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NAS CECIL FIELD
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# POST-EXCAVATION GROUNDWATER MONITORING REPORT FIRST EVENT AT BUILDING 502 TANK 502 NAS CECIL FIELD FL

01/26/2011

TETRA TECH NUS

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PITT-11-10-065-Rev 1

January 26, 2011

Project Number 112G00378

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 IV Contract Number N62467-04-D-0055
Contract Task Order 0025

Subject: Post-Excavation Groundwater Monitoring Report, First Event
Building 502, Tank 502
Naval Air Station Cecil Field
Jacksonville, Florida

Dear Mr. Grabka:

Tetra Tech NUS, Inc. (Tetra Tech) is pleased to submit this Groundwater Monitoring Report for the referenced Contract Task Order for Building 502, Tank 502. This Post-Excavation Groundwater Monitoring Report was prepared for Naval Facilities Engineering Command Southeast (NAVFAC SE) under the Comprehensive Long-Term Environmental Action Navy (CLEAN) Contract Number N62467-04-D-0055.

The primary objective of current activities at this site is to conduct sampling of groundwater associated with the intermediate zone of the surficial aquifer. This First Post-Excavation Groundwater Sampling event was conducted based on Meeting Minute No. 2638 with Decision No. 788 from the Base Realignment and Closure (BRAC) Cleanup Team (BCT) August 11, 2010 meeting.

This Post-Excavation Groundwater Monitoring Report summarizes the field operations and analytical results for the subject site for the sampling event conducted on September 15 and 16, 2010.

## BACKGROUND

Building 502, Tank 502 is located in the main base area of the former Naval Air Station Cecil Field as shown in Figure 1. Tank 502, a 1,000-gallon fuel oil tank, was removed in 1997, and a subsequent site assessment was performed in 1998 by Harding Lawson Associates, Inc. (HLA). HLA recommended a soil source removal in the area immediately surrounding the former location of the fuel tank. The source removal was conducted in January 1999, and the following items were noted in the report by CH2M Hill Constructors, Inc. (CH2M Hill):

- The contaminated soil associated with Tank 502 was removed.

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- No free product was encountered in the excavation.
- Three monitoring wells (CEF-502-1S, CEF-502-2S, and CEF-502-5D) were abandoned because they were within the limits of the excavation.

In April 1999, a follow-up Site Assessment Report (SAR) recommended that No Further Action (NFA) be conducted with regard to soils at the site. The SAR recommended that groundwater monitoring only for natural attenuation take place because benzene, ethylbenzene, xylenes, naphthalene, and total petroleum hydrocarbons (TPH) were previously detected in excess of Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels (GCTLs). The SAR noted that wells CEF-502-2S and CEF-502-5D had been abandoned, and it recommended that those wells be replaced and monitored along with CEF-502-4S. The FDEP responded in July 1999 with a Monitoring Only Plan (MOP) approval letter that required semi-annual sampling of monitoring wells CEF-502-1S, CEF-502-2S, CEF-502-4S, and CEF-502-5D. HLA replaced abandoned wells CEF-502-2S and CEF-502-5D with CEF-502-6S and CEF-502-7D, respectively, before conducting the first semi-annual event in August 1999. Following the second semi-annual sampling event in March 2000, the FDEP agreed that groundwater monitoring should continue. However, the FDEP required that a monitoring well be installed in the former location of CEF-502-1S, and stipulated that samples from the well should be collected and analyzed for benzene, toluene, ethylbenzene, and total xylenes using United States Environmental Protection Agency (USEPA) Method 602; Polynuclear Aromatic Hydrocarbons (PAHs) using USEPA Method 8310; and TPH using the Florida Petroleum Range Organics (FL-PRO) method.

During March and April 2001, Tetra Tech conducted a supplemental site assessment in response to the FDEP recommendations regarding the 1999 SAR. Tetra Tech personnel supervised the installation of a replacement well for CEF-502-1S (designated CEF-502-1SR), and sampled that well, along with CEF-502-4S, CEF-502-6S, and CEF-502-7D for volatile organic compounds (VOCs), PAHs, and TPH as required in the MOP. The Supplemental SAR recommended several modifications to the monitoring program, including the installation and sampling of an additional well (CEF-502-8S), and sampling of an additional existing well (CEF-502-3S). The recommendations were approved by the FDEP on August 3, 2001, and were implemented during the next semi-annual sampling event in December 2001.

Four semi-annual groundwater monitoring events were conducted from June 6, 2002, through January 28, 2004. The Second Semi-Annual, Fourth Year Groundwater Monitoring Report indicated that concentrations of benzene, ethylbenzene, and total xylenes were less than their respective milestone objectives for Year 4. However, the concentrations of naphthalene and TPH in well CEF-502-1SR were greater than the Year 4 milestone objectives.

Because the concentrations of naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, and TPH continued to exceed GCTLs in monitoring well CEF-502-1SR, Tetra Tech recommended that semi-annual monitoring of existing wells be continued and also recommended additional characterization of a potential source of contamination contributing to CEF-502-1SR. This recommendation was discussed and approved at the December 2005 BCT meeting. In November 2006, Tetra Tech installed a total of ten soil borings in the vicinity of CEF-502-1SR. Based on the field screening results and visual observations, one soil sample was collected from each location and analyzed for PAHs using USEPA Method SW-846 8310 and for TPH using the FL-PRO method. In addition, one round of groundwater samples was collected from the six existing groundwater monitoring wells (CEF-502-1SR, CEF-502-3S, CEF-502-4S, CEF-502-6S, CEF-502-7D, and CEF-502-8S) at the time of the soil sampling. The samples were analyzed for VOCs using USEPA Method SW-846 8260B; PAHs including 1-methylnaphthalene and 2-methylnaphthalene using USEPA Method SW-846 8310; and TPH using FL-PRO.

During the November 2006 sampling event, TPH was detected in excess of its Soil Cleanup Target Level (SCTL) at soil borings CEF-502-SB06 [collected at 5 feet (ft) below ground surface (bgs)], CEF-502-SB07 (collected at 5 ft bgs), CEF-502-SB09 (collected at 3 ft bgs), and CEF-502-SB10 (collected at 5 ft bgs). Also during the November 2006 sampling event, 1-methylnaphthalene and 2-methylnaphthalene were

detected in monitoring well CEF-502-1SR at concentrations exceeding their respective GCTLs. Isopropylbenzene was also detected at levels greater than the GCTL in groundwater from wells CEF-502-1SR and CEF-502-4S. Based on these sampling results, Tetra Tech prepared a SAR Addendum (SARA), submitted May 11, 2007, recommending source removal in the vicinity of the soil borings in which TPH was detected at concentrations greater than the SCTL. The details of the excavation activities were further outlined in the Dig and Haul Package, Building 502, Tank 502, prepared by Tetra Tech and submitted on September 11, 2007.

Prior to the submittal of the SARA, the first semi-annual, sixth year sampling event was conducted in February 2007. Groundwater samples were collected from monitoring wells CEF-502-1SR, CEF-502-3S, CEF-502-4S, CEF-502-6S, CEF-502-7D, and CEF-502-8S. All samples were analyzed for VOCs using USEPA Method SW-846 8260B; PAHs using USEPA Method SW-846 8310; and TPH using the FL-PRO method. During this event, 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene were detected in monitoring well CEF-502-1SR at concentrations exceeding their respective GCTLs. All other analytes were either not detected or were detected at levels less than their respective GCTLs at CEF-502-1SR. The analytical results for the remaining wells (CEF-502-3S, CEF-502-4S, CEF-502-6S, CEF-502-7D, and CEF-502-8S) indicated that all analytes were either not detected or were detected at levels less than their respective GCTLs.

Based on the excavation details outlined in the Dig and Haul Package, an Excavation of Petroleum Contaminated Soil at Building 502 and 290A Work Plan was prepared by CH2M Hill and submitted in March 2010. Subsequent excavation activities were conducted in June 2010, removing approximately 90 cubic yards of contaminated soil in the vicinity of the soil boring locations where contamination was detected at levels greater than SCTLs during the November 2006 sampling event. A Source Removal Report detailing these activities was submitted by CH2M Hill in November 2010. Following excavation and site restoration by CH2M Hill, Tetra Tech installed monitoring well CEF-502-9S to replace monitoring well CEF-502-1SR, which was abandoned during excavation activities. The well completion log and field log sheets can be found in Attachment A.

## FIELD OPERATIONS

Groundwater samples were collected from monitoring wells CEF-502-3S, CEF-502-4S, CEF-502-6S, CEF-502-7D, and CEF-502-9S, on September 15 and 16, 2010 as identified in Decision No. 788 from the BCT August 11, 2010 meeting . Monitoring well locations are provided on Figure 2. The samples were placed on ice and shipped, via FedEx under chain of custody to Empirical Laboratories, Inc., in Nashville, Tennessee. The laboratory analyzed the samples for VOCs using USEPA Method SW-846 8260B; PAHs using USEPA Method SW-846 8270C; and TPH 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 the sample wells. On September 15, 2010, depth to water ranged from 4.89 feet below top of casing (btoc) (CEF-502-3S) to 5.86 feet btoc (CEF-502-9S). Depth to water measurements, top of casing elevations, and groundwater elevations are presented in Table 1. General sampling protocols were in accordance with FDEP Standard Operating Procedures (SOPs) and Tetra Tech SOP SA-1.1.

## RESULTS

The groundwater elevation data indicated that groundwater flow is to the west-southwest, which is consistent with the range of historical groundwater flow directions reported for this site. Table 1 provides the groundwater elevation data. A groundwater elevation contour map generated from September 2010 data is provided in Figure 3.

The analytical results for this event are summarized in Table 2, and the laboratory report is provided as Attachment B. The results indicate that all analytes were either not detected or detected at concentrations less than their respective GCTLs. Dibenzo(a,h)anthracene had an estimated result of 0.0271 J µg/L in monitoring well CEF-502-6S, which exceeds the FDEP GCTL; however, this value is below the practical quantitation limit (PQL) of 0.2 µg/L, the acceptable cleanup target level (CTL) as identified in the "Guidance for the Selection of Analytical Methods for Evaluation of Practical Quantitation Limits" (FDEP, 2004). Figure 4 presents the analytical results for this event. Table 3 presents the analytical results by monitoring well, including results from previous sampling events.

**CONCLUSIONS AND RECOMMENDATIONS**

Prior to excavation activities conducted in June 2010, contaminant levels of some select PAHs in groundwater at monitoring well CEF-502-1SR were consistently greater than their respective GCTLs. However, during the First Post-Excavation monitoring event after the excavation of contaminated soil at Building 502 and subsequent replacement of monitoring well CEF-502-1SR by CEF-502-9S, contaminant levels for all analytes in this well were either not detected or detected at levels less than their respective GCTLs. Furthermore, all analytes were either not detected or were detected at concentrations less than their respective GCTLs at all other monitoring wells sampled during this event (CEF-502-3S, CEF-502-4S, CEF-502-6S, and CEF-502-7D) as well.

It was recommended and agreed upon by the BCT on November 3, 2010 (Decision No. 791) that the Second Post-Excavation monitoring event be conducted in December 2010. This event shall consist of sampling monitoring wells CEF-502-3S, CEF-502-4S, CEF-502-6S, and CEF-502-9S. Groundwater samples will be analyzed for VOCs using USEPA Method SW-846 8260B; TPH using the FL-PRO method; and PAHs using USEPA Method SW-846 8270C. If the analytical results for the Second Post-Excavation monitoring event indicate that all analytes are at concentrations less than their respective GCTLs, a Site Rehabilitation Completion Report requesting NFA will be prepared.

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

Sincerely,

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

RS/clm

Enclosures (4)

c: A. Sanford, NAVFAC SE (1 copy)
M. Davidson, NAVFAC SE (electronic copy)
D. Vaughn-Wright, USEPA (electronic copy)
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S. Martin, NAVFAC Atlantic (electronic copy)
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**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 Post-Excavation Groundwater Monitoring Report, First Event (September 2010) was developed for Building 502, Tank 502 at the Former Naval Air Station Cecil Field, Jacksonville, Florida, and should not be construed to apply to any other site.

1/26/11

January 26, 2011
Robert Simolk, P.E.
P.E. License Number 61263

## REFERENCES


BCT (Base Realignment and Closure Cleanup Team), 2010. Minutes of Meeting. Minutes Reference No. 2638, Decision No. 788, August 11.

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Tetra Tech (Tetra Tech NUS, Inc.), 2001, Site Assessment Report Addendum for Building 502, Tank 502, Naval Air Station Cecil Field, Jacksonville, Florida.

Tetra Tech, 2007, Final Quarterly Groundwater Monitoring Report, First Quarter, Sixth Year, Building 502, Tank 502, Naval Air Station Cecil Field, Jacksonville, Florida.

Tetra Tech, 2007, Final Dig and Haul Package, Building 502, Tank 502, Naval Air Station Cecil Field, Jacksonville, Florida.

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# TABLES

**TABLE 1**
**GROUNDWATER ELEVATION AND MONITORING WELL CONSTRUCTION DATA**
**POST-EXCAVATION GROUNDWATER MONITORING REPORT**
**FIRST EVENT (SEPTEMBER 2010)**
**BUILDING 502, TANK 502**
**NAS CECIL FIELD**
**JACKSONVILLE, FLORIDA**

| Well Number | Total Depth (ft bgs) | Top of Casing Elevation (ft NAVD) | April 9, 2001 | | December 11, 2001 | | March 4, 2002 | | June 6, 2002 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Depth to Water (ft btoc) | Water Elevation (ft above msl) | Depth to Water (ft btoc) | Water Elevation (ft above msl) | Depth to Water (ft btoc) | Water Elevation (ft above msl) | Depth to Water (ft btoc) | Water Elevation (ft above msl) |
| CEF-502-1SR | 12.48 | 82.16 | 6.31 | 75.85 | 5.27 | 76.89 | 4.65 | 77.51 | 8.38 | 73.78 |
| CEF-502-3S | 12.22 | 80.68 | 5.03 | 75.65 | 3.77 | 76.91 | 3.03 | 77.65 | 7.14 | 73.54 |
| CEF-502-4S | 12.36 | 80.64 | 5.07 | 75.57 | 3.73 | 76.91 | 3.02 | 77.62 | 7.18 | 73.46 |
| CEF-502-6S | 14.8 | 81.63 | 5.72 | 75.91 | 5.2 | 76.43 | 4.64 | 76.99 | 7.9 | 73.73 |
| CEF-502-7D | 29.95 | 81.65 | 6.00 | 75.65 | 4.87 | 76.78 | 4.21 | 77.44 | 7.84 | 73.81 |
| CEF-502-8S | 13.57 | 81.75 | NM | NA | 4.83 | 76.92 | 4.14 | 77.61 | 8 | 73.75 |

| Well Number | Total Depth (ft bgs) | Top of Casing Elevation (ft NAVD) | December 20, 2002 | | June 24, 2003 | | January 28, 2004 | | November 20, 2006 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Depth to Water (ft btoc) | Water Elevation (ft above msl) | Depth to Water (ft btoc) | Water Elevation (ft above msl) | Depth to Water (ft btoc) | Water Elevation (ft above msl) | Depth to Water (ft btoc) | Water Elevation (ft above msl) |
| CEF-502-1SR | 12.48 | 82.16 | 4.77 | 77.39 | 5.62 | 76.54 | 8.36 | 73.8 | 9.4 | 72.76 |
| CEF-502-3S | 12.22 | 80.68 | 3.52 | 77.16 | 4.44 | 76.24 | 7.07 | 73.61 | 8.46 | 72.22 |
| CEF-502-4S | 12.36 | 80.64 | 3.54 | 77.1 | 5.45 | 75.19 | 7.17 | 73.47 | 8.6 | 72.04 |
| CEF-502-6S | 14.8 | 81.63 | 4.29 | 77.34 | 5.00 | 76.63 | 7.96 | 73.67 | 9.44 | 72.19 |
| CEF-502-7D | 29.95 | 81.65 | 4.62 | 77.03 | 5.41 | 76.24 | 7.98 | 73.67 | 9.59 | 72.06 |
| CEF-502-8S | 13.57 | 81.75 | 4.47 | 77.28 | 5.30 | 76.45 | 8.02 | 73.73 | 9.33 | 72.42 |

| Well Number | Total Depth (ft bgs) | Top of Casing Elevation (ft NAVD) | February 7, 2007 | | September 15, 2010 | |
|---|---|---|---|---|---|---|
| | | | Depth to Water (ft btoc) | Water Elevation (ft above msl) | Depth to Water (ft btoc) | Water Elevation (ft above msl) |
| CEF-502-1SR[(1)] | 12.48 | 82.16 | 9.11 | 73.05 | NM | NA |
| CEF-502-3S | 12.22 | 80.68 | 7.79 | 72.89 | 4.89 | 75.79 |
| CEF-502-4S | 12.36 | 80.64 | 7.87 | 72.77 | 4.95 | 75.69 |
| CEF-502-6S | 14.8 | 81.63 | 8.75 | 72.88 | 5.38 | 76.25 |
| CEF-502-7D | 29.95 | 81.65 | 8.78 | 72.87 | 5.81 | 75.84 |
| CEF-502-8S | 13.57 | 81.75 | 8.74 | 73.01 | NM | NA |
| CEF-502-9S[(1)] | 15.25 | 82.05 | NM | NA | 5.86 | 76.19 |

1 Well CEF-502-1SR was abanoned during June 2010 excavation activities and was replaced by well CEF-502-9S in September 2010

bgs = Below ground surface.

btoc = Below top of casing.

ft = Feet.

msl = Mean sea level.

NAVD = North American Vertical Datum, 1988.

NA = Not applicable.

NM = Not measured.

**TABLE 2**
**GROUNDWATER ANALYTICAL DATA**
**POST-EXCAVATION GROUNDWATER MONITORING REPORT**
**FIRST EVENT (SEPTEMBER 2010)**
**BUILDING 502, TANK 502**
**NAS CECIL FIELD**
**JACKSONVILLE, FLORIDA**

| CONSTITUENTS | FDEP GCTL | CEF -502- | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | MW-9S | | MW-3S | MW-4S | MW-6S | MW-7D | MW-8S |
| | | Sample | Duplicate | | | | | |
| | | 09/16/10 | 09/16/10 | 09/16/10 | 09/16/10 | 09/15/10 | 09/15/10 | NS |
| **VOLATILE ORGANICS (μg/L)** | | | | | | | | |
| 1,2,4-TRIMETHYLBENZENE | 10 | 0.415 J | 0.440 J | 0.3 U | 0.3 U | 0.3 U | 0.3 U | NS |
| 1,3,5-TRIMETHYLBENZENE | 10 | 0.396 J | 0.418 J | 0.3 U | 0.3 U | 0.3 U | 0.3 U | NS |
| BENZENE | 1 | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | NS |
| ETHYLBENZENE | 30 | 0.745 J | 0.787 J | 0.3 U | 0.3 U | 0.3 U | 0.3 U | NS |
| ISOPROPYLBENZENE | 0.8 | 0.376 J | 0.408 J | 0.3 U | 0.3 U | 0.3 U | 0.3 U | NS |
| TOTAL XYLENES | 20 | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | NS |
| **SEMIVOLATILE ORGANICS (μg/L)** | | | | | | | | |
| 1-METHYLNAPHTHALENE | 28 | 2.03 | 1.60 | 0.519 | 0.0546 J | 0.727 | 0.0187 U | NS |
| 2-METHYLNAPHTHALENE | 28 | 1.67 | 1.25 | 0.0547 J | 0.907 | 0.829 | 0.0187 U | NS |
| ACENAPHTHENE | 20 | 0.0185 U | 0.0187 U | 0.0614 J | 0.0296 J | 1.09 | 0.0187 U | NS |
| ANTHRACENE | 2100 | 0.0185 U | 0.0187 U | 0.0185 U | 0.0187 U | 0.0185 U | 0.0187 U | NS |
| DIBENZO(a,h)ANTHRACENE | 0.005 | 0.0185 U | 0.0187 U | 0.0185 U | 0.0187 U | 0.0271 J* | 0.0187 U | NS |
| FLUORENE | 280 | 0.0185 U | 0.0187 U | 0.0185 U | 0.0320 J | 0.0185 U | 0.0187 U | NS |
| NAPHTHALENE | 14 | 0.879 | 0.695 | 0.0711 J | 0.120 | 0.0185 U | 0.0187 U | NS |
| PHENANTHRENE | 210 | 0.0185 U | 0.459 | 0.0185 U | 0.0195 J | 0.0185 U | 0.0302 J | NS |
| **TOTAL PETROLEUM HYDROCARBONS (mg/L)** | | | | | | | | |
| TPH (C08-C40) | 5 | 2.36 | 2.26 | 0.330 | 0.0794 U | 0.652 | 0.787 U | NS |

* "Guidance for the Selection of Analytical Methods for the Evaluation of Practical Quantitation Limits" (FDEP, 2004) identifies a PQL for Dibenzo(a,h)anthracene of 0.2 μg/L. This alternate CTL is used for comparison of the estimated value.

CTL = Cleanup target level.
J = Estimated concentration.
NS = Not sampled.
μg/L = Micrograms per liter.
mg/L = Milligrams per liter.
PQL = Practical Quatitation Limit.
U = Not detected at associated detection limit.

