



Enseco

ANALYTICAL RESULTS  
FOR  
U.S. GEOLOGICAL SURVEY  
ENSECO-RMAL NO. 015290

JUNE 29, 1991

Reviewed by:

  
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Randall Thompson

  
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Lindsay Breyer



## **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:

- o Sample Description Information
- o Analytical Test Requests
- o Analytical Results
- o 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.

SAMPLE DESCRIPTION INFORMATION  
for  
U.S. Geological Survey

Lab ID	Client ID	Matrix	Sampled Date	Time	Received Date
015290-0001-SA	KAFB050410-2	AQUEOUS	05 JUN 91	14:43	06 JUN 91
015290-0002-SA	KAFB090212-2	AQUEOUS	05 JUN 91	14:08	06 JUN 91
015290-0003-SA	KAFB090213-2	AQUEOUS	05 JUN 91	13:18	06 JUN 91

ANALYTICAL TEST REQUESTS  
for  
U.S. Geological Survey

Lab ID: 015290	Group Code	Analysis Description	Custom Test?
0001	A	Chromium, Furnace AA (Total)	N
		Prep - Total Metals, ICP	N
		Chromium, Furnace AA	N
		Chromium VI (Total)	N
		Chromium VI (Dissolved)	N
		Nitrate Plus Nitrite	N
		Total Organic Carbon (TOC)	N
		Total Organic Halogen (TOX)	N
		Chloride, Ion Chromatography, for Air Force Contracts	N
0002 - 0003	B	Chromium, Furnace AA (Total)	N
		Prep - Total Metals, ICP	N
		Chromium, Furnace AA	N
		Chromium VI (Total)	N
		Chromium VI (Dissolved)	N
		Nitrate Plus Nitrite	N
		Total Organic Carbon (TOC)	N
		Total Organic Halogen (TOX)	N
		Chloride, Ion Chromatography, for Air Force Contracts	N
		Halogenated Volatile Organics	N
		Halogenated Volatile Organics-2nd Column Analysis	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 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.

Halogenated Volatile Organics

Method 8010

Client Name: U.S. Geological Survey  
 Client ID: KAFB090212-2  
 Lab ID: 015290-0002-SA  
 Matrix: AQUEOUS  
 Authorized: 06 JUN 91

Sampled: 05 JUN 91  
 Prepared: NA

Received: 06 JUN 91  
 Analyzed: 18 JUN 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	0.44	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	76	%

(continued on following page)

ND = Not detected  
 NA = Not applicable

Reported By: Bret Collins

Approved By: Mike Hoffman

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Halogenated Volatile Organics (CONT.)

Enseco  
A Corning Company

Method 8010

Client Name: U.S. Geological Survey

Client ID: KAFB090212-2

Lab ID: 015290-0002-SA

Matrix: AQUEOUS

Authorized: 06 JUN 91

Sampled: 05 JUN 91

Prepared: NA

Received: 06 JUN 91

Analyzed: 18 JUN 91

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

ND = Not detected

NA = Not applicable

Reported By: Bret Collins

Approved By: Mike Hoffman

Halogenated Volatile Organics-2nd Column Analysis

Method 8010

Client Name: U.S. Geological Survey  
 Client ID: KAFB090212-2  
 Lab ID: 015290-0002-SA  
 Matrix: AQUEOUS  
 Authorized: 06 JUN 91  
 Sampled: 05 JUN 91  
 Prepared: NA  
 Received: 06 JUN 91  
 Analyzed: 18 JUN 91

Parameter	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	0.87	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	0.54	ug/L	0.50	L
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	L
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	
1,2,3-Trichloropropane	ND	ug/L	5.0	

Surrogate Recovery  
 Bromochloromethane 84 %

(continued on following page)

ND = Not detected  
 NA = Not applicable

Reported By: Bret Collins

Approved By: Mike Hoffman



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Halogenated Volatile Organics-2nd Column Analysis (CONT.)

Method 8010

Client Name: U.S. Geological Survey

Client ID: KAFB090212-2

Lab ID: 015290-0002-SA

Matrix: AQUEOUS

Authorized: 06 JUN 91

Sampled: 05 JUN 91

Prepared: NA

Received: 06 JUN 91

Analyzed: 18 JUN 91

Note L : These components are not separable using this method and are therefore quantified together.

ND = Not detected

NA = Not applicable

Reported By: Bret Collins

Approved By: Mike Hoffman

Halogenated Volatile Organics

Method 8010

Client Name: U.S. Geological Survey  
 Client ID: KAFB090213-2  
 Lab ID: 015290-0003-SA  
 Matrix: AQUEOUS  
 Authorized: 06 JUN 91

Sampled: 05 JUN 91  
 Prepared: NA

Received: 06 JUN 91  
 Analyzed: 18 JUN 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 97 %

(continued on following page)

ND = Not detected  
 NA = Not applicable

Reported By: Bret Collins

Approved By: Mike Hoffman

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Halogenated Volatile Organics (CONT.)

