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NAS CECIL FIELD, FL
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SAMPLING AND ANALYSIS OUTLINE REPORT FOR BUILDING 900 BASE REALIGNMENT AND CLOSURE REVISION 2 NAS CECIL FIELD FL

3/31/2000

TETRA TECH NUS INC

Rev. 2
03/31/00

Sampling and Analysis Outline Report

for

Building 900 Base Realignment and Closure

Naval Air Station, Cecil Field

Jacksonville, Florida

Southern Division Naval Facilities Engineering Command

Contract Number N62467-94-D-0888

Contract Task Order 0078

March 2000

Rev. 2
03/31/00

SAMPLING AND ANALYSIS OUTLINE REPORT
FOR
BUILDING 900
BASE REALIGNMENT AND CLOSURE

NAVAL AIR STATION, CECIL FIELD
JACKSONVILLE, FLORIDA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT N62467-89-D-0088

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 0078

MARCH 2000

PREPARED UNDER THE SUPERVISION OF:

Mark P. Speranza

MARK SPERANZA, P.E.
TASK ORDER MANAGER
TETRA TECH NUS, INC.
PITTSBURGH, PENNSYLVANIA

APPROVED FOR SUBMITTAL BY:

D M Wroblewski

DEBBIE WROBLEWSKI
PROGRAM MANAGER
TETRA TECH NUS, INC.
PITTSBURGH, PENNSYLVANIA

CERTIFICATION OF TECHNICAL
DATA CONFORMITY

The Contractor, Tetra Tech NUS, Inc., hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N62467-94-D-0888 are complete and accurate and comply with all requirements of this contract.

DATE: March 31, 2000

NAME AND TITLE OF CERTIFYING OFFICAL: Mark Speranza, P.E.
Task Order Manager

03609

The professional opinions rendered in this decision document identified as Sampling and Analysis Outline Report for Building 900, Naval Air Station Cecil Field, Jacksonville, Florida were developed in accordance with commonly accepted procedures consistent with applicable standards of practice. Decision documents are based on information obtained from others and under the supervision of the signing engineer. 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 this project described in this report.

Mark P. Speranza

Mark Speranza, P.E.
Professional Engineer No. PE0050304

Date: 3/31/00

Mark Speranza

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ACRONYMS

ABB-ES	ABB Environmental Services, Inc.
bgs	Below ground surface
BRAC	Base Realignment and Closure
CTO	Contract Task Order
EISOPQAM	Environmental Investigations Standard Operating Procedures and Quality Assurance Manual
FDEP	Florida Department of Environmental Protection
GCTL	Groundwater Cleanup Target Level
NAS	Naval Air Station
NGC	Northrup-Grumman Corporation
PRE	Preliminary Risk Evaluation
PVC	Polyvinyl chloride
SPLP	Synthetic Precipitation Leaching Procedure
STCL	Soil target cleanup level
THM	Trihalomethane
TtNUS	Tetra Tech NUS, Inc.
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile organic compound

1.0 INTRODUCTION

Tetra Tech NUS, Inc. (TtNUS), under contract to Southern Division, Naval Facilities Engineering Command, has completed the Base Realignment and Closure (BRAC) Phase II Sampling and Analysis Program for Building 900 at Naval Air Station (NAS) Cecil Field. This program was conducted under Contract Number N62467-94-D-088, Contract Task Order (CTO) 0078. This report summarizes the related field operations, results, conclusions, and recommendation of the Phase II investigation.

Building 900 is located in the Main Base Area between Seventh and Ninth Streets and New World Avenue, formerly Avenue D (see Figures 1-1 and 1-2). Sampling was conducted to confirm the results of soil and groundwater samples collected on behalf of Northrup-Grumman Corporation (NGC) as part of a due diligence investigation at Building 900 (Golder Associates, 1998). As part of the NGC investigation, six shallow and six intermediate temporary monitoring wells were installed, sampled, and analyzed for organic and inorganic parameters. Groundwater results indicated the presence of trihalomethanes (THMs) and total lead at concentrations in excess of the Florida Department of Environmental Protection (FDEP) criterion. Chromium and vanadium also were detected at concentrations in excess of FDEP criteria in one well. Also as part of the NGC investigation, twelve soil samples were collected in the Building 900 area and analyzed for organic and inorganic parameters. At one soil sample location, the benzene concentration exceeded the FDEP criterion. This sample was collected from a temporary well boring southeast of the building.

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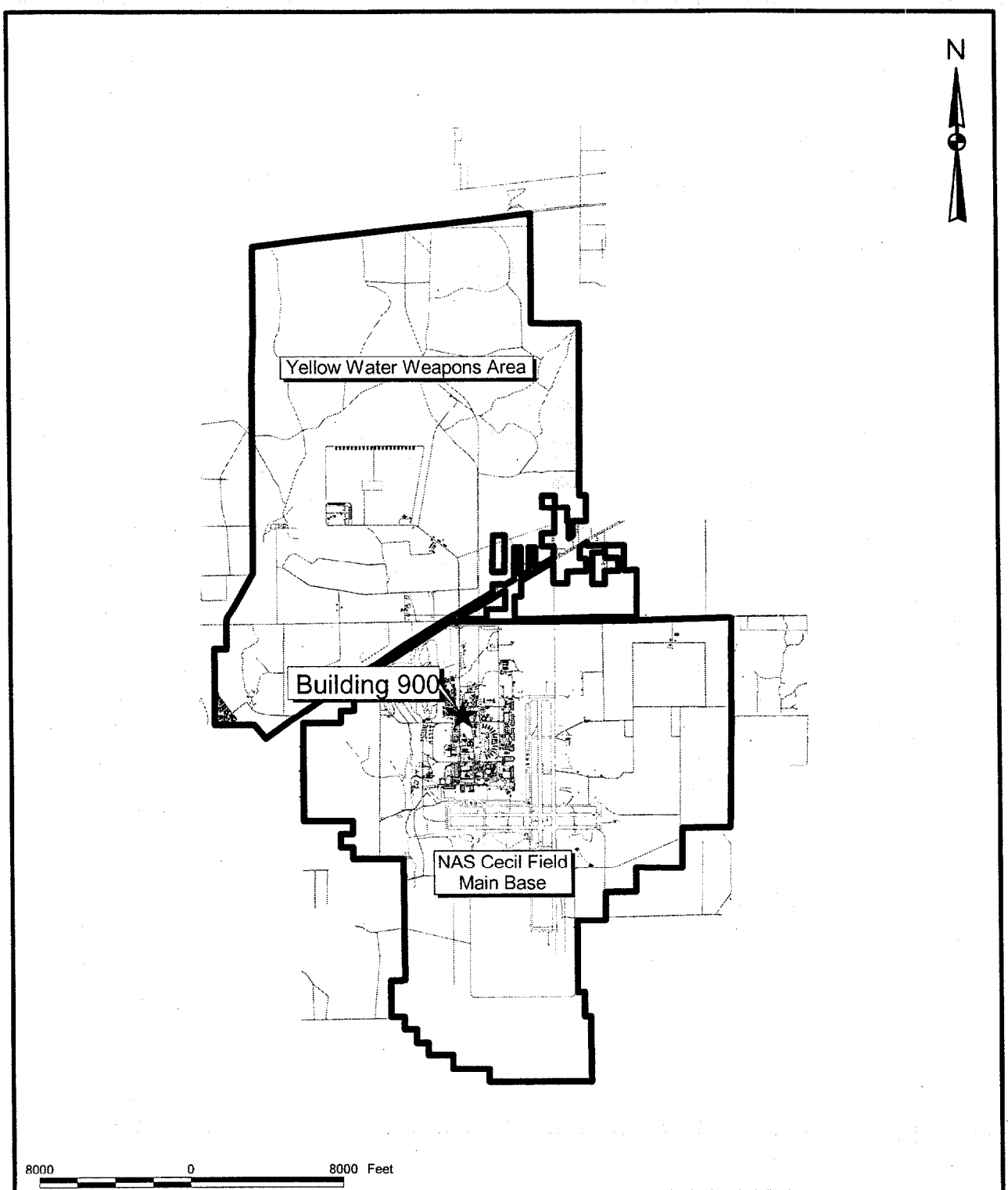
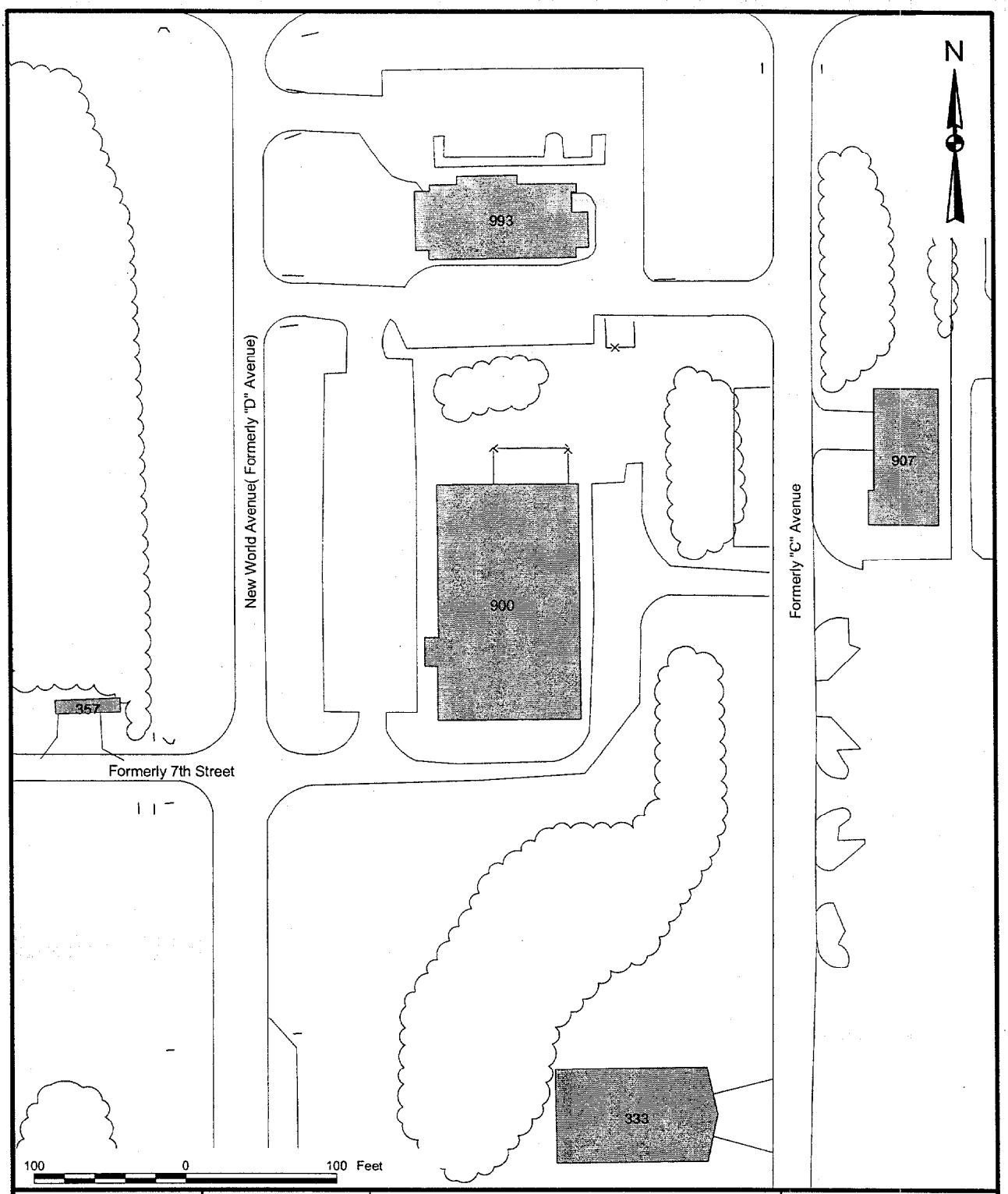


DRAWN BY MJJ	DATE 10Nov99	GENERAL LOCATION MAP BUILDING 900 NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 0039
CHECKED BY	DATE		APPROVED BY / DATE
COST/SCHEDULE-AREA			APPROVED BY / DATE
SCALE AS NOTED			DRAWING NO. FIGURE 1-1 / REV 0

P:\GIS\CECIL\bldg900.apr 10Nov99 MJJ 2-1 Site Location Map Layout



DRAWN BY MJJ	DATE 10Nov99	SITE LOCATION MAP BUILDING 900 NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 0039
CHECKED BY	DATE		APPROVED BY / DATE
COST/SCHEDULE-AREA			APPROVED BY / DATE
SCALE AS NOTED			DRAWING NO. FIGURE 1-2 / REV 0

P:\GIS\CECIL\bldg900.apr 18Nov99 MJJ Layout1

2.0 SAMPLING AND ANALYSIS OUTLINE

A Sampling and Analysis Plan for the assessment of this site was prepared by TtNUS and approved by the BRAC Cleanup Team (BCT) (TtNUS, 1999).

The Phase II investigation included the collection of one surface soil sample and the installation and sampling of two monitoring wells. Field activities were conducted in general conformance with the Base-Wide Generic Work Plan and the United States Environmental Protection Agency (U.S. EPA) Region V Environmental Investigation Standard Operating Procedures and Quality Assurance Manual (EISPOQAM) (TtNUS, 1998 and U.S. EPA, 1996). A site plan indicating the location of the soil samples and monitoring wells is presented on Figure 2-1. Analytical results are provided in Appendix A, and boring logs and monitoring well construction information are presented in Appendix B.

The surface soil sample (CEF-900-SS-001) was collected from 0 to 1 foot below ground surface (bgs) at approximately the same location as the NGC sample with the benzene exceedance. The original sample was collected from temporary well boring TMW-6, and the new sample location was located approximately 2 feet northwest of the concrete pad at the boring location. This sample was analyzed for volatile organic compounds (VOCs), with analysis via Synthetic Precipitation Leaching Procedure (SPLP) (volatile fraction, including benzene) contingent on the VOC analytical results. VOCs were not detected, therefore, SPLP sampling was not required.

The two monitoring wells (CEF-900-1I, CEF-900-2I) were constructed of 2-inch polyvinyl chloride (PVC) to depths of approximately 50 feet bgs with a 5-foot screen of 0.010 slot size. The wells were developed prior to sampling, and the samples were collected on August 3, 1999 using low-flow sampling techniques. The groundwater sample from well CEF-900-1I was analyzed for VOCs, and the sample from well CEF-900-2I was analyzed for total and dissolved lead, chromium, and vanadium. The sample for dissolved metals analysis was passed through a 1-micron filter prior to analysis.

The lead concentration in unfiltered groundwater from CEF-900-2I was 15.5 µg/L, slightly greater than the FDEP Groundwater Cleanup Target Level (GCTL) of 15 µg/L. Because of concerns that turbidity in the newly installed well might have resulted in the elevated lead concentration, this well was resampled on September 27, 1999 and analyzed for total and dissolved lead, chromium, and vanadium. The total vanadium concentration was less than the FDEP GTCL, and dissolved vanadium was less than the detection limit. Total lead and chromium concentrations also were less than detection limits.

