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POST-EXCAVATION GROUNDWATER MONITORING REPORT THIRD EVENT MARCH 2011
AT BUILDING 502 TANK 502 NAS CECIL FIELD FL
05/23/2011
TETRA TECH NUS



TETRA TECH

PITT-05-11-045

May 23, 2011

Project Number 112G00746

Mr. David Grabka
Remedial Project Manager
Technical Review/Federal Facilities
Florida Department of Environmental Protection
2600 Blair Stone Road
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Reference: CLEAN Contract Number N62467-04-D-0055
Contract Task Order 0076

Subject: Post-Excavation Groundwater Monitoring Report, Third Event – March 2011
Building 502, Tank 502
Naval Air Station Cecil Field
Jacksonville, Florida

Dear Mr. Grabka:

On behalf of the Navy, Tetra Tech NUS, Inc. (Tetra Tech) is pleased to submit this 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 to determine the presence or absence of groundwater contamination following June 2010 soil excavation activities. The third post-excavation groundwater monitoring event was conducted based on Meeting Minute No. 2668 and associated Decision No. 806 from the Base Realignment and Closure (BRAC) Cleanup Team (BCT) February 9, 2011 meeting (BCT, 2011a).

This Post-Excavation Groundwater Monitoring Report summarizes the field operations and analytical results for the subject site for the sampling event conducted on March 23, 2011.

BACKGROUND

Building 502 is located in the Main Base area of the former Naval Air Station Cecil Field, as shown on 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 (HLA). HLA recommended a soil source removal in the area immediately surrounding the former location of the fuel tank (HLA, 1998). The source removal was conducted in January 1999, and the following items were noted in the report by CH2MHill Constructors, Inc. (CH2MHill):

- The contaminated soil associated with Tank 502 was removed.
- 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 (CH2MHill, 1999).

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In April 1999, a follow-up Site Assessment Report (SAR) recommended that No Further Action (NFA) be conducted with regard to soil at the site (HLA, 1999). The SAR recommended groundwater monitoring only for natural attenuation 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 recommended that those wells be replaced and monitored along with CEF-502-4S. 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, FDEP agreed that groundwater monitoring should continue, but required that a monitoring well be installed at the former location of CEF-502-1S, and that samples from that well 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 total recoverable petroleum hydrocarbons (TRPH) using the Florida Petroleum-Range Organics (FL-PRO) method.

During March and April 2001, Tetra Tech conducted a Supplemental Site Assessment in response to 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 TRPH, as required in the MOP. The Supplemental SAR recommended several modifications to the monitoring program, including installation and sampling of a new well (CEF-502-8S), and sampling of an additional existing well (CEF-502-3S). The recommendations were approved by 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 (Tetra Tech, 2004). However, concentrations of naphthalene and TRPH in well CEF-502-1SR were greater than the Year 4 milestone objectives.

Because the concentrations of naphthalene, 1-methylnaphthalene, 2-methylnaphthalene, and TRPH continued to exceed GCTLs in monitoring well CEF-502-1SR, Tetra Tech recommended additional characterization of a potential source contributing to the contamination of CEF-502-1SR, and also recommended that semi-annual monitoring of existing wells be continued. This recommendation was discussed and approved at the December 2005 BCT meeting. In November 2006, Tetra Tech installed 10 soil borings in the vicinity of CEF-502-1SR. Based on field screening results and visual observations, one soil sample was collected from each soil boring location and analyzed for PAHs using USEPA Method SW-846 8310, and for TRPH 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 select VOCs using USEPA Method SW-846 8260B, PAHs including 1-methylnaphthalene and 2-methylnaphthalene using USEPA Method SW-846 8310, and TRPH using FL-PRO.

During the November 2006 sampling event, TRPH was detected in excess of its Soil Cleanup Target Level (SCTL) in soil samples from borings CEF-502-SB06 [at 5 feet below ground surface (bgs)], CEF-502-SB07 (at 5 feet bgs), CEF-502-SB09 (at 3 feet bgs), and CEF-502-SB10 (at 5 feet 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 concentrations greater than the GCTL in groundwater from wells CEF-502-1SR and



CEF-502-4S. Based on these sampling results, Tetra Tech prepared an SAR Addendum (SARA), submitted May 11, 2007, recommending source removal in the vicinity of the soil borings in which TRPH had been detected at concentrations greater than the SCTL (Tetra Tech, 2007a). 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 (Tetra Tech, 2007b).

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 TRPH 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 (Tetra Tech, 2007b), an Excavation of Petroleum-Contaminated Soil Work Plan for Buildings 502 and 290A was prepared by CH2MHill and submitted in March 2010 (CH2MHill, 2010a). 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 TRPH had been detected at levels greater than the SCTL during the November 2006 sampling event (CH2MHill, 2010b). Following excavation and site restoration by CH2MHill, Tetra Tech installed monitoring well CEF-502-9S to replace monitoring well CEF-502-1SR in September 2010, which was abandoned during excavation activities. The first post-excavation groundwater monitoring event was conducted in September 2010 and included collection of groundwater samples from monitoring wells CEF-502-3S, CEF-502-4S, CEF-502-6S, CEF-502-7D, and CEF-502-9S. Well CEF-502-8S was not sampled because all concentrations at this well were non-detect prior to the excavation, and it was not included in the sampling plan in the recommendations section of the SARA. Samples were analyzed for select VOCs using USEPA Method SW-846 8260B, PAHs using USEPA Method SW-846 8270C, and TRPH using the FL-PRO method. The analytical results for this first event indicated that all analytes were either not detected or detected at concentrations less than their respective GCTLs (Tetra Tech, 2010). The second post-excavation groundwater monitoring event was conducted in December, to confirm these results. The results for this event indicated that concentrations of isopropylbenzene in groundwater samples from wells CEF-502-4S and CEF-502-9S exceeded the GCTL (Tetra Tech, 2011). Concentrations of isopropylbenzene were not detected in groundwater samples from any other well. All other analytes were either not detected or detected at concentrations less than their respective GCTLs. The third post-excavation groundwater monitoring event was conducted in order to confirm these exceedances prior to making a decision if this site is a candidate for long-term monitoring.

FIELD OPERATIONS

As agreed upon by the BCT on February 9, 2011 (BCT, 2011a), post-excavation groundwater samples were collected from monitoring wells CEF-502-3S, CEF-502-4S, CEF-502-6S, and CEF-502-9S on March 23, 2011 to be analyzed for isopropylbenzene only. 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 isopropylbenzene only using USEPA Method SW-846 8260B.

Prior to obtaining groundwater samples, synoptic water levels and total well depths were measured and recorded on site-specific field data sheets for the four sampled wells and CEF-502-8S. The field data sheets can be found in Attachment A. On March 23, 2011, groundwater elevations ranged from 75.68 feet above mean sea level (msl) (CEF-502-4S) to 76.10 feet above msl (CEF-502-6S and 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 Tetra Tech Standard Operating Procedures (SOPs) and FDEP SOPs under DEP-SOP-001/01.

RESULTS

The March 2010 groundwater elevation data indicated that groundwater flow is to the 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 March 2011 data is provided as 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 isopropylbenzene was not detected in groundwater samples from any of the wells sampled during this monitoring event. Table 3 presents the analytical results by monitoring well, including results from previous sampling events, and Figure 4 shows the results from the current event, along with the past five monitoring events.

CONCLUSIONS AND RECOMMENDATIONS

Prior to excavation activities conducted in June 2010, concentrations of 1-methylnaphthalene, 2-methylnaphthalene, and naphthalene in groundwater at monitoring well CEF-502-1SR were consistently greater than their respective GCTLs. During the first post-excavation monitoring event, which occurred after the excavation of contaminated soil at Building 502 and the subsequent replacement of monitoring well CEF-502-1SR by CEF-502-9S, all analytes were either not detected or detected at levels less than their respective GCTLs at all monitoring wells sampled (CEF-502-3S, CEF-502-4S, CEF-502-6S, CEF-502-7D, and CEF-502-9S). During the second post-excavation monitoring event, concentrations of isopropylbenzene exceeded the GCTL in groundwater from two monitoring wells (CEF-502-4S and CEF-502-9S). However, no concentrations of isopropylbenzene were detected during the third post-excavation monitoring event.

It is recommended, based on discussions at the BCT meeting on May 11, 2011, that monitoring wells CEF-502-4S and CEF-502-9S be resampled for isopropylbenzene only to confirm the isopropylbenzene non-detects in groundwater samples collected during the March 2011 event (BCT, 2011b). If analytical results verify that all isopropylbenzene concentrations are less than the GCTL, then the site will be recommended for no further action (NFA). If any results are greater than the GCTL, then the site will be recommended for groundwater monitoring. The sampling effort is tentatively scheduled for the week of June 20, 2011.

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

Sincerely,

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

RS/clm

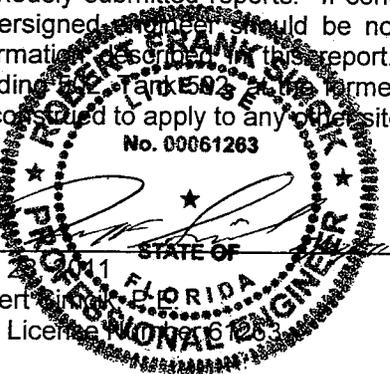


Attachments (4)

- c: A. Sanford, NAVFAC SE (electronic copy)
- M. Davidson, NAVFAC SE (electronic copy)
- S. Martin, NAVFAC Atlantic (electronic copy)
- D. Vaughn-Wright, USEPA (electronic copy)
- M. Halil, CH2MHill (electronic only)
- M. Boerio, Tetra Tech (electronic copy)
- C. Pike, Tetra Tech CTO 0076 project file (1 copy, unbound)
- D. Humbert, Tetra Tech
- M. Jonnet, Tetra Tech (electronic copy)
- J. Johnson, Tetra Tech (1 copy for Information Repository)

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 Third Post-Excavation Groundwater Monitoring Report for Building 502 Park 502, former Naval Air Station Cecil Field, Jacksonville, Florida, and should not be considered to apply to any other site.



 May 23, 2011
 Robert J. ...
 P.E. License No. 00061263

REFERENCES

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- BCT (Base Realignment and Closure Cleanup Team), 2010. Minutes of Meeting. Minutes Reference No. 2648, Decision No. 791, November 3.
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- Tetra Tech, 2006. Supplemental Soil Assessment Letter Report for Tank G290-A, Naval Air Station Cecil Field, Jacksonville, Florida.
- Tetra Tech, 2007a. Site Assessment Report Addendum, Building 502, Tank 502, Naval Air Station Cecil Field, Jacksonville, Florida.
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- Tetra Tech, 2010. Post-Excavation Groundwater Monitoring Report, First Event, Building 502, Tank 502, Naval Air Station Cecil Field, Jacksonville, Florida.
- Tetra Tech, 2011. Post-Excavation Groundwater Monitoring Report, Second Event, Building 502, Tank 502, Naval Air Station Cecil Field, Jacksonville, Florida.

