CAFB 97

DEPARTMENT OF THE AIR FORCE

HEADQUARTERS 27th FIGHTER WING (ACC)
CANNON AIR FORCE BASE, NEW MEXICO

10 JUN 1997

Colonel W. P. Ard
Commander, 27th Support Group
110 E Sextant Avenue Suite 1098
Cannon AFB NM 88103-5323

ENTERED

Mr. Benito J. Garcia, Chief
Hazardous and Radioactive Materials Bureau
New Mexico Environment Department
2044 Galisteo Street
P O Box 26110
Santa Fe NM 87502

Dear Mr. Garcia

Enclosed for your review and files is the quarterly sampling report for the monitoring wells at Landfill 5 (SWMU 113). After one more quarter of sampling, we will have USGS prepare a statistical report to determine the background values.

RECEIVED JUN 1997

If you have any questions, please contact Mr. Sanford Hutsell at (505) 784-6378.

Sincerely

W. P. ARD, Colonel, USAF
Commander

Attachment:
Quarterly Sampling Report

cc:
NMED (C. Will)
NMED w/o Atch (S. Pullen)
NMED GW Bureau (J. Jacobs)
EPA Region VI (D. Neleigh)
HQ ACC CES/ESUW w/o Atch (M. Patterson)

LIBRARY COPY

Cannon Air Force Base, New Mexico

RCRA Ground-Water Sampling at Landfill 5

Data Report for March 4-5, 1997 Sampling

Prepared for

United States Air Force Air Combat Command
Cannon Air Force Base, New Mexico 88103

April 30, 1997

Prepared by

U.S. Geological Survey, Water Resources Division
4501 Indian School Road NE
Suite 200
Albuquerque, New Mexico 87110

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EXECUTIVE SUMMARY

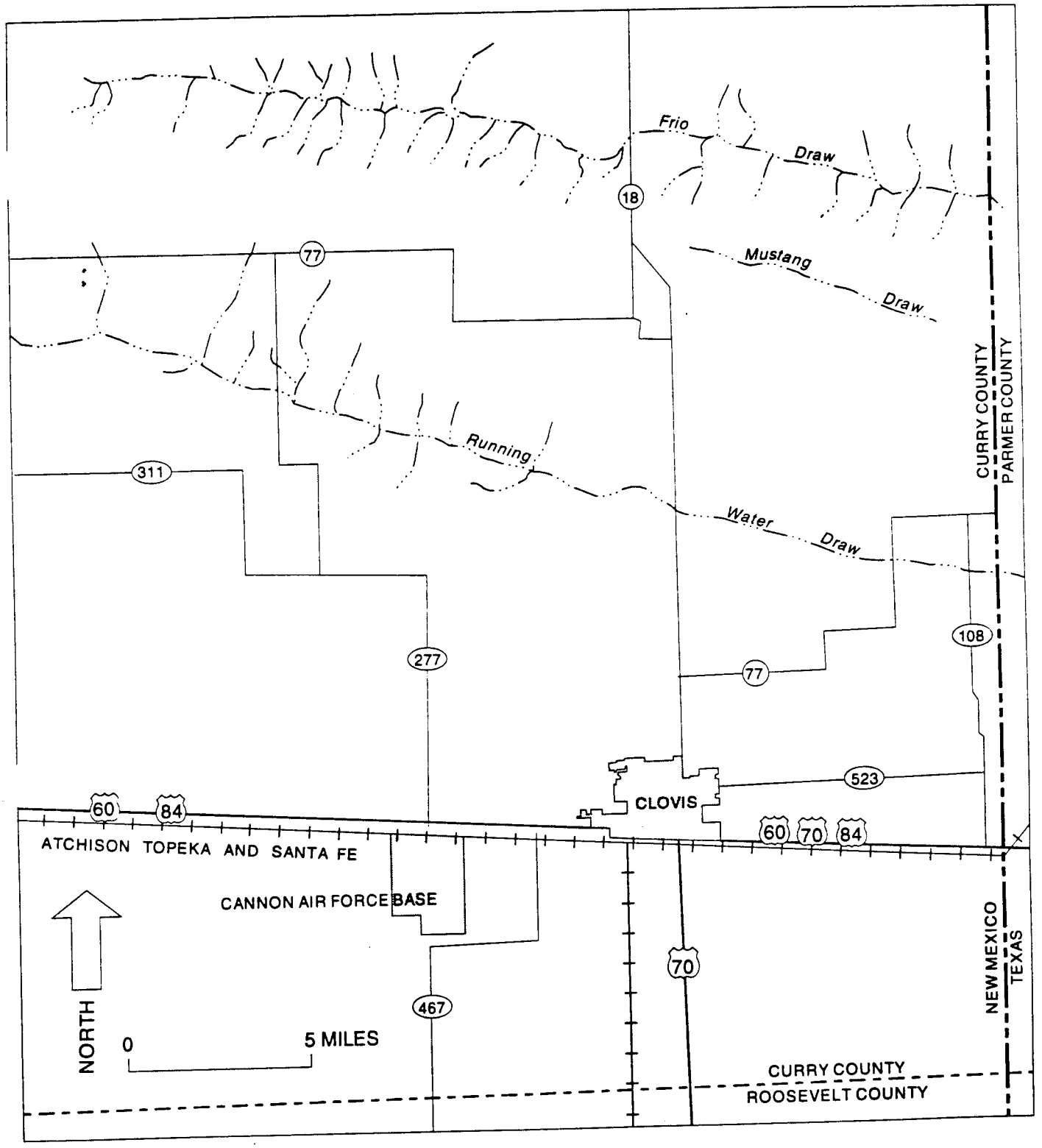
The U.S. Geological Survey (USGS), Water Resources Division and the U.S. Air Force Air Combat Command (ACC) have a memorandum of understanding that addresses the USGS assisting any ACC base in their hydrology or environmental programs. The USGS has agreed to assist Cannon Air Force Base (CAFB), an ACC base, in their RCRA ground-water sampling program. Cannon AFB is located in east-central New Mexico about 7 miles west of Clovis as shown on Figure 1. The ground-water sampling is at Landfill 5 on the southeast corner of the base as shown on Figure 2. The detection sampling is conducted semi-annually as part of the July 13, 1990 Compliance Agreement between CAFB and the New Mexico Environment Department (NMED).

This report presents the water-quality data for samples collected from four wells around Landfill 5 (figure 3), CAFB on March 4-5, 1997. The monitoring wells sampled at the landfill 5 are downgradient wells I, L, M, and an upgradient well Q as shown on figure 3. These wells were sampled for the following Appendix-IX parameters: volatile organic compounds by method SW8260, semivolatile organic compounds by method SW8270, dioxins and furrans by method SW8280, polynuclear aromatic hydrocarbons by method SW8310, pesticides and PCB's by method SW8080A, herbicides by method SW8150, total metals for fourteen metals (barium, beryllium, calcium, cobalt, copper, iron, magnesium, manganese, molybdenum, nickel, sodium, tin, vanadium, and zinc) by SW6010, antimony by SW7041, silver by SW7761, cadmium by SW7131, arsenic by SW7060, chromium by SW7191, lead by SW7421, mercury by SW7470, selenium by SW7740, and thallium by SW7841, and general inorganics (cyanide by SW9012, sulfide by E376.2, total organic carbon by SW9060, and total organic halogen by SW9020).

Water quality data results from wells around Landfill 5 are shown in table 1. Fluorene by method SW8310 was detected in water from well M at 0.25 μg/L. Use this data with caution and note that 0.10 μg/L of fluorene was also detected in the method blank. Arsenic was detected in water from well I at 0.0052 mg/L. The EPA (Environmental Protection Agency) MCL (Maximum Contaminant Level) for drinking water for arsenic is 0.05 mg/L. Barium was detected in water from all the wells ranging in concentrations from 0.032 to 0.054 mg/L. The EPA MCL for barium is 2.00 mg/L. Chromium was detected in water from well I at 0.0057 mg/L which is slightly above the reporting limit of 0.0050 mg/L. The EPA MCL for chromium is 0.1 mg/L. Iron was detected in water from three wells (L, M, and Q) ranging in concentrations from 0.11 to 0.13 mg/L. The EPA Secondary MCL for iron is 0.3 mg/L. Manganese was detected in water from well M at 0.020 mg/L.

The EPA Secondary MCL for manganese is 0.05 mg/L. Nickel was detected in water from well M at 0.14 mg/L. The EPA MCL for nickel is 0.1 mg/L. Selenium was detected in water from wells L and Q at concentrations less than 0.0063 mg/L. The EPA MCL for selenium is 0.05 mg/L. Zinc was detected in water from well M at 0.027 mg/L. The EPA Secondary MCL is 5.0 mg/L.

As part of the quality assurance and quality control (QA/QC) procedures for the Landfill 5 site, trip blank, duplicate, matrix spike, and matrix spike duplicate samples were collected. No target parameters other than the parameters associated with the duplicate analysis were detected in the QA/QC samples mentioned above.



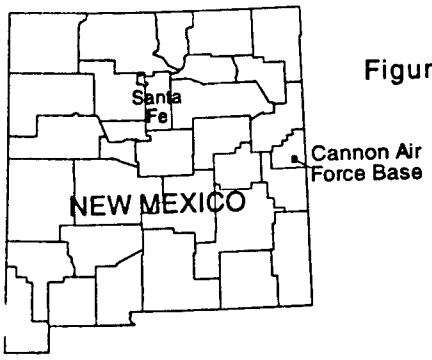


Figure 1.--Location of Cannon Air Force Base, New Mexico.

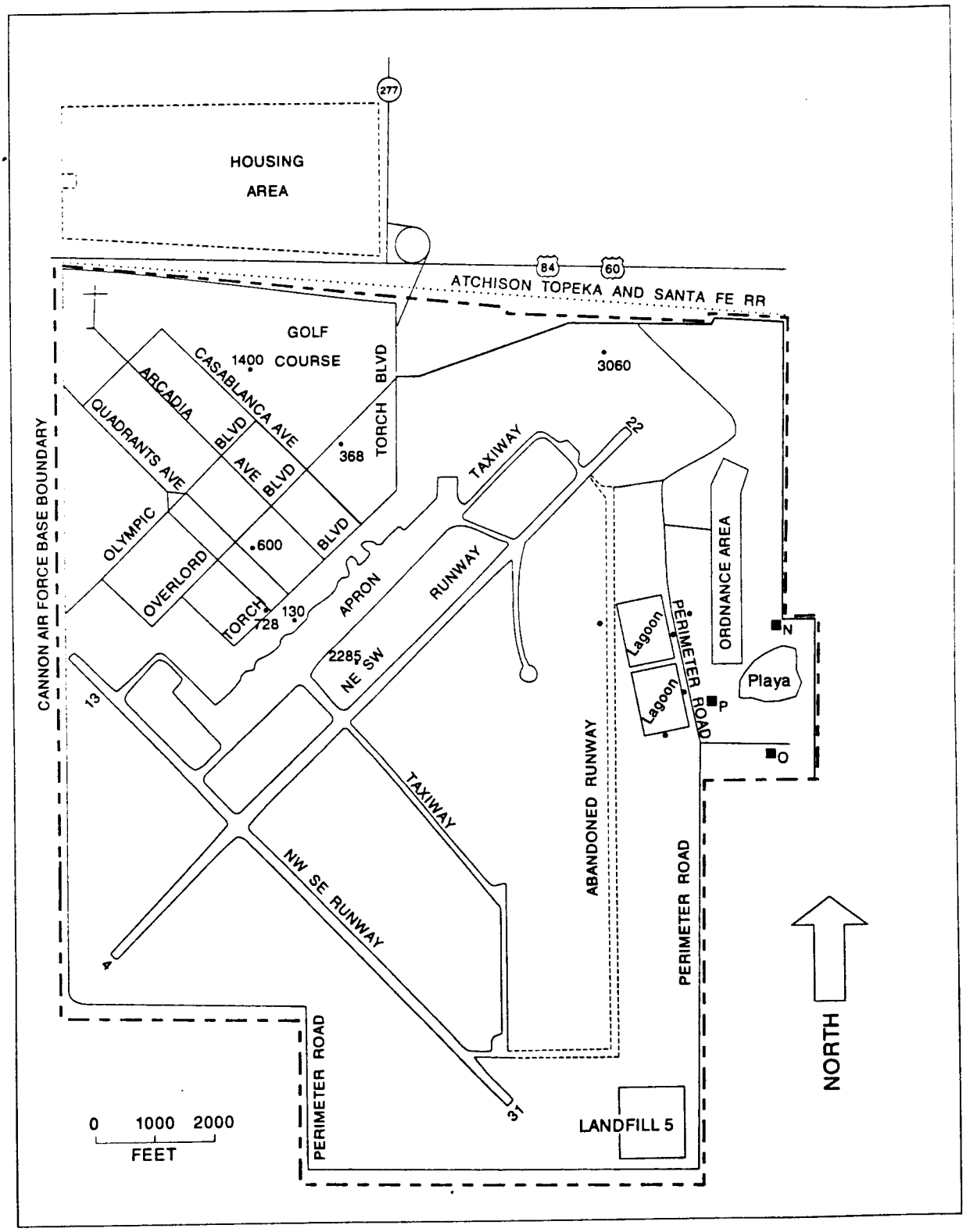


Figure 2.--Cannon Air Force Base and location of Landfill 5.

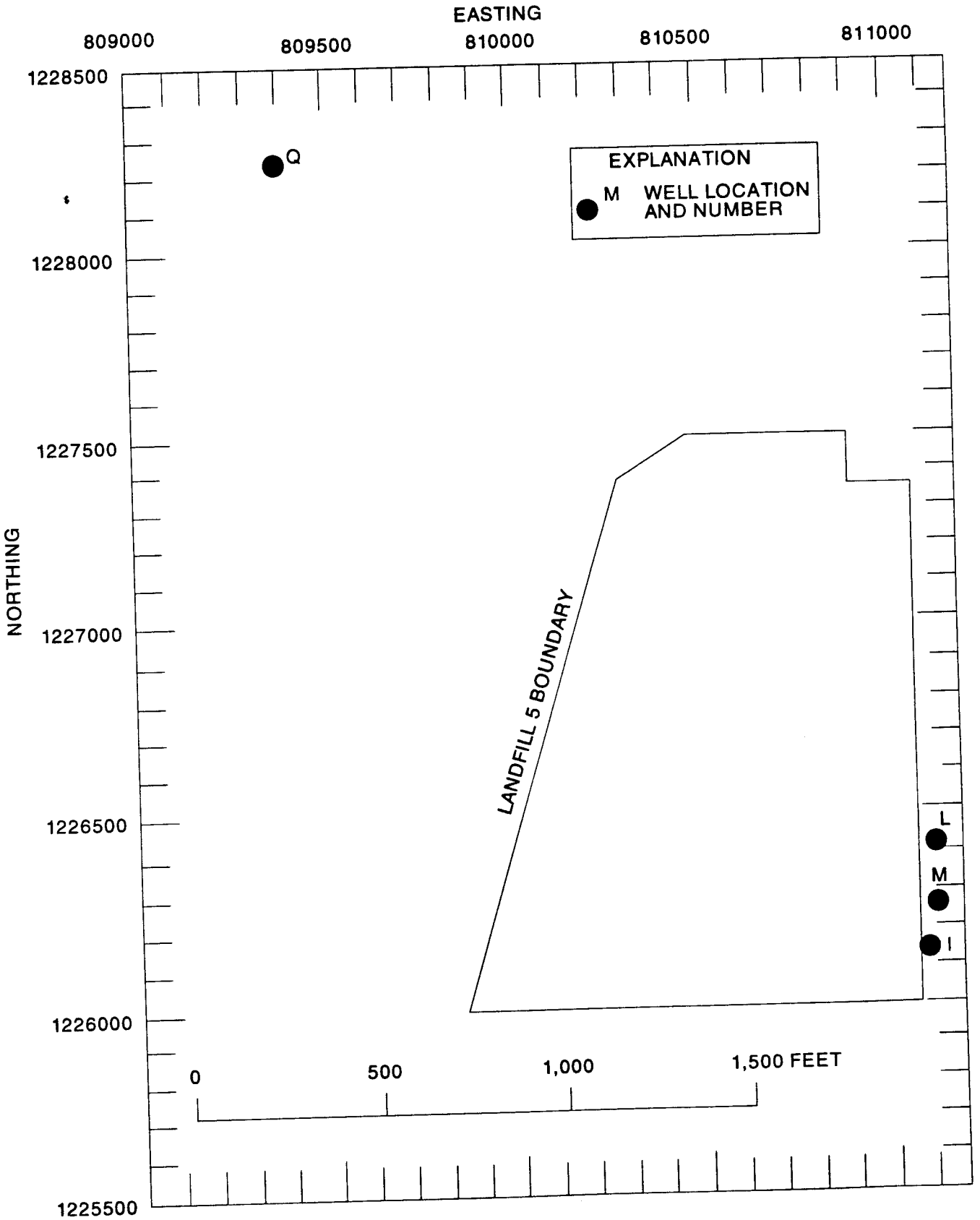


Figure 3.--Location of monitoring wells around Landfill 5.

Table 1.-- Summary of concentrations of analytes in ground-water from wells I, L, M, and Q around Landfill 5 for samples collected on March 4-5, 1997, Cannon Air Force Base, New Mexico

[RL, reporting limit; µg/L, micrograms per liter; ND, not detected; B, compound is also detected in the method blank; mg/L, milligrams per liter; G, reporting limit raised due to the matrix of the sample]

Well/sample ID: Date sampled:		I/CAFB-I-0397-1 03-05-97		L/CAFB-L-0397-1 03-05-97		L/CAFB-X-0397-1 03-05-97 Duplicate		M/CAFB-M-0397-1 03-04-97		Q/CAFB-Q-0397-1 03-04-97	
Analytes and Method		Result	RL	Result	RL	Result	RL	Result	RL	Result	RL
Polinuclear Aromatic Hydrocarbons SW8310, (µg/L)											
Fluorene		ND	0.19	ND	0.19	ND	0.19	0.25 B	0.19	ND	0.19
Appendix-IX, Metals, Total (mg/L)											
Arsenic	SW7060	0.0052	0.0050	ND G	0.010	ND G	0.010	ND	0.0050	ND	0.0050
Barium	SW6010	0.034	0.010	0.051	0.010	0.050	0.010	0.054	0.010	0.032	0.010
Calcium	SW6010	51.7	0.20	53.1	0.20	51.7	0.20	78.2	0.20	43.1	0.20
Chromium	SW7191	0.0057	0.0050	ND	0.0050	ND	0.0050	ND	0.0050	ND	0.0050
Iron	SW6010	ND	0.10	0.13	0.10	ND	0.10	0.12	0.10	0.11	0.10
Magnesium	SW6010	46.0	0.20	49.2	0.20	48.4	0.20	54.5	0.20	38.7	0.20
Manganese	SW6010	ND	0.010	ND	0.010	ND	0.010	0.020	0.010	ND	0.010
Nickel	SW6010	ND	0.040	ND	0.040	ND	0.040	0.14	0.040	ND	0.040
Selenium	SW7740	ND G	0.010	0.0055	0.0050	0.0060	0.0050	ND G	0.010	0.0063	0.0050
Sodium	SW6010	40.9	5.0	44.7	5.0	46.3	5.0	41.1	5.0	48.7	5.0
Vanadium	SW6010	0.028	0.010	0.018	0.010	0.018	0.010	ND	0.010	0.022	0.010
Zinc	SW6010	ND	0.020	ND	0.020	ND	0.020	0.027	0.020	ND	0.020

MONITORING WELL IDENTIFICATION REPORT

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUES, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME Cannon Air Force Base

EPA I.D. NUMBER NM 7572124454

COUNTY Curry

WELL NUMBER I

WELL LOCATION (LONGITUDE) 103° 18' 06.8"

WELL LOCATION (LATITUDE) 34° 21' 58.8"

AQUIFER NAME Ogalalla

AQUIFER CONFINED _____ UNCONFINED X

WELL INSTALLATION DATE 08-19-88

DRILLING METHOD HYDRT

INNER CASING DIAMETER 6"

BOREHOLE DIAMETER 9 7/8"

CASING MATERIAL PVC

METHOD OF DEVELOPMENT BAILD

ELEV BOTTOM OF BOREHOLE 3959.36

ELEV BOTTOM OF WELL CASING 3969.36

ELEV BOTTOM OF SCREENED INT 3969.36

ELEV OF TOP OF SCREENED INT 3989.36

SURVEYED ELEV OF CASING TOP 4262.36

DATE OF REPORT 02-24-89 SIGNATURE _____

NAME (TYPED) Sanford Hutsell

MONITORING WELL IDENTIFICATION REPORT

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUES, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME Cannon Air Force Base

EPA I.D. NUMBER NM 7572124454

COUNTY Curry

WELL NUMBER L

WELL LOCATION (LONGITUDE) 103° 18' 00"

WELL LOCATION (LATITUDE) 34° 22' 02"

AQUIFER NAME Ogalalla

AQUIFER CONFINED _____ UNCONFINED X

WELL INSTALLATION DATE 06-02-92

DRILLING METHOD HYDRT

INNER CASING DIAMETER 4" inside 5.8"

BOREHOLE DIAMETER 12"

CASING MATERIAL PVC

METHOD OF DEVELOPMENT BAILD

ELEV BOTTOM OF BOREHOLE 3972.72

ELEV BOTTOM OF WELL CASING 3977.72

ELEV BOTTOM OF SCREENED INT 3981.72

ELEV OF TOP OF SCREENED INT 4001.72

SURVEYED ELEV OF CASING TOP 4264.72

DATE OF REPORT 10-21-92 SIGNATURE _____

NAME (TYPED) Sanford Hutsell

MONITORING WELL IDENTIFICATION REPORT

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUES, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME Cannon Air Force Base

EPA I.D. NUMBER NM 7572124454

COUNTY Curry

WELL NUMBER M

WELL LOCATION (LONGITUDE) 103° 18' 00"

WELL LOCATION (LATITUDE) 34° 22' 01"

AQUIFER NAME Ogalalla

AQUIFER CONFINED _____ UNCONFINED X

WELL INSTALLATION DATE 02-04-92

DRILLING METHOD HYDRT

INNER CASING DIAMETER 5.8"

BOREHOLE DIAMETER 12"

CASING MATERIAL PVC

METHOD OF DEVELOPMENT BAILD

ELEV BOTTOM OF BOREHOLE 3975.29

ELEV BOTTOM OF WELL CASING 3975.29

ELEV BOTTOM OF SCREENED INT 3980.29

ELEV OF TOP OF SCREENED INT 4000.29

SURVEYED ELEV OF CASING TOP 4264.29

DATE OF REPORT 10-21-92 SIGNATURE _____

NAME (TYPED) Sanford Hutsell

MONITORING WELL IDENTIFICATION REPORT

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
525 CAMINO DE LOS MARQUES, SUITE 4
SANTA FE, NEW MEXICO 87502

FACILITY NAME Cannon Air Force Base

EPA I.D. NUMBER NM 7572124454

COUNTY Curry

WELL NUMBER Q

WELL LOCATION (LONGITUDE) 103° 18' 31"

WELL LOCATION (LATITUDE) 34° 22' 19"

AQUIFER NAME Ogalalla

AQUIFER CONFINED _____ UNCONFINED X

WELL INSTALLATION DATE 02-24-96

DRILLING METHOD _____

INNER CASING DIAMETER 4"

BOREHOLE DIAMETER 8"

CASING MATERIAL PVC

METHOD OF DEVELOPMENT BAILD

ELEV BOTTOM OF BOREHOLE 3969.30

ELEV BOTTOM OF WELL CASING 3970.30

ELEV BOTTOM OF SCREENED INT 3970.30

ELEV OF TOP OF SCREENED INT 4000.30

SURVEYED ELEV OF CASING TOP 4266.89

DATE OF REPORT 11-27-96 SIGNATURE _____

NAME (TYPED) Sanford Hutsell

FOURTH SAMPLING EVENT
SEMI-ANNUAL REPORT

SAMPLE COLLECTED BY F. Eileen Roybal

LABORATORY NAME Quanterra Environmental Services WELL NUMBER CAFB-1-0397-1

WELL DEPTH 293.00 WELL CASING VOLUME 14.23

DATE SAMPLED 03-05-97 LABORATORY SAMPLE I.D.# 054057-0001-SA

TIME SAMPLED 1030 DATE RECEIVED BY LAB 03-06-97

PARAMETERS	STORET CODE	UNITS	VALUE	DATE ANALYZED
Elevation of G. Water	71993	ft.	3979.06	03-05-97
Pump Rate	-----	gal/min	0.875	03-05-97
Pump Period	72004	min.	40.0	03-05-97
Volume Evacuated	73675	gal	35.0	03-05-97
Well Sampling Method	84077	---	PSPMP	03-05-97

Sampler Material: TEFLN Well Sampling Method: PSPMP

FOURTH SAMPLING EVENT
SEMI-ANNUAL REPORT
(continued)

PARAMETERS	STORET CODE	UNITS	VALUE	DETECTION LIMIT	DATE ANALYZED	METHOD USED
pH	00400	S.U.	7.51	N/A	03-05-97	
	00400	S.U.				(f)
	00400	S.U.				
	00400	S.U.				
Specific Conductivity	00095	umhos/cm	865	N/A	03-05-97	
	00095	umhos/cm				(f)
	00095	umhos/cm				
	00095	umhos/cm				
T.O.X.	70354	ug/l	ND	30.0	03-27-97	
	70354	ug/l				SW9020
	70354	ug/l				
	70354	ug/l				
T.O.C.	00680	mg/l	ND	1.0	03-19-97	
	00680	mg/l				SW9060
	00680	mg/l				
	00680	mg/l				

SIGNATURE: F. Eileen Roybal

NAME (PRINTED): F. Eileen Roybal

FOURTH SAMPLING EVENT
SEMI-ANNUAL REPORT

SAMPLE COLLECTED BY F. Eileen Roybal

LABORATORY NAME Quanterra Environmental Services WELL NUMBER CAFB-L-0397-1

WELL DEPTH 287.00 WELL CASING VOLUME 2.23

DATE SAMPLED 03-05-97 LABORATORY SAMPLE I.D.# 054057-0003-SA

TIME SAMPLED 0900 DATE RECEIVED BY LAB 03-06-97

PARAMETERS	STORET CODE	UNITS	VALUE	DATE ANALYZED
Elevation of G. Water	71993	ft.	3981.13	03-05-97
Pump Rate	-----	gal/min	0.54	03-05-97
Pump Period	72004	min.	13.0	03-05-97
Volume Evacuated	73675	gal	7.0	03-05-97
Well Sampling Method	84077	---	PSPMP	03-05-97

Sampler Material: TEFLN Well Sampling Method: PSPMP

FOURTH SAMPLING EVENT
SEMI-ANNUAL REPORT
(continued)

PARAMETERS	STORET CODE	UNITS	VALUE	DETECTION LIMIT	DATE ANALYZED	METHOD USED
pH	00400	S.U.	7.66	N/A	03-05-97	
	00400	S.U.				(f)
	00400	S.U.				
	00400	S.U.				
Specific Conductivity	00095	umhos/cm	950	N/A	03-05-97	
	00095	umhos/cm				(f)
	00095	umhos/cm				
	00095	umhos/cm				
T.O.X.	70354	ug/l	ND	30.0	03-27-97	
	70354	ug/l				SW9020
	70354	ug/l				
	70354	ug/l				
T.O.C.	00680	mg/l	ND	1.0	03-19-97	
	00680	mg/l				SW9060
	00680	mg/l				
	00680	mg/l				

SIGNATURE: F. Eileen Roybal

NAME (PRINTED): F.Eileen Roybal

FOURTH SAMPLING EVENT
SEMI-ANNUAL REPORT

SAMPLE COLLECTED BY F. Eileen Roybal

LABORATORY NAME Quanterra Environmental Services WELL NUMBER CAFB-M-0397-1

WELL DEPTH 289.00 WELL CASING VOLUME 8.89

DATE SAMPLED 03-04-97 LABORATORY SAMPLE I.D.# 054027-0001-SA

TIME SAMPLED 1245 DATE RECEIVED BY LAB 03-05-97

PARAMETERS	STORET CODE	UNITS	VALUE	DATE ANALYZED
Elevation of G. Water	71993	ft.	3981.77	03-04-97
Pump Rate	-----	gal/min	0.63	03-04-97
Pump Period	72004	min.	8.0	03-04-97
Volume Evacuated	73675	gal	5.0	03-04-97
Well Sampling Method	84077	---	PSPMP	03-04-97

Sampler Material: TEFLN Well Sampling Method: PSPMP

FOURTH SAMPLING EVENT
SEMI-ANNUAL REPORT
(continued)

PARAMETERS	STORET CODE	UNITS	VALUE	DETECTION LIMIT	DATE ANALYZED	METHOD USED
pH	00400	S.U.	6.86	N/A	03-04-97	
	00400	S.U.				(f)
	00400	S.U.				
	00400	S.U.				
Specific Conductivity	00095	umhos/cm	883	N/A	03-04-97	
	00095	umhos/cm				(f)
	00095	umhos/cm				
	00095	umhos/cm				
T.O.X.	70354	ug/l	ND	30.0	03-27-97	
	70354	ug/l				SW9020
	70354	ug/l				
	70354	ug/l				
T.O.C.	00680	mg/l	ND	1.0	03-19-97	
	00680	mg/l				SW9060
	00680	mg/l				
	00680	mg/l				

SIGNATURE: F. Eileen Roybal

NAME (PRINTED): F. Eileen Roybal

INTERIM STATUS DETECTION MONITORING SEMI-ANNUAL INDICATOR PARAMETER REPORT

This set of data sheets should be completed by facilities in semi-annual detection monitoring, HWMR-6, Part VI, Section 265.92 (d) (2) and (e) and Section 265.94 (a). These data sheets should be completed semi-annually and submitted annually. The raw lab data sheets should be submitted in addition to the Semi-Annual Report. **In order to be acceptable** the raw lab data sheets must include 1) the date the sample was taken, 2) the sample extraction date, if any, and 3) the date of analysis.

FACILITY NAME Cannon Air Force Base EPA I.D. NUMBER NM7572124454

WELL NUMBER CAFB-Q-0307-1

FIRST SAMPLING EVENT
SEMI-ANNUAL REPORT

LABORATORY NAME Quanterra Environmental Services DATE SAMPLED 03-04-97

SAMPLED BY F. Eileen Roybal LABORATORY SAMPLE I.D.# 054027-0002-SA

TIME SAMPLED 1150 DATE RECEIVED BY LAB 03-05-97

PARAMETERS	STORET CODE	UNITS	VALUE	DATE ANALYZED
Elevation of G. Water	71993	ft.	3989.89	03-04-97
Well Depth	-----	ft.	296.59	03-04-97
Well Casing Volume	-----	gal.	12.78	03-04-97
Pump Rate	-----	gal/min	1.18	03-04-97
Pump Period	72004	min.	34.00	03-04-97
Volume Excavated	73675	gal.	40.00	03-04-97

Sampler Material: TEFLN Well Sampling Method: PSPMP

FIRST SAMPLING EVENT
SEMI-ANNUAL REPORT
(continued)

PARAMETERS	STORET CODE	UNITS	VALUE	DETECTION LIMIT	DATE ANALYZED	METHOD USED
pH	00400	S.U.	7.70	N/A	03-04-97	
	00400	S.U.				(f)
	00400	S.U.				
	00400	S.U.				
Specific Conductivity	00095	umhos/cm	742	N/A	03-04-97	
	00095	umhos/cm				(f)
	00095	umhos/cm				
	00095	umhos/cm				
T.O.X.	70354	ug/l	ND	30.0	03-27-97	
	70354	ug/l				SW9020
	70354	ug/l				
	70354	ug/l				
T.O.C.	00680	mg/l	ND	1.0	03-19-97	
	00680	mg/l				SW9060
	00680	mg/l				
	00680	mg/l				

SIGNATURE: F. Eileen Roybal

NAME (PRINTED): F. Eileen Roybal

APPENDIX I

Analytical Results from Quanterra Environmental Services Laboratory
for Ground-Water Samples Collected on March 4-5, 1997

Quanterra
Environmental Services

Quanterra Incorporated
4955 Yarrow Street
Arvada, Colorado 80002

303 421-6611 Telephone
303 431-7171 Fax

ANALYTICAL RESULTS

FOR

U.S. GEOLOGICAL SURVEY

QUANTERRA NO. 054057

MARCH 28, 1997

Prepared by: _____
Mark D. Stella

Reviewed by: _____
Lindsay Breyer

Quanterra
Environmental Services

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General Chemistry	**H**	51
Subcontracted Data	**I**	

NARRATIVE

On March 6, 1997 , Quanterra Environmental Services, Denver received four aqueous samples from the U.S. Geological Survey.

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data.

With the exceptions noted below or on the data sheets, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory QC samples analyzed in conjunction with the samples in this project were within established control limits.

Sample Receipt/Chain-of-Custody

The samples have also been sent to Quanterra's West Sacramento, California laboratory for Appendix IX dioxin and furans. These results will be reported separately on project 054059.

General Comments

Dilution factors listed on the data sheets for the aqueous semivolatile organic parameters are based on the volume of sample actually extracted relative to the nominal volume of 1.0 liter. Any additional dilutions performed on the samples after extraction are also included in the dilution factor and will be indicated by G or t footnotes on the data sheets. All results and reporting limits are adjusted relative to the sample volume extracted and any subsequent dilutions performed. Dilution factors are rounded to two significant figures for reporting; all calculations are performed before rounding.

GC/MS Semivolatile Organics

Several compounds are not consistently recovered using Method 8270, and reporting limits cannot be established. These compounds include hexachlorophene and benzenethiol. Two compounds, pyridine and quinoline, are not recovered after alumina column cleanup.

Benzo(b) and benzo(k) fluoranthene cannot be differentiated based on their mass spectra and their retention times are almost identical. The isomer which is the closest in retention time to the sample is reported.

1,2-diphenylhydrazine is measured and reported as azobenzene.

N-nitrosodiphenylamine degrades to diphenylamine in the injection port of the instrument. Therefore, these two compounds cannot be distinguished from one another.

3-Methyl phenol and 4-methyl phenol cannot be differentiated based on their mass spectra and their retention times are identical. Results are reported as a combined value for 3/4-methyl phenol (or m&p-cresols).

Tentatively Identified Compounds

This report presents results for the "identification" of unknown compounds that were detected in the GC/MS analysis. The results from this work are presented as "tentatively identified compounds" (TICs). The approach used for reporting TICs was based on the protocol established for this purpose in the EPA Superfund methods and on guidelines established by the American Chemical Society (ACS).

In summary, the mass spectra of chromatographic peaks in concentrations in excess of 10% of the internal standard were obtained. Normally, the number of unknown compounds identified is limited to 10 compounds in the volatile fraction and 20 compounds in the semivolatile fraction. Each mass spectrum was then compared to a library of over 30,000 reference spectra in a computerized "library search." The three "best" matches obtained by the computer were hardcopied along with the mass spectrum of the unknown peak. This information was then reviewed by an analyst who "identified" the compound based on the available information. In general, mass spectrometry cannot distinguish isomers (compounds with the same molecular formula). Therefore, an identified compound may be any one of several different isomers.

All identifications were based on the "Guidelines for GC/MS Identification" developed by the American Chemical Society (Environmental Science and Technology, 1982, 16 143A). As recommended in these guidelines, identifications of unknown substances were reported with a level of confidence. The three levels of confidence cited in the ACS guidelines and used in this report are as follows:

3 Confirmed Identification; the identification is based on the analysis of an authentic standard.

2 Confident Identification; good agreement was observed between the unknown compound and a specific library spectrum.

1 Tentative Identification; the unknown compound is only indicative of a specific library spectrum.

If the unknown compound was not similar to a specific library spectrum, but it did contain ions characteristic of a class of compounds (saturated hydrocarbon, chlorinated hydrocarbon, etc.), a class identification is made without assigning a level of confidence.

If there were no library spectra similar to the unknown, and it could not be assigned to a particular class of compounds, the compound is reported as "unknown."

Quantitation of TICs is based on the total ionization peak area relative to an internal standard, assuming a response factor of one. Accordingly, the reported concentration is an estimate.

The tentatively identified compounds in this report may include some compounds reported as "siloxanes." Siloxanes are common laboratory and field artifacts or contaminants. Potential sources include silicon-based grease in the field or laboratory plus the liquid phase coating on gas chromatography columns, as well as other equipment in the laboratory. However, siloxanes may also be present in environmental samples from spills of silicone oils or lubricating oils with siloxane additives.

Chromatography

Analyte identification in chromatographic analysis is based upon retention time. Since it is possible for more than one compound to have the same retention time, analyte identification by these methods is not definitive. Most methods require analysis on a second dissimilar chromatographic column to confirm the presence of target analytes detected in a sample. Only confirmed hits are reported without further qualification or supporting data.

Some analytes (e.g. hydrocarbon products, technical chlordane, toxaphene, and the aroclors) consist of mixtures of a number of different compounds. These multicomponent analytes produce distinct patterns of peaks in the chromatograms and do not have a single retention time. The pattern of peaks observed is characteristic of the analyte and provides qualitative information about the analyte(s) present in the sample. For these analytes, second column confirmations are not generally required. Instead, identification is based on matching the pattern of peaks observed in the samples to the patterns observed for standards containing known concentrations of the analytes of interest.

All analytes are quantitated against multipoint calibration curves as specified in the applicable analytical methods. In some cases it is not practical to maintain multipoint calibration curves for every analyte on every instrument. These analytes include three Appendix IX compounds (diallate, isodrin, and kepone) and the multicomponent analytes (technical chlordane, toxaphene, and aroclors) analyzed by method 8080. For these analytes, a single calibration standard at the reporting limit is analyzed to establish instrument sensitivity for each compound. If the analyte is detected in any sample at greater than half the reporting limit, a multipoint calibration curve is prepared and the sample re-analyzed for quantitation against this curve.

Appendix IX Chlorinated Pesticides & PCBs

Aldrin was recovered below the lower control limit in the matrix spike (MS). As a result of the low MS recovery, the relative percent difference (RPD) is reported outside control limits for the matrix spike spike duplicate (MS/SD). In addition, the RPD for heptachlor is reported outside control limits in the MS/SD. Matrix effects are suspected. Since the mentioned analytes were recovered within precision and accuracy control limits in the duplicate control samples (DCS), the data were accepted.

Metals

Lead, thallium and chromium were recovered below the lower control limit in the MS/SD for the GFAA analyses. Matrix effects are suspected. Since the mentioned analytes were recovered within control limits in their respective DCS, the data were accepted.

Metals analyzed by Graphite Furnace Atomic Absorption (GFAA) are subject to matrix interferences. Consequently, Quanterra Environmental Services, Denver laboratory's protocol is to analyze a spiked aliquot with every sample. The severity of the interference, based upon analyte level and spike recovery, is assessed against specific criteria and the need for an elevated reporting limit or dilution is determined. An elevated reporting limit or dilution due to matrix interference will be noted by a G flag on the data sheet.

General Inorganics

The continuing calibration standard (CCV) for total organic halogen (TOX) associated with samples 054057-0001-SA through -0003-SA was measured below advisory limits. An instrument malfunction was observed in conjunction with the CCV failure. An MS/SD analyzed at the end of the run, immediately prior to the CCV were recovered within control limits, so the data were accepted.

Footnotes and Data Qualifiers

The data sheets contained in this report may contain a variety of footnotes and data qualifiers. Those used to indicate the confidence level for Tentatively Identified Compounds (GC/MS methods) are described above. Other footnotes are used with specific tests; for example, footnotes used with the GC/FID Petroleum Hydrocarbon methods to indicate (in the analysts judgment) the product that appears to be present. Finally, there are a number of general qualifiers that serve to identify problems and pertinent observations made during sample analysis that may not discussed in the Overview. These are described below:

B Compound is also detected in the blank.

The indicated compound was detected in the sample as well as the method blank. Please note that the B flag is not used when the sample result is ND (Not Detected).

G Reporting limit raised due to the matrix of the sample.

Indicates that reporting limits were raised due to the presence of non-target compounds or other matrix interferences. The sample may or may not have been diluted. For inorganic methods, the footnote applies

only to the flagged analyte. For organic methods, the footnote pertains to all analytes determined by the method.

J Result is detected below the reporting limit or is an estimated concentration.

Most commonly, a "J" value indicates that the reported result for the analyte is below the stated reporting limit and is an estimated value. "J" values are generally reported to 1/5 of the reporting limit for GC/MS Volatiles, 1/10 of the reporting limit for GC/MS Semivolatiles, 1/2 the reporting limit for GC and HPLC, or to the Instrument Detection Limit for metals and general inorganics. Analytes which are not detected at or below the reporting limit are reported as "ND" and do not have "J" flags. Because "J" values may represent false positive concentrations, care should be used when interpreting these data. If there is uncertainty about the quantiation of an analyte, this footnote may also indicate that a reported result is an estimated concentration, even if it is above the reporting limit.

t Sample diluted due to the concentration of target compounds.

Indicates that reporting limits were raised due to the presence of target analytes outside the calibration range of the method. For multi-analyte methods, the footnote will appear only for the first analyte but pertains to all analytes determined by the method.

T Preferred values unless footnoted on secondary column test.

This footnote is used with GC tests to indicate the primary column results. The footnote will be listed only for the first compound but pertains to all analytes determined by the method. It is used in conjunction the footnote V.

V Secondary column result is the preferred value.

This footnote is used for GC tests in conjunction the T footnote. It indicates that the value from the second column is preferred over the primary column result and pertains only to the indicated compound.

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LIMs Report Key

Section	Description
Cover Letter	Signature page, report narrative as applicable.
Sample Description Information	Tabulated cross-reference between the Lab ID and Client ID, including matrix, date and time sampled, and the date received for all samples in the project.
Sample Analysis Results Sheets	Lists sample results, test components, reporting limits, dates prepared and analyzed, and any data qualifiers. Pages are organized by test.
QC LOT Assignment Report	Cross-reference between lab IDs and applicable QC batches (DCS, LCS, Blank, MS/SD, DU)
Duplicate Control Sample Report	Percent recovery and RPD results, with acceptance limits, for the laboratory duplicate control samples for each test are tabulated in this report. These are measures of accuracy and precision for each test. Acceptance limits are based upon laboratory historical data.
Laboratory Control Sample Report	Percent recovery results for a single Laboratory Control Sample (if applicable) are tabulated in this report, with the applicable acceptance limits for each test.
Matrix Spike/Matrix Spike Duplicate Report	Percent recovery and RPD results for matrix-specific QC samples and acceptance limits, where applicable. This report can be used to assess matrix effects on an analysis.
Single Control Sample Report	A tabulation of the surrogate recoveries for the blank for organic analyses.
Method Blank Report	A summary of the results of the analysis of the method blank for each test.

List of Abbreviations and Terms

Abbreviation	Term	Abbreviation	Term
DCS	Duplicate Control Sample	MSD	Matrix Spike Duplicate
DU	Sample Duplicate	QC Run	Preparation Batch
EB	Equipment Blank	QC Category	LIMs QC Category
FB	Field Blank	QC Lot	DCS Batch
FD	Field Duplicate	ND	Not Detected at or above the reporting limit expressed
IDL	Instrument Detection Limit (Metals)	QC Matrix	Matrix of the laboratory control sample(s)
LCS	Laboratory Control Sample	RL	Reporting Limit
MB	Method Blank	QC	Quality Control
MDL	Method Detection Limit	SA	Sample
MS	Matrix Spike	SD	Spike Duplicate
RPD	Relative Percent Difference	TB	Trip Blank
ppm (part-per-million)	mg/L or mg/kg (usually)	ppb (part-per-billion)	ug/L or ug/kg (usually)
QUAL	Qualifier flag	DIL	Dilution Factor

SAMPLE DESCRIPTION INFORMATION/ANALYTICAL TEST REQUESTS

Sample Description Information

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at Quanterra's Denver laboratory is assigned a unique six digit number. Samples within the project are numbered sequentially. The laboratory identification number is a combination of the six digit project code and the sample sequence number.

Also given in the Sample Description Information is the Sample Type (matrix), Date of Sampling (if known) and Date of Receipt at the laboratory.

Analytical Test Requests

The Analytical Test Requests lists the analyses that were performed on each sample. The Custom Test column indicates where tests have been modified to conform to the specific requirements of this project.

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SAMPLE DESCRIPTION INFORMATION
for
U.S. Geological Survey

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
054057-0001-SA	CAFB-I-0397-1	AQUEOUS	05 MAR 97	10:30	06 MAR 97
054057-0001-MS	CAFB-I-0397-MS	AQUEOUS	05 MAR 97	10:30	06 MAR 97
054057-0001-SD	CAFB-I-0397-SD	AQUEOUS	05 MAR 97	10:30	06 MAR 97
054057-0002-SA	CAFB-X-0397-1	AQUEOUS	05 MAR 97	09:01	06 MAR 97
054057-0003-SA	CAFB-L-0397-1	AQUEOUS	05 MAR 97	09:00	06 MAR 97
054057-0004-TB	CAFB-L-0397-TB	AQUEOUS	05 MAR 97	08:00	06 MAR 97

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ANALYTICAL TEST REQUESTS
for
U.S. Geological Survey

Lab ID: 054057	Group Code	Analysis Description	Custom Test?
0004	B	Screen - Volatile Organics	N
		Volatile Organics	Y
		Appendix IX List	Y
		Volatiles Library Search (20 Compound TID)	N
0001 - 0003	D	Appendix IX Herbicides	N
		Prep - Herbicides by GC	N
		Appendix IX Herbicides	N
		Total Organic Halogen (TOX)	N
		Cyanide, Total	N
		Prep - Cyanide, Total	N
		Sulfide, Total	N
		Lead, Furnace AA (Total)	N
		Prep - Total Metals, Furnace AA	N
		Arsenic, Furnace AA (Total)	N
		Prep - Arsenic, Selenium - Total, Furnace AA	N
		Selenium, Furnace AA (Total)	N
		Thallium, Furnace AA (Total)	N
		Mercury, Cold Vapor AA (Total)	N
		Prep - Mercury, Cold Vapor AA (Total)	N
		Cadmium,Furnace AA	N
		Chromium, Furnace AA (Total)	N
		Antimony, Furnace AA (Total)	N
		Silver, Furnace AA	N
		Polynuclear Aromatic Hydrocarbons, HPLC	N
		Prep - Polynuclear Aromatic Hydrocarbons by HPLC	N
		Chlorinated Pesticides and PCB's Appendix IX List	N
		Prep - Organochlorine Pesticides/PCBs by GC (Appendix IX)	N
		Chlorinated Pesticides and PCB's Appendix IX List	N
		Total Organic Carbon (TOC)	N
		Screen - Volatile Organics	N
		Semivolatile Organics Appendix IX List	N
		Prep - Semivolatile Organics by GC/MS	N
		Semivolatiles Library Search (30 Compound TID)	N
		Volatile Organics	Y
		Appendix IX List	Y
		Volatiles Library Search (20 Compound TID)	N
		ICP Metals (Total)	Y

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ANALYTICAL TEST REQUESTS
for
U.S. Geological Survey

Lab ID: 054057	Group Code	Analysis Description	Custom Test?
		Prep - Total Metals, ICP	N

ANALYTICAL RESULTS

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization date is the date when the project was defined by the client such that laboratory work could begin. The date prepared is typically the date an extraction or digestion was initiated. For volatile organic compounds in water, the date prepared is the date the screening of the sample was performed.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Quanterra reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

Quanterra does not routinely blank-correct analytical data. Uncorrected analytical results are reported, along with associated blank results, for all organic and metals analyses. Analytical results and blank results are reported for conventional inorganic parameters as specified in the method. In addition, surrogate recovery data is presented for all GC/MS analyses. The surrogate recovery is an indication of the affect of the sample matrix on the performance of the method.