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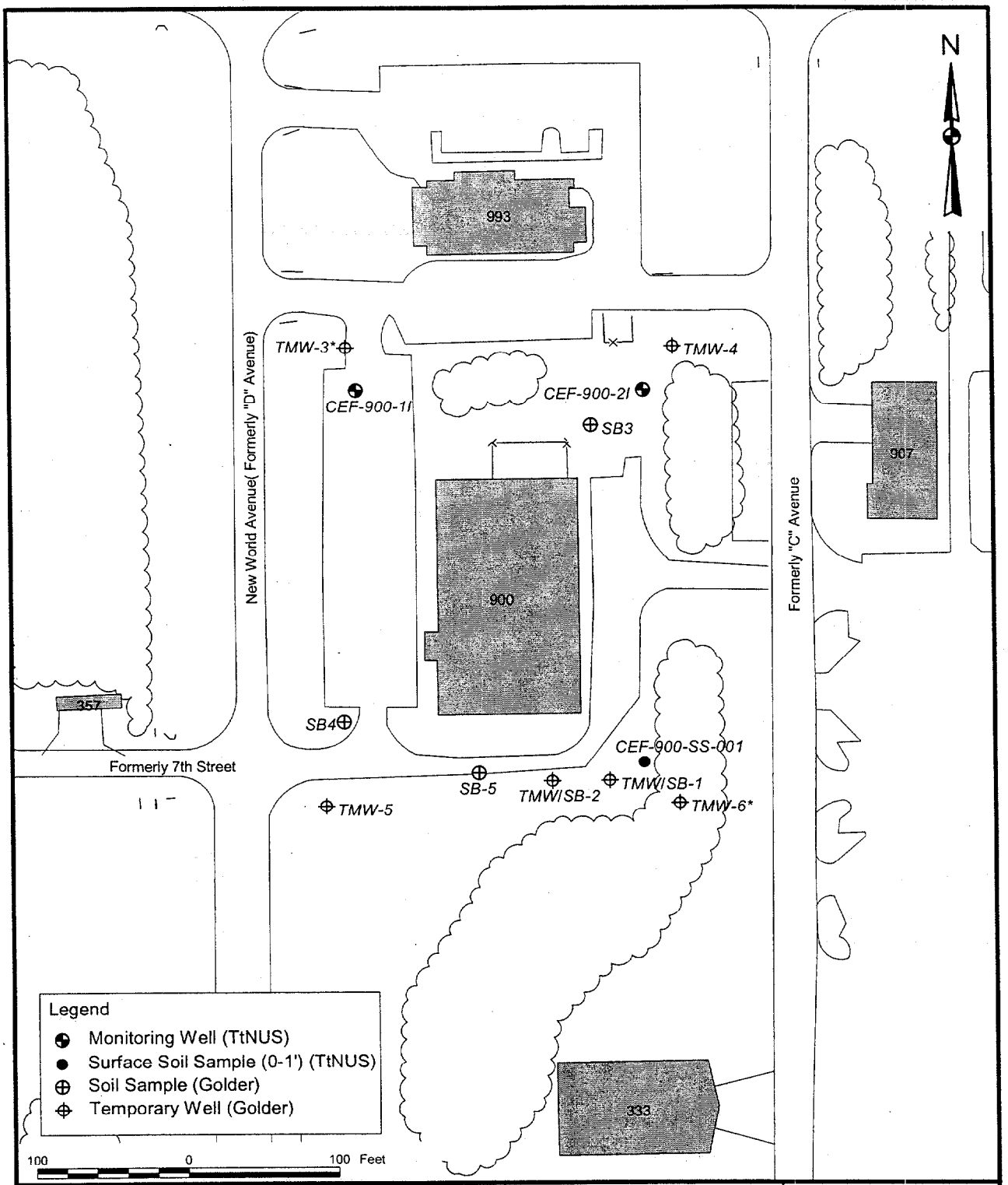

DRAWN BY MJJ	DATE 16Nov99	SAMPLE LOCATIONS BUILDING 900 NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 0039
CHECKED BY	DATE		APPROVED BY / DATE
COST/SCHEDULE-AREA			APPROVED BY / DATE
SCALE AS NOTED			DRAWING NO. FIGURE 2-1 / REV 0

P:\GIS\CECIL\bldg900.apr 18Nov99 MJJ Layout1

3.0 RESULTS AND PRELIMINARY RISK EVALUATION

VOCs were not detected in the soil or groundwater samples collected at Building 900. Total lead and chromium concentrations were less than detection limits in the groundwater resample collected from well CEF-900-2I. Vanadium was detected in groundwater from CEF-900-2I, but filtered and unfiltered concentrations were less than the FDEP GTCL in the resample. Based on this information, a human health preliminary risk evaluation (PRE) is not required for Building 900.

In addition, because no VOCs were detected in soil, an ecological risk assessment is not required.

4.0 CONCLUSIONS AND RECOMMENDATION

Vanadium detected in groundwater collected at Building 900 does not represent a risk to human health or the environment at the detected concentrations. No contaminants were detected in the soil. No other environmental concerns have been identified for this facility.

Based upon the findings of this evaluation, the color code for Building 900 should be reclassified to Light Green. No remedial action or further evaluation is recommended.

REFERENCES

ABB Environmental Services, Inc. (ABB-ES), 1994. Base Realignment and Closure Environmental Baseline Survey Report, Naval Air Station, Cecil Field, Jacksonville, Florida. Tallahassee, FL.

Florida Department of Environmental Protection (FDEP), 1999. Contaminant Target Cleanup Levels, Florida Administrative Code (F.A.C.) Chapter 62-777, August.

Golder Associates, 1998. Due Diligence Assessment of Environmental Concerns – Building 900, January.

Tetra Tech NUS, Inc. (TtNUS), 1999. Sampling and Analysis Plan, Building 900, Naval Air Station Cecil Field, Jacksonville, Florida. Pittsburgh, PA, June.

TtNUS, 1998. Base-Wide Generic Work Plan, Naval Air Station Cecil Field, Jacksonville, Florida. Pittsburgh, PA, October.

United States Environmental Protection Agency (U.S. EPA), 1996. Environmental Investigations Standard Operating Procedures and Quality Assurance Manual (EISOPQAM), May.

APPENDIX A

LABORATORY ANALYTICAL DATA

Tetra Tech NUS

INTERNAL CORRESPONDENCE

PITT-09-9-021

TO:	**M. SPERANZA**	**DATE:**	**SEPTEMBER 2, 1999**
FROM:	**TERRI L. SOLOMON**	**COPIES:**	**DV FILE**
SUBJECT:	**ORGANIC DATA VALIDATION –VOA CTO 078 –NAS CECIL FIELD, FLORIDA SDG – F4637**		
SAMPLES:	1/Aqueous/		
	CEF-900-GW-01I-01		
	1/Soil/		
	CEF-900-SS-001-01		

Overview

The sample set for CTO 078, Cecil Field, SDG F4637, consists of one (1) aqueous and one (1) soil environmental sample.

All samples were analyzed for volatile organic compounds (VOAs). The samples were collected by Tetra Tech NUS on August 3, 1999 and analyzed by Accutest under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. All analyses were conducted using SW-846 methods 8260B. These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
• Initial and Continuing Calibration Results
• Laboratory Blank Analyses
* • Surrogate Recoveries
* • Detection Limits

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

Volatile Analyses

The initial and continuing calibration relative response factors (RRFs) for acetone and 2-butanone were < 0.05 quality control limit affecting sample CEF-900-GW-01I-01. The nondetected results reported for the aforementioned compounds were qualified as rejected, "UR".

The following compound was detected in the laboratory method blanks at the following maximum concentration indicated below:

Compound	Concentration	Soil Action
Methylene chloride	0.89 ug/kg	8.9 ug/kg

- Value < Contract Required Quantitation Limit (CRQL); report CRQL followed by a "U".
- Value > CRQL and < action level; report value followed by a "U".
- Value > CRQL and > action level; report value unqualified.

Dilution factors and sample aliquots were taken into consideration during the application of all action levels. The positive result reported for this compound in the affected sample was qualified in the manner indicated by the blank action table. The positive result reported for methylene chloride was qualified as nondetected, "U".

Executive Summary

Laboratory Performance: The initial and continuing calibration RRFs for acetone and 2-butanone were < 0.05 quality control limit affecting sample CEF-900-GW-01I-01

Other Factors Affecting Data Quality: Methylene chloride was present in the laboratory method blank.

The data for these analyses were reviewed with reference to the "National Functional Guidelines for Organic Review", February 1994 and the NFESC document entitled "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

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
Terri L. Solomon
Chemist

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
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/PCB D% 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 = % Solid content is less than 30%

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4637

SAMPLE NUMBER:	CEF-900-GW-01I-01											
SAMPLE DATE:	08/03/99			/ /			/ /			/ /		
LABORATORY ID:	F4637-1											
QC_TYPE:	NORMAL											
% SOLIDS:	0.0 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/L											
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	1	U										
1,1,2,2-TETRACHLOROETHANE	1	U										
1,1,2-TRICHLOROETHANE	1	U										
1,1-DICHLOROETHANE	1	U										
1,1-DICHLOROETHENE	1	U										
1,2-DICHLOROETHANE	1	U										
1,2-DICHLOROPROPANE	1	U										
2-BUTANONE	5	UR	C									
2-HEXANONE	5	U										
4-METHYL-2-PENTANONE	5	U										
ACETONE	5	UR	C									
BENZENE	1	U										
BROMODICHLOROMETHANE	1	U										
BROMOFORM	1	U										
BROMOMETHANE	1	U										
CARBON DISULFIDE	5	U										
CARBON TETRACHLORIDE	1	U										
CHLOROBENZENE	1	U										
CHLOROETHANE	1	U										
CHLOROFORM	1	U										
CHLOROMETHANE	1	U										
CIS-1,2-DICHLOROETHENE	1	U										
CIS-1,3-DICHLOROPROPENE	1	U										
DIBROMOCHLOROMETHANE	1	U										
ETHYLBENZENE	1	U										
METHYLENE CHLORIDE	5	U										
STYRENE	1	U										
TETRACHLOROETHENE	1	U										
TOLUENE	1	U										
TRANS-1,2-DICHLOROETHENE	1	U										
TRANS-1,3-DICHLOROPROPENE	1	U										
TRICHLOROETHENE	1	U										
VINYL C[illegible]RIDE	1	U										
XY[illegible]	3											

OTO - NAS CECIL FIELD

SOIL DATA
Accutest, NJ
SDG: F4637

SAMPLE NUMBER:	CEF-900-SS-001-01											
SAMPLE DATE:	08/03/99			/ /			/ /			/ /		
LABORATORY ID:	F4637-3											
QC_TYPE:	NORMAL											
% SOLIDS:	86.9 %			100.0 %			100.0 %			100.0 %		
UNITS:	UG/KG											
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
VOLATILES												
1,1,1-TRICHLOROETHANE	5	U										
1,1,2,2-TETRACHLOROETHANE	5	U										
1,1,2-TRICHLOROETHANE	5	U										
1,1-DICHLOROETHANE	5	U										
1,1-DICHLOROETHENE	5	U										
1,2-DICHLOROETHANE	5	U										
1,2-DICHLOROPROPANE	5	U										
2-BUTANONE	5	U										
2-HEXANONE	5	U										
4-METHYL-2-PENTANONE	5	U										
ACETONE	5	U										
BENZENE	1	U										
BROMODICHLOROMETHANE	5	U										
BROMOFORM	5	U										
BROMOMETHANE	5	U										
CARBON DISULFIDE	5	U										
CARBON TETRACHLORIDE	5	U										
CHLOROBENZENE	5	U										
CHLOROETHANE	5	U										
CHLOROFORM	5	U										
CHLOROMETHANE	5	U										
CIS-1,2-DICHLOROETHENE	5	U										
CIS-1,3-DICHLOROPROPENE	5	U										
DIBROMOCHLOROMETHANE	5	U										
ETHYLBENZENE	1	U										
METHYLENE CHLORIDE	5	U	A									
STYRENE	5	U										
TETRACHLOROETHENE	5	U										
TOLUENE	1	U										
TRANS-1,2-DICHLOROETHENE	5	U										
TRANS-1,3-DICHLOROPROPENE	5	U										
TRICHLOROETHENE	5	U										
VINYL CHLORIDE	5	U										
XYLENES, TOTAL	5	U										

APPENDIX B
Results as reported by the Laboratory

ACCUTEST.

Report of Analysis

Client Sample ID:	CEF-900-GW-01I-01		
Lab Sample ID:	F4637-1	**Date Sampled:**	08/03/99
Matrix:	AQ - Ground Water	**Date Received:**	08/04/99
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0009860.D	1	08/10/99	CJP	n/a	n/a	VG270
Run #2							

VOA TCL List

CAS No.	Compound	Result	RDL	Units	Q
67-64-1	Acetone	ND	5.0	ug/l	
71-43-2	Benzene	ND	1.0	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	ug/l	
75-25-2	Bromoform	ND	1.0	ug/l	
108-90-7	Chlorobenzene	ND	1.0	ug/l	
75-00-3	Chloroethane	ND	1.0	ug/l	
67-66-3	Chloroform	ND	1.0	ug/l	
75-15-0	Carbon disulfide	ND	5.0	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	ug/l	
75-35-4	1,1-Dichloroethylene	ND	1.0	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	ug/l	
156-59-2	cis-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	ug/l	
156-60-5	trans-1,2-Dichloroethylene	ND	1.0	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	ug/l	
100-41-4	Ethylbenzene	ND	1.0	ug/l	
591-78-6	2-Hexanone	ND	5.0	ug/l	
108-10-1	4-Methyl-2-pentanone	ND	5.0	ug/l	
74-83-9	Methyl bromide	ND	1.0	ug/l	
74-87-3	Methyl chloride	ND	1.0	ug/l	
75-09-2	Methylene chloride	ND	5.0	ug/l	
78-93-3	Methyl ethyl ketone	ND	5.0	ug/l	
100-42-5	Styrene	ND	1.0	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	ug/l	
127-18-4	Tetrachloroethylene	ND	1.0	ug/l	
108-88-3	Toluene	ND	1.0	ug/l	
79-01-6	Trichloroethylene	ND	1.0	ug/l	
75-01-4	Vinyl chloride	ND	1.0	ug/l	
1330-20-7	Xylene (total)	ND	3.0	ug/l	

ND = Not detected
RDL = Reported Detection 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

000003

ACCUTEST.

Report of Analysis

Client Sample ID:	CEF-900-GW-01I-01		
Lab Sample ID:	F4637-1	**Date Sampled:**	08/03/99
Matrix:	AQ - Ground Water	**Date Received:**	08/04/99
Method:	SW846 8260B	**Percent Solids:**	n/a
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	G0009860.D	1	08/10/99	CJP	n/a	n/a	VG270
Run #2							

VOA TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		80-116%
17060-07-0	1,2-Dichloroethane-D4	107%		74-120%
2037-26-5	Toluene-D8	96%		80-120%
460-00-4	4-Bromofluorobenzene	101%		86-115%

ND = Not detected
RDL = Reported Detection 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.

Report of Analysis

Client Sample ID:	CEF-900-SS-001-01		
Lab Sample ID:	F4637-3	**Date Sampled:**	08/03/99
Matrix:	SO - Soil	**Date Received:**	08/04/99
Method:	SW846 8260B	**Percent Solids:**	86.9
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K24163.D	1	08/17/99	ANJ	n/a	n/a	N:VK998
Run #2							

VOA TCL List

CAS No.	Compound	Result	RDL	Units	Q
67-64-1	Acetone	ND	5.0	ug/kg	
71-43-2	Benzene	ND	1.0	ug/kg	
75-27-4	Bromodichloromethane	ND	5.0	ug/kg	
75-25-2	Bromoform	ND	5.0	ug/kg	
74-83-9	Bromomethane	ND	5.0	ug/kg	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.0	ug/kg	
108-90-7	Chlorobenzene	ND	5.0	ug/kg	
75-00-3	Chloroethane	ND	5.0	ug/kg	
67-66-3	Chloroform	ND	5.0	ug/kg	
74-87-3	Chloromethane	ND	5.0	ug/kg	
124-48-1	Dibromochloromethane	ND	5.0	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.0	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.0	ug/kg	
75-35-4	1,1-Dichloroethene	ND	5.0	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	5.0	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	5.0	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.0	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.0	ug/kg	
100-41-4	Ethylbenzene	ND	1.0	ug/kg	
591-78-6	2-Hexanone	ND	5.0	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	ug/kg	
75-09-2	Methylene chloride	1.8	5.0	ug/kg	JB
100-42-5	Styrene	ND	5.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.0	ug/kg	
127-18-4	Tetrachloroethene	ND	5.0	ug/kg	
108-88-3	Toluene	ND	1.0	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.0	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.0	ug/kg	
79-01-6	Trichloroethene	ND	5.0	ug/kg	
75-01-4	Vinyl chloride	ND	5.0	ug/kg	
1330-20-7	Xylene (total)	ND	5.0	ug/kg	

ND = Not detected
RDL = Reported Detection 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

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ACCUTEST.

Report of Analysis

Client Sample ID:	CEF-900-SS-001-01		
Lab Sample ID:	F4637-3	**Date Sampled:**	08/03/99
Matrix:	SO - Soil	**Date Received:**	08/04/99
Method:	SW846 8260B	**Percent Solids:**	86.9
Project:	NAS Cecil Field		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K24163.D	1	08/17/99	ANJ	n/a	n/a	N:VK998
Run #2							

VOA TCL List

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	82%		80-120%
17060-07-0	1,2-Dichloroethane-D4	79%		70-121%
2037-26-5	Toluene-D8	89%		81-117%
460-00-4	4-Bromofluorobenzene	110%		74-121%

ND = Not detected
RDL = Reported Detection 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

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APPENDIX C
Support Documentation

TETRA TECH NUS, INC.