TABLES

**Table 1
Groundwater Elevation Data**

Post-Excavation Monitoring Report, Third Event – March 2011
Building 502, Tank 502
Naval Air Station Cecil Field
Jacksonville, Florida

Well Number	Total Depth (ft bgs)	Top of Casing Elevation (ft above msl)	April 9, 2001		December 11, 2001		March 4, 2002		June 6, 2002	
			Depth to Water (ft btoc)	Groundwater Elevation (ft above msl)	Depth to Water (ft btoc)	Groundwater Elevation (ft above msl)	Depth to Water (ft btoc)	Groundwater Elevation (ft above msl)	Depth to Water (ft btoc)	Groundwater 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	14.80	81.63	5.72	75.91	5.20	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	8.00	73.75

Well Number	Total Depth (ft bgs)	Top of Casing Elevation (ft above msl)	December 20, 2002		June 24, 2003		January 28, 2004		November 20, 2006	
			Depth to Water (ft btoc)	Groundwater Elevation (ft above msl)	Depth to Water (ft btoc)	Groundwater Elevation (ft above msl)	Depth to Water (ft btoc)	Groundwater Elevation (ft above msl)	Depth to Water (ft btoc)	Groundwater Elevation (ft above msl)
CEF-502-1SR	12.48	82.16	4.77	77.39	5.62	76.54	8.36	73.8	9.40	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	77.10	5.45	75.19	7.17	73.47	8.60	72.04
CEF-502-6S	14.80	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 above msl)	February 7, 2007		September 15, 2010		December 9, 2010		March 23, 2011	
			Depth to Water (ft btoc)	Groundwater Elevation (ft above msl)	Depth to Water (ft btoc)	Groundwater Elevation (ft above msl)	Depth to Water (ft btoc)	Groundwater Elevation (ft above msl)	Depth to Water (ft btoc)	Groundwater Elevation (ft above msl)
CEF-502-1SR ⁽¹⁾	12.48	82.16	9.11	73.05	NM	NA	NM	NA	NM	NA
CEF-502-3S	12.22	80.68	7.79	72.89	4.89	75.79	7.63	73.05	4.95	75.73
CEF-502-4S	12.36	80.64	7.87	72.77	4.95	75.69	7.72	72.92	4.96	75.68
CEF-502-6S	14.80	81.63	8.75	72.88	5.38	76.25	8.53	73.10	5.53	76.10
CEF-502-7D	29.95	81.65	8.78	72.87	5.81	75.84	NM	NA	NM	NA
CEF-502-8S	13.57	81.75	8.74	73.01	NM	NA	8.56	73.19	5.84	75.91
CEF-502-9S ⁽¹⁾	15.25	82.05	NM	NA	5.86	76.19	8.80	73.25	5.95	76.10

1 Well CEF-502-1SR was abandoned 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.

All elevations are referenced to the North American Vertical Datum, 1988.

NA = Not applicable.

NM = Not measured.

Table 2
Post-Excavation Monitoring, Third Event Groundwater Results

Post-Excavation Monitoring Report, Third Event – March 2011
 Building 502, Tank 502
 Naval Air Station Cecil Field
 Jacksonville, Florida

CONSTITUENT	FDEP GCTL	CEF-502-				
		MW-3S	MW-4S	MW-6S		MW-9S
				Sample	Duplicate	
VOLATILE ORGANICS (µg/L)						
ISOPROPYLBENZENE	0.8	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U

µg/L = Micrograms per liter.

U = Not detected at associated detection limit.

**Table 3
Historical Groundwater Sampling Results**

Post-Excavation Monitoring Report, Third Event – March 2011
Building 502, Tank 502
Naval Air Station Cecil Field
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CONSTITUENT	FDEP GCTL	MW-1SR				MW-9S				MW-3S			
		Jan-04	Nov-06	Sample Feb-07	Duplicate	Sample Sep-10	Duplicate	Dec-10	Mar-11	Jan-04	Nov-06	Feb-07	Sep-10
VOLATILE ORGANICS (µg/L)													
1,2,4-TRIMETHYLBENZENE	10	NS	6.9	NS	NS	0.415 J	0.440 J	2.66	NS	NS	0.5 J	NS	0.3 U
1,3,5-TRIMETHYLBENZENE	10	NS	2.8	NS	NS	0.396 J	0.418 J	0.271 J	NS	NS	0.2 U	NS	0.3 U
BENZENE	1	0.5 U	0.2 U	0.50 U	0.50 U	0.3 U	0.3 U	0.25 U	NS	0.5 U	0.2 U	0.50 U	0.3 U
ETHYLBENZENE	30	7.9	2.5	3.3	3.2	0.745 J	0.787 J	1.26	NS	0.5 U	0.3 U	0.5 U	0.3 U
ISOPROPYLBENZENE	0.8	NS	2.7	NS	NS	0.376 J	0.408 J	1.49	0.25 U	NS	0.1 U	NS	0.3 U
TOTAL XYLENES	20	1.8 J	0.3 U	1.0 U	1.0 U	0.3 U	0.3 U	1.64 J	NS	1.0 U	0.3 U	1.0 U	0.3 U
SEMIVOLATILE ORGANICS (µg/L)													
1-METHYLNAPHTHALENE	28	49.9	52.8 D	40.4	42.8	2.03	1.60	5.48	NS	1.2 J	6.46	0.49 U	0.519
2-METHYLNAPHTHALENE	28	105	110 D	64.3	67.2	1.67	1.25	2.86	NS	0.51 U	4.92	0.49 U	0.0547 J
ACENAPHTHENE	20	1.1 U	1.72	3.5	2.8	0.0185 U	0.0187 U	0.56	NS	1.0 U	0.39	0.98 U	0.0614 J
ANTHRACENE	2100	1.1 U	0.07 J	0.98 U	0.98 U	0.0185 U	0.0187 U	0.0463 U	NS	1.0 U	0.02 U	0.98 U	0.0185 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	0.0463 U	NS	0.1 U	0.02 U	0.049 U	0.0185 U
FLUORENE	280	5	2.78	3.9	4	0.0185 U	0.0187 U	0.718	NS	1.0 U	0.58	0.98 U	0.0185 U
NAPHTHALENE	14	40.4	11.2	21.1	17.1	0.879	0.695	2.72	NS	0.92	0.92	0.98 U	0.0711 J
PHENANTHRENE	210	6.1	2.4	3.1	3.8	0.0185 U	0.459	0.426	NS	1.0 U	0.13	0.98 U	0.0185 U
TOTAL PETROLEUM HYDROCARBONS (mg/L)													
TPH (C08-C40)	5	7.42	2.11	3.93	4.65	2.36	2.26	1.5	NS	0.617	0.166 J	0.526	0.330

**Table 3
Historical Groundwater Sampling Results**

Post-Excavation Monitoring Report, Third Event – March 2011
Building 502, Tank 502
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CONSTITUENT	FDEP GCTL	MW-3S (continued)			MW-4S						MW-6S		
		Sample	Duplicate	Mar-11	Jan-04	Nov-06	Feb-07	Sep-10	Dec-10	Mar-11	Jan-04	Nov-06	Feb-07
		Dec-10											
VOLATILE ORGANICS (µg/L)													
1,2,4-TRIMETHYLBENZENE	10	0.25 U	0.25 U	NS	NS	0.6 J	NS	0.3 U	0.259 J	NS	NS	0.2 U	NS
1,3,5-TRIMETHYLBENZENE	10	0.25 U	0.25 U	NS	NS	0.6 J	NS	0.3 U	0.25 U	NS	NS	0.2 U	NS
BENZENE	1	0.25 U	0.25 U	NS	0.5 U	0.3 J	0.50 U	0.3 U	0.25 U	NS	0.5 U	0.2 U	0.50 U
ETHYLBENZENE	30	0.25 U	0.25 U	NS	0.76 J	2.2	3.7	0.3 U	2.35	NS	1.2	0.3 J	0.5 U
ISOPROPYLBENZENE	0.8	0.25 U	0.25 U	0.25 U	NS	1.2	NS	0.3 U	1.64	0.25 U	NS	0.4 J	NS
TOTAL XYLENES	20	0.75 U	0.75 U	NS	1.0 U	0.9 J	1.0 U	0.3 U	0.75 U	NS	1.0 U	0.3 U	1.0 U
SEMIVOLATILE ORGANICS (µg/L)													
1-METHYLNAPHTHALENE	28	0.963	7.54	NS	0.55 U	1.48	1	0.0546 J	0.306	NS	4	1.95	1.5
2-METHYLNAPHTHALENE	28	0.261	3.91	NS	1.8 J	8.37	8.2	0.907	5.83	NS	16.4	3.75	2.9
ACENAPHTHENE	20	0.0997 J	0.829	NS	1.1 U	0.29	1 U	0.0296 J	0.354	NS	1.1 U	1.11	0.97 U
ANTHRACENE	2100	0.0463 U	0.0463 U	NS	1.1 U	0.02 U	1.0 U	0.0187 U	0.0463 U	NS	1.1 U	0.02 U	0.97 U
DIBENZO(a,h)ANTHRACENE	0.005	0.0463 U	0.0463 U	NS	0.11 U	0.02 U	0.052 U	0.0187 U	0.0463 U	NS	0.11 U	0.02 U	0.049 U
FLUORENE	280	0.0463 U	0.986	NS	1.1 U	0.22	1 U	0.0320 J	0.267	NS	2.1 J	2.16	1.9
NAPHTHALENE	14	0.125 J	3.34	NS	0.55 U	2.69	4.3	0.120	0.685	NS	2.5	0.43	0.97
PHENANTHRENE	210	0.0463 U	0.565	NS	1.1 U	0.02 U	1 U	0.0195 J	0.0463 U	NS	1.1 U	0.08 J	0.97
TOTAL PETROLEUM HYDROCARBONS (mg/L)													
TPH (C08-C40)	5	0.157 U	0.157 U	NS	0.667	0.496	1.07	0.0794 U	1.12	NS	0.815	0.33	0.794

Table 3
Historical Groundwater Sampling Results

Post-Excavation Monitoring Report, Third Event – March 2011
Building 502, Tank 502
Naval Air Station Cecil Field
Jacksonville, Florida
Page 3 of 3

CONSTITUENT	FDEP GCTL	MW-6S (continued)				MW-7D				MW-8S			
		Sep-10	Dec-10	Sample Mar-11	Duplicate	Jan-04	Nov-06	Feb-07	Sep-10	Jan-04	Sample Nov-06	Duplicate	Feb-07
VOLATILE ORGANICS (µg/L)													
1,2,4-TRIMETHYLBENZENE	10	0.3 U	0.25 U	NS	NS	NS	0.2 U	NS	0.3 U	NS	0.2 U	0.2 U	NS
1,3,5-TRIMETHYLBENZENE	10	0.3 U	0.25 U	NS	NS	NS	0.2 U	NS	0.3 U	NS	0.2 U	0.2 U	NS
BENZENE	1	0.3 U	0.25 U	NS	NS	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	0.3 U	0.25 U	NS	NS	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	0.3 U	0.25 U	0.25 U	0.25 U	NS	0.1 U	NS	0.3 U	NS	0.1 U	0.1 U	NS
TOTAL XYLENES	20	0.3 U	0.75 U	NS	NS	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	0.727	1.48	NS	NS	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	0.829	1.79	NS	NS	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	1.09	0.896	NS	NS	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	0.0185 U	0.0463 U	NS	NS	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	0.0271 J	0.0463 U	NS	NS	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	0.0185 U	1.43	NS	NS	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	0.0185 U	0.396	NS	NS	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	0.0185 U	0.0519 J	NS	NS	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	0.652	0.522 J	NS	NS	0.27 U	0.094 U	0.16 U	0.787 U	0.303	0.094 U	0.094 U	0.17 U

Concentration exceeds criterion.

