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ENHANCED NATURAL ATTENUATION TREATABILITY STUDY FINAL REPORT
UNDERGROUND STORAGE TANK 26 (UST26) WITH TRANSMITTAL NAS PENSACOLA FL
11/11/2003
TETRA TECH

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TtNUS/TAL-03-081/4225-3.2

November 11, 2003

Project Number N4225

Ms. Tracie Vaught
Remedial Project Manager
Florida Department of Environmental Protection
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Mail Station 4535
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Reference: Clean Contract No. N62467-94-D-0888
Contract Task Order No. 241

Subject: Submittal of Enhanced Natural Attenuation Treatability Study Final Report for UST Site 26, Naval Air Station Pensacola, Pensacola, Florida

Dear Ms. Vaught:

Tetra Tech NUS is pleased to submit one copy of the Enhanced Natural Attenuation Treatability Study Final Report for UST Site 26 (Installation Restoration Site 22).

This report has been prepared for the United States Navy, Southern Division, Naval Facilities Engineering Command (NAVFAC EFD SOUTH) under Contract Task Order 0241 for the Comprehensive Long-term Environmental Action Navy (CLEAN) Contract Number N62467-94-D-0888.

If you have any questions, please call me at (850) 385-9899.

Sincerely yours,

Gerald Walker

Gerald Walker, P.G.
Project Manager

WDO/wdo

Enclosure

c: Greg Campbell, NAS Pensacola PWC
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Debbie Wroblewski (Cover Letter Only)
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Enhanced Natural Attenuation Treatability Study Final Report

for

UST Site 26

Naval Air Station Pensacola

Pensacola, Florida

Southern Division
Naval Facilities Engineering Command

Contract Number N62467-94-D-0888
Contract Task Order 0241

November 2003

The professional opinions rendered in this decision document identified as Enhanced Natural Attenuation Treatability Study Final Report for Underground Storage Tank Site 26, Naval Air Station Pensacola, Pensacola, Florida were developed in accordance with commonly accepted procedures consistent with applicable standards of practice. This document was prepared under the supervision of the signing engineer and is based on information obtained from others. If conditions are determined to exist differently than those described in this document, then the undersigned professional engineer should be notified to evaluate the effects of any additional information on the project described in this document.

Date: November 7, 2003
Gregory S. Root, P.E.
Professional Engineering Number 50842
Tetra Tech NUS, Inc. Engineering Number 7988

TtNUS/TAL-03-075/4225-6.4

ENHANCED NATURAL ATTENUATION TREATABILITY STUDY FINAL REPORT FOR UST SITE 26

NAVAL AIR STATION PENSACOLA
PENSACOLA, FLORIDA

COMPREHENSIVE LONG-TERM ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406

Submitted by:
Tetra Tech NUS, Inc.
661 Andersen Drive
Foster Plaza 7
Pittsburgh, Pennsylvania 15220

CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0241

NOVEMBER 2003

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ACRONYMS

bls	Below Land Surface
°C	Degrees Celsius
CLEAN	Comprehensive Long-term Environmental Action Navy
COC	Constituent of Concern
CTO	Contract Task Order
DO	Dissolved Oxygen
DPT	Direct Push Technology
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FE^{2+}	Ferrous Iron
FE^{3+}	Ferric Iron
ft	Feet/Foot
GCTLs	Groundwater Cleanup Target Levels
H_2S	Hydrogen Sulfide
µg/L	Micrograms per Liter
mg/L	Milligrams per Liter
MgO_2	Magnesium Peroxide
$Mg(OH)_2$	Magnesium Hydroxide
MNA	Monitored Natural Attenuation
MOP	Monitoring Only Proposal
mS/cm	Microsiemens per Centimeter
mV	Millivolts
NA	Not Analyzed
NADC	Natural Attenuation Default Concentration
Navy	United States Navy
NFA	No Further Action
ORC®	Oxygen Releasing Compounds
ORP	Oxidation-Reduction Potential
SAR	Site Assessment Report
SOPs	Standard Operating Procedures
TOC	Total Organic Carbon
TtNUS	Tetra Tech NUS, Inc.
USEPA	United States Environmental Protection Agency
UST	Underground Storage Tank
VOCs	Volatile Organic Compounds

1.0 INTRODUCTION

Tetra Tech NUS, Inc. (TtNUS) is pleased to submit the Enhanced Natural Attenuation Treatability Study Final Report for the referenced Contract Task Order (CTO). This report was prepared for the United States Navy (Navy) Southern Division, Naval Facilities Engineering Command under CTO 0241 for the Comprehensive Long-term Environmental Action Navy (CLEAN) Contract Number N62467-94-D-0888. This report provides the results of the fifth quarter groundwater sampling event conducted in August 2003 as the fourth post-injection sampling event of the treatability study for Underground Storage Tank (UST) Site 26, Naval Air Station Pensacola, Florida, and evaluates the effectiveness of the Oxygen Releasing Compounds (ORC)® technology selected for the treatability study.

1.1 SITE SUMMARY

UST Site 26, the former Refueler Repair Area, is located to the west of John Tower Road near the approximate center of the installation (Figure 1-1). The site is an irregularly shaped open area approximately 300- by 400-feet (ft) surfaced with crushed oyster shell, hard-packed gravel or soil, and sparse vegetation (Figure 1-2). The southwestern edge of the site is paved. This area is currently used for equipment and vehicle parking. A large debris pile of variably colored sand and silt mixed with wood and other organic material is located near the center of the site. Topography at UST Site 26 is generally flat with a land surface elevation of approximately 29 ft above mean sea level.

In 1998, a site assessment was completed for UST Site 26 (Ensafe, 1998). The Site Assessment Report (SAR) indicated that benzene contamination was present in the groundwater. The chemical analysis of groundwater samples suggested that the plume was attenuating through natural processes. Therefore, a monitoring-only proposal (MOP) was prepared for the site which recommended semi-annual groundwater sampling for volatile organic compounds (VOCs) from monitoring wells GS01, GS10, and GS12.

On May 15, 2001, three permanent micro wells were installed adjacent to temporary monitoring wells GS01, GS10, and GS12. The three temporary wells were abandoned, and the permanent wells were given the same name as the temporary wells they replaced. The locations of the three permanent monitoring wells are indicated on Figure 1-3. The first semi-annual sampling event for the MOP was completed on June 7, 2001 (TtNUS 2001). Groundwater samples were collected from permanent monitoring well GS01 (source well) and point of compliance wells GS10 and GS12 and analyzed for VOCs. Depth-to-water and top-of-casing elevations were recorded on June 7, 2001, and used to calculate groundwater elevations and flow direction. Groundwater flow was primarily in a northwesterly direction. Results of the monitoring event indicated that benzene concentrations in monitoring well GS10

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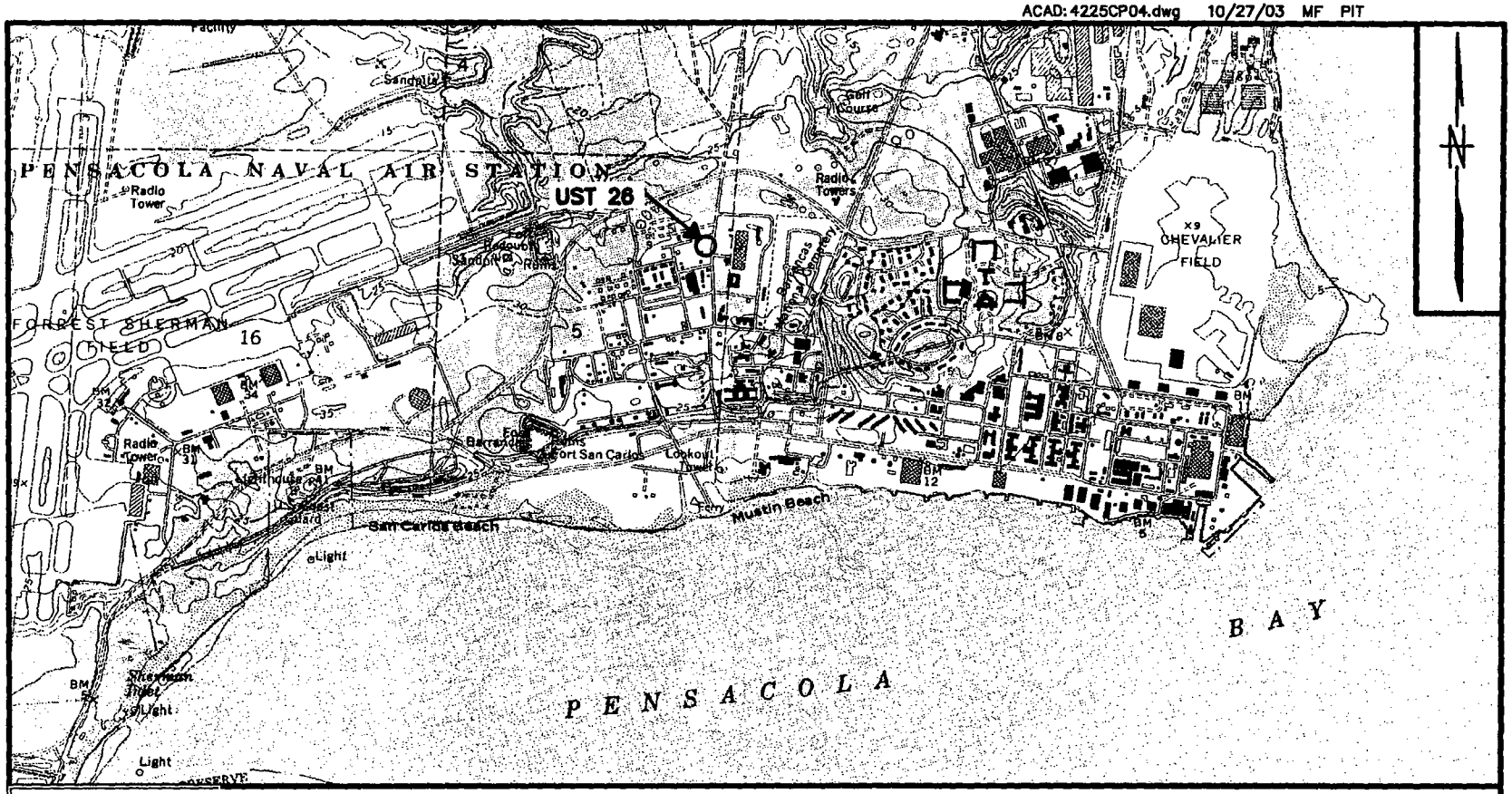

QUADRANGLE LOCATION

0 2000 4000
SCALE IN FEET

SOURCE: U.S.G.S. TOPOGRAPHIC QUADRANGLE FORT BARRANCAS, FLORIDA (1970 EDITION–PHOTOREVISED 1987).

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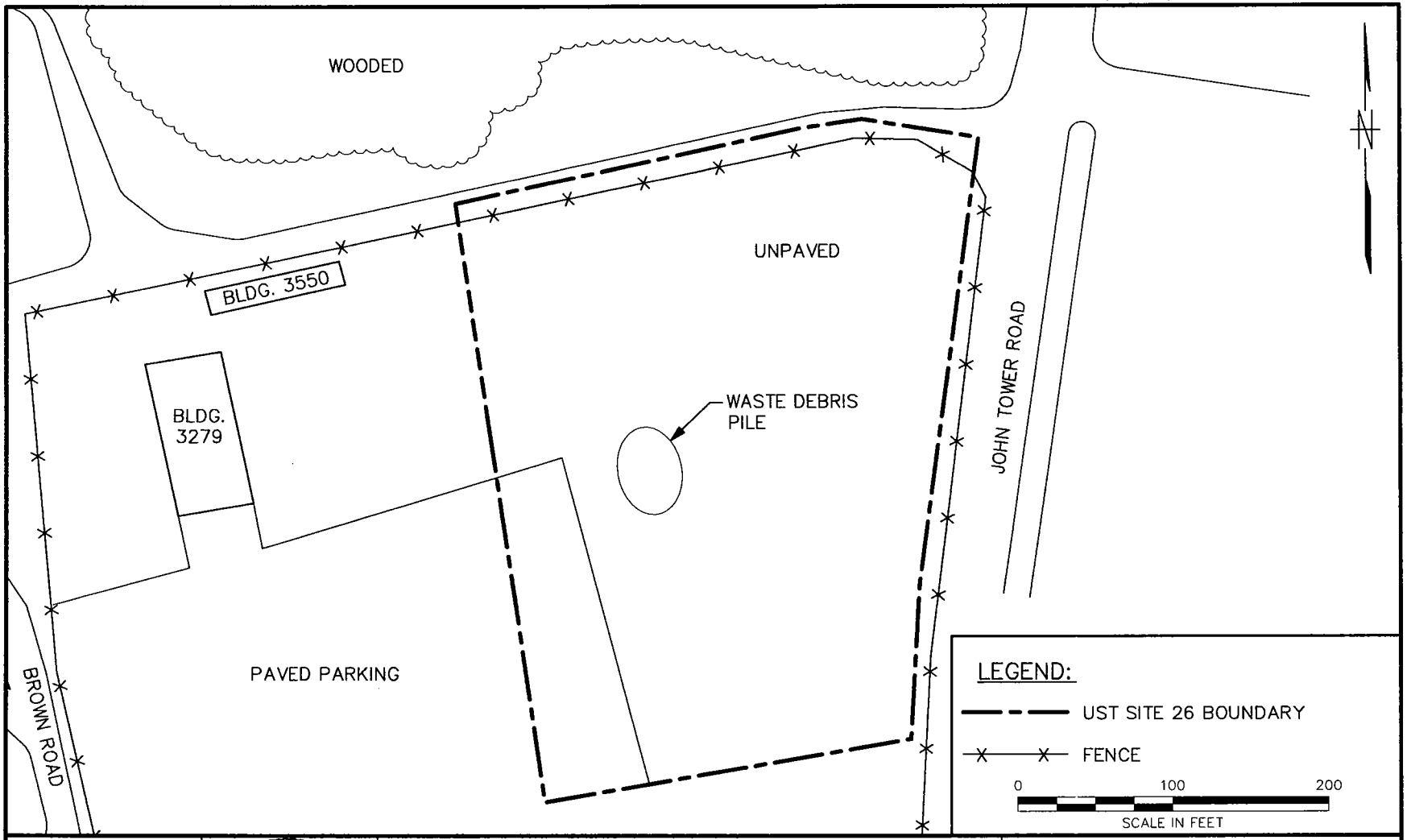

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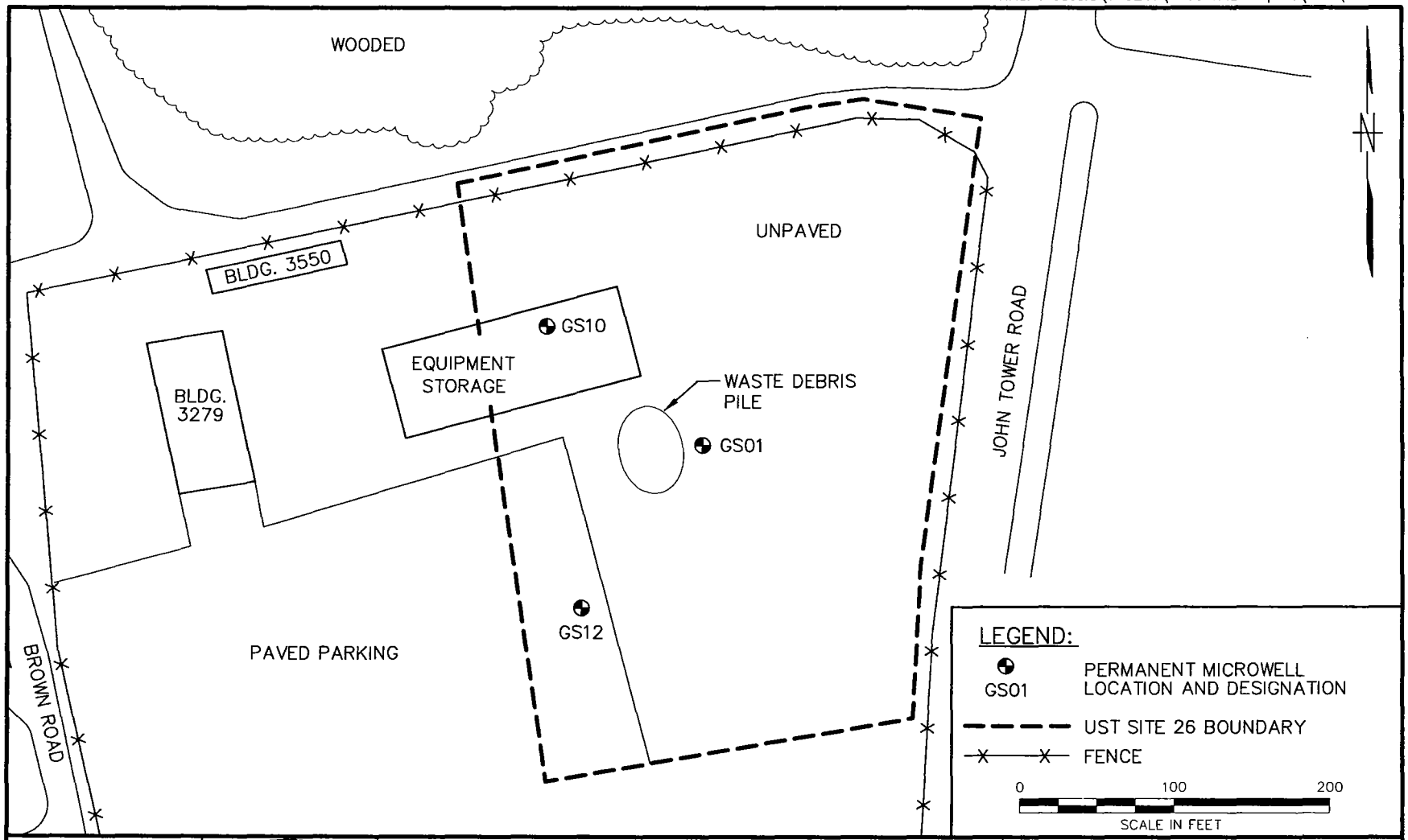

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(exceeded Florida Department of Environmental Protection (FDEP) Natural Attenuation Default Criteria NADC).

On August 9, 2001, monitoring well GS10 was resampled for VOCs and the benzene exceedance was confirmed. As a result of the confirmed benzene concentrations present in the site groundwater, a treatability study was proposed for UST Site 26 (TtNUS, 2002a).

2.0 TREATABILITY STUDY

2.1 TREATABILITY STUDY OBJECTIVE

The objective of the treatability study was to determine the effectiveness of ORC® technology at reducing the contaminant concentrations in the groundwater. This strategy relies on producing consistently high dissolved oxygen (DO) levels in groundwater to increase the microbial activity, thereby increasing contaminant reduction through aerobic respiration.

ORC® is a proprietary product produced by Regenesis Bioremediation Products, of San Clemente, California and is a patented formulation of magnesium peroxide (MgO_2) intercalated with food-grade phosphate that slowly releases molecular oxygen into the aquifer when hydrated [$Mg(OH)_2$]. The phosphate additive provides the time-release properties that are critical in a passive, low-cost oxygen application system. The oxygen consumption rate is dependent upon the level of the contaminant flux. This allows ORC® to release oxygen at a relatively constant rate over an extended period of time. The increase in DO in the aquifer creates aerobic conditions that will stimulate in-situ bioremediation of the petroleum hydrocarbon plume.

To monitor the effect of the ORC® injection on the contaminant plume, a baseline-sampling event prior to ORC® injection and four quarters of post-injection groundwater sampling were conducted. Groundwater samples were collected from the three monitoring wells at the site and analyzed for VOCs and monitored natural attenuation (MNA) parameters.

2.2 ORC® INJECTION

From September 5, 2002 to September 13, 2002, 56 soil borings were completed at the site using a Direct Push Technology (DPT) drill rig. The soil boring locations are shown on Figure 2-1. The borings were advanced to a depth of approximately 23 ft below land surface (bls). As the DPT rods were retracted from the ground, a pump was used to inject a slurry of the ORC® and water into the borehole. The compound was pumped at a rate such that the ORC® slurry was injected across the 10 ft zone from the depth of the boring to the water table (approximately 13 ft bls). The ORC® slurry consisted of approximately 10 pounds of ORC® powder mixed with approximately 5 gallons of water. The mixture was injected through the DPT rod using a high-pressure grout pump. The borings were sealed with bentonite chips above the ORC® slurry and filled to land surface with sand.

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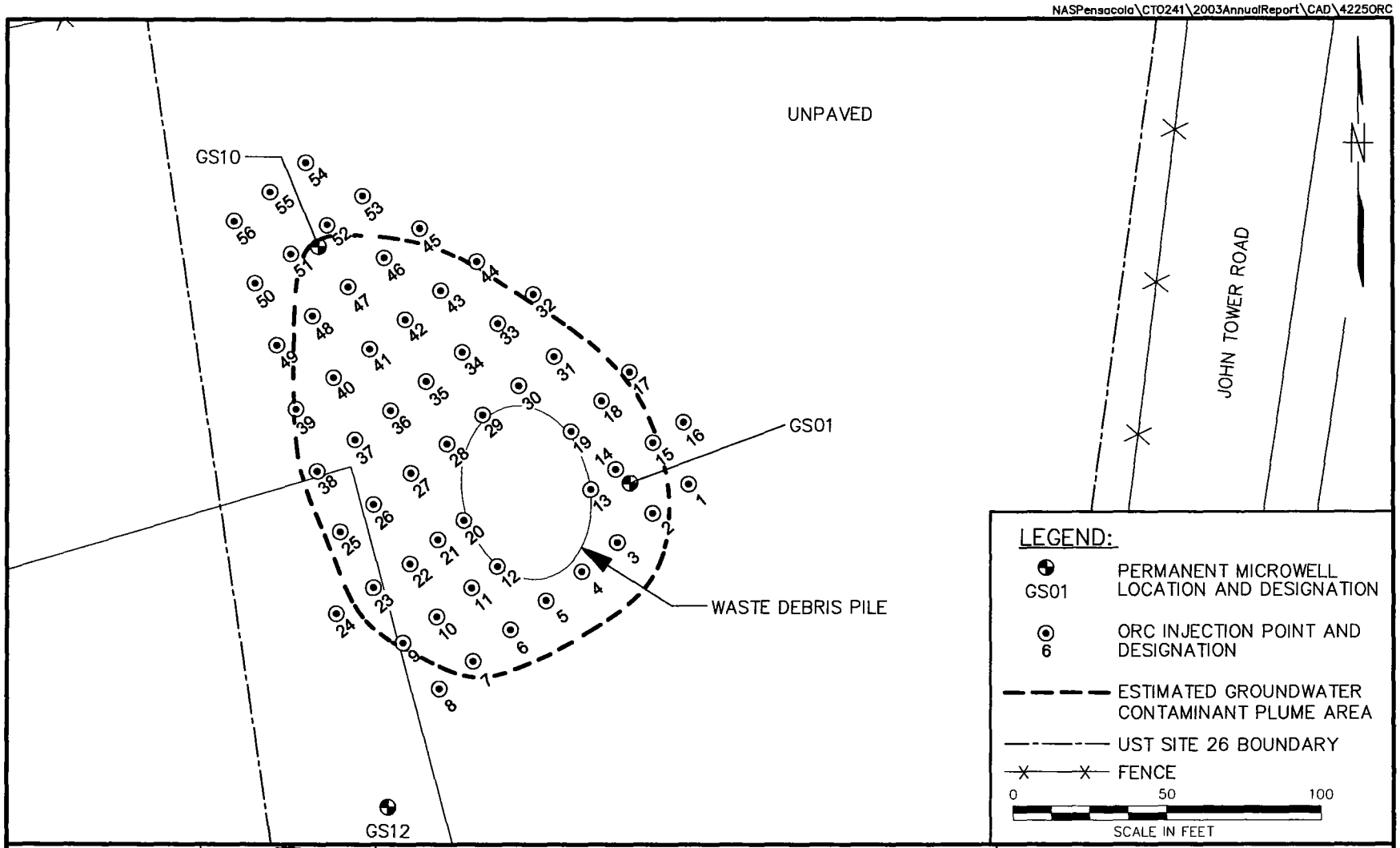

DRAWN BY LLK DATE 10/7/03	ORC INJECTION POINT LOCATIONS SEPTEMBER 2002 UST SITE 26 FINAL TREATABILITY STUDY REPORT NAS PENSACOLA PENSACOLA, FLORIDA	CONTRACT NO. 4225	
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2.3 GROUNDWATER SAMPLING ACTIVITIES

TtNUS personnel have conducted the following sampling events as part of the treatability study:

- September 4, 2002 – Baseline groundwater monitoring event (TtNUS, 2002b)
- December 4, 2002 – Second quarter groundwater monitoring event (TtNUS, 2003a)
- February 25, 2003 – Third quarter groundwater monitoring event (TtNUS, 2003b)
- May 20, 2003 – Fourth quarter groundwater monitoring event (TtNUS, 2003c)
- August 27, 2003 - Fifth Quarter Groundwater Monitoring event

Each Groundwater Monitoring event included the measurement of depth to groundwater and collection of groundwater samples from the site monitoring wells. The purpose of the sampling was to measure groundwater constituent concentrations for both constituents of concern (COCs) and natural attenuation parameters. Groundwater samples were collected from monitoring wells GS01, GS10, and GS12 and analyzed for selected VOCs, total organic carbon (TOC), sulfate, and other field natural attenuation parameters.

Groundwater samples were collected from the three wells in accordance with the current FDEP Standard Operating Procedures (SOPs). Depth-to-water was measured, and the wells were purged prior to sample collection. Purging was accomplished with a peristaltic pump using low flow purge technique. During purging, field parameters [pH, conductivity, temperature, DO, and oxidation-reduction potential (ORP)] were measured at approximately 5 to 10 minute intervals using an YSI® Model 556. The instrument was calibrated according to the manufacturer's specifications at the beginning of the day. A Field Calibration Log is provided in Appendix A. In addition, turbidity was monitored using a La Motte Turbidimeter.

Following the well purging activities, the groundwater samples were analyzed in the field for the following natural attenuation parameters: ferrous iron (Fe^{2+}), alkalinity, carbon dioxide, DO, and hydrogen sulfide (H_2S). Groundwater Sample Log Sheets, Low Flow Purge Data Sheets, and Natural Attenuation Parameter Sheets compiled during purging and sampling at each location are also provided in Appendix A.

Additional groundwater samples were collected for off-site analysis of benzene, ethylbenzene, tert-butylbenzene, toluene, and total xylenes by United States Environmental Protection Agency (USEPA) Method SW846 8260B; TOC by USEPA Method 415.1; and sulfate by USEPA Method 300. After collection, groundwater samples were placed on ice and shipped overnight via Federal Express to approved and certified laboratories for analysis. The validated laboratory data for the fifth quarter

sampling event is included in Appendix B. The validated laboratory data for the previous four quarterly sampling events are included in Appendix C.

3.0 TREATABILITY STUDY RESULTS

3.1 GROUNDWATER FLOW AND ELEVATION

Depth to water measurements collected during each quarterly groundwater monitoring event are included in Table 3-1. Only three permanent monitoring wells are installed at the site, therefore the groundwater elevation data set is limited to three data points per gauging event. Because of the limited number of gauging locations, the accuracy of the apparent groundwater flow can vary significantly. Groundwater elevations were calculated from the depth to water measurements and monitoring wells top of casing elevations referenced to an arbitrary site specific datum of 30 ft. Groundwater flow direction was determined from the groundwater elevations calculated for each sampling event.

Groundwater flow during September 2002 was almost due north. Groundwater elevations during this sampling event ranged from 18.28 to 18.57 ft. The groundwater elevations and direction of groundwater flow calculated for the first quarterly monitoring event are shown on Figure 3-1.

Groundwater flow during December 2002 was generally to the northwest. This groundwater flow direction was approximately 45 degrees to the west of the groundwater flow direction in the previous quarterly monitoring event. Groundwater elevations during this sampling event ranged from 22.23 to 22.33 ft, approximately 4 ft higher than during the previous sampling event in September 2002. The groundwater elevations and direction of groundwater flow calculated for the second quarterly monitoring event are shown on Figure 3-2.

Groundwater flow during February 2003 was generally to the west northwest. This groundwater flow direction is further to the west than indicated by the previous quarterly monitoring data. Groundwater elevations during this sampling event ranged from 20.34 to 20.88 ft, approximately 2-ft lower than during the previous sampling event in December 2002. The groundwater elevations and direction of groundwater flow calculated for the third quarter monitoring event are shown on Figure 3-3.

Groundwater flow during May 2003 was almost due west. Groundwater elevations during this sampling event ranged from 20.25 to 20.68 ft, approximately the same as the previous sampling event in February 2003. The groundwater elevations and direction of groundwater flow calculated for the fourth quarter monitoring event are shown on Figure 3-4.

Groundwater flow during August 2003 was generally to the northwest. This groundwater flow direction is consistent with previous quarterly monitoring data. Groundwater elevations during this sampling event ranged from 23.80 to 23.92 ft, approximately 3 ft higher than during the previous sampling event

Table 3-1
Groundwater Elevation Summary

Enhanced Natural Attenuation Treatability Study Final Report
UST Site 26
Naval Air Station Pensacola
Pensacola, Florida

Well ID	Well Depth	Top of Casing Elevation[1]	September 4, 2002		December 4, 2002		February 25, 2003	
			Depth to Water (ft)	Groundwater Elevation	Depth to Water (ft)	Groundwater Elevation	Depth to Water (ft)	Groundwater Elevation
GS01	19.40	31.12	12.71	18.41	8.79	22.33	10.24	20.88
GS10	19.41	31.60	13.32	18.28	9.37	22.23	11.26	20.34
GS12	19.80	31.42	12.85	18.57	9.10	22.32	10.84	20.58

Well ID	Well Depth	Top of Casing Elevation[1]	May 20, 2003		August 28, 2003	
			Depth to Water (ft)	Groundwater Elevation	Depth to Water (ft)	Groundwater Elevation
GS01	19.40	31.12	10.44	20.68	7.20	23.92
GS10	19.41	31.60	11.35	20.25	7.80	23.80
GS12	19.80	31.42	11.06	20.36	7.53	23.89

Notes:

[1] Top of casing and groundwater elevations are relative to an arbitrary site reference elevation of 30 ft mean sea level assumed in northeast corner of the site.

ft = feet

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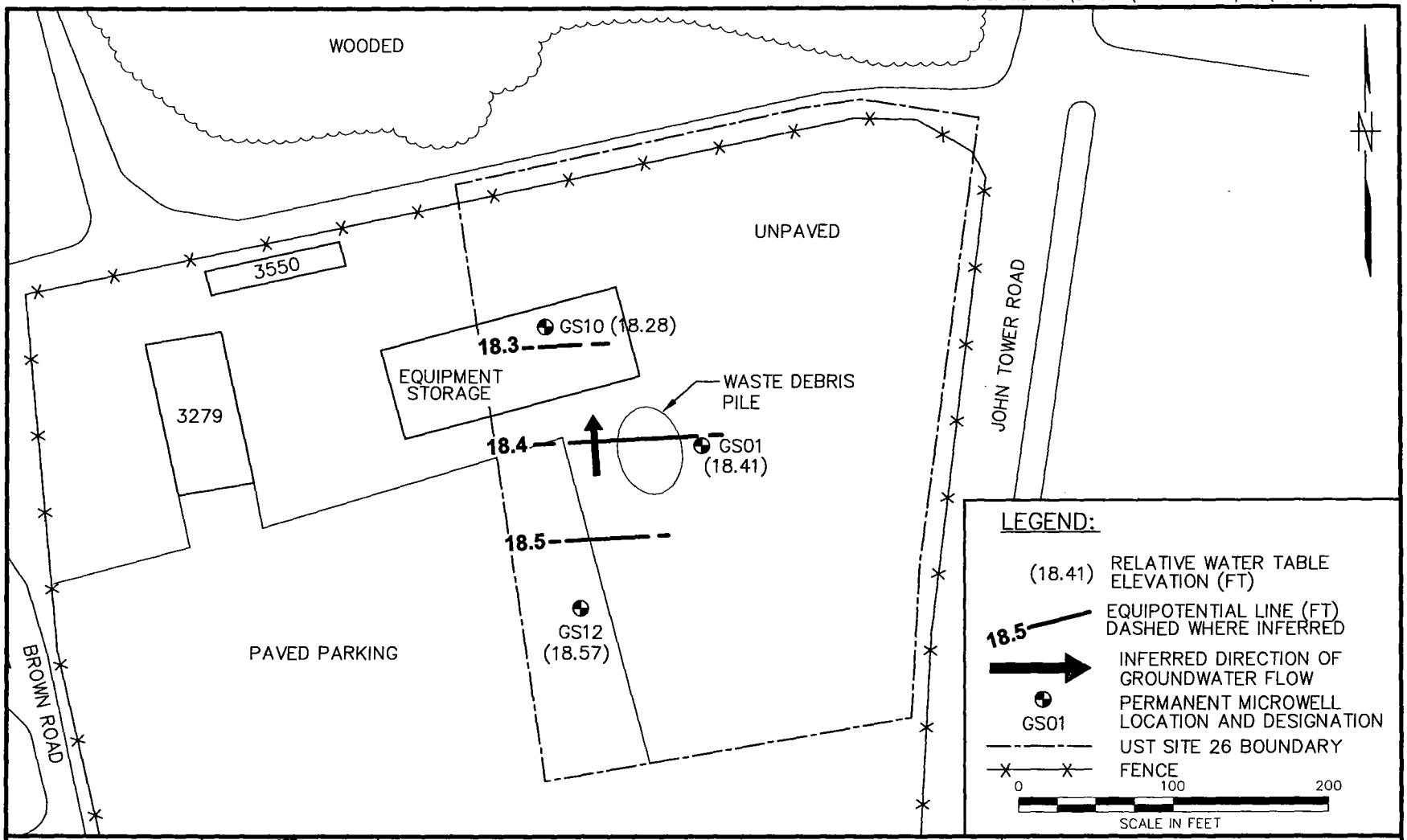

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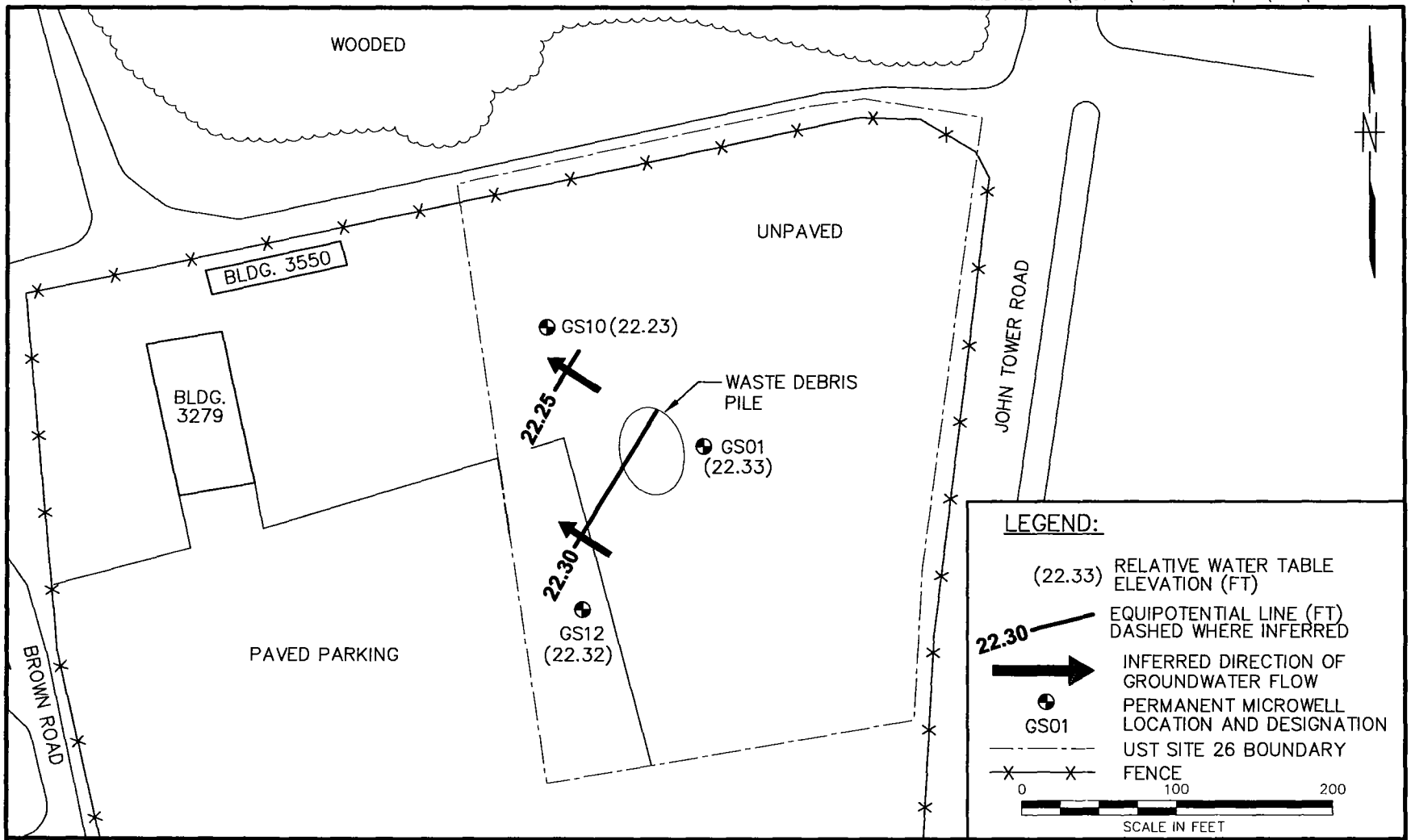