CHAIN OF CUSTODY | NUMBER Bldg 900-8/97 PAGE 1 OF 1

PROJECT NO: 0039 SITE NAME: Bldg 900

PROJECT MANAGER AND PHONE NUMBER: JOE LOGAN 412 921 7231

LABORATORY NAME AND CONTACT: ACCUTEST H. BEHZADI

SAMPLERS (SIGNATURE): Abby B Wilcox

FIELD OPERATIONS LEADER AND PHONE NUMBER: ABBY WILCOX 904 281 0400

ADDRESS: 4405 VINELAND RD

CARRIER/WAYBILL NUMBER: GREYHOUND

CITY, STATE: ORLANDO

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

DATE YEAR 1997	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: TCL VOCs 8260	Pb Total	Pb Filtered	SPLP VOCs (including dup blank)				COMMENTS
					CONTAINER TYPE PLASTIC (P) or GLASS (G)	G	P	P	G				
					PRESERVATIVE USED	GW HCL SS -	HNO3	HNO3	-				
8/3	0915	CEF-900-GW-01I-01	GW	G	2	2					MS/MSD		COOL TO 4°C
8/3	1045	CEF-900-GW-02I-01	GW	↓	2		1	1			MS/MSD		NOTE: ONLY 1 EXTRA VOLUME
8/3	0915	CEF-900-GW-MSMSD01	GW		2	2							
8/3	1045	CEF-900-GW-MSMSD02	GW		4		2	2					
8/3	1230	CEF-900-SS-001-01	SS		3	3			2		MS/MSD	3	NOTE: DO NOT ANALYZE FOR SPLP UNTIL DIRECTED BY TENUS
8/3	1230	CEF-900-SS-MSMSD001	SS		4	2			2			3	

F4637

COOLER, 4°C

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY: Abby B Wilcox	8/3	1800	1. RECEIVED BY: Rachel	8/7/97	1000
2. RELINQUISHED BY			2. RECEIVED BY		
3. RELINQUISHED BY			3. RECEIVED BY		

OW COP PINK (FILE COPY) DRM TINUS

F463

HOLDING TIME

08/26/99

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	CEF-900-GW-02I-01	F4637-2	NORMAL	F4637	M	08/03/99	08/06/99	08/09/99	3	3	6
UG/L	CEF-900-GW-02I-01-F	F4637-2A	NORMAL	F4637	MF	08/03/99	08/06/99	08/09/99	3	3	6
UG/L	CEF-900-GW-01I-01	F4637-1	NORMAL	F4637	OV	08/03/99	/ /	08/10/99	0	0	7
UG/KG	CEF-900-SS-001-01	F4637-3	NORMAL	F4637	OV	08/03/99	/ /	08/17/99	0	0	14

Method Blank Summary

Job Number: F4637
Account: ALSE Accutest Laboratories Southeast, Inc.
Project: TETRPAPT: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VK998-MB1	K24159.D	1	08/17/99	YD	n/a	n/a	VK998

The QC reported here applies to the following samples: **Method:** SW846 8260B

F4637-3

CAS No.	Compound	Result	RDL	Units	Q
67-64-1	Acetone	ND	5.0	ug/kg	
71-43-2	Benzene	ND	1.0	ug/kg	
75-27-4	Bromodichloromethane	ND	5.0	ug/kg	
75-25-2	Bromoform	ND	5.0	ug/kg	
74-83-9	Bromomethane	ND	5.0	ug/kg	
78-93-3	2-Butanone (MEK)	ND	5.0	ug/kg	
75-15-0	Carbon disulfide	ND	5.0	ug/kg	
56-23-5	Carbon tetrachloride	ND	5.0	ug/kg	
108-90-7	Chlorobenzene	ND	5.0	ug/kg	
75-00-3	Chloroethane	ND	5.0	ug/kg	
67-66-3	Chloroform	ND	5.0	ug/kg	
74-87-3	Chloromethane	ND	5.0	ug/kg	
124-48-1	Dibromochloromethane	ND	5.0	ug/kg	
75-34-3	1,1-Dichloroethane	ND	5.0	ug/kg	
107-06-2	1,2-Dichloroethane	ND	5.0	ug/kg	
75-35-4	1,1-Dichloroethene	ND	5.0	ug/kg	
156-59-2	cis-1,2-Dichloroethene	ND	5.0	ug/kg	
156-60-5	trans-1,2-Dichloroethene	ND	5.0	ug/kg	
78-87-5	1,2-Dichloropropane	ND	5.0	ug/kg	
10061-01-5	cis-1,3-Dichloropropene	ND	5.0	ug/kg	
10061-02-6	trans-1,3-Dichloropropene	ND	5.0	ug/kg	
100-41-4	Ethylbenzene	ND	1.0	ug/kg	
591-78-6	2-Hexanone	ND	5.0	ug/kg	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	ug/kg	
75-09-2	Methylene chloride	0.89	5.0	ug/kg	J
100-42-5	Styrene	ND	5.0	ug/kg	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.0	ug/kg	
127-18-4	Tetrachloroethene	ND	5.0	ug/kg	
108-88-3	Toluene	ND	1.0	ug/kg	
71-55-6	1,1,1-Trichloroethane	ND	5.0	ug/kg	
79-00-5	1,1,2-Trichloroethane	ND	5.0	ug/kg	
79-01-6	Trichloroethene	ND	5.0	ug/kg	
75-01-4	Vinyl chloride	ND	5.0	ug/kg	
1330-20-7	Xylene (total)	ND	5.0	ug/kg	

Method Blank Summary

Job Number: F4637
Account: ALSE Accutest Laboratories Southeast, Inc.
Project: TETRPAPT: NAS Cecil Field

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VK998-MB1	K24159.D	1	08/17/99	YD	n/a	n/a	VK998

The QC reported here applies to the following samples: **Method:** SW846 8260B

F4637-3

CAS No.	Surrogate Recoveries		Limits
1868-53-7	Dibromofluoromethane	83%	80-120%
17060-07-0	1,2-Dichloroethane-D4	71%	70-121%
2037-26-5	Toluene-D8	89%	81-117%
460-00-4	4-Bromofluorobenzene	79%	74-121%

Instrument Performance Check (BFB)

Job Number: F4637
Account: TETRPAPT Tetra Tech, NUS
Project: NAS Cecil Field

Sample: VG270-BFB
Lab File ID: G0009844.D
Instrument ID: GCMSG
Injection Date: 08/10/99
Injection Time: 09:18

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	14082	25.6		Pass
75	30.0 - 60.0% of mass 95	32194	58.5		Pass
95	Base peak, 100% relative abundance	55022	100.0		Pass
96	5.0 - 9.0% of mass 95	4124	7.5		Pass
173	Less than 2.0% of mass 174	270	0.49	(0.56) [a]	Pass
174	50.0 - 100.0% of mass 95	48274	87.7		Pass
175	5.0 - 9.0% of mass 174	3306	6.0	(6.8) [a]	Pass
176	95.0 - 101.0% of mass 174	47808	86.9	(99.0) [a]	Pass
177	5.0 - 9.0% of mass 176	3488	6.3	(7.3) [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
VG270-CC263	G0009845.D	08/10/99	09:33	00:15	Continuing cal 20
VG270-MB	G0009846.D	08/10/99	10:12	00:54	Method Blank
VG264-MB	G0009846.D	08/10/99	10:12	00:54	Method Blank
VG267-MB	G0009846.D	08/10/99	10:12	00:54	Method Blank
VG265-MB	G0009846.D	08/10/99	10:12	00:54	Method Blank
ZZZZZZ	G0009847.D	08/10/99	10:53	01:35	(unrelated sample)
F4622-7DUP	G0009848.D	08/10/99	11:32	02:14	Duplicate
ZZZZZZ	G0009849.D	08/10/99	12:11	02:53	(unrelated sample)
ZZZZZZ	G0009850.D	08/10/99	12:49	03:31	(unrelated sample)
ZZZZZZ	G0009851.D	08/10/99	13:28	04:10	(unrelated sample)
ZZZZZZ	G0009852.D	08/10/99	14:07	04:49	(unrelated sample)
ZZZZZZ	G0009853.D	08/10/99	14:45	05:27	(unrelated sample)
ZZZZZZ	G0009854.D	08/10/99	15:24	06:06	(unrelated sample)
ZZZZZZ	G0009855.D	08/10/99	16:03	06:45	(unrelated sample)
ZZZZZZ	G0009856.D	08/10/99	16:41	07:23	(unrelated sample)
ZZZZZZ	G0009857.D	08/10/99	17:20	08:02	(unrelated sample)
ZZZZZZ	G0009858.D	08/10/99	17:59	08:41	(unrelated sample)
ZZZZZZ	G0009859.D	08/10/99	18:37	09:19	(unrelated sample)
F4637-1	G0009860.D	08/10/99	19:16	09:58	CEF-900-GW-01I-01
ZZZZZZ	G0009861.D	08/10/99	19:55	10:37	(unrelated sample)
ZZZZZZ	G0009862.D	08/10/99	20:33	11:15	(unrelated sample)

RSD > 15% Quant by Curve CP

Response Factor Report MSVOA1

Method : C:\HPCHEM\1\METHODS\8260LL.M (RTE Integrator)
Title : SW-846 Method 8260B & EPA 624 (low level)
Last Update : Wed Aug 04 08:38:53 1999
Response via : Initial Calibration

Calibration Files
1 =G0009665.D 2 =G0009666.D 3 =G0009667.D
4 =G0009668.D 5 =G0009669.D 6 =G0009670.D

		Compound	1	2	3	4	5	6	Avg	%RSD
1)	I	Fluorobenzene	----------	----------	----------	ISTD	----------	----------	----------	
2)		Dichlorodifluoromet	0.350	0.409	0.417	0.403	0.399	0.395	0.394	6.03
3)	P	Chloromethane	0.195	0.211	0.202	0.203	0.206	0.203	0.203	2.66
4)	C	Vinyl Chloride		0.305	0.257	0.307	0.261	0.252	0.276	9.77
5)		Bromomethane	0.275	0.233	0.239	0.248	0.258	0.267	0.253	6.51
6)		Chloroethane		0.176	0.142	0.141	0.142	0.142	0.149	10.26
7)		Trichlorofluorometh	0.720	0.818	0.791	0.771	0.781	0.744	0.771	4.53
8)		Acrolein		0.006	0.008	0.007	0.008	0.007	0.007	9.22
9)	C	1,1-Dichloroethene	0.525	0.577	0.562	0.557	0.572	0.571	0.561	3.39
10)		Acetone		0.034	0.031	0.029	0.029	0.029	0.030	6.95
11)		Carbon Disulfide	0.614	0.702	0.705	0.703	0.713	0.716	0.692	5.60
12)		Methylene Chloride		0.452	0.401	0.378	0.381	0.395	0.401	7.42
13)		trans-1,2-Dichloroe	0.406	0.462	0.452	0.445	0.455	0.454	0.446	4.53
14)		Acrylonitrile		0.024	0.022	0.021	0.021	0.022	0.022	4.02
15)		Methyl Tert Butyl E	0.557	0.610	0.596	0.596	0.616	0.608	0.597	3.54
)	P	1,1-Dichloroethane	0.584	0.629	0.609	0.613	0.622	0.623	0.613	2.61
17)		Vinyl acetate	0.447	0.480	0.465	0.472	0.499	0.493	0.476	4.02
18)		Di-isopropyl ether	1.004	1.038	0.990	0.972	1.004	1.000	1.002	2.18
19)		2,2-Dichloropropane	0.631	0.607	0.588	0.571	0.590	0.581	0.595	3.62
20)		cis-1,2-Dichloroeth	0.327	0.339	0.291	0.307	0.311	0.296	0.312	5.84
21)		2-Butanone		0.054	0.050	0.047	0.049	0.047	0.049	5.63
22)		Bromochloromethane	0.148	0.159	0.162	0.155	0.163	0.162	0.158	3.68
23)	C	Chloroform		0.733	0.690	0.669	0.692	0.684	0.694	3.40
24)		1,1,1-Trichloroetha	0.609	0.662	0.661	0.638	0.675	0.668	0.652	3.73
25)	S	Dibromofluoromethan	0.261	0.260	0.259	0.250	0.267	0.270	0.261	2.73
26)		1,1-Dichloropropene	0.486	0.496	0.477	0.476	0.475	0.462	0.479	2.37
27)		Carbon Tetrachlorid	0.520	0.551	0.544	0.557	0.565	0.576	0.552	3.47
28)	S	1,2-Dichloroethane-	0.151	0.130	0.147	0.145	0.153	0.161	0.148	6.95
29)		Benzene	0.564	0.622	0.620	0.676	0.593	0.690	0.626	7.28
30)		1,2-Dichloroethane	0.340	0.386	0.385	0.420	0.379	0.422	0.389	7.81
31)		Trichloroethene	0.396	0.413	0.415	0.413	0.414	0.419	0.412	1.94
32)	C	1,2-Dichloropropane	0.346	0.353	0.344	0.339	0.349	0.353	0.347	1.60
33)		Dibromomethane	0.227	0.236	0.248	0.245	0.250	0.251	0.243	3.90
34)		1,4-Dioxane		0.001	0.001	0.001	0.001	0.001	0.001	1.66
35)		Bromodichloromethan	0.491	0.554	0.575	0.582	0.598	0.612	0.569	7.55
36)		2-Chloroethyl vinyl	0.070	0.079	0.080	0.082	0.091	0.087	0.081	8.65
37)		4-Methyl-2-pentanon	0.146	0.162	0.161	0.158	0.165	0.160	0.159	4.27
38)		cis-1,3-Dichloropro	0.333	0.403	0.397	0.422	0.436	0.437	0.405	9.56
39)	I	Chlorobenzene-d5	----------	----------	----------	ISTD	----------	----------	----------	
0)	S	Toluene-d8	0.693	0.713	0.680	0.689	0.703	0.701	0.697	1.65
1)	C	Toluene	1.268	1.379	1.309	1.337	1.371	1.357	1.337	3.16
42)		trans-1,3-Dichlorop	0.394	0.437	0.449	0.471	0.503	0.500	0.459	9.01

(#) = Out of Range

Response Factor Report MSVOA1

Method : C:\HPCHEM\1\METHODS\8260LL.M (RTE Integrator)
Title : SW-846 Method 8260B & EPA 624 (low level)
Last Update : Wed Aug 04 08:39:53 1999
Response via : Initial Calibration

Calibration Files
1 =G0009665.D 2 =G0009666.D 3 =G0009667.D
4 =G0009668.D 5 =G0009669.D 6 =G0009670.D

		Compound	1	2	3	4	5	6	Avg	%RSD
43)		1,1,2-Trichloroetha	0.261	0.273	0.281	0.278	0.293	0.282	0.278	3.78
44)		Tetrachloroethene	0.693	0.729	0.696	0.684	0.690	0.678	0.695	2.59
45)		2-hexanone	0.146	0.154	0.144	0.146	0.153	0.146	0.148	2.66
46)		1,3-Dichloropropane	0.561	0.547	0.502	0.515	0.528	0.507	0.527	4.48
47)		Dibromochloromethan		0.467	0.483	0.508	0.548	0.550	0.511	7.34
48)		1,2-Dibromoethane	0.357	0.375	0.377	0.402	0.421	0.425	0.393	6.93
49)		1-Chlorohexane	0.660	0.682	0.652	0.646	0.661	0.664	0.661	1.85
50)	P	Chlorobenzene	1.054	1.048	0.995	0.987	1.011	1.006	1.017	2.74
51)		1,1,1,2-Tetrachloro	0.412	0.478	0.452	0.478	0.502	0.508	0.471	7.53
52)	C	Ethylbenzene	1.684	1.778	1.683	1.726	1.728	1.737	1.723	2.08
53)		m,p-Xylene	1.332	1.440	1.429	1.393	1.434	1.422	1.409	2.90
54)		o-Xylene	1.232	1.401	1.343	1.336	1.405	1.369	1.348	4.72
55)		Styrene	0.669	0.781	0.761	0.787	0.820	0.813	0.772	7.09
56)	P	Bromoform		0.295	0.297	0.321	0.358	0.354	0.325	9.22
57)	I	1,4-Dichlorobenzene-d	----------	----------	----------	ISTD	----------	----------	----------	
58)		Isopropylbenzene	2.786	2.928	2.929	2.931	2.796	2.890	2.877	2.36
59)	S	4-Bromofluorobenzen	0.549	0.537	0.540	0.549	0.529	0.532	0.539	1.52
60)		Bromobenzene	0.755	0.846	0.818	0.815	0.828	0.782	0.808	4.07
61)	P	1,1,2,2-Tetrachloro	0.510	0.644	0.632	0.637	0.631	0.623	0.613	8.31
62)		1,2,3-Trichloroprop	0.147	0.163	0.165	0.164	0.172	0.158	0.162	5.27
63)		n-Propylbenzene	3.379	3.620	3.597	3.602	3.563	3.509	3.545	2.54
64)		2-Chlorotoluene	2.218	2.315	2.179	2.179	2.158	2.130	2.196	2.95
65)		4-Chlorotoluene	2.412	2.531	2.334	2.411	2.380	2.475	2.424	2.89
66)		1,3,5-Trimethylbenz	2.351	2.513	2.480	2.450	2.401	2.497	2.449	2.53
67)		sec-Butylbenzene	3.185	3.566	3.579	3.497	3.403	3.414	3.441	4.22
68)		1,3-Dichlorobenzene	1.412	1.485	1.459	1.466	1.471	1.454	1.458	1.72
69)		4-Isopropyltoluene	2.559	2.779	2.805	2.762	2.690	2.719	2.719	3.26
70)		1,4-Dichlorobenzene	1.412	1.508	1.456	1.448	1.428	1.417	1.445	2.45
71)		tert-Butylbenzene	1.854	1.976	1.962	1.951	1.907	1.923	1.929	2.32
72)		n-Butylbenzene	2.616	2.770	2.884	2.809	2.788	2.792	2.777	3.16
73)		1,2-Dichlorobenzene	1.300	1.301	1.285	1.265	1.241	1.240	1.272	2.17
74)		1,2,4-Trimethylbenz	2.392	2.427	2.485	2.376	2.362	2.412	2.409	1.83
75)		1,2-Dibromo-3-Chlor		0.094	0.105	0.109	0.115	0.113	0.107	7.98
76)		1,2,4-Trichlorobenz	0.919	0.990	1.022	1.036	1.057	1.013	1.006	4.82
77)		Hexachlorobutadiene	0.717	0.739	0.715	0.756	0.705	0.728	0.727	2.52
78)		Naphthalene	0.848	0.995	1.002	1.069	1.109	1.078	1.017	9.25
79)		1,2,3-Trichlorobenz	0.730	0.817	0.844	0.869	0.843	0.846	0.825	5.99

