH**

The pH of groundwater has an effect on the presence and activity of microbial populations in groundwater. Microbes capable of degrading petroleum hydrocarbons generally prefer pH values varying from 6 to 8 standard units. The pH values range from 4.97 (CEF-G82-4S) to 6.02 (CEF-G82-2S) with a background value of 5.81 (CEF-G82-3S), indicating that optimal pH conditions for microbial activity are not present at all locations at this site.

### **Nitrate/Nitrite**

Nitrate and nitrite were detected in each of the four monitoring wells in which the parameter was analyzed. The nitrate and nitrite concentrations ranging from 44 to 66 ug/L in the downgradient wells were similar to the concentration in background well CEF-G82-3S (72 ug/L). The presence of nitrate and nitrite in the areas of impacted groundwater suggests that reducing conditions favorable for denitrification are not present.

### **Sulfate/Sulfide**

Sulfate was detected in two of the four wells that were monitored for the parameter. The concentrations of sulfate were lower in the downgradient wells than the background well. The presence of sulfate in the areas of impacted groundwater at concentrations higher than background suggests that subsurface conditions at the site may not be favorable for sulfate reduction.

### **Dissolved Methane**

Dissolved methane was detected in each of the four wells analyzed. The concentration of methane exceeded background in wells CEF-G82-1S, CEF-G82-2I, and CEF-G82-2S. Because methane is not present in gasoline or diesel fuel, the presence of methane above background concentrations may be indicative of anaerobic microbial degradation of hydrocarbons.

## **4.0 Conclusions**

At the BP Wells Site, the following parameters were detected at concentrations above the GCTLs during the November 2006 sampling event: isopropylbenzene (cumene), ethylbenzene, total xylenes, 1,3,5-trimethylbenzene, and 1,2,4-trimethylebenzene in well CEF-BP-1S. Contaminant concentrations exceeded the GCTLs at only one monitoring well (CEF-BP-1S). Based on the laboratory analytical results, site contaminant concentrations in remaining wells at the BP Well site did not exceed GCTLs, and none of the detected

concentrations at this site exceed the NADC criteria. In general, the November 2006 site groundwater contaminant concentrations at the BP Wells site have decreased when compared to the historical sampling events. The MNA sampling data indicate that anaerobic degradation processes may be prevalent at the site.

Based on the analytical results, the residual groundwater contamination at this site appears to remain localized around the source area well CEF-BP-1S and does not appear to have migrated downgradient since the last sampling event in October 2003. Additionally, the impervious paved surface at the site acts as a barrier against the infiltration of precipitation, thus reducing the contaminant migration potential.

At the Building G-82 Site, the following parameters were detected at concentrations above the GCTLs during the well November 2006 sampling event: isopropylbenzene (cumene), naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, benzo(a)pyrene and dibenz(a,h)-anthracene. Only the dibenz(a,h)anthracene detection in well CEF-G82-1S exceeded the NADC criteria.

In summary, the concentrations of VOCs (benzene, ethylbenzene, and xylenes) in the source area well CEF-G82-2S have decreased in concentrations when compared to the previous sampling events, and the concentrations of PAHs have remained similar in CEF-G82-2S and increased slightly in well CEF-G82-1S, when compared to the historical results.

The single NADC exceedance in the source well CEF-G82-1S of dibenz(a,h)anthracene and the appearance of benzo(a)pyrene (two compounds which were not previously detected at the site above laboratory detection limits) appear to be anomalous. The PAH concentrations in CEF-G82-1S should be monitored further to establish concentration trends over time.

# Tables

**TABLE 1**  
Groundwater Analytical Results  
Bldg. G82 and BP Site Groundwater

| Parameter                             | Station ID        |         | BP WELL SITE   |               |               |               |               |               | Building 82 Tank G82 Site |                |                |                |                |                |                |                |                |
|---------------------------------------|-------------------|---------|----------------|---------------|---------------|---------------|---------------|---------------|---------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                                       | Sample ID         |         | CEF-BP-1S      | CEF-BP-2S     | CEF-BP-3S     | CEF-BP-4S     |               | CEF-BP-5I     | CEF-BP-6S                 | CEF-G82-1S     | CEF-G82-2I     |                | CEF-G82-2S     | CEF-G82-3S     | CEF-G82-4S     | CEF-G82-5S     | CEF-G82-6S     |
|                                       | Sample Date       |         | 86BP1SW061108  | 86BP2SW061107 | 86BP3SW061102 | 86BP4SW061102 | 86BPDPW061102 | 86BP5IW061107 | 86BP6SW061108             | 86G821SW061108 | 86G822IW061106 | 86G82DPW061106 | 86G822SW061106 | 86G823SW061106 | 86G824SW061102 | 86G825SW061102 | 86G826SW061102 |
|                                       | GCTL <sup>1</sup> | NADC    | 11/8/2006      | 11/7/2006     | 11/2/2006     | 11/2/2006     | 11/2/2006     | 11/7/2006     | 11/8/2006                 | 11/8/2006      | 11/6/2006      | 11/6/2006      | 11/6/2006      | 11/6/2006      | 11/2/2006      | 11/2/2006      | 11/2/2006      |
| <b>SW8260B</b>                        | Units in ug/L     |         |                |               |               |               |               |               |                           |                |                |                |                |                |                |                |                |
| 1,1,2-trichloro-1,2,2-trifluoroethane | 210000            | 2100000 | 1.15 J         | 5 U           | 5 U           | 5 U           | 5 U           | 5 U           | 5 U                       | 5 U            | 5 U            | 5 U            | 5 U            | 5 U            | 5 U            | 5 U            | 5 U            |
| 1,2,4-Trichlorobenzene                | 70                | 700     | 3.34 JB        | 5 U           | 5 U           | 5 U           | 5 U           | 5 U           | 3.39 JB                   | 3.44 JB        | 1.08 J         | 5 U            | 5 U            | 5 U            | 3.55 J         | 3.57 J         | 5 U            |
| 1,2,4-Trimethylbenzene                | 10                | 100     | <b>60.8 JB</b> | 5 U           | 0.201 J       | 5 U           | 5 U           | 5 U           |                           |                |                |                |                |                |                |                |                |
| 1,3,5-Trimethylbenzene (Mesitylene)   | 10                | 100     | <b>19 JB</b>   | 5 U           | 0.224 J       | 5 U           | 5 U           | 5 U           |                           |                |                |                |                |                |                |                |                |
| 1,2-Dichlorobenzene                   | 600               | 6000    | 5 UJ           | 5 U           | 0.277 J       | 5 U           | 5 U           | 5 U           | 5 UJ                      | 5 UJ           | 5 U            | 0.35 J         | 5 U            | 5 UJ           | 5 U            | 5 U            | 5 U            |
| 1,3-Dichlorobenzene                   | 210               | 2100    | 5 U            | 5 U           | 0.25 JB       | 5 U           | 5 U           | 5 U           | 5 U                       | 5 U            | 5 U            | 5 U            | 5 U            | 5 U            | 5 U            | 5 U            | 5 U            |
| Acetone                               | 6300              | 63000   | 5.42 JB        | 89            | 25 UJ         | 25 UJ         | 25 UJ         | 25 U          | 25 JB                     | 32.8 JB        | 3.25 J         | 6.72 B         | 18 J           | 15.9 B         | 7.38 JB        | 17.1 JB        | 25 U           |
| Benzene                               | 1                 | 10      | 5 U            | 5 U           | 5 U           | 5 U           | 5 U           | 5 U           | 5 U                       | 5 U            | 5 U            | 0.447 J        | 5 U            | 5 U            | 5 U            | 5 U            | 5 U            |
| Bromomethane                          | 9.8               | 98      | 5 U            | 5 UJ          | 5 U           | 5 U           | 5 U           | 5 UJ          | 0.924 JB                  | 5 U            | 5 UJ           | 0.74 B         | 5 UJ           | 0.926 B        | 5 U            | 5 U            | 5 U            |
| cyclohexane                           | NE                | NE      | 5.74           | 5 U           | 5 U           | 5 U           | 5 U           | 5 U           | 5 U                       | 3.97 J         | 5 U            | 5 U            | 2.62 J         | 5 U            | 5 U            | 5 U            | 5 U            |
| Ethylbenzene                          | 30                | 300     | <b>53.1</b>    | 5 U           | 5 U           | 5 U           | 5 U           | 5 U           | 0.458 J                   | 6.21           | 5 U            | 5 U            | 11.1           | 5 U            | 0.433 J        | 5 U            | 5 U            |
| Isopropylbenzene (Cumene)             | 0.8               | 8       | <b>5.61</b>    | 5 U           | 0.179 J       | 5 U           | 5 U           | 5 U           | 5 U                       | <b>3.66 J</b>  | 5 U            | 5 U            | <b>4.02 J</b>  | 5 U            | 5 U            | 5 U            | 5 U            |
| methylcyclohexane                     | NE                | NE      | 9.53           | 5 U           | 0.173 J       | 5 U           | 5 U           | 5 U           | 3.95 J                    | 4.04 J         | 5 U            | 5 U            | 3.23 J         | 5 U            | 5 U            | 5 U            | 5 U            |
| Methylene chloride                    | 5                 | 50      | 10 U           | 10 U          | 1.74 JB       | 1.58 JB       | 1.46 JB       | 10 U          | 10 U                      | 10 U           | 10 U           | 10 U           | 10 U           | 10 U           | 10 U           | 10 U           | 10 U           |
| Tetrachloroethene (PCE)               | 3                 | 30      | 5 UJ           | 5 U           | 0.406 J       | 0.233 J       | 5 U           | 5 U           | 5 UJ                      | 5 UJ           | 5 U            | 5 UJ           | 5 U            | 5 UJ           | 5 U            | 5 U            | 5 U            |
| Toluene                               | 40                | 400     | 3.16 J         | 5 U           | 5 U           | 5 U           | 5 U           | 5 U           | 5 U                       | 5 U            | 5 U            | 5 U            | 5 U            | 5 U            | 5 U            | 5 U            | 5 U            |
| Xylenes, total                        | 20                | 200     | <b>101 J</b>   | 10 U          | 0.61 J        | 10 U          | 10 U          | 10 U          | 10 UJ                     | 12.1 J         | 10 U           | 10 UJ          | 5.89 J         | 10 UJ          | 10 U           | 10 U           | 10 U           |
| <b>SW8310</b>                         |                   |         |                |               |               |               |               |               |                           |                |                |                |                |                |                |                |                |
| 1-methylnaphthalene                   | 28                | 280     | 8.66 J         | 1 U           | 1 U           | 1 U           | 1 U           | 1 U           | 1 U                       | <b>48.8</b>    | 1 U            | 1 U            | <b>138 J</b>   | 1 U            | 6.11 J         | 1 U            | 1 U            |
| 2-Methylnaphthalene                   | 28                | 280     | 1 U            | 1 U           | 1 U           | 1 U           | 1 U           | 1 U           | 1 U                       | 5 U            | 1 U            | 1 U            | <b>65.9 J</b>  | 1 U            | 1 U            | 1 U            | 1 U            |
| Acenaphthylene                        | 210               | 2100    | 1 U            | 1 U           | 1 U           | 1 U           | 1 U           | 1 U           | 1 U                       | 5 U            | 1 U            | 1 U            | 5.54 J         | 1 U            | 1 U            | 1 U            | 1 U            |
| Benzo(a)pyrene                        | 0.2               | 2       | 0.1 U          | 0.1 U         | 0.1 U         | 0.1 U         | 0.1 U         | 0.1 U         | 0.1 U                     | <b>7.95 J</b>  | 0.1 U          | 0.1 U          | 1 U            | 0.1 U          | 0.1 U          | 0.1 U          | 0.1 U          |
| Dibenz(a,h)anthracene                 | 0.005             | 0.05    | 0.1 U          | 0.1 U         | 0.1 U         | 0.1 U         | 0.1 U         | 0.1 U         | 0.1 U                     | <b>35.9 J</b>  | 0.1 U          | 0.1 U          | 1 U            | 0.1 U          | 0.1 U          | 0.1 U          | 0.1 U          |
| Fluorene                              | 280               | 2800    | 0.5 U          | 0.5 U         | 0.5 U         | 0.5 U         | 0.5 U         | 0.5 U         | 0.5 U                     | 2.51 J         | 0.5 U          | 0.5 U          | 3.98 J         | 0.5 U          | 0.5 U          | 0.5 U          | 0.5 U          |
| Naphthalene                           | 14                | 140     | 6.47           | 0.5 U                     | <b>40.7 J</b>  | 0.5 U          | 0.5 U          | <b>56.5 J</b>  | 0.5 U          | 0.5 U          | 0.5 U          | 0.5 U          |
| <b>FLPRO</b>                          |                   |         |                |               |               |               |               |               |                           |                |                |                |                |                |                |                |                |
| Petroleum hydrocarbons                | 5000              | 50000   | 459 B          | 126 B         | 86.4 B        | 112 B         | 114 B         | 69 JB         | 133 B                     | 613 B          | 59 JB          | 59 JB          | 878 JB         | 54 JB          | 202 B          | 274 B          | 86 B           |

Notes:  
All concentrations reported in micrograms per liter (ug/L).  
GCTL - Groundwater Cleanup Target Level  
NADC - Natural Attenuation Default Concentration  
1 = Ch 62-777 FAC GCTLs reported in ug/L  
U - The analyte was analyzed for, but not detected.  
J - Result is estimated  
UJ- Value non-detect, estimated.  
JB- Estimated value; the analyte was detected in the associated method and/or calibration blank.  
NE - Not Established at time of rule adoption  
Bold indicates concentration exceeds GCTL.  
Shaded indicates concentration exceeds NADC.

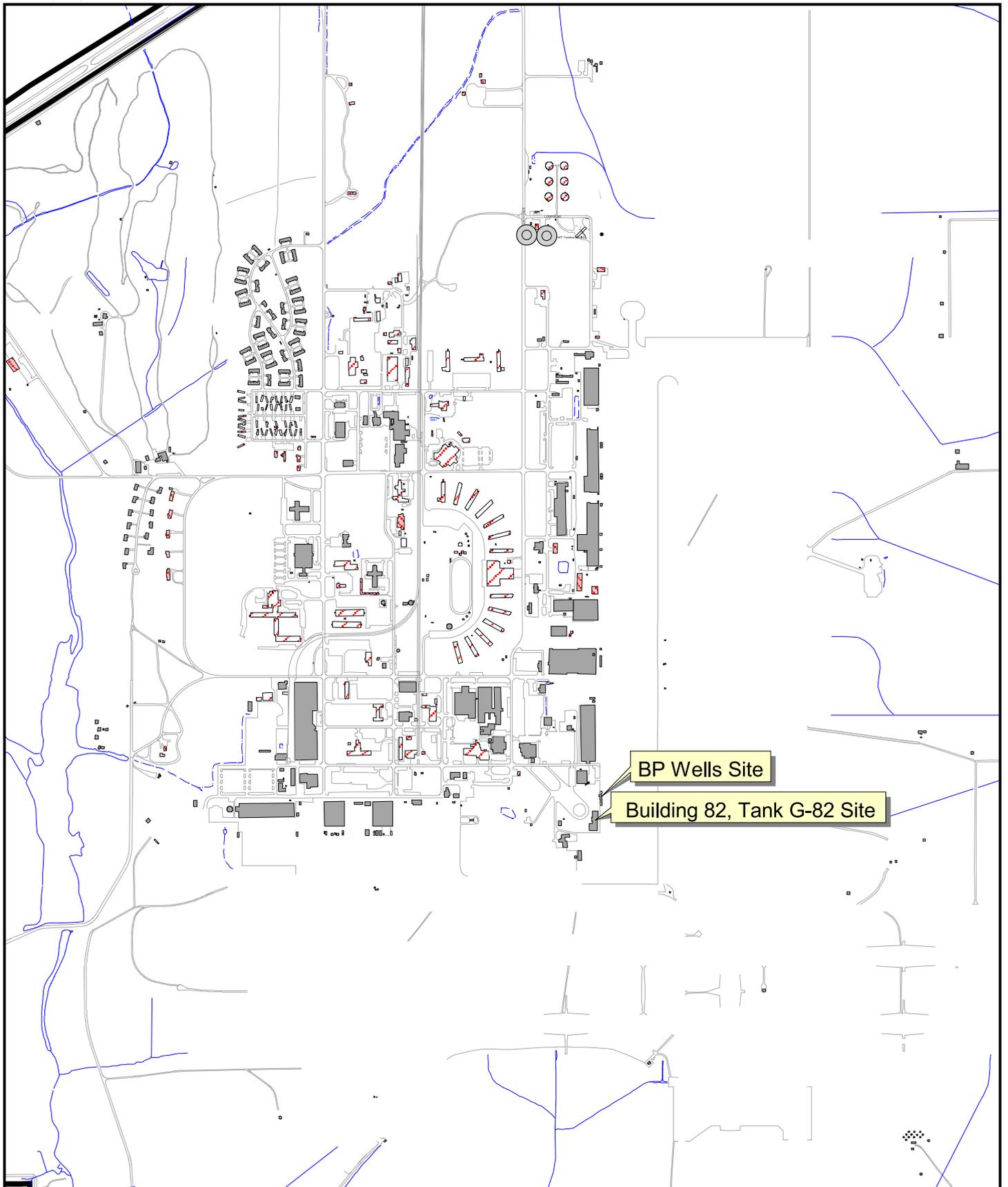
**TABLE 2**  
MNA Parameter Results  
Bldg. G82 and BP Site Groundwater

| Station ID<br><br>Sample ID<br><br>Sample Date | CEF-BP-1S     | CEF-BP-2S     | CEF-BP-3S     | CEF-BP-4S     |               | CEF-BP-5I     | CEF-BP-6S     | CEF-G82-1S     | CEF-G82-2I     |                | CEF-G82-2S     | CEF-G82-3S     | CEF-G82-4S     | CEF-G82-5S     | CEF-G82-6S     |
|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|  | 86BP1SW061108 | 86BP2SW061107 | 86BP3SW061102 | 86BP4SW061102 | 86BPDPW061102 | 86BP5IW061107 | 86BP6SW061108 | 86G821SW061108 | 86G822IW061106 | 86G82DPW061106 | 86G822SW061106 | 86G823SW061106 | 86G824SW061102 | 86G825SW061102 | 86G826SW061102 |
|  | 11/8/2006     | 11/7/2006     | 11/2/2006     | 11/2/2006     | 11/2/2006     | 11/7/2006     | 11/8/2006     | 11/8/2006      | 11/6/2006      | 11/6/2006      | 11/6/2006      | 11/6/2006      | 11/2/2006      | 11/2/2006      | 11/2/2006      |
| Parameter                                      | Units in ug/L |               |               |               |               |               |               |                |                |                |                |                |                |                |                |
| Nitrogen, nitrate (as n)                       | 10 U          | 709 B         | NA            | NA            | NA            | 561 B         | 10 U          | 10 U           | 10 U           | 10 U           | 36             | 65             | NA             | NA             | NA             |
| Nitrogen, nitrite                              | 10 U          | 24            | NA            | NA            | NA            | 10 U          | 3 J           | 44             | 66             | 59             | 18             | 7 J            | NA             | NA             | NA             |
| Sulfate (as SO4)                               | 6300          | 4200 J        | NA            | NA            | NA            | 10400         | 8600          | 5000 U         | 5000 J         | 5400           | 6800           | 31600          | NA             | NA             | NA             |
| <b>E376.1</b>                                  |               |               |               |               |               |               |               |                |                |                |                |                |                |                |                |
| Sulfide  | 4000 U        | 1600 J        | NA            | NA            | NA            | 3200 J        | 4000 U        | 8000           | 3200 JB        | 3200 JB        | 5200 JB        | 2800 JB        | NA             | NA             | NA             |
| <b>E415.1</b>                                  |               |               |               |               |               |               |               |                |                |                |                |                |                |                |                |
| Total Inorganic Carbon                         | 9400          | 6000          | NA            | NA            | NA            | 24600         | 6800          | 6500           | 9600 JB        | 8400 JB        | 24900 JB       | 20000 JB       | NA             | NA             | NA             |
| Total organic carbon                           | 9000          | 2300          | NA            | NA            | NA            | 1000 U        | 8100          | 16700          | 910 J          | 1100           | 9900           | 7700           | NA             | NA             | NA             |
| <b>RSK-175</b>                                 |               |               |               |               |               |               |               |                |                |                |                |                |                |                |                |
| Methane  | 7.8           | 2 U           | NA            | NA            | NA            | 1.26 J        | 1230          | 1340           | 2.27 JB        | 2.09 JB        | 680 JB         | 1.63 JB        | NA             | NA             | NA             |
| <b>Field Parameters</b>                        |               |               |               |               |               |               |               |                |                |                |                |                |                |                |                |
| pH   | 6.49          | 6.37          | 6.24          | 6.43          | 6.43          | 5.13          | 5.96          | 5.96           | 5.08           | 5.08           | 6.02           | 5.81           | 4.97           | 5.25           | 5              |
| Cond. (mmhos/cm)                               | 399           | 199           | 176           | 248           | 248           | 87            | 210           | 210            | 54             | 54             | 262            | 265            | 93             | 129            | 97             |
| Dissolved Oxygen (mg/L) Field                  | 0.3           | 0.53          | 1.97          | 0.69          | 0.69          | 1.07          | 0.37          | 0.37           | 0.36           | 0.36           | 0.51           | 0.78           | 0.64           | 0.84           | 0.65           |
| Dissolved Oxygen (mg/L) Chemets                | 0.6           | 0.8           | 1.5           | 1             | 1             | 1             | 0.8           | 0.6            | 0.3            | 0.3            | 0.6            | 0.8            | 0.6            | 1              | 1              |
| Dissolved Oxygen (mg/L) Hach                   | NA             | NA             | NA             | NA             | NA             | NA             | 0.8            | 1              |
| ORP (mV)                                       | -117.9        | 129.9         | 186.7         | 76.5          | 76.5          | 261           | -126          | -126           | -7             | -7             | -127.2         | 200.4          | 99.4           | 69.7           | 233.8          |
| Temp. (°C)                                     | 24.4          | 25.5          | 28.5          | 28.2          | 28.2          | 23.79         | 23.28         | 23.2           | 23.6           | 23.6           | 24.5           | 24.4           | 28.5           | 26.9           | 24.5           |
| Turbidity (NTUs)                               | 0.33          | 7.6           | 7.57          | 29.7          | 29.7          | 0.73          | 3.67          | 61.7           | 99.3           | 99.3           | 21.1           | 3.92           | 4.3            | 5.83           | 24             |

J - Result is estimated.  
UJ- Value non-detect, estimated.  
JB- Estimated value; the analyte was detected in the associated method and/or calibration blank.  
mS/cm = millisiemens per centimeter  
NTU = nephelometric turbidity units  
mg/L = milligrams per liter  
°C = degrees Celsius  
ORP = oxygen reducing potential  
mV = millivolts  
NA - Not analyzed

# Figures

NOTE: Original figure created in color



BP Wells Site

Building 82, Tank G-82 Site

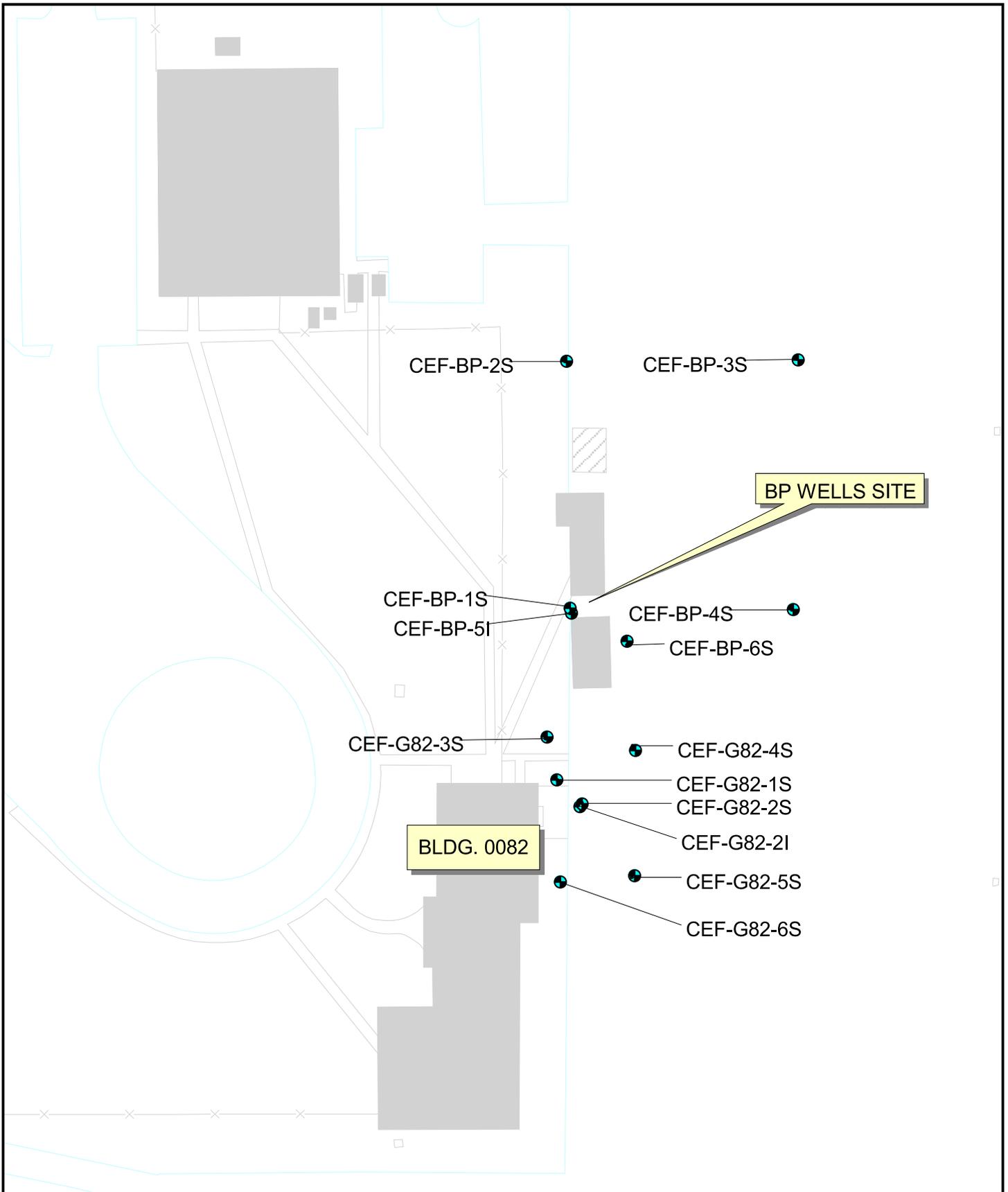


0 1000 2000 Feet

1 inch = 1376.99 feet

**Figure 1**  
Site Location  
Bldg. G-82 and BP Wells Sites  
Former NAS Cecil Field, Jacksonville, FL

**CH2MHILL**



● Monitoring Wells



0 60 120 Feet

1 inch = 78 feet

**Figure 2**  
 Locations of Groundwater Monitoring Wells  
 BP Wells and Bldg. G-82 Sites  
 Former NAS Cecil Field, Jacksonville, FL

**CH2MHILL**

**Attachment 1**  
**Laboratory Analytical Reports**  
**(provided on CD)**

**Attachment 2**  
**BP Well Site Historical Analytical Results**

## Historical Detects in BP Wells - NAS Cecil Field

| LOCID     | SAMPLEID            | QCTYPE | CAS        | PARAMETER               | RESULT | UNIT | QUALIFIER | FRACTION | MAT | SAMPLEDATE | SAMPLECODE |
|-----------|---------------------|--------|------------|-------------------------|--------|------|-----------|----------|-----|------------|------------|
| CEF-BP-1S | CEF-BP1-GW-01S-01   | NM     | 71-43-2    | BENZENE                 | 0.56   | UG/L | J         | OV       | GW  | 02/03/2000 | NORMAL     |
| CEF-BP-1S | CEF-BP1-GW-01S-01   | NM     | TTNUS001   | TOTAL PETROLEUM HYDROCA | 0.561  | MG/L |           | PET      | GW  | 02/03/2000 | NORMAL     |
| CEF-BP-1S | CEF-BP1-GW-01S-01   | NM     | 208-96-8   | ACENAPHTHYLENE          | 2      | UG/L |           | OS       | GW  | 02/03/2000 | NORMAL     |
| CEF-BP-1S | CEF-BP1-GW-01S-01   | NM     | 7439-95-4  | MAGNESIUM               | 9420   | UG/L |           | M        | GW  | 02/03/2000 | NORMAL     |
| CEF-BP-1S | CEF-BP1-GW-01S-01   | NM     | 7440-23-5  | SODIUM                  | 2430   | UG/L |           | M        | GW  | 02/03/2000 | NORMAL     |
| CEF-BP-1S | CEF-BP1-GW-01S-01   | NM     | 7439-97-6  | MERCURY                 | 0.11   | UG/L |           | M        | GW  | 02/03/2000 | NORMAL     |
| CEF-BP-1S | CEF-BP1-GW-01S-01   | NM     | 7440-66-6  | ZINC                    | 45.5   | UG/L |           | M        | GW  | 02/03/2000 | NORMAL     |
| CEF-BP-1S | CEF-BP1-GW-01S-01   | NM     | 91-20-3    | NAPHTHALENE             | 3.9    | UG/L |           | OS       | GW  | 02/03/2000 | NORMAL     |
| CEF-BP-1S | CEF-BP1-GW-01S-01   | NM     | 108-88-3   | TOLUENE                 | 38.5   | UG/L |           | OV       | GW  | 02/03/2000 | NORMAL     |
| CEF-BP-1S | CEF-BP1-GW-01S-01   | NM     | 1330-20-7  | TOTAL XYLENES           | 114    | UG/L |           | OV       | GW  | 02/03/2000 | NORMAL     |
| CEF-BP-1S | CEF-BP1-GW-01S-01   | NM     | 7440-09-7  | POTASSIUM               | 2260   | UG/L |           | M        | GW  | 02/03/2000 | NORMAL     |
| CEF-BP-1S | CEF-BP1-GW-01S-01   | NM     | 100-41-4   | ETHYLBENZENE            | 20.9   | UG/L |           | OV       | GW  | 02/03/2000 | NORMAL     |
| CEF-BP-1S | CEF-BP1-GW-01S-01   | NM     | 7439-89-6  | IRON                    | 209    | UG/L |           | M        | GW  | 02/03/2000 | NORMAL     |
| CEF-BP-1S | CEF-BP1-GW-01S-01   | NM     | 7440-39-3  | BARIUM                  | 5.6    | UG/L |           | M        | GW  | 02/03/2000 | NORMAL     |
| CEF-BP-1S | CEF-BP1-GW-01S-01   | NM     | 7440-70-2  | CALCIUM                 | 26800  | UG/L |           | M        | GW  | 02/03/2000 | NORMAL     |
| CEF-BP-1S | CEF-BP1-GW-01S-01   | NM     | 95-63-6    | 1,2,4-TRIMETHYLBENZENE  | 45.9   | UG/L |           | OV       | GW  | 02/03/2000 | NORMAL     |
| CEF-BP-1S | CEF-BP1-GW-01S-01   | NM     | 108-67-8   | 1,3,5-TRIMETHYLBENZENE  | 16.1   | UG/L |           | OV       | GW  | 02/03/2000 | NORMAL     |
| CEF-BP-1S | CEF-BP1-GW-01S-01   | NM     | 91-57-6    | 2-METHYLNAPHTHALENE     | 2.7    | UG/L |           | OS       | GW  | 02/03/2000 | NORMAL     |
| CEF-BP-1S | CEF-BP1-GW-01S-02-D | FD     | TTNUS054   | M+P-XYLENES             | 67.1   | UG/L |           | OV       | GW  | 03/27/2000 | DUP        |
| CEF-BP-1S | CEF-BP1-GW-01S-02-D | FD     | 108-67-8   | 1,3,5-TRIMETHYLBENZENE  | 13.5   | UG/L |           | OV       | GW  | 03/27/2000 | DUP        |
| CEF-BP-1S | CEF-BP1-GW-01S-02-D | FD     | 95-63-6    | 1,2,4-TRIMETHYLBENZENE  | 39.7   | UG/L |           | OV       | GW  | 03/27/2000 | DUP        |
| CEF-BP-1S | CEF-BP1-GW-01S-02-D | FD     | 100-41-4   | ETHYLBENZENE            | 15     | UG/L |           | OV       | GW  | 03/27/2000 | DUP        |
| CEF-BP-1S | CEF-BP1-GW-01S-02-D | FD     | 95-47-6    | O-XYLENE                | 19.1   | UG/L |           | OV       | GW  | 03/27/2000 | DUP        |
| CEF-BP-1S | CEF-BP1-GW-01S-02-D | FD     | 108-88-3   | TOLUENE                 | 30.1   | UG/L |           | OV       | GW  | 03/27/2000 | DUP        |
| CEF-BP-1S | CEF-BP-GW-01S-01-D  | FD     | 95-63-6    | 1,2,4-TRIMETHYLBENZENE  | 144    | UG/L |           | OV       | GW  | 04/11/2001 | DUP        |
| CEF-BP-1S | CEF-BP-GW-01S-01-D  | FD     | 108-67-8   | 1,3,5-TRIMETHYLBENZENE  | 49.9   | UG/L |           | OV       | GW  | 04/11/2001 | DUP        |
| CEF-BP-1S | CEF-BP-GW-01S-01-D  | FD     | 1330-20-7  | TOTAL XYLENES           | 432    | UG/L |           | OV       | GW  | 04/11/2001 | DUP        |
| CEF-BP-1S | CEF-BP-GW-01S-01A   | NM     | 95-63-6    | 1,2,4-TRIMETHYLBENZENE  | 156    | UG/L |           | OV       | GW  | 05/22/2001 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01S-01A   | NM     | 108-67-8   | 1,3,5-TRIMETHYLBENZENE  | 53.8   | UG/L |           | OV       | GW  | 05/22/2001 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01S-01A   | NM     | 1330-20-7  | TOTAL XYLENES           | 634    | UG/L |           | OV       | GW  | 05/22/2001 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01S-02A   | NM     | 95-63-6    | 1,2,4-TRIMETHYLBENZENE  | 360    | UG/L |           | OV       | GW  | 11/06/2001 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01S-02A   | NM     | 108-67-8   | 1,3,5-TRIMETHYLBENZENE  | 124    | UG/L |           | OV       | GW  | 11/06/2001 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01S-02A   | NM     | 1330-20-7  | TOTAL XYLENES           | 894    | UG/L |           | OV       | GW  | 11/06/2001 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01S-03    | NM     | 95-63-6    | 1,2,4-TRIMETHYLBENZENE  | 262    | UG/L |           | OV       | GW  | 10/03/2002 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01S-03    | NM     | 100-41-4   | ETHYLBENZENE            | 117    | UG/L |           | OV       | GW  | 10/03/2002 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01S-03    | NM     | 1330-20-7  | TOTAL XYLENES           | 658    | UG/L |           | OV       | GW  | 10/03/2002 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01S-04    | NM     | 95-63-6    | 1,2,4-TRIMETHYLBENZENE  | 224    | UG/L |           | OV       | GW  | 01/06/2003 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01S-04    | NM     | 108-67-8   | 1,3,5-TRIMETHYLBENZENE  | 71.5   | UG/L |           | OV       | GW  | 01/06/2003 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01S-04    | NM     | 100-41-4   | ETHYLBENZENE            | 161    | UG/L |           | OV       | GW  | 01/06/2003 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01S-04    | NM     | 1330-20-7  | TOTAL XYLENES           | 811    | UG/L |           | OV       | GW  | 01/06/2003 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01S-04A   | NM     | 14797-55-8 | NITRATE                 | 0.41   | MG/L |           | MISC     | GW  | 01/30/2003 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01S-04A   | NM     | TTNUS003   | TOTAL ORGANIC CARBON    | 12     | MG/L |           | MISC     | GW  | 01/30/2003 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01S-04A   | NM     | 74-82-8    | METHANE                 | 14     | UG/L |           | OV       | GW  | 01/30/2003 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01S-05-D  | FD     | 74-82-8    | METHANE                 | 6.55   | UG/L |           | OV       | GW  | 04/17/2003 | DUP        |
| CEF-BP-1S | CEF-BP-GW-01S-05-D  | FD     | 14797-55-8 | NITRATE                 | 0.12   | MG/L |           | MISC     | GW  | 04/17/2003 | DUP        |

## Historical Detects in BP Wells - NAS Cecil Field

| LOCID     | SAMPLEID            | QCTYPE | CAS        | PARAMETER              | RESULT | UNIT | QUALIFIER | FRACTION | MAT | SAMPLEDATE | SAMPLECODE |
|-----------|---------------------|--------|------------|------------------------|--------|------|-----------|----------|-----|------------|------------|
| CEF-BP-1S | CEF-BP-GW-01S-05-D  | FD     | TTNUS003   | TOTAL ORGANIC CARBON   | 11.7   | MG/L |           | MISC     | GW  | 04/17/2003 | DUP        |
| CEF-BP-1S | CEF-BP-GW-01S-05-D  | FD     | 95-63-6    | 1,2,4-TRIMETHYLBENZENE | 273    | UG/L |           | OV       | GW  | 04/17/2003 | DUP        |
| CEF-BP-1S | CEF-BP-GW-01S-05-D  | FD     | 108-67-8   | 1,3,5-TRIMETHYLBENZENE | 144    | UG/L |           | OV       | GW  | 04/17/2003 | DUP        |
| CEF-BP-1S | CEF-BP-GW-01S-05-D  | FD     | 100-41-4   | ETHYLBENZENE           | 184    | UG/L |           | OV       | GW  | 04/17/2003 | DUP        |
| CEF-BP-1S | CEF-BP-GW-01S-05-D  | FD     | 1330-20-7  | TOTAL XYLENES          | 542    | UG/L |           | OV       | GW  | 04/17/2003 | DUP        |
| CEF-BP-1S | CEF-BP-GW-01-06     | NM     | 74-82-8    | METHANE                | 24.5   | UG/L |           | OV       | GW  | 07/17/2003 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01-06     | NM     | 108-67-8   | 1,3,5-TRIMETHYLBENZENE | 38.4   | UG/L |           | OV       | GW  | 07/17/2003 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01-06     | NM     | 95-63-6    | 1,2,4-TRIMETHYLBENZENE | 118    | UG/L |           | OV       | GW  | 07/17/2003 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01-06     | NM     | 100-41-4   | ETHYLBENZENE           | 48     | UG/L |           | OV       | GW  | 07/17/2003 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01-06     | NM     | 1330-20-7  | TOTAL XYLENES          | 236    | UG/L |           | OV       | GW  | 07/17/2003 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-01-06     | NM     | TTNUS003   | TOTAL ORGANIC CARBON   | 13     | MG/L |           | MISC     | GW  | 07/17/2003 | NORMAL     |
| CEF-BP-1S | CEF-BP-GW-1S-07-D   | FD     | 1330-20-7  | TOTAL XYLENES          | 1040   | UG/L |           | OV       | GW  | 10/16/2003 | DUP        |
| CEF-BP-1S | CEF-BP-GW-1S-07-D   | FD     | TTNUS003   | TOTAL ORGANIC CARBON   | 12.4   | MG/L |           | MISC     | GW  | 10/16/2003 | DUP        |
| CEF-BP-1S | CEF-BP-GW-1S-07-D   | FD     | 74-82-8    | METHANE                | 28.3   | UG/L |           | OV       | GW  | 10/16/2003 | DUP        |
| CEF-BP-1S | CEF-BP-GW-1S-07-D   | FD     | 108-67-8   | 1,3,5-TRIMETHYLBENZENE | 130    | UG/L |           | OV       | GW  | 10/16/2003 | DUP        |
| CEF-BP-1S | CEF-BP-GW-1S-07-D   | FD     | 95-63-6    | 1,2,4-TRIMETHYLBENZENE | 460    | UG/L |           | OV       | GW  | 10/16/2003 | DUP        |
| CEF-BP-1S | CEF-BP-GW-1S-07-D   | FD     | 100-41-4   | ETHYLBENZENE           | 207    | UG/L |           | OV       | GW  | 10/16/2003 | DUP        |
| CEF-BP-2S | CEF-BP1-GW-02S-01-D | FD     | 7429-90-5  | ALUMINUM               | 1790   | UG/L |           | M        | GW  | 02/03/2000 | DUP        |
| CEF-BP-2S | CEF-BP1-GW-02S-01-D | FD     | 7440-70-2  | CALCIUM                | 41200  | UG/L |           | M        | GW  | 02/03/2000 | DUP        |
| CEF-BP-2S | CEF-BP1-GW-02S-01-D | FD     | 7439-95-4  | MAGNESIUM              | 1010   | UG/L |           | M        | GW  | 02/03/2000 | DUP        |
| CEF-BP-2S | CEF-BP1-GW-02S-01-D | FD     | 7440-39-3  | BARIIUM                | 11.5   | UG/L |           | M        | GW  | 02/03/2000 | DUP        |
| CEF-BP-2S | CEF-BP1-GW-02S-01-D | FD     | 7440-50-8  | COPPER                 | 1.2    | UG/L |           | M        | GW  | 02/03/2000 | DUP        |
| CEF-BP-2S | CEF-BP1-GW-02S-01-D | FD     | 7439-89-6  | IRON                   | 758    | UG/L |           | M        | GW  | 02/03/2000 | DUP        |
| CEF-BP-2S | CEF-BP1-GW-02S-01-D | FD     | 7439-97-6  | MERCURY                | 0.19   | UG/L |           | M        | GW  | 02/03/2000 | DUP        |
| CEF-BP-2S | CEF-BP1-GW-02S-01-D | FD     | 7440-66-6  | ZINC                   | 8.6    | UG/L |           | M        | GW  | 02/03/2000 | DUP        |
| CEF-BP-2S | CEF-BP1-GW-02S-01-D | FD     | 7440-23-5  | SODIUM                 | 12100  | UG/L |           | M        | GW  | 02/03/2000 | DUP        |
| CEF-BP-2S | CEF-BP1-GW-02S-01-D | FD     | 7440-62-2  | VANADIUM               | 9.2    | UG/L |           | M        | GW  | 02/03/2000 | DUP        |
| CEF-BP-2S | CEF-BP1-GW-02S-01-D | FD     | 7440-09-7  | POTASSIUM              | 3270   | UG/L |           | M        | GW  | 02/03/2000 | DUP        |
| CEF-BP-2S | CEF-BP-GW-02S-04A   | NM     | 74-82-8    | METHANE                | 1.4    | UG/L |           | OV       | GW  | 01/30/2003 | NORMAL     |
| CEF-BP-2S | CEF-BP-GW-02S-04A   | NM     | 14797-55-8 | NITRATE                | 0.88   | MG/L |           | MISC     | GW  | 01/30/2003 | NORMAL     |
| CEF-BP-2S | CEF-BP-GW-02S-04A   | NM     | TTNUS003   | TOTAL ORGANIC CARBON   | 4      | MG/L |           | MISC     | GW  | 01/30/2003 | NORMAL     |
| CEF-BP-2S | CEF-BP-GW-02S-05    | NM     | 14797-55-8 | NITRATE                | 0.34   | MG/L |           | MISC     | GW  | 04/17/2003 | NORMAL     |
| CEF-BP-2S | CEF-BP-GW-02S-05    | NM     | TTNUS003   | TOTAL ORGANIC CARBON   | 4.7    | MG/L |           | MISC     | GW  | 04/17/2003 | NORMAL     |
| CEF-BP-2S | CEF-BP-GW-02S-05    | NM     | 74-82-8    | METHANE                | 5.76   | UG/L |           | OV       | GW  | 04/17/2003 | NORMAL     |
| CEF-BP-2S | CEF-BP-GW-02S-06    | NM     | TTNUS003   | TOTAL ORGANIC CARBON   | 4.8    | MG/L |           | MISC     | GW  | 07/17/2003 | NORMAL     |
| CEF-BP-2S | CEF-BP-GW-2S-07     | NM     | TTNUS003   | TOTAL ORGANIC CARBON   | 4.6    | MG/L |           | MISC     | GW  | 10/16/2003 | NORMAL     |
| CEF-BP-2S | CEF-BP-GW-2S-07     | NM     | 14797-55-8 | NITRATE                | 0.33   | MG/L |           | MISC     | GW  | 10/16/2003 | NORMAL     |
| CEF-BP-2S | CEF-BP-GW-2S-07     | NM     | 74-82-8    | METHANE                | 12.9   | UG/L |           | OV       | GW  | 10/16/2003 | NORMAL     |
| CEF-BP-6S | CEF-BP1-GW-06S-01   | NM     | 67-64-1    | ACETONE                | 26.3   | UG/L |           | OV       | GW  | 03/27/2000 | NORMAL     |
| CEF-BP-6S | CEF-BP1-GW-06S-01   | NM     | 67-66-3    | CHLOROFORM             | 1.1    | UG/L |           | OV       | GW  | 03/27/2000 | NORMAL     |
| CEF-BP-6S | CEF-BP-GW-06S-04A   | NM     | 14797-55-8 | NITRATE                | 0.13   | MG/L |           | MISC     | GW  | 01/30/2003 | NORMAL     |
| CEF-BP-6S | CEF-BP-GW-06S-04A   | NM     | TTNUS003   | TOTAL ORGANIC CARBON   | 9      | MG/L |           | MISC     | GW  | 01/30/2003 | NORMAL     |
| CEF-BP-6S | CEF-BP-GW-06S-04A   | NM     | 74-82-8    | METHANE                | 136    | UG/L |           | OV       | GW  | 01/30/2003 | NORMAL     |
| CEF-BP-6S | CEF-BP-GW-06S-05    | NM     | 14797-55-8 | NITRATE                | 0.71   | MG/L |           | MISC     | GW  | 04/17/2003 | NORMAL     |
| CEF-BP-6S | CEF-BP-GW-06S-05    | NM     | TTNUS003   | TOTAL ORGANIC CARBON   | 6.1    | MG/L |           | MISC     | GW  | 04/17/2003 | NORMAL     |

## Historical Detects in BP Wells - NAS Cecil Field

| LOCID     | SAMPLEID           | QCTYPE | CAS        | PARAMETER            | RESULT | UNIT | QUALIFIER | FRACTION | MAT | SAMPLEDATE | SAMPLECODE |
|-----------|--------------------|--------|------------|----------------------|--------|------|-----------|----------|-----|------------|------------|
| CEF-BP-6S | CEF-BP-GW-06S-05   | NM     | 100-41-4   | ETHYLBENZENE         | 1.2    | UG/L |           | OV       | GW  | 04/17/2003 | NORMAL     |
| CEF-BP-6S | CEF-BP-GW-06S-05   | NM     | 74-82-8    | METHANE              | 149    | UG/L |           | OV       | GW  | 04/17/2003 | NORMAL     |
| CEF-BP-6S | CEF-BP-GW-06S-06-D | FD     | 100-41-4   | ETHYLBENZENE         | 0.51   | UG/L | J         | OV       | GW  | 07/17/2003 | DUP        |
| CEF-BP-6S | CEF-BP-GW-06S-06-D | FD     | TTNUS003   | TOTAL ORGANIC CARBON | 6.6    | MG/L |           | MISC     | GW  | 07/17/2003 | DUP        |
| CEF-BP-6S | CEF-BP-GW-06S-06-D | FD     | 14797-55-8 | NITRATE              | 0.33   | MG/L |           | MISC     | GW  | 07/17/2003 | DUP        |
| CEF-BP-6S | CEF-BP-GW-06S-06-D | FD     | 74-82-8    | METHANE              | 87.2   | UG/L |           | OV       | GW  | 07/17/2003 | DUP        |
| CEF-BP-6S | CEF-BP-GW-6S-07    | NM     | TTNUS003   | TOTAL ORGANIC CARBON | 8.5    | MG/L |           | MISC     | GW  | 10/16/2003 | NORMAL     |
| CEF-BP-6S | CEF-BP-GW-6S-07    | NM     | 14797-55-8 | NITRATE              | 0.34   | MG/L |           | MISC     | GW  | 10/16/2003 | NORMAL     |
| CEF-BP-6S | CEF-BP-GW-6S-07    | NM     | 74-82-8    | METHANE              | 738    | UG/L |           | OV       | GW  | 10/16/2003 | NORMAL     |

**Attachment 3**  
**Building G82 Site Historical Analytical Results**

TABLE 3-1

**SUMMARY OF POSITIVE DETECTIONS IN GROUNDWATER  
SITE ASSESSMENT REPORT BUILDING 82, TANK G82  
NAVAL AIR STATION CECIL FIELD  
JACKSONVILLE, FLORIDA  
PAGE 1 OF 2**

| Location                                     | FDEP<br>GCTL,<br>FAC 62-777 | CEF-G82-1S<br>CEF-G82-GW-1S-01<br>07-Oct-99<br>15 | CEF-G82-2S<br>CEF-G82-GW-2S-01<br>07-Oct-99<br>14 | CEF-G82-3S<br>CEF-G82-GW-3S-01<br>07-Oct-99<br>14 | CEF-G82-2I<br>CEF-G82-GW-2I-02<br>22-Feb-00<br>35 |
|--|-----------------------------|---|---|---|---|
| <b>Volatile Organic Compounds (ug/L)</b>     |                             |   |   |   |   |
| BENZENE                                      | 1                           | 1 U   | 19 J  | 1 U   | 1 U   |
| CHLOROFORM                                   | 5.7                         | 1 U   | 2 U   | 1 U   | 1.2   |
| ETHYLBENZENE                                 | 30                          | 3.3   | 50 J  | 1 U   | 1 U   |
| TOLUENE                                      | 40                          | 1 U   | 6.8   | 1 U   | 1 U   |
| XYLENES, TOTAL                               | 20                          | 3.8   | 196   | 3 U   | 3 U   |
| <b>Semivolatile Organic Compounds (ug/L)</b> |                             |   |   |   |   |
| 1-METHYLNAPHTHALENE                          | 20                          | 8.7 J   | 53.4 J  | 1.1 UJ  | 2.4 U   |
| 2-METHYLNAPHTHALENE                          | 20                          | 11.6 J  | 53.9 J  | 1.1 UJ  | 2.4 U   |
| ACENAPHTHENE                                 | 20                          | 1 UJ  | 1.8 J   | 1.1 UJ  | 2.4 U   |
| ACENAPHTHYLENE                               | 210                         | 1 UJ  | 1.8 J   | 1.1 UJ  | 2.4 U   |
| FLUORANTHENE                                 | 280                         | 1 UJ  | 2.3 J   | 1.1 UJ  | 2.4 U   |
| FLUORENE                                     | 280                         | 1.9 J   | 6.3 J   | 1.1 UJ  | 2.4 U   |
| NAPHTHALENE                                  | 20                          | 6.8 J   | 24.5 J  | 1.1 UJ  | 2.4 U   |
| PHENANTHRENE                                 | 210                         | 4 J   | 18.7 J  | 1.1 UJ  | 2.4 U   |
| <b>Total Petroleum Hydrocarbons (mg/L)</b>   |                             |   |   |   |   |
| TRPH (C8-C40)                                | 5                           | 1.19  | 3.57  | 0.5 U   | NM  |