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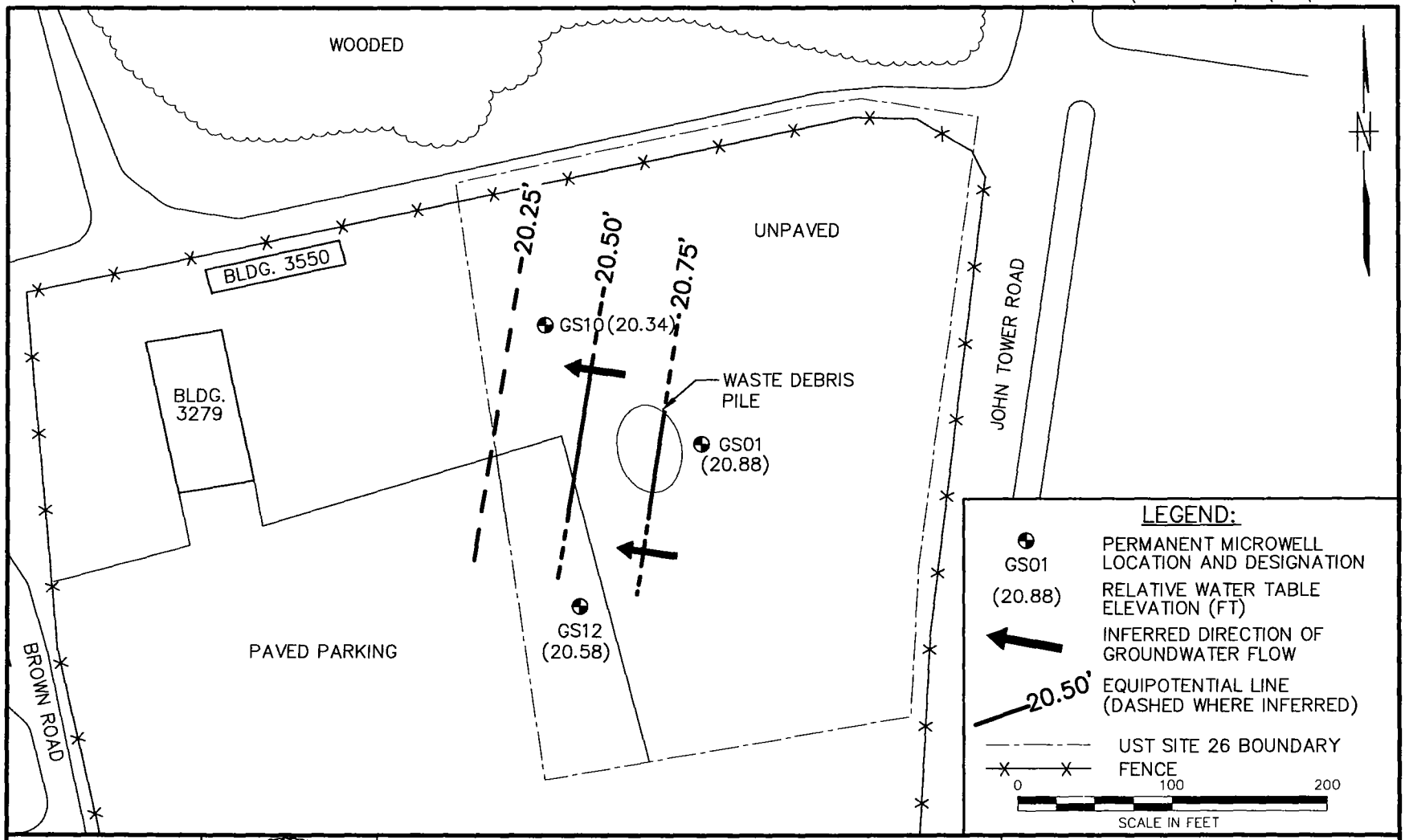

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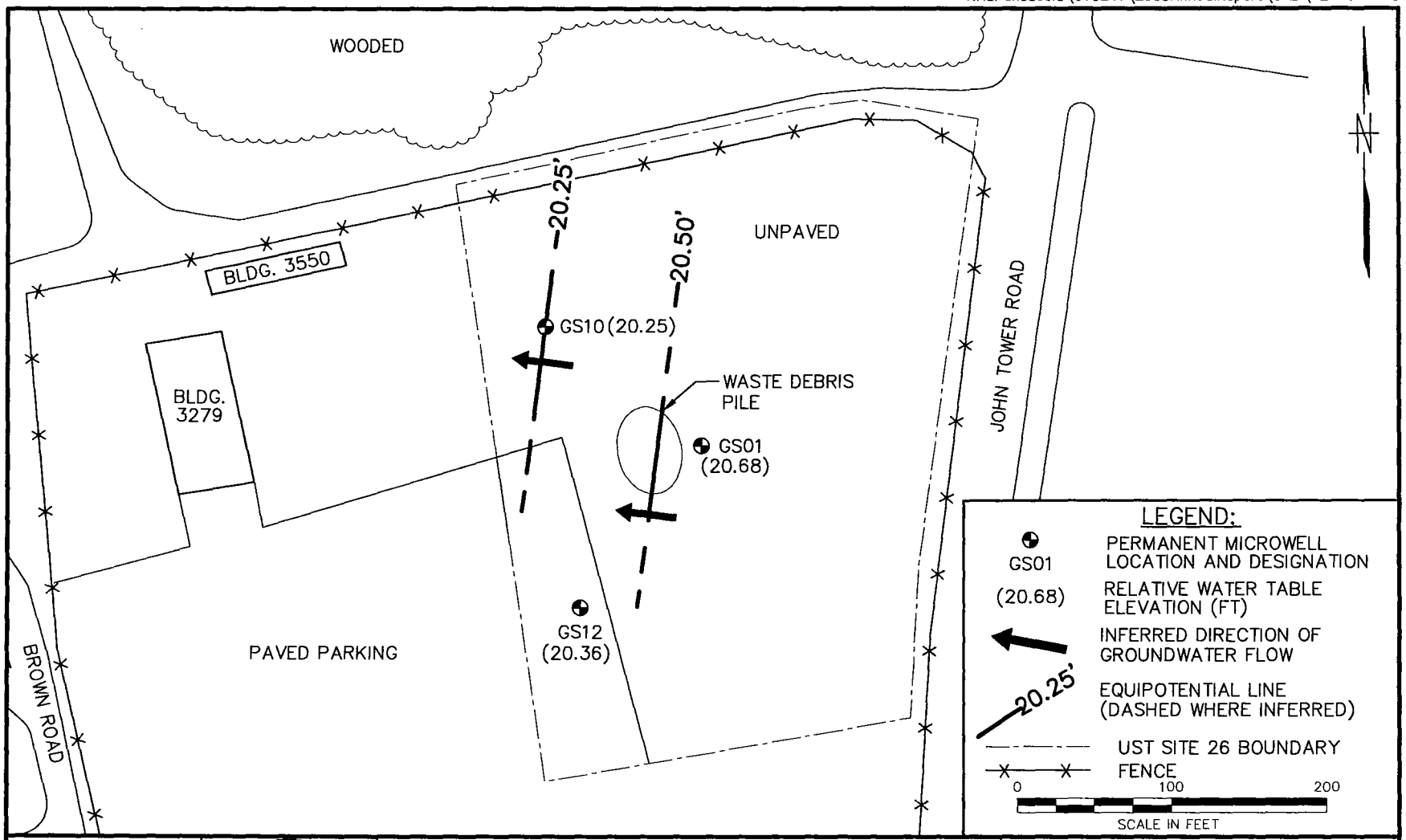

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DEPARTMENT OF THE NAVY · SOUTHERN DIV FACILITIES ENGINEERING COMD

in May 2003. The groundwater elevations and direction of groundwater flow calculated for the fifth quarter monitoring event are shown on Figure 3-5.

3.2 GROUNDWATER ANALYTICAL RESULTS

Analytical results for the groundwater samples are summarized in Table 3-2. The field and laboratory analytical results for MNA parameters are summarized in Table 3-3. The validated laboratory data for the fifth quarter sampling event is included in Appendix B. The validated laboratory data for the previous four quarterly sampling events are included in Appendix C.

Laboratory analytical results from the baseline sampling event (prior to ORC® injection) indicated that benzene concentrations in two monitoring wells, GS01 [8 micrograms per liter (µg/L)] and GS10 (6 µg/L), exceeded the groundwater cleanup target level (GCTL) of 1µg/L and that the total xylene concentration in GS10 (30 µg/L) exceeded the GCTL of 20 µg/L. Ethylbenzene was detected in the sample collected from monitoring well GS01 (3.1 µg/L, estimated) at a concentration less than the GCTL of 30 µg/L. Tert-butylbenzene was detected in the sample collected from GS01 (7.4 µg/L); however, there is no associated GCTL for the compound in Chapter 62-770, Florida Administrative Code (FAC). Analyte concentrations in the groundwater sample from monitoring well GS12 were less than standard laboratory detection limits. The selected results from the baseline sampling event are shown on Figure 3-6.

Laboratory analytical results from the second quarter sampling event (first event following the ORC® injection) indicated that the benzene (0.57 µg/L, estimated) and ethylbenzene (1.1 µg/L) concentrations in monitoring well GS01 had decreased since the previous sampling event and were less than GCTLs. Tert-butylbenzene was detected in monitoring well GS01 at a concentration of 12.1 µg/L, which was an increase from the previous sampling event. Analyte concentrations in the groundwater sample from wells GS10 and GS12 were less than standard laboratory detection limits. The selected results from the second quarter sampling event are shown on Figure 3-7.

The third quarter groundwater sampling results indicated that benzene and ethylbenzene concentrations in monitoring well GS01 continued to decline. The benzene concentration was less than the standard laboratory detection limit and the ethylbenzene concentration (0.9 µg/L, estimated) was less than the GCTL. Tert-butylbenzene was detected in the groundwater sample from monitoring well GS01 at a concentration of 9.1 µg/L, which was a decrease from the previous sampling event. Analyte concentrations in the groundwater sample from wells GS10 and GS12 were less than standard laboratory detection limits. The selected results from the third quarter sampling event are shown on Figure 3-8.

The fourth quarter groundwater sampling results were similar to the previous quarter. The benzene concentration in the groundwater sample from monitoring well GS01 was less than the standard

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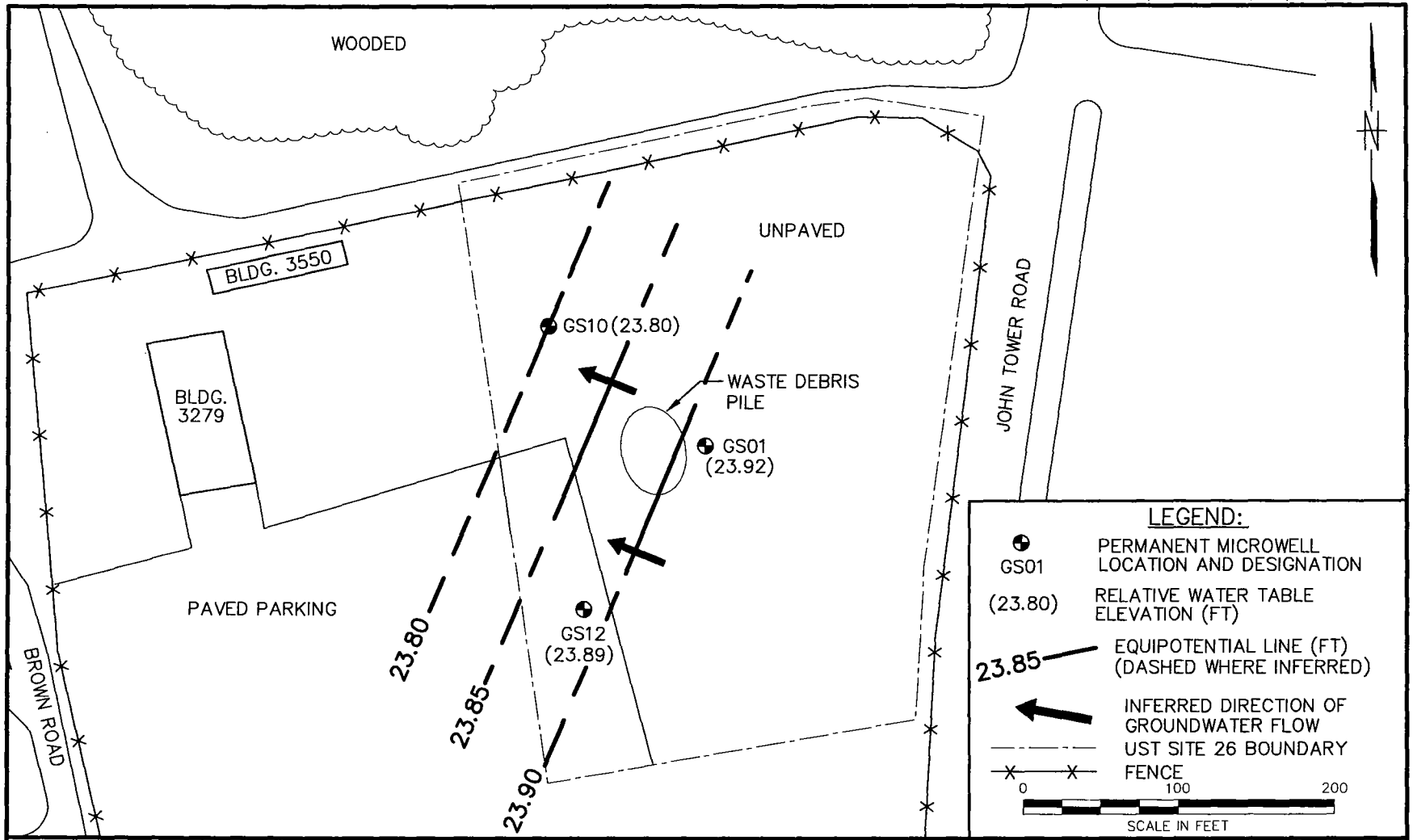

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CHECKED BY DATE		APPROVED BY DATE	
COST/SCHED-AREA		APPROVED BY DATE	
SCALE AS NOTED		DRAWING NO. FIGURE 3-5	REV. 0

Table 3-2
Summary of Groundwater Sample Analytical Results

Enhanced Natural Attenuation Treatability Study Final Report
UST Site 26
Naval Air Station Pensacola
Pensacola, Florida

Sample Location		**GS01** Source Well					**FDEP Action Levels Source Area Well**	**FDEP Action Levels Perimeter Wells**
Collection Date		09/04/02	12/04/02	02/25/03	05/20/03	08/26/03		
Volatile[2] (µg/L)	**GCTL[1] (µg/L)**	Baseline	2nd Quarter	3rd Quarter	4th Quarter	5th Quarter		
Benzene	1	**8.0**	0.57J	1.7U	1U	1 U	100	1
Ethylbenzene	30	3.1J	1.1	0.9J	0.7J	1 U	300	30
Tert-butylbenzene	NL	7.4	12.1	9.1	7.5	1 U	NA	NA
Toluene	40	5.0U	0.5U	1.7U	0.2J	1 U	400	40
Total Xylenes	20	5.0U	1.6J	1.7U	3U	3 U	200	20

Sample Location		**GS12** Perimeter Well					**GS10** Perimeter Well					**FDEP Action Levels Source Area Well**	**FDEP Action Levels Perimeter Wells**
Collection Date		09/04/02	12/04/02	02/25/03	05/20/03	08/26/03	09/04/02	12/04/02	02/25/03	05/20/03	08/26/03		
Volatile[2] (µg/L)	**GCTL[1] (µg/L)**	Baseline	2nd Quarter	3rd Quarter	4th Quarter	5th Quarter	Baseline	2nd Quarter	3rd Quarter	4th Quarter	5th Quarter		
Benzene	1	1.0U	0.5U	1U	1U	1 U	**6**	0.5U	1U	1U	1 U	100	1
Ethylbenzene	30	1.0U	0.7U	1U	1U	1 U	1.0U	0.7U	1U	1U	1 U	300	30
Tert-butylbenzene	NL	1.0U	0.5U	1U	1U	1 U	1.0U	0.5U	1U	1U	1 U	NA	NA
Toluene	40	1.0U	0.5U	1U	1U	1 U	1.0U	0.5U	1U	1U	1 U	400	40
Total Xylenes	20	1.0U	1.0U	1U	3U	3 U	**30**	1.0U	1U	3U	3 U	200	20

Notes:
[1] Groundwater Cleanup Target Level, Chapter 62-770, FAC
[2] USEPA Method SW-846 8260B
U = Analyte not detected, value shown is the minimum concentration reported by the laboratory.
J = Value is estimated.
NL = GCTLs not listed in Chapter 62-770, FAC
NA = not available
Bold values are above GCTLs.

Table 3-3
Natural Attenuation Analytical Results

Enhanced Natural Attenuation Treatability Study Final Report
UST Site 26
Naval Air Station Pensacola
Pensacola, Florida

		Sample Location	**GS01** Source Well					**GS10** Perimeter Well					**GS12** Perimeter Well				
		Collection Date	9/4/02	12/4/02	2/25/03	5/20/03	8/26/03	9/4/02	12/4/02	2/25/03	5/20/03	8/26/03	9/4/02	12/4/02	2/25/03	5/20/03	8/26/03
Fixed Base Laboratory Results	**Preferred Range**	**Units**	Baseline	2nd Quarter	3rd Quarter	4th Quarter	5th Quarter	Baseline	2nd Quarter	3rd Quarter	4th Quarter	5th Quarter	Baseline	2nd Quarter	3rd Quarter	4th Quarter	5th Quarter
Sulfate			150	20000U	6260	750 J	720 J	26300	40100	33200	15600	17000 J	24800	25000	50200	28100	25000
TOC			34000	32300	33000	29800	54000	4600	9700	11000	8000	5800	2800	2600	3500	2000	3000
Field Natural Attenuation Results																	
Alkalinity	> 2x	mg/L	300	200	0	200	450	35	33	40	80	55	40	20	13	25	35
Carbon Dioxide	> 2x	mg/L	60	90	50	50	120	25	45	45	40	45	25	40	35	45	45
Ferrous Iron	> 1 mg/L	mg/L	4.4	4.6	2.8	2.2	1.62	0	0	0	2	0.8	0	0	0.1	0	1.5
Hydrogen Sulfide (HSC)	NA	mg/L	2.0	2	2	5	5.0	0	0	0	0	0	0	0	0	0	0
Hydrogen Sulfide (CHEMetrics)	NA	mg/L	NM	0.6	2.0	4.0	NM	NM	0	0	0	NM	NM	0	0	0	NM
DO (CHEMetrics)	> 5 mg/L	mg/L	NM	0.25	0.20	0.30	0.60	NM	3	4	0	2.5	NM	0.5	3.0	3	1.5
DO (YSI®)	> 5 mg/L	mg/L	0.03	0.20	0.24	0.81	0.04	7.27	3.34	2.01	7.30	6.93	2.52	0.55	1.69	1.9	0.79
pH	5 < pH < 9	standard	6.51	7.59	6.52	6.58	6.75	5.63	6.90	6.12	6.42	6.10	5.20	6.84	5.42	4.9	5.84
Specific Conductivity	NA	mS/cm	0.625	0.861	0.635	0.582	1.004	0.001	0.497	0.363	0.150	0.375	0.289	0.286	0.394	0.255	0.260
Oxidation Reduction Potential	<50 mV or <-100mV	mV	-113.6	76.3	-202.8	-80.2	-154.3	204.9	131.8	-123.0	52.1	100.8	229.2	125.9	-7.0	198	109.6
Temperature	> 20 °C	°C	25.7	23.84	20.37	23.90	26.21	31.39	23.38	19.97	22.51	25.71	26.7	24.86	20.90	23.24	25.78

Notes:
mg/L = milligrams per liter
µg/L = micrograms per liter
mS/cm = microsiemens per centimeter
mV = millivolt
°C = degrees celsius
J = Value is estimated.
U = Analyte not detected, value shown is the minimum concentration reported by the laboratory.
NM = not measured
NA = not available
TOC = Total Organic Carbon

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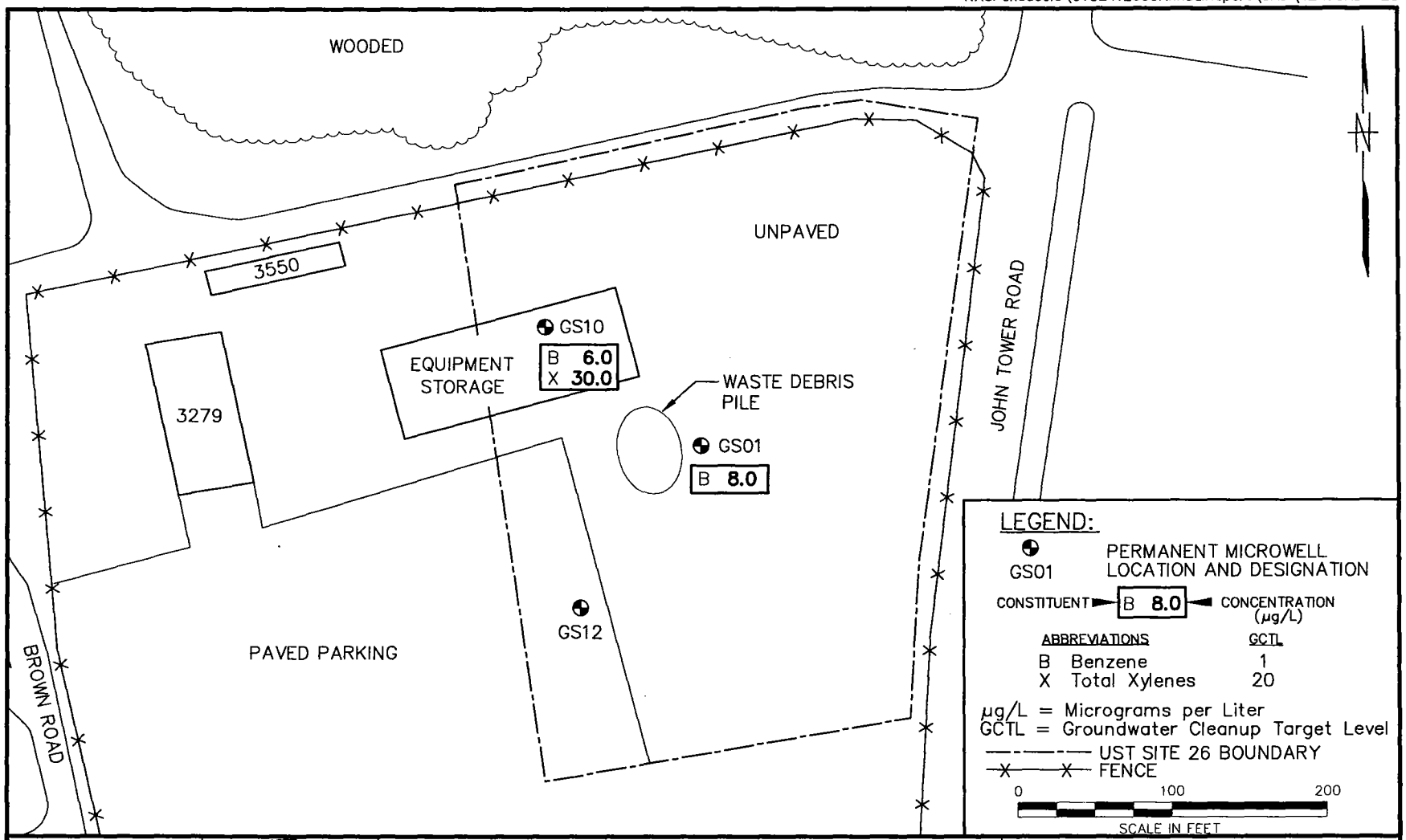

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CHECKED BY DATE		APPROVED BY DATE	
COST/SCHED-AREA		APPROVED BY DATE	
SCALE AS NOTED		DRAWING NO. FIGURE 3-6	REV. 0

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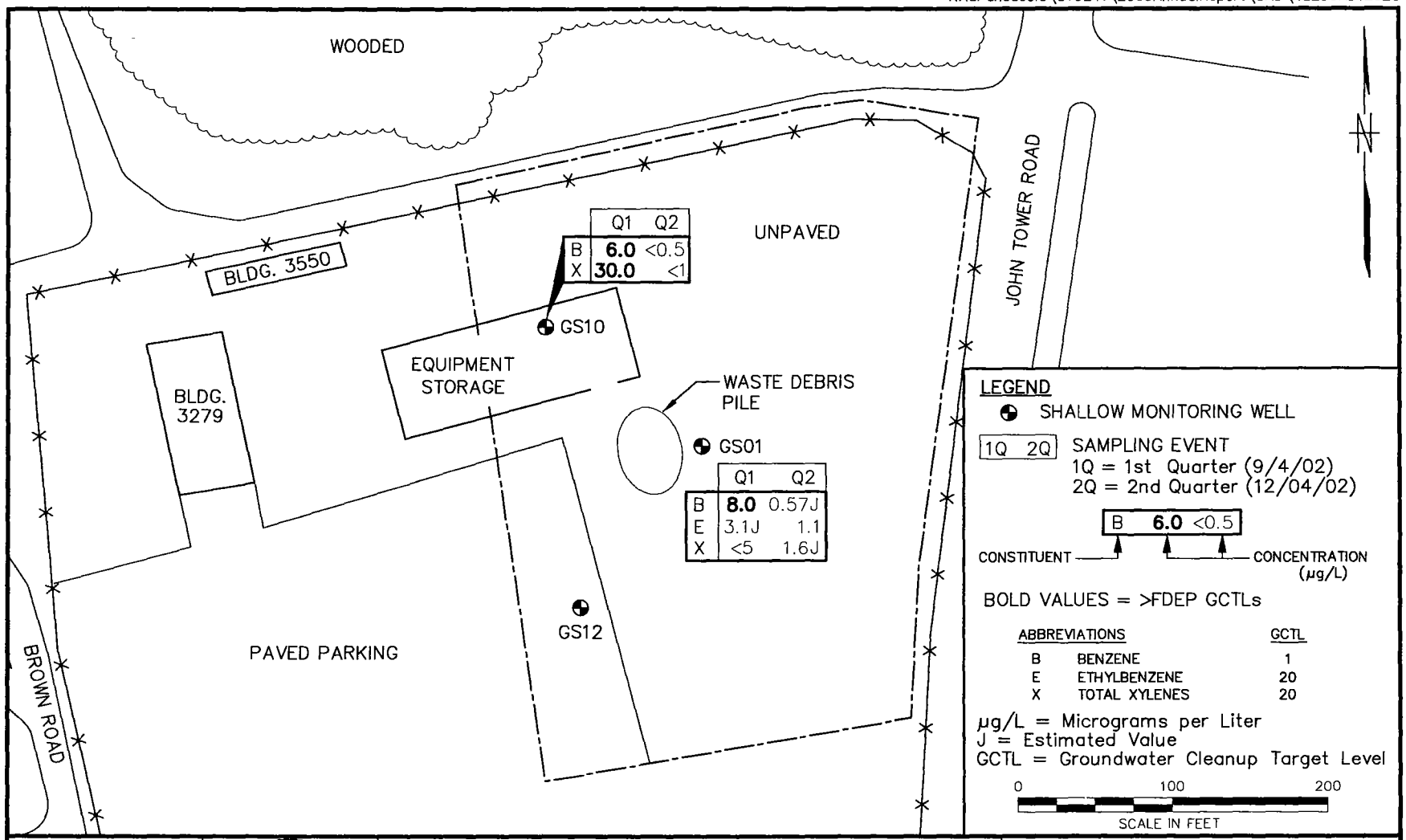

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CHECKED BY DATE		APPROVED BY DATE	
COST/SCHED-AREA		APPROVED BY DATE	
SCALE AS NOTED		DRAWING NO. FIGURE 3-7	REV. 0

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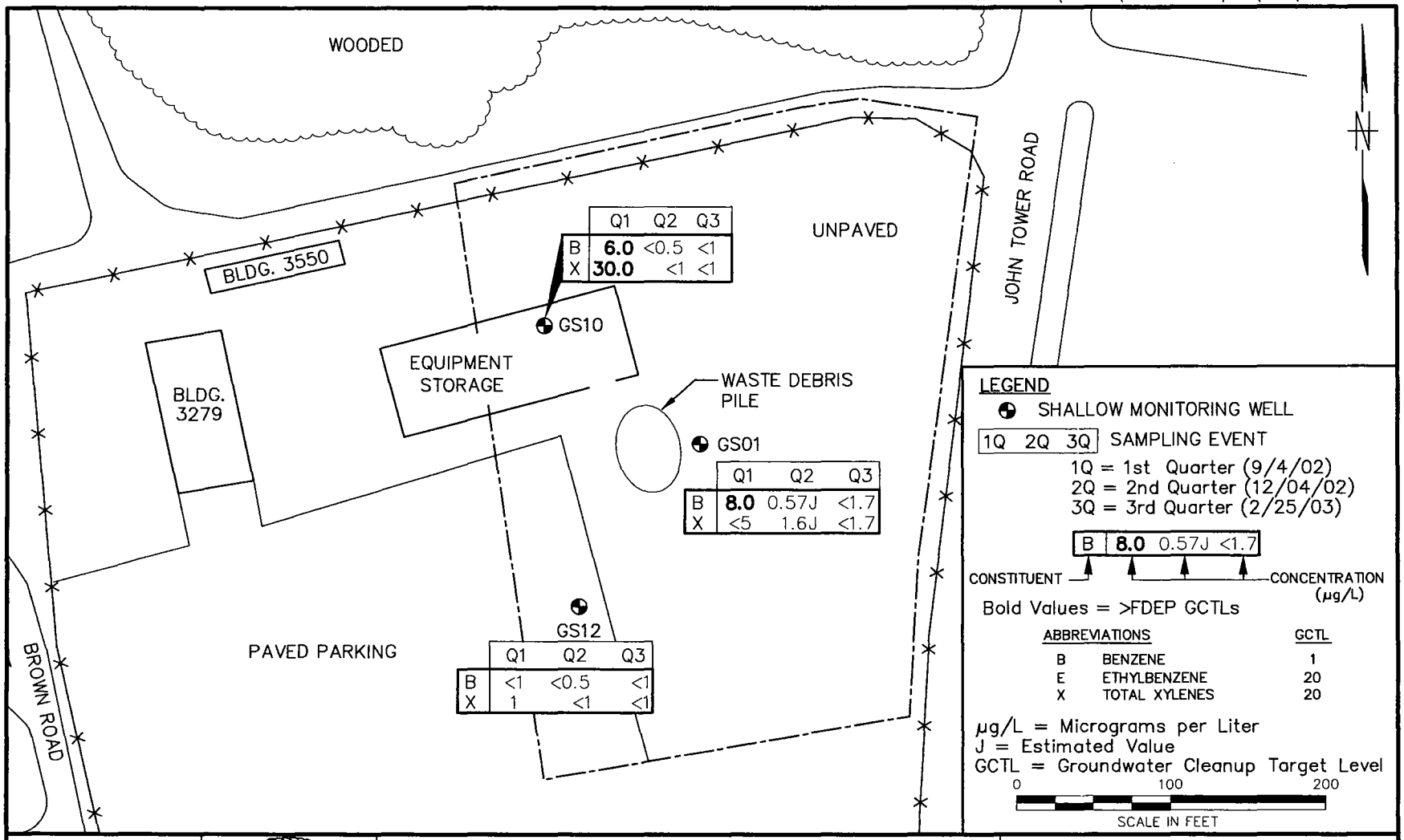

DRAWN BY LLK DATE 10/22/03	GROUNDWATER ANALYTICAL RESULTS, THIRD QUARTER UST SITE 26 FINAL TREATABILITY STUDY REPORT NAS PENSACOLA PENSACOLA, FLORIDA	CONTRACT NO. 4225	
CHECKED BY DATE		APPROVED BY DATE	
COST/SCHED-AREA		APPROVED BY DATE	
SCALE AS NOTED		DRAWING NO. FIGURE 3-8	REV. 0

laboratory detection limit and the ethylbenzene concentration (0.7 µg/L, estimated) was less than the GCTL. Toluene was detected in the sample collected from monitoring well GS01 (0.2 µg/L, estimated) at a concentration less than the GCTL of 40 µg/L. Toluene had not previously been reported in the quarterly groundwater samples from this well. Tert-butylbenzene was detected in the groundwater sample from monitoring well GS01 at a concentration of 7.5 µg/L, which was a decrease from the previous sampling event. Analyte concentrations in the groundwater sample from wells GS10 and GS12 were less than standard laboratory detection limits. The selected results from the fourth quarter sampling event are shown on Figure 3-9.

COC concentrations in the groundwater samples collected from all three monitoring wells during the fifth quarter were less than standard laboratory detection limits. The monitoring well locations and selected analytical results from each of the quarterly sampling events are depicted on Figure 3-10.

3.3 EVIDENCE FOR BIODEGRADATION

The field and laboratory analytical results for MNA parameters are summarized in Table 3-3. A summary of the results for each MNA parameter is provided below.

DO acts as a primary substrate or co-substrate during the initial stages of aerobic metabolism and is the single most efficient electron acceptor responsible for the biodegradation of natural or anthropogenic organic carbon. Therefore, a decrease in DO could indicate that microbes are using oxygen in the biodegradation process to remediate the site. The DO levels in the source well have gradually increased since the baseline event, but are still less than 1 mg/L. This would be expected with the injected ORC® slowly releasing oxygen into the subsurface groundwater. In the perimeter wells, the concentrations of DO were substantially higher than the DO in the source well and have fluctuated during the treatability study.

Fe^{2+} is the soluble end product of the reduction of ferric iron (Fe^{3+}). The presence of Fe^{2+} may indicate that anaerobic conditions exist. Microorganisms will use iron species as an electron acceptor under anaerobic conditions once DO and nitrate containing compounds have been depleted. In source well GS01, the concentration of Fe^{2+} has decreased since the baseline monitoring event, but still remains above 1 mg/L which suggests that iron reduction reactions have been occurring and that Fe^{3+} is being depleted. Fe^{2+} was detected at 2 mg/L in perimeter well GS10 during the fourth quarter, however, Fe^{2+} levels in both in perimeter monitoring wells are very low and indicate that aerobic conditions are present outside of the source area.

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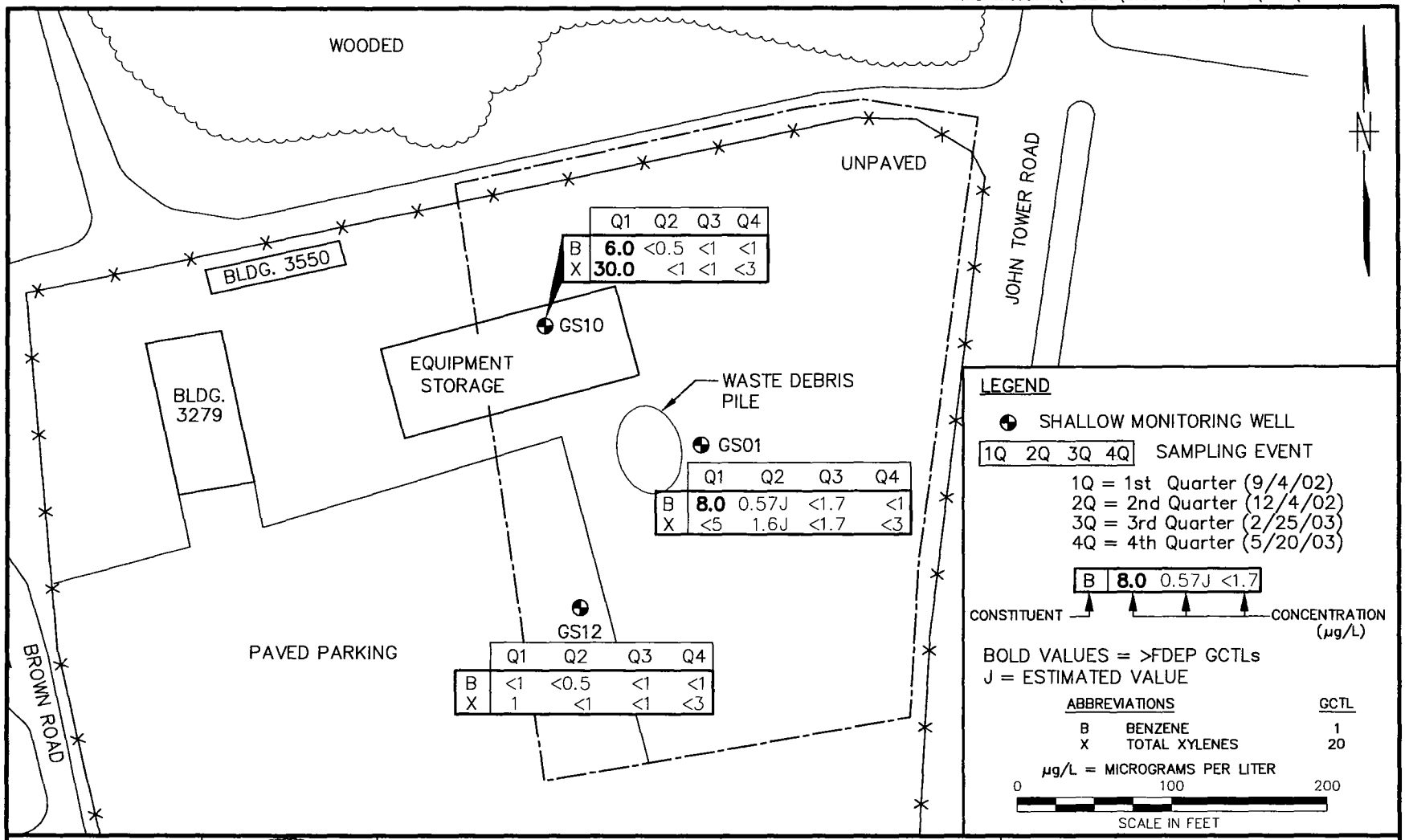
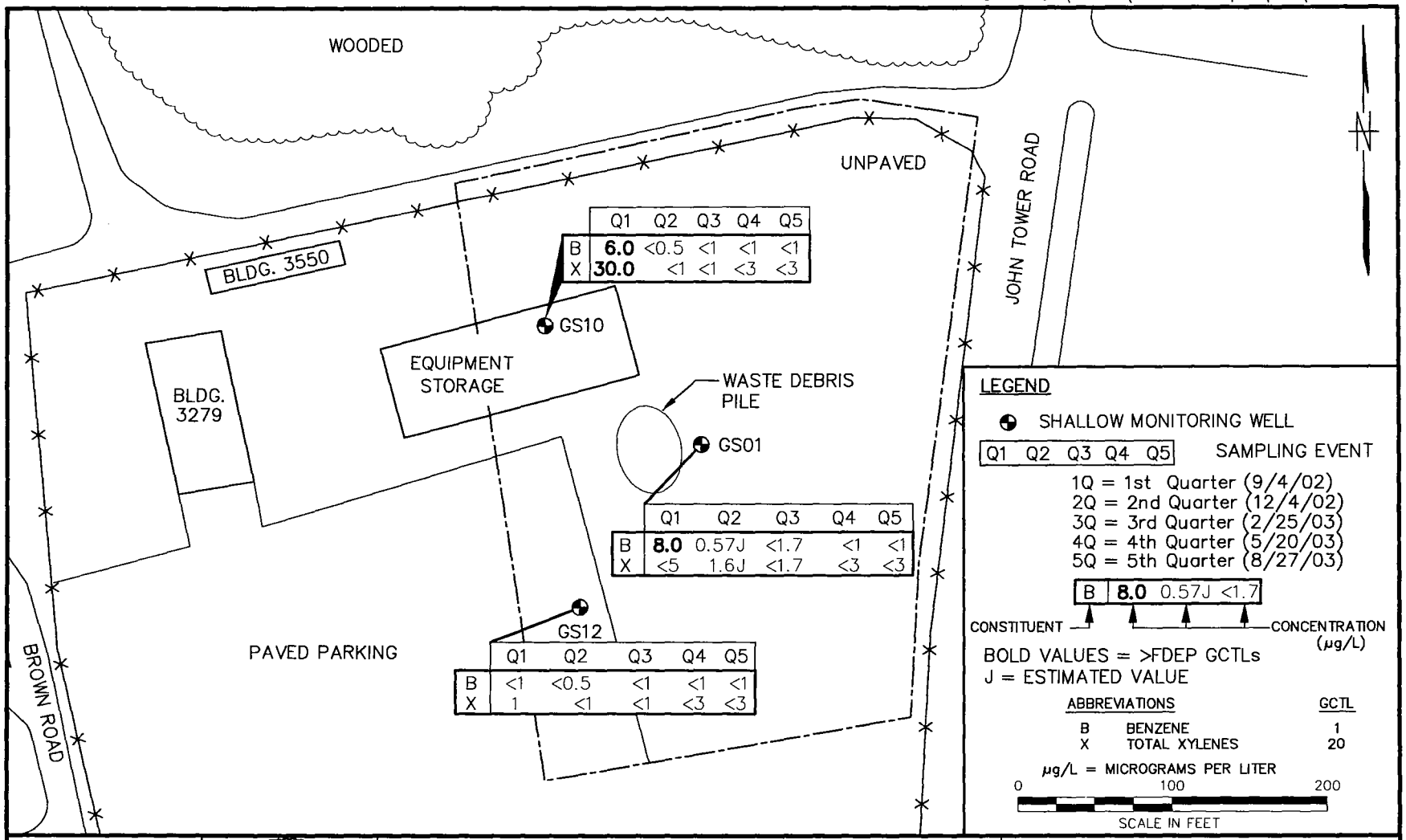


DRAWN BY	DATE	CONTRACT NO.
LLK	10/22/03	4225
CHECKED BY	DATE	APPROVED BY / DATE
COST/SCHED-AREA		APPROVED BY / DATE
SCALE: AS NOTED		DRAWING NO. FIGURE 3-9 / REV. 0

GROUNDWATER ANALYTICAL RESULTS, FOURTH QUARTER
UST SITE 26
FINAL TREATABILITY STUDY REPORT
NAS PENSACOLA
PENSACOLA, FLORIDA

NASPensacola\CTO241\2003AnnualReport\CAD\4225GAD803



	Q1	Q2	Q3	Q4	Q5
B	**6.0**	<0.5	<1	<1	<1
X	**30.0**	<1	<1	<3	<3

	Q1	Q2	Q3	Q4	Q5
B	**8.0**	0.57J	<1.7	<1	<1
X	<5	1.6J	<1.7	<3	<3

	Q1	Q2	Q3	Q4	Q5
B	<1	<0.5	<1	<1	<1
X	1	<1	<1	<3	<3

DRAWN BY LLK	DATE 10/22/03	GROUNDWATER ANALYTICAL RESULTS, FIFTH QUARTER UST SITE 26 FINAL TREATABILITY STUDY REPORT NAS PENSACOLA PENSACOLA, FLORIDA	CONTRACT NO. 4225
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHED-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 3-10 REV. 0

Sulfate can be used as an electron acceptor and is reduced to sulfide containing compounds (H_2S). Sulfate concentrations in the source well GS01 typically have been two to three orders of magnitude less than the sulfate concentrations in the perimeter wells. Sulfate concentrations in the perimeter wells have been predominantly greater than 20,000 µg/L. This distribution of sulfate concentration suggests that sulfate reduction reactions have been occurring in the source area. The high
sulfate levels in both perimeter monitoring wells indicates that aerobic conditions are present outside of the source area.

