Rocky Mountain
Analytical Laboratory

ANALYTICAL RESULTS

FOR

U.S. GEOLOGICAL SURVEY

ENSECO-RMAL NO. 013571

MARCH 14, 1991

Enseco

Reviewed by:

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Introduction

This report presents the analytical results as well as supporting information to aid in the evaluation and interpretation of the data and is arranged in the following order:

- Sample Description Information
- Analytical Test Requests
- Analytical Results
- Quality Control Report

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 Enseco - RMAL 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
013571-0001-SA	DI-CF-BOTTLED-H20	AQUEOUS	13 FEB 91	11:50	14 FEB 91

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ANALYTICAL TEST REQUESTS
for
U.S. Geological Survey

Lab ID: 013571	Group Code	Analysis Description	Custom Test?
0001	A	Total Organic Carbon (TOC)	N
		Halogenated Volatile Organics	N
		Halogenated Volatile Organics-2nd Column Analysis	N
		Semivolatile Organics Appendix IX List	N
		Prep - Semivolatile Organics by GC/MS	N
		Chromium, Furnace AA	N
		Arsenic, Furnace AA (Dissolved)	N
		ICP Suite: Air Force	Y

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 data is the date when the project was defined by the client such that laboratory work could begin.

Data sheets contain a listing of the parameters measured in each test, the analytical results and the Enseco 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.

Enseco-RMAL is no longer routinely blank-correcting 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. This policy is described in detail in the Enseco Incorporated Quality Assurance Program Plan for Environmental Chemical Monitoring, Revision 3.3, May, 1989.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, is provided subsequently.

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Semivolatile Organics
Appendix IX List
Method 8270

Client Name: U.S. Geological Survey
Client ID: DI-CF-BOTTLED-H2O
Lab ID: 013571-0001-SA
Matrix: AQUEOUS Sampled: 13 FEB 91 Received: 14 FEB 91
Authorized: 15 FEB 91 Prepared: 20 FEB 91 Analyzed: 27 FEB 91

Parameter	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	10
Aniline	ND	ug/L	10
Anthracene	ND	ug/L	10
Aramite	ND	ug/L	10
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	10
4-Chloroaniline	ND	ug/L	10
bis(2-Chloroethoxy)-methane	ND	ug/L	10
bis(2-Chloroethyl) ether	ND	ug/L	10
bis(2-Chloroisopropyl)-ether	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	20
2,4-Dichlorophenol	ND	ug/L	10
2,6-Dichlorophenol	ND	ug/L	10
Diethyl phthalate	ND	ug/L	10

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Ethan Hutchinson Approved By: Jeff Lowry

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Semivolatile Organics
Appendix IX List
Method 8270

Client Name: U.S. Geological Survey
Client ID: DI-CF-BOTTLED-H20
Lab ID: 013571-0001-SA
Matrix: AQUEOUS Sampled: 13 FEB 91 Received: 14 FEB 91
Authorized: 15 FEB 91 Prepared: 20 FEB 91 Analyzed: 27 FEB 91

Parameter	Result	Units	Reporting Limit
Dimethoate	ND	ug/L	--
p-Dimethylaminoazobenzene	ND	ug/L	10
7,12-Dimethylbenz(a)-anthracene	ND	ug/L	10
3,3'-Dimethylbenzidine	ND	ug/L	10
a,a-Dimethylphenethyl-amine	ND	ug/L	10
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	--
Fluoranthene	ND	ug/L	10
Fluorene	ND	ug/L	10
Hexachlorobenzene	ND	ug/L	10
Hexachlorobutadiene	ND	ug/L	10
Hexachlorocyclopentadiene	ND	ug/L	10
Hexachloroethane	ND	ug/L	10
Hexachlorophene	ND	ug/L	--
Hexachloropropene	ND	ug/L	10
Indeno(1,2,3-cd)pyrene	ND	ug/L	10
Isophorone	ND	ug/L	10
Isosafrole	ND	ug/L	20
Methapyrilene	ND	ug/L	10
3-Methylcholanthrene	ND	ug/L	10
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

(continued on following page)

ND = Not detected
NA = Not applicable

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Semivolatile Organics
Appendix IX List
Method 8270

Client Name: U.S. Geological Survey
Client ID: DI-CF-BOTTLED-H20
Lab ID: 013571-0001-SA
Matrix: AQUEOUS Sampled: 13 FEB 91 Received: 14 FEB 91
Authorized: 15 FEB 91 Prepared: 20 FEB 91 Analyzed: 27 FEB 91