Quanterra
Environmental Services

Volatile Organics
Appendix IX List
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-I-0397-1
Lab ID: 054057-0001-SA
Matrix: AQUEOUS Sampled: 05 MAR 97 Prepared: 06 MAR 97
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 11 MAR 97

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	20
Acetonitrile	ND	ug/L	100
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	20
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	5.0
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	10
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
cis-1,2-Dichloroethene	ND	ug/L	2.5
trans-1,2-Dichloroethene	ND	ug/L	2.5
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	5.0
2-Hexanone	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutyl alcohol	ND	ug/L	200
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
Methyl methacrylate	ND	ug/L	5.0

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Allen Quick Approved By: Audrey Cornell

Quanterra Environmental Services

(cont.)

Volatile Organics
Appendix IX List
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-I-0397-1
Lab ID: 054057-0001-SA
Matrix: AQUEOUS Sampled: 05 MAR 97 Prepared: 06 MAR 97
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 11 MAR 97

Parameter	Result	Units	Reporting Limit
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20
Propionitrile	ND	ug/L	20
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	10
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery		Limits
1,2-Dichloroethane-d4	98	%	77-115
4-Bromofluorobenzene	110	%	87-113
Toluene-d8	107	%	90-112

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Allen Quick Approved By: Audrey Cornell

Quanterra Environmental Services

Volatiles Library Search (20 Compound TID)
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-I-0397-1
Lab ID: 054057-0001-SA
Matrix AQUEOUS Sampled: 05 MAR 97 Prepared: NA
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 11 MAR 97

Parameter	Result	Units	Reporting Limit
None Detected	ND	ug/L	

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Allen Quick Approved By: Audrey Cornell

Quanterra
Environmental Services

Volatile Organics
Appendix IX List
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-X-0397-1
Lab ID: 054057-0002-SA
Matrix: AQUEOUS Sampled: 05 MAR 97 Prepared: 06 MAR 97
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 11 MAR 97

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	20
Acetonitrile	ND	ug/L	100
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	20
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	5.0
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	10
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
cis-1,2-Dichloroethene	ND	ug/L	2.5
trans-1,2-Dichloroethene	ND	ug/L	2.5
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	5.0
2-Hexanone	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutyl alcohol	ND	ug/L	200
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
Methyl methacrylate	ND	ug/L	5.0

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Allen Quick Approved By: Audrey Cornell

Quanterra Environmental Services

(cont.)

Volatile Organics
Appendix IX List
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-X-0397-1
Lab ID: 054057-0002-SA
Matrix: AQUEOUS Sampled: 05 MAR 97 Prepared: 06 MAR 97
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 11 MAR 97

Parameter	Result	Units	Reporting Limit
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20
Propionitrile	ND	ug/L	20
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	10
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery		Limits
1,2-Dichloroethane-d4	99	%	77-115
4-Bromofluorobenzene	106	%	87-113
Toluene-d8	108	%	90-112

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Allen Quick Approved By: Audrey Cornell

Quanterra
Environmental Services

Volatiles Library Search (20 Compound TID)
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-X-0397-1
Lab ID: 054057-0002-SA
Matrix AQUEOUS Sampled: 05 MAR 97 Prepared: NA
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 11 MAR 97

Parameter	Result	Units	Reporting Limit
None Detected	ND	ug/L	

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Allen Quick Approved By: Audrey Cornell

Quanterra
Environmental Services

Volatile Organics
Appendix IX List
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-L-0397-1
Lab ID: 054057-0003-SA
Matrix: AQUEOUS Sampled: 05 MAR 97 Prepared: 06 MAR 97
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 11 MAR 97

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	20
Acetonitrile	ND	ug/L	100
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	20
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	5.0
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	10
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
cis-1,2-Dichloroethene	ND	ug/L	2.5
trans-1,2-Dichloroethene	ND	ug/L	2.5
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	5.0
2-Hexanone	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutyl alcohol	ND	ug/L	200
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
Methyl methacrylate	ND	ug/L	5.0

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Allen Quick Approved By: Audrey Cornell

Quanterra Environmental Services

(cont.)

Volatile Organics
Appendix IX List
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-L-0397-1
Lab ID: 054057-0003-SA
Matrix: AQUEOUS — Sampled: 05 MAR 97 — Prepared: 06 MAR 97
Authorized: 06 MAR 97 — Received: 06 MAR 97 — Analyzed: 11 MAR 97

Parameter	Result	Units	Reporting Limit
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20
Propionitrile	ND	ug/L	20
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	10
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery		Limits
1,2-Dichloroethane-d4	98	%	77-115
4-Bromofluorobenzene	106	%	87-113
Toluene-d8	108	%	90-112

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Allen Quick — Approved By: Audrey Cornell

Quanterra Environmental Services

Volatiles Library Search (20 Compound TID)
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-L-0397-1
Lab ID: 054057-0003-SA
Matrix AQUEOUS Sampled: 05 MAR 97 Prepared: NA
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 11 MAR 97

Parameter	Result	Units	Reporting Limit
None Detected	ND	ug/L	

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Allen Quick Approved By: Audrey Cornell

Quanterra
Environmental Services

Volatile Organics
Appendix IX List
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-L-0397-TB
Lab ID: 054057-0004-TB
Matrix: AQUEOUS Sampled: 05 MAR 97 Prepared: 06 MAR 97
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 11 MAR 97

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	20
Acetonitrile	ND	ug/L	100
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	20
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	5.0
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	10
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
cis-1,2-Dichloroethene	ND	ug/L	2.5
trans-1,2-Dichloroethene	ND	ug/L	2.5
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	5.0
2-Hexanone	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutyl alcohol	ND	ug/L	200
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
Methyl methacrylate	ND	ug/L	5.0

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Allen Quick Approved By: Audrey Cornell

Quanterra Environmental Services

Volatile Organics
Appendix IX List
Method 8260A (cont.)

Client Name: U.S. Geological Survey
Client ID: CAFB-L-0397-TB
Lab ID: 054057-0004-TB
Matrix: AQUEOUS Sampled: 05 MAR 97 Prepared: 06 MAR 97
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 11 MAR 97

Parameter	Result	Units	Reporting Limit
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20
Propionitrile	ND	ug/L	20
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	10
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery		Limits
1,2-Dichloroethane-d4	100	%	77-115
4-Bromofluorobenzene	105	%	87-113
Toluene-d8	106	%	90-112

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Allen Quick Approved By: Audrey Cornell

Quanterra Environmental Services

Volatiles Library Search (20 Compound TID)
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-L-0397-TB
Lab ID: 054057-0004-TB
Matrix AQUEOUS Sampled: 05 MAR 97 Prepared: NA
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 11 MAR 97

Parameter	Result	Units	Reporting Limit
None Detected	ND	ug/L	

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Allen Quick Approved By: Audrey Cornell

Quanterra Environmental Services

Semivolatile Organics
Appendix IX List
Method 8270B

Client Name: U.S. Geological Survey
Client ID: CAFB-I-0397-1
Lab ID: 054057-0001-SA
Matrix: AQUEOUS Sampled: 05 MAR 97 Prepared: 12 MAR 97
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 18 MAR 97

Parameter	Result	Units	Reporting Limit
Acenaphthene	ND	ug/L	9.4
Acenaphthylene	ND	ug/L	9.4
Acetophenone	ND	ug/L	9.4
2-Acetylaminofluorene	ND	ug/L	94
4-Aminobiphenyl	ND	ug/L	47
Aniline	ND	ug/L	9.4
Anthracene	ND	ug/L	9.4
Aramite	ND	ug/L	19
Benzo(a)anthracene	ND	ug/L	9.4
Benzo(b)fluoranthene	ND	ug/L	9.4
Benzo(k)fluoranthene	ND	ug/L	9.4
Benzo(g,h,i)perylene	ND	ug/L	9.4
Benzo(a)pyrene	ND	ug/L	9.4
Benzyl alcohol	ND	ug/L	9.4
4-Bromophenyl phenyl ether	ND	ug/L	9.4
Butyl benzyl phthalate	ND	ug/L	9.4
2-sec-Butyl-4,6-dinitro-phenol	ND	ug/L	19
4-Chloroaniline	ND	ug/L	9.4
bis(2-Chloroethoxy)methane	ND	ug/L	9.4
bis(2-Chloroethyl) ether	ND	ug/L	9.4
2,2'-oxybis(1-chloropropane)	ND	ug/L	9.4
4-Chloro-3-methylphenol	ND	ug/L	9.4
2-Chloronaphthalene	ND	ug/L	9.4
2-Chlorophenol	ND	ug/L	9.4
4-Chlorophenyl phenyl ether	ND	ug/L	9.4
Chrysene	ND	ug/L	9.4
Dibenz(a,h)anthracene	ND	ug/L	9.4
Dibenzofuran	ND	ug/L	9.4
Di-n-butyl phthalate	ND	ug/L	9.4
1,2-Dichlorobenzene	ND	ug/L	9.4
1,3-Dichlorobenzene	ND	ug/L	9.4
1,4-Dichlorobenzene	ND	ug/L	9.4
3,3'-Dichlorobenzidine	ND	ug/L	47
2,4-Dichlorophenol	ND	ug/L	9.4
2,6-Dichlorophenol	ND	ug/L	9.4
Diethyl phthalate	ND	ug/L	9.4
Dimethoate	ND	ug/L	19
p-Dimethylaminoazobenzene	ND	ug/L	19
7,12-Dimethylbenz(a)-anthracene	ND	ug/L	19
3,3'-Dimethylbenzidine	ND	ug/L	47
a,a-Dimethylphenethyl-amine	ND	ug/L	47

Dilution factor is 0.94. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Dan Albritton Approved By: Audrey Cornell

Quanterra Environmental Services

Semivolatile Organics
Appendix IX List
Method 8270B (cont.)

Client Name: U.S. Geological Survey
Client ID: CAFB-I-0397-1
Lab ID: 054057-0001-SA
Matrix: AQUEOUS Sampled: 05 MAR 97 Prepared: 12 MAR 97
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 18 MAR 97

Parameter	Result	Units	Reporting Limit
2,4-Dimethylphenol	ND	ug/L	9.4
Dimethyl phthalate	ND	ug/L	9.4
1,3-Dinitrobenzene	ND	ug/L	9.4
4,6-Dinitro-2-methylphenol	ND	ug/L	47
2,4-Dinitrophenol	ND	ug/L	47
2,4-Dinitrotoluene	ND	ug/L	9.4
2,6-Dinitrotoluene	ND	ug/L	9.4
Di-n-octyl phthalate	ND	ug/L	9.4
Diphenylamine	ND	ug/L	9.4
Disulfoton	ND	ug/L	47
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.4
Ethyl methanesulfonate	ND	ug/L	9.4
Famphur	ND	ug/L	94
Fluoranthene	ND	ug/L	9.4
Fluorene	ND	ug/L	9.4
Hexachlorobenzene	ND	ug/L	9.4
Hexachlorobutadiene	ND	ug/L	9.4
Hexachlorocyclopentadiene	ND	ug/L	47
Hexachloroethane	ND	ug/L	9.4
Hexachlorophene	ND	ug/L	--
Hexachloropropene	ND	ug/L	94
Indeno(1,2,3-cd)pyrene	ND	ug/L	9.4
Isophorone	ND	ug/L	9.4
Isosafrole	ND	ug/L	19
Methapyrilene	ND	ug/L	47
3-Methylcholanthrene	ND	ug/L	19
Methyl methanesulfonate	ND	ug/L	9.4
2-Methylnaphthalene	ND	ug/L	9.4
Methyl parathion	ND	ug/L	47
2-Methylphenol	ND	ug/L	9.4
3/4-Methylphenol	ND	ug/L	9.4
Naphthalene	ND	ug/L	9.4
1,4-Naphthoquinone	ND	ug/L	47
1-Naphthylamine	ND	ug/L	9.4
2-Naphthylamine	ND	ug/L	9.4
2-Nitroaniline	ND	ug/L	47
3-Nitroaniline	ND	ug/L	47
4-Nitroaniline	ND	ug/L	47
Nitrobenzene	ND	ug/L	9.4
2-Nitrophenol	ND	ug/L	9.4
4-Nitrophenol	ND	ug/L	47

Dilution factor is 0.94. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Dan Albritton Approved By: Audrey Cornell

Quanterra Environmental Services

Semivolatile Organics
Appendix IX List
Method 8270B (cont.)

Client Name: U.S. Geological Survey
Client ID: CAFB-I-0397-1
Lab ID: 054057-0001-SA
Matrix: AQUEOUS Sampled: 05 MAR 97 Prepared: 12 MAR 97
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 18 MAR 97

Parameter	Result	Units	Reporting Limit
4-Nitroquinoline-1-oxide	ND	ug/L	94
N-Nitroso-di-n-butylamine	ND	ug/L	9.4
N-Nitrosodiethylamine	ND	ug/L	9.4
N-Nitrosodimethylamine	ND	ug/L	9.4
N-Nitrosodiphenylamine	ND	ug/L	9.4
N-Nitroso-di-n-propylamine	ND	ug/L	9.4
N-Nitrosomethylethylamine	ND	ug/L	9.4
N-Nitrosomorpholine	ND	ug/L	9.4
N-Nitrosopiperidine	ND	ug/L	9.4
N-Nitrosopyrrolidine	ND	ug/L	9.4
5-Nitro-o-toluidine	ND	ug/L	19
Parathion	ND	ug/L	47
Pentachlorobenzene	ND	ug/L	9.4
Pentachloroethane	ND	ug/L	47
Pentachloronitrobenzene	ND	ug/L	47
Pentachlorophenol	ND	ug/L	47
Phenacetin	ND	ug/L	19
Phenanthrene	ND	ug/L	9.4
Phenol	ND	ug/L	9.4
p-Phenylenediamine	ND	ug/L	94
Phorate	ND	ug/L	47
2-Picoline	ND	ug/L	19
Pronamide	ND	ug/L	19
Pyrene	ND	ug/L	9.4
Pyridine	ND	ug/L	19
Safrole	ND	ug/L	19
Sulfotepp	ND	ug/L	47
1,2,4,5-Tetrachloro-benzene	ND	ug/L	9.4
2,3,4,6-Tetrachlorophenol	ND	ug/L	47
Thionazin	ND	ug/L	47
o-Toluidine	ND	ug/L	9.4
1,2,4-Trichlorobenzene	ND	ug/L	9.4
2,4,5-Trichlorophenol	ND	ug/L	9.4
2,4,6-Trichlorophenol	ND	ug/L	9.4
0,0,0-Triethylphosphoro-thioate	ND	ug/L	47
1,3,5-Trinitrobenzene	ND	ug/L	47

Dilution factor is 0.94. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Dan Albritton Approved By: Audrey Cornell

Quanterra Environmental Services

Semivolatile Organics
Appendix IX List
Method 8270B (cont.)

Client Name: U.S. Geological Survey
Client ID: CAFB-I-0397-1
Lab ID: 054057-0001-SA
Matrix: AQUEOUS Sampled: 05 MAR 97 Prepared: 12 MAR 97
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 18 MAR 97

Parameter	Result	Units	Reporting Limit
Surrogate	Recovery		Limits
Nitrobenzene-d5	75	%	51-104
2-Fluorobiphenyl	65	%	43-116
Terphenyl-d14	80	%	33-141
Phenol-d5	89	%	47-106
2-Fluorophenol	71	%	36-108
2,4,6-Tribromophenol	73	%	49-106

Dilution factor is 0.94. All results and limits are corrected for dilution.

Reported By: Dan Albritton Approved By: Audrey Cornell

Quanterra
Environmental Services

Semivolatiles Library Search (30 Compound TID)
Method 8270B

Client Name: U.S. Geological Survey
Client ID: CAFB-I-0397-1
Lab ID: 054057-0001-SA
Matrix AQUEOUS Sampled: 05 MAR 97 Prepared: NA
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 18 MAR 97

Parameter	Result	Units	Reporting Limit
None Detected	ND	ug/L	

Dilution factor is 0.94. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Dan Albritton Approved By: Audrey Cornell

Quanterra
Environmental Services

Semivolatile Organics
Appendix IX List
Method 8270B

Client Name: U.S. Geological Survey
Client ID: CAFB-X-0397-1
Lab ID: 054057-0002-SA
Matrix: AQUEOUS Sampled: 05 MAR 97 Prepared: 12 MAR 97
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 18 MAR 97

Parameter	Result	Units	Reporting Limit
Acenaphthene	ND	ug/L	9.4
Acenaphthylene	ND	ug/L	9.4
Acetophenone	ND	ug/L	9.4
2-Acetylaminofluorene	ND	ug/L	94
4-Aminobiphenyl	ND	ug/L	47
Aniline	ND	ug/L	9.4
Anthracene	ND	ug/L	9.4
Aramite	ND	ug/L	19
Benzo(a)anthracene	ND	ug/L	9.4
Benzo(b)fluoranthene	ND	ug/L	9.4
Benzo(k)fluoranthene	ND	ug/L	9.4
Benzo(g,h,i)perylene	ND	ug/L	9.4
Benzo(a)pyrene	ND	ug/L	9.4
Benzyl alcohol	ND	ug/L	9.4
4-Bromophenyl phenyl ether	ND	ug/L	9.4
Butyl benzyl phthalate	ND	ug/L	9.4
2-sec-Butyl-4,6-dinitro-phenol	ND	ug/L	19
4-Chloroaniline	ND	ug/L	9.4
bis(2-Chloroethoxy)methane	ND	ug/L	9.4
bis(2-Chloroethyl) ether	ND	ug/L	9.4
2,2'-oxybis(1-chloropropane)	ND	ug/L	9.4
4-Chloro-3-methylphenol	ND	ug/L	9.4
2-Chloronaphthalene	ND	ug/L	9.4
2-Chlorophenol	ND	ug/L	9.4
4-Chlorophenyl phenyl ether	ND	ug/L	9.4
Chrysene	ND	ug/L	9.4
Dibenz(a,h)anthracene	ND	ug/L	9.4
Dibenzofuran	ND	ug/L	9.4
Di-n-butyl phthalate	ND	ug/L	9.4
1,2-Dichlorobenzene	ND	ug/L	9.4
1,3-Dichlorobenzene	ND	ug/L	9.4
1,4-Dichlorobenzene	ND	ug/L	9.4
3,3'-Dichlorobenzidine	ND	ug/L	47
2,4-Dichlorophenol	ND	ug/L	9.4
2,6-Dichlorophenol	ND	ug/L	9.4
Diethyl phthalate	ND	ug/L	9.4
Dimethoate	ND	ug/L	19
p-Dimethylaminoazobenzene	ND	ug/L	19
7,12-Dimethylbenz(a)-anthracene	ND	ug/L	19
3,3'-Dimethylbenzidine	ND	ug/L	47
a,a-Dimethylphenethyl-amine	ND	ug/L	47

Dilution factor is 0.94. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Dan Albritton Approved By: Audrey Cornell

Quanterra Environmental Services

Semivolatile Organics
Appendix IX List
Method 8270B (cont.)

Client Name: U.S. Geological Survey
Client ID: CAFB-X-0397-1
Lab ID: 054057-0002-SA
Matrix: AQUEOUS Sampled: 05 MAR 97 Prepared: 12 MAR 97
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 18 MAR 97

Parameter	Result	Units	Reporting Limit
2,4-Dimethylphenol	ND	ug/L	9.4
Dimethyl phthalate	ND	ug/L	9.4
1,3-Dinitrobenzene	ND	ug/L	9.4
4,6-Dinitro-2-methylphenol	ND	ug/L	47
2,4-Dinitrophenol	ND	ug/L	47
2,4-Dinitrotoluene	ND	ug/L	9.4
2,6-Dinitrotoluene	ND	ug/L	9.4
Di-n-octyl phthalate	ND	ug/L	9.4
Diphenylamine	ND	ug/L	9.4
Disulfoton	ND	ug/L	47
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.4
Ethyl methanesulfonate	ND	ug/L	9.4
Famphur	ND	ug/L	94
Fluoranthene	ND	ug/L	9.4
Fluorene	ND	ug/L	9.4
Hexachlorobenzene	ND	ug/L	9.4
Hexachlorobutadiene	ND	ug/L	9.4
Hexachlorocyclopentadiene	ND	ug/L	47
Hexachloroethane	ND	ug/L	9.4
Hexachlorophene	ND	ug/L	--
Hexachloropropene	ND	ug/L	94
Indeno(1,2,3-cd)pyrene	ND	ug/L	9.4
Isophorone	ND	ug/L	9.4
Isosafrole	ND	ug/L	19
Methapyrilene	ND	ug/L	47
3-Methylcholanthrene	ND	ug/L	19
Methyl methanesulfonate	ND	ug/L	9.4
2-Methylnaphthalene	ND	ug/L	9.4
Methyl parathion	ND	ug/L	47
2-Methylphenol	ND	ug/L	9.4
3/4-Methylphenol	ND	ug/L	9.4
Naphthalene	ND	ug/L	9.4
1,4-Naphthoquinone	ND	ug/L	47
1-Naphthylamine	ND	ug/L	9.4
2-Naphthylamine	ND	ug/L	9.4
2-Nitroaniline	ND	ug/L	47
3-Nitroaniline	ND	ug/L	47
4-Nitroaniline	ND	ug/L	47
Nitrobenzene	ND	ug/L	9.4
2-Nitrophenol	ND	ug/L	9.4
4-Nitrophenol	ND	ug/L	47

Dilution factor is 0.94. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Dan Albritton Approved By: Audrey Cornell

Quanterra Environmental Services

Semivolatile Organics
Appendix IX List
Method 8270B (cont.)

Client Name: U.S. Geological Survey
Client ID: CAFB-X-0397-1
Lab ID: 054057-0002-SA
Matrix: AQUEOUS
Authorized: 06 MAR 97

Sampled: 05 MAR 97
Received: 06 MAR 97

Prepared: 12 MAR 97
Analyzed: 18 MAR 97

Parameter	Result	Units	Reporting Limit
4-Nitroquinoline-1-oxide	ND	ug/L	94
N-Nitroso-di-n-butylamine	ND	ug/L	9.4
N-Nitrosodiethylamine	ND	ug/L	9.4
N-Nitrosodimethylamine	ND	ug/L	9.4
N-Nitrosodiphenylamine	ND	ug/L	9.4
N-Nitroso-di-n-propylamine	ND	ug/L	9.4
N-Nitrosomethylethylamine	ND	ug/L	9.4
N-Nitrosomorpholine	ND	ug/L	9.4
N-Nitrosopiperidine	ND	ug/L	9.4
N-Nitrosopyrrolidine	ND	ug/L	9.4
5-Nitro-o-toluidine	ND	ug/L	19
Parathion	ND	ug/L	47
Pentachlorobenzene	ND	ug/L	9.4
Pentachloroethane	ND	ug/L	47
Pentachloronitrobenzene	ND	ug/L	47
Pentachlorophenol	ND	ug/L	47
Phenacetin	ND	ug/L	19
Phenanthrene	ND	ug/L	9.4
Phenol	ND	ug/L	9.4
p-Phenylenediamine	ND	ug/L	94
Phorate	ND	ug/L	47
2-Picoline	ND	ug/L	19
Pronamide	ND	ug/L	19
Pyrene	ND	ug/L	9.4
Pyridine	ND	ug/L	19
Safrole	ND	ug/L	19
Sulfotepp	ND	ug/L	47
1,2,4,5-Tetrachloro-benzene	ND	ug/L	9.4
2,3,4,6-Tetrachlorophenol	ND	ug/L	47
Thionazin	ND	ug/L	47
o-Toluidine	ND	ug/L	9.4
1,2,4-Trichlorobenzene	ND	ug/L	9.4
2,4,5-Trichlorophenol	ND	ug/L	9.4
2,4,6-Trichlorophenol	ND	ug/L	9.4
0,0,0-Triethylphosphoro-thioate	ND	ug/L	47
1,3,5-Trinitrobenzene	ND	ug/L	47

Dilution factor is 0.94. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Dan Albritton

Approved By: Audrey Cornell

Quanterra Environmental Services

Semivolatile Organics
Appendix IX List
Method 8270B (cont.)

Client Name: U.S. Geological Survey
Client ID: CAFB-X-0397-1
Lab ID: 054057-0002-SA
Matrix: AQUEOUS
Authorized: 06 MAR 97

Sampled: 05 MAR 97
Received: 06 MAR 97

Prepared: 12 MAR 97
Analyzed: 18 MAR 97

Parameter	Result	Units	Reporting Limit
Surrogate	**Recovery**		**Limits**
Nitrobenzene-d5	69	%	51-104
2-Fluorobiphenyl	61	%	43-116
Terphenyl-d14	81	%	33-141
Phenol-d5	80	%	47-106
2-Fluorophenol	65	%	36-108
2,4,6-Tribromophenol	68	%	49-106

Dilution factor is 0.94. All results and limits are corrected for dilution.

Reported By: Dan Albritton

Approved By: Audrey Cornell

Quanterra Environmental Services

Semivolatiles Library Search (30 Compound TID)
Method 8270B

Client Name: U.S. Geological Survey
Client ID: CAFB-X-0397-1
Lab ID: 054057-0002-SA
Matrix AQUEOUS Sampled: 05 MAR 97 Prepared: NA
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 18 MAR 97

Parameter	Result	Units	Reporting Limit
None Detected	ND	ug/L	

Dilution factor is 0.94. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Dan Albritton Approved By: Audrey Cornell

Quanterra
Environmental Services

Semivolatile Organics
Appendix IX List
Method 8270B

Client Name: U.S. Geological Survey
Client ID: CAFB-L-0397-1
Lab ID: 054057-0003-SA
Matrix: AQUEOUS Sampled: 05 MAR 97 Prepared: 12 MAR 97
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 18 MAR 97

Parameter	Result	Units	Reporting Limit
Acenaphthene	ND	ug/L	9.4
Acenaphthylene	ND	ug/L	9.4
Acetophenone	ND	ug/L	9.4
2-Acetylaminofluorene	ND	ug/L	94
4-Aminobiphenyl	ND	ug/L	47
Aniline	ND	ug/L	9.4
Anthracene	ND	ug/L	9.4
Aramite	ND	ug/L	19
Benzo(a)anthracene	ND	ug/L	9.4
Benzo(b)fluoranthene	ND	ug/L	9.4
Benzo(k)fluoranthene	ND	ug/L	9.4
Benzo(g,h,i)perylene	ND	ug/L	9.4
Benzo(a)pyrene	ND	ug/L	9.4
Benzyl alcohol	ND	ug/L	9.4
4-Bromophenyl phenyl ether	ND	ug/L	9.4
Butyl benzyl phthalate	ND	ug/L	9.4
2-sec-Butyl-4,6-dinitro-phenol	ND	ug/L	19
4-Chloroaniline	ND	ug/L	9.4
bis(2-Chloroethoxy)methane	ND	ug/L	9.4
bis(2-Chloroethyl) ether	ND	ug/L	9.4
2,2'-oxybis(1-chloropropane)	ND	ug/L	9.4
4-Chloro-3-methylphenol	ND	ug/L	9.4
2-Chloronaphthalene	ND	ug/L	9.4
2-Chlorophenol	ND	ug/L	9.4
4-Chlorophenyl phenyl ether	ND	ug/L	9.4
Chrysene	ND	ug/L	9.4
Dibenz(a,h)anthracene	ND	ug/L	9.4
Dibenzofuran	ND	ug/L	9.4
Di-n-butyl phthalate	ND	ug/L	9.4
1,2-Dichlorobenzene	ND	ug/L	9.4
1,3-Dichlorobenzene	ND	ug/L	9.4
1,4-Dichlorobenzene	ND	ug/L	9.4
3,3'-Dichlorobenzidine	ND	ug/L	47
2,4-Dichlorophenol	ND	ug/L	9.4
2,6-Dichlorophenol	ND	ug/L	9.4
Diethyl phthalate	ND	ug/L	9.4
Dimethoate	ND	ug/L	19
p-Dimethylaminoazobenzene	ND	ug/L	19
7,12-Dimethylbenz(a)-anthracene	ND	ug/L	19
3,3'-Dimethylbenzidine	ND	ug/L	47
a,a-Dimethylphenethyl-amine	ND	ug/L	47

Dilution factor is 0.94. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Dan Albritton Approved By: Audrey Cornell

Quanterra Environmental Services

Semivolatile Organics
Appendix IX List
Method 8270B (cont.)

Client Name: U.S. Geological Survey
Client ID: CAFB-L-0397-1
Lab ID: 054057-0003-SA
Matrix: AQUEOUS
Authorized: 06 MAR 97

Sampled: 05 MAR 97
Received: 06 MAR 97

Prepared: 12 MAR 97
Analyzed: 18 MAR 97

Parameter	Result	Units	Reporting Limit
2,4-Dimethylphenol	ND	ug/L	9.4
Dimethyl phthalate	ND	ug/L	9.4
1,3-Dinitrobenzene	ND	ug/L	9.4
4,6-Dinitro-2-methylphenol	ND	ug/L	47
2,4-Dinitrophenol	ND	ug/L	47
2,4-Dinitrotoluene	ND	ug/L	9.4
2,6-Dinitrotoluene	ND	ug/L	9.4
Di-n-octyl phthalate	ND	ug/L	9.4
Diphenylamine	ND	ug/L	9.4
Disulfoton	ND	ug/L	47
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.4
Ethyl methanesulfonate	ND	ug/L	9.4
Famphur	ND	ug/L	94
Fluoranthene	ND	ug/L	9.4
Fluorene	ND	ug/L	9.4
Hexachlorobenzene	ND	ug/L	9.4
Hexachlorobutadiene	ND	ug/L	9.4
Hexachlorocyclopentadiene	ND	ug/L	47
Hexachloroethane	ND	ug/L	9.4
Hexachlorophene	ND	ug/L	--
Hexachloropropene	ND	ug/L	94
Indeno(1,2,3-cd)pyrene	ND	ug/L	9.4
Isophorone	ND	ug/L	9.4
Isosafrole	ND	ug/L	19
Methapyrilene	ND	ug/L	47
3-Methylcholanthrene	ND	ug/L	19
Methyl methanesulfonate	ND	ug/L	9.4
2-Methylnaphthalene	ND	ug/L	9.4
Methyl parathion	ND	ug/L	47
2-Methylphenol	ND	ug/L	9.4
3/4-Methylphenol	ND	ug/L	9.4
Naphthalene	ND	ug/L	9.4
1,4-Naphthoquinone	ND	ug/L	47
1-Naphthylamine	ND	ug/L	9.4
2-Naphthylamine	ND	ug/L	9.4
2-Nitroaniline	ND	ug/L	47
3-Nitroaniline	ND	ug/L	47
4-Nitroaniline	ND	ug/L	47
Nitrobenzene	ND	ug/L	9.4
2-Nitrophenol	ND	ug/L	9.4
4-Nitrophenol	ND	ug/L	47

Dilution factor is 0.94. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Dan Albritton

Approved By: Audrey Cornell

Quanterra Environmental Services

(cont.)

Semivolatile Organics
Appendix IX List
Method 8270B

Client Name: U.S. Geological Survey
Client ID: CAFB-L-0397-1
Lab ID: 054057-0003-SA
Matrix: AQUEOUS
Authorized: 06 MAR 97

Sampled: 05 MAR 97
Received: 06 MAR 97

Prepared: 12 MAR 97
Analyzed: 18 MAR 97

Parameter	Result	Units	Reporting Limit
4-Nitroquinoline-1-oxide	ND	ug/L	94
N-Nitroso-di-n-butylamine	ND	ug/L	9.4
N-Nitrosodiethylamine	ND	ug/L	9.4
N-Nitrosodimethylamine	ND	ug/L	9.4
N-Nitrosodiphenylamine	ND	ug/L	9.4
N-Nitroso-di-n-propylamine	ND	ug/L	9.4
N-Nitrosomethylethylamine	ND	ug/L	9.4
N-Nitrosomorpholine	ND	ug/L	9.4
N-Nitrosopiperidine	ND	ug/L	9.4
N-Nitrosopyrrolidine	ND	ug/L	9.4
5-Nitro-o-toluidine	ND	ug/L	19
Parathion	ND	ug/L	47
Pentachlorobenzene	ND	ug/L	9.4
Pentachloroethane	ND	ug/L	47
Pentachloronitrobenzene	ND	ug/L	47
Pentachlorophenol	ND	ug/L	47
Phenacetin	ND	ug/L	19
Phenanthrene	ND	ug/L	9.4
Phenol	ND	ug/L	9.4
p-Phenylenediamine	ND	ug/L	94
Phorate	ND	ug/L	47
2-Picoline	ND	ug/L	19
Pronamide	ND	ug/L	19
Pyrene	ND	ug/L	9.4
Pyridine	ND	ug/L	19
Safrole	ND	ug/L	19
Sulfotepp	ND	ug/L	47
1,2,4,5-Tetrachloro-benzene	ND	ug/L	9.4
2,3,4,6-Tetrachlorophenol	ND	ug/L	47
Thionazin	ND	ug/L	47
o-Toluidine	ND	ug/L	9.4
1,2,4-Trichlorobenzene	ND	ug/L	9.4
2,4,5-Trichlorophenol	ND	ug/L	9.4
2,4,6-Trichlorophenol	ND	ug/L	9.4
0,0,0-Triethylphosphoro-thioate	ND	ug/L	47
1,3,5-Trinitrobenzene	ND	ug/L	47

Dilution factor is 0.94. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Dan Albritton

Approved By: Audrey Cornell

Quanterra Environmental Services

Semivolatile Organics
Appendix IX List
Method 8270B (cont.)

Client Name: U.S. Geological Survey
Client ID: CAFB-L-0397-1
Lab ID: 054057-0003-SA
Matrix: AQUEOUS Sampled: 05 MAR 97 Prepared: 12 MAR 97
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 18 MAR 97

Parameter	Result	Units	Reporting Limit
Surrogate	Recovery		Limits
Nitrobenzene-d5	74	%	51-104
2-Fluorobiphenyl	65	%	43-116
Terphenyl-d14	88	%	33-141
Phenol-d5	92	%	47-106
2-Fluorophenol	70	%	36-108
2,4,6-Tribromophenol	72	%	49-106

Dilution factor is 0.94. All results and limits are corrected for dilution.

Reported By: Dan Albritton Approved By: Audrey Cornell

Quanterra Environmental Services

Semivolatiles Library Search (30 Compound TID)
Method 8270B

Client Name: U.S. Geological Survey
Client ID: CAFB-L-0397-1
Lab ID: 054057-0003-SA
Matrix AQUEOUS
Authorized: 06 MAR 97

Sampled: 05 MAR 97
Received: 06 MAR 97

Prepared: NA
Analyzed: 18 MAR 97

Parameter	Result	Units	Reporting Limit
None Detected	ND	ug/L	

Dilution factor is 0.94. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Dan Albritton

Approved By: Audrey Cornell

Quanterra Environmental Services

Appendix IX Herbicides
Method 8150

Client Name: U.S. Geological Survey
Client ID: CAFB-I-0397-1
Lab ID: 054057-0001-SA
Matrix: AQUEOUS
Authorized: 06 MAR 97

Sampled: 05 MAR 97
Received: 06 MAR 97

Prepared: 11 MAR 97
Analyzed: 21 MAR 97

Parameter	Result	Units	Reporting Limit	
2,4-D	ND	ug/L	1.1	T
2,4,5-TP (Silvex)	ND	ug/L	0.16	
2,4,5-T	ND	ug/L	0.19	

Surrogate	Recovery		Limits
DCAA	86	%	27-121

Dilution factor is 0.95. All results and limits are corrected for dilution.

T = Preferred values unless footnoted on secondary column test.
ND = Not Detected

Reported By: Bret Collins

Approved By: Audrey Cornell

Quanterra
Environmental Services

Appendix IX Herbicides
Method 8150

Client Name: U.S. Geological Survey
Client ID: CAFB-X-0397-1
Lab ID: 054057-0002-SA
Matrix: AQUEOUS Sampled: 05 MAR 97 Prepared: 11 MAR 97
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 21 MAR 97

Parameter	Result	Units	Reporting Limit	
2,4-D	ND	ug/L	1.1	T
2,4,5-TP (Silvex)	ND	ug/L	0.16	
2,4,5-T	ND	ug/L	0.19	

Surrogate	Recovery		Limits
DCAA	89	%	27-121

Dilution factor is 0.94. All results and limits are corrected for dilution.

T = Preferred values unless footnoted on secondary column test.
ND = Not Detected

Reported By: Bret Collins Approved By: Audrey Cornell

Quanterra Environmental Services

Appendix IX Herbicides
Method 8150

Client Name: U.S. Geological Survey
Client ID: CAFB-L-0397-1
Lab ID: 054057-0003-SA
Matrix: AQUEOUS Sampled: 05 MAR 97 Prepared: 11 MAR 97
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 21 MAR 97

Parameter	Result	Units	Reporting Limit	
2,4-D	ND	ug/L	1.1	T
2,4,5-TP (Silvex)	ND	ug/L	0.16	
2,4,5-T	ND	ug/L	0.19	

Surrogate	Recovery		Limits
DCAA	73	%	27-121

Dilution factor is 0.95. All results and limits are corrected for dilution.

T = Preferred values unless footnoted on secondary column test.
ND = Not Detected

Reported By: Bret Collins Approved By: Audrey Cornell

Quanterra
Environmental Services

Chlorinated Pesticides and PCB's
Appendix IX List
Method 8080A

Client Name: U.S. Geological Survey
Client ID: CAFB-I-0397-1
Lab ID: 054057-0001-SA
Matrix: AQUEOUS Sampled: 05 MAR 97 Prepared: 11 MAR 97
Authorized: 06 MAR 97 Received: 06 MAR 97 Analyzed: 21 MAR 97

Parameter	Result	Units	Reporting Limit	
Aldrin	ND	ug/L	0.048	T
Aroclor 1016	ND	ug/L	0.96	
Aroclor 1221	ND	ug/L	0.96	
Aroclor 1232	ND	ug/L	0.96	
Aroclor 1242	ND	ug/L	0.96	
Aroclor 1248	ND	ug/L	0.96	
Aroclor 1254	ND	ug/L	0.96	
Aroclor 1260	ND	ug/L	0.96	
alpha-BHC	ND	ug/L	0.048	
beta-BHC	ND	ug/L	0.048	
delta-BHC	ND	ug/L	0.048	
gamma-BHC (Lindane)	ND	ug/L	0.048	
alpha-Chlordane	ND	ug/L	0.048	
gamma-Chlordane	ND	ug/L	0.048	
Chlorobenzilate	ND	ug/L	0.96	
4,4'-DDD	ND	ug/L	0.096	
4,4'-DDE	ND	ug/L	0.096	
4,4'-DDT	ND	ug/L	0.096	
Diallate	ND	ug/L	0.96	
Dieldrin	ND	ug/L	0.096	
Endosulfan I	ND	ug/L	0.048	
Endosulfan II	ND	ug/L	0.096	
Endosulfan sulfate	ND	ug/L	0.096	
Endrin	ND	ug/L	0.096	
Endrin aldehyde	ND	ug/L	0.096	
Heptachlor	ND	ug/L	0.048	
Heptachlor epoxide	ND	ug/L	0.048	
Isodrin	ND	ug/L	0.096	
Kepone	ND	ug/L	2.4	
Methoxychlor	ND	ug/L	0.48	
Toxaphene	ND	ug/L	4.8	

Surrogate	Recovery		Limits
Tetrachloro-m-xylene	81	%	51-103
Dibutyl chlorendate	91	%	71-109
Decachlorobiphenyl	107	%	50-138

Dilution factor is 0.96. All results and limits are corrected for dilution.

T = Preferred values unless footnoted on secondary column test.
ND = Not Detected

Reported By: Houa Vue Approved By: Audrey Cornell

Quanterra
Environmental Services

Chlorinated Pesticides and PCB's
Appendix IX List
Method 8080A

Client Name: U.S. Geological Survey
Client ID: CAFB-X-0397-1
Lab ID: 054057-0002-SA
Matrix: AQUEOUS — Sampled: 05 MAR 97 — Prepared: 11 MAR 97
Authorized: 06 MAR 97 — Received: 06 MAR 97 — Analyzed: 21 MAR 97

Parameter	Result	Units	Reporting Limit	
Aldrin	ND	ug/L	0.048	T
Aroclor 1016	ND	ug/L	0.95	
Aroclor 1221	ND	ug/L	0.95	
Aroclor 1232	ND	ug/L	0.95	
Aroclor 1242	ND	ug/L	0.95	
Aroclor 1248	ND	ug/L	0.95	
Aroclor 1254	ND	ug/L	0.95	
Aroclor 1260	ND	ug/L	0.95	
alpha-BHC	ND	ug/L	0.048	
beta-BHC	ND	ug/L	0.048	
delta-BHC	ND	ug/L	0.048	
gamma-BHC (Lindane)	ND	ug/L	0.048	
alpha-Chlordane	ND	ug/L	0.048	
gamma-Chlordane	ND	ug/L	0.048	
Chlorobenzilate	ND	ug/L	0.95	
4,4'-DDD	ND	ug/L	0.095	
4,4'-DDE	ND	ug/L	0.095	
4,4'-DDT	ND	ug/L	0.095	
Diallate	ND	ug/L	0.95	
Dieldrin	ND	ug/L	0.095	
Endosulfan I	ND	ug/L	0.048	
Endosulfan II	ND	ug/L	0.095	
Endosulfan sulfate	ND	ug/L	0.095	
Endrin	ND	ug/L	0.095	
Endrin aldehyde	ND	ug/L	0.095	
Heptachlor	ND	ug/L	0.048	
Heptachlor epoxide	ND	ug/L	0.048	
Isodrin	ND	ug/L	0.095	
Kepone	ND	ug/L	2.4	
Methoxychlor	ND	ug/L	0.48	
Toxaphene	ND	ug/L	4.8	

Surrogate	Recovery		Limits
Tetrachloro-m-xylene	82	%	51-103
Dibutyl chlorendate	90	%	71-109
Decachlorobiphenyl	96	%	50-138

Dilution factor is 0.95. All results and limits are corrected for dilution.

T = Preferred values unless footnoted on secondary column test.
ND = Not Detected

Reported By: Houa Vue — Approved By: Audrey Cornell

Quanterra
Environmental Services

Chlorinated Pesticides and PCB's
Appendix IX List
Method 8080A

Client Name: U.S. Geological Survey
Client ID: CAFB-L-0397-1
Lab ID: 054057-0003-SA
Matrix: AQUEOUS — Sampled: 05 MAR 97 — Prepared: 11 MAR 97
Authorized: 06 MAR 97 — Received: 06 MAR 97 — Analyzed: 21 MAR 97

Parameter	Result	Units	Reporting Limit	
Aldrin	ND	ug/L	0.047	T
Aroclor 1016	ND	ug/L	0.94	
Aroclor 1221	ND	ug/L	0.94	
Aroclor 1232	ND	ug/L	0.94	
Aroclor 1242	ND	ug/L	0.94	
Aroclor 1248	ND	ug/L	0.94	
Aroclor 1254	ND	ug/L	0.94	
Aroclor 1260	ND	ug/L	0.94	
alpha-BHC	ND	ug/L	0.047	
beta-BHC	ND	ug/L	0.047	
delta-BHC	ND	ug/L	0.047	
gamma-BHC (Lindane)	ND	ug/L	0.047	
alpha-Chlordane	ND	ug/L	0.047	
gamma-Chlordane	ND	ug/L	0.047	
Chlorobenzilate	ND	ug/L	0.94	
4,4'-DDD	ND	ug/L	0.094	
4,4'-DDE	ND	ug/L	0.094	
4,4'-DDT	ND	ug/L	0.094	
Diallate	ND	ug/L	0.94	
Dieldrin	ND	ug/L	0.094	
Endosulfan I	ND	ug/L	0.047	
Endosulfan II	ND	ug/L	0.094	
Endosulfan sulfate	ND	ug/L	0.094	
Endrin	ND	ug/L	0.094	
Endrin aldehyde	ND	ug/L	0.094	
Heptachlor	ND	ug/L	0.047	
Heptachlor epoxide	ND	ug/L	0.047	
Isodrin	ND	ug/L	0.094	
Kepone	ND	ug/L	2.4	
Methoxychlor	ND	ug/L	0.47	
Toxaphene	ND	ug/L	4.7	

Surrogate	Recovery		Limits
Tetrachloro-m-xylene	79	%	51-103
Dibutyl chlorendate	93	%	71-109
Decachlorobiphenyl	101	%	50-138

Dilution factor is 0.94. All results and limits are corrected for dilution.