Bolded values exceed detection limit.

D = Data reported from a dilution.

J = Estimated concentration.

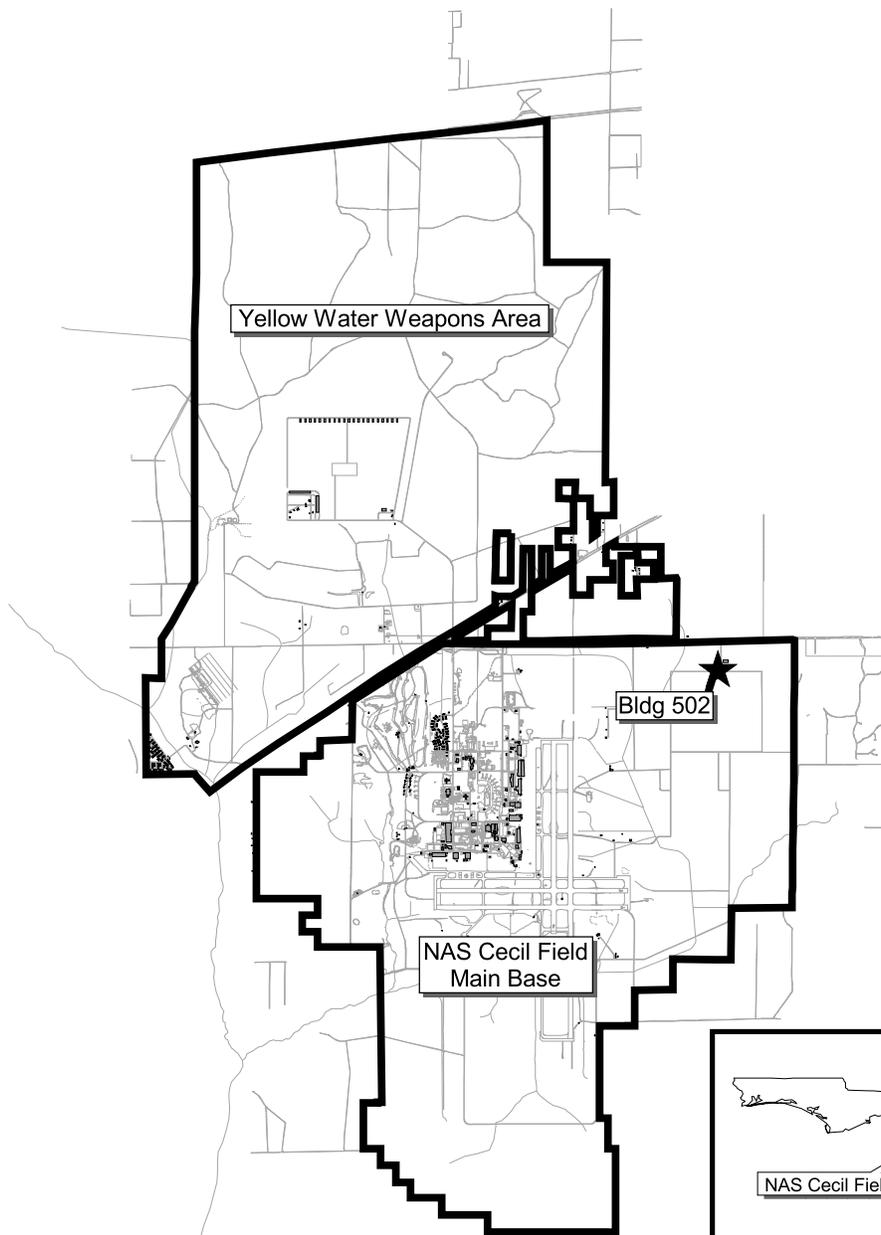
U = Not detected at associated detection limit.

NS = Not sampled.

mg/L = Micrograms per liter.

µg/L = Milligrams per liter.

FIGURES



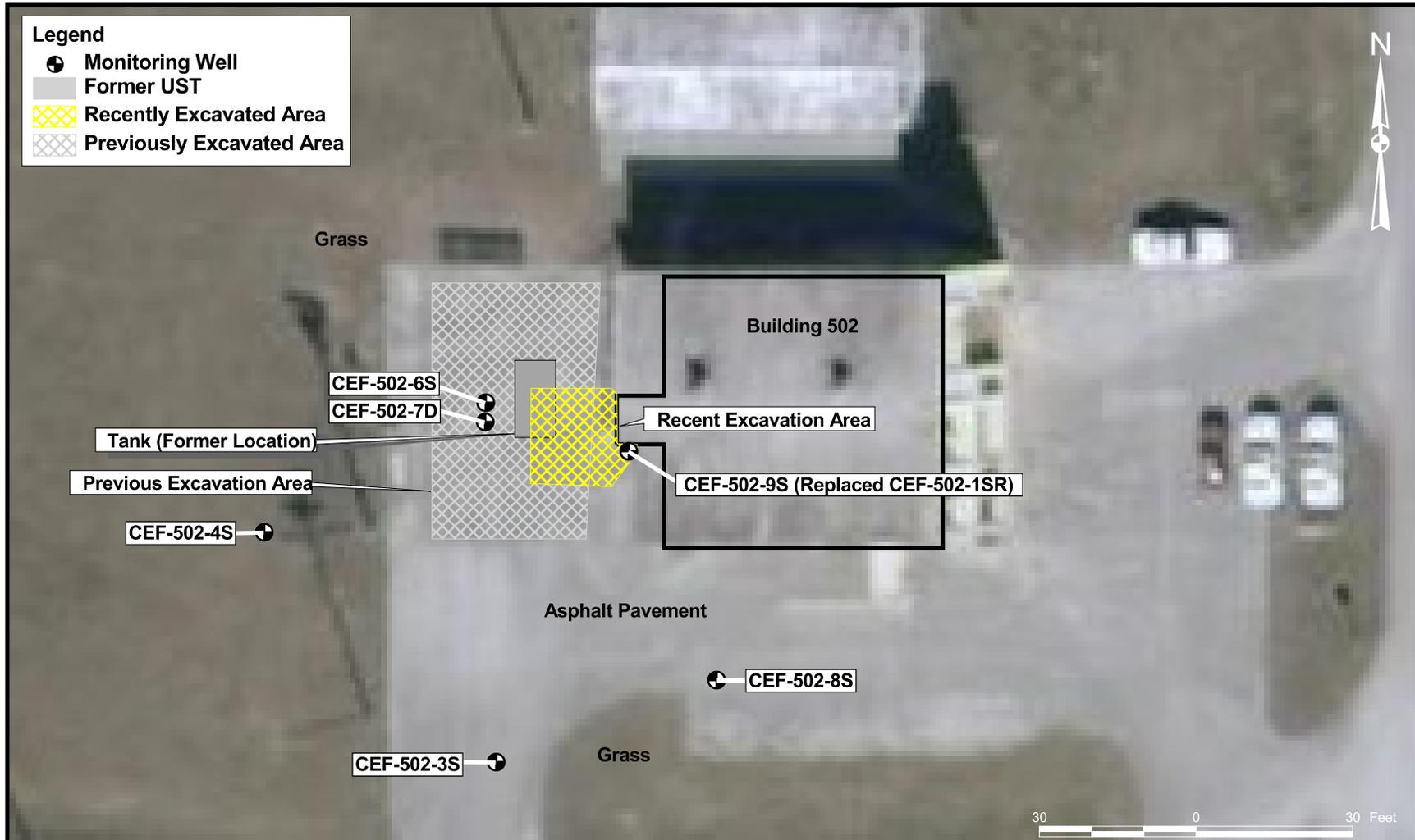
8000 0 8000 Feet

DRAWN BY MJJ	DATE 12Nov10
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	



GENERAL LOCATION MAP
BUILDING 502
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NUMBER 0025	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 1	REV 0

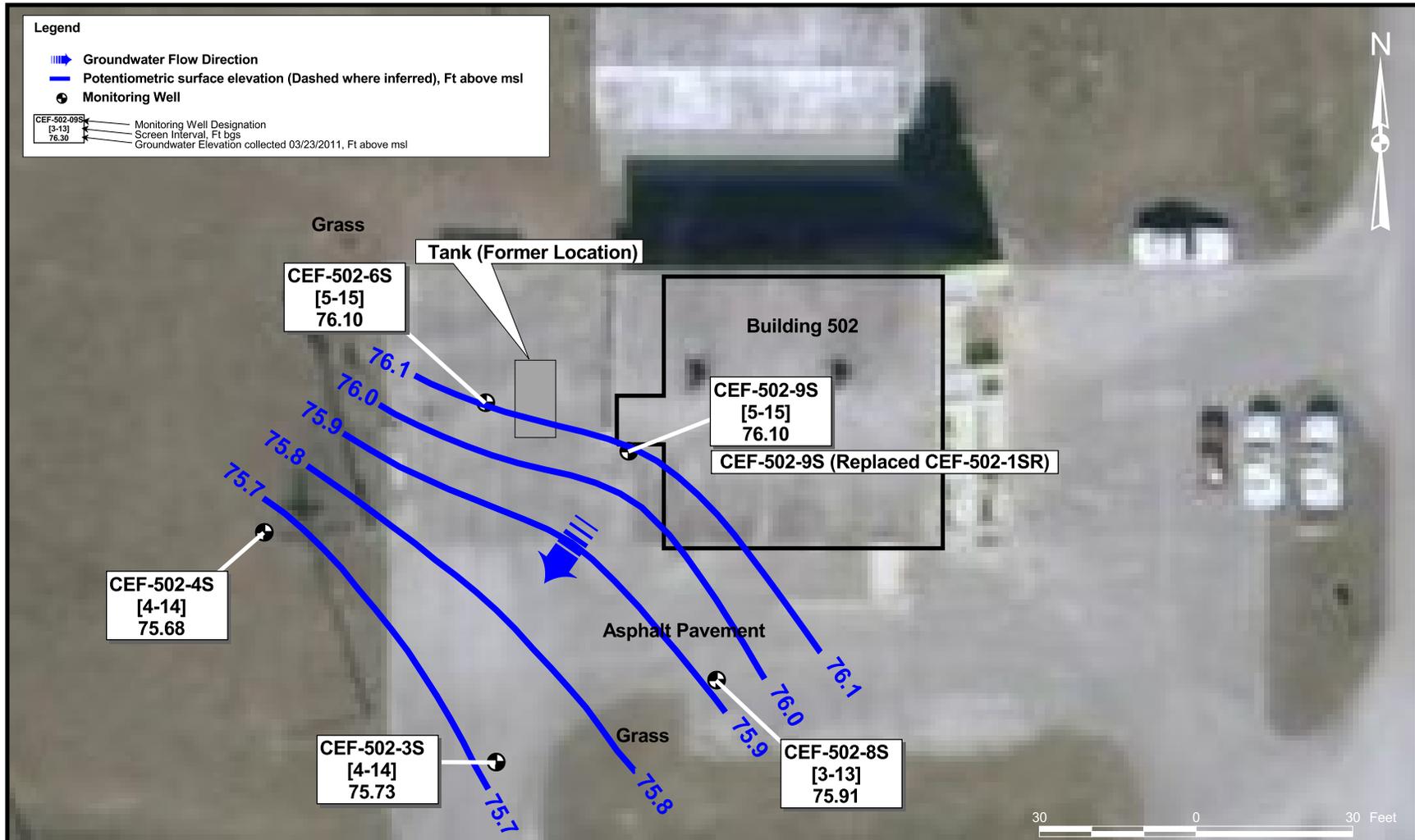


DRAWN BY	DATE
MJJ	12Nov10
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	



MONITORING WELL LOCATION MAP
 BUILDING 502
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 0025	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 2	REV 0