## Notes:

- GCTL- Groundwater Cleanup Target Level
- Shaded values are greater than criteria.
- µg/L - microgram per liter
- mg/L - milligram per liter
- NM - Not measured
- U - Not detected at detection limit shown
- J - Estimated value

**ATTACHMENT B**

**GROUNDWATER ANALYTICAL REPORT  
JANUARY 2009**

**(FULL ANALYTICAL REPORT INCLUDED IN ELECTRONIC COPY)**

# ***Summary Package***

## ***Tetra Tech NUS, Inc.***

***Tobreena Skeen  
Foster Plaza 7  
661 Anderson Drive  
Pittsburgh, PA 15220***

***SDG #JM09G82\_001***



**EMPIRICAL LABORATORIES  
COOLER RECEIPT FORM**

LIMS Number: \_\_\_\_\_ Number of Coolers: 1 of 4  
 Client: Tetra Tech NUS Project: Cecil Field Site 6-82  
 Date/Time Received: 10/23/09 08:30 Date cooler(s) opened: 10/23/09  
 Opened By (print): WILLIAM SCHWAB (signature): *[Signature]*

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered  
 EL Courier Other: \_\_\_\_\_

If applicable, enter airbill number here: 7369

2. Were custody seals on outside of cooler(s)? .....  Yes  No  
 How many: 1 Seal date: 10/22/09 Seal Initials: -

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

Type of Coolant:  WET  DRY  BLUE  NONE Temperature of Samples upon Receipt: 1.49

Dates samples were logged-in: 10/23/09

9. Initial this form to acknowledge login of sample(s): (Name): Will Schwab (Initial): WS

10. Were all bottle lids intact and sealed tightly? .....  Yes  No  N/A  
 11. Did all bottles arrive unbroken? .....  Yes  No  N/A  
 12. Was all required bottle label information complete? .....  Yes  No  N/A  
 13. Did all bottle labels agree with custody papers? .....  Yes  No  N/A  
 14. Were correct containers used for the analyses indicated? .....  Yes  No  N/A  
 15. Were preservative levels correct in all applicable sample containers? .....  Yes  No  N/A  
 16. Was residual chlorine present in any applicable sample containers? .....  Yes  No  N/A  
 17. Was sufficient amount of sample sent for the analyses required? .....  Yes  No  N/A  
 18. Was headspace present in any included VOA vials? .....  Yes  No  N/A

*pH to 12 & dissolved sulfides*

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

CAR#: \_\_\_\_\_

EMPIRICAL LABORATORIES  
COOLER RECEIPT FORM

LIMS Number: \_\_\_\_\_ Number of Coolers: 2 of 4  
Client: Tetra Tech MUS Project: Cecil Field Site G-82  
Date/Time Received: 10/23/09 08:30 Date cooler(s) opened: 10/23/09  
Opened By (print): WILLIAM SCHWAB (signature): [Signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered  
EL Courier Other: \_\_\_\_\_

If applicable, enter airbill number here: 7380

2. Were custody seals on outside of cooler(s)? ..... Yes No  
How many: 1 Seal date: 10/22/09 Seal Initials: ?

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

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 2.0°C

Dates samples were logged-in: 10/23/09

9. Initial this form to acknowledge login of sample(s): (Name): \_\_\_\_\_ (Initial): \_\_\_\_\_

10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A  
11. Did all bottles arrive unbroken? ..... Yes No N/A  
12. Was all required bottle label information complete? ..... Yes No N/A  
13. Did all bottle labels agree with custody papers? ..... Yes No N/A  
14. Were correct containers used for the analyses indicated? ..... Yes No N/A  
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A  
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A  
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A  
18. Was headspace present in any included VOA vials? ..... Yes No N/A

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

CAR#: \_\_\_\_\_

EMPIRICAL LABORATORIES  
COOLER RECEIPT FORM

LIMS Number: \_\_\_\_\_ Number of Coolers: 3 of 4  
Client: Tetra Tech NUS Project: Cecil Field Site G-82  
Date/Time Received: 10/23/09 08:30 Date cooler(s) opened: 10/23/09  
Opened By (print): WILLIAM SCHWAB (signature): [Signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered  
EL Courier Other: \_\_\_\_\_

If applicable, enter airbill number here: 1685

2. Were custody seals on outside of cooler(s)? ..... Yes No  
How many: 1 Seal date: 10/22/09 Seal Initials: 1

3. Were custody seals unbroken and intact at the date and time of arrival? ..... Yes No N/A

4. Were custody papers sealed in a plastic bag included in the sample cooler? ..... Yes No N/A

5. Were custody papers filled out properly (ink, signed, etc.)? ..... Yes No N/A

6. Did you sign custody papers in the appropriate place for acceptance? ..... Yes No N/A

7. Was project identifiable from custody papers? ..... Yes No N/A

8. If required, was enough ice present in the cooler(s)? ..... Yes No N/A

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 1.1°C

Dates samples were logged-in: 10/23/09

9. Initial this form to acknowledge login of sample(s): (Name): \_\_\_\_\_ (Initial): \_\_\_\_\_

10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A

11. Did all bottles arrive unbroken? ..... Yes No N/A

12. Was all required bottle label information complete? ..... Yes No N/A

13. Did all bottle labels agree with custody papers? ..... Yes No N/A

14. Were correct containers used for the analyses indicated? ..... Yes No N/A

15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A

16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A

17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A

18. Was headspace present in any included VOA vials? ..... Yes No N/A

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

CAR#: \_\_\_\_\_

EMPIRICAL LABORATORIES  
COOLER RECEIPT FORM

LIMS Number: \_\_\_\_\_ Number of Coolers: 4 of 4  
Client: Tetra Tech MS Project: Cecil Field Site G-82  
Date/Time Received: 10/23/09 08:30 Date cooler(s) opened: 10/23/09  
Opened By (print): WILLIAM SCHWAB (signature): [Signature]

Circle response below as appropriate

1. How did the samples arrive?: FedEx UPS DHL Hand Delivered  
EL Courier Other: \_\_\_\_\_

If applicable, enter airbill number here: 7370

2. Were custody seals on outside of cooler(s)? ..... Yes No  
How many: 1 Seal date: 10/22/09 Seal Initials: 1

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

Type of Coolant: WET DRY BLUE NONE Temperature of Samples upon Receipt: 3-8°C

Dates samples were logged-in: 10/23/09

9. Initial this form to acknowledge login of sample(s): (Name): \_\_\_\_\_ (Initial): \_\_\_\_\_

10. Were all bottle lids intact and sealed tightly? ..... Yes No N/A  
11. Did all bottles arrive unbroken? ..... Yes No N/A  
12. Was all required bottle label information complete? ..... Yes No N/A  
13. Did all bottle labels agree with custody papers? ..... Yes No N/A  
14. Were correct containers used for the analyses indicated? ..... Yes No N/A  
15. Were preservative levels correct in all applicable sample containers? ..... Yes No N/A  
16. Was residual chlorine present in any applicable sample containers? ..... Yes No N/A  
17. Was sufficient amount of sample sent for the analyses required? ..... Yes No N/A  
18. Was headspace present in any included VOA vials? ..... Yes No N/A

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

CAR#: \_\_\_\_\_

## Sample Delivery Group Assignment Form

CLIENT: Tetra Tech NUS, Inc. (T010)  
 PROJECT NAME: Cecil Field JM09 G82/BPWells  
 SDG # JM09G82\_001  
 MATRIX: Water

QC LEVEL: EDD/IV  
 Report Due: 11/6/2009 - 11/6/2009  
 Client Sample Count: 6

| Sample Type     | Sampled    | Received   | Lab ID     | Client ID              | E300.0 | FLPRO | RSK175 | SM2320B | SM4500S2CF | SW8260B | SW8270C |
|-----------------|------------|------------|------------|------------------------|--------|-------|--------|---------|------------|---------|---------|
| Client Sample   | 10/22/2009 | 10/23/2009 | 0910199-01 | CEF-G82-3S-20091022    | X      | X     | X      | X       | X          | X       | X       |
| Client Sample   | 10/22/2009 | 10/23/2009 | 0910199-02 | CEF-G82-1S-20091022    | X      | X     | X      | X       | X          | X       | X       |
| Client Sample   | 10/22/2009 | 10/23/2009 | 0910199-03 | CEF-G82-2S-20091022    | X      | X     | X      | X       | X          | X       | X       |
| Field Duplicate | 10/22/2009 | 10/23/2009 | 0910199-04 | CEF-G82-DUP01-20091022 | X      | X     | X      | X       | X          | X       | X       |
| Client Sample   | 10/22/2009 | 10/23/2009 | 0910199-05 | CEF-G82-2I-20091022    | X      | X     | X      | X       | X          | X       | X       |
| Trip Blank      | 10/22/2009 | 10/23/2009 | 0910199-06 | Trip Blank #7306       |        |       |        |         |            | X       |         |
| Trip Blank      | 10/22/2009 | 10/23/2009 | 0910199-07 | Trip Blank #7307       |        |       |        |         |            | X       |         |
| Trip Blank      | 10/22/2009 | 10/23/2009 | 0910199-08 | Trip Blank #7308       |        |       |        |         |            | X       |         |
| Trip Blank      | 10/22/2009 | 10/23/2009 | 0910199-09 | Trip Blank #7309       |        |       |        |         |            | X       |         |
| Client Sample   | 10/23/2009 | 10/24/2009 | 0910216-01 | CEF-G82-4S-2009        |        | X     |        |         |            | X       | X       |
| Client Sample   | 10/23/2009 | 10/24/2009 | 0910216-02 | CEF-G82-5S-2009        |        | X     |        |         |            | X       | X       |
| Client Sample   | 10/23/2009 | 10/24/2009 | 0910216-03 | CEF-G82-6S-2009        |        | X     |        |         |            | X       | X       |
| Trip Blank      | 10/23/2009 | 10/24/2009 | 0910216-04 | Trip Blank             |        |       |        |         |            | X       |         |

**ORGANIC CASE NARRATIVE**  
**Tetra Tech NUS, Inc./Nas Cecil Field (BP Wells) JM09**  
**SDG: JM09G82\_001**

| Sampled    | Received   | Lab ID     | Client ID              |
|------------|------------|------------|------------------------|
| 10/22/2009 | 10/23/2009 | 0910199-01 | CEF-G82-3S-20091022    |
| 10/22/2009 | 10/23/2009 | 0910199-02 | CEF-G82-1S-20091022    |
| 10/22/2009 | 10/23/2009 | 0910199-03 | CEF-G82-2S-20091022    |
| 10/22/2009 | 10/23/2009 | 0910199-04 | CEF-G82-DUP01-20091022 |
| 10/22/2009 | 10/23/2009 | 0910199-05 | CEF-G82-2I-20091022    |
| 10/22/2009 | 10/23/2009 | 0910199-06 | Trip Blank #7306       |
| 10/22/2009 | 10/23/2009 | 0910199-07 | Trip Blank #7307       |
| 10/22/2009 | 10/23/2009 | 0910199-08 | Trip Blank #7308       |
| 10/22/2009 | 10/23/2009 | 0910199-09 | Trip Blank #7309       |
| 10/23/2009 | 10/24/2009 | 0910216-01 | CEF-G82-4S-2009        |
| 10/23/2009 | 10/24/2009 | 0910216-02 | CEF-G82-5S-2009        |
| 10/23/2009 | 10/24/2009 | 0910216-03 | CEF-G82-6S-2009        |
| 10/23/2009 | 10/24/2009 | 0910216-04 | Trip Blank             |

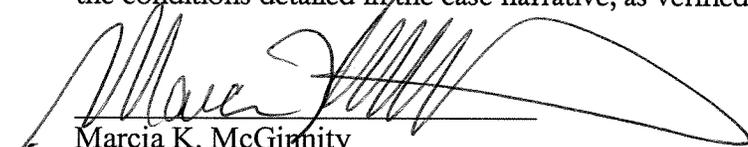
### Volatiles

**Method:** The samples were analyzed by USEPA SW-846 Methods 5030B/8260B (purge and trap then capillary column GC/MS) for waters or 5035B/8260B (purge and trap followed by capillary column GC/MS) for solids upon receipt to the laboratory in satisfactory condition.

**Comments:** The volatile analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following note/exceptions:

- Samples were analyzed for an abbreviated target list of benzene, ethylbenzene, isopropylbenzene, naphthalene, toluene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene and xylene (total).
- One or more analytes were detected at concentrations below ½ the quantitation limits in one or more of the method blanks. Reported concentrations in the associated samples are qualified with a "V".
- All spike and surrogate recoveries were within limits. Analysis of the LCSD was started 12 hours 6 minutes after the associated tuning standard.
- All samples were analyzed without dilution.
- Quantitation signals were manually integrated in order to accurately reflect the peak areas based on the technical judgment of the analyst. A listing of the manual integrations performed and reason for the integration is included with the logs. Before and after "pictures" are available at the laboratory where manual integrations were performed.

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

  
Marcia K. McGinnity  
Data Quality Manager

## ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

- MDL:** The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.
- EQL:** The estimated quantitation limit (EQL), also known as the reporting limit (RL), is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.
- U:** The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.
- 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".
- I:** The presence of an "I" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL/RL.
- L:** The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with a "L". Usually the sample will be rerun at a dilution to quantitate the flagged compound.
- V:** The presence of a "V" 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.
- J1:** The reported analyte concentration may have a low bias as the CCV exceeded the limit on the low side.
- J2:** The reported analyte concentration may have a high bias as the CCV exceeded the limit on the high side.
- M:** The presence of an "M" to the right of an analytical result indicates that the sample matrix interfered with the quantitation of the analyte. In GC and HPLC, results are reported from the column with the lower concentration.
- I:** The presence of an "I" to the right of an analytical result that the presence of a qualitative interference could have caused a false positive or over estimation of the analyte. In GC and HPLC, results are reported from the column with the lower concentration.

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-3  
S-20091022

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910199-01

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 1019901

Level: (low/med) LOW Date Sampled: 10/22/09 10:30

% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 10/30/09 17:47

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

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

| CAS NO.        | COMPOUND               | CONCENTRATION UNITS: (ug/L or ug/Kg) |      |      | UG/L<br>Q |
|----------------|------------------------|--------------------------------------|------|------|-----------|
|                |                        | MDL                                  | RL   | CONC |           |
| 71-43-2-----   | Benzene                | 0.12                                 | 1.0  |      | U         |
| 100-41-4-----  | Ethylbenzene           | 0.10                                 | 1.0  |      | U         |
| 98-82-8-----   | Isopropylbenzene       | 0.11                                 | 0.80 |      | U         |
| 91-20-3-----   | Naphthalene            | 0.12                                 | 1.0  |      | U         |
| 108-88-3-----  | Toluene                | 0.14                                 | 1.0  |      | U         |
| 95-63-6-----   | 1,2,4-Trimethylbenzene | 0.14                                 | 1.0  |      | U         |
| 108-67-8-----  | 1,3,5-Trimethylbenzene | 0.10                                 | 1.0  |      | U         |
| 1330-20-7----- | Xylene (total)         | 0.21                                 | 1.0  |      | U         |

FORM I VOA

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-1  
S-20091022

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910199-02

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 1019902

Level: (low/med) LOW Date Sampled: 10/22/09 11:55

% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 10/30/09 18:16

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

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

| CAS NO.        | COMPOUND               | CONCENTRATION UNITS: (ug/L or ug/Kg) |      |      | UG/L<br>CONC | Q |
|----------------|------------------------|--------------------------------------|------|------|--------------|---|
|                |                        | MDL                                  | RL   | CONC |              |   |
| 71-43-2-----   | Benzene                | 0.12                                 | 1.0  |      |              | U |
| 100-41-4-----  | Ethylbenzene           | 0.10                                 | 1.0  | 2.0  |              |   |
| 98-82-8-----   | Isopropylbenzene       | 0.11                                 | 0.80 | 1.2  |              |   |
| 91-20-3-----   | Naphthalene            | 0.12                                 | 1.0  | 10   |              | V |
| 108-88-3-----  | Toluene                | 0.14                                 | 1.0  |      |              | U |
| 95-63-6-----   | 1,2,4-Trimethylbenzene | 0.14                                 | 1.0  | 4.3  |              |   |
| 108-67-8-----  | 1,3,5-Trimethylbenzene | 0.10                                 | 1.0  | 1.4  |              |   |
| 1330-20-7----- | Xylene (total)         | 0.21                                 | 1.0  | 1.5  |              |   |

FORM I VOA

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-2  
S-20091022

Lab Name: EMPIRICAL LABS      Contract: TETRATECH

Lab Code: NA                      Case No.: NA                      SAS No.: NA                      SDG No.: JM09G82\_001

Matrix: (soil/water) WATER                                      Lab Sample ID: 0910199-03

Sample wt/vol:                      5.000 (g/mL) ML                                      Lab File ID:    1019903

Level:    (low/med)    LOW                                      Date Sampled:    10/22/09 13:05

% Moisture: not dec. \_\_\_\_\_                                      Date Analyzed: 10/30/09 18:46

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

Soil Extract Volume: \_\_\_\_\_ (uL)                                      Soil Aliquot Volume: \_\_\_\_\_ (uL)

| CAS NO.        | COMPOUND               | CONCENTRATION UNITS: (ug/L or ug/Kg) |      |      | UG/L |
|----------------|------------------------|--------------------------------------|------|------|------|
|                |                        | MDL                                  | RL   | CONC |      |
| 71-43-2-----   | Benzene                | 0.12                                 | 1.0  | 0.97 | I    |
| 100-41-4-----  | Ethylbenzene           | 0.10                                 | 1.0  | 25   |      |
| 98-82-8-----   | Isopropylbenzene       | 0.11                                 | 0.80 | 9.6  |      |
| 91-20-3-----   | Naphthalene            | 0.12                                 | 1.0  | 99   | V    |
| 108-88-3-----  | Toluene                | 0.14                                 | 1.0  |      | U    |
| 95-63-6-----   | 1,2,4-Trimethylbenzene | 0.14                                 | 1.0  | 26   |      |
| 108-67-8-----  | 1,3,5-Trimethylbenzene | 0.10                                 | 1.0  | 6.4  |      |
| 1330-20-7----- | Xylene (total)         | 0.21                                 | 1.0  | 24   |      |

FORM I VOA

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-D  
UP01-20091

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910199-04

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 1019904

Level: (low/med) LOW Date Sampled: 10/22/09 :

% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 10/30/09 19:15

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

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

| CAS NO.        | COMPOUND               | CONCENTRATION UNITS: (ug/L or ug/Kg) |      |      | UG/L<br>Q |
|----------------|------------------------|--------------------------------------|------|------|-----------|
|                |                        | MDL                                  | RL   | CONC |           |
| 71-43-2-----   | Benzene                | 0.12                                 | 1.0  | 1.0  | V<br>U    |
| 100-41-4-----  | Ethylbenzene           | 0.10                                 | 1.0  | 25   |           |
| 98-82-8-----   | Isopropylbenzene       | 0.11                                 | 0.80 | 9.8  |           |
| 91-20-3-----   | Naphthalene            | 0.12                                 | 1.0  | 100  |           |
| 108-88-3-----  | Toluene                | 0.14                                 | 1.0  |      |           |
| 95-63-6-----   | 1,2,4-Trimethylbenzene | 0.14                                 | 1.0  | 26   |           |
| 108-67-8-----  | 1,3,5-Trimethylbenzene | 0.10                                 | 1.0  | 6.8  |           |
| 1330-20-7----- | Xylene (total)         | 0.21                                 | 1.0  | 25   |           |

FORM I VOA

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-2  
I-20091022

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910199-05

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 1019905

Level: (low/med) LOW Date Sampled: 10/22/09 15:10

% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 10/30/09 19:44

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

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L  
MDL RL CONC Q

| CAS NO.   | COMPOUND               | MDL  | RL   | CONC | UG/L | Q |
|-----------|------------------------|------|------|------|------|---|
| 71-43-2   | Benzene                | 0.12 | 1.0  |      |      | U |
| 100-41-4  | Ethylbenzene           | 0.10 | 1.0  |      |      | U |
| 98-82-8   | Isopropylbenzene       | 0.11 | 0.80 |      |      | U |
| 91-20-3   | Naphthalene            | 0.12 | 1.0  | 3.2  |      | V |
| 108-88-3  | Toluene                | 0.14 | 1.0  |      |      | U |
| 95-63-6   | 1,2,4-Trimethylbenzene | 0.14 | 1.0  | 0.17 |      | I |
| 108-67-8  | 1,3,5-Trimethylbenzene | 0.10 | 1.0  |      |      | U |
| 1330-20-7 | Xylene (total)         | 0.21 | 1.0  |      |      | U |

FORM I VOA

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIP BLA  
NK #7306

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910199-06

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 1019906

Level: (low/med) LOW Date Sampled: 10/22/09 :

% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 10/30/09 14:50

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

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

| CAS NO.        | COMPOUND               | CONCENTRATION UNITS: (ug/L or ug/Kg) |      |      | UG/L<br>Q |
|----------------|------------------------|--------------------------------------|------|------|-----------|
|                |                        | MDL                                  | RL   | CONC |           |
| 71-43-2-----   | Benzene                | 0.12                                 | 1.0  |      | U         |
| 100-41-4-----  | Ethylbenzene           | 0.10                                 | 1.0  | 0.10 | I         |
| 98-82-8-----   | Isopropylbenzene       | 0.11                                 | 0.80 |      | U         |
| 91-20-3-----   | Naphthalene            | 0.12                                 | 1.0  |      | U         |
| 108-88-3-----  | Toluene                | 0.14                                 | 1.0  |      | U         |
| 95-63-6-----   | 1,2,4-Trimethylbenzene | 0.14                                 | 1.0  |      | U         |
| 108-67-8-----  | 1,3,5-Trimethylbenzene | 0.10                                 | 1.0  |      | U         |
| 1330-20-7----- | Xylene (total)         | 0.21                                 | 1.0  | 0.31 | I         |

FORM I VOA

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

|                      |
|----------------------|
| TRIP BLA<br>NK #7307 |
|----------------------|

Lab Name: EMPIRICAL LABS      Contract: TETRATECH

Lab Code: NA      Case No.: NA      SAS No.: NA      SDG No.: JM09G82\_001

Matrix: (soil/water) WATER      Lab Sample ID: 0910199-07

Sample wt/vol:      5.000 (g/mL) ML      Lab File ID:      1019907

Level: (low/med) LOW      Date Sampled: 10/22/09 :

% Moisture: not dec. \_\_\_\_\_      Date Analyzed: 10/30/09 15:20

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

Soil Extract Volume: \_\_\_\_\_ (uL)      Soil Aliquot Volume: \_\_\_\_\_ (uL)

| CAS NO.        | COMPOUND               | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L |      |      | Q |
|----------------|------------------------|---|------|------|---|
|                |                        | MDL                                       | RL   | CONC |   |
| 71-43-2-----   | Benzene                | 0.12                                      | 1.0  |      | U |
| 100-41-4-----  | Ethylbenzene           | 0.10                                      | 1.0  |      | U |
| 98-82-8-----   | Isopropylbenzene       | 0.11                                      | 0.80 |      | U |
| 91-20-3-----   | Naphthalene            | 0.12                                      | 1.0  |      | U |
| 108-88-3-----  | Toluene                | 0.14                                      | 1.0  |      | U |
| 95-63-6-----   | 1,2,4-Trimethylbenzene | 0.14                                      | 1.0  |      | U |
| 108-67-8-----  | 1,3,5-Trimethylbenzene | 0.10                                      | 1.0  |      | U |
| 1330-20-7----- | Xylene (total)         | 0.21                                      | 1.0  |      | U |

FORM I VOA

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIP BLA  
NK #7308

Lab Name: EMPIRICAL LABS      Contract: TETRATECH

Lab Code: NA      Case No.: NA      SAS No.: NA      SDG No.: JM09G82\_001

Matrix: (soil/water) WATER      Lab Sample ID: 0910199-08

Sample wt/vol:      5.000 (g/mL) ML      Lab File ID:      1019908

Level:      (low/med)      LOW      Date Sampled:      10/22/09 :

% Moisture: not dec. \_\_\_\_\_      Date Analyzed: 10/30/09 15:49

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

Soil Extract Volume: \_\_\_\_\_ (uL)      Soil Aliquot Volume: \_\_\_\_\_ (uL)

| CAS NO.        | COMPOUND               | CONCENTRATION UNITS: (ug/L or ug/Kg) |      |      | UG/L<br>Q |
|----------------|------------------------|--------------------------------------|------|------|-----------|
|                |                        | MDL                                  | RL   | CONC |           |
| 71-43-2-----   | Benzene                | 0.12                                 | 1.0  |      | U         |
| 100-41-4-----  | Ethylbenzene           | 0.10                                 | 1.0  |      | U         |
| 98-82-8-----   | Isopropylbenzene       | 0.11                                 | 0.80 |      | U         |
| 91-20-3-----   | Naphthalene            | 0.12                                 | 1.0  |      | U         |
| 108-88-3-----  | Toluene                | 0.14                                 | 1.0  |      | U         |
| 95-63-6-----   | 1,2,4-Trimethylbenzene | 0.14                                 | 1.0  |      | U         |
| 108-67-8-----  | 1,3,5-Trimethylbenzene | 0.10                                 | 1.0  |      | U         |
| 1330-20-7----- | Xylene (total)         | 0.21                                 | 1.0  |      | U         |

FORM I VOA

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

|                      |
|----------------------|
| TRIP BLA<br>NK #7309 |
|----------------------|

Lab Name: EMPIRICAL LABS      Contract: TETRATECH

Lab Code: NA      Case No.: NA      SAS No.: NA      SDG No.: JM09G82\_001

Matrix: (soil/water) WATER      Lab Sample ID: 0910199-09

Sample wt/vol:      5.000 (g/mL) ML      Lab File ID:      1019909

Level:      (low/med)      LOW      Date Sampled:      10/22/09 :

% Moisture: not dec. \_\_\_\_\_      Date Analyzed: 10/30/09 16:19

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

Soil Extract Volume: \_\_\_\_\_ (uL)      Soil Aliquot Volume: \_\_\_\_\_ (uL)

| CAS NO.        | COMPOUND               | CONCENTRATION UNITS: (ug/L or ug/Kg) |      |      | UG/L<br>Q |
|----------------|------------------------|--------------------------------------|------|------|-----------|
|                |                        | MDL                                  | RL   | CONC |           |
| 71-43-2-----   | Benzene                | 0.12                                 | 1.0  |      | U         |
| 100-41-4-----  | Ethylbenzene           | 0.10                                 | 1.0  |      | U         |
| 98-82-8-----   | Isopropylbenzene       | 0.11                                 | 0.80 |      | U         |
| 91-20-3-----   | Naphthalene            | 0.12                                 | 1.0  |      | U         |
| 108-88-3-----  | Toluene                | 0.14                                 | 1.0  |      | U         |
| 95-63-6-----   | 1,2,4-Trimethylbenzene | 0.14                                 | 1.0  |      | U         |
| 108-67-8-----  | 1,3,5-Trimethylbenzene | 0.10                                 | 1.0  |      | U         |
| 1330-20-7----- | Xylene (total)         | 0.21                                 | 1.0  |      | U         |

FORM I VOA

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

|                         |
|-------------------------|
| CEF-G82-4<br>S-20091023 |
|-------------------------|

Lab Name: EMPIRICAL LABS      Contract: TETRATECH

Lab Code: NA      Case No.: NA      SAS No.: NA      SDG No.: JM09G82\_001

Matrix: (soil/water) WATER      Lab Sample ID: 0910216-01

Sample wt/vol:      5.000 (g/mL) ML      Lab File ID:      1021601

Level:      (low/med)      LOW      Date Sampled:      10/23/09 09:30

% Moisture: not dec. \_\_\_\_\_      Date Analyzed: 10/30/09 20:14

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

Soil Extract Volume: \_\_\_\_\_ (uL)      Soil Aliquot Volume: \_\_\_\_\_ (uL)

| CAS NO.        | COMPOUND               | CONCENTRATION UNITS: (ug/L or ug/Kg) |      |      | UG/L<br>Q |
|----------------|------------------------|--------------------------------------|------|------|-----------|
|                |                        | MDL                                  | RL   | CONC |           |
| 71-43-2-----   | Benzene                | 0.12                                 | 1.0  |      | U         |
| 100-41-4-----  | Ethylbenzene           | 0.10                                 | 1.0  |      | U         |
| 98-82-8-----   | Isopropylbenzene       | 0.11                                 | 0.80 |      | U         |
| 91-20-3-----   | Naphthalene            | 0.12                                 | 1.0  | 0.90 | IV        |
| 108-88-3-----  | Toluene                | 0.14                                 | 1.0  |      | U         |
| 95-63-6-----   | 1,2,4-Trimethylbenzene | 0.14                                 | 1.0  |      | U         |
| 108-67-8-----  | 1,3,5-Trimethylbenzene | 0.10                                 | 1.0  |      | U         |
| 1330-20-7----- | Xylene (total)         | 0.21                                 | 1.0  |      | U         |

FORM I VOA



FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

|                         |
|-------------------------|
| CEF-G82-6<br>S-20091023 |
|-------------------------|

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910216-03

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 1021603

Level: (low/med) LOW Date Sampled: 10/23/09 11:15

% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 10/30/09 21:12

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

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

| CAS NO.        | COMPOUND               | CONCENTRATION UNITS: (ug/L or ug/Kg) |      |      | UG/L<br>Q |
|----------------|------------------------|--------------------------------------|------|------|-----------|
|                |                        | MDL                                  | RL   | CONC |           |
| 71-43-2-----   | Benzene                | 0.12                                 | 1.0  |      | U         |
| 100-41-4-----  | Ethylbenzene           | 0.10                                 | 1.0  |      | U         |
| 98-82-8-----   | Isopropylbenzene       | 0.11                                 | 0.80 |      | U         |
| 91-20-3-----   | Naphthalene            | 0.12                                 | 1.0  |      | U         |
| 108-88-3-----  | Toluene                | 0.14                                 | 1.0  |      | U         |
| 95-63-6-----   | 1,2,4-Trimethylbenzene | 0.14                                 | 1.0  |      | U         |
| 108-67-8-----  | 1,3,5-Trimethylbenzene | 0.10                                 | 1.0  |      | U         |
| 1330-20-7----- | Xylene (total)         | 0.21                                 | 1.0  |      | U         |

FORM I VOA

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

TRIP BLANK

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910216-04

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: 1021604

Level: (low/med) LOW Date Sampled: 10/23/09 :

% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 10/30/09 16:48

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

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

| CAS NO.        | COMPOUND               | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L |      |      | Q |
|----------------|------------------------|---|------|------|---|
|                |                        | MDL                                       | RL   | CONC |   |
| 71-43-2-----   | Benzene                | 0.12                                      | 1.0  |      | U |
| 100-41-4-----  | Ethylbenzene           | 0.10                                      | 1.0  |      | U |
| 98-82-8-----   | Isopropylbenzene       | 0.11                                      | 0.80 |      | U |
| 91-20-3-----   | Naphthalene            | 0.12                                      | 1.0  |      | U |
| 108-88-3-----  | Toluene                | 0.14                                      | 1.0  |      | U |
| 95-63-6-----   | 1,2,4-Trimethylbenzene | 0.14                                      | 1.0  |      | U |
| 108-67-8-----  | 1,3,5-Trimethylbenzene | 0.10                                      | 1.0  |      | U |
| 1330-20-7----- | Xylene (total)         | 0.21                                      | 1.0  |      | U |

FORM I VOA

FORM 2  
WATER VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: EMPIRICAL LABS      Contract: TETRATECH

Lab Code: NA                      Case No.: NA                      SAS No.: NA                      SDG No.: JM09G82\_001

|    | CLIENT<br>SAMPLE NO. | SMC1<br>(DFM) # | SMC2<br>(DCE) # | SMC3<br>(TOL) # | SMC4<br>(BFB) # | TOT<br>OUT |
|----|----------------------|-----------------|-----------------|-----------------|-----------------|------------|
| 01 | V4BLK1030LCS         | 106             | 102             | 100             | 98              | 0          |
| 02 | V4BLK1030            | 103             | 99              | 105             | 100             | 0          |
| 03 | TRIP BLANK #         | 105             | 95              | 106             | 101             | 0          |
| 04 | TRIP BLANK #         | 114             | 108             | 109             | 101             | 0          |
| 05 | TRIP BLANK #         | 104             | 98              | 113             | 104             | 0          |
| 06 | TRIP BLANK #         | 108             | 101             | 108             | 100             | 0          |
| 07 | TRIP BLANK           | 107             | 97              | 104             | 100             | 0          |
| 08 | CEF-G82-3S-2         | 108             | 104             | 110             | 100             | 0          |
| 09 | CEF-G82-1S-2         | 106             | 101             | 105             | 96              | 0          |
| 10 | CEF-G82-2S-2         | 109             | 99              | 107             | 104             | 0          |
| 11 | CEF-G82-DUP0         | 110             | 103             | 106             | 104             | 0          |
| 12 | CEF-G82-2I-2         | 114             | 102             | 104             | 99              | 0          |
| 13 | CEF-G82-4S-2         | 114             | 104             | 108             | 101             | 0          |
| 14 | CEF-G82-5S-2         | 113             | 97              | 106             | 99              | 0          |
| 15 | CEF-G82-6S-2         | 110             | 101             | 110             | 100             | 0          |
| 16 | V4BLK1030LCS         | 105             | 101             | 103             | 96              | 0          |
| 17 |                      |                 |                 |                 |                 |            |
| 18 |                      |                 |                 |                 |                 |            |
| 19 |                      |                 |                 |                 |                 |            |
| 20 |                      |                 |                 |                 |                 |            |
| 21 |                      |                 |                 |                 |                 |            |
| 22 |                      |                 |                 |                 |                 |            |
| 23 |                      |                 |                 |                 |                 |            |
| 24 |                      |                 |                 |                 |                 |            |
| 25 |                      |                 |                 |                 |                 |            |
| 26 |                      |                 |                 |                 |                 |            |
| 27 |                      |                 |                 |                 |                 |            |
| 28 |                      |                 |                 |                 |                 |            |
| 29 |                      |                 |                 |                 |                 |            |
| 30 |                      |                 |                 |                 |                 |            |

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

# Column to be used to flag recovery values

\* Values outside of contract required QC limits

D Surrogate results reported from a diluted analysis

FORM 3  
WATER VOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS      Contract: TETRATECH  
 Lab Code: NA                    Case No.: NA                    SAS No.: NA                    SDG No.: JM09G82\_001  
 Matrix Spike - Client Sample No.: V4BLK1030

| COMPOUND               | SPIKE ADDED (ug/L) | SAMPLE CONCENTRATION (ug/L) | LCS CONCENTRATION (ug/L) | LCS % REC # | QC. LIMITS REC. |
|------------------------|--------------------|-----------------------------|--------------------------|-------------|-----------------|
| Benzene                | 50.00              | 0.0000                      | 53.07                    | 106         | 80-120          |
| Ethylbenzene           | 50.00              | 0.0000                      | 50.91                    | 102         | 75-125          |
| Isopropylbenzene       | 50.00              | 0.0000                      | 56.21                    | 112         | 75-125          |
| Naphthalene            | 50.00              | 0.1762                      | 49.13                    | 98          | 55-140          |
| Toluene                | 50.00              | 0.0000                      | 49.88                    | 100         | 75-120          |
| 1,2,4-Trimethylbenzene | 50.00              | 0.0000                      | 50.50                    | 101         | 75-130          |
| 1,3,5-Trimethylbenzene | 50.00              | 0.0000                      | 49.63                    | 99          | 75-130          |
| Xylene (total)         | 150.0              | 0.0000                      | 150.6                    | 100         | 75-130          |

| COMPOUND               | SPIKE ADDED (ug/L) | LCSD CONCENTRATION (ug/L) | LCSD % REC # | % RPD # | QC LIMITS |        |
|------------------------|--------------------|---------------------------|--------------|---------|-----------|--------|
|                        |                    |                           |              |         | RPD       | REC.   |
| Benzene                | 50.00              | 51.25                     | 102          | 3       | 30        | 80-120 |
| Ethylbenzene           | 50.00              | 48.59                     | 97           | 5       | 30        | 75-125 |
| Isopropylbenzene       | 50.00              | 53.46                     | 107          | 5       | 30        | 75-125 |
| Naphthalene            | 50.00              | 44.73                     | 89           | 9       | 30        | 55-140 |
| Toluene                | 50.00              | 51.29                     | 102          | 3       | 30        | 75-120 |
| 1,2,4-Trimethylbenzene | 50.00              | 48.96                     | 98           | 3       | 30        | 75-130 |
| 1,3,5-Trimethylbenzene | 50.00              | 49.00                     | 98           | 1       | 30        | 75-130 |
| Xylene (total)         | 150.0              | 146.6                     | 98           | 3       | 30        | 75-130 |

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

\* Values outside of QC limits

RPD: 0 out of 8 outside limits  
 Spike Recovery: 0 out of 16 outside limits

COMMENTS: \_\_\_\_\_  
 \_\_\_\_\_

FORM 4  
VOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

V4BLK1030

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Lab File ID: V4BLK01 Lab Sample ID: 9K03014-BLK1

Date Analyzed: 10/30/09 Time Analyzed: 1322

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

Instrument ID: VOA4

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

|    | SAMPLE NO.   | LAB SAMPLE ID | LAB FILE ID | TIME ANALYZED |
|----|--------------|---------------|-------------|---------------|
|    | =====        | =====         | =====       | =====         |
| 01 | V4BLK1030LCS | 9K03014-BS1   | V4LCS01     | 1154          |
| 02 | TRIP BLANK # | 0910199-06    | 1019906     | 1450          |
| 03 | TRIP BLANK # | 0910199-07    | 1019907     | 1520          |
| 04 | TRIP BLANK # | 0910199-08    | 1019908     | 1549          |
| 05 | TRIP BLANK # | 0910199-09    | 1019909     | 1619          |
| 06 | TRIP BLANK   | 0910216-04    | 1021604     | 1648          |
| 07 | CEF-G82-3S-2 | 0910199-01    | 1019901     | 1747          |
| 08 | CEF-G82-1S-2 | 0910199-02    | 1019902     | 1816          |
| 09 | CEF-G82-2S-2 | 0910199-03    | 1019903     | 1846          |
| 10 | CEF-G82-DUP0 | 0910199-04    | 1019904     | 1915          |
| 11 | CEF-G82-2I-2 | 0910199-05    | 1019905     | 1944          |
| 12 | CEF-G82-4S-2 | 0910216-01    | 1021601     | 2014          |
| 13 | CEF-G82-5S-2 | 0910216-02    | 1021602     | 2043          |
| 14 | CEF-G82-6S-2 | 0910216-03    | 1021603     | 2112          |
| 15 | V4BLK1030LCS | 9K03014-BSD1  | V4LCSD01    | 2240          |
| 16 |              |               |             |               |
| 17 |              |               |             |               |
| 18 |              |               |             |               |
| 19 |              |               |             |               |
| 20 |              |               |             |               |
| 21 |              |               |             |               |
| 22 |              |               |             |               |
| 23 |              |               |             |               |
| 24 |              |               |             |               |
| 25 |              |               |             |               |
| 26 |              |               |             |               |
| 27 |              |               |             |               |
| 28 |              |               |             |               |
| 29 |              |               |             |               |
| 30 |              |               |             |               |

COMMENTS:

FORM 1  
VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

V4BLK1030

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 9K03014-BLK1

Sample wt/vol: 5.000 (g/mL) ML Lab File ID: V4BLK01

Level: (low/med) LOW Date Sampled: \_\_\_\_\_

% Moisture: not dec. \_\_\_\_\_ Date Analyzed: 10/30/09 13:22

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

Soil Extract Volume: \_\_\_\_\_ (uL) Soil Aliquot Volume: \_\_\_\_\_ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L  
MDL RL CONC Q

| CAS NO.        | COMPOUND               | MDL  | RL   | CONC | UG/L | Q |
|----------------|------------------------|------|------|------|------|---|
| 71-43-2-----   | Benzene                | 0.12 | 1.0  |      |      | U |
| 100-41-4-----  | Ethylbenzene           | 0.10 | 1.0  |      |      | U |
| 98-82-8-----   | Isopropylbenzene       | 0.11 | 0.80 |      |      | U |
| 91-20-3-----   | Naphthalene            | 0.12 | 1.0  | 0.18 |      | I |
| 108-88-3-----  | Toluene                | 0.14 | 1.0  |      |      | U |
| 95-63-6-----   | 1,2,4-Trimethylbenzene | 0.14 | 1.0  |      |      | U |
| 108-67-8-----  | 1,3,5-Trimethylbenzene | 0.10 | 1.0  |      |      | U |
| 1330-20-7----- | Xylene (total)         | 0.21 | 1.0  |      |      | U |

FORM I VOA

FORM 5  
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK  
BROMOFLUOROBENZENE (BFB)

Lab Name: EMPIRICAL LABS      Contract:

Lab Code:                      Case No.:                      SAS No.: NA                      SDG No.: SDGA84517

Lab File ID: V4BFB01                      BFB Injection Date: 10/16/09

Instrument ID: VOA4                      BFB Injection Time: 1201

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

| m/e | ION ABUNDANCE CRITERIA             | % RELATIVE ABUNDANCE |
|-----|------------------------------------|----------------------|
| 50  | 15.0 - 40.0% of mass 95            | 26.3                 |
| 75  | 30.0 - 60.0% of mass 95            | 51.9                 |
| 95  | Base Peak, 100% relative abundance | 100.0                |
| 96  | 5.0 - 9.0% of mass 95              | 7.4                  |
| 173 | Less than 2.0% of mass 174         | 0.0 ( 0.0)1          |
| 174 | Greater than 50.0% of mass 95      | 56.2                 |
| 175 | 5.0 - 9.0% of mass 174             | 4.8 ( 8.5)1          |
| 176 | 95.0 - 101.0% of mass 174          | 54.8 ( 97.5)1        |
| 177 | 5.0 - 9.0% of mass 176             | 3.8 ( 6.8)2          |

1-Value is % mass 174

2-Value is % mass 176

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

|    | EPA<br>SAMPLE NO. | LAB<br>SAMPLE ID | LAB<br>FILE ID | DATE<br>ANALYZED | TIME<br>ANALYZED |
|----|-------------------|------------------|----------------|------------------|------------------|
| 01 | V4STD0.25PPB      | V4STD0.25PPB     | V4STD01        | 10/16/09         | 1329             |
| 02 | V4STD0.5PPB       | V4STD0.5PPB      | V4STD02        | 10/16/09         | 1358             |
| 03 | V4STD1PPB         | V4STD1PPB        | V4STD03        | 10/16/09         | 1428             |
| 04 | V4STD2PPB         | V4STD2PPB        | V4STD04        | 10/16/09         | 1457             |
| 05 | V4STD10PPB        | V4STD10PPB       | V4STD05        | 10/16/09         | 1527             |
| 06 | V4STD20PPB        | V4STD20PPB       | V4STD06        | 10/16/09         | 1556             |
| 07 | V4STD50PPB        | V4STD50PPB       | V4STD07        | 10/16/09         | 1625             |
| 08 | V4BLK1016LCS      | V4BLK1016LCS     | V4ICV01        | 10/16/09         | 1655             |
| 09 | V4STD100PPB       | V4STD100PPB      | V4STD08        | 10/16/09         | 1724             |
| 10 | V4STD200PPB       | V4STD200PPB      | V4STD09        | 10/16/09         | 1754             |
| 11 |                   |                  |                |                  |                  |
| 12 |                   |                  |                |                  |                  |
| 13 |                   |                  |                |                  |                  |
| 14 |                   |                  |                |                  |                  |
| 15 |                   |                  |                |                  |                  |
| 16 |                   |                  |                |                  |                  |
| 17 |                   |                  |                |                  |                  |
| 18 |                   |                  |                |                  |                  |
| 19 |                   |                  |                |                  |                  |
| 20 |                   |                  |                |                  |                  |
| 21 |                   |                  |                |                  |                  |
| 22 |                   |                  |                |                  |                  |



FORM 8  
VOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS      Contract: TETRATECH  
 Lab Code: NA                    Case No.: NA                    SAS No.: NA                    SDG No.: JM09G82\_001  
 Lab File ID (Standard): SEQ-CCV1                    Date Analyzed: 10/30/09  
 Instrument ID: VOA4                                    Time Analyzed: 1103  
 GC Column: DB-VRX            ID: 0.25 (mm)                    Heated Purge: (Y/N) N

|                      | IS1 (FLB)<br>AREA # | RT #  | IS2 (CBZ)<br>AREA # | RT #  | IS3 (DCB)<br>AREA # | RT #  |
|----------------------|---------------------|-------|---------------------|-------|---------------------|-------|
| =====                | =====               | ===== | =====               | ===== | =====               | ===== |
| 12 HOUR STD          | 985388              | 13.82 | 530108              | 17.13 | 337914              | 19.16 |
| UPPER LIMIT          | 1970776             | 14.32 | 1060216             | 17.63 | 675828              | 19.66 |
| LOWER LIMIT          | 492694              | 13.32 | 265054              | 16.63 | 168957              | 18.66 |
| =====                | =====               | ===== | =====               | ===== | =====               | ===== |
| CLIENT<br>SAMPLE NO. |                     |       |                     |       |                     |       |
| =====                | =====               | ===== | =====               | ===== | =====               | ===== |
| 01 V4BLK1030LCS      | 1007044             | 13.83 | 512393              | 17.12 | 326166              | 19.16 |
| 02 V4BLK1030         | 998252              | 13.82 | 470788              | 17.12 | 319873              | 19.16 |
| 03 TRIP BLANK #      | 965748              | 13.83 | 449256              | 17.12 | 307409              | 19.16 |
| 04 TRIP BLANK #      | 876650              | 13.83 | 447008              | 17.12 | 297866              | 19.16 |
| 05 TRIP BLANK #      | 954683              | 13.82 | 426551              | 17.12 | 301873              | 19.16 |
| 06 TRIP BLANK #      | 937786              | 13.83 | 443876              | 17.12 | 287251              | 19.16 |
| 07 TRIP BLANK        | 928036              | 13.82 | 442971              | 17.13 | 299545              | 19.16 |
| 08 CEF-G82-3S-2      | 914940              | 13.83 | 437409              | 17.13 | 296768              | 19.16 |
| 09 CEF-G82-1S-2      | 943225              | 13.82 | 442142              | 17.13 | 301790              | 19.16 |
| 10 CEF-G82-2S-2      | 932907              | 13.82 | 440369              | 17.12 | 304282              | 19.17 |
| 11 CEF-G82-DUP0      | 909668              | 13.83 | 442348              | 17.12 | 294248              | 19.16 |
| 12 CEF-G82-2I-2      | 887635              | 13.83 | 419016              | 17.12 | 262861              | 19.16 |
| 13 CEF-G82-4S-2      | 887942              | 13.82 | 401018              | 17.13 | 249863              | 19.16 |
| 14 CEF-G82-5S-2      | 902535              | 13.82 | 401412              | 17.13 | 254491              | 19.16 |
| 15 CEF-G82-6S-2      | 930321              | 13.83 | 402900              | 17.12 | 263887              | 19.16 |
| 16 V4BLK1030LCS      | 958262              | 13.82 | 473146              | 17.12 | 290252              | 19.16 |
| 17                   |                     |       |                     |       |                     |       |
| 18                   |                     |       |                     |       |                     |       |
| 19                   |                     |       |                     |       |                     |       |
| 20                   |                     |       |                     |       |                     |       |
| 21                   |                     |       |                     |       |                     |       |
| 22                   |                     |       |                     |       |                     |       |

IS1 (FLB) = Fluorobenzene  
 IS2 (CBZ) = Chlorobenzene-d5  
 IS3 (DCB) = 1,4-Dichlorobenzene-d4

AREA UPPER LIMIT = +100% of internal standard area  
 AREA LOWER LIMIT = - 50% of internal standard area  
 RT UPPER LIMIT = + 0.50 minutes of internal standard RT  
 RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag values outside QC limits with an asterisk.  
 \* Values outside of QC limits.