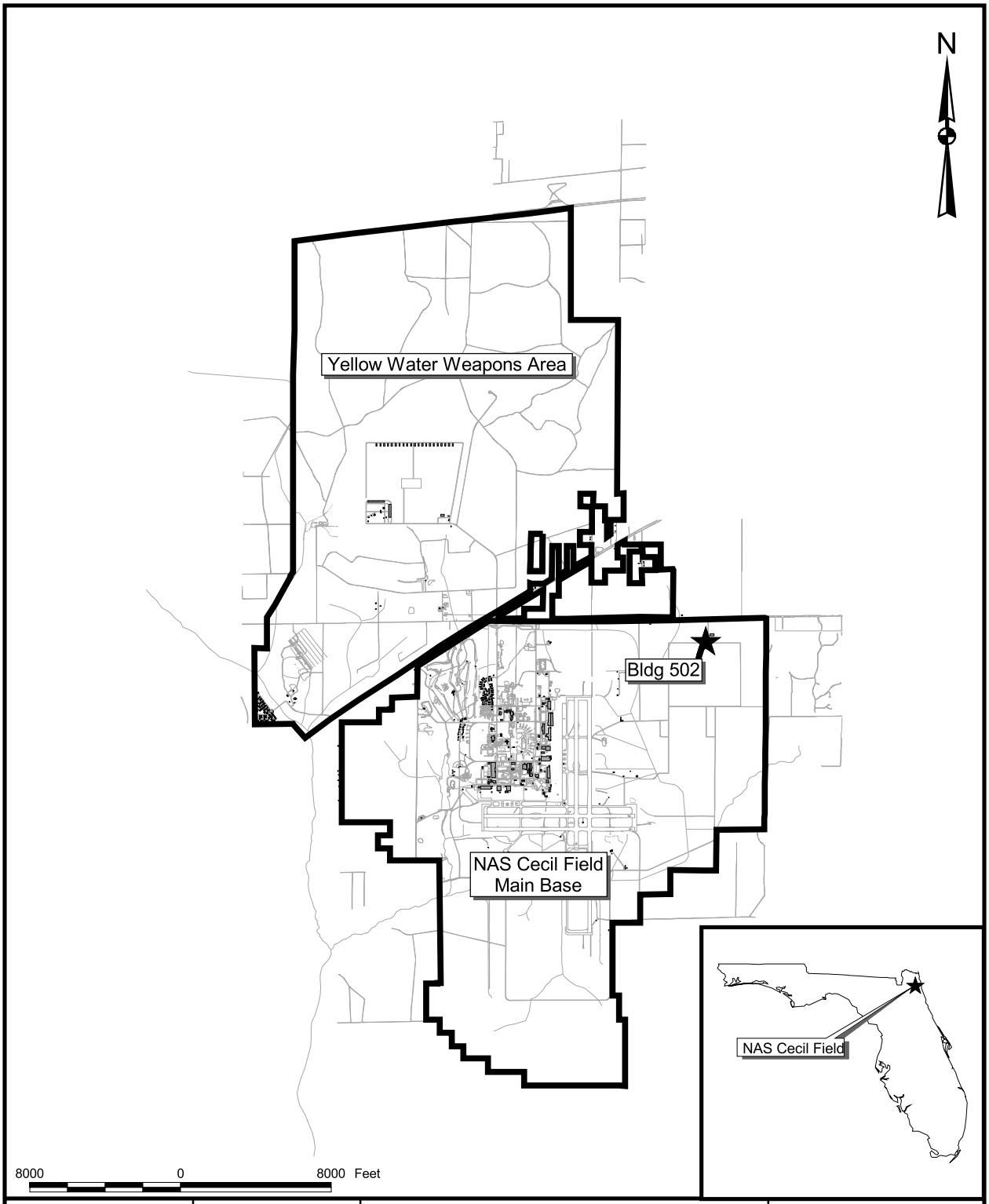
**TABLE 3**
**GROUNDWATER ANALYTICAL DATA BY WELLS**
**POST-EXCAVATION GROUNDWATER MONITORING REPORT**
**FIRST EVENT (SEPTEMBER 2010)**
**BUILDING 502, TANK 502**
**NAS CECIL FIELD**
**JACKSONVILLE, FLORIDA**

| CONSTITUENTS | FDEP GCTL | MW-1SR | | | | MW-9S | | MW-3S | | | | MW-4S | | | | MW-6S | | | | MW-7D | | | | MW-8S | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 01/28/04 | 11/21/06 | Sample 02/07/07 | Duplicate 02/07/07 | Sample 09/16/10 | Duplicate 09/16/10 | 01/28/04 | 11/21/06 | 02/07/07 | 09/16/10 | 01/28/04 | 11/21/06 | 02/07/07 | 09/16/10 | 01/28/04 | 11/21/06 | 02/07/07 | 09/15/10 | 01/28/04 | 11/21/06 | 02/07/07 | 09/15/10 | 01/28/04 | Sample 11/21/06 | Duplicate 11/21/06 | 02/07/07 |
| **VOLATILE ORGANICS (µg/L)** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1,2,4-TRIMETHYLBENZENE | 10 | NS | 6.9 | NS | NS | 0.415 J | 0.440 J | NS | 0.5 J | NS | 0.3 U | NS | 0.6 J | NS | 0.3 U | NS | 0.2 U | NS | 0.3 U | NS | 0.2 U | NS | 0.3 U | NS | 0.2 U | 0.2 U | NS |
| 1,3,5-TRIMETHYLBENZENE | 10 | NS | 2.8 | NS | NS | 0.396 J | 0.418 J | NS | 0.2 U | NS | 0.3 U | NS | 0.6 J | NS | 0.3 U | NS | 0.2 U | NS | 0.3 U | NS | 0.2 U | NS | 0.3 U | NS | 0.2 U | 0.2 U | NS |
| BENZENE | 1 | 0.5 U | 0.2 U | 0.50 U | 0.50 U | 0.3 U | 0.3 U | 0.5 U | 0.2 U | 0.50 U | 0.3 U | 0.5 U | 0.3 J | 0.50 U | 0.3 U | 0.5 U | 0.2 U | 0.50 U | 0.3 U | 0.5 U | 0.2 U | 0.50 U | 0.3 U | 0.5 U | 0.2 U | 0.2 U | 0.50 U |
| ETHYLBENZENE | 30 | 7.9 | **2.5** | 3.3 | 3.2 | 0.745 J | 0.787 J | 0.5 U | 0.3 U | 0.5 U | 0.3 U | 0.76 J | 2.2 | 3.7 | 0.3 U | 1.2 | 0.3 J | 0.5 U | 0.3 U | 0.5 U | 0.3 U | 0.5 | 0.3 U | 0.5 U | 0.3 U | 0.3 U | 0.5 U |
| ISOPROPYLBENZENE | 0.8 | NS | **2.7** | NS | NS | 0.376 J | 0.408 J | NS | 0.1 U | NS | 0.3 U | NS | **1.2** | NS | 0.3 U | NS | 0.4 J | NS | 0.3 U | NS | 0.1 U | NS | 0.3 U | NS | 0.1 U | 0.1 U | NS |
| TOTAL XYLENES | 20 | 1.8 J | 0.3 U | 1.0 U | 1.0 U | 0.3 U | 0.3 U | 1.0 U | 0.3 U | 1.0 U | 0.3 U | 1.0 U | 0.9 J | 1.0 U | 0.3 U | 1.0 U | 0.3 U | 1.0 U | 0.3 U | 1.0 U | 0.3 U | 1.0 U | 0.3 U | 1.0 U | 0.3 U | 0.3 U | 1.0 U |
| **SEMIVOLATILE ORGANICS (µg/L)** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1-METHYLNAPHTHALENE | 28 | **49.9** | **52.8 D** | **40.4** | **42.8** | 2.03 | 1.60 | 1.2 J | 6.46 | 0.49 U | 0.519 | 0.55 U | 1.48 | 1 | 0.0546 J | 4 | 1.95 | 1.5 | 0.727 | 0.53 U | 0.02 U | 0.5 U | 0.0187 U | 0.55 U | 0.02 U | 0.02 U | 0.49 U |
| 2-METHYLNAPHTHALENE | 28 | **105** | **110 D** | **64.3** | **67.2** | 1.67 | 1.25 | 0.51 U | 4.92 | 0.49 U | 0.0547 J | 1.8 J | 8.37 | 8.2 | 0.907 | 16.4 | 3.75 | 2.9 | 0.829 | 0.53 U | 0.02 U | 0.5 U | 0.0187 U | 0.55 U | 0.02 U | 0.02 U | 0.49 U |
| ACENAPHTHENE | 20 | 1.1 U | 1.72 | 3.5 | 2.8 | 0.0185 U | 0.0187 U | 1.0 U | 0.39 | 0.98 U | 0.0614 J | 1.1 U | 0.29 | 1 U | 0.0296 J | 1.1 U | 1.11 | 0.97 U | 1.09 | 1.1 U | 0.02 U | 0.99 U | 0.0187 U | 1.1 U | 0.02 U | 0.02 U | 0.99 U |
| ANTHRACENE | 2100 | 1.1 U | 0.07 J | 0.98 U | 0.98 U | 0.0185 U | 0.0187 U | 1.0 U | 0.02 U | 0.98 U | 0.0185 U | 1.1 U | 0.02 U | 1.0 U | 0.0187 U | 1.1 U | 0.02 U | 0.97 U | 0.0185 U | 1.1 U | 0.02 U | 0.99 U | 0.0187 U | 1.1 U | 0.02 U | 0.02 U | 0.98 U |
| DIBENZO(a,h)ANTHRACENE | 0.005 | 0.11 U | 0.02 U | 0.049 U | 0.049 U | 0.0185 U | 0.0187 U | 0.1 U | 0.02 U | 0.049 U | 0.0185 U | 0.11 U | 0.02 U | 0.052 U | 0.0187 U | 0.11 U | 0.02 U | 0.049 U | 0.0271 J* | 0.11 U | 0.02 U | 0.050 U | 0.0187 U | 0.11 U | 0.02 U | 0.02 U | 0.049 U |
| FLUORENE | 280 | 5 | 2.78 | 3.9 | 4 | 0.0185 U | 0.0187 U | 1.0 U | 0.58 | 0.98 U | 0.0185 U | 1.1 U | 0.22 | 1 U | 0.0320 J | 2.1 J | 2.16 | 1.9 | 0.0185 U | 1.1 U | 0.02 U | 0.99 U | 0.0187 U | 1.1 U | 0.02 U | 0.02 U | 0.99 U |
| NAPHTHALENE | 14 | **40.4** | 11.2 | **21.1** | **17.1** | 0.879 | 0.695 | 0.92 | 0.92 | 0.98 U | 0.0711 J | 0.55 U | 2.69 | 4.3 | 0.120 | 2.5 | 0.43 | 0.97 | 0.0185 U | 0.53 U | 0.02 U | 0.99 U | 0.0187 U | 0.55 U | 0.02 U | 0.02 U | 0.99 U |
| PHENANTHRENE | 210 | 6.1 | 2.4 | 3.1 | 3.8 | 0.0185 U | 0.459 | 1.0 U | 0.13 | 0.98 U | 0.0185 U | 1.1 U | 0.02 U | 1 U | 0.0195 J | 1.1 U | 0.08 J | 0.97 | 0.0185 U | 1.1 U | 0.02 U | 0.99 U | 0.0302 J | 1.1 U | 0.02 U | 0.02 U | 0.99 U |
| **TOTAL PETROLEUM HYDROCARBONS (mg/L)** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TPH (C08-C40) | 5 | **7.42** | 2.11 | 3.93 | 4.65 | 2.36 | 2.26 | 0.617 | 0.166 J | 0.526 | 0.330 | 0.667 | 0.496 | 1.07 | 0.0794 U | 0.815 | 0.33 | 0.794 | 0.652 | 0.27 U | 0.094 U | 0.16 U | 0.787 U | 0.303 | 0.094 U | 0.094 U | 0.17 U |

* "Guidance for the Selection of Analytical Methods for the Evaluation of Practical Quantitation Limits" (FDEP, 2004) identifies a PQL for Dibenzo(a,h)anthracene of 0.2 µg/L. This alternate CTL is used for comparison of the estimated value.

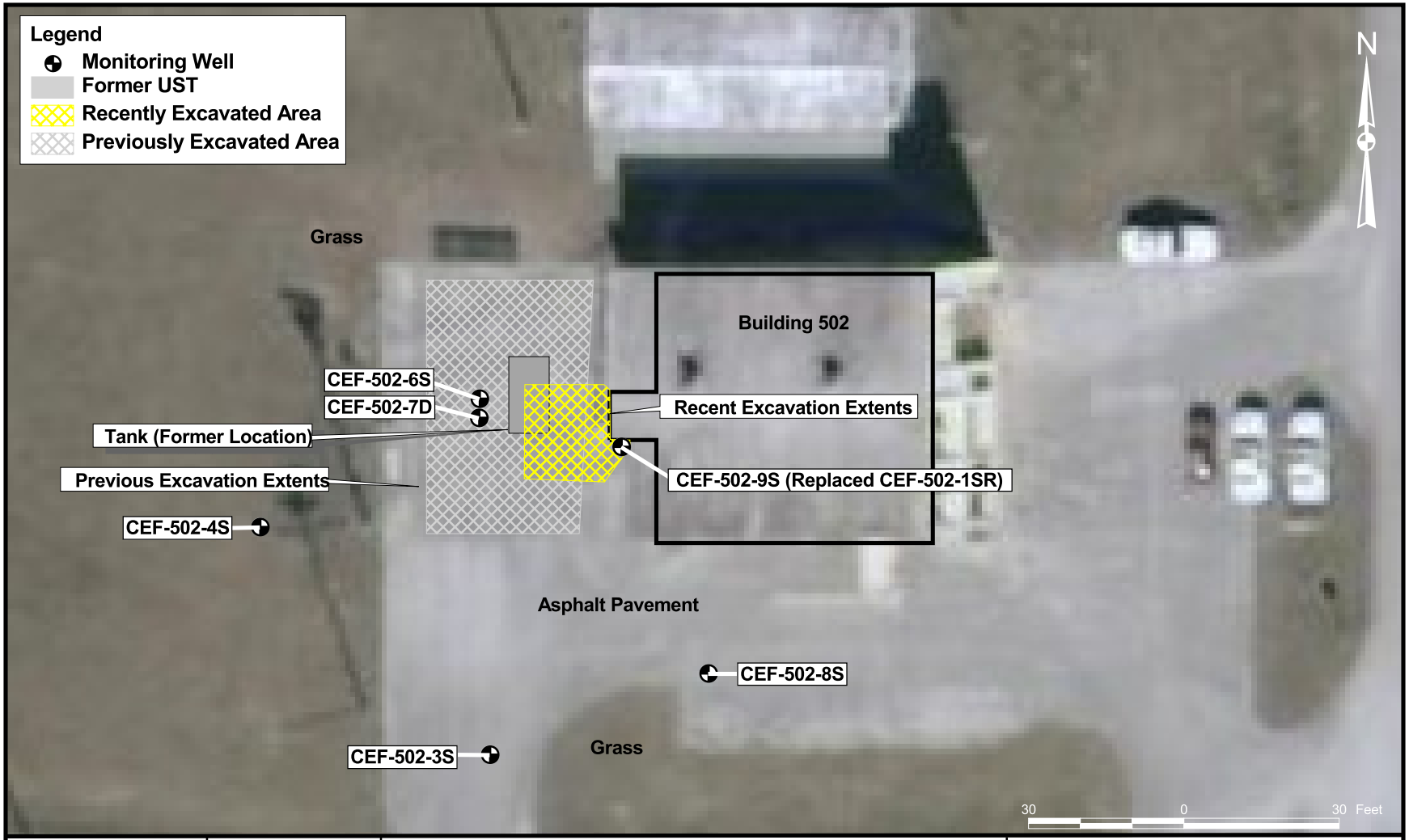
Concentration exceeds criterion.
CTL = Cleanup target level.
D = Data reported from a dilution.
J = Estimated concentration.
NS = Not sampled.
µg/L = Micrograms per liter.

# FIGURES



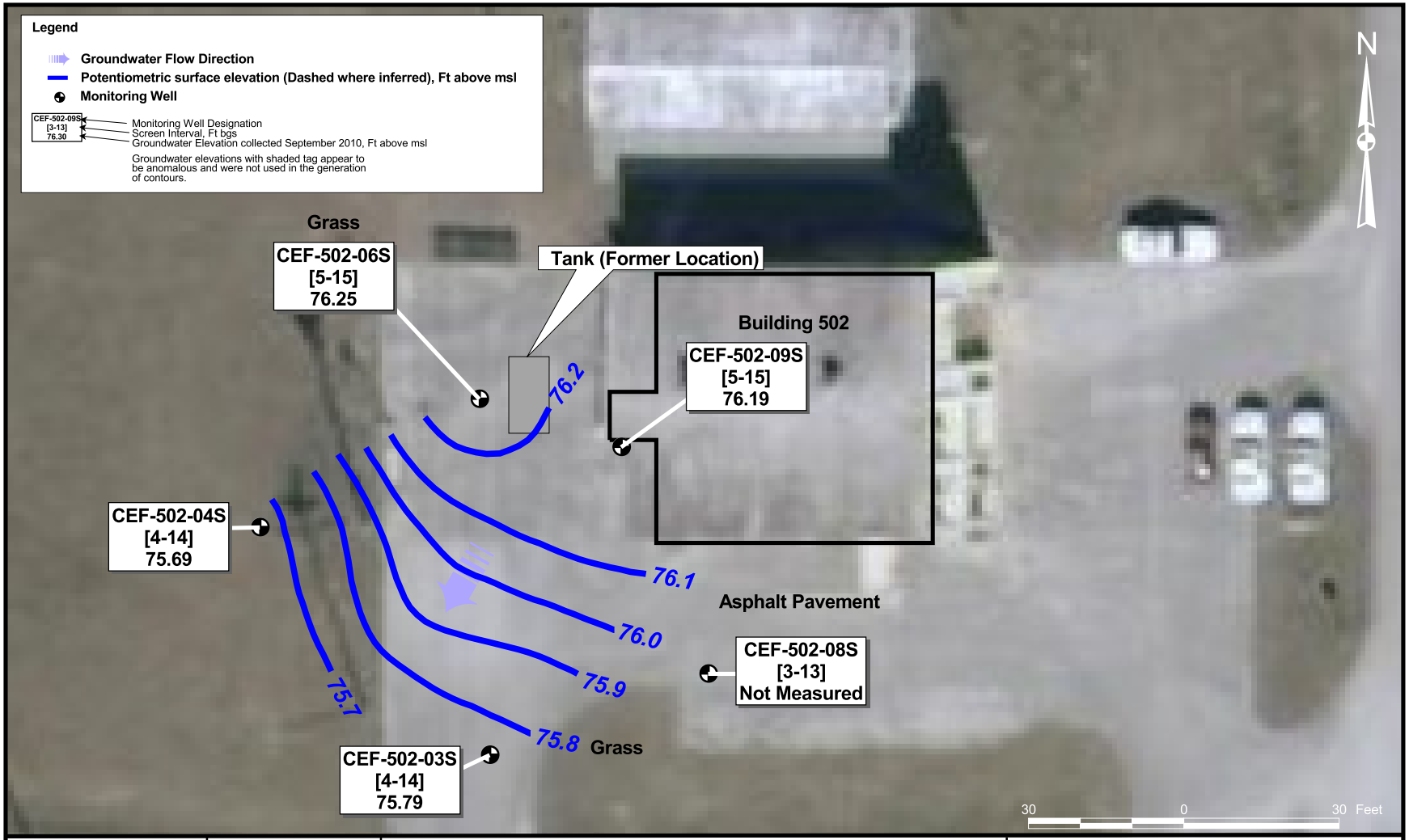

| | | | |
|---|---|---|---|
| DRAWN BY MJJ | DATE 12Nov10 | GENERAL LOCATION MAP<br>BUILDING 502<br>NAVAL AIR STATION CECIL FIELD<br>JACKSONVILLE, FLORIDA | CONTRACT NUMBER 0025 |
| CHECKED BY | DATE | | APPROVED BY DATE |
| COST/SCHEDULE-AREA | | | APPROVED BY DATE |
| SCALE AS NOTED | | | DRAWING NO. FIGURE 1 / REV 0 |

:\GIS\CECIL\Bldg0502.apr 19Nov10 MJJ Layout01




| | | | |
|---|---|---|---|
| DRAWN BY MJJ | DATE 12Nov10 | MONITORING WELL LOCATION MAP<br>BUILDING 502<br>NAVAL AIR STATION CECIL FIELD<br>JACKSONVILLE, FLORIDA | CONTRACT NUMBER 0025 |
| CHECKED BY | DATE | | APPROVED BY DATE |
| COST/SCHEDULE-AREA | | | APPROVED BY DATE |
| SCALE AS NOTED | | | DRAWING NO. FIGURE 2 / REV 0 |

:\GIS\CECIL\Bldg0502.apr 19Nov10 MJJ Layout03




| | | | |
|---|---|---|---|
| DRAWN BY MJJ | DATE 12Nov10 | POTENTIOMETRIC SURFACE ELEVATION MAP<br>SEPTEMBER 2010<br>BUILDING 502<br>NAVAL AIR STATION CECIL FIELD<br>JACKSONVILLE, FLORIDA | CONTRACT NUMBER 0025 |
| CHECKED BY | DATE | | APPROVED BY DATE |
| COST/SCHEDULE-AREA | | | APPROVED BY DATE |
| SCALE AS NOTED | | | DRAWING NO. FIGURE 3 / REV 0 |

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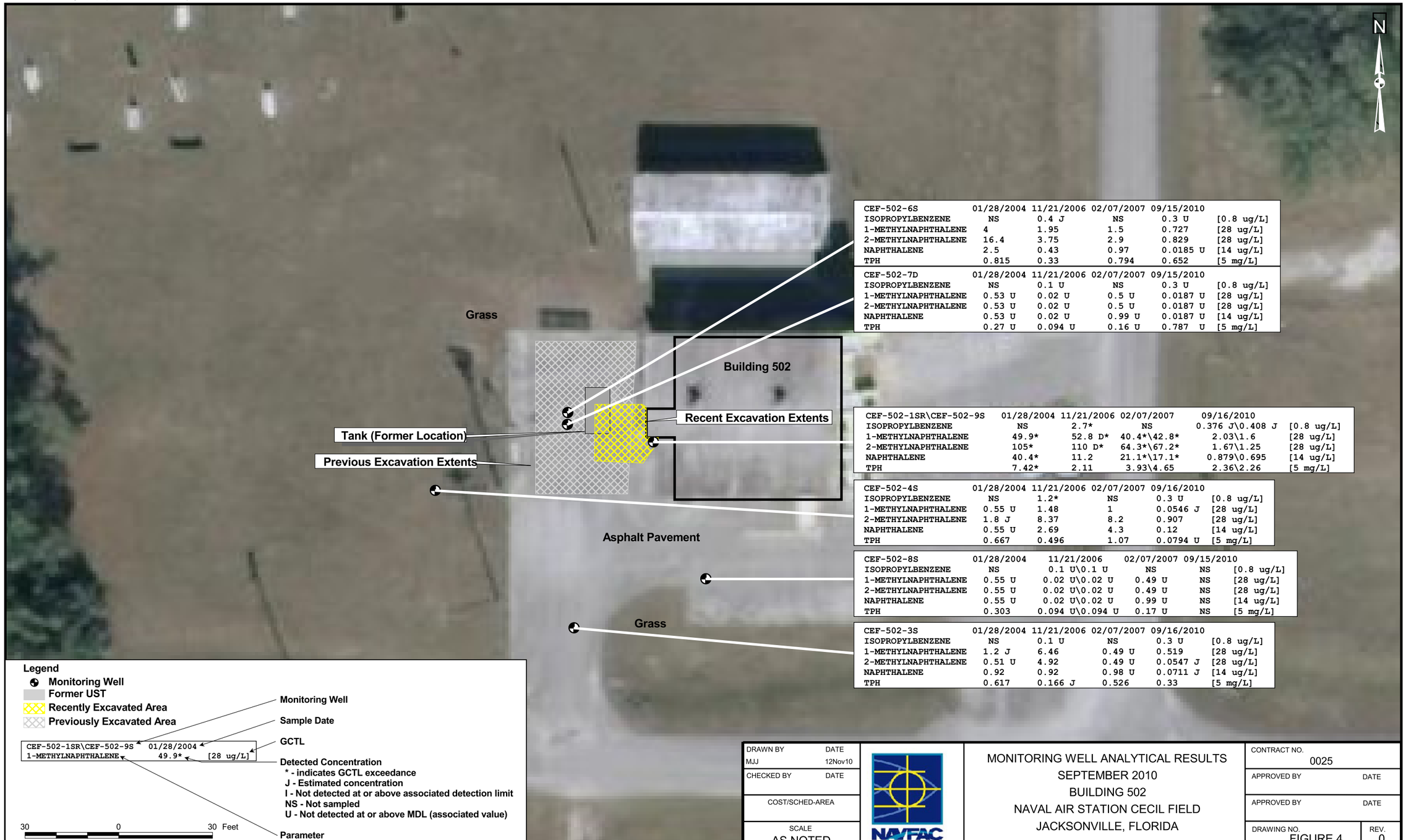
:\GIS\CECIL\Bldg0502.apr 19Nov10 MJJ Layout04




| CEF-502-6S | 01/28/2004 | 11/21/2006 | 02/07/2007 | 09/15/2010 | |
|---|---|---|---|---|---|
| ISOPROPYLBENZENE | NS | 0.4 J | NS | 0.3 U | [0.8 ug/L] |
| 1-METHYLNAPHTHALENE | 4 | 1.95 | 1.5 | 0.727 | [28 ug/L] |
| 2-METHYLNAPHTHALENE | 16.4 | 3.75 | 2.9 | 0.829 | [28 ug/L] |
| NAPHTHALENE | 2.5 | 0.43 | 0.97 | 0.0185 U | [14 ug/L] |
| TPH | 0.815 | 0.33 | 0.794 | 0.652 | [5 mg/L] |

| CEF-502-7D | 01/28/2004 | 11/21/2006 | 02/07/2007 | 09/15/2010 | |
|---|---|---|---|---|---|
| ISOPROPYLBENZENE | NS | 0.1 U | NS | 0.3 U | [0.8 ug/L] |
| 1-METHYLNAPHTHALENE | 0.53 U | 0.02 U | 0.5 U | 0.0187 U | [28 ug/L] |
| 2-METHYLNAPHTHALENE | 0.53 U | 0.02 U | 0.5 U | 0.0187 U | [28 ug/L] |
| NAPHTHALENE | 0.53 U | 0.02 U | 0.99 U | 0.0187 U | [14 ug/L] |
| TPH | 0.27 U | 0.094 U | 0.16 U | 0.787 U | [5 mg/L] |

| CEF-502-1SR\CEF-502-9S | 01/28/2004 | 11/21/2006 | 02/07/2007 | 09/16/2010 | |
|---|---|---|---|---|---|
| ISOPROPYLBENZENE | NS | 2.7* | NS | 0.376 J\0.408 J | [0.8 ug/L] |
| 1-METHYLNAPHTHALENE | 49.9* | 52.8 D* | 40.4*\42.8* | 2.03\1.6 | [28 ug/L] |
| 2-METHYLNAPHTHALENE | 105* | 110 D* | 64.3*\67.2* | 1.67\1.25 | [28 ug/L] |
| NAPHTHALENE | 40.4* | 11.2 | 21.1*\17.1* | 0.879\0.695 | [14 ug/L] |
| TPH | 7.42* | 2.11 | 3.93\4.65 | 2.36\2.26 | [5 mg/L] |

| CEF-502-4S | 01/28/2004 | 11/21/2006 | 02/07/2007 | 09/16/2010 | |
|---|---|---|---|---|---|
| ISOPROPYLBENZENE | NS | 1.2* | NS | 0.3 U | [0.8 ug/L] |
| 1-METHYLNAPHTHALENE | 0.55 U | 1.48 | 1 | 0.0546 J | [28 ug/L] |
| 2-METHYLNAPHTHALENE | 1.8 J | 8.37 | 8.2 | 0.907 | [28 ug/L] |
| NAPHTHALENE | 0.55 U | 2.69 | 4.3 | 0.12 | [14 ug/L] |
| TPH | 0.667 | 0.496 | 1.07 | 0.0794 U | [5 mg/L] |

| CEF-502-8S | 01/28/2004 | 11/21/2006 | 02/07/2007 | 09/15/2010 | |
|---|---|---|---|---|---|
| ISOPROPYLBENZENE | NS | 0.1 U\0.1 U | NS | NS | [0.8 ug/L] |
| 1-METHYLNAPHTHALENE | 0.55 U | 0.02 U\0.02 U | 0.49 U | NS | [28 ug/L] |
| 2-METHYLNAPHTHALENE | 0.55 U | 0.02 U\0.02 U | 0.49 U | NS | [28 ug/L] |
| NAPHTHALENE | 0.55 U | 0.02 U\0.02 U | 0.99 U | NS | [14 ug/L] |
| TPH | 0.303 | 0.094 U\0.094 U | 0.17 U | NS | [5 mg/L] |

| CEF-502-3S | 01/28/2004 | 11/21/2006 | 02/07/2007 | 09/16/2010 | |
|---|---|---|---|---|---|
| ISOPROPYLBENZENE | NS | 0.1 U | NS | 0.3 U | [0.8 ug/L] |
| 1-METHYLNAPHTHALENE | 1.2 J | 6.46 | 0.49 U | 0.519 | [28 ug/L] |
| 2-METHYLNAPHTHALENE | 0.51 U | 4.92 | 0.49 U | 0.0547 J | [28 ug/L] |
| NAPHTHALENE | 0.92 | 0.92 | 0.98 U | 0.0711 J | [14 ug/L] |
| TPH | 0.617 | 0.166 J | 0.526 | 0.33 | [5 mg/L] |

| | | | |
|---|---|---|---|
| DRAWN BY MJJ | DATE 12Nov10 | MONITORING WELL ANALYTICAL RESULTS<br>SEPTEMBER 2010<br>BUILDING 502<br>NAVAL AIR STATION CECIL FIELD<br>JACKSONVILLE, FLORIDA | CONTRACT NO. 0025 |
| CHECKED BY | DATE | | APPROVED BY / DATE |
| COST/SCHED-AREA | | | APPROVED BY / DATE |
| SCALE AS NOTED | NAVFAC | | DRAWING NO. FIGURE 4 / REV. 0 |

# ATTACHMENT A

## WELL COMPLETION LOG AND FIELD LOG SHEETS

Tetra Tech NUS, Inc.