Parameter	Result	Units	Reporting Limit
1,4-Naphthoquinone	ND	ug/L	10
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	--
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	10
Parathion	ND	ug/L	50
Pentachlorobenzene	ND	ug/L	10
Pentachloroethane	ND	ug/L	10
Pentachloronitrobenzene	ND	ug/L	50
Pentachlorophenol	ND	ug/L	50
Phenacetin	ND	ug/L	10
Phenanthrene	ND	ug/L	10
Phenol	ND	ug/L	10
4-Phenylenediamine	ND	ug/L	--
Phorate	ND	ug/L	100
2-Picoline	ND	ug/L	10
Pronamide	ND	ug/L	10
Pyrene	ND	ug/L	10
Pyridine	ND	ug/L	20
Safrole	ND	ug/L	10
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

(continued on following page)

ND = Not detected
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Reported By: Ethan Hutchinson Approved By: Jeff Lowry

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Semivolatile Organics
Appendix IX List
Method 8270

Client Name: U.S. Geological Survey
Client ID: DI-CF-BOTTLED-H2O
Lab ID: 013571-0001-SA
Matrix: AQUEOUS Sampled: 13 FEB 91 Received: 14 FEB 91
Authorized: 15 FEB 91 Prepared: 20 FEB 91 Analyzed: 27 FEB 91

Parameter	Result	Units	Reporting Limit
2-Toluidine	ND	ug/L	10
1,2,4-Trichlorobenzene	ND	ug/L	10
2,4,5-Trichlorophenol	ND	ug/L	50
2,4,6-Trichlorophenol	ND	ug/L	10
O,O,O-Triethylphosphorothioate	ND	ug/L	10
1,3,5-Trinitrobenzene	ND	ug/L	10
Surrogate	**Recovery**		
Nitrobenzene-d5	76	%	--
2-Fluorobiphenyl	67	%	--
Terphenyl-d14	84	%	--
Phenol-d5	77	%	--
2-Fluorophenol	74	%	--
2,4,6-Tribromophenol	75	%	--

ND = Not detected
NA = Not applicable

Reported By: Ethan Hutchinson Approved By: Jeff Lowry

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TENTATIVELY IDENTIFIED COMPOUNDS

FOR

U.S. GEOLOGICAL SURVEY

SAMPLE NUMBER 013571-0001

Compound Name	Fraction	Confidence Level	Estimated Concentration ug/L
None Detected	BNA		

NOTES:

Confidence Levels

Level 3 - Confirmed Identification
Level 2 - Confident Identification
Level 1 - Tentative Identification

Please refer to the discussion for further details.

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Halogenated Volatile Organics

Method 8010

Client Name: U.S. Geological Survey
Client ID: DI-CF-BOTTLED-H20
Lab ID: 013571-0001-SA
Matrix: AQUEOUS Sampled: 13 FEB 91 Received: 14 FEB 91
Authorized: 15 FEB 91 Prepared: NA Analyzed: 27 FEB 91

Parameter	Result	Units	Reporting Limit	
Chloromethane	ND	ug/L	1.1	T
Bromomethane	ND	ug/L	6.0	
Dichlorodifluoromethane	ND	ug/L	9.0	
Vinyl chloride	ND	ug/L	0.60	
Chloroethane	ND	ug/L	3.0	
Methylene chloride	ND	ug/L	2.0	
Trichlorofluoromethane	ND	ug/L	5.0	
1,1-Dichloroethene	ND	ug/L	0.70	
1,1-Dichloroethane	ND	ug/L	0.40	
trans-1,2-Dichloroethene	ND	ug/L	0.50	
Chloroform	ND	ug/L	0.30	
1,2-Dichloroethane	ND	ug/L	0.50	
1,1,1-Trichloroethane	ND	ug/L	0.20	
Carbon tetrachloride	ND	ug/L	0.60	
Bromodichloromethane	ND	ug/L	0.50	
1,2-Dichloropropane	ND	ug/L	0.50	
trans-1,3-Dichloropropene	ND	ug/L	2.0	
Trichloroethene	ND	ug/L	0.60	
Dibromochloromethane	ND	ug/L	0.60	
1,1,2-Trichloroethane	ND	ug/L	0.20	
2-Chloroethyl vinyl ether	ND	ug/L	5.5	
Bromoform	ND	ug/L	1.0	
1,1,2,2-Tetrachloroethane	ND	ug/L	1.4	
Tetrachloroethene	ND	ug/L	0.40	
Chlorobenzene	ND	ug/L	1.2	
1,3-Dichlorobenzene	ND	ug/L	1.0	
1,2-Dichlorobenzene	ND	ug/L	0.50	
1,4-Dichlorobenzene	ND	ug/L	0.50	
Benzyl chloride	ND	ug/L	6.8	
Bromobenzene	ND	ug/L	5.0	
bis(2-Chloroisopropyl)-ether	ND	ug/L	10	
1-Chlorohexane	ND	ug/L	5.0	
4-Chlorotoluene	ND	ug/L	23	
Dibromomethane	ND	ug/L	5.0	
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	
1,2,3-Trichloropropane	ND	ug/L	5.0	