FORM 6  
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code: ELABN      Case No.: NA      SAS No.: NA      SDG No.: SDGA03225

Instrument ID: VOA4      Calibration Date(s): 10/16/09      10/16/09

Column: DB-VRX      ID: 0.25 (mm)      Calibration Time(s): 1329      1754

LAB FILE ID:      RF0.25: V4STD01      RF0.5: V4STD02      RF1: V4STD03  
RF2: V4STD04      RF10: V4STD05

| COMPOUND                    | RF0.25 | RF0.5 | RF1   | RF2   | RF10  |
|-----------------------------|--------|-------|-------|-------|-------|
| Acetone                     |        |       |       | 0.122 | 0.114 |
| Acrolein                    |        |       |       | 0.007 | 0.008 |
| Acrylonitrile               |        | 0.098 | 0.113 | 0.107 | 0.120 |
| tert-Amyl Methyl Ether      |        |       | 1.126 | 0.924 | 0.780 |
| Benzene                     | 1.036  | 0.957 | 0.950 | 0.978 | 0.992 |
| Bromobenzene                | 0.673  | 0.573 | 0.620 | 0.605 | 0.657 |
| Bromochloromethane          | 0.115  | 0.101 | 0.119 | 0.116 | 0.119 |
| Bromodichloromethane        | 0.470  | 0.378 | 0.358 | 0.355 | 0.371 |
| Bromoform                   | 0.296  | 0.248 | 0.262 | 0.282 | 0.293 |
| Bromomethane                |        | 0.255 | 0.188 | 0.228 | 0.213 |
| 2-Butanone                  |        |       | 0.129 | 0.124 | 0.142 |
| t-Butyl alcohol             |        |       |       | 0.027 | 0.026 |
| n-Butylbenzene              | 2.087  | 2.023 | 2.033 | 1.877 | 2.005 |
| sec-Butylbenzene            | 2.928  | 2.691 | 2.439 | 2.324 | 2.560 |
| tert-Butylbenzene           | 2.056  | 1.877 | 1.683 | 1.506 | 1.618 |
| Carbon disulfide            | 0.831  | 0.759 | 0.759 | 0.716 | 0.841 |
| Carbon tetrachloride        | 0.296  | 0.255 | 0.248 | 0.255 | 0.268 |
| Chlorobenzene               | 1.227  | 1.192 | 1.178 | 1.192 | 1.215 |
| Chloroethane                | 0.255  | 0.275 | 0.226 | 0.219 | 0.234 |
| 2-Chloroethyl vinyl ether   | 0.115  | 0.119 | 0.119 | 0.120 | 0.127 |
| Chloroform                  | 0.600  | 0.530 | 0.464 | 0.484 | 0.468 |
| Chloromethane               |        | 0.268 | 0.216 | 0.187 | 0.211 |
| 1-Chlorohexane              |        |       | 0.726 | 0.596 | 0.615 |
| 2-Chlorotoluene             | 2.435  | 2.172 | 2.013 | 2.036 | 2.162 |
| 4-Chlorotoluene             | 2.799  | 2.371 | 2.221 | 2.325 | 2.470 |
| Cyclohexane                 | 0.509  | 0.444 | 0.450 | 0.435 | 0.446 |
| Dibromochloromethane        | 0.438  | 0.469 | 0.475 | 0.467 | 0.494 |
| 1,2-Dibromo-3-chloropropane |        |       | 0.128 | 0.114 | 0.121 |
| 1,2-Dibromoethane           | 0.552  | 0.530 | 0.482 | 0.480 | 0.500 |
| Dibromomethane              | 0.187  | 0.149 | 0.180 | 0.165 | 0.168 |
| 1,2-Dichlorobenzene         | 1.138  | 1.222 | 1.088 | 1.032 | 1.131 |
| 1,3-Dichlorobenzene         | 1.117  | 1.282 | 1.128 | 1.130 | 1.150 |
| 1,4-Dichlorobenzene         | 1.449  | 1.224 | 1.204 | 1.156 | 1.310 |
| Dichlorodifluoromethane     |        | 0.232 | 0.214 | 0.184 | 0.197 |
| 1,1-Dichloroethane          | 0.526  | 0.491 | 0.504 | 0.500 | 0.525 |
| 1,2-Dichloroethane          | 0.349  | 0.304 | 0.352 | 0.340 | 0.357 |
| 1,1-Dichloroethene          |        |       | 0.200 | 0.208 | 0.209 |

FORM VI VOA

FORM 6  
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code: ELABN      Case No.: NA      SAS No.: NA      SDG No.: , SDGA03225

Instrument ID: VOA4      Calibration Date(s): 10/16/09      10/16/09

Column: DB-VRX      ID: 0.25 (mm)      Calibration Time(s): 1329      1754

LAB FILE ID:      RF0.25: V4STD01      RF0.5: V4STD02      RF1: V4STD03  
RF2: V4STD04      RF10: V4STD05

| COMPOUND                   | RF0.25 | RF0.5 | RF1   | RF2   | RF10  |
|----------------------------|--------|-------|-------|-------|-------|
| cis-1,2-Dichloroethene     | 0.293  | 0.233 | 0.257 | 0.255 | 0.258 |
| trans-1,2-Dichloroethene   |        | 0.352 | 0.269 | 0.255 | 0.239 |
| 1,2-Dichloroethene (total) |        | 0.292 | 0.263 | 0.255 | 0.249 |
| 1,2-Dichloropropane        | 0.324  | 0.352 | 0.321 | 0.301 | 0.316 |
| 1,3-Dichloropropane        | 0.795  | 0.870 | 0.825 | 0.880 | 0.888 |
| 2,2-Dichloropropane        | 0.430  | 0.401 | 0.316 | 0.345 | 0.352 |
| 1,1-Dichloropropene        | 0.388  | 0.365 | 0.358 | 0.334 | 0.357 |
| cis-1,3-Dichloropropene    | 0.478  | 0.448 | 0.440 | 0.424 | 0.480 |
| trans-1,3-Dichloropropene  | 0.950  | 0.898 | 0.928 | 0.822 | 0.830 |
| Ethylbenzene               |        | 2.315 | 2.025 | 2.109 | 2.126 |
| Ethyl methacrylate         | 0.787  | 0.736 | 0.727 | 0.718 | 0.764 |
| Hexachlorobutadiene        | 0.239  | 0.279 | 0.230 | 0.239 | 0.241 |
| 2-Hexanone                 |        |       | 0.567 | 0.508 | 0.533 |
| Iodomethane                |        | 0.237 | 0.243 | 0.256 | 0.299 |
| Isopropylbenzene           |        | 1.748 | 1.623 | 1.513 | 1.550 |
| p-Isopropyltoluene         | 2.089  | 2.037 | 1.915 | 1.793 | 1.947 |
| Methyl acetate             |        |       | 0.390 | 0.423 | 0.377 |
| Methyl cyclohexane         | 0.351  | 0.344 | 0.299 | 0.288 | 0.316 |
| Methylene chloride         |        |       | 0.379 | 0.314 | 0.298 |
| Methyl methacrylate        |        | 0.337 | 0.262 | 0.281 | 0.314 |
| 4-Methyl-2-pentanone       | 0.393  | 0.365 | 0.322 | 0.365 | 0.363 |
| MTBE                       | 0.903  | 0.807 | 0.688 | 0.703 | 0.735 |
| Naphthalene                | 1.484  | 1.574 | 1.563 | 1.482 | 1.562 |
| n-Propylbenzene            | 3.398  | 3.474 | 3.184 | 2.912 | 3.393 |
| Styrene                    | 1.417  | 1.273 | 1.097 | 1.240 | 1.258 |
| 1,1,1,2-Tetrachloroethane  | 0.479  | 0.412 | 0.408 | 0.396 | 0.424 |
| 1,1,2,2-Tetrachloroethane  |        | 0.814 | 0.810 | 0.740 | 0.761 |
| Tetrachloroethene          | 0.409  | 0.364 | 0.330 | 0.341 | 0.368 |
| Tetrahydrofuran            |        |       |       | 0.099 | 0.096 |
| Toluene                    | 1.268  | 1.059 | 1.094 | 1.105 | 1.127 |
| 1,2,3-Trichlorobenzene     | 0.459  | 0.518 | 0.544 | 0.495 | 0.547 |
| 1,2,4-Trichlorobenzene     | 0.731  | 0.628 | 0.539 | 0.525 | 0.605 |
| 1,1,1-Trichloroethane      | 0.306  | 0.340 | 0.329 | 0.323 | 0.336 |
| 1,1,2-Trichloroethane      | 0.481  | 0.461 | 0.472 | 0.435 | 0.435 |
| Trichloroethene            | 0.328  | 0.299 | 0.269 | 0.245 | 0.273 |
| Trichlorotrifluoroethane   | 0.206  | 0.194 | 0.203 | 0.209 | 0.217 |
| Trichlorofluoromethane     | 0.344  | 0.312 | 0.356 | 0.323 | 0.363 |

FORM VI VOA

FORM 6  
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:  
 Lab Code: ELABN      Case No.: NA      SAS No.: NA      SDG No.: SDGA03225  
 Instrument ID: VOA4      Calibration Date(s): 10/16/09      10/16/09  
 Column: DB-VRX      ID: 0.25 (mm)      Calibration Time(s): 1329      1754  
 LAB FILE ID:      RF0.25: V4STD01      RF0.5: V4STD02      RF1: V4STD03  
 RF2: V4STD04      RF10: V4STD05

| COMPOUND               | RF0.25 | RF0.5 | RF1   | RF2   | RF10  |
|------------------------|--------|-------|-------|-------|-------|
| 1,2,3-Trichloropropane |        | 0.172 | 0.130 | 0.150 | 0.151 |
| 1,2,4-Trimethylbenzene | 2.427  | 2.245 | 2.050 | 1.941 | 2.122 |
| 1,3,5-Trimethylbenzene | 2.553  | 2.223 | 1.962 | 1.838 | 2.127 |
| Vinyl acetate          |        | 0.614 | 0.602 | 0.549 | 0.542 |
| Vinyl chloride         |        | 0.169 | 0.152 | 0.153 | 0.159 |
| m,p-Xylene             |        | 1.751 | 1.540 | 1.560 | 1.638 |
| Xylene(total)          |        | 5.181 | 4.702 | 4.725 | 5.005 |
| Di-isopropyl ether     | 1.395  | 1.356 | 1.242 | 1.283 | 1.372 |
| ETBE                   | 0.904  | 0.932 | 0.850 | 0.872 | 0.948 |
| Dibromofluoromethane   | 0.276  | 0.273 | 0.267 | 0.272 | 0.283 |
| 1,2-Dichloroethane-d4  | 0.064  | 0.061 | 0.061 | 0.063 | 0.063 |
| Toluene-d8             | 1.915  | 1.842 | 1.869 | 1.819 | 1.882 |
| Bromofluorobenzene     | 0.842  | 0.817 | 0.802 | 0.839 | 0.827 |

FORM VI VOA

FORM 6  
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:  
 Lab Code: ELABN      Case No.: NA      SAS No.: NA      SDG No.: SDGA03225  
 Instrument ID: VOA4      Calibration Date(s): 10/16/09      10/16/09  
 Column: DB-VRX      ID: 0.25 (mm)      Calibration Time(s): 1329      1754  
 LAB FILE ID:      RF20: V4STD06      RF50: V4STD07      RF100: V4STD08  
 RF200: V4STD09

| COMPOUND                    | RF20  | RF50  | RF100 | RF200 |
|-----------------------------|-------|-------|-------|-------|
| Acetone                     | 0.110 | 0.111 | 0.120 | 0.122 |
| Acrolein                    | 0.007 | 0.008 | 0.008 | 0.009 |
| Acrylonitrile               | 0.124 | 0.120 | 0.116 | 0.114 |
| tert-Amyl Methyl Ether      | 0.755 | 0.746 | 0.738 | 0.697 |
| Benzene                     | 0.979 | 0.951 | 0.947 | 0.848 |
| Bromobenzene                | 0.668 | 0.668 | 0.647 | 0.636 |
| Bromochloromethane          | 0.121 | 0.119 | 0.123 | 0.117 |
| Bromodichloromethane        | 0.362 | 0.360 | 0.367 | 0.346 |
| Bromoform                   | 0.299 | 0.296 | 0.289 | 0.272 |
| Bromomethane                | 0.225 | 0.226 | 0.242 | 0.234 |
| 2-Butanone                  | 0.150 | 0.155 | 0.159 | 0.162 |
| t-Butyl alcohol             | 0.027 | 0.026 | 0.026 | 0.026 |
| n-Butylbenzene              | 2.032 | 1.883 | 1.862 | 1.640 |
| sec-Butylbenzene            | 2.505 | 2.451 | 2.369 | 2.129 |
| tert-Butylbenzene           | 1.644 | 1.586 | 1.569 | 1.499 |
| Carbon disulfide            | 0.842 | 0.812 | 0.845 | 0.808 |
| Carbon tetrachloride        | 0.270 | 0.262 | 0.272 | 0.262 |
| Chlorobenzene               | 1.155 | 1.143 | 1.026 | 0.902 |
| Chloroethane                | 0.231 | 0.231 | 0.231 | 0.220 |
| 2-Chloroethyl vinyl ether   | 0.127 | 0.133 | 0.133 | 0.125 |
| Chloroform                  | 0.464 | 0.463 | 0.473 | 0.445 |
| Chloromethane               | 0.215 | 0.218 | 0.240 | 0.225 |
| 1-Chlorohexane              | 0.617 | 0.578 | 0.525 | 0.464 |
| 2-Chlorotoluene             | 2.175 | 2.136 | 2.042 | 1.801 |
| 4-Chlorotoluene             | 2.516 | 2.416 | 2.316 | 2.106 |
| Cyclohexane                 | 0.458 | 0.433 | 0.439 | 0.428 |
| Dibromochloromethane        | 0.522 | 0.501 | 0.479 | 0.436 |
| 1,2-Dibromo-3-chloropropane | 0.127 | 0.128 | 0.130 | 0.135 |
| 1,2-Dibromoethane           | 0.507 | 0.479 | 0.458 | 0.405 |
| Dibromomethane              | 0.166 | 0.166 | 0.168 | 0.163 |
| 1,2-Dichlorobenzene         | 1.129 | 1.086 | 1.095 | 1.038 |
| 1,3-Dichlorobenzene         | 1.217 | 1.172 | 1.197 | 1.103 |
| 1,4-Dichlorobenzene         | 1.263 | 1.233 | 1.214 | 1.213 |
| Dichlorodifluoromethane     | 0.203 | 0.192 | 0.201 | 0.200 |
| 1,1-Dichloroethane          | 0.518 | 0.522 | 0.527 | 0.509 |
| 1,2-Dichloroethane          | 0.362 | 0.365 | 0.366 | 0.363 |
| 1,1-Dichloroethene          | 0.207 | 0.209 | 0.212 | 0.204 |

FORM VI VOA

FORM 6  
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code: ELABN      Case No.: NA      SAS No.: NA      SDG No.: SDGA03225

Instrument ID: VOA4      Calibration Date(s): 10/16/09      10/16/09

Column: DB-VRX      ID: 0.25 (mm)      Calibration Time(s): 1329      1754

LAB FILE ID:      RF20: V4STD06      RF50: V4STD07      RF100: V4STD08  
RF200: V4STD09

| COMPOUND                   | RF20  | RF50  | RF100 | RF200 |
|----------------------------|-------|-------|-------|-------|
| cis-1,2-Dichloroethene     | 0.246 | 0.254 | 0.256 | 0.251 |
| trans-1,2-Dichloroethene   | 0.247 | 0.238 | 0.245 | 0.237 |
| 1,2-Dichloroethene (total) | 0.247 | 0.246 | 0.251 | 0.244 |
| 1,2-Dichloropropane        | 0.304 | 0.304 | 0.297 | 0.274 |
| 1,3-Dichloropropane        | 0.921 | 0.885 | 0.795 | 0.686 |
| 2,2-Dichloropropane        | 0.342 | 0.340 | 0.345 | 0.323 |
| 1,1-Dichloropropene        | 0.360 | 0.349 | 0.348 | 0.332 |
| cis-1,3-Dichloropropene    | 0.458 | 0.462 | 0.447 | 0.421 |
| trans-1,3-Dichloropropene  | 0.816 | 0.825 | 0.761 | 0.668 |
| Ethylbenzene               | 2.110 | 2.016 | 1.826 | 1.548 |
| Ethyl methacrylate         | 0.781 | 0.760 | 0.708 | 0.612 |
| Hexachlorobutadiene        | 0.256 | 0.252 | 0.261 | 0.269 |
| 2-Hexanone                 | 0.535 | 0.516 | 0.480 | 0.431 |
| Iodomethane                | 0.316 | 0.321 | 0.324 | 0.309 |
| Isopropylbenzene           | 1.511 | 1.492 | 1.339 | 1.181 |
| p-Isopropyltoluene         | 1.936 | 1.823 | 1.808 | 1.638 |
| Methyl acetate             | 0.389 | 0.392 | 0.410 | 0.396 |
| Methyl cyclohexane         | 0.312 | 0.296 | 0.298 | 0.297 |
| Methylene chloride         | 0.288 | 0.286 | 0.303 | 0.286 |
| Methyl methacrylate        | 0.329 | 0.315 | 0.339 | 0.319 |
| 4-Methyl-2-pentanone       | 0.367 | 0.359 | 0.355 | 0.325 |
| MTBE                       | 0.775 | 0.752 | 0.760 | 0.751 |
| Naphthalene                | 1.666 | 1.555 | 1.553 | 1.539 |
| n-Propylbenzene            | 3.365 | 3.207 | 3.030 | 2.726 |
| Styrene                    | 1.265 | 1.243 | 1.144 | 0.999 |
| 1,1,1,2-Tetrachloroethane  | 0.419 | 0.407 | 0.383 | 0.341 |
| 1,1,2,2-Tetrachloroethane  | 0.732 | 0.668 | 0.631 | 0.566 |
| Tetrachloroethene          | 0.375 | 0.364 | 0.345 | 0.322 |
| Tetrahydrofuran            | 0.098 | 0.095 | 0.104 | 0.100 |
| Toluene                    | 1.146 | 1.097 | 1.011 | 0.886 |
| 1,2,3-Trichlorobenzene     | 0.563 | 0.553 | 0.562 | 0.569 |
| 1,2,4-Trichlorobenzene     | 0.623 | 0.614 | 0.632 | 0.632 |
| 1,1,1-Trichloroethane      | 0.338 | 0.334 | 0.334 | 0.324 |
| 1,1,2-Trichloroethane      | 0.432 | 0.412 | 0.378 | 0.343 |
| Trichloroethene            | 0.272 | 0.262 | 0.269 | 0.255 |
| Trichlorotrifluoroethane   | 0.216 | 0.212 | 0.217 | 0.216 |
| Trichlorofluoromethane     | 0.363 | 0.358 | 0.376 | 0.374 |

FORM VI VOA

FORM 6  
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code: ELABN      Case No.: NA      SAS No.: NA      SDG No.: SDGA03225

Instrument ID: VOA4      Calibration Date(s): 10/16/09      10/16/09

Column: DB-VRX      ID: 0.25 (mm)      Calibration Time(s): 1329      1754

LAB FILE ID:      RF20: V4STD06      RF50: V4STD07      RF100: V4STD08  
RF200: V4STD09

| COMPOUND               | RF20  | RF50  | RF100 | RF200 |
|------------------------|-------|-------|-------|-------|
| 1,2,3-Trichloropropane | 0.156 | 0.145 | 0.139 | 0.129 |
| 1,2,4-Trimethylbenzene | 2.148 | 2.081 | 2.029 | 1.868 |
| 1,3,5-Trimethylbenzene | 2.132 | 2.062 | 1.923 | 1.814 |
| Vinyl acetate          | 0.591 | 0.574 | 0.630 | 0.572 |
| Vinyl chloride         | 0.158 | 0.157 | 0.161 | 0.147 |
| m,p-Xylene             | 1.611 | 1.512 | 1.348 | 1.072 |
| Xylene (total)         | 4.893 | 4.632 | 4.180 | 3.402 |
| Di-isopropyl ether     | 1.352 | 1.316 | 1.326 | 1.240 |
| ETBE                   | 0.926 | 0.933 | 0.944 | 0.867 |
| Dibromofluoromethane   | 0.274 | 0.278 | 0.279 | 0.273 |
| 1,2-Dichloroethane-d4  | 0.064 | 0.064 | 0.067 | 0.064 |
| Toluene-d8             | 1.894 | 1.918 | 1.775 | 1.647 |
| Bromofluorobenzene     | 0.813 | 0.818 | 0.793 | 0.734 |

FORM VI VOA

FORM 6  
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code: ELABN      Case No.: NA      SAS No.: NA      SDG No.: SDGA03225

Instrument ID: VOA4      Calibration Date(s): 10/16/09      10/16/09

Column: DB-VRX      ID: 0.25 (mm)      Calibration Time(s): 1329      1754

| COMPOUND                    | CURVE | COEFFICIENTS |            | %RSD<br>OR R <sup>2</sup> |
|-----------------------------|-------|--------------|------------|---------------------------|
|                             |       | A0           | A1         |                           |
| Acetone                     | AVRG  |              | 0.11658171 | 4.8                       |
| Acrolein                    | AVRG  |              | 7.98e-003  | 8.9                       |
| Acrylonitrile               | AVRG  |              | 0.11398569 | 7.4                       |
| tert-Amyl Methyl Ether      | LINR  | 0.00000000   | 0.70858096 | 0.999                     |
| Benzene                     | AVRG  |              | 0.96004105 | 5.3                       |
| Bromobenzene                | AVRG  |              | 0.63852447 | 5.3                       |
| Bromochloromethane          | AVRG  |              | 0.11671332 | 5.6                       |
| Bromodichloromethane        | AVRG  |              | 0.37420254 | 10.0                      |
| Bromoform                   | AVRG  |              | 0.28197289 | 6.3                       |
| Bromomethane                | AVRG  |              | 0.22641653 | 8.8                       |
| 2-Butanone                  | AVRG  |              | 0.14585903 | 10.1                      |
| t-Butyl alcohol             | AVRG  |              | 2.647e-002 | 1.6                       |
| n-Butylbenzene              | AVRG  |              | 1.93805140 | 7.1                       |
| sec-Butylbenzene            | AVRG  |              | 2.48857870 | 9.1                       |
| tert-Butylbenzene           | AVRG  |              | 1.67091116 | 11.0                      |
| Carbon disulfide            | AVRG  |              | 0.80121932 | 5.8                       |
| Carbon tetrachloride        | AVRG  |              | 0.26536053 | 5.3                       |
| Chlorobenzene               | AVRG  |              | 1.13679197 | 9.3                       |
| Chloroethane                | AVRG  |              | 0.23579107 | 7.6                       |
| 2-Chloroethyl vinyl ether   | AVRG  |              | 0.12418351 | 5.1                       |
| Chloroform                  | AVRG  |              | 0.48795410 | 9.9                       |
| Chloromethane               | AVRG  |              | 0.22260354 | 10.5                      |
| 1-Chlorohexane              | AVRG  |              | 0.58865191 | 13.9                      |
| 2-Chlorotoluene             | AVRG  |              | 2.10815192 | 8.1                       |
| 4-Chlorotoluene             | AVRG  |              | 2.39333373 | 8.2                       |
| Cyclohexane                 | AVRG  |              | 0.44922039 | 5.4                       |
| Dibromochloromethane        | AVRG  |              | 0.47594297 | 5.9                       |
| 1,2-Dibromo-3-chloropropane | AVRG  |              | 0.12628502 | 5.5                       |
| 1,2-Dibromoethane           | AVRG  |              | 0.48812787 | 8.7                       |
| Dibromomethane              | AVRG  |              | 0.16824148 | 6.2                       |
| 1,2-Dichlorobenzene         | AVRG  |              | 1.10659831 | 5.2                       |
| 1,3-Dichlorobenzene         | AVRG  |              | 1.16626037 | 4.9                       |
| 1,4-Dichlorobenzene         | AVRG  |              | 1.25185871 | 6.8                       |
| Dichlorodifluoromethane     | AVRG  |              | 0.20269121 | 7.2                       |
| 1,1-Dichloroethane          | AVRG  |              | 0.51339695 | 2.5                       |
| 1,2-Dichloroethane          | AVRG  |              | 0.35100234 | 5.5                       |
| 1,1-Dichloroethene          | AVRG  |              | 0.20699937 | 1.9                       |

FORM VI VOA

FORM 6  
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code: ELABN      Case No.: NA      SAS No.: NA      SDG No.: SDGA03225

Instrument ID: VOA4      Calibration Date(s): 10/16/09      10/16/09

Column: DB-VRX      ID: 0.25 (mm)      Calibration Time(s): 1329      1754

| COMPOUND                   | CURVE | COEFFICIENTS |            | %RSD<br>OR R^2 |
|----------------------------|-------|--------------|------------|----------------|
|                            |       | A0           | A1         |                |
| cis-1,2-Dichloroethene     | AVRG  |              | 0.25602751 | 6.2            |
| trans-1,2-Dichloroethene   | AVRG  |              | 0.26026686 | 14.8           |
| 1,2-Dichloroethene (total) | AVRG  |              | 0.25583460 | 6.3            |
| 1,2-Dichloropropane        | AVRG  |              | 0.31049108 | 7.0            |
| 1,3-Dichloropropane        | AVRG  |              | 0.83854599 | 8.6            |
| 2,2-Dichloropropane        | AVRG  |              | 0.35486696 | 10.4           |
| 1,1-Dichloropropene        | AVRG  |              | 0.35463086 | 4.8            |
| cis-1,3-Dichloropropene    | AVRG  |              | 0.45096591 | 4.6            |
| trans-1,3-Dichloropropene  | AVRG  |              | 0.83328494 | 10.4           |
| Ethylbenzene               | AVRG  |              | 2.00948195 | 11.5           |
| Ethyl methacrylate         | AVRG  |              | 0.73260935 | 7.2            |
| Hexachlorobutadiene        | AVRG  |              | 0.25191336 | 6.3            |
| 2-Hexanone                 | AVRG  |              | 0.51001780 | 8.6            |
| Iodomethane                | AVRG  |              | 0.28824318 | 12.7           |
| Isopropylbenzene           | AVRG  |              | 1.49465103 | 11.5           |
| p-Isopropyltoluene         | AVRG  |              | 1.88743724 | 7.3            |
| Methyl acetate             | AVRG  |              | 0.39678591 | 3.8            |
| Methyl cyclohexane         | LINR  | 0.00000000   | 0.29697282 | 1.000          |
| Methylene chloride         | AVRG  |              | 0.30789933 | 10.7           |
| Methyl methacrylate        | AVRG  |              | 0.31212546 | 8.7            |
| 4-Methyl-2-pentanone       | AVRG  |              | 0.35720264 | 6.1            |
| MTBE                       | AVRG  |              | 0.76391522 | 8.3            |
| Naphthalene                | AVRG  |              | 1.55330115 | 3.5            |
| n-Propylbenzene            | AVRG  |              | 3.18772508 | 7.9            |
| Styrene                    | AVRG  |              | 1.21525800 | 9.9            |
| 1,1,1,2-Tetrachloroethane  | AVRG  |              | 0.40767495 | 8.9            |
| 1,1,2,2-Tetrachloroethane  | AVRG  |              | 0.71511811 | 12.2           |
| Tetrachloroethene          | AVRG  |              | 0.35759439 | 7.4            |
| Tetrahydrofuran            | AVRG  |              | 9.887e-002 | 3.2            |
| Toluene                    | AVRG  |              | 1.08806677 | 9.5            |
| 1,2,3-Trichlorobenzene     | AVRG  |              | 0.53457350 | 6.9            |
| 1,2,4-Trichlorobenzene     | AVRG  |              | 0.61429869 | 9.6            |
| 1,1,1-Trichloroethane      | AVRG  |              | 0.32949632 | 3.2            |
| 1,1,2-Trichloroethane      | AVRG  |              | 0.42772534 | 10.4           |
| Trichloroethene            | AVRG  |              | 0.27484955 | 9.1            |
| Trichlorotrifluoroethane   | AVRG  |              | 0.20996728 | 3.7            |
| Trichlorofluoromethane     | AVRG  |              | 0.35209978 | 6.3            |

FORM VI VOA

FORM 6  
VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code: ELABN      Case No.: NA      SAS No.: NA      SDG No.: SDGA03225

Instrument ID: VOA4      Calibration Date(s): 10/16/09      10/16/09

Column: DB-VRX      ID: 0.25 (mm)      Calibration Time(s): 1329      1754

| COMPOUND               | CURVE | COEFFICIENTS |            | %RSD<br>OR R <sup>2</sup> |
|------------------------|-------|--------------|------------|---------------------------|
|                        |       | A0           | A1         |                           |
| 1,2,3-Trichloropropane | AVRG  |              | 0.14644449 | 9.6                       |
| 1,2,4-Trimethylbenzene | AVRG  |              | 2.10118598 | 7.9                       |
| 1,3,5-Trimethylbenzene | AVRG  |              | 2.07034917 | 11.0                      |
| Vinyl acetate          | AVRG  |              | 0.58440768 | 5.3                       |
| Vinyl chloride         | AVRG  |              | 0.15710872 | 4.3                       |
| m,p-Xylene             | AVRG  |              | 1.50415462 | 13.9                      |
| Xylene(total)          | AVRG  |              | 4.59002151 | 12.3                      |
| Di-isopropyl ether     | AVRG  |              | 1.32004692 | 4.2                       |
| ETBE                   | AVRG  |              | 0.90850127 | 4.0                       |
| Dibromofluoromethane   | AVRG  |              | 0.27512425 | 1.7                       |
| 1,2-Dichloroethane-d4  | AVRG  |              | 6.351e-002 | 2.8                       |
| Toluene-d8             | AVRG  |              | 1.84005424 | 4.7                       |
| Bromofluorobenzene     | AVRG  |              | 0.80938662 | 4.0                       |

FORM VI VOA

Empirical Laboratories, LLC

RECOVERY REPORT

Client Name: Client SDG: SDGa03225  
 Sample Matrix: LIQUID Fraction: VOA  
 Lab Smp Id: V4BLK1016LCS Client Smp ID: V4BLK1016LCS  
 Level: LOW Operator: JJH  
 Data Type: MS DATA SampleType: LCS  
 SpikeList File: c2nds5.spk Quant Type: ISTD  
 Sublist File: gm-all.sub  
 Method File: \\ELABNSH04\DD\chem\voa4.i\101609V4.b\VWATER4.m  
 Misc Info: ;3;LCS;;;gm-all.sub;9J0136,9J0330

| SPIKE COMPOUND          | CONC<br>ADDED<br>ug/L | CONC<br>RECOVERED<br>ug/L | %<br>RECOVERED | LIMITS |
|-------------------------|-----------------------|---------------------------|----------------|--------|
| 1 Dichlorodifluorome    | 50.00                 | 41.96                     | 83.92          | 75-125 |
| 3 Chloromethane         | 50.00                 | 50.32                     | 100.64         | 75-125 |
| 5 Vinyl chloride        | 50.00                 | 44.64                     | 89.28          | 75-125 |
| 7 Bromomethane          | 50.00                 | 50.10                     | 100.20         | 75-125 |
| 8 Chloroethane          | 50.00                 | 45.50                     | 91.00          | 75-125 |
| 11 t-Butyl alcohol      | 250.0                 | 244.6                     | 97.84          | 75-125 |
| 12 Acrolein             | 50.00                 | 230.6                     | 461.20*        | 75-125 |
| 13 Trichlorofluoromet   | 50.00                 | 40.91                     | 81.82          | 75-125 |
| 26 Trichlorotrifluoro   | 50.00                 | 40.25                     | 80.50          | 75-125 |
| 21 1,1-Dichloroethene   | 50.00                 | 40.33                     | 80.66          | 75-125 |
| 16 Acetone              | 100.0                 | 91.97                     | 91.97          | 75-125 |
| 22 Iodomethane          | 50.00                 | 54.85                     | 109.70         | 75-125 |
| 29 Carbon disulfide     | 50.00                 | 48.93                     | 97.86          | 75-125 |
| 24 Methylene chloride   | 50.00                 | 42.10                     | 84.20          | 75-125 |
| 25 Methyl acetate       | 50.00                 | 49.96                     | 99.92          | 75-125 |
| 35 trans-1,2-Dichloro   | 50.00                 | 42.14                     | 84.28          | 75-125 |
| 37 MTBE                 | 50.00                 | 47.68                     | 95.36          | 75-125 |
| 39 1,1-Dichloroethane   | 50.00                 | 47.39                     | 94.78          | 75-125 |
| 41 Vinyl acetate        | 100.0                 | 98.91                     | 98.91          | 75-125 |
| 42 ETBE                 | 50.00                 | 51.62                     | 103.24         | 75-125 |
| 48 cis-1,2-Dichloroet   | 50.00                 | 45.86                     | 91.72          | 75-125 |
| M 28 1,2-Dichloroethene | 100.0                 | 88.76                     | 88.76          | 75-125 |
| 46 2-Butanone           | 100.0                 | 96.94                     | 96.94          | 75-125 |
| 49 Bromochloromethane   | 50.00                 | 46.53                     | 93.06          | 75-125 |
| 50 Chloroform           | 50.00                 | 43.35                     | 86.70          | 75-125 |
| 53 Tetrahydrofuran      | 50.00                 | 49.21                     | 98.42          | 75-125 |
| 56 tert-Amyl Methyl E   | 50.00                 | 53.36                     | 106.72         | 75-125 |
| 58 1,1,1-Trichloroeth   | 50.00                 | 41.82                     | 83.64          | 75-125 |
| 60 Cyclohexane          | 50.00                 | 37.83                     | 75.66          | 75-125 |
| 61 Carbon tetrachlori   | 50.00                 | 41.95                     | 83.90          | 75-125 |
| 62 Benzene              | 50.00                 | 47.08                     | 94.16          | 75-125 |
| 57 1,2-Dichloroethane   | 50.00                 | 51.48                     | 102.96         | 75-125 |
| 51 2,2-Dichloropropan   | 50.00                 | 41.53                     | 83.06          | 75-125 |

| SPIKE COMPOUND         | CONC<br>ADDED<br>ug/L | CONC<br>RECOVERED<br>ug/L | %<br>RECOVERED | LIMITS |
|------------------------|-----------------------|---------------------------|----------------|--------|
| 59 1,1-Dichloropropen  | 50.00                 | 42.47                     | 84.94          | 75-125 |
| 69 Trichloroethene     | 50.00                 | 43.80                     | 87.60          | 75-125 |
| 68 1,2-Dichloropropan  | 50.00                 | 44.57                     | 89.14          | 75-125 |
| 67 Dibromomethane      | 50.00                 | 45.59                     | 91.18          | 75-125 |
| 72 Methyl methacrylat  | 50.00                 | 52.29                     | 104.58         | 75-125 |
| 70 Bromodichlorometha  | 50.00                 | 47.32                     | 94.64          | 75-125 |
| 74 2-Chloroethyl viny  | 100.0                 | 142.3                     | 142.30*        | 75-125 |
| 77 cis-1,3-Dichloropr  | 50.00                 | 48.76                     | 97.52          | 75-125 |
| 78 4-Methyl-2-pentano  | 100.0                 | 100.7                     | 100.70         | 75-125 |
| 82 Toluene             | 50.00                 | 47.28                     | 94.56          | 75-125 |
| 79 trans-1,3-Dichloro  | 50.00                 | 49.40                     | 98.80          | 75-125 |
| 84 Ethyl methacrylate  | 50.00                 | 49.60                     | 99.20          | 75-125 |
| 80 1,1,2-Trichloroeth  | 50.00                 | 42.98                     | 85.96          | 75-125 |
| 88 Tetrachloroethene   | 50.00                 | 41.64                     | 83.28          | 75-125 |
| 85 2-Hexanone          | 100.0                 | 95.92                     | 95.92          | 75-125 |
| 86 Dibromochlorometha  | 50.00                 | 51.77                     | 103.54         | 75-125 |
| 87 1,2-Dibromoethane   | 50.00                 | 46.11                     | 92.22          | 75-125 |
| 75 Methyl cyclohexane  | 50.00                 | 38.91                     | 77.82          | 75-125 |
| 89 1-Chlorohexane      | 50.00                 | 42.00                     | 84.00          | 75-125 |
| 92 Chlorobenzene       | 50.00                 | 46.51                     | 93.02          | 75-125 |
| 93 Ethylbenzene        | 50.00                 | 45.98                     | 91.96          | 75-125 |
| 90 1,1,1,2-Tetrachlor  | 50.00                 | 47.98                     | 95.96          | 75-125 |
| 94 m,p-Xylene          | 100.0                 | 95.50                     | 95.50          | 75-125 |
| M 116 Xylene (total)   | 150.0                 | 143.5                     | 95.67          | 75-125 |
| 99 o-Xylene            | 50.00                 | 47.96                     | 95.92          | 75-125 |
| 97 Styrene             | 50.00                 | 50.06                     | 100.12         | 75-125 |
| 95 Bromoform           | 50.00                 | 50.74                     | 101.48         | 75-125 |
| 102 Isopropylbenzene   | 50.00                 | 51.17                     | 102.34         | 75-125 |
| 98 1,1,2,2-Tetrachlor  | 50.00                 | 45.56                     | 91.12          | 75-125 |
| 83 1,3-Dichloropropan  | 50.00                 | 47.47                     | 94.94          | 75-125 |
| 100 1,2,3-Trichloropro | 50.00                 | 46.36                     | 92.72          | 75-125 |
| 105 n-Propylbenzene    | 50.00                 | 43.34                     | 86.68          | 75-125 |
| 108 1,3,5-Trimethylben | 50.00                 | 45.03                     | 90.06          | 75-125 |
| 110 1,2,4-Trimethylben | 50.00                 | 47.18                     | 94.36          | 75-125 |
| 111 sec-Butylbenzene   | 50.00                 | 43.52                     | 87.04          | 75-125 |
| 109 tert-Butylbenzene  | 50.00                 | 43.13                     | 86.26          | 75-125 |
| 112 1,3-Dichlorobenzen | 50.00                 | 49.63                     | 99.26          | 75-125 |
| 117 1,4-Dichlorobenzen | 50.00                 | 47.80                     | 95.60          | 75-125 |
| 119 n-Butylbenzene     | 50.00                 | 41.11                     | 82.22          | 75-125 |
| 118 1,2-Dichlorobenzen | 50.00                 | 46.84                     | 93.68          | 75-125 |
| 120 1,2-Dibromo-3-chlo | 50.00                 | 45.24                     | 90.48          | 75-125 |
| 104 Bromobenzene       | 50.00                 | 49.24                     | 98.48          | 75-125 |
| 106 2-Chlorotoluene    | 50.00                 | 47.37                     | 94.74          | 75-125 |
| 107 4-Chlorotoluene    | 50.00                 | 46.72                     | 93.44          | 75-125 |
| 122 1,2,4-Trichloroben | 50.00                 | 48.35                     | 96.70          | 75-125 |
| 123 Naphthalene        | 50.00                 | 50.16                     | 100.32         | 75-125 |
| 115 p-Isopropyltoluene | 50.00                 | 45.73                     | 91.46          | 75-125 |

Data File: \\ELABNSH04\DD\chem\voa4.i\101609V4.b\V4ICV01.D  
 Report Date: 17-Oct-2009 07:52

| SPIKE COMPOUND         | CONC<br>ADDED<br>ug/L | CONC<br>RECOVERED<br>ug/L | %<br>RECOVERED | LIMITS |
|------------------------|-----------------------|---------------------------|----------------|--------|
| 124 Hexachlorobutadien | 50.00                 | 48.16                     | 96.32          | 75-125 |
| 125 1,2,3-Trichloroben | 50.00                 | 49.43                     | 98.86          | 75-125 |

| SURROGATE COMPOUND        | CONC<br>ADDED<br>ug/L | CONC<br>RECOVERED<br>ug/L | %<br>RECOVERED | LIMITS |
|---------------------------|-----------------------|---------------------------|----------------|--------|
| \$ 52 Dibromofluorometha  | 30.00                 | 30.24                     | 100.80         | 85-120 |
| \$ 55 1,2-Dichloroethane  | 30.00                 | 31.03                     | 103.43         | 80-135 |
| \$ 81 Toluene-d8          | 30.00                 | 30.10                     | 100.33         | 85-115 |
| \$ 103 Bromofluorobenzene | 30.00                 | 30.37                     | 101.23         | 85-120 |

FORM 7  
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: EMPIRICAL LABS      Contract: TETRATECH  
 Lab Code: NA                    Case No.: NA                    SAS No.: NA                    SDG No.: JM09G82\_001  
 Instrument ID: VOA4                    Calibration Date: 10/30/09      Time: 1103  
 Lab File ID: SEQ-CCV1                    Init. Calib. Date(s): 03/05/08    10/16/09  
 Heated Purge: (Y/N) N                    Init. Calib. Times:    0908                    1754  
 GC Column: DB-VRX                    ID: 0.25 (mm)

| COMPOUND               | RRF   | RRF100 | CURVE AMOUNT | CCAL AMOUNT | MIN RRF | CURVE | %D   | MAX %D |
|------------------------|-------|--------|--------------|-------------|---------|-------|------|--------|
| Benzene                | 0.960 | 0.936  | 100.0        | 97.50       |         | AVRG  | -2.5 | 20.0   |
| Ethylbenzene           | 2.009 | 1.882  | 100.0        | 93.67       |         | AVRG  | -6.3 | 20.0   |
| Isopropylbenzene       | 1.495 | 1.372  | 100.0        | 91.83       |         | AVRG  | -8.2 | 20.0   |
| Naphthalene            | 1.553 | 1.550  | 100.0        | 99.79       |         | AVRG  | -0.2 | 20.0   |
| Toluene                | 1.088 | 1.026  | 100.0        | 94.33       |         | AVRG  | -5.7 | 20.0   |
| 1,2,4-Trimethylbenzene | 2.101 | 2.075  | 100.0        | 98.78       |         | AVRG  | -1.2 | 20.0   |
| 1,3,5-Trimethylbenzene | 2.070 | 1.982  | 100.0        | 95.75       |         | AVRG  | -4.2 | 20.0   |
| Xylene (total)         | 4.590 | 4.224  | 300.0        | 272.3       |         | AVRG  | -8.0 | 20.0   |
| Dibromofluoromethane   | 0.275 | 0.277  | 30.00        | 30.18       |         | AVRG  | 0.6  |        |
| 1,2-Dichloroethane-d4  | 0.063 | 0.061  | 30.00        | 28.69       |         | AVRG  | -4.4 |        |
| Toluene-d8             | 1.840 | 1.754  | 30.00        | 28.60       |         | AVRG  | -4.7 |        |
| Bromofluorobenzene     | 0.809 | 0.775  | 30.00        | 28.74       |         | AVRG  | -4.2 |        |

FORM VII VOA

**ORGANIC CASE NARRATIVE**  
**Tetra Tech NUS, Inc./Nas Cecil Field (BP Wells) JM09**  
**SDG: JM09G82\_001**

| Sampled    | Received   | Lab ID     | Client ID              |
|------------|------------|------------|------------------------|
| 10/22/2009 | 10/23/2009 | 0910199-01 | CEF-G82-3S-20091022    |
| 10/22/2009 | 10/23/2009 | 0910199-02 | CEF-G82-1S-20091022    |
| 10/22/2009 | 10/23/2009 | 0910199-03 | CEF-G82-2S-20091022    |
| 10/22/2009 | 10/23/2009 | 0910199-04 | CEF-G82-DUP01-20091022 |
| 10/22/2009 | 10/23/2009 | 0910199-05 | CEF-G82-2I-20091022    |
| 10/23/2009 | 10/24/2009 | 0910216-01 | CEF-G82-4S-2009        |
| 10/23/2009 | 10/24/2009 | 0910216-02 | CEF-G82-5S-2009        |
| 10/23/2009 | 10/24/2009 | 0910216-03 | CEF-G82-6S-2009        |

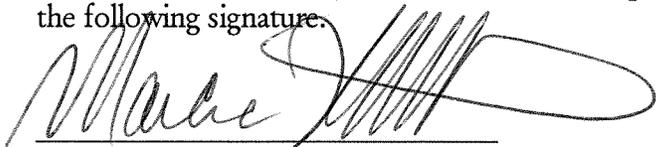
**Low Concentration Semi-Volatiles**

**Method:** The samples were extracted/analyzed for a client specified analyte list by USEPA SW-846 Methods 3510C/8270C (separatory funnel extraction then capillary column GC/MS) for waters upon receipt to the laboratory in satisfactory condition.

**Comments:** The volatile analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following note/exceptions:

- Note: These samples were analyzed for full-scan, low-concentration PAHs by employing a combination of sensitivity enhancing techniques in the extraction and analysis processes. AFCEE 4.02 Table 7.2.3.1-2 limits were applied for LCS/MS/MSD and surrogate.
- In the continuing calibration verification analyzed 10/29/09 12:10, benzo(k)fluoranthene and 2-methylnaphthalene exceeded 20% difference with positive biases of 31.1% and 46.2%. Reported concentrations above the quantitation limit in the associated samples were qualified "J2" to indicate a potential positive bias. All other CCV results were within 20% difference.
- Several analytes were detected in method blank 9J23017-BLK1 with some concentrations being above the quantitation limits. Reported concentrations in the associated samples are qualified with a "V". Associated samples were re-extracted 7 and 8 days after sampling with the exception of samples CEF-G82-2S-20091022 and CEF-G82-DUP01-20091022 which required dilutions to bring target analytes within range of the initial calibration. Results from the re-extracts are reported with an "RE" appended to the sample ID.
- Several analytes were detected in method blank 9J30332-BLK1 at concentrations less than 1/2 the reporting limit while phenanthrene was detected between 1/2 the quantitation limit and the quantitation limit. Reported concentrations in the associated samples are qualified with a "V".
- In spike samples 9J23017-BLK1LCS/LCSD, recoveries of benzo(a)anthracene were below the limit of 58% at (65%)/56%. In spike samples 9J30332-BLK1LCS/LCSD, the relative percent difference for 2-methylnaphthalene exceeded the limit at 41. All other recoveries and relative percent differences were within limits.
- Quantitation signals were manually integrated in order to accurately reflect the peak areas based on the technical judgment of the analyst. A listing of the manual integrations performed and reason for the integration is included with the logs. Before and after "pictures" are available at the laboratory where manual integrations were performed.

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



Marcia K. McGinnity  
Senior Project Manager

## ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

- MDL:** The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.
- EQL:** The estimated quantitation limit (EQL), also known as the reporting limit (RL), is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.
- U:** The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.
- 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".
- I:** The presence of an "I" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL/RL.
- L:** The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with a "L". Usually the sample will be rerun at a dilution to quantitate the flagged compound.
- V:** The presence of a "V" 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.
- J1:** The reported analyte concentration may have a low bias as the CCV exceeded the limit on the low side.
- J2:** The reported analyte concentration may have a high bias as the CCV exceeded the limit on the high side.
- M:** The presence of an "M" to the right of an analytical result indicates that the sample matrix interfered with the quantitation of the analyte. In GC and HPLC, results are reported from the column with the lower concentration.
- I:** The presence of an "I" to the right of an analytical result that the presence of a qualitative interference could have caused a false positive or over estimation of the analyte. In GC and HPLC, results are reported from the column with the lower concentration.