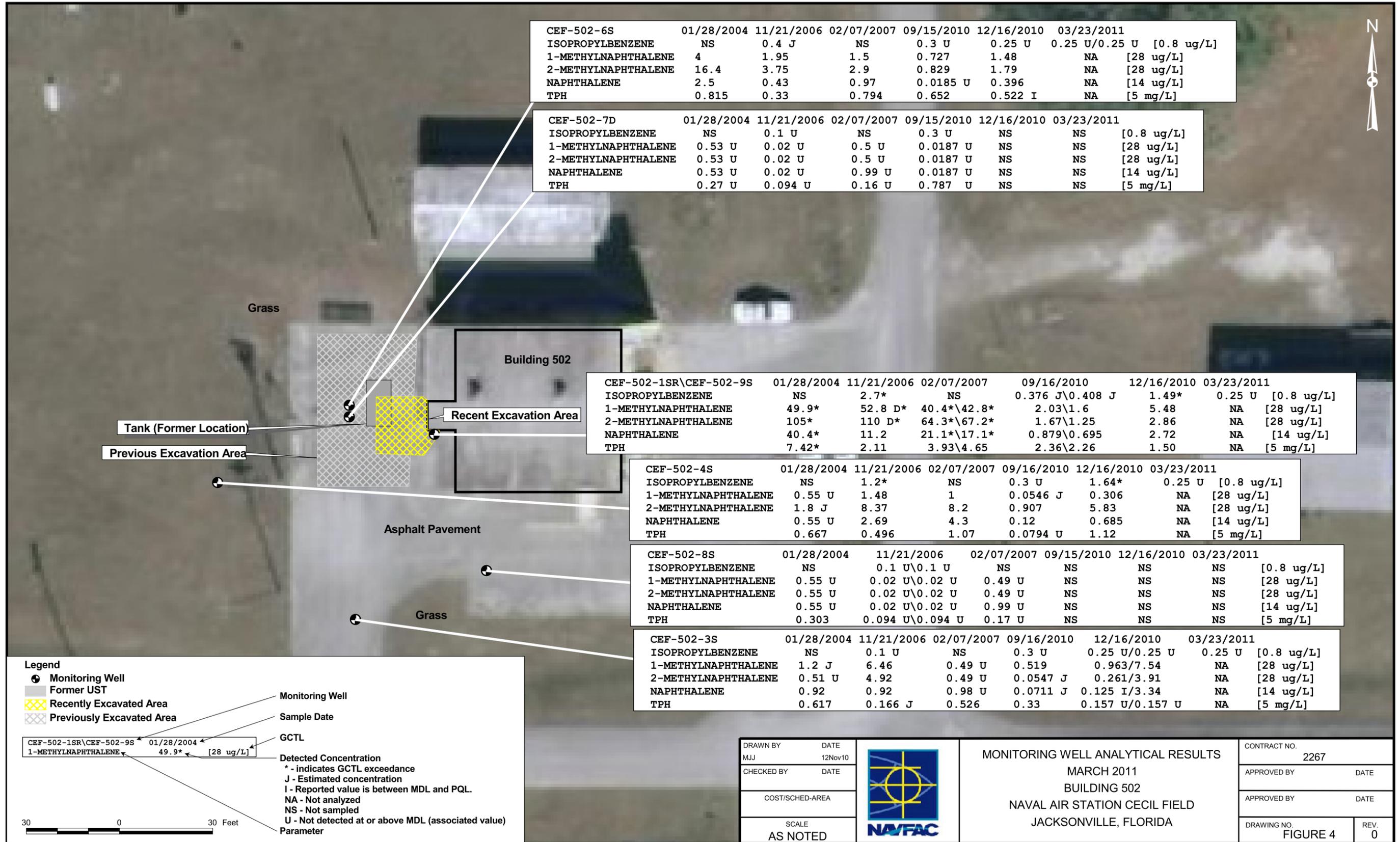


DRAWN BY	DATE
MJJ	03Mar11
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	



POTENTIOMETRIC SURFACE ELEVATION MAP
 MARCH 2011
 BUILDING 502
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 2267	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 3	REV 0



CEF-502-6S	01/28/2004	11/21/2006	02/07/2007	09/15/2010	12/16/2010	03/23/2011	
ISOPROPYLBENZENE	NS	0.4 J	NS	0.3 U	0.25 U	0.25 U/0.25 U	[0.8 ug/L]
1-METHYLNAPHTHALENE	4	1.95	1.5	0.727	1.48	NA	[28 ug/L]
2-METHYLNAPHTHALENE	16.4	3.75	2.9	0.829	1.79	NA	[28 ug/L]
NAPHTHALENE	2.5	0.43	0.97	0.0185 U	0.396	NA	[14 ug/L]
TPH	0.815	0.33	0.794	0.652	0.522 I	NA	[5 mg/L]

CEF-502-7D	01/28/2004	11/21/2006	02/07/2007	09/15/2010	12/16/2010	03/23/2011	
ISOPROPYLBENZENE	NS	0.1 U	NS	0.3 U	NS	NS	[0.8 ug/L]
1-METHYLNAPHTHALENE	0.53 U	0.02 U	0.5 U	0.0187 U	NS	NS	[28 ug/L]
2-METHYLNAPHTHALENE	0.53 U	0.02 U	0.5 U	0.0187 U	NS	NS	[28 ug/L]
NAPHTHALENE	0.53 U	0.02 U	0.99 U	0.0187 U	NS	NS	[14 ug/L]
TPH	0.27 U	0.094 U	0.16 U	0.787 U	NS	NS	[5 mg/L]

CEF-502-1SR\CEF-502-9S	01/28/2004	11/21/2006	02/07/2007	09/16/2010	12/16/2010	03/23/2011	
ISOPROPYLBENZENE	NS	2.7*	NS	0.376 J\0.408 J	1.49*	0.25 U	[0.8 ug/L]
1-METHYLNAPHTHALENE	49.9*	52.8 D*	40.4*\42.8*	2.03\1.6	5.48	NA	[28 ug/L]
2-METHYLNAPHTHALENE	105*	110 D*	64.3*\67.2*	1.67\1.25	2.86	NA	[28 ug/L]
NAPHTHALENE	40.4*	11.2	21.1*\17.1*	0.879\0.695	2.72	NA	[14 ug/L]
TPH	7.42*	2.11	3.93\4.65	2.36\2.26	1.50	NA	[5 mg/L]

CEF-502-4S	01/28/2004	11/21/2006	02/07/2007	09/16/2010	12/16/2010	03/23/2011	
ISOPROPYLBENZENE	NS	1.2*	NS	0.3 U	1.64*	0.25 U	[0.8 ug/L]
1-METHYLNAPHTHALENE	0.55 U	1.48	1	0.0546 J	0.306	NA	[28 ug/L]
2-METHYLNAPHTHALENE	1.8 J	8.37	8.2	0.907	5.83	NA	[28 ug/L]
NAPHTHALENE	0.55 U	2.69	4.3	0.12	0.685	NA	[14 ug/L]
TPH	0.667	0.496	1.07	0.0794 U	1.12	NA	[5 mg/L]

CEF-502-8S	01/28/2004	11/21/2006	02/07/2007	09/15/2010	12/16/2010	03/23/2011	
ISOPROPYLBENZENE	NS	0.1 U\0.1 U	NS	NS	NS	NS	[0.8 ug/L]
1-METHYLNAPHTHALENE	0.55 U	0.02 U\0.02 U	0.49 U	NS	NS	NS	[28 ug/L]
2-METHYLNAPHTHALENE	0.55 U	0.02 U\0.02 U	0.49 U	NS	NS	NS	[28 ug/L]
NAPHTHALENE	0.55 U	0.02 U\0.02 U	0.99 U	NS	NS	NS	[14 ug/L]
TPH	0.303	0.094 U\0.094 U	0.17 U	NS	NS	NS	[5 mg/L]

CEF-502-3S	01/28/2004	11/21/2006	02/07/2007	09/16/2010	12/16/2010	03/23/2011	
ISOPROPYLBENZENE	NS	0.1 U	NS	0.3 U	0.25 U/0.25 U	0.25 U	[0.8 ug/L]
1-METHYLNAPHTHALENE	1.2 J	6.46	0.49 U	0.519	0.963/7.54	NA	[28 ug/L]
2-METHYLNAPHTHALENE	0.51 U	4.92	0.49 U	0.0547 J	0.261/3.91	NA	[28 ug/L]
NAPHTHALENE	0.92	0.92	0.98 U	0.0711 J	0.125 I/3.34	NA	[14 ug/L]
TPH	0.617	0.166 J	0.526	0.33	0.157 U/0.157 U	NA	[5 mg/L]

Legend

- Monitoring Well
- Former UST
- Recently Excavated Area
- Previously Excavated Area

Monitoring Well

Sample Date

GCTL

Detected Concentration

- * - indicates GCTL exceedance
- J - Estimated concentration
- I - Reported value is between MDL and PQL.
- NA - Not analyzed
- NS - Not sampled
- U - Not detected at or above MDL (associated value)

Parameter

30 0 30 Feet

DRAWN BY MJJ	DATE 12Nov10		MONITORING WELL ANALYTICAL RESULTS MARCH 2011 BUILDING 502 NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA		CONTRACT NO. 2267	
CHECKED BY	DATE		APPROVED BY	DATE	APPROVED BY	DATE
COST/SCHED-AREA						
SCALE AS NOTED					DRAWING NO. FIGURE 4	REV. 0

ATTACHMENT A
FIELD DATA SHEETS

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD

SHIP TO: 621 Mainstream Drive, Suite 270 ♦ Nashville, TN 37228 ♦ 615-345-1115 ♦ (fax) 615-846-5426

13380

Send Results to:		Send Invoice to:		Analysis Requirements:										Lab Use Only:					
Name <u>DAVE SIEFKEN</u>		Name <u>DAVE SIEFKEN</u>		* SELECT VOC Isopropyl benzene										VOA Headspace Y N NA					
Company <u>TETRA TECH NUS</u>		Company <u>Tetra Tech NUS</u>												Field Filtered Y N NA					
Address <u>8640 Phil. p. Hwy 56</u>		Address <u>8640 Phil. p. Hwy 56</u>												Correct Containers Y N NA					
City <u>JACKSONVILLE</u>		City <u>JACKSONVILLE</u>		Discrepancies Y N NA															
State, Zip <u>FL 32256</u>		State, Zip <u>FL 32256</u>		Cust. Seals Intact Y N NA															
Phone <u>904-836-6125</u>		Phone <u>904-836-6125</u>		Containers Intact Y N NA															
Fax _____		Fax _____												Airbill #: _____					
E-mail <u>David.siefken@tetratech.com</u>		E-mail <u>David.siefken@tetratech.com</u>												CAR #: _____					
Project No./Name: <u>112600746 / CXC-2 Field 502</u>		Sampler's (Signature): 																	
Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix														Comments	No. of Bottles	Lab Use Only Containers/Pres.
	1100 3/23/11	LEF-502-35-20110323	4W	✓													* SELECT VOC Isopropyl benzene	3	
	1145 3/23/11	LEF-502-65-20110323	4W	✓														3	
	1240 3/23/11	LEF-502-95-20110323	4W	✓														3	
	1325 3/23/11	LEF-502-45-20110323	4W	✓														3	
	1100 3/23/11	LEF-502-DUP-01-20110323	4W	✓														3	
	1100 3/23/11	(MSMSD) LEF-502-65-20110323	4W	✓														6	
	1700 3/23/11	TRIP BLANK 9404	W	✓														2	
Sample Kit Prep'd by: (Signature) <u>Empirical</u>		Date/Time	Received By: (Signature) 		REMARKS:										Details:				
Relinquished by: (Signature) 		Date/Time 3/24/11 1400	Received By: (Signature)												Page <u>1</u> of <u>1</u>				
Relinquished by: (Signature)		Date/Time	Received By: (Signature)												Cooler No. ___ of ___				
Received for Laboratory by: (Signature)		Date/Time	Temperature												Date Shipped _____				
															Shipped By _____				
															Turnaround _____				