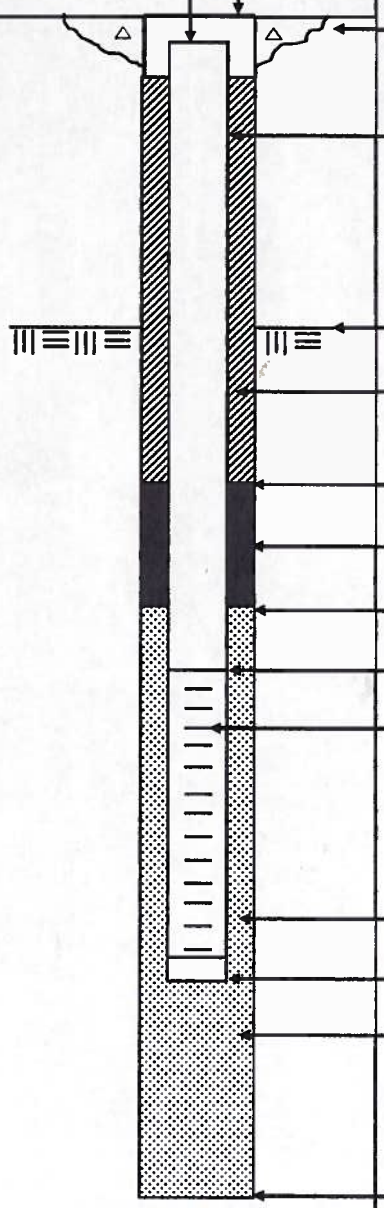
WELL No.: CCF-502-09S

## MONITORING WELL SHEET

| | | | |
|---|---|---|---|
| PROJECT NAS Cecil Field Site 502 | DRILLING Co.: Groundwater Protection | BORING No.: | 1 |
| PROJECT No. 2G00746 | DRILLER: Kevin | DATE COMPLETED: | 9/13/10 |
| SITE: 502 | DRILLING METHOD: Sonic | NORTHING: | 30°14.602' ~~30°12.601'~~ |
| GEOLOGIST: Jeff Krom | DEV. METHOD: | EASTING: | 81°51.281' ~~081°53.08~~ |

Ground Elevation =

Datum:



Not to Scale

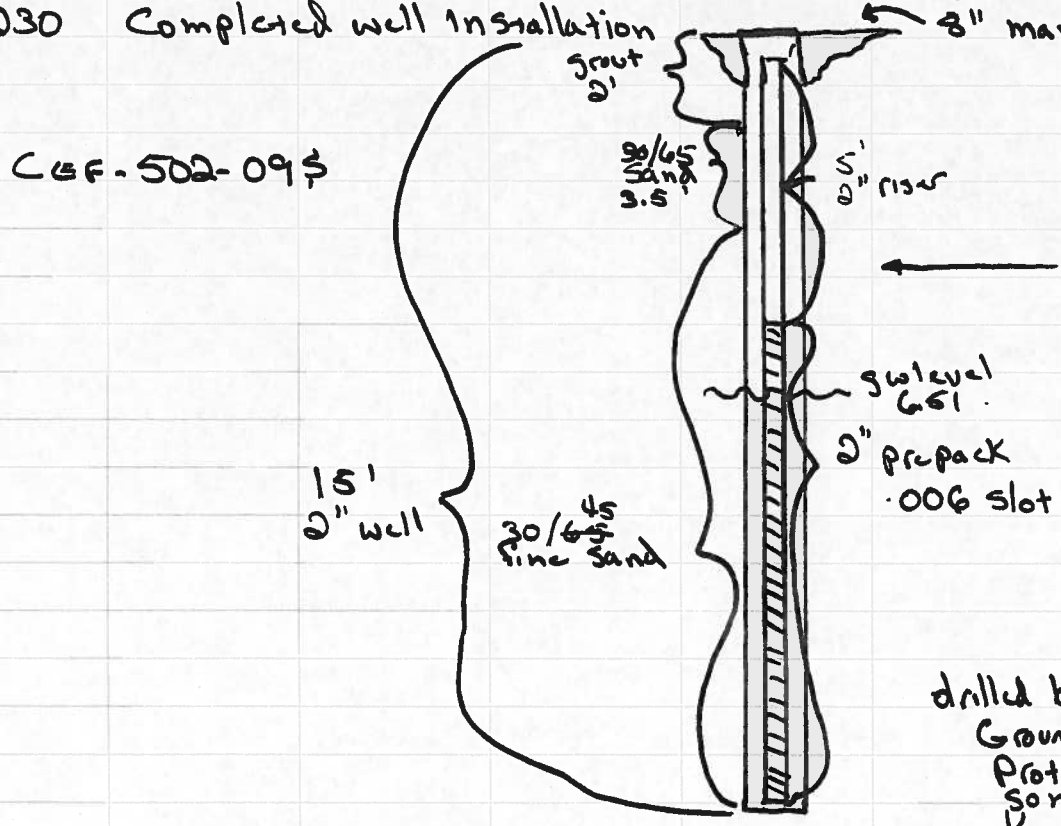
| | |
|---|---|
| Elevation / Depth of Top of Riser: | / |
| Elevation / Height of Top of Surface Casing: | / |
| I.D. of Surface Casing: | 8" |
| Type of Surface Casing: | 8" manhole / Steel |
| Type of Surface Seal: | 8" m Groot 2 1/2 |
| I.D. of Riser: | 2" |
| Type of Riser: | PVC |
| Borehole Diameter: | 6" |
| Elevation / Depth Top of Rock: | / |
| Type of Backfill: | Portland Cement 1/2 |
| Elevation / Depth of Seal: | 2 / 3.5 |
| Type of Seal: | fine sand 30/45 .5 |
| Elevation / Depth of Top of Filter Pack: | 3.5 / 15 |
| Elevation / Depth of Top of Screen: | / 5 |
| Type of Screen: | 2" Pre pack |
| Slot Size x Length: | .006 |
| I.D. of Screen: | 2" |
| Type of Filter Pack: | ~~Pre pack~~ 30/45 3.5 |
| Elevation / Depth of Bottom of Screen: | / 15 |
| Elevation / Depth of Bottom of Filter Pack: | / 15 |
| Type of Backfill Below Well: | none |
| Elevation / Total Depth of Borehole: | / 15 |

Pure sold lube

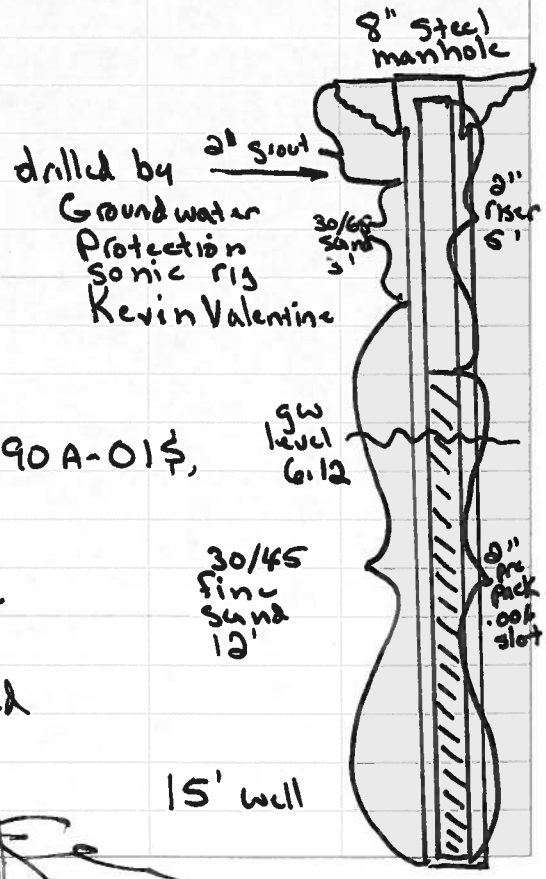
NAS Cecil Field CTO 076 112600746 Site SD2 290A Well Install 13 Sep 10

Personnel: Jeff Krone, Kevin Valentino, Robert Crandall, David Longino
Truck: 2006 F-250 and Groundwater Protection Vehicles
PPE: Level D
Weather: Partly Cloudy 88°
Objective: Well installation

0800 Departed office for Cecil Field
0900 On site awaiting well installers
1015 Well installers on site, obtained Contractor Passes.
1120 On site, obtained dig permit to proceed with well installations
1155 Began installation of well CEF-SD2-09$, see figure (below)
1230 Completed well installation




1250 Completed grouting
1350 arrived at Site 290 A
1409 Commenced drilling for well CEF-290A-01$, see figure (right)
1530 completed well and grouted
1630 Completed drilling operations, Groundwater protection crew departed Site
1700 Turned Contractor Passes and departed Cecil Field.



NAS Cecil Field CTO 076 112600746 Site 502 & 290A well development

Personnel: Jeff Krone (TtNUS) and Ricky Cisneros (GW Pro)
Truck: 2006 F-250 and GW Protection truck
PPE: Level D
Weather: Partly Cloudy 90°
Objective: Development of new wells 502-9S and 290A-1S

| | |
|---|---|
| 0830 | Departed office for Cecil Field |
| 0940 | Onsite, GW Protection crewman delayed due to mechanical problems. |
| 1215 | GW rep on site |
| 1220 | On well 502-9S, commenced purge |
| 1240 | Purged 40 gal, turbidity 10.97 NTU |
| 1245 | Purged 45 gal, turbidity 6.77 NTUs |
| 1300 | Purged 50 gal, turbidity 5.02 NTUs |
| 1310 | commenced purge of well 290A-01S, purged dry |
| 1330 | Purged 40 gal, turbidity 1428 NTUs |
| 1345 | Purged 50 gal, turbidity 777 NTUs, switched to drum 290A-5 |
| 1355 | purged dry again, allowed to recharge and resumed |
| 1605 | Purged 100 gal turbidity 120, Stopped purge |
| 1630 | Departed Cecil Field |

**ATTACHMENT B**

**GROUNDWATER ANALYTICAL REPORT**
**SEPTEMBER 2010**

**Tetra Tech NUS** **INTERNAL CORRESPONDENCE**

| | | | |
|---|---|---|---|
| **TO:** | **R. SIMCIK** | **DATE:** | **NOVEMBER 18, 2010** |
| **FROM:** | **MICHELLE ALLEN** | **COPIES:** | **DV FILE** |

**SUBJECT:** **ORGANIC DATA VALIDATION – VOC/PAH/PET**
**CTO 0025 ~~CTO-JM09~~, NAS CECIL FIELD**
**SDG CTOJM09CF_008**

**SAMPLES:** 9/Aqueous /VOC

| | | |
|---|---|---|
| CEF-290A-01S-20100915 | CEF-290A-DUP-20100915 | CEF-502-6S-20100915 |
| CEF-502-07D-20100915 | CEF-502-TB-20100915 | CEF-502-9S-20100915 |
| CEF-502-3S-20100916 | CEF-502-DUP-02-20100916 | CEF-502-4S-20100916 |

8/Aqueous/PAH/PET

| | | |
|---|---|---|
| CEF-290A-01S-20100915 | CEF-290A-DUP-20100915 | CEF-502-6S-20100915 |
| CEF-502-07D-20100915 | CEF-502-9S-20100915 | CEF-502-3S-20100916 |
| CEF-502-DUP-02-20100916 | CEF-502-4S-20100916 | |

OVERVIEW

The sample set for CTO ~~JM09~~ 0025 NAS Cecil Field SDG CTOJM09CF_008 consisted of nine (9) aqueous environmental samples including one (1) aqueous trip blank sample. The samples were analyzed as indicated above for volatile organic compounds (VOC), polynuclear aromatic hydrocarbons (PAH), and petroleum extractables (PET). The trip blank sample was only analyzed for VOC. Two field duplicate pairs were associated with this Sample Delivery Group (SDG), CEF-290A-01S-20100915/CEF-290A-DUP-20100915 and CEF-502-9S-20100916/CEF-502-DUP-02-20100916.

The samples were collected by TetraTech NUS on September 15 and 16, 2010 and analyzed by Empirical Laboratories, LLC. All analyses were conducted in accordance with SW-846 Methods 8260B, 8270C, and Method FL-PRO analytical and reporting protocols.

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

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

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

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

VOC

No issues were identified.

PAH

The compound phenanthrene was detected in sample CEF-502-9S-20100916, but not in the duplicate pair sample, CEF-502-DUP-02-20100916. The difference between the positive result and the non-detected result was greater than 2X the Reporting Limit (RL), therefore, the results for phenanthrene were qualified as estimated (J) and (UJ), respectively.

The Relative Percent Difference (%RPD) was greater than 30% for a few compounds in the field duplicate pair, CEF-290A-01S-20100915/CEF-290A-DUP-20100915. Additionally, several compounds were detected below the RL in sample CEF-290A-01S-20100915, but not detected in the duplicate pair sample, CEF-290A-DUP-20100915. No action was necessary since the difference between the positive results reported below the RL, and the difference between the positive and non-detected results did not exceed 2X the RL.

PET

No issues were identified.

NOTES

Positive results reported below the quantitation limit but above the method detection limit were qualified as estimated, (J).

EXECUTIVE SUMMARY

**Laboratory Performance Issues:** There were no laboratory issues.

**Other Factors Affecting Data Quality:** Field duplicate imprecision was noted for one PAH compound in one field duplicate pair. Positive results reported below the quantitation limit but above the method detection limit were qualified as estimated, (J).

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

Tetra Tech NUS
Michelle L. Allen
Chemist/Data Validator

TetraTech NUS

Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

Appendix A – Qualified Analytical Results
Appendix B – Results as Reported by the Laboratory
Appendix C – Support Documentation

# APPENDIX A

## QUALIFIED ANALYTICAL RESULTS

| PROJ_NO: 02267 | NSAMPLE | CEF-290A-01S-20100915 | | | CEF-290A-DUP-20100915 | | | CEF-502-07D-20100915 | | | CEF-502-3S-20100916 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SDG: CTOJM09CF008 | LAB_ID | 1009134-01 | | | 1009134-02 | | | 1009134-04 | | | 1009134-08 | | |
| FRACTION: OV | SAMP_DATE | 9/15/2010 | | | 9/15/2010 | | | 9/15/2010 | | | 9/16/2010 | | |
| MEDIA: WATER | QC_TYPE | NM | | | NM | | | NM | | | NM | | |
| | UNITS | UG/L | | | UG/L | | | UG/L | | | UG/L | | |
| | PCT_SOLIDS | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | | |
| | DUP_OF | | | | CEF-290A-01S-20100915 | | | | | | | | |
| PARAMETER | | RESULT | VQL | QLCD | RESULT | VQL | QLCD | RESULT | VQL | QLCD | RESULT | VQL | QLCD |
| 1,2,4-TRIMETHYLBENZENE | | 0.3 | U | | 0.3 | U | | 0.3 | U | | 0.3 | U | |
| 1,3,5-TRIMETHYLBENZENE | | 0.3 | U | | 0.3 | U | | 0.3 | U | | 0.3 | U | |
| BENZENE | | 0.3 | U | | 0.3 | U | | 0.3 | U | | 0.3 | U | |
| ETHYLBENZENE | | 0.3 | U | | 0.3 | U | | 0.3 | U | | 0.3 | U | |
| ISOPROPYLBENZENE | | 0.3 | U | | 0.3 | U | | 0.3 | U | | 0.3 | U | |
| TOLUENE | | 0.3 | U | | 0.3 | U | | 0.3 | U | | 0.3 | U | |
| TOTAL XYLENES | | 0.3 | U | | 0.3 | U | | 0.3 | U | | 0.3 | U | |

| PROJ_NO: 02267 | NSAMPLE | CEF-502-4S-20100916 | | | CEF-502-6S-20100915 | | | CEF-502-9S-20100916 | | | CEF-502-DUP-02-20100916 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SDG: CTOJM09CF008 | LAB_ID | 1009134-09 | | | 1009134-03 | | | 1009134-06 | | | 1009134-07 | | |
| FRACTION: OV | SAMP_DATE | 9/16/2010 | | | 9/15/2010 | | | 9/16/2010 | | | 9/16/2010 | | |
| MEDIA: WATER | QC_TYPE | NM | | | NM | | | NM | | | NM | | |
| | UNITS | UG/L | | | UG/L | | | UG/L | | | UG/L | | |
| | PCT_SOLIDS | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | | |
| | DUP_OF | | | | | | | | | | CEF-502-9S-20100916 | | |
| PARAMETER | | RESULT | VQL | QLCD | RESULT | VQL | QLCD | RESULT | VQL | QLCD | RESULT | VQL | QLCD |
| 1,2,4-TRIMETHYLBENZENE | | 0.3 | U | | 0.3 | U | | 0.415 | J | P | 0.44 | J | P |
| 1,3,5-TRIMETHYLBENZENE | | 0.3 | U | | 0.3 | U | | 0.396 | J | P | 0.418 | J | P |
| BENZENE | | 0.3 | U | | 0.3 | U | | 0.3 | U | | 0.3 | U | |
| ETHYLBENZENE | | 0.3 | U | | 0.3 | U | | 0.745 | J | P | 0.787 | J | P |
| ISOPROPYLBENZENE | | 0.3 | U | | 0.3 | U | | 0.376 | J | P | 0.408 | J | P |
| TOLUENE | | 0.3 | U | | 0.3 | U | | 0.3 | U | | 0.3 | U | |
| TOTAL XYLENES | | 0.3 | U | | 0.3 | U | | 0.3 | U | | 0.3 | U | |

| | | | | |
|---|---|---|---|---|
| **PROJ_NO: 02267** | NSAMPLE | CEF-502-TB-20100915 | | |
| **SDG: CTOJM09CF008** | LAB_ID | 1009134-05 | | |
| **FRACTION: OV** | SAMP_DATE | 9/15/2010 | | |
| **MEDIA: WATER** | QC_TYPE | NM | | |
| | UNITS | UG/L | | |
| | PCT_SOLIDS | 0.0 | | |
| | DUP_OF | | | |
| PARAMETER | | RESULT | VQL | QLCD |
| 1,2,4-TRIMETHYLBENZENE | | 0.3 | U | |
| 1,3,5-TRIMETHYLBENZENE | | 0.3 | U | |
| BENZENE | | 0.3 | U | |
| ETHYLBENZENE | | 0.3 | U | |
| ISOPROPYLBENZENE | | 0.3 | U | |
| TOLUENE | | 0.3 | U | |
| TOTAL XYLENES | | 0.3 | U | |

| PROJ_NO: 02267 | NSAMPLE | CEF-290A-01S-20100915 | | | CEF-290A-DUP-20100915 | | | CEF-502-07D-20100915 | | | CEF-502-3S-20100916 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SDG: CTOJM09CF008 | LAB_ID | 1009134-01 | | | 1009134-02 | | | 1009134-04 | | | 1009134-08 | | |
| FRACTION: PAH | SAMP_DATE | 9/15/2010 | | | 9/15/2010 | | | 9/15/2010 | | | 9/16/2010 | | |
| MEDIA: WATER | QC_TYPE | NM | | | NM | | | NM | | | NM | | |
| | UNITS | UG/L | | | UG/L | | | UG/L | | | UG/L | | |
| | PCT_SOLIDS | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | | |
| | DUP_OF | | | | CEF-290A-01S-20100915 | | | | | | | | |
| PARAMETER | | RESULT | VQL | QLCD | RESULT | VQL | QLCD | RESULT | VQL | QLCD | RESULT | VQL | QLCD |
| 1-METHYLNAPHTHALENE | | 0.0187 | U | | 0.0189 | U | | 0.0187 | U | | 0.519 | | |
| 2-METHYLNAPHTHALENE | | 0.0189 | J | P | 0.0189 | U | | 0.0187 | U | | 0.0547 | J | P |
| ACENAPHTHENE | | 0.0206 | J | P | 0.0189 | U | | 0.0187 | U | | 0.0614 | J | P |
| ACENAPHTHYLENE | | 0.0187 | U | | 0.0189 | U | | 0.0187 | U | | 0.0185 | U | |
| ANTHRACENE | | 0.0284 | J | P | 0.0189 | U | | 0.0187 | U | | 0.0185 | U | |
| BENZO(A)ANTHRACENE | | 0.0357 | J | P | 0.0189 | U | | 0.0187 | U | | 0.0185 | U | |
| BENZO(A)PYRENE | | 0.0316 | J | P | 0.0189 | U | | 0.0187 | U | | 0.0185 | U | |
| BENZO(B)FLUORANTHENE | | 0.0455 | J | P | 0.0189 | U | | 0.0187 | U | | 0.0185 | U | |
| BENZO(G,H,I)PERYLENE | | 0.0465 | J | P | 0.0189 | U | | 0.0187 | U | | 0.0185 | U | |
| BENZO(K)FLUORANTHENE | | 0.0427 | J | P | 0.0189 | U | | 0.0187 | U | | 0.0185 | U | |
| CHRYSENE | | 0.0425 | J | P | 0.0189 | U | | 0.019 | J | P | 0.0185 | U | |
| DIBENZO(A,H)ANTHRACENE | | 0.044 | J | P | 0.0189 | U | | 0.0187 | U | | 0.0185 | U | |
| FLUORANTHENE | | 0.0403 | J | P | 0.0196 | J | P | 0.0259 | J | P | 0.0218 | J | P |
| FLUORENE | | 0.0268 | J | P | 0.0189 | U | | 0.0187 | U | | 0.0185 | U | |
| INDENO(1,2,3-CD)PYRENE | | 0.0465 | J | P | 0.0189 | U | | 0.0187 | U | | 0.0185 | U | |
| NAPHTHALENE | | 0.0187 | U | | 0.0189 | U | | 0.0187 | U | | 0.0711 | J | P |
| PHENANTHRENE | | 0.0454 | J | P | 0.025 | J | P | 0.0302 | J | P | 0.0185 | U | |
| PYRENE | | 0.0421 | J | P | 0.0193 | J | P | 0.0289 | J | P | 0.0209 | J | P |