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-3  
S-20091022

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910199-01

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 1019901

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Sampled: 10/22/09 10:30

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted: 10/27/09

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 10/29/09 14:43

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L  
MDL RL CONC Q

| CAS NO.       | COMPOUND                   | MDL   | RL    | CONC  | UG/L Q |
|---------------|----------------------------|-------|-------|-------|--------|
| 83-32-9-----  | Acenaphthene               | 0.46  | 2.8   |       | U      |
| 208-96-8----- | Acenaphthylene             | 0.018 | 0.056 |       | U      |
| 120-12-7----- | Anthracene                 | 0.092 | 0.28  |       | U      |
| 56-55-3-----  | Benzo (a) anthracene       | 0.018 | 0.056 |       | U      |
| 205-99-2----- | Benzo (b) fluoranthene     | 0.018 | 0.056 |       | U      |
| 207-08-9----- | Benzo (k) fluoranthene     | 0.018 | 0.056 |       | U      |
| 191-24-2----- | Benzo (g, h, i) perylene   | 0.018 | 0.056 |       | U      |
| 50-32-8-----  | Benzo (a) pyrene           | 0.018 | 0.056 |       | U      |
| 218-01-9----- | Chrysene                   | 0.018 | 0.056 | 0.020 | IV     |
| 53-70-3-----  | Dibenz (a, h) anthracene   | 0.018 | 0.056 |       | U      |
| 206-44-0----- | Fluoranthene               | 0.092 | 0.28  |       | U      |
| 86-73-7-----  | Fluorene                   | 0.46  | 2.8   |       | U      |
| 193-39-5----- | Indeno (1, 2, 3-cd) pyrene | 0.018 | 0.056 |       | U      |
| 90-12-0-----  | 1-Methylnaphthalene        | 0.46  | 2.8   |       | U      |
| 91-57-6-----  | 2-Methylnaphthalene        | 0.46  | 2.8   |       | U      |
| 91-20-3-----  | Naphthalene                | 0.46  | 2.8   |       | U      |
| 85-01-8-----  | Phenanthrene               | 0.018 | 0.056 | 0.026 | IV     |
| 129-00-0----- | Pyrene                     | 0.092 | 0.28  |       | U      |

FORM I SV

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

|                           |
|---------------------------|
| CEF-G82-3<br>S-20091022RE |
|---------------------------|

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910199-01RE

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 1019901R

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Sampled: 10/22/09 10:30

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted: 10/30/09

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 11/05/09 10:35

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

| CAS NO.       | COMPOUND                   | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L |       |       | Q  |
|---------------|----------------------------|---|-------|-------|----|
|               |                            | MDL                                       | RL    | CONC  |    |
| 83-32-9-----  | Acenaphthene               | 0.46                                      | 2.8   |       | U  |
| 208-96-8----- | Acenaphthylene             | 0.018                                     | 0.056 | 0.036 | IV |
| 120-12-7----- | Anthracene                 | 0.092                                     | 0.28  |       | U  |
| 56-55-3-----  | Benzo (a) anthracene       | 0.018                                     | 0.056 | 0.067 | V  |
| 205-99-2----- | Benzo (b) fluoranthene     | 0.018                                     | 0.056 | 0.051 | I  |
| 207-08-9----- | Benzo (k) fluoranthene     | 0.018                                     | 0.056 | 0.058 |    |
| 191-24-2----- | Benzo (g, h, i) perylene   | 0.018                                     | 0.056 | 0.044 | I  |
| 50-32-8-----  | Benzo (a) pyrene           | 0.018                                     | 0.056 | 0.041 | I  |
| 218-01-9----- | Chrysene                   | 0.018                                     | 0.056 | 0.062 | V  |
| 53-70-3-----  | Dibenz (a, h) anthracene   | 0.018                                     | 0.056 |       | U  |
| 206-44-0----- | Fluoranthene               | 0.092                                     | 0.28  |       | U  |
| 86-73-7-----  | Fluorene                   | 0.46                                      | 2.8   |       | U  |
| 193-39-5----- | Indeno (1, 2, 3-cd) pyrene | 0.018                                     | 0.056 |       | U  |
| 90-12-0-----  | 1-Methylnaphthalene        | 0.46                                      | 2.8   |       | U  |
| 91-57-6-----  | 2-Methylnaphthalene        | 0.46                                      | 2.8   |       | U  |
| 91-20-3-----  | Naphthalene                | 0.46                                      | 2.8   |       | U  |
| 85-01-8-----  | Phenanthrene               | 0.018                                     | 0.056 | 0.077 | V  |
| 129-00-0----- | Pyrene                     | 0.092                                     | 0.28  |       | U  |

FORM I SV

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-1  
S-20091022

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910199-02

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 1019902R

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Sampled: 10/22/09 11:55

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted: 10/27/09

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 11/05/09 08:40

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L  
MDL RL CONC Q

| CAS NO.       | COMPOUND                   | MDL   | RL    | CONC  | UG/L | Q |
|---------------|----------------------------|-------|-------|-------|------|---|
| 83-32-9-----  | Acenaphthene               | 0.46  | 2.8   |       |      | U |
| 208-96-8----- | Acenaphthylene             | 0.018 | 0.056 |       |      | U |
| 120-12-7----- | Anthracene                 | 0.092 | 0.28  |       |      | U |
| 56-55-3-----  | Benzo (a) anthracene       | 0.018 | 0.056 |       |      | U |
| 205-99-2----- | Benzo (b) fluoranthene     | 0.018 | 0.056 |       |      | U |
| 207-08-9----- | Benzo (k) fluoranthene     | 0.018 | 0.056 |       |      | U |
| 191-24-2----- | Benzo (g, h, i) perylene   | 0.018 | 0.056 |       |      | U |
| 50-32-8-----  | Benzo (a) pyrene           | 0.018 | 0.056 |       |      | U |
| 218-01-9----- | Chrysene                   | 0.018 | 0.056 |       |      | U |
| 53-70-3-----  | Dibenz (a, h) anthracene   | 0.018 | 0.056 |       |      | U |
| 206-44-0----- | Fluoranthene               | 0.092 | 0.28  |       |      | U |
| 86-73-7-----  | Fluorene                   | 0.46  | 2.8   |       |      | U |
| 193-39-5----- | Indeno (1, 2, 3-cd) pyrene | 0.018 | 0.056 |       |      | U |
| 90-12-0-----  | 1-Methylnaphthalene        | 0.46  | 2.8   | 5.8   |      |   |
| 91-57-6-----  | 2-Methylnaphthalene        | 0.46  | 2.8   | 7.1   |      |   |
| 91-20-3-----  | Naphthalene                | 0.46  | 2.8   | 4.6   |      |   |
| 85-01-8-----  | Phenanthrene               | 0.018 | 0.056 | 0.083 |      | V |
| 129-00-0----- | Pyrene                     | 0.092 | 0.28  |       |      | U |

FORM I SV

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-1  
S-20091022RE

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910199-02RE

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 1019902R2

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Sampled: 10/22/09 11:55

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted: 10/30/09

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 11/05/09 11:13

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

| CAS NO.       | COMPOUND                   | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L |       |       | Q |
|---------------|----------------------------|---|-------|-------|---|
|               |                            | MDL                                       | RL    | CONC  |   |
| 83-32-9-----  | Acenaphthene               | 0.46                                      | 2.8   |       | U |
| 208-96-8----- | Acenaphthylene             | 0.018                                     | 0.056 |       | U |
| 120-12-7----- | Anthracene                 | 0.092                                     | 0.28  |       | U |
| 56-55-3-----  | Benzo (a) anthracene       | 0.018                                     | 0.056 |       | U |
| 205-99-2----- | Benzo (b) fluoranthene     | 0.018                                     | 0.056 |       | U |
| 207-08-9----- | Benzo (k) fluoranthene     | 0.018                                     | 0.056 |       | U |
| 191-24-2----- | Benzo (g, h, i) perylene   | 0.018                                     | 0.056 |       | U |
| 50-32-8-----  | Benzo (a) pyrene           | 0.018                                     | 0.056 |       | U |
| 218-01-9----- | Chrysene                   | 0.018                                     | 0.056 |       | U |
| 53-70-3-----  | Dibenz (a, h) anthracene   | 0.018                                     | 0.056 |       | U |
| 206-44-0----- | Fluoranthene               | 0.092                                     | 0.28  |       | U |
| 86-73-7-----  | Fluorene                   | 0.46                                      | 2.8   |       | U |
| 193-39-5----- | Indeno (1, 2, 3-cd) pyrene | 0.018                                     | 0.056 |       | U |
| 90-12-0-----  | 1-Methylnaphthalene        | 0.46                                      | 2.8   | 5.0   |   |
| 91-57-6-----  | 2-Methylnaphthalene        | 0.46                                      | 2.8   | 6.2   |   |
| 91-20-3-----  | Naphthalene                | 0.46                                      | 2.8   | 4.0   |   |
| 85-01-8-----  | Phenanthrene               | 0.018                                     | 0.056 | 0.077 | V |
| 129-00-0----- | Pyrene                     | 0.092                                     | 0.28  |       | U |

FORM I SV

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-2  
S-20091022

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910199-03

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 1019903

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Sampled: 10/22/09 13:05

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted: 10/27/09

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 10/29/09 16:00

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

| CAS NO.       | COMPOUND                   | CONCENTRATION UNITS: |                       |              | UG/L<br>Q      |
|---------------|----------------------------|----------------------|-----------------------|--------------|----------------|
|               |                            | MDL                  | (ug/L or ug/Kg)<br>RL | UG/L<br>CONC |                |
| 83-32-9-----  | Acenaphthene               | 0.46                 | 2.8                   | 4.9          |                |
| 208-96-8----- | Acenaphthylene             | 0.018                | 0.056                 | 2.6          | V              |
| 120-12-7----- | Anthracene                 | 0.092                | 0.28                  |              | U              |
| 56-55-3-----  | Benzo (a) anthracene       | 0.018                | 0.056                 |              | U              |
| 205-99-2----- | Benzo (b) fluoranthene     | 0.018                | 0.056                 |              | U              |
| 207-08-9----- | Benzo (k) fluoranthene     | 0.018                | 0.056                 |              | U              |
| 191-24-2----- | Benzo (g, h, i) perylene   | 0.018                | 0.056                 |              | U              |
| 50-32-8-----  | Benzo (a) pyrene           | 0.018                | 0.056                 |              | U              |
| 218-01-9----- | Chrysene                   | 0.018                | 0.056                 |              | U              |
| 53-70-3-----  | Dibenz (a, h) anthracene   | 0.018                | 0.056                 |              | U              |
| 206-44-0----- | Fluoranthene               | 0.092                | 0.28                  |              | U              |
| 86-73-7-----  | Fluorene                   | 0.46                 | 2.8                   | 7.4          |                |
| 193-39-5----- | Indeno (1, 2, 3-cd) pyrene | 0.018                | 0.056                 |              | U              |
| 90-12-0-----  | 1-Methylnaphthalene        | 0.46                 | 2.8                   | 98           | <del>U</del> L |
| 91-57-6-----  | 2-Methylnaphthalene        | 0.46                 | 2.8                   | 110          | <del>U</del> ↓ |
| 91-20-3-----  | Naphthalene                | 0.46                 | 2.8                   | 57           | <del>U</del> ↓ |
| 85-01-8-----  | Phenanthrene               | 0.018                | 0.056                 | 5.4          | V              |
| 129-00-0----- | Pyrene                     | 0.092                | 0.28                  |              | U              |

*M*  
*11/2/09*

FORM I SV

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-2  
S-20091022DL

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910199-03DL

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 1019903D

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Sampled: 10/22/09 13:05

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted: 10/27/09

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 11/05/09 14:25

Injection Volume: 1.0 (uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

| CAS NO.       | COMPOUND                   | CONCENTRATION UNITS: |                       |              | Q  |
|---------------|----------------------------|----------------------|-----------------------|--------------|----|
|               |                            | MDL                  | (ug/L or ug/Kg)<br>RL | UG/L<br>CONC |    |
| 83-32-9-----  | Acenaphthene               | 2.3                  | 14                    | 4.5          | ID |
| 208-96-8----- | Acenaphthylene             | 0.092                | 0.28                  |              | UD |
| 120-12-7----- | Anthracene                 | 0.46                 | 1.4                   |              | UD |
| 56-55-3-----  | Benzo (a) anthracene       | 0.092                | 0.28                  |              | UD |
| 205-99-2----- | Benzo (b) fluoranthene     | 0.092                | 0.28                  |              | UD |
| 207-08-9----- | Benzo (k) fluoranthene     | 0.092                | 0.28                  |              | UD |
| 191-24-2----- | Benzo (g, h, i) perylene   | 0.092                | 0.28                  |              | UD |
| 50-32-8-----  | Benzo (a) pyrene           | 0.092                | 0.28                  |              | UD |
| 218-01-9----- | Chrysene                   | 0.092                | 0.28                  |              | UD |
| 53-70-3-----  | Dibenz (a, h) anthracene   | 0.092                | 0.28                  |              | UD |
| 206-44-0----- | Fluoranthene               | 0.46                 | 1.4                   |              | UD |
| 86-73-7-----  | Fluorene                   | 2.3                  | 14                    | 7.8          | ID |
| 193-39-5----- | Indeno (1, 2, 3-cd) pyrene | 0.092                | 0.28                  |              | UD |
| 90-12-0-----  | 1-Methylnaphthalene        | 2.3                  | 14                    | 100          | D  |
| 91-57-6-----  | 2-Methylnaphthalene        | 2.3                  | 14                    | 130          | D  |
| 91-20-3-----  | Naphthalene                | 2.3                  | 14                    | 66           | D  |
| 85-01-8-----  | Phenanthrene               | 0.092                | 0.28                  | 5.8          | DV |
| 129-00-0----- | Pyrene                     | 0.46                 | 1.4                   |              | UD |

FORM I SV

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-D  
UP01-20091

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910199-04

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 1019904

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Sampled: 10/22/09 :

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted: 10/27/09

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 10/29/09 16:38

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

| CAS NO.       | COMPOUND                   | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L |       |       | Q              |
|---------------|----------------------------|---|-------|-------|----------------|
|               |                            | MDL                                       | RL    | CONC  |                |
| 83-32-9-----  | Acenaphthene               | 0.46                                      | 2.8   | 4.8   |                |
| 208-96-8----- | Acenaphthylene             | 0.018                                     | 0.056 | 2.4   | I              |
| 120-12-7----- | Anthracene                 | 0.092                                     | 0.28  |       | U              |
| 56-55-3-----  | Benzo (a) anthracene       | 0.018                                     | 0.056 | 0.047 | IV             |
| 205-99-2----- | Benzo (b) fluoranthene     | 0.018                                     | 0.056 | 0.042 | IV             |
| 207-08-9----- | Benzo (k) fluoranthene     | 0.018                                     | 0.056 | 0.046 | IV             |
| 191-24-2----- | Benzo (g, h, i) perylene   | 0.018                                     | 0.056 |       | U              |
| 50-32-8-----  | Benzo (a) pyrene           | 0.018                                     | 0.056 | 0.035 | IV             |
| 218-01-9----- | Chrysene                   | 0.018                                     | 0.056 | 0.047 | IV             |
| 53-70-3-----  | Dibenz (a, h) anthracene   | 0.018                                     | 0.056 | 0.031 | I              |
| 206-44-0----- | Fluoranthene               | 0.092                                     | 0.28  |       | U              |
| 86-73-7-----  | Fluorene                   | 0.46                                      | 2.8   | 6.9   |                |
| 193-39-5----- | Indeno (1, 2, 3-cd) pyrene | 0.018                                     | 0.056 | 0.025 | I              |
| 90-12-0-----  | 1-Methylnaphthalene        | 0.46                                      | 2.8   | 94    | <del>E</del> L |
| 91-57-6-----  | 2-Methylnaphthalene        | 0.46                                      | 2.8   | 110   | <del>E</del> L |
| 91-20-3-----  | Naphthalene                | 0.46                                      | 2.8   | 54    | <del>E</del> L |
| 85-01-8-----  | Phenanthrene               | 0.018                                     | 0.056 | 5.0   | V              |
| 129-00-0----- | Pyrene                     | 0.092                                     | 0.28  |       | U              |

*M. 10/29/09*

FORM I SV

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-D  
UP01-20091DL

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910199-04DL

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 1019904D

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Sampled: 10/22/09 :

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted:10/27/09

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 11/05/09 15:03

Injection Volume: 1.0 (uL) Dilution Factor: 5.0

GPC Cleanup: (Y/N) N pH: NA

| CAS NO.       | COMPOUND                 | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L |      |      | Q  |
|---------------|--------------------------|---|------|------|----|
|               |                          | MDL                                       | RL   | CONC |    |
| 83-32-9-----  | Acenaphthene             | 2.3                                       | 14   | 4.7  | ID |
| 208-96-8----- | Acenaphthylene           | 0.092                                     | 0.28 |      | UD |
| 120-12-7----- | Anthracene               | 0.46                                      | 1.4  |      | UD |
| 56-55-3-----  | Benzo (a) anthracene     | 0.092                                     | 0.28 |      | UD |
| 205-99-2----- | Benzo (b) fluoranthene   | 0.092                                     | 0.28 |      | UD |
| 207-08-9----- | Benzo (k) fluoranthene   | 0.092                                     | 0.28 |      | UD |
| 191-24-2----- | Benzo (g, h, i) perylene | 0.092                                     | 0.28 |      | UD |
| 50-32-8-----  | Benzo (a) pyrene         | 0.092                                     | 0.28 |      | UD |
| 218-01-9----- | Chrysene                 | 0.092                                     | 0.28 |      | UD |
| 53-70-3-----  | Dibenz (a, h) anthracene | 0.092                                     | 0.28 |      | UD |
| 206-44-0----- | Fluoranthene             | 0.46                                      | 1.4  |      | UD |
| 86-73-7-----  | Fluorene                 | 2.3                                       | 14   | 7.6  | ID |
| 193-39-5----- | Indeno (1,2,3-cd) pyrene | 0.092                                     | 0.28 |      | UD |
| 90-12-0-----  | 1-Methylnaphthalene      | 2.3                                       | 14   | 100  | D  |
| 91-57-6-----  | 2-Methylnaphthalene      | 2.3                                       | 14   | 130  | D  |
| 91-20-3-----  | Naphthalene              | 2.3                                       | 14   | 68   | D  |
| 85-01-8-----  | Phenanthrene             | 0.092                                     | 0.28 | 5.6  | DV |
| 129-00-0----- | Pyrene                   | 0.46                                      | 1.4  |      | UD |

FORM I SV

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-2  
I-20091022

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910199-05

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 1019905

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Sampled: 10/22/09 15:10

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted: 10/27/09

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 10/29/09 17:17

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

| CAS NO.       | COMPOUND                   | CONCENTRATION UNITS: |                       |       | UG/L<br>Q |
|---------------|----------------------------|----------------------|-----------------------|-------|-----------|
|               |                            | MDL                  | (ug/L or ug/Kg)<br>RL | CONC  |           |
| 83-32-9-----  | Acenaphthene               | 0.46                 | 2.8                   |       | U         |
| 208-96-8----- | Acenaphthylene             | 0.018                | 0.056                 |       | U         |
| 120-12-7----- | Anthracene                 | 0.092                | 0.28                  |       | U         |
| 56-55-3-----  | Benzo (a) anthracene       | 0.018                | 0.056                 |       | U         |
| 205-99-2----- | Benzo (b) fluoranthene     | 0.018                | 0.056                 |       | U         |
| 207-08-9----- | Benzo (k) fluoranthene     | 0.018                | 0.056                 |       | U         |
| 191-24-2----- | Benzo (g, h, i) perylene   | 0.018                | 0.056                 |       | U         |
| 50-32-8-----  | Benzo (a) pyrene           | 0.018                | 0.056                 |       | U         |
| 218-01-9----- | Chrysene                   | 0.018                | 0.056                 |       | U         |
| 53-70-3-----  | Dibenz (a, h) anthracene   | 0.018                | 0.056                 |       | U         |
| 206-44-0----- | Fluoranthene               | 0.092                | 0.28                  |       | U         |
| 86-73-7-----  | Fluorene                   | 0.46                 | 2.8                   |       | U         |
| 193-39-5----- | Indeno (1, 2, 3-cd) pyrene | 0.018                | 0.056                 |       | U         |
| 90-12-0-----  | 1-Methylnaphthalene        | 0.46                 | 2.8                   |       | U         |
| 91-57-6-----  | 2-Methylnaphthalene        | 0.46                 | 2.8                   |       | U         |
| 91-20-3-----  | Naphthalene                | 0.46                 | 2.8                   |       | U         |
| 85-01-8-----  | Phenanthrene               | 0.018                | 0.056                 | 0.027 | IV        |
| 129-00-0----- | Pyrene                     | 0.092                | 0.28                  |       | U         |

FORM I SV

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-2  
I-20091022RE

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910199-05RE

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 1019905R

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Sampled: 10/22/09 15:10

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted: 10/30/09

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 11/05/09 11:52

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

| CAS NO.       | COMPOUND                   | CONCENTRATION UNITS: |                            | UG/L | Q |
|---------------|----------------------------|----------------------|----------------------------|------|---|
|               |                            | MDL                  | (ug/L or ug/Kg)<br>RL CONC |      |   |
| 83-32-9-----  | Acenaphthene               | 0.46                 | 2.8                        |      | U |
| 208-96-8----- | Acenaphthylene             | 0.018                | 0.056                      |      | U |
| 120-12-7----- | Anthracene                 | 0.092                | 0.28                       |      | U |
| 56-55-3-----  | Benzo (a) anthracene       | 0.018                | 0.056                      |      | U |
| 205-99-2----- | Benzo (b) fluoranthene     | 0.018                | 0.056                      |      | U |
| 207-08-9----- | Benzo (k) fluoranthene     | 0.018                | 0.056                      |      | U |
| 191-24-2----- | Benzo (g, h, i) perylene   | 0.018                | 0.056                      |      | U |
| 50-32-8-----  | Benzo (a) pyrene           | 0.018                | 0.056                      |      | U |
| 218-01-9----- | Chrysene                   | 0.018                | 0.056                      |      | U |
| 53-70-3-----  | Dibenz (a, h) anthracene   | 0.018                | 0.056                      |      | U |
| 206-44-0----- | Fluoranthene               | 0.092                | 0.28                       |      | U |
| 86-73-7-----  | Fluorene                   | 0.46                 | 2.8                        |      | U |
| 193-39-5----- | Indeno (1, 2, 3-cd) pyrene | 0.018                | 0.056                      |      | U |
| 90-12-0-----  | 1-Methylnaphthalene        | 0.46                 | 2.8                        |      | U |
| 91-57-6-----  | 2-Methylnaphthalene        | 0.46                 | 2.8                        |      | U |
| 91-20-3-----  | Naphthalene                | 0.46                 | 2.8                        |      | U |
| 85-01-8-----  | Phenanthrene               | 0.018                | 0.056                      |      | U |
| 129-00-0----- | Pyrene                     | 0.092                | 0.28                       |      | U |

FORM I SV

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-4  
S-20091023

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910216-01

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 1021601

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Sampled: 10/23/09 09:30

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted: 10/27/09

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 10/29/09 17:55

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

| CAS NO.       | COMPOUND                   | CONCENTRATION UNITS: |                       | UG/L<br>CONC | UG/L<br>Q |
|---------------|----------------------------|----------------------|-----------------------|--------------|-----------|
|               |                            | MDL                  | (ug/L or ug/Kg)<br>RL |              |           |
| 83-32-9-----  | Acenaphthene               | 0.46                 | 2.8                   |              | U         |
| 208-96-8----- | Acenaphthylene             | 0.018                | 0.056                 |              | U         |
| 120-12-7----- | Anthracene                 | 0.092                | 0.28                  |              | U         |
| 56-55-3-----  | Benzo (a) anthracene       | 0.018                | 0.056                 |              | U         |
| 205-99-2----- | Benzo (b) fluoranthene     | 0.018                | 0.056                 |              | U         |
| 207-08-9----- | Benzo (k) fluoranthene     | 0.018                | 0.056                 |              | U         |
| 191-24-2----- | Benzo (g, h, i) perylene   | 0.018                | 0.056                 |              | U         |
| 50-32-8-----  | Benzo (a) pyrene           | 0.018                | 0.056                 |              | U         |
| 218-01-9----- | Chrysene                   | 0.018                | 0.056                 |              | U         |
| 53-70-3-----  | Dibenz (a, h) anthracene   | 0.018                | 0.056                 |              | U         |
| 206-44-0----- | Fluoranthene               | 0.092                | 0.28                  |              | U         |
| 86-73-7-----  | Fluorene                   | 0.46                 | 2.8                   |              | U         |
| 193-39-5----- | Indeno (1, 2, 3-cd) pyrene | 0.018                | 0.056                 |              | U         |
| 90-12-0-----  | 1-Methylnaphthalene        | 0.46                 | 2.8                   | 0.71         | I         |
| 91-57-6-----  | 2-Methylnaphthalene        | 0.46                 | 2.8                   |              | U         |
| 91-20-3-----  | Naphthalene                | 0.46                 | 2.8                   |              | U         |
| 85-01-8-----  | Phenanthrene               | 0.018                | 0.056                 | 0.032        | IV        |
| 129-00-0----- | Pyrene                     | 0.092                | 0.28                  |              | U         |

FORM I SV

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-4  
S-20091023RE

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910216-01RE

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 1021601R

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Sampled: 10/23/09 09:30

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted: 10/30/09

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 11/05/09 12:30

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

| CAS NO.       | COMPOUND                   | CONCENTRATION UNITS: |                       |      | UG/L<br>Q |
|---------------|----------------------------|----------------------|-----------------------|------|-----------|
|               |                            | MDL                  | (ug/L or ug/Kg)<br>RL | CONC |           |
| 83-32-9-----  | Acenaphthene               | 0.46                 | 2.8                   |      | U         |
| 208-96-8----- | Acenaphthylene             | 0.018                | 0.056                 |      | U         |
| 120-12-7----- | Anthracene                 | 0.092                | 0.28                  |      | U         |
| 56-55-3-----  | Benzo (a) anthracene       | 0.018                | 0.056                 |      | U         |
| 205-99-2----- | Benzo (b) fluoranthene     | 0.018                | 0.056                 |      | U         |
| 207-08-9----- | Benzo (k) fluoranthene     | 0.018                | 0.056                 |      | U         |
| 191-24-2----- | Benzo (g, h, i) perylene   | 0.018                | 0.056                 |      | U         |
| 50-32-8-----  | Benzo (a) pyrene           | 0.018                | 0.056                 |      | U         |
| 218-01-9----- | Chrysene                   | 0.018                | 0.056                 |      | U         |
| 53-70-3-----  | Dibenz (a, h) anthracene   | 0.018                | 0.056                 |      | U         |
| 206-44-0----- | Fluoranthene               | 0.092                | 0.28                  |      | U         |
| 86-73-7-----  | Fluorene                   | 0.46                 | 2.8                   |      | U         |
| 193-39-5----- | Indeno (1, 2, 3-cd) pyrene | 0.018                | 0.056                 |      | U         |
| 90-12-0-----  | 1-Methylnaphthalene        | 0.46                 | 2.8                   |      | U         |
| 91-57-6-----  | 2-Methylnaphthalene        | 0.46                 | 2.8                   |      | U         |
| 91-20-3-----  | Naphthalene                | 0.46                 | 2.8                   |      | U         |
| 85-01-8-----  | Phenanthrene               | 0.018                | 0.056                 |      | U         |
| 129-00-0----- | Pyrene                     | 0.092                | 0.28                  |      | U         |

FORM I SV

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-5  
S-20091023

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910216-02

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 1021602

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Sampled: 10/23/09 10:25

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted: 10/27/09

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 10/29/09 18:33

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

CAS NO. COMPOUND CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L  
MDL RL CONC Q

|               |                            |       |       |      |      |
|---------------|----------------------------|-------|-------|------|------|
| 83-32-9-----  | Acenaphthene               | 0.46  | 2.8   |      | U    |
| 208-96-8----- | Acenaphthylene             | 0.018 | 0.056 | 0.12 | V    |
| 120-12-7----- | Anthracene                 | 0.092 | 0.28  |      | U    |
| 56-55-3-----  | Benzo (a) anthracene       | 0.018 | 0.056 |      | U    |
| 205-99-2----- | Benzo (b) fluoranthene     | 0.018 | 0.056 |      | U    |
| 207-08-9----- | Benzo (k) fluoranthene     | 0.018 | 0.056 |      | U    |
| 191-24-2----- | Benzo (g, h, i) perylene   | 0.018 | 0.056 |      | U    |
| 50-32-8-----  | Benzo (a) pyrene           | 0.018 | 0.056 |      | U    |
| 218-01-9----- | Chrysene                   | 0.018 | 0.056 |      | U    |
| 53-70-3-----  | Dibenz (a, h) anthracene   | 0.018 | 0.056 |      | U    |
| 206-44-0----- | Fluoranthene               | 0.092 | 0.28  |      | U    |
| 86-73-7-----  | Fluorene                   | 0.46  | 2.8   |      | U    |
| 193-39-5----- | Indeno (1, 2, 3-cd) pyrene | 0.018 | 0.056 |      | U    |
| 90-12-0-----  | 1-Methylnaphthalene        | 0.46  | 2.8   | 5.2  | U    |
| 91-57-6-----  | 2-Methylnaphthalene        | 0.46  | 2.8   | 2.9  | X 12 |
| 91-20-3-----  | Naphthalene                | 0.46  | 2.8   |      | U    |
| 85-01-8-----  | Phenanthrene               | 0.018 | 0.056 |      | U    |
| 129-00-0----- | Pyrene                     | 0.092 | 0.28  |      | U    |

*m 11/9/09*

FORM I SV

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-5  
S-20091023RE

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910216-02RE

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 1021602R

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Sampled: 10/23/09 10:25

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted: 10/30/09

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 11/05/09 13:08

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

| CAS NO.       | COMPOUND                   | CONCENTRATION UNITS: |                            | UG/L  | Q  |
|---------------|----------------------------|----------------------|----------------------------|-------|----|
|               |                            | MDL                  | (ug/L or ug/Kg)<br>RL CONC |       |    |
| 83-32-9-----  | Acenaphthene               | 0.46                 | 2.8                        |       | U  |
| 208-96-8----- | Acenaphthylene             | 0.018                | 0.056                      |       | U  |
| 120-12-7----- | Anthracene                 | 0.092                | 0.28                       |       | U  |
| 56-55-3-----  | Benzo (a) anthracene       | 0.018                | 0.056                      |       | U  |
| 205-99-2----- | Benzo (b) fluoranthene     | 0.018                | 0.056                      |       | U  |
| 207-08-9----- | Benzo (k) fluoranthene     | 0.018                | 0.056                      |       | U  |
| 191-24-2----- | Benzo (g, h, i) perylene   | 0.018                | 0.056                      |       | U  |
| 50-32-8-----  | Benzo (a) pyrene           | 0.018                | 0.056                      |       | U  |
| 218-01-9----- | Chrysene                   | 0.018                | 0.056                      |       | U  |
| 53-70-3-----  | Dibenz (a, h) anthracene   | 0.018                | 0.056                      |       | U  |
| 206-44-0----- | Fluoranthene               | 0.092                | 0.28                       |       | U  |
| 86-73-7-----  | Fluorene                   | 0.46                 | 2.8                        |       | U  |
| 193-39-5----- | Indeno (1, 2, 3-cd) pyrene | 0.018                | 0.056                      |       | U  |
| 90-12-0-----  | 1-Methylnaphthalene        | 0.46                 | 2.8                        | 4.7   |    |
| 91-57-6-----  | 2-Methylnaphthalene        | 0.46                 | 2.8                        | 2.7   | I  |
| 91-20-3-----  | Naphthalene                | 0.46                 | 2.8                        |       | U  |
| 85-01-8-----  | Phenanthrene               | 0.018                | 0.056                      | 0.023 | IV |
| 129-00-0----- | Pyrene                     | 0.092                | 0.28                       |       | U  |

FORM I SV

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-6  
S-20091023

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910216-03

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 1021603

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Sampled: 10/23/09 11:15

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted: 10/27/09

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 10/29/09 19:11

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

| CAS NO.       | COMPOUND                   | CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L |       |       | Q  |
|---------------|----------------------------|---|-------|-------|----|
|               |                            | MDL                                       | RL    | CONC  |    |
| 83-32-9-----  | Acenaphthene               | 0.46                                      | 2.8   |       | U  |
| 208-96-8----- | Acenaphthylene             | 0.018                                     | 0.056 | 0.026 | IV |
| 120-12-7----- | Anthracene                 | 0.092                                     | 0.28  |       | U  |
| 56-55-3-----  | Benzo (a) anthracene       | 0.018                                     | 0.056 | 0.030 | IV |
| 205-99-2----- | Benzo (b) fluoranthene     | 0.018                                     | 0.056 | 0.019 | IV |
| 207-08-9----- | Benzo (k) fluoranthene     | 0.018                                     | 0.056 | 0.028 | IV |
| 191-24-2----- | Benzo (g, h, i) perylene   | 0.018                                     | 0.056 |       | U  |
| 50-32-8-----  | Benzo (a) pyrene           | 0.018                                     | 0.056 |       | U  |
| 218-01-9----- | Chrysene                   | 0.018                                     | 0.056 | 0.042 | IV |
| 53-70-3-----  | Dibenz (a, h) anthracene   | 0.018                                     | 0.056 |       | U  |
| 206-44-0----- | Fluoranthene               | 0.092                                     | 0.28  |       | U  |
| 86-73-7-----  | Fluorene                   | 0.46                                      | 2.8   |       | U  |
| 193-39-5----- | Indeno (1, 2, 3-cd) pyrene | 0.018                                     | 0.056 |       | U  |
| 90-12-0-----  | 1-Methylnaphthalene        | 0.46                                      | 2.8   |       | U  |
| 91-57-6-----  | 2-Methylnaphthalene        | 0.46                                      | 2.8   |       | U  |
| 91-20-3-----  | Naphthalene                | 0.46                                      | 2.8   |       | U  |
| 85-01-8-----  | Phenanthrene               | 0.018                                     | 0.056 | 0.056 | V  |
| 129-00-0----- | Pyrene                     | 0.092                                     | 0.28  |       | U  |

FORM I SV

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

CEF-G82-6  
S-20091023

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 0910216-03RE

Sample wt/vol: 1080 (g/mL) ML Lab File ID: 1021603R

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Sampled: 10/23/09 11:15

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted: 10/30/09

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 11/05/09 13:47

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

| CAS NO.       | COMPOUND                   | CONCENTRATION UNITS: |                            | UG/L  | Q  |
|---------------|----------------------------|----------------------|----------------------------|-------|----|
|               |                            | MDL                  | (ug/L or ug/Kg)<br>RL CONC |       |    |
| 83-32-9-----  | Acenaphthene               | 0.46                 | 2.8                        |       | U  |
| 208-96-8----- | Acenaphthylene             | 0.018                | 0.056                      |       | U  |
| 120-12-7----- | Anthracene                 | 0.092                | 0.28                       |       | U  |
| 56-55-3-----  | Benzo (a) anthracene       | 0.018                | 0.056                      |       | U  |
| 205-99-2----- | Benzo (b) fluoranthene     | 0.018                | 0.056                      |       | U  |
| 207-08-9----- | Benzo (k) fluoranthene     | 0.018                | 0.056                      |       | U  |
| 191-24-2----- | Benzo (g, h, i) perylene   | 0.018                | 0.056                      |       | U  |
| 50-32-8-----  | Benzo (a) pyrene           | 0.018                | 0.056                      |       | U  |
| 218-01-9----- | Chrysene                   | 0.018                | 0.056                      |       | U  |
| 53-70-3-----  | Dibenz (a, h) anthracene   | 0.018                | 0.056                      |       | U  |
| 206-44-0----- | Fluoranthene               | 0.092                | 0.28                       |       | U  |
| 86-73-7-----  | Fluorene                   | 0.46                 | 2.8                        |       | U  |
| 193-39-5----- | Indeno (1, 2, 3-cd) pyrene | 0.018                | 0.056                      |       | U  |
| 90-12-0-----  | 1-Methylnaphthalene        | 0.46                 | 2.8                        |       | U  |
| 91-57-6-----  | 2-Methylnaphthalene        | 0.46                 | 2.8                        |       | U  |
| 91-20-3-----  | Naphthalene                | 0.46                 | 2.8                        |       | U  |
| 85-01-8-----  | Phenanthrene               | 0.018                | 0.056                      | 0.018 | IV |
| 129-00-0----- | Pyrene                     | 0.092                | 0.28                       |       | U  |

FORM I SV

FORM 2  
WATER SEMIVOLATILE SURROGATE RECOVERY

Lab Name: EMPIRICAL LABS      Contract: TETRATECH

Lab Code: NA                      Case No.: NA                      SAS No.: NA                      SDG No.: JM09G82\_001

|    | CLIENT<br>SAMPLE NO. | S1<br>(FBP) # | S2<br>(TPH) # | S3<br># | S4<br># | S5<br># | S6<br># | S7<br># | S8<br># | TOT<br>OUT |
|----|----------------------|---------------|---------------|---------|---------|---------|---------|---------|---------|------------|
| 01 | 9J23017-BLK1         | 101           | 115           |         |         |         |         |         |         | 0          |
| 02 | 9J23017-BLK1         | 92            | 113           |         |         |         |         |         |         | 0          |
| 03 | 9J23017-BLK1         | 100           | 113           |         |         |         |         |         |         | 0          |
| 04 | CEF-G82-3S-2         | 93            | 108           |         |         |         |         |         |         | 0          |
| 05 | CEF-G82-2S-2         | 85            | 101           |         |         |         |         |         |         | 0          |
| 06 | CEF-G82-DUP0         | 84            | 91            |         |         |         |         |         |         | 0          |
| 07 | CEF-G82-2I-2         | 90            | 102           |         |         |         |         |         |         | 0          |
| 08 | CEF-G82-4S-2         | 95            | 110           |         |         |         |         |         |         | 0          |
| 09 | CEF-G82-5S-2         | 85            | 106           |         |         |         |         |         |         | 0          |
| 10 | CEF-G82-6S-2         | 92            | 106           |         |         |         |         |         |         | 0          |
| 11 | 9J30332-BLK1         | 71            | 93            |         |         |         |         |         |         | 0          |
| 12 | 9J30332-BLK1         | 92            | 111           |         |         |         |         |         |         | 0          |
| 13 | 9J30332-BLK1         | 67            | 91            |         |         |         |         |         |         | 0          |
| 14 | CEF-G82-1S-2         | 68            | 93            |         |         |         |         |         |         | 0          |
| 15 | CEF-G82-3S-2         | 79            | 76            |         |         |         |         |         |         | 0          |
| 16 | CEF-G82-1S-2         | 65            | 85            |         |         |         |         |         |         | 0          |
| 17 | CEF-G82-2I-2         | 74            | 89            |         |         |         |         |         |         | 0          |
| 18 | CEF-G82-4S-2         | 70            | 80            |         |         |         |         |         |         | 0          |
| 19 | CEF-G82-5S-2         | 68            | 85            |         |         |         |         |         |         | 0          |
| 20 | CEF-G82-6S-2         | 72            | 88            |         |         |         |         |         |         | 0          |
| 21 | CEF-G82-2S-2         | 80D           | 97D           |         |         |         |         |         |         | 0          |
| 22 | CEF-G82-DUP0         | 82D           | 96D           |         |         |         |         |         |         | 0          |
| 23 |                      |               |               |         |         |         |         |         |         |            |
| 24 |                      |               |               |         |         |         |         |         |         |            |
| 25 |                      |               |               |         |         |         |         |         |         |            |
| 26 |                      |               |               |         |         |         |         |         |         |            |
| 27 |                      |               |               |         |         |         |         |         |         |            |
| 28 |                      |               |               |         |         |         |         |         |         |            |
| 29 |                      |               |               |         |         |         |         |         |         |            |
| 30 |                      |               |               |         |         |         |         |         |         |            |

|                             |           |             |
|-----------------------------|-----------|-------------|
|                             | EL        | SPIKE       |
|                             | QC LIMITS | CONC (UG/L) |
| S1 (FBP) = 2-Fluorobiphenyl | (34-167)  | 50          |
| S2 (TPH) = Terphenyl-d14    | (34-167)  | 50          |

# Column to be used to flag recovery values  
 \* Values outside of contract required QC limits  
 D Surrogate results reported from a diluted analysis

FORM 3  
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS      Contract: TETRATECH

Lab Code: NA                      Case No.: NA                      SAS No.: NA                      SDG No.: JM09G82\_001

Matrix Spike - Client Sample No.: 9J23017-BLK1

| COMPOUND                   | SPIKE<br>ADDED<br>(ug/L) | SAMPLE<br>CONCENTRATION<br>(ug/L) | LCS<br>CONCENTRATION<br>(ug/L) | LCS<br>%<br>REC # | QC.<br>LIMITS<br>REC. |
|----------------------------|--------------------------|-----------------------------------|--------------------------------|-------------------|-----------------------|
| Acenaphthene               | 1.000                    | 0.0000                            | 0.8391                         | 84                | 41-132                |
| Acenaphthylene             | 1.000                    | 0.04342                           | 0.7973                         | 75                | 43-140                |
| Anthracene                 | 1.000                    | 0.1180                            | 0.8308                         | 71                | 50-139                |
| Benzo (a) anthracene       | 1.000                    | 0.04808                           | 0.6986                         | 65                | 58-141                |
| Benzo (b) fluoranthene     | 1.000                    | 0.05269                           | 0.7626                         | 71                | 42-156                |
| Benzo (k) fluoranthene     | 1.000                    | 0.07000                           | 1.031                          | 96                | 49-165                |
| Benzo (g, h, i) perylene   | 1.000                    | 0.0000                            | 0.5736                         | 57                | 12-171                |
| Benzo (a) pyrene           | 1.000                    | 0.03790                           | 0.6218                         | 58                | 31-142                |
| Chrysene                   | 1.000                    | 0.07696                           | 0.9363                         | 86                | 51-155                |
| Dibenz (a, h) anthracene   | 1.000                    | 0.0000                            | 0.4542                         | 45                | 28-153                |
| Fluoranthene               | 1.000                    | 0.0000                            | 0.8348                         | 83                | 47-158                |
| Fluorene                   | 1.000                    | 0.0000                            | 0.7554                         | 76                | 40-140                |
| Indeno (1, 2, 3-cd) pyrene | 1.000                    | 0.0000                            | 0.4024                         | 40                | 20-167                |
| 1-Methylnaphthalene        | 1.000                    | 0.0000                            | 0.7294                         | 73                | 35-131                |
| 2-Methylnaphthalene        | 1.000                    | 0.0000                            | 0.8868                         | 89                | 36-121                |
| Naphthalene                | 1.000                    | 0.0000                            | 0.7870                         | 79                | 39-125                |
| Phenanthrene               | 1.000                    | 0.1029                            | 0.8240                         | 72                | 46-144                |
| Pyrene                     | 1.000                    | 0.0000                            | 0.8423                         | 84                | 39-158                |

# Column to be used to flag recovery and RPD values with an asterisk  
\* Values outside of QC limits

COMMENTS: \_\_\_\_\_  
\_\_\_\_\_

FORM 3  
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS      Contract: TETRATECH  
 Lab Code: NA                    Case No.: NA                    SAS No.: NA                    SDG No.: JM09G82\_001  
 Matrix Spike - Client Sample No.: 9J23017-BLK1

| COMPOUND                   | SPIKE<br>ADDED<br>(ug/L) | LCSD<br>CONCENTRATION<br>(ug/L) | LCSD<br>%<br>REC # | %<br>RPD # | QC LIMITS |        |
|----------------------------|--------------------------|---------------------------------|--------------------|------------|-----------|--------|
|                            |                          |                                 |                    |            | RPD       | REC.   |
| Acenaphthene               | 1.000                    | 0.8517                          | 85                 | 1          | 40        | 41-132 |
| Acenaphthylene             | 1.000                    | 0.8670                          | 82                 | 8          | 40        | 43-140 |
| Anthracene                 | 1.000                    | 0.8269                          | 71                 | 0          | 40        | 50-139 |
| Benzo (a) anthracene       | 1.000                    | 0.6130                          | 56*                | 13         | 40        | 58-141 |
| Benzo (b) fluoranthene     | 1.000                    | 0.7370                          | 68                 | 3          | 40        | 42-156 |
| Benzo (k) fluoranthene     | 1.000                    | 0.9980                          | 93                 | 3          | 40        | 49-165 |
| Benzo (g, h, i) perylene   | 1.000                    | 0.5954                          | 60                 | 4          | 40        | 12-171 |
| Benzo (a) pyrene           | 1.000                    | 0.5692                          | 53                 | 9          | 40        | 31-142 |
| Chrysene                   | 1.000                    | 0.8922                          | 82                 | 5          | 40        | 51-155 |
| Dibenz (a, h) anthracene   | 1.000                    | 0.4409                          | 44                 | 3          | 40        | 28-153 |
| Fluoranthene               | 1.000                    | 0.8030                          | 80                 | 4          | 40        | 47-158 |
| Fluorene                   | 1.000                    | 0.7560                          | 76                 | 0          | 40        | 40-140 |
| Indeno (1, 2, 3-cd) pyrene | 1.000                    | 0.3938                          | 39                 | 2          | 40        | 20-167 |
| 1-Methylnaphthalene        | 1.000                    | 0.7979                          | 80                 | 9          | 40        | 35-131 |
| 2-Methylnaphthalene        | 1.000                    | 1.005                           | 100                | 12         | 40        | 36-121 |
| Naphthalene                | 1.000                    | 0.8538                          | 85                 | 8          | 40        | 39-125 |
| Phenanthrene               | 1.000                    | 0.8406                          | 74                 | 2          | 40        | 46-144 |
| Pyrene                     | 1.000                    | 0.8237                          | 82                 | 2          | 40        | 39-158 |

# Column to be used to flag recovery and RPD values with an asterisk  
 \* Values outside of QC limits

RPD: 0 out of 18 outside limits  
 Spike Recovery: 1 out of 36 outside limits

COMMENTS: \_\_\_\_\_

FORM 3  
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS      Contract: TETRATECH

Lab Code: NA      Case No.: NA      SAS No.: NA      SDG No.: JM09G82\_001

Matrix Spike - Client Sample No.: 9J30332-BLK1

| COMPOUND                 | SPIKE<br>ADDED<br>(ug/L) | SAMPLE<br>CONCENTRATION<br>(ug/L) | LCS<br>CONCENTRATION<br>(ug/L) | LCS<br>%<br>REC # | QC.<br>LIMITS<br>REC. |
|--------------------------|--------------------------|-----------------------------------|--------------------------------|-------------------|-----------------------|
| Acenaphthene             | 1.000                    | 0.0000                            | 0.8476                         | 85                | 41-132                |
| Acenaphthylene           | 1.000                    | 0.02111                           | 0.9112                         | 89                | 43-140                |
| Anthracene               | 1.000                    | 0.0000                            | 0.8901                         | 89                | 50-139                |
| Benzo (a) anthracene     | 1.000                    | 0.02201                           | 0.8295                         | 81                | 58-141                |
| Benzo (b) fluoranthene   | 1.000                    | 0.0000                            | 0.7864                         | 79                | 42-156                |
| Benzo (k) fluoranthene   | 1.000                    | 0.0000                            | 0.8863                         | 89                | 49-165                |
| Benzo (g,h,i) perylene   | 1.000                    | 0.0000                            | 0.8552                         | 86                | 12-171                |
| Benzo (a) pyrene         | 1.000                    | 0.0000                            | 0.7468                         | 75                | 31-142                |
| Chrysene                 | 1.000                    | 0.02495                           | 0.8825                         | 86                | 51-155                |
| Dibenz (a,h) anthracene  | 1.000                    | 0.0000                            | 0.7594                         | 76                | 28-153                |
| Fluoranthene             | 1.000                    | 0.0000                            | 0.9450                         | 94                | 47-158                |
| Fluorene                 | 1.000                    | 0.0000                            | 0.8482                         | 85                | 40-140                |
| Indeno (1,2,3-cd) pyrene | 1.000                    | 0.0000                            | 0.5940                         | 59                | 20-167                |
| 1-Methylnaphthalene      | 1.000                    | 0.0000                            | 0.8088                         | 81                | 35-131                |
| 2-Methylnaphthalene      | 1.000                    | 0.0000                            | 0.8591                         | 86                | 36-121                |
| Naphthalene              | 1.000                    | 0.0000                            | 0.8218                         | 82                | 39-125                |
| Phenanthrene             | 1.000                    | 0.03996                           | 0.8944                         | 85                | 46-144                |
| Pyrene                   | 1.000                    | 0.0000                            | 0.9308                         | 93                | 39-158                |

# Column to be used to flag recovery and RPD values with an asterisk  
\* Values outside of QC limits

COMMENTS: \_\_\_\_\_

FORM 3  
WATER SEMIVOLATILE LAB CONTROL SAMPLE

Lab Name: EMPIRICAL LABS      Contract: TETRATECH

Lab Code: NA                      Case No.: NA                      SAS No.: NA                      SDG No.: JM09G82\_001

Matrix Spike - Client Sample No.: 9J30332-BLK1

| COMPOUND                 | SPIKE<br>ADDED<br>(ug/L) | LCS D<br>CONCENTRATION<br>(ug/L) | LCS D<br>%<br>REC # | %<br>RPD # | QC LIMITS |        |
|--------------------------|--------------------------|----------------------------------|---------------------|------------|-----------|--------|
|                          |                          |                                  |                     |            | RPD       | REC.   |
| Acenaphthene             | 1.000                    | 0.6114                           | 61                  | 32         | 40        | 41-132 |
| Acenaphthylene           | 1.000                    | 0.6638                           | 64                  | 31         | 40        | 43-140 |
| Anthracene               | 1.000                    | 0.7345                           | 73                  | 19         | 40        | 50-139 |
| Benzo (a) anthracene     | 1.000                    | 0.6024                           | 58                  | 32         | 40        | 58-141 |
| Benzo (b) fluoranthene   | 1.000                    | 0.5659                           | 56                  | 33         | 40        | 42-156 |
| Benzo (k) fluoranthene   | 1.000                    | 0.6736                           | 67                  | 27         | 40        | 49-165 |
| Benzo (g, h, i) perylene | 1.000                    | 0.6488                           | 65                  | 27         | 40        | 12-171 |
| Benzo (a) pyrene         | 1.000                    | 0.5718                           | 57                  | 26         | 40        | 31-142 |
| Chrysene                 | 1.000                    | 0.6248                           | 60                  | 34         | 40        | 51-155 |
| Dibenz (a, h) anthracene | 1.000                    | 0.5780                           | 58                  | 27         | 40        | 28-153 |
| Fluoranthene             | 1.000                    | 0.7886                           | 79                  | 18         | 40        | 47-158 |
| Fluorene                 | 1.000                    | 0.6730                           | 67                  | 23         | 40        | 40-140 |
| Indeno (1,2,3-cd) pyrene | 1.000                    | 0.5363                           | 54                  | 10         | 40        | 20-167 |
| 1-Methylnaphthalene      | 1.000                    | 0.5509                           | 55                  | 38         | 40        | 35-131 |
| 2-Methylnaphthalene      | 1.000                    | 0.5662                           | 57                  | 41*        | 40        | 36-121 |
| Naphthalene              | 1.000                    | 0.5556                           | 56                  | 39         | 40        | 39-125 |
| Phenanthrene             | 1.000                    | 0.7018                           | 66                  | 24         | 40        | 46-144 |
| Pyrene                   | 1.000                    | 0.7616                           | 76                  | 20         | 40        | 39-158 |

# Column to be used to flag recovery and RPD values with an asterisk  
\* Values outside of QC limits

RPD: 1 out of 18 outside limits  
Spike Recovery: 0 out of 36 outside limits

COMMENTS: \_\_\_\_\_  
\_\_\_\_\_

FORM 4  
SEMIVOLATILE METHOD BLANK SUMMARY

CLIENT SAMPLE NO.

|              |
|--------------|
| 9J23017-BLK1 |
|--------------|

Lab Name: EMPIRICAL LABS      Contract: TETRATECH

Lab Code: NA                      Case No.: NA                      SAS No.: NA                      SDG No.: JM09G82\_001

Lab File ID: S1BW1027    Lab Sample ID: 9J23017-BLK1

Instrument ID: BNA3    Date Extracted: 10/27/09

Matrix: (soil/water) WATER                                      Date Analyzed: 10/29/09

Level: (low/med) LOW                      GPC Cleanup: (Y/N) N                      Time Analyzed: 1249

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

|    | SAMPLE NO.   | LAB SAMPLE ID | LAB FILE ID | DATE ANALYZED |
|----|--------------|---------------|-------------|---------------|
| 01 | 9J23017-BLK1 | 9J23017-BS1   | S1LW1027    | 10/29/09      |
| 02 | 9J23017-BLK1 | 9J23017-BSD1  | S1DW1027    | 10/29/09      |
| 03 | CEF-G82-3S-2 | 0910199-01    | 1019901     | 10/29/09      |
| 04 | CEF-G82-2S-2 | 0910199-03    | 1019903     | 10/29/09      |
| 05 | CEF-G82-DUP0 | 0910199-04    | 1019904     | 10/29/09      |
| 06 | CEF-G82-2I-2 | 0910199-05    | 1019905     | 10/29/09      |
| 07 | CEF-G82-4S-2 | 0910216-01    | 1021601     | 10/29/09      |
| 08 | CEF-G82-5S-2 | 0910216-02    | 1021602     | 10/29/09      |
| 09 | CEF-G82-6S-2 | 0910216-03    | 1021603     | 10/29/09      |
| 10 | CEF-G82-1S-2 | 0910199-02    | 1019902     | 11/05/09      |
| 11 | CEF-G82-2S-2 | 0910199-03DL  | 1019903D    | 11/05/09      |
| 12 | CEF-G82-DUP0 | 0910199-04DL  | 1019904D    | 11/05/09      |
| 13 |              |               |             |               |
| 14 |              |               |             |               |
| 15 |              |               |             |               |
| 16 |              |               |             |               |
| 17 |              |               |             |               |
| 18 |              |               |             |               |
| 19 |              |               |             |               |
| 20 |              |               |             |               |
| 21 |              |               |             |               |
| 22 |              |               |             |               |
| 23 |              |               |             |               |
| 24 |              |               |             |               |
| 25 |              |               |             |               |
| 26 |              |               |             |               |
| 27 |              |               |             |               |
| 28 |              |               |             |               |
| 29 |              |               |             |               |
| 30 |              |               |             |               |

COMMENTS:

---



---

FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

9J23017-BLK1

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 9J23017-BLK1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S1BW1027

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Sampled: \_\_\_\_\_

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted: 10/27/09

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 10/29/09 12:49

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

| CAS NO.       | COMPOUND                   | CONCENTRATION UNITS: (ug/L or ug/Kg) |       |       | UG/L<br>Q       |
|---------------|----------------------------|--------------------------------------|-------|-------|-----------------|
|               |                            | MDL                                  | RL    | CONC  |                 |
| 83-32-9-----  | Acenaphthene               | 0.50                                 | 3.0   |       | U               |
| 208-96-8----- | Acenaphthylene             | 0.020                                | 0.060 | 0.043 | <del>X</del> F  |
| 120-12-7----- | Anthracene                 | 0.10                                 | 0.30  | 0.12  | <del>X</del> ↓  |
| 56-55-3-----  | Benzo (a) anthracene       | 0.020                                | 0.060 | 0.048 | <del>X</del> ↓  |
| 205-99-2----- | Benzo (b) fluoranthene     | 0.020                                | 0.060 | 0.053 | <del>X</del> ↓  |
| 207-08-9----- | Benzo (k) fluoranthene     | 0.020                                | 0.060 | 0.070 | <del>X</del> J2 |
| 191-24-2----- | Benzo (g, h, i) perylene   | 0.020                                | 0.060 |       | U               |
| 50-32-8-----  | Benzo (a) pyrene           | 0.020                                | 0.060 | 0.038 | <del>X</del> F  |
| 218-01-9----- | Chrysene                   | 0.020                                | 0.060 | 0.077 |                 |
| 53-70-3-----  | Dibenz (a, h) anthracene   | 0.020                                | 0.060 |       | U               |
| 206-44-0----- | Fluoranthene               | 0.10                                 | 0.30  |       | U               |
| 86-73-7-----  | Fluorene                   | 0.50                                 | 3.0   |       | U               |
| 193-39-5----- | Indeno (1, 2, 3-cd) pyrene | 0.020                                | 0.060 |       | U               |
| 90-12-0-----  | 1-Methylnaphthalene        | 0.50                                 | 3.0   |       | U               |
| 91-57-6-----  | 2-Methylnaphthalene        | 0.50                                 | 3.0   |       | U               |
| 91-20-3-----  | Naphthalene                | 0.50                                 | 3.0   |       | U               |
| 85-01-8-----  | Phenanthrene               | 0.020                                | 0.060 | 0.10  |                 |
| 129-00-0----- | Pyrene                     | 0.10                                 | 0.30  |       | U               |