Surrogate	Recovery		
Bromochloromethane	70	%	--

(continued on following page)

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

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Halogenated Volatile Organics (CONT.)

Method 8010

Client Name: U.S. Geological Survey
Client ID: DI-CF-BOTTLED-H20
Lab ID: 013571-0001-SA
Matrix: AQUEOUS Sampled: 13 FEB 91 Received: 14 FEB 91
Authorized: 15 FEB 91 Prepared: NA Analyzed: 27 FEB 91

Note T : Preferred values unless footnoted on secondary column test.

ND = Not detected
NA = Not applicable

Reported By: Garth Atkins Approved By: Jeff Lowry

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Metals

Total Metals

Client Name: U.S. Geological Survey
Client ID: DI-CF-BOTTLED-H20
Lab ID: 013571-0001-SA
Matrix: AQUEOUS Sampled: 13 FEB 91 Received: 14 FEB 91
Authorized: 15 FEB 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Arsenic	ND	mg/L	0.010	7060	25 FEB 91	27 FEB 91
Chromium	0.0019	mg/L	0.0010	7191	25 FEB 91	04 MAR 91
Zinc	0.017	mg/L	0.010	6010	25 FEB 91	27 FEB 91

ND = Not detected
NA = Not applicable

Reported By: Scott Moroschan Approved By: Toni Lusk

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General Inorganics

Client Name: U.S. Geological Survey
Client ID: DI-CF-BOTTLED-H20
Lab ID: 013571-0001-SA
Matrix: AQUEOUS Sampled: 13 FEB 91 Received: 14 FEB 91
Authorized: 15 FEB 91 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Organic Carbon	1.1	mg/L	0.50	9060	NA	23 FEB 91

ND = Not detected
NA = Not applicable

Reported By: Steve Pope Approved By: Toni Lusk

Quality Control Results

The Enseco 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.

In addition, the Enseco laboratories maintain a comprehensive set of certifications from both state and federal governmental agencies which require frequent analyses of blind audit samples. Enseco - Rocky Mountain Analytical Laboratory is certified by the EPA under the EPA/CLP program for both Organic and Inorganic analyses, under the USATHAMA (U.S. Army) program, by the Army Corps of Engineers, and the states of Colorado, New Jersey, New York, Utah, and Florida, among others.

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 Enseco 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 either representative target compounds or surrogate compounds appropriate to the method being used. An SCS is prepared for each sample lot for which the DCS pair are not analyzed.

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).

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

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.

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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)
013571-0001-SA	AQUEOUS	625-A	18 FEB 91-A	20 FEB 91-A

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DUPLICATE CONTROL SAMPLE REPORT
Semivolatile Organics by GC/MS

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: 625-A Matrix: AQUEOUS QC Lot: 18 FEB 91-A Concentration Units: ug/L								
Phenol	100	69.1	69.7	69.4	69	12- 89	0.9	42
2-Chlorophenol	100	77.4	72.4	74.9	75	27-123	6.7	40
1,4-Dichlorobenzene	50	31.2	30.5	30.8	62	36- 97	2.3	28
N-Nitroso-di-n-propylamine	50	35.8	34.6	35.2	70	41-116	3.4	38
1,2,4-Trichlorobenzene	50	26.0	26.2	26.1	52	39- 98	0.8	28
4-Chloro-3-methylphenol	100	67.9	67.1	67.5	68	23- 97	1.2	42
Acenaphthene	50	35.0	32.6	33.8	68	46-118	7.1	31
4-Nitrophenol	100	52.2	63.6	57.9	58	10- 80	20	50
2,4-Dinitrotoluene	50	30.7	31.4	31.0	62	24- 96	2.3	38
Pentachlorophenol	100	80.2	80.5	80.4	80	9-103	0.4	50
Pyrene	50	37.3	32.8	35.0	70	26-127	13	31