Method 8010

Client Name: U.S. Geological Survey  
Client ID: KAFB090213-2  
Lab ID: 015290-0003-SA  
Matrix: AQUEOUS  
Authorized: 06 JUN 91  
Sampled: 05 JUN 91  
Prepared: NA  
Received: 06 JUN 91  
Analyzed: 18 JUN 91

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

ND = Not detected  
NA = Not applicable

Reported By: Bret Collins

Approved By: Mike Hoffman

Metals

Total Metals

Client Name: U.S. Geological Survey  
 Client ID: KAFB050410-2  
 Lab ID: 015290-0001-SA  
 Matrix: AQUEOUS  
 Authorized: 06 JUN 91

Sampled: 05 JUN 91  
 Prepared: See Below

Received: 06 JUN 91  
 Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Chromium (VI)	ND	mg/L	0.010	7196	NA	06 JUN 91
Chromium	0.0033	mg/L	0.0020	7191	15 JUN 91	20 JUN 91

ND = Not detected  
 NA = Not applicable

Reported By: David Patterson

Approved By: Fred Velasquez

Metals

Total Metals

Client Name: U.S. Geological Survey  
 Client ID: KAFB090212-2  
 Lab ID: 015290-0002-SA  
 Matrix: AQUEOUS  
 Authorized: 06 JUN 91

Sampled: 05 JUN 91  
 Prepared: See Below

Received: 06 JUN 91  
 Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Chromium (VI)	ND	mg/L	0.010	7196	NA	06 JUN 91
Chromium	ND	mg/L	0.0020	7191	15 JUN 91	20 JUN 91

ND = Not detected  
 NA = Not applicable

Reported By: David Patterson

Approved By: Fred Velasquez

Metals

Total Metals

Client Name: U.S. Geological Survey

Client ID: KAFB090213-2

Lab ID: 015290-0003-SA

Matrix: AQUEOUS

Authorized: 06 JUN 91

Sampled: 05 JUN 91

Prepared: See Below

Received: 06 JUN 91

Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Chromium (VI)	ND	mg/L	0.010	7196	NA	06 JUN 91
Chromium	0.0043	mg/L	0.0020	7191	15 JUN 91	20 JUN 91

ND = Not detected  
NA = Not applicable

Reported By: David Patterson

Approved By: Fred Velasquez

Metals

Dissolved Metals

Client Name: U.S. Geological Survey

Client ID: KAFB050410-2

Lab ID: 015290-0001-SA

Matrix: AQUEOUS

Authorized: 06 JUN 91

Sampled: 05 JUN 91

Prepared: See Below

Received: 06 JUN 91

Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Chromium (VI)	ND	mg/L	0.010	7196	NA	06 JUN 91
Chromium	ND	mg/L	0.0020	7191	NA	20 JUN 91

ND = Not detected  
NA = Not applicable

Reported By: David Patterson

Approved By: Fred Velasquez

Metals

Dissolved Metals

Client Name: U.S. Geological Survey

Client ID: KAFB090212-2

Lab ID: 015290-0002-SA

Matrix: AQUEOUS

Authorized: 06 JUN 91

Sampled: 05 JUN 91

Prepared: See Below

Received: 06 JUN 91

Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Chromium (VI)	ND	mg/L	0.010	7196	NA	06 JUN 91
Chromium	ND	mg/L	0.0020	7191	NA	20 JUN 91

ND = Not detected  
NA = Not applicable

Reported By: David Patterson

Approved By: Fred Velasquez



Metals

Dissolved Metals

Client Name: U.S. Geological Survey

Client ID: KAFB090213-2

Lab ID: 015290-0003-SA

Matrix: AQUEOUS

Authorized: 06 JUN 91

Sampled: 05 JUN 91

Prepared: See Below

Received: 06 JUN 91

Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Chromium (VI)	ND	mg/L	0.010	7196	NA	06 JUN 91
Chromium	ND	mg/L	0.0020	7191	NA	20 JUN 91