*ML 11/9/09*

FORM I SV



FORM 1  
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

9J30332-BLK1

Lab Name: EMPIRICAL LABS Contract: TETRATECH

Lab Code: NA Case No.: NA SAS No.: NA SDG No.: JM09G82\_001

Matrix: (soil/water) WATER Lab Sample ID: 9J30332-BLK1

Sample wt/vol: 1000 (g/mL) ML Lab File ID: S1BW1030

% Moisture: \_\_\_\_\_ decanted: (Y/N) \_\_\_\_\_ Date Sampled: \_\_\_\_\_

Extraction: (SepF/Cont/Sonc/Soxh) SEPF Date Extracted: 10/30/09

Concentrated Extract Volume: 1000.0 (uL) Date Analyzed: 11/05/09 06:31

Injection Volume: 1.0 (uL) Dilution Factor: 1.0

GPC Cleanup: (Y/N) N pH: NA

| CAS NO.  | COMPOUND                   | CONCENTRATION UNITS: |                       |              | Q  |
|----------|----------------------------|----------------------|-----------------------|--------------|----|
|          |                            | MDL                  | (ug/L or ug/Kg)<br>RL | UG/L<br>CONC |    |
| 83-32-9  | Acenaphthene               | 0.50                 | 3.0                   |              | U  |
| 208-96-8 | Acenaphthylene             | 0.020                | 0.060                 | 0.021        | JI |
| 120-12-7 | Anthracene                 | 0.10                 | 0.30                  |              | U  |
| 56-55-3  | Benzo (a) anthracene       | 0.020                | 0.060                 | 0.022        | JI |
| 205-99-2 | Benzo (b) fluoranthene     | 0.020                | 0.060                 |              | U  |
| 207-08-9 | Benzo (k) fluoranthene     | 0.020                | 0.060                 |              | U  |
| 191-24-2 | Benzo (g, h, i) perylene   | 0.020                | 0.060                 |              | U  |
| 50-32-8  | Benzo (a) pyrene           | 0.020                | 0.060                 |              | U  |
| 218-01-9 | Chrysene                   | 0.020                | 0.060                 | 0.025        | JI |
| 53-70-3  | Dibenz (a, h) anthracene   | 0.020                | 0.060                 |              | U  |
| 206-44-0 | Fluoranthene               | 0.10                 | 0.30                  |              | U  |
| 86-73-7  | Fluorene                   | 0.50                 | 3.0                   |              | U  |
| 193-39-5 | Indeno (1, 2, 3-cd) pyrene | 0.020                | 0.060                 |              | U  |
| 90-12-0  | 1-Methylnaphthalene        | 0.50                 | 3.0                   |              | U  |
| 91-57-6  | 2-Methylnaphthalene        | 0.50                 | 3.0                   |              | U  |
| 91-20-3  | Naphthalene                | 0.50                 | 3.0                   |              | U  |
| 85-01-8  | Phenanthrene               | 0.020                | 0.060                 | 0.040        | JI |
| 129-00-0 | Pyrene                     | 0.10                 | 0.30                  |              | U  |

*Multilog*

FORM I SV

FORM 5  
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK  
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS      Contract:

Lab Code:                      Case No.: NA                      SAS No.: NA                      SDG No.: SDGA89545

Lab File ID: DF0818B1                      DFTPP Injection Date: 08/18/09

Instrument ID: BNA3                      DFTPP Injection Time: 1201

| m/e | ION ABUNDANCE CRITERIA             | % RELATIVE ABUNDANCE |
|-----|------------------------------------|----------------------|
| 51  | 30.0 - 60.0% of mass 198           | 35.7                 |
| 68  | Less than 2.0% of mass 69          | 0.0 ( 0.0)1          |
| 69  | Mass 69 relative abundance         | 41.8                 |
| 70  | Less than 2.0% of mass 69          | 0.2 ( 0.5)1          |
| 127 | 40.0 - 60.0% of mass 198           | 49.9                 |
| 197 | Less than 1.0% of mass 198         | 0.0                  |
| 198 | Base Peak, 100% relative abundance | 100.0                |
| 199 | 5.0 to 9.0% of mass 198            | 6.7                  |
| 275 | 10.0 - 30.0% of mass 198           | 24.9                 |
| 365 | Greater than 1.0% of mass 198      | 2.98                 |
| 441 | Present, but less than mass 443    | 10.2                 |
| 442 | Greater than 40.0% of mass 198     | 66.1                 |
| 443 | 17.0 - 23.0% of mass 442           | 13.0 ( 19.7)2        |

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

|    | EPA<br>SAMPLE NO. | LAB<br>SAMPLE ID | LAB<br>FILE ID | DATE<br>ANALYZED | TIME<br>ANALYZED |
|----|-------------------|------------------|----------------|------------------|------------------|
| 01 | CAL0.05PPM        | CAL0.05PPM       | CAL1           | 08/18/09         | 1221             |
| 02 | CAL0.1PPM         | CAL0.1PPM        | CAL2           | 08/18/09         | 1259             |
| 03 | CAL0.25PPM        | CAL0.25PPM       | CAL3           | 08/18/09         | 1338             |
| 04 | CAL0.5PPM         | CAL0.5PPM        | CAL4           | 08/18/09         | 1416             |
| 05 | CAL1.0PPM         | CAL1.0PPM        | CAL5           | 08/18/09         | 1454             |
| 06 | CAL2.0PPM         | CAL2.0PPM        | CAL6           | 08/18/09         | 1533             |
| 07 | CAL5.0PPM         | CAL5.0PPM        | CAL7           | 08/18/09         | 1611             |
| 08 | CAL10PPM          | CAL10PPM         | CAL8           | 08/18/09         | 1649             |
| 09 | CAL20PPM          | CAL20PPM         | CAL9           | 08/18/09         | 1727             |
| 10 | CAL40PPM          | CAL40PPM         | CAL10          | 08/18/09         | 1805             |
| 11 | CAL50PPM          | CAL50PPM         | CAL11          | 08/18/09         | 1844             |
| 12 | ICV-5.0PPM        | ICV-5.0PPM       | ICV01          | 08/18/09         | 1922             |
| 13 |                   |                  |                |                  |                  |
| 14 |                   |                  |                |                  |                  |
| 15 |                   |                  |                |                  |                  |
| 16 |                   |                  |                |                  |                  |
| 17 |                   |                  |                |                  |                  |
| 18 |                   |                  |                |                  |                  |
| 19 |                   |                  |                |                  |                  |
| 20 |                   |                  |                |                  |                  |
| 21 |                   |                  |                |                  |                  |
| 22 |                   |                  |                |                  |                  |

FORM 5  
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK  
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS      Contract:

Lab Code: EL                      Case No.: NA                      SAS No.: NA                      SDG No.: SDGA95093

Lab File ID: SEQ-TUN1                                      DFTPP Injection Date: 11/04/09

Instrument ID: BNA3    DFTPP Injection Time: 0956

| m/e | ION ABUNDANCE CRITERIA             | % RELATIVE ABUNDANCE |
|-----|------------------------------------|----------------------|
| 51  | 30.0 - 60.0% of mass 198           | 42.8                 |
| 68  | Less than 2.0% of mass 69          | 0.2 ( 0.4)1          |
| 69  | Mass 69 relative abundance         | 51.1                 |
| 70  | Less than 2.0% of mass 69          | 0.3 ( 0.5)1          |
| 127 | 40.0 - 60.0% of mass 198           | 51.3                 |
| 197 | Less than 1.0% of mass 198         | 0.0                  |
| 198 | Base Peak, 100% relative abundance | 100.0                |
| 199 | 5.0 to 9.0% of mass 198            | 6.6                  |
| 275 | 10.0 - 30.0% of mass 198           | 25.4                 |
| 365 | Greater than 1.0% of mass 198      | 2.87                 |
| 441 | Present, but less than mass 443    | 9.3                  |
| 442 | Greater than 40.0% of mass 198     | 55.6                 |
| 443 | 17.0 - 23.0% of mass 442           | 10.8 ( 19.4)2        |

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

|    | EPA<br>SAMPLE NO. | LAB<br>SAMPLE ID | LAB<br>FILE ID | DATE<br>ANALYZED | TIME<br>ANALYZED |
|----|-------------------|------------------|----------------|------------------|------------------|
| 01 | CAL0.05PPM        | SEQ-CAL1         | SEQ-CAL1       | 11/04/09         | 1016             |
| 02 | CAL0.1PPM         | SEQ-CAL2         | SEQ-CAL2       | 11/04/09         | 1054             |
| 03 | CAL0.25PPM        | SEQ-CAL3         | SEQ-CAL3       | 11/04/09         | 1133             |
| 04 | CAL0.25PPM        | SEQ-CAL4         | SEQ-CAL4       | 11/04/09         | 1211             |
| 05 | CAL0.25PPM        | SEQ-CAL5         | SEQ-CAL5       | 11/04/09         | 1249             |
| 06 | CAL2PPM           | SEQ-CAL6         | SEQ-CAL6       | 11/04/09         | 1327             |
| 07 | CAL5PPM           | SEQ-CAL7         | SEQ-CAL7       | 11/04/09         | 1406             |
| 08 | CAL10PPM          | SEQ-CAL8         | SEQ-CAL8       | 11/04/09         | 1445             |
| 09 | CAL20PPM          | SEQ-CAL9         | SEQ-CAL9       | 11/04/09         | 1523             |
| 10 | CAL40PPM          | SEQ-CALA         | SEQ-CALA       | 11/04/09         | 1601             |
| 11 | CAL50PPM          | SEQ-CALB         | SEQ-CALB       | 11/04/09         | 1639             |
| 12 | ICV5PPM           | SEQ-ICV1         | SEQ-ICV1       | 11/04/09         | 1717             |
| 13 |                   |                  |                |                  |                  |
| 14 |                   |                  |                |                  |                  |
| 15 |                   |                  |                |                  |                  |
| 16 |                   |                  |                |                  |                  |
| 17 |                   |                  |                |                  |                  |
| 18 |                   |                  |                |                  |                  |
| 19 |                   |                  |                |                  |                  |
| 20 |                   |                  |                |                  |                  |
| 21 |                   |                  |                |                  |                  |
| 22 |                   |                  |                |                  |                  |

FORM 5  
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK  
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS      Contract: TETRATECH

Lab Code: NA      Case No.: NA      SAS No.: NA      SDG No.: JM09G82\_001

Lab File ID: SEQ-TUN1      DFTPP Injection Date: 10/29/09

Instrument ID: BNA3      DFTPP Injection Time: 1053

| m/e | ION ABUNDANCE CRITERIA             | % RELATIVE ABUNDANCE |
|-----|------------------------------------|----------------------|
| 51  | 30.0 - 60.0% of mass 198           | 45.8                 |
| 68  | Less than 2.0% of mass 69          | 0.0 ( 0.0)1          |
| 69  | Mass 69 relative abundance         | 51.0                 |
| 70  | Less than 2.0% of mass 69          | 0.2 ( 0.5)1          |
| 127 | 40.0 - 60.0% of mass 198           | 55.6                 |
| 197 | Less than 1.0% of mass 198         | 0.0                  |
| 198 | Base Peak, 100% relative abundance | 100.0                |
| 199 | 5.0 to 9.0% of mass 198            | 7.5                  |
| 275 | 10.0 - 30.0% of mass 198           | 22.9                 |
| 365 | Greater than 1.0% of mass 198      | 2.40                 |
| 441 | Present, but less than mass 443    | 6.4                  |
| 442 | Greater than 40.0% of mass 198     | 41.4                 |
| 443 | 17.0 - 23.0% of mass 442           | 8.0 ( 19.4)2         |

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

|    | EPA<br>SAMPLE NO. | LAB<br>SAMPLE ID | LAB<br>FILE ID | DATE<br>ANALYZED | TIME<br>ANALYZED |
|----|-------------------|------------------|----------------|------------------|------------------|
| 01 | CCV5.0PPM         | SEQ-CCV1         | SEQ-CCV1       | 10/29/09         | 1210             |
| 02 | 9J23017-BLK1      | 9J23017-BLK1     | S1BW1027       | 10/29/09         | 1249             |
| 03 | 9J23017-BLK1      | 9J23017-BS1      | S1LW1027       | 10/29/09         | 1327             |
| 04 | 9J23017-BLK1      | 9J23017-BSD1     | S1DW1027       | 10/29/09         | 1405             |
| 05 | CEF-G82-3S-2      | 0910199-01       | 1019901        | 10/29/09         | 1443             |
| 06 | CEF-G82-2S-2      | 0910199-03       | 1019903        | 10/29/09         | 1600             |
| 07 | CEF-G82-DUP0      | 0910199-04       | 1019904        | 10/29/09         | 1638             |
| 08 | CEF-G82-2I-2      | 0910199-05       | 1019905        | 10/29/09         | 1717             |
| 09 | CEF-G82-4S-2      | 0910216-01       | 1021601        | 10/29/09         | 1755             |
| 10 | CEF-G82-5S-2      | 0910216-02       | 1021602        | 10/29/09         | 1833             |
| 11 | CEF-G82-6S-2      | 0910216-03       | 1021603        | 10/29/09         | 1911             |
| 12 |                   |                  |                |                  |                  |
| 13 |                   |                  |                |                  |                  |
| 14 |                   |                  |                |                  |                  |
| 15 |                   |                  |                |                  |                  |
| 16 |                   |                  |                |                  |                  |
| 17 |                   |                  |                |                  |                  |
| 18 |                   |                  |                |                  |                  |
| 19 |                   |                  |                |                  |                  |
| 20 |                   |                  |                |                  |                  |
| 21 |                   |                  |                |                  |                  |
| 22 |                   |                  |                |                  |                  |

FORM 5  
SEMIVOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK  
DECAFLUOROTRIPHENYLPHOSPHINE (DFTPP)

Lab Name: EMPIRICAL LABS      Contract: TETRATECH

Lab Code: NA      Case No.: NA      SAS No.: NA      SDG No.: JM09G82\_001

Lab File ID: SEQ-TUN1      DFTPP Injection Date: 11/05/09

Instrument ID: BNA3      DFTPP Injection Time: 0530

| m/e | ION ABUNDANCE CRITERIA             | % RELATIVE ABUNDANCE |
|-----|------------------------------------|----------------------|
| 51  | 30.0 - 60.0% of mass 198           | 43.1                 |
| 68  | Less than 2.0% of mass 69          | 0.2 ( 0.3)1          |
| 69  | Mass 69 relative abundance         | 51.4                 |
| 70  | Less than 2.0% of mass 69          | 0.3 ( 0.5)1          |
| 127 | 40.0 - 60.0% of mass 198           | 52.5                 |
| 197 | Less than 1.0% of mass 198         | 0.0                  |
| 198 | Base Peak, 100% relative abundance | 100.0                |
| 199 | 5.0 to 9.0% of mass 198            | 6.6                  |
| 275 | 10.0 - 30.0% of mass 198           | 25.9                 |
| 365 | Greater than 1.0% of mass 198      | 3.07                 |
| 441 | Present, but less than mass 443    | 10.2                 |
| 442 | Greater than 40.0% of mass 198     | 64.4                 |
| 443 | 17.0 - 23.0% of mass 442           | 13.1 ( 20.3)2        |

1-Value is % mass 69

2-Value is % mass 442

THIS CHECK APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

|    | EPA<br>SAMPLE NO. | LAB<br>SAMPLE ID | LAB<br>FILE ID | DATE<br>ANALYZED | TIME<br>ANALYZED |
|----|-------------------|------------------|----------------|------------------|------------------|
| 01 | CCV5.0PPM         | SEQ-CCV1         | SEQ-CCV1       | 11/05/09         | 0549             |
| 02 | 9J30332-BLK1      | 9J30332-BLK1     | S1BW1030       | 11/05/09         | 0631             |
| 03 | 9J30332-BLK1      | 9J30332-BS1      | S1LW1030       | 11/05/09         | 0709             |
| 04 | 9J30332-BLK1      | 9J30332-BSD1     | S1DW1030       | 11/05/09         | 0802             |
| 05 | CEF-G82-1S-2      | 0910199-02       | 1019902R       | 11/05/09         | 0840             |
| 06 | CEF-G82-3S-2      | 0910199-01RE     | 1019901R       | 11/05/09         | 1035             |
| 07 | CEF-G82-1S-2      | 0910199-02RE     | 1019902R2      | 11/05/09         | 1113             |
| 08 | CEF-G82-2I-2      | 0910199-05RE     | 1019905R       | 11/05/09         | 1152             |
| 09 | CEF-G82-4S-2      | 0910216-01RE     | 1021601R       | 11/05/09         | 1230             |
| 10 | CEF-G82-5S-2      | 0910216-02RE     | 1021602R       | 11/05/09         | 1308             |
| 11 | CEF-G82-6S-2      | 0910216-03RE     | 1021603R       | 11/05/09         | 1347             |
| 12 | CEF-G82-2S-2      | 0910199-03DL     | 1019903D       | 11/05/09         | 1425             |
| 13 | CEF-G82-DUP0      | 0910199-04DL     | 1019904D       | 11/05/09         | 1503             |
| 14 |                   |                  |                |                  |                  |
| 15 |                   |                  |                |                  |                  |
| 16 |                   |                  |                |                  |                  |
| 17 |                   |                  |                |                  |                  |
| 18 |                   |                  |                |                  |                  |
| 19 |                   |                  |                |                  |                  |
| 20 |                   |                  |                |                  |                  |
| 21 |                   |                  |                |                  |                  |
| 22 |                   |                  |                |                  |                  |

FORM 8  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS      Contract: TETRATECH

Lab Code: NA                      Case No.: NA                      SAS No.: NA                      SDG No.: JM09G82\_001

Lab File ID (Standard): SEQ-CCV1                      Date Analyzed: 10/29/09

Instrument ID: BNA3                      Time Analyzed: 1210

|                      | IS1 (PHN)<br>AREA # | RT #  | IS2 (PRY)<br>AREA # | RT #  | AREA # | RT # |
|----------------------|---------------------|-------|---------------------|-------|--------|------|
| 12 HOUR STD          | 247014              | 14.70 | 139418              | 24.01 |        |      |
| UPPER LIMIT          | 494028              | 15.20 | 278836              | 24.51 |        |      |
| LOWER LIMIT          | 123507              | 14.20 | 69709               | 23.51 |        |      |
| CLIENT<br>SAMPLE NO. |                     |       |                     |       |        |      |
| 01 9J23017-BLK1      | 236810              | 14.69 | 69981               | 24.01 |        |      |
| 02 9J23017-BLK1      | 270170              | 14.69 | 125533              | 24.01 |        |      |
| 03 9J23017-BLK1      | 221196              | 14.69 | 90410               | 24.01 |        |      |
| 04 CEF-G82-3S-2      | 234481              | 14.69 | 97997               | 24.01 |        |      |
| 05 CEF-G82-2S-2      | 297429              | 14.70 | 133731              | 24.01 |        |      |
| 06 CEF-G82-DUP0      | 302742              | 14.69 | 117661              | 24.01 |        |      |
| 07 CEF-G82-2I-2      | 254630              | 14.69 | 109353              | 24.01 |        |      |
| 08 CEF-G82-4S-2      | 244056              | 14.69 | 108066              | 24.01 |        |      |
| 09 CEF-G82-5S-2      | 260927              | 14.69 | 124612              | 24.01 |        |      |
| 10 CEF-G82-6S-2      | 248381              | 14.69 | 99787               | 24.02 |        |      |
| 11                   |                     |       |                     |       |        |      |
| 12                   |                     |       |                     |       |        |      |
| 13                   |                     |       |                     |       |        |      |
| 14                   |                     |       |                     |       |        |      |
| 15                   |                     |       |                     |       |        |      |
| 16                   |                     |       |                     |       |        |      |
| 17                   |                     |       |                     |       |        |      |
| 18                   |                     |       |                     |       |        |      |
| 19                   |                     |       |                     |       |        |      |
| 20                   |                     |       |                     |       |        |      |
| 21                   |                     |       |                     |       |        |      |
| 22                   |                     |       |                     |       |        |      |

IS1 (PHN) = Phenanthrene-d10

IS2 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area

AREA LOWER LIMIT = - 50% of internal standard area

RT UPPER LIMIT = + 0.50 minutes of internal standard RT

RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.

\* Values outside of QC limits.

FORM 8  
SEMIVOLATILE INTERNAL STANDARD AREA AND RT SUMMARY

Lab Name: EMPIRICAL LABS      Contract: TETRATECH

Lab Code: NA                      Case No.: NA                      SAS No.: NA                      SDG No.: JM09G82\_001

Lab File ID (Standard): SEQ-CCV1                      Date Analyzed: 11/05/09

Instrument ID: BNA3                                      Time Analyzed: 0549

|                 | IS1 (PHN)<br>AREA # | RT #  | IS2 (PRY)<br>AREA # | RT #  | AREA # | RT #  |
|-----------------|---------------------|-------|---------------------|-------|--------|-------|
| =====           | =====               | ===== | =====               | ===== | =====  | ===== |
| 12 HOUR STD     | 108886              | 17.57 | 58711               | 27.14 |        |       |
| UPPER LIMIT     | 217772              | 18.07 | 117422              | 27.64 |        |       |
| LOWER LIMIT     | 54443               | 17.07 | 29356               | 26.64 |        |       |
| =====           | =====               | ===== | =====               | ===== | =====  | ===== |
| CLIENT          |                     |       |                     |       |        |       |
| SAMPLE NO.      |                     |       |                     |       |        |       |
| =====           | =====               | ===== | =====               | ===== | =====  | ===== |
| 01 9J30332-BLK1 | 136500              | 17.57 | 56567               | 27.14 |        |       |
| 02 9J30332-BLK1 | 104480              | 17.57 | 58721               | 27.13 |        |       |
| 03 9J30332-BLK1 | 146291              | 17.57 | 68637               | 27.14 |        |       |
| 04 CEF-G82-1S-2 | 132376              | 17.57 | 69871               | 27.14 |        |       |
| 05 CEF-G82-3S-2 | 127460              | 17.57 | 60173               | 27.14 |        |       |
| 06 CEF-G82-1S-2 | 147101              | 17.58 | 84722               | 27.14 |        |       |
| 07 CEF-G82-2I-2 | 167765              | 17.57 | 68426               | 27.14 |        |       |
| 08 CEF-G82-4S-2 | 155207              | 17.58 | 75787               | 27.14 |        |       |
| 09 CEF-G82-5S-2 | 172091              | 17.58 | 92011               | 27.14 |        |       |
| 10 CEF-G82-6S-2 | 146683              | 17.57 | 68386               | 27.14 |        |       |
| 11 CEF-G82-2S-2 | 136691              | 17.58 | 65763               | 27.14 |        |       |
| 12 CEF-G82-DUP0 | 138315              | 17.58 | 67526               | 27.14 |        |       |
| 13              |                     |       |                     |       |        |       |
| 14              |                     |       |                     |       |        |       |
| 15              |                     |       |                     |       |        |       |
| 16              |                     |       |                     |       |        |       |
| 17              |                     |       |                     |       |        |       |
| 18              |                     |       |                     |       |        |       |
| 19              |                     |       |                     |       |        |       |
| 20              |                     |       |                     |       |        |       |
| 21              |                     |       |                     |       |        |       |
| 22              |                     |       |                     |       |        |       |

IS1 (PHN) = Phenanthrene-d10  
IS2 (PRY) = Perylene-d12

AREA UPPER LIMIT = +100% of internal standard area  
 AREA LOWER LIMIT = - 50% of internal standard area  
 RT UPPER LIMIT = + 0.50 minutes of internal standard RT  
 RT LOWER LIMIT = - 0.50 minutes of internal standard RT

# Column used to flag internal standard area values with an asterisk.  
 \* Values outside of QC limits.

FORM 6  
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code:                      Case No.: NA              SAS No.: NA              SDG No.: SDGA89545

Instrument ID: BNA3                      Calibration Date(s): 08/18/09      08/18/09

Column: FUSED SILICA ID: 0.25 (mm)      Calibration Time(s): 1221              1844

LAB FILE ID:              RF0.05: CAL1              RF0.1: CAL2              RF0.25: CAL3  
RF0.5: CAL4              RF1: CAL5

| COMPOUND                   | RF0.05 | RF0.1 | RF0.25 | RF0.5 | RF1   |
|----------------------------|--------|-------|--------|-------|-------|
| Acenaphthene               | 0.620  | 0.667 | 0.674  | 0.690 | 0.649 |
| Acenaphthylene             | 0.741  | 0.775 | 0.760  | 0.810 | 0.810 |
| Anthracene                 | 0.735  | 0.733 | 0.885  | 0.930 | 0.957 |
| Benzo (a) anthracene       | 0.558  | 0.528 | 0.711  | 0.742 | 0.717 |
| Benzo (b) fluoranthene     | 0.774  | 0.713 | 0.875  | 0.957 | 1.086 |
| Benzo (k) fluoranthene     | 0.832  | 0.913 | 1.266  | 1.416 | 1.559 |
| Benzo (g, h, i) perylene   | 0.241  | 0.428 | 0.603  | 0.563 | 0.563 |
| Benzo (a) pyrene           | 0.528  | 0.523 | 0.633  | 0.733 | 0.867 |
| Chrysene                   | 0.774  | 0.888 | 1.081  | 1.094 | 0.927 |
| Dibenz (a, h) anthracene   | 0.209  | 0.332 | 0.378  | 0.413 | 0.388 |
| Fluoranthene               | 0.851  | 0.762 | 0.908  | 1.037 | 1.069 |
| Fluorene                   | 0.658  | 0.714 | 0.712  | 0.744 | 0.756 |
| Indeno (1, 2, 3-cd) pyrene | 0.177  | 0.327 | 0.307  | 0.311 | 0.341 |
| 1-Methylnaphthalene        | 0.587  | 0.752 | 0.711  | 0.680 | 0.637 |
| 2-Methylnaphthalene        | 0.551  | 0.851 | 0.737  | 0.737 | 0.711 |
| Naphthalene                | 1.079  | 1.265 | 1.131  | 1.099 | 1.032 |
| Phenanthrene               | 1.025  | 1.064 | 1.138  | 1.139 | 1.089 |
| Pyrene                     | 0.757  | 0.766 | 1.025  | 1.100 | 1.142 |
| 2-Fluorobiphenyl           | 0.731  | 0.874 | 0.868  | 0.822 | 0.765 |
| Terphenyl -d14             | 0.642  | 0.600 | 0.764  | 0.859 | 0.752 |

FORM VI SV

FORM 6  
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code:                      Case No.: NA                      SAS No.: NA                      SDG No.: SDGA89545

Instrument ID: BNA3                      Calibration Date(s): 08/18/09      08/18/09

Column: FUSED SILICA ID: 0.25 (mm)      Calibration Time(s): 1221                      1844

LAB FILE ID:                      RF2: CAL6                      RF5: CAL7                      RF10: CAL8  
RF20: CAL9                      RF40: CAL10

| COMPOUND                   | RF2   | RF5   | RF10  | RF20  | RF40  |
|----------------------------|-------|-------|-------|-------|-------|
| Acenaphthene               | 0.707 | 0.654 | 0.602 | 0.615 | 0.594 |
| Acenaphthylene             | 0.946 | 0.888 | 0.821 | 0.852 | 0.809 |
| Anthracene                 | 1.039 | 1.111 | 1.073 | 1.030 | 1.031 |
| Benzo (a) anthracene       | 0.752 | 1.090 | 1.041 | 1.071 |       |
| Benzo (b) fluoranthene     | 1.170 | 1.324 | 1.464 | 1.342 | 1.484 |
| Benzo (k) fluoranthene     | 1.514 | 1.597 | 1.607 | 1.289 | 1.488 |
| Benzo (g, h, i) perylene   | 0.838 | 0.834 | 0.866 |       |       |
| Benzo (a) pyrene           | 0.999 | 1.186 | 1.198 | 1.128 | 1.238 |
| Chrysene                   | 0.852 | 1.160 | 1.033 | 1.016 |       |
| Dibenz (a, h) anthracene   | 0.686 | 0.746 | 0.777 | 0.869 |       |
| Fluoranthene               | 1.080 | 1.325 | 1.257 | 1.167 | 1.155 |
| Fluorene                   | 0.809 | 0.787 | 0.747 | 0.741 | 0.739 |
| Indeno (1, 2, 3-cd) pyrene | 0.559 | 0.637 | 0.719 |       |       |
| 1-Methylnaphthalene        | 0.720 | 0.628 | 0.571 | 0.610 | 0.559 |
| 2-Methylnaphthalene        | 0.798 | 0.704 | 0.618 | 0.674 | 0.633 |
| Naphthalene                | 1.131 | 0.999 | 0.862 | 0.955 | 0.808 |
| Phenanthrene               | 1.129 | 1.142 | 1.103 | 1.037 | 1.055 |
| Pyrene                     | 1.126 | 1.378 | 1.309 | 1.205 | 1.167 |
| 2-Fluorobiphenyl           | 0.864 | 0.770 | 0.700 | 0.759 | 0.694 |
| Terphenyl-d14              | 0.733 | 0.914 | 0.880 | 0.810 | 0.788 |

FORM VI SV

FORM 6  
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code:                      Case No.: NA                      SAS No.: NA                      SDG No.: SDGA89545

Instrument ID: BNA3                      Calibration Date(s): 08/18/09      08/18/09

Column: FUSED SILICA ID: 0.25 (mm)      Calibration Time(s): 1221                      1844

RF50: CAL11

| COMPOUND                   | RF50  |
|----------------------------|-------|
| =====                      | ===== |
| Acenaphthene               | 0.525 |
| Acenaphthylene             | 0.714 |
| Anthracene                 | 1.000 |
| Benzo (a) anthracene       |       |
| Benzo (b) fluoranthene     | 1.337 |
| Benzo (k) fluoranthene     |       |
| Benzo (g, h, i) perylene   |       |
| Benzo (a) pyrene           | 1.140 |
| Chrysene                   |       |
| Dibenz (a, h) anthracene   |       |
| Fluoranthene               | 1.151 |
| Fluorene                   | 0.672 |
| Indeno (1, 2, 3-cd) pyrene |       |
| 1-Methylnaphthalene        | 0.480 |
| 2-Methylnaphthalene        | 0.536 |
| Naphthalene                |       |
| Phenanthrene               | 1.024 |
| Pyrene                     | 1.174 |
| =====                      | ===== |
| 2-Fluorobiphenyl           | 0.599 |
| Terphenyl-d14              | 0.805 |

FORM VI SV

FORM 6  
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code:                      Case No.: NA                      SAS No.: NA                      SDG No.: SDGA89545

Instrument ID: BNA3                      Calibration Date(s): 08/18/09      08/18/09

Column: FUSED SILICA ID: 0.25 (mm)      Calibration Time(s): 1221                      1844

| COMPOUND                   | CURVE | COEFFICIENTS |            |            | %RSD<br>OR R <sup>2</sup> |
|----------------------------|-------|--------------|------------|------------|---------------------------|
|                            |       | A0           | A1         | A2         |                           |
| Acenaphthene               | AVRG  |              | 0.63598873 |            | 8.1                       |
| Acenaphthylene             | AVRG  |              | 0.81147428 |            | 8.2                       |
| Anthracene                 | AVRG  |              | 0.95672641 |            | 13.3                      |
| Benzo (a) anthracene       | LINR  | 0.00000000   | 1.06425824 |            | 0.998                     |
| Benzo (b) fluoranthene     | LINR  | 0.00000000   | 1.39414201 |            | 0.996                     |
| Benzo (k) fluoranthene     | LINR  | 0.00000000   | 1.46299520 |            | 0.995                     |
| Benzo (g, h, i) perylene   | 2ORDR | 0.00000000   | 1.26197011 | -1.26e-002 | 0.999                     |
| Benzo (a) pyrene           | LINR  | 0.00000000   | 1.17607625 |            | 0.998                     |
| Chrysene                   | AVRG  |              | 0.98074541 |            | 13.0                      |
| Dibenz (a, h) anthracene   | 2ORDR | 0.00000000   | 1.40975310 | -1.49e-002 | 1.000                     |
| Fluoranthene               | LINR  | 0.00000000   | 1.15719596 |            | 1.000                     |
| Fluorene                   | AVRG  |              | 0.73449200 |            | 6.0                       |
| Indeno (1, 2, 3-cd) pyrene | 2ORDR | 0.00000000   | 1.79015588 | -5.6e-002  | 0.998                     |
| 1-Methylnaphthalene        | AVRG  |              | 0.63049837 |            | 12.8                      |
| 2-Methylnaphthalene        | AVRG  |              | 0.68638739 |            | 14.1                      |
| Naphthalene                | AVRG  |              | 1.03600286 |            | 13.1                      |
| Phenanthrene               | AVRG  |              | 1.08579349 |            | 4.4                       |
| Pyrene                     | LINR  | 0.00000000   | 1.17861846 |            | 0.999                     |
| 2-Fluorobiphenyl           | AVRG  |              | 0.76789447 |            | 11.2                      |
| Terphenyl-d14              | AVRG  |              | 0.77719900 |            | 12.2                      |

FORM VI SV

FORM 6  
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code: EL                      Case No.: NA                      SAS No.: NA                      SDG No.: SDGA89871

Instrument ID: BNA3                      Calibration Date(s): 11/04/09      11/04/09

Column: FUSED SILICA ID: 0.25 (mm)      Calibration Time(s): 1016                      1639

LAB FILE ID:      RF0.05: SEQ-CAL1      RF0.1: SEQ-CAL2      RF0.25: SEQ-CAL3  
RF0.5: SEQ-CAL4      RF1: SEQ-CAL5

| COMPOUND                   | RF0.05 | RF0.1 | RF0.25 | RF0.5 | RF1   |
|----------------------------|--------|-------|--------|-------|-------|
| Acenaphthene               | 0.771  | 0.657 | 0.781  | 0.762 | 0.709 |
| Acenaphthylene             | 0.939  | 0.872 | 0.996  | 0.994 | 0.988 |
| Anthracene                 | 0.819  | 0.888 | 0.886  | 0.863 | 0.907 |
| Benzo (a) anthracene       | 0.503  | 0.591 | 0.613  | 0.596 | 0.586 |
| Benzo (b) fluoranthene     | 1.124  | 1.043 | 1.098  | 1.192 | 1.124 |
| Benzo (k) fluoranthene     | 1.141  | 0.963 | 1.251  | 1.245 | 1.251 |
| Benzo (g,h,i) perylene     | 0.832  | 0.692 | 0.650  | 0.636 | 0.654 |
| Benzo (a) pyrene           | 0.953  | 0.785 | 0.862  | 0.892 | 0.889 |
| Chrysene                   | 0.472  | 0.577 | 0.621  | 0.657 | 0.621 |
| Dibenz (a,h) anthracene    | 0.635  | 0.548 | 0.464  | 0.498 | 0.479 |
| Fluoranthene               | 0.800  | 0.822 | 0.930  | 0.809 | 0.956 |
| Fluorene                   | 0.722  | 0.623 | 0.700  | 0.709 | 0.723 |
| Hexachlorobenzene          | 0.205  | 0.275 | 0.272  | 0.295 | 0.278 |
| Hexachlorobutadiene        | 0.387  | 0.302 | 0.381  | 0.367 | 0.344 |
| Hexachlorocyclopentadiene  | 0.146  | 0.134 | 0.141  | 0.162 | 0.132 |
| Indeno (1,2,3-cd) pyrene   | 0.753  | 0.519 | 0.433  | 0.466 | 0.642 |
| 1-Methylnaphthalene        | 0.827  | 0.689 | 0.860  | 0.795 | 0.766 |
| 2-Methylnaphthalene        | 0.857  | 0.832 | 0.901  | 0.867 | 0.816 |
| Naphthalene                | 1.477  | 1.176 | 1.452  | 1.372 | 1.266 |
| N-Nitroso-di-n-propylamine | 0.260  | 0.178 | 0.234  | 0.227 | 0.205 |
| Phenanthrene               | 0.945  | 0.873 | 1.044  | 1.017 | 1.034 |
| Pyrene                     | 0.738  | 0.924 | 0.936  | 0.876 | 0.925 |
| 2-Fluorobiphenyl           | 1.204  | 0.944 | 1.117  | 1.076 | 1.023 |
| Terphenyl-d14              | 0.561  | 0.642 | 0.648  | 0.650 | 0.610 |

FORM VI SV

FORM 6  
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code: EL                      Case No.: NA                      SAS No.: NA                      SDG No.: SDGA89871

Instrument ID: BNA3                      Calibration Date(s): 11/04/09      11/04/09

Column: FUSED SILICA ID: 0.25 (mm)      Calibration Time(s): 1016                      1639

LAB FILE ID:                      RF2: SEQ-CAL6                      RF5: SEQ-CAL7                      RF10: SEQ-CAL8  
RF20: SEQ-CAL9                      RF40: SEQ-CALA

| COMPOUND                   | RF2   | RF5   | RF10  | RF20  | RF40  |
|----------------------------|-------|-------|-------|-------|-------|
| Acenaphthene               | 0.692 | 0.699 | 0.753 | 0.722 | 0.655 |
| Acenaphthylene             | 0.981 | 0.991 | 1.061 | 1.009 | 0.899 |
| Anthracene                 | 0.920 | 0.995 | 0.994 | 0.954 | 0.952 |
| Benzo (a) anthracene       | 0.623 | 0.733 | 0.948 | 0.943 |       |
| Benzo (b) fluoranthene     | 1.164 | 1.330 | 1.375 | 1.451 | 1.562 |
| Benzo (k) fluoranthene     | 1.292 | 1.276 | 1.382 | 1.313 | 1.376 |
| Benzo (g,h,i) perylene     | 0.770 | 0.898 | 0.866 | 0.785 | 0.875 |
| Benzo (a) pyrene           | 0.966 | 1.103 | 1.166 | 1.160 | 1.217 |
| Chrysene                   | 0.618 | 0.717 | 0.895 | 0.873 | 0.925 |
| Dibenz (a,h) anthracene    | 0.598 | 0.726 | 0.749 | 0.728 | 0.892 |
| Fluoranthene               | 0.932 | 1.042 | 1.087 | 1.057 | 1.154 |
| Fluorene                   | 0.724 | 0.742 | 0.788 | 0.772 | 0.729 |
| Hexachlorobenzene          | 0.252 | 0.266 | 0.267 | 0.255 | 0.246 |
| Hexachlorobutadiene        | 0.316 | 0.309 | 0.343 | 0.324 | 0.284 |
| Hexachlorocyclopentadiene  | 0.138 | 0.150 | 0.167 | 0.169 | 0.150 |
| Indeno (1,2,3-cd) pyrene   | 0.657 | 0.790 | 0.863 | 0.790 | 0.956 |
| 1-Methylnaphthalene        | 0.729 | 0.711 | 0.767 | 0.724 | 0.639 |
| 2-Methylnaphthalene        | 0.792 | 0.769 | 0.847 | 0.805 | 0.711 |
| Naphthalene                | 1.207 | 1.180 | 1.302 | 1.221 | 1.035 |
| N-Nitroso-di-n-propylamine | 0.208 | 0.204 | 0.236 | 0.222 | 0.182 |
| Phenanthrene               | 1.016 | 1.056 | 1.053 | 1.031 | 1.038 |
| Pyrene                     | 0.944 | 1.056 | 1.107 | 1.088 | 1.180 |
| 2-Fluorobiphenyl           | 0.959 | 0.955 | 1.032 | 0.969 | 0.867 |
| Terphenyl-d14              | 0.615 | 0.668 | 0.734 | 0.709 | 0.789 |

FORM VI SV

FORM 6  
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code: EL                      Case No.: NA                      SAS No.: NA                      SDG No.: SDGA89871

Instrument ID: BNA3                      Calibration Date(s): 11/04/09      11/04/09

Column: FUSED SILICA ID: 0.25 (mm)      Calibration Time(s): 1016                      1639

RF50: SEQ-CALB

| COMPOUND                   | RF50  |
|----------------------------|-------|
| Acenaphthene               | 0.610 |
| Acenaphthylene             | 0.835 |
| Anthracene                 | 0.913 |
| Benzo (a) anthracene       |       |
| Benzo (b) fluoranthene     | 1.580 |
| Benzo (k) fluoranthene     |       |
| Benzo (g, h, i) perylene   | 0.785 |
| Benzo (a) pyrene           |       |
| Chrysene                   |       |
| Dibenz (a, h) anthracene   | 0.793 |
| Fluoranthene               | 1.118 |
| Fluorene                   | 0.680 |
| Hexachlorobenzene          | 0.234 |
| Hexachlorobutadiene        | 0.267 |
| Hexachlorocyclopentadiene  | 0.143 |
| Indeno (1, 2, 3-cd) pyrene |       |
| 1-Methylnaphthalene        | 0.598 |
| 2-Methylnaphthalene        | 0.665 |
| Naphthalene                | 0.968 |
| N-Nitroso-di-n-propylamine | 0.171 |
| Phenanthrene               | 0.982 |
| Pyrene                     | 1.136 |
| 2-Fluorobiphenyl           | 0.801 |
| Terphenyl-d14              | 0.755 |

FORM VI SV

FORM 6  
SEMIVOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code: EL                      Case No.: NA                      SAS No.: NA                      SDG No.: SDGA89871

Instrument ID: BNA3                      Calibration Date(s): 11/04/09      11/04/09

Column: FUSED SILICA ID: 0.25 (mm)      Calibration Time(s): 1016                      1639

| COMPOUND                   | CURVE | COEFFICIENTS |            |            | %RSD<br>OR R <sup>2</sup> |
|----------------------------|-------|--------------|------------|------------|---------------------------|
|                            |       | A0           | A1         | A2         |                           |
| Acenaphthene               | AVRG  |              | 0.71014840 |            | 7.7                       |
| Acenaphthylene             | AVRG  |              | 0.96056984 |            | 7.0                       |
| Anthracene                 | AVRG  |              | 0.91752846 |            | 5.9                       |
| Benzo (a) anthracene       | 2ORDR | 0.00000000   | 1.19123924 | -7.32e-003 | 0.997                     |
| Benzo (b) fluoranthene     | LINR  | 0.00000000   | 1.55811932 |            | 0.998                     |
| Benzo (k) fluoranthene     | LINR  | 0.00000000   | 1.36375737 |            | 0.999                     |
| Benzo (g, h, i) perylene   | LINR  | 0.00000000   | 0.82093484 |            | 0.996                     |
| Benzo (a) pyrene           | LINR  | 0.00000000   | 1.20293102 |            | 0.999                     |
| Chrysene                   | 2ORDR | 0.00000000   | 1.20184852 | -3.28e-003 | 0.999                     |
| Dibenz (a, h) anthracene   | 2ORDR | 0.00000000   | 1.35448555 | -3.95e-003 | 0.994                     |
| Fluoranthene               | AVRG  |              | 0.97348777 |            | 13.1                      |
| Fluorene                   | AVRG  |              | 0.71916064 |            | 6.1                       |
| Hexachlorobenzene          | AVRG  |              | 0.25861437 |            | 9.5                       |
| Hexachlorobutadiene        | AVRG  |              | 0.32950760 |            | 11.8                      |
| Hexachlorocyclopentadiene  | AVRG  |              | 0.14837547 |            | 8.6                       |
| Indeno (1, 2, 3-cd) pyrene | 2ORDR | 0.00000000   | 1.34017018 | -7.64e-003 | 0.999                     |
| 1-Methylnaphthalene        | AVRG  |              | 0.73688873 |            | 10.6                      |
| 2-Methylnaphthalene        | AVRG  |              | 0.80575081 |            | 8.6                       |
| Naphthalene                | AVRG  |              | 1.24145110 |            | 12.7                      |
| N-Nitroso-di-n-propylamine | AVRG  |              | 0.21159450 |            | 13.0                      |
| Phenanthrene               | AVRG  |              | 1.00819926 |            | 5.5                       |
| Pyrene                     | AVRG  |              | 0.99177456 |            | 13.3                      |
| 2-Fluorobiphenyl           | AVRG  |              | 0.99534605 |            | 11.3                      |
| Terphenyl-d14              | AVRG  |              | 0.67099037 |            | 10.2                      |

FORM VI SV

SEMIVOLATILE INITIAL CALIBRATION VERIFICATION

Lab Name: EMPIRICAL LABS Contract:

Lab Code: Case No.: NA SAS No.: NA SDG No.: SDGA89545

Instrument ID: BNA3 Calibration Date: 08/18/09 Time: 1922

Lab File ID: ICV01 Init. Calib. Date(s): 08/18/09 08/18/09

Init. Calib. Times: 1221 1844

| COMPOUND                   | RRF   | RRF5  | CURVE AMOUNT | CCAL AMOUNT | MIN RRF | CURVE | %D    | MAX %D |
|----------------------------|-------|-------|--------------|-------------|---------|-------|-------|--------|
| Acenaphthene               | 0.636 | 0.620 | 5.000        | 4.875       |         | AVRG  | -2.5  | 25.0   |
| Acenaphthylene             | 0.811 | 0.834 | 5.000        | 5.139       |         | AVRG  | 2.8   | 25.0   |
| Anthracene                 | 0.957 | 1.098 | 5.000        | 5.740       |         | AVRG  | 14.8  | 25.0   |
| Benzo (a) anthracene       | 0.801 | 1.067 | 5.000        | 5.011       |         | LINR  | 0.2   | 25.0   |
| Benzo (b) fluoranthene     | 1.139 | 1.456 | 5.000        | 5.223       |         | LINR  | 4.5   | 25.0   |
| Benzo (k) fluoranthene     | 1.348 | 1.586 | 5.000        | 5.419       |         | LINR  | 8.4   | 25.0   |
| Benzo (g, h, i) perylene   | 0.617 | 0.618 | 5.000        | 3.778       |         | 2ORDR | -24.4 | 25.0   |
| Benzo (a) pyrene           | 0.925 | 1.191 | 5.000        | 5.064       |         | LINR  | 1.3   | 25.0   |
| Chrysene                   | 0.980 | 1.105 | 5.000        | 5.635       |         | AVRG  | 12.7  | 25.0   |
| Dibenz (a, h) anthracene   | 0.533 | 0.569 | 5.000        | 3.892       |         | 2ORDR | -22.2 | 25.0   |
| Fluoranthene               | 1.069 | 1.297 | 5.000        | 5.603       |         | LINR  | 12.0  | 25.0   |
| Fluorene                   | 0.734 | 0.757 | 5.000        | 5.156       |         | AVRG  | 3.1   | 25.0   |
| Indeno (1, 2, 3-cd) pyrene | 0.422 | 0.531 | 5.000        | 4.360       |         | 2ORDR | -12.8 | 25.0   |
| 1-Methylnaphthalene        | 0.630 | 0.578 | 5.000        | 4.584       |         | AVRG  | -8.3  | 25.0   |
| 2-Methylnaphthalene        | 0.686 | 0.640 | 5.000        | 4.666       |         | AVRG  | -6.7  | 25.0   |
| Naphthalene                | 1.036 | 0.873 | 5.000        | 4.212       |         | AVRG  | -15.7 | 25.0   |
| Phenanthrene               | 1.086 | 1.136 | 5.000        | 5.232       |         | AVRG  | 4.6   | 25.0   |
| Pyrene                     | 1.104 | 1.345 | 5.000        | 5.704       |         | LINR  | 14.1  | 25.0   |

ICV SV

SEMIVOLATILE INITIAL CALIBRATION VERIFICATION

Lab Name: EMPIRICAL LABS Contract:  
 Lab Code: EL Case No.: NA SAS No.: NA SDG No.: SDGA55791  
 Instrument ID: BNA3 Calibration Date: 11/04/09 Time: 1717  
 Lab File ID: SEQ-ICV1 Init. Calib. Date(s): 11/04/09 11/04/09  
 Init. Calib. Times: 1016 1639

| COMPOUND                   | RRF   | RRF5  | CURVE AMOUNT | CCAL AMOUNT | MIN RRF | CURVE | %D    | MAX %D |
|----------------------------|-------|-------|--------------|-------------|---------|-------|-------|--------|
| Acenaphthene               | 0.710 | 0.743 | 5.000        | 5.229       |         | AVRG  | 4.6   | 25.0   |
| Acenaphthylene             | 0.960 | 1.026 | 5.000        | 5.341       |         | AVRG  | 6.8   | 25.0   |
| Anthracene                 | 0.917 | 0.962 | 5.000        | 5.245       |         | AVRG  | 4.9   | 25.0   |
| Benzo (a) anthracene       | 0.682 | 0.963 | 5.000        | 5.564       |         | 2ORDR | 11.3  | 25.0   |
| Benzo (b) fluoranthene     | 1.277 | 1.431 | 5.000        | 4.592       |         | LINR  | -8.2  | 25.0   |
| Benzo (k) fluoranthene     | 1.249 | 1.363 | 5.000        | 4.996       |         | LINR  | -0.1  | 25.0   |
| Benzo (g, h, i) perylene   | 0.768 | 0.690 | 5.000        | 4.203       |         | LINR  | -15.9 | 25.0   |
| Benzo (a) pyrene           | 0.999 | 1.118 | 5.000        | 4.646       |         | LINR  | -7.1  | 25.0   |
| Chrysene                   | 0.698 | 0.942 | 5.000        | 5.585       |         | 2ORDR | 11.7  | 25.0   |
| Dibenz (a, h) anthracene   | 0.646 | 0.590 | 5.000        | 3.959       |         | 2ORDR | -20.8 | 25.0   |
| Fluoranthene               | 0.973 | 1.079 | 5.000        | 5.542       |         | AVRG  | 10.8  | 25.0   |
| Fluorene                   | 0.719 | 0.764 | 5.000        | 5.316       |         | AVRG  | 6.3   | 25.0   |
| Hexachlorobenzene          | 0.259 | 0.249 | 5.000        | 4.811       |         | AVRG  | -3.8  | 25.0   |
| Hexachlorobutadiene        | 0.329 | 0.346 | 5.000        | 5.244       |         | AVRG  | 4.9   | 25.0   |
| Hexachlorocyclopentadiene  | 0.148 | 0.141 | 5.000        | 4.747       | 0.050   | AVRG  | -5.1  | 25.0   |
| Indeno (1, 2, 3-cd) pyrene | 0.687 | 0.675 | 5.000        | 4.435       |         | 2ORDR | -11.3 | 25.0   |
| 1-Methylnaphthalene        | 0.737 | 0.728 | 5.000        | 4.943       |         | AVRG  | -1.1  | 25.0   |
| 2-Methylnaphthalene        | 0.806 | 0.810 | 5.000        | 5.024       |         | AVRG  | 0.5   | 25.0   |
| Naphthalene                | 1.241 | 1.242 | 5.000        | 5.004       |         | AVRG  | 0.1   | 25.0   |
| N-Nitroso-di-n-propylamine | 0.212 | 0.222 | 5.000        | 5.254       | 0.050   | AVRG  | 5.1   | 25.0   |
| Phenanthrene               | 1.008 | 1.040 | 5.000        | 5.156       |         | AVRG  | 3.1   | 25.0   |
| Pyrene                     | 0.992 | 1.125 | 5.000        | 5.673       |         | AVRG  | 13.5  | 25.0   |

ICV SV





**ORGANIC CASE NARRATIVE**  
**Tetra Tech NUS, Inc./Nas Cecil Field (G82) JM09**  
**SDG: JM09G82\_001**

| Sampled    | Received   | Lab ID     | Client ID              |
|------------|------------|------------|------------------------|
| 10/22/2009 | 10/23/2009 | 0910199-01 | CEF-G82-3S-20091022    |
| 10/22/2009 | 10/23/2009 | 0910199-02 | CEF-G82-1S-20091022    |
| 10/22/2009 | 10/23/2009 | 0910199-03 | CEF-G82-2S-20091022    |
| 10/22/2009 | 10/23/2009 | 0910199-04 | CEF-G82-DUP01-20091022 |
| 10/22/2009 | 10/23/2009 | 0910199-05 | CEF-G82-2I-20091022    |

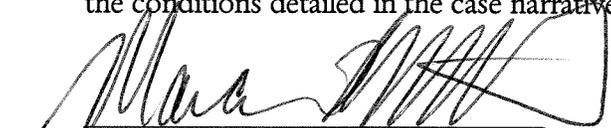
### **Volatile MEE Samples**

**Method:** The samples were extracted/analyzed by USEPA SW-846 Method 8015B (headspace extraction followed by capillary column GC/FID – also commonly referred to as RSK-175) for waters upon receipt to the laboratory in satisfactory condition.