(#) = Out of Range

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\081099\G0009845.D Vial: 16
Acq On : 10 Aug 1999 9:33 am Operator: ClaudiaP
Sample : CC263-20 Inst : MSVOA1
Misc : Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\HPCHEM\1\METHODS\8260LL.M (RTE Integrator)
Title : SW-846 Method 8260B & EPA 624 (low level)
Last Update : Wed Aug 04 08:38:53 1999
Response via : Multiple Level Calibration

Min. RRF : 0.001 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
41	C	Toluene	1.337	1.326	0.8	108	0.00
42		trans-1,3-Dichloropropene	0.459	0.449	2.2	104	-0.01
43		1,1,2-Trichloroethane	0.278	0.272	2.2	106	-0.02
44		Tetrachloroethene	0.695	0.698	-0.4	111	-0.01
45		2-hexanone	0.148	0.130	12.2	96	-0.01
46		1,3-Dichloropropane	0.527	0.503	4.6	106	-0.01
47		Dibromochloromethane	0.511	0.487	4.7	104	0.00
48		1,2-Dibromoethane	0.393	0.377	4.1	102	-0.01
49		1-Chlorohexane	0.661	0.678	-2.6	114	-0.01
50	P	Chlorobenzene	1.017	1.017	0.0	112	-0.01
51		1,1,1,2-Tetrachloroethane	0.471	0.484	-2.8	110	-0.01
52	C	Ethylbenzene	1.723	1.689	2.0	106	-0.02
[illegible]		m,p-Xylene	1.409	1.411	-0.1	110	-0.02
[illegible]		o-Xylene	1.348	1.325	1.7	108	-0.02
55		Styrene	0.772	0.787	-1.9	109	-0.01
56	P	Bromoform	0.325	0.290	10.8	98	-0.01
57	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	112	-0.01
58		Isopropylbenzene	2.877	2.869	0.3	110	-0.01
59	S	4-Bromofluorobenzene	0.539	0.526	2.4	107	-0.01
60		Bromobenzene	0.808	0.791	2.1	109	-0.02
61	P	1,1,2,2-Tetrachloroethane	0.613	0.564	8.0	99	-0.01
62		1,2,3-Trichloropropane	0.162	0.154	4.9	105	0.00
63		n-Propylbenzene	3.545	3.429	3.3	107	-0.02
64		2-Chlorotoluene	2.196	2.061	6.1	106	0.00
65		4-Chlorotoluene	2.424	2.340	3.5	109	0.00
66		1,3,5-Trimethylbenzene	2.449	2.441	0.3	111	0.00
67		sec-Butylbenzene	3.441	3.414	0.8	109	0.00
68		1,3-Dichlorobenzene	1.458	1.442	1.1	110	-0.02
69		4-Isopropyltoluene	2.719	2.730	-0.4	111	-0.01
70		1,4-Dichlorobenzene	1.445	1.430	1.0	110	-0.01
71		tert-Butylbenzene	1.929	1.874	2.9	107	0.00
72		n-Butylbenzene	2.777	2.733	1.6	109	-0.01
73		1,2-Dichlorobenzene	1.272	1.217	4.3	108	0.00
74		1,2,4-Trimethylbenzene	2.409	2.337	3.0	110	-0.01
75		1,2-Dibromo-3-Chloropropane	0.107	0.088	17.8	90	-0.01
76		1,2,4-Trichlorobenzene	1.006	0.988	1.8	107	-0.01
77		Hexachlorobutadiene	0.727	0.769	-5.8	114	-0.01
[illegible]		Naphthalene	1.017	0.914	10.1	96	-0.01
79		1,2,3-Trichlorobenzene	0.825	0.767	7.0	99	-0.02

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

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\080999\G0009834.D Vial: 5
Acq On : 9 Aug 1999 7:52 pm Operator: ClaudiaP
Sample : CC263-20 Inst : MSVOA1
Misc : ms339,vg270,,,,, Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\HPCHEM\1\METHODS\8260LL.M (RTE Integrator)
Title : SW-846 Method 8260B & EPA 624 (low level)
Last Update : Wed Aug 04 08:38:53 1999
Response via : Multiple Level Calibration

CP

Min. RRF : 0.001 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	I	Fluorobenzene	1.000	1.000	0.0	97	0.00
2		Dichlorodifluoromethane	0.394	0.353	10.4	85	0.00
3	P	Chloromethane	0.203	0.201	1.0	96	0.01
4	C	Vinyl Chloride	0.276	0.242	12.3	76	0.00
5		Bromomethane	0.253	0.155	38.7#	61	-0.03
6		Chloroethane	0.149	0.180	-20.8	123	-0.02
7		Trichlorofluoromethane	0.771	0.727	5.7	91	0.02
8		Acrolein	0.007	0.006	14.3	82	0.01
9	C	1,1-Dichloroethene	0.561	0.532	5.2	93	0.00
10		Acetone	0.030	0.030	0.0	99	0.00
11		Carbon Disulfide	0.692	0.671	3.0	93	0.00
12		Methylene Chloride	0.401	0.390	2.7	100	0.01
13		trans-1,2-Dichloroethene	0.446	0.438	1.8	95	0.00
14		Acrylonitrile	0.022	0.022	0.0	100	0.03
15		Methyl Tert Butyl Ether	0.597	0.592	0.8	96	0.00
16	P	1,1-Dichloroethane	0.613	0.609	0.7	96	0.01
17		Vinyl acetate	0.476	0.506	-6.3	104	0.00
18		Di-isopropyl ether	1.002	1.011	-0.9	101	0.00
19		2,2-Dichloropropane	0.595	0.515	13.4	87	0.00
20		cis-1,2-Dichloroethene	0.312	0.295	5.4	93	0.01
21		2-Butanone	0.049	0.049	0.0	100	0.00
22		Bromochloromethane	0.158	0.158	0.0	99	0.01
23	C	Chloroform	0.694	0.690	0.6	100	0.00
24		1,1,1-Trichloroethane	0.652	0.626	4.0	95	0.00
25	S	Dibromofluoromethane	0.261	0.272	-4.2	105	0.00
26		1,1-Dichloropropene	0.479	0.455	5.0	93	0.00
27		Carbon Tetrachloride	0.552	0.526	4.7	91	0.00
28	S	1,2-Dichloroethane-d4	0.148	0.151	-2.0	101	0.00
29		Benzene	0.626	0.538	14.1	77	0.00
30		1,2-Dichloroethane	0.389	0.375	3.6	87	0.00
31		Trichloroethene	0.412	0.398	3.4	93	0.00
32	C	1,2-Dichloropropane	0.347	0.358	-3.2	102	-0.02
33		Dibromomethane	0.243	0.248	-2.1	98	0.00
34		1,4-Dioxane	0.001	0.001	0.0	85	-0.03
35		Bromodichloromethane	0.569	0.567	0.4	94	0.00
36		2-Chloroethyl vinyl ether	0.081	0.084	-3.7	100	0.00
37		4-Methyl-2-pentanone	0.159	0.163	-2.5	100	0.00
38		cis-1,3-Dichloropropene	0.405	0.399	1.5	92	0.00
39	I	Chlorobenzene-d5	1.000	1.000	0.0	102	0.00
40	S	Toluene-d8	0.697	0.662	5.0	97	0.00

(#) = Out of Range

000143

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\080999\G0009834.D Vial: 5
Acq On : 9 Aug 1999 7:52 pm Operator: ClaudiaP
Sample ; CC263-20 Inst : MSVOA1
Misc : ms339,vg270,,,,, Multiplr: 1.00
MS Integration Params: RTEINT.P

Method : C:\HPCHEM\1\METHODS\8260LL.M (RTE Integrator)
Title : SW-846 Method 8260B & EPA 624 (low level)
Last Update : Wed Aug 04 08:38:53 1999
Response via : Multiple Level Calibration

Min. RRF : 0.001 Min. Rel. Area : 50% Max. R.T. Dev 0.50min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
41	C	Toluene	1.337	1.265	5.4	96	0.00
42		trans-1,3-Dichloropropene	0.459	0.413	10.0	89	0.00
43		1,1,2-Trichloroethane	0.278	0.273	1.8	99	-0.02
44		Tetrachloroethene	0.695	0.627	9.8	93	0.00
45		2-hexanone	0.148	0.132	10.8	92	0.00
46		1,3-Dichloropropane	0.527	0.497	5.7	98	-0.02
47		Dibromochloromethane	0.511	0.476	6.8	95	0.00
48		1,2-Dibromoethane	0.393	0.384	2.3	97	-0.02
49		1-Chlorohexane	0.661	0.583	11.8	92	0.01
50	P	Chlorobenzene	1.017	0.978	3.8	101	0.00
51		1,1,1,2-Tetrachloroethane	0.471	0.463	1.7	98	0.00
52	C	Ethylbenzene	1.723	1.614	6.3	95	0.00
[illegible]		m,p-Xylene	1.409	1.312	6.9	96	0.00
[illegible]		o-Xylene	1.348	1.332	1.2	101	0.00
55		Styrene	0.772	0.728	5.7	94	0.00
56	P	Bromoform	0.325	0.283	12.9	90	0.00
57	I	1,4-Dichlorobenzene-d4	1.000	1.000	0.0	98	0.00
58		Isopropylbenzene	2.877	2.862	0.5	95	0.00
59	S	4-Bromofluorobenzene	0.539	0.532	1.3	95	0.00
60		Bromobenzene	0.808	0.822	-1.7	98	0.00
61	P	1,1,2,2-Tetrachloroethane	0.613	0.616	-0.5	94	0.00
62		1,2,3-Trichloropropane	0.162	0.164	-1.2	97	0.00
63		n-Propylbenzene	3.545	3.598	-1.5	98	0.00
64		2-Chlorotoluene	2.196	2.160	1.6	97	0.00
65		4-Chlorotoluene	2.424	2.429	-0.2	98	0.01
66		1,3,5-Trimethylbenzene	2.449	2.353	3.9	94	0.00
67		sec-Butylbenzene	3.441	3.408	1.0	95	0.00
68		1,3-Dichlorobenzene	1.458	1.438	1.4	96	0.00
69		4-Isopropyltoluene	2.719	2.715	0.1	96	0.00
70		1,4-Dichlorobenzene	1.445	1.443	0.1	97	0.00
71		tert-Butylbenzene	1.929	1.955	-1.3	98	0.02
72		n-Butylbenzene	2.777	2.772	0.2	96	0.00
73		1,2-Dichlorobenzene	1.272	1.276	-0.3	99	0.00
74		1,2,4-Trimethylbenzene	2.409	2.341	2.8	96	0.00
75		1,2-Dibromo-3-Chloropropane	0.107	0.101	5.6	91	0.00
76		1,2,4-Trichlorobenzene	1.006	1.007	-0.1	95	0.00
77		Hexachlorobutadiene	0.727	0.715	1.7	92	0.00
		Naphthalene	1.017	0.972	4.4	89	0.01
79		1,2,3-Trichlorobenzene	0.825	0.832	-0.8	93	0.00

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

Instrument Performance Check (BFB)

Job Number: F4637
Account: ALSE Accutest Laboratories Southeast, Inc.
Project: TETRPAPT: NAS Cecil Field

Sample: VK998-BFB1 **Injection Date:** 08/17/99
Lab File ID: K24156.D **Injection Time:** 09:36
Instrument ID: GCMSK

m/e	Ion Abundance Criteria	Raw Abundance	% Relative Abundance		Pass/Fail
50	15.0 - 40.0% of mass 95	4659	27.3		Pass
75	30.0 - 60.0% of mass 95	10126	59.3		Pass
95	Base peak, 100% relative abundance	17076	100.0		Pass
96	5.0 - 9.0% of mass 95	1143	6.7		Pass
173	Less than 2.0% of mass 174	0	0.0	(0.0) [a]	Pass
174	50.0 - 120.0% of mass 95	11136	65.2		Pass
175	5.0 - 9.0% of mass 174	911	5.3	(8.2) [a]	Pass
176	95.0 - 101.0% of mass 174	11104	65.0	(99.7) [a]	Pass
177	5.0 - 9.0% of mass 176	677	4.0	(6.1) [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
VK998-CC997	K24157.D	08/17/99	10:09	00:33	Continuing cal 50
VK998-MB1	K24159.D	08/17/99	11:25	01:49	Method Blank
VK997-MB3	K24160.D	08/17/99	12:04	02:28	Method Blank
VK997-BS1	K24161.D	08/17/99	12:43	03:07	Blank Spike
VK998-BS1	K24162.D	08/17/99	13:22	03:46	Blank Spike
F4637-3	K24163.D	08/17/99	14:02	04:26	CEF-900-SS-001-01
F4637-3MS	K24164.D	08/17/99	14:42	05:06	Matrix Spike
F4637-3MSD	K24165.D	08/17/99	15:22	05:46	Matrix Spike Duplicate
ZZZZZZ	K24166.D	08/17/99	16:03	06:27	(unrelated sample)
ZZZZZZ	K24167.D	08/17/99	16:43	07:07	(unrelated sample)
ZZZZZZ	K24168.D	08/17/99	17:22	07:46	(unrelated sample)
ZZZZZZ	K24169.D	08/17/99	18:02	08:26	(unrelated sample)
ZZZZZZ	K24170.D	08/17/99	18:42	09:06	(unrelated sample)
ZZZZZZ	K24171.D	08/17/99	19:21	09:45	(unrelated sample)
ZZZZZZ	K24172.D	08/17/99	20:00	10:24	(unrelated sample)
ZZZZZZ	K24173.D	08/17/99	20:39	11:03	(unrelated sample)
ZZZZZZ	K24174.D	08/17/99	21:18	11:42	(unrelated sample)

Response Factor Report gc/ms-K

Method : C:\HPCHEM\1\METHODS\MK997.M
Title : SW-846 Method 8260
Last Update : Mon Aug 16 14:26:30 1999
Response via : Initial Calibration

Calibration Files
5 =K24121.D 10 =K24120.D 50 =K24119.D
200 =K24123.D 400 =K24124.D 100 =K24122.D