| PROJ_NO: 02267 | NSAMPLE | CEF-502-4S-20100916 | | | CEF-502-6S-20100915 | | | CEF-502-9S-20100916 | | | CEF-502-DUP-02-20100916 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SDG: CTOJM09CF008 | LAB_ID | 1009134-09 | | | 1009134-03 | | | 1009134-06 | | | 1009134-07 | | |
| FRACTION: PAH | SAMP_DATE | 9/16/2010 | | | 9/15/2010 | | | 9/16/2010 | | | 9/16/2010 | | |
| MEDIA: WATER | QC_TYPE | NM | | | NM | | | NM | | | NM | | |
| | UNITS | UG/L | | | UG/L | | | UG/L | | | UG/L | | |
| | PCT_SOLIDS | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | | |
| | DUP_OF | | | | | | | | | | CEF-502-9S-20100916 | | |
| PARAMETER | | RESULT | VQL | QLCD | RESULT | VQL | QLCD | RESULT | VQL | QLCD | RESULT | VQL | QLCD |
| 1-METHYLNAPHTHALENE | | 0.0546 | J | P | 0.727 | | | 2.03 | | | 1.6 | | |
| 2-METHYLNAPHTHALENE | | 0.907 | | | 0.829 | | | 1.67 | | | 1.25 | | |
| ACENAPHTHENE | | 0.0296 | J | P | 1.09 | | | 0.0185 | U | | 0.0187 | U | |
| ACENAPHTHYLENE | | 0.0187 | U | | 0.0185 | U | | 0.0185 | U | | 0.0187 | U | |
| ANTHRACENE | | 0.0187 | U | | 0.0185 | U | | 0.0185 | U | | 0.0187 | U | |
| BENZO(A)ANTHRACENE | | 0.0187 | U | | 0.0303 | J | P | 0.0185 | U | | 0.0187 | U | |
| BENZO(A)PYRENE | | 0.0187 | U | | 0.0223 | J | P | 0.0185 | U | | 0.0187 | U | |
| BENZO(B)FLUORANTHENE | | 0.0187 | U | | 0.0323 | J | P | 0.0185 | U | | 0.0187 | U | |
| BENZO(G,H,I)PERYLENE | | 0.0187 | U | | 0.0263 | J | P | 0.0185 | U | | 0.0187 | U | |
| BENZO(K)FLUORANTHENE | | 0.0187 | U | | 0.034 | J | P | 0.0185 | U | | 0.0187 | U | |
| CHRYSENE | | 0.0187 | U | | 0.0288 | J | P | 0.0185 | U | | 0.0187 | U | |
| DIBENZO(A,H)ANTHRACENE | | 0.0187 | U | | 0.0271 | J | P | 0.0185 | U | | 0.0187 | U | |
| FLUORANTHENE | | 0.0187 | U | | 0.0433 | J | P | 0.0185 | U | | 0.0187 | U | |
| FLUORENE | | 0.032 | J | P | 0.0185 | U | | 0.0185 | U | | 0.0187 | U | |
| INDENO(1,2,3-CD)PYRENE | | 0.0187 | U | | 0.0297 | J | P | 0.0185 | U | | 0.0187 | U | |
| NAPHTHALENE | | 0.12 | | | 0.0185 | U | | 0.879 | | | 0.695 | | |
| PHENANTHRENE | | 0.0195 | J | P | 0.0185 | U | | 0.0185 | UJ | G | 0.459 | J | G |
| PYRENE | | 0.0187 | U | | 0.0494 | J | P | 0.0185 | U | | 0.0187 | U | |

| PROJ_NO: 02267 | NSAMPLE | CEF-290A-01S-20100915 | | | CEF-290A-DUP-20100915 | | | CEF-502-07D-20100915 | | | CEF-502-3S-20100916 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SDG: CTOJM09CF008 | LAB_ID | 1009134-01 | | | 1009134-02 | | | 1009134-04 | | | 1009134-08 | | |
| FRACTION: PET | SAMP_DATE | 9/15/2010 | | | 9/15/2010 | | | 9/15/2010 | | | 9/16/2010 | | |
| MEDIA: WATER | QC_TYPE | NM | | | NM | | | NM | | | NM | | |
| | UNITS | MG/L | | | MG/L | | | MG/L | | | MG/L | | |
| | PCT_SOLIDS | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | | |
| | DUP_OF | | | | CEF-290A-01S-20100915 | | | | | | | | |
| PARAMETER | | RESULT | VQL | QLCD | RESULT | VQL | QLCD | RESULT | VQL | QLCD | RESULT | VQL | QLCD |
| TPH (C08-C40) | | 0.0794 | U | | 0.0787 | U | | 0.0787 | U | | 0.33 | | |

| PROJ_NO: 02267 | NSAMPLE | CEF-502-4S-20100916 | | | CEF-502-6S-20100915 | | | CEF-502-9S-20100916 | | | CEF-502-DUP-02-20100916 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SDG: CTOJM09CF008 | LAB_ID | 1009134-09 | | | 1009134-03 | | | 1009134-06 | | | 1009134-07 | | |
| FRACTION: PET | SAMP_DATE | 9/16/2010 | | | 9/15/2010 | | | 9/16/2010 | | | 9/16/2010 | | |
| MEDIA: WATER | QC_TYPE | NM | | | NM | | | NM | | | NM | | |
| | UNITS | MG/L | | | MG/L | | | MG/L | | | MG/L | | |
| | PCT_SOLIDS | 0.0 | | | 0.0 | | | 0.0 | | | 0.0 | | |
| | DUP_OF | | | | | | | | | | CEF-502-9S-20100916 | | |
| PARAMETER | | RESULT | VQL | QLCD | RESULT | VQL | QLCD | RESULT | VQL | QLCD | RESULT | VQL | QLCD |
| TPH (C08-C40) | | 0.0794 | U | | 0.652 | | | 2.36 | | | 2.26 | | |

# APPENDIX B

## RESULTS AS REPORTED BY THE LABORATORY

# ANALYSIS DATA SHEET

CEF-290A-01S-20100915

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-01 | File ID: | 0913401.D |
| Sampled: | 09/15/10 10:33 | Prepared: | 09/25/10 00:00 | Analyzed: | 09/25/10 20:23 |
| Solids: | | Preparation: | 5030B | Dilution: | 1 |

Batch: 0I25920 Sequence: 0I27008 Calibration: 0268001 Instrument: MS-VOA3

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 71-43-2 | Benzene | | 0.300 | 0.500 | 1.00 | U |
| 100-41-4 | Ethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 98-82-8 | Isopropylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 108-88-3 | Toluene | | 0.300 | 0.500 | 1.00 | U |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 1330-20-7 | Xylenes (total) | | 0.300 | 1.50 | 3.00 | U |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| Bromofluorobenzene | 30.00 | 30.74 | 102 | 75 - 120 | |
| Dibromofluoromethane | 30.00 | 33.52 | 112 | 85 - 115 | |
| 1,2-Dichloroethane-d4 | 30.00 | 29.54 | 98.5 | 70 - 120 | |
| Toluene-d8 | 30.00 | 28.20 | 94.0 | 85 - 120 | |

# ANALYSIS DATA SHEET

**CEF-290A-DUP-20100915**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-02 | File ID: | 0913402.D |
| Sampled: | 09/15/10 00:00 | Prepared: | 09/25/10 00:00 | Analyzed: | 09/25/10 20:54 |
| Solids: | | Preparation: | 5030B | Dilution: | 1 |

Batch: 0I25920 Sequence: 0I27008 Calibration: 0268001 Instrument: MS-VOA3

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 71-43-2 | Benzene | | 0.300 | 0.500 | 1.00 | U |
| 100-41-4 | Ethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 98-82-8 | Isopropylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 108-88-3 | Toluene | | 0.300 | 0.500 | 1.00 | U |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 1330-20-7 | Xylenes (total) | | 0.300 | 1.50 | 3.00 | U |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| Bromofluorobenzene | 30.00 | 30.80 | 103 | 75 - 120 | |
| Dibromofluoromethane | 30.00 | 33.25 | 111 | 85 - 115 | |
| 1,2-Dichloroethane-d4 | 30.00 | 30.99 | 103 | 70 - 120 | |
| Toluene-d8 | 30.00 | 28.51 | 95.0 | 85 - 120 | |

# ANALYSIS DATA SHEET

CEF-502-6S-20100915

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-03 | File ID: | 0913403.D |
| Sampled: | 09/15/10 13:23 | Prepared: | 09/25/10 00:00 | Analyzed: | 09/25/10 21:24 |
| Solids: | | Preparation: | 5030B | Dilution: | 1 |

Batch: 0I25920 Sequence: 0I27008 Calibration: 0268001 Instrument: MS-VOA3

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 71-43-2 | Benzene | | 0.300 | 0.500 | 1.00 | U |
| 100-41-4 | Ethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 98-82-8 | Isopropylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 108-88-3 | Toluene | | 0.300 | 0.500 | 1.00 | U |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 1330-20-7 | Xylenes (total) | | 0.300 | 1.50 | 3.00 | U |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| Bromofluorobenzene | 30.00 | 30.95 | 103 | 75 - 120 | |
| Dibromofluoromethane | 30.00 | 33.62 | 112 | 85 - 115 | |
| 1,2-Dichloroethane-d4 | 30.00 | 31.11 | 104 | 70 - 120 | |
| Toluene-d8 | 30.00 | 28.38 | 94.6 | 85 - 120 | |

# ANALYSIS DATA SHEET

CEF-502-07D-20100915

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-04 | File ID: | 0913404.D |
| Sampled: | 09/15/10 13:49 | Prepared: | 09/25/10 00:00 | Analyzed: | 09/25/10 21:55 |
| Solids: | | Preparation: | 5030B | Dilution: | 1 |

Batch: 0I25920 Sequence: 0I27008 Calibration: 0268001 Instrument: MS-VOA3

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 71-43-2 | Benzene | | 0.300 | 0.500 | 1.00 | U |
| 100-41-4 | Ethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 98-82-8 | Isopropylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 108-88-3 | Toluene | | 0.300 | 0.500 | 1.00 | U |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 1330-20-7 | Xylenes (total) | | 0.300 | 1.50 | 3.00 | U |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| Bromofluorobenzene | 30.00 | 31.49 | 105 | 75 - 120 | |
| Dibromofluoromethane | 30.00 | 33.99 | 113 | 85 - 115 | |
| 1,2-Dichloroethane-d4 | 30.00 | 30.11 | 100 | 70 - 120 | |
| Toluene-d8 | 30.00 | 28.73 | 95.8 | 85 - 120 | |

# ANALYSIS DATA SHEET

**CEF-502-TB-20100915**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Water | Laboratory ID: | 1009134-05 | File ID: | 0913405.D |
| Sampled: | 09/15/10 00:00 | Prepared: | 09/25/10 00:00 | Analyzed: | 09/25/10 22:25 |
| Solids: | | Preparation: | 5030B | Dilution: | 1 |

Batch: 0I25920 Sequence: 0I27008 Calibration: 0268001 Instrument: MS-VOA3

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 71-43-2 | Benzene | | 0.300 | 0.500 | 1.00 | U |
| 100-41-4 | Ethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 98-82-8 | Isopropylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 108-88-3 | Toluene | | 0.300 | 0.500 | 1.00 | U |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 1330-20-7 | Xylenes (total) | | 0.300 | 1.50 | 3.00 | U |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| Bromofluorobenzene | 30.00 | 31.76 | 106 | 75 - 120 | |
| Dibromofluoromethane | 30.00 | 34.29 | 114 | 85 - 115 | |
| 1,2-Dichloroethane-d4 | 30.00 | 29.45 | 98.2 | 70 - 120 | |
| Toluene-d8 | 30.00 | 28.69 | 95.6 | 85 - 120 | |

# ANALYSIS DATA SHEET

CEF-502-9S-20100916

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-06 | File ID: | 0913406.D |
| Sampled: | 09/16/10 11:45 | Prepared: | 09/25/10 00:00 | Analyzed: | 09/25/10 22:56 |
| Solids: | | Preparation: | 5030B | Dilution: | 1 |

Batch: 0I25920 Sequence: 0I27008 Calibration: 0268001 Instrument: MS-VOA3

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 71-43-2 | Benzene | | 0.300 | 0.500 | 1.00 | U |
| 100-41-4 | Ethylbenzene | 0.745 | 0.300 | 0.500 | 1.00 | I |
| 98-82-8 | Isopropylbenzene | 0.376 | 0.300 | 0.500 | 1.00 | I |
| 108-88-3 | Toluene | | 0.300 | 0.500 | 1.00 | U |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.396 | 0.300 | 0.500 | 1.00 | I |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.415 | 0.300 | 0.500 | 1.00 | I |
| 1330-20-7 | Xylenes (total) | | 0.300 | 1.50 | 3.00 | U |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| Bromofluorobenzene | 30.00 | 31.22 | 104 | 75 - 120 | |
| Dibromofluoromethane | 30.00 | 33.34 | 111 | 85 - 115 | |
| 1,2-Dichloroethane-d4 | 30.00 | 30.67 | 102 | 70 - 120 | |
| Toluene-d8 | 30.00 | 28.55 | 95.2 | 85 - 120 | |

# ANALYSIS DATA SHEET

**CEF-502-DUP-02-20100916**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-07 | File ID: | 0913407.D |
| Sampled: | 09/16/10 00:00 | Prepared: | 09/25/10 00:00 | Analyzed: | 09/25/10 23:26 |
| Solids: | | Preparation: | 5030B | Dilution: | 1 |

Batch: 0I25920 Sequence: 0I27008 Calibration: 0268001 Instrument: MS-VOA3

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 71-43-2 | Benzene | | 0.300 | 0.500 | 1.00 | U |
| 100-41-4 | Ethylbenzene | 0.787 | 0.300 | 0.500 | 1.00 | I |
| 98-82-8 | Isopropylbenzene | 0.408 | 0.300 | 0.500 | 1.00 | I |
| 108-88-3 | Toluene | | 0.300 | 0.500 | 1.00 | U |
| 108-67-8 | 1,3,5-Trimethylbenzene | 0.418 | 0.300 | 0.500 | 1.00 | I |
| 95-63-6 | 1,2,4-Trimethylbenzene | 0.440 | 0.300 | 0.500 | 1.00 | I |
| 1330-20-7 | Xylenes (total) | | 0.300 | 1.50 | 3.00 | U |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| Bromofluorobenzene | 30.00 | 31.65 | 105 | 75 - 120 | |
| Dibromofluoromethane | 30.00 | 33.00 | 110 | 85 - 115 | |
| 1,2-Dichloroethane-d4 | 30.00 | 30.28 | 101 | 70 - 120 | |
| Toluene-d8 | 30.00 | 28.78 | 95.9 | 85 - 120 | |

# ANALYSIS DATA SHEET

**CEF-502-3S-20100916**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-08 | File ID: | 0913408.D |
| Sampled: | 09/16/10 12:45 | Prepared: | 09/27/10 00:00 | Analyzed: | 09/27/10 12:06 |
| Solids: | | Preparation: | 5030B | Dilution: | 1 |

Batch: 0I27002 Sequence: 0I27013 Calibration: 0268001 Instrument: MS-VOA3

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 71-43-2 | Benzene | | 0.300 | 0.500 | 1.00 | U |
| 100-41-4 | Ethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 98-82-8 | Isopropylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 108-88-3 | Toluene | | 0.300 | 0.500 | 1.00 | U |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 1330-20-7 | Xylenes (total) | | 0.300 | 1.50 | 3.00 | U |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| Bromofluorobenzene | 30.00 | 32.15 | 107 | 75 - 120 | |
| Dibromofluoromethane | 30.00 | 34.04 | 113 | 85 - 115 | |
| 1,2-Dichloroethane-d4 | 30.00 | 30.64 | 102 | 70 - 120 | |
| Toluene-d8 | 30.00 | 28.94 | 96.5 | 85 - 120 | |

# ANALYSIS DATA SHEET

CEF-502-4S-20100916

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-09 | File ID: | 0913409.D |
| Sampled: | 09/16/10 13:35 | Prepared: | 09/27/10 00:00 | Analyzed: | 09/27/10 12:37 |
| Solids: | | Preparation: | 5030B | Dilution: | 1 |

Batch: 0I27002 Sequence: 0I27013 Calibration: 0268001 Instrument: MS-VOA3

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 71-43-2 | Benzene | | 0.300 | 0.500 | 1.00 | U |
| 100-41-4 | Ethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 98-82-8 | Isopropylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 108-88-3 | Toluene | | 0.300 | 0.500 | 1.00 | U |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 1330-20-7 | Xylenes (total) | | 0.300 | 1.50 | 3.00 | U |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| Bromofluorobenzene | 30.00 | 31.98 | 107 | 75 - 120 | |
| Dibromofluoromethane | 30.00 | 33.67 | 112 | 85 - 115 | |
| 1,2-Dichloroethane-d4 | 30.00 | 28.85 | 96.2 | 70 - 120 | |
| Toluene-d8 | 30.00 | 29.44 | 98.1 | 85 - 120 | |

# ANALYSIS DATA SHEET

**CEF-290A-01S-20100915**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-01 | File ID: | 0913401.D |
| Sampled: | 09/15/10 10:33 | Prepared: | 09/20/10 10:45 | Analyzed: | 09/24/10 14:57 |
| Solids: | | Preparation: | EXT_3510 | Dilution: | 1 |

Batch: 0I20006 Sequence: 0I26707 Calibration: 0237003 Instrument: MS-BNA4

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 83-32-9 | Acenaphthene | 0.0206 | 0.0187 | 0.0374 | 0.0935 | I |
| 208-96-8 | Acenaphthylene | | 0.0187 | 0.0374 | 0.0935 | U |
| 120-12-7 | Anthracene | 0.0284 | 0.0187 | 0.0374 | 0.0935 | I |
| 56-55-3 | Benzo(a)anthracene | 0.0357 | 0.0187 | 0.0374 | 0.0935 | N I |
| 50-32-8 | Benzo(a)pyrene | 0.0316 | 0.0187 | 0.0374 | 0.0935 | I |
| 205-99-2 | Benzo(b)fluoranthene | 0.0455 | 0.0187 | 0.0374 | 0.0935 | N I |
| 191-24-2 | Benzo(g,h,i)perylene | 0.0465 | 0.0187 | 0.0374 | 0.0935 | N I |
| 207-08-9 | Benzo(k)fluoranthene | 0.0427 | 0.0187 | 0.0374 | 0.0935 | N I |
| 218-01-9 | Chrysene | 0.0425 | 0.0187 | 0.0374 | 0.0935 | N I |
| 53-70-3 | Dibenz(a,h)anthracene | 0.0440 | 0.0187 | 0.0374 | 0.0935 | N I |
| 206-44-0 | Fluoranthene | 0.0403 | 0.0187 | 0.0374 | 0.0935 | I |
| 86-73-7 | Fluorene | 0.0268 | 0.0187 | 0.0374 | 0.0935 | I |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.0465 | 0.0187 | 0.0374 | 0.0935 | I |
| 90-12-0 | 1-Methylnaphthalene | | 0.0187 | 0.0374 | 0.0935 | U |
| 91-57-6 | 2-Methylnaphthalene | 0.0189 | 0.0187 | 0.0374 | 0.0935 | I |
| 91-20-3 | Naphthalene | | 0.0187 | 0.0374 | 0.0935 | U |
| 85-01-8 | Phenanthrene | 0.0454 | 0.0187 | 0.0374 | 0.0935 | I |
| 129-00-0 | Pyrene | 0.0421 | 0.0187 | 0.0374 | 0.0935 | I |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 46.73 | 26.03 | 55.7 | 34 - 167 | |
| Terphenyl-d14 | 46.73 | 17.94 | 38.4 | 34 - 167 | |

# ANALYSIS DATA SHEET

**CEF-290A-DUP-20100915**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-02 | File ID: | 0913402.D |
| Sampled: | 09/15/10 00:00 | Prepared: | 09/20/10 10:45 | Analyzed: | 09/24/10 15:26 |
| Solids: | | Preparation: | EXT_3510 | Dilution: | 1 |

Batch: 0I20006 Sequence: 0I26707 Calibration: 0237003 Instrument: MS-BNA4

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 83-32-9 | Acenaphthene | | 0.0189 | 0.0377 | 0.0943 | U |
| 208-96-8 | Acenaphthylene | | 0.0189 | 0.0377 | 0.0943 | U |
| 120-12-7 | Anthracene | | 0.0189 | 0.0377 | 0.0943 | U |
| 56-55-3 | Benzo(a)anthracene | | 0.0189 | 0.0377 | 0.0943 | U |
| 50-32-8 | Benzo(a)pyrene | | 0.0189 | 0.0377 | 0.0943 | U |
| 205-99-2 | Benzo(b)fluoranthene | | 0.0189 | 0.0377 | 0.0943 | U |
| 191-24-2 | Benzo(g,h,i)perylene | | 0.0189 | 0.0377 | 0.0943 | U |
| 207-08-9 | Benzo(k)fluoranthene | | 0.0189 | 0.0377 | 0.0943 | U |
| 218-01-9 | Chrysene | | 0.0189 | 0.0377 | 0.0943 | U |
| 53-70-3 | Dibenz(a,h)anthracene | | 0.0189 | 0.0377 | 0.0943 | U |
| 206-44-0 | Fluoranthene | 0.0196 | 0.0189 | 0.0377 | 0.0943 | I |
| 86-73-7 | Fluorene | | 0.0189 | 0.0377 | 0.0943 | U |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 0.0189 | 0.0377 | 0.0943 | U |
| 90-12-0 | 1-Methylnaphthalene | | 0.0189 | 0.0377 | 0.0943 | U |
| 91-57-6 | 2-Methylnaphthalene | | 0.0189 | 0.0377 | 0.0943 | U |
| 91-20-3 | Naphthalene | | 0.0189 | 0.0377 | 0.0943 | U |
| 85-01-8 | Phenanthrene | 0.0250 | 0.0189 | 0.0377 | 0.0943 | I |
| 129-00-0 | Pyrene | 0.0193 | 0.0189 | 0.0377 | 0.0943 | I |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 47.17 | 30.74 | 65.2 | 34 - 167 | |
| Terphenyl-d14 | 47.17 | 32.70 | 69.3 | 34 - 167 | |

# ANALYSIS DATA SHEET

CEF-502-07D-20100915

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-04 | File ID: | 0913404.D |
| Sampled: | 09/15/10 13:49 | Prepared: | 09/20/10 10:45 | Analyzed: | 09/24/10 16:23 |
| Solids: | | Preparation: | EXT_3510 | Dilution: | 1 |

Batch: 0I20006 Sequence: 0I26707 Calibration: 0237003 Instrument: MS-BNA4

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 83-32-9 | Acenaphthene | | 0.0187 | 0.0374 | 0.0935 | U |
| 208-96-8 | Acenaphthylene | | 0.0187 | 0.0374 | 0.0935 | U |
| 120-12-7 | Anthracene | | 0.0187 | 0.0374 | 0.0935 | U |
| 56-55-3 | Benzo(a)anthracene | | 0.0187 | 0.0374 | 0.0935 | U |
| 50-32-8 | Benzo(a)pyrene | | 0.0187 | 0.0374 | 0.0935 | U |
| 205-99-2 | Benzo(b)fluoranthene | | 0.0187 | 0.0374 | 0.0935 | U |
| 191-24-2 | Benzo(g,h,i)perylene | | 0.0187 | 0.0374 | 0.0935 | U |
| 207-08-9 | Benzo(k)fluoranthene | | 0.0187 | 0.0374 | 0.0935 | U |
| 218-01-9 | Chrysene | 0.0190 | 0.0187 | 0.0374 | 0.0935 | I |
| 53-70-3 | Dibenz(a,h)anthracene | | 0.0187 | 0.0374 | 0.0935 | U |
| 206-44-0 | Fluoranthene | 0.0259 | 0.0187 | 0.0374 | 0.0935 | I |
| 86-73-7 | Fluorene | | 0.0187 | 0.0374 | 0.0935 | U |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 0.0187 | 0.0374 | 0.0935 | U |
| 90-12-0 | 1-Methylnaphthalene | | 0.0187 | 0.0374 | 0.0935 | U |
| 91-57-6 | 2-Methylnaphthalene | | 0.0187 | 0.0374 | 0.0935 | U |
| 91-20-3 | Naphthalene | | 0.0187 | 0.0374 | 0.0935 | U |
| 85-01-8 | Phenanthrene | 0.0302 | 0.0187 | 0.0374 | 0.0935 | I |
| 129-00-0 | Pyrene | 0.0289 | 0.0187 | 0.0374 | 0.0935 | I |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 46.73 | 25.59 | 54.8 | 34 - 167 | |
| Terphenyl-d14 | 46.73 | 29.46 | 63.0 | 34 - 167 | |