H_2S is one of the end products of the sulfate reduction reaction. In source well GSO1, the H_2S concentration has increased during the treatability study, more than doubling from 2 mg/L to more than 5 mg/L. H_2S has not been detected in the perimeter wells during the treatability study. The increase in H_2S in the source area well and the absence in the perimeter wells suggests that reducing conditions have been occurring in the source area and that aerobic conditions are present outside of the source area.

The ORP of groundwater is indicative of the redox state that may be occurring based on the relative tendency of the groundwater to accept or transfer electrons. ORP values in the source well GS01 were generally negative and ranged from -202.8 to 76.3 mV. ORP values in the perimeter wells were generally positive ranging from 52.1 to 229.2 mV, except for the third quarter sampling event, when ORP values from both perimeter wells were negative. The ORP values in the source area indicate reducing conditions in this area, possibly resulting from biodegradation.

The presence of carbon dioxide in groundwater in excess of background levels may indicate that biodegradation is occurring. Carbon dioxide is the daughter product of aerobic and anaerobic biological reactions. The carbon dioxide concentration in source well GS01 has consistently been higher in perimeter wells GS10 and GS12, which may indicate higher rates of biological activity in the source area.

Alkalinity is a measure of the buffering capacity that a particular groundwater aquifer exhibits. Areas with fuel hydrocarbons generally exhibit alkalinity concentrations that are higher than background levels. The alkalinity levels in source well GS01 (200 -450 mg/L) have consistently been an order of magnitude greater than the alkalinity levels in the perimeter wells GS10 (33-80 mg/L) and GS12 (13-40 mg/L). The elevated alkalinity levels in the source area suggest that biodegradation is occurring in this area.

Microbial activity and presence can be affected by the pH of groundwater. Petroleum metabolizing microorganisms generally prefer pH values between 6 and 8 standard units. Reported pH values from all three monitoring wells were generally within the preferred pH range. The groundwater pH in perimeter

well GS12 was less than the preferred range at a pH of 4.9 standard units during the fourth quarter monitoring event.

The rate of hydrocarbon degradation roughly doubles for every 10°C increase between 5°C and 25°C. The temperature of the groundwater in the three on-site wells decreased from the baseline event to the third quarter event, but temperatures increased during the fourth and fifth quarter events. This is attributed to seasonal temperature variation. Temperatures ranged from 19.97°C to 31.39°C during all events, which is close to or within the optimal range for biodegradation to occur.

4.0 CONCLUSIONS AND RECOMMENDATIONS

This report concludes the treatability study for UST Site 26. The data collected during this treatability study indicate that the ORC® injection has been effective in remediating the petroleum constituents previously reported in the groundwater. The primary line of evidence for this conclusion, a reduction in the COC concentrations in groundwater, was evident shortly after the injection of ORC®. The COC concentrations in the first post injection monitoring event were less than the GCTLs and remained that way through the end of the study. The secondary line of evidence, the MNA parameter information, suggests that the ORC® injection has increased the DO available in the subsurface, enhancing microbiological activity resulting in increased concentrations of the biodegradation end products (e.g., H_2S and carbon dioxide). Therefore, it appears that enhanced biodegradation is an applicable technology for treating the petroleum compounds at this site.

The objective of the treatability study was to evaluate the effectiveness of ORC® injection as a remedial technology for petroleum constituents in groundwater at UST Site 26. During the course of the post remedial action (ORC® injection) groundwater monitoring, the detected COC concentrations were less than GCTLs for all four quarterly sampling events. This complies with the requirements of 62-770, FAC for post remedial action monitoring. Because concentrations of COCs have been less than FDEP GCTLs for four consecutive quarterly sampling events, a rebound to elevated COC concentrations is unlikely to occur. Therefore, rehabilitation of this site should be considered complete and No Further Action (NFA) should be required.

REFERENCES

Ensafe, 1998. Site Assessment Report, UST 26 – Refueler Repair Shop, Naval Air Station Pensacola, Pensacola, Florida, October.

TtNUS (Tetra Tech NUS, Inc.), 2001, Initial Semi-annual Groundwater Monitoring for Natural Attenuation Letter Report: UST 26 – Refueler Repair Shop, Naval Air Station Pensacola, Pensacola, Florida, October.

TtNUS, 2002a, Enhanced Natural Attenuation Treatability Study Work Plan for UST Site 26, Naval Air Station Pensacola, Pensacola, Florida, July.

TtNUS, 2002b, First Quarter Groundwater Monitoring Letter Report: Underground Storage Tank (UST) Site 26, Naval Air Station Pensacola, Pensacola, Florida, November.

TtNUS, 2003a, Second Quarter Groundwater Monitoring Letter Report: Underground Storage Tank (UST) Site 26, Naval Air Station Pensacola, Pensacola, Florida, February.

TtNUS, 2003b, Third Quarter Groundwater Monitoring Letter Report: Underground Storage Tank (UST) Site 26, Naval Air Station Pensacola, Pensacola, Florida, April.

TtNUS, 2003c, Fourth Quarter Groundwater Monitoring Letter Report: Underground Storage Tank (UST) Site 26, Naval Air Station Pensacola, Pensacola, Florida, July.

APPENDIX A

FIELD DATA FORMS

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: UST Site 26 Quarter 3 Sampling
Project No.: N4225
Location: NAS Pensacola
Personnel: L.Middleton, M.Ferguson
Weather Conditions:
Measuring Device: Heron
Tidally Influenced: Yes ____ No ____
Remarks:

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
GS01	~~0732~~ 5/20/09	0732	31.12	19.40	10.44	SHEEN	20.68	PID 0/0
GS10	~~0730~~ 5/20/09	0730	31.60	19.41	11.35	—	20.25	0/0
GS12	~~0735~~ 5/20/09	0735	31.42	19.80	11.06	—	20.36	0/0

* All measurements to the nearest 0.01 foot

Page ____ of ____

EQUIPMENT CALIBRATION LOG

INSTRUMENT NAME/MODEL : _____ PROJECT NAME : NAS Pensacola UST Site 26 QA

MANUFACTURER : _____ PROJECT NUMBER : N4225

CALIBRATION DATE	INSTRUMENT/ SERIAL #	INITIAL SETTINGS	STANDARDS USED	PROCEDURE	ADJUSTMENTS MADE	FINAL SETTINGS	SIGNATURE	COMMENTS
5/20/03	02A0704	1.412	COND mmhos	CAL		1.414	RCM	LOT 2815
		7.04	7.0 pH	CAL		7.0	RCM	
		3.95	4.0 pH	CAL		4.0	RCM	
	PID	82.1	Isobutylene	CAL		100	RCM	
	MINERAE							

SI ODR 5%

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NAS Pensacola UST Site 26
Project No.: N4225

[ ] Domestic Well Data
[X] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: NASP26GS0108 4
Sample Location: NASP-26-GS01
Sampled By: DS / CM
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 5. [redacted] 3	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/L	Temp. °C	ORP mV	Other
Time: [redacted]								
Method: Low Flo[redacted] Peristaltic	[redacted]	6.58	0.582	2.4	[redacted]	[redacted]	[redacted]	

PURGE DATA

Date: 5 - 2[redacted]3	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm): [redacted]								
Well Casing Diameter: [redacted]2.5								
Well Casing Mater[redacted] PVC								
Total Well Depth (TD): [redacted]9.40			[redacted]	[redacted]	[redacted]			
Static Water Level (W[redacted]): 10.44								
One Casing Volume ([redacted]L):								
Start Purge (hrs): [redacted]								
End Purge (hrs): [redacted]0 20								
Total Purge Time (min): 25								
Total Vol. Purged (gal/L): 7.5								

SAMPLE PREPARATION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC	HCl	3 - 40mL vials	
TOC	H2SO4	1 - 250 mL HDPE bottle	
Sulfate	None	1 - 250 mL HDPE bottle	

OBSERVATIONS / NOTES

[redacted] on H2O in [redacted]
[redacted] HUT

Circle if Applicable:
MS/MSD
Duplicate ID No.:

Signature(s): [redacted]

CANT take HNO levels, micro well

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAS Pensacola UST Site 26
PROJECT NUMBER: N4225

WELL ID.: NASP-26-GS01
DATE: 5-20-03

Time	Water Level	Flow	Volume	pH	Cond.	Turb.	DO	Temp.	ORP	Comments
0855	10.44	300	–							
0905		300	3	6.77	0.583	3.2	7.94	23.37	-7.2	
0910		300	4.5	6.64	0.582	2.8	6.24	23.98	-75.7	
0915		300	6	6.57	0.581	2.5	0.85	23.91	-79.6	
0920		300	7.5	6.58	0.582	2.4	0.81	23.90	-80.2	
0925	SAMPLE									

SIGNATURE(S): [illegible]

PAGE 2 OF 2

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NAS Pensacola UST Site 26	Sample ID No.:	NASP26GS01~~0~~4
Project No.:	N4225	Sample Location:	NASP-26-GS01
Sampled By:	LM/DS	Duplicate:	☐
Field Analyst:	LM/DS	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):			

SAMPLING DATA

	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV
Date: 5/20/03							
Time: 0925							
Method: Peristaltic	CLEAR	6.58	0.582	2.4	0.81	23.90	-80.2

SAMPLE COLLECTION/ANALYSIS INFORMATION

Ferrous Iron:

Equipment: HACH IR-18C Test Kit

Concentration: 2.2 mg/L

Notes: TIME: 0927

Hydrogen Sulfide (H_2S):

Equipment HS-C & CHEMetrics K-9510

Analysis Time: 0930

HS_C	CHEMetrics
5 mg/L	4 mg/L

Concentration:

Notes:

Alkalinity:

Equipment:

CHEMetrics (Range: ~~0-500~~ mg/L)

Analysis Time: 0932

Filtered: ☐

CHEMetrics: 200 mg/L

Notes:

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT

CHEMetrics (Range: ~~10-100~~ mg/L)

Analysis Time: 0921

CHEMetrics: 50 mg/L

Notes:

Dissolved Oxygen:

Equipment:

CHEMetrics Range ☒ 0 - 1.0 mg/L ☐ 1 - 12 mg/L

Analysis Time: 0920

CHEMetrics: 0.3 mg/L

QA/QC Checklist:

All data fields have been completed as necessary: ☒
Correct measurement units are cited in the SAMPLING DATA block: ☒
Mulitplication is correct for each *Multiplier* table: ☒
Final calulated concentration is within the appropriate *Range Used* block: ☒
Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☒
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☒
Nitrite interference treatment used for Nitrate test if Nitrite was detected: ☒
Title block is initialized by person who performed the QA/QC checklist: ☒

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NAS Pensacola UST Site 26
Project No.: N4225

[ ] Domestic Well Data
[X] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: NASP26GS100
Sample Location: NASP-26-GS10
Sampled By: PJ
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 5-20-03 Time: 1015	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Method: Low Flow Peristaltic	cc	6.42	1150	8.3	7.30	22.57	52.1	

PURGE DATA

Date: 5-20-03	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 0								
Well Casing Diameter: .75								
Well Casing Material: PVC								
Total Well Depth (TD): 19.41			See	DATA	Sheet			
Static Water Level (WL): 16.67								
One Casing Volume(gal/L):								
Start Purge (hrs) 0845								
End Purge (hrs): 1010								
Total Purge Time (min): 25								
Total Vol. Purged (gal/L): 7.5								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC	HCl	3 - 40mL vials	PJ
TOC	H2SO4	1 - 250 mL HDPE bottle	PJ
Sulfate	None	1 - 250 mL HDPE bottle	PJ

OBSERVATIONS / NOTES

Circle if Applicable:
MS/MSD
Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAS Pensacola UST Site 26
PROJECT NUMBER: N4225

WELL ID.: NASP-26-GS10
DATE: 5-20-03

Time	Water Level	Flow	Volume	pH	Cond.	Turb.	DO	Temp.	ORP	Comments
0945 ~~1045~~ WS	11.43	300								
0950 ~~1050~~ WS		300	3	6.27	.277	18.1	2.04	22.8	45.5	
0955 ~~1055~~ WS		300	4.5	6.24	.274	9.2	1.34	22.71	50.8	Dup H2O
1000		300	6	6.32	.149	11.2	7.45	22.53	50.8	
1005		300	7.5	6.31	.151	9.2	7.40	22.50	54.1	
1010		300	9	6.42	.150	8.3	7.30	22.51	52.9	
1015	Sample									

SIGNATURE(S):

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NAS Pensacola UST Site 26	Sample ID No.:	NASP26GS100~~9~~
Project No.:	N4225	Sample Location:	NASP-26-GS10
Sampled By:	LM/DS	Duplicate:	☐
Field Analyst:	LM/DS	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):			

SAMPLING DATA

Date: 5/20/03 Time: 1015	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	
Method: Peristaltic	CLEAR	6.42	.150	8.3	7.30	22.51	52.1	

SAMPLE COLLECTION/ANALYSIS INFORMATION

Ferrous Iron:

Equipment: HACH IR-18C Test Kit

Concentration: 2.0 mg/L

Notes: TIME: 1021

Hydrogen Sulfide (H_2S):

Equipment HS-C & CHEMetrics K-9510

Analysis Time: 1020

HS_C	CHEMetrics
0 mg/L	0 mg/L

Concentration:

Notes:

Alkalinity:

Equipment: — CHEMetrics (Range: 50-300 mg/L)

Analysis Time: 1011

Filtered: ☐

CHEMetrics: 80 mg/L

Notes:

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT CHEMetrics (Range: 10-100 mg/L)

Analysis Time: 1013

CHEMetrics: 40 mg/L

Notes:

Dissolved Oxygen:

Equipment: CHEMetrics Range ☒ 0 - 1.0 mg/L ☐ 1 - 12 mg/L

Analysis Time: 1015

CHEMetrics: 0.2 mg/L

QA/QC Checklist:

All data fields have been completed as necessary: ☒
Correct measurement units are cited in the SAMPLING DATA block: ☒
Mulitplication is correct for each *Multiplier* table: ☒
Final calulated concentration is within the appropriate *Range Used* block: ☒
Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☒
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☒
Nitrite Interference treatment used for Nitrate test if Nitrite was detected: ☒
Title block is initialized by person who performed the QA/QC Checklist: ☒

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NAS Pensacola UST Site 26
Project No.: N4225

[ ] Domestic Well Data
[X] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: NASP26GS1204
Sample Location: NASP-26-GS12
Sampled By: LM/DS
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 5/20/03 Time: 0825	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Method: Low Flow Peristaltic	CLEAR	7.90	0.255	0.32	1.90	23.24	148.0	

PURGE DATA

Date: 5/20/03	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 0/0								
Well Casing Diameter: 1.25"								
Well Casing Material: PVC								
Total Well Depth (TD): 19.80								
Static Water Level (WL): 4.06								
One Casing Volume(gal/L): 2.4								
Start Purge (hrs): 0750								
End Purge (hrs): 0820								
Total Purge Time (min): 30								
Total Vol. Purged (gal/L): 9								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC	HCl	3 - 40mL vials	✓
TOC	H2SO4	1 - 250 mL HDPE bottle	✓
Sulfate	None	1 - 250 mL HDPE bottle	✓

OBSERVATIONS / NOTES

Circle if Applicable:
MS/MSD
Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAS Pensacola UST Site 26
PROJECT NUMBER: N4225

WELL ID.: NASP-26-GS12
DATE: 5/20/03

Time	Water Level	Flow	Volume	pH	Cond.	Turb.	DO	Temp.	ORP	Comments
0750	11.06	300	—	—	—	—	—	—	—	
0755		300	1.5	5.78	0.208	0.92	7.49	23.22	183.3	CLEAR
0800		300	3	5.36	0.255		2.14	23.24	206.5	
0805		300	4.5	5.00	0.255	0.67	1.82	23.24	222.3	
0810		300	6.0	4.85	0.255		1.83	23.26	227.1	
0815		300	7.5	4.90	0.255	0.32	1.90	23.24	178.0	
END PURGE										

SIGNATURE(S): [signature]

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NAS Pensacola UST Site 26	Sample ID No.:	NASP26GS1201
Project No.:	N4225	Sample Location:	NASP-26-GS12
Sampled By:	LM/DS	Duplicate:	☐
Field Analyst:	LM/DS	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):			

SAMPLING DATA

	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	
Date: 5/20/03 Time: 0825								
Method: Peristaltic	CLEAR	4.90	0.255	0.32	1.90	23.24	198.0	

SAMPLE COLLECTION/ANALYSIS INFORMATION

Ferrous Iron:

Equipment: HACH IR-18C Test Kit

Concentration: 0 0840 mg/L

Notes: TIME: 0840

Hydrogen Sulfide (H_2S):

Equipment HS-C & CHEMetrics K-9510

Analysis Time: 0836

HS_C	CHEMetrics
0	0

Concentration: 0 mg/L (HS_C) 0 mg/L (CHEMetrics)

Notes:

Alkalinity:

Analysis Time: 0827

Equipment: CHEMetrics (Range: 10-100 mg/L) Filtered: ☐

CHEMetrics: 25 mg/L

Notes:

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT CHEMetrics (Range: 10-100 mg/L) Analysis Time: 0830

CHEMetrics: 45 mg/L

Notes:

Dissolved Oxygen:

Equipment: CHEMetrics Range ☐ 0 - 1.0 mg/L ☒ 1 - 12 mg/L Analysis Time: 0832

CHEMetrics: 3 mg/L

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☒
Correct measurement units are cited in the SAMPLING DATA block: ☒
Mulitplication is correct for each *Multiplier* table: ☒
Final calulated concentration is within the appropriate *Range Used* block: ☒
Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☒
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☒
Nitrite Interference treatment used for Nitrate test if Nitrite was detected: ☒
Title block is initialized by person who performed the QA/QC checklist: ☒

EQUIPMENT CALIBRATION LOG

INSTRUMENT NAME/MODEL : - YSI water Quality Meter 556
- Mini RAE 2000 PID

PROJECT NAME : NAS Pensacola UST Site 26 TS

MANUFACTURER :

PROJECT NUMBER : N4225

CALIBRATION DATE	INSTRUMENT/ SERIAL #	INITIAL SETTINGS	STANDARDS USED	PROCEDURE	ADJUSTMENTS MADE	FINAL SETTINGS	SIGNATURE	COMMENTS
9/4/02	YSI 02A0253	3.94	pH=4.0	CAL	—	4.00	RLM	
	YSI 00234	3.97	pH=4.0	CAL	—	4.00	RLM	
	PID	76.2	100PPM Iso Buty	CAL	—	100	RLM	
9/5/02	PID	88.7	100PPM Iso Buty	CAL	—	99.9	RLM	
9/6/02	PID	169	100PPM Iso Buty	CAL	—	100	RLM	
9/9/02	PID	110	100PPM Iso	CAL	—	100	RLM	
9/10/02	PID	102	100PPM Iso	CAL	—	100	RLM	
9/11/02	PID	92.4	100PPM Iso	CAL	—	100	RLM	
9/12/02	PID	99.4	100PPM Iso	CAL	—	100	RLM	

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: UST Site 26 Treatability Study **Project No.:** N4225

Location: NAS Pensacola **Personnel:** J.E., L.A., M.F.

Weather Conditions: Sunny 80° **Measuring Device:** Heron Dipper T

Tidally Influenced: Yes ___ No ___ **Remarks:**

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
GS01	9/4/02	1467		19.5	12.71			
GS10	9/4/02	1405			13.32			
GS12	9/4/02	1409		19.6	12.85			

* All measurements to the nearest 0.01 foot

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NAS Pensacola UST Site 26
Project No.: N4225

[ ] Domestic Well Data
[X] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: NASP26GS0102
Sample Location: NASP-26-GS01
Sampled By: MF/JF
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 9-4-02	Color	pH	S.C.	Turbidity	DO	Temp.	ORP	Other
Time: ~~1485~~ 1500	Visual	Standard	mS/cm	NTU	mg/l	°C	mV	
Method: Low Flow Peristaltic	Grey	6.51	0.625	Grey	0.03	25.70	-113.6	

PURGE DATA

Date: 9-4-02	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 0								
Well Casing Diameter: 1in								
Well Casing Material: PVC								
Total Well Depth (TD): 19.9								
Static Water Level (WL): 12.71								
One Casing Volume(gal/L): 3.0								
Start Purge (hrs): 1435								
End Purge (hrs): 1500								
Total Purge Time (min): 25								
Total Vol. Purged (gal/L): 10.0								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC	HCl	3 - 40mL vials	X
TOC	H2SO4	1 - 250 mL HDPE bottle	X
Sulfate	None	1 - 250 mL HDPE bottle	X

OBSERVATIONS / NOTES

Circle if Applicable:
MS/MSD
Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAS Pensacola UST Site 26
PROJECT NUMBER: N4225

WELL ID.: NASP-26-GS01
DATE: 9-4-02

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	Volume (L)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments
1435	12.71	500	—	—	—	—	—	—	—	
1440	12.71	500	2.5	6.64	0.625	~~clear~~ dark	0.46	26.54	-75.0	
1445	12.71	500	5.0	6.51	0.626	clear	0.08	26.01	-97.4	
1450	12.71	500	7.5	6.51	0.626	clear	0.06	25.89	-106.9	
1455	12.71	500	10.0	6.51	0.625	~~clear~~	0.03	25.70	-113.6	
1500	Sampling	500	12.5	—	—	clear	—	—	—	
1505		500	15.0							
1510		500	17.5							
1515										

SIGNATURE(S): [signature]

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NAS Pensacola UST Site 26	Sample ID No.:	NASP26GS0102
Project No.:	N4225	Sample Location:	NASP-26-GS01
Sampled By:	MF	Duplicate:	☐
Field Analyst:	CM	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):			

SAMPLING DATA:

Date: 9-4-02	Color	ORP (Eh)	S.C.	Temp.	Turbidity	DO	~~Sal.~~	pH
Time: 1500	(Visual)	(+/- mv)	(mS/cm)	(°C)	(NTU)	(Meter, mg/l)	~~(%)~~	(SU)
Method: Peristaltic	Gray	-113.6	0.625	25.7	gray	0.03		6.51

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Ferrous Iron: ~~1630~~ 1530

Equipment: HACH IR-18C Test Kit

Concentration: 4.4 mg/L

Notes:

Alkalinity: Analysis Time: ~~1628~~

Equipment: CHEMetrics (Range: 100-1000 mg/L) Filtered: ☐ 1528

CHEMetrics: 300 mg/L

Notes:

Standard Additions: ☐ Titrant Molarity:____ Digits Required: 1st.:____ 2nd.:____ 3rd.:____

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT CHEMetrics (Range: 10-100 mg/L) Analysis Time: ~~1620~~ 1520

CHEMetrics: 60 mg/L

Notes:

Standard Additions: ☐ Titrant Molarity:____ Digits Required: 1st.:____ 2nd.:____ 3rd.:____

Dissolved Oxygen:

Equipment: CHEMetrics Range ☐ 0 - 1.0 mg/L ☐ 1 - 12 mg/L Analysis Time: ~~1623~~ 1523

CHEMetrics: 0.03 mg/L

Notes: ☐ YSI METER

QA/QC Checklist: RLM

All data fields have been completed as necessary: ☒
Correct measurement units are cited in the SAMPLING DATA block: ☒
Mulitplication is correct for each *Multiplier* table: ☒
Final calulated concentration is within the appropriate *Range Used* block: ☒
Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☒
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☒
Nitrite Interference treatment used for Nitrate test if Nitrite was detected: ☒
Title block is initialized by person who performed the QA/QC Ckecklist: ☒

H_2S 2.0 mg/L (HSC)

Analysis Time = ~~1625~~ 1525

Tetra Tech NUS, Inc. **GROUNDWATER SAMPLE LOG SHEET**

Project Site Name:	NAS Pensacola UST Site 26	Sample ID No.:	NASP26GS1002
Project No.:	N4225	Sample Location:	NASP-26-GS10
		Sampled By:	LM/CM
[ ] Domestic Well Data		C.O.C. No.:	
[X] Monitoring Well Data		Type of Sample:	
[ ] Other Well Type:		[X] Low Concentration	
[ ] QA Sample Type:		[ ] High Concentration	

SAMPLING DATA

Date: 9/4/12	Color	pH	S.C.	Turbidity	DO	Temp.	ORP	Other
Time: 1500	Visual	Standard	µS/cm	NTU	mg/l	°C	mV	
Method: Low Flow Peristaltic	Light Brown Liquid	5.63	1	CLEAR	7.27	31.39	264.9	

PURGE DATA

Date: 9/4/12	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 0								
Well Casing Diameter: 1"								
Well Casing Material: PVC								
Total Well Depth (TD): 19.5								
Static Water Level (WL): 13.32								
One Casing Volume(gal): 1.9								
Start Purge (hrs): 1425								
End Purge (hrs): 1450								
Total Purge Time (min): 25								
Total Vol. Purged (gal/L): 10.5								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC	HCl	3 - 40mL vials	X
TOC	H2SO4	1 - 250 mL HDPE bottle	X
Sulfate	None	1 - 250 mL HDPE bottle	X

OBSERVATIONS / NOTES

Circle if Applicable:		Signature(s):
MS/MSD	Duplicate ID No.:	

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAS Pensacola UST Site 26
PROJECT NUMBER: N4225

WELL ID.: NASP-26-GS10
DATE: 9/4/12

Cum. Vol	Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	Volume (L)	pH (S.U.)	Cond. (µS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments
0	1425	13.32		—	—	—	—	—	—	—	
3	1435	13.34	300	3	5.31	1	LtBROWN	7.82	28.85	196.2	LtBROWN
5.5	1440	13.34	300	5.5	5.38	1	CLEAR	7.70	30.08	203.0	CLEAR
8	1445	13.34	500	8	5.60	0	CLEAR	7.34	31.22	204.1	
10.5	1450	13.34	500	10.5	5.63	1	CLEAR	7.27	31.39	209.9	
											End Purge
	Sample Time = 1500										

SIGNATURE(S):

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NAS Pensacola UST Site 26	Sample ID No.:	NASP26GS1002
Project No.:	N4225	Sample Location:	NASP-26-GS10
Sampled By:	LM	Duplicate:	☐
Field Analyst:	CM	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):			

SAMPLING DATA:

		Color (Visual)	ORP (Eh) (+/- mv)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (Meter) mg/l)	~~Sal.~~ (%)	pH (SU)
Date: 9/4/12									
Time: 1500									
Method:	Peristaltic	light brown clear	+204.9	1	31.39	—	7.27		5.63

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Ferrous Iron: TIME: 1506

Equipment: HACH IR-18C Test Kit

Concentration: 0 mg/L

Notes:

Alkalinity: Analysis Time: 1501

Equipment: CHEMetrics (Range: 10-100 mg/L) Filtered: ☐

CHEMetrics: 35 mg/L

Notes:

Standard Additions: ☐ Titrant Molarity: Digits Required: 1st.: 2nd.: 3rd.:

Carbon Dioxide:

Equipment: ~~HACH Digital Titrator CA-DT~~ CHEMetrics (Range: 10-100 mg/L) Analysis Time: 1504

CHEMetrics: 25 mg/L

Notes:

Standard Additions: ☐ Titrant Molarity: Digits Required: 1st.: 2nd.: 3rd.:

Dissolved Oxygen:

Equipment: CHEMetrics Range ☐ 0 - 1.0 mg/L ☐ 1 - 12 mg/L Analysis Time:

CHEMetrics: ~~25~~ 7.27 mg/L

Notes: YSI METER

QA/QC Checklist:

All data fields have been completed as necessary: ☒
Correct measurement units are cited in the SAMPLING DATA block: ☒
Mulitplication is correct for each *Multiplier* table: ☒
Final calulated concentration is within the appropriate *Range Used* block: ☒
Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☒
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☒
Nitrite interference treatment used for Nitrate test if Nitrite was detected: ☒
Title block is initialized by person who performed the QA/QC Checklist: ☒

H_2S (HSC) TIME 1508

CONCENTRATION 0 mg/L

Tetra Tech NUS, Inc. **GROUNDWATER SAMPLE LOG SHEET**

Project Site Name:	NAS Pensacola UST Site 26	Sample ID No.:	NASP26GS1202
Project No.:	N4225	Sample Location:	NASP-26-GS12
		Sampled By:	MFCM
[ ] Domestic Well Data		C.O.C. No.:	
[X] Monitoring Well Data		Type of Sample:	
[ ] Other Well Type:		[X] Low Concentration	
[ ] QA Sample Type:		[ ] High Concentration	

SAMPLING DATA

Date: 9/4/02	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Time: 1555								
Method: Low Flow Peristaltic	clear	5.20	0.289	clear	2.52	26.70	229.2	

PURGE DATA

Date: 9/4/02	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 0								
Well Casing Diameter: 1"								
Well Casing Material: PVC								
Total Well Depth (TD): 19.6								
Static Water Level (WL): 12.9								
One Casing Volume(gal/L): 1.7								
Start Purge (hrs): 1525								
End Purge (hrs): 1550								
Total Purge Time (min): 25								
Total Vol. Purged (gal/L): 1.5								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC	HCl	3 - 40mL vials	X
TOC	H2SO4	1 - 250 mL HDPE bottle	X
Sulfate	None	1 - 250 mL HDPE bottle	X

OBSERVATIONS / NOTES

Circle if Applicable:		Signature(s):
MS/MSD	Duplicate ID No.:	

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAS Pensacola UST Site 26
PROJECT NUMBER: N4225

WELL ID.: NASP-26-GS12
DATE: 9/4/02

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	Volume (L)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments
1525	12.90	500	—	—	—	—	—	—	—	
1530	12.90	500	2.5	6.0	0.368	lt. brown	2.16	26.93	200.7	
1535	12.90	500	5.0	4.85	0.333	clear	23.8	26.8	230	DO = 1.89
1540	12.90	500	7.5	4.87	0.306	clear	1.89	26.69	230.5	
1545	12.9	500	10.0	5.18	0.292	clear	2.53	26.77	229.1	
1550	12.9	500	12.5	5.20	0.289	clear	2.52	26.70	229.2	
1555	Sampling									

SIGNATURE(S):

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NAS Pensacola UST Site 26	Sample ID No.:	NASP26GS1202
Project No.:	N4225	Sample Location:	NASP-26-GS12
Sampled By:	MF	Duplicate:	☐
Field Analyst:	CM	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):			

SAMPLING DATA:

Date: 9-04-02	Color	ORP (Eh)	S.C.	Temp.	Turbidity	DO	Sal.	pH
Time: 1555	(Visual)	(+/- mv)	(mS/cm)	(°C)	(NTU)	(Meter, mg/l)	(%)	(SU)
Method: Peristaltic	CLEAR	229	20.289	26.7	CLEAR	2.52	/	5.20

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Ferrous Iron:

Equipment: HACH IR-18C Test Kit

1557

Concentration: 0 mg/L

Notes:

Alkalinity: Analysis Time: 1600

Equipment: CHEMetrics (Range: 10-100 mg/L) Filtered: ☐

CHEMetrics: 40 mg/L

Notes:

Standard Additions: ☐ Titrant Molarity:____ Digits Required: 1st.:____ 2nd.:____ 3rd.:____

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT CHEMetrics (Range: 10-100 mg/L) Analysis Time: 1602

CHEMetrics: 25 mg/L

Notes:

Standard Additions: ☐ Titrant Molarity:____ Digits Required: 1st.:____ 2nd.:____ 3rd.:____

Dissolved Oxygen:

Equipment: CHEMetrics Range ☐ ~~0 - 1.0 mg/L~~ ☐ 1 - 12 mg/L Analysis Time: [illegible]

CHEMetrics: 2.52 mg/L

Notes: ☐ YSI METER

QA/QC Checklist: KM

All data fields have been completed as necessary: ☒
Correct measurement units are cited in the SAMPLING DATA block: ☒
Multiplication is correct for each *Multiplier* table: ☒
Final calulated concentration is within the appropriate *Range Used* block: ☒
Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☒
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☒
Nitrite Interference treatment used for Nitrate test if Nitrite was detected: ☒
Title block is initialized by person who performed the QA/QC Checklist: ☒

1604

H_2S — HSC 0 mg/L

EQUIPMENT CALIBRATION LOG

INSTRUMENT NAME/MODEL : _____ PROJECT NAME : NAS Pensacola UST Site 26 Q2

MANUFACTURER : _____ PROJECT NUMBER : N4225

CALIBRATION DATE	INSTRUMENT/ SERIAL #	INITIAL SETTINGS	STANDARDS USED	PROCEDURE	ADJUSTMENTS MADE	FINAL SETTINGS	SIGNATURE	COMMENTS
12/4/02	YSI Model 556 00178	4.09	4.00 pH	CAL	–	4.01	RLM	
	Photovac PID RDFK202	93.2	100 ppm	CAL	–	100	RLM	
12/6/02	YSI Model 556 00178	4.03	4.00 pH	CAL	–	4.00	RLM	
	Photovac PID RDFK202	97.3	100 ppm	CAL	–	100.1	RLM	

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: UST Site 26 Quarter 2 Sampling **Project No.:** N4225
Location: NAS Pensacola **Personnel:** L.Middleton, M.Ferguson
Weather Conditions: **Measuring Device:** Heron
Tidally Influenced: Yes ___ No ___ **Remarks:**

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
GS01	12/4/02	1242		19.55	8.79			
GS10	12/4/02	1240		19.49	9.37			
GS12	12/4/02	1237		19.68	9.10			

* All measurements to the nearest 0.01 foot

Page ____ of ____

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NAS Pensacola UST Site 26
Project No.: N4225

[ ] Domestic Well Data
[X] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: NASP26GS0102
Sample Location: NASP-26-GS01
Sampled By: LM/MF
C.O.C. No.: 0252
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 12/4/02 Time: 1525	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Method: Low Flow Peristaltic	CLEAR	7.59	0.861	2.95	0.20	23.84	76.3	

PURGE DATA

Date: 12/4/02	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 0/0								
Well Casing Diameter: 0.5								
Well Casing Material: PVC								
Total Well Depth (TD): 19.55								
Static Water Level (WL): 8.87								
One Casing Volume(gal/L): 6.2								
Start Purge (hrs): 1500								
End Purge (hrs): 1520								
Total Purge Time (min): 20								
Total Vol. Purged (gal/L): 8								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC	HCl	3 - 40mL vials	X
TOC	H2SO4	1 - 250 mL HDPE bottle	X
Sulfate	None	1 - 250 mL HDPE bottle	X