T = Preferred values unless footnoted on secondary column test.
ND = Not Detected

Reported By: Houa Vue — Approved By: Audrey Cornell

Quanterra
Environmental Services

Polynuclear Aromatic Hydrocarbons, HPLC
Method 8310

Client Name: U.S. Geological Survey
Client ID: CAFB-I-0397-1
Lab ID: 054057-0001-SA
Matrix: AQUEOUS — Sampled: 05 MAR 97 — Prepared: 12 MAR 97
Authorized: 06 MAR 97 — Received: 06 MAR 97 — Analyzed: 18 MAR 97

Parameter	Result	Units	Reporting Limit
Naphthalene	ND	ug/L	0.96
Acenaphthylene	ND	ug/L	0.96
Acenaphthene	ND	ug/L	0.96
Fluorene	ND	ug/L	0.19
Phenanthrene	ND	ug/L	0.19
Anthracene	ND	ug/L	0.096
Fluoranthene	ND	ug/L	0.19
Pyrene	ND	ug/L	0.19
Benzo(a)anthracene	ND	ug/L	0.096
Chrysene	ND	ug/L	0.19
Benzo(b)fluoranthene	ND	ug/L	0.096
Benzo(k)fluoranthene	ND	ug/L	0.096
Benzo(a)pyrene	ND	ug/L	0.096
Dibenz(a,h)anthracene	ND	ug/L	0.19
Benzo(g,h,i)perylene	ND	ug/L	0.19
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.19

Surrogate	Recovery		Limits
Terphenyl-d14	87	%	37-123

Dilution factor is 0.96. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Blake Besser — Approved By: Lynn S. Calvin

Quanterra
Environmental Services

Polynuclear Aromatic Hydrocarbons, HPLC
Method 8310

Client Name: U.S. Geological Survey
Client ID: CAFB-X-0397-1
Lab ID: 054057-0002-SA
Matrix: AQUEOUS — Sampled: 05 MAR 97 — Prepared: 12 MAR 97
Authorized: 06 MAR 97 — Received: 06 MAR 97 — Analyzed: 18 MAR 97

Parameter	Result	Units	Reporting Limit
Naphthalene	ND	ug/L	0.95
Acenaphthylene	ND	ug/L	0.95
Acenaphthene	ND	ug/L	0.95
Fluorene	ND	ug/L	0.19
Phenanthrene	ND	ug/L	0.19
Anthracene	ND	ug/L	0.095
Fluoranthene	ND	ug/L	0.19
Pyrene	ND	ug/L	0.19
Benzo(a)anthracene	ND	ug/L	0.095
Chrysene	ND	ug/L	0.19
Benzo(b)fluoranthene	ND	ug/L	0.095
Benzo(k)fluoranthene	ND	ug/L	0.095
Benzo(a)pyrene	ND	ug/L	0.095
Dibenz(a,h)anthracene	ND	ug/L	0.19
Benzo(g,h,i)perylene	ND	ug/L	0.19
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.19

Surrogate	Recovery		Limits
Terphenyl-d14	85	%	37-123

Dilution factor is 0.95. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Blake Besser — Approved By: Lynn S. Calvin

Quanterra
Environmental Services

Polynuclear Aromatic Hydrocarbons, HPLC
Method 8310

Client Name: U.S. Geological Survey
Client ID: CAFB-L-0397-1
Lab ID: 054057-0003-SA
Matrix: AQUEOUS — Sampled: 05 MAR 97 — Prepared: 12 MAR 97
Authorized: 06 MAR 97 — Received: 06 MAR 97 — Analyzed: 18 MAR 97

Parameter	Result	Units	Reporting Limit
Naphthalene	ND	ug/L	0.95
Acenaphthylene	ND	ug/L	0.95
Acenaphthene	ND	ug/L	0.95
Fluorene	ND	ug/L	0.19
Phenanthrene	ND	ug/L	0.19
Anthracene	ND	ug/L	0.095
Fluoranthene	ND	ug/L	0.19
Pyrene	ND	ug/L	0.19
Benzo(a)anthracene	ND	ug/L	0.095
Chrysene	ND	ug/L	0.19
Benzo(b)fluoranthene	ND	ug/L	0.095
Benzo(k)fluoranthene	ND	ug/L	0.095
Benzo(a)pyrene	ND	ug/L	0.095
Dibenz(a,h)anthracene	ND	ug/L	0.19
Benzo(g,h,i)perylene	ND	ug/L	0.19
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.19

Surrogate	Recovery		Limits
Terphenyl-d14	89	%	37-123

Dilution factor is 0.95. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Blake Besser — Approved By: Lynn S. Calvin

Quanterra
Environmental Services

Metals
Total Metals

Client Name: U.S. Geological Survey
Client ID: CAFB-I-0397-1
Lab ID: 054057-0001-SA
Matrix: AQUEOUS — Sampled: 05 MAR 97 — Received: 06 MAR 97
Authorized: 06 MAR 97 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	Dil	RL	Units	Test Method	Prepared Date	Analyzed Date
Antimony	ND		1.0	0.010	mg/L	7041	19 MAR 97	19 MAR 97
Silver	ND		1.0	0.00050	mg/L	7761	07 MAR 97	11 MAR 97
Cadmium	ND		1.0	0.00050	mg/L	7131	07 MAR 97	12 MAR 97
Arsenic	0.0052		1.0	0.0050	mg/L	7060	10 MAR 97	12 MAR 97
Chromium	0.0057		1.0	0.0050	mg/L	7191	07 MAR 97	13 MAR 97
Barium	0.034		1.0	0.010	mg/L	6010	19 MAR 97	21 MAR 97
Beryllium	ND		1.0	0.0020	mg/L	6010	19 MAR 97	21 MAR 97
Calcium	51.7		1.0	0.20	mg/L	6010	19 MAR 97	21 MAR 97
Cobalt	ND		1.0	0.010	mg/L	6010	19 MAR 97	21 MAR 97
Copper	ND		1.0	0.020	mg/L	6010	19 MAR 97	21 MAR 97
Iron	ND		1.0	0.10	mg/L	6010	19 MAR 97	21 MAR 97
Lead	ND	G	1.0	0.010	mg/L	7421	07 MAR 97	11 MAR 97
Magnesium	46.0		1.0	0.20	mg/L	6010	19 MAR 97	21 MAR 97
Manganese	ND		1.0	0.010	mg/L	6010	19 MAR 97	21 MAR 97
Mercury	ND		1.0	0.00020	mg/L	7470	12 MAR 97	12 MAR 97
Molybdenum	ND		1.0	0.020	mg/L	6010	19 MAR 97	21 MAR 97
Nickel	ND		1.0	0.040	mg/L	6010	19 MAR 97	21 MAR 97
Selenium	ND	G	2.0	0.010	mg/L	7740	10 MAR 97	11 MAR 97
Sodium	40.9		1.0	5.0	mg/L	6010	19 MAR 97	21 MAR 97
Thallium	ND	G	1.0	0.010	mg/L	7841	07 MAR 97	11 MAR 97
Tin	ND		1.0	0.10	mg/L	6010	19 MAR 97	21 MAR 97
Vanadium	0.028		1.0	0.010	mg/L	6010	19 MAR 97	21 MAR 97
Zinc	ND		1.0	0.020	mg/L	6010	19 MAR 97	21 MAR 97

G = Reporting limit raised due to the matrix of the sample.
ND = Not Detected

Reported By: Patrick Carroll — Approved By: Richard Persichitte

Quanterra
Environmental Services

Metals
Total Metals

Client Name: U.S. Geological Survey
Client ID: CAFB-X-0397-1
Lab ID: 054057-0002-SA
Matrix: AQUEOUS
Authorized: 06 MAR 97

Sampled: 05 MAR 97
Prepared: See Below

Received: 06 MAR 97
Analyzed: See Below

Parameter	Result	Qual	Dil	RL	Units	Test Method	Prepared Date	Analyzed Date
Antimony	ND		1.0	0.010	mg/L	7041	19 MAR 97	19 MAR 97
Silver	ND		1.0	0.00050	mg/L	7761	07 MAR 97	11 MAR 97
Cadmium	ND		1.0	0.00050	mg/L	7131	07 MAR 97	12 MAR 97
Arsenic	ND	G	1.0	0.010	mg/L	7060	10 MAR 97	12 MAR 97
Chromium	ND		1.0	0.0050	mg/L	7191	07 MAR 97	13 MAR 97
Barium	0.050		1.0	0.010	mg/L	6010	19 MAR 97	21 MAR 97
Beryllium	ND		1.0	0.0020	mg/L	6010	19 MAR 97	21 MAR 97
Calcium	51.7		1.0	0.20	mg/L	6010	19 MAR 97	21 MAR 97
Cobalt	ND		1.0	0.010	mg/L	6010	19 MAR 97	21 MAR 97
Copper	ND		1.0	0.020	mg/L	6010	19 MAR 97	21 MAR 97
Iron	ND		1.0	0.10	mg/L	6010	19 MAR 97	21 MAR 97
Lead	ND		1.0	0.0050	mg/L	7421	07 MAR 97	11 MAR 97
Magnesium	48.4		1.0	0.20	mg/L	6010	19 MAR 97	21 MAR 97
Manganese	ND		1.0	0.010	mg/L	6010	19 MAR 97	21 MAR 97
Mercury	ND		1.0	0.00020	mg/L	7470	12 MAR 97	12 MAR 97
Molybdenum	ND		1.0	0.020	mg/L	6010	19 MAR 97	21 MAR 97
Nickel	ND		1.0	0.040	mg/L	6010	19 MAR 97	21 MAR 97
Selenium	0.0060		1.0	0.0050	mg/L	7740	10 MAR 97	11 MAR 97
Sodium	46.3		1.0	5.0	mg/L	6010	19 MAR 97	21 MAR 97
Thallium	ND	G	1.0	0.010	mg/L	7841	07 MAR 97	11 MAR 97
Tin	ND		1.0	0.10	mg/L	6010	19 MAR 97	21 MAR 97
Vanadium	0.018		1.0	0.010	mg/L	6010	19 MAR 97	21 MAR 97
Zinc	ND		1.0	0.020	mg/L	6010	19 MAR 97	21 MAR 97

G = Reporting limit raised due to the matrix of the sample.
ND = Not Detected

Reported By: Patrick Carroll

Approved By: Richard Persichitte

Quanterra
Environmental Services

Metals
Total Metals

Client Name: U.S. Geological Survey
Client ID: CAFB-L-0397-1
Lab ID: 054057-0003-SA
Matrix: AQUEOUS
Authorized: 06 MAR 97

Sampled: 05 MAR 97
Prepared: See Below

Received: 06 MAR 97
Analyzed: See Below

Parameter	Result	Qual	Dil	RL	Units	Test Method	Prepared Date	Analyzed Date
Antimony	ND		1.0	0.010	mg/L	7041	19 MAR 97	19 MAR 97
Silver	ND		1.0	0.00050	mg/L	7761	07 MAR 97	11 MAR 97
Cadmium	ND		1.0	0.00050	mg/L	7131	07 MAR 97	12 MAR 97
Arsenic	ND	G	1.0	0.010	mg/L	7060	10 MAR 97	12 MAR 97
Chromium	ND		1.0	0.0050	mg/L	7191	07 MAR 97	13 MAR 97
Barium	0.051		1.0	0.010	mg/L	6010	19 MAR 97	21 MAR 97
Beryllium	ND		1.0	0.0020	mg/L	6010	19 MAR 97	21 MAR 97
Calcium	53.1		1.0	0.20	mg/L	6010	19 MAR 97	21 MAR 97
Cobalt	ND		1.0	0.010	mg/L	6010	19 MAR 97	21 MAR 97
Copper	ND		1.0	0.020	mg/L	6010	19 MAR 97	21 MAR 97
Iron	0.13		1.0	0.10	mg/L	6010	19 MAR 97	21 MAR 97
Lead	ND		1.0	0.0050	mg/L	7421	07 MAR 97	11 MAR 97
Magnesium	49.2		1.0	0.20	mg/L	6010	19 MAR 97	21 MAR 97
Manganese	ND		1.0	0.010	mg/L	6010	19 MAR 97	21 MAR 97
Mercury	ND		1.0	0.00020	mg/L	7470	12 MAR 97	12 MAR 97
Molybdenum	ND		1.0	0.020	mg/L	6010	19 MAR 97	21 MAR 97
Nickel	ND		1.0	0.040	mg/L	6010	19 MAR 97	21 MAR 97
Selenium	0.0055		1.0	0.0050	mg/L	7740	10 MAR 97	11 MAR 97
Sodium	44.7		1.0	5.0	mg/L	6010	19 MAR 97	21 MAR 97
Thallium	ND		1.0	0.0050	mg/L	7841	07 MAR 97	11 MAR 97
Tin	ND		1.0	0.10	mg/L	6010	19 MAR 97	21 MAR 97
Vanadium	0.018		1.0	0.010	mg/L	6010	19 MAR 97	21 MAR 97
Zinc	ND		1.0	0.020	mg/L	6010	19 MAR 97	21 MAR 97

G = Reporting limit raised due to the matrix of the sample.
ND = Not Detected

Reported By: Patrick Carroll

Approved By: Richard Persichitte

Quanterra Environmental Services

General Inorganics

Client Name: U.S. Geological Survey
Client ID: CAFB-I-0397-1
Lab ID: 054057-0001-SA
Matrix: AQUEOUS
Authorized: 06 MAR 97

Sampled: 05 MAR 97
Prepared: See Below

Received: 06 MAR 97
Analyzed: See Below

Parameter	Result	Qual	Dil	RL	Units	Test Method	Prepared Date	Analyzed Date
Cyanide	ND		1.0	0.010	mg/L	9012	11 MAR 97	11 MAR 97
Sulfide, Total	ND		1.0	0.050	mg/L	376.2	NA	11 MAR 97
Total Organic Carbon	ND		1.0	1.0	mg/L	9060	NA	19 MAR 97
Total Organic Halogen as Cl	ND		1.0	30.0	ug/L	9020	NA	27 MAR 97

ND = Not Detected

Reported By: Judy Lange

Approved By: Roxanne Sullivan

Quanterra Environmental Services

General Inorganics

Client Name: U.S. Geological Survey
Client ID: CAFB-X-0397-1
Lab ID: 054057-0002-SA
Matrix: AQUEOUS — Sampled: 05 MAR 97 — Received: 06 MAR 97
Authorized: 06 MAR 97 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	Dil	RL	Units	Test Method	Prepared Date	Analyzed Date
Cyanide	ND		1.0	0.010	mg/L	9012	11 MAR 97	11 MAR 97
Sulfide, Total	ND		1.0	0.050	mg/L	376.2	NA	11 MAR 97
Total Organic Carbon	ND		1.0	1.0	mg/L	9060	NA	19 MAR 97
Total Organic Halogen as Cl	ND		1.0	30.0	ug/L	9020	NA	27 MAR 97

ND = Not Detected

Reported By: Judy Lange

Approved By: Roxanne Sullivan

Quanterra Environmental Services

General Inorganics

Client Name: U.S. Geological Survey
Client ID: CAFB-L-0397-1
Lab ID: 054057-0003-SA
Matrix: AQUEOUS — Sampled: 05 MAR 97 — Received: 06 MAR 97
Authorized: 06 MAR 97 — Prepared: See Below — Analyzed: See Below

Parameter	Result	Qual	Dil	RL	Units	Test Method	Prepared Date	Analyzed Date
Cyanide	ND		1.0	0.010	mg/L	9012	11 MAR 97	11 MAR 97
Sulfide, Total	ND		1.0	0.050	mg/L	376.2	NA	11 MAR 97
Total Organic Carbon	ND		1.0	1.0	mg/L	9060	NA	19 MAR 97
Total Organic Halogen as Cl	ND		1.0	30.0	ug/L	9020	NA	27 MAR 97

ND = Not Detected

Reported By: Judy Lange

Approved By: Roxanne Sullivan

Quanterra
Environmental Services

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ANALYTICAL RESULTS

FOR

U.S. GEOLOGICAL SURVEY

QUANTERRA NO. 054059

APRIL 7, 1997

Prepared by: _____
Mark D. Stella

Reviewed by: _____
Lindsay Breyer

Quanterra
Environmental Services

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NARRATIVE

On March 6, 1997, Quanterra Environmental Services, Denver received three aqueous samples from the U.S. Geological Survey.

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data.

With the exceptions noted below or on the data sheets, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory QC samples analyzed in conjunction with the samples in this project were within established control limits.

Sample Receipt/Chain-of-Custody

The samples were analyzed for Appendix IX dioxins and furans at Quanterra's West Sacramento, California laboratory. Other parameters requested for the samples will be reported separately on project 054057.

Dioxins and Furans

Detection Limits for dioxins and furans are reported on a sample-specific basis and all results are recovery corrected per the isotope dilution technique. For an analyte reported as "Not Detected " (ND), the associated detection limit represents its maximum possible concentration.

LIMs Report Key

Section	Description
Cover Letter	Signature page, report narrative as applicable.
Sample Description Information	Tabulated cross-reference between the Lab ID and Client ID, including matrix, date and time sampled, and the date received for all samples in the project.
Sample Analysis Results Sheets	Lists sample results, test components, reporting limits, dates prepared and analyzed, and any data qualifiers. Pages are organized by test.
QC LOT Assignment Report	Cross-reference between lab IDs and applicable QC batches (DCS, LCS, Blank, MS/SD, DU)
Duplicate Control Sample Report	Percent recovery and RPD results, with acceptance limits, for the laboratory duplicate control samples for each test are tabulated in this report. These are measures of accuracy and precision for each test. Acceptance limits are based upon laboratory historical data.
Laboratory Control Sample Report	Percent recovery results for a single Laboratory Control Sample (if applicable) are tabulated in this report, with the applicable acceptance limits for each test.
Matrix Spike/Matrix Spike Duplicate Report	Percent recovery and RPD results for matrix-specific QC samples and acceptance limits, where applicable. This report can be used to assess matrix effects on an analysis.
Single Control Sample Report	A tabulation of the surrogate recoveries for the blank for organic analyses.
Method Blank Report	A summary of the results of the analysis of the method blank for each test.

List of Abbreviations and Terms

Abbreviation	Term	Abbreviation	Term
DCS	Duplicate Control Sample	MSD	Matrix Spike Duplicate
DU	Sample Duplicate	QC Run	Preparation Batch
EB	Equipment Blank	QC Category	LIMs QC Category
FB	Field Blank	QC Lot	DCS Batch
FD	Field Duplicate	ND	Not Detected at or above the reporting limit expressed
IDL	Instrument Detection Limit (Metals)	QC Matrix	Matrix of the laboratory control sample(s)
LCS	Laboratory Control Sample	RL	Reporting Limit
MB	Method Blank	QC	Quality Control
MDL	Method Detection Limit	SA	Sample
MS	Matrix Spike	SD	Spike Duplicate
RPD	Relative Percent Difference	TB	Trip Blank
ppm (part-per-million)	mg/L or mg/kg (usually)	ppb (part-per-billion)	ug/L or ug/kg (usually)
QUAL	Qualifier flag	DIL	Dilution Factor

SAMPLE DESCRIPTION INFORMATION/ANALYTICAL TEST REQUESTS

Sample Description Information

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at Quanterra's Denver laboratory is assigned a unique six digit number. Samples within the project are numbered sequentially. The laboratory identification number is a combination of the six digit project code and the sample sequence number.

Also given in the Sample Description Information is the Sample Type (matrix), Date of Sampling (if known) and Date of Receipt at the laboratory.

Analytical Test Requests

The Analytical Test Requests lists the analyses that were performed on each sample. The Custom Test column indicates where tests have been modified to conform to the specific requirements of this project.

Quanterra
Environmental Services

SAMPLE DESCRIPTION INFORMATION
for
U.S. Geological Survey

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
054059-0001-SA	CAFB-I-0397-1	AQUEOUS	05 MAR 97	10:30	06 MAR 97
054059-0001-MS	CAFB-I-0397-MS	AQUEOUS	05 MAR 97	10:30	06 MAR 97
054059-0001-SD	CAFB-I-0397-SD	AQUEOUS	05 MAR 97	10:30	06 MAR 97
054059-0001-MB	Method Blank	AQUEOUS	05 MAR 97		06 MAR 97
054059-0002-SA	CAFB-X-0397-1	AQUEOUS	05 MAR 97	09:01	06 MAR 97
054059-0003-SA	CAFB-L-0397-1	AQUEOUS	05 MAR 97	09:00	06 MAR 97

Quanterra
Environmental Services

ANALYTICAL TEST REQUESTS
for
U.S. Geological Survey

Lab ID: 054059	Group Code	Analysis Description	Custom Test?
0001 - 0003	A	Appendix IX Cl4-Cl6 Dioxins and Furans	N
		Prep - Low Res. Method 613 L-L Extraction for Dioxins/Furans	N

ANALYTICAL RESULTS

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization date is the date when the project was defined by the client such that laboratory work could begin. The date prepared is typically the date an extraction or digestion was initiated. For volatile organic compounds in water, the date prepared is the date the screening of the sample was performed.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Quanterra reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

Quanterra does not routinely blank-correct analytical data. Uncorrected analytical results are reported, along with associated blank results, for all organic and metals analyses. Analytical results and blank results are reported for conventional inorganic parameters as specified in the method. In addition, surrogate recovery data is presented for all GC/MS analyses. The surrogate recovery is an indication of the affect of the sample matrix on the performance of the method.

Quanterra Environmental Services

Appendix IX Dioxins/Furans

Low Resolution

Client Name: U.S. Geological Survey
Client ID: CAFB-I-0397-1
Lab ID: 054059-0001-SA
Matrix: AQUEOUS
Authorized: 06 MAR 97

Sampled: 05 MAR 97
Prepared: 17 MAR 97

Received: 06 MAR 97
Analyzed: 18 MAR 97

Sample Amount 1.06 L
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Furans				
TCDFs (total)	ND	ng/L	0.69	
PeCDFs (total)	ND	ng/L	0.57	
HxCDFs (total)	ND	ng/L	0.63	
Dioxins				
TCDDs (total)	ND	ng/L	0.51	
2,3,7,8-TCDD	ND	ng/L	0.51	
PeCDDs (total)	ND	ng/L	0.86	
HxCDDs (total)	ND	ng/L	0.75	
	% Recovery			
13C-2,3,7,8-TCDF	85			
13C-2,3,7,8-TCDD	86			
13C-1,2,3,6,7,8-HxCDD	87			
13C-1,2,3,4,6,7,8-HpCDF	97			

ND = Not detected
NA = Not applicable

Reported By: MBAQUERFO

Approved By: RHRABAK

Quanterra Environmental Services

Appendix IX Dioxins/Furans

Low Resolution

Client Name: U.S. Geological Survey
Client ID: CAFB-X-0397-1
Lab ID: 054059-0002-SA
Matrix: AQUEOUS
Authorized: 06 MAR 97

Sampled: 05 MAR 97
Prepared: 17 MAR 97

Received: 06 MAR 97
Analyzed: 18 MAR 97

Sample Amount 1.06 L
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Furans				
TCDFs (total)	ND	ng/L	0.77	
PeCDFs (total)	ND	ng/L	0.57	
HxCDFs (total)	ND	ng/L	0.55	
Dioxins				
TCDDs (total)	ND	ng/L	0.42	
2,3,7,8-TCDD	ND	ng/L	0.42	
PeCDDs (total)	ND	ng/L	1.2	
HxCDDs (total)	ND	ng/L	0.72	
	% Recovery			
13C-2,3,7,8-TCDF	87			
13C-2,3,7,8-TCDD	86			
13C-1,2,3,6,7,8-HxCDD	92			
13C-1,2,3,4,6,7,8-HpCDF	101			

ND = Not detected
NA = Not applicable

Reported By: TSTONE

Approved By: RHRABAK

Quanterra Environmental Services

Appendix IX Dioxins/Furans

Low Resolution

Client Name: U.S. Geological Survey
Client ID: CAFB-L-0397-1
Lab ID: 054059-0003-SA
Matrix: AQUEOUS Sampled: 05 MAR 97 Received: 06 MAR 97
Authorized: 06 MAR 97 Prepared: 17 MAR 97 Analyzed: 18 MAR 97

Sample Amount 1.06 L
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Furans				
TCDFs (total)	ND	ng/L	0.66	
PeCDFs (total)	ND	ng/L	0.46	
HxCDFs (total)	ND	ng/L	0.47	
Dioxins				
TCDDs (total)	ND	ng/L	0.49	
2,3,7,8-TCDD	ND	ng/L	0.49	
PeCDDs (total)	ND	ng/L	0.91	
HxCDDs (total)	ND	ng/L	0.81	
	% Recovery			
13C-2,3,7,8-TCDF	93			
13C-2,3,7,8-TCDD	96			
13C-1,2,3,6,7,8-HxCDD	90			
13C-1,2,3,4,6,7,8-HpCDF	101			

ND = Not detected
NA = Not applicable

Reported By: TSTONE Approved By: RHRABAK

Quanterra
Environmental Services

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ANALYTICAL RESULTS

FOR

U.S. GEOLOGICAL SURVEY

QUANTERRA NO. 054027

MARCH 28, 1997

Prepared by: _____
Mark D. Stella

Reviewed by: _____
Lindsay Breyer

Quanterra
Environmental Services

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NARRATIVE

On March 5, 1997 , Quanterra Environmental Services, Denver received three aqueous samples from the U.S. Geological Survey.

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data.

With the exceptions noted below or on the data sheets, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory QC samples analyzed in conjunction with the samples in this project were within established control limits.

Sample Receipt/Chain-of-Custody

The samples have also been sent to Quanterra's West Sacramento, California laboratory for Appendix IX dioxin and furans. These results will be reported separately on project 054030.

General Comments

Dilution factors listed on the data sheets for the aqueous semivolatile organic parameters are based on the volume of sample actually extracted relative to the nominal volume of 1.0 liter. Any additional dilutions performed on the samples after extraction are also included in the dilution factor and will be indicated by G or t footnotes on the data sheets. All results and reporting limits are adjusted relative to the sample volume extracted and any subsequent dilutions performed. Dilution factors are rounded to two significant figures for reporting; all calculations are performed before rounding.

GC/MS Volatile Organics

Chlorobenzene was recovered above the upper control limit in the matrix spike (MS). A matrix effect is suspected. Since chlorobenzene was recovered within control limits in the duplicate control samples (DCS), the data were accepted. The matrix spike/spike duplicate (MS/SD) were not associated with this project.

GC/MS Semivolatile Organics

The phenol-d5 surrogate was recovered above the upper control limit in DCS-1. A potential positive bias exists for target compounds in DCS-1. Since all analytes were recovered within control limits in the DCS, the data were accepted.

Several compounds are not consistently recovered using Method 8270, and reporting limits cannot be established. These compounds include hexachlorophene and benzenethiol. Two compounds, pyridine and quinoline, are not recovered after alumina column cleanup.

Benzo(b) and benzo(k) fluoranthene cannot be differentiated based on their mass spectra and their retention times are almost identical. The isomer which is the closest in retention time to the sample is reported.

1,2-diphenylhydrazine is measured and reported as azobenzene.

N-nitrosodiphenylamine degrades to diphenylamine in the injection port of the instrument. Therefore, these two compounds cannot be distinguished from one another.

3-Methyl phenol and 4-methyl phenol cannot be differentiated based on their mass spectra and their retention times are identical. Results are reported as a combined value for 3/4-methyl phenol (or m&p-cresols).

Tentatively Identified Compounds

This report presents results for the "identification" of unknown compounds that were detected in the GC/MS analysis. The results from this work are presented as "tentatively identified compounds" (TICs). The approach used for reporting TICs was based on the protocol established for this purpose in the EPA Superfund methods and on guidelines established by the American Chemical Society (ACS).

In summary, the mass spectra of chromatographic peaks in concentrations in excess of 10% of the internal standard were obtained. Normally, the number of unknown compounds identified is limited to 10

compounds in the volatile fraction and 20 compounds in the semivolatile fraction. Each mass spectrum was then compared to a library of over 30,000 reference spectra in a computerized "library search." The three "best" matches obtained by the computer were hardcopied along with the mass spectrum of the unknown peak. This information was then reviewed by an analyst who "identified" the compound based on the available information. In general, mass spectrometry cannot distinguish isomers (compounds with the same molecular formula). Therefore, an identified compound may be any one of several different isomers.

All identifications were based on the "Guidelines for GC/MS Identification" developed by the American Chemical Society (Environmental Science and Technology, 1982, 16 143A). As recommended in these guidelines, identifications of unknown substances were reported with a level of confidence. The three levels of confidence cited in the ACS guidelines and used in this report are as follows:

3 Confirmed Identification; the identification is based on the analysis of an authentic standard.

2 Confident Identification; good agreement was observed between the unknown compound and a specific library spectrum.

1 Tentative Identification; the unknown compound is only indicative of a specific library spectrum.

If the unknown compound was not similar to a specific library spectrum, but it did contain ions characteristic of a class of compounds (saturated hydrocarbon, chlorinated hydrocarbon, etc.), a class identification is made without assigning a level of confidence.

If there were no library spectra similar to the unknown, and it could not be assigned to a particular class of compounds, the compound is reported as "unknown."

Quantitation of TICs is based on the total ionization peak area relative to an internal standard, assuming a response factor of one. Accordingly, the reported concentration is an estimate.

The tentatively identified compounds in this report may include some compounds reported as "siloxanes." Siloxanes are common laboratory and field artifacts or contaminants. Potential sources include silicon-based grease in the field or laboratory plus the liquid phase coating on gas chromatography columns, as

well as other equipment in the laboratory. However, siloxanes may also be present in environmental samples from spills of silicone oils or lubricating oils with siloxane additives.

Chromatography

Analyte identification in chromatographic analysis is based upon retention time. Since it is possible for more than one compound to have the same retention time, analyte identification by these methods is not definitive. Most methods require analysis on a second dissimilar chromatographic column to confirm the presence of target analytes detected in a sample. Only confirmed hits are reported without further qualification or supporting data.

Some analytes (e.g. hydrocarbon products, technical chlordane, toxaphene, and the aroclors) consist of mixtures of a number of different compounds. These multicomponent analytes produce distinct patterns of peaks in the chromatograms and do not have a single retention time. The pattern of peaks observed is characteristic of the analyte and provides qualitative information about the analyte(s) present in the sample. For these analytes, second column confirmations are not generally required. Instead, identification is based on matching the pattern of peaks observed in the samples to the patterns observed for standards containing known concentrations of the analytes of interest.

All analytes are quantitated against multipoint calibration curves as specified in the applicable analytical methods. In some cases it is not practical to maintain multipoint calibration curves for every analyte on every instrument. These analytes include three Appendix IX compounds (diallate, isodrin, and kepone) and the multicomponent analytes (technical chlordane, toxaphene, and aroclors) analyzed by method 8080. For these analytes, a single calibration standard at the reporting limit is analyzed to establish instrument sensitivity for each compound. If the analyte is detected in any sample at greater than half the reporting limit, a multipoint calibration curve is prepared and the sample re-analyzed for quantitation against this curve.

Appendix IX Chlorinated Pesticides & PCBs

Aldrin was recovered below the lower control limit in the MS. As a result of the low MS recovery, the relative percent difference (RPD) is reported outside control limits for the MS/SD. In addition, the RPD

for heptachlor is reported outside control limits in the MS/SD. Matrix effects are suspected. Since the mentioned analytes were recovered within precision and accuracy control limits in the DCS, the data were accepted. The MS/SD were not associated with this project.

Metals

Boron was recovered above the upper control limit in the DCS for the ICP analysis. Since boron is not an analyte of interest for this project, the data were reported.

Lead, selenium, thallium and chromium were recovered below the lower control limit in the MS/SD for the GFAA analyses. Matrix effects are suspected. Since the mentioned analytes were recovered within control limits in their respective DCS, the data were accepted. The MS/SDs were not associated with this project.

Sodium is reported as "NC" (not calculated) in the MS/SD for the ICP analysis. The precision and accuracy calculations are not performed if the spike level is less than or equal to 25% of the value of the sample. The MS/SD were not associated with this project.

Metals analyzed by Graphite Furnace Atomic Absorption (GFAA) are subject to matrix interferences. Consequently, Quanterra Environmental Services, Denver laboratory's protocol is to analyze a spiked aliquot with every sample. The severity of the interference, based upon analyte level and spike recovery, is assessed against specific criteria and the need for an elevated reporting limit or dilution is determined. An elevated reporting limit or dilution due to matrix interference will be noted by a G flag on the data sheet.

Footnotes and Data Qualifiers

The data sheets contained in this report may contain a variety of footnotes and data qualifiers. Those used to indicate the confidence level for Tentatively Identified Compounds (GC/MS methods) are described above. Other footnotes are used with specific tests; for example, footnotes used with the GC/FID Petroleum Hydrocarbon methods to indicate (in the analysts judgment) the product that appears to be present. Finally, there are a number of general qualifiers that serve to identify problems and pertinent observations made during sample analysis that may not discussed in the Overview. These are described below:

B Compound is also detected in the blank.

The indicated compound was detected in the sample as well as the method blank. Please note that the B flag is not used when the sample result is ND (Not Detected).

G Reporting limit raised due to the matrix of the sample.

Indicates that reporting limits were raised due to the presence of non-target compounds or other matrix interferences. The sample may or may not have been diluted. For inorganic methods, the footnote applies only to the flagged analyte. For organic methods, the footnote pertains to all analytes determined by the method.

J Result is detected below the reporting limit or is an estimated concentration.

Most commonly, a "J" value indicates that the reported result for the analyte is below the stated reporting limit and is an estimated value. "J" values are generally reported to 1/5 of the reporting limit for GC/MS Volatiles, 1/10 of the reporting limit for GC/MS Semivolatiles, 1/2 the reporting limit for GC and HPLC, or to the Instrument Detection Limit for metals and general inorganics. Analytes which are not detected at or below the reporting liinit are reported as "ND" and do not have "J" flags. Because "J" values may represent false positive concentrations, care should be used when interpreting these data. If there is uncertainty about the quantiation of an analyte, this footnote may also indicate that a reported result is an estimated concentration, even if it is above the reporting limit.

t Sample diluted due to the concentration of target compounds.

Indicates that reporting limits were raised due to the presence of target analytes outside the calibration range of the method. For multi-analyte methods, the footnote will appear only for the first analyte but pertains to all analytes determined by the method.

T Preferred values unless footnoted on secondary column test.

This footnote is used with GC tests to indicate the primary column results. The footnote will be listed only for the first compound but pertains to all analytes determined by the method. It is used in conjunction the footnote V.

V Secondary column result is the preferred value.

This footnote is used for GC tests in conjunction the T footnote. It indicates that the value from the second column is preferred over the primary column result and pertains only to the indicated compound.

LIMs Report Key

Section	Description
Cover Letter	Signature page, report narrative as applicable.
Sample Description Information	Tabulated cross-reference between the Lab ID and Client ID, including matrix, date and time sampled, and the date received for all samples in the project.
Sample Analysis Results Sheets	Lists sample results, test components, reporting limits, dates prepared and analyzed, and any data qualifiers. Pages are organized by test.
QC LOT Assignment Report	Cross-reference between lab IDs and applicable QC batches (DCS, LCS, Blank, MS/SD, DU)
Duplicate Control Sample Report	Percent recovery and RPD results, with acceptance limits, for the laboratory duplicate control samples for each test are tabulated in this report. These are measures of accuracy and precision for each test. Acceptance limits are based upon laboratory historical data.
Laboratory Control Sample Report	Percent recovery results for a single Laboratory Control Sample (if applicable) are tabulated in this report, with the applicable acceptance limits for each test.
Matrix Spike/Matrix Spike Duplicate Report	Percent recovery and RPD results for matrix-specific QC samples and acceptance limits, where applicable. This report can be used to assess matrix effects on an analysis.
Single Control Sample Report	A tabulation of the surrogate recoveries for the blank for organic analyses.
Method Blank Report	A summary of the results of the analysis of the method blank for each test.

List of Abbreviations and Terms

Abbreviation	Term	Abbreviation	Term
DCS	Duplicate Control Sample	MSD	Matrix Spike Duplicate
DU	Sample Duplicate	QC Run	Preparation Batch
EB	Equipment Blank	QC Category	LIMs QC Category
FB	Field Blank	QC Lot	DCS Batch
FD	Field Duplicate	ND	Not Detected at or above the reporting limit expressed
IDL	Instrument Detection Limit (Metals)	QC Matrix	Matrix of the laboratory control sample(s)
LCS	Laboratory Control Sample	RL	Reporting Limit
MB	Method Blank	QC	Quality Control
MDL	Method Detection Limit	SA	Sample
MS	Matrix Spike	SD	Spike Duplicate
RPD	Relative Percent Difference	TB	Trip Blank
ppm (part-per-million)	mg/L or mg/kg (usually)	ppb (part-per-billion)	ug/L or ug/kg (usually)
QUAL	Qualifier flag	DIL	Dilution Factor

SAMPLE DESCRIPTION INFORMATION/ANALYTICAL TEST REQUESTS

Sample Description Information

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at Quanterra's Denver laboratory is assigned a unique six digit number. Samples within the project are numbered sequentially. The laboratory identification number is a combination of the six digit project code and the sample sequence number.

Also given in the Sample Description Information is the Sample Type (matrix), Date of Sampling (if known) and Date of Receipt at the laboratory.

Analytical Test Requests

The Analytical Test Requests lists the analyses that were performed on each sample. The Custom Test column indicates where tests have been modified to conform to the specific requirements of this project.

Quanterra
Environmental Services

SAMPLE DESCRIPTION INFORMATION
for
U.S. Geological Survey

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
054027-0001-SA	CAFB-M-0397-1	AQUEOUS	04 MAR 97	12:45	05 MAR 97
054027-0002-SA	CAFB-Q-0397-1	AQUEOUS	04 MAR 97	11:50	05 MAR 97
054027-0003-TB	CAFB-Q-0397-1	AQUEOUS	04 MAR 97	11:30	05 MAR 97

Quanterra
Environmental Services

ANALYTICAL TEST REQUESTS
for
U.S. Geological Survey

Lab ID: 054027	Group Code	Analysis Description	Custom Test?
0001 - 0002	A	Appendix IX Herbicides	N
		Prep - Herbicides by GC	N
		Appendix IX Herbicides	N
		Total Organic Halogen (TOX)	N
		Cyanide, Total	N
		Prep - Cyanide, Total	N
		Sulfide, Total	N
		Lead, Furnace AA (Total)	N
		Prep - Total Metals, Furnace AA	N
		Arsenic, Furnace AA (Total)	N
		Prep - Arsenic, Selenium - Total, Furnace AA	N
		Selenium, Furnace AA (Total)	N
		Thallium, Furnace AA (Total)	N
		Mercury, Cold Vapor AA (Total)	N
		Prep - Mercury, Cold Vapor AA (Total)	N
		Cadmium,Furnace AA	N
		Chromium, Furnace AA (Total)	N
		Antimony, Furnace AA (Total)	N
		Silver, Furnace AA	N
		Polynuclear Aromatic Hydrocarbons, HPLC	N
		Prep - Polynuclear Aromatic Hydrocarbons by HPLC	N
		Chlorinated Pesticides and PCB's Appendix IX List	N
		Prep - Organochlorine Pesticides/PCBs by GC (Appendix IX)	N
		Chlorinated Pesticides and PCB's Appendix IX List	N
		ICP Suite: Air Force	N
		Prep - Total Metals, ICP	N
		Total Organic Carbon (TOC)	N
		Screen - Volatile Organics	N
		Semivolatile Organics Appendix IX List	N
		Prep - Semivolatile Organics by GC/MS	N
		Semivolatiles Library Search (30 Compound TID)	N
		Volatile Organics	N
		Appendix IX List	N
		Volatiles Library Search (20 Compound TID)	N
0003	B	Screen - Volatile Organics	N
		Volatile Organics	N
		Appendix IX List	N

Quanterra
Environmental Services

ANALYTICAL TEST REQUESTS
for
U.S. Geological Survey

Lab ID: 054027	Group Code	Analysis Description	Custom Test?
		Volatiles Library Search (20 Compound TID)	N

ANALYTICAL RESULTS

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization date is the date when the project was defined by the client such that laboratory work could begin. The date prepared is typically the date an extraction or digestion was initiated. For volatile organic compounds in water, the date prepared is the date the screening of the sample was performed.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Quanterra reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

Quanterra does not routinely blank-correct analytical data. Uncorrected analytical results are reported, along with associated blank results, for all organic and metals analyses. Analytical results and blank results are reported for conventional inorganic parameters as specified in the method. In addition, surrogate recovery data is presented for all GC/MS analyses. The surrogate recovery is an indication of the affect of the sample matrix on the performance of the method.

Quanterra
Environmental Services

Volatile Organics
Appendix IX List
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-M-0397-1
Lab ID: 054027-0001-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: 06 MAR 97
Analyzed: 07 MAR 97

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	20
Acetonitrile	ND	ug/L	100
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	20
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	5.0
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	10
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
cis-1,2-Dichloroethene	ND	ug/L	2.5
trans-1,2-Dichloroethene	ND	ug/L	2.5
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	5.0
2-Hexanone	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutyl alcohol	ND	ug/L	200
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
Methyl methacrylate	ND	ug/L	5.0

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Paul Smith

Approved By: Kristin Shadowlight

Quanterra Environmental Services

(cont.)

Volatile Organics
Appendix IX List
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-M-0397-1
Lab ID: 054027-0001-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: 06 MAR 97
Analyzed: 07 MAR 97

Parameter	Result	Units	Reporting Limit
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20
Propionitrile	ND	ug/L	20
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	10
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery		Limits
1,2-Dichloroethane-d4	105	%	77-115
4-Bromofluorobenzene	101	%	87-113
Toluene-d8	100	%	90-112

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Paul Smith

Approved By: Kristin Shadowlight

Quanterra Environmental Services

Volatiles Library Search (20 Compound TID)
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-M-0397-1
Lab ID: 054027-0001-SA
Matrix AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: NA
Analyzed: 07 MAR 97

Parameter	Result	Units	Reporting Limit
None Detected	ND	ug/L	

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Paul Smith

Approved By: Kristin Shadowlight

Quanterra
Environmental Services

Volatile Organics
Appendix IX List
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-Q-0397-1
Lab ID: 054027-0002-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: 06 MAR 97
Analyzed: 07 MAR 97

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	20
Acetonitrile	ND	ug/L	100
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	20
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	5.0
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	10
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
cis-1,2-Dichloroethene	ND	ug/L	2.5
trans-1,2-Dichloroethene	ND	ug/L	2.5
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	5.0
2-Hexanone	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutyl alcohol	ND	ug/L	200
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
Methyl methacrylate	ND	ug/L	5.0

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Paul Smith

Approved By: Kristin Shadowlight

Quanterra Environmental Services

(cont.)

Volatile Organics
Appendix IX List
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-Q-0397-1
Lab ID: 054027-0002-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: 06 MAR 97
Analyzed: 07 MAR 97

Parameter	Result	Units	Reporting Limit
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20
Propionitrile	ND	ug/L	20
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	10
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery		Limits
1,2-Dichloroethane-d4	100	%	77-115
4-Bromofluorobenzene	98	%	87-113
Toluene-d8	99	%	90-112

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Paul Smith

Approved By: Kristin Shadowlight

Quanterra
Environmental Services

Volatiles Library Search (20 Compound TID)
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-Q-0397-1
Lab ID: 054027-0002-SA
Matrix AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: NA
Analyzed: 07 MAR 97

Parameter	Result	Units	Reporting Limit
Siloxane	5.1	ug/L	

Dilution factor is 1.0. All results and limits are corrected for dilution.

Reported By: Paul Smith

Approved By: Kristin Shadowlight

Quanterra
Environmental Services

Volatile Organics
Appendix IX List
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-Q-0397-1
Lab ID: 054027-0003-TB
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: 06 MAR 97
Analyzed: 07 MAR 97

Parameter	Result	Units	Reporting Limit
Acetone	ND	ug/L	20
Acetonitrile	ND	ug/L	100
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	20
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	5.0
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	10
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
cis-1,2-Dichloroethene	ND	ug/L	2.5
trans-1,2-Dichloroethene	ND	ug/L	2.5
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	5.0
2-Hexanone	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutyl alcohol	ND	ug/L	200
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
Methyl methacrylate	ND	ug/L	5.0

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Paul Smith

Approved By: Kristin Shadowlight

Quanterra Environmental Services

(cont.)

Volatile Organics
Appendix IX List
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-Q-0397-1
Lab ID: 054027-0003-TB
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: 06 MAR 97
Analyzed: 07 MAR 97

Parameter	Result	Units	Reporting Limit
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20
Propionitrile	ND	ug/L	20
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	10
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Surrogate	Recovery		Limits
1,2-Dichloroethane-d4	102	%	77-115
4-Bromofluorobenzene	101	%	87-113
Toluene-d8	99	%	90-112

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Paul Smith

Approved By: Kristin Shadowlight

Quanterra Environmental Services

Volatiles Library Search (20 Compound TID)
Method 8260A

Client Name: U.S. Geological Survey
Client ID: CAFB-Q-0397-1
Lab ID: 054027-0003-TB
Matrix AQUEOUS Sampled: 04 MAR 97 Prepared: NA
Authorized: 05 MAR 97 Received: 05 MAR 97 Analyzed: 07 MAR 97

Parameter	Result	Units	Reporting Limit
None Detected	ND	ug/L	

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Paul Smith Approved By: Kristin Shadowlight

Quanterra
Environmental Services

Semivolatile Organics
Appendix IX List
Method 8270B

Client Name: U.S. Geological Survey
Client ID: CAFB-M-0397-1
Lab ID: 054027-0001-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: 10 MAR 97
Analyzed: 25 MAR 97

Parameter	Result	Units	Reporting Limit
Acenaphthene	ND	ug/L	9.3
Acenaphthylene	ND	ug/L	9.3
Acetophenone	ND	ug/L	9.3
2-Acetylaminofluorene	ND	ug/L	93
4-Aminobiphenyl	ND	ug/L	47
Aniline	ND	ug/L	9.3
Anthracene	ND	ug/L	9.3
Aramite	ND	ug/L	19
Benzo(a)anthracene	ND	ug/L	9.3
Benzo(b)fluoranthene	ND	ug/L	9.3
Benzo(k)fluoranthene	ND	ug/L	9.3
Benzo(g,h,i)perylene	ND	ug/L	9.3
Benzo(a)pyrene	ND	ug/L	9.3
Benzyl alcohol	ND	ug/L	9.3
4-Bromophenyl phenyl ether	ND	ug/L	9.3
Butyl benzyl phthalate	ND	ug/L	9.3
2-sec-Butyl-4,6-dinitro-phenol	ND	ug/L	19
4-Chloroaniline	ND	ug/L	9.3
bis(2-Chloroethoxy)methane	ND	ug/L	9.3
bis(2-Chloroethyl) ether	ND	ug/L	9.3
2,2'-oxybis(1-chloropropane)	ND	ug/L	9.3
4-Chloro-3-methylphenol	ND	ug/L	9.3
2-Chloronaphthalene	ND	ug/L	9.3
2-Chlorophenol	ND	ug/L	9.3
4-Chlorophenyl phenyl ether	ND	ug/L	9.3
Chrysene	ND	ug/L	9.3
Dibenz(a,h)anthracene	ND	ug/L	9.3
Dibenzofuran	ND	ug/L	9.3
Di-n-butyl phthalate	ND	ug/L	9.3
1,2-Dichlorobenzene	ND	ug/L	9.3
1,3-Dichlorobenzene	ND	ug/L	9.3
1,4-Dichlorobenzene	ND	ug/L	9.3
3,3'-Dichlorobenzidine	ND	ug/L	47
2,4-Dichlorophenol	ND	ug/L	9.3
2,6-Dichlorophenol	ND	ug/L	9.3
Diethyl phthalate	ND	ug/L	9.3
Dimethoate	ND	ug/L	19
p-Dimethylaminoazobenzene	ND	ug/L	19
7,12-Dimethylbenz(a)-anthracene	ND	ug/L	19
3,3'-Dimethylbenzidine	ND	ug/L	47
a,a-Dimethylphenethyl-amine	ND	ug/L	47

Dilution factor is 0.93. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Lisa Burgesser

Approved By: Audrey Cornell

Quanterra Environmental Services

Semivolatile Organics
Appendix IX List
Method 8270B

(cont.)