# ANALYSIS DATA SHEET

**CEF-502-3S-20100916**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-08 | File ID: | 0913408.D |
| Sampled: | 09/16/10 12:45 | Prepared: | 09/20/10 10:45 | Analyzed: | 09/24/10 17:49 |
| Solids: | | Preparation: | EXT_3510 | Dilution: | 1 |

Batch: 0I20006 Sequence: 0I26707 Calibration: 0237003 Instrument: MS-BNA4

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 83-32-9 | Acenaphthene | 0.0614 | 0.0185 | 0.0370 | 0.0926 | I |
| 208-96-8 | Acenaphthylene | | 0.0185 | 0.0370 | 0.0926 | U |
| 120-12-7 | Anthracene | | 0.0185 | 0.0370 | 0.0926 | U |
| 56-55-3 | Benzo(a)anthracene | | 0.0185 | 0.0370 | 0.0926 | U |
| 50-32-8 | Benzo(a)pyrene | | 0.0185 | 0.0370 | 0.0926 | U |
| 205-99-2 | Benzo(b)fluoranthene | | 0.0185 | 0.0370 | 0.0926 | U |
| 191-24-2 | Benzo(g,h,i)perylene | | 0.0185 | 0.0370 | 0.0926 | U |
| 207-08-9 | Benzo(k)fluoranthene | | 0.0185 | 0.0370 | 0.0926 | U |
| 218-01-9 | Chrysene | | 0.0185 | 0.0370 | 0.0926 | U |
| 53-70-3 | Dibenz(a,h)anthracene | | 0.0185 | 0.0370 | 0.0926 | U |
| 206-44-0 | Fluoranthene | 0.0218 | 0.0185 | 0.0370 | 0.0926 | I |
| 86-73-7 | Fluorene | | 0.0185 | 0.0370 | 0.0926 | U |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 0.0185 | 0.0370 | 0.0926 | U |
| 90-12-0 | 1-Methylnaphthalene | 0.519 | 0.0185 | 0.0370 | 0.0926 | |
| 91-57-6 | 2-Methylnaphthalene | 0.0547 | 0.0185 | 0.0370 | 0.0926 | I |
| 91-20-3 | Naphthalene | 0.0711 | 0.0185 | 0.0370 | 0.0926 | I |
| 85-01-8 | Phenanthrene | | 0.0185 | 0.0370 | 0.0926 | U |
| 129-00-0 | Pyrene | 0.0209 | 0.0185 | 0.0370 | 0.0926 | I |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 46.30 | 26.32 | 56.9 | 34 - 167 | |
| Terphenyl-d14 | 46.30 | 27.42 | 59.2 | 34 - 167 | |

# ANALYSIS DATA SHEET

CEF-502-4S-20100916

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-09 | File ID: | 0913409.D |
| Sampled: | 09/16/10 13:35 | Prepared: | 09/20/10 10:45 | Analyzed: | 09/24/10 18:17 |
| Solids: | | Preparation: | EXT_3510 | Dilution: | 1 |

Batch: 0I20006 Sequence: 0I26707 Calibration: 0237003 Instrument: MS-BNA4

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 83-32-9 | Acenaphthene | 0.0296 | 0.0187 | 0.0374 | 0.0935 | I |
| 208-96-8 | Acenaphthylene | | 0.0187 | 0.0374 | 0.0935 | U |
| 120-12-7 | Anthracene | | 0.0187 | 0.0374 | 0.0935 | U |
| 56-55-3 | Benzo(a)anthracene | | 0.0187 | 0.0374 | 0.0935 | U |
| 50-32-8 | Benzo(a)pyrene | | 0.0187 | 0.0374 | 0.0935 | U |
| 205-99-2 | Benzo(b)fluoranthene | | 0.0187 | 0.0374 | 0.0935 | U |
| 191-24-2 | Benzo(g,h,i)perylene | | 0.0187 | 0.0374 | 0.0935 | U |
| 207-08-9 | Benzo(k)fluoranthene | | 0.0187 | 0.0374 | 0.0935 | U |
| 218-01-9 | Chrysene | | 0.0187 | 0.0374 | 0.0935 | U |
| 53-70-3 | Dibenz(a,h)anthracene | | 0.0187 | 0.0374 | 0.0935 | U |
| 206-44-0 | Fluoranthene | | 0.0187 | 0.0374 | 0.0935 | U |
| 86-73-7 | Fluorene | 0.0320 | 0.0187 | 0.0374 | 0.0935 | I |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 0.0187 | 0.0374 | 0.0935 | U |
| 90-12-0 | 1-Methylnaphthalene | 0.0546 | 0.0187 | 0.0374 | 0.0935 | I |
| 91-57-6 | 2-Methylnaphthalene | 0.907 | 0.0187 | 0.0374 | 0.0935 | |
| 91-20-3 | Naphthalene | 0.120 | 0.0187 | 0.0374 | 0.0935 | |
| 85-01-8 | Phenanthrene | 0.0195 | 0.0187 | 0.0374 | 0.0935 | I |
| 129-00-0 | Pyrene | | 0.0187 | 0.0374 | 0.0935 | U |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 46.73 | 32.36 | 69.2 | 34 - 167 | |
| Terphenyl-d14 | 46.73 | 34.51 | 73.8 | 34 - 167 | |

# ANALYSIS DATA SHEET

CEF-502-6S-20100915

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-03 | File ID: | 0913403.D |
| Sampled: | 09/15/10 13:23 | Prepared: | 09/20/10 10:45 | Analyzed: | 09/24/10 15:55 |
| Solids: | | Preparation: | EXT_3510 | Dilution: | 1 |

Batch: 0I20006 Sequence: 0I26707 Calibration: 0237003 Instrument: MS-BNA4

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 83-32-9 | Acenaphthene | 1.09 | 0.0185 | 0.0370 | 0.0926 | |
| 208-96-8 | Acenaphthylene | | 0.0185 | 0.0370 | 0.0926 | U |
| 120-12-7 | Anthracene | | 0.0185 | 0.0370 | 0.0926 | U |
| 56-55-3 | Benzo(a)anthracene | 0.0303 | 0.0185 | 0.0370 | 0.0926 | I |
| 50-32-8 | Benzo(a)pyrene | 0.0223 | 0.0185 | 0.0370 | 0.0926 | I |
| 205-99-2 | Benzo(b)fluoranthene | 0.0323 | 0.0185 | 0.0370 | 0.0926 | I |
| 191-24-2 | Benzo(g,h,i)perylene | 0.0263 | 0.0185 | 0.0370 | 0.0926 | I |
| 207-08-9 | Benzo(k)fluoranthene | 0.0340 | 0.0185 | 0.0370 | 0.0926 | I |
| 218-01-9 | Chrysene | 0.0288 | 0.0185 | 0.0370 | 0.0926 | I |
| 53-70-3 | Dibenz(a,h)anthracene | 0.0271 | 0.0185 | 0.0370 | 0.0926 | I |
| 206-44-0 | Fluoranthene | 0.0433 | 0.0185 | 0.0370 | 0.0926 | I |
| 86-73-7 | Fluorene | | 0.0185 | 0.0370 | 0.0926 | U |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 0.0297 | 0.0185 | 0.0370 | 0.0926 | I |
| 90-12-0 | 1-Methylnaphthalene | 0.727 | 0.0185 | 0.0370 | 0.0926 | |
| 91-57-6 | 2-Methylnaphthalene | 0.829 | 0.0185 | 0.0370 | 0.0926 | |
| 91-20-3 | Naphthalene | | 0.0185 | 0.0370 | 0.0926 | U |
| 85-01-8 | Phenanthrene | | 0.0185 | 0.0370 | 0.0926 | U |
| 129-00-0 | Pyrene | 0.0494 | 0.0185 | 0.0370 | 0.0926 | I |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 46.30 | 25.78 | 55.7 | 34 - 167 | |
| Terphenyl-d14 | 46.30 | 31.49 | 68.0 | 34 - 167 | |

# ANALYSIS DATA SHEET

**CEF-502-9S-20100916**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-06 | File ID: | 0913406.D |
| Sampled: | 09/16/10 11:45 | Prepared: | 09/20/10 10:45 | Analyzed: | 09/24/10 16:52 |
| Solids: | | Preparation: | EXT_3510 | Dilution: | 1 |

Batch: 0I20006 Sequence: 0I26707 Calibration: 0237003 Instrument: MS-BNA4

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 83-32-9 | Acenaphthene | | 0.0185 | 0.0370 | 0.0926 | U |
| 208-96-8 | Acenaphthylene | | 0.0185 | 0.0370 | 0.0926 | U |
| 120-12-7 | Anthracene | | 0.0185 | 0.0370 | 0.0926 | U |
| 56-55-3 | Benzo(a)anthracene | | 0.0185 | 0.0370 | 0.0926 | U |
| 50-32-8 | Benzo(a)pyrene | | 0.0185 | 0.0370 | 0.0926 | U |
| 205-99-2 | Benzo(b)fluoranthene | | 0.0185 | 0.0370 | 0.0926 | U |
| 191-24-2 | Benzo(g,h,i)perylene | | 0.0185 | 0.0370 | 0.0926 | U |
| 207-08-9 | Benzo(k)fluoranthene | | 0.0185 | 0.0370 | 0.0926 | U |
| 218-01-9 | Chrysene | | 0.0185 | 0.0370 | 0.0926 | U |
| 53-70-3 | Dibenz(a,h)anthracene | | 0.0185 | 0.0370 | 0.0926 | U |
| 206-44-0 | Fluoranthene | | 0.0185 | 0.0370 | 0.0926 | U |
| 86-73-7 | Fluorene | | 0.0185 | 0.0370 | 0.0926 | U |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 0.0185 | 0.0370 | 0.0926 | U |
| 90-12-0 | 1-Methylnaphthalene | 2.03 | 0.0185 | 0.0370 | 0.0926 | |
| 91-57-6 | 2-Methylnaphthalene | 1.67 | 0.0185 | 0.0370 | 0.0926 | |
| 91-20-3 | Naphthalene | 0.879 | 0.0185 | 0.0370 | 0.0926 | |
| 85-01-8 | Phenanthrene | | 0.0185 | 0.0370 | 0.0926 | U |
| 129-00-0 | Pyrene | | 0.0185 | 0.0370 | 0.0926 | U |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 46.30 | 32.38 | 69.9 | 34 - 167 | |
| Terphenyl-d14 | 46.30 | 31.72 | 68.5 | 34 - 167 | |

# ANALYSIS DATA SHEET

**CEF-502-DUP-02-20100916**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-07 | File ID: | 0913407.D |
| Sampled: | 09/16/10 00:00 | Prepared: | 09/20/10 10:45 | Analyzed: | 09/24/10 17:20 |
| Solids: | | Preparation: | EXT_3510 | Dilution: | 1 |

Batch: 0I20006 Sequence: 0I26707 Calibration: 0237003 Instrument: MS-BNA4

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 83-32-9 | Acenaphthene | | 0.0187 | 0.0374 | 0.0935 | U |
| 208-96-8 | Acenaphthylene | | 0.0187 | 0.0374 | 0.0935 | U |
| 120-12-7 | Anthracene | | 0.0187 | 0.0374 | 0.0935 | U |
| 56-55-3 | Benzo(a)anthracene | | 0.0187 | 0.0374 | 0.0935 | U |
| 50-32-8 | Benzo(a)pyrene | | 0.0187 | 0.0374 | 0.0935 | U |
| 205-99-2 | Benzo(b)fluoranthene | | 0.0187 | 0.0374 | 0.0935 | U |
| 191-24-2 | Benzo(g,h,i)perylene | | 0.0187 | 0.0374 | 0.0935 | U |
| 207-08-9 | Benzo(k)fluoranthene | | 0.0187 | 0.0374 | 0.0935 | U |
| 218-01-9 | Chrysene | | 0.0187 | 0.0374 | 0.0935 | U |
| 53-70-3 | Dibenz(a,h)anthracene | | 0.0187 | 0.0374 | 0.0935 | U |
| 206-44-0 | Fluoranthene | | 0.0187 | 0.0374 | 0.0935 | U |
| 86-73-7 | Fluorene | | 0.0187 | 0.0374 | 0.0935 | U |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 0.0187 | 0.0374 | 0.0935 | U |
| 90-12-0 | 1-Methylnaphthalene | 1.60 | 0.0187 | 0.0374 | 0.0935 | |
| 91-57-6 | 2-Methylnaphthalene | 1.25 | 0.0187 | 0.0374 | 0.0935 | |
| 91-20-3 | Naphthalene | 0.695 | 0.0187 | 0.0374 | 0.0935 | |
| 85-01-8 | Phenanthrene | 0.459 | 0.0187 | 0.0374 | 0.0935 | |
| 129-00-0 | Pyrene | | 0.0187 | 0.0374 | 0.0935 | U |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 46.73 | 27.64 | 59.1 | 34 - 167 | |
| Terphenyl-d14 | 46.73 | 31.77 | 68.0 | 34 - 167 | |

# ANALYSIS DATA SHEET

**CEF-290A-01S-20100915**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-01 | File ID: | 010B1001.D |
| Sampled: | 09/15/10 10:33 | Prepared: | 09/20/10 11:47 | Analyzed: | 09/22/10 16:10 |
| Solids: | | Preparation: | EXT_3510 | Dilution: | 1 |

Batch: 0I20004 Sequence: 0I26608 Calibration: 0244001 Instrument: GL-GCFID

| CAS NO. | COMPOUND | CONC. (mg/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| . | Petroleum Range Organics | | 0.0794 | 0.159 | 0.318 | U |

| SYSTEM MONITORING COMPOUND | ADDED (mg/L) | CONC (mg/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 0.04673 | 0.03888 | 83.2 | 50 - 150 | |
| o-Terphenyl | 0.04673 | 0.03155 | 67.5 | 82 - 142 | * |

# ANALYSIS DATA SHEET

**CEF-290A-DUP-20100915**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-02 | File ID: | 013B1301.D |
| Sampled: | 09/15/10 00:00 | Prepared: | 09/20/10 11:47 | Analyzed: | 09/22/10 17:54 |
| Solids: | | Preparation: | EXT_3510 | Dilution: | 1 |

Batch: 0I20004 Sequence: 0I26608 Calibration: 0244001 Instrument: GL-GCFID

| CAS NO. | COMPOUND | CONC. (mg/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| | Petroleum Range Organics | | 0.0787 | 0.157 | 0.315 | U |

| SYSTEM MONITORING COMPOUND | ADDED (mg/L) | CONC (mg/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 0.04630 | 0.03731 | 80.6 | 50 - 150 | |
| o-Terphenyl | 0.04630 | 0.03112 | 67.2 | 82 - 142 | * |

# ANALYSIS DATA SHEET

CEF-502-07D-20100915

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-04 | File ID: | 015B1501.D |
| Sampled: | 09/15/10 13:49 | Prepared: | 09/20/10 11:47 | Analyzed: | 09/22/10 19:02 |
| Solids: | | Preparation: | EXT_3510 | Dilution: | 1 |

Batch: 0I20004 Sequence: 0I26608 Calibration: 0244001 Instrument: GL-GCFID

| CAS NO. | COMPOUND | CONC. (mg/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| | Petroleum Range Organics | | 0.0787 | 0.157 | 0.315 | U |

| SYSTEM MONITORING COMPOUND | ADDED (mg/L) | CONC (mg/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 0.04630 | 0.03984 | 86.1 | 50 - 150 | |
| o-Terphenyl | 0.04630 | 0.04272 | 92.3 | 82 - 142 | |

# ANALYSIS DATA SHEET

**CEF-502-3S-20100916**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-08 | File ID: | 018B1801.D |
| Sampled: | 09/16/10 12:45 | Prepared: | 09/20/10 11:47 | Analyzed: | 09/22/10 20:44 |
| Solids: | | Preparation: | EXT_3510 | Dilution: | 1 |

Batch: 0I20004 Sequence: 0I26608 Calibration: 0244001 Instrument: GL-GCFID

| CAS NO. | COMPOUND | CONC. (mg/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| | Petroleum Range Organics | 0.330 | 0.0787 | 0.157 | 0.315 | |

| SYSTEM MONITORING COMPOUND | ADDED (mg/L) | CONC (mg/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 0.04630 | 0.04436 | 95.8 | 50 - 150 | |
| o-Terphenyl | 0.04630 | 0.04594 | 99.2 | 82 - 142 | |

# ANALYSIS DATA SHEET

CEF-502-4S-20100916

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-09 | File ID: | 021B2101.D |
| Sampled: | 09/16/10 13:35 | Prepared: | 09/20/10 11:47 | Analyzed: | 09/22/10 22:26 |
| Solids: | | Preparation: | EXT_3510 | Dilution: | 1 |

Batch: 0I20004 Sequence: 0I26608 Calibration: 0244001 Instrument: GL-GCFID

| CAS NO. | COMPOUND | CONC. (mg/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| | Petroleum Range Organics | | 0.0794 | 0.159 | 0.318 | U |

| SYSTEM MONITORING COMPOUND | ADDED (mg/L) | CONC (mg/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 0.04673 | 0.03947 | 84.5 | 50 - 150 | |
| o-Terphenyl | 0.04673 | 0.03790 | 81.1 | 82 - 142 | * |

# ANALYSIS DATA SHEET

CEF-502-6S-20100915

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-03 | File ID: | 014B1401.D |
| Sampled: | 09/15/10 13:23 | Prepared: | 09/20/10 11:47 | Analyzed: | 09/22/10 18:28 |
| Solids: | | Preparation: | EXT_3510 | Dilution: | 1 |

Batch: 0I20004 Sequence: 0I26608 Calibration: 0244001 Instrument: GL-GCFID

| CAS NO. | COMPOUND | CONC. (mg/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| | Petroleum Range Organics | 0.652 | 0.0787 | 0.157 | 0.315 | |

| SYSTEM MONITORING COMPOUND | ADDED (mg/L) | CONC (mg/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 0.04630 | 0.04357 | 94.1 | 50 - 150 | |
| o-Terphenyl | 0.04630 | 0.04492 | 97.0 | 82 - 142 | |

# ANALYSIS DATA SHEET

**CEF-502-9S-20100916**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | Ground Water | Laboratory ID: | 1009134-06 | File ID: | 016B1601.D |
| Sampled: | 09/16/10 11:45 | Prepared: | 09/20/10 11:47 | Analyzed: | 09/22/10 19:37 |
| Solids: | | Preparation: | EXT_3510 | Dilution: | 1 |

Batch: 0I20004 Sequence: 0I26608 Calibration: 0244001 Instrument: GL-GCFID

| CAS NO. | COMPOUND | CONC. (mg/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| | Petroleum Range Organics | 2.36 | 0.0787 | 0.157 | 0.315 | |

| SYSTEM MONITORING COMPOUND | ADDED (mg/L) | CONC (mg/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 0.04630 | 0.03906 | 84.4 | 50 - 150 | |
| o-Terphenyl | 0.04630 | 0.04560 | 98.5 | 82 - 142 | |

# ANALYSIS DATA SHEET

**CEF-502-DUP-02-20100916**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | SDG: | CTOJM09CF_008 | |
| Client: | Tetra Tech NUS, Inc. (T010) | | Project: | CTO JM09 BP Wells_2010 | |
| Matrix: | Ground Water | Laboratory ID: | 1009134-07 | File ID: | 017B1701.D |
| Sampled: | 09/16/10 00:00 | Prepared: | 09/20/10 11:47 | Analyzed: | 09/22/10 20:10 |
| Solids: | | Preparation: | EXT_3510 | Dilution: | 1 |

Batch: 0I20004 Sequence: 0I26608 Calibration: 0244001 Instrument: GL-GCFID

| CAS NO. | COMPOUND | CONC. (mg/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| | Petroleum Range Organics | 2.26 | 0.0787 | 0.157 | 0.315 | |

| SYSTEM MONITORING COMPOUND | ADDED (mg/L) | CONC (mg/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 0.04630 | 0.03894 | 84.1 | 50 - 150 | |
| o-Terphenyl | 0.04630 | 0.04629 | 100 | 82 - 142 | |

# APPENDIX C

## SUPPORT DOCUMENTATION

**SDG** CTOJM09CF_

| SORT | UNITS | NSAMPLE | LAB_ID | QC_TYPE | SAMP_DATE | EXTR_DATE | ANAL_DATE | SMP_EXTR | EXTR_ANL | SMP_ANL |
|---|---|---|---|---|---|---|---|---|---|---|
| OV | UG/L | CEF-502-DUP-02-201009 | 1009134-07 | NM | 09/16/2010 | 09/25/2010 | 09/25/2010 | 9 | 0 | 9 |
| OV | UG/L | CEF-290A-01S-20100915 | 1009134-01 | NM | 09/15/2010 | 09/25/2010 | 09/25/2010 | 10 | 0 | 10 |
| OV | UG/L | CEF-502-TB-20100915 | 1009134-05 | NM | 09/15/2010 | 09/25/2010 | 09/25/2010 | 10 | 0 | 10 |
| OV | UG/L | CEF-502-9S-20100916 | 1009134-06 | NM | 09/16/2010 | 09/25/2010 | 09/25/2010 | 9 | 0 | 9 |
| OV | UG/L | CEF-502-6S-20100915 | 1009134-03 | NM | 09/15/2010 | 09/25/2010 | 09/25/2010 | 10 | 0 | 10 |
| OV | UG/L | CEF-502-4S-20100916 | 1009134-09 | NM | 09/16/2010 | 09/27/2010 | 09/27/2010 | 11 | 0 | 11 |
| OV | UG/L | CEF-502-3S-20100916 | 1009134-08 | NM | 09/16/2010 | 09/27/2010 | 09/27/2010 | 11 | 0 | 11 |
| OV | UG/L | CEF-502-07D-20100915 | 1009134-04 | NM | 09/15/2010 | 09/25/2010 | 09/25/2010 | 10 | 0 | 10 |
| OV | UG/L | CEF-290A-DUP-20100915 | 1009134-02 | NM | 09/15/2010 | 09/25/2010 | 09/25/2010 | 10 | 0 | 10 |
| SIM | UG/L | CEF-502-4S-20100916 | 1009134-09 | NM | 09/16/2010 | 09/20/2010 | 09/24/2010 | 4 | 4 | 8 |
| SIM | UG/L | CEF-290A-01S-20100915 | 1009134-01 | SUR | 09/15/2010 | 09/20/2010 | 09/24/2010 | 5 | 4 | 9 |
| SIM | UG/L | CEF-290A-DUP-20100915 | 1009134-02 | NM | 09/15/2010 | 09/20/2010 | 09/24/2010 | 5 | 4 | 9 |
| SIM | UG/L | CEF-290A-DUP-20100915 | 1009134-02 | SUR | 09/15/2010 | 09/20/2010 | 09/24/2010 | 5 | 4 | 9 |
| SIM | UG/L | CEF-502-07D-20100915 | 1009134-04 | NM | 09/15/2010 | 09/20/2010 | 09/24/2010 | 5 | 4 | 9 |
| SIM | UG/L | CEF-502-07D-20100915 | 1009134-04 | SUR | 09/15/2010 | 09/20/2010 | 09/24/2010 | 5 | 4 | 9 |

| SORT | UNITS | NSAMPLE | LAB_ID | QC_TYPE | SAMP_DATE | EXTR_DATE | ANAL_DATE | SMP_EXTR | EXTR_ANL | SMP_ANL |
|---|---|---|---|---|---|---|---|---|---|---|
| SIM | UG/L | CEF-290A-01S-20100915 | 1009134-01 | NM | 09/15/2010 | 09/20/2010 | 09/24/2010 | 5 | 4 | 9 |
| SIM | UG/L | CEF-502-DUP-02-201009 | 1009134-07 | NM | 09/16/2010 | 09/20/2010 | 09/24/2010 | 4 | 4 | 8 |
| SIM | UG/L | CEF-502-3S-20100916 | 1009134-08 | NM | 09/16/2010 | 09/20/2010 | 09/24/2010 | 4 | 4 | 8 |
| SIM | UG/L | CEF-502-DUP-02-201009 | 1009134-07 | SUR | 09/16/2010 | 09/20/2010 | 09/24/2010 | 4 | 4 | 8 |
| SIM | UG/L | CEF-502-3S-20100916 | 1009134-08 | SUR | 09/16/2010 | 09/20/2010 | 09/24/2010 | 4 | 4 | 8 |
| SIM | UG/L | CEF-502-9S-20100916 | 1009134-06 | SUR | 09/16/2010 | 09/20/2010 | 09/24/2010 | 4 | 4 | 8 |
| SIM | UG/L | CEF-502-9S-20100916 | 1009134-06 | NM | 09/16/2010 | 09/20/2010 | 09/24/2010 | 4 | 4 | 8 |
| SIM | UG/L | CEF-502-6S-20100915 | 1009134-03 | SUR | 09/15/2010 | 09/20/2010 | 09/24/2010 | 5 | 4 | 9 |
| SIM | UG/L | CEF-502-6S-20100915 | 1009134-03 | NM | 09/15/2010 | 09/20/2010 | 09/24/2010 | 5 | 4 | 9 |
| SIM | UG/L | CEF-502-4S-20100916 | 1009134-09 | SUR | 09/16/2010 | 09/20/2010 | 09/24/2010 | 4 | 4 | 8 |
| TPH | MG/L | CEF-502-DUP-02-201009 | 1009134-07 | NM | 09/16/2010 | 09/20/2010 | 09/22/2010 | 4 | 2 | 6 |
| TPH | MG/L | CEF-290A-DUP-20100915 | 1009134-02 | NM | 09/15/2010 | 09/20/2010 | 09/22/2010 | 5 | 2 | 7 |
| TPH | MG/L | CEF-502-07D-20100915 | 1009134-04 | NM | 09/15/2010 | 09/20/2010 | 09/22/2010 | 5 | 2 | 7 |
| TPH | MG/L | CEF-502-3S-20100916 | 1009134-08 | NM | 09/16/2010 | 09/20/2010 | 09/22/2010 | 4 | 2 | 6 |
| TPH | MG/L | CEF-502-4S-20100916 | 1009134-09 | NM | 09/16/2010 | 09/20/2010 | 09/22/2010 | 4 | 2 | 6 |
| TPH | MG/L | CEF-502-6S-20100915 | 1009134-03 | NM | 09/15/2010 | 09/20/2010 | 09/22/2010 | 5 | 2 | 7 |
| TPH | MG/L | CEF-502-9S-20100916 | 1009134-06 | NM | 09/16/2010 | 09/20/2010 | 09/22/2010 | 4 | 2 | 6 |
| TPH | MG/L | CEF-290A-01S-20100915 | 1009134-01 | NM | 09/15/2010 | 09/20/2010 | 09/22/2010 | 5 | 2 | 7 |

## Sample Delivery Group Case Narrative

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

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

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

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

**Chromatographic Flags for Manual Integration:**
The following letters are used to denote manual integrations on the laboratory's raw data in association with chromatographic integrations:

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

**SW8260B:**
No anomalies or deviations are noted.

**SW8270C PAH:**
The matrix spikes associated to sample 1009134-01 exceeded criteria for Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene and Dibenz(a,h)anthracene.