		Compound	5	10	50	200	400	100	Avg	%RSD
1)	I	pentafluorobenzene	----------	----------	----------	ISTD	----------	----------	----------	
2)	M	chlorodifluorometha	0.545	0.467	0.514	0.477	0.430	0.410	0.474	10.64
3)	M	dichlorodifluoromet	0.504	0.656	0.629	0.587	0.604	0.554	0.589	9.24
4)	M	chloromethane	0.197	0.221	0.195	0.181	0.173	0.185	0.192	8.69
5)	M	vinyl chloride	0.156	0.191	0.176	0.166	0.169	0.164	0.170	7.10
6)	M	bromomethane	0.170	0.206	0.162	0.161	0.181	0.168	0.175	9.72
7)	M	chloroethane	0.072	0.111	0.089	0.076	0.077	0.082	0.084	16.67
8)	M	trichlorofluorometh	0.741	0.924	0.949	0.763	0.697	0.752	0.804	13.07
9)	M	ethyl ether	0.110	0.116	0.109	0.106	0.098	0.102	0.107	5.85
10)	M	acrolein	0.015	0.016	0.015	0.012	0.012	0.012	0.014	14.07
11)	M	1,1-dichloroethene	0.240	0.239	0.220	0.231	0.224	0.219	0.229	4.09
12)	M	Tertiary Butyl Alco	0.037	0.036	0.045	0.040	0.035	0.035	0.038	10.58
13)	M	acetone	0.128	0.138	0.103	0.082	0.070	0.087	0.101	26.56
14)	M	methyl acetate	0.248	0.201	0.177	0.140	0.124	0.135	0.171	27.81
15)	M	allyl chloride	0.138	0.151	0.113	0.124	0.114	0.123	0.127	11.69
16)	M	acetonitrile	0.056	0.052	0.050	0.044	0.038	0.043	0.047	14.03
)	M	iodomethane	0.655	0.599	0.576	0.592	0.553	0.566	0.590	6.10
18)	M	iso-butyl alcohol	0.021	0.019	0.020	0.017	0.014	0.015	0.018	14.75
19)	M	carbon disulfide	0.600	0.551	0.508	0.521	0.497	0.496	0.529	7.65
20)	M	methylene chloride	0.276	0.251	0.240	0.244	0.235	0.226	0.245	7.06
21)	M	methyl tert butyl e	1.230	1.099	1.090	1.019	0.937	0.980	1.059	9.86
22)	M	trans-1,2-dichloroe	0.229	0.227	0.229	0.233	0.227	0.218	0.227	2.19
23)	M	di-isopropyl ether	1.367	1.272	1.169	0.981	0.836	0.903	1.088	19.61
24)	M	2-butanone	0.094	0.100	0.108	0.077	0.077	0.080	0.089	14.66
25)	M	1,1-dichloroethane	0.714	0.675	0.655	0.634	0.601	0.628	0.651	6.08
26)	M	hexane	0.395	0.389	0.362	0.321	0.282	0.281	0.338	15.15
27)	M	chloroprene	0.721	0.662	0.676	0.642	0.579	0.573	0.642	8.96
28)	M	acrylonitrile	0.035	0.029	0.039	0.034	0.032	0.034	0.034	9.60
29)	M	vinyl acetate	1.412	1.269	1.212	1.080	0.929	0.997	1.150	15.75
30)	M	ethyl acetate	0.227	0.216	0.293	0.268	0.230	0.234	0.245	12.04
31)	M	2,2-dichloropropane	0.710	0.664	0.654	0.586	0.505	0.576	0.616	12.00
32)	M	cis-1,2-dichloroeth	0.331	0.329	0.309	0.331	0.319	0.318	0.323	2.85
33)	M	propionitrile	0.014	0.020	0.024	0.023	0.021	0.022	0.021	17.41
34)	M	bromochloromethane	0.180	0.199	0.202	0.212	0.204	0.204	0.200	5.49
35)	M	chloroform	1.094	0.990	0.977	0.956	0.896	0.908	0.970	7.33
36)	M	freon 113	0.656	0.700	0.650	0.623	0.534	0.542	0.618	10.72
37)	M	2-ethoxyethanol						0.016	0.016	0.00
38)	S	dibromofluoromethan	0.972	0.866	0.785	0.702	0.674	0.808	0.801	13.63
39)	M	methacrylonitrile	0.611	0.593	0.517	0.444	0.394	0.470	0.505	16.90
40)	M	butyl acetate	0.138	0.143	0.195	0.176	0.152	0.155	0.160	13.64
41)	M	1,1,1-trichloroetha	1.074	1.019	1.035	0.972	0.875	0.951	0.988	7.16
)	S	1,2-dichloroethane-	0.984	0.829	0.812	0.757	0.715	0.826	0.821	11.20

(#) = Out of Range

Response Factor Report gc/ms-K

Method : C:\HPCHEM\1\METHODS\MK997.M
Title : SW-846 Method 8260
Last Update : Mon Aug 16 14:26:30 1999
Response via : Initial Calibration

Calibration Files

5	=K24121.D	10	=K24120.D	50	=K24119.D
200	=K24123.D	400	=K24124.D	100	=K24122.D

		Compound	5	10	50	200	400	100	Avg	%RSD
43)	I	1,4-difluorobenzene	----------	----------	----------	ISTD	----------	----------	----------	
44)	M	heptane	0.258	0.263	0.216	0.222	0.189	0.205	0.226	13.07
45)	M	n-propyl acetate	0.610	0.411	0.608	0.443	0.362	0.427	0.477	22.27
46)	M	2-nitropropane	0.209	0.183	0.155	0.131	0.123	0.134	0.156	21.67
47)	M	tetrahydrofuran	0.069	0.085	0.093	0.062	0.053	0.068	0.072	20.38
48)	M	2-Chloroethyl Vinyl	0.153	0.151	0.186	0.166	0.143	0.157	0.159	9.36
49)	M	n-butyl alcohol	0.023	0.018	0.014	0.013	0.011	0.013	0.015	27.29
50)	M	cyclohexane	0.282	0.418	0.309	0.294	0.264	0.302	0.311	17.58
51)	M	carbon tetrachlorid	1.214	1.040	1.228	0.992	0.847	1.038	1.060	13.52
52)	M	1,1-dichloropropene	0.556	0.616	0.591	0.535	0.479	0.549	0.554	8.59
53)	M	isopropyl acetate	1.055	0.952	1.114	0.829	0.646	0.843	0.907	18.77
54)	M	benzene	0.801	0.776	0.731	0.688	0.629	0.697	0.720	8.73
55)	M	1,2-dichloroethane	0.970	0.915	0.967	0.871	0.798	0.892	0.902	7.16
56)	M	trichloroethene	0.579	0.481	0.492	0.478	0.430	0.478	0.490	9.93
57)	M	methyl methacrylate	0.254	0.222	0.263	0.242	0.221	0.251	0.242	7.22
58)	M	1,2-dichloropropane	0.436	0.359	0.369	0.333	0.300	0.341	0.356	12.7
59)	M	di-isobutylene	1.103	0.860	0.967	0.798	0.683	0.863	0.879	16.3
60)	M	dibromomethane	0.440	0.401	0.439	0.412	0.376	0.412	0.413	5.88
61)	M	1,4-dioxane	0.002	0.002	0.003	0.002	0.002	0.002	0.002	14.36
62)	M	bromodichloromethan	1.150	1.013	1.087	1.003	0.924	0.991	1.028	7.69
63)	M	cis-1,3-dichloropro	0.517	0.517	0.577	0.553	0.516	0.552	0.539	4.81
64)	S	toluene-d8 (s)	1.271	1.082	1.023	0.953	0.875	1.091	1.049	12.95
65)	M	4-methyl-2-pentanon	0.714	0.503	0.616	0.487	0.432	0.521	0.546	18.74
66)	M	toluene	0.581	0.529	0.543	0.543	0.497	0.528	0.537	5.06
67)	M	trans-1,3-dichlorop	0.472	0.503	0.619	0.613	0.579	0.594	0.563	10.87
68)	M	ethyl methacrylate	0.326	0.287	0.374	0.333	0.304	0.332	0.326	9.15
69)	M	1,1,2-trichloroetha	0.304	0.281	0.304	0.292	0.265	0.285	0.288	5.16
70)	M	2-hexanone	0.323	0.295	0.324	0.238	0.210	0.237	0.271	18.13
71)	I	chlorobenzene-d5	----------	----------	----------	ISTD	----------	----------	----------	
72)	M	cyclohexanone	0.061	0.057	0.055	0.012	0.011	0.016	0.035	69.61
73)	M	tetrachloroethene	0.828	0.787	0.726	0.662	0.605	0.678	0.714	11.57
74)	M	1,3-dichloropropane	0.665	0.699	0.671	0.622	0.569	0.626	0.642	7.13
75)	M	dibromochloromethan	0.841	0.925	0.963	0.891	0.842	0.876	0.890	5.40
76)	M	1,2-dibromoethane	0.499	0.552	0.641	0.587	0.537	0.588	0.567	8.67
77)	M	chlorobenzene	1.004	0.976	0.971	0.944	0.891	0.932	0.953	4.17
78)	M	1,1,1,2-tetrachloro	0.796	0.779	0.761	0.701	0.632	0.693	0.727	8.60
79)	M	ethylbenzene	1.881	1.800	1.711	1.658	1.523	1.670	1.707	7.24
80)	M	m,p-xylene	0.594	0.527	0.534	0.480	0.459	0.484	0.513	9.59
81)	M	o-xylene	0.622	0.605	0.566	0.523	0.500	0.531	0.558	8.64
82)	M	styrene	0.735	0.693	0.790	0.789	0.742	0.779	0.755	5.1
83)	M	bromoform	0.486	0.556	0.664	0.648	0.624	0.616	0.599	11.1

#) = Out of Range

Response Factor Report gc/ms-K

Method : C:\HPCHEM\1\METHODS\MK997.M
Title : SW-846 Method 8260
Last Update : Mon Aug 16 14:26:30 1999
Response via : Initial Calibration

Calibration Files

5	=K24121.D	10	=K24120.D	50	=K24119.D
200	=K24123.D	400	=K24124.D	100	=K24122.D

		Compound	5	10	50	200	400	100	Avg	%RSD
84)	I	1,4-dichlorobenzene-d	----------	----------	----------	ISTD	----------	----------	----------	
85)	M	isopropylbenzene	3.853	3.343	3.029	2.943	2.743	2.832	3.124	13.21
86)	S	4-bromofluorobenzen	2.294	1.894	1.773	1.655	1.528	1.803	1.825	14.40
87)	M	bromobenzene	0.886	0.920	0.945	0.948	0.880	0.901	0.913	3.20
88)	M	1,1,2,2-tetrachloro	1.041	0.974	0.958	0.870	0.794	0.834	0.912	10.35
89)	M	trans-1,4-dichloro-	0.155	0.187	0.226	0.223	0.224	0.205	0.203	13.75
90)	M	1,2,3-trichloroprop	0.355	0.328	0.351	0.314	0.294	0.303	0.324	7.77
91)	M	n-propylbenzene	3.460	3.287	3.060	3.386	3.230	3.181	3.267	4.40
92)	M	2-chlorotoluene	2.748	2.248	2.443	2.235	1.977	2.131	2.297	11.70
93)	M	4-chlorotoluene	2.571	2.522	2.724	2.715	2.515	2.537	2.597	3.73
94)	M	1,3,5-trimethylbenz	3.651	2.991	2.587	2.597	2.360	2.489	2.779	17.14
95)	M	tert-butylbenzene	3.617	3.134	2.886	2.714	2.367	2.655	2.896	15.03
96)	M	pentachloroethane	1.005	0.837	0.852	0.795	0.713	0.770	0.829	12.01
97)	M	1,2,4-trimethylbenz	3.012	2.721	2.478	2.498	2.276	2.400	2.564	10.27
98)	M	sec-butylbenzene	4.343	3.519	3.270	3.298	3.064	3.162	3.443	13.56
)	M	1,3-dichlorobenzene	1.374	1.226	1.213	1.305	1.264	1.209	1.265	5.10
100)	M	p-isopropyltoluene	3.600	2.810	2.758	2.739	2.537	2.657	2.850	13.32
101)	M	1,4-dichlorobenzene	1.137	0.983	1.250	1.186	1.131	1.085	1.129	8.03
102)	M	1,2-dichlorobenzene	1.489	1.210	1.235	1.255	1.208	1.181	1.263	9.02
103)	M	n-butylbenzene	3.008	2.517	2.768	2.796	2.581	2.705	2.729	6.37
104)	M	1,2-dibromo-3-chlor	0.372	0.284	0.304	0.304	0.283	0.276	0.304	11.69
105)	M	1,2,4-trichlorobenz	0.721	0.703	0.807	0.866	0.823	0.816	0.790	8.04
106)	M	hexachlorobutadiene	1.355	1.209	1.012	0.964	0.875	1.006	1.070	16.57
107)	M	naphthalene	0.675	0.619	0.878	0.841	0.787	0.785	0.764	12.94
108)	M	1,2,3-trichlorobenz	0.760	0.629	0.539	0.596	0.568	0.533	0.604	13.94
109)	M	epichlorohydrin	0.128	0.104	0.117	0.100	0.085	0.090	0.104	15.76
110)	M	2-methylnaphthalene	1.685	1.732	1.666	1.678	1.738	0.090	1.700	1.94
111)	M	3-methyl-1-butanol	0.024	0.021	0.024	0.018	0.016	0.017	0.020	18.68
112)		hexachloroethane	1.665	1.278	1.174	1.133	1.071	1.060	1.230	18.48
113)	M	ethylenimine						1.060	0.000	-1.00

(#) = Out of Range

Evaluate Continuing Calibration Report

Data File : C:\HPCHEM\1\DATA\K24157.D
Acq On : 17 Aug 99 10:09 am
Sample : CC997-50
Misc : MS27525,VK998,5.00,,,5,1

Vial: 100
Operator: YD
Inst : gc/ms-K
Multiplr: 1.00

Method : C:\HPCHEM\1\METHODS\MK997.M
Title : SW-846 Method 8260
Last Update : Mon Aug 16 14:26:30 1999
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 : 150%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	I	pentafluorobenzene	1.000	1.000	0.0	123	-0.01
2	M	chlorodifluoromethane	0.474	0.503	-6.1	120	0.00
3	M	dichlorodifluoromethane	0.589	0.623	-5.8	121	-0.01
4	M	chloromethane	0.192	0.183	4.7	115	0.00
5	M	vinyl chloride	0.170	0.182	-7.1	127	0.00
6	M	bromomethane	0.175	0.187	-6.9	141	0.00
7	M	chloroethane	0.084	0.098	-16.7	135	-0.02
8	M	trichlorofluoromethane	0.804	0.902	-12.2	117	-0.01
9	M	ethyl ether	0.107	0.116	-8.4	130	-0.01
10	M	acrolein	0.014	0.013	7.1	107	0.00
11	M	1,1-dichloroethene	0.229	0.250	-9.2	139	-0.03
12	M	Tertiary Butyl Alcohol	0.038	0.042	-10.5	115	0.00
13	M	acetone	0.101	0.094	6.9	112	-0.01
14	M	methyl acetate	0.171	0.159	7.0	110	-0.02
15	M	allyl chloride	0.127	0.120	5.5	131	-0.01
16	M	acetonitrile	0.047	0.047	0.0	115	-0.02
17	M	iodomethane	0.590	0.612	-3.7	130	-0.01
18	M	iso-butyl alcohol	0.018	0.017	5.6	109	-0.01
19	M	carbon disulfide	0.529	0.518	2.1	125	-0.03
20	M	methylene chloride	0.245	0.246	-0.4	126	0.00
21	M	methyl tert butyl ether	1.059	1.060	-0.1	119	-0.03
22	M	trans-1,2-dichloroethene	0.227	0.240	-5.7	129	-0.01
23	M	di-isopropyl ether	1.088	1.093	-0.5	115	0.00
24	M	2-butanone	0.089	0.086	3.4	98	0.00
25	M	1,1-dichloroethane	0.651	0.709	-8.9	133	-0.04
26	M	hexane	0.338	0.354	-4.7	120	-0.01
27	M	chloroprene	0.642	0.708	-10.3	128	-0.03
28	M	acrylonitrile	0.034	0.035	-2.9	113	-0.03
29	M	vinyl acetate	1.150	1.113	3.2	113	0.00
30	M	ethyl acetate	0.245	0.265	-8.2	111	-0.04
31	M	2,2-dichloropropane	0.616	0.677	-9.9	127	-0.01
32	M	cis-1,2-dichloroethene	0.323	0.332	-2.8	132	0.00
33	M	propionitrile	0.021	0.022	-4.8	109	-0.02
34	M	bromochloromethane	0.200	0.199	0.5	121	-0.03
35	M	chloroform	0.970	0.982	-1.2	123	-0.02
36	M	freon 113	0.618	0.675	-9.2	127	0.00
38	S	dibromofluoromethane (s)	0.801	0.680	15.1	106	-0.01
39	M	methacrylonitrile	0.505	0.568	-12.5	134	-0.03
40	M	butyl acetate	0.160	0.186	-16.3	117	0.01
41	M	1,1,1-trichloroethane	0.988	1.035	-4.8	123	-0.03
42	S	1,2-dichloroethane-d4 (s)	0.821	0.688	16.2	104	-0.01
43	I	1,4-difluorobenzene	1.000	1.000	0.0	120	0.00
44	M	heptane	0.226	0.251	-11.1	140	-0.01
45	M	n-propyl acetate	0.477	0.463	2.9	92	0.00
46	M	2-nitropropane	0.156	0.132	15.4	102	-0.02