Client Name: U.S. Geological Survey
Client ID: CAFB-M-0397-1
Lab ID: 054027-0001-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: 10 MAR 97
Analyzed: 25 MAR 97

Parameter	Result	Units	Reporting Limit
2,4-Dimethylphenol	ND	ug/L	9.3
Dimethyl phthalate	ND	ug/L	9.3
1,3-Dinitrobenzene	ND	ug/L	9.3
4,6-Dinitro-2-methylphenol	ND	ug/L	47
2,4-Dinitrophenol	ND	ug/L	47
2,4-Dinitrotoluene	ND	ug/L	9.3
2,6-Dinitrotoluene	ND	ug/L	9.3
Di-n-octyl phthalate	ND	ug/L	9.3
Diphenylamine	ND	ug/L	9.3
Disulfoton	ND	ug/L	47
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.3
Ethyl methanesulfonate	ND	ug/L	9.3
Famphur	ND	ug/L	93
Fluoranthene	ND	ug/L	9.3
Fluorene	ND	ug/L	9.3
Hexachlorobenzene	ND	ug/L	9.3
Hexachlorobutadiene	ND	ug/L	9.3
Hexachlorocyclopentadiene	ND	ug/L	47
Hexachloroethane	ND	ug/L	9.3
Hexachlorophene	ND	ug/L	--
Hexachloropropene	ND	ug/L	93
Indeno(1,2,3-cd)pyrene	ND	ug/L	9.3
Isophorone	ND	ug/L	9.3
Isosafrole	ND	ug/L	19
Methapyrilene	ND	ug/L	47
3-Methylcholanthrene	ND	ug/L	19
Methyl methanesulfonate	ND	ug/L	9.3
2-Methylnaphthalene	ND	ug/L	9.3
Methyl parathion	ND	ug/L	47
2-Methylphenol	ND	ug/L	9.3
3/4-Methylphenol	ND	ug/L	9.3
Naphthalene	ND	ug/L	9.3
1,4-Naphthoquinone	ND	ug/L	47
1-Naphthylamine	ND	ug/L	9.3
2-Naphthylamine	ND	ug/L	9.3
2-Nitroaniline	ND	ug/L	47
3-Nitroaniline	ND	ug/L	47
4-Nitroaniline	ND	ug/L	47
Nitrobenzene	ND	ug/L	9.3
2-Nitrophenol	ND	ug/L	9.3
4-Nitrophenol	ND	ug/L	47

Dilution factor is 0.93. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Lisa Burgesser

Approved By: Audrey Cornell

Quanterra Environmental Services

Semivolatile Organics
Appendix IX List
Method 8270B (cont.)

Client Name: U.S. Geological Survey
Client ID: CAFB-M-0397-1
Lab ID: 054027-0001-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: 10 MAR 97
Analyzed: 25 MAR 97

Parameter	Result	Units	Reporting Limit
4-Nitroquinoline-1-oxide	ND	ug/L	93
N-Nitroso-di-n-butylamine	ND	ug/L	9.3
N-Nitrosodiethylamine	ND	ug/L	9.3
N-Nitrosodimethylamine	ND	ug/L	9.3
N-Nitrosodiphenylamine	ND	ug/L	9.3
N-Nitroso-di-n-propylamine	ND	ug/L	9.3
N-Nitrosomethylethylamine	ND	ug/L	9.3
N-Nitrosomorpholine	ND	ug/L	9.3
N-Nitrosopiperidine	ND	ug/L	9.3
N-Nitrosopyrrolidine	ND	ug/L	9.3
5-Nitro-o-toluidine	ND	ug/L	19
Parathion	ND	ug/L	47
Pentachlorobenzene	ND	ug/L	9.3
Pentachloroethane	ND	ug/L	47
Pentachloronitrobenzene	ND	ug/L	47
Pentachlorophenol	ND	ug/L	47
Phenacetin	ND	ug/L	19
Phenanthrene	ND	ug/L	9.3
Phenol	ND	ug/L	9.3
p-Phenylenediamine	ND	ug/L	93
Phorate	ND	ug/L	47
2-Picoline	ND	ug/L	19
Pronamide	ND	ug/L	19
Pyrene	ND	ug/L	9.3
Pyridine	ND	ug/L	19
Safrole	ND	ug/L	19
Sulfotepp	ND	ug/L	47
1,2,4,5-Tetrachloro-benzene	ND	ug/L	9.3
2,3,4,6-Tetrachlorophenol	ND	ug/L	47
Thionazin	ND	ug/L	47
o-Toluidine	ND	ug/L	9.3
1,2,4-Trichlorobenzene	ND	ug/L	9.3
2,4,5-Trichlorophenol	ND	ug/L	9.3
2,4,6-Trichlorophenol	ND	ug/L	9.3
0,0,0-Triethylphosphoro-thioate	ND	ug/L	47
1,3,5-Trinitrobenzene	ND	ug/L	47

Dilution factor is 0.93. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Lisa Burgesser

Approved By: Audrey Cornell

Quanterra Environmental Services

Semivolatile Organics
Appendix IX List
Method 8270B

(cont.)

Client Name: U.S. Geological Survey
Client ID: CAFB-M-0397-1
Lab ID: 054027-0001-SA
Matrix: AQUEOUS Sampled: 04 MAR 97 Prepared: 10 MAR 97
Authorized: 05 MAR 97 Received: 05 MAR 97 Analyzed: 25 MAR 97

Parameter	Result	Units	Reporting Limit
Surrogate	Recovery		Limits
Nitrobenzene-d5	72	%	51-104
2-Fluorobiphenyl	84	%	43-116
Terphenyl-d14	103	%	33-141
Phenol-d5	98	%	47-106
2-Fluorophenol	77	%	36-108
2,4,6-Tribromophenol	90	%	49-106

Dilution factor is 0.93. All results and limits are corrected for dilution.

Reported By: Lisa Burgesser Approved By: Audrey Cornell

Quanterra
Environmental Services

Semivolatiles Library Search (30 Compound TID)
Method 8270B

Client Name: U.S. Geological Survey
Client ID: CAFB-M-0397-1
Lab ID: 054027-0001-SA
Matrix AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: NA
Analyzed: 25 MAR 97

Parameter	Result	Units	Reporting Limit
None Detected	ND	ug/L	

Dilution factor is 0.93. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Lisa Burgesser

Approved By: Audrey Cornell

Quanterra
Environmental Services

Semivolatile Organics
Appendix IX List
Method 8270B

Client Name: U.S. Geological Survey
Client ID: CAFB-Q-0397-1
Lab ID: 054027-0002-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: 10 MAR 97
Analyzed: 25 MAR 97

Parameter	Result	Units	Reporting Limit
Acenaphthene	ND	ug/L	9.4
Acenaphthylene	ND	ug/L	9.4
Acetophenone	ND	ug/L	9.4
2-Acetylaminofluorene	ND	ug/L	94
4-Aminobiphenyl	ND	ug/L	47
Aniline	ND	ug/L	9.4
Anthracene	ND	ug/L	9.4
Aramite	ND	ug/L	19
Benzo(a)anthracene	ND	ug/L	9.4
Benzo(b)fluoranthene	ND	ug/L	9.4
Benzo(k)fluoranthene	ND	ug/L	9.4
Benzo(g,h,i)perylene	ND	ug/L	9.4
Benzo(a)pyrene	ND	ug/L	9.4
Benzyl alcohol	ND	ug/L	9.4
4-Bromophenyl phenyl ether	ND	ug/L	9.4
Butyl benzyl phthalate	ND	ug/L	9.4
2-sec-Butyl-4,6-dinitro-phenol	ND	ug/L	19
4-Chloroaniline	ND	ug/L	9.4
bis(2-Chloroethoxy)methane	ND	ug/L	9.4
bis(2-Chloroethyl) ether	ND	ug/L	9.4
2,2'-oxybis(1-chloropropane)	ND	ug/L	9.4
4-Chloro-3-methylphenol	ND	ug/L	9.4
2-Chloronaphthalene	ND	ug/L	9.4
2-Chlorophenol	ND	ug/L	9.4
4-Chlorophenyl phenyl ether	ND	ug/L	9.4
Chrysene	ND	ug/L	9.4
Dibenz(a,h)anthracene	ND	ug/L	9.4
Dibenzofuran	ND	ug/L	9.4
Di-n-butyl phthalate	ND	ug/L	9.4
1,2-Dichlorobenzene	ND	ug/L	9.4
1,3-Dichlorobenzene	ND	ug/L	9.4
1,4-Dichlorobenzene	ND	ug/L	9.4
3,3'-Dichlorobenzidine	ND	ug/L	47
2,4-Dichlorophenol	ND	ug/L	9.4
2,6-Dichlorophenol	ND	ug/L	9.4
Diethyl phthalate	ND	ug/L	9.4
Dimethoate	ND	ug/L	19
p-Dimethylaminoazobenzene	ND	ug/L	19
7,12-Dimethylbenz(a)-anthracene	ND	ug/L	19
3,3'-Dimethylbenzidine	ND	ug/L	47
a,a-Dimethylphenethyl-amine	ND	ug/L	47

Dilution factor is 0.94. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Lisa Burgesser

Approved By: Audrey Cornell

Quanterra Environmental Services

(cont.)

Semivolatile Organics
Appendix IX List
Method 8270B

Client Name: U.S. Geological Survey
Client ID: CAFB-Q-0397-1
Lab ID: 054027-0002-SA
Matrix: AQUEOUS Sampled: 04 MAR 97 Prepared: 10 MAR 97
Authorized: 05 MAR 97 Received: 05 MAR 97 Analyzed: 25 MAR 97

Parameter	Result	Units	Reporting Limit
2,4-Dimethylphenol	ND	ug/L	9.4
Dimethyl phthalate	ND	ug/L	9.4
1,3-Dinitrobenzene	ND	ug/L	9.4
4,6-Dinitro-2-methylphenol	ND	ug/L	47
2,4-Dinitrophenol	ND	ug/L	47
2,4-Dinitrotoluene	ND	ug/L	9.4
2,6-Dinitrotoluene	ND	ug/L	9.4
Di-n-octyl phthalate	ND	ug/L	9.4
Diphenylamine	ND	ug/L	9.4
Disulfoton	ND	ug/L	47
bis(2-Ethylhexyl)phthalate	ND	ug/L	9.4
Ethyl methanesulfonate	ND	ug/L	9.4
Famphur	ND	ug/L	94
Fluoranthene	ND	ug/L	9.4
Fluorene	ND	ug/L	9.4
Hexachlorobenzene	ND	ug/L	9.4
Hexachlorobutadiene	ND	ug/L	9.4
Hexachlorocyclopentadiene	ND	ug/L	47
Hexachloroethane	ND	ug/L	9.4
Hexachlorophene	ND	ug/L	--
Hexachloropropene	ND	ug/L	94
Indeno(1,2,3-cd)pyrene	ND	ug/L	9.4
Isophorone	ND	ug/L	9.4
Isosafrole	ND	ug/L	19
Methapyrilene	ND	ug/L	47
3-Methylcholanthrene	ND	ug/L	19
Methyl methanesulfonate	ND	ug/L	9.4
2-Methylnaphthalene	ND	ug/L	9.4
Methyl parathion	ND	ug/L	47
2-Methylphenol	ND	ug/L	9.4
3/4-Methylphenol	ND	ug/L	9.4
Naphthalene	ND	ug/L	9.4
1,4-Naphthoquinone	ND	ug/L	47
1-Naphthylamine	ND	ug/L	9.4
2-Naphthylamine	ND	ug/L	9.4
2-Nitroaniline	ND	ug/L	47
3-Nitroaniline	ND	ug/L	47
4-Nitroaniline	ND	ug/L	47
Nitrobenzene	ND	ug/L	9.4
2-Nitrophenol	ND	ug/L	9.4
4-Nitrophenol	ND	ug/L	47

Dilution factor is 0.94. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Lisa Burgesser Approved By: Audrey Cornell

Quanterra Environmental Services

(cont.)

Semivolatile Organics
Appendix IX List
Method 8270B

Client Name: U.S. Geological Survey
Client ID: CAFB-Q-0397-1
Lab ID: 054027-0002-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: 10 MAR 97
Analyzed: 25 MAR 97

Parameter	Result	Units	Reporting Limit
4-Nitroquinoline-1-oxide	ND	ug/L	94
N-Nitroso-di-n-butylamine	ND	ug/L	9.4
N-Nitrosodiethylamine	ND	ug/L	9.4
N-Nitrosodimethylamine	ND	ug/L	9.4
N-Nitrosodiphenylamine	ND	ug/L	9.4
N-Nitroso-di-n-propylamine	ND	ug/L	9.4
N-Nitrosomethylethylamine	ND	ug/L	9.4
N-Nitrosomorpholine	ND	ug/L	9.4
N-Nitrosopiperidine	ND	ug/L	9.4
N-Nitrosopyrrolidine	ND	ug/L	9.4
5-Nitro-o-toluidine	ND	ug/L	19
Parathion	ND	ug/L	47
Pentachlorobenzene	ND	ug/L	9.4
Pentachloroethane	ND	ug/L	47
Pentachloronitrobenzene	ND	ug/L	47
Pentachlorophenol	ND	ug/L	47
Phenacetin	ND	ug/L	19
Phenanthrene	ND	ug/L	9.4
Phenol	ND	ug/L	9.4
p-Phenylenediamine	ND	ug/L	94
Phorate	ND	ug/L	47
2-Picoline	ND	ug/L	19
Pronamide	ND	ug/L	19
Pyrene	ND	ug/L	9.4
Pyridine	ND	ug/L	19
Safrole	ND	ug/L	19
Sulfotepp	ND	ug/L	47
1,2,4,5-Tetrachloro-benzene	ND	ug/L	9.4
2,3,4,6-Tetrachlorophenol	ND	ug/L	47
Thionazin	ND	ug/L	47
o-Toluidine	ND	ug/L	9.4
1,2,4-Trichlorobenzene	ND	ug/L	9.4
2,4,5-Trichlorophenol	ND	ug/L	9.4
2,4,6-Trichlorophenol	ND	ug/L	9.4
0,0,0-Triethylphosphoro-thioate	ND	ug/L	47
1,3,5-Trinitrobenzene	ND	ug/L	47

Dilution factor is 0.94. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Lisa Burgesser

Approved By: Audrey Cornell

Quanterra Environmental Services

Semivolatile Organics (cont.)
Appendix IX List
Method 8270B

Client Name: U.S. Geological Survey
Client ID: CAFB-Q-0397-1
Lab ID: 054027-0002-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: 10 MAR 97
Analyzed: 25 MAR 97

Parameter	Result	Units	Reporting Limit
Surrogate	**Recovery**		**Limits**
Nitrobenzene-d5	72	%	51-104
2-Fluorobiphenyl	83	%	43-116
Terphenyl-d14	99	%	33-141
Phenol-d5	98	%	47-106
2-Fluorophenol	75	%	36-108
2,4,6-Tribromophenol	87	%	49-106

Dilution factor is 0.94. All results and limits are corrected for dilution.

Reported By: Lisa Burgesser

Approved By: Audrey Cornell

Quanterra Environmental Services

Semivolatiles Library Search (30 Compound TID)
Method 8270B

Client Name: U.S. Geological Survey
Client ID: CAFB-Q-0397-1
Lab ID: 054027-0002-SA
Matrix AQUEOUS Sampled: 04 MAR 97 Prepared: NA
Authorized: 05 MAR 97 Received: 05 MAR 97 Analyzed: 25 MAR 97

Parameter	Result	Units	Reporting Limit
None Detected	ND	ug/L	

Dilution factor is 0.94. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Lisa Burgesser Approved By: Audrey Cornell

Quanterra
Environmental Services

Appendix IX Herbicides
Method 8150

Client Name: U.S. Geological Survey
Client ID: CAFB-M-0397-1
Lab ID: 054027-0001-SA
Matrix: AQUEOUS Sampled: 04 MAR 97 Prepared: 11 MAR 97
Authorized: 05 MAR 97 Received: 05 MAR 97 Analyzed: 22 MAR 97

Parameter	Result	Units	Reporting Limit	
2,4-D	ND	ug/L	1.1	T
2,4,5-TP (Silvex)	ND	ug/L	0.16	
2,4,5-T	ND	ug/L	0.19	

Surrogate	Recovery		Limits
DCAA	90	%	27-121

Dilution factor is 0.94. All results and limits are corrected for dilution.

T = Preferred values unless footnoted on secondary column test.
ND = Not Detected

Reported By: Bret Collins Approved By: Audrey Cornell

Quanterra
Environmental Services

Appendix IX Herbicides
Method 8150

Client Name: U.S. Geological Survey
Client ID: CAFB-Q-0397-1
Lab ID: 054027-0002-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: 11 MAR 97
Analyzed: 22 MAR 97

Parameter	Result	Units	Reporting Limit	
2,4-D	ND	ug/L	1.1	T
2,4,5-TP (Silvex)	ND	ug/L	0.16	
2,4,5-T	ND	ug/L	0.19	

Surrogate	Recovery		Limits
DCAA	97	%	27-121

Dilution factor is 0.95. All results and limits are corrected for dilution.

T = Preferred values unless footnoted on secondary column test.
ND = Not Detected

Reported By: Bret Collins

Approved By: Audrey Cornell

Quanterra
Environmental Services

Chlorinated Pesticides and PCB's
Appendix IX List
Method 8080A

Client Name: U.S. Geological Survey
Client ID: CAFB-M-0397-1
Lab ID: 054027-0001-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: 11 MAR 97
Analyzed: 21 MAR 97

Parameter	Result	Units	Reporting Limit	
Aldrin	ND	ug/L	0.050	T
Aroclor 1016	ND	ug/L	1.0	
Aroclor 1221	ND	ug/L	1.0	
Aroclor 1232	ND	ug/L	1.0	
Aroclor 1242	ND	ug/L	1.0	
Aroclor 1248	ND	ug/L	1.0	
Aroclor 1254	ND	ug/L	1.0	
Aroclor 1260	ND	ug/L	1.0	
alpha-BHC	ND	ug/L	0.050	
beta-BHC	ND	ug/L	0.050	
delta-BHC	ND	ug/L	0.050	
gamma-BHC (Lindane)	ND	ug/L	0.050	
alpha-Chlordane	ND	ug/L	0.050	
gamma-Chlordane	ND	ug/L	0.050	
Chlorobenzilate	ND	ug/L	1.0	
4,4'-DDD	ND	ug/L	0.10	
4,4'-DDE	ND	ug/L	0.10	
4,4'-DDT	ND	ug/L	0.10	
Diallate	ND	ug/L	1.0	
Dieldrin	ND	ug/L	0.10	
Endosulfan I	ND	ug/L	0.050	
Endosulfan II	ND	ug/L	0.10	
Endosulfan sulfate	ND	ug/L	0.10	
Endrin	ND	ug/L	0.10	
Endrin aldehyde	ND	ug/L	0.10	
Heptachlor	ND	ug/L	0.050	
Heptachlor epoxide	ND	ug/L	0.050	
Isodrin	ND	ug/L	0.10	
Kepone	ND	ug/L	2.5	
Methoxychlor	ND	ug/L	0.50	
Toxaphene	ND	ug/L	5.0	

Surrogate	Recovery		Limits
Tetrachloro-m-xylene	80	%	51-103
Dibutyl chlorendate	91	%	71-109
Decachlorobiphenyl	107	%	50-138

Dilution factor is 1.0. All results and limits are corrected for dilution.

T = Preferred values unless footnoted on secondary column test.
ND = Not Detected

Reported By: Houa Vue

Approved By: Audrey Cornell

Quanterra
Environmental Services

Chlorinated Pesticides and PCB's
Appendix IX List
Method 8080A

Client Name: U.S. Geological Survey
Client ID: CAFB-Q-0397-1
Lab ID: 054027-0002-SA
Matrix: AQUEOUS — Sampled: 04 MAR 97 — Prepared: 11 MAR 97
Authorized: 05 MAR 97 — Received: 05 MAR 97 — Analyzed: 21 MAR 97

Parameter	Result	Units	Reporting Limit	
Aldrin	ND	ug/L	0.048	T
Aroclor 1016	ND	ug/L	0.95	
Aroclor 1221	ND	ug/L	0.95	
Aroclor 1232	ND	ug/L	0.95	
Aroclor 1242	ND	ug/L	0.95	
Aroclor 1248	ND	ug/L	0.95	
Aroclor 1254	ND	ug/L	0.95	
Aroclor 1260	ND	ug/L	0.95	
alpha-BHC	ND	ug/L	0.048	
beta-BHC	ND	ug/L	0.048	
delta-BHC	ND	ug/L	0.048	
gamma-BHC (Lindane)	ND	ug/L	0.048	
alpha-Chlordane	ND	ug/L	0.048	
gamma-Chlordane	ND	ug/L	0.048	
Chlorobenzilate	ND	ug/L	0.95	
4,4'-DDD	ND	ug/L	0.095	
4,4'-DDE	ND	ug/L	0.095	
4,4'-DDT	ND	ug/L	0.095	
Diallate	ND	ug/L	0.95	
Dieldrin	ND	ug/L	0.095	
Endosulfan I	ND	ug/L	0.048	
Endosulfan II	ND	ug/L	0.095	
Endosulfan sulfate	ND	ug/L	0.095	
Endrin	ND	ug/L	0.095	
Endrin aldehyde	ND	ug/L	0.095	
Heptachlor	ND	ug/L	0.048	
Heptachlor epoxide	ND	ug/L	0.048	
Isodrin	ND	ug/L	0.095	
Kepone	ND	ug/L	2.4	
Methoxychlor	ND	ug/L	0.48	
Toxaphene	ND	ug/L	4.8	

Surrogate	Recovery		Limits
Tetrachloro-m-xylene	79	%	51-103
Dibutyl chlorendate	86	%	71-109
Decachlorobiphenyl	99	%	50-138

Dilution factor is 0.95. All results and limits are corrected for dilution.

T = Preferred values unless footnoted on secondary column test.
ND = Not Detected

Reported By: Houa Vue — Approved By: Audrey Cornell

Quanterra Environmental Services

Polynuclear Aromatic Hydrocarbons, HPLC
Method 8310

Client Name: U.S. Geological Survey
Client ID: CAFB-M-0397-1
Lab ID: 054027-0001-SA
Matrix: AQUEOUS — Sampled: 04 MAR 97 — Prepared: 11 MAR 97
Authorized: 05 MAR 97 — Received: 05 MAR 97 — Analyzed: 19 MAR 97

Parameter	Result	Units	Reporting Limit	
Naphthalene	ND	ug/L	0.94	
Acenaphthylene	ND	ug/L	0.94	
Acenaphthene	ND	ug/L	0.94	
Fluorene	0.25	ug/L	0.19	B
Phenanthrene	ND	ug/L	0.19	
Anthracene	ND	ug/L	0.094	
Fluoranthene	ND	ug/L	0.19	
Pyrene	ND	ug/L	0.19	
Benzo(a)anthracene	ND	ug/L	0.094	
Chrysene	ND	ug/L	0.19	
Benzo(b)fluoranthene	ND	ug/L	0.094	
Benzo(k)fluoranthene	ND	ug/L	0.094	
Benzo(a)pyrene	ND	ug/L	0.094	
Dibenz(a,h)anthracene	ND	ug/L	0.19	
Benzo(g,h,i)perylene	ND	ug/L	0.19	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.19	

Surrogate	Recovery		Limits
Terphenyl-d14	87	%	37-123

Dilution factor is 0.94. All results and limits are corrected for dilution.

B = Compound is also detected in the blank.
ND = Not Detected

Reported By: Blake Besser — Approved By: Lynn S. Calvin

Quanterra Environmental Services

Polynuclear Aromatic Hydrocarbons, HPLC
Method 8310

Client Name: U.S. Geological Survey
Client ID: CAFB-Q-0397-1
Lab ID: 054027-0002-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: 11 MAR 97
Analyzed: 19 MAR 97

Parameter	Result	Units	Reporting Limit
Naphthalene	ND	ug/L	0.95
Acenaphthylene	ND	ug/L	0.95
Acenaphthene	ND	ug/L	0.95
Fluorene	ND	ug/L	0.19
Phenanthrene	ND	ug/L	0.19
Anthracene	ND	ug/L	0.095
Fluoranthene	ND	ug/L	0.19
Pyrene	ND	ug/L	0.19
Benzo(a)anthracene	ND	ug/L	0.095
Chrysene	ND	ug/L	0.19
Benzo(b)fluoranthene	ND	ug/L	0.095
Benzo(k)fluoranthene	ND	ug/L	0.095
Benzo(a)pyrene	ND	ug/L	0.095
Dibenz(a,h)anthracene	ND	ug/L	0.19
Benzo(g,h,i)perylene	ND	ug/L	0.19
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.19

Surrogate	Recovery		Limits
Terphenyl-d14	92	%	37-123

Dilution factor is 0.95. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: Blake Besser

Approved By: Lynn S. Calvin

Quanterra
Environmental Services

Metals
Total Metals

Client Name: U.S. Geological Survey
Client ID: CAFB-M-0397-1
Lab ID: 054027-0001-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Prepared: See Below

Received: 05 MAR 97
Analyzed: See Below

Parameter	Result	Qual	Dil	RL	Units	Test Method	Prepared Date	Analyzed Date
Antimony	ND		1.0	0.010	mg/L	7041	11 MAR 97	13 MAR 97
Silver	ND		1.0	0.00050	mg/L	7761	07 MAR 97	11 MAR 97
Cadmium	ND		1.0	0.00050	mg/L	7131	07 MAR 97	12 MAR 97
Arsenic	ND		1.0	0.0050	mg/L	7060	07 MAR 97	10 MAR 97
Chromium	ND		1.0	0.0050	mg/L	7191	07 MAR 97	13 MAR 97
Barium	0.054		1.0	0.010	mg/L	6010	11 MAR 97	13 MAR 97
Beryllium	ND		1.0	0.0020	mg/L	6010	11 MAR 97	13 MAR 97
Calcium	78.2		1.0	0.20	mg/L	6010	11 MAR 97	13 MAR 97
Cobalt	ND		1.0	0.010	mg/L	6010	11 MAR 97	13 MAR 97
Copper	ND		1.0	0.020	mg/L	6010	11 MAR 97	13 MAR 97
Iron	0.12		1.0	0.10	mg/L	6010	11 MAR 97	13 MAR 97
Lead	ND		1.0	0.0050	mg/L	7421	07 MAR 97	11 MAR 97
Magnesium	54.5		1.0	0.20	mg/L	6010	11 MAR 97	13 MAR 97
Manganese	0.020		1.0	0.010	mg/L	6010	11 MAR 97	13 MAR 97
Mercury	ND		1.0	0.00020	mg/L	7470	11 MAR 97	11 MAR 97
Molybdenum	ND		1.0	0.020	mg/L	6010	11 MAR 97	13 MAR 97
Nickel	0.14		1.0	0.040	mg/L	6010	11 MAR 97	13 MAR 97
Selenium	ND	G	2.0	0.010	mg/L	7740	07 MAR 97	11 MAR 97
Sodium	41.1		1.0	5.0	mg/L	6010	11 MAR 97	13 MAR 97
Thallium	ND		1.0	0.0050	mg/L	7841	07 MAR 97	11 MAR 97
Tin	ND		1.0	0.10	mg/L	6010	11 MAR 97	13 MAR 97
Vanadium	ND		1.0	0.010	mg/L	6010	11 MAR 97	13 MAR 97
Zinc	0.027		1.0	0.020	mg/L	6010	11 MAR 97	13 MAR 97

G = Reporting limit raised due to the matrix of the sample.
ND = Not Detected

Reported By: Patrick Carroll

Approved By: Richard Persichitte

Quanterra
Environmental Services

Metals
Total Metals

Client Name: U.S. Geological Survey
Client ID: CAFB-Q-0397-1
Lab ID: 054027-0002-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Prepared: See Below

Received: 05 MAR 97
Analyzed: See Below

Parameter	Result	Qual	Dil	RL	Units	Test Method	Prepared Date	Analyzed Date
Antimony	ND		1.0	0.010	mg/L	7041	11 MAR 97	13 MAR 97
Silver	ND	G	1.0	0.0010	mg/L	7761	07 MAR 97	11 MAR 97
Cadmium	ND	G	1.0	0.0010	mg/L	7131	07 MAR 97	12 MAR 97
Arsenic	ND		1.0	0.0050	mg/L	7060	07 MAR 97	10 MAR 97
Chromium	ND		1.0	0.0050	mg/L	7191	07 MAR 97	13 MAR 97
Barium	0.032		1.0	0.010	mg/L	6010	11 MAR 97	13 MAR 97
Beryllium	ND		1.0	0.0020	mg/L	6010	11 MAR 97	13 MAR 97
Calcium	43.1		1.0	0.20	mg/L	6010	11 MAR 97	13 MAR 97
Cobalt	ND		1.0	0.010	mg/L	6010	11 MAR 97	13 MAR 97
Copper	ND		1.0	0.020	mg/L	6010	11 MAR 97	13 MAR 97
Iron	0.11		1.0	0.10	mg/L	6010	11 MAR 97	13 MAR 97
Lead	ND	G	1.0	0.010	mg/L	7421	07 MAR 97	11 MAR 97
Magnesium	38.7		1.0	0.20	mg/L	6010	11 MAR 97	13 MAR 97
Manganese	ND		1.0	0.010	mg/L	6010	11 MAR 97	13 MAR 97
Mercury	ND		1.0	0.00020	mg/L	7470	11 MAR 97	11 MAR 97
Molybdenum	ND		1.0	0.020	mg/L	6010	11 MAR 97	13 MAR 97
Nickel	ND		1.0	0.040	mg/L	6010	11 MAR 97	13 MAR 97
Selenium	0.0063		1.0	0.0050	mg/L	7740	07 MAR 97	11 MAR 97
Sodium	48.7		1.0	5.0	mg/L	6010	11 MAR 97	13 MAR 97
Thallium	ND		1.0	0.0050	mg/L	7841	07 MAR 97	11 MAR 97
Tin	ND		1.0	0.10	mg/L	6010	11 MAR 97	13 MAR 97
Vanadium	0.022		1.0	0.010	mg/L	6010	11 MAR 97	13 MAR 97
Zinc	ND		1.0	0.020	mg/L	6010	11 MAR 97	13 MAR 97

G = Reporting limit raised due to the matrix of the sample.
ND = Not Detected

Reported By: Patrick Carroll

Approved By: Richard Persichitte

Quanterra
Environmental Services

General Inorganics

Client Name: U.S. Geological Survey
Client ID: CAFB-M-0397-1
Lab ID: 054027-0001-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Prepared: See Below

Received: 05 MAR 97
Analyzed: See Below

Parameter	Result	Qual	Dil	RL	Units	Test Method	Prepared Date	Analyzed Date
Cyanide	ND		1.0	0.010	mg/L	9012	11 MAR 97	11 MAR 97
Sulfide, Total	ND		1.0	0.050	mg/L	376.2	NA	11 MAR 97
Total Organic Carbon	ND		1.0	1.0	mg/L	9060	NA	19 MAR 97
Total Organic Halogen as Cl	ND		1.0	30.0	ug/L	9020	NA	27 MAR 97

ND = Not Detected

Reported By: Judy Lange

Approved By: Roxanne Sullivan

Quanterra
Environmental Services

General Inorganics

Client Name: U.S. Geological Survey
Client ID: CAFB-Q-0397-1
Lab ID: 054027-0002-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Prepared: See Below

Received: 05 MAR 97
Analyzed: See Below

Parameter	Result	Qual	Dil	RL	Units	Test Method	Prepared Date	Analyzed Date
Cyanide	ND		1.0	0.010	mg/L	9012	11 MAR 97	11 MAR 97
Sulfide, Total	ND		1.0	0.050	mg/L	376.2	NA	11 MAR 97
Total Organic Carbon	ND		1.0	1.0	mg/L	9060	NA	19 MAR 97
Total Organic Halogen as Cl	ND		1.0	30.0	ug/L	9020	NA	27 MAR 97

ND = Not Detected

Reported By: Judy Lange

Approved By: Roxanne Sullivan

Quanterra
Environmental Services

Quanterra Incorporated
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ANALYTICAL RESULTS

FOR

U.S. GEOLOGICAL SURVEY

QUANTERRA NO. 054035

APRIL 4, 1997

Prepared by: _____
Mark D. Stella

Reviewed by: _____
Lindsay Breyer

Quanterra
Environmental Services

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NARRATIVE

On March 5, 1997, Quanterra Environmental Services, Denver received two aqueous samples from the U.S. Geological Survey.

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data.

With the exceptions noted below or on the data sheets, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory QC samples analyzed in conjunction with the samples in this project were within established control limits.

Sample Receipt/Chain-of-Custody

The samples were analyzed for Appendix IX dioxins and furans at Quanterra's West Sacramento, California laboratory. Other parameters requested for the samples will be reported separately on project 054027.

A 32 ounce bottle for client sample CAFB-Q-0397-1 was broken in transit between the Denver and West Sacramento laboratories. A replacement sample was sent to Quanterra - West Sacramento and arrived in good condition.

Dioxins and Furans

Detection Limits for dioxins and furans are reported on a sample-specific basis and all results are recovery corrected per the isotope dilution technique. For an analyte reported as "Not Detected " (ND), the associated detection limit represents its maximum possible concentration.

Quanterra
Environmental Services

LIMs Report Key

Section	Description
Cover Letter	Signature page, report narrative as applicable.
Sample Description Information	Tabulated cross-reference between the Lab ID and Client ID, including matrix, date and time sampled, and the date received for all samples in the project.
Sample Analysis Results Sheets	Lists sample results, test components, reporting limits, dates prepared and analyzed, and any data qualifiers. Pages are organized by test.
QC LOT Assignment Report	Cross-reference between lab IDs and applicable QC batches (DCS, LCS, Blank, MS/SD, DU)
Duplicate Control Sample Report	Percent recovery and RPD results, with acceptance limits, for the laboratory duplicate control samples for each test are tabulated in this report. These are measures of accuracy and precision for each test. Acceptance limits are based upon laboratory historical data.
Laboratory Control Sample Report	Percent recovery results for a single Laboratory Control Sample (if applicable) are tabulated in this report, with the applicable acceptance limits for each test.
Matrix Spike/Matrix Spike Duplicate Report	Percent recovery and RPD results for matrix-specific QC samples and acceptance limits, where applicable. This report can be used to assess matrix effects on an analysis.
Single Control Sample Report	A tabulation of the surrogate recoveries for the blank for organic analyses.
Method Blank Report	A summary of the results of the analysis of the method blank for each test.

List of Abbreviations and Terms

Abbreviation	Term	Abbreviation	Term
DCS	Duplicate Control Sample	MSD	Matrix Spike Duplicate
DU	Sample Duplicate	QC Run	Preparation Batch
EB	Equipment Blank	QC Category	LIMs QC Category
FB	Field Blank	QC Lot	DCS Batch
FD	Field Duplicate	ND	Not Detected at or above the reporting limit expressed
IDL	Instrument Detection Limit (Metals)	QC Matrix	Matrix of the laboratory control sample(s)
LCS	Laboratory Control Sample	RL	Reporting Limit
MB	Method Blank	QC	Quality Control
MDL	Method Detection Limit	SA	Sample
MS	Matrix Spike	SD	Spike Duplicate
RPD	Relative Percent Difference	TB	Trip Blank
ppm (part-per-million)	mg/L or mg/kg (usually)	ppb (part-per-billion)	ug/L or ug/kg (usually)
QUAL	Qualifier flag	DIL	Dilution Factor

SAMPLE DESCRIPTION INFORMATION/ANALYTICAL TEST REQUESTS

Sample Description Information

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at Quanterra's Denver laboratory is assigned a unique six digit number. Samples within the project are numbered sequentially. The laboratory identification number is a combination of the six digit project code and the sample sequence number.

Also given in the Sample Description Information is the Sample Type (matrix), Date of Sampling (if known) and Date of Receipt at the laboratory.

Analytical Test Requests

The Analytical Test Requests lists the analyses that were performed on each sample. The Custom Test column indicates where tests have been modified to conform to the specific requirements of this project.

Quanterra
Environmental Services

SAMPLE DESCRIPTION INFORMATION
for
U.S. Geological Survey

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
054035-0001-SA	CAFB-M-0397-1	AQUEOUS	04 MAR 97	12:45	05 MAR 97
054035-0001-MB	Method Blank	AQUEOUS	04 MAR 97		05 MAR 97
054035-0002-SA	CAFB-Q-0397-1	AQUEOUS	04 MAR 97	11:50	05 MAR 97

Quanterra
Environmental Services

ANALYTICAL TEST REQUESTS
for
U.S. Geological Survey

Lab ID: 054035	Group Code	Analysis Description	Custom Test?
0001 - 0002	A	Appendix IX Cl4-Cl6 Dioxins and Furans	N
		Prep - Low Res. Method 613 L-L Extraction for Dioxins/Furans	N

ANALYTICAL RESULTS

The analytical results for this project are presented in the following data tables. Each data table includes sample identification information, and when available and appropriate, dates sampled, received, authorized, prepared and analyzed. The authorization date is the date when the project was defined by the client such that laboratory work could begin. The date prepared is typically the date an extraction or digestion was initiated. For volatile organic compounds in water, the date prepared is the date the screening of the sample was performed.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Quanterra reporting limit. Reporting limits are adjusted to reflect dilution of the sample, when appropriate. Solid and waste samples are reported on an "as received" basis, i.e. no correction is made for moisture content.

Quanterra does not routinely blank-correct analytical data. Uncorrected analytical results are reported, along with associated blank results, for all organic and metals analyses. Analytical results and blank results are reported for conventional inorganic parameters as specified in the method. In addition, surrogate recovery data is presented for all GC/MS analyses. The surrogate recovery is an indication of the affect of the sample matrix on the performance of the method.

Quanterra
Environmental Services

Appendix IX Dioxins/Furans
Low Resolution

Client Name: U.S. Geological Survey
Client ID: CAFB-M-0397-1
Lab ID: 054035-0001-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: 17 MAR 97
Analyzed: 19 MAR 97

Sample Amt: 1.1

Parameter	Result	Units	Reporting Limit
TCDFs (total)	ND	ng/L	0.78
PeCDFs (total)	ND	ng/L	0.55
HxCDFs (total)	ND	ng/L	0.52
TCDDs (total)	ND	ng/L	0.38
2,3,7,8-TCDD	ND	ng/L	0.38
PeCDDs (total)	ND	ng/L	1.0
HxCDDs (total)	ND	ng/L	0.69
13C-2,3,7,8-TCDF	87	ng/L	
13C-2,3,7,8-TCDD	86	ng/L	
13C-1,2,3,6,7,8-HxCDD	87	ng/L	
13C-1,2,3,4,6,7,8-HpCDF	93	ng/L	

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: MBAQUERFO

Approved By: RHRABAK

Quanterra Environmental Services

Appendix IX Dioxins/Furans
Low Resolution

Client Name: U.S. Geological Survey
Client ID: CAFB-Q-0397-1
Lab ID: 054035-0002-SA
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: 17 MAR 97
Analyzed: 19 MAR 97

Sample Amt: 1.0

Parameter	Result	Units	Reporting Limit
TCDFs (total)	ND	ng/L	0.65
PeCDFs (total)	ND	ng/L	0.56
HxCDFs (total)	ND	ng/L	0.48
TCDDs (total)	ND	ng/L	0.66
2,3,7,8-TCDD	ND	ng/L	0.66
PeCDDs (total)	ND	ng/L	0.94
HxCDDs (total)	ND	ng/L	0.63
13C-2,3,7,8-TCDF	82	ng/L	
13C-2,3,7,8-TCDD	83	ng/L	
13C-1,2,3,6,7,8-HxCDD	83	ng/L	
13C-1,2,3,4,6,7,8-HpCDF	92	ng/L	

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: MBAQUERFO

Approved By: RHRABAK

APPENDIX II

Laboratory Quality Assurance / Quality Control Results

DODEC LABORATORY DATA REVIEW WORKSHEET

1.0 GENERAL INFORMATION

Data reviewer: Bruce Darnell
Date of review: 4/16/97
Sample project number: 54057
Project name: NM - Cannon AFB
Sample collection date: March 5, 1997
Sample matrix and number: Aqueous 6

Type and number of samples in project:

Type	Number
Environmental	3
Trip blank	1
Equipment blank	
Ambient blank	
MS/MSD	2
Other	

2.0 DATA REPORT

Date of Analytical Results Report: 3/28/97
Number of volumes in Raw Data Report: 2
Raw Data Report reviewed? Yes____ No ✓

Were all analyses requested on the COC form performed by the laboratory?
Yes____ No ✓

If no, list cancelled analyses and reason for non-performance:

Method 8290 - dioxins and furans will be reported on project 54059.

Were the samples properly preserved upon receipt by the laboratory?
Yes ✓ No____

If no, list laboratory ID for samples that were not properly preserved.

3.0 ANALYTICAL METHODS

Analytical methods used in this project

✓	VOC by GC/MS (SW 8240, SW 8260, E524, E624)
	Halogenated VOC by GC (SW 8010)
	Aromatic VOC by GC (SW 8020)
✓	SVOC by GC/MS (SW 8270)
✓	PAH by HPLC (SW 8310)
✓	Organochlorine pesticides and PCB (SW 8080)
✓	Organophosphorous pesticides (SW 8140)
✓	Chlorinated herbicides (SW 8150)
	Dioxins and Furans (SW 8280)
	Explosives (8330)
✓	TOC (E415.1 or SW 9060)
	TPH (E418.1)
	Oil and Grease (E413.2)
✓	TOX (SW9020)
✓	ICP screen for metals (SW 6010)
	ICP/MS screen for metals (SW 6020)
	Trace ICP screen for metals (SW 6010 modified)
✓	Antimony by GFAA (SW 7041)
✓	Arsenic by GFAA (SW 7060)
✓	Chromium (SW 7191 or 7196)
✓	Lead by GFAA (SW 7421)
✓	Mercury by CVAA (SW 7470 or 7471)
✓	Selenium by GFAA (SW 7740)
✓	Thallium by GFAA (SW 7841)
	Inorganic anions (E300.0)
	Alkalinity (310.1)
✓	Cyanide, total and amenable (SW 9010/9012)
	Nitrogen, ammonia (E350.1)
	Nitrogen, TKN (E351.2)
	Nitrogen, nitrate (E353.2)
	Nitrogen, nitrate plus nitrite (E353.2)
	Nitrogen, nitrite (E354.1)
	Phosphorous, total or ortho (E365.3)
	Sulfate (E375.4)
✓	Sulfide (E376.2)
	TDS (E160.1)
	pH (SW 9040 or 9045)
	Percent moisture (D2216)
	Gross alpha and gross beta radioactivity (SW 9310)
	Alpha-emitting radium isotopes (SW 9315)
	Radium-228 (SW 9320)
	Uranium (908.1)
✓	Other analyses : ✓ Silver 7761
	✓ Cadmium 7131

Were analytical holding times met? Yes_____ No _____

If no, list analytical method and laboratory ID for samples that exceeded holding time:

_____
_____
_____
_____
_____
_____

Did surrogate recoveries meet QC acceptance criteria?
Yes_____ No _____

If no, list analytical method, laboratory ID, and surrogates that did not meet acceptance criteria:

_____
_____
_____
_____
_____

Did actual reporting limits meet project detection limits?
Organic analyses : Yes_____ No_____

If no, list analytical method, laboratory ID, and reason for non-conformance:

_____
_____
_____
_____
_____
_____

Inorganic analyses: Yes_____ No_✓_

GFAA metals and some inorganic anions are subject to matrix interferences and their reporting limits may be raised accordingly as required by USEPA protocols. Reporting limits for ICP metals and mercury by CVAA are typically only raised when the sample concentration exceeds the instrument linear range.

Did DCS meet QC acceptance criteria? Yes_____ No_____

If no, list analytical method, laboratory ID, and reason for non-conformance:

_____
_____
_____
_____
_____
_____

Did SCS meet QC acceptance criteria? Yes_____ No_____

If no, list analytical method, laboratory ID, and reason for non-conformance:

Were any target compounds found in the method, trip, equipment, or ambient blanks above the RL? Yes _____ No _____

If yes, list the analytical method, laboratory ID, type of blank and compound:

Did the MS/MSD meet QC acceptance criteria? Yes___ No ✓

MS/MSD data are used to evaluate the effect of the sample matrix on the analytical process and should only be used in conjunction with other available laboratory QC information to evaluate precision and accuracy.

If no, list the analytical method , laboratory ID, and reason for non-comfrormance :

User-submitted matrix

Appendix IX: Chlorinated pesticides and PCB's - Aldrin was recovered below the LCL, and the RPD was outside control limits. The RPD for heptachlor was also outside control limits. The precision of the associated DCS, and the accuracy, were within control limits.

GFAA Metals: Lead, thallium, and chromium recoveries were less the LCL. The recoveries were within control limits in the DCS.

Additional comments:

QC SUMMARY

The Quanterra laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

The standard laboratory QC package is designed to:

1. establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data,

2. assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix,

3. establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and

4. provide a standard set of reportables which assures the client of the quality of his data.