ND = Not detected  
NA = Not applicable

Reported By: David Patterson

Approved By: Fred Velasquez

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General Inorganics

Enseco  
A Corning Company

Client Name: U.S. Geological Survey

Client ID: KAFB050410-2

Lab ID: 015290-0001-SA

Matrix: AQUEOUS

Authorized: 06 JUN 91

Sampled: 05 JUN 91

Prepared: See Below

Received: 06 JUN 91

Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Chloride	14.0	mg/L	0.50	A429	NA	16 JUN 91
Nitrate plus Nitrite	2.7	mg/L	0.25	353.2	NA	15 JUN 91
Total Organic Carbon	ND	mg/L	0.50	9060	NA	07 JUN 91
Total Organic Halogen as Cl	ND	ug/L	30.0	9020	NA	10 JUN 91

ND = Not detected  
NA = Not applicable

Reported By: Dan Appelhans

Approved By: Roxanne Sullivan

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General Inorganics

Client Name: U.S. Geological Survey  
Client ID: KAFB090212-2  
Lab ID: 015290-0002-SA  
Matrix: AQUEOUS  
Authorized: 06 JUN 91

Sampled: 05 JUN 91  
Prepared: See Below

Received: 06 JUN 91  
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Chloride	0.58	mg/L	0.50	A429	NA	16 JUN 91
Nitrate plus Nitrite	ND	mg/L	0.050	353.2	NA	15 JUN 91
Total Organic Carbon	43.7	mg/L	0.50	9060	NA	08 JUN 91
Total Organic Halogen as Cl	ND	ug/L	30.0	9020	NA	10 JUN 91

ND = Not detected  
NA = Not applicable

Reported By: Dan Appelhans

Approved By: Roxanne Sullivan

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General Inorganics

Client Name: U.S. Geological Survey  
Client ID: KAFB090213-2  
Lab ID: 015290-0003-SA  
Matrix: AQUEOUS  
Authorized: 06 JUN 91

Sampled: 05 JUN 91  
Prepared: See Below

Received: 06 JUN 91  
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Chloride	15.7	mg/L	0.50	A429	NA	16 JUN 91
Nitrate plus Nitrite	1.4	mg/L	0.10	353.2	NA	15 JUN 91
Total Organic Carbon	41.0	mg/L	0.50	9060	NA	08 JUN 91
Total Organic Halogen as Cl	ND	ug/L	30.0	9020	NA	10 JUN 91

ND = Not detected  
NA = Not applicable

Reported By: Dan Appelhans

Approved By: Roxanne Sullivan

## 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).

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

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.

QC LOT ASSIGNMENT REPORT  
Volatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
015290-0002-SA	AQUEOUS	601-A	17 JUN 91-F	18 JUN 91-F
015290-0002-SA	AQUEOUS	601-A	17 JUN 91-F	18 JUN 91-F
015290-0003-SA	AQUEOUS	601-A	17 JUN 91-F	18 JUN 91-F



DUPLICATE CONTROL SAMPLE REPORT  
Volatile Organics by GC

Analyte	Concentration Spiked	Concentration Measured		AVG	Accuracy Average(%)		Precision (RPD)		
		DCS1	DCS2		DCS	Limits	DCS	Limit	
Category: 601-A									
Matrix: AQUEOUS									
QC Lot: 17 JUN 91-F									
Concentration Units: ug/L									
1,1-Dichloroethane	5.0	4.85	4.98	4.92	98	80-130	2.6	20	
Chloroform	5.0	5.49	5.53	5.51	110	80-120	0.7	20	
Bromodichloromethane	10	8.73	8.76	8.74	87	80-120	0.3	20	
Trichloroethene	5.0	5.55	5.63	5.59	112	70-120	1.4	20	
Chlorobenzene	5.0	4.73	4.77	4.75	95	80-120	0.8	20	

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

SINGLE CONTROL SAMPLE REPORT  
Volatile Organics by GC

Analyte	Concentration		Accuracy(%)	
	Spiked	Measured	SCS	Limits
Category: 601-A Matrix: AQUEOUS QC Lot: 17 JUN 91-F    QC Run: 18 JUN 91-F Concentration Units: ug/L				
Bromochloromethane	5.00	4.30	86	20-160

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

METHOD BLANK REPORT  
Volatile Organics by GC

Analyte	Result	Units	Reporting Limit
Test: 601-AFIR-A			
Matrix: AQUEOUS			
QC Lot: 17 JUN 91-F    QC Run: 18 JUN 91-F			
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
Benzy l 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

METHOD BLANK REPORT  
Volatile Organics by GC (cont.)