47	M	tetrahydrofuran	0.072	0.072	0.0	94	-0.02
48	M	2-Chloroethyl Vinyl Ether	0.159	0.187	-17.6	121	0.00
49	M	n-butyl alcohol	0.015	0.016	-6.7	134	0.00
50	M	cyclohexane	0.311	0.368	-18.3	144	0.00
51	M	carbon tetrachloride	1.060	1.125	-6.1	110	-0.03
[illegible]	M	1,1-dichloropropene	0.554	0.660	-19.1	134	-0.02
[illegible]	M	isopropyl acetate	0.907	1.001	-10.4	108	0.00
54	M	benzene	0.720	0.809	-12.4	133	-0.01
55	M	1,2-dichloroethane	0.902	0.989	-9.6	123	-0.01
56	M	trichloroethene	0.490	0.553	-12.9	135	-0.02
57	M	methyl methacrylate	0.242	0.281	-16.1	128	-0.02
58	M	1,2-dichloropropane	0.356	0.376	-5.6	123	-0.01
59	M	di-isobutylene	0.879	0.940	-6.9	117	0.00
60	M	dibromomethane	0.413	0.424	-2.7	116	-0.01
61	M	1,4-dioxane	0.002	0.002	0.0	104	-0.01
62	M	bromodichloromethane	1.028	1.044	-1.6	116	-0.01
63	M	cis-1,3-dichloropropene	0.539	0.584	-8.3	122	0.00
64	S	toluene-d8 (s)	1.049	1.021	2.7	120	0.00
65	M	4-methyl-2-pentanone	0.546	0.551	-0.9	108	0.00
66	M	toluene	0.537	0.610	-13.6	135	-0.01
67	M	trans-1,3-dichloropropene	0.563	0.616	-9.4	120	0.02
68	M	ethyl methacrylate	0.326	0.344	-5.5	111	0.00
69	M	1,1,2-trichloroethane	0.288	0.307	-6.6	122	0.02
70	M	2-hexanone	0.271	0.257	5.2	96	0.00
71	I	chlorobenzene-d5	1.000	1.000	0.0	119	-0.01
72	M	cyclohexanone	0.035	0.040	-14.3	87	0.00
73	M	tetrachloroethene	0.714	0.797	-11.6	131	0.00
74	M	1,3-dichloropropane	0.642	0.707	-10.1	125	0.00
75	M	dibromochloromethane	0.890	0.908	-2.0	112	0.00
76	M	1,2-dibromoethane	0.567	0.634	-11.8	118	0.01
[illegible]	M	chlorobenzene	0.953	1.081	-13.4	132	0.00
78	M	1,1,1,2-tetrachloroethane	0.727	0.757	-4.1	118	0.00
79	M	ethylbenzene	1.707	1.930	-13.1	134	0.00
80	M	m,p-xylene	0.513	0.546	-6.4	122	0.00
81	M	o-xylene	0.558	0.602	-7.9	127	0.00
82	M	styrene	0.755	0.863	-14.3	130	0.00
83	M	bromoform	0.599	0.597	0.3	107	0.00
84	I	1,4-dichlorobenzene-d4	1.000	1.000	0.0	120	0.00
85	M	isopropylbenzene	3.124	3.172	-1.5	125	0.00
86	S	4-bromofluorobenzene (s)	1.825	1.596	12.5	108	0.00
87	M	bromobenzene	0.913	0.968	-6.0	123	0.02
88	M	1,1,2,2-tetrachloroethane	0.912	0.944	-3.5	118	-0.01
89	M	trans-1,4-dichloro-2-butene	0.203	0.213	-4.9	113	0.01
90	M	1,2,3-trichloropropane	0.324	0.344	-6.2	117	0.01
91	M	n-propylbenzene	3.267	3.394	-3.9	133	0.00
92	M	2-chlorotoluene	2.297	2.540	-10.6	124	0.01
93	M	4-chlorotoluene	2.597	2.828	-8.9	124	0.00
94	M	1,3,5-trimethylbenzene	2.779	2.815	-1.3	130	0.00
95	M	tert-butylbenzene	2.896	2.972	-2.6	123	0.00
96	M	pentachloroethane	0.829	0.828	0.1	116	0.00
97	M	1,2,4-trimethylbenzene	2.564	2.741	-6.9	132	0.00
98	M	sec-butylbenzene	3.443	3.514	-2.1	129	0.00
99	M	1,3-dichlorobenzene	1.265	1.292	-2.1	127	0.00
100	M	p-isopropyltoluene	2.850	2.897	-1.6	126	-0.01
[illegible]	M	1,4-dichlorobenzene	1.129	1.109	1.8	106	0.00
[illegible]	M	1,2-dichlorobenzene	1.263	1.269	-0.5	123	-0.01
103	M	n-butylbenzene	2.729	2.965	-8.6	128	0.00
104	M	1,2-dibromo-3-chloropropane	0.304	0.289	4.9	114	0.00
105	M	1,2,4-trichlorobenzene	0.790	0.931	-17.8	138	0.00
106	M	hexachlorobutadiene	1.070	1.023	4.4	121	0.01
107	M	naphthalene	0.764	0.884	-15.7	120	0.00

08	M	1,2,3-trichlorobenzene	0.604	0.612	-1.3	136	0.00
09	M	epichlorohydrin	0.104	0.107	-2.9	109	-0.01
11	M	3-methyl-1-butanol	0.020	0.019	5.0	94	0.00
12		hexachloroethane	1.230	1.114	9.4	114	0.00

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

K24119.D MK997.M Fri Aug 20 12:05:57 1999 GC/MS-K

Tetra Tech NUS

INTERNAL CORRESPONDENCE

PITT-08-9-269

TO: M. SPERANZA **DATE:** AUGUST 31, 1999

FROM: TERRI L. SOLOMON **COPIES:** DV FILE

SUBJECT: INORGANIC DATA VALIDATION – LEAD, DISSOLVED LEAD
CTO 078 –CECIL FIELD, FLORIDA
SDG – F4637

SAMPLES: 2/Aqueous/

CEF-900-GW-02I-01 CEF-900-GW-02I-01-F

Overview

The sample set for CTO 078, Cecil Field, SDG F4637, consists of two (2) aqueous environmental samples.

Sample CEF-900-GW-02I-01 was analyzed for lead. Sample CEF-900-GW-02I-01-F was analyzed for dissolved lead. The samples were collected by Tetra Tech NUS on August 3, 1999 and analyzed by Accutest Laboratories under Naval Facilities Engineering Service Center (NFESC) Quality Assurance/Quality Control (QA/QC) criteria. All metals analyses, were conducted using SW-846 method 6010B. These data were evaluated based on the following parameters:

* • Data Completeness
* • Holding Times
* • Initial and Continuing Calibration Recoveries
  • Laboratory Blank Analyses
* • Detection Limits

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

Laboratory Blank Analyses

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

Analyte	Maximum Concentration	Action Level (aqueous)
lead	2.3 ug/L	11.5 ug/L

Samples affected: All

An action level of 5X the maximum concentration has been used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the action level for lead have been qualified as nondetected "U".

Notes – None.

Executive Summary

Laboratory Performance: Lead was present in the laboratory method blank.

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 Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96).

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)."

Terri L. Solomon

Tetra Tech NUS
Terri L. Solomon
Chemist

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

CTO(- NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4637

SAMPLE NUMBER:	CEF-900-GW-02I-01			CEF-900-GW-02I-01-F								
SAMPLE DATE:	08/03/99			08/03/99			/ /			/ /		
LABORATORY ID:	F4637-2			F4637-2A								
QC_TYPE:	NORMAL			NORMAL								
% SOLIDS:	0.0 %			0.0 %			100.0 %			100.0 %		
UNITS:	UG/L			UG/L								
FIELD DUPLICATE OF:												
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
LEAD	15.5			3.3	U	A						

APPENDIX B
Results as reported by the Laboratory

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-900-GW-02I-01		
Lab Sample ID:	F4637-2	**Date Sampled:**	08/03/99
Matrix:	AQ - Ground Water	**Date Received:**	08/04/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed By		Method
Lead	15.5	5.0	ug/l	1	08/06/99	08/09/99	JK	SW846 6010A

RDL = Reported Detection Limit

000005

ACCUTEST

Report of Analysis

Client Sample ID:	CEF-900-GW-02I-01		
Lab Sample ID:	F4637-2A	**Date Sampled:**	08/03/99
Matrix:	AQ - Groundwater Filtered	**Date Received:**	08/04/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Lead	3.3 B	5.0	ug/l	1	08/06/99	08/09/99	JK	SW846 6010A

RDL = Reported Detection Limit

000006

APPENDIX C
Support Documentation

TETRA TECH NUS, INC.

CHAIN OF CUSTODY | NUMBER Bldg 900-8/91 PAGE 1 OF 1

PROJECT NO: 0039	SITE NAME: Bldg 900	PROJECT MANAGER AND PHONE NUMBER: JOE LOGAN 412 921 7231	LABORATORY NAME AND CONTACT: ACCUTEST H. BEHZADI
SAMPLERS (SIGNATURE): Abby B Wilcox		FIELD OPERATIONS LEADER AND PHONE NUMBER: ABBY WILCOX 904 281 0400	ADDRESS: 4405 VINELAND RD
		CARRIER/WAYBILL NUMBER: GREYHOUND	CITY, STATE: ORLANDO

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

DATE YEAR 1995	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TCL VOCs 8260	Pb Total	Pb Filtered	SPLP VOCs including dup				COMMENTS
CONTAINER TYPE PLASTIC (P) or GLASS (G)						G	G	P	P	G			
PRESERVATIVE USED						GW HCL SS -		HNO3	HNO3	-			
8/3	0915	CEF-900-GW-01I-01	GW	G	2	2					MS/MSD		COOL TO 4°C
8/3	1045	CEF-900-GW-02I-01	GW	↓	2		1	1			MS/MSD		
8/3	0915	CEF-900-GW-MSMSD01	GW	↓	2	2							NOTE: ONLY 1 EXTRA VOLUME
8/3	1045	CEF-900-GW-MSMSD02	GW	↓	4		2	2					
8/3	1230	CEF-900-SS-001-01	SS	↓	3	3			2		MS/MSD	3	NOTE: DO NOT ANALYZE FOR SPLP UNTIL DIRECTED BY TENUS
8/3	1230	CEF-900-SS-MSMSD001	SS	↓	4	2			2			3	
													COOLER, 4°C

F4637

1. RELINQUISHED BY: Abby B Wilcox	DATE 8/3	TIME 1800	1. RECEIVED BY: Rachel	DATE 8/4/95	TIME 1000
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

WHITE YELLOW (FIELD COPY) PINK (FILE COPY)

FORM NO. TINUS 001 3/99

F4637

HOLDING TIME

08/26/99

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	CEF-900-GW-02I-01	F4637-2	NORMAL	F4637	M	08/03/99	08/06/99	08/09/99	3	3	6
UG/L	CEF-900-GW-02I-01-F	F4637-2A	NORMAL	F4637	MF	08/03/99	08/06/99	08/09/99	3	3	6
UG/L	CEF-900-GW-01I-01	F4637-1	NORMAL	F4637	OV	08/03/99	/ /	08/10/99	0	0	7
UG/KG	CEF-900-SS-001-01	F4637-3	NORMAL	F4637	OV	08/03/99	/ /	08/17/99	0	0	14

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: F4637
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0809M1.ASC
QC Limits: result < RDL

Date Analyzed: 08/09/99
Run ID: MA1508

Methods: EPA 200.7, SW846 6010A
Units: ug/l

Metal	RDL	IDL	ICB raw	final	CCB raw	final	CCB raw	final	CCB raw	final
Aluminum	200	30	anr							
Antimony	5.0	2.39	anr							
Arsenic	10	3.45	anr							
Barium	200	.39	anr							
Beryllium	5.0	.363	anr							
Cadmium	5.0	.33	anr							
Calcium	1000	19.5	anr							
Chromium	10	.637	anr							
Cobalt	50	.797	anr							
Copper	25	.747	anr							
Iron	300	32	anr							
Lead	5.0	1.59	3.0	<5.0	3.2	<5.0	2.3	<5.0	1.4	<5.0
Magnesium	5000	17.6	anr							
Manganese	15	.16	anr							
Molybdenum	50	.68	anr							
Nickel	40	1	anr							
Potassium	5000	28.2	anr							
Selenium	10	2.04	anr							
Silver	10	.963	anr							
Sodium	5000	153	anr							
Thallium	10	2.69	anr							
Tin	50	2.23	anr							
Vanadium	50	.717	anr							
Zinc	20	.83	anr							

CCB 4
Final
1.8

(*) Outside of QC limits
(anr) Analyte not requested

000160

METALS DIGESTION LOG: WATER

Method of Digestion: EG-3010A Temp: 94°C Thermometer ID#: 18

Analyst: J. —

Added:	HNO_3	HCl	H_2O_2
Mfg:	Fisher	Fisher	
Lot #:	118070	418091	

Sample #	Initial Vol.	Final Vol.	Date	Comments
F4634-1 -DUP	50-1	50-1	8/6/99	
F4634-1 -MS				Spiked w/ 1mL ACC1472 + 50 mL 16N 597
F4634-1				
2- F4634-2				
3- F4634-3				
4- F4607-1				
5- F4628-1A				
6- F4628-2A				
7- F4637-2				
8- F4637-2A				
9- F4638-1A				
10- F4638-2A				
11- F4634-1-SD				Same as ms
12-				
13-				
14-				
15-				
16-				
17-				
18-				
19-				
20-				
MB/SB	50-1	50	8/6/99	
MB/SB				Same as ms

RELINQUISHED BY: DATE: 8/6/99

ACCEPTED BY: DATE: 8/6/99

000191

00002

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: F4637
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR0809M1.ASC
Analyst: JK
Parameters: Pb

Date Analyzed: 08/09/99
Run ID: MA1508

Methods: EPA 200.7, SW846 6010A

Time	Sample Description	Dilution Factor	PS Recov	Comments
08:38	MA1508-HSTD1	1		
08:44	MA1508-ICV1	1		
08:51	MA1508-ICB1	1	3.0	
08:57	MA1508-CCV1	1		
09:02	MA1508-CCB1	1	- 3.2	
09:07	MA1508-CRIA1	1		
09:13	MA1508-CRI1	1		
09:19	MA1508-CRI2	1		
09:25	MA1508-ICSA1	1		
09:30	MA1508-ICSAB1	1		
09:37	MA1508-CCV2	1		
09:42	MA1508-CCB2	1	2.3	
09:48	MP1987-MB1	1	1.9	
09:53	MP1987-B1	1		
09:58	MP1987-D1	1		
10:04	F4634-1	1		(sample used for QC only; not part of login F4637)
10:09	MP1987-S1	1		
10:15	MP1987-S2	1		
10:20	MP1987-SD1	5		
10:25	ZZZZZZ	1		
10:31	ZZZZZZ	1		
10:36	MA1508-CCV3	1		
10:44	MA1508-CCB3	1		Pb 1.4
10:49	ZZZZZZ	1		
10:55	ZZZZZZ	1		
11:00	ZZZZZZ	1		
11:05	F4637-2	1		
11:11	F4637-2A	1		
11:16	ZZZZZZ	1		
11:22	ZZZZZZ	1		
11:28	ZZZZZZ	1		
11:34	ZZZZZZ	2		
11:39	MA1508-CCV4	1		

03619

Tetra Tech NUS **INTERNAL CORRESPONDENCE**

PITT-10-9-115

TO:	**M. SPERANZA**	**DATE:**	**OCTOBER 22, 1999**
FROM:	**JENNIFER MALLE**	**COPIES:**	**DV FILE**

SUBJECT: **INORGANIC DATA VALIDATION-CHROMIUM, LEAD AND VANADIUM AND DISSOLVED CHROMIUM, LEAD AND VANADIUM**
CTO 078 – CECIL FIELD
SDG – F4954

SAMPLES: 4/Aqueous/

CEF-900-GW-2I-02 CEF-900-GW-2I-02-F CEF-900-GW-DU01
CEF-900-GW-DU01-F

Overview

The sample set for CTO 078, Cecil Field, SDG F4954, consists of four (4) aqueous environmental samples. Two (2) field duplicate pairs (CEF-900-GW-2I-02 / CEF-900-GW-DU01 and CEF-900-GW-2I-02-F/CEF-900-GW-DU01-F) were included within this SDG.

All samples were analyzed for chromium, lead and vanadium. The samples designated with an "-F" indicate a dissolved or filtered fraction. The samples were collected by Tetra Tech NUS on September 27, 1999 and analyzed by Accutest Laboratory under Naval Facilities Engineering Service Center (NFESC) "Navy Installation Restoration Laboratory Quality Assurance Guide " (NFESC 2/96). Lead and vanadium analyses were conducted using SW846 method 6010B.

The data was evaluated based on the following parameters:

- * Data Completeness
- * Holding Times
- * Initial and Continuing Calibration Recoveries
- Laboratory Blank Analyses
- * Field Duplicate Precision
- * Detection Limits

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

The following contaminants were detected in the laboratory method blanks at the following maximum concentrations:

Analyte	Maximum Concentration	Action Level (aqueous)
Chromium	1.7 ug/L	8.5 ug/L
Lead	5.9 ug/L	29.5 ug/L
Vanadium	1.5 ug/L	7.5 ug/L

Samples affected: All

An action level of 5x the maximum concentration has been used to evaluate the sample data for blank contamination. Sample aliquot and dilution factors were taken into consideration when evaluating for blank contamination. Positive results less than the action levels for chromium and lead have been qualified as nondetected, "U", due to blank contamination.

Notes

A comparision of the field duplicate pairs is included in Appendix C.

Executive Summary

Laboratory Performance: Chromium, lead and vanadium were present in a laboratory blank.

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 Installation Restoration Laboratory Quality Assurance Guide" (February 1996).