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/MS

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 625-A				
Matrix: AQUEOUS				
QC Lot: 18 FEB 91-A QC Run: 20 FEB 91-A				
Concentration Units: ug/L				
Nitrobenzene-d5	100	72.7	73	35-114
2-Fluorobiphenyl	100	71.7	72	43-116
Terphenyl-d14	100	107	107	33-141
2-Fluorophenol	200	136	68	21-100
Phenol-d5	200	139	70	10- 94
2,4,6-Tribromophenol	200	200	100	10-123

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

METHOD BLANK REPORT
Semivolatile Organics by GC/MS

Test: 8270CP-AP9-A
Matrix: AQUEOUS
QC Lot: 18 FEB 91-A QC Run: 20 FEB 91-A

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	10
Aniline	ND	ug/L	10
Anthracene	ND	ug/L	10
Aramite	ND	ug/L	10
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	10
4-Chloroaniline	ND	ug/L	10
bis(2-Chloroethoxy)-methane	ND	ug/L	10
bis(2-Chloroethyl) ether	ND	ug/L	10
bis(2-Chloroisopropyl)-ether	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	20
2,4-Dichlorophenol	ND	ug/L	10
2,6-Dichlorophenol	ND	ug/L	10
Diethyl phthalate	ND	ug/L	10

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

Test: 8270CP-AP9-A
Matrix: AQUEOUS
QC Lot: 18 FEB 91-A QC Run: 20 FEB 91-A

Analyte	Result	Units	Reporting Limit
Dimethoate	ND	ug/L	--
p-Dimethylaminoazobenzene	ND	ug/L	10
7,12-Dimethylbenz(a)-anthracene	ND	ug/L	10
3,3'-Dimethylbenzidine	ND	ug/L	10
a,a-Dimethylphenethyl-amine	ND	ug/L	10
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	--
Fluoranthene	ND	ug/L	10
Fluorene	ND	ug/L	10
Hexachlorobenzene	ND	ug/L	10
Hexachlorobutadiene	ND	ug/L	10
Hexachlorocyclopentadiene	ND	ug/L	10
Hexachloroethane	ND	ug/L	10
Hexachlorophene	ND	ug/L	--
Hexachloropropene	ND	ug/L	10
Indeno(1,2,3-cd)pyrene	ND	ug/L	10
Isophorone	ND	ug/L	10
Isosafrole	ND	ug/L	20
Methapyrilene	ND	ug/L	10
3-Methylcholanthrene	ND	ug/L	10
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

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

Test: 8270CP-AP9-A
Matrix: AQUEOUS
QC Lot: 18 FEB 91-A QC Run: 20 FEB 91-A

Analyte	Result	Units	Reporting Limit
1,4-Naphthoquinone	ND	ug/L	10
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	--
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	10
Parathion	ND	ug/L	50
Pentachlorobenzene	ND	ug/L	10
Pentachloroethane	ND	ug/L	10
Pentachloronitrobenzene	ND	ug/L	50
Pentachlorophenol	ND	ug/L	50
Phenacetin	ND	ug/L	10
Phenanthrene	ND	ug/L	10
Phenol	ND	ug/L	10
4-Phenylenediamine	ND	ug/L	--
Phorate	ND	ug/L	100
2-Picoline	ND	ug/L	10
Pronamide	ND	ug/L	10
Pyrene	ND	ug/L	10
Pyridine	ND	ug/L	20
Safrole	ND	ug/L	10
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

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

Analyte	Result	Units	Reporting Limit
Test: 8270CP-AP9-A Matrix: AQUEOUS QC Lot: 18 FEB 91-A QC Run: 20 FEB 91-A			
2-Toluidine	ND	ug/L	10
1,2,4-Trichlorobenzene	ND	ug/L	10
2,4,5-Trichlorophenol	ND	ug/L	50
2,4,6-Trichlorophenol	ND	ug/L	10
O,O,O-Triethylphosphoro-thioate	ND	ug/L	10
1,3,5-Trinitrobenzene	ND	ug/L	10

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QC LOT ASSIGNMENT REPORT
Volatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
013571-0001-SA	AQUEOUS	601-A	26 FEB 91-F	26 FEB 91-F

DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: 601-A Matrix: AQUEOUS QC Lot: 26 FEB 91-F Concentration Units: ug/L								
1,1-Dichloroethane	5.0	4.90	4.81	4.86	97	80-130	1.9	20
Chloroform	5.0	5.15	4.98	5.06	101	80-120	3.4	20
Bromodichloromethane	10	8.72	8.61	8.66	87	80-120	1.3	20
Trichloroethene	5.0	5.51	5.23	5.37	107	70-120	5.2	20
Chlorobenzene	5.0	4.39	4.79	4.59	92	80-120	8.7	20

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

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SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Measured	Accuracy(%) SCS	Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 26 FEB 91-F QC Run: 26 FEB 91-F				
Concentration Units: ug/L				
Bromochloromethane	5.00	4.16	83	20-160

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

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METHOD BLANK REPORT
Volatile Organics by GC

Test: 601-AFIR-A
Matrix: AQUEOUS
QC Lot: 26 FEB 91-F QC Run: 26 FEB 91-F

Analyte	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	1.1
Bromomethane	ND	ug/L	6.0
Dichlorodifluoromethane	ND	ug/L	9.0
Vinyl chloride	ND	ug/L	0.60
Chloroethane	ND	ug/L	3.0
Methylene chloride	ND	ug/L	2.0
Trichlorofluoromethane	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.70
1,1-Dichloroethane	ND	ug/L	0.40
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.30
1,2-Dichloroethane	ND	ug/L	0.50
1,1,1-Trichloroethane	ND	ug/L	0.20
Carbon tetrachloride	ND	ug/L	0.60
Bromodichloromethane	ND	ug/L	0.50
1,2-Dichloropropane	ND	ug/L	0.50
trans-1,3-Dichloropropene	ND	ug/L	2.0
Trichloroethene	ND	ug/L	0.60
Dibromochloromethane	ND	ug/L	0.60
1,1,2-Trichloroethane	ND	ug/L	0.20
2-Chloroethyl vinyl ether	ND	ug/L	5.5
Bromoform	ND	ug/L	1.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.4
Tetrachloroethene	ND	ug/L	0.40
Chlorobenzene	ND	ug/L	1.2
1,3-Dichlorobenzene	ND	ug/L	1.0
1,2-Dichlorobenzene	ND	ug/L	0.50
1,4-Dichlorobenzene	ND	ug/L	0.50
Benzyl chloride	ND	ug/L	6.8
Bromobenzene	ND	ug/L	5.0
bis(2-Chloroisopropyl)-ether	ND	ug/L	10
1-Chlorohexane	ND	ug/L	5.0
4-Chlorotoluene	ND	ug/L	23
Dibromomethane	ND	ug/L	5.0
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0
1,2,3-Trichloropropane	ND	ug/L	5.0

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QC LOT ASSIGNMENT REPORT
Metals Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
013571-0001-SA	AQUEOUS	ICP-AT	25 FEB 91-L	25 FEB 91-L
013571-0001-SA	AQUEOUS	CR-FAA-AT	25 FEB 91-L	25 FEB 91-L
013571-0001-SA	AQUEOUS	AS-FAA-AT	25 FEB 91-L	25 FEB 91-L

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 Limit
Category: ICP-AT Matrix: AQUEOUS QC Lot: 25 FEB 91-L Concentration Units: mg/L								
Aluminum	2.0	2.00	2.05	2.03	101	75-125	2.3	20
Antimony	0.5	0.500	0.521	0.510	102	75-125	4.1	20
Arsenic	0.5	0.482	0.499	0.490	98	75-125	3.6	20
Barium	2.0	1.95	2.01	1.98	99	75-125	2.6	20
Beryllium	0.05	0.0509	0.0493	0.0501	100	75-125	3.1	20
Cadmium	0.05	0.0450	0.0474	0.0462	92	75-125	5.2	20
Calcium	100	99.8	103	101	101	75-125	3.0	20
Chromium	0.2	0.192	0.194	0.193	97	75-125	1.2	20
Cobalt	0.5	0.473	0.484	0.479	96	75-125	2.5	20
Copper	0.25	0.252	0.254	0.253	101	75-125	0.9	20
Iron	1.0	1.01	1.03	1.02	102	75-125	1.8	20
Lead	0.5	0.477	0.498	0.487	97	75-125	4.4	20
Magnesium	50	50.3	52.0	51.1	102	75-125	3.3	20
Manganese	0.5	0.482	0.492	0.487	97	75-125	2.0	20
Nickel	0.5	0.475	0.490	0.483	97	75-125	3.2	20
Potassium	50	47.8	50.4	49.1	98	75-125	5.3	20
Silver	0.05	0.0436	0.0467	0.0451	90	75-125	7.0	20
Sodium	100	96.8	100	98.6	99	75-125	3.7	20
Vanadium	0.5	0.500	0.509	0.505	101	75-125	1.7	20
Zinc	0.5	0.479	0.492	0.486	97	75-125	2.8	20
Category: CR-FAA-AT Matrix: AQUEOUS QC Lot: 25 FEB 91-L Concentration Units: mg/L								
Chromium	0.20	0.202	0.207	0.204	102	75-125	2.4	20
Category: AS-FAA-AT Matrix: AQUEOUS QC Lot: 25 FEB 91-L Concentration Units: mg/L								
Arsenic	0.04	0.0409	0.0463	0.0436	109	75-125	12	20