The Quanterra QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with surrogate compounds appropriate to the method being used. In cases where no surrogate is available, (e.g., metals or conventional analyses) a single DCS serves as the control sample. An SCS is prepared for each sample lot for which the DCS pair are not analyzed. The recovery of the SCS is charted in exactly the same manner as described for the DCS, and provides a daily check on the performance of the method.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\% \text{ Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{|\text{ Measured Concentration DCS1 - Measured Concentration DCS2 }|}{(\text{Measured Concentration DCS1 + Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

Quanterra
Environmental Services

QC LOT ASSIGNMENT REPORT
Volatile Organics by GC/MS

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
054057-0001-SA	AQUEOUS	Q8260-5M-A	11 MAR 97-Z	11 MAR 97-Z
054057-0001-MS	AQUEOUS	Q8260-5M-A	11 MAR 97-Z	11 MAR 97-Z
054057-0001-SD	AQUEOUS	Q8260-5M-A	11 MAR 97-Z	11 MAR 97-Z
054057-0002-SA	AQUEOUS	Q8260-5M-A	11 MAR 97-Z	11 MAR 97-Z
054057-0003-SA	AQUEOUS	Q8260-5M-A	11 MAR 97-Z	11 MAR 97-Z
054057-0004-TB	AQUEOUS	Q8260-5M-A	11 MAR 97-Z	11 MAR 97-Z

Quanterra
Environmental Services

DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC/MS
Project: 054057

Category: Q8260-5M-A Volatile Organics
Matrix: AQUEOUS
QC Lot: 11 MAR 97-Z
Concentration Units: ug/L

Date Analyzed: 11 MAR 97

Analyte	Concentration Spiked	Measured DCS1	Qual	DCS2	Qual	AVG	Accuracy Average(%) DCS	Limits	Precision (RPD) DCS	Limit
1,1-Dichloroethene	50.0	52.2		51.8		52.0	104	80-132	0.77	20
Trichloroethene	50.0	55.2		54.6		54.9	110	85-112	1.1	20
Benzene	50.0	54.2		53.7		54.0	108	83-121	0.93	20
Toluene	50.0	54.7		55.9		55.3	111	85-120	2.2	20
Chlorobenzene	50.0	54.0		54.8		54.4	109	90-113	1.5	20

Surrogate	Concentration Spiked	Measured DCS1	Qual	DCS2	Qual	Accuracy Average(%) DCS	Limits
1,2-Dichloroethane-d4	50.0	49.0		48.8		98	77-115
4-Bromofluorobenzene	50.0	53.3		53.2		107	87-113
Toluene-d8	50.0	53.2		54.6		108	90-112

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

Quanterra
Environmental Services

SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC/MS

Category: Q8260-5M-A
Matrix: AQUEOUS
QC Lot: 11 MAR 97-Z QC Run: 11 MAR 97-Z
Concentration Units: ug/L

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
1,2-Dichloroethane-d4	50.0	48.4	97	77-115
4-Bromofluorobenzene	50.0	52.6	105	87-113
Toluene-d8	50.0	53.7	107	90-112

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

Quanterra
Environmental Services

METHOD BLANK REPORT
Volatile Organics by GC/MS

Test: Q8260-AP9-5ML-AP
Matrix: AQUEOUS
QC Lot: 11 MAR 97-Z QC Run: 11 MAR 97-Z

Analyte	Result	Units	Reporting Limit	
Acetone	2.0	ug/L	20	J
Acetonitrile	ND	ug/L	100	
Acrolein	ND	ug/L	100	
Acrylonitrile	1.4	ug/L	100	J
Allyl chloride	ND	ug/L	10	
Benzene	ND	ug/L	5.0	
Bromodichloromethane	ND	ug/L	5.0	
Bromoform	ND	ug/L	5.0	
Bromomethane	ND	ug/L	10	
2-Butanone (MEK)	ND	ug/L	20	
Carbon disulfide	ND	ug/L	5.0	
Carbon tetrachloride	ND	ug/L	5.0	
Chlorobenzene	ND	ug/L	5.0	
Chloroethane	ND	ug/L	10	
Chloroform	ND	ug/L	5.0	
Chloromethane	ND	ug/L	10	
Chloroprene	ND	ug/L	5.0	
Dibromochloromethane	ND	ug/L	5.0	
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	
Dibromomethane	ND	ug/L	5.0	
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0	
Dichlorodifluoromethane	ND	ug/L	10	
1,1-Dichloroethane	ND	ug/L	5.0	
1,2-Dichloroethane	ND	ug/L	5.0	
1,1-Dichloroethene	ND	ug/L	5.0	
cis-1,2-Dichloroethene	ND	ug/L	2.5	
trans-1,2-Dichloroethene	ND	ug/L	2.5	
1,2-Dichloropropane	ND	ug/L	5.0	
cis-1,3-Dichloropropene	ND	ug/L	5.0	
trans-1,3-Dichloropropene	ND	ug/L	5.0	
1,4-Dioxane	ND	ug/L	500	
Ethylbenzene	ND	ug/L	5.0	
Ethyl methacrylate	ND	ug/L	5.0	
2-Hexanone	ND	ug/L	20	
Iodomethane	ND	ug/L	5.0	
Isobutyl alcohol	ND	ug/L	200	
Methacrylonitrile	ND	ug/L	5.0	
Methylene chloride	ND	ug/L	5.0	
Methyl methacrylate	ND	ug/L	5.0	

J = Result is detected below the reporting limit or is an estimated concentration.

Quanterra
Environmental Services

METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Analyte	Result	Units	Reporting Limit	
Test: Q8260-AP9-5ML-AP Matrix: AQUEOUS QC Lot: 11 MAR 97-Z QC Run: 11 MAR 97-Z				
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20	
Propionitrile	ND	ug/L	20	
Styrene	ND	ug/L	5.0	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	
Tetrachloroethene	ND	ug/L	5.0	
Toluene	ND	ug/L	5.0	
1,1,1-Trichloroethane	ND	ug/L	5.0	
1,1,2-Trichloroethane	ND	ug/L	5.0	
Trichloroethene	ND	ug/L	5.0	
Trichlorofluoromethane	ND	ug/L	10	
1,2,3-Trichloropropane	ND	ug/L	5.0	
Vinyl acetate	ND	ug/L	10	
Vinyl chloride	ND	ug/L	10	
Xylenes (total)	ND	ug/L	5.0	
Test: Q8260-AP9-5ML-AP Matrix: AQUEOUS QC Lot: 11 MAR 97-Z QC Run: 11 MAR 97-Z				
Acetone	2.0	ug/L	20	J
Acetonitrile	ND	ug/L	100	
Acrolein	ND	ug/L	100	
Acrylonitrile	1.4	ug/L	100	J
Allyl chloride	ND	ug/L	10	
Benzene	ND	ug/L	5.0	
Bromodichloromethane	ND	ug/L	5.0	
Bromoform	ND	ug/L	5.0	
Bromomethane	ND	ug/L	10	
2-Butanone (MEK)	ND	ug/L	20	
Carbon disulfide	ND	ug/L	5.0	
Carbon tetrachloride	ND	ug/L	5.0	
Chlorobenzene	ND	ug/L	5.0	
Chloroethane	ND	ug/L	10	
Chloroform	ND	ug/L	5.0	
Chloromethane	ND	ug/L	10	
Chloroprene	ND	ug/L	5.0	
Dibromochloromethane	ND	ug/L	5.0	
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10	

J = Result is detected below the reporting limit or is an estimated concentration.

Quanterra
Environmental Services

METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Test: Q8260-AP9-5ML-AP
Matrix: AQUEOUS
QC Lot: 11 MAR 97-Z QC Run: 11 MAR 97-Z

Analyte	Result	Units	Reporting Limit
1,2-Dibromoethane (EDB)	ND	ug/L	5.0
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	10
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
trans-1,2-Dichloroethene	ND	ug/L	2.5
1,2-Dichloroethene (total)	ND	ug/L	5.0
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	5.0
2-Hexanone	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutyl alcohol	ND	ug/L	200
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
Methyl methacrylate	ND	ug/L	5.0
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20
Propionitrile	ND	ug/L	20
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	10
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Quanterra
Environmental Services

METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Test: Q8260-AP9-5ML-AP
Matrix: AQUEOUS
QC Lot: 11 MAR 97-Z QC Run: 11 MAR 97-Z

Analyte	Result	Units	Reporting Limit	
Acetone	2.0	ug/L	20	J
Acetonitrile	ND	ug/L	100	
Acrolein	ND	ug/L	100	
Acrylonitrile	1.4	ug/L	100	J
Allyl chloride	ND	ug/L	10	
Benzene	ND	ug/L	5.0	
Bromodichloromethane	ND	ug/L	5.0	
Bromoform	ND	ug/L	5.0	
Bromomethane	ND	ug/L	10	
2-Butanone (MEK)	ND	ug/L	20	
Carbon disulfide	ND	ug/L	5.0	
Carbon tetrachloride	ND	ug/L	5.0	
Chlorobenzene	ND	ug/L	5.0	
Chloroethane	ND	ug/L	10	
Chloroform	ND	ug/L	5.0	
Chloromethane	ND	ug/L	10	
Chloroprene	ND	ug/L	5.0	
Dibromochloromethane	ND	ug/L	5.0	
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	
Dibromomethane	ND	ug/L	5.0	
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0	
Dichlorodifluoromethane	ND	ug/L	10	
1,1-Dichloroethane	ND	ug/L	5.0	
1,2-Dichloroethane	ND	ug/L	5.0	
1,1-Dichloroethene	ND	ug/L	5.0	
cis-1,2-Dichloroethene	ND	ug/L	2.5	
trans-1,2-Dichloroethene	ND	ug/L	2.5	
1,2-Dichloropropane	ND	ug/L	5.0	
cis-1,3-Dichloropropene	ND	ug/L	5.0	
trans-1,3-Dichloropropene	ND	ug/L	5.0	
1,4-Dioxane	ND	ug/L	500	
Ethylbenzene	ND	ug/L	5.0	
Ethyl methacrylate	ND	ug/L	5.0	
2-Hexanone	ND	ug/L	20	
Iodomethane	ND	ug/L	5.0	
Isobutyl alcohol	ND	ug/L	200	
Methacrylonitrile	ND	ug/L	5.0	
Methylene chloride	ND	ug/L	5.0	
Methyl methacrylate	ND	ug/L	5.0	

J = Result is detected below the reporting limit or is an estimated concentration.

Quanterra
Environmental Services

METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Analyte	Result	Units	Reporting Limit
Test: Q8260-AP9-5ML-AP			
Matrix: AQUEOUS			
QC Lot: 11 MAR 97-Z QC Run: 11 MAR 97-Z			
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20
Propionitrile	ND	ug/L	20
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	10
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Quanterra
Environmental Services

'ATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
/olatile Organics by GC/MS
Project: 054057

Category: Q8260-5M-A Volatile Organics
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 11 MAR 97-Z
Units: ug/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
1,1-Dichloroethene	ND	49.8	47.8	50.0	50.0	100	96	80-132	4.1	20
Trichloroethene	ND	53.9	54.0	50.0	50.0	108	108	85-112	0.1	20
Benzene	ND	53.0	52.6	50.0	50.0	106	105	83-121	0.7	20
Toluene	ND	54.1	52.0	50.0	50.0	108	104	85-120	4.1	20
Chlorobenzene	ND	53.8	53.7	50.0	50.0	108	107	90-113	0.2	20

Surrogates		%Recovery		Rec. Accept. Limits
1,2-Dichloroethane-d4	97.9	98.3	97.7	77-115
4-Bromofluorobenzene	110	106	111	87-113
Toluene-d8	107	107	104	90-112

ND = Not Detected

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

Quanterra
Environmental Services

QC LOT ASSIGNMENT REPORT
Semivolatile Organics by GC/MS

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
054057-0001-SA	AQUEOUS	Q8270-A	12 MAR 97-02	12 MAR 97-02
054057-0001-MS	AQUEOUS	Q8270-A	12 MAR 97-02	12 MAR 97-02
054057-0001-SD	AQUEOUS	Q8270-A	12 MAR 97-02	12 MAR 97-02
054057-0002-SA	AQUEOUS	Q8270-A	12 MAR 97-02	12 MAR 97-02
054057-0003-SA	AQUEOUS	Q8270-A	12 MAR 97-02	12 MAR 97-02

Quanterra
Environmental Services

DUPLICATE CONTROL SAMPLE REPORT
Semivolatile Organics by GC/MS
Project: 054057

Category: Q8270-A Acid, Base and Neutrals by GC/MS.
Matrix: AQUEOUS
QC Lot: 12 MAR 97-02
Concentration Units: ug/L

Date Analyzed: 18 MAR 97

Analyte	Concentration Spiked	Measured DCS1	Qual	DCS2	Qual	AVG	Accuracy Average(%) DCS	Limits	Precision (RPD) DCS	Limit
Phenol	150	128		118		123	82	45-105	8.1	20
2-Chlorophenol	150	112		104		108	72	52-107	7.4	22
1,4-Dichlorobenzene	100	70.2		59.7		65.0	65	20-124	16	27
N-Nitroso-di-n-propylamine	100	79.1		76.8		78.0	78	52-108	3.0	20
1,2,4-Trichlorobenzene	100	70.9		61.2		66.0	66	44-142	15	27
4-Chloro-3-methylphenol	150	120		114		117	78	22-147	5.1	20
Acenaphthene	100	77.6		72.7		75.2	75	47-145	6.5	20
4-Nitrophenol	150	81.2		79.8		80.5	54	42-115	1.7	32
2,4-Dinitrotoluene	100	73.6		64.2		68.9	69	55-116	14	21
Pentachlorophenol	150	105		93.2		99.1	66	14-176	12	30
Pyrene	100	88.7		87.2		88.0	88	56-120	1.7	20

Surrogate	Concentration Spiked	Measured DCS1	Qual	DCS2	Qual	Accuracy Average(%) DCS	Limits
Nitrobenzene-d5	100	76.4		74.1		75	51-104
2-Fluorobiphenyl	100	68.8		66.2		68	43-116
Terphenyl-d14	100	81.0		82.0		82	33-141
2-Fluorophenol	150	106		99.8		69	36-108
Phenol-d5	150	138		134		91	47-106
2,4,6-Tribromophenol	150	116		112		76	49-106

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

Quanterra
Environmental Services

SINGLE CONTROL SAMPLE REPORT
Semivolatile Organics by GC/MS

Category: Q8270-A
Matrix: AQUEOUS
QC Lot: 12 MAR 97-02 QC Run: 12 MAR 97-02
Concentration Units: ug/L

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Nitrobenzene-d5	100	66.9	67	51-104
2-Fluorobiphenyl	100	60.7	61	43-116
Terphenyl-d14	100	80.1	80	33-141
2-Fluorophenol	150	101	67	36-108
Phenol-d5	150	119	79	47-106
2,4,6-Tribromophenol	150	102	68	49-106

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

Quanterra
Environmental Services

METHOD BLANK REPORT
Semivolatile Organics by GC/MS

Test: Q8270-AP9-3520-A
Matrix: AQUEOUS
QC Lot: 12 MAR 97-02 QC Run: 12 MAR 97-02

Analyte	Result	Units	Reporting Limit
Acenaphthene	ND	ug/L	10
Acenaphthylene	ND	ug/L	10
Acetophenone	ND	ug/L	10
2-Acetylaminofluorene	ND	ug/L	100
4-Aminobiphenyl	ND	ug/L	50
Aniline	ND	ug/L	10
Anthracene	ND	ug/L	10
Aramite	ND	ug/L	20
Benzo(a)anthracene	ND	ug/L	10
Benzo(b)fluoranthene	ND	ug/L	10
Benzo(k)fluoranthene	ND	ug/L	10
Benzo(g,h,i)perylene	ND	ug/L	10
Benzo(a)pyrene	ND	ug/L	10
Benzyl alcohol	ND	ug/L	10
4-Bromophenyl phenyl ether	ND	ug/L	10
Butyl benzyl phthalate	ND	ug/L	10
2-sec-Butyl-4,6-dinitro-phenol	ND	ug/L	20
4-Chloroaniline	ND	ug/L	10
bis(2-Chloroethoxy) methane	ND	ug/L	10
bis(2-Chloroethyl) ether	ND	ug/L	10
2,2'-oxybis(1-chloropropane)	ND	ug/L	10
4-Chloro-3-methylphenol	ND	ug/L	10
2-Chloronaphthalene	ND	ug/L	10
2-Chlorophenol	ND	ug/L	10
4-Chlorophenyl phenyl ether	ND	ug/L	10
Chrysene	ND	ug/L	10
Dibenz(a,h)anthracene	ND	ug/L	10
Dibenzofuran	ND	ug/L	10
Di-n-butyl phthalate	ND	ug/L	10
1,2-Dichlorobenzene	ND	ug/L	10
1,3-Dichlorobenzene	ND	ug/L	10
1,4-Dichlorobenzene	ND	ug/L	10
3,3'-Dichlorobenzidine	ND	ug/L	50
2,4-Dichlorophenol	ND	ug/L	10
2,6-Dichlorophenol	ND	ug/L	10
Diethyl phthalate	ND	ug/L	10
Dimethoate	ND	ug/L	20

Quanterra
Environmental Services

METHOD BLANK REPORT
Semivolatile Organics by GC/MS (cont.)

Test: Q8270-AP9-3520-A
Matrix: AQUEOUS
QC Lot: 12 MAR 97-02 QC Run: 12 MAR 97-02

Analyte	Result	Units	Reporting Limit
p-Dimethylaminoazobenzene	ND	ug/L	20
7,12-Dimethylbenz(a)-anthracene	ND	ug/L	20
3,3'-Dimethylbenzidine	ND	ug/L	50
a,a-Dimethylphenethylamine	ND	ug/L	50
2,4-Dimethylphenol	ND	ug/L	10
Dimethyl phthalate	ND	ug/L	10
1,3-Dinitrobenzene	ND	ug/L	10
4,6-Dinitro-2-methylphenol	ND	ug/L	50
2,4-Dinitrophenol	ND	ug/L	50
2,4-Dinitrotoluene	ND	ug/L	10
2,6-Dinitrotoluene	ND	ug/L	10
Di-n-octyl phthalate	ND	ug/L	10
Diphenylamine	ND	ug/L	10
Disulfoton	ND	ug/L	50
bis(2-Ethylhexyl) phthalate	ND	ug/L	10
Ethyl methanesulfonate	ND	ug/L	10
Famphur	ND	ug/L	100
Fluoranthene	ND	ug/L	10
Fluorene	ND	ug/L	10
Hexachlorobenzene	ND	ug/L	10
Hexachlorobutadiene	ND	ug/L	10
Hexachlorocyclopentadiene	ND	ug/L	50
Hexachloroethane	ND	ug/L	10
Hexachlorophene	ND	ug/L	--
Hexachloropropene	ND	ug/L	100
Indeno(1,2,3-cd)pyrene	ND	ug/L	10
Isophorone	ND	ug/L	10
Isosafrole	ND	ug/L	20
Methapyrilene	ND	ug/L	50
3-Methylcholanthrene	ND	ug/L	20
Methyl methanesulfonate	ND	ug/L	10
2-Methylnaphthalene	ND	ug/L	10
Methyl parathion	ND	ug/L	50
2-Methylphenol	ND	ug/L	10
3/4-Methylphenol	ND	ug/L	10
Naphthalene	ND	ug/L	10
1,4-Naphthoquinone	ND	ug/L	50

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Environmental Services

METHOD BLANK REPORT
Semivolatile Organics by GC/MS (cont.)

Test: Q8270-AP9-3520-A
Matrix: AQUEOUS
QC Lot: 12 MAR 97-02 QC Run: 12 MAR 97-02

Analyte	Result	Units	Reporting Limit
1-Naphthylamine	ND	ug/L	10
2-Naphthylamine	ND	ug/L	10
2-Nitroaniline	ND	ug/L	50
3-Nitroaniline	ND	ug/L	50
4-Nitroaniline	ND	ug/L	50
Nitrobenzene	ND	ug/L	10
2-Nitrophenol	ND	ug/L	10
4-Nitrophenol	ND	ug/L	50
4-Nitroquinoline-1-oxide	ND	ug/L	100
N-Nitroso-di-n-butylamine	ND	ug/L	10
N-Nitrosodiethylamine	ND	ug/L	10
N-Nitrosodimethylamine	ND	ug/L	10
N-Nitrosodiphenylamine	ND	ug/L	10
N-Nitroso-di-n-propylamine	ND	ug/L	10
N-Nitrosomethylethylamine	ND	ug/L	10
N-Nitrosomorpholine	ND	ug/L	10
N-Nitrosopiperidine	ND	ug/L	10
N-Nitrosopyrrolidine	ND	ug/L	10
5-Nitro-o-toluidine	ND	ug/L	20
Parathion	ND	ug/L	50
Pentachlorobenzene	ND	ug/L	10
Pentachloroethane	ND	ug/L	50
Pentachloronitrobenzene	ND	ug/L	50
Pentachlorophenol	ND	ug/L	50
Phenacetin	ND	ug/L	20
Phenanthrene	ND	ug/L	10
Phenol	ND	ug/L	10
p-Phenylenediamine	ND	ug/L	100
Phorate	ND	ug/L	50
2-Picoline	ND	ug/L	20
Pronamide	ND	ug/L	20
Pyrene	ND	ug/L	10
Pyridine	ND	ug/L	20
Safrole	ND	ug/L	20
Sulfotepp	ND	ug/L	50
1,2,4,5-Tetrachlorobenzene	ND	ug/L	10
2,3,4,6-Tetrachlorophenol	ND	ug/L	50
Thionazin	ND	ug/L	50
o-Toluidine	ND	ug/L	10

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Environmental Services

METHOD BLANK REPORT
Semivolatile Organics by GC/MS (cont.)

Analyte	Result	Units	Reporting Limit
Test: Q8270-AP9-3520-A			
Matrix: AQUEOUS			
QC Lot: 12 MAR 97-02 QC Run: 12 MAR 97-02			
1,2,4-Trichlorobenzene	ND	ug/L	10
2,4,5-Trichlorophenol	ND	ug/L	10
2,4,6-Trichlorophenol	ND	ug/L	10
0,0,0-Triethylphosphorothioate	ND	ug/L	50
1,3,5-Trinitrobenzene	ND	ug/L	50
Test: Q8270-AP9-3520-A			
Matrix: AQUEOUS			
QC Lot: 12 MAR 97-02 QC Run: 12 MAR 97-02			
Acenaphthene	ND	ug/L	10
Acenaphthylene	ND	ug/L	10
Acetophenone	ND	ug/L	10
2-Acetylaminofluorene	ND	ug/L	100
4-Aminobiphenyl	ND	ug/L	50
Aniline	ND	ug/L	10
Anthracene	ND	ug/L	10
Aramite	ND	ug/L	20
Benzo(a)anthracene	ND	ug/L	10
Benzo(b)fluoranthene	ND	ug/L	10
Benzo(k)fluoranthene	ND	ug/L	10
Benzo(g,h,i)perylene	ND	ug/L	10
Benzo(a)pyrene	ND	ug/L	10
Benzyl alcohol	ND	ug/L	10
4-Bromophenyl phenyl ether	ND	ug/L	10
Butyl benzyl phthalate	ND	ug/L	10
2-sec-Butyl-4,6-dinitrophenol	ND	ug/L	20
4-Chloroaniline	ND	ug/L	10
bis(2-Chloroethoxy) methane	ND	ug/L	10
bis(2-Chloroethyl) ether	ND	ug/L	10
2,2'-oxybis(1-chloropropane)	ND	ug/L	10
4-Chloro-3-methylphenol	ND	ug/L	10
2-Chloronaphthalene	ND	ug/L	10
2-Chlorophenol	ND	ug/L	10
4-Chlorophenyl phenyl ether	ND	ug/L	10

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Environmental Services

METHOD BLANK REPORT
Semivolatile Organics by GC/MS (cont.)

Test: Q8270-AP9-3520-A
Matrix: AQUEOUS
QC Lot: 12 MAR 97-02 QC Run: 12 MAR 97-02

Analyte	Result	Units	Reporting Limit
Chrysene	ND	ug/L	10
Dibenz(a,h)anthracene	ND	ug/L	10
Dibenzofuran	ND	ug/L	10
Di-n-butyl phthalate	ND	ug/L	10
1,2-Dichlorobenzene	ND	ug/L	10
1,3-Dichlorobenzene	ND	ug/L	10
1,4-Dichlorobenzene	ND	ug/L	10
3,3'-Dichlorobenzidine	ND	ug/L	50
2,4-Dichlorophenol	ND	ug/L	10
2,6-Dichlorophenol	ND	ug/L	10
Diethyl phthalate	ND	ug/L	10
Dimethoate	ND	ug/L	20
p-Dimethylaminoazobenzene	ND	ug/L	20
7,12-Dimethylbenz(a)-anthracene	ND	ug/L	20
3,3'-Dimethylbenzidine	ND	ug/L	50
a,a-Dimethylphenethylamine	ND	ug/L	50
2,4-Dimethylphenol	ND	ug/L	10
Dimethyl phthalate	ND	ug/L	10
1,3-Dinitrobenzene	ND	ug/L	10
4,6-Dinitro-2-methylphenol	ND	ug/L	50
2,4-Dinitrophenol	ND	ug/L	50
2,4-Dinitrotoluene	ND	ug/L	10
2,6-Dinitrotoluene	ND	ug/L	10
Di-n-octyl phthalate	ND	ug/L	10
Diphenylamine	ND	ug/L	10
Disulfoton	ND	ug/L	50
bis(2-Ethylhexyl) phthalate	ND	ug/L	10
Ethyl methanesulfonate	ND	ug/L	10
Famphur	ND	ug/L	100
Fluoranthene	ND	ug/L	10
Fluorene	ND	ug/L	10
Hexachlorobenzene	ND	ug/L	10
Hexachlorobutadiene	ND	ug/L	10
Hexachlorocyclopentadiene	ND	ug/L	50
Hexachloroethane	ND	ug/L	10
Hexachlorophene	ND	ug/L	--
Hexachloropropene	ND	ug/L	100

Quanterra
Environmental Services

METHOD BLANK REPORT
Semivolatile Organics by GC/MS (cont.)

Test: Q8270-AP9-3520-A
Matrix: AQUEOUS
QC Lot: 12 MAR 97-02 QC Run: 12 MAR 97-02

Analyte	Result	Units	Reporting Limit
Indeno(1,2,3-cd)pyrene	ND	ug/L	10
Isophorone	ND	ug/L	10
Isosafrole	ND	ug/L	20
Methapyrilene	ND	ug/L	50
3-Methylcholanthrene	ND	ug/L	20
Methyl methanesulfonate	ND	ug/L	10
2-Methylnaphthalene	ND	ug/L	10
Methyl parathion	ND	ug/L	50
2-Methylphenol	ND	ug/L	10
3/4-Methylphenol	ND	ug/L	10
Naphthalene	ND	ug/L	10
1,4-Naphthoquinone	ND	ug/L	50
1-Naphthylamine	ND	ug/L	10
2-Naphthylamine	ND	ug/L	10
2-Nitroaniline	ND	ug/L	50
3-Nitroaniline	ND	ug/L	50
4-Nitroaniline	ND	ug/L	50
Nitrobenzene	ND	ug/L	10
2-Nitrophenol	ND	ug/L	10
4-Nitrophenol	ND	ug/L	50
4-Nitroquinoline-1-oxide	ND	ug/L	100
N-Nitroso-di-n-butylamine	ND	ug/L	10
N-Nitrosodiethylamine	ND	ug/L	10
N-Nitrosodimethylamine	ND	ug/L	10
N-Nitrosodiphenylamine	ND	ug/L	10
N-Nitroso-di-n-propylamine	ND	ug/L	10
N-Nitrosomethylethylamine	ND	ug/L	10
N-Nitrosomorpholine	ND	ug/L	10
N-Nitrosopiperidine	ND	ug/L	10
N-Nitrosopyrrolidine	ND	ug/L	10
5-Nitro-o-toluidine	ND	ug/L	20
Parathion	ND	ug/L	50
Pentachlorobenzene	ND	ug/L	10
Pentachloroethane	ND	ug/L	50
Pentachloronitrobenzene	ND	ug/L	50
Pentachlorophenol	ND	ug/L	50
Phenacetin	ND	ug/L	20
Phenanthrene	ND	ug/L	10
Phenol	ND	ug/L	10
p-Phenylenediamine	ND	ug/L	100

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METHOD BLANK REPORT
Semivolatile Organics by GC/MS (cont.)

Test: Q8270-AP9-3520-A
Matrix: AQUEOUS
QC Lot: 12 MAR 97-02 QC Run: 12 MAR 97-02

Analyte	Result	Units	Reporting Limit
Phorate	ND	ug/L	50
2-Picoline	ND	ug/L	20
Pronamide	ND	ug/L	20
Pyrene	ND	ug/L	10
Pyridine	ND	ug/L	20
Safrole	ND	ug/L	20
Sulfotepp	ND	ug/L	50
1,2,4,5-Tetrachloro-benzene	ND	ug/L	10
2,3,4,6-Tetrachlorophenol	ND	ug/L	50
Thionazin	ND	ug/L	50
o-Toluidine	ND	ug/L	10
1,2,4-Trichlorobenzene	ND	ug/L	10
2,4,5-Trichlorophenol	ND	ug/L	10
2,4,6-Trichlorophenol	ND	ug/L	10
0,0,0-Triethylphosphoro-thioate	ND	ug/L	50
1,3,5-Trinitrobenzene	ND	ug/L	50

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Environmental Services

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
Semivolatile Organics by GC/MS
Project: 054057

Category: Q8270-A Acid, Base and Neutrals by GC/MS.
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 12 MAR 97-02
Units: ug/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Phenol	ND	118	136	142	144	83	94	45-105	12	20
2-Chlorophenol	ND	100	115	142	144	71	80	52-107	12	22
1,4-Dichlorobenzene	ND	57.4	66.5	94.8	96.2	61	69	20-124	13	27
N-Nitroso-di-n-propylamine	ND	76.6	89.1	94.8	96.2	81	93	52-108	14	20
1,2,4-Trichlorobenzene	ND	57.9	64.3	94.8	96.2	61	67	44-142	9.0	27
4-Chloro-3-methylphenol	ND	101	115	142	144	71	80	22-147	11	20
Acenaphthene	ND	66.1	75.2	94.8	96.2	70	78	47-145	11	20
4-Nitrophenol	ND	85.7	105	142	144	60	73	42-115	19	32
2,4-Dinitrotoluene	ND	66.6	78.7	94.8	96.2	70	82	55-116	15	21
Pentachlorophenol	ND	86.1	104	142	144	61	72	14-176	18	30
Pyrene	ND	76.4	86.8	94.8	96.2	81	90	56-120	11	20

Surrogates		%Recovery		Rec. Accept. Limits
Nitrobenzene-d5	75.2	75.6	83.8	51-104
2-Fluorobiphenyl	65.4	62.4	70.0	43-116
Terphenyl-d14	80.3	75.9	85.5	33-141
2-Fluorophenol	70.8	65.9	75.8	36-108
Phenol-d5	89.4	94.2	104	47-106
2,4,6-Tribromophenol	73.0	66.6	78.4	49-106

ND = Not Detected

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

Quanterra
Environmental Services

QC LOT ASSIGNMENT REPORT
Semivolatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
054057-0001-SA	AQUEOUS	615-A	11 MAR 97-01	11 MAR 97-01
054057-0001-SA	AQUEOUS	8080-A	11 MAR 97-01	11 MAR 97-01
054057-0001-MS	AQUEOUS	615-A	11 MAR 97-01	11 MAR 97-01
054057-0001-MS	AQUEOUS	8080-A	11 MAR 97-01	11 MAR 97-01
054057-0001-SD	AQUEOUS	615-A	11 MAR 97-01	11 MAR 97-01
054057-0001-SD	AQUEOUS	8080-A	11 MAR 97-01	11 MAR 97-01
054057-0002-SA	AQUEOUS	615-A	11 MAR 97-01	11 MAR 97-01
054057-0002-SA	AQUEOUS	8080-A	11 MAR 97-01	11 MAR 97-01
054057-0003-SA	AQUEOUS	615-A	11 MAR 97-01	11 MAR 97-01
054057-0003-SA	AQUEOUS	8080-A	11 MAR 97-01	11 MAR 97-01

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Environmental Services

DUPLICATE CONTROL SAMPLE REPORT
Semivolatile Organics by GC

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limits
Category: 615-A Matrix: AQUEOUS QC Lot: 11 MAR 97-01 Concentration Units: ug/L								
2,4-D	5.00	3.44	3.97	3.70	74	23-114	14	27
2,4,5-TP (Silvex)	1.00	0.764	0.854	0.809	81	26-124	11	31
2,4,5-T	1.00	0.741	0.808	0.774	77	26-127	8.7	29
Category: 8080-A Matrix: AQUEOUS QC Lot: 11 MAR 97-01 Concentration Units: ug/L								
gamma-BHC (Lindane)	0.200	0.196	0.208	0.202	101	76-122	5.9	15
Heptachlor	0.200	0.186	0.197	0.192	96	69-125	5.7	15
Aldrin	0.200	0.172	0.179	0.176	88	64-116	4.0	17
Dieldrin	0.500	0.443	0.470	0.456	91	74-107	5.9	15
Endrin	0.500	0.505	0.534	0.520	104	72-118	5.6	15
4,4'-DDT	0.500	0.472	0.504	0.488	98	74-117	6.6	15

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

Quanterra
Environmental Services

SINGLE CONTROL SAMPLE REPORT
Semivolatile Organics by GC

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 615-A				
Matrix: AQUEOUS				
QC Lot: 11 MAR 97-01 QC Run: 11 MAR 97-01				
Concentration Units: ug/L				
DCAA	5.00	3.66	73	27-121
Category: 8080-A				
Matrix: AQUEOUS				
QC Lot: 11 MAR 97-01 QC Run: 11 MAR 97-01				
Concentration Units: ug/L				
Tetrachloro-m-xylene	1.00	0.698	70	51-103
Dibutyl chlorendate	1.00	0.875	88	71-109
Decachlorobiphenyl	0.200	0.206	103	50-138

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

Quanterra
Environmental Services

METHOD BLANK REPORT
Semivolatile Organics by GC

Analyte	Result	Units	Reporting Limit
Test: 8150-AP9-A			
Matrix: AQUEOUS			
QC Lot: 11 MAR 97-01 QC Run: 11 MAR 97-01			
2,4-D	ND	ug/L	1.2
2,4,5-TP (Silvex)	ND	ug/L	0.17
2,4,5-T	ND	ug/L	0.20
Test: 8080-AP9-A			
Matrix: AQUEOUS			
QC Lot: 11 MAR 97-01 QC Run: 11 MAR 97-01			
Aldrin	ND	ug/L	0.050
Aroclor 1016	ND	ug/L	1.0
Aroclor 1221	ND	ug/L	1.0
Aroclor 1232	ND	ug/L	1.0
Aroclor 1242	ND	ug/L	1.0
Aroclor 1248	ND	ug/L	1.0
Aroclor 1254	ND	ug/L	1.0
Aroclor 1260	ND	ug/L	1.0
alpha-BHC	ND	ug/L	0.050
beta-BHC	ND	ug/L	0.050
delta-BHC	ND	ug/L	0.050
gamma-BHC (Lindane)	ND	ug/L	0.050
alpha-Chlordane	ND	ug/L	0.050
gamma-Chlordane	ND	ug/L	0.050
Chlorobenzilate	ND	ug/L	1.0
4,4'-DDD	ND	ug/L	0.10
4,4'-DDE	ND	ug/L	0.10
4,4'-DDT	ND	ug/L	0.10
Diallate	ND	ug/L	1.0
Dieldrin	ND	ug/L	0.10
Endosulfan I	ND	ug/L	0.050
Endosulfan II	ND	ug/L	0.10
Endosulfan sulfate	ND	ug/L	0.10
Endrin	ND	ug/L	0.10
Endrin aldehyde	ND	ug/L	0.10
Heptachlor	ND	ug/L	0.050
Heptachlor epoxide	ND	ug/L	0.050
Isodrin	ND	ug/L	0.10
Kepone	ND	ug/L	2.5
Methoxychlor	ND	ug/L	0.50
Toxaphene	ND	ug/L	5.0

Quanterra
Environmental Services

METHOD BLANK REPORT
Semivolatile Organics by GC (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8150-AP9-A			
Matrix: AQUEOUS			
QC Lot: 11 MAR 97-01 QC Run: 11 MAR 97-01			
2,4-D	ND	ug/L	1.2
2,4,5-TP (Silvex)	ND	ug/L	0.17
2,4,5-T	ND	ug/L	0.20
Test: 8080-AP9-A			
Matrix: AQUEOUS			
QC Lot: 11 MAR 97-01 QC Run: 11 MAR 97-01			
Aldrin	ND	ug/L	0.050
Aroclor 1016	ND	ug/L	1.0
Aroclor 1221	ND	ug/L	1.0
Aroclor 1232	ND	ug/L	1.0
Aroclor 1242	ND	ug/L	1.0
Aroclor 1248	ND	ug/L	1.0
Aroclor 1254	ND	ug/L	1.0
Aroclor 1260	ND	ug/L	1.0
alpha-BHC	ND	ug/L	0.050
beta-BHC	ND	ug/L	0.050
delta-BHC	ND	ug/L	0.050
gamma-BHC (Lindane)	ND	ug/L	0.050
alpha-Chlordane	ND	ug/L	0.050
gamma-Chlordane	ND	ug/L	0.050
Chlorobenzilate	ND	ug/L	1.0
4,4'-DDD	ND	ug/L	0.10
4,4'-DDE	ND	ug/L	0.10
4,4'-DDT	ND	ug/L	0.10
Diallate	ND	ug/L	1.0
Dieldrin	ND	ug/L	0.10
Endosulfan I	ND	ug/L	0.050
Endosulfan II	ND	ug/L	0.10
Endosulfan sulfate	ND	ug/L	0.10
Endrin	ND	ug/L	0.10
Endrin aldehyde	ND	ug/L	0.10
Heptachlor	ND	ug/L	0.050
Heptachlor epoxide	ND	ug/L	0.050
Isodrin	ND	ug/L	0.10
Kepone	ND	ug/L	2.5
Methoxychlor	ND	ug/L	0.50
Toxaphene	ND	ug/L	5.0

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Environmental Services

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
Semivolatile Organics by GC
Project: 054057

Category: 615-A Herbicides
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 11 MAR 97-01
Units: ug/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
2,4-D	ND	3.82	4.21	4.76	4.78	80	88	23-114	9.3	27
2,4,5-TP (Silvex)	ND	0.842	0.913	0.952	0.957	88	95	26-124	7.6	31
2,4,5-T	ND	0.790	0.857	0.952	0.957	83	90	26-127	7.6	29

Category: 8080-A Organochlorine Pesticides
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 11 MAR 97-01
Units: ug/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
gamma-BHC (Lindane)	ND	0.185	0.195	0.189	0.192	98	102	76-122	3.7	15
Heptachlor	ND	0.161	0.139	0.189	0.192	85	72	69-125	16	15
Aldrin	ND	T 0.143	0.0923	0.189	0.192	76	48	64-116	45	17
Dieldrin	ND	0.421	0.438	0.472	0.481	89	91	74-107	2.1	15
Endrin	ND	0.471	0.503	0.472	0.481	100	105	72-118	4.7	15
4,4'-DDT	ND	0.450	0.473	0.472	0.481	95	98	74-117	3.1	15

T = Preferred values unless footnoted on secondary column test.
ND = Not Detected

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

Quanterra
Environmental Services

QC LOT ASSIGNMENT REPORT
High Performance Liquid Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
054057-0001-SA	AQUEOUS	8310-A	12 MAR 97-01	12 MAR 97-01
054057-0001-MS	AQUEOUS	8310-A	12 MAR 97-01	12 MAR 97-01
054057-0001-SD	AQUEOUS	8310-A	12 MAR 97-01	12 MAR 97-01
054057-0002-SA	AQUEOUS	8310-A	12 MAR 97-01	12 MAR 97-01
054057-0003-SA	AQUEOUS	8310-A	12 MAR 97-01	12 MAR 97-01

Quanterra
Environmental Services

DUPLICATE CONTROL SAMPLE REPORT
High Performance Liquid Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limits
Category: 8310-A								
Matrix: AQUEOUS								
QC Lot: 12 MAR 97-01								
Concentration Units: ug/L								
Naphthalene	10.0	8.57	9.73	9.15	92	53-111	13	33
Fluorene	2.00	1.79	2.03	1.91	96	59-123	13	26
Pyrene	2.00	1.94	2.21	2.08	104	62-122	13	28
Benzo(a)pyrene	1.00	0.824	0.906	0.865	87	65-117	9.5	22
Indeno(1,2,3-cd)pyrene	1.00	0.956	1.05	1.00	100	53-153	9.4	22

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

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Environmental Services

SINGLE CONTROL SAMPLE REPORT
High Performance Liquid Chromatography

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 8310-A				
Matrix: AQUEOUS				
QC Lot: 12 MAR 97-01 QC Run: 12 MAR 97-01				
Concentration Units: ug/L				
Terphenyl-d14	20.0	17.8	89	37-123

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

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METHOD BLANK REPORT
High Performance Liquid Chromatography

Analyte	Result	Units	Reporting Limit	
Test: 8310-HPLC-A				
Matrix: AQUEOUS				
QC Lot: 12 MAR 97-01 QC Run: 12 MAR 97-01				
Naphthalene	ND	ug/L	1.0	
Acenaphthylene	ND	ug/L	1.0	
Acenaphthene	ND	ug/L	1.0	
Fluorene	0.19	ug/L	0.20	J
Phenanthrene	ND	ug/L	0.20	
Anthracene	ND	ug/L	0.10	
Fluoranthene	ND	ug/L	0.20	
Pyrene	ND	ug/L	0.20	
Benzo(a)anthracene	ND	ug/L	0.10	
Chrysene	ND	ug/L	0.20	
Benzo(b)fluoranthene	ND	ug/L	0.10	
Benzo(k)fluoranthene	ND	ug/L	0.10	
Benzo(a)pyrene	ND	ug/L	0.10	
Dibenz(a,h)anthracene	ND	ug/L	0.20	
Benzo(g,h,i)perylene	ND	ug/L	0.20	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.20	
Test: 8310-HPLC-A				
Matrix: AQUEOUS				
QC Lot: 12 MAR 97-01 QC Run: 12 MAR 97-01				
Naphthalene	ND	ug/L	1.0	
Acenaphthylene	ND	ug/L	1.0	
Acenaphthene	ND	ug/L	1.0	
Fluorene	0.19	ug/L	0.20	J
Phenanthrene	ND	ug/L	0.20	
Anthracene	ND	ug/L	0.10	
Fluoranthene	ND	ug/L	0.20	
Pyrene	ND	ug/L	0.20	
Benzo(a)anthracene	ND	ug/L	0.10	
Chrysene	ND	ug/L	0.20	
Benzo(b)fluoranthene	ND	ug/L	0.10	
Benzo(k)fluoranthene	ND	ug/L	0.10	
Benzo(a)pyrene	ND	ug/L	0.10	
Dibenz(a,h)anthracene	ND	ug/L	0.20	
Benzo(g,h,i)perylene	ND	ug/L	0.20	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.20	

J = Result is detected below the reporting limit or is an estimated concentration.

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Environmental Services

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
High Performance Liquid Chromatography
Project: 054057

Category: 8310-A Polynuclear Aromatic Hydrocarbons by HPLC
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 12 MAR 97-01Z
Units: ug/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Naphthalene	ND	8.74	9.16	9.43	9.62	93	95	53-111	2.7	33
Fluorene	ND	1.87	1.82	1.89	1.92	99	95	59-123	4.3	26
Pyrene	ND	2.00	2.02	1.89	1.92	106	105	62-122	0.5	28
Benzo(a)pyrene	ND	0.834	0.851	0.943	0.962	88	88	65-117	0.0	22
Indeno(1,2,3-cd) pyrene	ND	0.981	1.01	0.943	0.962	104	105	53-153	0.9	22

Category: 8310-A Polynuclear Aromatic Hydrocarbons by HPLC
Matrix: AQUEOUS
Sample: 054070-0003
MS Run: 12 MAR 97-01
Units: ug/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Naphthalene	ND	9.58	9.13	9.80	9.90	98	92	53-111	5.8	33
Fluorene	ND	1.87	1.79	1.96	1.98	95	90	59-123	5.4	26
Pyrene	ND	2.11	2.10	1.96	1.98	108	106	62-122	1.5	28
Benzo(a)pyrene	ND	0.856	0.814	0.980	0.990	87	82	65-117	6.0	22
Indeno(1,2,3-cd) pyrene	ND	0.969	0.935	0.980	0.990	99	94	53-153	4.6	22

ND = Not Detected

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

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Environmental Services

QC LOT ASSIGNMENT REPORT
Metals Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
054057-0001-SA	AQUEOUS	PB-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054057-0001-SA	AQUEOUS	AS-FAA-AT	10 MAR 97-SA	10 MAR 97-SA
054057-0001-SA	AQUEOUS	SE-FAA-AT	10 MAR 97-SA	10 MAR 97-SA
054057-0001-SA	AQUEOUS	TL-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054057-0001-SA	AQUEOUS	HG-CVAA-AT	12 MAR 97-N1	12 MAR 97-N1
054057-0001-SA	AQUEOUS	CD-FAA-AT	07 MAR 97-SA	07 MAR 97-SA
054057-0001-SA	AQUEOUS	CR-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054057-0001-SA	AQUEOUS	SB-FAA-AT	19 MAR 97-N3	19 MAR 97-N3
054057-0001-SA	AQUEOUS	AG-FAA-AT	07 MAR 97-SA	07 MAR 97-SA
054057-0001-SA	AQUEOUS	ICP-AT	19 MAR 97-N3	19 MAR 97-N3
054057-0001-MS	AQUEOUS	PB-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054057-0001-MS	AQUEOUS	AS-FAA-AT	10 MAR 97-SA	10 MAR 97-SA
054057-0001-MS	AQUEOUS	SE-FAA-AT	10 MAR 97-SA	10 MAR 97-SA
054057-0001-MS	AQUEOUS	TL-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054057-0001-MS	AQUEOUS	HG-CVAA-AT	12 MAR 97-N1	12 MAR 97-N1
054057-0001-MS	AQUEOUS	CD-FAA-AT	07 MAR 97-SA	07 MAR 97-SA
054057-0001-MS	AQUEOUS	CR-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054057-0001-MS	AQUEOUS	SB-FAA-AT	19 MAR 97-N3	19 MAR 97-N3
054057-0001-MS	AQUEOUS	AG-FAA-AT	07 MAR 97-SA	07 MAR 97-SA
054057-0001-MS	AQUEOUS	ICP-AT	19 MAR 97-N3	19 MAR 97-N3
054057-0001-SD	AQUEOUS	PB-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054057-0001-SD	AQUEOUS	AS-FAA-AT	10 MAR 97-SA	10 MAR 97-SA
054057-0001-SD	AQUEOUS	SE-FAA-AT	10 MAR 97-SA	10 MAR 97-SA
054057-0001-SD	AQUEOUS	TL-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054057-0001-SD	AQUEOUS	HG-CVAA-AT	12 MAR 97-N1	12 MAR 97-N1
054057-0001-SD	AQUEOUS	CD-FAA-AT	07 MAR 97-SA	07 MAR 97-SA
054057-0001-SD	AQUEOUS	CR-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054057-0001-SD	AQUEOUS	SB-FAA-AT	19 MAR 97-N3	19 MAR 97-N3
054057-0001-SD	AQUEOUS	AG-FAA-AT	07 MAR 97-SA	07 MAR 97-SA
054057-0001-SD	AQUEOUS	ICP-AT	19 MAR 97-N3	19 MAR 97-N3
054057-0002-SA	AQUEOUS	PB-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054057-0002-SA	AQUEOUS	AS-FAA-AT	10 MAR 97-SA	10 MAR 97-SA
054057-0002-SA	AQUEOUS	SE-FAA-AT	10 MAR 97-SA	10 MAR 97-SA
054057-0002-SA	AQUEOUS	TL-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054057-0002-SA	AQUEOUS	HG-CVAA-AT	12 MAR 97-N1	12 MAR 97-N1
054057-0002-SA	AQUEOUS	CD-FAA-AT	07 MAR 97-SA	07 MAR 97-SA
054057-0002-SA	AQUEOUS	CR-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054057-0002-SA	AQUEOUS	SB-FAA-AT	19 MAR 97-N3	19 MAR 97-N3
054057-0002-SA	AQUEOUS	AG-FAA-AT	07 MAR 97-SA	07 MAR 97-SA
054057-0002-SA	AQUEOUS	ICP-AT	19 MAR 97-N3	19 MAR 97-N3
054057-0003-SA	AQUEOUS	PB-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054057-0003-SA	AQUEOUS	AS-FAA-AT	10 MAR 97-SA	10 MAR 97-SA
054057-0003-SA	AQUEOUS	SE-FAA-AT	10 MAR 97-SA	10 MAR 97-SA
054057-0003-SA	AQUEOUS	TL-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054057-0003-SA	AQUEOUS	HG-CVAA-AT	12 MAR 97-N1	12 MAR 97-N1
054057-0003-SA	AQUEOUS	CD-FAA-AT	07 MAR 97-SA	07 MAR 97-SA
054057-0003-SA	AQUEOUS	CR-FAA-AT	07 MAR 97-SB	07 MAR 97-SB

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QC LOT ASSIGNMENT REPORT
Metals Analysis and Preparation (cont.)