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
Jennifer Malle
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

CTO078 - NAS CECIL FIELD
WATER DATA
Accutest, NJ
SDG: F4954

SAMPLE NUMBER:	CEF-900-GW-2I-02			CEF-900-GW-2I-02-F			CEF-900-GW-DU01			CEF-900-GW-DU01-F		
SAMPLE DATE:	09/27/99			09/27/99			09/27/99			09/27/99		
LABORATORY ID:	F4954-1			F4954-1A			F4954-2			F4954-2A		
QC_TYPE:	NORMAL			NORMAL			NORMAL			NORMAL		
% SOLIDS:	0.0 %			0.0 %			0.0 %			0.0 %		
UNITS:	UG/L			UG/L			UG/L			UG/L		
FIELD DUPLICATE OF:							CEF-900-GW-2I-02			CEF-900-GW-2I-02-F		
	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE	RESULT	QUAL	CODE
INORGANICS												
CHROMIUM	6.5	U	A	1.8	U	A	8.0	U	A	2.2	U	A
LEAD	3.9	U	A	2.5	U	A	4.9	U	A	2.8	U	A
VANADIUM	28.2			17			30.1			22		

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
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/PCB D% 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 = % Solid content is less than 30%

APPENDIX B

Results as Reported by the Laboratory

Report of Analysis

Client Sample ID:	CEF-900-GW-2I-02		
Lab Sample ID:	F4954-1	**Date Sampled:**	09/27/99
Matrix:	AQ - Ground Water	**Date Received:**	09/28/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Chromium	6.5 B	10.0	ug/l	1	10/05/99	10/06/99	JK	SW846 6010A
Lead	3.9 B	5.0	ug/l	1	10/05/99	10/06/99	JK	SW846 6010A
Vanadium	28.2 B	50.0	ug/l	1	10/05/99	10/06/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-900-GW-2I-02 -F-gnm 10/14/99		
Lab Sample ID:	F4954-1A	**Date Sampled:**	09/27/99
Matrix:	AQ - Groundwater Filtered	**Date Received:**	09/28/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Chromium	1.8 B	10.0	ug/l	1	10/05/99	10/06/99	JK	SW846 6010A
Lead	2.5 B	5.0	ug/l	1	10/05/99	10/06/99	JK	SW846 6010A
Vanadium	17.0 B	50.0	ug/l	1	10/05/99	10/06/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-900-GW-DU01		
Lab Sample ID:	F4954-2	**Date Sampled:**	09/27/99
Matrix:	AQ - Ground Water	**Date Received:**	09/28/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed	By	Method
Chromium	8.0 B	10.0	ug/l	1	10/05/99	10/06/99	JK	SW846 6010A
Lead	4.9 B	5.0	ug/l	1	10/05/99	10/06/99	JK	SW846 6010A
Vanadium	30.1 B	50.0	ug/l	1	10/05/99	10/06/99	JK	SW846 6010A

RDL = Reported Detection Limit

Report of Analysis

Client Sample ID:	CEF-900-GW-DU01-F SMM 10/14/99		
Lab Sample ID:	F4954-2A	**Date Sampled:**	09/27/99
Matrix:	AQ - Groundwater Filtered	**Date Received:**	09/28/99
		Percent Solids:	n/a
Project:	NAS Cecil Field		

Metals Analysis

Analyte	Result	RDL	Units	DF	Prep	Analyzed By		Method
Chromium	2.2 B	10.0	ug/l	1	10/05/99	10/06/99	JK	SW846 6010A
Lead	2.8 B	5.0	ug/l	1	10/05/99	10/06/99	JK	SW846 6010A
Vanadium	22.0 B	50.0	ug/l	1	10/05/99	10/06/99	JK	SW846 6010A

RDL = Reported Detection Limit

APPENDIX C

Support Documentation

TETRA TECH NUS, INC.

CHAIN OF CUSTODY | NUMBER 900-2 9/99 PAGE 1 OF 1

PROJECT NO: 0039

SITE NAME: Bldg 900

SAMPLERS (SIGNATURE)

PROJECT MANAGER AND PHONE NUMBER: Joe Logan 412-921-7231

FIELD OPERATIONS LEADER AND PHONE NUMBER: Abby Wilcox 904-281-0400

CARRIER/WAYBILL NUMBER: Greyhound

LABORATORY NAME AND CONTACT: Accutest H. Behcadi

ADDRESS: 4405 Vineland Rd

CITY, STATE: Orlando, FL

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

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

PRESERVATIVE USED: HNO3 HNO3

DATE YEAR 1999	TIME	SAMPLE ID	MATRIX	GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: Total Pb Cr, Va Cd Ba	Filtered Pb Cr, Va Cd Ba						COMMENTS
9-27	1515	CEF-900-GW-2I-02	GW	G	2	1	1				F4954-1		Cool to 4°C
9-27	1515	CEF-900-GW-MS/MSD03	↓	↓	2	1	1				-1MS/MSD		
9-27	0000	CEF-900-GW-DU01	↓	↓	2	1	1				-2		
													Cooler 1 4°C

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	9-27-99	1800	1. RECEIVED BY Abby Wilcox	9-28-99	0930
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS

YELLOW (FIELD COPY) PINK (FILE COPY)

3/99 FORM NO. TINUS-001

000007

F4954
HOLDING TIME
10/14/99

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	CEF-900-GW-2I-02	F4954-1	NORMAL	F4954	M	09/27/99	10/05/99	10/06/99	8	1	9
UG/L	CEF-900-GW-2I-02-D	F4954-2	NORMAL	F4954	M	09/27/99	10/05/99	10/06/99	8	1	9
UG/L	CEF-900-GW-2I-02-F	F4954-1A	NORMAL	F4954	MF	09/27/99	10/05/99	10/06/99	8	1	9
UG/L	CEF-900-GW-2I-02-F-D	F4954-2A	NORMAL	F4954	MF	09/27/99	10/05/99	10/06/99	8	1	9

LOW CALIBRATION CHECK STANDARDS SUMMARY
(CRDL) Standard gmm 10/14/99

Login Number: F4954
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR1006M1.ASC
QC Limits: 70 to 130 % Recovery

Date Analyzed: 10/06/99
Run ID: MA1576

Methods: SW846 6010A
Units: ug/l

Metal	CRI True	CRIA True	CRIA Results	% Rec	CRI Results	% Rec
Aluminum	200					
Antimony		5.0	anr			
Arsenic		10	anr			
Barium	200					
Beryllium	5.0					
Cadmium	5.0					
Calcium	1000					
Chromium	10				10B	99.5
Cobalt	50					
Copper	25					
Iron	300					
Lead		5.0	8.1	81.0		
Magnesium	5000					
Manganese	15					
Molybdenum	50					
Nickel	40					
Potassium	5000					
Selenium		10	anr			
Silver	10					
Sodium	5000					
Thallium		10	anr			
Tin	50					
Vanadium	50				48.6B	97.1
Zinc	20					

(*) Outside of QC limits
(anr) Analyte not requested

000014

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: F4954
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR1006M1.ASC Date Analyzed: 10/06/99 Methods: SW846 6010A
QC Limits: 90 to 110 % Recovery Run ID: MA1576 Units: ug/l

Metal	ICV True	ICV Results	% Rec	CCV True	CCV Results	% Rec	CCV True	CCV Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	anr								
Barium	anr								
Beryllium	anr								
Cadmium	anr								
Calcium	anr								
Chromium	2000	2030	101.7	2000	2010	100.5	2000	2000	100.0
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	2000	2060	102.9	2000	2030	101.3	2000	2030	101.7
Magnesium	anr								
Manganese	anr								
Molybdenum	anr								
Nickel	anr								
Potassium	anr								
Selenium	anr								
Silver	anr								
Sodium	anr								
Thallium	anr								
Tin	anr								
Vanadium	2000	2010	100.5	2000	1990	99.5	2000	1980	98.8
Zinc	anr								

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: F4954
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR1006M1.ASC Date Analyzed: 10/06/99 Methods: SW846 6010A
QC Limits: 90 to 110 % Recovery Run ID: MA1576 Units: ug/l

Metal	CCV True	CCV Results	% Rec	CCV True	CCV Results	% Rec	CCV True	CCV Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	anr								
Barium	anr								
Beryllium	anr								
Cadmium	anr								
Calcium	anr								
Chromium	2000	1940	96.8	2000	1950	97.5	2000	1950	97.5
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	2000	1960	98.2	2000	1980	99.2	2000	2040	102.0
Magnesium	anr								
Manganese	anr								
Molybdenum	anr								
Nickel	anr								
Potassium	anr								
Selenium	anr								
Silver	anr								
Sodium	anr								
Thallium	anr								
Tin	anr								
Vanadium	2000	1920	96.0	2000	1940	97.0	2000	1940	97.0
Zinc	anr								

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: F4954
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR1006M1.ASC
QC Limits: 90 to 110 % Recovery

Date Analyzed: 10/06/99
Run ID: MA1576

Methods: SW846 6010A
Units: ug/l

Metal	CCV True	CCV Results	% Rec	CCV True	CCV Results	% Rec
Aluminum	anr					
Antimony	anr					
Arsenic	anr					
Barium	anr					
Beryllium	anr					
Cadmium	anr					
Calcium	anr					
Chromium	2000	1940	96.9	2000	1930	96.6
Cobalt	anr					
Copper	anr					
Iron	anr					
Lead	2000	1980	99.2	2000	1980	99.0
Magnesium	anr					
Manganese	anr					
Molybdenum	anr					
Nickel	anr					
Potassium	anr					
Selenium	anr					
Silver	anr					
Sodium	anr					
Thallium	anr					
Tin	anr					
Vanadium	2000	1940	96.8	2000	1930	96.4
Zinc	anr					

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: F4954
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR1006M1.ASC
QC Limits: result < RDL

Date Analyzed: 10/06/99
Run ID: MA1576

Methods: SW846 6010A
Units: ug/l

Metal	RDL	IDL	ICB raw	ICB final	ICB raw	ICB final	CCB raw	CCB final	CCB raw	CCB final
Aluminum	200	30								
Antimony	5.0	2.39								
Arsenic	10	3.4								
Barium	200	.39								
Beryllium	5.0	.36								
Cadmium	5.0	.33								
Calcium	1000	19.5								
Chromium	10	.637			0.60	<10.0	0.40	<10.0	0.30	<10.0
Cobalt	50	.797								
Copper	25	.747								
Iron	300	32								
Lead	5.0	1.59			1.9	<5.0B	2.7	<5.0B	3.9	<5.0B
Magnesium	5000	17.6								
Manganese	15	.16								
Molybdenum	50	.68								
Nickel	40	1								
Potassium	5000	28.2								
Selenium	10	2								
Silver	10	.96								
Sodium	5000	153								
Thallium	10	2.69								
Tin	50	2.2								
Vanadium	50	.717			0.90	<50.0B	0.30	<50.0	0.50	<50.0
Zinc	20	.83								

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: F4954
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR1006M1.ASC
QC Limits: result < RDL

Date Analyzed: 10/06/99
Run ID: MA1576

Methods: SW846 6010A
Units: ug/l

Metal	RDL	IDL	CCB raw	final	CCB raw	final	CCB raw	final	CCB raw	final
Aluminum	200	30	anr							
Antimony	5.0	2.39	anr							
Arsenic	10	3.4	anr							
Barium	200	.39	anr							
Beryllium	5.0	.36	anr							
Cadmium	5.0	.33	anr							
Calcium	1000	19.5	anr							
Chromium	10	.637	0.30	<10.0	0.70	<10.0B			-0.17	<10
Cobalt	50	.797	anr							
Copper	25	.747	anr							
Iron	300	32	anr							
Lead	5.0	1.59	1.8	<5.0B	1.9	<5.0B			2.9	<5.0
Magnesium	5000	17.6	anr							
Manganese	15	.16	anr							
Molybdenum	50	.68	anr							
Nickel	40	1	anr							
Potassium	5000	28.2	anr							
Selenium	10	2	anr							
Silver	10	.96	anr							
Sodium	5000	153	anr							
Thallium	10	2.69	anr							
Tin	50	2.2	anr							
Vanadium	50	.717	0.10	<50.0	0.80	<50.0B			-0.050	<50
Zinc	20	.83	anr							

(*) Outside of QC limits
(anr) Analyte not requested

000019

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: F4954
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR1006M1.ASC
QC Limits: result < RDL

Date Analyzed: 10/06/99
Run ID: MA1576

Methods: SW846 6010A
Units: ug/l

Metal	RDL	IDL	CCB raw	final	CCB raw	final
Aluminum	200	30	anr			
Antimony	5.0	2.39	anr			
Arsenic	10	3.4	anr			
Barium	200	.39	anr			
Beryllium	5.0	.36	anr			
Cadmium	5.0	.33	anr			
Calcium	1000	19.5	anr			
Chromium	10	.637	1.7	<10.0B	1.6	<10.0B
Cobalt	50	.797	anr			
Copper	25	.747	anr			
Iron	300	32	anr			
Lead	5.0	1.59	5.9	<15	3.8	<5.0B
Magnesium	5000	17.6	anr			
Manganese	15	.16	anr			
Molybdenum	50	.68	anr			
Nickel	40	1	anr			
Potassium	5000	28.2	anr			
Selenium	10	2	anr			
Silver	10	.96	anr			
Sodium	5000	153	anr			
Thallium	10	2.69	anr			
Tin	50	2.2	anr			
Vanadium	50	.717	1.1	<50.0B	1.5	<50.0B
Zinc	20	.83	anr			

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: F4954
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

QC Batch ID: MP2119
Matrix Type: AQUEOUS

Methods: SW846 6010A
Units: ug/l

Prep Date: 10/05/99

Metal	RDL	IDL	MB raw	final
Aluminum	200	30	anr	
Antimony	5.0	2.4	anr	
Arsenic	10.0	3.4	anr	
Barium	200	.39	anr	
Beryllium	5.0	.36	anr	
Cadmium	5.0	.33	anr	
Calcium	1000	19.5	anr	
Chromium	10.0	.64	0.13	<10.0
Cobalt	50.0	.8	anr	
Copper	25.0	.75	anr	
Iron	300	32	anr	
Lead	5.0	1.6	1.4	<5.0
Magnesium	5000	17.6	anr	
Manganese	15.0	.16	anr	
Molybdenum	50.0	.68	anr	
Nickel	40.0	1	anr	
Potassium	5000	28.2	anr	
Selenium	10.0	2	anr	
Silver	10.0	.96	anr	
Sodium	5000	153	anr	
Thallium	10.0	2.7	anr	
Tin	50.0	2.2	anr	
Vanadium	50.0	.72	0.18	<50.0
Zinc	20.0	.83	anr	

Associated samples MP2119: F4954-1, F4954-2, F4954-1A, F4954-2A

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

FIELD DUPLICATE PRECISION

COMPOUND	CEF-900-GW-2I-02	CEF-900-GW-DU01	RPD
	mg/kg	mg/kg	%
Chromium	6.5	8	20.69
Lead	3.9	4.9	22.73
Vanadium	28.2	30.1	6.52

FIELD DUPLICATE PRECISION

COMPOUND	CEF-900-GW-2I-02-F	CEF-900-GW-DU01-F	RPD
	mg/kg	mg/kg	%
Chromium	1.8	2.2	20.00
Lead	2.5	2.8	11.32
Vanadium	17	22	25.64

Accutest Laboratories Southeast
Instrument Detection Limit

Instrument: Thermal Jarrel Ash Trace ICP Model: 13685202 Serial No: 470790

Date: June, 1999

Analyte	Wavelength (nm)	CRDL (ug/l)	IDL (ug/l)
Aluminum	308.2	200	10.6
Antimony	206.8	60	3.77
Arsenic	189.0	10	3.12
Barium	493.4	200	0.47
Beryllium	313.0	5	0.2
Cadmium	226.5	5	0.5
Calcium	317.9	5000	6.65
Chromium	267.7	10	0.96
Cobalt	228.6	50	0.71
Copper	324.7	25	1.21
Iron	271.4	100	16.6
Lead	220.3	3	2.06
Magnesium	279.0	5000	10
Manganese	257.6	15	0.39
Mercury	253.7	0.2	0.025
Nickel	231.6	40	1.58
Potassium	766.4	5000	25.3
Selenium	196.0	5	2.32
Silver	328.0	10	1.75
Sodium	333.2	5000	332
Tallium	190.8	10	3.86
Vanadium	292.4	50	1.07
Zinc	206.2	20	0.46