OBSERVATIONS / NOTES

Circle if Applicable:

MS/MSD	Duplicate ID No.:	Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAS Pensacola UST Site 26
PROJECT NUMBER: N4225

WELL ID.: NASP-26-~~0012~~ GS01
DATE: 12/4/02

	Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	Volume (L)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments
1500	~~1600~~	8.87	400	—	—	—	—	—	—	—	—
1505	~~1605~~	8.87	400	2	7.38	0.874	4.03	0.85	23.74	130.9	CLEAR
1510	~~1610~~	8.87	400	4	7.55	0.870	4.00	0.39	23.87	102.5	
	1515	8.86	400	6	7.61	0.863	2.95	0.25	23.86	85.9	
	1520	8.86	400	8	7.59	0.861		0.20	23.84	76.3	
1525	—	(Sampling)									

SIGNATURE(S): [signature]

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NAS Pensacola UST Site 26
Sample ID No.: NASP26GS01
Project No.: N4225
Sample Location: NASP-26-GS01
Sampled By: LM/MF
Duplicate: ☐
Field Analyst: LM/MF
Blank: ☐
Field Form Checked as per QA/QC Checklist (initials): RLM

SAMPLING DATA:

	Color (Visual)	ORP (Eh) (+/- mv)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (Meter, mg/l)	Sal. (%)	pH (SU)
Date: 12/4/02								
Time: 1525								
Method: Peristaltic	CLEAR	76.3	0.861	23.84	2.95	0.20		7.59

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Ferrous Iron:
Equipment: HACH IR-18C Test Kit
Concentration: 4.60 mg/L
Notes: TIME: 1524

Hydrogen Sulfide (H_2S):
Equipment: HS-C CHEMETRICS K-9510 Analysis Time: 1527
HS-C Concentration: 2 mg/L K-9510 CONC. 0.6 mg/L
Notes:

Alkalinity:
Equipment: CHEMetrics (Range: 50-500 mg/L) Analysis Time: 1529
Filtered: ☐
CHEMetrics: 200 mg/L
Notes:
Standard Additions: ☐ Titrant Molarity: ____ Digits Required: 1st.: ____ 2nd.: ____ 3rd.: ____

Carbon Dioxide:
Equipment: HACH Digital Titrator CA-DT CHEMetrics (Range: 10-100 mg/L) Analysis Time: 1540
CHEMetrics: 90 mg/L
Notes:
Standard Additions: ☐ Titrant Molarity: ____ Digits Required: 1st.: ____ 2nd.: ____ 3rd.: ____

Dissolved Oxygen:
Equipment: CHEMetrics Range ☒ 0 - 1.0 mg/L ☐ 1 - 12 mg/L Analysis Time: 1533
CHEMetrics: 0.25 mg/L
Notes: ☐

QA/QC Checklist:
All data fields have been completed as necessary: ☒
Correct measurement units are cited in the SAMPLING DATA block: ☒
Mulitplication is correct for each *Multiplier* table: ☒
Final calulated concentration is within the appropriate *Range Used* block: ☒
Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☒
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☒
Nitrite Interference treatment used for Nitrate test if Nitrite was detected: ☒
Title block is initialized by person who performed the QA/QC Ckecklist: ☒

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NAS Pensacola UST Site 26
Project No.: N4225

[ ] Domestic Well Data
[X] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: NASP26GS1002
Sample Location: NASP-26-GS10
Sampled By: [illegible]
C.O.C. No.: 0252
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 12/4/02 Time: 1430	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Method: Low Flow Peristaltic	CLEAR	6.90	0.417	0.50	3.34	23.38	131.8	✓

PURGE DATA

Date: 12/4/02	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 0.0								
Well Casing Diameter: 0.5								
Well Casing Material: PVC								
Total Well Depth (TD): 19.49								
Static Water Level (WL): 9.4								
One Casing Volume(gal): 0.62								
Start Purge (hrs): 1405								
End Purge (hrs): 1425								
Total Purge Time (min): 20								
Total Vol. Purged (gal): 8								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC	HCl	3 - 40mL vials	X
TOC	H2SO4	1 - 250 mL HDPE bottle	X
Sulfate	None	1 - 250 mL HDPE bottle	X

OBSERVATIONS / NOTES

Circle if Applicable:
MS/MSD
Duplicate ID No.:

Signature(s): [illegible]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAS Pensacola UST Site 26
PROJECT NUMBER: N4225

WELL ID.: NASP-26-GS10
DATE: 12/4/02

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	Volume (L)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments
1405	9.40	400	0	—	—	—	—	—	—	—
1410	9.40	400	2	7.01	0.519	8.37	3.40	23.18	146.8	CLEAR
1415	9.40	400	4	6.94	0.507	1.46	3.12	23.31	138.5	
1420	9.40	400	6	6.90	0.498	0.21	3.31	23.36	133.1	
1425	9.40	400	8	6.90	0.497	0.50	3.34	23.38	131.8	
1430	—	Sampling	—							

SIGNATURE(S): [illegible]

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NAS Pensacola UST Site 26	Sample ID No.:	NASP26GS[redacted]02
Project No.:	N4225	Sample Location:	NASP-26-GS[redacted] 10
Sampled By:	MP/LM	Duplicate:	☐
Field Analyst:	MP/LM	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):	RLM		

SAMPLING DATA:

Date: 12/4/02	Color	ORP (Eh)	S.C.	Temp.	Turbidity	DO	~~Sal.~~	pH
Time: 1430	(Visual)	(+/- mv)	(mS/cm)	(°C)	(NTU)	(Meter, mg/l)	~~(%)~~	(SU)
Method: Peristaltic	CLEAR	131.8	0.497	23.38	0.50	3.34		6.80

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Ferrous Iron:

Equipment: HACH IR-18C Test Kit

Concentration: 0 mg/L

Notes: Time 1431

Hydrogen Sulfide (H_2S):

Equipment: HS-C & CHEMETRICS K-9510 Analysis Time: 1439

HS-C Concentration: 0 mg/L CHEMETRICS CONC. 0 mg/L

Notes:

Alkalinity:

Analysis Time: 1436

Equipment: — CHEMetrics (Range: 10-100 mg/L) Filtered: ☐

CHEMetrics: 33 mg/L

Notes:

Standard Additions: ☐ Titrant Molarity:____ Digits Required: 1st.:____ 2nd.:____ 3rd.:____

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT CHEMetrics (Range: 10-100 mg/L) Analysis Time: 1434

CHEMetrics: 45 mg/L

Notes:

Standard Additions: ☐ Titrant Molarity:____ Digits Required: 1st.:____ 2nd.:____ 3rd.:____

Dissolved Oxygen:

Equipment: CHEMetrics Range ☐ 0 - 1.0 mg/L ☒ 1 - 12 mg/L Analysis Time: 1439

CHEMetrics: 3 mg/L

Notes: ☐

QA/QC Checklist:

All data fields have been completed as necessary: ☒
Correct measurement units are cited in the SAMPLING DATA block: ☒
Mulitplication is correct for each *Multiplier* table: ☒
Final calulated concentration is within the appropriate *Range Used* block: ☒
Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☒
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☒
Nitrite Interference treatment used for Nitrate test if Nitrite was detected: ☒
Title block is initialized by person who performed the QA/QC Checklist: ☒

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NAS Pensacola UST Site 26
Project No.: N4225

[ ] Domestic Well Data
[X] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: NASP26GS1202
Sample Location: NASP-26-GS12
Sampled By: LM/MF
C.O.C. No.: 0252
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 12/4/02 Time: 1325	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Method: Low Flow Peristaltic	CLEAR	6.84	0.286	0	0.55	24.86	125.9	

PURGE DATA

Date: 12/4/02	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 0/0								
Well Casing Diameter: 1"								
Well Casing Material: PVC								
Total Well Depth (TD): 19.68								
Static Water Level (WL): 9.10								
One Casing Volume(gal/L): 6.2 10' SCREEN								
Start Purge (hrs): 12.50								
End Purge (hrs): 1320								
Total Purge Time (min): 30								
Total Vol. Purged (gal/L): 12								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC	HCl	3 - 40mL vials	X
TOC	H2SO4	1 - 250 mL HDPE bottle	X
Sulfate	None	1 - 250 mL HDPE bottle	X

OBSERVATIONS / NOTES

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAS Pensacola UST Site 26
PROJECT NUMBER: N4225

WELL ID.: NASP-26-~~0307~~ GS12
DATE:

	Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	Volume (L)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments
	1250	9.10	400	0	7.83	0.311	–	4.90	24.27	116.3	
	~~1255~~	9.12	400	2	6.87	0.287	–	0.62	24.82	133.7	
	1300	9.12	400	4	6.88	0.287	0	0.46	24.87	133.8	
1315	~~1310~~	9.12	400	6	6.89	0.288	0	0.49	24.88	128.7	
1320	~~1315~~	9.12	400	8	6.84	0.286	0	0.55	24.86	125.9	
1325		(Sampling)									

SIGNATURE(S): [signature]

PAGE_2_OF_2_

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name: NAS Pensacola UST Site 26
Sample ID No.: NASP26GS1202
Project No.: N4225
Sample Location: NASP-26-GS12
Sampled By: MF/LM
Duplicate: ☐
Field Analyst: M Ferguson
Blank: ☐
Field Form Checked as per QA/QC Checklist (initials): RLM

SAMPLING DATA:

	Color (Visual)	ORP (Eh) (+/- mv)	S.C. (mS/cm)	Temp. (°C)	Turbidity (NTU)	DO (Meter, mg/l)	Sal. (%)	pH (SU)
Date: 12/4/02								
Time: 1325								
Method: Peristaltic	CLEAR	125.9	0.286	24.86	0	0.55	—	6.89

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Ferrous Iron:
Equipment: HACH IR-18C Test Kit
Concentration: 0 mg/L
Notes: TIME: 1355

Hydrogen Sulfide (H_2S):
Equipment: HS-C & CHEMETRICS K-9510 Analysis Time: 1345
HS-C Concentration: 0 mg/L K-9510 Conc. 0 mg/L
Notes:

Alkalinity:
Analysis Time: 1341
Equipment: CHEMetrics (Range: 10-100 mg/L) Filtered: ☐
CHEMetrics: 20 mg/L
Notes:
Standard Additions: ☐ Titrant Molarity: Digits Required: 1st.: 2nd.: 3rd.:

Carbon Dioxide:
Equipment: HACH Digital Titrator CA-DT CHEMetrics (Range: 10-100 mg/L) Analysis Time: 1338
CHEMetrics: 40 mg/L
Notes:
Standard Additions: ☐ Titrant Molarity: Digits Required: 1st.: 2nd.: 3rd.:

Dissolved Oxygen:
Equipment: CHEMetrics Range ☒ 0 - 1.0 mg/L ☐ 1 - 12 mg/L Analysis Time: 1332
CHEMetrics: 0.5 mg/L
Notes ☐

QA/QC Checklist:
All data fields have been completed as necessary: ☒
Correct measurement units are cited in the SAMPLING DATA block: ☒
Mulitplication is correct for each *Multiplier* table: ☒
Final calulated concentration is within the appropriate *Range Used* block: ☒
Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☒
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☒
Nitrite Interference treatment used for Nitrate test if Nitrite was detected: ☒
Title block is initialized by person who performed the QA/QC Ckecklist: ☒

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER 0252 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
N4225	UST SITE 26	GERALD WALKER	850-385-9899	ACCUTEST
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		LANE MIDDLETON	904-636-6185	VINELAND CT
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FEDEX 837110057388		ORLANDO, FL

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G P
PRESERVATIVE USED: HCl H2SO4 NONE

DATE YEAR 2002	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAP (G) COMP (C)	No. OF CONTAINERS	VOC	TOC	SULFATE						COMMENTS
12/4	1525	NASP26GS0102	GS01			GW	G	5	3	1	1						COOL TO 4°C
12/4	1430	NASP26GS0002	GS10			GW	C	5	3	1	1						
12/4		NASP26GS1202	GS12			GW	G	5	3	1	1						CTO 241
																	WORK RELEASE

1. RELINQUISHED BY	DATE	TIME	1. RECEIVED BY	DATE	TIME
	12/6/02	1100			
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

4/02R
FORM NO. TtNUS-001

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NAS Pensacola UST Site 26
Project No.: N4225

[ ] Domestic Well Data
[X] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: NASP26GS1003
Sample Location: NASP-26-GS10
Sampled By: LM/MF
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 2/25/03 Time: 1555	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Method: Low Flow Peristaltic	CLEAR	6.12	0.363	4.3	2.01	19.37	-123	

PURGE DATA

Date: 2/25/03	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 0/0								
Well Casing Diameter: .75"								
Well Casing Material: PVC								
Total Well Depth (TD): 19.8								
Static Water Level (WL):								
One Casing Volume(gal/L): 22								
Start Purge (hrs): 1530								
End Purge (hrs): 1550								
Total Purge Time (min): 20								
Total Vol. Purged (gal/L): 8								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC	HCl	3 - 40mL vials	X
TOC	H2SO4	2-40mL ~~1-250 mL HDPE bottle~~ VOAs	X
Sulfate	None	1 - 250 mL HDPE bottle	X

OBSERVATIONS / NOTES

Circle if Applicable:

MS/MSD	Duplicate ID No.:
—	

Signature(s):

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAS Pensacola UST Site 26
PROJECT NUMBER: N4225

WELL ID.: NASP-26-GS10
DATE: 2/25/03

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	Volume (L)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments
1530	11.26	400	–	–	–	–	–	–	–	
1535	11.26	400	2	6.10	0.363	7.2	2.18	19.30	-133	CLEAR
1540	11.26	400	4	6.10	0.363		1.92	19.34	-131	
1545	11.26	400	6	6.12	0.363		1.97	19.36	-129	
1550	11.26	400	8	~~6.23~~ 6.12*	0.363	4.3	2.01	19.37	-123	

SIGNATURE(S): [signature]

EQUIPMENT CALIBRATION LOG

INSTRUMENT NAME/MODEL : _____ PROJECT NAME : (UST Site 26) OLF Bronson Site 1140NW

MANUFACTURER : _____ PROJECT NUMBER : N4250 (249) & 241

CALIBRATION DATE	INSTRUMENT/ SERIAL #	~~INITIAL SETTINGS~~	STANDARDS USED	~~PROCEDURE~~ initial	ADJUSTMENTS MADE	FINAL SETTINGS	SIGNATURE	COMMENTS Lot #
		Instrument						
2-25-03	03349	Lamotte	1 ~~&10~~	0.99, 10.23	Cal	1.0, 10.0	MCF	BLMT12 (10MM)
2-25-03	03349	Lamotte	10	~~0.99~~ 10.23		10.0	MCF	ALMT13 (1MM)
2-25-03	D1090	PID	100PPM	0.0		98.3	MCF	00TS2-02

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: UST Site 26 Quarter 3 Sampling
Project No.: N4225
Location: NAS Pensacola
Personnel: L.Middleton, M.Ferguson
Weather Conditions:
Measuring Device: Heron
Tidally Influenced: Yes ___ No ___
Remarks:

Well or Piezometer Number	Date 2003	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
GS01	2/25	1441	31.12	19.40	10.24			
GS10	2/25	1445	31.60	19.41	11.26			
GS12	2/25	1443	31.42	19.80	10.84			

* All measurements to the nearest 0.01 foot

Page ____ of ____

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NAS Pensacola UST Site 26	Sample ID No.:	NASP26GS1003
Project No.:	N4225	Sample Location:	NASP-26-GS10
Sampled By:	CM/MF	Duplicate:	☐
Field Analyst:	CM/MF	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):	MMF		

SAMPLING DATA:

	Color	pH	S.C.	Turbidity	DO	Temp.	ORP	
Date: 2/25/03	Visual	Standard	mS/cm	NTU	mg/l	°C	mV	
Time: 1555								
Method: Peristaltic	CLEAR	6.12	0.363	4.3	2.01	19.37	-123	

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Ferrous Iron:

Equipment: HACH IR-18C Test Kit

Concentration: ~~0.1555~~ 0 mg/L

Notes: TIME: 1555

Hydrogen Sulfide (H_2S):

Equipment: HS-C & CHEMetrics K-9510

Analysis Time: 1556

HS_C	CHEMetrics
0 mg/L	0 mg/L

Concentration:

Notes:

Alkalinity:

Equipment:

CHEMetrics (Range: 10-100 mg/L)

Analysis Time: 1557

Filtered: ☐

CHEMetrics: 40 mg/L

Notes:

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT

CHEMetrics (Range: 10-100 mg/L)

Analysis Time: 1558

CHEMetrics: 45 mg/L

Notes:

Dissolved Oxygen:

Equipment:

CHEMetrics Range ☐ 0 - 1.0 mg/L ☒ 1 - 12 mg/L

Analysis Time: 1600

CHEMetrics: 4 mg/L

QA/QC Checklist:

All data fields have been completed as necessary: ☒
Correct measurement units are cited in the SAMPLING DATA block: ☒
Mulitplication is correct for each *Multiplier* table: ☒
Final calulated concentration is within the appropriate *Range Used* block: ☒
Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☒
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☒
Nitrite Interference treatment used for Nitrate test if Nitrite was detected: ☒
Title block is initialized by person who performed the QA/QC Ckecklist: ☒

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NAS Pensacola UST Site 26
Project No.: N4225

[ ] Domestic Well Data
[X] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: NASP26GS0103
Sample Location: NASP-26-GS01
Sampled By: MF | LM
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 2.25.03 Time: 1515	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Method: Low Flow Peristaltic	CLEAR	6.52	0.635	3.9	0.24	20.37	-202.8	

PURGE DATA

Date: 2.25.03	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 1.0	NLF							
Well Casing Diameter: 2in	0.75							
Well Casing Material: PVC								
Total Well Depth (TD): 19.40								
Static Water Level (WL): 10.74								
One Casing Volume(gal/L): 2.2								
Start Purge (hrs): 1450								
End Purge (hrs): 1510								
Total Purge Time (min): 20								
Total Vol. Purged (gal/L): 8								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC	HCl	3 - 40mL vials	X
TOC	H2SO4	~~1 - 250 mL HDPE bottle~~ 40mL VEAL	X
Sulfate	None	1 - 250 mL HDPE bottle	X

OBSERVATIONS / NOTES

Circle if Applicable:

MS/MSD

Duplicate ID No.: NASP-26-DUP1-03 (VOC'S only)

Signature(s): [illegible]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAS Pensacola UST Site 26
PROJECT NUMBER: N4225

WELL ID.: NASP-26-GS01
DATE: 2.25.03

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	Volume (L)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments
1450	10.24	400	—	—	—	—	—	—	—	—
1455	~~10.24~~	400	2L	6.56	0.6027	3.4	0.14	20.37	-206.2	CLEAR W/ SHEEN
1500	—	400	4L	6.54	0.624		0.20	20.38	-209.6	PETRO ODOR
1505	—	400	6L	6.53	0.6235		0.33	20.35	-146.6	
1510	—	400	8	6.52	0.635	3.9	0.24	20.37	-202.8	
Sample Time		1515								

SIGNATURE(S): MCJr

PAGE_2_OF_2_

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NAS Pensacola UST Site 26	Sample ID No.:	NASP26GS0103
Project No.:	N4225	Sample Location:	NASP-26-GS01
Sampled By:	LM / MF	Duplicate:	☐
Field Analyst:	LM / MF	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):	MF		

SAMPLING DATA:

Date: 2/25/03	Color	pH	S.C.	Turbidity	DO	Temp.	ORP	
Time: 1515	Visual	Standard	mS/cm	NTU	mg/l	°C	mV	
Method: Peristaltic	CLEAR	6.52	0.635	3.9	0.24	20.37	-202.8	

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Ferrous Iron:

Equipment: HACH IR-18C Test Kit

Concentration: 2.8 mg/L

Notes: TIME: 1523

Hydrogen Sulfide (H_2S):

Equipment: HS-C & CHEMetrics K-9510

Analysis Time: 1516

HS_C	CHEMetrics
2	2

Concentration: 2 mg/L (HS_C); 2 mg/L (CHEMetrics)

Notes:

Alkalinity:

Analysis Time: 1523

Equipment: —

CHEMetrics (Range: 10-100 mg/L)

Filtered: ☐

CHEMetrics: 0 mg/L

Notes:

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT

CHEMetrics (Range: 10-100 mg/L)

Analysis Time: 1521

CHEMetrics: 50 mg/L

Notes:

Dissolved Oxygen:

Equipment: —

CHEMetrics Range ☒ 0 - 1.0 mg/L ☐ 1 - 12 mg/L

Analysis Time: 1517

CHEMetrics: 0.2 mg/L

QA/QC Checklist:

All data fields have been completed as necessary: ☒
Correct measurement units are cited in the SAMPLING DATA block: ☒
Mulitplication is correct for each *Multiplier* table: ☒
Final calulated concentration is within the appropriate *Range Used* block: ☒
Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☒
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☒
Nitrite Interference treatment used for Nitrate test if Nitrite was detected: ☒
Title block is initialized by person who performed the QA/QC Ckecklist: ☒

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NAS Pensacola UST Site 28
Project No.: N4225

[ ] Domestic Well Data
[X] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: NASP26GS1203
Sample Location: NASP-26-GS12
Sampled By: MCF/LM
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 2-25-03 Time: 1650	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Method: Low Flow Peristaltic	clear	5.42	0.394	0.8	1.69	20.90	-7	

PURGE DATA

Date: 2-25-03	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 0.0								
Well Casing Diameter: 0.75								
Well Casing Material: PVC								
Total Well Depth (TD): 19.0								
Static Water Level (WL): 10.4								
One Casing Volume(gal/L): 2.2								
Start Purge (hrs): 1624								
End Purge (hrs): 1640								
Total Purge Time (min): 22								
Total Vol. Purged (gal/L): 8L								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC	HCl	3 - 40mL vials	X
TOC	H2SO4	1 - 250 mL HDPE bottle	X
Sulfate	None	1 - 250 mL HDPE bottle	X

OBSERVATIONS / NOTES

Circle if Applicable:

MS/MSD

Duplicate ID No.: none

Signature(s): MCF

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAS Pensacola UST Site 26
PROJECT NUMBER: N4225

WELL ID.: NASP-26-GS12
DATE: 2-25-03

Time (Hrs.)	Water Level (Ft. below TOC)	Flow (mL/Min.)	Volume (L)	pH (S.U.)	Cond. (mS/cm)	Turb. (NTU)	DO (mg/L)	Temp. (Celsius)	ORP (mV)	Comments
1624	10.84	—	—	—	—	—	—	—	—	—
1630	10.84	400	2L	5.32	0.395	1.3	2.08	21.05	-36.6	
1635	10.84	400	4.0L	5.37	0.397	1.0	1.69	20.99	-34	
1640	10.84	400	6.0L	5.41	0.396	0.9	1.67	20.96	-26	
1643	10.84	400	7.0	5.43	0.393	0.8	1.72	20.90	-28	
1646	10.84	400	8.0	5.42	0.394	0.8	1.69	20.90	-7	
1650	Sample									

SIGNATURE(S): MCJ

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NAS Pensacola UST Site 26	Sample ID No.:	NASP26GS1203
Project No.:	N4225	Sample Location:	NASP-26-GS12
Sampled By:	MF / LM	Duplicate:	☐
Field Analyst:	MF / LM	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):	MF		

SAMPLING DATA:

	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV
Date: 2-25-03							
Time: 1650							
Method: Peristaltic	clear	5.42	0.394	0.8	1.69	20.70	-7

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Ferrous Iron:

Equipment: HACH IR-18C Test Kit

Concentration: 0.1 mg/L

Notes: time 1654

Hydrogen Sulfide (H_2S):

Equipment: HS-C & CHEMetrics K-9510

Analysis Time: 1652

HS_C	CHEMetrics
0.0 mg/L	0.0 mg/L

Concentration:

Notes:

Alkalinity:

Equipment: —

CHEMetrics (Range: 0-100 mg/L)

Analysis Time: 1658

Filtered: ☐

CHEMetrics: 13 mg/L

Notes:

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT

CHEMetrics (Range: 0-100 mg/L)

Analysis Time: 1701

CHEMetrics: 35 mg/L

Notes:

Dissolved Oxygen:

Equipment: —

CHEMetrics Range ☐ 0 - 1.0 mg/L ☒ 1 - 12 mg/L

Analysis Time: 1700

CHEMetrics: 3.0 mg/L

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☒
Correct measurement units are cited in the SAMPLING DATA block: ☒
Mulitplication is correct for each *Multiplier* table: ☒
Final calulated concentration is within the appropriate *Range Used* block: ☒
Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☒
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning doouments: ☒
Nitrite Interference treatment used for Nitrate test if Nitrite was detected: ☒
Title block is initialized by person who performed the QA/QC Ckecklist: ☒

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 1

PROJECT NO: N4225	FACILITY: NAS PEN	PROJECT MANAGER Gerry Walker	PHONE NUMBER 850-385-989	LABORATORY NAME AND CONTACT: Katahdin
SAMPLERS (SIGNATURE) Charles Metz		FIELD OPERATIONS LEADER Chuck Metz	PHONE NUMBER 904-636-6125	ADDRESS 340 Country RD # 5
		CARRIER/WAYBILL NUMBER		CITY, STATE Westbrook MA

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

DATE YEAR 2003	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAP (G) COMP (C)	No. OF CONTAINERS	VOC	TOC	Sulfate						COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)									G	P	P						
PRESERVATIVE USED									HCl	H_2SO_4							
8-27	0905	NASP26GS10				GW	G	6	3	2	1						
8-27	0950	NASP26GS12				GW	G	6	3	2	1						
8-27	0915	NASP26GS01				GW	G	6	3	2	1						

1. RELINQUISHED BY Charles Metz	DATE 1730	TIME	1. RECEIVED BY	DATE	TIME
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

RIBB... WHITE (COMPANIES SAMPLE) YELLOW (FIELD COPY)

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: UST Site 26 Quarter 4 Sampling
Project No.: N4225
Location: NAS Pensacola
Personnel: C. Mott
Weather Conditions: Sunny / 90°F
Measuring Device: Heron Dipper T
Tidally Influenced: Yes ___ No X
Remarks:

Well or Piezometer Number	Date	Time	Elevation of Reference Point (feet)*	Total Well Depth (feet)*	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
GS01	8/27/03	0810	31.12	19.40	7.20	—	23.92	
GS10	8/27/03	0812	31.60	19.41	7.80	—	23.80	
GS12	8/27/03	0815	31.42	19.80	7.53	—	23.89	

* All measurements to the nearest 0.01 foot

INSTRUMENT CALIBRATION SHEET

PROJECT NAME: Pensacola UST Site 26 Q4

PROJECT NUMBER : N4225

CALIBRATION DATE	INSTRUMENT/MODEL	Serial #	STANDARDS USED	Lot #	EXP. DATE	PRE READING	FINAL READING	SIGNATURE	COMMENTS
8-27-03	Lamotte Turbidimeter/20	1552-0100	1/10	N/A	N/A	0.94/9.93	1.0/10.0	MTA	
8-27-03	Lamotte Turbidimeter/2020	1001-4798	1/10	↓	↓	0.81/11.10	1.0/10.0	CM	
8-27-03	YSI/556	02F0622AE	4.0 pH	2302-10	1-22-05	3.84	4.0 pH	MTA	
			7.0 pH	3041-20	10-30-04	6.52	7.0 pH		
↓	↓	↓	1.409mS/cm	3003-08	10-30-04	1.281	1.409mS/cm	↓	
8-27-03	YSI/556	01M0521AG	4.0 pH	2302-10	1-22-05	3.91	4.0 pH	CM	
			7.0 pH	3041-20	10-30-04	6.75	7.0 pH		
↓	↓	↓	1.409mS/cm	3003-08	10-30-04	1.342	1.409mS/cm	↓	
8-27-03	MiniRae PID/	5652	100ppm Isob				100 ppm	CM	
8-27-03	Lamotte	1552-0100	1/10	N/A	N/A	0.89/10.10	1.0/10.0	MTA	
	Lamotte	1001-4798	1/10	N/A	N/A	0.91/10.42	1.0/10.0	CM	
	YSI 556	02F0623AE	4 pH	2302-10	1-22-05	3.96	4.0 pH	MTA	
			7pH	3041-20	10-30-04	6.75	7.0 pH		
	↓	↓	1.409mS/cm	3003-08	10-30-04	1.384	1.409mS/cm	↓	
	YSI 556	01M0521AG	4.0 pH	2302-10	1-22-05	3.96	4.0 pH	CM	
			7.0 pH	3041-20	10-30-04	6.91	7.0 pH		
↓	↓	↓	1.409mS/cm	3003-08	10-30-04	1.397	1.409mS/cm	↓	
8-27-03	MiniRae PID	5652	100ppm Isobutylene					CM	

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NAS Pensacola UST Site 26
Project No.: N4225

[ ] Domestic Well Data
[X] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: NASP26GS0104
Sample Location: NASP-26-GS01
Sampled By: CM
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 8-26-03 Time: 0915	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Method: Low Flow Peristaltic	Clear	6.75	1.004	2.08	0.04	26.21	-154.3	

PURGE DATA

Date: 8-26-03	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm): 0								
Well Casing Diameter: 0.75"								
Well Casing Material: PVC								
Total Well Depth (TD): 19.40								
Static Water Level (WL): 7.20								
One Casing Volume(gal):								
Start Purge (hrs): 0845								
End Purge (hrs): 0900								
Total Purge Time (min): 15								
Total Vol. Purged (gal/L): 4.5								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC	HCl	3 - 40mL vials	✓
TOC	H2SO4	2 x 40mL ~~1 - 250 mL HDPE bottle~~ vials	✓
Sulfate	None	1 - 250 mL HDPE bottle	✓

OBSERVATIONS / NOTES

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): Charles Moss

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAS Pensacola UST Site 26
PROJECT NUMBER: N4225

WELL ID.: NASP-26-GS01
DATE: 8-27-03

Time	Water Level	Flow	Volume	pH	Cond.	Turb.	DO	Temp.	ORP	Comments
0845	200	300	0	—	—	—	—	—	—	START PURGE
0850	—	300	1.5	6.72	1.036	—	0.50	26.60	-122.9	
0852	—		2.0	6.74	1.019	2.46	0.09	26.33	-148.1	
0855	—		3.0	6.74	1.009	2.28	0.03	26.23	-154.9	
0888	—		4.0	6.74	1.007	2.15	0.04	26.21	-153.1	
0900			4.5	6.75	1.004	2.08	0.04	26.21	-154.3	

0915 = Sample Time

SIGNATURE(S): Charles Mee

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NAS Pensacola UST Site 26	Sample ID No.:	NASP26GS0104
Project No.:	N4225	Sample Location:	NASP-26-GS01
Sampled By:	CM	Duplicate:	☐
Field Analyst:	CM	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):			

SAMPLING DATA

	Color	pH	S.C.	Turbidity	DO	Temp.	ORP
Date: 8-26-03	Visual	Standard	mS/cm	NTU	mg/l	°C	mV
Time: 0915							
Method: Peristaltic	Clear	6.75	1.004	2.08	0.04	26.21	-154.3

SAMPLE COLLECTION/ANALYSIS INFORMATION

Ferrous Iron: DR890 Time: 0918

Equipment: ~~HACH HR-18C Test Kit~~

Concentration: 1.62 mg/L

Notes:

Hydrogen Sulfide (H_2S): 0920

Equipment HS-C & CHEMetrics K-9510

Analysis Time: 0922

HS_C	CHEMetrics
75.0 mg/L	mg/L

Concentration:

Notes:

Alkalinity:

Analysis Time: 0928

Equipment: CHEMetrics

CHEMetrics (Range: 100-1000 mg/L)

Filtered: ☐

CHEMetrics: 450 mg/L

Notes:

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT

CHEMetrics (Range: _____ mg/L)

Analysis Time: 0930

CHEMetrics: 120 mg/L

Notes:

Dissolved Oxygen:

Equipment:

CHEMetrics Range ☒ 0 - 1.0 mg/L ☐ 1 - 12 mg/L

Analysis Time: 0925

CHEMetrics: 0.6 mg/L

QA/QC Checklist:

All data fields have been completed as necessary: ☐
Correct measurement units are cited in the SAMPLING DATA block: ☐
Mulitplication is correct for each *Multiplier* table: ☐
Final calulated concentration is within the appropriate *Range Used* block: ☐
Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☐
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☐
Nitrite Interference treatment used for Nitrate test if Nitrite was detected: ☐
Title block is initialized by person who performed the QA/QC Checklist: ☐

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NAS Pensacola UST Site 26
Project No.: N4225

[ ] Domestic Well Data
[X] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: NASP26GS1004
Sample Location: NASP-26-GS10
Sampled By: JK
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 8/27/03 Time: 0905	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Method: Low Flow Peristaltic	clear	6.10	0.375	6.43	6.93	25.71	100.8	

PURGE DATA

Date: 8/27/03	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm):								
Well Casing Diameter: 1"								
Well Casing Material: PVC								
Total Well Depth (TD): 19.41								
Static Water Level (WL): 7.80								
One Casing Volume(gal/L): 1.8L								
Start Purge (hrs): 0850								
End Purge (hrs): 0904								
Total Purge Time (min): 14								
Total Vol. Purged (gal/L): 5.6L								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC	HCl	3 - 40mL vials	Y
TOC	H2SO4	1 - 250 mL HDPE bottle	Y
Sulfate	None	1 - 250 mL HDPE bottle	Y

OBSERVATIONS / NOTES

400 mL/min

Circle if Applicable:

MS/MSD	Duplicate ID No.:

Signature(s): JK

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAS Pensacola UST Site 26
PROJECT NUMBER: N4225

WELL ID.: NASP-26-GS10
DATE: 8/27/03

Time	Water Level	Flow	Volume	pH	Cond.	Turb.	DO	Temp.	ORP	Comments
0855	~8	400	2L	6.26	0.398	17.8	6.43	25.94	105.6	
0858			3.2L	6.23	0.386	16.1	6.45	25.83	102.1	
0901			4.4L	6.12	0.378	10.4	7.03	25.73	99.1	
0904			5.6L	6.10	0.375	6.43	6.93	25.71	100.8	

SIGNATURE(S):

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NAS Pensacola UST Site 26	Sample ID No.:	NASP26GS1004
Project No.:	N4225	Sample Location:	NASP-26-GS10
Sampled By:	JPL	Duplicate:	☐
Field Analyst:	JPA	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):			

SAMPLING DATA:

Date: 8/27/03	Color	pH	S.C.	Turbidity	DO	Temp.	ORP	
Time: 0905	Visual	Standard	mS/cm	NTU	mg/l	°C	mV	
Method: Peristaltic	Clear	6.10	0.375	6.43	6.73	25.31	100.8	

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Ferrous Iron:

Equipment: HACH IR-18C Test Kit

Concentration: 0.80 mg/L

Notes:

Hydrogen Sulfide (H_2S):

Equipment HS-C & CHEMetrics K-9510

Analysis Time: 0910

HS_C	~~CHEMetrics~~
Ø	

Concentration: Ø mg/L ~~CHEMetrics~~ mg/L

Notes:

Alkalinity:

Equipment: CHEMetrics

CHEMetrics (Range: 10 - 100 mg/L)

Analysis Time: 0925

Filtered: ☐

CHEMetrics: 55 mg/L

Notes:

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT

CHEMetrics (Range: 10 - 100 mg/L)

Analysis Time: 0920

CHEMetrics: 45 mg/L

Notes:

Dissolved Oxygen:

Equipment:

CHEMetrics Range ☐ 0 - 1.0 mg/L ☑ 1 - 12 mg/L

Analysis Time: 0915

CHEMetrics: 2.5 mg/L

QA/QC Checklist:

All data fields have been completed as necessary: ☐
Correct measurement units are cited in the SAMPLING DATA block: ☐
Mulitplication is correct for each *Multiplier* table: ☐
Final calulated concentration is within the appropriate *Range Used* block: ☐
Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☐
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☐
Nitrite Interference treatment used for Nitrate test if Nitrite was detected: ☐
Title block is initialized by person who performed the QA/QC Checklist: ☐

Tetra Tech NUS, Inc.

GROUNDWATER SAMPLE LOG SHEET

Project Site Name: NAS Pensacola UST Site 26
Project No.: N4225

[ ] Domestic Well Data
[X] Monitoring Well Data
[ ] Other Well Type:
[ ] QA Sample Type:

Sample ID No.: NASP26GS1204
Sample Location: NASP-26-GS12
Sampled By: [illegible]
C.O.C. No.:
Type of Sample:
[X] Low Concentration
[ ] High Concentration

SAMPLING DATA

Date: 8/27/03 Time: 0950	Color Visual	pH Standard	S.C. mS/cm	Turbidity NTU	DO mg/l	Temp. °C	ORP mV	Other
Method: Low Flow Peristaltic	clear	5.84	0.260	1.52	0.79	25.78	109.6	

PURGE DATA

Date: 8/27/03	Time	pH	S.C.	Turbidity	DO	Temp (°C)	ORP	
Method: Low Flow Peristaltic								
Monitor Reading (ppm):								
Well Casing Diameter: 1"								
Well Casing Material: PVC								
Total Well Depth (TD): 19.80								
Static Water Level (WL): 7.53								
One Casing Volume(gal/L): 1.8L								
Start Purge (hrs): 0936								
End Purge (hrs): 0950								
Total Purge Time (min): 14								
Total Vol. Purged (gal/L): 5.6L								

SAMPLE COLLECTION INFORMATION

Analysis	Preservative	Container Requirements	Collected
VOC	HCl	3 - 40mL vials	Y
TOC	H2SO4	1 - 250 mL HDPE bottle	Y
Sulfate	None	1 - 250 mL HDPE bottle	Y

OBSERVATIONS / NOTES

400mL/min

Circle if Applicable:

MS/MSD Duplicate ID No.:

Signature(s): [illegible]

Tetra Tech NUS, Inc.

LOW FLOW PURGE DATA SHEET

PROJECT SITE NAME: NAS Pensacola UST Site 26
PROJECT NUMBER: N4225

WELL ID.: NASP26-GS12
DATE: 8/27/03

Time	Water Level	Flow	Volume	pH	Cond.	Turb.	DO	Temp.	ORP	Comments
0941	~7.5	400	3 L	5.84	0.261	4.68	0.84	25.80	112.6	
0944	↓	↓	3.2	5.84	0.261	4.32	0.91	25.80	112.2	
0947	↓	↓	4.4	5.85	0.260	1.78	0.81	25.78	109.7	
0950	↓	↓	5.6	5.84	0.260	1.52	0.79	25.78	109.6	

SIGNATURE(S): [illegible]

FIELD ANALYTICAL LOG SHEET
GEOCHEMICAL PARAMETERS

Tetra Tech NUS, Inc.