No additional anomalies or deviations are noted and the data is properly qualified.

**FLPRO:**
The surrogate o-Terphenyl exceeded criteria in samples 1009134-01, -01MS, -01MSD, -02, and -09.

The retention time for the surrogates o-Terphenyl and/or 2-Fluorobiphenyl exceeded the retention time window in 0I20004-BLK1, 1009134-01, -02, -04, -06, -07, -08, -08MS, -08MSD, and -09. Sample results biased due to the retention time shift were determined to be negligible.

No additional anomalies or deviations are noted and the data is properly qualified.

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

**Analytical Report Terms and Qualifiers**

**MDL:** The method detection limit (MDL) is defined as the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample containing the analyte in a given matrix. For DoD QSM 4.1 reporting purposes, this definition is also applied to the reported Detection Limit (DL).

**LOD:** The Limit of Detection is an estimate of the minimum amount of a substance that an analytical process can reliably detect. An LOD is analyte- and matrix-specific and may be laboratory-dependent. This definition is further clarified in the DoD QSM 4.1 revisions as the smallest amount or concentration of a substance that must be present in a sample in order to be detected at a high level of confidence (99%). At the LOD, the false negative rate (Type II error) is 1%.

**LOQ:** The Limit of Quantitation is the minimum level, concentration, or quantity of a target variable (e.g., target analyte) that can be reported with a specified degree of confidence. This term is further clarified within the DoD QSM 4.1 as the lowest concentration that produces a quantitative result within specified limits of precision and bias.

*: An exceeding quality control criteria is associated with the reported result.

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

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

**E:** The concentration for any compound found which exceeds the highest concentration level on the standard curve for that compound will be flagged with an "E". Usually the sample will be rerun at a dilution to quantitate the flagged compound. **For Florida DEP reports this qualifier is "L".**

**H1**: The result was analyzed outside of the EPA recommended holding time.

**H2**: The result was extracted outside of the EPA recommended holding time

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

**M**: Indicates that the sample matrix interfered with the quantitation of the analyte. In dual column analysis the result is reported from the column with the lower concentration. In inorganics, it indicates that the parameters MDL/RL has been raised.

**N:** The MS/MSD accuracy and/or precision are outside criteria. The predigested spike recovery is not within control limits for the associated parameter.

**P**: The associated numerical value is an estimated quantity. There is greater than a 40% difference between the two GC columns for the detected concentrations. The higher of the two values is reported unless matrix interference is obvious or for HPLC analysis where the primary column is reported.

**Q**: The RPD and/or percent recovery exceeded limits in the associated Blank Spike and/or Blank Spike Duplicate.

**S**: The associated internal standard failed criteria.

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

**X**: The parameter shows a potential positive bias on a reported concentration due to an ICV or CCV exceeding the upper control limit on the high side.

**Y**: The parameter shows a potential negative bias on a reported concentration due to an ICV or CCV exceeding the lower control limit on the low side.

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

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

a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally.

**BS**: LIMS assigns a unique identifier to the Blank Spike by naming it as the letters BS appended to the Batch ID. The Blank Spike or Lab Control Sample is a controlled analyte-free matrix, which is spiked with known and verified concentrations of target analytes. Spiking concentrations can be referenced in the method SOP. The BS is used to evaluate the viability of analytes taken through the entire prep (when applicable) and analytical process. Blank Spikes within a Batch or Analytical sequence will be appended with a numerical value beginning with 1 that will increase incrementally. A duplicate Blank Spike will be designated as a BSD.

**MS**: The LIMS assigns each Client sample with a unique identifier. The Matrix Spike is designated with a MS at the end of the sample's unique identifier. The Matrix Spike sample is used to assess the effect of the sample matrix on the precision and accuracy of the results generated using the selected method. A duplicate Matrix Spike will be designated as a MSD.

**IDs**: The LIMS assigns each Client sample with a unique identifier. The letter "RE" may potentially be appended to the end of the LIMS Sample ID. And "**RE**" implies that the sample was either re-prepped, re-analyzed straight, or re-analyzed at a dilution. Subsequent re-analysis for the sample will be appended with a numerical value beginning with 1 that will increase incrementally. Eg: RE1, RE2, RE3, etc.

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

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

TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER № 2083 PAGE 1 OF 2

| | | | |
|---|---|---|---|
| PROJECT NO: 112600746 | FACILITY: Cecil Field Site 502 & 290A | PROJECT MANAGER: Rob Simcik | PHONE NUMBER: 4129218163 |
| LABORATORY NAME AND CONTACT: Empirical Laboratories / Kim Kosteer | | | |
| SAMPLERS (SIGNATURE) | | FIELD OPERATIONS LEADER: Jeff Kronc | PHONE NUMBER: 904 699-7473 |
| ADDRESS: 621 Mainstream Dr Suite 270 | | | |
| | | CARRIER/WAYBILL NUMBER: FEDEX Airbill 8660 1730 2171 | CITY, STATE: Nashville, TN 37228 |

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

| DATE YEAR 2010 | TIME | SAMPLE ID | LOCATION ID | TOP DEPTH (FT) | BOTTOM DEPTH (FT) | MATRIX (GW, SO, SW, SD, QC, ETC.) | COLLECTION METHOD GRAB (G) COMP (C) | No. OF CONTAINERS | BTEX (8260B) | Naphthalene (8260B) | PAH (8270C) | TRPH (FL PRO) | | | | | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONTAINER TYPE PLASTIC (P) or GLASS (G) | | | | | | | | | G | G | G | | | | | | |
| PRESERVATIVE USED | | | | | | | | | HCl | — | HCl | $H_2SO_4$ | | | | | |
| TYPE OF ANALYSIS | | | | | | | | | | | | | | | | | 1009134 |
| 9/15 | 1033 | CEF-290A-01S-20100915 | | | | GW | G | 21 | X | X | X | | | | | | MS/MSD -01 |
| 9/15 | 0000 | CEF-290A-DUP-20100915 | | | | GW | G | 7 | X | X | X | | | | | | Cool to 4°C -02 |
| 9/15 | 1323 | CEF-502-6S-20100915 | | | | GW | G | 7 | X | X | X | | | | | | -03 |
| 9/15 | 1349 | CEF-502-07D-20100915 | | | | GW | G | 7 | X | X | X | | | | | | -04 |
| 9/15 | 1000 | CEF-502-TB-20100915 | | | | QC | G | 2 | X | | | | | | | | -05 |

| | | | | | |
|---|---|---|---|---|---|
| 1. RELINQUISHED BY | DATE 9/16/10 | TIME 1700 | 1. RECEIVED BY | DATE | TIME |
| 2. RELINQUISHED BY | DATE | TIME | 2. RECEIVED BY | DATE | TIME |
| 3. RELINQUISHED BY | DATE | TIME | 3. RECEIVED BY | DATE 9/17/10 | TIME 08:45 |

COMMENTS 2.6°C

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

4/02R
FORM NO. TtNUS-001

CTOJM09CF_008

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TETRA TECH NUS, INC. CHAIN OF CUSTODY NUMBER No. 2089 PAGE 2 OF 2

| | | | |
|---|---|---|---|
| PROJECT NO: 112G00746 | FACILITY: Cecil Field SHe 502 & 290A | PROJECT MANAGER: Rob Simcik | PHONE NUMBER: 4129218163 |
| SAMPLERS (SIGNATURE) | | FIELD OPERATIONS LEADER: Jeff Klonk | PHONE NUMBER: 904699-7423 |
| | | CARRIER/WAYBILL NUMBER: Fedex Airbill 8660 1730 2171 | |

LABORATORY NAME AND CONTACT: Empirical Labs / Kim Koszer
ADDRESS: 621 Mainstream Drive Suite 270
CITY, STATE: Nashville, TN 37228

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G G
PRESERVATIVE USED: HCl — H2SO4
TYPE OF ANALYSIS: BTEX (SW8260B) Naphthalene (8260B) Isopropylbenzene 135 — QAH (8270C) — TRPH (FLPRO)

1009134

| DATE YEAR 2010 | TIME | SAMPLE ID | LOCATION ID | TOP DEPTH (FT) | BOTTOM DEPTH (FT) | MATRIX (GW, SO, SW, SD, QC, ETC.) | COLLECTION METHOD GRAB (G) COMP (C) | No. OF CONTAINERS | BTEX | Naphthalene | Isopropylbenzene | QAH | TRPH | | | | | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/16 | 1145 | CEF-502-9$-20100916 | | | | GW | G | 7 | X | X | X | | | | | | | Cool to 4°C -06 |
| 9/16 | 0000 | CEF-502-DUP-02-20100916 | | | | GW | G | 7 | X | X | X | | | | | | | -07 |
| 9/16 | 1245 | CEF-502-3$-20100916 | | | | GW | G | 21 | X | X | X | | | | | | | MS/MSD -08 |
| 9/16 | 1335 | CEF-502-4$-20100916 | | | | GW | G | 7 | X | X | X | | | | | | | -09 |

| | DATE | TIME | | DATE | TIME |
|---|---|---|---|---|---|
| 1. RELINQUISHED BY | 9/16/10 | 1700 | 1. RECEIVED BY | | |
| 2. RELINQUISHED BY | | | 2. RECEIVED BY | | |
| 3. RELINQUISHED BY | | | 3. RECEIVED BY | 9/17/10 | 08:45 |

COMMENTS: 2.6°C

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

4/02R
FORM NO. TtNUS-001

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CTOJM09CF_008

**EMPIRICAL LABORATORIES**
**COOLER RECEIPT FORM**

LIMS Number: 1009134 Number of Coolers: 1 of 7

Client: JTNUS Project: Cecil Field Sites 502+290A

Date/Time Received: 9/17/10 08:45 Date cooler(s) opened: 9/17/10

Opened By (print): Will 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: 6440

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

How many: 1 Seal date: 9/16/10 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: 2-6 °C

Dates samples were logged-in: 9/17/10

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 pH < 2 for all FL-PRO's
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#: _____

1 1L Amber (UNP) broken in shipment for CEF-502-35-20100916. 1 1L Amber ($H_2SO_4$) for CEF-502-45-20100916 broken in shipment.

**EMPIRICAL LABORATORIES**
**COOLER RECEIPT FORM**

LIMS Number: 1009134 Number of Coolers: 5 of 7

Client: ITNOS Project: Cecil Field Site 5024 290A

Date/Time Received: 9/17/10 08:45 Date cooler(s) opened: 9/17/10

Opened By (print): Will 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: 6439

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

How many: 1 Seal date: 9/16/10 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: 2.3 °C

~~Dates samples were logged in: 9/17/10~~

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

See Page 1 of 7

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

_____ CAR#: _____

**EMPIRICAL LABORATORIES**
**COOLER RECEIPT FORM**

LIMS Number: 1009134 Number of Coolers: 6 of 7

Client: TTNUS Project: Cecil Field Sites 5042904

Date/Time Received: 9/17/10 08:45 Date cooler(s) opened: 9/17/10

Opened By (print): Will Schwab (signature): [illegible]

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: 6406

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

How many: 1 Seal date: 9/16/10 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: 9/17/10~~

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

See Page 1 of 7

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

_____ CAR#: _____

**EMPIRICAL LABORATORIES**
**COOLER RECEIPT FORM**

LIMS Number: 1009134 Number of Coolers: 7 of 7

Client: JTNUS Project: Cecil Field Sites 5024-290A

Date/Time Received: **9/17/10** **08:45** Date cooler(s) opened: **9/17/10**

Opened By (print): Will 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: 6450

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

How many: 1 Seal date: 9/16/10 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: 1.1 °C

~~Dates samples were logged in: 9/17/10~~

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

See Page 1 of 7

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

_____ CAR#: _____

**EMPIRICAL LABORATORIES**
**COOLER RECEIPT FORM**

LIMS Number: 1009134 Number of Coolers: 4 of 7

Client: ITNOS Project: Cecil Field Site SOL+2904

Date/Time Received: 9/17/10 08:45 Date cooler(s) opened: 9/17/10

Opened By (print): Will 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: 2171

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

How many: 1 Seal date: 9/16/10 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: 4.2 °C

~~Dates samples were logged in: 9/17/10~~

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#: _____

Housed trip Blank

See Page 1 of 7

**EMPIRICAL LABORATORIES**
**COOLER RECEIPT FORM**

LIMS Number: 1009134 Number of Coolers: 3 of 7

Client: ITNOS Project: Cecil Field Sites 504+290A

Date/Time Received: 9/17/10 08:45 Date cooler(s) opened: 9/17/10

Opened By (print): Will 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: 6417

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

How many: 1 Seal date: 9/16/10 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: 3.3 °C

~~Dates samples were logged in: 9/17/10~~

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

See Page 1 of 7

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

_____ CAR#: _____

**EMPIRICAL LABORATORIES**
**COOLER RECEIPT FORM**

LIMS Number: 1009134 Number of Coolers: 2 of 7

Client: ITNUS Project: Cecil Field Site 504-2904

Date/Time Received: 9/17/10 08:45 Date cooler(s) opened: 9/17/10

Opened By (print): Will 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: 6428

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

How many: 1 Seal date: 9/16/10 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: 0-6 °C

~~Dates samples were logged in: 9/17/10~~

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

See Page 1 of 7

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

_____ CAR#: _____

# HOLDING TIME SUMMARY
## SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOJM09CF_008

Client: Tetra Tech NUS, Inc. (T010) Project: CTO JM09 BP Wells_2010

| Sample Name | Date Collected | Date Received | Date Prepared | Days to Prep | Max Days to Prep | Date Analyzed | Days to Analysis | Max Days to Analysis | Q |
|---|---|---|---|---|---|---|---|---|---|
| CEF-290A-01S-20100915 | 09/15/10 10:33 | 09/17/10 08:45 | 09/25/10 00:00 | N/A | 14.00 | 09/25/10 20:23 | 10.45 | 14.00 | |
| CEF-290A-DUP-20100915 | 09/15/10 00:00 | 09/17/10 08:45 | 09/25/10 00:00 | N/A | 14.00 | 09/25/10 20:54 | 10.91 | 14.00 | |
| CEF-502-6S-20100915 | 09/15/10 13:23 | 09/17/10 08:45 | 09/25/10 00:00 | N/A | 14.00 | 09/25/10 21:24 | 10.38 | 14.00 | |
| CEF-502-07D-20100915 | 09/15/10 13:49 | 09/17/10 08:45 | 09/25/10 00:00 | N/A | 14.00 | 09/25/10 21:55 | 10.38 | 14.00 | |
| CEF-502-TB-20100915 | 09/15/10 00:00 | 09/17/10 08:45 | 09/25/10 00:00 | N/A | 14.00 | 09/25/10 22:25 | 10.98 | 14.00 | |
| CEF-502-9S-20100916 | 09/16/10 11:45 | 09/17/10 08:45 | 09/25/10 00:00 | N/A | 14.00 | 09/25/10 22:56 | 9.51 | 14.00 | |
| CEF-502-DUP-02-20100916 | 09/16/10 00:00 | 09/17/10 08:45 | 09/25/10 00:00 | N/A | 14.00 | 09/25/10 23:26 | 10.02 | 14.00 | |
| CEF-502-3S-20100916 | 09/16/10 12:45 | 09/17/10 08:45 | 09/27/10 00:00 | N/A | 14.00 | 09/27/10 12:06 | 11.01 | 14.00 | |
| CEF-502-4S-20100916 | 09/16/10 13:35 | 09/17/10 08:45 | 09/27/10 00:00 | N/A | 14.00 | 09/27/10 12:37 | 11.00 | 14.00 | |

# PREPARATION BATCH SUMMARY

## SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOJM09CF_008

Client: Tetra Tech NUS, Inc. (T010) Project: CTO JM09 BP Wells_2010

Batch: 0I25920 Batch Matrix: Water Preparation: 5030B

| SAMPLE NAME | LAB SAMPLE ID | DATE PREPARED | INITIAL VOL./WEIGHT | FINAL VOL. |
|---|---|---|---|---|
| Blank | 0I25920-BLK1 | 09/25/10 00:00 | 5.00 | 5.00 |
| LCS | 0I25920-BS1 | 09/25/10 00:00 | 5.00 | 5.00 |
| CEF-290A-01S-20100915 | 0I25920-MS1 | 09/25/10 00:00 | 5.00 | 5.00 |
| CEF-290A-01S-20100915 | 0I25920-MSD1 | 09/25/10 00:00 | 5.00 | 5.00 |
| CEF-290A-01S-20100915 | 1009134-01 | 09/25/10 00:00 | 5.00 | 5.00 |
| CEF-290A-DUP-20100915 | 1009134-02 | 09/25/10 00:00 | 5.00 | 5.00 |
| CEF-502-6S-20100915 | 1009134-03 | 09/25/10 00:00 | 5.00 | 5.00 |
| CEF-502-07D-20100915 | 1009134-04 | 09/25/10 00:00 | 5.00 | 5.00 |
| CEF-502-TB-20100915 | 1009134-05 | 09/25/10 00:00 | 5.00 | 5.00 |
| CEF-502-9S-20100916 | 1009134-06 | 09/25/10 00:00 | 5.00 | 5.00 |
| CEF-502-DUP-02-20100916 | 1009134-07 | 09/25/10 00:00 | 5.00 | 5.00 |

# PREPARATION BATCH SUMMARY

## SW8260B

Laboratory: Empirical Laboratories, LLC SDG: CTOJM09CF_008

Client: Tetra Tech NUS, Inc. (T010) Project: CTO JM09 BP Wells_2010

Batch: 0I27002 Batch Matrix: Water Preparation: 5030B

| SAMPLE NAME | LAB SAMPLE ID | DATE PREPARED | INITIAL VOL./WEIGHT | FINAL VOL. |
|---|---|---|---|---|
| Blank | 0I27002-BLK1 | 09/27/10 00:00 | 5.00 | 5.00 |
| LCS | 0I27002-BS1 | 09/27/10 00:00 | 5.00 | 5.00 |
| CEF-502-3S-20100916 | 0I27002-MS1 | 09/27/10 00:00 | 5.00 | 5.00 |
| CEF-502-3S-20100916 | 0I27002-MSD1 | 09/27/10 00:00 | 5.00 | 5.00 |
| CEF-502-3S-20100916 | 1009134-08 | 09/27/10 00:00 | 5.00 | 5.00 |
| CEF-502-4S-20100916 | 1009134-09 | 09/27/10 00:00 | 5.00 | 5.00 |

# ANALYSIS SEQUENCE SUMMARY
## SW8260B

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Sequence: | 0I26801 | Instrument: | MS-VOA3 |
| Calibration: | 0268001 | | |

| Sample Name | Lab Sample ID | Lab File ID | Analysis Date/Time |
|---|---|---|---|
| MS Tune | 0I26801-TUN1 | SEQ-TUN1.D | 09/23/10 08:49 |
| Cal Standard | 0I26801-CAL1 | SEQ-CAL1.D | 09/23/10 09:34 |
| Cal Standard | 0I26801-CAL2 | SEQ-CAL2.D | 09/23/10 10:05 |
| Cal Standard | 0I26801-CAL3 | SEQ-CAL3.D | 09/23/10 10:36 |
| Cal Standard | 0I26801-CAL4 | SEQ-CAL4.D | 09/23/10 11:06 |
| Cal Standard | 0I26801-CAL6 | SEQ-CAL6.D | 09/23/10 12:08 |
| Cal Standard | 0I26801-CAL7 | SEQ-CAL7.D | 09/23/10 12:39 |
| Cal Standard | 0I26801-CAL8 | SEQ-CAL8.D | 09/23/10 13:10 |
| Cal Standard | 0I26801-CAL9 | SEQ-CAL9.D | 09/23/10 13:40 |
| Initial Cal Check | 0I26801-ICV1 | SEQ-ICV1.D | 09/23/10 14:11 |

# MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

## SW8260B

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Lab File ID: | SEQ-TUN1.D | Injection Date: | 09/23/10 |
| Instrument ID: | MS-VOA3 | Injection Time: | 08:49 |
| Sequence: | 0I26801 | Lab Sample ID: | 0I26801-TUN1 |

| m/z | ION ABUNDANCE CRITERIA | % RELATIVE ABUNDANCE | |
|---|---|---|---|
| 50 | 15 - 40% of 95 | 15.7 | PASS |
| 75 | 30 - 60% of 95 | 46.4 | PASS |
| 95 | Base peak, 100% relative abundance | 100 | PASS |
| 96 | 5 - 9% of 95 | 7.02 | PASS |
| 173 | Less than 2% of 174 | 0 | PASS |
| 174 | 50 - 200% of 95 | 109 | PASS |
| 175 | 5 - 9% of 174 | 7.28 | PASS |
| 176 | 95 - 101% of 174 | 99.4 | PASS |
| 177 | 5 - 9% of 176 | 6.82 | PASS |