Metals Digestion Log: Water MP2119

Method Of Digestion: ICP 3010A Temp: 94° Thermometer ID#: 18

HNO₃	HCl	H₂O₂
Fisher	Fisher	
118070	418091	

Sample#	Init. Vol / Wt	Final Vol / Wt	Date	Comments
F4937.6 -DUP	50	50	10.5.99	
F4937.6 -MS				spiked w/1.0ml acc 172 + 0.05ml GN 6880 + 0.75ml acc 149
F4937-6 (MSD)				same as MS
2- F4937.6				
3- F4950.1				
4- F4950.2				
5- F4950.3				
6- F4950.4				
7- F4954.1				
8- F4954.2				
9- F4954.1A				
10- F4954.2A	✓	✓	✓	
11-				
12-				
13-				
14-				
15-				
16-				
17-				
18-				
19-				
20-				
MB/SB	50	50	10.5.99	same as MS
MB/SB	↓	↓	✓	↓

Analyst's Signature: [signature] Date: 10.5.99

QC Review: Date:

000030

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: F4954
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR1006M1.ASC
Analyst: JK
Parameters: Cr,Pb,V

Date Analyzed: 10/06/99
Run ID: MA1576

Methods: SW846 6010A

Time	Sample Description	Dilution Factor	PS Recov	Comments
07:30	MA1576-ICV1	1		
07:35	MA1576-ICB1	1		Repoured. See rerun.
07:43	MA1576-ICB2	1		
07:48	MA1576-CCV1	1		
07:54	MA1576-CCB1	1		
08:00	MA1576-CRIA1	1		
08:05	MA1576-CRI1	1		
08:11	MA1576-ICSA1	1		
08:16	MA1576-ICSAB1	1		
08:22	MA1576-CCV2	1		
08:28	MA1576-CCB2	1		
08:33	MP2118-MB1	1		
08:38	MP2118-B1	1		
08:44	MP2118-D1	1		
08:51	F4937-1	1		(sample used for QC only; not part of login F4954)
08:59	MP2118-S1	1		
09:04	MP2118-S2	1		
09:10	MP2118-SD1	5		
09:15	ZZZZZZ	1		
09:21	ZZZZZZ	1		
09:27	MA1576-CCV3	1		
09:37	MA1576-CCB3	1		
09:42	ZZZZZZ	1		
09:48	ZZZZZZ	1		
09:53	ZZZZZZ	1		
09:59	MP2119-MB1	1		
10:04	MP2119-B1	1		
10:10	MP2119-D1	1		
10:15	F4937-6	1		(sample used for QC only; not part of login F4954)
10:21	MP2119-S1	1		
10:26	MP2119-S2	1		
10:32	MP2119-SD1	5		
10:38	MA1576-CCV4	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: F4954
Account: TETRPAPT - Tetra Tech, NUS
Project: TETRPAPT1252 - NAS Cecil Field

File ID: IR1006M1.ASC
Analyst: JK
Parameters: Cr,Pb,V

Date Analyzed: 10/06/99
Run ID: MA1576

Methods: SW846 6010A

Time	Sample Description	Dilution Factor	PS Recov	Comments
10:44	MA1576-CCB4	1		
10:50	MP2107-MB2	1		
10:55	MP2107-MB3	1		
11:00	MP2107-B2	1		
11:06	ZZZZZZ	1		
11:11	ZZZZZZ	1		
11:17	F4954-1	1		
11:23	F4954-2	1		
11:31	F4954-1A	1		
11:36	F4954-2A	1		
11:42	ZZZZZZ	1		
11:48	MA1576-CCV5	1		
11:53	MA1576-CCB5	1		Repoured. See rerun.
12:09	MA1576-CCB6	1		
12:14	ZZZZZZ	1		
12:20	ZZZZZZ	1		
12:25	ZZZZZZ	1		
12:30	ZZZZZZ	1		
12:36	ZZZZZZ	1		
12:41	ZZZZZZ	1		
12:47	ZZZZZZ	2		
12:53	ZZZZZZ	1		
12:58	ZZZZZZ	1		
13:04	ZZZZZZ	1		
13:10	MA1576-CCV6	1		
13:16	MA1576-CCB7	1		
13:22	ZZZZZZ	1		
13:29	ZZZZZZ	1		
13:34	ZZZZZZ	1		
13:40	ZZZZZZ	1		
13:46	ZZZZZZ	1		
13:51	MA1576-CCV7	1		
13:58	MA1576-CCB8	1		

Refer to raw data for calibration curve and standards.

[redacted] gmm 10/14

Method: TRACE2 Sample Name: F4954-2 Operator:
Run Time: 10/06/99 11:23 Filename: R1006M1
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.:

Elems	Ag3280	Al3082	As1890	Ba4934	Be3130	Ca3179
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0006	7.750	.0053	.0155	-.0016	3.247
SDev	.0001	.0293	.0019	0	0	.0081
%RSD	19.43	.3786	36.18	.217	2.57	.2507

Elems	Cd2265	Co2286	Cr2677	Cu3247	Fe2714	K_7664
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avge	-.0001	.0008	.0081	.0024	10.05	.6519
SDev	.0003	.0001	.0002	.0002	.0186	.0063
%RSD	388.9	14.96	2.033	8.258	.1849	.9633

Elems	Mg2790	Mn2576	Mo2020	Na3302	Ni2316	2203/1
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avge	1.220	.0103	.0007	5.183	.0029	.0075
SDev	.005	0	.0001	.1755	.0001	.0012
%RSD	.4064	.2278	9.894	3.386	3.546	15.64

Elems	2203/2	Pb2203	Se1960	Sb2068	1960/1	1960/2
Units	ppm	ppm	ppm	ppm	ppm	ppm
Avge	.0018	.0049	.0001	.0034	-.0016	-.0006
SDev	.0008	.0002	.0008	.0015	.003	.0012
%RSD	45.34	4.177	1235	43.68	189.3	200.3

Elems	Sn1899	Tl1908	V 2924	Zn2062
Units	ppm	ppm	ppm	ppm
Avge	.0012	-.0073	.0301	.0107
SDev	.0001	.0024	.0001	0
%RSD	10.4	33	.4604	.2386

.0301 mg/L (1000ug / 1mg) = [redacted] gmm 10/14/99

Reported Result = 30.1 ug/L

APPENDIX B

BORING LOGS AND
MONITORING WELL CONSTRUCTION INFORMATION

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NAS CECIL FIELD
PROJECT NUMBER: 0039
DRILLING COMPANY: GPI
DRILLING RIG: Hollow-stem Diedrich D-120
BORING NUMBER: CEF-900-01I
DATE: 7/23/99
GEOLOGIST: JASON McLaun
DRILLER: Jeff Zeigler

Sample No. and Type or RQD	Depth (FL) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/FL) or Screened Interval	MATERIAL DESCRIPTION: Soil Density/ Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	PID/FID Reading (ppm): Sample	Background	Borehole**	Drilling Area
		HAND Auger				Gray	Fine-grained Sand	SP	3" Asphalt, Back Fill material, dry, No odor				
	2'					Grey to Brown			dry, No odor				
						Brown to Lt Brown							
	4'								Moist, No odor			0.0	0.0
		Drilling											
	6'					Dk Brown to Brown	Silty Sand	SM	water table ~6', No odor				
												0.0	0.0
												0.0	0.0
	50'											0.0	0.0

*) rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0.0

Converted to Well: Yes X No

Well I.D. #: CEF-900-01I

Tetra Tech NUS, Inc.

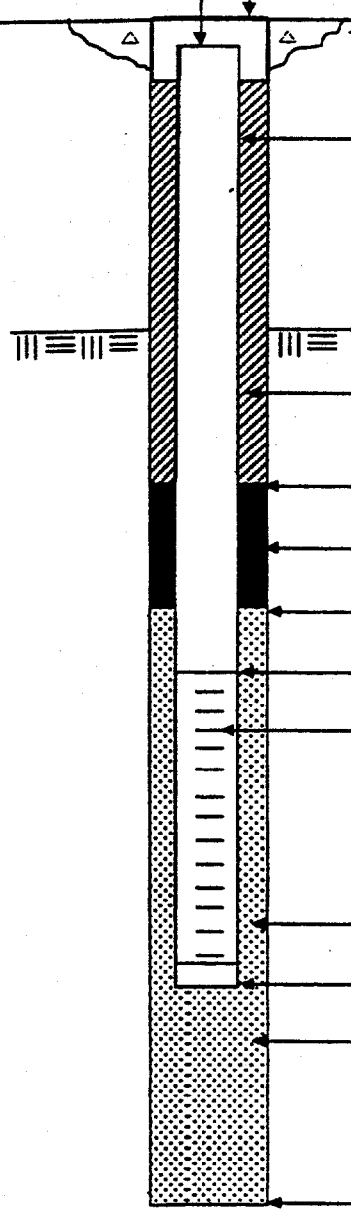
WELL No.: Cef-900-01 I

MONITORING WELL SHEET

PROJECT:	NAS CECIL FIELD	DRILLING Co.:	GPI	BORING No.:	Cef-900-01I
PROJECT No.:	0039	DRILLER:	Jeff Zeigler	DATE COMPLETED:	7/23/99
SITE:	building 900	DRILLING METHOD:	Hollow-stem Auger	NORTHING:	
GEOLOGIST:	JASON McGlam	DEV. METHOD:	pumping	EASTING:	

Ground Elevation =

Datum:



Not to Scale

Elevation / Depth of Top of Riser:	/
Elevation / Height of Top of Surface Casing:	/
I.D. of Surface Casing:	
Type of Surface Casing:	Flush mount
Type of Surface Seal:	concrete Pad
I.D. of Riser:	2"
Type of Riser:	PVC
Borehole Diameter:	8.25"
Elevation / Depth Top of Rock:	/
Type of Backfill:	Portland cement
Elevation / Depth of Seal:	40' /
Type of Seal:	30/65 sand
Elevation / Depth of Top of Filter Pack:	43' /
Elevation / Depth of Top of Screen:	45' /
Type of Screen:	PVC
Slot Size x Length:	0.010x5'
I.D. of Screen:	2"
Type of Filter Pack:	20/30 sand
Elevation / Depth of Bottom of Screen:	50' /
Elevation / Depth of Bottom of Filter Pack:	/
Type of Backfill Below Well:	
Elevation / Total Depth of Borehole:	/

Rev. 0
March 27, 1997

Tetra Tech NUS. Inc.
CERTIFICATE OF CONFORMANCE

Well Designation: CEF-900-01 I
Site Name: Building 900
Date Installed: 7/23/99
Project Name: NAS Cecil Field

Site Geologist: JASON McCann
Drilling Company: CPI
Driller: Jeff Zeigler
Project Number: 0039

Material	Brand/Description	Source/Supplier	Sample Collected ?
Well Casing	Johnson / PVC	Tony drilling Supply	No
Well Screen	↓	↓	↓
End Cap	↓	↓	↓
Drilling Fluid	–	↓	↓
Drilling Fluid Additives	–	↓	↓
Backfill Material	–	↓	↓
Annular Filter Pack	Standard Sand & Silica Co. / 20/30 Sand	↓	↓
Bentonite Seal	Standard Sand & Silica Co. / 30/65 Sand	↓	↓
Annular Grout	HoLNam / Portland Cement	↓	↓
Surface Cement	↓	↓	↓
Protective Casing	Flush mount Man-hole Cover	↓	↓
Paint	–		
Rod Lubricant	–		
Compressor Oil	–		

To the best of my knowledge, I certify that the above described materials were used during installation of this monitoring well.

Signature of Site Geologist: J. McCann

Tetra Tech NUS, Inc.

BORING LOG

PROJECT NAME: NAS CECIL FIELD
PROJECT NUMBER: 0039
DRILLING COMPANY: GPI
DRILLING RIG: Hollow-stem Diedrich D-120

BORING NUMBER: CEF-900-02I
DATE: 7/22/99
GEOLOGIST: JASON McLaun
DRILLER: Jeff Zeigler

Sample No. and Type or RQD	Depth (Ft.) or Run No.	Blows / 6" or RQD (%)	Sample Recovery / Sample Length	Lithology Change (Depth/Ft.) or Screened Interval	Soil Density, Consistency or Rock Hardness	Color	Material Classification	USCS*	Remarks	Sample Rec.	Borehole**	Driller Rec.
		Hand Auger				Gray to Dk Gray	Fine-grained Sand	SP	grass, organic debris, roots, dry, No odor			
	2'											
	4'								Moist, No odor Roots		0.0	0.0
		Drilling				Gray			Moist, No odor			
	6'					Lt. Brown	Silty Sand	SM	water table ~6', No odor			
											0.0	0.0
											0.0	0.0
	50'										0.0	0.0

* When rock coring, enter rock brokeness.

** Include monitor reading in 6 foot intervals @ borehole. Increase reading frequency if elevated reponse read.

Remarks:

Drilling Area Background (ppm): 0.0

Converted to Well: Yes X No

Well I.D. #: CEF-900-2I

Tetra Tech NUS, Inc.

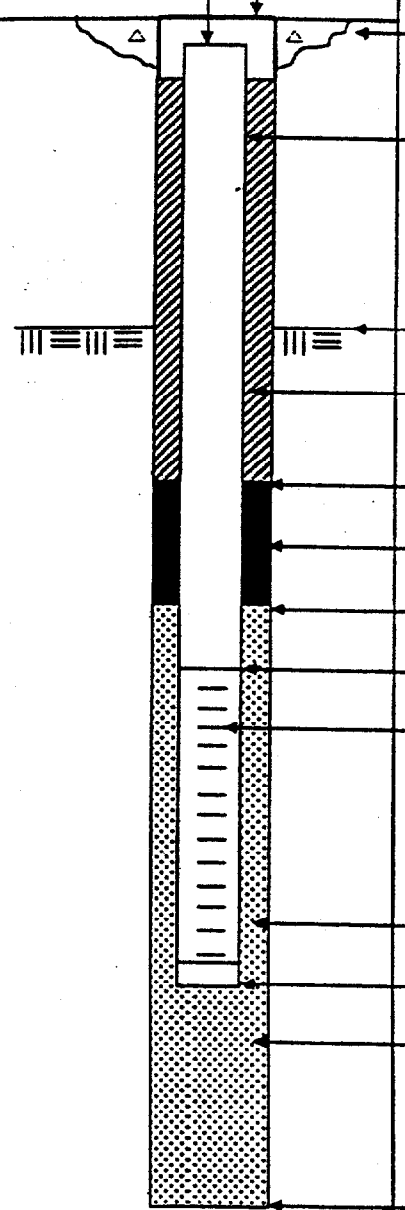
WELL No.: CEF-900-02I

MONITORING WELL SHEET

PROJECT:	NAS CECIL FIELD	DRILLING Co.:	GPI	BORING No.:	CEF-900-02I
PROJECT No.:	0039	DRILLER:	Jeff Zeigler	DATE COMPLETED:	7/22/99
SITE:	building 900	DRILLING METHOD:	Hollow-stem Auger	NORTHING:	
GEOLOGIST:	JASON McLaren	DEV. METHOD:	pumping	EASTING:	

Ground Elevation =

Datum:



Not to Scale

Elevation / Depth of Top of Riser:	/
Elevation / Height of Top of Surface Casing:	/
I.D. of Surface Casing:	
Type of Surface Casing:	Flush mount
Type of Surface Seal:	concrete pad
I.D. of Riser:	2"
Type of Riser:	PVC
Borehole Diameter:	8.25"
Elevation / Depth Top of Rock:	/
Type of Backfill:	Portland cement
Elevation / Depth of Seal:	41 /
Type of Seal:	bent. chips
Elevation / Depth of Top of Filter Pack:	43' /
Elevation / Depth of Top of Screen:	45' /
Type of Screen:	PVC
Slot Size x Length:	0.010x5'
I.D. of Screen:	2"
Type of Filter Pack:	20/30 Sand
Elevation / Depth of Bottom of Screen:	50' /
Elevation / Depth of Bottom of Filter Pack:	/
Type of Backfill Below Well:	
Elevation / Total Depth of Borehole:	/

Rev. 0
March 27, 1997

Tetra Tech NUS. Inc.
CERTIFICATE OF CONFORMANCE

Well Designation: CEF-900-02I
Site Name: Building 900
Date Installed: 7/22/99
Project Name: NAS Cecil Field

Site Geologist: JASON McCann
Drilling Company: GPI
Driller: Jeff Zeigler
Project Number: 0039

Material	Brand/Description	Source/Supplier	Sample Collected ?
Well Casing	Johnson / PVC	Tony drilling Supply	No
Well Screen	↓	↓	↓
End Cap	↓	↓	↓
Drilling Fluid	–	↓	↓
Drilling Fluid Additives	–	↓	↓
Backfill Material	–	↓	↓
Annular Filter Pack	Standard Sand & Silica Co. / 20/30 Sand	↓	↓
Bentonite Seal	CETCO/Medium bent. chips	↓	↓
Annular Grout	Holnam/Portland cement	↓	↓
Surface Cement	↓	↓	↓
Protective Casing	Flush mount Man-hole cover	↓	↓
Paint	–		
Rod Lubricant	–		
Compressor Oil	–		

To the best of my knowledge, I certify that the above described materials were used during installation of this monitoring well.

Signature of Site Geologist: Jason J. McCann