Project Site Name:	NAS Pensacola UST Site 26	Sample ID No.:	NASP26GS1204
Project No.:	N4225	Sample Location:	NASP-26-GS12
Sampled By:	CM	Duplicate:	☐
Field Analyst:	MA	Blank:	☐
Field Form Checked as per QA/QC Checklist (initials):			

SAMPLING DATA:

Date: 8/27/03	Color	pH	S.C.	Turbidity	DO	Temp.	ORP
Time: 0950	Visual	Standard	mS/cm	NTU	mg/l	°C	mV
Method: Peristaltic	clear	5.84	0.240	1.52	0.79	25.78	109.6

SAMPLE COLLECTION/ANALYSIS INFORMATION:

Ferrous Iron:

Equipment: HACH IR-18C Test Kit

Concentration: Ø mg/L

Notes:

Hydrogen Sulfide (H_2S):

Equipment HS-C & CHEMetrics K-9510

Analysis Time: 1000

HS_C	~~CHEMetrics~~
Ø mg/L	~~mg/L~~

Notes:

Alkalinity:

Analysis Time: 1010

Equipment: CHEMetrics

CHEMetrics (Range: 10 - 100 mg/L)

Filtered: ☐

CHEMetrics: 35 mg/L

Notes:

Carbon Dioxide:

Equipment: HACH Digital Titrator CA-DT

CHEMetrics (Range: 10 - 100 mg/L)

Analysis Time: 1005

CHEMetrics: 45 mg/L

Notes:

Dissolved Oxygen:

Equipment:

CHEMetrics Range ☐ 0 - 1.0 mg/L ☑ 1 - 12 mg/L

Analysis Time: 1005

CHEMetrics: 1.5 mg/L

Notes:

QA/QC Checklist:

All data fields have been completed as necessary: ☐
Correct measurement units are cited in the SAMPLING DATA block: ☐
Mulitplication is correct for each *Multiplier* table: ☐
Final calulated concentration is within the appropriate *Range Used* block: ☐
Alkalinity *Relationship* is determined appropriatly as per manufacturer instructions: ☐
QA/QC sample (e.g., Std. Additions, etc.) frequency is appropriate as per the project planning documents: ☐
Nitrite Interference treatment used for Nitrate test if Nitrite was detected: ☐
Title block is initialized by person who performed the QA/QC Ckecklist: ☐

APPENDIX B

GROUNDWATER ANALYTICAL REPORT
FIFTH QUARTER

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**G. WALKER**	**DATE:**	**OCTOBER 1, 2003**
FROM:	**BERNARD F SPADA III**	**COPIES:**	**DV FILE**
SUBJECT:	**DATA VALIDATION- VOC/MISCELLANEOUS CTO 241, NAS PENSACOLA SDG WT2072**		
SAMPLES:	5/Aqueous		

NASP26DUP	NASP26GS01	NASP26GS10
NASP26GS12	NASP26TB082703*	

OVERVIEW

The sample set for CTO 241, NAS Pensacola, SDG WT2072 consists of three (3) environmental aqueous samples, one (1) trip blank, and one (1) field duplicate. All environmental samples were analyzed for volatile organic compounds (VOC), sulfate, and total organic carbon (TOC). The trip blank denoted with an asterisk (*) was analyzed for VOC only. The field duplicate pair included in this SDG is NASP26DUP and NASP26GS12.

The samples were collected by Tetra Tech NUS on August 27, 2003 and analyzed by Katahdin Analytical Services. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria using SW-846 Method 8260B and EPA Methods 375.4 and 415.1 analytical and reporting protocols. The data contained in this SDG were validated with regard to the following parameters:

- * Data completeness
- * Holding times
- * Initial and continuing calibration
- * Laboratory method and field quality control blank results
- * Detection Limits
- Matrix Spike Recoveries

The symbol (*) indicates that all 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 formulated to address only gross non-compliances resulting in the rejection of data and the elimination of false positives.

Volatile

No qualifications were assigned to this fraction.

MISC

The percent recovery of sulfate was below the 30% quality control criteria in the MS of sample NASP26GS10. The result for sulfate was qualified as estimated (J) in sample NASP26GS10.

Positive results below the reporting limit were qualified as estimated (J) due to uncertainty near the detection limit.

Additional comments

Two samples submitted for analysis were not included on the COC. No qualifications were made on this basis.

EXECUTIVE SUMMARY

Laboratory Performance Issues: None.

Other Factors Affecting Data Quality: The matrix spike recovery for sulfate was low affecting one sample.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (10/99) and the NFESC guidelines. The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."

Tetra Tech NUS
Bernard F. Spada III
Chemist/Data Validator

TetraTech NUS
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:
1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as Reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % 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 (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity

PROJ_NO: 4225

SDG: WT2072 MEDIA: WATER DATA FRACTION: MISC

nsample	NASP26DUP	nsample	NASP26GS01	nsample	NASP26GS10
samp_date	8/27/2003	samp_date	8/27/2003	samp_date	8/27/2003
lab_id	WT2072-4	lab_id	WT2072-3	lab_id	WT2072-1
qc_type	NM	qc_type	NM	qc_type	NM
Pct_Solids	0	Pct_Solids	0	Pct_Solids	0
DUP_OF:	NASP26GS12	DUP_OF:		DUP_OF:	

Parameter	units	Result	Val Qual	Qual Code
SULFATE	MG/L	32		
TOTAL ORGANIC CARBON	MG/L	3		

Parameter	units	Result	Val Qual	Qual Code
SULFATE	MG/L	0.72	J	P
TOTAL ORGANIC CARBON	MG/L	54		

Parameter	units	Result	Val Qual	Qual Code
SULFATE	MG/L	17	J	D
TOTAL ORGANIC CARBON	MG/L	5.8		

PROJ_NO: 4225

SDG: WT2072 MEDIA: WATER DATA FRACTION: MISC

nsample	NASP26GS12
samp_date	8/27/2003
lab_id	WT2072-2
qc_type	NM
Pct_Solids	0
DUP_OF:	

Parameter	units	Result	Val Qual	Qual Code
SULFATE	MG/L	25		
TOTAL ORGANIC CARBON	MG/L	3		

PROJ_NO: 4225

SDG: WT2072 MEDIA: WATER DATA FRACTION: OV

nsample	NASP26DUP	nsample	NASP26GS01	nsample	NASP26GS10
samp_date	8/27/2003	samp_date	8/27/2003	samp_date	8/27/2003
lab_id	WT2072-4	lab_id	WT2072-3	lab_id	WT2072-1
qc_type	NM	qc_type	NM	qc_type	NM
units	UG/L	units	UG/L	units	UG/L
Pct_Solids	0	Pct_Solids	0	Pct_Solids	0
DUP_OF:	NASP26GS12	DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
BENZENE	1	U	
ETHYLBENZENE	1	U	
M+P-XYLENES	2	U	
O-XYLENE	1	U	
TERT-BUTYLBENZENE	1	U	
TOLUENE	1	U	
TOTAL XYLENES	3	U	

Parameter	Result	Val Qual	Qual Code
BENZENE	1	U	
ETHYLBENZENE	1	U	
M+P-XYLENES	2	U	
O-XYLENE	1	U	
TERT-BUTYLBENZENE	1	U	
TOLUENE	1	U	
TOTAL XYLENES	3	U	

Parameter	Result	Val Qual	Qual Code
BENZENE	1	U	
ETHYLBENZENE	1	U	
M+P-XYLENES	2	U	
O-XYLENE	1	U	
TERT-BUTYLBENZENE	1	U	
TOLUENE	1	U	
TOTAL XYLENES	3	U	

PROJ_NO: 4225

SDG: WT2072 MEDIA: WATER DATA FRACTION: OV

nsample	NASP26GS12	nsample	NASP26TB082703
samp_date	8/27/2003	samp_date	8/27/2003
lab_id	WT2072-2	lab_id	WT2072-5
qc_type	NM	qc_type	NM
units	UG/L	units	UG/L
Pct_Solids	0	Pct_Solids	0
DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
BENZENE	1	U	
ETHYLBENZENE	1	U	
M+P-XYLENES	2	U	
O-XYLENE	1	U	
TERT-BUTYLBENZENE	1	U	
TOLUENE	1	U	
TOTAL XYLENES	3	U	

Parameter	Result	Val Qual	Qual Code
BENZENE	1	U	
ETHYLBENZENE	1	U	
M+P-XYLENES	2	U	
O-XYLENE	1	U	
TERT-BUTYLBENZENE	1	U	
TOLUENE	1	U	
TOTAL XYLENES	3	U	

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

KATAHDIN ANALYTICAL SERVICES
Report of Analytical Results

Client: Tetra Tech NUS, Inc
Project: CTO 241 NAS PENSACOLA
PO No:
Sample Date: 08/27/03
Received Date: 08/28/03
Extraction Date:
Analysis Date: 09/02/03
Report Date: 09/04/2003
Matrix: WATER
% Solids: NA

Lab ID: WT2072-4
Client ID: NASP26DUP
SDG: WT2072
Extracted by:
Extraction Method: SW846 5030
Analyst: JLP
Analysis Method: SW846 8260B
Lab Prep Batch: WG3354
Units: ug/l

CAS#	Compound	Flags	Results	DF	PQL	Adj.PQL	Adj.MDL
71-43-2	Benzene	U	1	1.0	1	1	0.1
108-88-3	Toluene	U	1	1.0	1	1	0.2
100-41-4	Ethylbenzene	U	1	1.0	1	1	0.1
1330-20-7	Xylenes (total)	U	3	1.0	3	3	0.3
	m+p-Xylenes	U	2	1.0	2	2	0.2
95-47-6	o-Xylene	U	1	1.0	1	1	0.2
98-06-6	tert-Butylbenzene	U	1	1.0	1	1	0.6
1868-53-7	Dibromofluoromethane		109%				
17060-07-0	1,2-Dichloroethane-D4		104%				
2037-26-5	Toluene-D8		85%				
460-00-4	P-Bromofluorobenzene		88%				

KATAHDIN ANALYTICAL SERVICES
Report of Analytical Results

Client: Tetra Tech NUS, Inc
Project: CTO 241 NAS PENSACOLA
PO No:
Sample Date: 08/27/03
Received Date: 08/28/03
Extraction Date:
Analysis Date: 09/02/03
Report Date: 09/04/2003
Matrix: WATER
% Solids: NA

Lab ID: WT2072-3
Client ID: NASP26GS01
SDG: WT2072
Extracted by:
Extraction Method: SW846 5030
Analyst: JLP
Analysis Method: SW846 8260B
Lab Prep Batch: WG3354
Units: ug/l

CAS#	Compound	Flags	Results	DF	PQL	Adj.PQL	Adj.MDL
71-43-2	Benzene	U	1	1.0	1	1	0.1
108-88-3	Toluene	U	1	1.0	1	1	0.2
100-41-4	Ethylbenzene	U	1	1.0	1	1	0.1
1330-20-7	Xylenes (total)	U	3	1.0	3	3	0.3
	m+p-Xylenes	U	2	1.0	2	2	0.2
95-47-6	o-Xylene	U	1	1.0	1	1	0.2
98-06-6	tert-Butylbenzene	U	1	1.0	1	1	0.6
1868-53-7	Dibromofluoromethane		111%				
17060-07-0	1,2-Dichloroethane-D4		104%				
2037-26-5	Toluene-D8		95%				
460-00-4	P-Bromofluorobenzene		103%				

KATAHDIN ANALYTICAL SERVICES
Report of Analytical Results

Client: Tetra Tech NUS, Inc
Project: CTO 241 NAS PENSACOLA
PO No:
Sample Date: 08/27/03
Received Date: 08/28/03
Extraction Date:
Analysis Date: 09/02/03
Report Date: 09/04/2003
Matrix: WATER
% Solids: NA

Lab ID: WT2072-1
Client ID: NASP26GS10
SDG: WT2072
Extracted by:
Extraction Method: SW846 5030
Analyst: JLP
Analysis Method: SW846 8260B
Lab Prep Batch: WG3354
Units: ug/l

CAS#	Compound	Flags	Results	DF	PQL	Adj.PQL	Adj.MDL
71-43-2	Benzene	U	1	1.0	1	1	0.1
108-88-3	Toluene	U	1	1.0	1	1	0.2
100-41-4	Ethylbenzene	U	1	1.0	1	1	0.1
1330-20-7	Xylenes (total)	U	3	1.0	3	3	0.3
	m+p-Xylenes	U	2	1.0	2	2	0.2
95-47-6	o-Xylene	U	1	1.0	1	1	0.2
98-06-6	tert-Butylbenzene	U	1	1.0	1	1	0.6
1868-53-7	Dibromofluoromethane		114%				
17060-07-0	1,2-Dichloroethane-D4		111%				
2037-26-5	Toluene-D8		91%				
460-00-4	P-Bromofluorobenzene		93%				

KATAHDIN ANALYTICAL SERVICES
Report of Analytical Results

Client: Tetra Tech NUS, Inc
Project: CTO 241 NAS PENSACOLA
PO No:
Sample Date: 08/27/03
Received Date: 08/28/03
Extraction Date:
Analysis Date: 09/02/03
Report Date: 09/04/2003
Matrix: WATER
% Solids: NA

Lab ID: WT2072-2
Client ID: NASP26GS12
SDG: WT2072
Extracted by:
Extraction Method: SW846 5030
Analyst: JLP
Analysis Method: SW846 8260B
Lab Prep Batch: WG3354
Units: ug/l

CAS#	Compound	Flags	Results	DF	PQL	Adj.PQL	Adj.MDL
71-43-2	Benzene	U	1	1.0	1	1	0.1
108-88-3	Toluene	U	1	1.0	1	1	0.2
100-41-4	Ethylbenzene	U	1	1.0	1	1	0.1
1330-20-7	Xylenes (total)	U	3	1.0	3	3	0.3
	m+p-Xylenes	U	2	1.0	2	2	0.2
95-47-6	o-Xylene	U	1	1.0	1	1	0.2
98-06-6	tert-Butylbenzene	U	1	1.0	1	1	0.6
1868-53-7	Dibromofluoromethane		115%				
17060-07-0	1,2-Dichloroethane-D4		109%				
2037-26-5	Toluene-D8		90%				
460-00-4	P-Bromofluorobenzene		91%				

KATAHDIN ANALYTICAL SERVICES
Report of Analytical Results

Client: Tetra Tech NUS, Inc
Project: CTO 241 NAS PENSACOLA
PO No:
Sample Date: 08/27/03
Received Date: 08/28/03
Extraction Date:
Analysis Date: 09/02/03
Report Date: 09/04/2003
Matrix: WATER
% Solids: NA

Lab ID: WT2072-5
Client ID: NASP26TB082703
SDG: WT2072
Extracted by:
Extraction Method: SW846 5030
Analyst: JLP
Analysis Method: SW846 8260B
Lab Prep Batch: WG3354
Units: ug/l

CAS#	Compound	Flags	Results	DF	PQL	Adj.PQL	Adj.MDL
71-43-2	Benzene	U	1	1.0	1	1	0.1
108-88-3	Toluene	U	1	1.0	1	1	0.2
100-41-4	Ethylbenzene	U	1	1.0	1	1	0.1
1330-20-7	Xylenes (total)	U	3	1.0	3	3	0.3
	m+p-Xylenes	U	2	1.0	2	2	0.2
95-47-6	o-Xylene	U	1	1.0	1	1	0.2
98-06-6	tert-Butylbenzene	U	1	1.0	1	1	0.6
1868-53-7	Dibromofluoromethane		105%				
17060-07-0	1,2-Dichloroethane-D4		94%				
2037-26-5	Toluene-D8		88%				
460-00-4	P-Bromofluorobenzene		91%				

Katahdin
ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: Amy Thomson
Tetra Tech NUS, Inc.
661 Andersen Drive
Foster Plaza 7
Pittsburgh, PA 15220

Lab Sample Id: WT2072-4
Report Date: 9/16/03 12:13:01 PM
Client PO: MSA-0402-N4113-05 N4225-WR373(SS)
Project: CTO 241 NAS PENSACOLA
SDG: WT2072

Sample Description	Matrix	Date Sampled	Date Received
NASP26DUP	AQ	08/27/2003	08/28/2003

Parameter	Result	Adj Pql	Method	Anal Date/Time	By	Prep Method	Prep Date	By	Notes
Sulfate-Turbidimetric	32 mg/L	1.0	EPA 375.4	09/09/03 13:58	PAG	N/A	N/A	N/A	
Total Organic Carbon	3 mg/L	1.0	EPA 415.1	09/08/03 20:18	CYD	N/A	N/A	N/A	

Notes

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel:(207) 874-2400 Fax:(207) 775-4029

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sales@katahdinlab.com

Katahdin
ANALYTICAL SERVICES

Accredited in accordance with nelac
Cert No E87604

Report of Analytical Results

Client: Amy Thomson
Tetra Tech NUS, Inc.
661 Andersen Drive
Foster Plaza 7
Pittsburgh, PA 15220

Lab Sample Id: WT2072-3
Report Date: 9/16/03 12:13:01 PM
Client PO: MSA-0402-N4113-05 N4225-WR373(SS)
Project: CTO 241 NAS PENSACOLA
SDG: WT2072

Sample Description	Matrix	Date Sampled	Date Received
NASP26GS01	AQ	08/27/2003	08/28/2003

Parameter	Result	Adj Pql	Method	Anal Date/Time	By	Prep Method	Prep Date	By	Notes
Sulfate-Turbidimetric	J0.72 mg/L	1.0	EPA 375.4	09/09/03 13:58	PAG	N/A	N/A	N/A	1
Total Organic Carbon	54 mg/L	1.0	EPA 415.1	09/08/03 19:54	CYD	N/A	N/A	N/A	

Notes

(1) 'J' flag denotes an estimated value. The analyte was detected in the sample at a concentration greater than the measured detection limit but less than the laboratory's Practical Quantitation Level.

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Katahdin
ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: Amy Thomson
Tetra Tech NUS, Inc.
661 Andersen Drive
Foster Plaza 7
Pittsburgh, PA 15220

Lab Sample Id: WT2072-1
Report Date: 9/16/03 12:13:01 PM
Client PO: MSA-0402-N4113-05 N4225-WR373(SS)
Project: CTO 241 NAS PENSACOLA
SDG: WT2072

Sample Description	Matrix	Date Sampled	Date Received
NASP26GS10	AQ	08/27/2003	08/28/2003

Parameter	Result	Adj Pql	Method	Anal Date/Time	By	Prep Method	Prep Date	By	Notes
Sulfate-Turbidimetric	17 mg/L	1.0	EPA 375.4	09/09/03 13:58	PAG	N/A	N/A	N/A	
Total Organic Carbon	5.8 mg/L	1.0	EPA 415.1	09/08/03 19:30	CYD	N/A	N/A	N/A	

Notes

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Katahdin
ANALYTICAL SERVICES

Cert No E87604

Report of Analytical Results

Client: Amy Thomson
Tetra Tech NUS, Inc.
661 Andersen Drive
Foster Plaza 7
Pittsburgh, PA 15220

Lab Sample Id: WT2072-2
Report Date: 9/16/03 12:13:01 PM
Client PO: MSA-0402-N4113-05 N4225-WR373(SS)
Project: CTO 241 NAS PENSACOLA
SDG: WT2072

Sample Description	Matrix	Date Sampled	Date Received
NASP26GS12	AQ	08/27/2003	08/28/2003

Parameter	Result	Adj Pql	Method	Anal Date/Time	By	Prep Method	Prep Date	By	Notes
Sulfate-Turbidimetric	25 mg/L	10	EPA 375.4	09/09/03 14:05	PAG	N/A	N/A	N/A	
Total Organic Carbon	3 mg/L	1.0	EPA 415.1	09/08/03 19:42	CYD	N/A	N/A	N/A	

Notes

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel:(207) 874-2400 Fax:(207) 775-4029

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APPENDIX C

SUPPORT DOCUMENTATION

FIELD DUPLICATE PRECISION

ANALYTE	NASP26DUP	NASP26GS12	RPD	DIFFERENCE
Sulfate	32	25	24.56	7
TOC	3	3	0.00	0

WT2084 4m72

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 1

PROJECT NO: N4225	FACILITY: NAS PEN	PROJECT MANAGER Gerry Walker	PHONE NUMBER 850-385-989	LABORATORY NAME AND CONTACT: Katahdin
SAMPLERS (SIGNATURE) Charles Metz		FIELD OPERATIONS LEADER Chuck Metz	PHONE NUMBER 904-636-6125	ADDRESS 340 Country RD # 5
		CARRIER/WAYBILL NUMBER		CITY, STATE Westbrook MA

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

CONTAINER TYPE PLASTIC (P) or GLASS (G): G P P
PRESERVATIVE USED: HCl H_2SO_4

DATE YEAR 2003	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAP (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: VOC	TOC	Sulfate						COMMENTS
8-27	0905	NASP26GS10				GW	G	6	3	2	1						
8-27	0950	NASP26GS12				GW	G	6	3	2	1						
8-27	0915	NASP26GS01				GW	G	6	3	2	1						

1. RELINQUISHED BY Charles Metz	DATE 1730	TIME	1. RECEIVED BY [illegible]	DATE 8/28/03	TIME 0920
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

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

Spada, Bernie

From: Metz, Charles
Sent: Tuesday, September 30, 2003 10:26 AM
To: Spada, Bernie
Subject: RE: Pensacola CTO-241 SDG-WT2072

Bernie,

The duplicate for the sample you listed below was for NASP26GS12.

Chuck

Subject: Pensacola CTO-241 SDG-WT2072

Charles,

Do you know which sample is the duplicate pair for NASP26DUP? It was collected in August.

Bernard F Spada III
Bernard F Spada III
Environmental Scientist
TETRA TECH NUS, Inc.
Foster Plaza 7
661 Andersen Drive
Pittsburgh, PA 15220-2745
Telephone: (412) 921-8729
FAX: (412) 921-4040
spadab@ttnus.com
http://www.ttnus.com
http://www.tetratech.com

WT2072

HOLDING TIME

09/23/03

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
UG/L	NASP26DUP	WT2072-4	NORMAL	WT2072	OV	08/27/03	09/02/03	09/02/03	6	0	6
UG/L	NASP26GS01	WT2072-3	NORMAL	WT2072	OV	08/27/03	09/02/03	09/02/03	6	0	6
UG/L	NASP26GS10	WT2072-1	NORMAL	WT2072	OV	08/27/03	09/02/03	09/02/03	6	0	6
UG/L	NASP26GS12	WT2072-2	NORMAL	WT2072	OV	08/27/03	09/02/03	09/02/03	6	0	6
UG/L	NASP26TB082703	WT2072-5	NORMAL	WT2072	OV	08/27/03	09/02/03	09/02/03	6	0	6
UG/L	WG3354-BLANK	WG3354-2	P BLANK	WT2072	OV	/ /	09/02/03	09/02/03	0	0	0
%	WG3354-LCS	WG3354-1	LCS	WT2072	OV	/ /	09/02/03	09/02/03	0	0	0
MG/L	LABQC	MBLANK	LCS	WT2072	SO4	09/08/03	09/09/03	09/09/03	1	0	1
MG/L	NASP26DUP	WT2072-4	NORMAL	WT2072	SO4	08/27/03	09/09/03	09/09/03	13	0	13
MG/L	NASP26GS01	WT2072-3	NORMAL	WT2072	SO4	08/27/03	09/09/03	09/09/03	13	0	13
MG/L	NASP26GS10	WT2072-1	NORMAL	WT2072	SO4	08/27/03	09/09/03	09/09/03	13	0	13
MG/L	NASP26GS10DUP	WT2072-1 DUP	DUPLICATE	WT2072	SO4	08/27/03	09/09/03	09/09/03	13	0	13
%	NASP26GS10MS	WT2072-1 MS	MS	WT2072	SO4	08/27/03	09/09/03	09/09/03	13	0	13
MG/L	NASP26GS12	WT2072-2	NORMAL	WT2072	SO4	08/27/03	09/09/03	09/09/03	13	0	13
MG/L	LABQC	MBLANK	P BLANK	WT2072	TOC	09/08/03	09/08/03	09/08/03	0	0	0
MG/L	NASP26DUP	WT2072-4	NORMAL	WT2072	TOC	08/27/03	09/08/03	09/08/03	12	0	12
MG/L	NASP26GS01	WT2072-3	NORMAL	WT2072	TOC	08/27/03	09/08/03	09/08/03	12	0	12
%	NASP26GS01MS	WT2072-3 MS	MS	WT2072	TOC	08/27/03	09/08/03	09/08/03	12	0	12
MG/L	NASP26GS10	WT2072-1	NORMAL	WT2072	TOC	08/27/03	09/08/03	09/08/03	12	0	12
MG/L	NASP26GS12	WT2072-2	NORMAL	WT2072	TOC	08/27/03	09/08/03	09/08/03	12	0	12

Katahdin
ANALYTICAL SERVICES

Cert. No. E87604

SDG NARRATIVE
KATAHDIN ANALYTICAL SERVICES
TETRA TECH NUS
CASE NAS PENSACOLA CTO 241
WT2072

Sample Receipt

The following samples were received on August 28, 2003 and were logged in under Katahdin Analytical Services work order number WT2072 for a hardcopy due date of September 23, 2003.

KATAHDIN Sample No.	TTNUS Sample Identification
WT2072-1	NASP26GS10
WT2072-2	NASP26GS12
WT2072-3	NASP26GS01
WT2072-4	NASP26DUP
WT2072-5	NASP26TB082703

The samples were logged in for the analyses specified on the chain of custody form. All problems encountered and resolved during sample receipt have been documented on the applicable chain of custody forms.

Sample analyses have been performed by the methods as noted herein.

Should you have any questions or comments concerning this Report of Analysis, please do not hesitate to contact your Katahdin Analytical Services Project Manager, **Andrea J. Colby**. This narrative is an integral part of the Report of Analysis.

Organics Laboratory

Samples WT2072-1-5 were received on August 28, 2003 and were analyzed for Volatile Organics according to SW-846 method 8260B. Manual integrations may have been performed due to split peaks and/or corrected baselines. All have been flagged with a "M" (software-generated) on the pertinent quantitation reports. The samples were analyzed within holding time, and all QC criteria were acceptable with the following comments:

8260 Analysis:

The reported percent recovery acceptance limits for the Laboratory Control Samples (LCSs) and Matrix Spike Samples (MS and MSD's) are statistically derived. Katahdin standard operating procedure is to not take corrective action until greater than ten percent of the target analytes (with the exception of the common laboratory contaminants acetone and methylene chloride) in the LCS are outside of QC limits.

There were no other protocol deviations or observations noted by the organics laboratory staff.

340 County Road No. 5 • P.O. Box 720, Westbrook, ME 04098 • Tel: (207) 874-2400 • Fax: (207) 775-4029 • www.katahdinlab.com

Katahdin
ANALYTICAL SERVICES

Cert. No. E87604

Wet Chemistry Analysis

The samples of Work Order WT2072 were analyzed in accordance with the specific methods listed on the Report of Analysis.

Analyses for sulfate and total organic carbon were performed according to "Methods for Chemical Analysis of Water and Wastes", EPA 600/4-79-020, 1979 Revised 1983, U.S. EPA.

All Wet Chemistry results were evaluated to Katahdin Analytical Services' Method Detection Limit (MDL). These levels are indicated in the result field of the analytical report. For hits that fall between the MDL and Katahdin's Practical Quantitation Limit (PQL), a "J" flag has been used.

All analyses were performed within analytical hold time.

All quality control criteria were met with the following exceptions:

The Matrix Spike Sample analyzed concurrently with sample WT2072-1 was out of the laboratory acceptance criteria for Sulfate by method EPA375.4. The recovery was 27%. The laboratory acceptance criteria is 75-125%.

No other deviations were noted by the Wet Chemistry group.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Operations Manager or the Quality Assurance Officer as verified by the following signature.

Maria Crouch
09.17.03
María Crouch
Quality Assurance Officer

0000003

KATAHDIN ANALYTICAL SERVICES, INC.
SAMPLE RECEIPT CONDITION REPORT
Tel. (207) 874-2400
Fax (207) 775-4029

LAB (WORK ORDER) # WT2072

PAGE: 1 OF 1

COOLER: 1 OF 1

COC#
SDG#
DATE / TIME RECEIVED: 8/28/03 0920
DELIVERED BY: Fedex
RECEIVED BY: AMB
LIMS ENTRY BY: AM
LIMS REVIEW BY / PM: KL

CLIENT: Tetra tech

PROJECT: NAS Pensacola

	YES	NO	EXCEPTIONS	COMMENTS	RESOLUTION
1. CUSTODY SEALS PRESENT / INTACT?	☑	☐	☐		
2. CHAIN OF CUSTODY PRESENT IN THIS COOLER?	☑	☐	☐		
3. CHAIN OF CUSTODY SIGNED BY CLIENT?	☑	☐	☐		
4. CHAIN OF CUSTODY MATCHES SAMPLES?	☑	☑	☐		
5. TEMPERATURE BLANKS PRESENT?	☑	☐	☐	TEMP BLANK TEMP (°C)= 0.7	
6. SAMPLES RECEIVED AT 4°C +/- 2? ICE / ICE PACKS PRESENT (Y) or N?	☑	☐	☐	COOLER TEMP (°C)= NA (RECORD COOLER TEMP ONLY IF TEMP BLANK IS NOT PRESENT)	
7. VOLATILES FREE OF HEADSPACE?	☑	☐	☐ 1		
8. TRIP BLANK PRESENT IN THIS COOLER	☑	☐	☐		
9. PROPER SAMPLE CONTAINERS AND VOLUME?	☑	☐	☐		
10. SAMPLES WITHIN HOLD TIME UPON RECEIPT?	☑	☐	☐		
11. SAMPLES PROPERLY PRESERVED[1]?	☑	☐	☐		
12. CORRECTIVE ACTION REPORT FILED?	☐	☑	N/A		

13. ANALYTICAL PROGRAMS (CIRCLE ONE) COMMERCIAL CLP HAZWRAP (NFESC) ACOE AFCEE OTHER (STATE OF ORIGIN):

LOG - IN NOTES[1]: Received Nasp-26-Dup + Nasp-26-TB082703 Not on COC Add per Louis Knight 8/28/03.

[1] Use this space (and additional sheets if necessary) to document samples that are received broken or compromised, C-O-C discrepancies, radiation checks, residual chlorine check, results of pH check if required. If samples required pH adjustment, record volume and type of preservative added.

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: KATAHDIN ANALYTICAL SERVICES Lab Code: KAS

Project: CTO 241 NAS PENSACOLA SDG No.: WT2072

Lab File ID: FB232 BFB Injection Date: 08/27/03

Instrument ID: GCMS-F BFB Injection Time: 0819

GC Column: RTX-VMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	26.7
75	30.0 - 60.0% of mass 95	59.9
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.6
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	68.1
175	4.0 - 9.0% of mass 174	4.7 (7.0)1
176	95.0 - 101.0% of mass 174	65.4 (96.0)1
177	5.0 - 9.0% of mass 176	4.2 (6.5)2

1-Value is % mass 174 2-Value is % mass 176

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

	CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		VSTD050F27C	F1374	08/27/03	1319
02		VSTD020F27B	F1375	08/27/03	1401
03		VSTD005F27B	F1376	08/27/03	1454
04		VSTD001F27B	F1377	08/27/03	1526
05		VSTD200F27B	F1378	08/27/03	1559
06		VSTD100F27B	F1379	08/27/03	1632
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM 5
VOLATILE ORGANIC INSTRUMENT PERFORMANCE CHECK
BROMOFLUOROBENZENE (BFB)

Lab Name: KATAHDIN ANALYTICAL SERVICES Lab Code: KAS

Project: CTO 241 NAS PENSACOLA SDG No.: WT2072

Lab File ID: FB235 BFB Injection Date: 09/02/03

Instrument ID: GCMS-F BFB Injection Time: 0851

GC Column: RTX-VMS ID: 0.18 (mm) Heated Purge: (Y/N) N

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	32.0
75	30.0 - 60.0% of mass 95	57.3
95	Base Peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.4
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	52.4
175	4.0 - 9.0% of mass 174	4.5 (8.7)1
176	95.0 - 101.0% of mass 174	51.3 (97.8)1
177	5.0 - 9.0% of mass 176	3.1 (6.0)2

1-Value is % mass 174 2-Value is % mass 176

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

	CLIENT SAMPLE ID	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01		VSTD050F02B	F1422	09/02/03	0956
02	WG3354-LCS	WG3354-1	F1423	09/02/03	1036
03	WG3354-BLANK	WG3354-2	F1425	09/02/03	1156
04	NASP26TB082703	WT2072-5	F1426	09/02/03	1236
05	NASP26GS10	WT2072-1	F1432	09/02/03	1628
06	NASP26GS12	WT2072-2	F1433	09/02/03	1703
07	NASP26GS01	WT2072-3	F1434	09/02/03	1737
08	NASP26DUP	WT2072-4	F1435	09/02/03	1812
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

KATAHDIN ANALYTICAL SERVICES
LAB CONTROL SAMPLE

Client:
Project: CTO 241 NAS PENSACOLA
PO No:
Sample Date:
Received Date:
Extraction Date:
Analysis Date: 09/02/03
Report Date: 09/04/2003
Matrix: WATER

Lab ID: WG3354-1
Client ID: WG3354-LCS
SDG: WT2072
Extracted by:
Extraction Method: SW846 5030
Analyst: JLP
Analysis Method: SW846 8260B
Lab Prep Batch: WG3354
Units: ug/l

COMPOUND	LCS SPIKE	SAMPLE CONC.	LCS CONC.		%REC.	QC. LIMITS
Dichlorodifluoromethane	50	NA	75		150	4-217
Chloromethane	50	NA	45		90	40-163
Vinyl chloride	50	NA	53		106	55-151
Bromomethane	50	NA	39		79	24-217
Chloroethane	50	NA	48		95	69-134
Trichlorofluoromethane	50	NA	57		114	71-147
Diethyl Ether	50	NA	36		72	67-135
Tertiary-butyl alcohol	250	NA	200		80	58-146
1,1-Dichloroethene	50	NA	56		113	78-136
Carbon Disulfide	50	NA	38		77	70-136
Freon-113	50	NA	56		112	60-140
Iodomethane	50	NA	45		90	60-140
Acrolein	250	NA	145		58	0-199
Methylene Chloride	50	NA	47		95	52-115
Acetone	50	NA	46		93	0-158
Isobutyl Alcohol	1000	NA	795		80	60-140
trans-1,2-Dichloroethene	50	NA	56		112	84-131
Allyl Chloride	50	NA	43		87	60-140
Methyl tert-butyl ether	100	NA	78		78	62-130
Acetonitrile	500	NA	292		58	53-141
Di-isopropyl ether	50	NA	40	*	79	82-130
Chloroprene	50	NA	46		92	60-140
Methacrylonitrile	500	NA	325		65	60-140
Propionitrile	500	NA	314		63	60-140
1,1-Dichloroethane	50	NA	52		105	81-134
Acrylonitrile	250	NA	147		59	29-172
Ethyl tertiary-butyl ether	50	NA	40	*	80	85-124
Vinyl Acetate	50	NA	29	*	58	68-174
cis-1,2-Dichloroethene	50	NA	50		99	84-123
1,2-Dichloroethylene (total)	100	NA	106		106	84-131
Methyl Methacrylate	50	NA	32		64	60-140
2,2-Dichloropropane	50	NA	60		121	69-150
Bromochloromethane	50	NA	49		99	77-146
Chloroform	50	NA	52		105	80-130
Carbon Tetrachloride	50	NA	62		124	74-137
Tetrahydrofuran	50	NA	53		105	32-140
1,1,1-Trichloroethane	50	NA	57		113	76-138
1,1-Dichloropropene	50	NA	51		101	82-120
2-Butanone	50	NA	71		142	49-154
Benzene	50	NA	54		107	88-120
Ethyl Methacrylate	50	NA	35		69	60-140
Methyl Acrylate	50	NA	5.9	*	12	60-140
Tertiary-amyl methyl ether	50	NA	39	*	77	85-125
1,2-Dichloroethane	50	NA	50		101	78-138
Trichloroethene	50	NA	53		106	80-125

KATAHDIN ANALYTICAL SERVICES
LAB CONTROL SAMPLE

Client:
Project: CTO 241 NAS PENSACOLA
PO No:
Sample Date:
Received Date:
Extraction Date:
Analysis Date: 09/02/03
Report Date: 09/04/2003
Matrix: WATER

Lab ID: WG3354-1
Client ID: WG3354-LCS
SDG: WT2072
Extracted by:
Extraction Method: SW846 5030
Analyst: JLP
Analysis Method: SW846 8260B
Lab Prep Batch: WG3354
Units: ug/l

COMPOUND	LCS SPIKE	SAMPLE CONC.	LCS CONC.		%REC.	QC. LIMITS
Dibromomethane	50	NA	49		97	88-130
1,2-Dichloropropane	50	NA	50		100	80-122
Bromodichloromethane	50	NA	50		101	83-133
cis-1,3-dichloropropene	50	NA	47		94	81-138
2-Chloroethylvinylether	50	NA	25		50	50-211
Toluene	50	NA	51		101	88-121
4-methyl-2-pentanone	50	NA	50		99	72-140
Tetrachloroethene	50	NA	51		102	77-129
trans-1,3-Dichloropropene	50	NA	48		96	81-149
1,1,2-Trichloroethane	50	NA	47		94	82-126
Dibromochloromethane	50	NA	53		105	80-133
1,3-Dichloropropane	50	NA	48		97	86-125
1,2-Dibromoethane	50	NA	45		90	88-127
2-Hexanone	50	NA	47		95	45-146
Chlorobenzene	50	NA	57		114	84-123
Ethylbenzene	50	NA	56		113	84-134
1,1,1,2-Tetrachloroethane	50	NA	56		113	83-130
Xylenes (total)	150	NA	162		108	88-123
m+p-Xylenes	100	NA	107		107	88-122
o-Xylene	50	NA	55		110	90-123
Styrene	50	NA	51		101	87-131
Bromoform	50	NA	46		91	77-138
Isopropylbenzene	50	NA	58		116	88-125
cis-1,4-Dichloro-2-Butene	50	NA	38		76	60-140
trans-1,4-Dichloro-2-Butene	50	NA	39		79	60-140
Bromobenzene	50	NA	50		99	84-133
N-Propylbenzene	50	NA	54		109	88-124
2-bromo-1-chloropropane	50	NA	51		102	60-140
1,1,2,2-Tetrachloroethane	50	NA	44		87	81-131
1,3,5-Trimethylbenzene	50	NA	55		110	89-124
2-Chlorotoluene	50	NA	55		109	84-128
1,2,3-Trichloropropane	50	NA	44		88	76-132
4-Chlorotoluene	50	NA	58		117	86-132
tert-Butylbenzene	50	NA	54		109	82-131
Pentachloroethane	50	NA	75	*	150	60-140
1,2,4-Trimethylbenzene	50	NA	54		107	88-121
P-Isopropyltoluene	50	NA	59		117	86-122
1,3-Dichlorobenzene	50	NA	56		112	86-124
1,4-Dichlorobenzene	50	NA	54		108	80-127
N-Butylbenzene	50	NA	57		115	81-133
sec-Butylbenzene	50	NA	62	*	124	85-122
1,2-Dichlorobenzene	50	NA	52		104	86-126
1,2-Dibromo-3-Chloropropane	50	NA	42		84	61-136
1,3,5-Trichlorobenzene	50	NA	45		89	67-128
Hexachlorobutadiene	50	NA	61		121	52-129

KATAHDIN ANALYTICAL SERVICES
LAB CONTROL SAMPLE

Client:
Project: CTO 241 NAS PENSACOLA
PO No:
Sample Date:
Received Date:
Extraction Date:
Analysis Date: 09/02/03
Report Date: 09/04/2003
Matrix: WATER

Lab ID: WG3354-1
Client ID: WG3354-LCS
SDG: WT2072
Extracted by:
Extraction Method: SW846 5030
Analyst: JLP
Analysis Method: SW846 8260B
Lab Prep Batch: WG3354
Units: ug/l

COMPOUND	LCS SPIKE	SAMPLE CONC.	LCS CONC.	%REC.	QC. LIMITS
1,2,4-Trichlorobenzene	50	NA	42	84	53-157
1,2,3-Trimethylbenzene	50	NA	46	91	60-140
Naphthalene	50	NA	32	65	45-151
1,2,3-Trichlorobenzene	50	NA	24	49	30-164
Methyl Acetate	50	NA	34	68	60-140
Methylcyclohexane	50	NA	53	105	60-140

Katahdin
ANALYTICAL SERVICES

Cert No E87604

Quality Control Report

Method Blank Summary Report

Company: Tetra Tech NUS, Inc.