**Comments:** The volatile analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications except for the following:

- Continuing calibration recoveries were within 20% difference or exceeded with a positive bias without detection above the quantitation limit in the associated samples.
- Method Blank Results: Methane was detected in the method blank. Reported concentrations in the associated samples are qualified with a “V”.
- All samples were analyzed without dilution. Some samples required further dilution to bring methane within range of the initial calibration.
- As is necessary for all GC/LC chromatography, manual integrations were performed to correctly quantitate target analytes. A “before” chromatogram and “after” chromatogram is available at the laboratory for all sample analyses to provide information regarding the manual integrations performed.

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



Marcia K. McGinnity  
Data Quality Manager

## ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

- MDL:** The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.
- EQL:** The estimated quantitation limit (EQL), also known as the reporting limit (RL), is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.
- U:** The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.
- 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".
- I:** The presence of an "I" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL/RL.
- L:** The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with a "L". Usually the sample will be rerun at a dilution to quantitate the flagged compound.
- V:** The presence of a "V" 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.
- J1:** The reported analyte concentration may have a low bias as the CCV exceeded the limit on the low side.
- J2:** The reported analyte concentration may have a high bias as the CCV exceeded the limit on the high side.
- M:** The presence of an "M" to the right of an analytical result indicates that the sample matrix interfered with the quantitation of the analyte. In GC and HPLC, results are reported from the column with the lower concentration.
- I:** The presence of an "I" to the right of an analytical result that the presence of a qualitative interference could have caused a false positive or over estimation of the analyte. In GC and HPLC, results are reported from the column with the lower concentration.

# ANALYSIS DATA SHEET

CEF-G82-3S-20091022

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Matrix: Ground Water

Laboratory ID: 0910199-01

Sampled: 10/22/09 10:30

Received: 10/23/09 08:30

% Solids: 0.00

| CAS NO. | Analyte  | Concentration (ug/L) | MDL  | RL   | Dilution Factor | Q | Method | Batch   | Analyzed       |
|---------|----------|----------------------|------|------|-----------------|---|--------|---------|----------------|
| 74-82-8 | Methane  |                      | 1.00 | 3.00 | 1               | U | RSK175 | 9J27928 | 10/28/09 18:17 |
| 74-84-0 | Ethane   |                      | 1.00 | 3.00 | 1               | U | RSK175 | 9J27928 | 10/28/09 18:17 |
| 74-85-1 | Ethylene |                      | 1.00 | 3.00 | 1               | U | RSK175 | 9J27928 | 10/28/09 18:17 |

# ANALYSIS DATA SHEET

CEF-G82-1S-20091022

Laboratory: Empirical Laboratories, LLC  
 Client: Tetra Tech NUS, Inc. (T010)  
 Matrix: Ground Water  
 Sampled: 10/22/09 11:55  
 % Solids: 0.00

SDG: JM09G82\_001  
 Project: Cecil Field JM09 G82/BPWells  
 Laboratory ID: 0910199-02  
 Received: 10/23/09 08:30

| CAS NO. | Analyte  | Concentration (ug/L) | MDL  | RL   | Dilution Factor | Q                | Method | Batch   | Analyzed       |
|---------|----------|----------------------|------|------|-----------------|------------------|--------|---------|----------------|
| 74-82-8 | Methane  | 1940                 | 1.00 | 3.00 | 1               | <del>AVL</del>   | RSK175 | 9J27928 | 10/28/09 18:41 |
| 74-82-8 | Methane  | 1760                 | 5.00 | 15.0 | 5               | D <del>AVL</del> | RSK175 | 9J27928 | 10/28/09 20:37 |
| 74-84-0 | Ethane   |                      | 1.00 | 3.00 | 1               | U                | RSK175 | 9J27928 | 10/28/09 18:41 |
| 74-85-1 | Ethylene |                      | 1.00 | 3.00 | 1               | U                | RSK175 | 9J27928 | 10/28/09 18:41 |

*M*  
10/19/09

# ANALYSIS DATA SHEET

CEF-G82-2S-20091022

Laboratory: Empirical Laboratories, LLC  
 Client: Tetra Tech NUS, Inc. (T010)  
 Matrix: Ground Water  
 Sampled: 10/22/09 13:05  
 % Solids: 0.00

SDG: JM09G82\_001  
 Project: Cecil Field JM09 G82/BPWells  
 Laboratory ID: 0910199-03  
 Received: 10/23/09 08:30

| CAS NO. | Analyte  | Concentration (ug/L) | MDL  | RL   | Dilution Factor | Q                | Method | Batch   | Analyzed       |
|---------|----------|----------------------|------|------|-----------------|------------------|--------|---------|----------------|
| 74-82-8 | Methane  | 5690                 | 1.00 | 3.00 | 1               | <del>B</del> VL  | RSK175 | 9J27928 | 10/28/09 19:04 |
| 74-82-8 | Methane  | 7170                 | 15.0 | 45.0 | 15              | <del>D</del> B ✓ | RSK175 | 9J27928 | 10/28/09 21:00 |
| 74-84-0 | Ethane   |                      | 1.00 | 3.00 | 1               | U                | RSK175 | 9J27928 | 10/28/09 19:04 |
| 74-85-1 | Ethylene |                      | 1.00 | 3.00 | 1               | U                | RSK175 | 9J27928 | 10/28/09 19:04 |

*M-11/9/09*

# ANALYSIS DATA SHEET

CEF-G82-DUP01-20091022

Laboratory: Empirical Laboratories, LLC  
 Client: Tetra Tech NUS, Inc. (T010)  
 Matrix: Ground Water  
 Sampled: 10/22/09 00:00  
 % Solids: 0.00

SDG: JM09G82\_001  
 Project: Cecil Field JM09 G82/BPWells  
 Laboratory ID: 0910199-04  
 Received: 10/23/09 08:30

| CAS NO. | Analyte  | Concentration (ug/L) | MDL  | RL   | Dilution Factor | Q   | Method | Batch   | Analyzed       |
|---------|----------|----------------------|------|------|-----------------|-----|--------|---------|----------------|
| 74-82-8 | Methane  | 5030                 | 1.00 | 3.00 | 1               | B ✓ | RSK175 | 9J27928 | 10/28/09 19:28 |
| 74-82-8 | Methane  | 9340                 | 15.0 | 45.0 | 15              | D ✓ | RSK175 | 9J27928 | 10/28/09 21:23 |
| 74-84-0 | Ethane   |                      | 1.00 | 3.00 | 1               | U   | RSK175 | 9J27928 | 10/28/09 19:28 |
| 74-85-1 | Ethylene |                      | 1.00 | 3.00 | 1               | U   | RSK175 | 9J27928 | 10/28/09 19:28 |

M. 10/19/09

# ANALYSIS DATA SHEET

CEF-G82-2I-20091022

Laboratory: Empirical Laboratories, LLC  
 Client: Tetra Tech NUS, Inc. (T010)  
 Matrix: Ground Water  
 Sampled: 10/22/09 15:10  
 % Solids: 0.00

SDG: JM09G82\_001  
 Project: Cecil Field JM09 G82/BPWells  
 Laboratory ID: 0910199-05  
 Received: 10/23/09 08:30

| CAS NO. | Analyte  | Concentration (ug/L) | MDL  | RL   | Dilution Factor | Q              | Method | Batch   | Analyzed       |
|---------|----------|----------------------|------|------|-----------------|----------------|--------|---------|----------------|
| 74-82-8 | Methane  | 4.64                 | 1.00 | 3.00 | 1               | <del>U</del> ✓ | RSK175 | 9J27928 | 10/28/09 19:51 |
| 74-84-0 | Ethane   |                      | 1.00 | 3.00 | 1               | U              | RSK175 | 9J27928 | 10/28/09 19:51 |
| 74-85-1 | Ethylene |                      | 1.00 | 3.00 | 1               | U              | RSK175 | 9J27928 | 10/28/09 19:51 |

*m 11/9/09*

# LCS / LCS DUPLICATE RECOVERY

RSK175

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Matrix: Water

Batch: 9J27928

Laboratory ID: 9J27928-BS1

Preparation: 8015MEE

Initial/Final: 15 mL / 15 mL

| ANALYTE  | SPIKE<br>ADDED<br>(ug/L) | LCS<br>CONCENTRATION<br>(ug/L) | LCS<br>%<br>REC. | QC<br>LIMITS<br>REC. |
|----------|--------------------------|--------------------------------|------------------|----------------------|
| Methane  | 254.5                    | 265.2                          | 104              | 80 - 120             |
| Ethane   | 490.2                    | 503.6                          | 103              | 80 - 120             |
| Ethylene | 532.1                    | 573.8                          | 108              | 80 - 120             |

# PREPARATION BATCH SUMMARY

RSK175

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Batch: 9J27928 Batch Matrix: Water

Preparation: 8015MEE

| SAMPLE NAME            | LAB SAMPLE ID | DATE PREPARED  | INITIAL VOL./WEIGHT | FINAL VOL. |
|------------------------|---------------|----------------|---------------------|------------|
| CEF-G82-3S-20091022    | 0910199-01    | 10/28/09 12:00 | 15.00               | 15.00      |
| CEF-G82-1S-20091022    | 0910199-02    | 10/28/09 12:00 | 15.00               | 15.00      |
| CEF-G82-1S-20091022    | 0910199-02RE1 | 10/28/09 12:00 | 15.00               | 15.00      |
| CEF-G82-2S-20091022    | 0910199-03    | 10/28/09 12:00 | 15.00               | 15.00      |
| CEF-G82-2S-20091022    | 0910199-03RE1 | 10/28/09 12:00 | 15.00               | 15.00      |
| CEF-G82-DUP01-20091022 | 0910199-04    | 10/28/09 12:00 | 15.00               | 15.00      |
| CEF-G82-DUP01-20091022 | 0910199-04RE1 | 10/28/09 12:00 | 15.00               | 15.00      |
| CEF-G82-2I-20091022    | 0910199-05    | 10/28/09 12:00 | 15.00               | 15.00      |
| Blank                  | 9J27928-BLK1  | 10/28/09 12:00 | 15.00               | 15.00      |
| LCS                    | 9J27928-BS1   | 10/28/09 12:00 | 15.00               | 15.00      |

**METHOD BLANK DATA SHEET**  
**RSK175**

|  |  |
|--|--|
| Laboratory: <u>Empirical Laboratories, LLC</u> | SDG: <u>JM09G82_001</u>                      |
| Client: <u>Tetra Tech NUS, Inc. (T010)</u>     | Project: <u>Cecil Field JM09 G82/BPWells</u> |
| Matrix: <u>Water</u>                           | Laboratory ID: <u>9J27928-BLK1</u>           |
| Prepared: <u>10/28/09 12:00</u>                | Preparation: <u>8015MEE</u>                  |
| Analyzed: <u>10/28/09 15:59</u>                | Instrument: <u>GL-GCVOA</u>                  |
| Batch: <u>9J27928</u>                          | Sequence: <u>9J30201</u>                     |
|  | File ID: <u>004F0101.D</u>                   |
|  | Initial/Final: <u>15 mL / 15 mL</u>          |
|  | Calibration: <u>9G15001</u>                  |

| CAS NO. | COMPOUND | CONC. (ug/L) | Q         |
|---------|----------|--------------|-----------|
| 74-82-8 | Methane  | 1.27         | <i>SI</i> |
| 74-84-0 | Ethane   | 3.00         | U         |
| 74-85-1 | Ethylene | 3.00         | U         |

*M 10/28/09*

# INITIAL CALIBRATION DATA

**RSK175**

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Calibration: 9G15001

Instrument: GL-GCVOA

Matrix: Water

Calibration Date: 4/9/2009 2:51:32PM

| Compound | Level 01 |          | Level 02 |          | Level 03 |          | Level 04 |          | Level 05 |          | Level 06 |          |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|          | Area     | RF       |
| Methane  | 0.509    | 6047.151 | 2.545    | 3529.273 | 5.09     | 1480.943 | 25.45    | 2907.623 | 50.9     | 2575.364 | 254.5    | 2782.676 |
| Ethane   | 0.9804   | 1745.206 | 4.902    | 2430.437 | 9.804    | 1247.246 | 49.02    | 2756.691 | 98.04    | 2492.574 | 490.2    | 2710.196 |
| Ethylene | 1.064    | 1420.113 | 5.321    | 2219.696 | 10.64    | 997.6504 | 53.21    | 2334.148 | 106.4    | 2099.69  | 532.1    | 2257.929 |

# INITIAL CALIBRATION DATA (Continued)

RSK175

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Calibration: 9G15001

Instrument: GL-GCVOA

Matrix: Water

Calibration Date: 4/9/2009 2:51:32PM

| Compound | Level 07 |          | Level 08 |    | Level 09 |    | Level 10 |    | Level 11 |    | Level 12 |    |
|----------|----------|----------|----------|----|----------|----|----------|----|----------|----|----------|----|
|          | nalEquiv | RF       | nalEquiv | RF | nalEquiv | RF | nalEquiv | RF | nalEquiv | RF | nalEquiv | RF |
| Methane  | 1018     | 2188.577 |          |    |          |    |          |    |          |    |          |    |
| Ethane   | 1961     | 2143.96  |          |    |          |    |          |    |          |    |          |    |
| Ethylene | 2129     | 1804.87  |          |    |          |    |          |    |          |    |          |    |

# INITIAL CALIBRATION DATA (Continued)

RSK175

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Calibration: 9G15001

Instrument: GL-GCVOA

Matrix: Water

Calibration Date: 4/9/2009 2:51:32PM

| Compound | Mean RF  | RF RSD   | Mean RT  | RT RSD    | Linear r  | Quad COD | LIMIT | Q |
|----------|----------|----------|----------|-----------|-----------|----------|-------|---|
| Methane  | 3073.087 | 47.3982  | 4.599714 | 0.2702981 | 0.9954709 |          | 0.995 |   |
| Ethane   | 2218.044 | 24.86038 | 10.02757 | 0.1616114 | 0.9956377 |          | 0.995 |   |
| Ethylene | 1876.299 | 26.72203 | 9.289143 | 0.175436  | 0.9960622 |          | 0.995 |   |

# INITIAL CALIBRATION STANDARDS

## RSK175

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Sequence: 9G15019

Instrument: GL-GCVOA

Calibration: 9G15001

| Standard ID | Description    | Lab Sample ID | Lab File ID | Analysis Date/Time |
|-------------|----------------|---------------|-------------|--------------------|
| 09G0261     | MEE CAL1@0.002 | 9G15019-CAL1  | 002F0101.D  | 04/09/09 10:50     |
| 09G0262     | MEE CAL1@0.01  | 9G15019-CAL2  | 003F0101.D  | 04/09/09 11:11     |
| 09G0263     | MEE CAL1@0.02  | 9G15019-CAL3  | 004F0101.D  | 04/09/09 11:33     |
| 09G0264     | MEE CAL1@0.1   | 9G15019-CAL4  | 005F0101.D  | 04/09/09 11:55     |
| 09G0265     | MEE CAL1@0.2   | 9G15019-CAL5  | 006F0101.D  | 04/09/09 12:18     |
| 09G0266     | MEE CAL1@1.0   | 9G15019-CAL6  | 007F0101.D  | 04/09/09 12:40     |
| 09G0267     | MEE CAL1@4.0   | 9G15019-CAL7  | 008F0101.D  | 04/09/09 13:02     |

Data File: \\ELABNSH05\TARGET\chem\gcvoa.i\040909.b\009F0101.D  
Report Date: 09-Apr-2009 16:12

ICV

Empirical Laboratories, LLC

JL909  
49.09

~~CONTINUING CALIBRATION COMPOUNDS~~

Instrument ID: gcvoa.i      Injection Date: 09-APR-2009 13:55  
Lab File ID: 009F0101.D      Init. Cal. Date(s): 09-NOV-2007 09-APR-2009  
Analysis Type:      Init. Cal. Times: 13:21      13:02  
Lab Sample ID: ICV/1.0 09B0218      Quant Type: ESTD  
Method: \\ELABNSH05\TARGET\chem\gcvoa.i\040909.b\MEE.m

| COMPOUND  | RRF     | RF1     | MIN<br>RRF | %D    | MAX<br>%D |
|-----------|---------|---------|------------|-------|-----------|
| 1 Methane | 1.00000 | 1.17979 | 0.010      | -18.0 | 20.0      |
| 3 Ethene  | 1076287 | 1288504 | 0.010      | 19.7  | 20.0      |
| 4 Ethane  | 1166617 | 1306342 | 0.010      | 12.0  | 20.0      |

BM  
0910909

# CONTINUING CALIBRATION CHECK

**RSK175**

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Instrument ID: GL-GCVOA

Calibration: 9G15001

Lab File ID: 002F0101.D

Calibration Date: 04/09/09 14:51

Sequence: 9J30201

Injection Date: 10/28/09

Lab Sample ID: 9J30201-CCV1

Injection Time: 14:33

| COMPOUND | TYPE | CONC. (DecimalEquivalents) |       | RESPONSE FACTOR |         |         | % DIFF / DRIFT |           |
|----------|------|----------------------------|-------|-----------------|---------|---------|----------------|-----------|
|          |      | STD                        | CCV   | ICAL            | CCV     | MIN (#) | CCV            | LIMIT (#) |
| Methane  | L    | 1.000                      | 1.178 | 3073.087        | 22327.3 |         | 17.8           | 20        |
| Ethane   | L    | 1.000                      | 1.200 | 2218.044        | 42871.9 |         | 20.0           | 20        |
| Ethylene | L    | 1.000                      | 1.278 | 1876.299        | 41700.1 |         | 27.8           | 20 *      |

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

\* Values outside of QC limits

# CONTINUING CALIBRATION CHECK

RSK175

|  |  |
|--|--|
| Laboratory: <u>Empirical Laboratories, LLC</u> | SDG: <u>JM09G82_001</u>                      |
| Client: <u>Tetra Tech NUS, Inc. (T010)</u>     | Project: <u>Cecil Field JM09 G82/BPWells</u> |
| Instrument ID: <u>GL-GCVOA</u>                 | Calibration: <u>9G15001</u>                  |
| Lab File ID: <u>015F0101.D</u>                 | Calibration Date: <u>04/09/09 14:51</u>      |
| Sequence: <u>9J30201</u>                       | Injection Date: <u>10/28/09</u>              |
| Lab Sample ID: <u>9J30201-CCV2</u>             | Injection Time: <u>20:14</u>                 |

| COMPOUND | TYPE | CONC. (DecimalEquivalents) |        | RESPONSE FACTOR |         |         | % DIFF / DRIFT |           |
|----------|------|----------------------------|--------|-----------------|---------|---------|----------------|-----------|
|          |      | STD                        | CCV    | ICAL            | CCV     | MIN (#) | CCV            | LIMIT (#) |
| Methane  | L    | 1.000                      | 0.8522 | 3073.087        | 16148.7 |         | -14.8          | 20        |
| Ethane   | L    | 1.000                      | 0.8484 | 2218.044        | 30316.3 |         | -15.2          | 20        |
| Ethylene | L    | 1.000                      | 0.8312 | 1876.299        | 27117.4 |         | -16.9          | 20        |

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

\* Values outside of QC limits

**CONTINUING CALIBRATION CHECK**  
**RSK175**

|  |  |
|--|--|
| Laboratory: <u>Empirical Laboratories, LLC</u> | SDG: <u>JM09G82_001</u>                      |
| Client: <u>Tetra Tech NUS, Inc. (T010)</u>     | Project: <u>Cecil Field JM09 G82/BPWells</u> |
| Instrument ID: <u>GL-GCVOA</u>                 | Calibration: <u>9G15001</u>                  |
| Lab File ID: <u>019F0101.D</u>                 | Calibration Date: <u>04/09/09 14:51</u>      |
| Sequence: <u>9J30201</u>                       | Injection Date: <u>10/28/09</u>              |
| Lab Sample ID: <u>9J30201-CCV3</u>             | Injection Time: <u>21:46</u>                 |

| COMPOUND | TYPE | CONC. (DecimalEquivalents) |        | RESPONSE FACTOR |         |         | % DIFF / DRIFT |           |
|----------|------|----------------------------|--------|-----------------|---------|---------|----------------|-----------|
|          |      | STD                        | CCV    | ICAL            | CCV     | MIN (#) | CCV            | LIMIT (#) |
| Methane  | L    | 1.000                      | 0.9377 | 3073.087        | 17768.5 |         | -6.2           | 20        |
| Ethane   | L    | 1.000                      | 0.9230 | 2218.044        | 32982.3 |         | -7.7           | 20        |
| Ethylene | L    | 1.000                      | 0.8883 | 1876.299        | 28978.9 |         | -11.2          | 20        |

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

\* Values outside of QC limits

FORM 8  
MEE ANALYTICAL SEQUENCE

Lab Name: EMPIRICAL LABS      Contract:

Lab Code:                      Case No.:                      SAS No.: NA                      SDG No.: SDGA21679

Column: CARBOXEN 1006 PLOT ID: 0.53 (mm) Cont. Calib. Date(s): 04/09/09

Instrument ID: GCVOA

THE ANALYTICAL SEQUENCE OF PERFORMANCE BLANKS, AND SAMPLES  
GIVEN BELOW:

| SURROGATE RT FROM CONTINUING CALIBRATION |                  |                  |                  |    |   |    |   |
|--|------------------|------------------|------------------|----|---|----|---|
| CLIENT<br>SAMPLE NO.                     | LAB<br>SAMPLE ID | DATE<br>ANALYZED | TIME<br>ANALYZED | RT | # | RT | # |
|  |                  |                  |                  |    |   |    |   |
| 01                                       | CAL/0.002 8J     | 04/09/09         | 1050             |    |   |    |   |
| 02                                       | CAL/0.01 08J     | 04/09/09         | 1111             |    |   |    |   |
| 03                                       | CAL/0.02 08J     | 04/09/09         | 1133             |    |   |    |   |
| 04                                       | CAL/0.1 08J0     | 04/09/09         | 1155             |    |   |    |   |
| 05                                       | CAL/0.2 08J0     | 04/09/09         | 1218             |    |   |    |   |
| 06                                       | CAL/1.0 08J0     | 04/09/09         | 1240             |    |   |    |   |
| 07                                       | CAL/4.0 08J0     | 04/09/09         | 1302             |    |   |    |   |
| 08                                       |                  |                  |                  |    |   |    |   |
| 09                                       |                  |                  |                  |    |   |    |   |
| 10                                       |                  |                  |                  |    |   |    |   |
| 11                                       |                  |                  |                  |    |   |    |   |
| 12                                       |                  |                  |                  |    |   |    |   |
| 13                                       |                  |                  |                  |    |   |    |   |
| 14                                       |                  |                  |                  |    |   |    |   |
| 15                                       |                  |                  |                  |    |   |    |   |
| 16                                       |                  |                  |                  |    |   |    |   |
| 17                                       |                  |                  |                  |    |   |    |   |
| 18                                       |                  |                  |                  |    |   |    |   |
| 19                                       |                  |                  |                  |    |   |    |   |
| 20                                       |                  |                  |                  |    |   |    |   |
| 21                                       |                  |                  |                  |    |   |    |   |
| 22                                       |                  |                  |                  |    |   |    |   |
| 23                                       |                  |                  |                  |    |   |    |   |
| 24                                       |                  |                  |                  |    |   |    |   |
| 25                                       |                  |                  |                  |    |   |    |   |
| 26                                       |                  |                  |                  |    |   |    |   |
| 27                                       |                  |                  |                  |    |   |    |   |
| 28                                       |                  |                  |                  |    |   |    |   |
| 29                                       |                  |                  |                  |    |   |    |   |
| 30                                       |                  |                  |                  |    |   |    |   |
| 31                                       |                  |                  |                  |    |   |    |   |
| 32                                       |                  |                  |                  |    |   |    |   |

QC LIMITS

# Column used to flag retention time values with an asterisk.  
\* Values outside of QC limits.

**ANALYSIS SEQUENCE SUMMARY**  
**RSK175**

Laboratory: Empirical Laboratories, LLC  
 Client: Tetra Tech NUS, Inc. (T010)  
 Sequence: 9J30201  
 Calibration: 9G15001

SDG: JM09G82\_001  
 Project: Cecil Field JM09 G82/BPWells  
 Instrument: GL-GCVOA

| Sample Name            | Lab Sample ID | Lab File ID | Analysis Date/Time |
|------------------------|---------------|-------------|--------------------|
| Calibration Check      | 9J30201-CCV1  | 002F0101.D  | 10/28/09 14:33     |
| LCS                    | 9J27928-BS1   | 003F0101.D  | 10/28/09 15:13     |
| Blank                  | 9J27928-BLK1  | 004F0101.D  | 10/28/09 15:59     |
| CEF-G82-3S-20091022    | 0910199-01    | 010F0101.D  | 10/28/09 18:17     |
| CEF-G82-1S-20091022    | 0910199-02    | 011F0101.D  | 10/28/09 18:41     |
| CEF-G82-2S-20091022    | 0910199-03    | 012F0101.D  | 10/28/09 19:04     |
| CEF-G82-DUP01-20091022 | 0910199-04    | 013F0101.D  | 10/28/09 19:28     |
| CEF-G82-2I-20091022    | 0910199-05    | 014F0101.D  | 10/28/09 19:51     |
| Calibration Check      | 9J30201-CCV2  | 015F0101.D  | 10/28/09 20:14     |
| CEF-G82-1S-20091022    | 0910199-02RE1 | 016F0101.D  | 10/28/09 20:37     |
| CEF-G82-2S-20091022    | 0910199-03RE1 | 017F0101.D  | 10/28/09 21:00     |
| CEF-G82-DUP01-20091022 | 0910199-04RE1 | 018F0101.D  | 10/28/09 21:23     |
| Calibration Check      | 9J30201-CCV3  | 019F0101.D  | 10/28/09 21:46     |

# HOLDING TIME SUMMARY

## RSK175

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

| 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-G82-3S-20091022    | 10/22/09<br>10:30 | 10/23/09<br>08:30 | 10/28/09<br>12:00 | 6.10         | 14.00            | 10/28/09<br>18:17 | 6.37             | 14.00                |   |
| CEF-G82-1S-20091022    | 10/22/09<br>11:55 | 10/23/09<br>08:30 | 10/28/09<br>12:00 | 6.05         | 14.00            | 10/28/09<br>18:41 | 6.32             | 14.00                |   |
| CEF-G82-1S-20091022    | 10/22/09<br>11:55 | 10/23/09<br>08:30 | 10/28/09<br>12:00 | 6.05         | 14.00            | 10/28/09<br>20:37 | 6.40             | 14.00                |   |
| CEF-G82-2S-20091022    | 10/22/09<br>13:05 | 10/23/09<br>08:30 | 10/28/09<br>12:00 | 6.00         | 14.00            | 10/28/09<br>19:04 | 6.29             | 14.00                |   |
| CEF-G82-2S-20091022    | 10/22/09<br>13:05 | 10/23/09<br>08:30 | 10/28/09<br>12:00 | 6.00         | 14.00            | 10/28/09<br>21:00 | 6.37             | 14.00                |   |
| CEF-G82-DUP01-20091022 | 10/22/09<br>00:00 | 10/23/09<br>08:30 | 10/28/09<br>12:00 | 6.54         | 14.00            | 10/28/09<br>19:28 | 6.85             | 14.00                |   |
| CEF-G82-DUP01-20091022 | 10/22/09<br>00:00 | 10/23/09<br>08:30 | 10/28/09<br>12:00 | 6.54         | 14.00            | 10/28/09<br>21:23 | 6.93             | 14.00                |   |
| CEF-G82-2I-20091022    | 10/22/09<br>15:10 | 10/23/09<br>08:30 | 10/28/09<br>12:00 | 5.91         | 14.00            | 10/28/09<br>19:51 | 6.24             | 14.00                |   |

**ORGANIC CASE NARRATIVE**  
**Tetra Tech NUS, Inc./Nas Cecil Field (BP Wells) JM09**  
**SDG: JM09G82\_001**

| Sampled    | Received   | Lab ID     | Client ID              |
|------------|------------|------------|------------------------|
| 10/22/2009 | 10/23/2009 | 0910199-01 | CEF-G82-3S-20091022    |
| 10/22/2009 | 10/23/2009 | 0910199-02 | CEF-G82-1S-20091022    |
| 10/22/2009 | 10/23/2009 | 0910199-03 | CEF-G82-2S-20091022    |
| 10/22/2009 | 10/23/2009 | 0910199-04 | CEF-G82-DUP01-20091022 |
| 10/22/2009 | 10/23/2009 | 0910199-05 | CEF-G82-2I-20091022    |
| 10/23/2009 | 10/24/2009 | 0910216-01 | CEF-G82-4S-2009        |
| 10/23/2009 | 10/24/2009 | 0910216-02 | CEF-G82-5S-2009        |
| 10/23/2009 | 10/24/2009 | 0910216-03 | CEF-G82-6S-2009        |

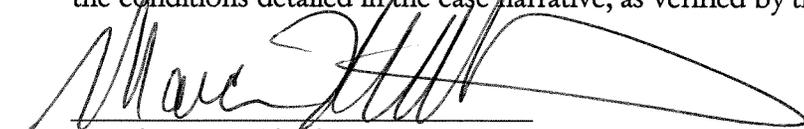
### Petroleum Range Organics

**Method:** The samples were analyzed by the Florida Petroleum Range Organics Method (FL-PRO, separatory funnel or sonication extraction followed by capillary column GC/FID) for waters or soils upon receipt to the laboratory in satisfactory condition.

**Comments:** The analyses for these samples were satisfactorily completed within sample holding times and met the corresponding specifications with the following exceptions:

- In the calibration verification standards associated with these samples, the surrogates exceeded the limit of 25% difference with positive biases. All surrogate recoveries were evaluated and determined not to have been biased into control by the exceedence.
- In the LCS/LCSD, recoveries of the surrogate o-terphenyl exceeded the limit of 140% at 141%/143%. All other surrogate recoveries were within limits. There was an observed retention time shift for the surrogate 2-fluorobiphenyl to a slightly later retention time in some of the samples. Chromatograms were evaluated and found not to be impacted by this retention time shift as they were non-detect for PRO.
- As is necessary for all GC/LC chromatography, manual integrations were performed to correctly quantitate target analytes. A “before” chromatogram and “after” chromatogram is available at the laboratory for all sample analyses to provide information regarding the manual integrations performed.

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



Marcia K. McGinnity  
Senior Project Manager

## ANALYTICAL REPORT TERMS AND QUALIFIERS (ORGANIC)

- MDL:** The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix.
- EQL:** The estimated quantitation limit (EQL), also known as the reporting limit (RL), is defined as the estimated concentration above which quantitative results can be obtained with a specific degree of confidence. Empirical Laboratories defines the EQL to be at or near the lowest standard of the calibration curve.
- U:** The presence of a "U" indicates that the analyte was analyzed for but was not detected or the concentration of the analyte quantitated below the MDL.
- 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".
- I:** The presence of an "I" to the right of an analytical result indicates that the reported result is estimated. The data pass the identification criteria indicating that the compound is present, but the calculated result is less than the EQL/RL.
- L:** The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with a "L". Usually the sample will be rerun at a dilution to quantitate the flagged compound.
- V:** The presence of a "V" 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.
- J1:** The reported analyte concentration may have a low bias as the CCV exceeded the limit on the low side.
- J2:** The reported analyte concentration may have a high bias as the CCV exceeded the limit on the high side.
- M:** The presence of an "M" to the right of an analytical result indicates that the sample matrix interfered with the quantitation of the analyte. In GC and HPLC, results are reported from the column with the lower concentration.
- I:** The presence of an "I" to the right of an analytical result that the presence of a qualitative interference could have caused a false positive or over estimation of the analyte. In GC and HPLC, results are reported from the column with the lower concentration.

# SURROGATE STANDARD RECOVERY AND RT SUMMARY

## FLPRO

Laboratory: Empirical Laboratories, LLC  
 Client: Tetra Tech NUS, Inc. (T010)  
 Sequence: 9J30107

SDG: JM09G82\_001  
 Project: Cecil Field JM09 G82/BPWells  
 Instrument: GL-GCFID2  
 Calibration: 9204001

*RTW. 2/20/09  
 see form 8  
 m 1/19/09*

| Surrogate Compound                              | Spike Level | % Recovery | Recovery Limits | RT                      | CCV RT | RT Diff                  | RT Diff Limit | Q |
|---|-------------|------------|-----------------|-------------------------|--------|--------------------------|---------------|---|
| <b>Calibration Check (9J30107-CCV1) mg/L</b>    |             |            |                 | Lab File ID: 002F0201.D |        | Analyzed: 10/28/09 11:56 |               |   |
| 2-Fluorobiphenyl                                | 25.00       | 148 ↑      | 75 - 125        | 5.936                   |        | 5.9360                   | +/-1.000      | ✓ |
| o-Terphenyl                                     | 25.00       | 143 ↑      | 75 - 125        | 7.883                   |        | 7.8830                   | +/-1.000      | ✓ |
| <b>Blank (9J23016-BLK1) mg/L</b>                |             |            |                 | Lab File ID: 003F0301.D |        | Analyzed: 10/28/09 12:19 |               |   |
| 2-Fluorobiphenyl                                | 0.05000     | 123 ✓      | 50 - 150        | 6.003                   | 5.936  | 0.0670                   | +/-1.000      |   |
| o-Terphenyl                                     | 0.05000     | 111 ✓      | 30 - 140        | 7.876                   | 7.883  | -0.0070                  | +/-1.000      |   |
| <b>LCS (9J23016-BS1) mg/L</b>                   |             |            |                 | Lab File ID: 004F0401.D |        | Analyzed: 10/28/09 12:42 |               |   |
| 2-Fluorobiphenyl                                | 0.05000     | 105 ✓      | 50 - 150        | 5.933                   | 5.936  | -0.0030                  | +/-1.000      |   |
| o-Terphenyl                                     | 0.05000     | 141 ↑      | 30 - 140        | 7.88                    | 7.883  | -0.0030                  | +/-1.000      | * |
| <b>LCS Dup (9J23016-BSD1) mg/L</b>              |             |            |                 | Lab File ID: 005F0501.D |        | Analyzed: 10/28/09 13:04 |               |   |
| 2-Fluorobiphenyl                                | 0.05000     | 109 ✓      | 50 - 150        | 5.933                   | 5.936  | -0.0030                  | +/-1.000      |   |
| o-Terphenyl                                     | 0.05000     | 143 ↑      | 30 - 140        | 7.88                    | 7.883  | -0.0030                  | +/-1.000      | * |
| <b>CEF-G82-3S-20091022 (0910199-01) mg/L</b>    |             |            |                 | Lab File ID: 006F0601.D |        | Analyzed: 10/28/09 13:27 |               |   |
| 2-Fluorobiphenyl                                | 0.04630     | 129 ✓      | 50 - 150        | 6                       | 5.936  | 0.0640                   | +/-1.000      |   |
| o-Terphenyl                                     | 0.04630     | 116 ✓      | 30 - 140        | 7.873                   | 7.883  | -0.0100                  | +/-1.000      |   |
| <b>CEF-G82-1S-20091022 (0910199-02) mg/L</b>    |             |            |                 | Lab File ID: 007F0701.D |        | Analyzed: 10/28/09 13:50 |               |   |
| 2-Fluorobiphenyl                                | 0.04630     | 105 ✓      | 50 - 150        | 5.96                    | 5.936  | 0.0240                   | +/-1.000      |   |
| o-Terphenyl                                     | 0.04630     | 102 ✓      | 30 - 140        | 7.873                   | 7.883  | -0.0100                  | +/-1.000      |   |
| <b>CEF-G82-2S-20091022 (0910199-03) mg/L</b>    |             |            |                 | Lab File ID: 008F0801.D |        | Analyzed: 10/28/09 14:13 |               |   |
| 2-Fluorobiphenyl                                | 0.04630     | 125 ✓      | 50 - 150        | 5.923                   | 5.936  | -0.0130                  | +/-1.000      |   |
| o-Terphenyl                                     | 0.04630     | 107 ✓      | 30 - 140        | 7.873                   | 7.883  | -0.0100                  | +/-1.000      |   |
| <b>CEF-G82-DUP01-20091022 (0910199-04) mg/L</b> |             |            |                 | Lab File ID: 009F0901.D |        | Analyzed: 10/28/09 14:35 |               |   |
| 2-Fluorobiphenyl                                | 0.04630     | 134 ✓      | 50 - 150        | 5.923                   | 5.936  | -0.0130                  | +/-1.000      |   |
| o-Terphenyl                                     | 0.04630     | 128 ✓      | 30 - 140        | 7.873                   | 7.883  | -0.0100                  | +/-1.000      |   |
| <b>CEF-G82-2I-20091022 (0910199-05) mg/L</b>    |             |            |                 | Lab File ID: 010F1001.D |        | Analyzed: 10/28/09 14:58 |               |   |
| 2-Fluorobiphenyl                                | 0.04630     | 126 ✓      | 50 - 150        | 6.006                   | 5.936  | 0.0700                   | +/-1.000      |   |
| o-Terphenyl                                     | 0.04630     | 109 ✓      | 30 - 140        | 7.876                   | 7.883  | -0.0070                  | +/-1.000      |   |
| <b>CEF-G82-4S-20091023 (0910216-01) mg/L</b>    |             |            |                 | Lab File ID: 011F1101.D |        | Analyzed: 10/28/09 15:21 |               |   |
| 2-Fluorobiphenyl                                | 0.04630     | 128 ✓      | 50 - 150        | 5.99                    | 5.936  | 0.0540                   | +/-1.000      |   |
| o-Terphenyl                                     | 0.04630     | 101 ✓      | 30 - 140        | 7.873                   | 7.883  | -0.0100                  | +/-1.000      |   |
| <b>CEF-G82-5S-20091023 (0910216-02) mg/L</b>    |             |            |                 | Lab File ID: 012F1201.D |        | Analyzed: 10/28/09 15:43 |               |   |
| 2-Fluorobiphenyl                                | 0.04630     | 107 ✓      | 50 - 150        | 5.96                    | 5.936  | 0.0240                   | +/-1.000      |   |
| o-Terphenyl                                     | 0.04630     | 117 ✓      | 30 - 140        | 7.87                    | 7.883  | -0.0130                  | +/-1.000      |   |

*m 1/19/09*

**SURROGATE STANDARD RECOVERY AND RT SUMMARY  
FLPRO**

Laboratory: Empirical Laboratories, LLC  
 Client: Tetra Tech NUS, Inc. (T010)  
 Sequence: 9J30107

SDG: JM09G82\_001  
 Project: Cecil Field JM09 G82/BPWells  
 Instrument: GL-GCFID2  
 Calibration: 9204001

| Surrogate Compound                            | Spike Level | % Recovery | Recovery Limits | RT                      | CCV RT | RT Diff                  | RT Diff Limit | Q |
|---|-------------|------------|-----------------|-------------------------|--------|--------------------------|---------------|---|
| <b>CEF-G82-6S-20091023 (0910216-03 ) mg/L</b> |             |            |                 | Lab File ID: 013F1301.D |        | Analyzed: 10/28/09 16:06 |               |   |
| 2-Fluorobiphenyl                              | 0.04630     | 118 ✓      | 50 - 150        | 6.003                   | 5.936  | 0.0670                   | +/-1.000      |   |
| o-Terphenyl                                   | 0.04630     | 117 ✓      | 30 - 140        | 7.873                   | 7.883  | -0.0100                  | +/-1.000      |   |
| <b>Calibration Check (9J30107-CCV2 ) mg/L</b> |             |            |                 | Lab File ID: 014F1401.D |        | Analyzed: 10/28/09 16:29 |               |   |
| 2-Fluorobiphenyl                              | 25.00       | 149 ↑      | 75 - 125        | 5.933                   | 5.936  | -0.0030                  | +/-1.000      | * |
| o-Terphenyl                                   | 25.00       | 145 ↑      | 75 - 125        | 7.88                    | 7.883  | -0.0030                  | +/-1.000      | * |

# ANALYSIS DATA SHEET

CEF-G82-3S-20091022

Laboratory: Empirical Laboratories, LLC  
 Client: Tetra Tech NUS, Inc. (T010)  
 Matrix: Ground Water  
 Sampled: 10/22/09 10:30  
 % Solids: 0.00

SDG: JM09G82\_001  
 Project: Cecil Field JM09 G82/BPWells  
 Laboratory ID: 0910199-01  
 Received: 10/23/09 08:30

| CAS NO. | Analyte                  | Concentration (mg/L) | MDL   | RL    | Dilution Factor | Q | Method | Batch   | Analyzed       |
|---------|--------------------------|----------------------|-------|-------|-----------------|---|--------|---------|----------------|
|         | Petroleum Range Organics |                      | 0.157 | 0.472 | 1               | U | FLPRO  | 9J23016 | 10/28/09 13:27 |

# ANALYSIS DATA SHEET

CEF-G82-1S-20091022

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Matrix: Ground Water

Laboratory ID: 0910199-02

Sampled: 10/22/09 11:55

Received: 10/23/09 08:30

% Solids: 0.00

| CAS NO. | Analyte                  | Concentration (mg/L) | MDL   | RL    | Dilution Factor | Q         | Method | Batch   | Analyzed       |
|---------|--------------------------|----------------------|-------|-------|-----------------|-----------|--------|---------|----------------|
|         | Petroleum Range Organics | 0.260                | 0.157 | 0.472 | 1               | <i>SI</i> | FLPRO  | 9J23016 | 10/28/09 13:50 |

*m. 11/9/09*

# ANALYSIS DATA SHEET

**CEF-G82-2S-20091022**

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Matrix: Ground Water

Laboratory ID: 0910199-03

Sampled: 10/22/09 13:05

Received: 10/23/09 08:30

% Solids: 0.00

| CAS NO. | Analyte                  | Concentration<br>(mg/L) | MDL   | RL    | Dilution<br>Factor | Q | Method | Batch   | Analyzed       |
|---------|--------------------------|-------------------------|-------|-------|--------------------|---|--------|---------|----------------|
|         | Petroleum Range Organics | 2.68                    | 0.157 | 0.472 | 1                  |   | FLPRO  | 9J23016 | 10/28/09 14:13 |

# ANALYSIS DATA SHEET

CEF-G82-DUP01-20091022

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Matrix: Ground Water

Laboratory ID: 0910199-04

Sampled: 10/22/09 00:00

Received: 10/23/09 08:30

% Solids: 0.00

| CAS NO. | Analyte                  | Concentration<br>(mg/L) | MDL   | RL    | Dilution<br>Factor | Q | Method | Batch   | Analyzed       |
|---------|--------------------------|-------------------------|-------|-------|--------------------|---|--------|---------|----------------|
|         | Petroleum Range Organics | 3.32                    | 0.157 | 0.472 | 1                  |   | FLPRO  | 9J23016 | 10/28/09 14:35 |

# ANALYSIS DATA SHEET

**CEF-G82-21-20091022**

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Matrix: Ground Water

Laboratory ID: 0910199-05

Sampled: 10/22/09 15:10

Received: 10/23/09 08:30

% Solids: 0.00

| CAS NO. | Analyte                  | Concentration<br>(mg/L) | MDL   | RL    | Dilution<br>Factor | Q | Method | Batch   | Analyzed       |
|---------|--------------------------|-------------------------|-------|-------|--------------------|---|--------|---------|----------------|
|         | Petroleum Range Organics |                         | 0.157 | 0.472 | 1                  | U | FLPRO  | 9J23016 | 10/28/09 14:58 |

# ANALYSIS DATA SHEET

CEF-G82-4S-20091023

Laboratory: Empirical Laboratories, LLC  
Client: Tetra Tech NUS, Inc. (T010)  
Matrix: Ground Water  
Sampled: 10/23/09 09:30  
% Solids: 0.00

SDG: JM09G82\_001  
Project: Cecil Field JM09 G82/BPWells  
Laboratory ID: 0910216-01  
Received: 10/24/09 09:10

| CAS NO. | Analyte                  | Concentration (mg/L) | MDL   | RL    | Dilution Factor | Q | Method | Batch   | Analyzed       |
|---------|--------------------------|----------------------|-------|-------|-----------------|---|--------|---------|----------------|
|         | Petroleum Range Organics |                      | 0.157 | 0.472 | 1               | U | FLPRO  | 9J23016 | 10/28/09 15:21 |

# ANALYSIS DATA SHEET

CEF-G82-5S-20091023

Laboratory: Empirical Laboratories, LLC  
 Client: Tetra Tech NUS, Inc. (T010)  
 Matrix: Ground Water  
 Sampled: 10/23/09 10:25  
 % Solids: 0.00

SDG: JM09G82\_001  
 Project: Cecil Field JM09 G82/BPWells  
 Laboratory ID: 0910216-02  
 Received: 10/24/09 09:10

| CAS NO. | Analyte                  | Concentration (mg/L) | MDL   | RL    | Dilution Factor | Q         | Method | Batch   | Analyzed       |
|---------|--------------------------|----------------------|-------|-------|-----------------|-----------|--------|---------|----------------|
|         | Petroleum Range Organics | 0.216                | 0.157 | 0.472 | 1               | <i>SI</i> | FLPRO  | 9J23016 | 10/28/09 15:43 |

*m 11/9/09*

# ANALYSIS DATA SHEET

CEF-G82-6S-20091023

Laboratory: Empirical Laboratories, LLC  
Client: Tetra Tech NUS, Inc. (T010)  
Matrix: Ground Water  
Sampled: 10/23/09 11:15  
% Solids: 0.00

SDG: JM09G82\_001  
Project: Cecil Field JM09 G82/BPWells  
Laboratory ID: 0910216-03  
Received: 10/24/09 09:10

| CAS NO. | Analyte                  | Concentration (mg/L) | MDL   | RL    | Dilution Factor | Q | Method | Batch   | Analyzed       |
|---------|--------------------------|----------------------|-------|-------|-----------------|---|--------|---------|----------------|
|         | Petroleum Range Organics |                      | 0.157 | 0.472 | 1               | U | FLPRO  | 9J23016 | 10/28/09 16:06 |

**LCS / LCS DUPLICATE RECOVERY  
FLPRO**

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Matrix: Water

Batch: 9J23016

Laboratory ID: 9J23016-BS1

Preparation: EXT\_3510

Initial/Final: 1000 mL / 2 mL

| ANALYTE                  | SPIKE ADDED (mg/L) | LCS CONCENTRATION (mg/L) | LCS % REC. | QC LIMITS REC. |
|--------------------------|--------------------|--------------------------|------------|----------------|
| Petroleum Range Organics | 3.200              | 3.414                    | 107        | 55 - 118       |

| ANALYTE                  | SPIKE ADDED (mg/L) | LCSD CONCENTRATION (mg/L) | LCSD % REC. # | % RPD # | QC LIMITS |          |
|--------------------------|--------------------|---------------------------|---------------|---------|-----------|----------|
|                          |                    |                           |               |         | RPD       | REC.     |
| Petroleum Range Organics | 3.200              | 3.483                     | 109           | 1.98    | 30        | 55 - 118 |

# PREPARATION BATCH SUMMARY

## FLPRO

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Batch: 9J23016 Batch Matrix: Water

Preparation: EXT\_3510

| SAMPLE NAME            | LAB SAMPLE ID | DATE PREPARED  | INITIAL VOL./WEIGHT | FINAL VOL. |
|------------------------|---------------|----------------|---------------------|------------|
| CEF-G82-3S-20091022    | 0910199-01    | 10/26/09 14:25 | 1,080.00            | 2.00       |
| CEF-G82-1S-20091022    | 0910199-02    | 10/26/09 14:25 | 1,080.00            | 2.00       |
| CEF-G82-2S-20091022    | 0910199-03    | 10/26/09 14:25 | 1,080.00            | 2.00       |
| CEF-G82-DUP01-20091022 | 0910199-04    | 10/26/09 14:25 | 1,080.00            | 2.00       |
| CEF-G82-2I-20091022    | 0910199-05    | 10/26/09 14:25 | 1,080.00            | 2.00       |
| CEF-G82-4S-20091023    | 0910216-01    | 10/26/09 14:25 | 1,080.00            | 2.00       |
| CEF-G82-5S-20091023    | 0910216-02    | 10/26/09 14:25 | 1,080.00            | 2.00       |
| CEF-G82-6S-20091023    | 0910216-03    | 10/26/09 14:25 | 1,080.00            | 2.00       |
| Blank                  | 9J23016-BLK1  | 10/26/09 14:25 | 1,000.00            | 2.00       |
| LCS                    | 9J23016-BS1   | 10/26/09 14:25 | 1,000.00            | 2.00       |
| LCS Dup                | 9J23016-BSD1  | 10/26/09 14:25 | 1,000.00            | 2.00       |



FORM 6  
PRO ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code:                      Case No.:                      SAS No.: NA                      SDG No.: SDGA21837

Instrument ID: GCFID2                      Calibration Date(s): 03/16/07      05/06/09

Column: ZB-5MS      ID: 0.32 (mm)      Calibration Time(s): 1021                      1835

LAB FILE ID:                      RF8500: 004R0201      RF5950: 005R0201      RF4250: 006R0201  
RF2550: 007R0201      RF850: 008R0201

| COMPOUND         | RF8500   | RF5950   | RF4250   | RF2550   | RF850    |
|------------------|----------|----------|----------|----------|----------|
| Petroleum Range  | 1489.816 | 1663.197 | 1610.314 | 1947.654 | 1623.614 |
| Ortho-Terphenyl  | 1924.120 | 1915.920 | 1939.840 | 2346.080 | 1977.120 |
| 2-Fluorobiphenyl | 1481.240 | 1614.720 | 1563.640 | 1911.560 | 1527.400 |