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

**Form FD 9000-24
GROUNDWATER SAMPLING LOG**

SITE NAME: NAS Cecil Field	SITE LOCATION: Site 502
WELL NO: CEF-502-35	SAMPLE ID: CEF-502-35-20110323
DATE 3/23/11	

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): 4.95	PURGE PUMP TYPE OR BAILER: Peristaltic Pump
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = (13.20 feet - 4.95 feet) X 0.605 liters/foot = 4.99 liters				

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

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 6.0	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 5.5	PURGING INITIATED AT: 1022	PURGING ENDED AT: 1050	TOTAL VOLUME PURGED (liters): 9.0
---------------------------------------------------------	-------------------------------------------------------	-----------------------------------	-------------------------------	------------------------------------------

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) μmhos/cm or μS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1022	—	—	300	4.95	4.64	22.42	89	3.83	8.99	clear	n/a
1039	5.1	5.1	300	4.89	4.64	22.11	94	3.80	6.22	clear	n/a
1041	0.9	6.0	300	4.91	4.66	22.14	94	3.80	4.31	clear	n/a
1044	0.9	6.9	300	4.91	4.66	22.10	93	2.99	4.30	clear	n/a
1047	0.9	7.8	300	4.90	4.63	22.10	94	2.98	4.41	clear	n/a
1050	0.9	8.7	300	4.91	4.63	22.10	94	2.99	4.29	clear	n/a
All Readings Stable											

WELL CAPACITY (Liters Per Foot): 0.75" = 0.0757; 1" = 0.151; 1.25" = 0.227; 2" = 0.605; 3" = 0.37; 4" = 1.40; 5" = 3.861; 6" = 5.564; 12" = 22.25
 TUBING INSIDE DIA. CAPACITY (Ltr./Ft.): 1/8" = 0.00227; 3/16" = 0.00529; 1/4" = 0.00984; 5/16" = 0.0151; 3/8" = 0.0227; 1/2" = 0.0378; 5/8" = 0.0605
 PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: T. Trumbull / INUS	SAMPLER(S) SIGNATURE(S):	SAMPLING INITIATED AT: 1100	SAMPLING ENDED AT: 1110
PUMP OR TUBING DEPTH IN WELL (feet): 5.5	TUBING MATERIAL CODE: Teflon, Poly (circle one)	FIELD-FILTERED: Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	FILTER SIZE: _____ μm
FIELD DECONTAMINATION: PUMP Y <input checked="" type="checkbox"/> N <input type="checkbox"/>	TUBING Y <input checked="" type="checkbox"/> N (replaced) <input type="checkbox"/>	DUPLICATE: Y <input checked="" type="checkbox"/> N <input type="checkbox"/> MSMSD	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
—	3	G	40ml	HCL	—	4.63	Select Vol	RFPP	300
MSMSD	6	G	40ml	HCL	—	4.63	Select Vol	RFPP	300

REMARKS: **MSMSD**

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

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

**Form FD 9000-24
GROUNDWATER SAMPLING LOG**

SITE NAME: <u>NAS CECIL FIELD</u>	SITE LOCATION: <u>SITE 502</u>
WELL NO: <u>CEF-502-65</u>	SAMPLE ID: <u>CEF-502-65-20110323</u>
DATE: <u>3/23/11</u>	

PURGING DATA

WELL DIAMETER (inches): <u>2</u>	TUBING DIAMETER (inches): <u>3/16</u>	WELL SCREEN INTERVAL DEPTH: <u>feet to feet</u>	STATIC DEPTH TO WATER (feet): <u>5.53</u>	PURGE PUMP TYPE OR BAILER: <u>Peristaltic Pump</u>
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = (<u>14.83</u> feet - <u>5.53</u> feet) X <u>0.605</u> liters/foot = <u>5.63</u> liters				

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

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <u>6.5</u>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <u>6.0</u>	PURGING INITIATED AT: <u>1110</u>	PURGING ENDED AT: <u>1143</u>	TOTAL VOLUME PURGED (liters): <u>10</u>
---------------------------------------------------------	-------------------------------------------------------	-----------------------------------	-------------------------------	-----------------------------------------

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) μmhos/cm or μS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
1110	-	-	300	5.53	4.70	22.41	126	2.31	7.45	clear	n/a
1131	6.3	6.3	300	5.59	4.63	22.46	101	2.27	6.11	clear	n/a
1134	0.9	7.2	300	5.59	4.63	22.46	109	2.28	3.43	clear	n/a
1137	0.9	8.1	300	5.54	4.62	22.45	109	2.27	3.61	clear	n/a
1140	0.9	9.0	300	5.54	4.63	22.46	111	2.27	3.60	clear	n/a
1143	0.9	9.9	300	5.54	4.63	22.46	108	2.27	3.60	clear	n/a
All Readings Stable											

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

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

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: <u>T. Trumbull / TNUS</u>	SAMPLER(S) SIGNATURE(S): 	SAMPLING INITIATED AT: <u>1145</u>	SAMPLING ENDED AT: <u>1150</u>
----------------------------------------------------------------	------------------------------	------------------------------------	--------------------------------

PUMP OR TUBING DEPTH IN WELL (feet): <u>6.0</u>	TUBING MATERIAL CODE: <u>Teflon</u> Poly (circle one)	FIELD-FILTERED: Y <u>(N)</u>	FILTER SIZE: _____ μm
-------------------------------------------------	-------------------------------------------------------	------------------------------	-----------------------

FIELD DECONTAMINATION: PUMP Y <u>(N)</u> TUBING Y <u>(N (replaced))</u>	DUPLICATE: <u>(Y)</u> N
-------------------------------------------------------------------------	-------------------------

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
-	3	G	40 ml	HCL	-	4.63	SELECT VOC	RFP	300
Dup	3	G	40 ml	HCL	-	4.63	SELECT VOC	RFP	300

REMARKS: Dup

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

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

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

**Form FD 9000-24
GROUNDWATER SAMPLING LOG**

SITE NAME: <i>NAS LECIL FIELD</i>	SITE LOCATION: <i>Site 502</i>
WELL NO: <i>LEF-502-95</i>	SAMPLE ID: <i>LEF-502-95-20110323</i>
DATE: <i>3/23/11</i>	

PURGING DATA

WELL DIAMETER (inches): 2	TUBING DIAMETER (inches): 3/16	WELL SCREEN INTERVAL DEPTH: feet to feet	STATIC DEPTH TO WATER (feet): <i>5.95</i>	PURGE PUMP TYPE OR BAILER: <i>Peristaltic Pump</i>
---------------------------	--------------------------------	------------------------------------------	-------------------------------------------	----------------------------------------------------

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)
= (*14.90* feet - *5.95* feet) X *0.605* liters/foot = *5.42* liters

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

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <i>7.5</i>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <i>6.5</i>	PURGING INITIATED AT: <i>1200</i>	PURGING ENDED AT: <i>1231</i>	TOTAL VOLUME PURGED (liters): <i>9.5</i>
---------------------------------------------------------	-------------------------------------------------------	-----------------------------------	-------------------------------	------------------------------------------

TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) μmhos/cm or μS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
<i>1200</i>	<i>—</i>	<i>—</i>	<i>300</i>	<i>5.95</i>	<i>5.78</i>	<i>24.23</i>	<i>684</i>	<i>1.51</i>	<i>0.91</i>	<i>clear</i>	<i>n/a</i>
<i>1219</i>	<i>5.7</i>	<i>5.7</i>	<i>300</i>	<i>6.04</i>	<i>5.73</i>	<i>24.24</i>	<i>683</i>	<i>1.48</i>	<i>1.04</i>	<i>clear</i>	<i>n/a</i>
<i>1222</i>	<i>0.9</i>	<i>6.6</i>	<i>300</i>	<i>6.00</i>	<i>5.73</i>	<i>24.24</i>	<i>684</i>	<i>1.50</i>	<i>0.99</i>	<i>clear</i>	<i>n/a</i>
<i>1225</i>	<i>0.9</i>	<i>7.5</i>	<i>300</i>	<i>6.03</i>	<i>5.74</i>	<i>24.25</i>	<i>681</i>	<i>1.50</i>	<i>0.99</i>	<i>clear</i>	<i>n/a</i>
<i>1228</i>	<i>0.9</i>	<i>8.4</i>	<i>300</i>	<i>5.99</i>	<i>5.73</i>	<i>24.24</i>	<i>683</i>	<i>1.51</i>	<i>0.93</i>	<i>clear</i>	<i>n/a</i>
<i>1231</i>	<i>0.9</i>	<i>9.3</i>	<i>300</i>	<i>5.99</i>	<i>5.78</i>	<i>24.24</i>	<i>683</i>	<i>1.51</i>	<i>0.93</i>	<i>clear</i>	<i>n/a</i>
<i>All Readings Stable</i>											

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

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

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: <i>T. Trumbull / TNUS</i>	SAMPLER(S) SIGNATURE(S): <i>[Signature]</i>	SAMPLING INITIATED AT: <i>1240</i>	SAMPLING ENDED AT: <i>1245</i>
PUMP OR TUBING DEPTH IN WELL (feet): <i>6.5</i>	TUBING MATERIAL CODE: Teflon Poly (circle one)	FIELD-FILTERED: Y (N)	FILTER SIZE: _____ μm
FIELD DECONTAMINATION: PUMP Y (N)	TUBING Y (N (replaced))	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE	SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH			
<i>—</i>	<i>3</i>	<i>G</i>	<i>40ml</i>	<i>HCL</i>	<i>—</i>	<i>5.78</i>	<i>Select Vol</i>	<i>RFP</i>	<i>300</i>

REMARKS:

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

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

**Form FD 9000-24
GROUNDWATER SAMPLING LOG**

SITE NAME: <u>NAS LULL FIELD</u>	SITE LOCATION: <u>SITE 502</u>
WELL NO: <u>CRF-502-45</u>	SAMPLE ID: <u>CRF-502-45-20110323</u>
DATE: <u>3/23/11</u>	