Sdg: WT2072

Parameter: Sulfate-Turbidimetric

QC Batch Id: TI10WL8
Anal Method: EPA 375.4 | Anal Date: 09/09/03 | Blank Result: U1.0mg/L
Prep Method: N/A | Prep Date: N/A | Pql: 1.0mg/L
Associated Samples:

Client Sample ID	Lab Sample ID	Analysis Date
LABQC	LCS	09/09/03
LABQC	MBLANK	09/09/03
NASP26GS10	WT2072-1	09/09/03
NASP26GS10	WT2072-1 DUP	09/09/03
NASP26GS10	WT2072-1 MS	09/09/03
NASP26GS01	WT2072-3	09/09/03
NASP26DUP	WT2072-4	09/09/03

QC Batch Id: TI10WL9
Anal Method: EPA 375.4 | Anal Date: 09/09/03 | Blank Result: U1.0mg/L
Prep Method: N/A | Prep Date: N/A | Pql: 1.0mg/L
Associated Samples:

Client Sample ID	Lab Sample ID	Analysis Date
LABQC	LCS	09/09/03
LABQC	MBLANK	09/09/03
NASP26GS12	WT2072-2	09/09/03

Parameter: Total Organic Carbon

QC Batch Id: TI09WL6
Anal Method: EPA 415.1 | Anal Date: 09/08/03 | Blank Result: J0.6338mg/L
Prep Method: N/A | Prep Date: N/A | Pql: 1.0mg/L
Associated Samples:

Client Sample ID	Lab Sample ID	Analysis Date
LABQC	LCS	09/08/03
LABQC	MBLANK	09/08/03
NASP26GS10	WT2072-1	09/08/03
NASP26GS12	WT2072-2	09/08/03
NASP26GS01	WT2072-3	09/08/03
NASP26GS01	WT2072-3 MS	09/08/03
NASP26DUP	WT2072-4	09/08/03

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel:(207) 874-2400 Fax:(207) 775-4029

http://katahdinlab.com

Katahdin
ANALYTICAL SERVICES

Cert No E87604

Quality Control Report

Laboratory Control Sample Report

Company Tetra Tech NUS, Inc.
Sdg WT2072

Qc Batch Id	Anal Date	Prep Date	Units	Spike Amount	Result	Recovery (%)	Recovery Acceptance Range
Parameter: Sulfate-Turbidimetric							
TI10WL8	09/09/03	N/A	mg/L	15.0	15	97	80-120
TI10WL9	09/09/03	N/A	mg/L	15.0	15	99	80-120
Parameter: Total Organic Carbon							
TI09WL6	09/08/03	N/A	mg/L	50.0	51	101	80-120

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel:(207) 874-2400 Fax:(207) 775-4029

http://katahdinlab.com
sales@katahdinlab.com

Katahdin
ANALYTICAL SERVICES

nelac
Cert No E87604

Quality Control Report

Matrix Spike Report

Company: Tetra Tech NUS, Inc.
Sdg: WT2072

Sample	Anal Date	Result	Units	Spike Level	Result	Recovery (%)	Acceptance Range
Parameter: Sulfate-Turbidimetric							
WT2072-1	09/09/03	17	mg/L	10.0	20	*27	75-125
Parameter: Total Organic Carbon							
WT2072-3	09/08/03	54	mg/L	100	160	103	75-125

340 County Road No. 5
P.O. Box 720, Westbrook, ME 04098
Tel:(207) 874-2400 Fax:(207) 775-4029

Katahdin
ANALYTICAL SERVICES

nelac
ert No E87604

Quality Control Report

Sample Duplicate Report

Client: Tetra Tech NUS, Inc.
Sdg: WT2072

Sample	Anal Date	Units	Native Result	Duplicate Result	RPD	Criteria (%)
Sulfate-Turbidimetric						
WT2072-1	09/09/03	mg/L	17	18	2	20

340 County Road No. 5
P.O. Box 720, Westborrk, ME 04098
Tel:(207) 874-2400 Fax:(207) 775-4029

Calibration results Konelab 5.4.24 Page: 1

Laboratory: Katahdin Analytical Services, Inc.
Konelab User

09.09.2003 14:00

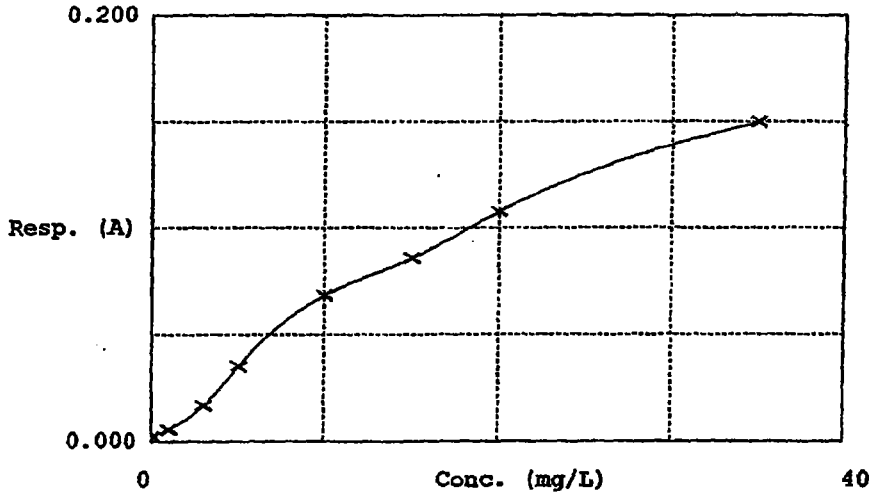
Test SULFATE

CCV TV= 10 PPM
LCS TV= 15 PPM
MS TV= 10 PPM

Accepted 09.09.2003 13:44

Coeff. of det. 1.000000

Errors



	Calibrator	Response	Calc. con.	Conc.	Errors
1	SO4-0	0.002	0.00000	0.00000	
2	SO4-1	0.006	1.00000	1.00000	
3	SO4-3	0.017	3.00000	3.00000	
4	SO4-5	0.035	5.00000	5.00000	
5	SO4-10	0.068	10.00000	10.00000	
6	SO4-15	0.086	15.00000	15.00000	
7	SO4-20	0.108	20.00000	20.00000	
8	SO4-35	0.150	35.00000	35.00000	

PAG
9.9.03

APPENDIX C

ANALYTICAL REPORTS
QUARTERS 1, 2, 3, AND 4

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**G. WALKER**	**DATE:**	**SEPTEMBER 30, 2002**
FROM:	**ETHAN G. LEE**	**COPIES:**	**DV FILE**
SUBJECT:	**ORGANIC DATA VALIDATION –VOC** **NAS PENSACOLA – CTO 241** **SAMPLE DELIVERY GROUP (SDG) – I060191**		
SAMPLES:	4/AQUEOUS/		
	NASP26GS0102 NASP26GS1002 NASP26GS1202		
	NASP TRIPBLANK 090402		

Overview

The sample set for NAS Pensacola, CTO 241, SDG I060191, consists of three (3) aqueous environmental samples and one (1) trip blank.

All samples were analyzed for benzene, ethylbenzene, tert-butylbenzene, toluene, and total xylenes. The samples were collected by Tetra Tech NUS September 4, 2002 and analyzed by Severn Trent Laboratories, Inc. VOC analyses were conducted using method SW846 8260B.

These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • Initial and continuing calibration results
* • Method Blank Analyses
  • Detection Limits

* - All quality control criteria were met for this parameter.

Uncertainty near detection limit

The positive result for ethylbenzene in sample NASP26GS0102 was less than the reporting limit. The result was qualified as estimated (J).

Notes

The sampling time on the chain of custody (COC) did not match the sampling time on the bottles for sample NASP26GS1202. The samples were logged per the COC record.

A dilution was performed for sample NASP26GS0102 resulting in elevated detection limits.

Executive Summary

Laboratory Performance: All quality control criteria were met for this SDG.

Other Factors Affecting Data Quality: Ethylbenzene was qualified due to uncertainty near the detection limit.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (October 1999) and the NFESC document entitled "Navy IRCDQM" (September 1999).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Tetra Tech NUS
Ethan G. Lee
Environmental Scientist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD 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 - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
N01 = Internal Standard Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCD% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity

PROJ_NO: 4225

SDG: I060191 MEDIA: WATER DATA FRACTION: OV

nsample	NASP TRIPBLANK 090402
samp_date	9/4/2002
lab_id	A2I060191004
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	ValQual	QualCode
BENZENE	1.0	U	
ETHYLBENZENE	1.0	U	
TERT-BUTYLBENZENE	1.0	U	
TOLUENE	1.0	U	
TOTAL XYLENES	1.0	U	

nsample	NASP26GS0102
samp_date	9/4/2002
lab_id	A2I060191001
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	ValQual	QualCode
BENZENE	8.0		
ETHYLBENZENE	3.1	J	P
TERT-BUTYLBENZENE	7.4		
TOLUENE	5.0	U	
TOTAL XYLENES	5.0	U	

nsample	NASP26GS1002
samp_date	9/4/2002
lab_id	A2I060191002
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	ValQual	QualCode
BENZENE	6.0		
ETHYLBENZENE	1.0	U	
TERT-BUTYLBENZENE	1.0	U	
TOLUENE	1.0	U	
TOTAL XYLENES	30		

PROJ_NO: 4225

SDG: I060191 MEDIA: WATER DATA FRACTION: OV

nsample	NASP26GS1202
samp_date	9/4/2002
lab_id	A2I060191003
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	ValQual	QualCode
BENZENE	1.0	U	
ETHYLBENZENE	1.0	U	
TERT-BUTYLBENZENE	1.0	U	
TOLUENE	1.0	U	
TOTAL XYLENES	1.0	U	

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**G. WALKER**	**DATE:**	**SEPTEMBER 25, 2002**
FROM:	**ETHAN G. LEE**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION –MISCELLANEOUS PARAMETERS**
NAS PENSACOLA – CTO 241
SAMPLE DELIVERY GROUP (SDG) – I060191

SAMPLES: 3/AQUEOUS/

NASP26GS0102 NASP26GS1002 NASP26GS1202

Overview

The sample set for NAS Pensacola, CTO 241, SDG I060191, consists of three (3) aqueous environmental samples.

All samples were analyzed for sulfate, and total organic carbon (TOC). The samples were collected by Tetra Tech NUS September 4, 2002 and analyzed by Severn Trent Laboratories, Inc. Sulfate analyses were conducted using method EPA 300. TOC analyses were conducted using method EPA 415.1

These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • Method Blank Analyses
* • Detection Limits

* - All quality control criteria were met for this parameter.

Notes

The sampling time on the chain of custody (COC) did not match the sampling time on the bottles for sample NASP26GS1202. The samples were logged per the COC record.

Executive Summary

Laboratory Performance: All quality control criteria were met for this SDG.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", February 1994 and the NFESC document entitled "Navy IRCDQM" (September 1999).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Tetra Tech NUS
Ethan G. Lee
Environmental Scientist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
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APPENDIX A

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D = MS/MSD Noncompliance
E = LCS/LCSD 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 - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
N01 = Internal Standard Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCD% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity

PROJ_NO: 4225

SDG: I060191 MEDIA: WATER DATA FRACTION: MISC

nsample	NASP26GS0102
samp_date	9/4/2002
lab_id	A2I060191001
qc_type	NM
Pct_Solids	0
DUP_OF:	

Parameter	units	Result	Val Qual	Qual Code
SULFATE	UG/L	150		
TOTAL ORGANIC CARBON	UG/L	34000		

nsample	NASP26GS1002
samp_date	9/4/2002
lab_id	A2I060191002
qc_type	NM
Pct_Solids	0
DUP_OF:	

Parameter	units	Result	Val Qual	Qual Code
SULFATE	UG/L	26300		
TOTAL ORGANIC CARBON	UG/L	4600		

nsample	NASP26GS1202
samp_date	9/4/2002
lab_id	A2I060191003
qc_type	NM
Pct_Solids	0
DUP_OF:	

Parameter	units	Result	Val Qual	Qual Code
SULFATE	UG/L	24800		
TOTAL ORGANIC CARBON	UG/L	2800		

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**G. WALKER**	**DATE:**	**JANUARY 14, 2003**
FROM:	**BERNARD F SPADA III**	**COPIES:**	**DV FILE**
SUBJECT:	**ORGANIC DATA VALIDATION- VOC CTO 241, NAS PENSACOLA SDG F15763**		
SAMPLES:	3/Aqueous		

NASP26GS0102 NASP26GS1002 NASP26GS1202

OVERVIEW

The sample set for CTO 241, NAS Pensacola, SDG F15763 consists of three (3) environmental aqueous samples. All samples were analyzed for BTEX plus MTBE volatile organic compounds (VOC) by SW-846 Method 8260B.

The samples were collected by Tetra Tech NUS on December 4, 2002 and analyzed by Accutest Laboratories. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria using SW-846 Method 8260B analytical and reporting protocols. The data contained in this SDG were validated with regard to the following parameters:

* • Data completeness
* • Holding times
* • Initial and continuing calibration
* • Laboratory method and field quality control blank results
* • Detection Limits

The symbol (*) indicates that all 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.

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

Volatile

Positive results less than the reporting limit (RL) were qualified as estimated (J), due to uncertainty near the detection limit.

Additional Comments

The laboratory reported to the MDLs. Positive results >MDL but <RL were qualified as estimated (J) due to uncertainty near the detection limit.

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 NFESC guidelines. The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."

Tetra Tech NUS
Bernard F. Spada III
Chemist/Data Validator

TetraTech NUS
Joseph A. Samchuck
Data Validation Quality Assurance Officer

Attachments:

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E = LCS/LCSD 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 - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
N01 = Internal Standard Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCD% between columns for positive results.
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity

PROJ_NO: 4225

SDG: F15763 MEDIA: WATER DATA FRACTION:

nsample	NASP26GS0102
samp_date	12/4/2002
lab_id	F15763-1
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
BENZENE	0.57	J	P
ETHYLBENZENE	1.1		
TERT-BUTYLBENZENE	12.1		
TOLUENE	0.5	U	
TOTAL XYLENES	1.6	J	P

nsample	NASP26GS1002
samp_date	12/4/2002
lab_id	F15763-2
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
BENZENE	0.5	U	
ETHYLBENZENE	0.7	U	
TERT-BUTYLBENZENE	0.5	U	
TOLUENE	0.5	U	
TOTAL XYLENES	1	U	

nsample	NASP26GS1202
samp_date	12/4/2002
lab_id	F15763-3
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
BENZENE	0.5	U	
ETHYLBENZENE	0.7	U	
TERT-BUTYLBENZENE	0.5	U	
TOLUENE	0.5	U	
TOTAL XYLENES	1	U	

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

Accutest Laboratories

Report of Analysis

Client Sample ID:	NASP26GS0102		
Lab Sample ID:	F15763-1	**Date Sampled:**	12/04/02
Matrix:	AQ - Ground Water	**Date Received:**	12/09/02
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	NAS Pensacola CTO# 241 N4225		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	C0013742.D	1	12/18/02	KW	n/a	n/a	VC604
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.57	1.0	0.50	ug/l	J
98-06-6	tert-Butylbenzene	12.1	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	1.1	1.0	0.70	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
1330-20-7	Xylene (total)	1.6	3.0	1.0	ug/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	96%		86-115%
17060-07-0	1,2-Dichloroethane-D4	96%		78-125%
2037-26-5	Toluene-D8	104%		87-113%
460-00-4	4-Bromofluorobenzene	100%		84-117%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	NASP26GS1002		
Lab Sample ID:	F15763-2	**Date Sampled:**	12/04/02
Matrix:	AQ - Ground Water	**Date Received:**	12/09/02
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	NAS Pensacola CTO# 241 N4225		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B013091.D	1	12/17/02	KW	n/a	n/a	VB579
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.50	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.70	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
1330-20-7	Xylene (total)	ND	3.0	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	93%		86-115%
17060-07-0	1,2-Dichloroethane-D4	90%		78-125%
2037-26-5	Toluene-D8	102%		87-113%
460-00-4	4-Bromofluorobenzene	106%		84-117%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Accutest Laboratories

Report of Analysis

Client Sample ID:	NASP26GS1202		
Lab Sample ID:	F15763-3	**Date Sampled:**	12/04/02
Matrix:	AQ - Ground Water	**Date Received:**	12/09/02
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	NAS Pensacola CTO# 241 N4225		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	B013092.D	1	12/17/02	KW	n/a	n/a	VB579
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA Special List

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.50	ug/l	
98-06-6	tert-Butylbenzene	ND	1.0	0.50	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.70	ug/l	
108-88-3	Toluene	ND	1.0	0.50	ug/l	
1330-20-7	Xylene (total)	ND	3.0	1.0	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	93%		86-115%
17060-07-0	1,2-Dichloroethane-D4	89%		78-125%
2037-26-5	Toluene-D8	103%		87-113%
460-00-4	4-Bromofluorobenzene	108%		84-117%

ND = Not detected MDL - Method Detection Limit J = Indicates an estimated value
RL = Reporting Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

APPENDIX C

SUPPORT DOCUMENTATION

F15763

HOLDING TIME
01/07/03

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
%	F15715-3MS	F15715-3MS	MS	F15763	OV	12/17/02	/ /	12/17/02	0	0	0
%	F15715-3MSD	F15715-3MSD	MSD	F15763	OV	12/17/02	/ /	12/17/02	0	0	0
%	F15785-31MS	F15785-31MS	MS	F15763	OV	12/18/02	/ /	12/18/02	0	0	0
%	F15785-31MSD	F15785-31MSD	MSD	F15763	OV	12/18/02	/ /	12/18/02	0	0	0
%	NASP26GS0102	F15763-1	NORMAL	F15763	OV	12/04/02	/ /	12/18/02	0	0	14
%	NASP26GS1002	F15763-2	NORMAL	F15763	OV	12/04/02	/ /	12/17/02	0	0	13
%	NASP26GS1202	F15763-3	NORMAL	F15763	OV	12/04/02	/ /	12/17/02	0	0	13
%	VB579-BS	VB579-BS	BSP	F15763	OV	12/17/02	/ /	12/17/02	0	0	0
UG/L	VBLK1	VC604-MB	M_BLANK	F15763	OV	12/17/02	/ /	12/18/02	0	0	1
%	VC604-BS	VC604-BS	BSP	F15763	OV	12/18/02	/ /	12/18/02	0	0	0
%	GP3717-B1	GP3717-B1	BSP	F15763	SO4	12/10/02	12/10/02	12/10/02	0	0	0
%	GP3717-D1	GP3717-D1	DUPLICATE	F15763	SO4	12/10/02	12/10/02	12/10/02	0	0	0
%	GP3717-S1	GP3717-S1	MS	F15763	SO4	12/10/02	12/10/02	12/10/02	0	0	0
%	GP3717-S2	GP3717-S2	MSD	F15763	SO4	12/10/02	12/10/02	12/10/02	0	0	0
MG/L	NASP26GS0102	F15763-1	NORMAL	F15763	SO4	12/04/02	12/10/02	12/10/02	6	0	6
MG/L	NASP26GS1002	F15763-2	NORMAL	F15763	SO4	12/04/02	12/10/02	12/10/02	6	0	6
MG/L	NASP26GS1202	F15763-3	NORMAL	F15763	SO4	12/04/02	12/10/02	12/10/02	6	0	6
MG/L	PBW1	GP3717-MB1	M_BLANK	F15763	SO4	12/10/02	12/10/02	12/10/02	0	0	0
%	GN10920-B1	GN10920-B1	BSP	F15763	TOC	12/26/02	/ /	12/26/02	0	0	0
%	GN10920-D1	GN10920-D1	DUPLICATE	F15763	TOC	12/26/02	/ /	12/26/02	0	0	0
%	GN10920-S1	GN10920-S1	MS	F15763	TOC	12/26/02	/ /	12/26/02	0	0	0
%	GN10920-S2	GN10920-S2	MSD	F15763	TOC	12/26/02	/ /	12/26/02	0	0	0
MG/L	NASP26GS0102	F15763-1	NORMAL	F15763	TOC	12/04/02	/ /	12/26/02	0	0	22
MG/L	NASP26GS1002	F15763-2	NORMAL	F15763	TOC	12/04/02	/ /	12/26/02	0	0	22

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
MG/L	NASP26GS1202	F15763-3	NORMAL	F15763	TOC	12/04/02	/ /	12/26/02	0	0	22
MG/L	PBW1	GN10920-MB	M_BLANK	F15763	TOC	12/26/02	/ /	12/26/02	0	0	0

Southeast
ACCUTEST.
Laboratories

01/02/03

Technical Report for

Tetra-Tech, NUS

NAS Pensacola CTO# 241 N4225

N4225 WR 95 UST Site 26

Accutest Job Number: F15763

Report to:

Tetra Tech, NUS
Foster Plaza 7
661 Andersen Drive
Pittsburgh, PA 15220-2745

ATTN: Amy Thomson

Total number of pages in report: 274

ACCREDITED IN ACCORDANCE WITH

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

Harry Behzadi, Ph.D.
Laboratory Director

Certifications: FL (DOH E83510), NC (573), NJ (FL002), MA (FL946), IA (366), LA (03051), KS (E-10327), SC, AK

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Accutest Laboratories Southeast, Inc.
Analytical Narrative

Client:	Tetra Tech, NUS
Site:	NAS Pensacola CTO 241
Report Date:	December 31, 2002
Job Number:	F15763

3 samples were collected on December 04, 2002, and received on December 09, 2002. Samples were properly cooled, preserved and intact. A listing of the Laboratory Sample ID, Client Sample ID, and dates of collection are presented in the Results Summary section of this report.

All method specified holding times, calibrations and quality control performance criteria were met.

Accutest Laboratories Southeast, Inc. certifies that this report meets the project requirements for analytical data produced for the samples as received at the Accutest Laboratories Southeast location as stated in the Analytical Task Order and the COC. In addition, Accutest Laboratories Southeast, Inc. certifies that data as reported meet the Data Quality Objectives for precision, accuracy and completeness as specified in the Accutest Laboratories Southeast, Inc. Quality Manual for other that conditions detailed above. ALSE routinely reports Organic target analytes down to 1/2 the Reporting Level. These positive results are flagged with a "J" qualifier. It is recommended by Accutest Laboratories Southeast, Inc. that this report is to be used in its entirety. Accutest Laboratories Southeast, Inc. is not responsible for any assumptions of data quality if partial data packages are used to interpret data. The Accutest Laboratories Southeast, Inc. Laboratory Director as verified by the signature on the front page has authorized release of this report.

Narrative prepared by:

Date: December 31, 2002

Sue O. Bell, Project Manager (signature on file)

ACCUTEST LABORATORIES SOUTHEAST
SAMPLE RECEIPT CONFIRMATION

Accutest's Job Number: F15763

Client/Project: Tetra Tech / N4225.

Date/Time Received: 12/9/02/1000 Total Number of Coolers 1

Method of Delivery: FedEx Greyhound UPS Pickup Delivery Other

Air Bill Number: 8371 1005 7388

Cooler Temperatures: 0.6

Custody Seals Intact ?	YES	NO	
Trip Blank Provided ?	YES	NO	
Trip Blank on COC ?	YES	NO	
Trip Blank Intact ?	YES	NO	N/A
Chain Of Custody Provided?	YES	NO	
Chain Of Custody Match Bottles?	YES	NO	
Sample Labels Present?	YES	NO	
Are All Bottles Unbroken?	YES	NO	
Are All Appropriate Samples Preserved?	YES	NO	
Correct Containers Used?	YES	NO	
Sufficient Sample Volume?	YES	NO	

Number of Encores: 0

COMMENTS:

Signature: Mura Mohammed Date: 12/9/02.

0006

Revised 04/24/02 ASBD

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER 0252 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
N4225	U ST SITE 26	GERALD WALKER	850-385-2899	ACCUTEST
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		LANE MIDDLETON	904-636-6185	VINELAND CT
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED EX 837110057388		ORLANDO, FL

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

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

PRESERVATIVE USED: HCl, H2SO4, NONE

TYPE OF ANALYSIS: VOC, TOC, SULFATE

	DATE YEAR 2002	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAP (G) COMP (C)	No. OF CONTAINERS	VOC	TOC	SULFATE						COMMENTS
1	12/4	1525	NASP26GS0102	GS01			GW	G	5	3	1	1						COOL TO 4°C
2	12/4	1430	NASP26GS1002	GS10			GW	C	5	3	1	1						
3	12/4		NASP26GS1202	GS12			GW	G	5	3	1	1						CTO 241
																		WORK RELEASE

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	12/6/02	1100	1. RECEIVED BY FED EX		
2. RELINQUISHED BY FED EX			2. RECEIVED BY Muna Mohammed	12/9/02	1000
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

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

4/02R FORM NO. TINUS-001

Instrument Performance Check (BFB)

Job Number: F15763
Account: TETRFLTA Tetra-Tech, NUS
Project: NAS Pensacola CTO# 241 N4225

Sample: VB578-BFB
Lab File ID: B013047.D
Instrument ID: GCMSB
Injection Date: 12/16/02
Injection Time: 08:45

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	15687	27.7		Pass
75	30.0 - 60.0% of mass 95	26589	46.9		Pass
95	Base peak, 100% relative abundance	56717	100.0		Pass
96	5.0 - 9.0% of mass 95	4431	7.8		Pass
173	Less than 2.0% of mass 174	424	0.75	(0.88) [a]	Pass
174	50.0 - 100.0% of mass 95	47997	84.6		Pass
175	5.0 - 9.0% of mass 174	3240	5.7	(6.8) [a]	Pass
176	95.0 - 101.0% of mass 174	45797	80.7	(95.4) [a]	Pass
177	5.0 - 9.0% of mass 176	2969	5.2	(6.5) [b]	Pass

(a) Value is % of mass 174
(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VB578-IC578	B013048.D	12/16/02	09:12	00:27	Initial cal 1
VB578-IC578	B013049.D	12/16/02	09:39	00:54	Initial cal 5
VB578-IC578	B013050.D	12/16/02	10:07	01:22	Initial cal 20
VB578-ICC578	B013051.D	12/16/02	10:34	01:49	Initial cal 40
VB578-IC578	B013052.D	12/16/02	11:01	02:16	Initial cal 70
VB578-IC578	B013053.D	12/16/02	11:29	02:44	Initial cal 100

Response Factor Report MSVOA4

Method : C:\MSDCHEM\1\METHODS\826045.M (RTE Integrator)
Title : EPA 624 & SWA 5030B/8260B
Last Update : Mon Dec 16 12:44:10 2002
Response via : Initial Calibration

KW 12/17/02

Calibration Files
1 =B013048.D 2 =B013049.D 3 =B013050.D
4 =B013051.D 5 =B013052.D 6 =B013053.D

		Compound	1	2	3	4	5	6	Avg	%RS
1)	I	Fluorobenzene	----------	----------	ISTD	----------	----------	----------		
2)		Dichlorodifluoromet		0.433	0.375	0.365	0.362	0.331	0.373	10.02
3)	P	Chloromethane		0.845	0.697	0.682	0.675	0.624	0.705	11.78
4)	C	Vinyl Chloride		0.618	0.527	0.508	0.512	0.461	0.525	10.94
5)		Bromomethane	0.251	0.345	0.271	0.267	0.248	0.228	0.268	15.10
		----- Linear regression ----- Coefficient = 0.9943								
		Response Ratio= 0.01414 + 0.22869 *Amt.ratio								
6)		Chloroethane		0.306	0.252	0.241	0.231	0.211	0.248	14.33
7)		Trichlorofluorometh		0.689	0.546	0.545	0.552	0.512	0.569	12.16
8)		Ethyl Ether	0.221	0.335	0.284	0.279	0.280	0.265	0.277	13.17
9)	C	1,1-Dichloroethene	0.469	0.568	0.488	0.483	0.486	0.468	0.494	7.56
10)		Freon 113	0.244	0.335	0.266	0.265	0.259	0.244	0.269	12.55
11)		Acetone		0.127	0.096	0.095	0.095	0.093	0.101	14.14
12)		Iodomethane	0.092	0.100	0.092	0.095	0.090	0.093	0.094	3.65
13)		Methyl acetate	0.223	0.307	0.257	0.257	0.267	0.270	0.263	10.21
14)		Carbon Disulfide	0.715	1.095	0.901	0.897	0.888	0.865	0.893	13.55
15)		Methylene Chloride	0.553	0.676	0.554	0.537	0.526	0.523	0.561	10.25
16)		trans-1,2-Dichloroe		0.489	0.437	0.440	0.447	0.447	0.452	4.67
17)		Acrylonitrile	0.079	0.091	0.104	0.097	0.102	0.109	0.097	10.89
18)		Methyl Tert Butyl E		0.586	0.564	0.610	0.639	0.658	0.611	6.24
19)		Hexane		0.359	0.336	0.362	0.362	0.348	0.353	3.13
20)	P	1,1-Dichloroethane		0.677	0.547	0.556	0.550	0.556	0.577	9.67
21)		ETBE		0.756	0.790	0.855	0.913	0.941	0.851	9.22
22)		Vinyl acetate		0.300	0.262	0.262	0.277	0.278	0.276	5.65
23)		Di-isopropyl ether		1.167	1.160	1.240	1.299	1.318	1.237	5.91
24)		2,2-Dichloropropane		0.335	0.285	0.283	0.278	0.274	0.291	8.50
25)		cis-1,2-Dichloroeth		0.317	0.282	0.293	0.295	0.294	0.296	4.35
26)		2-Butanone		0.145	0.136	0.137	0.147	0.150	0.143	4.34
27)		Bromochloromethane		0.161	0.141	0.143	0.144	0.143	0.146	5.68
28)	C	Chloroform		0.581	0.483	0.486	0.491	0.496	0.507	8.16
29)		Tetrahydrofuran		0.090	0.082	0.080	0.089	0.093	0.087	6.42
30)		1,1,1-Trichloroetha		0.460	0.368	0.378	0.381	0.383	0.394	9.46
31)	S	Dibromofluoromethan	0.275	0.273	0.269	0.274	0.268	0.269	0.271	1.09
32)		Cyclohexane		0.491	0.493	0.521	0.526	0.510	0.508	3.13
33)		1,1-Dichloropropene		0.332	0.308	0.332	0.333	0.334	0.328	3.36
34)		Carbon Tetrachlorid		0.336	0.287	0.297	0.312	0.318	0.310	6.09
35)	S	1,2-Dichloroethane-	0.311	0.313	0.321	0.314	0.326	0.343	0.321	3.78
36)		TAME		0.645	0.622	0.660	0.720	0.756	0.681	8.18
37)		Benzene	1.170	1.302	1.096	1.100	1.106	1.119	1.149	6.94
38)		1,2-Dichloroethane	0.412	0.479	0.388	0.398	0.399	0.404	0.414	7.99
39)		Trichloroethene	0.217	0.274	0.241	0.254	0.265	0.264	0.253	8.31

(#) = Out of Range

Response Factor Report MSVOA4

Method : C:\MSDCHEM\1\METHODS\826045.M (RTE Integrator)
Title : EPA 624 & SWA 5030B/8260B
Last Update : Mon Dec 16 12:44:10 2002
Response via : Initial Calibration

Calibration Files
1 =B013048.D 2 =B013049.D 3 =B013050.D
4 =B013051.D 5 =B013052.D 6 =B013053.D

		Compound	1	2	3	4	5	6	Avg	%RS
40)		Methylcyclohexane		0.314	0.332	0.362	0.364	0.349	0.344	6.12
41)	C	1,2-Dichloropropane		0.355	0.305	0.308	0.312	0.313	0.319	6.49
42)		Dibromomethane		0.196	0.169	0.170	0.171	0.171	0.175	6.61
43)		Bromodichloromethan	0.266	0.397	0.347	0.346	0.351	0.359	0.344	12.44
44)		2-Nitropropane		0.092	0.084	0.082	0.088	0.090	0.087	4.51
45)		2-Chloroethyl vinyl		0.096	0.106	0.112	0.121	0.124	0.112	9.95
46)		4-Methyl-2-pentanon		0.309	0.311	0.322	0.350	0.355	0.329	6.58
47)		cis-1,3-Dichloropro		0.403	0.396	0.422	0.441	0.448	0.422	5.42
48)	I	Chlorobenzene-d5	----------ISTD----------							
49)	S	Toluene-d8	1.297	1.292	1.280	1.261	1.258	1.267	1.276	1.30
50)	C	Toluene		1.654	1.435	1.451	1.480	1.506	1.505	5.81
51)		trans-1,3-Dichlorop		0.442	0.432	0.469	0.489	0.504	0.467	6.51
52)		1,1,2-Trichloroetha	0.209	0.291	0.248	0.252	0.256	0.255	0.252	10.40
53)		Tetrachloroethene		0.357	0.323	0.332	0.343	0.341	0.339	3.79
54)		2-hexanone		0.230	0.248	0.260	0.286	0.294	0.264	10.11
55)		1,3-Dichloropropane		0.600	0.518	0.514	0.527	0.531	0.538	6.59
56)		Dibromochloromethan		0.365	0.328	0.333	0.348	0.363	0.348	4.81
57)		1,2-Dibromoethane		0.312	0.279	0.289	0.302	0.306	0.298	4.51
58)		1-Chlorohexane		0.334	0.367	0.409	0.427	0.422	0.392	10.26
59)	P	Chlorobenzene		1.137	0.959	0.981	0.984	0.987	1.010	7.14
60)		1,1,1,2-Tetrachloro		0.365	0.337	0.340	0.352	0.359	0.350	3.44
61)	C	Ethylbenzene		1.645	1.534	1.601	1.650	1.696	1.625	3.76
62)		m,p-Xylene		1.242	1.183	1.242	1.337	1.381	1.277	6.25
63)		o-Xylene		1.083	1.161	1.255	1.343	1.405	1.249	10.47
64)		Styrene		0.924	0.959	1.019	1.069	1.117	1.018	7.73
65)	P	Bromoform		0.227	0.200	0.207	0.233	0.241	0.222	7.79
66)	I	1,4-Dichlorobenzene-d	----------ISTD----------							
67)		Isopropylbenzene		2.402	2.550	2.681	2.757	2.742	2.627	5.70
68)	S	4-Bromofluorobenzen	0.984	0.934	0.932	0.916	0.930	0.919	0.936	2.62
69)		Bromobenzene		0.885	0.789	0.779	0.792	0.790	0.807	5.42
70)	P	1,1,2,2-Tetrachloro	0.651	0.931	0.742	0.707	0.723	0.704	0.743	13.09
71)		trans-1,4-Dichloro-		0.258	0.255	0.261	0.286	0.290	0.270	6.21
72)		1,2,3-Trichloroprop	0.198	0.247	0.209	0.206	0.216	0.213	0.215	7.78
73)		n-Propylbenzene		3.723	3.494	3.562	3.729	3.746	3.651	3.14
74)		2-Chlorotoluene		2.649	2.441	2.427	2.553	2.588	2.532	3.79
75)		4-Chlorotoluene		2.084	2.031	2.077	2.178	2.191	2.112	3.27
76)		1,3,5-Trimethylbenz		2.225	2.241	2.330	2.459	2.497	2.350	5.27
77)		sec-Butylbenzene		2.569	2.625	2.752	2.834	2.761	2.708	4.00
78)		1,3-Dichlorobenzene		1.441	1.322	1.349	1.415	1.399	1.385	3.51
79)		4-Isopropyltoluene		1.949	2.087	2.187	2.308	2.272	2.161	6.74
80)		1,4-Dichlorobenzene	1.161	1.663	1.439	1.423	1.462	1.448	1.433	11.16

(#) = Out of Range

Response Factor Report MSVOA4

Method : C:\MSDCHEM\1\METHODS\826045.M (RTE Integrator)
Title : EPA 624 & SWA 5030B/8260B
Last Update : Mon Dec 16 12:44:10 2002
Response via : Initial Calibration

Calibration Files
1 =B013048.D 2 =B013049.D 3 =B013050.D
4 =B013051.D 5 =B013052.D 6 =B013053.D