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
054057-0003-SA	AQUEOUS	SB-FAA-AT	19 MAR 97-N3	19 MAR 97-N3
054057-0003-SA	AQUEOUS	AG-FAA-AT	07 MAR 97-SA	07 MAR 97-SA
054057-0003-SA	AQUEOUS	ICP-AT	19 MAR 97-N3	19 MAR 97-N3

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DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limits
Category: PB-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-SB Concentration Units: mg/L								
Lead	0.0400	0.0420	0.0415	0.0418	104	84-124	1.2	10
Category: AS-FAA-AT Matrix: AQUEOUS QC Lot: 10 MAR 97-SA Concentration Units: mg/L								
Arsenic	0.0400	0.0456	0.0458	0.0457	114	85-114	0.44	10
Category: SE-FAA-AT Matrix: AQUEOUS QC Lot: 10 MAR 97-SA Concentration Units: mg/L								
Selenium	0.0400	0.0393	0.0400	0.0396	99	80-118	1.8	10
Category: TL-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-SB Concentration Units: mg/L								
Thallium	0.0400	0.0375	0.0368	0.0372	93	84-124	1.9	10
Category: HG-CVAA-AT Matrix: AQUEOUS QC Lot: 12 MAR 97-N1 Concentration Units: mg/L								
Mercury	0.00100	0.00102	0.00101	0.00101	101	77-117	0.89	10

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

Quanterra Environmental Services

DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation (cont.)

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precision (RPD) DCS	Precision (RPD) Limits
Category: CD-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-SA Concentration Units: mg/L								
Cadmium	0.0040	0.00417	0.00433	0.00425	106	83-123	3.8	10
Category: CR-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-SB Concentration Units: mg/L								
Chromium	0.0100	0.0110	0.0109	0.0110	110	81-121	0.91	14
Category: SB-FAA-AT Matrix: AQUEOUS QC Lot: 19 MAR 97-N3 Concentration Units: mg/L								
Antimony	0.500	0.527	0.524	0.526	105	83-123	0.57	14
Category: AG-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-SA Concentration Units: mg/L								
Silver	0.0050	0.00504	0.00516	0.00510	102	81-121	2.4	15
Category: ICP-AT Matrix: AQUEOUS QC Lot: 19 MAR 97-N3 Concentration Units: mg/L								
Aluminum	2.00	2.07	2.07	2.07	103	86-117	0.40	10
Antimony	0.500	0.522	0.515	0.519	104	81-119	1.4	10
Arsenic	2.00	1.97	1.98	1.98	99	81-110	0.60	10
Barium	2.00	2.04	2.06	2.05	103	86-114	1.0	10
Beryllium	0.0500	0.0480	0.0485	0.0482	97	83-117	1.0	10
Boron	1.00	1.05	1.05	1.05	105	82-122	0.29	10
Cadmium	0.0500	0.0446	0.0460	0.0453	91	80-120	3.2	17
Calcium	50.0	50.6	51.2	50.9	102	88-112	1.2	10

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

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Environmental Services

DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation (cont.)

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limits
Category: ICP-AT								
Matrix: AQUEOUS								
QC Lot: 19 MAR 97-N3								
Concentration Units: mg/L								
Chromium	0.200	0.203	0.202	0.202	101	83-112	0.61	10
Cobalt	0.500	0.532	0.533	0.533	107	80-120	0.12	10
Copper	0.250	0.252	0.256	0.254	102	84-115	1.6	10
Iron	1.00	1.03	1.06	1.04	104	87-117	2.1	10
Lead	0.500	0.511	0.484	0.498	100	83-114	5.4	15
Lithium	1.00	0.878	0.877	0.878	88	80-120	0.11	10
Magnesium	50.0	50.6	51.6	51.1	102	84-114	1.9	10
Manganese	0.500	0.516	0.518	0.517	103	84-113	0.34	10
Molybdenum	1.00	1.02	1.03	1.03	103	80-120	1.2	10
Nickel	0.500	0.507	0.505	0.506	101	85-112	0.22	10
Potassium	50.0	48.1	48.7	48.4	97	82-111	1.3	10
Selenium	2.00	2.05	2.00	2.02	101	86-111	2.3	10
Silver	0.0500	0.0465	0.0472	0.0468	94	83-115	1.6	10
Sodium	50.0	51.6	51.0	51.3	103	86-115	1.2	10
Tin	2.00	2.07	2.08	2.08	104	86-114	0.50	10
Titanium	1.00	1.04	1.05	1.05	105	87-112	0.82	10
Vanadium	0.500	0.511	0.516	0.514	103	85-114	1.0	10
Zinc	0.500	0.493	0.498	0.495	99	82-113	0.97	10

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

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Environmental Services

METHOD BLANK REPORT
Metals Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: PB-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-SB QC Run: 07 MAR 97-SB			
Lead	ND	mg/L	0.0050
Test: AS-FAA-AT Matrix: AQUEOUS QC Lot: 10 MAR 97-SA QC Run: 10 MAR 97-SA			
Arsenic	ND	mg/L	0.0050
Test: SE-FAA-AT Matrix: AQUEOUS QC Lot: 10 MAR 97-SA QC Run: 10 MAR 97-SA			
Selenium	ND	mg/L	0.0050
Test: TL-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-SB QC Run: 07 MAR 97-SB			
Thallium	ND	mg/L	0.0050
Test: HG-CVAA-7470-AT Matrix: AQUEOUS QC Lot: 12 MAR 97-N1 QC Run: 12 MAR 97-N1			
Mercury	ND	mg/L	0.00020
Test: CD-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-SA QC Run: 07 MAR 97-SA			
Cadmium	ND	mg/L	0.00050

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Environmental Services

METHOD BLANK REPORT
Metals Analysis and Preparation (cont.)

Analyte	Result	Units	Reporting Limit
Test: CR-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 07 MAR 97-SB QC Run: 07 MAR 97-SB			
Chromium	ND	mg/L	0.0050
Test: SB-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 19 MAR 97-N3 QC Run: 19 MAR 97-N3			
Antimony	ND	mg/L	0.010
Test: AG-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 07 MAR 97-SA QC Run: 07 MAR 97-SA			
Silver	ND	mg/L	0.00050
Test: ICP-AT			
Matrix: AQUEOUS			
QC Lot: 19 MAR 97-N3 QC Run: 19 MAR 97-N3			
Antimony	ND	mg/L	0.060
Arsenic	ND	mg/L	0.10
Barium	ND	mg/L	0.010
Beryllium	ND	mg/L	0.0020
Cadmium	ND	mg/L	0.0050
Calcium	ND	mg/L	0.20
Chromium	ND	mg/L	0.010
Cobalt	ND	mg/L	0.010
Copper	ND	mg/L	0.020
Iron	ND	mg/L	0.10
Lead	ND	mg/L	0.050
Magnesium	ND	mg/L	0.20
Manganese	ND	mg/L	0.010
Molybdenum	ND	mg/L	0.020
Nickel	ND	mg/L	0.040
Selenium	ND	mg/L	0.20
Silver	ND	mg/L	0.010
Sodium	ND	mg/L	5.0
Thallium	ND	mg/L	2.0
Tin	ND	mg/L	0.10

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Environmental Services

METHOD BLANK REPORT
Metals Analysis and Preparation (cont.)

Analyte	Result	Units	Reporting Limit
Test: ICP-AT			
Matrix: AQUEOUS			
QC Lot: 19 MAR 97-N3 QC Run: 19 MAR 97-N3			
Vanadium	ND	mg/L	0.010
Zinc	ND	mg/L	0.020
Test: PB-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 07 MAR 97-SB QC Run: 07 MAR 97-SB			
Lead	ND	mg/L	0.0050
Test: AS-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 10 MAR 97-SA QC Run: 10 MAR 97-SA			
Arsenic	ND	mg/L	0.0050
Test: SE-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 10 MAR 97-SA QC Run: 10 MAR 97-SA			
Selenium	ND	mg/L	0.0050
Test: TL-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 07 MAR 97-SB QC Run: 07 MAR 97-SB			
Thallium	ND	mg/L	0.0050
Test: HG-CVAA-7470-AT			
Matrix: AQUEOUS			
QC Lot: 12 MAR 97-N1 QC Run: 12 MAR 97-N1			
Mercury	ND	mg/L	0.00020

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Environmental Services

METHOD BLANK REPORT
Metals Analysis and Preparation (cont.)

Analyte	Result	Units	Reporting Limit
Test: CD-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 07 MAR 97-SA QC Run: 07 MAR 97-SA			
Cadmium	ND	mg/L	0.00050
Test: CR-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 07 MAR 97-SB QC Run: 07 MAR 97-SB			
Chromium	ND	mg/L	0.0050
Test: SB-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 19 MAR 97-N3 QC Run: 19 MAR 97-N3			
Antimony	ND	mg/L	0.010
Test: AG-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 07 MAR 97-SA QC Run: 07 MAR 97-SA			
Silver	ND	mg/L	0.00050
Test: ICP-AT			
Matrix: AQUEOUS			
QC Lot: 19 MAR 97-N3 QC Run: 19 MAR 97-N3			
Antimony	ND	mg/L	0.060
Arsenic	ND	mg/L	0.10
Barium	ND	mg/L	0.010
Beryllium	ND	mg/L	0.0020
Cadmium	ND	mg/L	0.0050
Calcium	ND	mg/L	0.20
Chromium	ND	mg/L	0.010
Cobalt	ND	mg/L	0.010
Copper	ND	mg/L	0.020
Iron	ND	mg/L	0.10
Lead	ND	mg/L	0.050
Magnesium	ND	mg/L	0.20
Manganese	ND	mg/L	0.010

Quanterra
Environmental Services

METHOD BLANK REPORT
Metals Analysis and Preparation (cont.)

Test: ICP-AT
Matrix: AQUEOUS
QC Lot: 19 MAR 97-N3 QC Run: 19 MAR 97-N3

Analyte	Result	Units	Reporting Limit
Molybdenum	ND	mg/L	0.020
Nickel	ND	mg/L	0.040
Selenium	ND	mg/L	0.20
Silver	ND	mg/L	0.010
Sodium	ND	mg/L	5.0
Thallium	ND	mg/L	2.0
Tin	ND	mg/L	0.10
Vanadium	ND	mg/L	0.010
Zinc	ND	mg/L	0.020

Quanterra
Environmental Services

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
Metals Analysis and Preparation
Project: 054057

Category: PB-FAA-AT Lead, Furnace AA / Total Metals
Matrix; AQUEOUS
Sample: 054057-0001
MS Run: 07 MAR 97-SB
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Lead	ND	G 0.0308	0.0308	0.0400	0.0400	77	77	84-124	0.0	10

Category: AS-FAA-AT Arsenic, Furnace AA / Total Metals
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 10 MAR 97-SA
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Arsenic	0.0052	0.0485	0.0475	0.0400	0.0400	108	106	85-114	2.1	10

Category: SE-FAA-AT Selenium, Furnace AA / Total Metals
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 10 MAR 97-SA
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Selenium	ND	G 0.0351	0.0363	0.0400	0.0400	88	91	80-118	3.4	10

G = Reporting limit raised due to the matrix of the sample.
ND = Not Detected

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

Quanterra
Environmental Services

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
Metals Analysis and Preparation
Project: 054057 (cont.)

Category: TL-FAA-AT Thallium, Furnace AA / Total Metals
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 07 MAR 97-SB
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Thallium	ND	G 0.032	0.032	0.040	0.040	80	80	84-124	0.3	10

Category: HG-CVAA-AT Mercury by CVAA / Total Mercury
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 12 MAR 97-N1
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Mercury	ND	0.000990	0.00100	0.0010	0.0010	99	100	77-117	1.5	10

Category: CD-FAA-AT Cadmium,Furnace AA/ Total Metals
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 07 MAR 97-SA
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Cadmium	ND	0.00462	0.00461	0.0040	0.0040	116	115	83-123	0.2	10

G = Reporting limit raised due to the matrix of the sample.
ND = Not Detected

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

Quanterra
Environmental Services

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
Metals Analysis and Preparation
Project: 054057 (cont.)

Category: CR-FAA-AT Chromium, Furnace AA, Total
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 07 MAR 97-SB
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Chromium	0.0057	0.0131	0.0131	0.0100	0.0100	74	74	81-121	0.0	14

Category: SB-FAA-AT Antimony by Furnace
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 19 MAR 97-N3
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Antimony	ND	0.527	0.539	0.500	0.500	105	108	83-123	2.3	14

Category: AG-FAA-AT Silver,Furnace AA/Total Metals
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 07 MAR 97-SA
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Silver	ND	0.00414	0.00423	0.0050	0.0050	83	85	81-121	2.2	15

ND = Not Detected

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

Quanterra
Environmental Services

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
Metals Analysis and Preparation
Project: 054057 (cont.)

Category: ICP-AT ICP Metals / Total
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 19 MAR 97-N3B
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Aluminum	NA	NA	NA	2.00	2.00	NC	NC	86-117	NC	10
Antimony	ND	0.511	0.509	0.500	0.500	102	102	81-119	0.4	10
Arsenic	ND	1.96	1.98	2.00	2.00	98	99	81-110	1.0	10
Barium	0.034	2.03	2.04	2.00	2.00	100	100	86-114	0.4	10
Beryllium	ND	0.0479	0.0490	0.0500	0.0500	96	98	83-117	2.2	10
Boron	NA	NA	NA	1.00	1.00	NC	NC	82-122	NC	10
Cadmium	ND	0.0414	0.0442	0.0500	0.0500	83	88	80-120	6.7	17
Calcium	51.7	100	100	50.0	50.0	98	97	88-112	0.4	10
Chromium	ND	0.200	0.198	0.200	0.200	100	99	83-112	1.0	10
Cobalt	ND	0.519	0.516	0.500	0.500	104	103	80-120	0.6	10
Copper	ND	0.247	0.248	0.250	0.250	99	99	84-115	0.5	10
Iron	ND	1.06	1.06	1.00	1.00	106	106	87-117	0.0	10
Lead	ND	0.494	0.466	0.500	0.500	99	93	83-114	5.8	15
Lithium	NA	NA	NA	1.00	1.00	NC	NC	80-120	NC	10
Magnesium	46.0	96.9	97.5	50.0	50.0	102	103	84-114	0.6	10
Manganese	ND	0.508	0.509	0.500	0.500	102	102	84-113	0.1	10
Molybdenum	ND	NA	NA	1.00	1.00	NC	NC	80-120	NC	10
Nickel	ND	0.492	0.493	0.500	0.500	98	99	85-112	0.1	10
Potassium	NA	NA	NA	50.0	50.0	NC	NC	82-111	NC	10
Selenium	ND	2.03	2.03	2.00	2.00	102	101	86-111	0.1	10
Silver	ND	0.0452	0.0477	0.0500	0.0500	90	95	83-115	5.2	10
Sodium	40.9	91.4	90.6	50.0	50.0	101	100	86-115	0.8	10
Strontium	NA	NA	NA	1.00	1.00	NC	NC	80-120	NC	20
Thallium	ND	2.12	2.22	2.00	2.00	106	111	80-120	4.4	20
Tin	ND	2.07	2.06	2.00	2.00	103	103	86-114	0.6	10
Titanium	NA	NA	NA	1.00	1.00	NC	NC	87-112	NC	10
Vanadium	0.028	0.533	0.529	0.500	0.500	101	100	85-114	0.6	10
Zinc	ND	0.485	0.489	0.500	0.500	97	98	82-113	0.8	10

NA = Not Applicable
NC = Not Calculated, calculation not applicable.
ND = Not Detected

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

Quanterra
Environmental Services

QC LOT ASSIGNMENT REPORT
Wet Chemistry Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
054057-0001-SA	AQUEOUS	TOX-A	27 MAR 97-N1	27 MAR 97-N1
054057-0001-SA	AQUEOUS	CN-A	11 MAR 97-N1	11 MAR 97-N1
054057-0001-SA	AQUEOUS	S-A	11 MAR 97-S1	11 MAR 97-S1
054057-0001-SA	AQUEOUS	TOC-9060-A	19 MAR 97-N1	19 MAR 97-N1
054057-0001-MS	AQUEOUS	TOX-A	27 MAR 97-N1	27 MAR 97-N1
054057-0001-MS	AQUEOUS	CN-A	11 MAR 97-N1	11 MAR 97-N1
054057-0001-MS	AQUEOUS	S-A	11 MAR 97-S1	11 MAR 97-S1
054057-0001-MS	AQUEOUS	TOC-9060-A	19 MAR 97-N1	19 MAR 97-N1
054057-0001-SD	AQUEOUS	TOX-A	27 MAR 97-N1	27 MAR 97-N1
054057-0001-SD	AQUEOUS	CN-A	11 MAR 97-N1	11 MAR 97-N1
054057-0001-SD	AQUEOUS	S-A	11 MAR 97-S1	11 MAR 97-S1
054057-0001-SD	AQUEOUS	TOC-9060-A	19 MAR 97-N1	19 MAR 97-N1
054057-0002-SA	AQUEOUS	TOX-A	27 MAR 97-N1	27 MAR 97-N1
054057-0002-SA	AQUEOUS	CN-A	11 MAR 97-N1	11 MAR 97-N1
054057-0002-SA	AQUEOUS	S-A	11 MAR 97-S1	11 MAR 97-S1
054057-0002-SA	AQUEOUS	TOC-9060-A	19 MAR 97-N1	19 MAR 97-N1
054057-0003-SA	AQUEOUS	TOX-A	27 MAR 97-N1	27 MAR 97-N1
054057-0003-SA	AQUEOUS	CN-A	11 MAR 97-N1	11 MAR 97-N1
054057-0003-SA	AQUEOUS	S-A	11 MAR 97-S1	11 MAR 97-S1
054057-0003-SA	AQUEOUS	TOC-9060-A	19 MAR 97-N1	19 MAR 97-N1

Quanterra
Environmental Services

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limits
Category: TOX-A Matrix: AQUEOUS QC Lot: 27 MAR 97-N1 Concentration Units: ug/L								
Total Organic Halogen as Cl	100	83.6	86.2	84.9	85	84-110	3.0	13
Category: CN-A Matrix: AQUEOUS QC Lot: 11 MAR 97-N1 Concentration Units: mg/L								
Cyanide	0.176	0.194	0.196	0.195	111	72-118	1.2	18
Category: S-A Matrix: AQUEOUS QC Lot: 11 MAR 97-S1 Concentration Units: mg/L								
Sulfide, Total	0.471	0.502	0.500	0.501	106	79-131	0.34	10
Category: TOC-9060-A Matrix: AQUEOUS QC Lot: 19 MAR 97-N1 Concentration Units: mg/L								
Total Organic Carbon	30.0	29.7	29.4	29.6	99	90-110	1.0	10

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

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Environmental Services

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TOX-TOX-A Matrix: AQUEOUS QC Lot: 27 MAR 97-N1 QC Run: 27 MAR 97-N1			
Total Organic Halogen as Cl	ND	ug/L	30.0
Test: CNTOT-TEC-A Matrix: AQUEOUS QC Lot: 11 MAR 97-N1 QC Run: 11 MAR 97-N1			
Cyanide	ND	mg/L	0.010
Test: S-SPEC-AT Matrix: AQUEOUS QC Lot: 11 MAR 97-S1 QC Run: 11 MAR 97-S1			
Sulfide, Total	ND	mg/L	0.050
Test: TOC-TOC-A Matrix: AQUEOUS QC Lot: 19 MAR 97-N1 QC Run: 19 MAR 97-N1			
Total Organic Carbon	ND	mg/L	1.0
Test: TOX-TOX-A Matrix: AQUEOUS QC Lot: 27 MAR 97-N1 QC Run: 27 MAR 97-N1			
Total Organic Halogen as Cl	ND	ug/L	30.0
Test: CNTOT-TEC-A Matrix: AQUEOUS QC Lot: 11 MAR 97-N1 QC Run: 11 MAR 97-N1			
Cyanide	ND	mg/L	0.010

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Environmental Services

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation (cont.)

Analyte	Result	Units	Reporting Limit
Test: S-SPEC-AT Matrix: AQUEOUS QC Lot: 11 MAR 97-S1 QC Run: 11 MAR 97-S1			
Sulfide, Total	ND	mg/L	0.050
Test: TOC-TOC-A Matrix: AQUEOUS QC Lot: 19 MAR 97-N1 QC Run: 19 MAR 97-N1			
Total Organic Carbon	ND	mg/L	1.0

Quanterra
Environmental Services

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
Wet Chemistry Analysis and Preparation
Project: 054057

Category: TOX-A Total Organic Halogen
Matrix; AQUEOUS
Sample: 054057-0001
MS Run: 27 MAR 97-N1
Units: ug/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Total Organic Halogen as Cl	ND	87.0	86.6	100	100	87	87	84-110	0.4	13

Category: CN-A Cyanide
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 11 MAR 97-N1
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Cyanide	ND	0.222	0.227	0.198	0.198	112	115	72-118	2.4	18

Category: S-A Sulfide
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 11 MAR 97-S1
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Sulfide, Total	ND	0.406	0.438	0.449	0.449	90	98	79-131	7.6	10

ND = Not Detected

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

Quanterra
Environmental Services

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
Wet Chemistry Analysis and Preparation
Project: 054057 (cont.)

Category: TOC-9060-A Total Organic Carbon
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 19 MAR 97-N1
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Total Organic Carbon	ND	25.0	24.8	25.0	25.0	100	99	90-110	0.8	10

ND = Not Detected

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

U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQUEST/CHAIN OF CUSTODY

057

Project Name & Number: Cannon Air Force Base, Ground Water Sampling 463536004	PACKING AND SHIPPING DETAILS
	Packed and Sealed for Shipping by: F. Eileen Roybal — Seal Number: 081586
Sampling Location: Landfill-5, Cannon Air Force Base, NM	Delivered to Shipper by: F. Eileen Roybal — Airbill Number: 2767643421
Team Leader: F. Eileen Roybal	Sampling Status: ☒ Done ☐ Continuing

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
5 MAR97	1030	CAFB- I-0397-1	Ground-water	16	AllApx-IX: SW8260,SW8270,SW8280,SW8310,SW8080,SW8150, Total-METALS: SW6010 (Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu, Fe,Pb,Mg,Mn,Mo,Hg,Ni,Ag,Se,Na,Tl,Sn,V,Zn), plus SW7041,SW7060, SW7131,SW7191,SW7421,SW7740,SW7761,SW7841; SW9012, SW9030,SW9060,SW9020	Environmental Sample 01

Additional Comments: VOC's are in cooler with air bill # 2767643303

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☐ Yes ☐ No
F. Eileen Roybal		5MAR97	1200	Quanterra Environmental 4955 Yarrow Street Arvada, CO 80002 ph: (303) 421-6611 Attention: Lindsay Breyer	Condition of Contents
	[illegible]	3/6/97	9:00		Contents Temperature
					Laboratory Project Number

U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQUEST/CHAIN OF CUSTODY

1057

Project Name & Number	PACKING AND SHIPPING DETAILS	
Cannon Air Force Base, Ground Water Sampling 463536004	Packed and Sealed for Shipping by: F. Eileen Roybal	Seal Number: C81587
Sampling Location: Landfill-5, Cannon Air Force Base, NM	Delivered to Shipper by: F. Eileen Roybal	Airbill Number: 2767643410
Team Leader: F. Eileen Roybal	Sampling Status: ☒ Done ☐ Continuing	

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
5 MAR97	1030	CAFB-I-0397-MS	Ground-water	16	AllApx-IX: SW8260,SW8270,SW8280,SW8310,SW8080,SW8150, Total-METALS: SW6010 (Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu, Fe,Pb,Mg,Mn,Mo,Hg,Ni,Ag,Se,Na,Tl,Sn,V,Zn), plus SW7041,SW7060, SW7131,SW7191,SW7421,SW7740,SW7761,SW7841; SW9012, SW9030,SW9060,SW9020	~~Environmental Sample~~ Matrix Spike 01 MS

Additional Comments: VOC's are in cooler with airbill # 2767643303

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☐ Yes ☐ No
F. Eileen Roybal		5MAR97	1200	Quanterra Environmental 4955 Yarrow Street Arvada, CO 80002 ph: (303) 421-6611 Attention: Lindsay Breyer	Condition of Contents
	[illegible]	3-6-97	9:00		Contents Temperature
					Laboratory Project Number

U.S. GEOLOGICAL SURVEY, WATER R[illegible]URCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQU[illegible]T/CHAIN OF CUSTODY

257

Project Name & Number: Cannon Air Force Base, Ground Water Sampling 463536004	PACKING AND SHIPPING DETAILS
	Packed and Sealed for Shipping by: F. Eileen Roybal — Seal Number: 081584
Sampling Location: Landfill-5, Cannon Air Force Base, NM	Delivered to Shipper by: F. Eileen Roybal — Airbill Number: 2767643406
Team Leader: F. Eileen Roybal	Sampling Status: ☒ Done ☐ Continuing

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
5 MAR97	1030	CAFB-I-0397-25D	Ground-water	16	AllApx-IX: SW8260,SW8270,SW8280,SW8310,SW8080,SW8150, Total-METALS: SW6010 (Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu, Fe,Pb,Mg,Mn,Mo,Hg,Ni,Ag,Se,Na,Tl,Sn,V,Zn), plus SW7041,SW7060, SW7131,SW7191,SW7421,SW7740,SW7761,SW7841; SW9012, SW9030,SW9060,SW9020	~~Environmental Sample~~ 01 Matrix spike duplicate SD

Additional Comments: VOC's are in cooler with air bill # 2767643303

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☐ Yes ☐ No
F. Eileen Roybal		5MAR97	1200	Quanterra Environmental 4955 Yarrow Street Arvada, CO 80002 ph: (303) 421-6611 Attention: Lindsay Breyer	Condition of Contents
	[illegible]	3/6/97	9:00		Contents Temperature
					Laboratory Project Number

U.S. GEOLOGICAL SURVEY, WATER R[illegible]URCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQ[illegible]T/CHAIN OF CUSTODY

,057

Project Name & Number: Cannon Air Force Base, Ground Water Sampling 463536004	PACKING AND SHIPPING DETAILS
Sampling Location: Landfill-5, Cannon Air Force Base, NM	Packed and Sealed for Shipping by: F. Eileen Roybal; Seal Number: 081585
Team Leader: F. Eileen Roybal	Delivered to Shipper by: F. Eileen Roybal; Airbill Number: 2767643432
	Sampling Status: ☐ Done ☒ Continuing

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
5 MAR97	0901	CAFB-X -0397-1	Ground-water	16	AllApx-IX: SW8260,SW8270,SW8280,SW8310,SW8080,SW8150, Total-METALS: SW6010 (Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu, Fe,Pb,Mg,Mn,Mo,Hg,Ni,Ag,Se,Na,Tl,Sn,V,Zn), plus SW7041,SW7060, SW7131,SW7191,SW7421,SW7740,SW7761,SW7841; SW9012, SW9030,SW9060,SW9020	Environmental Sample 02

Additional Comments: VOC's are in cooler with air bill # 2767643303

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☐ Yes ☐ No
F. Eileen Roybal		5 MAR97	1200	Quanterra Environmental 4955 Yarrow Street Arvada, CO 80002 ph: (303) 421-6611 Attention: Lindsay Breyer	Condition of Contents
	[illegible]	3/6/97	9.00		Contents Temperature
					Laboratory Project Number

U.S. GEOLOGICAL SURVEY, WATER R URCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQU T/CHAIN OF CUSTODY

-4057

Project Name & Number: Cannon Air Force Base, Ground Water Sampling 463536004	PACKING AND SHIPPING DETAILS
	Packed and Sealed for Shipping by: F. Eileen Roybal — Seal Number: 08/5 83
Sampling Location: Landfill-5, Cannon Air Force Base, NM	Delivered to Shipper by: F. Eileen Roybal — Airbill Number: 2767643313
Team Leader: F. Eileen Roybal	Sampling Status: ☐ Done ☒ Continuing

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
5 MAR97	0900	CAFB- L -0397-1	Ground-water	16	AllApx-IX: SW8260,SW8270,SW8280,SW8310,SW8080,SW8150, Total-METALS: SW6010 (Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu, Fe,Pb,Mg,Mn,Mo,Hg,Ni,Ag,Se,Na,Tl,Sn,V,Zn), plus SW7041,SW7060, SW7131,SW7191,SW7421,SW7740,SW7761,SW7841; SW9012, SW9030,SW9060,SW9020	Environmental Sample 03
5MAR97	0800	CAFB-L-0397-TB	Ultra Pure water	3	SW8260	Trip Blank 04 TB

Additional Comments: All VOC's from Well I and MS, SD, and from X are in this cooler-

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☐ Yes ☐ No
F. Eileen Roybal		5MAR97	1200	Quanterra Environmental 4955 Yarrow Street Arvada, CO 80002 ph: (303) 421-6611 Attention: Lindsay Breyer	Condition of Contents
	[illegible signature]	3/6/97	9:10		Contents Temperature
					Laboratory Project Number

Sample Checklist

Quanterra Environmental Services

Project #: 054057 Date/Time Received: 3-6-97 @9:00

Company Name & Sampling Site: USGS- Camm AFB

*Cooler #(s): _____ _____ _____ _____ _____ _____ _____ _____

Temperatures: 4.4 4.5 5.7 3.3 2.6 _____ _____ _____

*Place copy of airbill inside all non-QUANTERRA coolers. Describe here.

Unpacking & Labeling Check Points:

Yes	No		Initials
☐	☐	1. Radiation checked, record if reading > 0.5 mR/hr. (_____mR/hr)	KU
☑	☐	2. Cooler seals intact.	
☑	☐	3. Chain of custody present.	
☐	☑	4. Bottles broken and/or are leaking, comment if yes.	
		PHOTOGRAPH BROKEN BOTTLES	
☑	☐	5. Containers labeled, comment if no.	
☐	☐	6. pH of all samples checked and meet requirements, note exceptions.	
☑	☐	7. Chain of custody includes "received by" and "relinquished" by signatures, dates, and times	
☑	☐	8. Chain of custody agrees with bottle count, comment if no.	
☑	☐	9. Chain of custody agrees with labels, comment if no.	
☑	☐	10. VOA samples filled completely, comment if no.	
☑	☐	11. Are VOA bottles preserved, check for labels.	
☐	☐	12. Sediment present in "D," dissolved, bottles. NA	
☐	☑	13. Are analyses with short holding times requested.	
☑	☐	14. Is extra sample volume provided for MS, MSD or matrix duplicates.	
☐	☑	15. Multiphase samples present, comment is yes.	
		PHOTOGRAPH MULTIPHASE SAMPLES	
☑	☐	16. Clear picture taken, labeled, and stapled to project folder.	

Comments: Include action taken to resolve discrepancies/problems. Include a hard copy of e-mail or use extra paper if more space is needed. _____

Initials: _____

DODEC LABORATORY DATA REVIEW WORKSHEET

1.0 GENERAL INFORMATION

Data reviewer: Bob Brock
Date of review: 4/25/97
Sample project number: 54059
Project name: NM-Cannon AFB
Sample collection date: 3/5/97
Sample matrix and number: 6 Aqueous

Type and number of samples in project:

Type	Number
Environmental	3
Trip blank	
Equipment blank	
Ambient blank	
MS/MSD	2
Other	1

2.0 DATA REPORT

Date of Analytical Results Report: 4/7/97
Number of volumes in Raw Data Report: 1
Raw Data Report reviewed? Yes____ No X

Were all analyses requested on the COC form performed by the laboratory?
Yes____ No____

If no, list canceled analyses and reason for non-performance:

Associated samples are reported in project 54057

Were the samples properly preserved upon receipt by the laboratory?
Yes____ No____

If no, list laboratory ID for samples that were not properly preserved.

3.0 ANALYTICAL METHODS

Analytical methods used in this project

	VOC by GC/MS (SW 8240, SW 8260, E524, E624)
	Halogenated VOC by GC (SW 8010)
	Aromatic VOC by GC (SW 8020)
	SVOC by GC/MS (SW 8270)
	PAH by HPLC (SW 8310)
	Organochlorine pesticides and PCB (SW 8080)
	Organophosphorous pesticides (SW 8140)
	Chlorinated herbicides (SW 8150)
X	Dioxins and Furans (SW 8280)
	Explosives (8330)
	TOC (E415.1 or SW 9060)
	TPH (E418.1)
	Oil and Grease (E413.2)
	TOX (SW9020)
	ICP screen for metals (SW 6010)
	ICP/MS screen for metals (SW 6020)
	Trace ICP screen for metals (SW 6010 modified)
	Antimony by GFAA (SW 7041)
	Arsenic by GFAA (SW 7060)
	Chromium (SW 7191 or 7196)
	Lead by GFAA (SW 7421)
	Mercury by CVAA (SW 7470 or 7471)
	Selenium by GFAA (SW 7740)
	Thallium by GFAA (SW 7841)
	Inorganic anions (E300.0)
	Alkalinity (310.1)
	Cyanide, total and amenable (SW 9010/9012)
	Nitrogen, ammonia (E350.1)
	Nitrogen, TKN (E351.2)
	Nitrogen, nitrate (E353.2)
	Nitrogen, nitrate plus nitrite (E353.2)
	Nitrogen, nitrite (E354.1)
	Phosphorous, total or ortho (E365.3)
	Sulfate (E375.4)
	Sulfide (E376.2)
	TDS (E160.1)
	pH (SW 9040 or 9045)
	Percent moisture (D2216)
	Gross alpha and gross beta radioactivity (SW 9310)
	Alpha-emitting radium isotopes (SW 9315)
	Radium-228 (SW 9320)
	Uranium (908.1)
	Other analyses :

Were analytical holding times met? Yes X No _____

If no, list analytical method and laboratory ID for samples that exceeded holding time:

_____
_____
_____
_____
_____
_____

Did surrogate recoveries meet QC acceptance criteria? NA
Yes_____ No _____

If no, list analytical method, laboratory ID, and surrogates that did not meet acceptance criteria:

_____
_____
_____
_____
_____

Did actual reporting limits meet project detection limits? NA
Organic analyses : Yes_____ No_____

If no, list analytical method, laboratory ID, and reason for non-conformance:

_____
_____
_____
_____
_____
_____

Inorganic analyses: Yes_____ No_____ NA

Reporting limits for GFAA metals and inorganic anions may be raised when: (1) sample concentrations exceed the instrument linear range and (2) target analytes are subject to matrix interferences. Reporting limits for ICP metals and mercury by CVAA are typically only raised when the sample concentration exceeds the instrument linear range.

Did DCS meet QC acceptance criteria? Yes X No_____

If no, list analytical method, laboratory ID, and reason for non-conformance:

_____
_____
_____
_____
_____
_____

Did SCS meet QC acceptance criteria? Yes_____ No_____ NA

If no, list analytical method, laboratory ID, and reason for non-conformance:

Were any target compounds found in the method, trip, equipment, or ambient blanks above the RL? Yes _____ No X

If yes, list the analytical method, laboratory ID, type of blank and compound:

Did the MS/MSD meet QC acceptance criteria? Yes X No____

MS/MSD data are used to evaluate the effect of the sample matrix on the analytical process and should only be used in conjunction with other available laboratory QC information to evaluate precision and accuracy.

If no, list the analytical method, laboratory ID, and reason for non-conformance : NOT CLIENT REQUESTED

Additional comments:

INTERNAL STANDARD RECOVERIES WERE WITHIN QC LIMITS FOR ALL SAMPLES (40-120%)

QC SUMMARY

The Quanterra laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

The standard laboratory QC package is designed to:

1. establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data,

2. assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix,

3. establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and

4. provide a standard set of reportables which assures the client of the quality of his data.

The Quanterra QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with surrogate compounds appropriate to the method being used. In cases where no surrogate is available, (e.g., metals or conventional analyses) a single DCS serves as the control sample. An SCS is prepared for each sample lot for which the DCS pair are not analyzed. The recovery of the SCS is charted in exactly the same manner as described for the DCS, and provides a daily check on the performance of the method.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\% \text{ Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{|\text{ Measured Concentration DCS1 - Measured Concentration DCS2 }|}{(\text{Measured Concentration DCS1 + Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

Quanterra
Environmental Services

QC LOT ASSIGNMENT REPORT
Subcontracted to Quanterra Lab

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
054059-0001-MB	AQUEOUS	DXNFUR-A	17 MAR 97-A	
054059-0001-MS	AQUEOUS	DXNFUR-A	17 MAR 97-A	
054059-0001-SA	AQUEOUS	DXNFUR-A	17 MAR 97-A	
054059-0001-SD	AQUEOUS	DXNFUR-A	17 MAR 97-A	
054059-0002-SA	AQUEOUS	DXNFUR-A	17 MAR 97-A	
054059-0003-SA	AQUEOUS	DXNFUR-A	17 MAR 97-A	

Quanterra
Environmental Services

DUPLICATE CONTROL SAMPLE REPORT
Subcontracted to Quanterra Lab
Project: 054059

Category: DXNFUR-A Cl4-Cl8 Dioxins & Furans
Matrix: AQUEOUS
QC Lot: 17 MAR 97-A Date Analyzed: 18 MAR 97
Concentration Units: ng/L

Analyte	Concentration Spiked	Measured DCS1	Qual	DCS2	Qual	AVG	Accuracy Average(%) DCS	Limits	Precision (RPD) DCS	Limit
2,3,7,8-TCDF	25.0	26.2		27.6		26.9	108	62-129	4.9	18
1,2,3,7,8-PeCDF	62.5	71.4		74.7		73.1	117	60-140	4.5	50
1,2,3,6,7,8-HxCDF	62.5	66.9		70.7		68.8	110	60-140	5.6	50
1,2,3,4,6,7,8-HpCDF	62.5	66.4		68.8		67.6	108	50-150	3.6	50
OCDF	125	142		150		146	116	50-150	5.4	28
2,3,7,8-TCDD	25.0	27.1		28.4		27.7	111	57-128	4.7	20
1,2,3,7,8-PeCDD	62.5	69.4		73.6		71.5	114	80-125	5.9	25
1,2,3,6,7,8-HxCDD	62.5	66.3		67.9		67.1	107	60-140	2.5	50
1,2,3,4,6,7,8-HpCDD	62.5	73.1		72.9		73.0	117	60-131	0.33	23
OCDD	125	124		132		128	102	50-147	5.6	20
13C-2,3,7,8-TCDF	25.0	20.4		19.3		19.9	80	40-120	5.6	
13C-2,3,7,8-TCDD	25.0	21.2		19.9		20.6	82	40-120	6.6	
13C-1,2,3,6,7,8-HxCDD	25.0	21.7		21.7		21.7	87	40-120	0.04	
13C-1,2,3,4,6,7,8-HpCDF	50.0	47.1		46.4		46.7	93	40-120	1.6	
13C-OCDD	50.0	45.6		43.8		44.7	89	40-120	3.9	

= Value outside control limits

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

Quanterra Environmental Services

Appendix IX Dioxins/Furans

Low Resolution

Client Name: U.S. Geological Survey
Client ID: Method Blank
Lab ID: 054059-0001-MB
Matrix: AQUEOUS Sampled: NA Received: NA
Authorized: 06 MAR 97 Prepared: 17 MAR 97 Analyzed: 18 MAR 97

Sample Amount 1.0 L
Column Type DB-5

Parameter	Result	Units	Detection Limit	Data Qualifiers
Furans				
TCDFs (total)	ND	ng/L	0.68	
PeCDFs (total)	ND	ng/L	0.53	
HxCDFs (total)	ND	ng/L	0.50	
Dioxins				
TCDDs (total)	ND	ng/L	0.48	
2,3,7,8-TCDD	ND	ng/L	0.48	
PeCDDs (total)	ND	ng/L	1.1	
HxCDDs (total)	ND	ng/L	0.82	
	% Recovery			
13C-2,3,7,8-TCDF	78			
13C-2,3,7,8-TCDD	77			
13C-1,2,3,6,7,8-HxCDD	79			
13C-1,2,3,4,6,7,8-HpCDF	87			

ND = Not detected
NA = Not applicable

Reported By: MBAQUERFO Approved By: RHRABAK

Quanterra
Environmental Services

APPENDIX IX DIOXINS/FURANS
LOW RESOLUTION
QUALITY CONTROL SUMMARY

Client Name: U.S. Geological Survey
Client ID: CAFB-I-0397-MS
Lab ID: 054059-0001-MS
Matrix: AQUEOUS Sampled: 05 MAR 97 Received: 06 MAR 97
Authorized: 06 MAR 97 Prepared: 17 MAR 97 Analyzed: 18 MAR 97

Sample Amount: 1.05 L
Column Type: DB-5

Parameters	ng/L Found in Sample	ng/L Spiked	ng/L Found in MS Sample	% Recovery
Furans				
2,3,7,8-TCDF	ND	23.8	25.5	107
1,2,3,7,8-PeCDF	ND	59.5	65.9	111
1,2,3,6,7,8-HxCDF	ND	59.5	62.9	106
Dioxins				
2,3,7,8-TCDD	ND	23.8	26.8	113
1,2,3,7,8-PeCDD	ND	59.5	66.3	111
1,2,3,6,7,8-HxCDD	ND	59.5	62.2	105

	% Recovery
13C-2,3,7,8-TCDF	82
13C-2,3,7,8-TCDD	81
13C-1,2,3,6,7,8-HxCDD	95
13C-1,2,3,4,6,7,8-HpCDF	100

ND=Not Detected
NA=Not Applicable

Reported by: Terry Stone Approved by: Robert Harbak

The cover letter is an integral part of this report.
Version 020197

Quanterra
Environmental Services

APPENDIX IX DIOXINS/FURANS
LOW RESOLUTION
QUALITY CONTROL SUMMARY

Client Name: U.S. Geological Survey
Client ID: CAFB-I-0397-SD
Lab ID: 054059-0001-SD
Matrix: AQUEOUS — Sampled: 05 MAR 97 — Received: 06 MAR 97
Authorized: 06 MAR 97 — Prepared: 17 MAR 97 — Analyzed: 18 MAR 97

Sample Amount: 1.05 L
Column Type: DB-5

Parameters	ng/L Found in Sample	ng/L Spiked	ng/L Found in MSD Sample	% Recovery
Furans				
2,3,7,8-TCDF	ND	23.8	28.1	118
1,2,3,7,8-PeCDF	ND	59.5	73.0	123
1,2,3,6,7,8-HxCDF	ND	59.5	69.7	117
Dioxins				
2,3,7,8-TCDD	ND	23.8	29.8	125
1,2,3,7,8-PeCDD	ND	59.5	76.3	128
1,2,3,6,7,8-HxCDD	ND	59.5	69.2	116

	% Recovery
13C-2,3,7,8-TCDF	82
13C-2,3,7,8-TCDD	79
13C-1,2,3,6,7,8-HxCDD	89
13C-1,2,3,4,6,7,8-HpCDF	96

ND=Not Detected
NA=Not Applicable

Reported by: Terry Stone — Approved by: Robert Harbak

The cover letter is an integral part of this report.
Version 020197

U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQUEST/CHAIN OF CUSTODY

057

Project Name & Number	PACKING AND SHIPPING DETAILS	
Cannon Air Force Base, Ground Water Sampling 463536004	Packed and Sealed for Shipping by: F. Eileen Roybal	Seal Number: 081586
Sampling Location: Landfill-5, Cannon Air Force Base, NM	Delivered to Shipper by: F. Eileen Roybal	Airbill Number: 2767693421
Team Leader: F. Eileen Roybal	Sampling Status: ☒ Done ☐ Continuing	

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
5 MAR97	1030	CAFB- I-0397-1	Ground-water	16	AllApx-IX: SW8260,SW8270,SW8280,SW8310,SW8080,SW8150, Total-METALS: SW6010 (Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu, Fe,Pb,Mg,Mn,Mo,Hg,Ni,Ag,Se,Na,Tl,Sn,V,Zn), plus SW7041,SW7060, SW7131,SW7191,SW7421,SW7740,SW7761,SW7841; SW9012, SW9030,SW9060,SW9020	Environmental Sample 01

Additional Comments: VOC's are in cooler with air bill # 2767643303

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☐ Yes ☐ No
F. Eileen Roybal		5MAR97	1200	Quanterra Environmental 4955 Yarrow Street Arvada, CO 80002 ph: (303) 421-6611 Attention: Lindsay Breyer	Condition of Contents
	[illegible]	5/6/97	9:00		Contents Temperature
					Laboratory Project Number

U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQUEST/CHAIN OF CUSTODY

057

Project Name & Number	PACKING AND SHIPPING DETAILS	
Cannon Air Force Base, Ground Water Sampling 463536004	Packed and Sealed for Shipping by: F. Eileen Roybal	Seal Number: C81587
Sampling Location: Landfill-5, Cannon Air Force Base, NM	Delivered to Shipper by: F. Eileen Roybal	Airbill Number: 2767643410
Team Leader: F. Eileen Roybal	Sampling Status: ☒ Done ☐ Continuing	

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
5 MAR97	1030	CAFB-I-0397-MS	Ground-water	16	AllApx-IX: SW8260,SW8270,SW8280,SW8310,SW8080,SW8150, Total-METALS: SW6010 (Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu, Fe,Pb,Mg,Mn,Mo,Hg,Ni,Ag,Se,Na,Tl,Sn,V,Zn), plus SW7041,SW7060, SW7131,SW7191,SW7421,SW7740,SW7761,SW7841; SW9012, SW9030,SW9060,SW9020	~~Environmental Sample~~ Matrix Spike MS

Additional Comments: VOC's are in cooler with airbill # 2767643303

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☐ Yes ☐ No
F. Eileen Roybal		5MAR97	1200	Quanterra Environmental 4955 Yarrow Street Arvada, CO 80002 ph: (303) 421-6611 Attention: Lindsay Breyer	Condition of Contents
	[illegible]	3-6-97	9:00		Contents Temperature
					Laboratory Project Number

1057

U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQUEST/CHAIN OF CUSTODY

Project Name & Number	PACKING AND SHIPPING DETAILS	
Cannon Air Force Base, Ground Water Sampling 463536004	Packed and Sealed for Shipping by: F. Eileen Roybal	Seal Number: 081584
Sampling Location: Landfill-5, Cannon Air Force Base, NM	Delivered to Shipper by: F. Eileen Roybal	Airbill Number: 2767643406
Team Leader: F. Eileen Roybal	Sampling Status: ☒ Done ☐ Continuing	

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
5 MAR97	10:30	CAFB-I-0397-25D	Ground-water	16	AllApx-IX: SW8260,SW8270,SW8280,SW8310,SW8080,SW8150, Total-METALS: SW6010 (Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu, Fe,Pb,Mg,Mn,Mo,Hg,Ni,Ag,Se,Na,Tl,Sn,V,Zn), plus SW7041,SW7060, SW7131,SW7191,SW7421,SW7740,SW7761,SW7841; SW9012, SW9030,SW9060,SW9020	~~Environmental Sample~~ 01 Matrix spike duplicate SD

Additional Comments: VOC's are in cooler with air bill # 2767643303

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☐ Yes ☐ No
F. Eileen Roybal		5/4/97	1200	Quanterra Environmental 4955 Yarrow Street Arvada, CO 80002 ph: (303) 421-6611 Attention: Lindsay Breyer	Condition of Contents
	[illegible]	3/6/97	9:10		Contents Temperature
					Laboratory Project Number

U.S. GEOLOGICAL SURVEY, WATER R[illegible]OURCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQ[illegible]ST/CHAIN OF CUSTODY

1057

Project Name & Number	PACKING AND SHIPPING DETAILS:	
Cannon Air Force Base, Ground Water Sampling 463536004	Packed and Sealed for Shipping by: F. Eileen Roybal	Seal Number: 081585
Sampling Location: Landfill-5, Cannon Air Force Base, NM	Delivered to Shipper by: F. Eileen Roybal	Airbill Number: 2767643432
Team Leader: F. Eileen Roybal	Sampling Status: ☐ Done ☒ Continuing	

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
5 MAR97	0901	CAFB-X -0397-1	Ground-water	16	AllApx-IX: SW8260,SW8270,SW8280,SW8310,SW8080,SW8150, Total-METALS: SW6010 (Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu, Fe,Pb,Mg,Mn,Mo,Hg,Ni,Ag,Se,Na,Tl,Sn,V,Zn), plus SW7041,SW7060, SW7131,SW7191,SW7421,SW7740,SW7761,SW7841; SW9012, SW9030,SW9060,SW9020	Environmental Sample 02

Additional Comments: VOC's are in cooler with air bill # 2767643303

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☐ Yes ☐ No
F. Eileen Roybal		5 MAR97	1200	Quanterra Environmental 4955 Yarrow Street Arvada, CO 80002 ph: (303) 421-6611 Attention: Lindsay Breyer	Condition of Contents
	[illegible]	3/6/97	9:20		Contents Temperature
					Laboratory Project Number

U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQUEST/CHAIN OF CUSTODY

5405 7

Project Name & Number	PACKING AND SHIPPING DETAILS	
Cannon Air Force Base, Ground Water Sampling 463536004	Packed and Sealed for Shipping by: F. Eileen Roybal	Seal Number: 03/5 3
Sampling Location: Landfill-5, Cannon Air Force Base, NM	Delivered to Shipper by: F. Eileen Roybal	Airbill Number: 2767643303
Team Leader: F. Eileen Roybal	Sampling Status: ☐ Done ☒ Continuing	

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
5 MAR97	0900	CAFB- L -0397-1	Ground-water	16	AllApx-IX: SW8260,SW8270,SW8280,SW8310,SW8080,SW8150, Total-METALS: SW6010 (Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu, Fe,Pb,Mg,Mn,Mo,Hg,Ni,Ag,Se,Na,Tl,Sn,V,Zn), plus SW7041,SW7060, SW7131,SW7191,SW7421,SW7740,SW7761,SW7841; SW9012, SW9030,SW9060,SW9020	Environmental Sample 03
5MAR97	0800	CAFB-L-0397-TB	Ultra Pure water	3	SW8260	Trip Blank 04 TB

Additional Comments: All VOC's from Well I and MS, SD, and tin X are in this cooler-

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☐ Yes ☐ No
F. Eileen Roybal		5MAR97	1200	Quanterra Environmental 4955 Yarrow Street Arvada, CO 80002 ph: (303) 421-6611 Attention: Lindsay Breyer	Condition of Contents
	[illegible signature]	3/6/97	9:10		Contents Temperature
					Laboratory Project Number

[redacted]

Chain Custody Record

Quanterra Environmental Services

ATTN: Robert Hrabak

QUA-4124

Client: OES - Sacramento	Project Manager: STELLA	Date: 3-6-97	Chain Of Custody Number: 27331
Address	Telephone Number (Area Code)/Fax Number	Lab Number	Page ____ of ____
City / State / Zip Code	Site Contact		
Project Name: USGS - Cannon AFB	Carrier/Waybill Number		
Contract/Purchase Order/Quote No.: 054059			

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: A29 VOCs
054059-01			AQ	1.0L	22 z	1	NONE		
01-MS									
01-SD									
02-									
03									

Special Instructions: Received in good condition. H(C) 030797

Possible Hazard Identification: [X] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown

Sample Disposal: [ ] Return To Client [ ] Disposal By Lab [ ] Archive For ____ Months

Turn Around Time Required: [X] Normal [ ] Rush

QC Level: [ ] I. [ ] II. [ ] III.