PURGING DATA

WELL DIAMETER (inches): <u>2</u>	TUBING DIAMETER (inches): <u>3/16</u>	WELL SCREEN INTERVAL DEPTH: <u>feet to feet</u>	STATIC DEPTH TO WATER (feet): <u>4.96</u>	PURGE PUMP TYPE OR BAILER: <u>Peristaltic Pump</u>							
WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY (only fill out if applicable) = (<u>12.38</u> feet - <u>4.96</u> feet) X <u>0.605</u> liters/foot = <u>4.49</u> liters											
EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME (only fill out if applicable) = _____ liters + (_____ liters/foot X _____ feet) + _____ liters = _____ liters											
INITIAL PUMP OR TUBING DEPTH IN WELL (feet): <u>7.0 - B</u>	FINAL PUMP OR TUBING DEPTH IN WELL (feet): <u>* 10.5</u>	PURGING INITIATED AT: <u>1005</u>	PURGING ENDED AT: <u>* 1320</u>	TOTAL VOLUME PURGED (liters): <u>5</u>							
TIME	VOLUME PURGED (gallons)	CUMUL. VOLUME PURGED (gallons)	PURGE RATE (gpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (circle units) μmhos/cm or μS/cm	DISSOLVED OXYGEN (circle units) mg/L or % saturation	TURBIDITY (NTUs)	COLOR (describe)	ODOR (describe)
<u>1005</u>	<u>0.5</u>	<u>0.5</u>	<u>300</u>	<u>4.96</u>	<u>6.38</u>	<u>20.11</u>	<u>105</u>	<u>4.61</u>	<u>32.3</u>	<u>lt Brown / 2 Lead</u>	<u>n/a</u>
<u>1022</u>	<u>4.5</u>	<u>4.5</u>		<u>PUMPED WELL DRY</u>							
<u>1320</u>	<u>0.5</u>	<u>5.0</u>	<u>300</u>	<u>10.11</u>	<u>6.71</u>	<u>20.05</u>	<u>213</u>	<u>5.53</u>	<u>41.0</u>	<u>lt. Brown</u>	<u>n/a</u>
<u>* Sample Collected @ 1325</u>											
WELL CAPACITY (Liters Per Foot): 0.75" = 0.0757; 1" = 0.151; 1.25" = 0.227; 2" = 0.605; 3" = 0.37; 4" = 1.40; 5" = 3.861; 6" = 5.564; 12" = 22.25 TUBING INSIDE DIA. CAPACITY (Ltr./Ft.): 1/8" = 0.00227; 3/16" = 0.00529; 1/4" = 0.00984; 5/16" = 0.0151; 3/8" = 0.0227; 1/2" = 0.0378; 5/8" = 0.0605											
PURGING EQUIPMENT CODES: B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; PP = Peristaltic Pump; O = Other (Specify)											

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: <u>T. Trumbull</u> / TINUS				SAMPLER(S) SIGNATURE(S): 				SAMPLING INITIATED AT: <u>1325</u>		SAMPLING ENDED AT: <u>1330</u>		
PUMP OR TUBING DEPTH IN WELL (feet): <u>10.5</u>				TUBING MATERIAL CODE: Teflon <u>Poly</u> (circle one)				FIELD-FILTERED: Y <u>(N)</u>		FILTER SIZE: _____ μm		
FIELD DECONTAMINATION: PUMP Y <u>(N)</u>				TUBING Y <u>(N)</u> (replaced)				DUPLICATE: Y <u>(N)</u>				
SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION				INTENDED ANALYSIS AND/OR METHOD		SAMPLING EQUIPMENT CODE		SAMPLE PUMP FLOW RATE (mL per minute)
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH						
<u>-</u>	<u>3</u>	<u>G</u>	<u>40ml</u>	<u>HCL</u>	<u>-</u>	<u>6.71</u>	<u>Select Vol</u>		<u>RFP</u>		<u>300</u>	
REMARKS:												
MATERIAL CODES: AG = Amber Glass; CG = Clear Glass; PE = Polyethylene; PP = Polypropylene; S = Silicone; T = Teflon; O = Other (Specify)												
SAMPLING EQUIPMENT CODES: APP = After Peristaltic Pump; B = Bailer; BP = Bladder Pump; ESP = Electric Submersible Pump; RFP = Reverse Flow Peristaltic Pump; SM = Straw Method (Tubing Gravity Drain); O = Other (Specify)												

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

March 21, 2011 event
Building 502 WELLS

Well	Sample number*	Analysis
CEF-502-3S	CEF-502-3S-20110321	Select VOCs (8260 B)
CEF-502-4S	CEF-502-4S-20110321	Select VOCs (8260 B)
CEF-502-6S	CEF-502-6S-20110321	Select VOCs (8260 B)
CEF-502-9S	CEF-502-9S-20110321	Select VOCs (8260 B)
Dup	CEF-502-DUP-01-20110321	Select VOCs (8260 B)

WATER LEVELS OF ALL wells analyzed, plus CEF-502-8S.

Collect 1 duplicate samples.
Collect 1 MS/MSD.
Use Trip Blanks.

** Select VOCs- 1 VOC as analyte
Isopropylbenzene

DATE: February 14, 2011

CTO / Job Number for Analyses: 0076 / 00746 06.100

CTO / Job Number for Validation: 0076 / 00746 07.100

CTO / Job Number for Data Mgt: 0076 / 00746 07.110

Purpose of Sampling: 3rd Post-Excavation Groundwater Sampling at NAS Cecil Field – Building 502

Samples Collected and Shipped: Week of March 21, 2011

Attached Work Plans: Tables – Tank 502 Plan – Mar 2011

Turnaround Time: 28 days Hardcopy Data Package: 28 Days **Data Available Online**

Additional needs: See work plans and cost estimate detail for specifics. **Do NOT report TICs.**

Data Package Deliverable: Same as for all previous Cecil Field monitoring events.

**NOTE: 4 wells to be sampled for analysis, and the same 5 wells to be measured for GW elevations.
Lab to be used is Empirical Laboratories, Inc.**

Estimated Cost **\$600** (See attached Cost Detail)

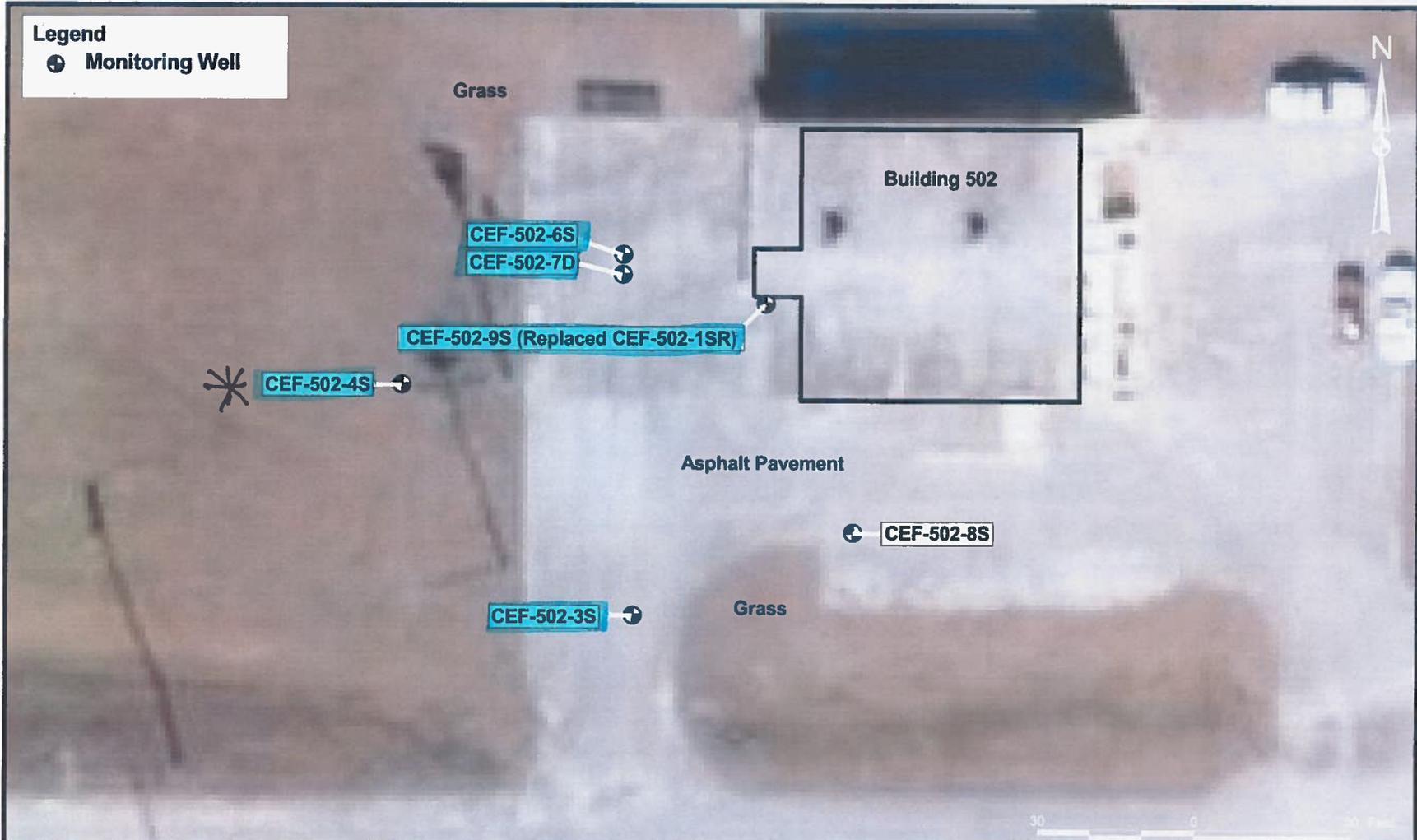
Req No. is _____

**ANALYTICAL COST ESTIMATE - 59th SAMPLING EVENT March 2011
 NAS CECIL FIELD - JACKSONVILLE, FLORIDA**

TEST / METHOD	SITE >>>	502		TOTAL		UNIT PRICE	TOTAL
Select VOCs (includes 1 trip blank, 1 field dup)- SW-846 / 8260B		6		6		\$ 90.00	\$ 540.00
TOTAL							\$ 540.00