		Compound	1	2	3	4	5	6	Avg	%RS
81)		tert-Butylbenzene		1.239	1.216	1.246	1.329	1.320	1.270	4.03
82)		Benzyl Chloride		1.212	1.125	1.167	1.265	1.254	1.205	4.90
83)		n-Butylbenzene		1.959	1.938	2.066	2.153	2.122	2.048	4.70
84)		1,2-Dichlorobenzene		1.365	1.240	1.288	1.350	1.328	1.314	3.83
85)		1,2,4-Trimethylbenz		2.330	2.284	2.375	2.463	2.479	2.386	3.52
86)		1,2-Dibromo-3-Chlor	0.138	0.119	0.111	0.102	0.104	0.105	0.113	12.04
87)		1,2,4-Trichlorobenz		0.629	0.615	0.649	0.704	0.712	0.662	6.68
88)		Hexachlorobutadiene	0.222	0.325	0.272	0.272	0.280	0.281	0.275	11.85
89)		Naphthalene		1.307	1.417	1.506	1.652	1.694	1.515	10.62
90)		1,2,3-Trichlorobenz		0.612	0.563	0.580	0.616	0.631	0.600	4.68
91)	I	Tert Butyl alcohol-d1		----------ISTD----------						
92)		Acrolein		2.490	2.347	2.210	3.066	2.942	2.611	14.35
93)		Tert-Butyl Alcohol		2.212	1.757	1.962	1.943	1.918	1.958	8.33
94)		1,4-Dioxane		0.189	0.176	0.189	0.189	0.195	0.188	3.73
95)		Cyclohexanone		0.920	0.726	0.721	0.710	0.707	0.757	12.12

(#) = Out of Range

Evaluate Continuing Calibration Report

Data File : C:\MSDCHEM\1\DATA\121602\B013054.D Vial: 7
Acq On : 16 Dec 2002 11:56 am Operator: Karenw
Sample : ICV578-40 Inst : MSVOA4
Misc : Multiplr: 1.00
MS Integration Params: Rteint.p

Method : C:\MSDCHEM\1\METHODS\826045.M (RTE Integrator)
Title : EPA 624 & SWA 5030B/8260B
Last Update : Mon Dec 16 12:44:10 2002
Response via : Multiple Level Calibration

KW 12/17/02

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	I	Fluorobenzene	1.000	1.000	0.0	118	0.00
2		Dichlorodifluoromethane	0.373	0.337	9.7	109	0.00
3	P	Chloromethane	0.705	0.607	13.9	105	0.00
4	C	Vinyl Chloride	0.525	0.472	10.1	110	0.00
5		Bromomethane	0.268	0.240	10.4	106	0.00
6		Chloroethane	0.248	0.211	14.9	104	0.00
7		Trichlorofluoromethane	0.569	0.513	9.8	111	0.00
8		Ethyl Ether	0.277	0.023	91.7#	10#	0.00
9	C	1,1-Dichloroethene	0.494	0.457	7.5	112	0.00
10		Freon 113	0.269	0.271	-0.7	121	0.00
11		Acetone	0.101	0.091	9.9	112	0.00
12		Iodomethane	0.094	0.411	-337.2#	509#	0.07
13		Methyl acetate	0.263	0.231	12.2	106	0.00
14		Carbon Disulfide	0.893	0.821	8.1	108	0.00
15		Methylene Chloride	0.561	0.506	9.8	111	0.00
16		trans-1,2-Dichloroethene	0.452	0.407	10.0	109	0.00
17		Acrylonitrile	0.097	0.095	2.1	116	0.00
18		Methyl Tert Butyl Ether	0.611	0.628	-2.8	121	0.00
19		Hexane	0.353	0.366	-3.7	119	0.00
20	P	1,1-Dichloroethane	0.577	0.536	7.1	114	0.00
21		ETBE	0.851	0.899	-5.6	124	0.00
22		Vinyl acetate	0.276	4.401	-1494.6#	1978#	0.00
23		Di-isopropyl ether	1.237	1.297	-4.9	123	0.00
24		2,2-Dichloropropane	0.291	0.289	0.7	120	0.00
25		cis-1,2-Dichloroethene	0.296	0.289	2.4	116	0.00
26		2-Butanone	0.143	0.136	4.9	117	0.00
27		Bromochloromethane	0.146	0.141	3.4	116	0.00
28	C	Chloroform	0.507	0.472	6.9	114	0.00
29		Tetrahydrofuran	0.087	0.085	2.3	125	0.00
30		1,1,1-Trichloroethane	0.394	0.371	5.8	116	0.00
31	S	Dibromofluoromethane	0.271	0.271	0.0	117	0.00
32		Cyclohexane	0.508	0.519	-2.2	117	0.00
33		1,1-Dichloropropene	0.328	0.332	-1.2	118	0.00
34		Carbon Tetrachloride	0.310	0.299	3.5	118	0.00
35	S	1,2-Dichloroethane-d4	0.321	0.317	1.2	119	0.00
36		TAME	0.681	0.711	-4.4	127	0.00
37		Benzene	1.149	1.059	7.8	114	0.00
38		1,2-Dichloroethane	0.414	0.380	8.2	112	0.00
39		Trichloroethene	0.253	0.250	1.2	116	0.00

(#) = Out of Range

Evaluate Continuing Calibration Report

Data File : C:\MSDCHEM\1\DATA\121602\B013054.D Vial: 7
Acq On : 16 Dec 2002 11:56 am Operator: Karenw
Sample : ICV578-40 Inst : MSVOA4
Misc : Multiplr: 1.00
MS Integration Params: Rteint.p

Method : C:\MSDCHEM\1\METHODS\826045.M (RTE Integrator)
Title : EPA 624 & SWA 5030B/8260B
Last Update : Mon Dec 16 12:44:10 2002
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
40		Methylcyclohexane	0.344	0.370	-7.6	121	0.00
41	C	1,2-Dichloropropane	0.319	0.307	3.8	118	0.00
42		Dibromomethane	0.175	0.162	7.4	112	0.00
43		Bromodichloromethane	0.344	0.343	0.3	117	0.00
44		2-Nitropropane	0.087	0.081	6.9	117	0.00
45		2-Chloroethyl vinyl ether	0.112	0.132	-17.9	139	0.00
46		4-Methyl-2-pentanone	0.329	0.316	4.0	115	0.00
47		cis-1,3-Dichloropropene	0.422	0.398	5.7	111	0.00
48	I	Chlorobenzene-d5	1.000	1.000	0.0	115	0.00
49	S	Toluene-d8	1.276	1.256	1.6	115	0.00
50	C	Toluene	1.505	1.414	6.0	112	0.00
51		trans-1,3-Dichloropropene	0.467	0.434	7.1	107	0.00
52		1,1,2-Trichloroethane	0.252	0.248	1.6	114	0.00
53		Tetrachloroethene	0.339	0.342	-0.9	119	0.00
54		2-hexanone	0.264	0.260	1.5	115	0.00
55		1,3-Dichloropropane	0.538	0.508	5.6	114	0.00
56		Dibromochloromethane	0.348	0.341	2.0	118	0.00
57		1,2-Dibromoethane	0.298	0.292	2.0	117	0.00
58		1-Chlorohexane	0.392	0.429	-9.4	121	0.00
59	P	Chlorobenzene	1.010	0.953	5.6	112	0.00
60		1,1,1,2-Tetrachloroethane	0.350	0.335	4.3	114	0.00
61	C	Ethylbenzene	1.625	1.530	5.8	110	0.00
62		m,p-Xylene	1.277	1.241	2.8	115	0.00
63		o-Xylene	1.249	1.233	1.3	113	0.00
64		Styrene	1.018	1.008	1.0	114	0.00
65	P	Bromoform	0.222	0.221	0.5	123	0.00
66	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	115	0.00
67		Isopropylbenzene	2.627	2.725	-3.7	116	0.00
68	S	4-Bromofluorobenzene	0.936	0.923	1.4	115	0.00
69		Bromobenzene	0.807	0.777	3.7	114	0.00
70	P	1,1,2,2-Tetrachloroethane	0.743	0.696	6.3	113	0.00
71		trans-1,4-Dichloro-2-Butene	0.270	0.270	0.0	119	0.00
72		1,2,3-Trichloropropane	0.215	0.205	4.7	114	0.00
73		n-Propylbenzene	3.651	3.543	3.0	114	0.00
74		2-Chlorotoluene	2.532	2.389	5.6	113	0.00
75		4-Chlorotoluene	2.112	2.053	2.8	113	0.00
76		1,3,5-Trimethylbenzene	2.350	2.348	0.1	115	0.00

(#) = Out of Range

Evaluate Continuing Calibration Report

Data File : C:\MSDCHEM\1\DATA\121602\B013054.D Vial: 7
Acq On : 16 Dec 2002 11:56 am Operator: Karenw
Sample : ICV578-40 Inst : MSVOA4
Misc : Multiplr: 1.00
MS Integration Params: Rteint.p

Method : C:\MSDCHEM\1\METHODS\826045.M (RTE Integrator)
Title : EPA 624 & SWA 5030B/8260B
Last Update : Mon Dec 16 12:44:10 2002
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

	Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
77	sec-Butylbenzene	2.708	2.848	-5.2	119	0.00
78	1,3-Dichlorobenzene	1.385	1.385	0.0	118	0.00
79	4-Isopropyltoluene	2.161	2.283	-5.6	120	0.00
80	1,4-Dichlorobenzene	1.433	1.454	-1.5	117	0.00
81	tert-Butylbenzene	1.270	1.273	-0.2	117	0.00
82	Benzyl Chloride	1.205	0.101	91.6#	10#	0.00
83	n-Butylbenzene	2.048	2.078	-1.5	115	0.00
84	1,2-Dichlorobenzene	1.314	1.301	1.0	116	0.00
85	1,2,4-Trimethylbenzene	2.386	2.447	-2.6	118	0.00
86	1,2-Dibromo-3-Chloropropane	0.113	0.103	8.8	116	0.00
87	1,2,4-Trichlorobenzene	0.662	0.709	-7.1	125	0.00
88	Hexachlorobutadiene	0.275	0.309	-12.4	130	0.00
89	Naphthalene	1.515	1.645	-8.6	125	0.00
90	1,2,3-Trichlorobenzene	0.600	0.634	-5.7	125	0.00
91 I	Tert Butyl alcohol-d10	1.000	1.000	0.0	127	0.00
92	Acrolein	2.611	3.514	-34.6#	202#	0.00
93	Tert-Butyl Alcohol	1.958	1.927	1.6	125	0.00
94	1,4-Dioxane	0.188	0.197	-4.8	133	0.00
95	Cyclohexanone	0.757	0.627	17.2	111	0.00

Average % D = 27.3232

Volatile Surrogate Recovery Summary

Job Number: F15763
Account: TETRFLTA Tetra-Tech, NUS
Project: NAS Pensacola CTO# 241 N4225

Method: SW846 8260B **Matrix:** AQ

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3	S4
F15763-1	C0013742.D	96.0	96.0	104.0	100.0
F15763-2	B013091.D	93.0	90.0	102.0	106.0
F15763-3	B013092.D	93.0	89.0	103.0	108.0
F15715-3MS	B013088.D	95.0	102.0	101.0	105.0
F15715-3MSD	B013089.D	94.0	99.0	102.0	104.0
F15785-31MS	C0013740.D	98.0	98.0	99.0	96.0
F15785-31MSD	C0013741.D	99.0	98.0	101.0	98.0
VB579-BS	B013077.D	100.0	100.0	102.0	100.0
VB579-MB	B013078.D	99.0	96.0	105.0	111.0
VC604-BS	C0013736.D	98.0	94.0	100.0	98.0
VC604-MB	C0013737.D	98.0	96.0	102.0	101.0

Surrogate Compounds	Recovery Limits
S1 = Dibromofluoromethane	86-115%
S2 = 1,2-Dichloroethane-D4	78-125%
S3 = Toluene-D8	87-113%
S4 = 4-Bromofluorobenzene	84-117%

Instrument Performance Check (BFB)

Job Number: F15763
Account: TETRFLTA Tetra-Tech, NUS
Project: NAS Pensacola CTO# 241 N4225

Sample:	VB579-BFB	**Injection Date:**	12/17/02
Lab File ID:	B013075.D	**Injection Time:**	10:47
Instrument ID:	GCMSB		

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	12880	27.9		Pass
75	30.0 - 60.0% of mass 95	23218	50.3		Pass
95	Base peak, 100% relative abundance	46189	100.0		Pass
96	5.0 - 9.0% of mass 95	3294	7.1		Pass
173	Less than 2.0% of mass 174	183	0.4	(0.45) [a]	Pass
174	50.0 - 100.0% of mass 95	40944	88.6		Pass
175	5.0 - 9.0% of mass 174	3007	6.5	(7.3) [a]	Pass
176	95.0 - 101.0% of mass 174	39661	85.9	(96.9) [a]	Pass
177	5.0 - 9.0% of mass 176	2621	5.7	(6.6) [b]	Pass

(a) Value is % of mass 174
(b) Value is % of mass 176

This check applies to the following Samples, MS, MSD, Blanks, and Standards:

Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed	Hours Lapsed	Client Sample ID
VB579-CC578	B013076.D	12/17/02	11:12	00:25	Continuing cal 40
VB579-BS	B013077.D	12/17/02	11:39	00:52	Blank Spike
VB579-MB	B013078.D	12/17/02	12:07	01:20	Method Blank
ZZZZZZ	B013080.D	12/17/02	13:03	02:16	(unrelated sample)
F15715-3	B013081.D	12/17/02	13:30	02:43	(used for QC only; not part of job F15763)
ZZZZZZ	B013082.D	12/17/02	13:58	03:11	(unrelated sample)
ZZZZZZ	B013083.D	12/17/02	14:25	03:38	(unrelated sample)
ZZZZZZ	B013084.D	12/17/02	14:52	04:05	(unrelated sample)
ZZZZZZ	B013086.D	12/17/02	15:46	04:59	(unrelated sample)
ZZZZZZ	B013087.D	12/17/02	16:15	05:28	(unrelated sample)
F15715-3MS	B013088.D	12/17/02	16:42	05:55	Matrix Spike
F15715-3MSD	B013089.D	12/17/02	17:09	06:22	Matrix Spike Duplicate
F15763-2	B013091.D	12/17/02	18:05	07:18	NASP26GS1002
F15763-3	B013092.D	12/17/02	18:32	07:45	NASP26GS1202
ZZZZZZ	B013093.D	12/17/02	19:00	08:13	(unrelated sample)
ZZZZZZ	B013094.D	12/17/02	19:27	08:40	(unrelated sample)
ZZZZZZ	B013095.D	12/17/02	19:54	09:07	(unrelated sample)
ZZZZZZ	B013096.D	12/17/02	20:21	09:34	(unrelated sample)
ZZZZZZ	B013097.D	12/17/02	20:48	10:01	(unrelated sample)
ZZZZZZ	B013098.D	12/17/02	21:15	10:28	(unrelated sample)
ZZZZZZ	B013099.D	12/17/02	21:43	10:56	(unrelated sample)
ZZZZZZ	B013100.D	12/17/02	22:10	11:23	(unrelated sample)
ZZZZZZ	B013101.D	12/17/02	22:37	11:50	(unrelated sample)

Evaluate Continuing Calibration Report

Data File : C:\MSDCHEM\1\DATA\121702\B013076.D Vial: 1
Acq On : 17 Dec 2002 11:12 am Operator: Karenw
Sample : CC578-40 Inst : MSVOA4
Misc : ms1959,vb579,,,,, Multiplr: 1.00
MS Integration Params: Rteint.p

Method : C:\MSDCHEM\1\METHODS\826045.M (RTE Integrator)
Title : EPA 624 & SWA 5030B/8260B
Last Update : Mon Dec 16 12:44:10 2002
Response via : Multiple Level Calibration

KW 12/18/02

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	I	Fluorobenzene	1.000	1.000	0.0	87	0.00
2		Dichlorodifluoromethane	0.373	0.303	18.8	72	0.00
3	P	Chloromethane	0.705	0.571	19.0	73	0.00
4	C	Vinyl Chloride	0.525	0.447	14.9	77	0.00
5		Bromomethane	0.268	0.254	5.2	83	0.00
6		Chloroethane	0.248	0.225	9.3	81	0.00
7		Trichlorofluoromethane	0.569	0.525	7.7	84	0.00
8		Ethyl Ether	0.277	0.266	4.0	83	0.00
9	C	1,1-Dichloroethene	0.494	0.452	8.5	81	0.00
10		Freon 113	0.269	0.250	7.1	82	0.00
11		Acetone	0.101	0.086	14.9	78	0.00
12		Iodomethane	0.094	0.078	17.0	71	0.00
13		Methyl acetate	0.263	0.237	9.9	80	0.00
14		Carbon Disulfide	0.893	0.829	7.2	80	0.00
15		Methylene Chloride	0.561	0.516	8.0	84	0.00
16		trans-1,2-Dichloroethene	0.452	0.415	8.2	82	0.00
17		Acrylonitrile	0.097	0.094	3.1	84	0.00
18		Methyl Tert Butyl Ether	0.611	0.561	8.2	80	0.00
19		Hexane	0.353	0.333	5.7	80	-0.01
20	P	1,1-Dichloroethane	0.577	0.527	8.7	82	0.00
21		ETBE	0.851	0.794	6.7	81	0.00
22		Vinyl acetate	0.276	0.287	-4.0	95	0.00
23		Di-isopropyl ether	1.237	1.169	5.5	82	0.00
24		2,2-Dichloropropane	0.291	0.263	9.6	81	0.00
25		cis-1,2-Dichloroethene	0.296	0.272	8.1	81	0.00
26		2-Butanone	0.143	0.127	11.2	81	0.00
27		Bromochloromethane	0.146	0.130	11.0	79	0.00
28	C	Chloroform	0.507	0.457	9.9	82	0.00
29		Tetrahydrofuran	0.087	0.075	13.8	82	0.00
30		1,1,1-Trichloroethane	0.394	0.349	11.4	80	0.00
31	S	Dibromofluoromethane	0.271	0.274	-1.1	87	0.00
32		Cyclohexane	0.508	0.470	7.5	78	0.00
33		1,1-Dichloropropene	0.328	0.299	8.8	78	0.00
34		Carbon Tetrachloride	0.310	0.301	2.9	88	0.00
35	S	1,2-Dichloroethane-d4	0.321	0.317	1.2	88	0.00
36		TAME	0.681	0.615	9.7	81	0.00
37		Benzene	1.149	1.044	9.1	83	0.00
38		1,2-Dichloroethane	0.414	0.373	9.9	82	0.00
39		Trichloroethene	0.253	0.237	6.3	81	0.00

(#) = Out of Range

Evaluate Continuing Calibration Report

Data File : C:\MSDCHEM\1\DATA\121702\B013076.D Vial: 1
Acq On : 17 Dec 2002 11:12 am Operator: Karenw
Sample : CC578-40 Inst : MSVOA4
Misc : ms1959,vb579,,,,, Multiplr: 1.00
MS Integration Params: Rteint.p

Method : C:\MSDCHEM\1\METHODS\826045.M (RTE Integrator)
Title : EPA 624 & SWA 5030B/8260B
Last Update : Mon Dec 16 12:44:10 2002
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
40		Methylcyclohexane	0.344	0.322	6.4	77	0.00
41	C	1,2-Dichloropropane	0.319	0.296	7.2	84	0.00
42		Dibromomethane	0.175	0.160	8.6	82	0.00
43		Bromodichloromethane	0.344	0.339	1.5	85	0.00
44		2-Nitropropane	0.087	0.077	11.5	81	0.00
45		2-Chloroethyl vinyl ether	0.112	0.080	28.6#	62	0.00
46		4-Methyl-2-pentanone	0.329	0.299	9.1	81	0.00
47		cis-1,3-Dichloropropene	0.422	0.404	4.3	83	0.00
48	I	Chlorobenzene-d5	1.000	1.000	0.0	83	0.00
49	S	Toluene-d8	1.276	1.314	-3.0	87	0.00
50	C	Toluene	1.505	1.449	3.7	83	0.00
51		trans-1,3-Dichloropropene	0.467	0.466	0.2	83	0.00
52		1,1,2-Trichloroethane	0.252	0.250	0.8	83	0.00
53		Tetrachloroethene	0.339	0.320	5.6	80	0.00
54		2-hexanone	0.264	0.249	5.7	80	0.00
55		1,3-Dichloropropane	0.538	0.515	4.3	84	0.00
56		Dibromochloromethane	0.348	0.337	3.2	84	0.00
57		1,2-Dibromoethane	0.298	0.286	4.0	82	0.00
58		1-Chlorohexane	0.392	0.391	0.3	80	0.00
59	P	Chlorobenzene	1.010	0.971	3.9	83	0.00
60		1,1,1,2-Tetrachloroethane	0.350	0.352	-0.6	86	0.00
61	C	Ethylbenzene	1.625	1.585	2.5	83	0.00
62		m,p-Xylene	1.277	1.236	3.2	83	0.00
63		o-Xylene	1.249	1.262	-1.0	84	0.00
64		Styrene	1.018	1.027	-0.9	84	0.00
65	P	Bromoform	0.222	0.211	5.0	85	0.00
66	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	85	0.00
67		Isopropylbenzene	2.627	2.607	0.8	82	0.00
68	S	4-Bromofluorobenzene	0.936	0.906	3.2	84	0.00
69		Bromobenzene	0.807	0.827	-2.5	90	0.00
70	P	1,1,2,2-Tetrachloroethane	0.743	0.700	5.8	84	0.00
71		trans-1,4-Dichloro-2-Butene	0.270	0.250	7.4	81	0.00
72		1,2,3-Trichloropropane	0.215	0.199	7.4	82	0.00
73		n-Propylbenzene	3.651	3.501	4.1	83	0.00
74		2-Chlorotoluene	2.532	2.415	4.6	84	0.00
75		4-Chlorotoluene	2.112	2.077	1.7	85	0.00
76		1,3,5-Trimethylbenzene	2.350	2.313	1.6	84	0.00

(#) = Out of Range

Evaluate Continuing Calibration Report

Data File : C:\MSDCHEM\1\DATA\121702\B013076.D Vial: 1
Acq On : 17 Dec 2002 11:12 am Operator: Karenw
Sample : CC578-40 Inst : MSVOA4
Misc : ms1959,vb579,,,,, Multiplr: 1.00
MS Integration Params: Rteint.p

Method : C:\MSDCHEM\1\METHODS\826045.M (RTE Integrator)
Title : EPA 624 & SWA 5030B/8260B
Last Update : Mon Dec 16 12:44:10 2002
Response via : Multiple Level Calibration

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 20% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
77		sec-Butylbenzene	2.708	2.652	2.1	82	0.00
78		1,3-Dichlorobenzene	1.385	1.364	1.5	86	0.00
79		4-Isopropyltoluene	2.161	2.154	0.3	83	0.00
80		1,4-Dichlorobenzene	1.433	1.422	0.8	85	0.00
81		tert-Butylbenzene	1.270	1.227	3.4	83	0.00
82		Benzyl Chloride	1.205	1.188	1.4	86	0.00
83		n-Butylbenzene	2.048	1.999	2.4	82	0.00
84		1,2-Dichlorobenzene	1.314	1.298	1.2	85	0.00
85		1,2,4-Trimethylbenzene	2.386	2.359	1.1	84	0.00
86		1,2-Dibromo-3-Chloropropane	0.113	0.092	18.6	77	0.00
87		1,2,4-Trichlorobenzene	0.662	0.654	1.2	85	0.00
88		Hexachlorobutadiene	0.275	0.279	-1.5	87	0.00
89		Naphthalene	1.515	1.370	9.6	77	0.00
90		1,2,3-Trichlorobenzene	0.600	0.585	2.5	85	0.00
91	I	Tert Butyl alcohol-d10	1.000	1.000	0.0	82	0.00
92		Acrolein	2.611	3.004	-15.1	112	0.00
93		Tert-Butyl Alcohol	1.958	1.790	8.6	75	0.00
94		1,4-Dioxane	0.188	0.185	1.6	81	0.00
95		Cyclohexanone	0.757	0.694	8.3	79	0.00

Average % D = 6.34955

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**G. WALKER**	**DATE:**	**JANUARY 8 2003**
FROM:	**ETHAN G. LEE**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION –MISCELLANEOUS PARAMETERS**
NAS PENSACOLA – CTO 241
SAMPLE DELIVERY GROUP (SDG) – F15763

SAMPLES: 3/AQUEOUS/

NASP26GS0102 NASP26GS1002 NASP26GS1202

Overview

The sample set for NAS Pensacola, CTO 241, SDG F15763, consists of three (3) aqueous environmental samples.

All samples were analyzed for sulfate and total organic carbon (TOC). The samples were collected by Tetra Tech NUS December 4, 2002 and analyzed by Accutest Laboratories Southeast, Inc. Sulfate analyses were conducted using method EPA 300. TOC analyses were conducted using method EPA 415.2.

These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • Calibration Analyses
* • Laboratory Method Blank Analyses
* • Detection Limits

* - All quality control criteria were met for this parameter.

Notes

Reporting limits on Form 1 and electronic data deliverable (EDD) did not agree. The data reviewer amended the database for sulfate.

Executive Summary

Laboratory Performance: All quality control criteria were met for this SDG.

Other Factors Affecting Data Quality: None.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Inorganic Review", July 2002 and the NFESC document entitled "Navy IRCDQM" (September 1999).

The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC Guidelines and the Quality Assurance Project Plan (QAPP)."

Tetra Tech NUS
Ethan G. Lee
Environmental Scientist

Tetra Tech NUS
Joseph A. Samchuck
Quality Assurance Officer

Attachments:

1. Appendix A - Qualified Analytical Results
2. Appendix B - Results as reported by the Laboratory
3. Appendix C - Support Documentation

APPENDIX A

QUALIFIED ANALYTICAL RESULTS

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration (i.e., % RSDs, %Ds, ICVs, CCVs, RPDs, RRFs, etc.) Noncompliance
D = MS/MSD Noncompliance
E = LCS/LCSD 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 - include ICSAB % R's
L = Instrument Calibration Range Exceedance
M = Sample Preservation
N = Internal Standard Noncompliance
N01 = Internal Standard Noncompliance Dioxins
N02 = Recovery Standard Noncompliance Dioxins
N03 = Clean-up Standard Noncompliance Dioxins
O = Poor Instrument Performance (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = Pest/PCD% between columns for positive results
V = Non-linear calibrations, tuning $r < 0.995$ (correlation coefficient)
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity

PROJ_NO: 4225

SDG: F15763 MEDIA: WATER DATA FRACTION:

nsample	NASP26GS0102
samp_date	12/4/2002
lab_id	F15763-1
qc_type	NM
Pct_Solids	0
DUP_OF:	

Parameter	units	Result	Val Qual	Qual Code
SULFATE	MG/L	20	U	
TOTAL ORGANIC CARBON	MG/L	32.3		

nsample	NASP26GS1002
samp_date	12/4/2002
lab_id	F15763-2
qc_type	NM
Pct_Solids	0
DUP_OF:	

Parameter	units	Result	Val Qual	Qual Code
SULFATE	MG/L	40.1		
TOTAL ORGANIC CARBON	MG/L	9.7		

nsample	NASP26GS1202
samp_date	12/4/2002
lab_id	F15763-3
qc_type	NM
Pct_Solids	0
DUP_OF:	

Parameter	units	Result	Val Qual	Qual Code
SULFATE	MG/L	25		
TOTAL ORGANIC CARBON	MG/L	2.6		

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

Accutest Laboratories

Report of Analysis

Client Sample ID:	NASP26GS0102		
Lab Sample ID:	F15763-1	**Date Sampled:**	12/04/02
Matrix:	AQ - Ground Water	**Date Received:**	12/09/02
		Percent Solids:	n/a
Project:	NAS Pensacola CTO# 241 N4225		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed By	Method
Sulfate	<20	20	mg/l	1	12/10/02 LL	EPA 300/SW846 9056
Total Organic Carbon	32.3	1.0	mg/l	1	12/26/02 SL	EPA 415.2

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID:	NASP26GS1002		
Lab Sample ID:	F15763-2	**Date Sampled:**	12/04/02
Matrix:	AQ - Ground Water	**Date Received:**	12/09/02
		Percent Solids:	n/a
Project:	NAS Pensacola CTO# 241 N4225		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed By	Method
Sulfate	40.1	20	mg/l	1	12/10/02 LL	EPA 300/SW846 9056
Total Organic Carbon	9.7	1.0	mg/l	1	12/26/02 SL	EPA 415.2

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID:	NASP26GS1202		
Lab Sample ID:	F15763-3	**Date Sampled:**	12/04/02
Matrix:	AQ - Ground Water	**Date Received:**	12/09/02
		Percent Solids:	n/a
Project:	NAS Pensacola CTO# 241 N4225		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed By	Method
Sulfate	25.0	20	mg/l	1	12/10/02 LL	EPA 300/SW846 9056
Total Organic Carbon	2.6	1.0	mg/l	1	12/26/02 SL	EPA 415.2

RL = Reporting Limit

APPENDIX C

SUPPORT DOCUMENTATION

F15763

HOLDING TIME

01/07/03

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
%	F15715-3MS	F15715-3MS	MS	F15763	OV	12/17/02	/ /	12/17/02	0	0	0
%	F15715-3MSD	F15715-3MSD	MSD	F15763	OV	12/17/02	/ /	12/17/02	0	0	0
%	F15785-31MS	F15785-31MS	MS	F15763	OV	12/18/02	/ /	12/18/02	0	0	0
%	F15785-31MSD	F15785-31MSD	MSD	F15763	OV	12/18/02	/ /	12/18/02	0	0	0
%	NASP26GS0102	F15763-1	NORMAL	F15763	OV	12/04/02	/ /	12/18/02	0	0	14
%	NASP26GS1002	F15763-2	NORMAL	F15763	OV	12/04/02	/ /	12/17/02	0	0	13
%	NASP26GS1202	F15763-3	NORMAL	F15763	OV	12/04/02	/ /	12/17/02	0	0	13
%	VB579-BS	VB579-BS	BSP	F15763	OV	12/17/02	/ /	12/17/02	0	0	0
UG/L	VBLK1	VC604-MB	M_BLANK	F15763	OV	12/17/02	/ /	12/18/02	0	0	1
%	VC604-BS	VC604-BS	BSP	F15763	OV	12/18/02	/ /	12/18/02	0	0	0
%	GP3717-B1	GP3717-B1	BSP	F15763	SO4	12/10/02	12/10/02	12/10/02	0	0	0
%	GP3717-D1	GP3717-D1	DUPLICATE	F15763	SO4	12/10/02	12/10/02	12/10/02	0	0	0
%	GP3717-S1	GP3717-S1	MS	F15763	SO4	12/10/02	12/10/02	12/10/02	0	0	0
%	GP3717-S2	GP3717-S2	MSD	F15763	SO4	12/10/02	12/10/02	12/10/02	0	0	0
MG/L	NASP26GS0102	F15763-1	NORMAL	F15763	SO4	12/04/02	12/10/02	12/10/02	6	0	6
MG/L	NASP26GS1002	F15763-2	NORMAL	F15763	SO4	12/04/02	12/10/02	12/10/02	6	0	6
MG/L	NASP26GS1202	F15763-3	NORMAL	F15763	SO4	12/04/02	12/10/02	12/10/02	6	0	6
MG/L	PBW1	GP3717-MB1	M_BLANK	F15763	SO4	12/10/02	12/10/02	12/10/02	0	0	0
%	GN10920-B1	GN10920-B1	BSP	F15763	TOC	12/26/02	/ /	12/26/02	0	0	0
%	GN10920-D1	GN10920-D1	DUPLICATE	F15763	TOC	12/26/02	/ /	12/26/02	0	0	0
%	GN10920-S1	GN10920-S1	MS	F15763	TOC	12/26/02	/ /	12/26/02	0	0	0
%	GN10920-S2	GN10920-S2	MSD	F15763	TOC	12/26/02	/ /	12/26/02	0	0	0
MG/L	NASP26GS0102	F15763-1	NORMAL	F15763	TOC	12/04/02	/ /	12/26/02	0	0	22
MG/L	NASP26GS1002	F15763-2	NORMAL	F15763	TOC	12/04/02	/ /	12/26/02	0	0	22

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
MG/L	NASP26GS1202	F15763-3	NORMAL	F15763	TOC	12/04/02	/ /	12/26/02	0	0	22
MG/L	PBW1	GN10920-MB	M_BLANK	F15763	TOC	12/26/02	/ /	12/26/02	0	0	0

TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER 0252 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
N4225	U ST SDTE 26	GERALD WALKER	850-385-9899	ALLWEST TEST
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		LANE MIDDLETON	904-636-6165	VINELAND CT
		CARRIER/WAYBILL NUMBER		CITY, STATE
		FED EX 837110057388		ORLANDO, FL

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

	DATE YEAR 2002	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAP (G) COMP (C)	No. OF CONTAINERS	VOC	TOC	SULFATE						COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)										G	G	P						
PRESERVATIVE USED										HCl	H_2SO_4	None						
1	12/4	1525	NASP26GS0102	GS01			GW	G	5	3	1 ✓	1 ✓						Cool to 4°C
2	12/4	1430	NASP26GS0002	GS10			GW	G	5	3	1 ✓	1 ✓						
3	12/4		NASP26GS1202	GS12			GW	G	5	3	1 ✓	1 ✓						CTO 241
																		Work Release

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	12/6/02	1100	1. RECEIVED BY FED EX		
2. RELINQUISHED BY FED EX			2. RECEIVED BY Muna Mohammed	12/9/02	1000
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY) 4/02R

ACCUTEST LABORATORIES SOUTHEAST
SAMPLE RECEIPT CONFIRMATION

Accutest's Job Number: F15763

Client/Project: Terra Tech / N4225.

Date/Time Received: 12/9/02/1000 Total Number of Coolers 1

Method of Delivery: FedEx Greyhound UPS Pickup Delivery Other

Air Bill Number: 8371100057388

Cooler Temperatures: 0.6

Custody Seals Intact ?	YES	NO	
Trip Blank Provided ?	YES	NO	
Trip Blank on COC ?	YES	NO	
Trip Blank Intact ?	YES	NO	N/A
Chain Of Custody Provided?	YES	NO	
Chain Of Custody Match Bottles?	YES	NO	
Sample Labels Present?	YES	NO	
Are All Bottles Unbroken?	YES	NO	
Are All Appropriate Samples Preserved?	YES	NO	
Correct Containers Used?	YES	NO	
Sufficient Sample Volume?	YES	NO	

Number of Encores: 0

COMMENTS:

Signature: Mura Mohammed Date: 12/9/02.

0006

Revised 04/24/02 ASBD

Accutest Laboratories Southeast, Inc.
Analytical Narrative

Client:	Tetra Tech, NUS
Site:	NAS Pensacola CTO 241
Report Date:	December 31, 2002
Job Number:	F15763

3 samples were collected on December 04, 2002, and received on December 09, 2002. Samples were properly cooled, preserved and intact. A listing of the Laboratory Sample ID, Client Sample ID, and dates of collection are presented in the Results Summary section of this report.

All method specified holding times, calibrations and quality control performance criteria were met.

Accutest Laboratories Southeast, Inc. certifies that this report meets the project requirements for analytical data produced for the samples as received at the Accutest Laboratories Southeast location as stated in the Analytical Task Order and the COC. In addition, Accutest Laboratories Southeast, Inc. certifies that data as reported meet the Data Quality Objectives for precision, accuracy and completeness as specified in the Accutest Laboratories Southeast, Inc. Quality Manual for other that conditions detailed above. ALSE routinely reports Organic target analytes down to 1/2 the Reporting Level. These positive results are flagged with a "J" qualifier. It is recommended by Accutest Laboratories Southeast, Inc. that this report is to be used in its entirety. Accutest Laboratories Southeast, Inc. is not responsible for any assumptions of data quality if partial data packages are used to interpret data. The Accutest Laboratories Southeast, Inc. Laboratory Director as verified by the signature on the front page has authorized release of this report.