# INITIAL CALIBRATION CHECK

## SW8260B

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Instrument ID: | MS-VOA3 | Calibration: | 0268001 |
| Lab File ID: | SEQ-ICV1.D | Calibration Date: | 09/23/10 06:31 |
| Sequence: | 0I26801 | Injection Date: | 09/23/10 |
| Lab Sample ID: | 0I26801-ICV1 | Injection Time: | 14:11 |

| | | CONC. (ug/L) | | RESPONSE FACTOR | | | % DIFF / DRIFT | |
|---|---|---|---|---|---|---|---|---|
| COMPOUND | TYPE | STD | ICV | ICAL | ICV | MIN (#) | ICV | LIMIT (#) |
| Benzene | A | 100.0 | 95.99 | 0.777743 | 0.7465904 | | -4.0 | 20 |
| Ethylbenzene | Q | 100.0 | 99.44 | 2.401782 | 2.070524 | | -0.6 | 20 |
| Isopropylbenzene | A | 100.0 | 87.24 | 2.155401 | 1.880459 | | -12.8 | 20 |
| Toluene | A | 100.0 | 91.80 | 1.241631 | 1.139788 | | -8.2 | 20 |
| 1,3,5-Trimethylbenzene | A | 100.0 | 92.13 | 1.502416 | 1.38421 | | -7.9 | 20 |
| 1,2,4-Trimethylbenzene | A | 100.0 | 92.22 | 1.552578 | 1.431838 | | -7.8 | 20 |
| Xylenes (total) | Q | 300.0 | 283.2 | 2.07955 | 1.650208 | | -5.6 | 20 |
| Bromofluorobenzene | A | 30.00 | 29.18 | 1.006847 | 0.9792466 | | -2.7 | 20 |
| Dibromofluoromethane | A | 30.00 | 29.85 | 0.3013951 | 0.2998407 | | -0.5 | 20 |
| 1,2-Dichloroethane-d4 | A | 30.00 | 30.90 | 5.822045E-02 | 5.996842E-02 | | 3.0 | 20 |
| Toluene-d8 | A | 30.00 | 29.32 | 2.167989 | 2.119043 | | -2.3 | 20 |

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

* Values outside of QC limits

# ANALYSIS SEQUENCE SUMMARY
## SW8260B

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Sequence: | 0I27008 | Instrument: | MS-VOA3 |
| Calibration: | 0268001 | | |

| Sample Name | Lab Sample ID | Lab File ID | Analysis Date/Time |
|---|---|---|---|
| MS Tune | 0I27008-TUN1 | SEQ-TUN1.D | 09/25/10 12:33 |
| Calibration Check | 0I27008-CCV1 | SEQ-CCV1.D | 09/25/10 13:04 |
| LCS | 0I25920-BS1 | V3LCS01.D | 09/25/10 13:47 |
| Blank | 0I25920-BLK1 | V3BLK01.D | 09/25/10 15:17 |
| CEF-290A-01S-20100915 | 1009134-01 | 0913401.D | 09/25/10 20:23 |
| CEF-290A-DUP-20100915 | 1009134-02 | 0913402.D | 09/25/10 20:54 |
| CEF-502-6S-20100915 | 1009134-03 | 0913403.D | 09/25/10 21:24 |
| CEF-502-07D-20100915 | 1009134-04 | 0913404.D | 09/25/10 21:55 |
| CEF-502-TB-20100915 | 1009134-05 | 0913405.D | 09/25/10 22:25 |
| CEF-502-9S-20100916 | 1009134-06 | 0913406.D | 09/25/10 22:56 |
| CEF-502-DUP-02-20100916 | 1009134-07 | 0913407.D | 09/25/10 23:26 |
| CEF-290A-01S-20100915 | 0I25920-MS1 | 0913401M.D | 09/25/10 23:57 |
| CEF-290A-01S-20100915 | 0I25920-MSD1 | 0913401S.D | 09/26/10 00:27 |

# MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

## SW8260B

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Lab File ID: | SEQ-TUN1.D | Injection Date: | 09/25/10 |
| Instrument ID: | MS-VOA3 | Injection Time: | 12:33 |
| Sequence: | 0I27008 | Lab Sample ID: | 0I27008-TUN1 |

| m/z | ION ABUNDANCE CRITERIA | % RELATIVE ABUNDANCE | |
|---|---|---|---|
| 50 | 15 - 40% of 95 | 17.8 | PASS |
| 75 | 30 - 60% of 95 | 55.7 | PASS |
| 95 | Base peak, 100% relative abundance | 100 | PASS |
| 96 | 5 - 9% of 95 | 7.38 | PASS |
| 173 | Less than 2% of 174 | 0 | PASS |
| 174 | 50 - 200% of 95 | 120 | PASS |
| 175 | 5 - 9% of 174 | 7.64 | PASS |
| 176 | 95 - 101% of 174 | 97.3 | PASS |
| 177 | 5 - 9% of 176 | 5.64 | PASS |

# CONTINUING CALIBRATION CHECK

## SW8260B

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Instrument ID: | MS-VOA3 | Calibration: | 0268001 |
| Lab File ID: | SEQ-CCV1.D | Calibration Date: | 09/23/10 06:31 |
| Sequence: | 0I27008 | Injection Date: | 09/25/10 |
| Lab Sample ID: | 0I27008-CCV1 | Injection Time: | 13:04 |

| | | CONC. (ug/L) | | RESPONSE FACTOR | | | % DIFF / DRIFT | |
|---|---|---|---|---|---|---|---|---|
| COMPOUND | TYPE | STD | CCV | ICAL | CCV | MIN (#) | CCV | LIMIT (#) |
| Benzene | A | 100.0 | 93.57 | 0.777743 | 0.7277682 | | -6.4 | 20 |
| Ethylbenzene | Q | 100.0 | 100.6 | 2.401782 | 2.087921 | | 0.6 | 20 |
| Isopropylbenzene | A | 100.0 | 92.28 | 2.155401 | 1.989022 | | -7.7 | 20 |
| Toluene | A | 100.0 | 83.92 | 1.241631 | 1.042048 | | -16.1 | 20 |
| 1,3,5-Trimethylbenzene | A | 100.0 | 92.92 | 1.502416 | 1.396069 | | -7.1 | 20 |
| 1,2,4-Trimethylbenzene | A | 100.0 | 95.54 | 1.552578 | 1.483322 | | -4.5 | 20 |
| Xylenes (total) | Q | 300.0 | 304.6 | 2.07955 | 1.750913 | | 1.5 | 20 |
| Bromofluorobenzene | A | 30.00 | 31.08 | 1.006847 | 1.043097 | | 3.6 | 20 |
| Dibromofluoromethane | A | 30.00 | 31.63 | 0.3013951 | 0.3178094 | | 5.4 | 20 |
| 1,2-Dichloroethane-d4 | A | 30.00 | 28.15 | 5.822045E-02 | 0.0546318 | | -6.2 | 20 |
| Toluene-d8 | A | 30.00 | 26.90 | 2.167989 | 1.944352 | | -10.3 | 20 |

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

* Values outside of QC limits

# ANALYSIS DATA SHEET

**Blank**

Laboratory: Empirical Laboratories, LLC SDG: CTOJM09CF_008

Client: Tetra Tech NUS, Inc. (T010) Project: CTO JM09 BP Wells_2010

Matrix: Laboratory ID: 0I25920-BLK1 File ID: V3BLK01.D

Sampled: Prepared: Analyzed: 09/25/10 15:17

Solids: Preparation: 5030B Dilution:

Batch: 0I25920 Sequence: 0I27008 Calibration: 0268001 Instrument: MS-VOA3

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 71-43-2 | Benzene | | 0.300 | 0.500 | 1.00 | U |
| 100-41-4 | Ethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 98-82-8 | Isopropylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 108-88-3 | Toluene | | 0.300 | 0.500 | 1.00 | U |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 1330-20-7 | Xylenes (total) | | 0.300 | 1.50 | 3.00 | U |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| Bromofluorobenzene | 30.00 | 31.49 | 105 | 75 - 120 | |
| Dibromofluoromethane | 30.00 | 33.09 | 110 | 85 - 115 | |
| 1,2-Dichloroethane-d4 | 30.00 | 30.05 | 100 | 70 - 120 | |
| Toluene-d8 | 30.00 | 30.03 | 100 | 85 - 120 | |

# ANALYSIS SEQUENCE SUMMARY
## SW8260B

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Sequence: | 0I27013 | Instrument: | MS-VOA3 |
| Calibration: | 0268001 | | |

| Sample Name | Lab Sample ID | Lab File ID | Analysis Date/Time |
|---|---|---|---|
| MS Tune | 0I27013-TUN1 | SEQ-TUN1.D | 09/27/10 06:01 |
| Calibration Check | 0I27013-CCV1 | SEQ-CCV1.D | 09/27/10 06:32 |
| LCS | 0I27002-BS1 | V3LCS01.D | 09/27/10 07:03 |
| Blank | 0I27002-BLK1 | V3BLK01.D | 09/27/10 08:32 |
| CEF-502-3S-20100916 | 1009134-08 | 0913408.D | 09/27/10 12:06 |
| CEF-502-4S-20100916 | 1009134-09 | 0913409.D | 09/27/10 12:37 |
| CEF-502-3S-20100916 | 0I27002-MS1 | 0913408M.D | 09/27/10 16:11 |
| CEF-502-3S-20100916 | 0I27002-MSD1 | 0913408S.D | 09/27/10 16:42 |

# MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

## SW8260B

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Lab File ID: | SEQ-TUN1.D | Injection Date: | 09/27/10 |
| Instrument ID: | MS-VOA3 | Injection Time: | 06:01 |
| Sequence: | 0I27013 | Lab Sample ID: | 0I27013-TUN1 |

| m/z | ION ABUNDANCE CRITERIA | % RELATIVE ABUNDANCE | |
|---|---|---|---|
| 50 | 15 - 40% of 95 | 19.6 | PASS |
| 75 | 30 - 60% of 95 | 56.2 | PASS |
| 95 | Base peak, 100% relative abundance | 100 | PASS |
| 96 | 5 - 9% of 95 | 5.83 | PASS |
| 173 | Less than 2% of 174 | 0.55 | PASS |
| 174 | 50 - 200% of 95 | 81.2 | PASS |
| 175 | 5 - 9% of 174 | 8.81 | PASS |
| 176 | 95 - 101% of 174 | 99.9 | PASS |
| 177 | 5 - 9% of 176 | 7.89 | PASS |

# CONTINUING CALIBRATION CHECK

## SW8260B

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Instrument ID: | MS-VOA3 | Calibration: | 0268001 |
| Lab File ID: | SEQ-CCV1.D | Calibration Date: | 09/23/10 06:31 |
| Sequence: | 0I27013 | Injection Date: | 09/27/10 |
| Lab Sample ID: | 0I27013-CCV1 | Injection Time: | 06:32 |

| | | CONC. (ug/L) | | RESPONSE FACTOR | | | % DIFF / DRIFT | |
|---|---|---|---|---|---|---|---|---|
| COMPOUND | TYPE | STD | CCV | ICAL | CCV | MIN (#) | CCV | LIMIT (#) |
| Benzene | A | 100.0 | 94.72 | 0.777743 | 0.7366512 | | -5.3 | 20 |
| Ethylbenzene | Q | 100.0 | 96.53 | 2.401782 | 2.025081 | | -3.5 | 20 |
| Isopropylbenzene | A | 100.0 | 90.30 | 2.155401 | 1.946379 | | -9.7 | 20 |
| Toluene | A | 100.0 | 80.57 | 1.241631 | 1.000422 | | -19.4 | 20 |
| 1,3,5-Trimethylbenzene | A | 100.0 | 94.45 | 1.502416 | 1.418994 | | -5.6 | 20 |
| 1,2,4-Trimethylbenzene | A | 100.0 | 96.45 | 1.552578 | 1.497512 | | -3.5 | 20 |
| Xylenes (total) | Q | 300.0 | 290.6 | 2.07955 | 1.685648 | | -3.1 | 20 |
| Bromofluorobenzene | A | 30.00 | 30.02 | 1.006847 | 1.007453 | | 0.06 | 20 |
| Dibromofluoromethane | A | 30.00 | 32.18 | 0.3013951 | 0.323353 | | 7.3 | 20 |
| 1,2-Dichloroethane-d4 | A | 30.00 | 28.45 | 5.822045E-02 | 5.521963E-02 | | -5.2 | 20 |
| Toluene-d8 | A | 30.00 | 26.26 | 2.167989 | 1.897458 | | -12.5 | 20 |

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

* Values outside of QC limits

# ANALYSIS DATA SHEET

**Blank**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | | | Project: | CTO JM09 BP Wells_2010 |
| Matrix: | | Laboratory ID: | 0I27002-BLK1 | File ID: | V3BLK01.D |
| Sampled: | | Prepared: | | Analyzed: | 09/27/10 08:32 |
| Solids: | | Preparation: | 5030B | Dilution: | |

Batch: 0I27002 Sequence: 0I27013 Calibration: 0268001 Instrument: MS-VOA3

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 71-43-2 | Benzene | | 0.300 | 0.500 | 1.00 | U |
| 100-41-4 | Ethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 98-82-8 | Isopropylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 108-88-3 | Toluene | | 0.300 | 0.500 | 1.00 | U |
| 108-67-8 | 1,3,5-Trimethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 95-63-6 | 1,2,4-Trimethylbenzene | | 0.300 | 0.500 | 1.00 | U |
| 1330-20-7 | Xylenes (total) | | 0.300 | 1.50 | 3.00 | U |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| Bromofluorobenzene | 30.00 | 30.71 | 102 | 75 - 120 | |
| Dibromofluoromethane | 30.00 | 32.46 | 108 | 85 - 115 | |
| 1,2-Dichloroethane-d4 | 30.00 | 30.44 | 101 | 70 - 120 | |
| Toluene-d8 | 30.00 | 28.09 | 93.6 | 85 - 120 | |

# HOLDING TIME SUMMARY
## SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOJM09CF_008

Client: Tetra Tech NUS, Inc. (T010) Project: CTO JM09 BP Wells_2010

| Sample Name | Date Collected | Date Received | Date Prepared | Days to Prep | Max Days to Prep | Date Analyzed | Days to Analysis | Max Days to Analysis | Q |
|---|---|---|---|---|---|---|---|---|---|
| CEF-290A-01S-20100915 | 09/15/10 10:33 | 09/17/10 08:45 | 09/20/10 10:45 | 5.05 | 7.00 | 09/24/10 14:57 | 4.18 | 40.00 | |
| CEF-290A-DUP-20100915 | 09/15/10 00:00 | 09/17/10 08:45 | 09/20/10 10:45 | 5.49 | 7.00 | 09/24/10 15:26 | 4.20 | 40.00 | |
| CEF-502-6S-20100915 | 09/15/10 13:23 | 09/17/10 08:45 | 09/20/10 10:45 | 4.93 | 7.00 | 09/24/10 15:55 | 4.22 | 40.00 | |
| CEF-502-07D-20100915 | 09/15/10 13:49 | 09/17/10 08:45 | 09/20/10 10:45 | 4.91 | 7.00 | 09/24/10 16:23 | 4.23 | 40.00 | |
| CEF-502-9S-20100916 | 09/16/10 11:45 | 09/17/10 08:45 | 09/20/10 10:45 | 4.00 | 7.00 | 09/24/10 16:52 | 4.25 | 40.00 | |
| CEF-502-DUP-02-20100916 | 09/16/10 00:00 | 09/17/10 08:45 | 09/20/10 10:45 | 4.49 | 7.00 | 09/24/10 17:20 | 4.27 | 40.00 | |
| CEF-502-3S-20100916 | 09/16/10 12:45 | 09/17/10 08:45 | 09/20/10 10:45 | 3.96 | 7.00 | 09/24/10 17:49 | 4.29 | 40.00 | |
| CEF-502-4S-20100916 | 09/16/10 13:35 | 09/17/10 08:45 | 09/20/10 10:45 | 3.92 | 7.00 | 09/24/10 18:17 | 4.31 | 40.00 | |

# PREPARATION BATCH SUMMARY

## SW8270C

Laboratory: Empirical Laboratories, LLC SDG: CTOJM09CF_008

Client: Tetra Tech NUS, Inc. (T010) Project: CTO JM09 BP Wells_2010

Batch: 0I20006 Batch Matrix: Water Preparation: EXT_3510

| SAMPLE NAME | LAB SAMPLE ID | DATE PREPARED | INITIAL VOL./WEIGHT | FINAL VOL. |
|---|---|---|---|---|
| Blank | 0I20006-BLK1 | 09/20/10 10:45 | 1,000.00 | 1.00 |
| LCS | 0I20006-BS1 | 09/20/10 10:45 | 1,000.00 | 1.00 |
| CEF-290A-01S-20100915 | 0I20006-MS1 | 09/20/10 10:45 | 1,070.00 | 1.00 |
| CEF-502-3S-20100916 | 0I20006-MS2 | 09/20/10 10:45 | 1,080.00 | 1.00 |
| CEF-290A-01S-20100915 | 0I20006-MSD1 | 09/20/10 10:45 | 1,070.00 | 1.00 |
| CEF-502-3S-20100916 | 0I20006-MSD2 | 09/20/10 10:45 | 1,080.00 | 1.00 |
| CEF-290A-01S-20100915 | 1009134-01 | 09/20/10 10:45 | 1,070.00 | 1.00 |
| CEF-290A-DUP-20100915 | 1009134-02 | 09/20/10 10:45 | 1,060.00 | 1.00 |
| CEF-502-6S-20100915 | 1009134-03 | 09/20/10 10:45 | 1,080.00 | 1.00 |
| CEF-502-07D-20100915 | 1009134-04 | 09/20/10 10:45 | 1,070.00 | 1.00 |
| CEF-502-9S-20100916 | 1009134-06 | 09/20/10 10:45 | 1,080.00 | 1.00 |
| CEF-502-DUP-02-20100916 | 1009134-07 | 09/20/10 10:45 | 1,070.00 | 1.00 |
| CEF-502-3S-20100916 | 1009134-08 | 09/20/10 10:45 | 1,080.00 | 1.00 |
| CEF-502-4S-20100916 | 1009134-09 | 09/20/10 10:45 | 1,070.00 | 1.00 |

# ANALYSIS SEQUENCE SUMMARY
## SW8270C

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Sequence: | 0H23613 | Instrument: | MS-BNA4 |
| Calibration: | 0237003 | | |

| Sample Name | Lab Sample ID | Lab File ID | Analysis Date/Time |
|---|---|---|---|
| MS Tune | 0H23613-TUN1 | SEQ-TUN1.D | 08/23/10 10:58 |
| Cal Standard | 0H23613-CAL1 | SEQ-CAL1.D | 08/23/10 11:18 |
| Cal Standard | 0H23613-CAL2 | SEQ-CAL2.D | 08/23/10 11:46 |
| Cal Standard | 0H23613-CAL3 | SEQ-CAL3.D | 08/23/10 12:14 |
| Cal Standard | 0H23613-CAL4 | SEQ-CAL4.D | 08/23/10 12:43 |
| Cal Standard | 0H23613-CAL5 | SEQ-CAL5.D | 08/23/10 13:12 |
| Cal Standard | 0H23613-CAL6 | SEQ-CAL6.D | 08/23/10 13:41 |
| Cal Standard | 0H23613-CAL7 | SEQ-CAL7.D | 08/23/10 14:09 |
| Cal Standard | 0H23613-CAL8 | SEQ-CAL8.D | 08/23/10 14:38 |
| Cal Standard | 0H23613-CAL9 | SEQ-CAL9.D | 08/23/10 15:07 |
| Cal Standard | 0H23613-CALA | SEQ-CALA.D | 08/23/10 15:35 |
| Cal Standard | 0H23613-CALB | SEQ-CALB.D | 08/23/10 16:04 |
| Initial Cal Check | 0H23613-ICV1 | SEQ-ICV1.D | 08/23/10 16:33 |

# MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

## SW8270C

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Lab File ID: | SEQ-TUN1.D | Injection Date: | 08/23/10 |
| Instrument ID: | MS-BNA4 | Injection Time: | 10:58 |
| Sequence: | 0H23613 | Lab Sample ID: | 0H23613-TUN1 |

| m/z | ION ABUNDANCE CRITERIA | % RELATIVE ABUNDANCE | |
|---|---|---|---|
| 51 | 30 - 60% of 198 | 37.1 | PASS |
| 68 | Less than 2% of 69 | 1.35 | PASS |
| 69 | Less than 200% of 198 | 35.2 | PASS |
| 70 | Less than 2% of 69 | 0.535 | PASS |
| 127 | 40 - 60% of 198 | 44.6 | PASS |
| 197 | Less than 1% of 198 | 0.57 | PASS |
| 198 | Base peak, 100% relative abundance | 100 | PASS |
| 199 | 5 - 9% of 198 | 6.65 | PASS |
| 275 | 10 - 30% of 198 | 29.4 | PASS |
| 365 | 1 - 200% of 198 | 4.31 | PASS |
| 441 | 0.001 - 100% of 443 | 81.1 | PASS |
| 442 | 40 - 200% of 198 | 171 | PASS |
| 443 | 17 - 23% of 442 | 19.6 | PASS |

# INITIAL CALIBRATION CHECK

## SW8270C

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Instrument ID: | MS-BNA4 | Calibration: | 0237003 |
| Lab File ID: | SEQ-ICV1.D | Calibration Date: | 08/23/10 14:19 |
| Sequence: | 0H23613 | Injection Date: | 08/23/10 |
| Lab Sample ID: | 0H23613-ICV1 | Injection Time: | 16:33 |

| | | CONC. (ug/mL) | | RESPONSE FACTOR | | | % DIFF / DRIFT | |
|---|---|---|---|---|---|---|---|---|
| COMPOUND | TYPE | STD | ICV | ICAL | ICV | MIN (#) | ICV | LIMIT (#) |
| Acenaphthene | A | 5.000 | 5.459 | 0.8490211 | 0.9269866 | | 9.2 | 20 |
| Acenaphthylene | A | 5.000 | 5.703 | 1.256297 | 1.432929 | | 14.1 | 20 |
| Anthracene | A | 5.000 | 5.160 | 1.162297 | 1.199487 | | 3.2 | 20 |
| Benzo(a)anthracene | A | 5.000 | 5.178 | 1.05022 | 1.087508 | | 3.6 | 20 |
| Benzo(a)pyrene | A | 5.000 | 5.685 | 1.281052 | 1.456646 | | 13.7 | 20 |
| Benzo(b)fluoranthene | A | 5.000 | 5.211 | 1.518281 | 1.582416 | | 4.2 | 20 |
| Benzo(g,h,i)perylene | A | 5.000 | 5.197 | 1.255234 | 1.304654 | | 3.9 | 20 |
| Benzo(k)fluoranthene | A | 5.000 | 5.510 | 1.472463 | 1.622768 | | 10.2 | 20 |
| Chrysene | A | 5.000 | 5.161 | 1.036307 | 1.069754 | | 3.2 | 20 |
| Dibenz(a,h)anthracene | A | 5.000 | 5.628 | 1.117366 | 1.257663 | | 12.6 | 20 |
| Fluoranthene | A | 5.000 | 5.209 | 1.238826 | 1.290573 | | 4.2 | 20 |
| Fluorene | A | 5.000 | 5.488 | 0.8096793 | 0.8887667 | | 9.8 | 20 |
| Indeno(1,2,3-cd)pyrene | A | 5.000 | 5.500 | 1.182429 | 1.300687 | | 10.0 | 20 |
| 1-Methylnaphthalene | A | 5.000 | 5.971 | 0.7624406 | 0.9105566 | | 19.4 | 20 |
| 2-Methylnaphthalene | A | 5.000 | 5.658 | 0.8439543 | 0.9550044 | | 13.2 | 20 |
| Naphthalene | A | 5.000 | 5.701 | 1.34026 | 1.528177 | | 14.0 | 20 |
| Phenanthrene | A | 5.000 | 5.284 | 1.181841 | 1.249062 | | 5.7 | 20 |
| Pyrene | A | 5.000 | 5.200 | 1.285122 | 1.336607 | | 4.0 | 20 |