Estimate: \$600

Select VOCs: Analyze for isopropylbenzene only



DRAWN BY	DATE
MJJ	12Nov10
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	

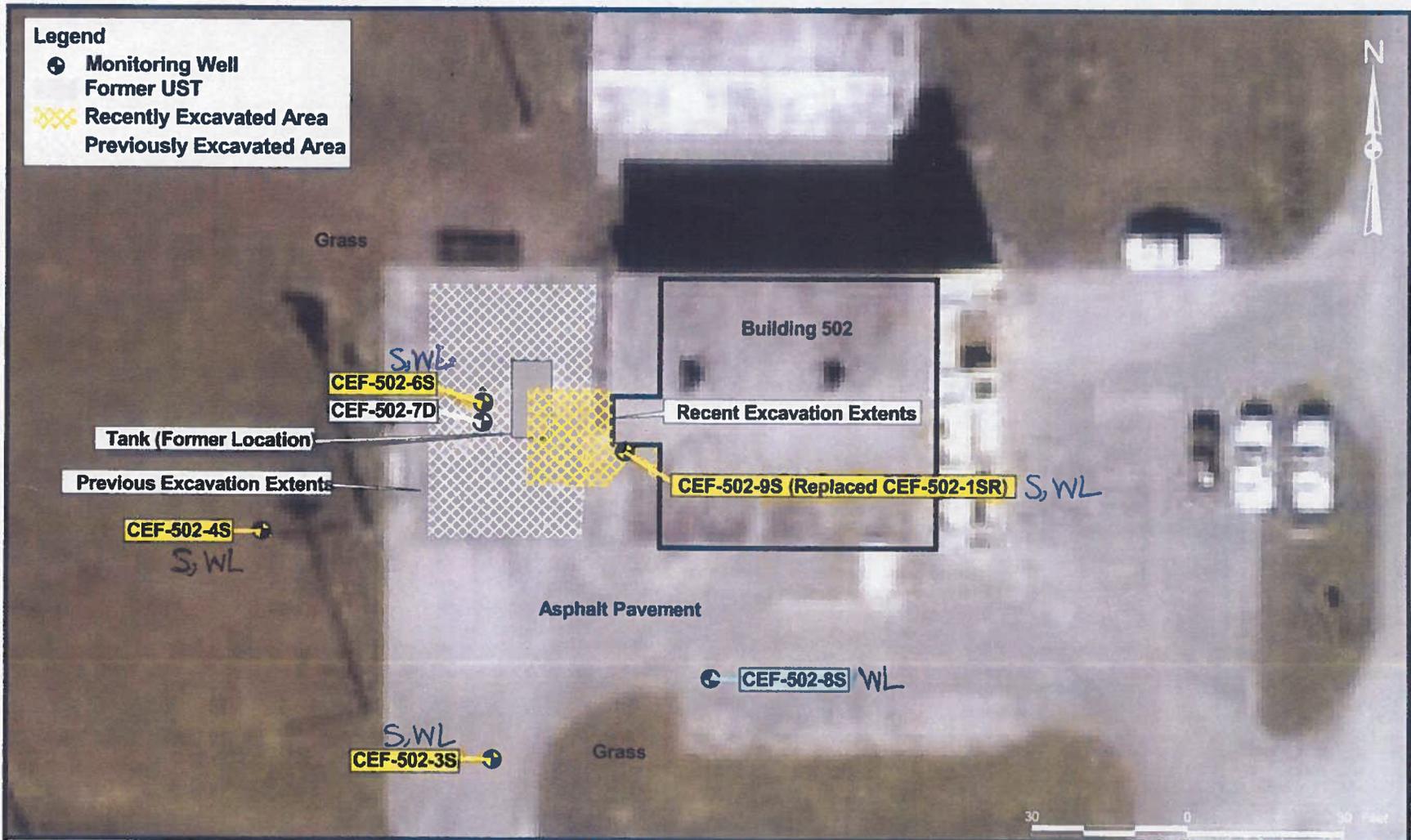


MONITORING WELL LOCATION MAP
 BUILDING 502
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 248	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 1	REV 0

* This well will purge dry within minutes. Purge it first till dry, then allow to recharge while you sample the other wells. Inform Dave of the situation. Sample at the end (within 12 hrs of purge). Collect readings if possible before it goes dry.

- WATER LEVEL ONLY (WL)
- collect sample and water level (S,WL)



DRAWN BY	DATE
MJJ	12Nov10
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE AS NOTED	



MONITORING WELL LOCATION MAP
 BUILDING 502
 NAVAL AIR STATION CECIL FIELD
 JACKSONVILLE, FLORIDA

CONTRACT NUMBER 0025	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE 2	REV 0

1:\G\SI\CECIL\Bldg0502.apr 12Nov10 MJJ Layout03

ATTACHMENT B
GROUNDWATER ANALYTICAL REPORT
MARCH 2011



Tetra Tech NUS

INTERNAL CORRESPONDENCE

TO: R.SIMCIK **DATE:** April 25, 2011
FROM: MEGAN CARSON **COPIES:** DV FILE
SUBJECT: ORGANIC DATA VALIDATION- ISOPROPYL BENZENE
CTO JM09, NAS CECIL FIELD
SDG 1103218

SAMPLES: 6/Water/
CEF-502-3S-20110323 CEF-502-4S-20110323
CEF-502-6S-20110323 CEF-502-9S-20110323
CEF-502-DUP-01-20110323 Trip Blank-9404

OVERVIEW

The sample set for CTO JM09 NAS Cecil Field, SDG 1103218 consists of five (5) aqueous samples and one (1) trip blank. This SDG contained one field duplicate pair: CEF-502-6S-20110323/CEF-502-DUP-01-20110323.

All samples were analyzed for isopropylbenzene. The samples were collected by TetraTech NUS on March 23rd, 2011 analyzed Empirical Laboratories LLC. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria using method 8260B analytical and reporting protocol. The data contained in this SDG were validated with regard to the following parameters:

- Data completeness
- * • Holding times
- * • 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.

ISOPROPYLBENZENE:

All results were within quality control criteria.

Additional Comments:

The raw data was not included in the original data package. A revised data package was requested.

To: R. Simcik
SDG: 1103218
Page: 2

EXECUTIVE SUMMARY

Laboratory Performance Issues: None.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (10/99) and the Department of Defense (DoD) Quality Systems Manual (QSM) (April, 2009). The text of this report has been formulated to address only those problem areas affecting data quality.


Tetra Tech NUS
Megan Carson
Chemist/Data Validator


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

Attachments:

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

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Data Validation Qualifier Codes:

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

PROJ_NO: 02267 SDG: 1103218 FRACTION: OV MEDIA: WATER	NSAMPLE	CEF-502-3S-20110323			CEF-502-4S-20110323			CEF-502-6S-20110323			CEF-502-9S-20110323		
	LAB_ID	1103218-01			1103218-04			1103218-02			1103218-03		
	SAMP_DATE	3/23/2011			3/23/2011			3/23/2011			3/23/2011		
	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												
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	RESULT	VQL	QLCD	
ISOPROPYLBENZENE	0.25	U		0.25	U		0.25	U		0.25	U		

PROJ_NO: 02267 SDG: 1103218 FRACTION: OV MEDIA: WATER	NSAMPLE	CEF-502-DUP-01-20110323		Trip Blank-9404		
	LAB_ID	1103218-05		1103218-06		
	SAMP_DATE	3/23/2011		3/23/2011		
	QC_TYPE	NM		NM		
	UNITS	UG/L		UG/L		
	PCT_SOLIDS	0.0		0.0		
	DUP_OF	CEF-502-6S-20110323				
PARAMETER	RESULT	VQL	QLCD	RESULT	VQL	QLCD
ISOPROPYLBENZENE	0.25	U		0.25	U	

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

APPENDIX C

SUPPORT DOCUMENTATION

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:

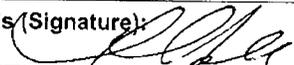
The batch spike associated to batch 1C29006 exceeded criteria with a positive bias for Isopropylbenzene.

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

EMPIRICAL LABORATORIES, LLC - CHAIN OF CUSTODY RECORD

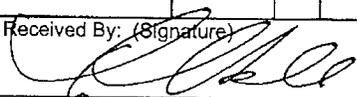
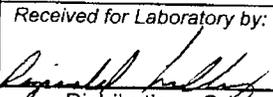
SHIP TO: 621 Mainstream Drive, Suite 270 + Nashville, TN 37228 + 615-345-1115 + (fax) 615-846-5426

13380

Send Results to:	Send Invoice to:	Analysis Requirements:	Lab Use Only:
Name <u>DAVE SIEFKEN</u>	Name <u>DAVE SIEFKEN</u>		VOA Headspace <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N NA
Company <u>TETRA TECH NUS</u>	Company <u>Tetra Tech nus</u>		Field Filtered <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N NA
Address <u>8840 Philips Hwy ^{5th}</u>	Address <u>8840 Philips Hwy ^{5th}</u>		Correct Containers <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N NA
City <u>JACKSONVILLE</u>	City <u>JACKSONVILLE</u>		Discrepancies <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N NA
State, Zip <u>FL 32256</u>	State, Zip <u>FL 32256</u>		Cust. Seals Intact <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N NA
Phone <u>904-836-6125</u>	Phone <u>904-836-6125</u>		Containers Intact <input checked="" type="checkbox"/> Y <input checked="" type="checkbox"/> N NA
Fax _____	Fax _____		Airbill #: <u>1808</u>
E-mail <u>David.siefken@tetra-tech.com</u>	E-mail <u>David.siefken@tetra-tech.com</u>		CAR #: _____
Project No./Name: <u>112600746 / CEC-2 field 502</u>	Sampler's (Signature): 		

* SELECT VOC: IsoPropyl Benz

Lab Use Only Lab #	Date/Time Sampled	Sample Description	Sample Matrix									Comments	No. of Bottles	Lab Use Only Containers/Pres.
1103218 -01	3/23/11 1100	CEF-502-35-20110323	4W	<input checked="" type="checkbox"/>								* SELECT VOC IsoPropyl Benz	3	3 JHY
-02	3/23/11 1145	CEF-502-63-20110323	4W	<input checked="" type="checkbox"/>									3	
-03	3/23/11 1240	CEF-502-93-20110323	4W	<input checked="" type="checkbox"/>									3	
-04	3/23/11 1325	CEF-502-45-20110323	4W	<input checked="" type="checkbox"/>									3	
-05	3/23/11	CEF-502-DUP-01-20110323	4W	<input checked="" type="checkbox"/>									3	
-02	3/23/11 1100	CEF-502-63-20110323 (M3MSD)	4W	<input checked="" type="checkbox"/>									6	6 JHY
-06	3/23/11 1700	TRIP BLANK 9404	W	<input checked="" type="checkbox"/>									2	2 JHY

Sample Kit Prep'd by: (Signature) <u>Empirical</u>	Date/Time	Received By: (Signature) 	REMARKS:	Details:	
Relinquished by: (Signature) 	Date/Time 3/24/11 1900	Received By: (Signature)		Page <u>1</u> of <u>1</u>	Cooler No. ___ of ___
Relinquished by: (Signature)	Date/Time	Received By: (Signature)		Date Shipped _____	Shipped By _____
Received for Laboratory by: (Signature) 	Date/Time 3.25.11	Temperature 2.2 °C		Turnaround _____	

Distribution: Original and yellow copies accompany sample shipment to laboratory; Pink retained by samplers.