Project Specific (Specify)

	Date	Time		Date	Time
1. Relinquished By: Mark Bell	3-6-97	3:30PM	1. Received By: [illegible]	030797	1100
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Sample Checklist

Quanterra Environmental Services

Project #: 54059 Date/Time Received: 3·6·97 9:00

Company Name & Sampling Site: USGS Cannon AFB

*Cooler #(s): _____ _____ _____ _____ _____ _____ _____ _____

Temperatures: 4.4 4.5 5.7 3.3 2.6 _____ _____ _____

*Place copy of airbill inside all non-QUANTERRA coolers. Describe here.

Unpacking & Labeling Check Points:

Yes	No		Initials
☐	☐	1. Radiation checked, record if reading > 0.5 mR/hr. (_____mR/hr)	MO
☑	☐	2. Cooler seals intact.	
☑	☐	3. Chain of custody present.	
☐	☑	4. Bottles broken and/or are leaking, comment if yes.	
		PHOTOGRAPH BROKEN BOTTLES	
☑	☐	5. Containers labeled, comment if no.	
☐	☐	6. pH of all samples checked and meet requirements, note exceptions.	
☑	☐	7. Chain of custody includes "received by" and "relinquished" by signatures, dates, and times	
☑	☐	8. Chain of custody agrees with bottle count, comment if no.	
☑	☐	9. Chain of custody agrees with labels, comment if no.	
☐	☐	10. VOA samples filled completely, comment if no. N/A	
☐	☐	11. Are VOA bottles preserved, check for labels. N/A	
☐	☑	12. Sediment present in "D," dissolved, bottles.	
☐	☑	13. Are analyses with short holding times requested.	
☑	☐	14. Is extra sample volume provided for MS, MSD or matrix duplicates.	
☐	☑	15. Multiphase samples present, comment is yes.	
		PHOTOGRAPH MULTIPHASE SAMPLES	
☑	☐	16. Clear picture taken, labeled, and stapled to project folder.	

Comments: Include action taken to resolve discrepancies/problems. Include a hard copy of e-mail or use extra paper if more space is needed. _____

Initials: _____

DODEC LABORATORY DATA REVIEW WORKSHEET

1.0 GENERAL INFORMATION

Data reviewer: Bruce Darnell
Date of review: 4/24/97
Sample project number: 54027
Project name: Bill - Canada AFB
Sample collection date: 3/4/97
Sample matrix and number: Aqueous 3

Type and number of samples in project:

Type	Number
Environmental	2
Trip blank	1
Equipment blank	
Ambient blank	
MS/MSD	
Other	

2.0 DATA REPORT

Date of Analytical Results Report: 3/25/97
Number of volumes in Raw Data Report: 2
Raw Data Report reviewed? Yes____ No ✓

Were all analyses requested on the COC form performed by the laboratory?
Yes____ No ✓

If no, list canceled analyses and reason for non-performance:

Dioxins and furans will be reported on ~~the~~ project 54030. The COC specifies SW9030 for sulfide analysis; the report shows sulfide was analyzed by 376.2.

Were the samples properly preserved upon receipt by the laboratory?
Yes ✓ No____

If no, list laboratory ID for samples that were not properly preserved.

3.0 ANALYTICAL METHODS

Analytical methods used in this project

- ✓ VOC by GC/MS (SW 8240, SW 8260, E524, E624)
- Halogenated VOC by GC (SW 8010)
- Aromatic VOC by GC (SW 8020)
- ✓ SVOC by GC/MS (SW 8270)
- ✓ PAH by HPLC (SW 8310)
- ✓ Organochlorine pesticides and PCB (SW 8080)
- Organophosphorous pesticides (SW 8140)
- ✓ Chlorinated herbicides (SW 8150)
- Dioxins and Furans (SW 8280)
- Explosives (8330)
- ✓ TOC (E415.1 or SW 9060)
- TPH (E418.1)
- Oil and Grease (E413.2)
- ✓ TOX (SW9020)

- ✓ ICP screen for metals (SW 6010)
- ICP/MS screen for metals (SW 6020)
- Trace ICP screen for metals (SW 6010 modified)
- ✓ Antimony by GFAA (SW 7041)
- ✓ Arsenic by GFAA (SW 7060)
- ✓ Chromium (SW 7191 or 7196)
- ✓ Lead by GFAA (SW 7421)
- ✓ Mercury by CVAA (SW 7470 or 7471)
- ✓ Selenium by GFAA (SW 7740)
- ✓ Thallium by GFAA (SW 7841)
- Inorganic anions (E300.0)
- Alkalinity (310.1)
- ✓ Cyanide, total and amenable (SW 9010/9012)
- Nitrogen, ammonia (E350.1)
- Nitrogen, TKN (E351.2)
- Nitrogen, nitrate (E353.2)
- Nitrogen, nitrate plus nitrite (E353.2)
- Nitrogen, nitrite (E354.1)
- Phosphorous, total or ortho (E365.3)
- Sulfate (E375.4)
- ✓ Sulfide (E376.2)
- TDS (E160.1)
- pH (SW 9040 or 9045)
- Percent moisture (D2216)

- Gross alpha and gross beta radioactivity (SW 9310)
- Alpha-emitting radium isotopes (SW 9315)
- Radium-228 (SW 9320)
- Uranium (908.1)

- ✓ Other analyses : ✓ Silver 7761
  ✓ Cadmium 7131

54627

Were analytical holding times met? Yes ✓ No _____

If no, list analytical method and laboratory ID for samples that exceeded holding time:

_____

Did surrogate recoveries meet QC acceptance criteria?
Yes _____ No ✓

If no, list analytical method, laboratory ID, and surrogates that did not meet acceptance criteria:

Method 8270 - DCS#1 - the phenol-d5 surrogate recovery exceeded the upper control limit. All analytes were recovered within control limits in the DCS.

Did actual reporting limits meet project detection limits?
Organic analyses : Yes ✓ No _____

If no, list analytical method, laboratory ID, and reason for non-conformance:

_____

Inorganic analyses: Yes _____ No ✓

Reporting limits for ~~GFAA~~ metals and inorganic anions may be raised when: (1) sample concentrations exceed the instrument linear range and (2) target analytes are subject to matrix interferences. Reporting limits for ICP metals and mercury by CVAA are typically only raised when the sample concentration exceeds the instrument linear range.

Did DCS meet QC acceptance criteria? Yes ✓ No _____

If no, list analytical method, laboratory ID, and reason for non-conformance:

_____

Did SCS meet QC acceptance criteria? Yes ✓ No ____

If no, list analytical method, laboratory ID, and reason for non-conformance:

Were any target compounds found in the method, trip, equipment, or ambient blanks above the RL? Yes ____ No ✓

If yes, list the analytical method, laboratory ID, type of blank and compound:

Did the MS/MSD meet QC acceptance criteria? Yes ____ No ✓

MS/MSD data are used to evaluate the effect of the sample matrix on the analytical process and should only be used in conjunction with other available laboratory QC information to evaluate precision and accuracy.

If no, list the analytical method, laboratory ID, and reason for non-conformance :

- GC/MS VOC's: chlorobenzene recovery exceeded the upper control limit in the matrix spike. The chlorobenzene recovery was within control limits in the DCS. (The matrix that was spiked was not submitted with this project's samples.)
- Method 8080 - aldrin was recovered below the LCL in the MS, and the RPD was outside control limits. The RPD for heptachlor was also outside control limits. The data for these analytes in the DCS were within control limits.
- Metals by GFAA: Lead, selenium, thallium, and chromium recoveries < LCL; were within control limits in the DCS.

Additional comments:

QC SUMMARY

The Quanterra laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

The standard laboratory QC package is designed to:

1. establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data,

2. assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix,

3. establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and

4. provide a standard set of reportables which assures the client of the quality of his data.

The Quanterra QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with surrogate compounds appropriate to the method being used. In cases where no surrogate is available, (e.g., metals or conventional analyses) a single DCS serves as the control sample. An SCS is prepared for each sample lot for which the DCS pair are not analyzed. The recovery of the SCS is charted in exactly the same manner as described for the DCS, and provides a daily check on the performance of the method.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\% \text{ Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{|\text{Measured Concentration DCS1} - \text{Measured Concentration DCS2}|}{(\text{Measured Concentration DCS1} + \text{Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

Quanterra
Environmental Services

QC LOT ASSIGNMENT REPORT
Volatile Organics by GC/MS

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
054027-0001-SA	AQUEOUS	Q8260-5M-A	07 MAR 97-N	07 MAR 97-N
054027-0002-SA	AQUEOUS	Q8260-5M-A	07 MAR 97-N	07 MAR 97-N
054027-0003-TB	AQUEOUS	Q8260-5M-A	07 MAR 97-N	07 MAR 97-N

Quanterra
Environmental Services

DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC/MS
Project: 054027

Category: Q8260-5M-A Volatile Organics
Matrix: AQUEOUS
QC Lot: 07 MAR 97-N
Concentration Units: ug/L

Date Analyzed: 07 MAR 97

Analyte	Concentration Spiked	Measured DCS1	Qual	DCS2	Qual	AVG	Accuracy Average(%) DCS	Limits	Precision (RPD) DCS	Limit
1,1-Dichloroethene	50.0	54.7		53.6		54.2	108	80-132	2.0	20
Trichloroethene	50.0	52.6		52.2		52.4	105	85-112	0.76	20
Benzene	50.0	51.1		49.6		50.4	101	83-121	3.0	20
Toluene	50.0	50.7		52.5		51.6	103	85-120	3.5	20
Chlorobenzene	50.0	52.1		52.7		52.4	105	90-113	1.1	20

Surrogate	Concentration Spiked	Measured DCS1	Qual	DCS2	Qual	Accuracy Average(%) DCS	Limits
1,2-Dichloroethane-d4	50.0	48.3		48.3		97	77-115
4-Bromofluorobenzene	50.0	46.5		51.0		98	87-113
Toluene-d8	50.0	49.4		51.3		101	90-112

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

Quanterra
Environmental Services

SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC/MS

Category: Q8260-5M-A
Matrix: AQUEOUS
QC Lot: 07 MAR 97-N QC Run: 07 MAR 97-N
Concentration Units: ug/L

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
1,2-Dichloroethane-d4	50.0	49.8	100	77-115
4-Bromofluorobenzene	50.0	49.1	98	87-113
Toluene-d8	50.0	49.1	98	90-112

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

Quanterra
Environmental Services

METHOD BLANK REPORT
Volatile Organics by GC/MS

Test: Q8260-AP9-5ML-AP
Matrix: AQUEOUS
QC Lot: 07 MAR 97-N QC Run: 07 MAR 97-N

Analyte	Result	Units	Reporting Limit
Acetone	ND	ug/L	20
Acetonitrile	ND	ug/L	100
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	20
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10
1,2-Dibromoethane (EDB)	ND	ug/L	5.0
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	10
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
cis-1,2-Dichloroethene	ND	ug/L	2.5
trans-1,2-Dichloroethene	ND	ug/L	2.5
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	5.0
2-Hexanone	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutyl alcohol	ND	ug/L	200
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
Methyl methacrylate	ND	ug/L	5.0

Quanterra
Environmental Services

METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Analyte	Result	Units	Reporting Limit
Test: Q8260-AP9-5ML-AP			
Matrix: AQUEOUS			
QC Lot: 07 MAR 97-N QC Run: 07 MAR 97-N			
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20
Propionitrile	ND	ug/L	20
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	10
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0
Test: Q8260-AP9-5ML-AP			
Matrix: AQUEOUS			
QC Lot: 07 MAR 97-N QC Run: 07 MAR 97-N			
Acetone	ND	ug/L	20
Acetonitrile	ND	ug/L	100
Acrolein	ND	ug/L	100
Acrylonitrile	ND	ug/L	100
Allyl chloride	ND	ug/L	10
Benzene	ND	ug/L	5.0
Bromodichloromethane	ND	ug/L	5.0
Bromoform	ND	ug/L	5.0
Bromomethane	ND	ug/L	10
2-Butanone (MEK)	ND	ug/L	20
Carbon disulfide	ND	ug/L	5.0
Carbon tetrachloride	ND	ug/L	5.0
Chlorobenzene	ND	ug/L	5.0
Chloroethane	ND	ug/L	10
Chloroform	ND	ug/L	5.0
Chloromethane	ND	ug/L	10
Chloroprene	ND	ug/L	5.0
Dibromochloromethane	ND	ug/L	5.0
1,2-Dibromo-3-chloro-propane (DBCP)	ND	ug/L	10

Quanterra
Environmental Services

METHOD BLANK REPORT
Volatile Organics by GC/MS (cont.)

Test: Q8260-AP9-5ML-AP
Matrix: AQUEOUS
QC Lot: 07 MAR 97-N QC Run: 07 MAR 97-N

Analyte	Result	Units	Reporting Limit
1,2-Dibromoethane (EDB)	ND	ug/L	5.0
Dibromomethane	ND	ug/L	5.0
trans-1,4-Dichloro-2-butene	ND	ug/L	5.0
Dichlorodifluoromethane	ND	ug/L	10
1,1-Dichloroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	5.0
cis-1,2-Dichloroethene	ND	ug/L	2.5
trans-1,2-Dichloroethene	ND	ug/L	2.5
1,2-Dichloropropane	ND	ug/L	5.0
cis-1,3-Dichloropropene	ND	ug/L	5.0
trans-1,3-Dichloropropene	ND	ug/L	5.0
1,4-Dioxane	ND	ug/L	500
Ethylbenzene	ND	ug/L	5.0
Ethyl methacrylate	ND	ug/L	5.0
2-Hexanone	ND	ug/L	20
Iodomethane	ND	ug/L	5.0
Isobutyl alcohol	ND	ug/L	200
Methacrylonitrile	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
Methyl methacrylate	ND	ug/L	5.0
4-Methyl-2-pentanone (MIBK)	ND	ug/L	20
Propionitrile	ND	ug/L	20
Styrene	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0
Tetrachloroethene	ND	ug/L	5.0
Toluene	ND	ug/L	5.0
1,1,1-Trichloroethane	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	5.0
Trichloroethene	ND	ug/L	5.0
Trichlorofluoromethane	ND	ug/L	10
1,2,3-Trichloropropane	ND	ug/L	5.0
Vinyl acetate	ND	ug/L	10
Vinyl chloride	ND	ug/L	10
Xylenes (total)	ND	ug/L	5.0

Quanterra
Environmental Services

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
Volatile Organics by GC/MS
Project: 054027

Category: Q8260-5M-A Volatile Organics
Matrix: AQUEOUS
Sample: 054026-0007
MS Run: 07 MAR 97-N
Units: ug/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
1,1-Dichloroethene	ND	52.7	48.9	50.0	50.0	105	98	80-132	7.6	20
Trichloroethene	ND	53.7	52.7	50.0	50.0	107	105	85-112	1.8	20
Benzene	ND	54.3	54.1	50.0	50.0	109	108	83-121	0.4	20
Toluene	ND	58.5	53.2	50.0	50.0	117	106	85-120	9.6	20
Chlorobenzene	ND	57.3	53.4	50.0	50.0	115	107	90-113	7.0	20

Surrogates		%Recovery		Rec. Accept. Limits
1,2-Dichloroethane-d4	103	101	102	77-115
4-Bromofluorobenzene	102	103	98.6	87-113
Toluene-d8	94.5	103	98.0	90-112

ND = Not Detected

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

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QC LOT ASSIGNMENT REPORT
Semivolatile Organics by GC/MS

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
054027-0001-SA	AQUEOUS	Q8270-A	10 MAR 97-02	10 MAR 97-02
054027-0002-SA	AQUEOUS	Q8270-A	10 MAR 97-02	10 MAR 97-02

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DUPLICATE CONTROL SAMPLE REPORT
Semivolatile Organics by GC/MS
Project: 054027

Category: Q8270-A Acid, Base and Neutrals by GC/MS.
Matrix: AQUEOUS
QC Lot: 10 MAR 97-02 Date Analyzed: 20 MAR 97
Concentration Units: ug/L

Analyte	Concentration Spiked	Measured DCS1	Qual	DCS2	Qual	AVG	Accuracy Average(%) DCS	Limits	Precision (RPD) DCS	Limit
Phenol	150	147		129		138	92	45-105	13	20
2-Chlorophenol	150	120		108		114	76	52-107	11	22
1,4-Dichlorobenzene	100	70.4		61.6		66.0	66	20-124	13	27
N-Nitroso-di-n-propylamine	100	96.6		82.8		89.7	90	52-108	15	20
1,2,4-Trichlorobenzene	100	72.1		67.1		69.6	70	44-142	7.2	27
4-Chloro-3-methylphenol	150	130		115		122	82	22-147	12	20
Acenaphthene	100	81.6		73.8		77.7	78	47-145	10	20
4-Nitrophenol	150	106		89.4		97.6	65	42-115	17	32
2,4-Dinitrotoluene	100	79.2		71.2		75.2	75	55-116	11	21
Pentachlorophenol	150	93.8		75.8		84.8	57	14-176	21	30
Pyrene	100	89.5		82.6		86.0	86	56-120	8.0	20

Surrogate	Concentration Spiked	Measured DCS1	Qual	DCS2	Qual	Accuracy Average(%) DCS	Limits
Nitrobenzene-d5	100	92.6		79.3		86	51-104
2-Fluorobiphenyl	100	76.4		67.1		72	43-116
Terphenyl-d14	100	85.7		75.2		80	33-141
2-Fluorophenol	150	114		99.0		71	36-108
Phenol-d5	150	165	#	143		103	47-106
2,4,6-Tribromophenol	150	112		94.6		69	49-106

= Value outside control limits

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

Quanterra
Environmental Services

SINGLE CONTROL SAMPLE REPORT
Semivolatile Organics by GC/MS

Category: Q8270-A
Matrix: AQUEOUS
QC Lot: 10 MAR 97-02 QC Run: 10 MAR 97-02
Concentration Units: ug/L

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Nitrobenzene-d5	100	84.8	85	51-104
2-Fluorobiphenyl	100	68.7	69	43-116
Terphenyl-d14	100	82.4	82	33-141
2-Fluorophenol	150	106	71	36-108
Phenol-d5	150	148	99	47-106
2,4,6-Tribromophenol	150	89.4	60	49-106

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

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METHOD BLANK REPORT
Semivolatile Organics by GC/MS

Test: Q8270-AP9-3520-A
Matrix: AQUEOUS
QC Lot: 10 MAR 97-02 QC Run: 10 MAR 97-02

Analyte	Result	Units	Reporting Limit
Acenaphthene	ND	ug/L	10
Acenaphthylene	ND	ug/L	10
Acetophenone	ND	ug/L	10
2-Acetylaminofluorene	ND	ug/L	100
4-Aminobiphenyl	ND	ug/L	50
Aniline	ND	ug/L	10
Anthracene	ND	ug/L	10
Aramite	ND	ug/L	20
Benzo(a)anthracene	ND	ug/L	10
Benzo(b)fluoranthene	ND	ug/L	10
Benzo(k)fluoranthene	ND	ug/L	10
Benzo(g,h,i)perylene	ND	ug/L	10
Benzo(a)pyrene	ND	ug/L	10
Benzyl alcohol	ND	ug/L	10
4-Bromophenyl phenyl ether	ND	ug/L	10
Butyl benzyl phthalate	ND	ug/L	10
2-sec-Butyl-4,6-dinitro-phenol	ND	ug/L	20
4-Chloroaniline	ND	ug/L	10
bis(2-Chloroethoxy) methane	ND	ug/L	10
bis(2-Chloroethyl) ether	ND	ug/L	10
2,2'-oxybis(1-chloropropane)	ND	ug/L	10
4-Chloro-3-methylphenol	ND	ug/L	10
2-Chloronaphthalene	ND	ug/L	10
2-Chlorophenol	ND	ug/L	10
4-Chlorophenyl phenyl ether	ND	ug/L	10
Chrysene	ND	ug/L	10
Dibenz(a,h)anthracene	ND	ug/L	10
Dibenzofuran	ND	ug/L	10
Di-n-butyl phthalate	ND	ug/L	10
1,2-Dichlorobenzene	ND	ug/L	10
1,3-Dichlorobenzene	ND	ug/L	10
1,4-Dichlorobenzene	ND	ug/L	10
3,3'-Dichlorobenzidine	ND	ug/L	50
2,4-Dichlorophenol	ND	ug/L	10
2,6-Dichlorophenol	ND	ug/L	10
Diethyl phthalate	ND	ug/L	10
Dimethoate	ND	ug/L	20

Quanterra
Environmental Services

METHOD BLANK REPORT
Semivolatile Organics by GC/MS (cont.)

Test: Q8270-AP9-3520-A
Matrix: AQUEOUS
QC Lot: 10 MAR 97-02 QC Run: 10 MAR 97-02

Analyte	Result	Units	Reporting Limit
p-Dimethylaminoazobenzene	ND	ug/L	20
7,12-Dimethylbenz(a)-anthracene	ND	ug/L	20
3,3'-Dimethylbenzidine	ND	ug/L	50
a,a-Dimethylphenethylamine	ND	ug/L	50
2,4-Dimethylphenol	ND	ug/L	10
Dimethyl phthalate	ND	ug/L	10
1,3-Dinitrobenzene	ND	ug/L	10
4,6-Dinitro-2-methylphenol	ND	ug/L	50
2,4-Dinitrophenol	ND	ug/L	50
2,4-Dinitrotoluene	ND	ug/L	10
2,6-Dinitrotoluene	ND	ug/L	10
Di-n-octyl phthalate	ND	ug/L	10
Diphenylamine	ND	ug/L	10
Disulfoton	ND	ug/L	50
bis(2-Ethylhexyl) phthalate	ND	ug/L	10
Ethyl methanesulfonate	ND	ug/L	10
Famphur	ND	ug/L	100
Fluoranthene	ND	ug/L	10
Fluorene	ND	ug/L	10
Hexachlorobenzene	ND	ug/L	10
Hexachlorobutadiene	ND	ug/L	10
Hexachlorocyclopentadiene	ND	ug/L	50
Hexachloroethane	ND	ug/L	10
Hexachlorophene	ND	ug/L	--
Hexachloropropene	ND	ug/L	100
Indeno(1,2,3-cd)pyrene	ND	ug/L	10
Isophorone	ND	ug/L	10
Isosafrole	ND	ug/L	20
Methapyrilene	ND	ug/L	50
3-Methylcholanthrene	ND	ug/L	20
Methyl methanesulfonate	ND	ug/L	10
2-Methylnaphthalene	ND	ug/L	10
Methyl parathion	ND	ug/L	50
2-Methylphenol	ND	ug/L	10
3/4-Methylphenol	ND	ug/L	10
Naphthalene	ND	ug/L	10
1,4-Naphthoquinone	ND	ug/L	50

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Environmental Services

METHOD BLANK REPORT
Semivolatile Organics by GC/MS (cont.)

Test: Q8270-AP9-3520-A
Matrix: AQUEOUS
QC Lot: 10 MAR 97-02 QC Run: 10 MAR 97-02

Analyte	Result	Units	Reporting Limit
1-Naphthylamine	ND	ug/L	10
2-Naphthylamine	ND	ug/L	10
2-Nitroaniline	ND	ug/L	50
3-Nitroaniline	ND	ug/L	50
4-Nitroaniline	ND	ug/L	50
Nitrobenzene	ND	ug/L	10
2-Nitrophenol	ND	ug/L	10
4-Nitrophenol	ND	ug/L	50
4-Nitroquinoline-1-oxide	ND	ug/L	100
N-Nitroso-di-n-butylamine	ND	ug/L	10
N-Nitrosodiethylamine	ND	ug/L	10
N-Nitrosodimethylamine	ND	ug/L	10
N-Nitrosodiphenylamine	ND	ug/L	10
N-Nitroso-di-n-propylamine	ND	ug/L	10
N-Nitrosomethylethylamine	ND	ug/L	10
N-Nitrosomorpholine	ND	ug/L	10
N-Nitrosopiperidine	ND	ug/L	10
N-Nitrosopyrrolidine	ND	ug/L	10
5-Nitro-o-toluidine	ND	ug/L	20
Parathion	ND	ug/L	50
Pentachlorobenzene	ND	ug/L	10
Pentachloroethane	ND	ug/L	50
Pentachloronitrobenzene	ND	ug/L	50
Pentachlorophenol	ND	ug/L	50
Phenacetin	ND	ug/L	20
Phenanthrene	ND	ug/L	10
Phenol	ND	ug/L	10
p-Phenylenediamine	ND	ug/L	100
Phorate	ND	ug/L	50
2-Picoline	ND	ug/L	20
Pronamide	ND	ug/L	20
Pyrene	ND	ug/L	10
Pyridine	ND	ug/L	20
Safrole	ND	ug/L	20
Sulfotepp	ND	ug/L	50
1,2,4,5-Tetrachlorobenzene	ND	ug/L	10
2,3,4,6-Tetrachlorophenol	ND	ug/L	50
Thionazin	ND	ug/L	50
o-Toluidine	ND	ug/L	10

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METHOD BLANK REPORT
Semivolatile Organics by GC/MS (cont.)

Analyte	Result	Units	Reporting Limit
Test: Q8270-AP9-3520-A			
Matrix: AQUEOUS			
QC Lot: 10 MAR 97-02 QC Run: 10 MAR 97-02			
1,2,4-Trichlorobenzene	ND	ug/L	10
2,4,5-Trichlorophenol	ND	ug/L	10
2,4,6-Trichlorophenol	ND	ug/L	10
0,0,0-Triethylphosphoro-thioate	ND	ug/L	50
1,3,5-Trinitrobenzene	ND	ug/L	50

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Environmental Services

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
Semivolatile Organics by GC/MS
Project: 054027

Category: Q8270-A Acid, Base and Neutrals by GC/MS.
Matrix: AQUEOUS
Sample: 053999-0002
MS Run: 10 MAR 97-02
Units: ug/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Phenol	ND	133	123	140	156	95	79	45-105	19	20
2-Chlorophenol	ND	111	104	140	156	79	66	52-107	17	22
1,4-Dichlorobenzene	ND	67.2	66.7	93.5	104	72	64	20-124	12	27
N-Nitroso-di-n-propylamine	ND	83.0	84.3	93.5	104	89	81	52-108	9.2	20
1,2,4-Trichlorobenzene	ND	66.7	71.6	93.5	104	71	69	44-142	3.8	27
4-Chloro-3-methylphenol	ND	114	110	140	156	81	70	22-147	14	20
Acenaphthene	ND	74.2	70.9	93.5	104	79	68	47-145	15	20
4-Nitrophenol	ND	101	90.0	140	156	72	58	42-115	22	32
2,4-Dinitrotoluene	ND	74.2	68.0	93.5	104	79	65	55-116	19	21
Pentachlorophenol	ND	104	98.8	140	156	74	63	14-176	16	30
Pyrene	ND	83.1	78.6	93.5	104	89	75	56-120	16	20

Surrogates	%Recovery			Rec. Accept. Limits
Nitrobenzene-d5	87.8	88.0	76.9	51-104
2-Fluorobiphenyl	70.4	75.4	65.9	43-116
Terphenyl-d14	73.7	72.1	60.9	33-141
2-Fluorophenol	75.5	75.4	63.4	36-108
Phenol-d5	104	106	92.9	47-106
2,4,6-Tribromophenol	67.9	77.2	64.1	49-106

ND = Not Detected

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

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QC LOT ASSIGNMENT REPORT
Semivolatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
054027-0001-SA	AQUEOUS	615-A	11 MAR 97-01	11 MAR 97-01
054027-0001-SA	AQUEOUS	8080-A	11 MAR 97-01	11 MAR 97-01
054027-0002-SA	AQUEOUS	615-A	11 MAR 97-01	11 MAR 97-01
054027-0002-SA	AQUEOUS	8080-A	11 MAR 97-01	11 MAR 97-01

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DUPLICATE CONTROL SAMPLE REPORT
Semivolatile Organics by GC

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limits
Category: 615-A Matrix: AQUEOUS QC Lot: 11 MAR 97-01 Concentration Units: ug/L								
2,4-D	5.00	3.44	3.97	3.70	74	23-114	14	27
2,4,5-TP (Silvex)	1.00	0.764	0.854	0.809	81	26-124	11	31
2,4,5-T	1.00	0.741	0.808	0.774	77	26-127	8.7	29
Category: 8080-A Matrix: AQUEOUS QC Lot: 11 MAR 97-01 Concentration Units: ug/L								
gamma-BHC (Lindane)	0.200	0.196	0.208	0.202	101	76-122	5.9	15
Heptachlor	0.200	0.186	0.197	0.192	96	69-125	5.7	15
Aldrin	0.200	0.172	0.179	0.176	88	64-116	4.0	17
Dieldrin	0.500	0.443	0.470	0.456	91	74-107	5.9	15
Endrin	0.500	0.505	0.534	0.520	104	72-118	5.6	15
4,4'-DDT	0.500	0.472	0.504	0.488	98	74-117	6.6	15

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

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SINGLE CONTROL SAMPLE REPORT
Semivolatile Organics by GC

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 615-A				
Matrix: AQUEOUS				
QC Lot: 11 MAR 97-01 QC Run: 11 MAR 97-01				
Concentration Units: ug/L				
DCAA	5.00	3.66	73	27-121
Category: 8080-A				
Matrix: AQUEOUS				
QC Lot: 11 MAR 97-01 QC Run: 11 MAR 97-01				
Concentration Units: ug/L				
Tetrachloro-m-xylene	1.00	0.698	70	51-103
Dibutyl chlorendate	1.00	0.875	88	71-109
Decachlorobiphenyl	0.200	0.206	103	50-138

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

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METHOD BLANK REPORT
Semivolatile Organics by GC

Analyte	Result	Units	Reporting Limit
Test: 8150-AP9-A			
Matrix: AQUEOUS			
QC Lot: 11 MAR 97-01 QC Run: 11 MAR 97-01			
2,4-D	ND	ug/L	1.2
2,4,5-TP (Silvex)	ND	ug/L	0.17
2,4,5-T	ND	ug/L	0.20
Test: 8080-AP9-A			
Matrix: AQUEOUS			
QC Lot: 11 MAR 97-01 QC Run: 11 MAR 97-01			
Aldrin	ND	ug/L	0.050
Aroclor 1016	ND	ug/L	1.0
Aroclor 1221	ND	ug/L	1.0
Aroclor 1232	ND	ug/L	1.0
Aroclor 1242	ND	ug/L	1.0
Aroclor 1248	ND	ug/L	1.0
Aroclor 1254	ND	ug/L	1.0
Aroclor 1260	ND	ug/L	1.0
alpha-BHC	ND	ug/L	0.050
beta-BHC	ND	ug/L	0.050
delta-BHC	ND	ug/L	0.050
gamma-BHC (Lindane)	ND	ug/L	0.050
alpha-Chlordane	ND	ug/L	0.050
gamma-Chlordane	ND	ug/L	0.050
Chlorobenzilate	ND	ug/L	1.0
4,4'-DDD	ND	ug/L	0.10
4,4'-DDE	ND	ug/L	0.10
4,4'-DDT	ND	ug/L	0.10
Diallate	ND	ug/L	1.0
Dieldrin	ND	ug/L	0.10
Endosulfan I	ND	ug/L	0.050
Endosulfan II	ND	ug/L	0.10
Endosulfan sulfate	ND	ug/L	0.10
Endrin	ND	ug/L	0.10
Endrin aldehyde	ND	ug/L	0.10
Heptachlor	ND	ug/L	0.050
Heptachlor epoxide	ND	ug/L	0.050
Isodrin	ND	ug/L	0.10
Kepone	ND	ug/L	2.5
Methoxychlor	ND	ug/L	0.50
Toxaphene	ND	ug/L	5.0

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MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
Semivolatile Organics by GC
Project: 054027

Category: 615-A Herbicides
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 11 MAR 97-01
Units: ug/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
2,4-D	ND	3.82	4.21	4.76	4.78	80	88	23-114	9.3	27
2,4,5-TP (Silvex)	ND	0.842	0.913	0.952	0.957	88	95	26-124	7.6	31
2,4,5-T	ND	0.790	0.857	0.952	0.957	83	90	26-127	7.6	29

Category: 8080-A Organochlorine Pesticides
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 11 MAR 97-01
Units: ug/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
gamma-BHC (Lindane)	ND	0.185	0.195	0.189	0.192	98	102	76-122	3.7	15
Heptachlor	ND	0.161	0.139	0.189	0.192	85	72	69-125	16	15
Aldrin	ND	T 0.143	0.0923	0.189	0.192	76	48	64-116	45	17
Dieldrin	ND	0.421	0.438	0.472	0.481	89	91	74-107	2.1	15
Endrin	ND	0.471	0.503	0.472	0.481	100	105	72-118	4.7	15
4,4'-DDT	ND	0.450	0.473	0.472	0.481	95	98	74-117	3.1	15

T = Preferred values unless footnoted on secondary column test.
ND = Not Detected

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

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Environmental Services

QC LOT ASSIGNMENT REPORT
High Performance Liquid Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
054027-0001-SA	AQUEOUS	8310-A	11 MAR 97-01	11 MAR 97-01
054027-0002-SA	AQUEOUS	8310-A	11 MAR 97-01	11 MAR 97-01

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DUPLICATE CONTROL SAMPLE REPORT
High Performance Liquid Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limits
Category: 8310-A								
Matrix: AQUEOUS								
QC Lot: 11 MAR 97-01								
Concentration Units: ug/L								
Naphthalene	10.0	9.68	9.71	9.70	97	53-111	0.31	33
Fluorene	2.00	2.00	1.99	2.00	100	59-123	0.50	26
Pyrene	2.00	2.35	2.16	2.26	113	62-122	8.4	28
Benzo(a)pyrene	1.00	0.904	0.869	0.886	89	65-117	3.9	22
Indeno(1,2,3-cd)pyrene	1.00	1.05	1.04	1.04	105	53-153	0.96	22

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

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SINGLE CONTROL SAMPLE REPORT
High Performance Liquid Chromatography

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 8310-A				
Matrix: AQUEOUS				
QC Lot: 11 MAR 97-01 QC Run: 11 MAR 97-01				
Concentration Units: ug/L				
Terphenyl-d14	20.0	15.3	76	37-123

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

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METHOD BLANK REPORT
High Performance Liquid Chromatography

Analyte	Result	Units	Reporting Limit	
Test: 8310-HPLC-A				
Matrix: AQUEOUS				
QC Lot: 11 MAR 97-01 QC Run: 11 MAR 97-01				
Naphthalene	ND	ug/L	1.0	
Acenaphthylene	ND	ug/L	1.0	
Acenaphthene	ND	ug/L	1.0	
Fluorene	0.10	ug/L	0.20	J
Phenanthrene	ND	ug/L	0.20	
Anthracene	ND	ug/L	0.10	
Fluoranthene	ND	ug/L	0.20	
Pyrene	ND	ug/L	0.20	
Benzo(a)anthracene	ND	ug/L	0.10	
Chrysene	ND	ug/L	0.20	
Benzo(b)fluoranthene	ND	ug/L	0.10	
Benzo(k)fluoranthene	ND	ug/L	0.10	
Benzo(a)pyrene	ND	ug/L	0.10	
Dibenz(a,h)anthracene	ND	ug/L	0.20	
Benzo(g,h,i)perylene	ND	ug/L	0.20	
Indeno(1,2,3-cd)pyrene	ND	ug/L	0.20	

J = Result is detected below the reporting limit or is an estimated concentration.

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'ATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
.igh Performance Liquid Chromatography
Project: 054027

Category: 8310-A Polynuclear Aromatic Hydrocarbons by HPLC
Matrix: AQUEOUS
Sample: 054085-0004
MS Run: 11 MAR 97-01
Units: ug/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS	Amount Spiked MSD	% Recovery MS	% Recovery MSD	Recov. Accep. Limits	RPD MS-MSD	RPD Accept Limits
Naphthalene	ND	11.5	11.7	11.5	12.8	100	91	53-111	9.0	33
Fluorene	ND	2.29	2.31	2.30	2.56	100	90	59-123	9.8	26
Pyrene	ND	2.55	2.67	2.30	2.56	111	104	62-122	6.1	28
Benzo(a)pyrene	ND	0.954	0.971	1.15	1.28	83	76	65-117	8.9	22
Indeno(1,2,3-cd) pyrene	ND	1.02	1.00	1.15	1.28	89	78	53-153	13	22

ND = Not Detected

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

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Environmental Services

QC LOT ASSIGNMENT REPORT
Metals Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
054027-0001-SA	AQUEOUS	PB-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054027-0001-SA	AQUEOUS	AS-FAA-AT	07 MAR 97-K1	07 MAR 97-K1
054027-0001-SA	AQUEOUS	SE-FAA-AT	07 MAR 97-K1	07 MAR 97-K1
054027-0001-SA	AQUEOUS	TL-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054027-0001-SA	AQUEOUS	HG-CVAA-AT	11 MAR 97-N2	11 MAR 97-N2
054027-0001-SA	AQUEOUS	CD-FAA-AT	07 MAR 97-SA	07 MAR 97-SA
054027-0001-SA	AQUEOUS	CR-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054027-0001-SA	AQUEOUS	SB-FAA-AT	11 MAR 97-N2	11 MAR 97-N2
054027-0001-SA	AQUEOUS	AG-FAA-AT	07 MAR 97-SA	07 MAR 97-SA
054027-0001-SA	AQUEOUS	ICP-AT	11 MAR 97-N2	11 MAR 97-N2
054027-0002-SA	AQUEOUS	PB-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054027-0002-SA	AQUEOUS	AS-FAA-AT	07 MAR 97-K1	07 MAR 97-K1
054027-0002-SA	AQUEOUS	SE-FAA-AT	07 MAR 97-K1	07 MAR 97-K1
054027-0002-SA	AQUEOUS	TL-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054027-0002-SA	AQUEOUS	HG-CVAA-AT	11 MAR 97-N2	11 MAR 97-N2
054027-0002-SA	AQUEOUS	CD-FAA-AT	07 MAR 97-SA	07 MAR 97-SA
054027-0002-SA	AQUEOUS	CR-FAA-AT	07 MAR 97-SB	07 MAR 97-SB
054027-0002-SA	AQUEOUS	SB-FAA-AT	11 MAR 97-N2	11 MAR 97-N2
054027-0002-SA	AQUEOUS	AG-FAA-AT	07 MAR 97-SA	07 MAR 97-SA
054027-0002-SA	AQUEOUS	ICP-AT	11 MAR 97-N2	11 MAR 97-N2

Quanterra Environmental Services

DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limits
Category: PB-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-SB Concentration Units: mg/L								
Lead	0.0400	0.0420	0.0415	0.0418	104	84-124	1.2	10
Category: AS-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-K1 Concentration Units: mg/L								
Arsenic	0.0400	0.0411	0.0425	0.0418	105	85-114	3.3	10
Category: SE-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-K1 Concentration Units: mg/L								
Selenium	0.0400	0.0400	0.0396	0.0398	100	80-118	1.0	10
Category: TL-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-SB Concentration Units: mg/L								
Thallium	0.0400	0.0375	0.0368	0.0372	93	84-124	1.9	10
Category: HG-CVAA-AT Matrix: AQUEOUS QC Lot: 11 MAR 97-N2 Concentration Units: mg/L								
Mercury	0.00100	0.00101	0.000986	0.000997	100	77-117	2.1	10

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

Quanterra
Environmental Services

DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation (cont.)