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

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METHOD BLANK REPORT
Metals Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: ICP-AFIR-AT Matrix: AQUEOUS QC Lot: 25 FEB 91-L QC Run: 25 FEB 91-L			
Zinc	ND	mg/L	0.010
Test: GF-CRCP-TAL-AT Matrix: AQUEOUS QC Lot: 25 FEB 91-L QC Run: 25 FEB 91-L			
Chromium	ND	mg/L	0.0010
Test: GF-ASCP-TAL-AT Matrix: AQUEOUS QC Lot: 25 FEB 91-L QC Run: 25 FEB 91-L			
Arsenic	ND	mg/L	0.0050

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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)
013571-0001-SA	AQUEOUS	TOC-A	23 FEB 91-N	-

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DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: TOC-A Matrix: AQUEOUS QC Lot: 23 FEB 91-N Concentration Units: mg/L								
Total Organic Carbon	25.0	25.0	25.2	25.1	100	91-109	0.8	20

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

ENSECO ANALYTICAL SERVICES REQUEST FORM

Special Handling (Circle as appropriate and explain in record 5)

Hazardous material

RMA# - 13571-01

Site Type (circle one)
SW - Surface Water
GW - Ground Water
ME - Meteorological
LK - Lake
ES - Estuary
SP - Spring
(SS) - Special Source

DI-CF-BOTTLED-H2O-[redacted]		KIRTLAND AFB-IRP	MIKO ROYBAL & K/M ONG	(505) 262-5327
Station Name	Field ID / USGS/WRD/NEW MEXICO Field Office	Project	Collector	Phone (FTS)

File Deposition* (Circle one)
Q - WATSTORE
X - Lab File

For Laboratory Use Only

Sample identification

DICFBOTTLE[redacted] — Station ID or Unique Number*

463536001 — Project Account #

1991	02	13	1150				NM	035	001
Year*	Month*	Day*	Time*	Month	Day	Time	State Code*	District/ User Code*	County Code
Begin Date				Composite End Date					

Analysis level codes and schedules

UNFILTERED DI-CF-H2O		H or 9	9		BLANK	TEST
Sample Medium**	Geologic Unit	Analysis Status**	Analysis Source**	Hydrologic Condition**	Sample Type**	Hydrologic Event**

PARAMETER:	TOC	VOX	APP IX SEMIVOC
METHOD:	SW 9060	SW 5030/SW 8010	SW 3510/SW 8270
PARAMETER:	CHROMIUM	ARSENIC	ZINC
METHOD:	SW 3020/7191	SW 3020/7060	SW 3010/6010
PARAMETER:			
METHOD:			

Chain-of-Custody Record

PROJECT NAME KIRTLAND AFB IRP PROJECT NO. 46353600 / P.O. NO.

Relinquished by: (Signature)	Received by: (Signature)	Date	Time
Miko Roybal	FEDERAL EXPRESS	2/13/91	1545
Relinquished by: (Signature)	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Received at lab by: (Signature)	Date	Time
	Robert M. Rainey (ENSECO-RMAL)	14 FEB 91	1244 hrs
Relinquished from lab by: (Signature)	Received by: (Signature)	Date	Time

Comments (Only 50 characters stored in NWIS)

Record 5: PH = 7.90
SPC = 8.0 uS/cm

Record 6: BOTTLE FILLED ON JANUARY 30, 1991 BY BOB MCBREEN

Total number of sample bottles for this request: 6

SHIP TO:

Enseco-Rocky Mountain Analytical
4955 Yarrow Street
Arvada, CO 80002
(303) 421-6611

ATTENTION: LINDSAY BREYER

SS-034