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

* Values outside of QC limits

# ANALYSIS SEQUENCE SUMMARY

## SW8270C

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Sequence: | 0I26707 | Instrument: | MS-BNA4 |
| Calibration: | 0237003 | | |

| Sample Name | Lab Sample ID | Lab File ID | Analysis Date/Time |
|---|---|---|---|
| MS Tune | 0I26707-TUN1 | SEQ-TUN1.D | 09/24/10 09:36 |
| Calibration Check | 0I26707-CCV1 | SEQ-CCV1.D | 09/24/10 09:55 |
| LCS | 0I20006-BS1 | I20006L1.D | 09/24/10 14:00 |
| Blank | 0I20006-BLK1 | I20006B1.D | 09/24/10 14:29 |
| CEF-290A-01S-20100915 | 1009134-01 | 0913401.D | 09/24/10 14:57 |
| CEF-290A-DUP-20100915 | 1009134-02 | 0913402.D | 09/24/10 15:26 |
| CEF-502-6S-20100915 | 1009134-03 | 0913403.D | 09/24/10 15:55 |
| CEF-502-07D-20100915 | 1009134-04 | 0913404.D | 09/24/10 16:23 |
| CEF-502-9S-20100916 | 1009134-06 | 0913406.D | 09/24/10 16:52 |
| CEF-502-DUP-02-20100916 | 1009134-07 | 0913407.D | 09/24/10 17:20 |
| CEF-502-3S-20100916 | 1009134-08 | 0913408.D | 09/24/10 17:49 |
| CEF-502-4S-20100916 | 1009134-09 | 0913409.D | 09/24/10 18:17 |
| CEF-290A-01S-20100915 | 0I20006-MS1 | 0913401M.D | 09/24/10 18:45 |
| CEF-290A-01S-20100915 | 0I20006-MSD1 | 0913401S.D | 09/24/10 19:13 |
| CEF-502-3S-20100916 | 0I20006-MS2 | 0913408M.D | 09/24/10 19:40 |
| CEF-502-3S-20100916 | 0I20006-MSD2 | 0913408S.D | 09/24/10 20:08 |

# MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

## SW8270C

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Lab File ID: | SEQ-TUN1.D | Injection Date: | 09/24/10 |
| Instrument ID: | MS-BNA4 | Injection Time: | 09:36 |
| Sequence: | 0I26707 | Lab Sample ID: | 0I26707-TUN1 |

| m/z | ION ABUNDANCE CRITERIA | % RELATIVE ABUNDANCE | |
|---|---|---|---|
| 51 | 30 - 60% of 198 | 58.7 | PASS |
| 68 | Less than 2% of 69 | 1.54 | PASS |
| 69 | Less than 200% of 198 | 56.4 | PASS |
| 70 | Less than 2% of 69 | 0.401 | PASS |
| 127 | 40 - 60% of 198 | 57 | PASS |
| 197 | Less than 1% of 198 | 0.707 | PASS |
| 198 | Base peak, 100% relative abundance | 100 | PASS |
| 199 | 5 - 9% of 198 | 7.01 | PASS |
| 275 | 10 - 30% of 198 | 23.4 | PASS |
| 365 | 1 - 200% of 198 | 2.72 | PASS |
| 441 | 0.001 - 100% of 443 | 79.7 | PASS |
| 442 | 40 - 200% of 198 | 90.8 | PASS |
| 443 | 17 - 23% of 442 | 20 | PASS |

# CONTINUING CALIBRATION CHECK

## SW8270C

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Instrument ID: | MS-BNA4 | Calibration: | 0237003 |
| Lab File ID: | SEQ-CCV1.D | Calibration Date: | 08/23/10 14:19 |
| Sequence: | 0I26707 | Injection Date: | 09/24/10 |
| Lab Sample ID: | 0I26707-CCV1 | Injection Time: | 09:55 |

| | | CONC. (ug/mL) | | RESPONSE FACTOR | | | % DIFF / DRIFT | |
|---|---|---|---|---|---|---|---|---|
| COMPOUND | TYPE | STD | CCV | ICAL | CCV | MIN (#) | CCV | LIMIT (#) |
| Acenaphthene | A | 5.000 | 4.446 | 0.8490211 | 0.7548814 | | -11.1 | 20 |
| Acenaphthylene | A | 5.000 | 4.416 | 1.256297 | 1.10953 | | -11.7 | 20 |
| Anthracene | A | 5.000 | 4.840 | 1.162297 | 1.125216 | | -3.2 | 20 |
| Benzo(a)anthracene | A | 5.000 | 4.862 | 1.05022 | 1.021165 | | -2.8 | 20 |
| Benzo(a)pyrene | A | 5.000 | 4.895 | 1.281052 | 1.254239 | | -2.1 | 20 |
| Benzo(b)fluoranthene | A | 5.000 | 4.915 | 1.518281 | 1.492521 | | -1.7 | 20 |
| Benzo(g,h,i)perylene | A | 5.000 | 4.545 | 1.255234 | 1.140965 | | -9.1 | 20 |
| Benzo(k)fluoranthene | A | 5.000 | 4.913 | 1.472463 | 1.446764 | | -1.7 | 20 |
| Chrysene | A | 5.000 | 5.063 | 1.036307 | 1.049442 | | 1.3 | 20 |
| Dibenz(a,h)anthracene | A | 5.000 | 4.817 | 1.117366 | 1.076457 | | -3.7 | 20 |
| Fluoranthene | A | 5.000 | 4.973 | 1.238826 | 1.232085 | | -0.5 | 20 |
| Fluorene | A | 5.000 | 4.900 | 0.8096793 | 0.7934381 | | -2.0 | 20 |
| Indeno(1,2,3-cd)pyrene | A | 5.000 | 4.604 | 1.182429 | 1.088711 | | -7.9 | 20 |
| 1-Methylnaphthalene | A | 5.000 | 4.501 | 0.7624406 | 0.6863228 | | -10.0 | 20 |
| 2-Methylnaphthalene | A | 5.000 | 4.608 | 0.8439543 | 0.7778331 | | -7.8 | 20 |
| Naphthalene | A | 5.000 | 4.405 | 1.34026 | 1.180845 | | -11.9 | 20 |
| Phenanthrene | A | 5.000 | 4.832 | 1.181841 | 1.142114 | | -3.4 | 20 |
| Pyrene | A | 5.000 | 4.984 | 1.285122 | 1.281009 | | -0.3 | 20 |
| 2-Fluorobiphenyl | A | 5.000 | 4.283 | 0.9978073 | 0.8546515 | | -14.3 | 20 |
| Terphenyl-d14 | A | 5.000 | 5.143 | 0.9438304 | 0.9708986 | | 2.9 | 20 |

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

* Values outside of QC limits

# ANALYSIS DATA SHEET

**Blank**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | SDG: | CTOJM09CF_008 | |
| Client: | Tetra Tech NUS, Inc. (T010) | | Project: | CTO JM09 BP Wells_2010 | |
| Matrix: | | Laboratory ID: | 0I20006-BLK1 | File ID: | I20006B1.D |
| Sampled: | | Prepared: | | Analyzed: | 09/24/10 14:29 |
| Solids: | | Preparation: | EXT_3510 | Dilution: | |

Batch: 0I20006 Sequence: 0I26707 Calibration: 0237003 Instrument: MS-BNA4

| CAS NO. | COMPOUND | CONC. (ug/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| 83-32-9 | Acenaphthene | | 0.0200 | 0.0400 | 0.100 | U |
| 208-96-8 | Acenaphthylene | | 0.0200 | 0.0400 | 0.100 | U |
| 120-12-7 | Anthracene | | 0.0200 | 0.0400 | 0.100 | U |
| 56-55-3 | Benzo(a)anthracene | | 0.0200 | 0.0400 | 0.100 | U |
| 50-32-8 | Benzo(a)pyrene | | 0.0200 | 0.0400 | 0.100 | U |
| 205-99-2 | Benzo(b)fluoranthene | | 0.0200 | 0.0400 | 0.100 | U |
| 191-24-2 | Benzo(g,h,i)perylene | | 0.0200 | 0.0400 | 0.100 | U |
| 207-08-9 | Benzo(k)fluoranthene | | 0.0200 | 0.0400 | 0.100 | U |
| 218-01-9 | Chrysene | | 0.0200 | 0.0400 | 0.100 | U |
| 53-70-3 | Dibenz(a,h)anthracene | | 0.0200 | 0.0400 | 0.100 | U |
| 206-44-0 | Fluoranthene | | 0.0200 | 0.0400 | 0.100 | U |
| 86-73-7 | Fluorene | | 0.0200 | 0.0400 | 0.100 | U |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | | 0.0200 | 0.0400 | 0.100 | U |
| 90-12-0 | 1-Methylnaphthalene | | 0.0200 | 0.0400 | 0.100 | U |
| 91-57-6 | 2-Methylnaphthalene | | 0.0200 | 0.0400 | 0.100 | U |
| 91-20-3 | Naphthalene | | 0.0200 | 0.0400 | 0.100 | U |
| 85-01-8 | Phenanthrene | | 0.0200 | 0.0400 | 0.100 | U |
| 129-00-0 | Pyrene | | 0.0200 | 0.0400 | 0.100 | U |

| SYSTEM MONITORING COMPOUND | ADDED (ug/L) | CONC (ug/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 50.00 | 32.00 | 64.0 | 34 - 167 | |
| Terphenyl-d14 | 50.00 | 34.47 | 68.9 | 34 - 167 | |

# HOLDING TIME SUMMARY
## FLPRO

Laboratory: Empirical Laboratories, LLC SDG: CTOJM09CF_008

Client: Tetra Tech NUS, Inc. (T010) Project: CTO JM09 BP Wells_2010

| Sample Name | Date Collected | Date Received | Date Prepared | Days to Prep | Max Days to Prep | Date Analyzed | Days to Analysis | Max Days to Analysis | Q |
|---|---|---|---|---|---|---|---|---|---|
| CEF-290A-01S-20100915 | 09/15/10 10:33 | 09/17/10 08:45 | 09/20/10 11:47 | 5.09 | 7.00 | 09/22/10 16:10 | 2.18 | 40.00 | |
| CEF-290A-DUP-20100915 | 09/15/10 00:00 | 09/17/10 08:45 | 09/20/10 11:47 | 5.53 | 7.00 | 09/22/10 17:54 | 2.25 | 40.00 | |
| CEF-502-6S-20100915 | 09/15/10 13:23 | 09/17/10 08:45 | 09/20/10 11:47 | 4.98 | 7.00 | 09/22/10 18:28 | 2.28 | 40.00 | |
| CEF-502-07D-20100915 | 09/15/10 13:49 | 09/17/10 08:45 | 09/20/10 11:47 | 4.96 | 7.00 | 09/22/10 19:02 | 2.30 | 40.00 | |
| CEF-502-9S-20100916 | 09/16/10 11:45 | 09/17/10 08:45 | 09/20/10 11:47 | 4.04 | 7.00 | 09/22/10 19:37 | 2.33 | 40.00 | |
| CEF-502-DUP-02-20100916 | 09/16/10 00:00 | 09/17/10 08:45 | 09/20/10 11:47 | 4.53 | 7.00 | 09/22/10 20:10 | 2.35 | 40.00 | |
| CEF-502-3S-20100916 | 09/16/10 12:45 | 09/17/10 08:45 | 09/20/10 11:47 | 4.00 | 7.00 | 09/22/10 20:44 | 2.37 | 40.00 | |
| CEF-502-4S-20100916 | 09/16/10 13:35 | 09/17/10 08:45 | 09/20/10 11:47 | 3.97 | 7.00 | 09/22/10 22:26 | 2.44 | 40.00 | |

# PREPARATION BATCH SUMMARY

## FLPRO

Laboratory: Empirical Laboratories, LLC SDG: CTOJM09CF_008

Client: Tetra Tech NUS, Inc. (T010) Project: CTO JM09 BP Wells_2010

Batch: 0I20004 Batch Matrix: Water Preparation: EXT_3510

| SAMPLE NAME | LAB SAMPLE ID | DATE PREPARED | INITIAL VOL./WEIGHT | FINAL VOL. |
|---|---|---|---|---|
| Blank | 0I20004-BLK1 | 09/20/10 11:47 | 1,000.00 | 2.00 |
| LCS | 0I20004-BS1 | 09/20/10 11:47 | 1,000.00 | 2.00 |
| CEF-290A-01S-20100915 | 0I20004-MS1 | 09/20/10 11:47 | 1,070.00 | 2.00 |
| CEF-502-3S-20100916 | 0I20004-MS2 | 09/20/10 11:47 | 1,080.00 | 2.00 |
| CEF-290A-01S-20100915 | 0I20004-MSD1 | 09/20/10 11:47 | 1,080.00 | 2.00 |
| CEF-502-3S-20100916 | 0I20004-MSD2 | 09/20/10 11:47 | 1,080.00 | 2.00 |
| CEF-290A-01S-20100915 | 1009134-01 | 09/20/10 11:47 | 1,070.00 | 2.00 |
| CEF-290A-DUP-20100915 | 1009134-02 | 09/20/10 11:47 | 1,080.00 | 2.00 |
| CEF-502-6S-20100915 | 1009134-03 | 09/20/10 11:47 | 1,080.00 | 2.00 |
| CEF-502-07D-20100915 | 1009134-04 | 09/20/10 11:47 | 1,080.00 | 2.00 |
| CEF-502-9S-20100916 | 1009134-06 | 09/20/10 11:47 | 1,080.00 | 2.00 |
| CEF-502-DUP-02-20100916 | 1009134-07 | 09/20/10 11:47 | 1,080.00 | 2.00 |
| CEF-502-3S-20100916 | 1009134-08 | 09/20/10 11:47 | 1,080.00 | 2.00 |
| CEF-502-4S-20100916 | 1009134-09 | 09/20/10 11:47 | 1,070.00 | 2.00 |

# ANALYSIS SEQUENCE SUMMARY
## FLPRO

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Sequence: | 0I24408 | Instrument: | GL-GCFID |
| Calibration: | 0244001 | | |

| Sample Name | Lab Sample ID | Lab File ID | Analysis Date/Time |
|---|---|---|---|
| Cal Standard | 0I24408-CAL6 | 002B0201.D | 08/31/10 10:50 |
| Cal Standard | 0I24408-CAL5 | 003B0301.D | 08/31/10 11:25 |
| Cal Standard | 0I24408-CAL4 | 004B0401.D | 08/31/10 11:59 |
| Cal Standard | 0I24408-CAL3 | 005B0501.D | 08/31/10 12:34 |
| Cal Standard | 0I24408-CAL2 | 006B0601.D | 08/31/10 13:08 |
| Cal Standard | 0I24408-CAL1 | 007B0701.D | 08/31/10 13:43 |
| Initial Cal Check | 0I24408-ICV1 | 008B0901.D | 08/31/10 14:56 |

# INITIAL CALIBRATION STANDARDS

## FLPRO

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Sequence: | 0I24408 | Instrument: | GL-GCFID |
| Calibration: | 0244001 | | |

| Standard ID | Description | Lab Sample ID | Lab File ID | Analysis Date/Time |
|---|---|---|---|---|
| 10H0857 | Florida pro ICAL 85ppm | 0I24408-CAL6 | 002B0201.D | 08/31/10 10:50 |
| 10H0856 | Florida pro ICAL 850ppm | 0I24408-CAL5 | 003B0301.D | 08/31/10 11:25 |
| 10H0855 | Florida pro ICAL 2550ppm | 0I24408-CAL4 | 004B0401.D | 08/31/10 11:59 |
| 10H0854 | Florida pro ICAL 4250ppm | 0I24408-CAL3 | 005B0501.D | 08/31/10 12:34 |
| 10H0853 | Florida pro ICAL 5950ppm | 0I24408-CAL2 | 006B0601.D | 08/31/10 13:08 |
| 10H0852 | Florida pro ICAL 8500ppm | 0I24408-CAL1 | 007B0701.D | 08/31/10 13:43 |

# INITIAL CALIBRATION CHECK

## FLPRO

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Instrument ID: | GL-GCFID | Calibration: | 0244001 |
| Lab File ID: | 008B0901.D | Calibration Date: | 08/31/10 00:00 |
| Sequence: | 0I24408 | Injection Date: | 08/31/10 |
| Lab Sample ID: | 0I24408-ICV1 | Injection Time: | 14:56 |

| | | CONC. (mg/L) | | RESPONSE FACTOR | | | % DIFF / DRIFT | |
|---|---|---|---|---|---|---|---|---|
| COMPOUND | TYPE | STD | ICV | ICAL | ICV | MIN (#) | ICV | LIMIT (#) |
| Petroleum Range Organics | A | 4000 | 3677 | 1345.229 | 1236.544 | | -8.1 | 25 |

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

* Values outside of QC limits

# ANALYSIS SEQUENCE SUMMARY
## FLPRO

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Sequence: | 0I26608 | Instrument: | GL-GCFID |
| Calibration: | 0244001 | | |

| Sample Name | Lab Sample ID | Lab File ID | Analysis Date/Time |
|---|---|---|---|
| Calibration Check | 0I26608-CCV1 | 007B0701.D | 09/22/10 14:20 |
| Blank | 0I20004-BLK1 | 008B0801.D | 09/22/10 15:01 |
| LCS | 0I20004-BS1 | 009B0901.D | 09/22/10 15:36 |
| CEF-290A-01S-20100915 | 1009134-01 | 010B1001.D | 09/22/10 16:10 |
| CEF-290A-01S-20100915 | 0I20004-MS1 | 011B1101.D | 09/22/10 16:45 |
| CEF-290A-01S-20100915 | 0I20004-MSD1 | 012B1201.D | 09/22/10 17:20 |
| CEF-290A-DUP-20100915 | 1009134-02 | 013B1301.D | 09/22/10 17:54 |
| CEF-502-6S-20100915 | 1009134-03 | 014B1401.D | 09/22/10 18:28 |
| CEF-502-07D-20100915 | 1009134-04 | 015B1501.D | 09/22/10 19:02 |
| CEF-502-9S-20100916 | 1009134-06 | 016B1601.D | 09/22/10 19:37 |
| CEF-502-DUP-02-20100916 | 1009134-07 | 017B1701.D | 09/22/10 20:10 |
| CEF-502-3S-20100916 | 1009134-08 | 018B1801.D | 09/22/10 20:44 |
| CEF-502-3S-20100916 | 0I20004-MS2 | 019B1901.D | 09/22/10 21:18 |
| CEF-502-3S-20100916 | 0I20004-MSD2 | 020B2001.D | 09/22/10 21:52 |
| CEF-502-4S-20100916 | 1009134-09 | 021B2101.D | 09/22/10 22:26 |
| Calibration Check | 0I26608-CCV2 | 022B2201.D | 09/23/10 09:35 |

# CONTINUING CALIBRATION CHECK

## FLPRO

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Instrument ID: | GL-GCFID | Calibration: | 0244001 |
| Lab File ID: | 007B0701.D | Calibration Date: | 08/31/10 00:00 |
| Sequence: | 0I26608 | Injection Date: | 09/22/10 |
| Lab Sample ID: | 0I26608-CCV1 | Injection Time: | 14:20 |

| | | CONC. (mg/L) | | RESPONSE FACTOR | | | % DIFF / DRIFT | |
|---|---|---|---|---|---|---|---|---|
| COMPOUND | TYPE | STD | CCV | ICAL | CCV | MIN (#) | CCV | LIMIT (#) |
| Petroleum Range Organics | A | 4250 | 4254 | 1345.229 | 1346.602 | | 0.1 | 25 |
| 2-Fluorobiphenyl | A | 25.00 | 25.67 | 1813.167 | 1861.6 | | 2.7 | 25 |
| o-Terphenyl | A | 25.00 | 25.70 | 2199.287 | 2261.12 | | 2.8 | 25 |

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

* Values outside of QC limits

# ANALYSIS DATA SHEET

**Blank**

| | | | | | |
|---|---|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | | SDG: | CTOJM09CF_008 | |
| Client: | Tetra Tech NUS, Inc. (T010) | | Project: | CTO JM09 BP Wells_2010 | |
| Matrix: | | Laboratory ID: | 0I20004-BLK1 | File ID: | 008B0801.D |
| Sampled: | | Prepared: | | Analyzed: | 09/22/10 15:01 |
| Solids: | | Preparation: | EXT_3510 | Dilution: | |

Batch: 0I20004 Sequence: 0I26608 Calibration: 0244001 Instrument: GL-GCFID

| CAS NO. | COMPOUND | CONC. (mg/L) | DL | LOD | LOQ | Q |
|---|---|---|---|---|---|---|
| | Petroleum Range Organics | | 0.0850 | 0.170 | 0.340 | U |

| SYSTEM MONITORING COMPOUND | ADDED (mg/L) | CONC (mg/L) | % REC | QC LIMITS | Q |
|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 0.05000 | 0.04421 | 88.4 | 50 - 150 | |
| o-Terphenyl | 0.05000 | 0.04229 | 84.6 | 82 - 142 | |

# CONTINUING CALIBRATION CHECK

## FLPRO

| | | | |
|---|---|---|---|
| Laboratory: | Empirical Laboratories, LLC | SDG: | CTOJM09CF_008 |
| Client: | Tetra Tech NUS, Inc. (T010) | Project: | CTO JM09 BP Wells_2010 |
| Instrument ID: | GL-GCFID | Calibration: | 0244001 |
| Lab File ID: | 022B2201.D | Calibration Date: | 08/31/10 00:00 |
| Sequence: | 0I26608 | Injection Date: | 09/23/10 |
| Lab Sample ID: | 0I26608-CCV2 | Injection Time: | 09:35 |

| | | CONC. (mg/L) | | RESPONSE FACTOR | | | % DIFF / DRIFT | |
|---|---|---|---|---|---|---|---|---|
| COMPOUND | TYPE | STD | CCV | ICAL | CCV | MIN (#) | CCV | LIMIT (#) |
| Petroleum Range Organics | A | 4250 | 4293 | 1345.229 | 1358.767 | | 1.0 | 25 |
| 2-Fluorobiphenyl | A | 25.00 | 25.07 | 1813.167 | 1818.56 | | 0.3 | 25 |
| o-Terphenyl | A | 25.00 | 25.79 | 2199.287 | 2268.44 | | 3.1 | 25 |

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

* Values outside of QC limits

# METHOD DETECTION AND REPORTING LIMITS

**Laboratory:** Empirical Laboratories, LLC
**SDG:** CTOJM09CF_008
**Client:** Tetra Tech NUS, Inc. (T010)
**Project:** CTO JM09 BP Wells_2010
**Matrix:** Water
**Instrument:** GL-GCFID

| Analyte | MDL | MRL | Units | Method |
|---|---|---|---|---|
| Petroleum Range Organics | 0.0850 | 0.340 | mg/L | FLPRO |

FIELD DUPLICATE CALCULATIONS SDG: CTOJM09CF_008

| PARAMETERS | ORIGINAL SAMPLE | DUPLICATE SAMPLE | RPD |
|---|---|---|---|
| | CEF-290A-01S-20100915 | CEF-290A-DUP-20100915 | % |
| | | | |
| ACENAPTHENE | 0.0206 J | NON-DETECT | NA |
| ANTHRACENE | 0.0284 J | NON-DETECT | NA |
| BENZO(A)ANTHRACENE | 0.0357 J | NON-DETECT | NA |
| BENZO(A)PYRENE | 0.0316 J | NON-DETECT | NA |
| BENZO(B)FLUORANTHENE | 0.0455 J | NON-DETECT | NA |
| BENZO(G,H,I)PERYLENE | 0.0465 J | NON-DETECT | NA |
| BENZO(K)FLUORANTHENE | 0.0427 J | NON-DETECT | NA |
| CHRYSENE | 0.0425 J | NON-DETECT | NA |
| DIBENZ(A,H)ANTHRACENE | 0.044 J | NON-DETECT | NA |
| FLUORANTHENE | 0.0403 | 0.0196 | 69.12 |
| FLUORENE | 0.0268 J | NON-DETECT | NA |
| INDENO(1,2,3-CD)PYRENE | 0.0465 J | NON-DETECT | NA |
| 2-METHYLNAPHTHALENE | 0.0189 J | NON-DETECT | NA |
| PHENANTHRENE | 0.0454 | 0.025 | 57.95 |
| PYRENE | 0.0421 | 0.0193 | 74.27 |
| | | | |
| | ORIGINAL SAMPLE | DUPLICATE SAMPLE | RPD |
| | CEF-502-9S-20100916 | CEF-502-DUP-01-20100916 | % |
| | | | |
| ETHYLBENZENE | 0.787 | 0.745 | 5.48 |
| ISOPROPYLBENZENE | 0.408 | 0.376 | 8.16 |
| 1,3,5-TRIMETHYLBENZENE | 0.418 | 0.396 | 5.41 |
| 1,2,4-TRIMETHYLBENZENE | 0.44 | 0.415 | 5.85 |
| | | | |
| 2-METHYLNAPHTHALENE | 2.03 | 1.6 | 23.69 |
| 1-METHYLNAPHTHALENE | 1.67 | 1.25 | 28.77 |
| NAPHTHALENE | 0.879 | 0.695 | 23.38 |
| PHENANTHRENE | NON-DETECT | 0.459 | NA |
| | | | |
| PETROLEUM RANGE ORGANICS | 2.36 | 2.26 | 4.33 |