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Limits	Precision (RPD) DCS	Limits
Category: CD-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-SA Concentration Units: mg/L								
Cadmium	0.0040	0.00417	0.00433	0.00425	106	83-123	3.8	10
Category: CR-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-SB Concentration Units: mg/L								
Chromium	0.0100	0.0110	0.0109	0.0110	110	81-121	0.91	14
Category: SB-FAA-AT Matrix: AQUEOUS QC Lot: 11 MAR 97-N2 Concentration Units: mg/L								
Antimony	0.500	0.507	0.513	0.510	102	83-123	1.2	14
Category: AG-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-SA Concentration Units: mg/L								
Silver	0.0050	0.00504	0.00516	0.00510	102	81-121	2.4	15
Category: ICP-AT Matrix: AQUEOUS QC Lot: 11 MAR 97-N2 Concentration Units: mg/L								
Aluminum	2.00	2.14	2.15	2.15	107	86-117	0.66	10
Antimony	0.500	0.551	0.547	0.549	110	81-119	0.64	10
Arsenic	2.00	1.92	1.96	1.94	97	81-110	2.1	10
Barium	2.00	2.00	2.01	2.00	100	86-114	0.52	10
Beryllium	0.0500	0.0470	0.0481	0.0476	95	83-117	2.2	10
Boron	1.00	1.85	1.93	1.89	189#	82-122	4.4	10
Cadmium	0.0500	0.0501	0.0486	0.0494	99	80-120	3.1	17
Calcium	50.0	49.7	49.9	49.8	100	88-112	0.44	10

= Recovery outside QC Limits

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

Quanterra
Environmental Services

DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation (cont.)

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limits
Category: ICP-AT								
Matrix: AQUEOUS								
QC Lot: 11 MAR 97-N2								
Concentration Units: mg/L								
Chromium	0.200	0.199	0.200	0.200	100	83-112	0.62	10
Cobalt	0.500	0.515	0.519	0.517	103	80-120	0.76	10
Copper	0.250	0.240	0.242	0.241	96	84-115	0.78	10
Iron	1.00	1.03	1.02	1.02	102	87-117	0.54	10
Lead	0.500	0.486	0.474	0.480	96	83-114	2.4	15
Lithium	1.00	0.846	0.850	0.848	85	80-120	0.45	10
Magnesium	50.0	48.6	48.8	48.7	97	84-114	0.53	10
Manganese	0.500	0.498	0.500	0.499	100	84-113	0.58	10
Molybdenum	1.00	0.983	0.995	0.989	99	80-120	1.2	10
Nickel	0.500	0.495	0.501	0.498	100	85-112	1.2	10
Potassium	50.0	46.5	46.8	46.7	93	82-111	0.63	10
Selenium	2.00	1.97	1.97	1.97	99	86-111	0.12	10
Silver	0.0500	0.0476	0.0474	0.0475	95	83-115	0.36	10
Sodium	50.0	50.4	50.1	50.3	101	86-115	0.61	10
Tin	2.00	2.04	2.04	2.04	102	86-114	0.23	10
Titanium	1.00	1.01	1.01	1.01	101	87-112	0.27	10
Vanadium	0.500	0.493	0.495	0.494	99	85-114	0.43	10
Zinc	0.500	0.495	0.492	0.494	99	82-113	0.67	10

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

Quanterra
Environmental Services

METHOD BLANK REPORT
Metals Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: PB-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-SB QC Run: 07 MAR 97-SB			
Lead	ND	mg/L	0.0050
Test: AS-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-K1 QC Run: 07 MAR 97-K1			
Arsenic	ND	mg/L	0.0050
Test: SE-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-K1 QC Run: 07 MAR 97-K1			
Selenium	ND	mg/L	0.0050
Test: TL-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-SB QC Run: 07 MAR 97-SB			
Thallium	ND	mg/L	0.0050
Test: HG-CVAA-7470-AT Matrix: AQUEOUS QC Lot: 11 MAR 97-N2 QC Run: 11 MAR 97-N2			
Mercury	ND	mg/L	0.00020
Test: CD-FAA-AT Matrix: AQUEOUS QC Lot: 07 MAR 97-SA QC Run: 07 MAR 97-SA			
Cadmium	ND	mg/L	0.00050

Quanterra
Environmental Services

METHOD BLANK REPORT
Metals Analysis and Preparation (cont.)

Analyte	Result	Units	Reporting Limit
Test: CR-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 07 MAR 97-SB QC Run: 07 MAR 97-SB			
Chromium	ND	mg/L	0.0050
Test: SB-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 11 MAR 97-N2 QC Run: 11 MAR 97-N2			
Antimony	ND	mg/L	0.010
Test: AG-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 07 MAR 97-SA QC Run: 07 MAR 97-SA			
Silver	ND	mg/L	0.00050
Test: ICP-AT			
Matrix: AQUEOUS			
QC Lot: 11 MAR 97-N2 QC Run: 11 MAR 97-N2			
Antimony	ND	mg/L	0.060
Arsenic	ND	mg/L	0.10
Barium	ND	mg/L	0.010
Beryllium	ND	mg/L	0.0020
Cadmium	ND	mg/L	0.0050
Calcium	ND	mg/L	0.20
Chromium	ND	mg/L	0.010
Cobalt	ND	mg/L	0.010
Copper	ND	mg/L	0.020
Iron	ND	mg/L	0.10
Lead	ND	mg/L	0.050
Magnesium	ND	mg/L	0.20
Manganese	ND	mg/L	0.010
Molybdenum	ND	mg/L	0.020
Nickel	ND	mg/L	0.040
Selenium	ND	mg/L	0.20
Silver	ND	mg/L	0.010
Sodium	ND	mg/L	5.0
Thallium	ND	mg/L	2.0
Tin	ND	mg/L	0.10

Quanterra
Environmental Services

METHOD BLANK REPORT
Metals Analysis and Preparation (cont.)

Analyte	Result	Units	Reporting Limit
Test: ICP-AT			
Matrix: AQUEOUS			
QC Lot: 11 MAR 97-N2 QC Run: 11 MAR 97-N2			
Vanadium	ND	mg/L	0.010
Zinc	ND	mg/L	0.020

Quanterra
Environmental Services

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
Metals Analysis and Preparation
Project: 054027

Category: PB-FAA-AT Lead, Furnace AA / Total Metals
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 07 MAR 97-SB
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS/MSD	%Recovery MS	%Recovery MSD	%RPD	Acceptance Limit Recov.	Acceptance Limit RPD
Lead	ND G	0.0308	0.0308	0.0400	77	77	0.0	84-124	10

Category: AS-FAA-AT Arsenic, Furnace AA / Total Metals
Matrix: AQUEOUS
Sample: 054026-0007
MS Run: 07 MAR 97-K1
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS/MSD	%Recovery MS	%Recovery MSD	%RPD	Acceptance Limit Recov.	Acceptance Limit RPD
Arsenic	ND	0.0386	0.0388	0.0400	96	97	0.5	85-114	10

Category: SE-FAA-AT Selenium, Furnace AA / Total Metals
Matrix: AQUEOUS
Sample: 054026-0007
MS Run: 07 MAR 97-K1
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS/MSD	%Recovery MS	%Recovery MSD	%RPD	Acceptance Limit Recov.	Acceptance Limit RPD
Selenium	ND	0.0280	0.0276	0.0400	70	69	1.4	80-118	10

G = Reporting limit raised due to the matrix of the sample.
ND = Not Detected

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

Quanterra
Environmental Services

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
Metals Analysis and Preparation
Project: 054027 (cont.)

Category: TL-FAA-AT Thallium, Furnace AA / Total Metals
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 07 MAR 97-SB
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS/MSD	%Recovery MS	%Recovery MSD	%RPD	Acceptance Limit Recov.	Acceptance Limit RPD
Thallium	ND G	0.032	0.032	0.040	80	80	0.3	84-124	10

Category: HG-CVAA-AT Mercury by CVAA / Total Mercury
Matrix: AQUEOUS
Sample: 054089-0001
MS Run: 11 MAR 97-N2
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS/MSD	%Recovery MS	%Recovery MSD	%RPD	Acceptance Limit Recov.	Acceptance Limit RPD
Mercury	ND	0.00103	0.00101	0.00100	103	101	2.5	77-117	10

Category: CD-FAA-AT Cadmium,Furnace AA/ Total Metals
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 07 MAR 97-SA
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS/MSD	%Recovery MS	%Recovery MSD	%RPD	Acceptance Limit Recov.	Acceptance Limit RPD
Cadmium	ND	0.00462	0.00461	0.00400	116	115	0.2	83-123	10

G = Reporting limit raised due to the matrix of the sample.
ND = Not Detected

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

Quanterra
Environmental Services

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
Metals Analysis and Preparation
Project: 054027 (cont.)

Category: CR-FAA-AT Chromium, Furnace AA, Total
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 07 MAR 97-SB
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS/MSD	%Recovery MS	%Recovery MSD	%RPD	Acceptance Limit Recov.	Acceptance Limit RPD
Chromium	0.0057	0.0131	0.0131	0.0100	74	74	0.0	81-121	14

Category: SB-FAA-AT Antimony by Furnace
Matrix: AQUEOUS
Sample: 054075-0002
MS Run: 11 MAR 97-N2
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS/MSD	%Recovery MS	%Recovery MSD	%RPD	Acceptance Limit Recov.	Acceptance Limit RPD
Antimony	ND	0.521	0.527	0.500	104	105	1.1	83-123	14

Category: AG-FAA-AT Silver,Furnace AA/Total Metals
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 07 MAR 97-SA
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS/MSD	%Recovery MS	%Recovery MSD	%RPD	Acceptance Limit Recov.	Acceptance Limit RPD
Silver	ND	0.00414	0.00423	0.00500	83	85	2.2	81-121	15

ND = Not Detected

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

Quanterra
Environmental Services

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
Metals Analysis and Preparation
Project: 054027 (cont.)

Category: ICP-AT ICP Metals / Total
Matrix: AQUEOUS
Sample: 054075-0002
MS Run: 11 MAR 97-N2
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS/MSD	%Recovery MS	%Recovery MSD	%RPD	Acceptance Limit Recov.	Acceptance Limit RPD
Antimony	ND	0.514	0.534	0.500	103	107	3.8	81-119	10
Arsenic	ND	1.92	1.95	2.00	96	98	1.8	81-110	10
Barium	0.060	1.97	1.97	2.00	96	96	0.0	86-114	10
Beryllium	ND	0.0458	0.0458	0.0500	92	92	0.0	83-117	10
Cadmium	ND	0.0410	0.0446	0.0500	82	89	8.4	80-120	17
Calcium	50.5	98.4	98.7	50.0	96	96	0.2	88-112	10
Chromium	ND	0.192	0.195	0.200	96	97	1.3	83-112	10
Cobalt	ND	0.501	0.498	0.500	100	100	0.6	80-120	10
Copper	ND	0.251	0.248	0.250	100	99	1.1	84-115	10
Iron	0.28	1.25	1.26	1.00	97	98	0.5	87-117	10
Lead	ND	0.461	0.460	0.500	92	92	0.1	83-114	15
Magnesium	12.5	61.9	61.7	50.0	99	98	0.2	84-114	10
Manganese	0.029	0.514	0.513	0.500	97	97	0.1	84-113	10
Nickel	ND	0.484	0.483	0.500	97	97	0.2	85-112	10
Silver	ND	0.0436	0.0453	0.0500	87	91	3.9	83-115	10
Sodium	337	387	390	50.0	NC	NC	NC	86-115	10
Tin	ND	1.98	1.99	2.00	99	99	0.4	86-114	10
Vanadium	ND	0.484	0.486	0.500	97	97	0.4	85-114	10
Zinc	0.052	0.523	0.524	0.500	94	94	0.2	82-113	10

NC = Not Calculated, calculation not applicable.
ND = Not Detected

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

Quanterra
Environmental Services

QC LOT ASSIGNMENT REPORT
Wet Chemistry Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
054027-0001-SA	AQUEOUS	TOX-A	27 MAR 97-N1	27 MAR 97-N1
054027-0001-SA	AQUEOUS	CN-A	11 MAR 97-N1	11 MAR 97-N1
054027-0001-SA	AQUEOUS	S-A	11 MAR 97-S1	11 MAR 97-S1
054027-0001-SA	AQUEOUS	TOC-9060-A	19 MAR 97-N1	19 MAR 97-N1
054027-0002-SA	AQUEOUS	TOX-A	27 MAR 97-N1	27 MAR 97-N1
054027-0002-SA	AQUEOUS	CN-A	11 MAR 97-N1	11 MAR 97-N1
054027-0002-SA	AQUEOUS	S-A	11 MAR 97-S1	11 MAR 97-S1
054027-0002-SA	AQUEOUS	TOC-9060-A	19 MAR 97-N1	19 MAR 97-N1

Quanterra
Environmental Services

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limits
Category: TOX-A Matrix: AQUEOUS QC Lot: 27 MAR 97-N1 Concentration Units: ug/L								
Total Organic Halogen as Cl	100	83.6	86.2	84.9	85	84-110	3.0	13
Category: CN-A Matrix: AQUEOUS QC Lot: 11 MAR 97-N1 Concentration Units: mg/L								
Cyanide	0.176	0.194	0.196	0.195	111	72-118	1.2	18
Category: S-A Matrix: AQUEOUS QC Lot: 11 MAR 97-S1 Concentration Units: mg/L								
Sulfide, Total	0.471	0.502	0.500	0.501	106	79-131	0.34	10
Category: TOC-9060-A Matrix: AQUEOUS QC Lot: 19 MAR 97-N1 Concentration Units: mg/L								
Total Organic Carbon	30.0	29.7	29.4	29.6	99	90-110	1.0	10

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

Quanterra
Environmental Services

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TOX-TOX-A Matrix: AQUEOUS QC Lot: 27 MAR 97-N1 QC Run: 27 MAR 97-N1			
Total Organic Halogen as Cl	ND	ug/L	30.0
Test: CNTOT-TEC-A Matrix: AQUEOUS QC Lot: 11 MAR 97-N1 QC Run: 11 MAR 97-N1			
Cyanide	ND	mg/L	0.010
Test: S-SPEC-AT Matrix: AQUEOUS QC Lot: 11 MAR 97-S1 QC Run: 11 MAR 97-S1			
Sulfide, Total	ND	mg/L	0.050
Test: TOC-TOC-A Matrix: AQUEOUS QC Lot: 19 MAR 97-N1 QC Run: 19 MAR 97-N1			
Total Organic Carbon	ND	mg/L	1.0

Quanterra
Environmental Services

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
Wet Chemistry Analysis and Preparation
Project: 054027

Category: TOX-A Total Organic Halogen
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 27 MAR 97-N1
Units: ug/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS/MSD	%Recovery MS	%Recovery MSD	%RPD	Acceptance Limit Recov.	Acceptance Limit RPD
Total Organic Halogen as Cl	ND	87.0	86.6	100	87	87	0.4	84-110	13

Category: CN-A Cyanide
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 11 MAR 97-N1
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS/MSD	%Recovery MS	%Recovery MSD	%RPD	Acceptance Limit Recov.	Acceptance Limit RPD
Cyanide	ND	0.222	0.227	0.198	112	115	2.4	72-118	18

Category: S-A Sulfide
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 11 MAR 97-S1
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS/MSD	%Recovery MS	%Recovery MSD	%RPD	Acceptance Limit Recov.	Acceptance Limit RPD
Sulfide, Total	ND	0.406	0.438	0.449	90	98	7.6	79-131	10

ND = Not Detected

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

Quanterra
Environmental Services

MATRIX SPIKE/MATRIX SPIKE DUPLICATE QC REPORT
Wet Chemistry Analysis and Preparation
Project: 054027 (cont.)

Category: TOC-9060-A Total Organic Carbon
Matrix: AQUEOUS
Sample: 054057-0001
MS Run: 19 MAR 97-N1
Units: mg/L

Analyte	Sample Result	Concentration MS Result	Concentration MSD Result	Amount Spiked MS/MSD	%Recovery MS	%Recovery MSD	%RPD	Acceptance Limit Recov.	Acceptance Limit RPD
Total Organic Carbon	ND	25.0	24.8	25.0	100	99	0.8	90-110	10

ND = Not Detected

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

U.S. GEOLOGICAL SURVEY, WATER R URCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQ T/CHAIN OF CUSTODY

Project Name & Number: Cannon Air Force Base, Ground Water Sampling 463536004	PACKING AND SHIPPING DETAILS
Sampling Location: Landfill-5, Cannon Air Force Base, NM	Packed and Sealed for Shipping by: F. Eileen Roybal — Seal Number: 081582
Team Leader: F. Eileen Roybal	Delivered to Shipper by: F. Eileen Roybal — Airbill Number: 27676443 34
	Sampling Status: ☐ Done ☒ Continuing

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
4 MAR97	1245	CAFB-M -0397-1	Ground-water	16	AllApx-IX: SW8260,SW8270,SW8280,SW8310,SW8080,SW8150, Total-METALS: SW6010 (Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu, Fe,Pb,Mg,Mn,Mo,Hg,Ni,Ag,Se,Na,Tl,Sn,V,Zn), plus SW7041,SW7060, SW7131,SW7191,SW7421,SW7740,SW7761,SW7841; SW9012, SW9030,SW9060,SW9020	Environmental Sample — 51

Additional Comments: VOC's for this sample are in cooler with air bill # 3476848476

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☑ Yes ☐ No
F. Eileen Roybal		4MAR97	1500	Quanterra Environmental 4955 Yarrow Street Arvada, CO 80002 ph: (303) 421-6611 Attention: Lindsay Breyer	Condition of Contents
	[illegible]	3/5/97	945		Contents Temperature
					Laboratory Project Number

U.S. GEOLOGICAL SURVEY, WATER F URCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQUEST/CHAIN OF CUSTODY

Project Name & Number: Cannon Air Force Base, Ground Water Sampling 463536004	PACKING AND SHIPPING DETAILS
Sampling Location: Landfill-5, Cannon Air Force Base, NM	Packed and Sealed for Shipping by: F. Eileen Roybal; Seal Number: 081581
Team Leader: F. Eileen Roybal	Delivered to Shipper by: F. Eileen Roybal; Airbill Number: 3476847 6
	Sampling Status: ☐ Done ☒ Continuing 84

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
4 MAR97	1150	CAFB-Q-0397-1	Ground-water	16	AllApx-IX: SW8260,SW8270,SW8280,SW8310,SW8080,SW8150, Total-METALS: SW6010 (Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu, Fe,Pb,Mg,Mn,Mo,Hg,Ni,Ag,Se,Na,Tl,Sn,V,Zn), plus SW7041,SW7060, SW7131,SW7191,SW7421,SW7740,SW7761,SW7841; SW9012, SW9030,SW9060,SW9020	Environmental Sample -02
4MAR97	1130	CAFB-Q-0397-1	Ultra pure water	3	SW8260	Trip Blank -03

Additional Comments: Also includes VOC from CAFB-M-0397-1 (airbill # 2767643443)

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☑ Yes ☐ No
F. Eileen Roybal		4MAR97	1500	Quanterra Environmental 4955 Yarrow Street Arvada, CO 80002 ph: (303) 421-6611 Attention: Lindsay Breyer	Condition of Contents
	[illegible]	3/5/97	745		Contents Temperature
					Laboratory Project Number

Sample Checklist

Quanterra Environmental Services

Project #: 54027 Date/Time Received: 3/5/97 945

Company Name & Sampling Site: USGS Canon

*Cooler #(s): _____ _____ _____ _____ _____ _____ _____ _____

Temperatures: 2.0 1.4 _____ _____ _____ _____ _____ _____

*Place copy of airbill inside all non-QUANTERRA coolers. Describe here.

Unpacking & Labeling Check Points:

Yes	No		Initials
☑	☐	1. Radiation checked, record if reading > 0.5 mR/hr. (_____mR/hr)	JD
☑	☐	2. Cooler seals intact.	
☑	☐	3. Chain of custody present.	
☐	☑	4. Bottles broken and/or are leaking, comment if yes.	
		PHOTOGRAPH BROKEN BOTTLES	
☑	☐	5. Containers labeled, comment if no.	
☑	☐	6. pH of all samples checked and meet requirements, note exceptions.	
☑	☐	7. Chain of custody includes "received by" and "relinquished" by signatures, dates, and times	
☑	☐	8. Chain of custody agrees with bottle count, comment if no.	
☑	☐	9. Chain of custody agrees with labels, comment if no.	
☑	☐	10. VOA samples filled completely, comment if no.	
☑	☐	11. Are VOA bottles preserved, check for labels.	
☐	☑	12. Sediment present in "D," dissolved, bottles.	
☐	☑	13. Are analyses with short holding times requested.	
☐	☑	14. Is extra sample volume provided for MS, MSD or matrix duplicates.	
☐	☑	15. Multiphase samples present, comment is yes.	
		PHOTOGRAPH MULTIPHASE SAMPLES	
☑	☐	16. Clear picture taken, labeled, and stapled to project folder.	

Comments: Include action taken to resolve discrepancies/problems. Include a hard copy of e-mail or use extra paper if more space is needed. _____

Initials: _____

DODEC LABORATORY DATA REVIEW WORKSHEET

1.0 GENERAL INFORMATION

Data reviewer: Bruce Darnell
Date of review: 4-17-97
Sample project number: 54035
Project name: NM- Cannon AFB
Sample collection date: 3/4/97
Sample matrix and number: Aqueous 3

Type and number of samples in project:

Type	Number
Environmental	2
Trip blank	
Equipment blank	
Ambient blank	
MS/MSD	
Other Method Blank	1

2.0 DATA REPORT

Date of Analytical Results Report: 4-4-97
Number of volumes in Raw Data Report: 1
Raw Data Report reviewed? Yes____ No ✓

Were all analyses requested on the COC form performed by the laboratory?
Yes____ No ✓

If no, list cancelled analyses and reason for non-performance:

Parameters other than dioxins and furans will be reported on #54027.

Were the samples properly preserved upon receipt by the laboratory?
Yes ✓ No____

If no, list laboratory ID for samples that were not properly preserved.

3.0 ANALYTICAL METHODS

Analytical methods used in this project

- _____ VOC by GC/MS (SW 8240, SW 8260, E524, E624)
- _____ Halogenated VOC by GC (SW 8010)
- _____ Aromatic VOC by GC (SW 8020)
- _____ SVOC by GC/MS (SW 8270)
- _____ PAH by HPLC (SW 8310)
- _____ Organochlorine pesticides and PCB (SW 8080)
- _____ Organophosphorous pesticides (SW 8140)
- _____ Chlorinated herbicides (SW 8150)
- ✓ Dioxins and Furans (SW 8280)
- _____ Explosives (8330)
- _____ TOC (E415.1 or SW 9060)
- _____ TPH (E418.1)
- _____ Oil and Grease (E413.2)
- _____ TOX (SW9020)

- _____ ICP screen for metals (SW 6010)
- _____ ICP/MS screen for metals (SW 6020)
- _____ Trace ICP screen for metals (SW 6010 modified)
- _____ Antimony by GFAA (SW 7041)
- _____ Arsenic by GFAA (SW 7060)
- _____ Chromium (SW 7191 or 7196)
- _____ Lead by GFAA (SW 7421)
- _____ Mercury by CVAA (SW 7470 or 7471)
- _____ Selenium by GFAA (SW 7740)
- _____ Thallium by GFAA (SW 7841)
- _____ Inorganic anions (E300.0)
- _____ Alkalinity (310.1)
- _____ Cyanide, total and amenable (SW 9010/9012)
- _____ Nitrogen, ammonia (E350.1)
- _____ Nitrogen, TKN (E351.2)
- _____ Nitrogen, nitrate (E353.2)
- _____ Nitrogen, nitrate plus nitrite (E353.2)
- _____ Nitrogen, nitrite (E354.1)
- _____ Phosphorous, total or ortho (E365.3)
- _____ Sulfate (E375.4)
- _____ Sulfide (E376.2)
- _____ TDS (E160.1)
- _____ pH (SW 9040 or 9045)
- _____ Percent moisture (D2216)

- _____ Gross alpha and gross beta radioactivity (SW 9310)
- _____ Alpha-emitting radium isotopes (SW 9315)
- _____ Radium-228 (SW 9320)
- _____ Uranium (908.1)

- _____ Other analyses : _____

Were analytical holding times met? Yes ✓ No _____

If no, list analytical method and laboratory ID for samples that exceeded holding time:

_____

Did ~~surrogate~~ internal std recoveries meet QC acceptance criteria?
Yes ✓ No _____

If no, list analytical method, laboratory ID, and surrogates that did not meet acceptance criteria:

_____

Did actual reporting limits meet project detection limits?
Organic analyses : Yes ✓ No _____

If no, list analytical method, laboratory ID, and reason for non-conformance:

_____

Inorganic analyses: Yes _____ No _____ NA

GFAA metals and some inorganic anions are subject to matrix interferences and their reporting limits may be raised accordingly as required by USEPA protocols. Reporting limits for ICP metals and mercury by CVAA are typically only raised when the sample concentration exceeds the instrument linear range.

Did DCS meet QC acceptance criteria? Yes ✓ No _____

If no, list analytical method, laboratory ID, and reason for non-conformance:

_____

54035

Did SCS meet QC acceptance criteria? Yes_____ No_____ NA

If no, list analytical method, laboratory ID, and reason for non-conformance:

_____
_____
_____
_____
_____
_____
_____

Were any target compounds found in the method, trip, equipment, or ambient blanks above the RL? Yes _____ No ✓

If yes, list the analytical method, laboratory ID, type of blank and compound:

_____
_____
_____
_____
_____
_____
_____

Did the MS/MSD meet QC acceptance criteria? Yes___ No____ NA

MS/MSD data are used to evaluate the effect of the sample matrix on the analytical process and should only be used in conjunction with other available laboratory QC information to evaluate precision and accuracy.

If no, list the analytical method , laboratory ID, and reason for non-comfrormance :

_____
_____
_____
_____
_____
_____

Additional comments:

_____
_____
_____
_____
_____
_____
_____

QC SUMMARY

The Quanterra laboratories operate under a vigorous QA/QC program designed to ensure the generation of scientifically valid, legally defensible data by monitoring every aspect of laboratory operations. Routine QA/QC procedures include the use of approved methodologies, independent verification of analytical standards, use of duplicate Laboratory Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

The standard laboratory QC package is designed to:

1. establish a strong, cost-effective QC program that ensures the generation of scientifically valid, legally defensible data,

2. assess the laboratory's performance of the analytical method using control limits generated with a well-defined matrix,

3. establish clear-cut guidelines for acceptability of analytical data so that QC decisions can be made immediately at the bench, and

4. provide a standard set of reportables which assures the client of the quality of his data.

The Quanterra QC program is based upon monitoring the precision and accuracy of an analytical method by analyzing a set of Duplicate Control Samples (DCS) at frequent, well-defined intervals. Each DCS is a well-characterized matrix which is spiked with target compounds at 5-100 times the reporting limit, depending upon the methodology being monitored. The purpose of the DCS is not to duplicate the sample matrix, but rather to provide an interference-free, homogeneous matrix from which to gather data to establish control limits. These limits are used to determine whether data generated by the laboratory on any given day is in control.

Control limits for accuracy (percent recovery) are based on the average, historical percent recovery +/- 3 standard deviation units. Control limits for precision (relative percent difference) range from 0 (identical duplicate DCS results) to the average, historical relative percent difference + 3 standard deviation units. These control limits are fairly narrow based on the consistency of the matrix being monitored and are updated on a quarterly basis.

For each batch of samples analyzed, an additional control measure is taken in the form of a Single Control Sample (SCS). The SCS consists of a control matrix that is spiked with surrogate compounds appropriate to the method being used. In cases where no surrogate is available, (e.g., metals or conventional analyses) a single DCS serves as the control sample. An SCS is prepared for each sample lot for which the DCS pair are not analyzed. The recovery of the SCS is charted in exactly the same manner as described for the DCS, and provides a daily check on the performance of the method.

Accuracy for DCS and SCS is measured by Percent Recovery.

$$\% \text{ Recovery} = \frac{\text{Measured Concentration}}{\text{Actual Concentration}} \times 100$$

Precision for DCS is measured by Relative Percent Difference (RPD).

$$\text{RPD} = \frac{|\text{ Measured Concentration DCS1 - Measured Concentration DCS2 }|}{(\text{Measured Concentration DCS1 + Measured Concentration DCS2})/2} \times 100$$

All samples analyzed concurrently by the same test are assigned the same QC lot number. Projects which contain numerous samples, analyzed over several days, may have multiple QC lot numbers associated with each test. The QC information which follows includes a listing of the QC lot numbers associated with each of the samples reported, DCS and SCS (where applicable) recoveries from the QC lots associated with the samples, and control limits for these lots. The QC data is reported by test code, in the order that the tests are reported in the analytical results section of this report.

Quanterra
Environmental Services

QC LOT ASSIGNMENT REPORT
Subcontracted to Quanterra Lab

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
054035-0001-MB	AQUEOUS	DXNFUR-A	17 MAR 97-A	
054035-0001-SA	AQUEOUS	DXNFUR-A	17 MAR 97-A	
054035-0002-SA	AQUEOUS	DXNFUR-A	17 MAR 97-A	

Quanterra
Environmental Services

DUPLICATE CONTROL SAMPLE REPORT
Subcontracted to Quanterra Lab
Project: 054035

Category: DXNFUR-A C14-C18 Dioxins & Furans
Matrix: AQUEOUS
QC Lot: 17 MAR 97-A
Concentration Units: ng/L

Date Analyzed: 18 MAR 97

Analyte	Concentration Spiked	Measured DCS1	Qual	DCS2	Qual	AVG	Accuracy Average(%) DCS	Limits	Precision (RPD) DCS	Limit
2,3,7,8-TCDF	25.0	26.2		27.6		26.9	108	62-129	4.9	18
1,2,3,7,8-PeCDF	62.5	71.4		74.7		73.1	117	60-140	4.5	50
1,2,3,6,7,8-HxCDF	62.5	66.9		70.7		68.8	110	60-140	5.6	50
1,2,3,4,6,7,8-HpCDF	62.5	66.4		68.8		67.6	108	50-150	3.6	50
OCDF	125	142		150		146	116	50-150	5.4	28
2,3,7,8-TCDD	25.0	27.1		28.4		27.7	111	57-128	4.7	20
1,2,3,7,8-PeCDD	62.5	69.4		73.6		71.5	114	80-125	5.9	25
1,2,3,6,7,8-HxCDD	62.5	66.3		67.9		67.1	107	60-140	2.5	50
1,2,3,4,6,7,8-HpCDD	62.5	73.1		72.9		73.0	117	60-131	0.33	23
OCDD	125	124		132		128	102	50-147	5.6	20
13C-2,3,7,8-TCDF	25.0	20.4		19.3		19.9	80	40-120	5.6	
13C-2,3,7,8-TCDD	25.0	21.2		19.9		20.6	82	40-120	6.6	
13C-1,2,3,6,7,8-HxCDD	25.0	21.7		21.7		21.7	87	40-120	0.04	
13C-1,2,3,4,6,7,8-HpCDF	50.0	47.1		46.4		46.7	93	40-120	1.6	
13C-OCDD	50.0	45.6		43.8		44.7	89	40-120	3.9	

= Value outside control limits

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

Quanterra Environmental Services

Appendix IX Dioxins/Furans
Low Resolution

Client Name: U.S. Geological Survey
Client ID: Method Blank
Lab ID: 054035-0001-MB
Matrix: AQUEOUS
Authorized: 05 MAR 97

Sampled: 04 MAR 97
Received: 05 MAR 97

Prepared: 17 MAR 97
Analyzed: 18 MAR 97

Sample Amt: 1.0

Parameter	Result	Units	Reporting Limit
TCDFs (total)	ND	ng/L	0.68
PeCDFs (total)	ND	ng/L	0.53
HxCDFs (total)	ND	ng/L	0.50
TCDDs (total)	ND	ng/L	0.48
2,3,7,8-TCDD	ND	ng/L	0.48
PeCDDs (total)	ND	ng/L	1.1
HxCDDs (total)	ND	ng/L	0.82
13C-2,3,7,8-TCDF	78	ng/L	
13C-2,3,7,8-TCDD	77	ng/L	
13C-1,2,3,6,7,8-HxCDD	79	ng/L	
13C-1,2,3,4,6,7,8-HpCDF	87	ng/L	

Dilution factor is 1.0. All results and limits are corrected for dilution.

ND = Not Detected

Reported By: MBAQUERFO

Approved By: RHRABAK

U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQUEST/CHAIN OF CUSTODY

Project Name & Number: Cannon Air Force Base, Ground Water Sampling 463536004	PACKING AND SHIPPING DETAILS
	Packed and Sealed for Shipping by: F. Eileen Roybal — Seal Number: 081582
Sampling Location: Landfill-5, Cannon Air Force Base, NM	Delivered to Shipper by: F. Eileen Roybal — Airbill Number: 27676943 34
Team Leader: F. Eileen Roybal	Sampling Status: ☐ Done ☒ Continuing

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
4 MAR97	1245	CAFB-M -0397-1	Ground-water	16	AllApx-IX: SW8260,SW8270,SW8280,SW8310,SW8080,SW8150, Total-METALS: SW6010 (Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu, Fe,Pb,Mg,Mn,Mo,Hg,Ni,Ag,Se,Na,Tl,Sn,V,Zn), plus SW7041,SW7060, SW7131,SW7191,SW7421,SW7740,SW7761,SW7841; SW9012, SW9030,SW9060,SW9020	Environmental Sample — 01

Additional Comments: VOC's for this sample are in cooler with air bill # 3476848476

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☑ Yes ☐ No
F. Eileen Roybal		4MAR97	1500	Quanterra Environmental 4955 Yarrow Street Arvada, CO 80002 ph: (303) 421-6611 Attention: Lindsay Breyer	Condition of Contents
	[illegible]	3/5/97	915		Contents Temperature
					Laboratory Project Number

U.S. GEOLOGICAL SURVEY, WATER RESOURCES DIVISION, NEW MEXICO DISTRICT
ANALYTICAL REQUEST/CHAIN OF CUSTODY

Project Name & Number	PACKING AND SHIPPING DETAILS	
Cannon Air Force Base, Ground Water Sampling 463536004	Packed and Sealed for Shipping by: F. Eileen Roybal	Seal Number: 081581
Sampling Location: Landfill-5, Cannon Air Force Base, NM	Delivered to Shipper by: F. Eileen Roybal	Airbill Number: 3476847676
Team Leader: F. Eileen Roybal	Sampling Status: ☐ Done ☒ Continuing	84

Sample Date	Sample Time	Field Sample Number	Sample Type	No. of Containers	Analytical Methods (Parameters)	Remarks
4 MAR97	1150	CAFB-Q-0397-1	Ground-water	16	AllApx-IX: SW8260,SW8270,SW8280,SW8310,SW8080,SW8150, Total-METALS: SW6010 (Sb,As,Ba,Be,Cd,Ca,Cr,Co,Cu, Fe,Pb,Mg,Mn,Mo,Hg,Ni,Ag,Se,Na,Tl,Sn,V,Zn), plus SW7041,SW7060, SW7131,SW7191,SW7421,SW7740,SW7761,SW7841; SW9012, SW9030,SW9060,SW9020	Environmental Sample
4MAR97	1130	CAFB-Q-0397-1	Ultra pure water	3	SW8260	Trip Blank -03

Additional Comments: Also include VOC from CAFB-M-0397-1 (airbill # 2767643443)

CHAIN OF CUSTODY RECORD				LABORATORY LOG-IN OF SAMPLE SHIPPING CONTAINER	
Relinquished by (signed)	Received by (signed)	Date	Time	Analytical Laboratory	Seal Intact upon Receipt ☑ Yes ☐ No
F. Eileen Roybal		4MAR97	1500	Quanterra Environmental 4955 Yarrow Street Arvada, CO 80002 ph: (303) 421-6611 Attention: Lindsay Breyer	Condition of Contents
	[illegible]	3/5/97	7:25		Contents Temperature
					Laboratory Project Number

Chain of Custody Record

Quanterra Environmental Services

QUA-4124

Client: USCS	Project Manager: Mark Stella	Date:	Chain Of Custody Number: 27257
Address: Camon	Telephone Number (Area Code)/Fax Number: 303 12-6611	Lab Number:	Page ____ of ____
City:	State:	Zip Code:	Site Contact:
Project Name:	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.:			

Analysis: DIOXINS

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	DIOXINS
54035-01			Aq	1l					✓
L -02				↓					
1 sample 54035-02 was received broken. JK 3/6/97									

Special Instructions:

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months

Turn Around Time Required: ☑ Normal ☐ Rush

QC Level: ☐ I. ☐ II. ☐ III.

Project Specific (Specify):

	Date	Time		Date	Time
1. Relinquished By: [signature]	3/5/97	1600	1. Received By: [signature]	3/6/97	1150
2. Relinquished By:			2. Received By:		
3. Relinquished By:			3. Received By:		

Comments:

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

II-143

A-17

[redacted]

Chain of Custody Record

ATTN: Robert Hrabak

Quanterra Environmental Services

QUA-412M

Client: OES. DENVER	Project Manager: Stella	Date: 3-7-97	Chain Of Custody Number: 27332
Address:	Telephone Number (Area Code)/Fax Number:	Lab Number:	Page ____ of ____
City: / State: / Zip Code:	Site Contact:		
Project Name: USCoS- Conrm AFB- Dioxin	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.:			

Analysis: 8290

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	8290
54035-02					1.0L	1			X

Special Instructions:

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months

Turn Around Time Required: ☒ Normal ☐ Rush

QC Level: ☐ I. ☐ II. ☐ III.

Project Specific (Specify):

	Date	Time		Date	Time
1. Relinquished By: [signature]	3-7-97	11:45	1. Received By: [signature]	3-7-97	1425
2. Relinquished By:			2. Received By:		
3. Relinquished By:			3. Received By:		

Comments: Replacement Sample

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

[redacted]

Ch[redacted] of Custody Record

Quan[redacted]ra Environmental Services

QUA-4124

Client	Project Manager	Date	Chain Of Custody Number
USOS	Mark Stella		27257
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page ____ of ____**
Canon	303 42 6611		

City	State	Zip Code	Site Contact

Project Name	Carrier/Waybill Number

Contract/Purchase Order/Quote No.

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: Dioxins
S4035-01			Ag	1l					1
L -02			L	1					
1 Sample S4035-02 was received broken									

Special Instructions

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months

Turn Around Time Required
☑ Normal ☐ Rush

QC Level
☐ I. ☐ II. ☐ III.

Project Specific (Specify)

	Date	Time		Date	Time
1. Relinquished By	3/3/97	1600	1. Received By	3/4/97	11:50
2. Relinquished By			2. Received By		
3. Relinquished By			3. Received By		

Comments

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

[redacted]

Chain of Custody Record

ATTN: Robert Hrabak

Quanta Environmental Services

QUA-4124

Client: OES - DENVER	Project Manager: Stella	Date: 3-7-97	Chain Of Custody Number: 27332
Address:	Telephone Number (Area Code)/Fax Number:	Lab Number:	Page ____ of ____
City: / State: / Zip Code:	Site Contact:		
Project Name: USCoS - Conrm AFB - Dioxin	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.:			

Sample I.D. No. and Description	Date	Time	Sample Type	Total Volume	Containers Type	Containers No.	Preservative	Condition on Receipt	Analysis: 8290
54035-02					[illegible]	1			X

Special Instructions:

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months

Turn Around Time Required: ☒ Normal ☐ Rush

QC Level: ☐ I. ☐ II. ☐ III.

Project Specific (Specify):

1. Relinquished By: [signature]	Date: 3-7-97	Time: 11:45	1. Received By: [signature]	Date: 03/07/97	Time: 1425
2. Relinquished By:	Date:	Time:	2. Received By:	Date:	Time:
3. Relinquished By:	Date:	Time:	3. Received By:	Date:	Time:

Comments: Replacement Sample

DISTRIBUTION: WHITE - Stays with Sample; CANARY - Returned to Client with Report; PINK - Field Copy

Sample Checklist

Quanterra Environmental Services

Project #: 54027 Date/Time Received: 3/5/97 945

Company Name & Sampling Site: USGS Canon

*Cooler #(s): _____ _____ _____ _____ _____ _____ _____ _____

Temperatures: 2.0 1.4 _____ _____ _____ _____ _____ _____

*Place copy of airbill inside all non-QUANTERRA coolers. Describe here.

Unpacking & Labeling Check Points:

Yes	No		Initials
☑	☐	1. Radiation checked, record if reading > 0.5 mR/hr. (_____mR/hr)	JD
☑	☐	2. Cooler seals intact.	
☑	☐	3. Chain of custody present.	
☐	☑	4. Bottles broken and/or are leaking, comment if yes.	
		PHOTOGRAPH BROKEN BOTTLES	
☑	☐	5. Containers labeled, comment if no.	
☑	☐	6. pH of all samples checked and meet requirements, note exceptions.	
☑	☐	7. Chain of custody includes "received by" and "relinquished" by signatures, dates, and times	
☑	☐	8. Chain of custody agrees with bottle count, comment if no.	
☑	☐	9. Chain of custody agrees with labels, comment if no.	
☑	☐	10. VOA samples filled completely, comment if no.	
☑	☐	11. Are VOA bottles preserved, check for labels.	
☐	☑	12. Sediment present in "D," dissolved, bottles.	
☐	☑	13. Are analyses with short holding times requested.	
☐	☑	14. Is extra sample volume provided for MS, MSD or matrix duplicates.	
☐	☑	15. Multiphase samples present, comment is yes.	
		PHOTOGRAPH MULTIPHASE SAMPLES	
☑	☐	16. Clear picture taken, labeled, and stapled to project folder.	

Comments: Include action taken to resolve discrepancies/problems. Include a hard copy of e-mail or use extra paper if more space is needed. _____

Initials: _____

APPENDIX III

Field Data

Sample container and preservation requirements

Parameters and methods	Bottle Size and Type	Preservatives
Appendix-IX, Volatile Organic Compounds SW8260	Three 40 ml glass vials	200 uL 50 % Hydrochloric Acid, Chilled
Appendix-IX, Semivolatile Organic Compounds SW8270	Two 32 oz. glass (amber)	None, Chilled
Appendix-IX, Pesticides and PCB's SW8080A	Two 32 oz. glass	None, Chilled
Appendix-IX, Dioxins and Furans SW8280	Two 32 oz. glass (amber)	None, Chilled
Polynuclear Aromatic Hydrocarbons SW8310	Two 32 oz. glass (amber)	None, Chilled
Appendix-IX, Herbicides SW8150	32 oz. glass	None, Chilled
Appendix-IX, 23 Metals, total by SW6010, also SW7041,SW7060,SW7131, SW7191, SW7421, SW7740, SW7761, SW7841	16 oz. polyethylene	10 mL 20% Nitric Acid, pH<2
Cyanide, SW9012	8 oz. polyethylene	2 mL 50% Sodium Hydroxide, Chilled, pH>12
Sulfide, E376.2	8 oz. polyethylene	1 mL 1N Zinc Acetate, plus 1 mL 50% Sodium Hydroxide, Chilled, pH>9
Total Organic Carbon (TOC) SW9060	16 oz. glass	2 mL 50% Sulfuric Acid, Chilled, pH<2
Total Organic Halogen, (TOX), SW9020	8 oz. glass (amber)	1 mL 50% Sulfuric Acid, Chilled, pH<2

4MAR97

1005 - M. Roybal arrive at environment office. Delivered 8 copies of the mepts (12/97 Sampling round) to Sanford Huttzel. Talked about getting more work. Weather - Sunny and warm. Slight breeze

1030 - M. Roybal arrive at well Q - Calibrate meters.
PH 7 = 7.01 PH 10 = 10.07 Temp = 19.4°C Slope = 96.4
PH meter - Orion 250A ; S/N 001951
SPC meter - Orion 126 ; W-597220
SPC calibrated with 763 µS/cm. ; @ 1100 - RK Dewees arrive onsite

1108 - Mscpe w 457118 - WL = 277.00' blw pump
HNU = 0.0 unit

1113 - Begin purging well - Q
1130 - Trip Blank CAFB-Q-0397-TB

TIME	VOL(gal)	TEMP(C)	PH	COND (µS/cm)	
1113	0	20.8	8.05	173	
1120	5	18.9	7.62	728	
1124	10	18.6	7.67	654	
1129	15	18.3	7.69	737	
1134	20	18.2	7.70	737	
1136	25	18.3	7.71	738	
1138	30	18.3	7.69	749	J. Larson arrive on site.
1143	35	18.2	7.69	743	
1147	40	18.3	7.70	742	

1150 Collect env. sample CAFB-Q-0397-1
1220 - Go to M to sample.

Well M

4 MAR 97

1230 – F.E. Roybal, J. Larson, RK Dewees arrive on site.
HNU – 0.0 unit
WL = 282.52 ft blw pump.

1234 – Begin purging well-M

TIME	VOL (gal)	TEMP (°C)	PH	COND (µS/cm)
1234	0	19.0	7.38	814
1235	1½	18.1	7.32	806
1238	3	18.3	6.85	881
1240	4	18.4	6.85	883
1242	5	18.4	6.86	883

1245 Collect env. sample CAFB-M-0397-1

14:00 M. Roybal pack up and call for Fed Ex pickup.
RK Dewees and J. Larson installing transducer to well-B.

5MAR97 well L.

0730 – F.E. ROYBAL, J. Larson, RK Dewees > arrive on site. Weather – cold, sunny, E-east wind. M. Roybal calibrate meters.

PID = 0.0. W.L. = 283.57 ft. blw pump.

PH7 = 7.09 PH10 = 10.28 Slope -95.4 Temp = 2.6°C

SPC calibrated with 763 µS/cm.

0817 – Begin purging well L. 0800 – Trip blank – CAFB-L-0397-TB

TIME	VOL (gal)	TEMP (°C)	PH	COND (µS/cm)	
0817	0	11.5	7.58	933	
0818	1	14.8	7.29	831	
0820	2	15.8	7.13	849	
0821	3	15.8	7.10	844	
0824	4	16.0	7.02	845	well dry Let it recover

well recovering period.

0835 Begin purging again ~~7.5~~ ~~929~~

0838	5	10.5	7.38	941
0840	6	13.2	7.40	950
0841	7	14.7	7.66	950

well dry let it recover

0900 Collect environmental Sample CAFB-L-0397-1

0901 and duplicate Sample CAFB-X-0397-1

0943 Move to well I

5MAR97 well-I

0945 - F.E. Roybal, J. Larson, RK Dewees arrive on site
PID = 0.0 Weather - warming up, slight breeze
WL = 283.30 ft. b/w pump

0949 - Begin purging well I

TIME	VOL (gal)	TEMP (°C)	PH	COND (us/cm)
0950	0	13.6	7.59	810
0955	5	16.2	7.55	870
1000	10	17.5	7.50	864
1006	15	17.7	7.49	866
1011	20	17.8	7.50	865
1016	25	17.7	7.50	775
1021	30	17.9	7.50	776
1027	35	17.7	7.51	865

1030 collect env. sample CAFB-I-0397-1
matrix spike CAFB-I-0397-MS
matrix spike duplicate CAFB-I-0397-SD

1115 J. Larson leave site to take coolers to env. department.

1130 - R.K Dewees + F.E. Roybal leave site

end of sampling round.