*JL9  
5.8.09*

*WL  
5/8/04*

FORM VI PRO

FORM 6  
PRO ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code:                      Case No.:                      SAS No.: NA                      SDG No.: SDGA21837

Instrument ID: GCFID2                      Calibration Date(s): 03/16/07      05/06/09

Column: ZB-5MS      ID: 0.32 (mm)      Calibration Time(s): 1021                      1835

RF85: 009R0201

| COMPOUND         | RF85     | CURVE | COEFFICIENT<br>A1 | %RSD<br>OR R <sup>2</sup> |
|------------------|----------|-------|-------------------|---------------------------|
| Petroleum Range  | 2069.859 | AVRG  | 1734.07579        | 12.9                      |
| Ortho-Terphenyl  | 2551.200 | AVRG  | 2109.04667        | 12.9                      |
| 2-Fluorobiphenyl | 2061.800 | AVRG  | 1693.39333        | 13.9                      |

FORM VI PRO

FORM 6  
PRO ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code:                      Case No.:                      SAS No.: NA                      SDG No.: SDGA21837

Instrument ID: GCFID2                      Calibration Date(s): 03/16/07      05/06/09

Column: ZB-5MS      ID: 0.32 (mm)      Calibration Time(s): 1021                      1835

LAB FILE ID:                      RT1: 004R0201                      RT2: 005R0201                      RT3: 006R0201  
RT4: 007R0201                      RT5: 008R0201

| COMPOUND         | RT1   | RT2   | RT3   | RT4   | RT5   |
|------------------|-------|-------|-------|-------|-------|
| Petroleum Range  | 9.014 | 9.014 | 9.014 | 9.014 | 9.014 |
| Ortho-Terphenyl  | 8.567 | 8.560 | 8.553 | 8.553 | 8.547 |
| 2-Fluorobiphenyl | 5.887 | 5.880 | 5.877 | 5.873 | 5.873 |

FORM VI PRO

FORM 6  
PRO ORGANICS INITIAL CALIBRATION DATA

Lab Name: EMPIRICAL LABS      Contract:

Lab Code:                      Case No.:                      SAS No.: NA                      SDG No.: SDGA21837

Instrument ID: GCFID2                      Calibration Date(s): 03/16/07      05/06/09

Column: ZB-5MS      ID: 0.32 (mm)      Calibration Time(s): 1021                      1835

RT6: 009R0201

| COMPOUND         | RT6   | MEAN<br>RT | RT WINDOW |        |
|------------------|-------|------------|-----------|--------|
|                  |       |            | FROM      | TO     |
| Petroleum Range  | 9.014 | 9.014      | 1.957     | 16.070 |
| Ortho-Terphenyl  | 8.550 | 8.555      | 8.410     | 8.690  |
| 2-Fluorobiphenyl | 5.873 | 5.877      | 5.823     | 5.923  |

FORM VI PRO

Empirical Laboratories, LLC  
*ICV*  
~~CONTINUING CALIBRATION COMPOUNDS~~

*JL 5.8.09*

Instrument ID: gcfid2.i      Injection Date: 06-MAY-2009 19:01  
Lab File ID: 009F0901.D      Init. Cal. Date(s): 16-MAR-2007 06-MAY-2009  
Analysis Type:      Init. Cal. Times: 10:21 18:35  
Lab Sample ID: PRO ICV 09D0233 Quant Type: ESTD  
Method: \\ELABNSH05\TARGET\chem\gcfid2.i\050609.b\FLPROR.m

| COMPOUND            | RRF  | RF4250        | MIN RRF | %D    | MAX %D |
|---------------------|------|---------------|---------|-------|--------|
| S 1 Petroleum Range | 1734 | <i>2</i> 1466 | 0.010   | -15.4 | 25.0   |

*WL*  
*5/8/09*

Empirical Laboratories, LLC

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: gcfid2.i      Injection Date: 28-OCT-2009 11:56  
 Lab File ID: 002F0201.D      Init. Cal. Date(s): 16-MAR-2007 06-MAY-2009  
 Analysis Type:      Init. Cal. Times: 10:21 18:35  
 Lab Sample ID: SEQ-CCV1      Quant Type: ESTD  
 Method: \\ELABNSH05\TARGET\chem\gcfid2.i\102809.b\FLPROR.m

| COMPOUND              | RRF  | RF4250 | MIN RRF | %D   | MAX %D |
|-----------------------|------|--------|---------|------|--------|
| S 1 Petroleum Range   | 1734 | 1722   | 0.010   | -0.7 | 25.0   |
| \$ 2 2-Fluorobiphenyl | 1693 | 2502   | 0.010   | 47.7 | 25.0   |
| \$ 3 Ortho-Terphenyl  | 2109 | 3025   | 0.010   | 43.4 | 25.0   |

Cal  
11/2/09

BM  
11/02/09

Empirical Laboratories, LLC

CONTINUING CALIBRATION COMPOUNDS

Instrument ID: gcfid2.i Injection Date: 28-OCT-2009 16:29  
 Lab File ID: 014F1401.D Init. Cal. Date(s): 16-MAR-2007 06-MAY-2009  
 Analysis Type: Init. Cal. Times: 10:21 18:35  
 Lab Sample ID: SEQ-CCV2 Quant Type: ESTD  
 Method: \\ELABNSH05\TARGET\chem\gcfid2.i\102809.b\FLPROR.m

| COMPOUND           | RRF  | RF4250 | MIN RRF | %D   | MAX %D |
|--------------------|------|--------|---------|------|--------|
| 1 Petroleum Range  | 1734 | 1766   | 0.010   | 1.8  | 25.0   |
| 2 2-Fluorobiphenyl | 1693 | 2528   | 0.010   | 49.3 | 25.0   |
| 3 Ortho-Terphenyl  | 2109 | 2059   | 0.010   | 45.0 | 25.0   |

*(Handwritten signature)*  
11/2/09

*BM*  
*110209*

FORM 8  
PRO ANALYTICAL SEQUENCE

Lab Name: EMPIRICAL LABS      Contract:  
 Lab Code:                      Case No.:                      SAS No.: NA                      SDG No.: SDGA21837  
 Column: ZB-5MS      ID: 0.32 (mm) Cont. Calib. Date(s): 05/06/09  
 Instrument ID: GCFID2

THE ANALYTICAL SEQUENCE OF PERFORMANCE BLANKS, AND SAMPLES  
GIVEN BELOW:

| SURROGATE RT FROM CONTINUING CALIBRATION |                  |                  |                  |               |               |
|--|------------------|------------------|------------------|---------------|---------------|
| S1 : 8.55                      S2 : 5.87 |                  |                  |                  |               |               |
| CLIENT<br>SAMPLE NO.                     | LAB<br>SAMPLE ID | DATE<br>ANALYZED | TIME<br>ANALYZED | S1<br>RT    # | S2<br>RT    # |
| 01                                       | PRO 8500 09D     | 05/06/09         | 1622             | 8.57          | 5.89          |
| 02                                       | PRO 5950 09D     | 05/06/09         | 1648             | 8.56          | 5.88          |
| 03                                       | PRO 4250 09D     | 05/06/09         | 1715             | 8.55          | 5.88          |
| 04                                       | PRO 2550 09D     | 05/06/09         | 1742             | 8.55          | 5.87          |
| 05                                       | PRO 850 09D0     | 05/06/09         | 1808             | 8.55          | 5.87          |
| 06                                       | PRO 85 09D02     | 05/06/09         | 1835             | 8.55          | 5.87          |
| 07                                       | PRO ICV 09D0     | 05/06/09         | 1901             |               |               |
| 08                                       |                  |                  |                  |               |               |
| 09                                       |                  |                  |                  |               |               |
| 10                                       |                  |                  |                  |               |               |
| 11                                       |                  |                  |                  |               |               |
| 12                                       |                  |                  |                  |               |               |
| 13                                       |                  |                  |                  |               |               |
| 14                                       |                  |                  |                  |               |               |
| 15                                       |                  |                  |                  |               |               |
| 16                                       |                  |                  |                  |               |               |
| 17                                       |                  |                  |                  |               |               |
| 18                                       |                  |                  |                  |               |               |
| 19                                       |                  |                  |                  |               |               |
| 20                                       |                  |                  |                  |               |               |
| 21                                       |                  |                  |                  |               |               |
| 22                                       |                  |                  |                  |               |               |
| 23                                       |                  |                  |                  |               |               |
| 24                                       |                  |                  |                  |               |               |
| 25                                       |                  |                  |                  |               |               |
| 26                                       |                  |                  |                  |               |               |
| 27                                       |                  |                  |                  |               |               |
| 28                                       |                  |                  |                  |               |               |
| 29                                       |                  |                  |                  |               |               |
| 30                                       |                  |                  |                  |               |               |
| 31                                       |                  |                  |                  |               |               |
| 32                                       |                  |                  |                  |               |               |

QC LIMITS

S1 = Ortho-Terphenyl                      (+/- 0.14 MINUTES)  
 S2 = 2-Fluorobiphenyl                      (+/- 0.05 MINUTES)

# Column used to flag retention time values with an asterisk.  
 \* Values outside of QC limits.

FORM 8  
PRO ANALYTICAL SEQUENCE

Lab Name: EMPIRICAL LABS      Contract: TETRATECH

Lab Code:                      Case No.:                      SAS No.: NA                      SDG No.: JM09G82\_001

Column: ZB-5MS      ID: 0.32 (mm) Cont. Calib. Date(s): 10/28/09

Instrument ID: GCFID2

THE ANALYTICAL SEQUENCE OF PERFORMANCE BLANKS, AND SAMPLES  
GIVEN BELOW:

| SURROGATE RT FROM CONTINUING CALIBRATION |                  |  |                  |            |            |
|--|------------------|--|------------------|------------|------------|
|  |                  | S1 : 7.88                      S2 : 5.94 |                  |            |            |
| CLIENT<br>SAMPLE NO.                     | LAB<br>SAMPLE ID | DATE<br>ANALYZED                         | TIME<br>ANALYZED | S1<br>RT # | S2<br>RT # |
| =====                                    | =====            | =====                                    | =====            | =====      | =====      |
| 01                                       | SEQ-CCV1         | 10/28/09                                 | 1156             | 7.88       | 5.94       |
| 02                                       | 9J23016-BLK1     | 10/28/09                                 | 1219             | 7.88       | 6.00*      |
| 03                                       | 9J23016-BS1      | 10/28/09                                 | 1242             | 7.88       | 5.93       |
| 04                                       | 9J23016-BSD1     | 10/28/09                                 | 1304             | 7.88       | 5.93       |
| 05                                       | CEF-G82-3S-2     | 0910199-01                               | 1327             | 7.87       | 6.00*      |
| 06                                       | CEF-G82-1S-2     | 0910199-02                               | 1350             | 7.87       | 5.96       |
| 07                                       | CEF-G82-2S-2     | 0910199-03                               | 1413             | 7.87       | 5.92       |
| 08                                       | CEF-G82-DUP0     | 0910199-04                               | 1435             | 7.87       | 5.92       |
| 09                                       | CEF-G82-2I-2     | 0910199-05                               | 1458             | 7.88       | 6.01*      |
| 10                                       | CEF-G82-4S-2     | 0910216-01                               | 1521             | 7.87       | 5.99*      |
| 11                                       | CEF-G82-5S-2     | 0910216-02                               | 1543             | 7.87       | 5.96       |
| 12                                       | CEF-G82-6S-2     | 0910216-03                               | 1606             | 7.87       | 6.00*      |
| 13                                       | SEQ-CCV2         | 10/28/09                                 | 1629             | 7.88       | 5.93       |
| 14                                       |                  |  |                  |            |            |
| 15                                       |                  |  |                  |            |            |
| 16                                       |                  |  |                  |            |            |
| 17                                       |                  |  |                  |            |            |
| 18                                       |                  |  |                  |            |            |
| 19                                       |                  |  |                  |            |            |
| 20                                       |                  |  |                  |            |            |
| 21                                       |                  |  |                  |            |            |
| 22                                       |                  |  |                  |            |            |
| 23                                       |                  |  |                  |            |            |
| 24                                       |                  |  |                  |            |            |
| 25                                       |                  |  |                  |            |            |
| 26                                       |                  |  |                  |            |            |
| 27                                       |                  |  |                  |            |            |
| 28                                       |                  |  |                  |            |            |
| 29                                       |                  |  |                  |            |            |
| 30                                       |                  |  |                  |            |            |
| 31                                       |                  |  |                  |            |            |
| 32                                       |                  |  |                  |            |            |

QC LIMITS

S1 = Ortho-Terphenyl                      (+/- 0.14 MINUTES)

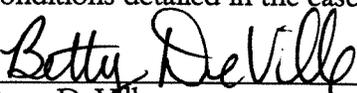
S2 = 2-Fluorobiphenyl                      (+/- 0.05 MINUTES)

# Column used to flag retention time values with an asterisk.  
\* Values outside of QC limits.

**INORGANIC CASE NARRATIVE**  
**TETRA TECH NUS**  
**SDG# JM09G82\_001**  
**Work Order # 0810199**  
**October, 2008**

| Empirical Laboratories ID | Client ID              |
|---------------------------|------------------------|
| 0910199-01                | CEF-G82-3S-20091022    |
| 0910199-02                | CEF-G82-1S-20091022    |
| 0910199-03                | CEF-G82-2S-20091022    |
| 0910199-04                | CEF-G82-DUP01-20091022 |
| 0910199-05                | CEF-G82-2I-20091022    |

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 the case narrative, as verified by the following signature.

  
Betty DeVille  
Inorganic Lab Manager

**I. RECEIPT**

No exceptions were encountered unless a Sample Receipt Exception Report is attached to the Chain-of-Custody included with this data package.

**I. HOLDING TIMES**

**A. Sample Preparation:** All holding times were met.

**B. Sample Analysis:** All holding times were met .

**II. METHODS**

US EPA Methods For Chemical Analysis of Water and Wastes, method 300.0 was used to analyze nitrogen, nitrite (as N) and nitrogen, nitrate (as N) and sulfate. Standard Methods 19<sup>th</sup> Edition Method SM2320B was used to analyze total alkalinity (as CaCO<sub>3</sub>) and method SM4500-SCF was used to analyze sulfide. Note: The "U" flag indicates that the sample concentration is reported down to the laboratory MDL. The "J" flag indicates that the analyte result is between the laboratory reporting limit and the laboratory MDL. All methods performed according to EPA guidelines and Empirical Laboratories Standard Operating Procedures.

**Note:** For all samples analyzed by method 300.0 all samples and analytes were manually integrated for one of the following reasons:

(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.

## INORGANIC CASE NARRATIVE

TETRA TECH NUS

SDG# JM09G82\_001

Work Order # 0810199

October, 2008

(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 incorrect 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.

All raw data is labeled with the letter applicable to why the peak was manually integrated. Please find a copy of the un-integrated data and the integrated data included in the level IV data package.

### III. PREPARATION

All methods performed according to EPA guidelines and Empirical Laboratories Standard Operating Procedures.

### IV. ANALYSIS

- A. **Calibration:** All calibration criteria were met.
- B. **Blanks:** All blank criteria were met.
- C. **Spikes:** All matrix spikes quality control criteria were met.
- D. **Duplicates:** All duplicate quality control criteria were met.
- E. **Samples:** All sample analysis proceeded normally.
- F. **Laboratory Control Samples:** All percent recovery quality control criteria were met.

**0910199**

**Empirical Laboratories, LLC**

**Client:** Tetra Tech NUS, Inc. (T010)  
**Project:** Cecil Field JM09 G82/BPWells

**Project Manager:** Kim Kostzer  
**Project Number:** TET09JM09(2)

**Report To:**  
 Tetra Tech NUS, Inc. (T010)  
 Tobrena Skeen  
 Foster Plaza 7, 661 Anderson Drive  
 Pittsburgh, PA 15220  
 Phone: (412) 921-8182  
 Fax: (412) 921-4040

**Invoice To:**  
 Tetra Tech NUS, Inc. (T010)  
 Accounts Payable  
 Foster Plaza 7, 661 Anderson Drive  
 Pittsburgh, PA 15220  
 Phone : (412) 921-8182  
 Fax: (412) 921-4040

Date Due: 11/06/2009 16:00 (10 day TAT)

Received By: William Schwab

Date Received: 10/23/2009 08:30

Logged In By: William Schwab

Date Logged In: 10/23/2009 10:15

Samples Received at **1.1°C**  
 Custody Seals Yes Received On Ice Yes  
 Containers Intact Yes  
 COC/Labels Agree Yes  
 Preservation Confin Yes

| Analysis   | Due              | TAT | Expires          | Comments          |
|--|------------------|-----|------------------|-------------------|
| <b>0910199-01 CEF-G82-3S-20091022 [Water] Sampled 10/22/2009 10:30 Eastern</b> |                  |     |                  |                   |
| SMS_PAH_8270C_3510_SIM   | 11/03/2009 14:00 | 10  | 10/29/2009 09:30 | FL Flags          |
| VGC_RSK175_MEE   | 11/03/2009 14:00 | 10  | 11/05/2009 09:30 | FL Flags          |
| VOC_8260B_REG  | 11/03/2009 14:00 | 10  | 11/05/2009 09:30 | FL Flags          |
| WC_ALKALINITY_2320B  | 11/03/2009 14:00 | 10  | 11/05/2009 09:30 | FL Flags          |
| WC_ANIONS_300.0 (Regular)  | 11/03/2009 14:00 | 10  | 11/19/2009 09:30 | FL Flags SO4      |
| WC_ANIONS_300.0 (Short Hold)   | 11/03/2009 14:00 | 10  | 10/24/2009 09:30 | FL Flags          |
| WC_SULFIDE_4500S2CF  | 11/03/2009 14:00 | 10  | 10/29/2009 09:30 | Dissolved Sulfide |
| SGC_FLPRO_3510C  | 11/03/2009 14:00 | 10  | 10/29/2009 09:30 | FL Flags          |

|  |                  |    |                  |                   |
|--|------------------|----|------------------|-------------------|
| <b>0910199-02 CEF-G82-1S-20091022 [Water] Sampled 10/22/2009 11:55 Eastern</b> |                  |    |                  |                   |
| WC_ANIONS_300.0 (Short Hold)   | 11/03/2009 14:00 | 10 | 10/24/2009 10:55 | FL Flags          |
| SGC_FLPRO_3510C  | 11/03/2009 14:00 | 10 | 10/29/2009 10:55 | FL Flags          |
| SMS_PAH_8270C_3510_SIM   | 11/03/2009 14:00 | 10 | 10/29/2009 10:55 | FL Flags          |
| VGC_RSK175_MEE   | 11/03/2009 14:00 | 10 | 11/05/2009 10:55 | FL Flags          |
| VOC_8260B_REG  | 11/03/2009 14:00 | 10 | 11/05/2009 10:55 | FL Flags          |
| WC_ANIONS_300.0 (Regular)  | 11/03/2009 14:00 | 10 | 11/19/2009 10:55 | FL Flags SO4      |
| WC_SULFIDE_4500S2CF  | 11/03/2009 14:00 | 10 | 10/29/2009 10:55 | Dissolved Sulfide |
| WC_ALKALINITY_2320B  | 11/03/2009 14:00 | 10 | 11/05/2009 10:55 | FL Flags          |

0910199

## Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)  
Project: Cecil Field JM09 G82/BPWells

Project Manager: Kim Kostzer  
Project Number: TET09JM09(2)

| Analysis  | Due              | TAT | Expires          | Comments          |
|---|------------------|-----|------------------|-------------------|
| <b>0910199-03 CEF-G82-2S-20091022 [Water] Sampled 10/22/2009 13:05 Eastern</b>    |                  |     |                  |                   |
| VOC_8260B_REG   | 11/03/2009 14:00 | 10  | 11/05/2009 12:05 | FL Flags          |
| VGC_RSK175_MEE  | 11/03/2009 14:00 | 10  | 11/05/2009 12:05 | FL Flags          |
| SMS_PAH_8270C_3510_SIM  | 11/03/2009 14:00 | 10  | 10/29/2009 12:05 | FL Flags          |
| SGC_FLPRO_3510C   | 11/03/2009 14:00 | 10  | 10/29/2009 12:05 | FL Flags          |
| WC_ANIONS_300.0 (Regular)   | 11/03/2009 14:00 | 10  | 11/19/2009 12:05 | FL Flags SO4      |
| WC_ANIONS_300.0 (Short Hold)  | 11/03/2009 14:00 | 10  | 10/24/2009 12:05 | FL Flags          |
| WC_SULFIDE_4500S2CF   | 11/03/2009 14:00 | 10  | 10/29/2009 12:05 | Dissolved Sulfide |
| WC_ALKALINITY_2320B   | 11/03/2009 14:00 | 10  | 11/05/2009 12:05 | FL Flags          |
| <b>0910199-04 CEF-G82-DUP01-20091022 [Water] Sampled 10/22/2009 00:00 Eastern</b> |                  |     |                  |                   |
| SMS_PAH_8270C_3510_SIM  | 11/03/2009 14:00 | 10  | 10/28/2009 23:00 | FL Flags          |
| WC_ANIONS_300.0 (Regular)   | 11/03/2009 14:00 | 10  | 11/18/2009 23:00 | FL Flags SO4      |
| WC_ALKALINITY_2320B   | 11/03/2009 14:00 | 10  | 11/04/2009 23:00 | FL Flags          |
| WC_ANIONS_300.0 (Short Hold)  | 11/03/2009 14:00 | 10  | 10/23/2009 23:00 | FL Flags          |
| VGC_RSK175_MEE  | 11/03/2009 14:00 | 10  | 11/04/2009 23:00 | FL Flags          |
| SGC_FLPRO_3510C   | 11/03/2009 14:00 | 10  | 10/28/2009 23:00 | FL Flags          |
| WC_SULFIDE_4500S2CF   | 11/03/2009 14:00 | 10  | 10/28/2009 23:00 | Dissolved Sulfide |
| VOC_8260B_REG   | 11/03/2009 14:00 | 10  | 11/04/2009 23:00 | FL Flags          |
| <b>0910199-05 CEF-G82-2I-20091022 [Water] Sampled 10/22/2009 15:10 Eastern</b>    |                  |     |                  |                   |
| WC_SULFIDE_4500S2CF   | 11/03/2009 14:00 | 10  | 10/29/2009 14:10 | Dissolved Sulfide |
| SGC_FLPRO_3510C   | 11/03/2009 14:00 | 10  | 10/29/2009 14:10 | FL Flags          |
| WC_ALKALINITY_2320B   | 11/03/2009 14:00 | 10  | 11/05/2009 14:10 | FL Flags          |
| WC_ANIONS_300.0 (Regular)   | 11/03/2009 14:00 | 10  | 11/19/2009 14:10 | FL Flags SO4      |
| WC_ANIONS_300.0 (Short Hold)  | 11/03/2009 14:00 | 10  | 10/24/2009 14:10 | FL Flags          |
| VOC_8260B_REG   | 11/03/2009 14:00 | 10  | 11/05/2009 14:10 | FL Flags          |
| SMS_PAH_8270C_3510_SIM  | 11/03/2009 14:00 | 10  | 10/29/2009 14:10 | FL Flags          |
| VGC_RSK175_MEE  | 11/03/2009 14:00 | 10  | 11/05/2009 14:10 | FL Flags          |
| <b>0910199-06 Trip Blank #7306 [Water] Sampled 10/22/2009 00:00 Eastern</b>       |                  |     |                  |                   |
| VOC_8260B_REG   | 11/03/2009 14:00 | 10  | 11/04/2009 23:00 | FL Flags          |
| <b>0910199-07 Trip Blank #7307 [Water] Sampled 10/22/2009 00:00 Eastern</b>       |                  |     |                  |                   |
| VOC_8260B_REG   | 11/03/2009 14:00 | 10  | 11/04/2009 23:00 | FL Flags          |
| <b>0910199-08 Trip Blank #7308 [Water] Sampled 10/22/2009 00:00 Eastern</b>       |                  |     |                  |                   |
| VOC_8260B_REG   | 11/03/2009 14:00 | 10  | 11/04/2009 23:00 | FL Flags          |

0910199

Empirical Laboratories, LLC

Client: Tetra Tech NUS, Inc. (T010)  
Project: Cecil Field JM09 G82/BPWells

Project Manager: Kim Kostzer  
Project Number: TET09JM09(2)

| Analysis  | Due              | TAT | Expires          | Comments |
|---|------------------|-----|------------------|----------|
| <b>0910199-09 Trip Blank #7309 [Water] Sampled 10/22/2009 00:00 Eastern</b> |                  |     |                  |          |
| VOC_8260B_REG   | 11/03/2009 14:00 | 10  | 11/04/2009 23:00 | FL Flags |

# ANALYSIS DATA SHEET

CEF-G82-3S-20091022

Laboratory: Empirical Laboratories, LLC  
 Client: Tetra Tech NUS, Inc. (T010)  
 Matrix: Ground Water  
 Sampled: 10/22/09 10:30  
 % Solids: 0.00

SDG: JM09G82\_001  
 Project: Cecil Field JM09 G82/BPWells  
 Laboratory ID: 0910199-01  
 Received: 10/23/09 08:30

| CAS NO.    | Analyte                      | Concentration<br>(mg/L) | MDL    | RL    | Dilution<br>Factor | Q | Method     | Batch   | Analyzed       |
|------------|------------------------------|-------------------------|--------|-------|--------------------|---|------------|---------|----------------|
| 184-96-258 | Sulfide                      |                         | 0.678  | 2.03  | 0.68               | U | SM4500S2CF | 9J27919 | 10/27/09 11:10 |
| 14797-55-8 | Nitrate as N                 | 1.30                    | 0.0330 | 0.100 | 1                  |   | E300.0     | 9J23005 | 10/23/09 12:28 |
| NA         | Alkalinity, Total (as CaCO3) | 62.8                    | 1.00   | 1.00  | 1                  |   | SM2320B    | 9K03007 | 11/03/09 12:35 |
| 14797-65-0 | Nitrite as N                 |                         | 0.0330 | 0.100 | 1                  | U | E300.0     | 9J23005 | 10/23/09 12:28 |
| 148-08-798 | Sulfate as SO4               | 19.7                    | 0.330  | 1.00  | 1                  |   | E300.0     | 9J23005 | 10/23/09 12:28 |

# ANALYSIS DATA SHEET

**CEF-G82-1S-20091022**

Laboratory: Empirical Laboratories, LLC  
 Client: Tetra Tech NUS, Inc. (T010)  
 Matrix: Ground Water  
 Sampled: 10/22/09 11:55  
 % Solids: 0.00

SDG: JM09G82\_001  
 Project: Cecil Field JM09 G82/BPWells  
 Laboratory ID: 0910199-02  
 Received: 10/23/09 08:30

| CAS NO.    | Analyte                      | Concentration (mg/L) | MDL    | RL    | Dilution Factor | Q | Method     | Batch   | Analyzed       |
|------------|------------------------------|----------------------|--------|-------|-----------------|---|------------|---------|----------------|
| 184-96-258 | Sulfide                      | 1.36                 | 0.678  | 2.03  | 0.68            | J | SM4500S2CF | 9J27919 | 10/27/09 11:11 |
| 14797-55-8 | Nitrate as N                 |                      | 0.0330 | 0.100 | 1               | U | E300.0     | 9J23005 | 10/23/09 12:46 |
| NA         | Alkalinity, Total (as CaCO3) | 78.2                 | 1.00   | 1.00  | 1               |   | SM2320B    | 9K03007 | 11/03/09 13:25 |
| 14797-65-0 | Nitrite as N                 |                      | 0.0330 | 0.100 | 1               | U | E300.0     | 9J23005 | 10/23/09 12:46 |
| 148-08-798 | Sulfate as SO4               | 3.52                 | 0.330  | 1.00  | 1               |   | E300.0     | 9J23005 | 10/23/09 12:46 |

# ANALYSIS DATA SHEET

**CEF-G82-2S-20091022**

Laboratory: Empirical Laboratories, LLC  
 Client: Tetra Tech NUS, Inc. (T010)  
 Matrix: Ground Water  
 Sampled: 10/22/09 13:05  
 % Solids: 0.00

SDG: JM09G82\_001  
 Project: Cecil Field JM09 G82/BPWells  
 Laboratory ID: 0910199-03  
 Received: 10/23/09 08:30

| CAS NO.    | Analyte                      | Concentration<br>(mg/L) | MDL    | RL    | Dilution<br>Factor | Q | Method     | Batch   | Analyzed       |
|------------|------------------------------|-------------------------|--------|-------|--------------------|---|------------|---------|----------------|
| 184-96-258 | Sulfide                      | 1.89                    | 0.678  | 2.03  | 0.68               | J | SM4500S2CF | 9J27919 | 10/27/09 11:11 |
| 14797-55-8 | Nitrate as N                 |                         | 0.0330 | 0.100 | 1                  | U | E300.0     | 9J23005 | 10/23/09 13:03 |
| NA         | Alkalinity, Total (as CaCO3) | 138                     | 1.00   | 1.00  | 1                  |   | SM2320B    | 9K03007 | 11/03/09 13:45 |
| 14797-65-0 | Nitrite as N                 |                         | 0.0330 | 0.100 | 1                  | U | E300.0     | 9J23005 | 10/23/09 13:03 |
| 148-08-798 | Sulfate as SO4               |                         | 0.330  | 1.00  | 1                  | U | E300.0     | 9J23005 | 10/23/09 13:03 |

# ANALYSIS DATA SHEET

**CEF-G82-DUP01-20091022**

Laboratory: Empirical Laboratories, LLC  
 Client: Tetra Tech NUS, Inc. (T010)  
 Matrix: Ground Water  
 Sampled: 10/22/09 00:00  
 % Solids: 0.00

SDG: JM09G82\_001  
 Project: Cecil Field JM09 G82/BPWells  
 Laboratory ID: 0910199-04  
 Received: 10/23/09 08:30

| CAS NO.    | Analyte                      | Concentration (mg/L) | MDL    | RL    | Dilution Factor | Q | Method     | Batch   | Analyzed       |
|------------|------------------------------|----------------------|--------|-------|-----------------|---|------------|---------|----------------|
| 184-96-258 | Sulfide                      | 1.93                 | 0.690  | 2.07  | 0.69            | J | SM4500S2CF | 9J27919 | 10/27/09 11:12 |
| 14797-55-8 | Nitrate as N                 |                      | 0.0330 | 0.100 | 1               | U | E300.0     | 9J23005 | 10/23/09 13:21 |
| NA         | Alkalinity, Total (as CaCO3) | 140                  | 1.00   | 1.00  | 1               |   | SM2320B    | 9K03007 | 11/03/09 13:50 |
| 14797-65-0 | Nitrite as N                 |                      | 0.0330 | 0.100 | 1               | U | E300.0     | 9J23005 | 10/23/09 13:21 |
| 148-08-798 | Sulfate as SO4               |                      | 0.330  | 1.00  | 1               | U | E300.0     | 9J23005 | 10/23/09 13:21 |

# ANALYSIS DATA SHEET

**CEF-G82-2I-20091022**

Laboratory: Empirical Laboratories, LLC  
 Client: Tetra Tech NUS, Inc. (T010)  
 Matrix: Ground Water  
 Sampled: 10/22/09 15:10  
 % Solids: 0.00

SDG: JM09G82\_001  
 Project: Cecil Field JM09 G82/BPWells  
 Laboratory ID: 0910199-05  
 Received: 10/23/09 08:30

| CAS NO.    | Analyte                      | Concentration<br>(mg/L) | MDL    | RL    | Dilution<br>Factor | Q | Method     | Batch   | Analyzed       |
|------------|------------------------------|-------------------------|--------|-------|--------------------|---|------------|---------|----------------|
| 184-96-258 | Sulfide                      | 1.76                    | 0.678  | 2.03  | 0.68               | J | SM4500S2CF | 9J27919 | 10/27/09 11:12 |
| 14797-55-8 | Nitrate as N                 |                         | 0.0330 | 0.100 | 1                  | U | E300.0     | 9J23005 | 10/23/09 14:13 |
| NA         | Alkalinity, Total (as CaCO3) | 4.05                    | 1.00   | 1.00  | 1                  |   | SM2320B    | 9K03007 | 11/03/09 14:35 |
| 14797-65-0 | Nitrite as N                 |                         | 0.0330 | 0.100 | 1                  | U | E300.0     | 9J23005 | 10/23/09 14:13 |
| 148-08-798 | Sulfate as SO4               | 8.90                    | 0.330  | 1.00  | 1                  |   | E300.0     | 9J23005 | 10/23/09 14:13 |

# INITIAL AND CONTINUING CALIBRATION CHECK

E300.0

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Instrument ID: WC-IC

Calibration: 9240002

Sequence: 9J29604

| Lab Sample ID | Analyte        | True  | Found | %R   | Units | Control Limit |
|---------------|----------------|-------|-------|------|-------|---------------|
| J29604-ICV1   | Nitrate as N   | 2.500 | 2.371 | 94.8 | mg/L  | +/- 10.00%    |
|               | Nitrite as N   | 2.500 | 2.586 | 103  | mg/L  | +/- 10.00%    |
|               | Sulfate as SO4 | 25.00 | 24.74 | 99.0 | mg/L  | +/- 10.00%    |
| J29604-CCV1   | Nitrate as N   | 2.500 | 2.416 | 96.6 | mg/L  | +/- 10.00%    |
|               | Nitrite as N   | 2.500 | 2.637 | 105  | mg/L  | +/- 10.00%    |
|               | Sulfate as SO4 | 25.00 | 24.69 | 98.8 | mg/L  | +/- 10.00%    |
| J29604-CCV2   | Nitrate as N   | 2.500 | 2.406 | 96.2 | mg/L  | +/- 10.00%    |
|               | Nitrite as N   | 2.500 | 2.612 | 104  | mg/L  | +/- 10.00%    |
|               | Sulfate as SO4 | 25.00 | 24.41 | 97.6 | mg/L  | +/- 10.00%    |

**BLANKS**  
**E300.0**

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Instrument ID: WC-IC

Project: Cecil Field JM09 G82/BPWells

Sequence: 9J29604

Calibration: 9240002

| Lab Sample ID | Analyte        | Found  | MDL    | MRL   | Units | C | Method |
|---------------|----------------|--------|--------|-------|-------|---|--------|
| 9J23005-BLK1  | Nitrate as N   | 0.00   | 0.0330 | 0.100 | mg/L  | U | E300.0 |
|               | Nitrite as N   | 0.00   | 0.0330 | 0.100 | mg/L  | U | E300.0 |
|               | Sulfate as SO4 | -0.457 | 0.330  | 1.00  | mg/L  | J | E300.0 |
| 9J29604-CCB1  | Nitrate as N   | 0.00   | 0.0330 | 0.100 | mg/L  | U | E300.0 |
|               | Nitrite as N   | 0.00   | 0.0330 | 0.100 | mg/L  | U | E300.0 |
|               | Sulfate as SO4 | 0.00   | 0.330  | 1.00  | mg/L  | U | E300.0 |
| 9J29604-CCB2  | Nitrate as N   | 0.00   | 0.0330 | 0.100 | mg/L  | U | E300.0 |
|               | Nitrite as N   | 0.00   | 0.0330 | 0.100 | mg/L  | U | E300.0 |
|               | Sulfate as SO4 | 0.00   | 0.330  | 1.00  | mg/L  | U | E300.0 |

**Classical Chemistry Parameters - Quality Control**

| Analyte                                      | Result | MDL   | RL   | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|--|--------|-------|------|-------|-------------|---------------|------|-------------|-----|-----------|-------|
| <b>Batch 9J27919</b>                         |        |       |      |       |             |               |      |             |     |           |       |
| <b>Blank</b> Prepared & Analyzed: 10/27/2009 |        |       |      |       |             |               |      |             |     |           |       |
| Sulfide                                      | ND     | 0.800 | 2.40 | mg/L  |             |               |      |             |     |           | U     |
| <b>Batch 9K03007</b>                         |        |       |      |       |             |               |      |             |     |           |       |
| <b>Blank</b> Prepared & Analyzed: 11/03/2009 |        |       |      |       |             |               |      |             |     |           |       |
| Alkalinity, Total (as CaCO3)                 | ND     | 1.00  | 1.00 | mg/L  |             |               |      |             |     |           | U     |

# MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

CEF-G82-2I-20091022

E300.0

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Matrix: Water

Batch: 9J23005

% Solids:

Source Sample Name: 0910199-05

| ANALYTE        | SPIKE ADDED (mg/L) | SAMPLE CONCENTRATION (mg/L) | MS CONCENTRATION (mg/L) | MS % REC. | Q | QC LIMITS REC. |
|----------------|--------------------|-----------------------------|-------------------------|-----------|---|----------------|
| Nitrate as N   | 2.778              | ND                          | 2.682                   | 96.6      |   | 80 - 120       |
| Nitrite as N   | 2.778              | ND                          | 2.693                   | 97.0      |   | 80 - 120       |
| Sulfate as SO4 | 27.78              | 8.897                       | 37.38                   | 103       |   | 80 - 120       |

| ANALYTE        | SPIKE ADDED (mg/L) | MSD CONCENTRATION (mg/L) | MSD % REC. # | % RPD | Q | QC LIMITS |          |
|----------------|--------------------|--------------------------|--------------|-------|---|-----------|----------|
|                |                    |                          |              |       |   | RPD       | REC.     |
| Nitrate as N   | 2.778              | 2.676                    | 96.3         | 0.249 |   | 20        | 80 - 120 |
| Nitrite as N   | 2.778              | 2.590                    | 93.2         | 3.91  |   | 20        | 80 - 120 |
| Sulfate as SO4 | 27.78              | 36.74                    | 100          | 1.72  |   | 20        | 80 - 120 |

# MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

CEF-G82-DUP01-20091022

SM2320B

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Matrix: Water

Batch: 9K03007

% Solids:

Source Sample Name: 0910199-04

| ANALYTE                      | SPIKE ADDED (mg/L) | SAMPLE CONCENTRATION (mg/L) | MS CONCENTRATION (mg/L) | MS % REC. | Q | QC LIMITS REC. |
|------------------------------|--------------------|-----------------------------|-------------------------|-----------|---|----------------|
| Alkalinity, Total (as CaCO3) | 111.1              | 139.7                       | 252.4                   | 101       |   | 75 - 125       |

| ANALYTE                      | SPIKE ADDED (mg/L) | MSD CONCENTRATION (mg/L) | MSD % REC. # | % RPD | Q | QC LIMITS |          |
|------------------------------|--------------------|--------------------------|--------------|-------|---|-----------|----------|
|                              |                    |                          |              |       |   | RPD       | REC.     |
| Alkalinity, Total (as CaCO3) | 111.1              | 258.7                    | 107          | 2.46  |   | 20        | 75 - 125 |

# DUPLICATES

CEF-G82-2I-2009102

E300.0

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Matrix: Water

Laboratory ID: 9J23005-DUP1

Batch: 9J23005

Lab Source ID: 0910199-05

Preparation: WC PREP ANIONS W

Initial/Final: 5 mL / 5 mL

Source Sample Name: CEF-G82-2I-20091022

% Solids:

| ANALYTE        | CONTROL LIMIT | SAMPLE CONCENTRATION (mg/L) | DUPLICATE CONCENTRATION (mg/L) | RPD % | Q | METHOD |
|----------------|---------------|-----------------------------|--------------------------------|-------|---|--------|
| Nitrate as N   | 20            | 0.100 U                     | 0.100 U                        |       |   | E300.0 |
| Nitrite as N   | 20            | 0.100 U                     | 0.100 U                        |       |   | E300.0 |
| Sulfate as SO4 | 20            | 8.90                        | 8.867                          | 0.338 |   | E300.0 |

# LCS / LCS DUPLICATE RECOVERY

E300.0

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Matrix: Water

Batch: 9J23005

Laboratory ID: 9J23005-BS1

Preparation: WC\_PREP\_ANIONS\_W

Initial/Final: 5 mL / 5 mL

| ANALYTE                    | SPIKE<br>ADDED<br>(mg/L) | LCS<br>CONCENTRATION<br>(mg/L) | LCS<br>%<br>REC. | QC<br>LIMITS<br>REC. |
|----------------------------|--------------------------|--------------------------------|------------------|----------------------|
| Nitrate as N               | 3.616                    | 3.566                          | 98.6             | 90 - 110             |
| Nitrite as N               | 4.864                    | 4.853                          | 99.8             | 90 - 110             |
| Sulfate as SO <sub>4</sub> | 24.00                    | 23.80                          | 99.2             | 90 - 110             |

# LCS / LCS DUPLICATE RECOVERY

SM4500S2CF

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Matrix: Water

Batch: 9J27919

Laboratory ID: 9J27919-BS1

Preparation: pNone

Initial/Final: 3 mL / 250 mL

| ANALYTE | SPIKE<br>ADDED<br>(mg/L) | LCS<br>CONCENTRATION<br>(mg/L) | LCS<br>%<br>REC. | QC<br>LIMITS<br>REC. |
|---------|--------------------------|--------------------------------|------------------|----------------------|
| Sulfide | 1307                     | 1217                           | 93.1             | 80 - 120             |

| ANALYTE | SPIKE<br>ADDED<br>(mg/L) | LCSD<br>CONCENTRATION<br>(mg/L) | LCSD<br>%<br>REC. # | %<br>RPD # | QC LIMITS |          |
|---------|--------------------------|---------------------------------|---------------------|------------|-----------|----------|
|         |                          |                                 |                     |            | RPD       | REC.     |
| Sulfide | 1307                     | 1167                            | 89.3                | 4.20       | 20        | 80 - 120 |

**LCS / LCS DUPLICATE RECOVERY**  
**SM2320B**

Laboratory: Empirical Laboratories, LLC

SDG: JM09G82\_001

Client: Tetra Tech NUS, Inc. (T010)

Project: Cecil Field JM09 G82/BPWells

Matrix: Water

Batch: 9K03007

Laboratory ID: 9K03007-BS1

Preparation: pNone

Initial/Final: 25 mL / 25 mL

| ANALYTE                                   | SPIKE<br>ADDED<br>(mg/L) | LCS<br>CONCENTRATION<br>(mg/L) | LCS<br>%<br>REC. | QC<br>LIMITS<br>REC. |
|---|--------------------------|--------------------------------|------------------|----------------------|
| Alkalinity, Total (as CaCO <sub>3</sub> ) | 200.0                    | 192.3                          | 96.2             | 80 - 120             |

**ATTACHMENT C**  
**COMPLETED FIELD FORMS**





|   |      |                                    |             |  |                   |                                    |   |   |   |   |   |                   |
|---|------|------------------------------------|-------------|--|-------------------|------------------------------------|---|---|---|---|---|-------------------|
| PROJECT NO:<br>112602967  |      | FACILITY: Cecil Field<br>Site G-23 |             | PROJECT MANAGER<br>Kara Wimbic             |                   | PHONE NUMBER<br>904 636 6125       |   | LABORATORY NAME AND CONTACT:<br>Empirical Laboratories/Janice Skilling                  |   |   |   |                   |
| SAMPLERS (SIGNATURE)<br>  |      |                                    |             | FIELD OPERATIONS LEADER<br>Jeff Krone      |                   | PHONE NUMBER<br>904 699-7473       |   | ADDRESS<br>621 Mainstream Dr Suite 270  |   |   |   |                   |
|   |      |                                    |             | CARRIER/WAYBILL NUMBER<br>864351421696     |                   | CITY, STATE<br>Nashville, TN 37208 |   |   |   |   |   |                   |
| STANDARD TAT <input checked="" type="checkbox"/><br>RUSH TAT <input type="checkbox"/><br><input type="checkbox"/> 24 hr. <input type="checkbox"/> 48 hr. <input type="checkbox"/> 72 hr. <input type="checkbox"/> 7 day <input type="checkbox"/> 14 day |      |                                    |             | CONTAINER TYPE<br>PLASTIC (P) or GLASS (G) |                   | PRESERVATIVE<br>USED               |   | TYPE OF ANALYSIS<br>VOC's limited 200B HCl G<br>PAHs 207D sim none G<br>TRPH FIRD HSW G |   |   |   |                   |
| DATE<br>YEAR<br>2009  | TIME | SAMPLE ID                          | LOCATION ID | TOP DEPTH (FT)                             | BOTTOM DEPTH (FT) | MATRIX (GW, SO, SW, SD, QC, ETC.)  | COLLECTION METHOD<br>GRAP (G)<br>COMP (C) |   |   |   |   | No. OF CONTAINERS |
| 9/23  | 0930 | CEF-682-43-20091023                |             |  |                   | GW                                 | G   | 7   | X | X | X | Cool to 40 c      |
| 10/23   | 1025 | CEF-682-53-20091023                |             |  |                   | GW                                 | G   | 7   | X | X | X |                   |
| 10/23   | 1115 | CEF-682-63-20091023                |             |  |                   | GW                                 | G   | 7   | X | X | X |                   |
|   |      | Trip Blank                         |             |  |                   |                                    |   | 1   |   |   |   |                   |

|                    |                  |              |                |      |      |
|--------------------|------------------|--------------|----------------|------|------|
| 1. RELINQUISHED BY | DATE<br>10/23/09 | TIME<br>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



|                          |                                    |  |                              |  |
|--------------------------|------------------------------------|--|------------------------------|--|
| PROJECT NO:<br>112602267 | FACILITY: Cecil Field<br>Site G-22 | PROJECT MANAGER<br>Kara Wamble           | PHONE NUMBER<br>901 636-6125 | LABORATORY NAME AND CONTACT:<br>Empirical Laboratories/Janice Shilling |
| SAMPLERS (SIGNATURE)<br> |                                    | FIELD OPERATIONS LEADER<br>Jeff Krone    | PHONE NUMBER<br>901 699-7473 | ADDRESS<br>621 Mainstream Dr Suite 270                                 |
|                          |                                    | CARRIER/WAYBILL NUMBER<br>8643 5142 1685 |                              | CITY, STATE<br>Nashville, TN 37228                                     |

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

| DATE<br>YEAR | TIME | SAMPLE ID              | LOCATION ID | TOP DEPTH (FT) | BOTTOM DEPTH (FT) | MATRIX (GW, SO, SW, SD, QC, ETC.) | COLLECTION METHOD<br>GRAP (G)<br>COMP (C) | No. OF CONTAINERS | TYPE OF ANALYSIS      |                |             |        |            |         |                   |        |        |        |        |        | COMMENTS |        |        |
|--------------|------|------------------------|-------------|----------------|-------------------|-----------------------------------|---|-------------------|-----------------------|----------------|-------------|--------|------------|---------|-------------------|--------|--------|--------|--------|--------|----------|--------|--------|
|              |      |                        |             |                |                   |                                   |   |                   | VOC's 11method 8230 B | PAH's 8270 SIM | TRPH FL PRO | metals | Alkalinity | Ammonia | Dissolved Sulfide | None P |          | None P | None P |
| 10/20        | 1030 | CEF-G82-3S-20091022    |             |                |                   | GW                                | G   | 14                | X                     | X              | X           | X      | X          | X       | X                 | X      | X      | X      | X      | X      | X        | X      |        |
| 10/20        | 1155 | CEF-G82-1S-20091022    |             |                |                   | GW                                | G   | 14                | X                     | X              | X           | X      | X          | X       | X                 | X      | X      | X      | X      | X      | X        | X      |        |
| 10/20        | 1305 | CEF-G82-2S-20091022    |             |                |                   | GW                                | G   | 14                | X                     | X              | X           | X      | X          | X       | X                 | X      | X      | X      | X      | X      | X        | X      |        |
| 10/20        | 0000 | CEF-G82-DUP#1-20091022 |             |                |                   | GW                                | G   | 14                | X                     | X              | X           | X      | X          | X       | X                 | X      | X      | X      | X      | X      | X        | X      |        |
| 10/20        | 1570 | CEF-G82-2I-20091022    |             |                |                   | GW                                | G   | 14                | X                     | X              | X           | X      | X          | X       | X                 | X      | X      | X      | X      | X      | X        | X      |        |
| 10/20        |      | Trip Blank             |             |                |                   |                                   |   | 4                 |                       |                |             |        |            |         |                   |        |        |        |        |        |          |        |        |

|                        |                  |              |                |      |      |
|------------------------|------------------|--------------|----------------|------|------|
| 1. RELINQUISHED BY<br> | DATE<br>10/20/09 | TIME<br>1800 | 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

**Tetra Tech NUS / FDEP Groundwater Sampling Sheet**

|                                |  |
|--------------------------------|--|
| SITE NAME: <b>G82/BP Wells</b> | SITE LOCATION: <b>NAS Cecil Field</b>  |
| WELL NO: <b>CEF-G82-1S</b>     | SAMPLE ID: <b>CEF-G82-1S-200910 92</b> |
| DATE: <b>10 / 92 / 2009</b>    |  |

**PURGING DATA**

| WELL DIAMETER (in): <b>2</b>  | TUBING DIAMETER (inches): <b>3/16</b>                 | WELL SCREEN INTERVAL DEPTH: <b>5 - 15'</b> | STATIC DEPTH TO WATER (ft): | PURGE PUMP TYPE OR BAILER: <b>Peristaltic Pump</b> |                     |              |               |                         |                  |               |              |
|---|---|--|-----------------------------|--|---------------------|--------------|---------------|-------------------------|------------------|---------------|--------------|
| WELL VOLUME PURGE: <b>1</b> WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY<br>only fill out if applicable<br><b>5.17</b> Liters $15 - 6.46 = 8.54 \times .16 = 1.366 \times 3.785 = 5.17$   |   |  |                             |  |                     |              |               |                         |                  |               |              |
| EQUIPMENT VOLUME PURGE: <b>1</b> EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME<br>(only fill out if applicable)<br><b>89.2</b> Liters   |   |  |                             |  |                     |              |               |                         |                  |               |              |
| INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>8</b>   | FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>7.5</b> | PURGE INITIATED AT: <b>0925</b>            | PURGE ENDED AT: <b>1151</b> | TOTAL VOLUME PURGED (Liters): <b>89.2</b>          |                     |              |               |                         |                  |               |              |
| TIME  | VOLUME PURGED (Liters)                                | CUMUL. VOLUME PURGED (Liters)              | PURGE RATE (mlpm)           | DEPTH TO WATER (ft)                                | pH (standard units) | TEMP. (°C)   | COND. (µS/cm) | DISSOLVED OXYGEN (mg/L) | TURBIDITY (NTUs) | ORP (mv)      | COLOR        |
| <b>0925</b>   | <b>—</b>  | <b>—</b>                                   | <b>200</b>                  | <b>—</b>   | <b>—</b>            | <b>—</b>     | <b>—</b>      | <b>—</b>                | <b>—</b>         | <b>—</b>      | <b>—</b>     |
| <b>1145</b>   | <b>28</b>   | <b>28</b>                                  | <b>200</b>                  | <b>6.61</b>  | <b>6.03</b>         | <b>25.35</b> | <b>0.224</b>  | <b>0.24</b>             | <b>13.8</b>      | <b>-112.1</b> | <b>clear</b> |
| <b>1147</b>   | <b>.6</b>   | <b>28.6</b>                                | <b>200</b>                  | <b>6.61</b>  | <b>6.03</b>         | <b>25.38</b> | <b>0.224</b>  | <b>0.23</b>             | <b>12.3</b>      | <b>-112.6</b> | <b>clear</b> |
| <b>1151</b>   | <b>.6</b>   | <b>29.2</b>                                | <b>200</b>                  | <b>6.61</b>  | <b>6.03</b>         | <b>25.37</b> | <b>0.224</b>  | <b>0.24</b>             | <b>10.31</b>     | <b>-113.9</b> | <b>clear</b> |
| <b>1155</b>   | <b>Sample time</b>                                    |  |                             |  |                     |              |               |                         |                  |               |              |
| 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<br>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 |   |  |                             |  |                     |              |               |                         |                  |               |              |