HOLD TIME

SDG 1103218

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

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: 1103218

Client: Tetra Tech NUS, Inc. (T010)

Project: NAS Cecil Field CTO076 bldg 502 2010

Batch: 1C29006 Batch Matrix: Water

Preparation: 5030B

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
CEF-502-3S-20110323	1103218-01	03/29/11 00:00	5.00	5.00
CEF-502-6S-20110323	1103218-02	03/29/11 00:00	5.00	5.00
Blank	1C29006-BLK1	03/29/11 00:00	5.00	5.00
LCS	1C29006-BS1	03/29/11 00:00	5.00	5.00
CEF-502-6S-20110323	1C29006-MS1	03/29/11 00:00	5.00	5.00
CEF-502-6S-20110323	1C29006-MSD1	03/29/11 00:00	5.00	5.00

PREPARATION BATCH SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: 1103218

Client: Tetra Tech NUS, Inc. (T010)

Project: NAS Cecil Field CTO076 bldg 502_2010

Batch: 1C29011 Batch Matrix: Water

Preparation: 5030B

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT	FINAL VOL.
CEF-502-9S-20110323	1103218-03	03/29/11 11:03	5.00	5.00
CEF-502-4S-20110323	1103218-04	03/29/11 11:03	5.00	5.00
CEF-502-DUP-01-20110323	1103218-05	03/29/11 11:03	5.00	5.00
Trip Blank	1103218-06	03/29/11 11:03	5.00	5.00
Blank	1C29011-BLK1	03/29/11 11:03	5.00	5.00
LCS	1C29011-BS1	03/29/11 11:03	5.00	5.00

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory:	<u>Empirical Laboratories, LLC</u>	SDG:	<u>1103218</u>
Client:	<u>Tetra Tech NUS, Inc. (T010)</u>	Project:	<u>NAS Cecil Field CTO076 bldg 502 2010</u>
Sequence:	<u>1C07710</u>	Instrument:	<u>MS-VOA5</u>
Calibration:	<u>1078001</u>		

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	1C07710-TUN1	0307TU1.D	03/07/11 12:22
Cal Standard	1C07710-CAL1	0307CAL1.D	03/07/11 12:53
Cal Standard	1C07710-CAL2	0307CAL2.D	03/07/11 13:23
Cal Standard	1C07710-CAL3	0307CAL3.D	03/07/11 13:53
Cal Standard	1C07710-CAL4	0307CAL4.D	03/07/11 14:23
Cal Standard	1C07710-CAL5	0307CAL5.D	03/07/11 14:54
Cal Standard	1C07710-CAL6	0307CAL6.D	03/07/11 15:24
Cal Standard	1C07710-CAL7	0307CAL7.D	03/07/11 15:54
Cal Standard	1C07710-CAL8	0307CAL8.D	03/07/11 16:24
Cal Standard	1C07710-CAL9	0307CAL9.D	03/07/11 16:54
Initial Cal Check	1C07710-ICV2	0307ICV2.D	03/07/11 17:55
MS Tune	1C07710-TUN2	0317TU2.D	03/17/11 18:43
Cal Standard	1C07710-CALB	0317CAL2.D	03/17/11 19:13
Cal Standard	1C07710-CALC	0317CAL3.D	03/17/11 20:14
Cal Standard	1C07710-CALD	0317CAL4.D	03/17/11 20:44
Cal Standard	1C07710-CALE	0317CAL5.D	03/17/11 21:14
Cal Standard	1C07710-CALF	0317CAL6.D	03/17/11 21:44
Cal Standard	1C07710-CALG	0317CAL7.D	03/17/11 22:14
Cal Standard	1C07710-CALH	0317CAL8.D	03/17/11 22:44
Cal Standard	1C07710-CALI	0317CAL9.D	03/17/11 23:15

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory: <u>Empirical Laboratories, LLC</u>	SDG: <u>1103218</u>
Client: <u>Tetra Tech NUS, Inc. (T010)</u>	Project: <u>NAS Cecil Field CTO076 bldg 502 2010</u>
Lab File ID: <u>0307TU1.D</u>	Injection Date: <u>03/07/11</u>
Instrument ID: <u>MS-VOA5</u>	Injection Time: <u>12:22</u>
Sequence: <u>1C07710</u>	Lab Sample ID: <u>1C07710-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	29.7	PASS
75	30 - 60% of 95	59.7	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.36	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	73.4	PASS
175	5 - 9% of 174	8.34	PASS
176	95 - 101% of 174	99.3	PASS
177	5 - 9% of 176	6.54	PASS

INITIAL CALIBRATION DATA (Continued)

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: 1103218

Client: Tetra Tech NUS, Inc. (T010)

Project: NAS Cecil Field CTO076 bldg 502 2010

Calibration: 1078001

Instrument: MS-VOA5

Matrix: Water

Calibration Dates: 3/7/11 12:53

3/17/11 23:15

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
1,4-Dichlorobenzene	1.153474	6.60659	18.72089	8.928354E-03			15	
Dichlorodifluoromethane	0.312813	10.72439	4.119	9.264489E-02			15	
1,1-Dichloroethane	0.4332253	8.462878	9.104889	6.797151E-02			SPCC (0.1)	
1,2-Dichloroethane	0.4958155	6.096188	12.131	3.325407E-02			15	
1,1-Dichloroethene	0.1779832	11.23937	6.967667	0.1020339			CCC (20)	
cis-1,2-Dichloroethene	0.2226177	11.77531	10.56189	0.0539483			15	
trans-1,2-Dichloroethene	0.2077027	10.73761	8.525556	6.283411E-02			15	
1,2-Dichloroethene (total)	0.2151602	10.90176	0	0			15	
1,2-Dichloropropane	0.2138675	12.72516	13.69356	2.877113E-02	0.9994699		CCC (20)	
1,3-Dichloropropane	0.7045052	7.35678	15.46267	3.084139E-02			15	
2,2-Dichloropropane	0.387605	6.483752	11.15322	4.720791E-02			15	
1,1-Dichloropropene	0.3169346	12.22384	12.60622	4.157777E-02			15	
cis-1,3-Dichloropropene	0.3942719	12.15062	14.59088	1.900144E-02			15	
trans-1,3-Dichloropropene	0.6325373	15.33703	15.05978	2.420188E-02	0.996921		0.995	
Diisopropyl Ether	0.7397891	20.08696	10.34763	4.918967E-02	0.9988929		0.995	
Ethylbenzene	1.744482	8.836318	16.84989	7.809333E-03			CCC (20)	
Ethyl tert-Butyl Ether	0.6852749	17.62275	11.194	5.283168E-02	0.9997283		0.995	
Ethyl Methacrylate	0.4920032	19.18719	15.50875	1.084665E-02	0.9984347		0.995	
Hexachlorobutadiene	0.3208413	8.710181	21.0895	1.924166E-02			15	
2-Hexanone	0.28784	36.32521	15.62175	0.0320628	0.9989233		0.995	
Iodomethane	0.3171042	26.94596	7.022444	9.520778E-02	0.9998641		0.995	
Isopropylbenzene	1.42457	9.248017	17.611	1.726366E-02			15	
p-Isopropyltoluene	1.23658	14.38435	18.40356	2.441437E-02			15	
Methylene chloride	0.2446354	7.987041	7.210778	6.620158E-02			15	
Methyl Acetate	0.2084104	8.369294	7.26575	5.467954E-02			15	
Methylcyclohexane	0.2523952	13.64479	14.39522	2.265609E-02			15	
Naphthalene	1.191261	23.06464	21.05987	0.0200552	0.9993743		0.995	
Methyl Methacrylate	0.2187958	26.61596	14.03787	3.704044E-02	0.9996399		0.995	
4-Methyl-2-pentanone	0.2291641	26.90628	14.72129	3.572917E-02	0.998877		0.995	
Methyl t-Butyl Ether	0.6052207	12.8349	8.8215	8.072976E-02			15	
n-Propylbenzene	2.237126	9.337395	17.95567	1.994119E-02			15	
Styrene	0.9900017	17.07341	17.26711	2.496185E-02	0.9965055		0.995	

ANALYSIS SEQUENCE SUMMARY

SW8260B

Laboratory: Empirical Laboratories, LLC

SDG: 1103218

Client: Tetra Tech NUS, Inc. (T010)

Project: NAS Cecil Field CTO076 bldg 502 2010

Sequence: 1C08903

Instrument: MS-VOA5

Calibration: 1078001

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	1C08903-TUN1	0329TUN1.D	03/29/11 06:57
Calibration Check	1C08903-CCV1	0329CC1.D	03/29/11 07:28
LCS	1C29006-BS1	0329LS1.D	03/29/11 07:58
Blank	1C29006-BLK1	0329BL1.D	03/29/11 09:28
CEF-502-3S-20110323	1103218-01	0321801.D	03/29/11 16:02
CEF-502-6S-20110323	1103218-02	0321802.D	03/29/11 16:32
CEF-502-6S-20110323	1C29006-MS1	0321802M.D	03/29/11 18:03
CEF-502-6S-20110323	1C29006-MSD1	0321802S.D	03/29/11 18:33

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory: <u>Empirical Laboratories, LLC</u>	SDG: <u>1103218</u>
Client: <u>Tetra Tech NUS, Inc. (T010)</u>	Project: <u>NAS Cecil Field CTO076 bldg 502_2010</u>
Lab File ID: <u>0329TU1.D</u>	Injection Date: <u>03/29/11</u>
Instrument ID: <u>MS-VOA5</u>	Injection Time: <u>06:57</u>
Sequence: <u>1C08903</u>	Lab Sample ID: <u>1C08903-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	28.6	PASS
75	30 - 60% of 95	56.4	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.87	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	54.2	PASS
175	5 - 9% of 174	7.34	PASS
176	95 - 101% of 174	99.4	PASS
177	5 - 9% of 176	7.3	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory: <u>Empirical Laboratories, LLC</u>	SDG: <u>1103218</u>
Client: <u>Tetra Tech NUS, Inc. (T010)</u>	Project: <u>NAS Cecil Field CTO076 bldg 502 2010</u>
Instrument ID: <u>MS-VOA5</u>	Calibration: <u>1078001</u>
Lab File ID: <u>0329CC1.D</u>	Calibration Date: <u>03/07/11 12:53</u>
Sequence: <u>1C08903</u>	Injection Date: <u>03/29/11</u>
Lab Sample ID: <u>1C08903-CCV1</u>	Injection Time: <u>07:28</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Isopropylbenzene	A	100.0	114.7	1.42457	1.634488		14.7	20
Bromofluorobenzene	A	30.00	29.26	0.864999	0.8436702		-2.5	20
Dibromofluoromethane	A	30.00	28.04	0.3744165	0.3504506		-6.4	20
1,2-Dichloroethane-d4	A	30.00	29.80	6.425678E-02	0.0638402		-0.6	20
Toluene-d8	A	30.00	27.91	1.791679	1.666762		-7.0	20

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

* Values outside of QC limits

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

SW8260B

Laboratory: <u>Empirical Laboratories, LLC</u>	SDG: <u>1103218</u>
Client: <u>Tetra Tech NUS, Inc. (T010)</u>	Project: <u>NAS Cecil Field CTO076 bldg 502 2010</u>
Lab File ID: <u>0329TU1E.D</u>	Injection Date: <u>03/29/11</u>
Instrument ID: <u>MS-VOA5</u>	Injection Time: <u>19:03</u>
Sequence: <u>1C08905</u>	Lab Sample ID: <u>1C08905-TUN1</u>

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	15 - 40% of 95	30.7	PASS
75	30 - 60% of 95	57.6	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	8.18	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	64.3	PASS
175	5 - 9% of 174	8.07	PASS
176	95 - 101% of 174	95.4	PASS
177	5 - 9% of 176	7.56	PASS

CONTINUING CALIBRATION CHECK

SW8260B

Laboratory: <u>Empirical Laboratories, LLC</u>	SDG: <u>1103218</u>
Client: <u>Tetra Tech NUS, Inc. (T010)</u>	Project: <u>NAS Cecil Field CTO076 bldg 502 2010</u>
Instrument ID: <u>MS-VOA5</u>	Calibration: <u>1078001</u>
Lab File ID: <u>0329CC1E.D</u>	Calibration Date: <u>03/07/11 12:53</u>
Sequence: <u>1C08905</u>	Injection Date: <u>03/29/11</u>
Lab Sample ID: <u>1C08905-CCV1</u>	Injection Time: <u>19:33</u>

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Isopropylbenzene	A	100.0	107.7	1.42457	1.534766		7.7	20
Bromofluorobenzene	A	30.00	28.84	0.864999	0.831672		-3.9	20
Dibromofluoromethane	A	30.00	29.03	0.3744165	0.3627915		-3.1	20
1,2-Dichloroethane-d4	A	30.00	28.97	6.425678E-02	6.204223E-02		-3.4	20
Toluene-d8	A	30.00	27.71	1.791679	1.655129		-7.6	20

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

* Values outside of QC limits