Narrative prepared by:

Date: December 31, 2002

Sue O. Bell, Project Manager (signature on file)

0004

Accutest Laboratories

Sample Summary

Tetra-Tech, NUS

Job No: F15763

NAS Pensacola CTO# 241 N4225
Project No: N4225 WR 95 UST Site 26

Sample Number	Collected Date	Time By	Received	Matrix Code	Matrix Type	Client Sample ID
F15763-1	12/04/02	15:25 RM	12/09/02	AQ	Ground Water	NASP26GS0102
F15763-2	12/04/02	14:30 RM	12/09/02	AQ	Ground Water	NASP26GS1002
F15763-3	12/04/02	00:00 RM	12/09/02	AQ	Ground Water	NASP26GS1202

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: F15763
Account: TETRFLTA - Tetra-Tech, NUS
Project: NAS Pensacola CTO# 241 N4225

Analyte	Batch ID	RL	MB Result	Units	BSP %Recov	QC Limits
Chloride	GP3717/GN10815	20	<20	mg/l	98.0	90-110%
Sulfate	GP3717/GN10815	20	<20	mg/l	98.0	90-110%
Total Organic Carbon	GN10920	1.0	<1.0	mg/l	101.0	80-120%

Associated Samples:
Batch GN10920: F15763-1, F15763-2, F15763-3
Batch GP3717: F15763-1, F15763-2, F15763-3

0223

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: F15763
Account: TETRFLTA - Tetra-Tech, NUS
Project: NAS Pensacola CTO# 241 N4225

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chloride	GP3717/GN10815	F15762-1	mg/l	12.1	100	103	90.9	80-120
Chloride	GP3717/GN10815	F15762-1	mg/l	12.1	100	103	90.9	80-120
Sulfate	GP3717/GN10815	F15762-1	mg/l	11.2	100	101	89.8	80-120
Sulfate	GP3717/GN10815	F15762-1	mg/l	11.2	100	101	89.8	80-120
Total Organic Carbon	GN10920	F15762-4	mg/l	14.0	50.000	70.9	114.0	80-120
Total Organic Carbon	GN10920	F15762-4	mg/l	14.0	50.000	70.4	113.0	80-120

Associated Samples:
Batch GN10920: F15763-1, F15763-2, F15763-3
Batch GP3717: F15763-1, F15763-2, F15763-3

DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: F15763
Account: TETRFLTA - Tetra-Tech, NUS
Project: NAS Pensacola CTO# 241 N4225

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chloride	GP3717/GN10815	F15762-1	mg/l	12.1	12.0	0.8	0-20%
Sulfate	GP3717/GN10815	F15762-1	mg/l	11.2	11.2	0.0	0-20%
Total Organic Carbon	GN10920	F15762-4	mg/l	14.0	13.3	5.2	0-20%

Associated Samples:
Batch GN10920: F15763-1, F15763-2, F15763-3
Batch GP3717: F15763-1, F15763-2, F15763-3

0227

PROJ_NO: 4250

SDG: 270297 MEDIA: WATER DATA FRACTION:

nsample	NASP-26-DUP1-03
samp_date	2/25/2003
lab_id	A3B270297004RE
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	NASP-26-GS01-03

Parameter	Result	Val Qual	Qual Code
BENZENE	1.2	U	
ETHYLBENZENE	1.1	J	P
TERT-BUTYLBENZENE	9		
TOLUENE	1.2	U	
TOTAL XYLENES	1.2	U	

nsample	NASP-26-GS01-03
samp_date	2/25/2003
lab_id	A3B270297001RE
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
BENZENE	1.7	U	
ETHYLBENZENE	0.9	J	P
TERT-BUTYLBENZENE	9.1		
TOLUENE	1.7	U	
TOTAL XYLENES	1.7	U	

nsample	NASP-26-GS10-03
samp_date	2/25/2003
lab_id	A3B270297002
qc_type	NM
units	UG/L
Pct_Solids	0
DUP_OF:	

Parameter	Result	Val Qual	Qual Code
BENZENE	1	U	
ETHYLBENZENE	1	U	
TERT-BUTYLBENZENE	1	U	
TOLUENE	1	U	
TOTAL XYLENES	1	U	

PROJ_NO: 4250

SDG: 270297 MEDIA: WATER DATA FRACTION:

nsample	NASP-26-GS12-03	nsample	NASP-26-TB01
samp_date	2/25/2003	samp_date	2/25/2003
lab_id	A3B270297003	lab_id	A3B270297005
qc_type	NM	qc_type	NM
units	UG/L	units	UG/L
Pct_Solids	0	Pct_Solids	0
DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
BENZENE	1	U	
ETHYLBENZENE	1	U	
TERT-BUTYLBENZENE	1	U	
TOLUENE	1	U	
TOTAL XYLENES	1	U	

Parameter	Result	Val Qual	Qual Code
BENZENE	1	U	
ETHYLBENZENE	1	U	
TERT-BUTYLBENZENE	1	U	
TOLUENE	1	U	
TOTAL XYLENES	1	U	

TETRA TECH NUS INC

Client Sample ID: HASP-26-DUP1-03

GC/MS Volatiles

Lot-Sample #...:	A3B270297-004	Work Order #...:	FJCEF1AA	Matrix.....:	WQ
Date Sampled...:	02/25/03	Date Received..:	02/27/03		
Prep Date.....:	03/06/03	Analysis Date..:	03/06/03		
Prep Batch #...:	3069119				
Dilution Factor:	12.5	Initial Wgt/Vol:	5 mL	Final Wgt/Vol..:	5 mL
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	12	ug/L
tert-Butylbenzene	7.5 J	12	ug/L
Ethylbenzene	ND	12	ug/L
Toluene	ND	12	ug/L
Xylenes (total)	ND	12	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	94	(73 - 122)
1,2-Dichloroethane-d4	94	(61 - 128)
Toluene-d8	100	(76 - 110)
4-Bromofluorobenzene	103	(74 - 116)

NOTE(S):

J Estimated result. Result is less than RL.

Elevated reporting limits due to TICs.

TETRA TECH NUS INC

Client Sample ID: NASP-26-DUP1-03

GC/MS Volatiles

Lot-Sample #...:	A3B270297-004	Work Order #...:	FJCEF2AA	Matrix.....:	WQ
Date Sampled...:	02/25/03	Date Received..:	02/27/03		
Prep Date.....:	03/06/03	Analysis Date..:	03/06/03		
Prep Batch #...:	3069119				
Dilution Factor:	1.25	Initial Wgt/Vol:	5 mL	Final Wgt/Vol..:	5 mL
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	1.2	ug/L
tert-Butylbenzene	9.0	1.2	ug/L
Ethylbenzene	1.1 J	1.2	ug/L
Toluene	ND	1.2	ug/L
Xylenes (total)	ND	1.2	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	91	(73 - 122)
1,2-Dichloroethane-d4	97	(61 - 128)
Toluene-d8	114 *	(76 - 110)
4-Bromofluorobenzene	104	(74 - 116)

NOTE(S):

* Surrogate recovery is outside stated control limits.

J Estimated result. Result is less than RL.

Elevated reporting limits due to TICs.

TETRA TECH NUS INC

Client Sample ID: NASP-26-GS01-03

GC/MS Volatiles

Lot-Sample #...:	A3B270297-001	Work Order #...:	FJCD01AD	Matrix.....:	WG
Date Sampled...:	02/25/03 15:15	Date Received..:	02/27/03		
Prep Date.....:	03/06/03	Analysis Date..:	03/06/03		
Prep Batch #...:	3069119				
Dilution Factor:	16.67	Initial Wgt/Vol:	5 mL	Final Wgt/Vol..:	5 mL
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	17	ug/L
tert-Butylbenzene	7.1 J	17	ug/L
Ethylbenzene	ND	17	ug/L
Toluene	ND	17	ug/L
Xylenes (total)	ND	17	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	93	(73 - 122)
1,2-Dichloroethane-d4	93	(61 - 128)
Toluene-d8	97	(76 - 110)
4-Bromofluorobenzene	96	(74 - 116)

NOTE(S):

J Estimated result. Result is less than RL.

Elevated reporting limits due to TICs.

TETRA TECH NUS INC

Client Sample ID: NASP-26-GS01-03

GC/MS Volatiles

Lot-Sample #...: A3B270297-001 Work Order #...: FJCD02AD Matrix.....: WG
Date Sampled...: 02/25/03 15:15 Date Received..: 02/27/03
Prep Date.....: 03/06/03 Analysis Date..: 03/06/03
Prep Batch #...: 3069119
Dilution Factor: 1.67 Initial Wgt/Vol: 5 mL Final Wgt/Vol..: 5 mL
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	1.7	ug/L
tert-Butylbenzene	9.1	1.7	ug/L
Ethylbenzene	0.98 J	1.7	ug/L
Toluene	ND	1.7	ug/L
Xylenes (total)	ND	1.7	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	94	(73 - 122)
1,2-Dichloroethane-d4	95	(61 - 128)
Toluene-d8	106	(76 - 110)
4-Bromofluorobenzene	103	(74 - 116)

NOTE(S):

J Estimated result. Result is less than RL.

Elevated reporting limits due to TICs.

TETRA TECH NUS INC

Client Sample ID: NASP-26-GS10-03

GC/MS Volatiles

Lot-Sample #...:	A3B270297-002	Work Order #...:	FJCD81AD	Matrix.....:	WG
Date Sampled...:	02/25/03 15:55	Date Received..:	02/27/03		
Prep Date.....:	03/06/03	Analysis Date..:	03/06/03		
Prep Batch #...:	3069119				
Dilution Factor:	1	Initial Wgt/Vol:	5 mL	Final Wgt/Vol..:	5 mL
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	1.0	ug/L
tert-Butylbenzene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
Xylenes (total)	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	97	(73 - 122)
1,2-Dichloroethane-d4	99	(61 - 128)
Toluene-d8	97	(76 - 110)
4-Bromofluorobenzene	97	(74 - 116)

TETRA TECH NUS INC

Client Sample ID: NASP-26-GS12-03

GC/MS Volatiles

Lot-Sample #...: A3B270297-003 Work Order #...: FJCEE1AD Matrix.....: WG
Date Sampled...: 02/25/03 16:50 Date Received..: 02/27/03
Prep Date.....: 03/06/03 Analysis Date..: 03/06/03
Prep Batch #...: 3069119
Dilution Factor: 1 Initial Wgt/Vol: 5 mL Final Wgt/Vol..: 5 mL
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	1.0	ug/L
tert-Butylbenzene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
Xylenes (total)	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	92	(73 - 122)
1,2-Dichloroethane-d4	95	(61 - 128)
Toluene-d8	100	(76 - 110)
4-Bromofluorobenzene	96	(74 - 116)

TETRA TECH NUS INC

Client Sample ID: NASP-26-TB01

GC/MS Volatiles

Lot-Sample #...: A3B270297-005 Work Order #...: FJCEG1AA Matrix.....: WQ
Date Sampled...: 02/25/03 Date Received..: 02/27/03
Prep Date.....: 03/06/03 Analysis Date..: 03/06/03
Prep Batch #...: 3069119
Dilution Factor: 1 Initial Wgt/Vol: 5 mL Final Wgt/Vol..: 5 mL
Method.....: SW846 8260B

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Benzene	ND	1.0	ug/L
tert-Butylbenzene	ND	1.0	ug/L
Ethylbenzene	ND	1.0	ug/L
Toluene	ND	1.0	ug/L
Xylenes (total)	ND	1.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	89	(73 - 122)
1,2-Dichloroethane-d4	91	(61 - 128)
Toluene-d8	98	(76 - 110)
4-Bromofluorobenzene	98	(74 - 116)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: A3B270297
MB Lot-Sample #: A3C100000-119
Analysis Date..: 03/06/03
Dilution Factor: 1

Work Order #...: FJT8M1AA
Prep Date.....: 03/06/03
Prep Batch #...: 3069119
Initial Wgt/Vol: 5 mL

Matrix.....: WATER
Final Wgt/Vol..: 5 mL

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	1.0	ug/L	SW846 8260B
tert-Butylbenzene	ND	1.0	ug/L	SW846 8260B
Ethylbenzene	ND	1.0	ug/L	SW846 8260B
Toluene	ND	1.0	ug/L	SW846 8260B
Xylenes (total)	ND	1.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Dibromofluoromethane	95	(73 - 122)
1,2-Dichloroethane-d4	96	(61 - 128)
Toluene-d8	97	(76 - 110)
4-Bromofluorobenzene	93	(74 - 116)

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

FIELD DUPLICATE PRECISION

ANALYTE	NASP-26-DUP1-03	NASP-26-GS01-03	RPD	DIFFERENCE
Ethylbenzene	1.1	0.9	20.00	0.2
tert-Butylbenzene	9	9.1	1.10	0.1

Spada, Bernie

From: Ferguson, Meg
Sent: Tuesday, March 25, 2003 10:00 AM
To: Spada, Bernie
Subject: RE: Pensacola CTO-249 SDG-270300 field duplicates

Bernie -

The duplicate came from NASP-26-GS01-03 for this project. Hope this helps.

Thanks, Meg

> ----Original Message----
> **From:** Spada, Bernie
> **Sent:** Tuesday, March 25, 2003 8:06 AM
> **To:** Ferguson, Meg
> **Subject:** RE: Pensacola CTO-249 SDG-270300 field duplicates
>
> Meg,
>
> Do you have the pair for NASP-26-DUP1-03 for the same project? Thanks again.
>
> Bernie
>
> > ----Original Message----
> > **From:** Ferguson, Meg
> > **Sent:** Monday, March 24, 2003 3:15 PM
> > **To:** Spada, Bernie
> > **Subject:** RE: Pensacola CTO-249 SDG-270300 field duplicates
> >
> > Hey Bernie -
> >
> > We took the duplicate from OLFB-1140-MW13-03 - Let me know if you need to know anything else. Thanks!
> >
> > Meg
> >
> > > ----Original Message----
> > > **From:** Spada, Bernie
> > > **Sent:** Monday, March 24, 2003 2:45 PM
> > > **To:** Ferguson, Meg
> > > **Subject:** Pensacola CTO-249 SDG-270300 field duplicates
> > >
> > > Meg,
> > >
> > > Do you have the duplicate pair for sample OLFB-1140DUP1 sampled on 2/25? Thank you for your time.
> > >
> > > *Bernard F Spada III*
> > > **Bernard F Spada III**
> > > Environmental Scientist
> > > **TETRA TECH** NUS, Inc.

CASE NARRATIVE

A3B270297

The following report contains the analytical results for five water samples submitted to STL North Canton by Tetra Tech NUS, Inc. from the Site 1140 NW site, project number N4250. The samples were received on February 27, 2003, according to documented sample acceptance procedures.

STL-North Canton utilizes USEPA approved methods in all analytical work. The sample(s) presented in this report were analyzed for the parameter(s) listed on the Analytical Methods Summary page in accordance with the method(s) indicated.

The results included in this report have been reviewed for compliance with the laboratory QA/QC plan. All data have been found to be compliant with laboratory protocol.

SUPPLEMENTAL QC INFORMATION

SAMPLE RECEIVING

The temperature of the coolers upon sample receipt was 1.6 and 1.2° C.

See STL's Cooler Receipt Form for additional information.

GC/MS VOLATILES

Surrogate recoveries were outside criteria for sample NASP-26-DUP1-03. Due to insufficient sample volume, re-preparation and reanalysis could not occur.

Sample(s) that contain results between the MDL and the RL were flagged with "J". There is the possibility of false positive or mis-identification at these quantitation levels. In analytical methods requiring confirmation of the analyte reported, confirmation was performed only down to the standard reporting limit (SRL). The acceptance criteria for QC samples may not be met at these quantitation levels.

Samples NASP-26-GS01-03 and NASP-26-DUP1-03 had elevated reporting limits due to TICs.

QUALITY CONTROL ELEMENTS OF SW-846 METHODS

STL North Canton conducts a quality assurance/quality control (QA/QC) program designed to provide scientifically valid and legally defensible data. Toward this end, several types of quality control indicators are incorporated into the QA/QC program, which is described in detail in QA Policy, QA-003. These indicators are introduced into the sample testing process to provide a mechanism for the assessment of the analytical data.

QC BATCH

Environmental samples are taken through the testing process in groups called QUALITY CONTROL BATCHES (QC batches). A QC batch contains up to twenty environmental samples of a similar matrix (water, soil) that are processed using the same reagents and standards. STL North Canton requires that each environmental sample be associated with a QC batch.

Several quality control samples are included in each QC batch and are processed identically to the twenty environmental samples. These QC samples include a METHOD BLANK (MB), a LABORATORY CONTROL SAMPLE (LCS) and, where appropriate, a MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) pair or a MATRIX SPIKE/SAMPLE DUPLICATE (MS/DU) pair. If there is insufficient sample to perform an MS/MSD or an MS/DU, then a LABORATORY CONTROL SAMPLE DUPLICATE (LCSD) is included in the QC batch.

LABORATORY CONTROL SAMPLE

The Laboratory Control Sample is a QC sample that is created by adding known concentrations of a full or partial set of target analytes to a matrix similar to that of the environmental samples in the QC batch. The LCS analyte recovery results are used to monitor the analytical process and provide evidence that the laboratory is performing the method within acceptable guidelines. All control analytes indicated by a bold type in the LCS must meet acceptance criteria. Failure to meet the established recovery guidelines requires the repreparation and reanalysis of all samples in the QC batch. The only exception is that if the LCS recoveries are biased high and the associated sample is ND (non-detected) for the parameter(s) of interest, the batch is acceptable.

At times, a Laboratory Control Sample Duplicate (LCSD) is also included in the QC batch. An LCSD is a QC sample that is created and handled identically to the LCS. Analyte recovery data from the LCSD is assessed in the same way as that of the LCS. The LCSD recoveries, together with the LCS recoveries, are used to determine the reproducibility (precision) of the analytical system. Precision data are expressed as relative percent differences (RPDs). If the RPD fails for an LCS/LCSD and yet the recoveries are within acceptance criteria, the batch is still acceptable.

METHOD BLANK

The Method Blank is a QC sample consisting of all the reagents used in analyzing the environmental samples contained in the QC batch. Method Blank results are used to determine if interference or contamination in the analytical system could lead to the reporting of false positive data or elevated analyte concentrations. All target analytes must be below the reporting limits (RL) or the associated sample(s) must be ND except under the following circumstances:

- Common organic contaminants may be present at concentrations up to 5 times the reporting limits. Common metals contaminants may be present at concentrations up to 2 times the reporting limit, or the reported blank concentration must be twenty fold less than the concentration reported in the associated environmental samples. (See common laboratory contaminants listed below.)

Volatile (GC or GC/MS)	Semivolatile (GC/MS)	Metals
Methylene chloride	Phthalate Esters	Copper
Acetone		Iron
2-Butanone		Zinc
		Lead*

- *for analyses run on TJA Trace ICP, ICPMS or GFAA only*

- Organic blanks will be accepted if compounds detected in the blank are present in the associated samples at levels 10 times the blank level. Inorganic blanks will be accepted if elements detected in the blank are present in the associated samples at 20 times the blank level.

QUALITY CONTROL ELEMENTS OF SW-846 METHODS
(Continued)

- Blanks will be accepted if the compounds/elements detected are not present in any of the associated environmental samples.

Failure to meet these Method Blank criteria requires the repreparation and reanalysis of all samples in the QC batch.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE

A Matrix Spike and a Matrix Spike Duplicate are a pair of environmental samples to which known concentrations of a full or partial set of target analytes are added. The MS/MSD results are determined in the same manner as the results of the environmental sample used to prepare the MS/MSD. The analyte recoveries and the relative percent differences (RPDs) of the recoveries are calculated and used to evaluate the effect of the sample matrix on the analytical results. Due to the potential variability of the matrix of each sample, the MS/MSD results may not have an immediate bearing on any samples except the one spiked; therefore, the associated batch MS/MSD may not reflect the same compounds as the samples contained in the analytical report. When these MS/MSD results fail to meet acceptance criteria, the data is evaluated. If the LCS is within acceptance criteria, the batch is considered acceptable. The acceptance criteria do not apply to samples that are diluted for organics if the native sample amount is 4x the concentration of the spike.

For certain methods, a Matrix Spike/Sample Duplicate (MS/DU) may be included in the QC batch in place of the MS/MSD. For the parameters (i.e. pH, ignitability) where it is not possible to prepare a spiked sample, a Sample Duplicate may be included in the QC batch. However, a Sample Duplicate is less likely to provide usable precision statistics depending on the likelihood of finding concentrations below the standard reporting limit. When the Sample Duplicate result fails to meet acceptance criteria, the data is evaluated.

SURROGATE COMPOUNDS

In addition to these batch-related QC indicators, each organic environmental and QC sample is spiked with surrogate compounds. Surrogates are organic chemicals that behave similarly to the analytes of interest and that are rarely present in the environment. Surrogate recoveries are used to monitor the individual performance of a sample in the analytical system.

If surrogate recoveries are biased high in the LCS, LCSD, or the Method Blank, and the associated sample(s) are ND, the batch is acceptable. Otherwise, if the LCS, LCSD, or Method Blank surrogate(s) fail to meet recovery criteria, the entire sample batch is reprepped and reanalyzed. If the surrogate recoveries are outside criteria for environmental samples, the samples will be reprepped and reanalyzed unless there is objective evidence of matrix interference or if the sample dilution is greater than the threshold outlined in the associated method SOP.

For the GC/MS BNA methods, the surrogate criterion is that two of the three surrogates for each fraction must meet acceptance criteria. The third surrogate must have a recovery of ten percent or greater.

For the Pesticide, PCB, PAH, and Herbicide methods, the surrogate criterion is that one of two surrogate compounds must meet acceptance criteria.

STL North Canton Certifications and Approvals:

Alabama (#41170), California (#2157), Connecticut (#PH-0590), Florida (#E87225), Illinois (#100439), Kansas (#E10336), Kentucky (#90021), Massachusetts (#M-OH048), Maryland (#272), Minnesota (#39-999-348), Missouri (#6090), New Jersey (#74001), New York (#10975), North Dakota (#R-156), Ohio (#6090), OhioVAP (#CL0024), Pennsylvania (#68-340), Rhode Island (#237), South Carolina (#92007001, #92007002, #92007003), Tennessee (#02903), West Virginia (#210), Wisconsin (#999518190), NAVY, ARMY, USDA Soil Permit, ACIL Seal of Excellence – Participating Lab Status Award (#82)

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TETRA TECH NUS, INC. CHAIN OF CUSTODY | NUMBER | PAGE 1 OF 1

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PROJECT NO.	FACILITY	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT
N4750	Site 1140NW	Gerry Walker	850-385-1997	STL Canton

SAMPLERS (SIGNATURE)	FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
[signature]	Meg Ferguson	904.636.6126	4101 Shuffel Dr. NW
	CARRIER/WAYBILL NUMBER: 8371 1005 7230 (FedEX)		CITY, STATE: North Canton, OH 44720

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

DATE YEAR 2003	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (WW, SO, SW, SD, DC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS / CONTAINER TYPE PLASTIC (P) or GLASS (G) / PRESERVATIVE USED: VOCs HCl	TPC* H2SO4	SVOCs* none							COMMENTS
2/25	1515	NASP.26.GS01.03	GS01	—	—	GW	G	6	3	2	1							* please report in ug/L using lowest detection limits
2/25	1555	NASP.26.GS10.03	GS10	—	—	GW	G	6	3	2	1							
2/25	1650	NASP.26.GS12.03	GS12	—	—	GW	G	6	3	2	1							
2/25	0000	NASP.26.DUP1.03	DUP1			GW	G	3	3									
2/25	0000	NASP.26.TB01																- trip blank
																		Cool all to 4°C

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY [signature]	2/26/03	1600	1. RECEIVED BY [signature]	2-27-03	1005
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

COMMENTS

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

4/02R
FORM NO. TtNUS-001

STL North Canton

PROJ_NO: 4250

SDG: 270297 MEDIA: WATER DATA FRACTION:

nsample	NASP-26-GS01-03
samp_date	2/25/2003
lab_id	A3B270297001
qc_type	NM
Pct_Solids	0
DUP_OF:	

Parameter	units	Result	Val Qual	Qual Code
SULFATE	UG/L	6560		
TOTAL ORGANIC CARBON	UG/L	33000		

nsample	NASP-26-GS10-03
samp_date	2/25/2003
lab_id	A3B270297002
qc_type	NM
Pct_Solids	0
DUP_OF:	

Parameter	units	Result	Val Qual	Qual Code
SULFATE	UG/L	33200		
TOTAL ORGANIC CARBON	UG/L	11000		

nsample	NASP-26-GS12-03
samp_date	2/25/2003
lab_id	A3B270297003
qc_type	NM
Pct_Solids	0
DUP_OF:	

Parameter	units	Result	Val Qual	Qual Code
SULFATE	UG/L	50200		
TOTAL ORGANIC CARBON	UG/L	3500		

TETRA TECH NUS INC

Client Sample ID: NASP-26-GS01-03

General Chemistry

Lot-Sample #...: A3B270297-001 Work Order #...: FJCD0 Matrix.....: WG
Date Sampled...: 02/25/03 15:15 Date Received..: 02/27/03

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Sulfate	6560	5000	ug/L	MCAWW 300.0A	03/03/03	3063226
	Dilution Factor: 5					
Total Organic Carbon	33000	1000	ug/L	MCAWW 415.1	03/03/03	3063139
	Dilution Factor: 1					

TETRA TECH NUS INC

Client Sample ID: NASP-26-GS10-03

General Chemistry

Lot-Sample #...: A3B270297-002 Work Order #...: FJCD8 Matrix.....: WG
Date Sampled...: 02/25/03 15:55 Date Received..: 02/27/03

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Sulfate	33200	1000	ug/L	MCAWW 300.0A	03/03/03	3063226
		Dilution Factor: 1				
Total Organic Carbon	11000	1000	ug/L	MCAWW 415.1	03/03/03	3063139
		Dilution Factor: 1				

TETRA TECH NUS INC

Client Sample ID: NASP-26-GS12-03

General Chemistry

Lot-Sample #...: A3B270297-003 Work Order #...: FJCEE Matrix.....: WG
Date Sampled...: 02/25/03 16:50 Date Received..: 02/27/03

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Sulfate	50200	1000	ug/L	MCAWW 300.0A	03/03/03	3063226
		Dilution Factor: 1				
Total Organic Carbon	3500	1000	ug/L	MCAWW 415.1	03/03/03	3063139
		Dilution Factor: 1				

270297

HOLDING TIME
03/24/03

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
%	CHECK SAMPLE	A3C100000119C	LCS	270297	OV	02/25/03	03/06/03	03/06/03	9	0	9
%	DUPLICATE CHECK	A3C100000119L	LCSD	270297	OV	02/25/03	03/06/03	03/06/03	9	0	9
UG/L	INTRA-LAB BLANK	A3C100000119B	M_BLANK	270297	OV	02/20/03	03/06/03	03/06/03	14	0	14
UG/L	NASP-26-DUP1-03	A3B270297004	NORMAL	270297	OV	02/25/03	03/06/03	03/06/03	9	0	9
UG/L	NASP-26-DUP1-03RE	A3B270297004	NORMAL	270297	OV	02/25/03	03/06/03	03/06/03	9	0	9
UG/L	NASP-26-GS01-03	A3B270297001	NORMAL	270297	OV	02/25/03	03/06/03	03/06/03	9	0	9
%	NASP-26-GS01-03MS	A3B270297001S	MS	270297	OV	02/25/03	03/06/03	03/06/03	9	0	9
%	NASP-26-GS01-03MSD	A3B270297001D	MSD	270297	OV	02/25/03	03/06/03	03/06/03	9	0	9
UG/L	NASP-26-GS01-03RE	A3B270297001	NORMAL	270297	OV	02/25/03	03/06/03	03/06/03	9	0	9
UG/L	NASP-26-GS10-03	A3B270297002	NORMAL	270297	OV	02/25/03	03/06/03	03/06/03	9	0	9
UG/L	NASP-26-GS12-03	A3B270297003	NORMAL	270297	OV	02/25/03	03/06/03	03/06/03	9	0	9
UG/L	NASP-26-TB01	A3B270297005		270297	OV	02/25/03	03/06/03	03/06/03	9	0	9
%	CHECK SAMPLE	A3C040000226C	LCS	270297	SO4	02/25/03	03/03/03	03/03/03	6	0	6
%	DUPLICATE CHECK	A3C040000226L	LCSD	270297	SO4	02/25/03	03/03/03	03/03/03	6	0	6
UG/L	INTRA-LAB BLANK	A3C040000226B	M_BLANK	270297	SO4	02/25/03	03/03/03	03/03/03	6	0	6
UG/L	NASP-26-GS01-03	A3B270297001	NORMAL	270297	SO4	02/25/03	03/03/03	03/03/03	6	0	6
UG/L	NASP-26-GS10-03	A3B270297002	NORMAL	270297	SO4	02/25/03	03/03/03	03/03/03	6	0	6
UG/L	NASP-26-GS12-03	A3B270297003	NORMAL	270297	SO4	02/25/03	03/03/03	03/03/03	6	0	6
%	CHECK SAMPLE	A3C040000139C	LCS	270297	TOC	02/20/03	03/03/03	03/03/03	11	0	11
UG/L	INTRA-LAB BLANK	A3C040000139B	M_BLANK	270297	TOC	02/25/03	03/03/03	03/03/03	6	0	6
UG/L	NASP-26-GS01-03	A3B270297001	NORMAL	270297	TOC	02/25/03	03/03/03	03/03/03	6	0	6
%	NASP-26-GS01-03MS	A3B270297001S	MS	270297	TOC	02/25/03	03/03/03	03/03/03	6	0	6
%	NASP-26-GS01-03MSD	A3B270297001D	MSD	270297	TOC	02/25/03	03/03/03	03/03/03	6	0	6
UG/L	NASP-26-GS10-03	A3B270297002	NORMAL	270297	TOC	02/25/03	03/03/03	03/03/03	6	0	6

Units	Nsample	Lab Id	Qc Type	Sdg	Sort	Samp Date	Extr Date	Anal Date	SAMP_DATE TO EXTR_DATE	EXTR_DATE TO ANAL_DATE	SAMP_DATE TO ANAL_DATE
UG/L	NASP-26-GS12-03	A3B270297003	NORMAL	270297	TOC	02/25/03	03/03/03	03/03/03	6	0	6

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

TO:	**MR. G. WALKER**	**DATE:**	**July 7, 2003**
FROM:	**EDWARD SEDLMYER**	**COPIES:**	**DV FILE**

SUBJECT: **ORGANIC DATA VALIDATION- VOA/SULFATE/TOC**
CTO 241, NAS PENSACOLA
SDG 230290

SAMPLES: 3/Aqueous

NASP26GS0104 NASP26GS1004 NASP26GS1204

OVERVIEW

The sample set for CTO 241, NAS Pensacola, SDG 230290 consists of three (3) aqueous environmental samples. The samples were analyzed for benzene, ethylbenzene, toluene, total xylenes, tert-butylbenzene , sulfate, and total organic carbon (TOC).

The samples were collected by TetraTech NUS on May 20, 2003 and analyzed by Severn Trent Laboratories, Inc. All analyses were conducted in accordance with Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria using SW-846 Method 8260B, EPA Method 300.0, and EPA Method 415.1 analytical and reporting protocols. 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
- 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.

Volatiles

The reporting limit for total xylene (3 ug/L) is greater than the reporting limit specified in the laboratory spec. (1 ug/L). No action was taken on this basis.

The trip blank (NASP26TB01) listed on the chain-of-custody was not received by the laboratory. No action was taken on this basis.

TOC

The reporting limit for total organic carbon (1.0 mg/L) is greater than the reporting limit specified in the laboratory spec. (0.1 mg/L). No action was taken on this basis.

SULFATE

The reporting limit for sulfate (1.0 mg/L) is greater than the reporting limit specified in the laboratory spec. (0.1 mg/L). No action was taken on this basis.

EXECUTIVE SUMMARY

Laboratory Performance Issues: The reporting limits for total xylene, TOC, and sulfate were greater than the reporting limits required in the laboratory spec.

Other Factors Affecting Data Quality: The trip blank was not received with the environmental samples.

The data for these analyses were reviewed with reference to the EPA Functional Guidelines for Organic Data Validation (10/99), and the NFESC guidelines IRCDQM (Sept., 1999). The text of this report has been formulated to address only those problem areas affecting data quality.

"I attest that the data referenced herein were validated according to the agreed upon validation criteria as specified in the NFESC guidelines and the Quality Assurance Project Plan (QAPP)."

Tetra Tech NUS

Edward Sedlmyer
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

Qualifier Codes:

A = Lab Blank Contamination
B = Field Blank Contamination
C = Calibration Noncompliance (i.e., % 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 (i.e., base-time drifting)
P = Uncertainty near detection limit (< 2 x IDL for inorganics and <CRQL for organics)
Q = Other problems (can encompass a number of issues; i.e.chromatography,interferences, etc.)
R = Surrogates Recovery Noncompliance
S = Pesticide/PCB Resolution
T = % Breakdown Noncompliance for DDT and Endrin
U = % Difference between columns/detectors >25% for positive results determined via GC/HPLC
V = Non-linear calibrations; correlation coefficient $r < 0.995$
W = EMPC result
X = Signal to noise response drop
Y = Percent solids <30%
Z = Uncertainty at 2 sigma deviation is less than sample activity

PROJ_NO: 4225

SDG: 230290 MEDIA: WATER DATA FRACTION: OV

nsample	NASP26GS0104	nsample	NASP26GS1004	nsample	NASP26GS1204
samp_date	5/20/2003	samp_date	5/20/2003	samp_date	5/20/2003
lab_id	C3E230290001	lab_id	C3E230290002	lab_id	C3E230290003
qc_type	NM	qc_type	NM	qc_type	NM
units	UG/L	units	UG/L	units	UG/L
Pct_Solids	0	Pct_Solids	0	Pct_Solids	0
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	Result	Val Qual	Qual Code
BENZENE	1	U	
ETHYLBENZENE	0.7	J	P
TERT-BUTYLBENZENE	7.5		
TOLUENE	0.2	J	P
TOTAL XYLENES	3	U	

Parameter	Result	Val Qual	Qual Code
BENZENE	1	U	
ETHYLBENZENE	1	U	
TERT-BUTYLBENZENE	1	U	
TOLUENE	1	U	
TOTAL XYLENES	3	U	

Parameter	Result	Val Qual	Qual Code
BENZENE	1	U	
ETHYLBENZENE	1	U	
TERT-BUTYLBENZENE	1	U	
TOLUENE	1	U	
TOTAL XYLENES	3	U	

PROJ_NO: 4225

SDG: 230290 MEDIA: WATER DATA FRACTION: MISC

nsample	NASP26GS0104	nsample	NASP26GS1004	nsample	NASP26GS1204
samp_date	5/20/2003	samp_date	5/20/2003	samp_date	5/20/2003
lab_id	C3E230290001	lab_id	C3E230290002	lab_id	C3E230290003
qc_type	NM	qc_type	NM	qc_type	NM
Pct_Solids	0	Pct_Solids	0	Pct_Solids	0
DUP_OF:		DUP_OF:		DUP_OF:	

Parameter	units	Result	Val Qual	Qual Code
SULFATE	MG/L	0.75	J	P
TOTAL ORGANIC CARBON	MG/L	29.8		

Parameter	units	Result	Val Qual	Qual Code
SULFATE	MG/L	15.6		
TOTAL ORGANIC CARBON	MG/L	8		

Parameter	units	Result	Val Qual	Qual Code
SULFATE	MG/L	28.1		
TOTAL ORGANIC CARBON	MG/L	2		

APPENDIX B

RESULTS AS REPORTED BY THE LABORATORY

TETRA TECH NUS INC

Client Sample ID: NASP26GS0104

GC/MS Volatiles

Lot-Sample #...:	C3E230290-001	Work Order #...:	FPCHT1AA	Matrix.....:	WATER
Date Sampled...:	05/20/03	Date Received..:	05/23/03	MS Run #.....:	3150062
Prep Date.....:	05/30/03	Analysis Date..:	05/30/03		
Prep Batch #...:	3150118	Analysis Time..:	07:46		
Dilution Factor:	1	Initial Wgt/Vol:	5 mL	Final Wgt/Vol..:	5 mL
Analyst ID.....:	010099	Instrument ID..:	HP5		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.11
tert-Butylbenzene	7.5	1.0	ug/L	0.14
Ethylbenzene	0.70 J	1.0	ug/L	0.11
Toluene	0.20 J	1.0	ug/L	0.14
Xylenes (total)	ND	3.0	ug/L	0.45

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	110	(76 - 110)
1,2-Dichloroethane-d4	100	(61 - 128)
4-Bromofluorobenzene	93	(74 - 116)
Dibromofluoromethane	93	(73 - 122)

NOTE(S):

J Estimated result. Result is less than RL.

TETRA TECH NUS INC

Client Sample ID: NASP26GS1004

GC/MS Volatiles

Lot-Sample #...:	C3E230290-002	Work Order #...:	FPCHV1AA	Matrix.....:	WATER
Date Sampled...:	05/20/03	Date Received..:	05/23/03	MS Run #.....:	3150062
Prep Date.....:	05/30/03	Analysis Date..:	05/30/03		
Prep Batch #...:	3150118	Analysis Time..:	07:23		
Dilution Factor:	1	Initial Wgt/Vol:	5 mL	Final Wgt/Vol..:	5 mL
Analyst ID.....:	010099	Instrument ID..:	HP5		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.11
tert-Butylbenzene	ND	1.0	ug/L	0.14
Ethylbenzene	ND	1.0	ug/L	0.11
Toluene	ND	1.0	ug/L	0.14
Xylenes (total)	ND	3.0	ug/L	0.45

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	86	(76 - 110)
1,2-Dichloroethane-d4	100	(61 - 128)
4-Bromofluorobenzene	84	(74 - 116)
Dibromofluoromethane	95	(73 - 122)

TETRA TECH NUS INC

Client Sample ID: NASP26GS1204

GC/MS Volatiles

Lot-Sample #...:	C3E230290-003	Work Order #...:	FPCHW1AA	Matrix.....:	WATER
Date Sampled...:	05/20/03	Date Received..:	05/23/03	MS Run #.....:	3150062
Prep Date.....:	05/30/03	Analysis Date..:	05/30/03		
Prep Batch #...:	3150118	Analysis Time..:	07:00		
Dilution Factor:	1	Initial Wgt/Vol:	5 mL	Final Wgt/Vol..:	5 mL
Analyst ID.....:	010099	Instrument ID..:	HP5		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS	MDL
Benzene	ND	1.0	ug/L	0.11
tert-Butylbenzene	ND	1.0	ug/L	0.14
Ethylbenzene	ND	1.0	ug/L	0.11
Toluene	ND	1.0	ug/L	0.14
Xylenes (total)	ND	3.0	ug/L	0.45

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Toluene-d8	81	(76 - 110)
1,2-Dichloroethane-d4	104	(61 - 128)
4-Bromofluorobenzene	80	(74 - 116)
Dibromofluoromethane	95	(73 - 122)

CTO 241 NAS Pensacola, FL

TOC

Lab Name:	STL PITTSBURGH	**Method:**	MCAWW 415.1
Client Name:	TETRA TECH NUS INC	**Lot Number:**	C3E230290
Matrix:	WATER	**Date/Time Received:**	5/23/2003 10:00:00AM

Client Sample ID	Sample Number	Workorder	Result	Units	Reporting Limit	Dilution Factor	Prep Date - Analysis Date/Time	QC Batch
NASP26GS0104	001	FPCHT1AD	29.8	mg/L	1.0	1	5/28/2003 - 5/28/2003 12:23	3148191
NASP26GS1004	002	FPCHV1AD	8.0	mg/L	1.0	1	5/28/2003 - 5/28/2003 12:59	3148191
NASP26GS1204	003	FPCHW1AD	2.0	mg/L	1.0	1	5/28/2003 - 5/28/2003 13:12	3148191

CTO 241 NAS Pensacola, FL

Sulfate

Lab Name:	STL PITTSBURGH	**Method:**	MCAWW 300.0A
Client Name:	TETRA TECH NUS INC	**Lot Number:**	C3E230290
Matrix:	WATER	**Date/Time Received:**	5/23/2003 10:00:00AM

Client Sample ID	Sample Number	Workorder	Result	Units	Reporting Limit	Dilution Factor	Prep Date - Analysis Date/Time	QC Batch
NASP26GS0104	001	FPCHT1AC	0.75 B	mg/L	1.0	1	6/13/2003 - 6/13/2003 15:17	3167496
NASP26GS1004	002	FPCHV1AC	15.6	mg/L	1.0	1	6/13/2003 - 6/13/2003 15:32	3167496
NASP26GS1204	003	FPCHW1AC	28.1	mg/L	1.0	1	6/13/2003 - 6/13/2003 15:47	3167496