**SAMPLING DATA**

| SAMPLED BY (PRINT) / AFFILIATION: <b>Jeff Krone TtNUS/</b>  |              |               | SAMPLER(S) SIGNATURES:   |  |                               | SAMPLING INITIATED AT: <b>1155</b>  |                                 | SAMPLING ENDED AT: <b>1230</b>  |                         |  |
|---|--------------|---------------|--|--|-------------------------------|-------------------------------------|---------------------------------|---|-------------------------|--|
| PUMP OR TUBING DEPTH IN WELL (feet): <b>7.5</b>   |              |               | SAMPLE PUMP FLOW RATE (mL per minute): <b>200</b>                          |  |                               | TUBING MATERIAL CODE: <b>Teflon</b> |                                 |   |                         |  |
| FIELD DECONTAMINATION: Y <input checked="" type="radio"/> N <input type="radio"/>   |              |               | FIELD-FILTERED: Y <input type="radio"/> N <input checked="" type="radio"/> |  |                               | FILTRATION EQUIPMENT TYPE: _____    |                                 | DUPLICATE: Y <input type="radio"/> N <input checked="" type="radio"/> |                         |  |
| SAMPLE CONTAINER SPECIFICATION  |              |               |  | SAMPLE PRESERVATION                      |                               |                                     | INTENDED ANALYSIS AND/OR METHOD |   | SAMPLING EQUIPMENT CODE |  |
| SAMPLE ID CODE  | # CONTAINERS | MATERIAL CODE | VOLUME   | PRESERVATIVE USED                        | TOTAL VOL ADDED IN FIELD (mL) | FINAL pH                            |                                 |   |                         |  |
| <b>TRPH</b>   | <b>2</b>     | <b>AG</b>     | <b>1 L</b>   | <b>H<sub>2</sub>SO<sub>4</sub></b>       |                               |                                     | <b>FL-PRO</b>                   |   |                         |  |
| <b>VOC's</b>  | <b>3</b>     | <b>CG</b>     | <b>40 ml</b>   | <b>HCl</b>                               |                               |                                     | <b>8260B</b>                    |   |                         |  |
| <b>PAHS</b>   | <b>1</b>     | <b>AG</b>     | <b>1 L</b>   | <b>None</b>                              |                               |                                     | <b>8270 SIM</b>                 |   |                         |  |
| <b>Sulfide</b>  | <b>1</b>     | <b>PE</b>     | <b>250 ml</b>  | <b>Zinc acetate and sodium hydroxide</b> |                               |                                     | <b>EPA method 376.1</b>         |   |                         |  |
| <b>Sulfate</b>  |              |               |  |  |                               |                                     | <b>EPA method 300.00</b>        |   |                         |  |
| <b>Nitrate/Nitrite</b>  | <b>1</b>     | <b>PE</b>     | <b>500 ml</b>  | <b>None</b>                              |                               |                                     | <b>EPA method 300.00</b>        |   |                         |  |
| <b>Alkalinity</b>   |              |               |  |  |                               |                                     | <b>EPA Method 310.0</b>         |   |                         |  |
| <b>Methane</b>  | <b>2</b>     | <b>CG</b>     | <b>40 ml</b>   | <b>None</b>                              |                               |                                     | <b>Method RSK 175</b>           |   |                         |  |
| REMARKS:  |              |               |  |  |                               |                                     |                                 |   |                         |  |
| MATERIAL CODES: <b>AG</b> = Amber Glass; <b>CG</b> = Clear Glass; <b>PE</b> = Polyethylene; <b>PP</b> = Polypropylene; <b>S</b> = Silicone; <b>T</b> = Teflon; <b>O</b> = Other (Specify)   |              |               |  |  |                               |                                     |                                 |   |                         |  |
| SAMPLING/PURGING EQUIPMENT CODES: <b>APP</b> = After Peristaltic Pump; <b>B</b> = Bailer; <b>BP</b> = Bladder Pump; <b>ESP</b> = Electric Submersible Pump; <b>PP</b> = Peristaltic Pump; <b>RFPP</b> = Reverse Flow Peristaltic Pump; <b>SM</b> = Straw Method (Tubing Gravity Drain); <b>VT</b> = Vacuum Trap; <b>O</b> = Other (Specify) |              |               |  |  |                               |                                     |                                 |   |                         |  |



Tetra Tech NUS / FDEP Groundwater Sampling Sheet

|                                |  |  |  |
|--------------------------------|--|--|--|
| SITE NAME: <b>G82/BP Wells</b> |  | SITE LOCATION: <b>NAS Cecil Field</b>  |  |
| WELL NO: <b>CEF-G82-2S</b>     |  | SAMPLE ID: <b>CEF-G82-2S-200910 22</b> |  |
| DATE: <b>10 / 22 / 2009</b>    |  |  |  |

**PURGING DATA**

| WELL DIAMETER (in): <b>2</b>   | TUBING DIAMETER (inches): <b>3/16</b> | WELL SCREEN INTERVAL DEPTH: <b>4 - 14'</b>          | STATIC DEPTH TO WATER (ft): <b>6.60</b> | PURGE PUMP TYPE OR BAILER: <b>Peristaltic Pump</b> |                             |   |               |                         |                  |               |              |
|--|---------------------------------------|---|---|--|-----------------------------|---|---------------|-------------------------|------------------|---------------|--------------|
| WELL VOLUME PURGE: <b>1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY</b><br>$4.48 \text{ Liters} = (14 - 6.60) \times 1.184 \times 3.785 = 4.48$ |                                       |   |   |  |                             |   |               |                         |                  |               |              |
| EQUIPMENT VOLUME PURGE: <b>1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME</b><br>(only fill out if applicable)                        |                                       |   |   |  |                             |   |               |                         |                  |               |              |
| INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>8</b>  |                                       | FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>8</b> |   | PURGE INITIATED AT: <b>1130</b>                    | PURGE ENDED AT: <b>1301</b> | TOTAL VOLUME PURGED (Liters): <b>18.2</b> |               |                         |                  |               |              |
| TIME   | VOLUME PURGED (Liters)                | CUMUL. VOLUME PURGED (Liters)                       | PURGE RATE (mlpm)                       | DEPTH TO WATER (ft)                                | pH (standard units)         | TEMP. (°C)                                | COND. (µS/cm) | DISSOLVED OXYGEN (mg/L) | TURBIDITY (NTUs) | ORP (mV)      | COLOR        |
| <b>1130</b>  |                                       |   | <b>200</b>                              |  |                             |   |               |                         |                  |               |              |
| <b>1255</b>  | <b>17</b>                             | <b>17</b>   | <b>200</b>                              | <b>6.87</b>  | <b>6.16</b>                 | <b>27.03</b>                              | <b>0.362</b>  | <b>0.08</b>             | <b>1.73</b>      | <b>-151.6</b> | <b>Clear</b> |
| <b>1258</b>  | <b>.6</b>                             | <b>17.6</b>   | <b>200</b>                              | <b>6.87</b>  | <b>6.16</b>                 | <b>27.04</b>                              | <b>0.362</b>  | <b>0.07</b>             | <b>1.71</b>      | <b>-153.7</b> | <b>clear</b> |
| <b>1301</b>  | <b>.6</b>                             | <b>18.2</b>   | <b>200</b>                              | <b>6.88</b>  | <b>6.16</b>                 | <b>27.08</b>                              | <b>0.362</b>  | <b>0.07</b>             | <b>1.16</b>      | <b>-155.1</b> | <b>clear</b> |
| <b>1305 Sample time</b>  |                                       |   |   |  |                             |   |               |                         |                  |               |              |
| WELL CAPACITY (Gallons Per Foot): <b>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</b>                            |                                       |   |   |  |                             |   |               |                         |                  |               |              |
| TUBING INSIDE DIA. CAPACITY (Gal./Ft.): <b>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</b>                         |                                       |   |   |  |                             |   |               |                         |                  |               |              |

**SAMPLING DATA**

| SAMPLED BY (PRINT) / AFFILIATION: <b>Jeff Krone TTNUS/</b>  |              |               |               | SAMPLER(S) SIGNATURES: <i>[Signature]</i>  |                               |          | SAMPLING INITIATED AT: <b>1305</b>  |                                 | SAMPLING ENDED AT: <b>1340</b>  |                         |
|---|--------------|---------------|---------------|--|-------------------------------|----------|-------------------------------------|---------------------------------|---|-------------------------|
| PUMP OR TUBING DEPTH IN WELL (feet): <b>8</b>   |              |               |               | SAMPLE PUMP FLOW RATE (mL per minute): <b>200</b>  |                               |          | TUBING MATERIAL CODE: <b>Teflon</b> |                                 | <b>CEF-G82-DUP01-2009102</b>  |                         |
| FIELD DECONTAMINATION: <b>Y</b> <input checked="" type="radio"/> <b>N</b> <input type="radio"/>   |              |               |               | FIELD-FILTERED: <b>Y</b> <input type="radio"/> <b>N</b> <input checked="" type="radio"/> |                               |          | FILTER SIZE: <b>µm</b>              |                                 | DUPLICATE: <b>Y</b> <input type="radio"/> <b>N</b> <input checked="" type="radio"/> |                         |
| SAMPLE CONTAINER SPECIFICATION  |              |               |               | SAMPLE PRESERVATION  |                               |          |                                     | INTENDED ANALYSIS AND/OR METHOD |   | SAMPLING EQUIPMENT CODE |
| SAMPLE ID CODE  | # CONTAINERS | MATERIAL CODE | VOLUME        | PRESERVATIVE USED  | TOTAL VOL ADDED IN FIELD (mL) | FINAL pH |                                     |                                 |   |                         |
| <b>TRPH</b>   | <b>2</b>     | <b>AG</b>     | <b>1 L</b>    | <b>H<sub>2</sub>SO<sub>4</sub></b>   |                               |          | <b>FL-PRO</b>                       |                                 |   |                         |
| <b>VOC's</b>  | <b>3</b>     | <b>CG</b>     | <b>40 ml</b>  | <b>HCl</b>   |                               |          | <b>8260B</b>                        |                                 |   |                         |
| <b>PAHS</b>   | <b>1</b>     | <b>AG</b>     | <b>1 L</b>    | <b>None</b>  |                               |          | <b>8270 SIM</b>                     |                                 |   |                         |
| <b>Sulfide</b>  | <b>1</b>     | <b>PE</b>     | <b>250 ml</b> | <b>Zinc acetate and sodium hydroxide</b>   |                               |          | <b>EPA method 376.1</b>             |                                 |   |                         |
| <b>Sulfate</b>  | <b>1</b>     | <b>PE</b>     | <b>500 ml</b> | <b>None</b>  |                               |          | <b>EPA method 300.00</b>            |                                 |   |                         |
| <b>Nitrate/Nitrite</b>  |              |               |               |  |                               |          | <b>EPA method 300.00</b>            |                                 |   |                         |
| <b>Alkalinity</b>   |              |               |               |  |                               |          | <b>EPA Method 310.0</b>             |                                 |   |                         |
| <b>Methane</b>  | <b>2</b>     | <b>CG</b>     | <b>40 ml</b>  | <b>None</b>  |                               |          | <b>Method RSK 175</b>               |                                 |   |                         |
| REMARKS:  |              |               |               |  |                               |          |                                     |                                 |   |                         |
| MATERIAL CODES: <b>AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)</b>   |              |               |               |  |                               |          |                                     |                                 |   |                         |
| SAMPLING/PURGING EQUIPMENT CODES: <b>APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPF = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)</b> |              |               |               |  |                               |          |                                     |                                 |   |                         |



# FIELD ANALYTICAL LOG SHEET GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Page 1 of 1

|  |                                     |   |
|--|-------------------------------------|---|
| Project Site Name: <b>NAS Cecil Field G82/BP Wells</b>   |                                     | Sample ID No.: <b>CEF-G82-2S-200910</b> |
| Project No.: <b>112G02267</b>  |                                     | Sample Location: <b>CEF-G82-2S</b>      |
| Sampled By: <b>Jeff Krone</b>  | Duplicate: <input type="checkbox"/> |   |
| Field Analyst:   | Blank: <input type="checkbox"/>     |   |
| Field Form Checked as per QA/QC Checklist (initials): <span style="border: 1px solid black; padding: 2px;">JK</span> |                                     |   |

**SAMPLING DATA:**

|                              |                   |             |                 |                    |                     |               |                      |
|------------------------------|-------------------|-------------|-----------------|--------------------|---------------------|---------------|----------------------|
| Date: <sup>10</sup> 04/20/09 | Color<br>(Visual) | pH<br>(SU)  | S.C.<br>(mS/cm) | Turbidity<br>(NTU) | DO<br>(Meter, mg/l) | Temp.<br>(°C) | ORP (Eh)<br>(+/- mv) |
| Time: <b>1301</b>            | <b>Clear</b>      | <b>6.16</b> | <b>0.362</b>    | <b>1.16</b>        | <b>0.07</b>         | <b>27.08</b>  | <b>-155.1</b>        |
| Method: <b>Peristaltic</b>   |                   |             |                 |                    |                     |               |                      |

**SAMPLE COLLECTION/ANALYSIS INFORMATION:**

**Dissolved Oxygen:**

Equipment: Chemetrics K-7501 or K-7512      Range:  0 - 1.0 mg/L      Analysis Time: 1435  
 1 - 12 mg/L  
 Concentration: 0.2 mg/L

Notes:

**Sulfide (S<sup>2-</sup>):**

Equipment: **DR-890**      Analysis Time: 1441  
 Program/Module: 93 / 610 nm      Concentration: 0.22 mg/L

Notes:

**Carbon Dioxide:**

Equipment: (Range: 10 to 100 mg/L)      Analysis Time: 1440  
 CHEMetrics K1910, K1920, or K1925.      Concentration: 80 mg/L

Notes:

**Alkalinity:**

Equipment: (Range: 10 to 100 mg/L)      Analysis Time: 1442  
 CHEMetrics K9810, K9815, or K9820.      Concentration: 90 mg/L

Notes:

**Ferrous Iron (Fe<sup>2+</sup>):**

Equipment: **DR-890**      IR-18C Color Wheel      Analysis Time: \_\_\_\_\_  
 Program/Module: **33** / 500nm      Concentration: \_\_\_\_\_ mg/L  
 Filtered:

Notes:

**Hydrogen Sulfide (H<sub>2</sub>S):**

Equipment: **HS-C**      Analysis Time: \_\_\_\_\_  
 Exceeded 5.0 mg/L range on color chart:       Concentration: \_\_\_\_\_ mg/L

Notes:

**QA/QC Checklist:**

- All data fields have been completed as necessary:
- Correct measurement units are cited in the SAMPLING DATA block:
- Multiplication is correct for each Multiplier table:
- Final concentration is within the appropriate Range Used block:
- QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents:
- Title block is initialized by person who performed the QA/QC Checklist:

## Tetra Tech NUS / FDEP Groundwater Sampling Sheet

|                                |  |
|--------------------------------|--|
| SITE NAME: <b>G82/BP Wells</b> | SITE LOCATION: <b>NAS Cecil Field</b>  |
| WELL NO: <b>CEF-G82-21</b>     | SAMPLE ID: <b>CEF-G82-21-200910 22</b> |
| DATE: <b>10 / 22 / 2009</b>    |  |

### PURGING DATA

|   |                                       |  |   |  |
|---|---------------------------------------|--|---|--|
| WELL DIAMETER (in): <b>2</b>  | TUBING DIAMETER (inches): <b>3/16</b> | WELL SCREEN INTERVAL DEPTH: <b>30 - 35'</b>          | STATIC DEPTH TO WATER (ft): <b>6.95</b> | PURGE PUMP TYPE OR BAILER: <b>Peristaltic Pump</b> |
| WELL VOLUME PURGE: <b>1</b> WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY<br>only fill out if applicable)                  |                                       |  |   |  |
| Liters  |                                       |  |   |  |
| EQUIPMENT VOLUME PURGE: <b>1</b> EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME<br>(only fill out if applicable) |                                       |  |   |  |
| Liters  |                                       |  |   |  |
| INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>31</b>  |                                       | FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>31</b> |   | PURGE INITIATED AT: <b>1245</b>                    |
|   |                                       |  |   | PURGE ENDED AT: <b>1507</b>                        |
|   |                                       |  |   | TOTAL VOLUME PURGED (Liters): <b>20.2</b>          |

| TIME        | VOLUME PURGED (Liters) | CUMUL. VOLUME PURGED (Liters) | PURGE RATE (mlpm) | DEPTH TO WATER (ft) | pH (standard units) | TEMP. (°C)   | COND. (µS/cm) | DISSOLVED OXYGEN (mg/L) | TURBIDITY (NTUs) | ORP (mV)     | COLOR         |
|-------------|------------------------|-------------------------------|-------------------|---------------------|---------------------|--------------|---------------|-------------------------|------------------|--------------|---------------|
| <b>1245</b> | —                      | —                             | <b>200</b>        | —                   | —                   | —            | —             | —                       | —                | —            | —             |
| <b>1345</b> | <b>12</b>              | <b>12</b>                     | <b>200</b>        | <b>7.02</b>         | <b>5.13</b>         | <b>26.91</b> | <b>0.055</b>  | <b>0.19</b>             | <b>31.9</b>      | <b>-36.1</b> | <b>cloudy</b> |
| <b>1445</b> | <b>6</b>               | <b>18</b>                     | <b>100</b>        | <b>7.02</b>         | <b>5.13</b>         | <b>26.60</b> | <b>0.055</b>  | <b>0.18</b>             | <b>30.2</b>      | <b>-38.0</b> | <b>cloudy</b> |
| <b>1455</b> | <b>1.0</b>             | <b>19</b>                     | <b>100</b>        | <b>7.02</b>         | <b>5.23</b>         | <b>27.79</b> | <b>0.060</b>  | <b>0.62</b>             | <b>19.1</b>      | <b>-30.2</b> | <b>cloudy</b> |
| <b>1458</b> | <b>.3</b>              | <b>19.3</b>                   | <b>100</b>        | <b>7.02</b>         | <b>5.23</b>         | <b>28.11</b> | <b>0.054</b>  | <b>0.19</b>             | <b>4.81</b>      | <b>-31.9</b> | <b>clear</b>  |
| <b>1501</b> | <b>.3</b>              | <b>19.6</b>                   | <b>100</b>        | <b>7.02</b>         | <b>5.14</b>         | <b>27.86</b> | <b>0.054</b>  | <b>0.21</b>             | <b>3.19</b>      | <b>-32.9</b> | <b>clear</b>  |
| <b>1504</b> | <b>.3</b>              | <b>20.0</b>                   | <b>100</b>        | <b>7.02</b>         | <b>5.13</b>         | <b>27.78</b> | <b>0.054</b>  | <b>0.22</b>             | <b>3.31</b>      | <b>-32.7</b> | <b>clear</b>  |
| <b>1507</b> | <b>.3</b>              | <b>20.2</b>                   | <b>100</b>        | <b>7.02</b>         | <b>5.13</b>         | <b>27.74</b> | <b>0.054</b>  | <b>0.22</b>             | <b>3.05</b>      | <b>-31.9</b> | <b>clear</b>  |

**1510 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**

### SAMPLING DATA

|  |  |  |   |  |  |                                     |  |                                |  |
|--|--|--|---|--|--|-------------------------------------|--|--------------------------------|--|
| SAMPLED BY (PRINT) / AFFILIATION:<br>Jeff Krone/TNUS / <b>Jeff Krone</b> |  |  | SAMPLER(S) SIGNATURES:<br>                            |  |  | SAMPLING INITIATED AT: <b>1510</b>  |  | SAMPLING ENDED AT: <b>1600</b> |  |
| PUMP OR TUBING DEPTH IN WELL (feet): <b>31</b>                           |  |  | SAMPLE PUMP FLOW RATE (mL per minute): <b>200/100</b> |  |  | TUBING MATERIAL CODE: <b>Teflon</b> |  |                                |  |
| FIELD DECONTAMINATION: <b>Y</b> <b>(N)</b>                               |  |  | FIELD-FILTERED: <b>Y</b> <b>(N)</b>                   |  |  | FILTER SIZE: <b>—</b> µm            |  | DUPLICATE: <b>Y</b> <b>(N)</b> |  |

| SAMPLE CONTAINER SPECIFICATION |              |               |        | SAMPLE PRESERVATION               |                               |          | INTENDED ANALYSIS AND/OR METHOD | SAMPLING EQUIPMENT CODE |
|--------------------------------|--------------|---------------|--------|-----------------------------------|-------------------------------|----------|---------------------------------|-------------------------|
| SAMPLE ID CODE                 | # CONTAINERS | MATERIAL CODE | VOLUME | PRESERVATIVE USED                 | TOTAL VOL ADDED IN FIELD (mL) | FINAL pH |                                 |                         |
| TRPH                           | 2            | AG            | 1 L    | H <sub>2</sub> SO <sub>4</sub>    |                               |          | FL-PRO                          |                         |
| VOC's                          | 3            | CG            | 40 ml  | HCl                               |                               |          | 8260B                           |                         |
| PAHS                           | 1            | AG            | 1 L    | None                              |                               |          | 8270 SIM                        |                         |
| Sulfide                        | 1            | PE            | 250 ml | Zinc acetate and sodium hydroxide |                               |          | EPA method 376.1                |                         |
| Sulfate                        |              |               |        |                                   |                               |          | EPA method 300.00               |                         |
| Nitrate/Nitrite                | 1            | PE            | 500 ml | None                              |                               |          | EPA method 300.00               |                         |
| Alkalinity                     |              |               |        |                                   |                               |          | EPA Method 310.0                |                         |
| Methane                        | 2            | CG            | 40 ml  | None                              |                               |          | Method RSK 175                  |                         |

REMARKS: **Adjusted Purge rate to lower turbidity**

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



# FIELD ANALYTICAL LOG SHEET GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Page 1 of 1

|  |  |   |
|--|--|---|
| Project Site Name: <b>NAS Cecil Field G82/BP Wells</b>   |  | Sample ID No.: <b>CEF-G82-2I-200910</b> |
| Project No.: <b>112G02267</b>  |  | Sample Location: <b>CEF-G82-2I</b>      |
| Sampled By: <u>Jeff Krone</u>  |  | Duplicate: <input type="checkbox"/>     |
| Field Analyst:   |  | Blank: <input type="checkbox"/>         |
| Field Form Checked as per QA/QC Checklist (initials): <span style="border: 1px solid black; padding: 2px;">JK</span> |  |   |

**SAMPLING DATA:**

| Date:                      | Color        | pH          | S.C.         | Turbidity   | DO            | Temp.        | ORP (Eh)     |
|----------------------------|--------------|-------------|--------------|-------------|---------------|--------------|--------------|
| Time:                      | (Visual)     | (SU)        | (mS/cm)      | (NTU)       | (Meter, mg/l) | (°C)         | (+/- mv)     |
| <u>10/22/09</u>            | <u>clear</u> | <u>5.13</u> | <u>0.054</u> | <u>3.05</u> | <u>0.22</u>   | <u>27.74</u> | <u>-31.9</u> |
| <u>1507</u>                |              |             |              |             |               |              |              |
| Method: <u>Peristaltic</u> |              |             |              |             |               |              |              |

**SAMPLE COLLECTION/ANALYSIS INFORMATION:**

**Dissolved Oxygen:**

Equipment: Chemetrics K-7501 or K-7512      Range:  0 - 1.0 mg/L      Analysis Time: 1541  
 1 - 12 mg/L  
 Concentration: 0.3 mg/L

Notes:

**Sulfide (S<sup>2-</sup>):**

Equipment: DR-890      Analysis Time: 1555  
 Program/Module: 93 / 610 nm      Concentration: 0.15 mg/L

Notes:

**Carbon Dioxide:**

Equipment: (Range: 0 to 100 mg/L)      Analysis Time: 1549  
 CHEMetrics K1910, K1920, or K1925.      Concentration: 60 mg/L

Notes:

**Alkalinity:**

Equipment: (Range: 0 to 100 mg/L)      Analysis Time: 1545  
 CHEMetrics K9810, K9815, or K9820.      Concentration: 0 mg/L

Notes:

**Ferrous Iron (Fe<sup>2+</sup>):**

Equipment: DR-890      IR-18C Color Wheel      Analysis Time: \_\_\_\_\_  
 Program/Module: 33 / 500nm      Concentration: \_\_\_\_\_ mg/L  
 Filtered:

Notes:

**Hydrogen Sulfide (H<sub>2</sub>S):**

Equipment: HS-C      Analysis Time: \_\_\_\_\_  
 Exceeded 5.0 mg/L range on color chart:       Concentration: \_\_\_\_\_ mg/L

Notes:

**QA/QC Checklist:**

- All data fields have been completed as necessary:
- Correct measurement units are cited in the SAMPLING DATA block:
- Multiplication is correct for each *Multiplier* table:
- Final concentration is within the appropriate *Range Used* block:
- QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents:
- Title block is initialized by person who performed the QA/QC Checklist:

**Tetra Tech NUS / FDEP Groundwater Sampling Sheet**

|                                |  |
|--------------------------------|--|
| SITE NAME: <b>G82/BP Wells</b> | SITE LOCATION: <b>NAS Cecil Field</b>  |
| WELL NO: <b>CEF-G82-3S</b>     | SAMPLE ID: <b>CEF-G82-3S-200910 33</b> |
| DATE: <b>10/22</b> / 2009      |  |

**PURGING DATA**

|   |   |  |                             |  |                     |              |               |                         |                  |              |              |
|---|---|--|-----------------------------|--|---------------------|--------------|---------------|-------------------------|------------------|--------------|--------------|
| WELL DIAMETER (in): <b>2</b>  | TUBING DIAMETER (inches): <b>3/16</b>                 | WELL SCREEN INTERVAL DEPTH: <b>4 - 14'</b> | STATIC DEPTH TO WATER (ft): | PURGE PUMP TYPE OR BAILER: <b>Peristaltic Pump</b> |                     |              |               |                         |                  |              |              |
| WELL VOLUME PURGE: <b>1</b> WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY<br>only fill out if applicable<br>$3 \times 13.71 = 4.57$ Liters $14 - 6.45 = 7.55 \times .16 = 1.208 \times 3.785 = 4.576$  |   |  |                             |  |                     |              |               |                         |                  |              |              |
| EQUIPMENT VOLUME PURGE: <b>1</b> EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME<br>(only fill out if applicable)   |   |  |                             |  |                     |              |               |                         |                  |              |              |
| INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>7.5</b>   | FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>7.5</b> | PURGE INITIATED AT: <b>0925</b>            | PURGE ENDED AT: <b>1026</b> | TOTAL VOLUME PURGED (Liters): <b>13.8</b>          |                     |              |               |                         |                  |              |              |
| TIME  | VOLUME PURGED (Liters)                                | CUMUL. VOLUME PURGED (Liters)              | PURGE RATE (mlpm)           | DEPTH TO WATER (ft)                                | pH (standard units) | TEMP. (°C)   | COND. (µS/cm) | DISSOLVED OXYGEN (mg/L) | TURBIDITY (NTUs) | ORP (mV)     | COLOR        |
| <b>0925</b>   | —   | —  | <b>200</b>                  | —  | —                   | —            | —             | —                       | —                | —            | —            |
| <b>1010</b>   | <b>9.0</b>  | <b>9.0</b>                                 | <b>300</b>                  | <b>6.59</b>  | <b>6.03</b>         | <b>25.33</b> | <b>0.254</b>  | <b>0.33</b>             | <b>6.45</b>      | <b>143.3</b> | <b>clear</b> |
| <b>1020</b>   | <b>3.0</b>  | <b>12.0</b>                                | <b>300</b>                  | <b>6.59</b>  | <b>6.02</b>         | <b>25.34</b> | <b>0.254</b>  | <b>0.33</b>             | <b>6.05</b>      | <b>141.3</b> | <b>clear</b> |
| <b>1023</b>   | <b>.9</b>   | <b>12.9</b>                                | <b>300</b>                  | <b>6.59</b>  | <b>6.02</b>         | <b>25.34</b> | <b>0.254</b>  | <b>0.31</b>             | <b>5.47</b>      | <b>139.3</b> | <b>clear</b> |
| <b>1026</b>   | <b>.9</b>   | <b>13.8</b>                                | <b>300</b>                  | <b>6.58</b>  | <b>6.02</b>         | <b>25.35</b> | <b>0.254</b>  | <b>0.31</b>             | <b>5.19</b>      | <b>137.5</b> | <b>clear</b> |
| <b>1030</b>   | <b>Sample time</b>                                    |  |                             |  |                     |              |               |                         |                  |              |              |
| 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<br>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 |   |  |                             |  |                     |              |               |                         |                  |              |              |

**SAMPLING DATA**

|  |              |               |   |                                   |                               |                                     |                                 |   |                         |  |
|--|--------------|---------------|---|-----------------------------------|-------------------------------|-------------------------------------|---------------------------------|---|-------------------------|--|
| SAMPLED BY (PRINT) / AFFILIATION:<br>Jeff Krone Tetra Tech                                   |              |               | SAMPLER(S) SIGNATURES:<br>  |                                   |                               | SAMPLING INITIATED AT: <b>1030</b>  |                                 | SAMPLING ENDED AT: <b>1100</b>  |                         |  |
| PUMP OR TUBING DEPTH IN WELL (feet): <b>7.5</b>  |              |               | SAMPLE PUMP FLOW RATE (mL per minute): <b>200/300</b>                                 |                                   |                               | TUBING MATERIAL CODE: <b>Teflon</b> |                                 |   |                         |  |
| FIELD DECONTAMINATION: Y <input checked="" type="radio"/> N <input checked="" type="radio"/> |              |               | FIELD-FILTERED: Y <input checked="" type="radio"/> N <input checked="" type="radio"/> |                                   |                               | FILTRATION EQUIPMENT TYPE: _____    |                                 | DUPLICATE: Y <input type="radio"/> N <input checked="" type="radio"/> |                         |  |
| SAMPLE CONTAINER SPECIFICATION   |              |               |   | SAMPLE PRESERVATION               |                               |                                     | INTENDED ANALYSIS AND/OR METHOD |   | SAMPLING EQUIPMENT CODE |  |
| SAMPLE ID CODE   | # CONTAINERS | MATERIAL CODE | VOLUME  | PRESERVATIVE USED                 | TOTAL VOL ADDED IN FIELD (mL) | FINAL pH                            |                                 |   |                         |  |
| TRPH   | 2            | AG            | 1 L   | H <sub>2</sub> SO <sub>4</sub>    |                               |                                     | FL-PRO                          |   |                         |  |
| VOC's  | 3            | CG            | 40 ml   | HCl                               |                               |                                     | 8260B                           |   |                         |  |
| PAHS   | 1            | AG            | 1 L   | None                              |                               |                                     | 8270 SIM                        |   |                         |  |
| Sulfide  | 1            | PE            | 250 ml  | Zinc acetate and sodium hydroxide |                               |                                     | EPA method 376.1                |   |                         |  |
| Sulfate  | 1            | PE            | 500 ml  | None                              |                               |                                     | EPA method 300.00               |   |                         |  |
| Nitrate/Nitrite  |              |               |   |                                   |                               |                                     | EPA method 300.00               |   |                         |  |
| Alkalinity   |              |               |   |                                   |                               |                                     | EPA Method 310.0                |   |                         |  |
| Methane  | 2            | CG            | 40 ml   | None                              |                               |                                     | Method RSK 175                  |   |                         |  |

REMARKS:

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

**SAMPLING/PURGING EQUIPMENT CODES:** APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPF = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)



Tetra Tech NUS / FDEP Groundwater Sampling Sheet

|                                |  |                                       |  |
|--------------------------------|--|---------------------------------------|--|
| SITE NAME: <b>G82/BP Wells</b> |  | SITE LOCATION: <b>NAS Cecil Field</b> |  |
| WELL NO: <b>CEF-G82-4S</b>     |  | SAMPLE ID: <b>CEF-G82-4S-20091023</b> |  |
| DATE: <b>10/23/2009</b>        |  |                                       |  |

**PURGING DATA**

|   |   |  |   |  |                     |            |               |                         |                  |          |       |
|---|---|--|---|--|---------------------|------------|---------------|-------------------------|------------------|----------|-------|
| WELL DIAMETER (in): <b>2</b>  | TUBING DIAMETER (inches): <b>3/16</b>               | WELL SCREEN INTERVAL DEPTH: <b>5 - 15'</b> | STATIC DEPTH TO WATER (ft): <b>7.33</b> | PURGE PUMP TYPE OR BAILER: <b>Peristaltic Pump</b> |                     |            |               |                         |                  |          |       |
| WELL VOLUME PURGE: <b>1</b> WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY<br>only fill out if applicable<br>$4.6 = (15 - 7.33) \times 1.6 = 1.22 \times 3.785 = 4.6$<br>Liters   |   |  |   |  |                     |            |               |                         |                  |          |       |
| EQUIPMENT VOLUME PURGE: <b>1</b> EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME<br>(only fill out if applicable)   |   |  |   |  |                     |            |               |                         |                  |          |       |
| INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>3</b>   | FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>8</b> | PURGE INITIATED AT: <b>0850</b>            | PURGE ENDED AT: <b>0930</b>             | TOTAL VOLUME PURGED (Liters): <b>6.9</b>           |                     |            |               |                         |                  |          |       |
| TIME  | VOLUME PURGED (Liters)                              | CUMUL. VOLUME PURGED (Liters)              | PURGE RATE (mlpm)                       | DEPTH TO WATER (ft)                                | pH (standard units) | TEMP. (°C) | COND. (µS/cm) | DISSOLVED OXYGEN (mg/L) | TURBIDITY (NTUs) | ORP (mV) | COLOR |
| 0850  | —   | —  | 200                                     | —  | —                   | —          | —             | —                       | —                | —        | —     |
| 0920  | 6   | 6  | 200                                     | 7.44   | 5.15                | 28.31      | 0.155         | 1.40                    | 3.66             | 163.3    | clear |
| 0923  | 0.6   | 6.6  | 200                                     | 7.44   | 5.16                | 28.33      | 0.153         | 1.45                    | 1.79             | 149.0    | clear |
| 0926  | 0.6   | 7.2  | 200                                     | 7.44   | 5.16                | 28.33      | 0.153         | 1.44                    | 1.61             | 133.9    | clear |
| 0930  | 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<br>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 |   |  |   |  |                     |            |               |                         |                  |          |       |

**SAMPLING DATA**

|   |              |  |        |                                     |                                |          |                                 |  |                         |  |  |
|---|--------------|--|--------|-------------------------------------|--------------------------------|----------|---------------------------------|--|-------------------------|--|--|
| SAMPLED BY (PRINT) / AFFILIATION: <b>TiNUS/ Jeff Krone</b>                |              | SAMPLER(S) SIGNATURES:   |        | SAMPLING INITIATED AT: <b>0930</b>  | SAMPLING ENDED AT: <b>0950</b> |          |                                 |  |                         |  |  |
| PUMP OR TUBING DEPTH IN WELL (feet): <b>8</b>                             |              | SAMPLE PUMP FLOW RATE (mL per minute): <b>200</b>                  |        | TUBING MATERIAL CODE: <b>Teflon</b> |                                |          |                                 |  |                         |  |  |
| FIELD DECONTAMINATION: <b>Y</b> <input checked="" type="radio"/> <b>N</b> |              | FIELD-FILTERED: <b>Y</b> <input checked="" type="radio"/> <b>N</b> |        | FILTER SIZE: _____ µm               |                                |          |                                 |  |                         |  |  |
| DUPLICATE: <b>Y</b> <input checked="" type="radio"/> <b>N</b>             |              | FILTRATION EQUIPMENT TYPE: _____                                   |        |                                     |                                |          |                                 |  |                         |  |  |
| SAMPLE CONTAINER SPECIFICATION  |              |  |        | SAMPLE PRESERVATION                 |                                |          | INTENDED ANALYSIS AND/OR METHOD |  | SAMPLING EQUIPMENT CODE |  |  |
| SAMPLE ID CODE  | # CONTAINERS | MATERIAL CODE  | VOLUME | PRESERVATIVE USED                   | TOTAL VOL ADDED IN FIELD (mL)  | FINAL pH |                                 |  |                         |  |  |
| TRPH  | 2            | AG   | 1 L    | H <sub>2</sub> SO <sub>4</sub>      |                                |          | FL-PRO                          |  |                         |  |  |
| VOC's   | 3            | CG   | 40 ml  | HCl                                 |                                |          | 8260B                           |  |                         |  |  |
| PAHS  | 1            | AG   | 1 L    | None                                |                                |          | 8270 SIM                        |  |                         |  |  |
| REMARKS:  |              |  |        |                                     |                                |          |                                 |  |                         |  |  |

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

**SAMPLING/PURGING EQUIPMENT CODES:** APP = After Peristaltic Pump; B = Bailor; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump  
 RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)

**Tetra Tech NUS / FDEP Groundwater Sampling Sheet**

|                                |  |                                       |  |
|--------------------------------|--|---------------------------------------|--|
| SITE NAME: <b>G82/BP Wells</b> |  | SITE LOCATION: <b>NAS Cecil Field</b> |  |
| WELL NO: <b>CEF-G82-5S</b>     | SAMPLE ID: <b>CEF-G82-5S-200910 23</b> | DATE: <b>10/23/2009</b>               |  |

**PURGING DATA**

|  |   |  |   |  |                     |              |               |                         |                  |              |              |
|--|---|--|---|--|---------------------|--------------|---------------|-------------------------|------------------|--------------|--------------|
| WELL DIAMETER (in): <b>2</b>   | TUBING DIAMETER (inches): <b>3/16</b>               | WELL SCREEN INTERVAL DEPTH: <b>5 - 15'</b> | STATIC DEPTH TO WATER (ft): <b>7.26</b> | PURGE PUMP TYPE OR BAILER: <b>Peristaltic Pump</b> |                     |              |               |                         |                  |              |              |
| WELL VOLUME PURGE: <b>1</b> WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY<br>only fill out if applicable<br><b>4.68 Liters</b> <b>15 - 7.26 = 7.74 x .16 = 1.238 x 3.785 = 4.68</b> |   |  |   |  |                     |              |               |                         |                  |              |              |
| EQUIPMENT VOLUME PURGE: <b>1</b> EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME<br>(only fill out if applicable)  |   |  |   |  |                     |              |               |                         |                  |              |              |
| INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>8</b>  | FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>8</b> | PURGE INITIATED AT: <b>0845</b>            | PURGE ENDED AT: <b>1021</b>             | TOTAL VOLUME PURGED (Liters):                      |                     |              |               |                         |                  |              |              |
| TIME   | VOLUME PURGED (Liters)                              | CUMUL. VOLUME PURGED (Liters)              | PURGE RATE (mlpm)                       | DEPTH TO WATER (ft)                                | pH (standard units) | TEMP. (°C)   | COND. (µS/cm) | DISSOLVED OXYGEN (mg/L) | TURBIDITY (NTUs) | ORP (mV)     | COLOR        |
| <b>0845</b>  |   |  | <b>100</b>                              |  |                     |              |               |                         |                  |              |              |
| <b>1015</b>  | <b>9</b>  | <b>9</b>                                   | <b>200</b>                              | <b>7.34</b>  | <b>5.63</b>         | <b>27.61</b> | <b>0.154</b>  | <b>0.54</b>             | <b>2.39</b>      | <b>-10.5</b> | <b>clear</b> |
| <b>1018</b>  | <b>.6</b>   | <b>9.6</b>                                 | <b>200</b>                              | <b>7.34</b>  | <b>5.63</b>         | <b>27.62</b> | <b>0.156</b>  | <b>0.54</b>             | <b>2.26</b>      | <b>-11.4</b> | <b>clear</b> |
| <b>1021</b>  | <b>.6</b>   | <b>9.9</b>                                 | <b>200</b>                              | <b>7.34</b>  | <b>5.63</b>         | <b>27.62</b> | <b>0.155</b>  | <b>0.54</b>             | <b>1.98</b>      | <b>-0.3</b>  | <b>clear</b> |
| <b>1025</b>  | <b>Sample time</b>                                  |  |   |  |                     |              |               |                         |                  |              |              |
| WELL CAPACITY (Gallons Per Foot): <b>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</b>  |   |  |   |  |                     |              |               |                         |                  |              |              |
| TUBING INSIDE DIA. CAPACITY (Gal./Ft.): <b>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</b>   |   |  |   |  |                     |              |               |                         |                  |              |              |

**SAMPLING DATA**

|   |              |  |              |                                     |                                |          |                                 |  |                         |  |  |
|---|--------------|--|--------------|-------------------------------------|--------------------------------|----------|---------------------------------|--|-------------------------|--|--|
| SAMPLED BY (PRINT) / AFFILIATION:<br><b>Jeff Krone TINUS/</b>   |              | SAMPLER(S) SIGNATURES:<br>   |              | SAMPLING INITIATED AT: <b>1025</b>  | SAMPLING ENDED AT: <b>1040</b> |          |                                 |  |                         |  |  |
| PUMP OR TUBING DEPTH IN WELL (feet): <b>8</b>   |              | SAMPLER PUMP FLOW RATE (mL per minute): <b>100/200</b>                                   |              | TUBING MATERIAL CODE: <b>Teflon</b> |                                |          |                                 |  |                         |  |  |
| FIELD DECONTAMINATION: <b>Y</b> <input checked="" type="radio"/> <b>N</b> <input type="radio"/>   |              | FIELD-FILTERED: <b>Y</b> <input type="radio"/> <b>N</b> <input checked="" type="radio"/> |              | FILTER SIZE: _____ µm               |                                |          |                                 |  |                         |  |  |
| FILTRATION EQUIPMENT TYPE: _____  |              | DUPLICATE: <b>Y</b> <input type="radio"/> <b>N</b> <input checked="" type="radio"/>      |              |                                     |                                |          |                                 |  |                         |  |  |
| SAMPLE CONTAINER SPECIFICATION  |              |  |              | SAMPLE PRESERVATION                 |                                |          | INTENDED ANALYSIS AND/OR METHOD |  | SAMPLING EQUIPMENT CODE |  |  |
| SAMPLE ID CODE  | # CONTAINERS | MATERIAL CODE  | VOLUME       | PRESERVATIVE USED                   | TOTAL VOL ADDED IN FIELD (mL)  | FINAL pH |                                 |  |                         |  |  |
| <b>TRPH</b>   | <b>2</b>     | <b>AG</b>  | <b>1 L</b>   | <b>H<sub>2</sub>SO<sub>4</sub></b>  |                                |          | <b>FL-PRO</b>                   |  |                         |  |  |
| <b>VOC's</b>  | <b>3</b>     | <b>CG</b>  | <b>40 ml</b> | <b>HCl</b>                          |                                |          | <b>8260B</b>                    |  |                         |  |  |
| <b>PAHS</b>   | <b>1</b>     | <b>AG</b>  | <b>1 L</b>   | <b>None</b>                         |                                |          | <b>8270 SIM</b>                 |  |                         |  |  |
| REMARKS:  |              |  |              |                                     |                                |          |                                 |  |                         |  |  |
| MATERIAL CODES: <b>AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)</b>   |              |  |              |                                     |                                |          |                                 |  |                         |  |  |
| SAMPLING/PURGING EQUIPMENT CODES: <b>APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; RFPP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); VT = Vacuum Trap; O = Other (Specify)</b> |              |  |              |                                     |                                |          |                                 |  |                         |  |  |

**Tetra Tech NUS / FDEP Groundwater Sampling Sheet**

|                                   |  |
|-----------------------------------|--|
| SITE<br>NAME: <b>G82/BP Wells</b> | SITE<br>LOCATION: <b>NAS Cecil Field</b> |
| WELL NO: <b>CEF-G82-6S</b>        | SAMPLE ID: <b>CEF-G82-6S-20091023</b>    |
| DATE: <b>10/23/2009</b>           |  |

**PURGING DATA**

|   |  |   |   |  |                     |              |               |                         |                  |             |               |
|---|--|---|---|--|---------------------|--------------|---------------|-------------------------|------------------|-------------|---------------|
| WELL DIAMETER (in): <b>2</b>  | TUBING DIAMETER (inches): <b>3/16</b>                  | WELL SCREEN INTERVAL DEPTH: <b>5 - 15</b> | STATIC DEPTH TO WATER (ft): <b>9.91</b> | PURGE PUMP TYPE OR BAILER: <b>Peristaltic Pump</b> |                     |              |               |                         |                  |             |               |
| WELL VOLUME PURGE: <b>1</b> WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY<br>only fill out if applicable<br><b>3.08</b> $15 - 9.91 = 5.09 \times .16 = .8144 \times 3.785 = 3.08$ Liters   |  |   |   |  |                     |              |               |                         |                  |             |               |
| EQUIPMENT VOLUME PURGE: <b>1</b> EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME<br>(only fill out if applicable)<br>Liters   |  |   |   |  |                     |              |               |                         |                  |             |               |
| INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <b>10.5</b>  | FINAL PUMP OR TUBING DEPTH IN WELL (feet): <b>10.5</b> | PURGE INITIATED AT: <b>1010</b>           | PURGE ENDED AT: <b>1111</b>             | TOTAL VOLUME PURGED (Liters): <b>12.2</b>          |                     |              |               |                         |                  |             |               |
| TIME  | VOLUME PURGED (Liters)                                 | CUMUL. VOLUME PURGED (Liters)             | PURGE RATE (mlpm)                       | DEPTH TO WATER (ft)                                | pH (standard units) | TEMP. (°C)   | COND. (µS/cm) | DISSOLVED OXYGEN (mg/L) | TURBIDITY (NTUs) | ORP (mV)    | COLOR         |
| <b>1010</b>   |  |   | <b>200</b>                              |  |                     |              |               |                         |                  |             |               |
| <b>1105</b>   | <b>11</b>  | <b>11</b>                                 | <b>200</b>                              | <b>10.15</b>                                       | <b>5.75</b>         | <b>24.67</b> | <b>0.242</b>  | <b>0.36</b>             | <b>15.1</b>      | <b>94.2</b> | <b>cloudy</b> |
| <b>1108</b>   | <b>.6</b>  | <b>11.6</b>                               | <b>200</b>                              | <b>10.16</b>                                       | <b>5.76</b>         | <b>24.65</b> | <b>0.241</b>  | <b>0.35</b>             | <b>15.0</b>      | <b>95.0</b> | <b>clear</b>  |
| <b>1111</b>   | <b>.6</b>  | <b>12.2</b>                               | <b>200</b>                              | <b>10.16</b>                                       | <b>5.75</b>         | <b>24.68</b> | <b>0.241</b>  | <b>0.35</b>             | <b>15.2</b>      | <b>94.1</b> | <b>clear</b>  |
| <b>1115</b>   | <b>sample time</b>                                     |   |   |  |                     |              |               |                         |                  |             |               |
| WELL CAPACITY (Gallons Per Foot): <b>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</b><br>TUBING INSIDE DIA. CAPACITY (Gal./Ft.): <b>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</b> |  |   |   |  |                     |              |               |                         |                  |             |               |

**SAMPLING DATA**

|   |              |               |        |  |                               |          |                                     |                                 |   |                         |  |
|---|--------------|---------------|--------|--|-------------------------------|----------|-------------------------------------|---------------------------------|---|-------------------------|--|
| SAMPLED BY (PRINT) / AFFILIATION:<br>TINUS/ Jeff Krone  |              |               |        | SAMPLER(S) SIGNATURES:<br>   |                               |          | SAMPLING INITIATED AT: <b>1115</b>  |                                 | SAMPLING ENDED AT: <b>1130</b>                                |                         |  |
| PUMP OR TUBING DEPTH IN WELL (feet): <b>10.8</b>  |              |               |        | SAMPLE PUMP FLOW RATE (mL per minute): <b>200</b>                  |                               |          | TUBING MATERIAL CODE: <b>Teflon</b> |                                 |   |                         |  |
| FIELD DECONTAMINATION: <b>Y</b> <input checked="" type="radio"/> <b>N</b>   |              |               |        | FIELD-FILTERED: <b>Y</b> <input checked="" type="radio"/> <b>N</b> |                               |          | FILTER SIZE: _____ µm               |                                 | DUPLICATE: <b>Y</b> <input checked="" type="radio"/> <b>N</b> |                         |  |
| SAMPLE CONTAINER SPECIFICATION  |              |               |        | SAMPLE PRESERVATION  |                               |          |                                     | INTENDED ANALYSIS AND/OR METHOD |   | SAMPLING EQUIPMENT CODE |  |
| SAMPLE ID CODE  | # CONTAINERS | MATERIAL CODE | VOLUME | PRESERVATIVE USED  | TOTAL VOL ADDED IN FIELD (mL) | FINAL pH |                                     |                                 |   |                         |  |
| TRPH  | 2            | AG            | 1 L    | H <sub>2</sub> SO <sub>4</sub>                                     |                               |          | FL-PRO                              |                                 |   |                         |  |
| VOC's   | 3            | CG            | 40 ml  | HCl  |                               |          | 8260B                               |                                 |   |                         |  |
| PAHS  | 1            | AG            | 1 L    | None   |                               |          | 8270 SIM                            |                                 |   |                         |  |
| REMARKS:  |              |               |        |  |                               |          |                                     |                                 |   |                         |  |
| MATERIAL CODES: <b>AG</b> = Amber Glass; <b>CG</b> = Clear Glass; <b>PE</b> = Polyethylene; <b>PP</b> = Polypropylene; <b>S</b> = Silicone; <b>T</b> = Teflon; <b>O</b> = Other (Specify)   |              |               |        |  |                               |          |                                     |                                 |   |                         |  |
| SAMPLING/PURGING <b>APP</b> = After Peristaltic Pump; <b>B</b> = Bailor; <b>BP</b> = Bladder Pump; <b>ESP</b> = Electric Submersible Pump; <b>PP</b> = Peristaltic Pump<br>EQUIPMENT CODES: <b>RFPP</b> = Reverse Flow Peristaltic Pump; <b>SM</b> = Straw Method (Tubing Gravity Drain); <b>VT</b> = Vacuum Trap; <b>O</b> = Other (Specify) |              |               |        |  |                               |          |                                     |                                 |   |                         |  |