Analyte	Result	Units	Reporting Limit
Test: 601-AFIR-2-A			
Matrix: AQUEOUS			
QC Lot: 17 JUN 91-F    QC Run: 18 JUN 91-F			
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

QC LOT ASSIGNMENT REPORT  
Metals Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
015290-0001-SA	AQUEOUS	CR-FAA-AT	15 JUN 91-A	15 JUN 91-A
015290-0001-SA	AQUEOUS	CR-FAA-AD	20 JUN 91-G	-
015290-0001-SA	AQUEOUS	CR6-AT	06 JUN 91-F	-
015290-0001-SA	AQUEOUS	CR6-A	06 JUN 91-F	-
015290-0002-SA	AQUEOUS	CR-FAA-AT	15 JUN 91-A	15 JUN 91-A
015290-0002-SA	AQUEOUS	CR-FAA-AD	20 JUN 91-G	-
015290-0002-SA	AQUEOUS	CR6-AT	06 JUN 91-F	-
015290-0002-SA	AQUEOUS	CR6-A	06 JUN 91-F	-
015290-0003-SA	AQUEOUS	CR-FAA-AT	15 JUN 91-A	15 JUN 91-A
015290-0003-SA	AQUEOUS	CR-FAA-AD	20 JUN 91-G	-
015290-0003-SA	AQUEOUS	CR6-AT	06 JUN 91-F	-
015290-0003-SA	AQUEOUS	CR6-A	06 JUN 91-F	-

DUPLICATE CONTROL SAMPLE REPORT  
Metals Analysis and Preparation

Analyte	Spiked	Concentration		AVG	Accuracy		Precision		
		DCS1	Measured DCS2		Average (%) DCS	Limits	(RPD) DCS	Limit	
Category: CR-FAA-AT Matrix: AQUEOUS QC Lot: 15 JUN 91-A Concentration Units: mg/L									
Chromium	0.20	0.180	0.181	0.180	90	75-125	0.6	20	
Category: CR-FAA-AD Matrix: AQUEOUS QC Lot: 20 JUN 91-G Concentration Units: mg/L									
Chromium	0.20	0.181	0.190	0.186	93	75-125	4.9	20	
Category: CR6-AT Matrix: AQUEOUS QC Lot: 06 JUN 91-F Concentration Units: mg/L									
Chromium (VI)	0.05	0.0491	0.0542	0.0516	103	75-125	9.9	20	
Category: CR6-A Matrix: AQUEOUS QC Lot: 06 JUN 91-F Concentration Units: mg/L									
Chromium (VI)	0.05	0.0491	0.0542	0.0516	103	75-125	9.9	20	

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

METHOD BLANK REPORT  
Metals Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: CR-FAA-AT Matrix: AQUEOUS QC Lot: 15 JUN 91-A    QC Run: 15 JUN 91-A			
Chromium	ND	mg/L	0.0050
Test: CR-FAA-AT Matrix: AQUEOUS QC Lot: 15 JUN 91-A    QC Run: 15 JUN 91-A			
Chromium	ND	mg/L	0.0050

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)
015290-0001-SA	AQUEOUS	NO3-A	15 JUN 91-B	-
015290-0001-SA	AQUEOUS	TOC-A	07 JUN 91-B	-
015290-0001-SA	AQUEOUS	TOX-A	10 JUN 91-A	-
015290-0001-SA	AQUEOUS	CL-IC-A	16 JUN 91-N	-
015290-0002-SA	AQUEOUS	NO3-A	15 JUN 91-B	-
015290-0002-SA	AQUEOUS	TOC-A	08 JUN 91-C	-
015290-0002-SA	AQUEOUS	TOX-A	10 JUN 91-A	-
015290-0002-SA	AQUEOUS	CL-IC-A	16 JUN 91-N	-
015290-0003-SA	AQUEOUS	NO3-A	15 JUN 91-B	-
015290-0003-SA	AQUEOUS	TOC-A	08 JUN 91-C	-
015290-0003-SA	AQUEOUS	TOX-A	10 JUN 91-A	-
015290-0003-SA	AQUEOUS	CL-IC-A	16 JUN 91-N	-



DUPLICATE CONTROL SAMPLE REPORT  
Wet Chemistry Analysis and Preparation

Analyte	Concentration		Measured DCS2	AVG	Accuracy Average(%)		Precision (RPD)		
	Spiked	DCS1			DCS	Limits	DCS	Limit	
Category: NO3-A Matrix: AQUEOUS QC Lot: 15 JUN 91-B Concentration Units: mg/L									
Nitrate as N	7.1	6.99	6.83	6.91	97	91-109	2.3	10	
Category: TOC-A Matrix: AQUEOUS QC Lot: 07 JUN 91-B Concentration Units: mg/L									
Total Organic Carbon	25	24.8	24.8	24.8	99	91-109	0.0	20	
Category: TOX-A Matrix: AQUEOUS QC Lot: 10 JUN 91-A Concentration Units: ug Cl/L									
Total Organic Halogen as Cl	100	96.4	97.4	96.9	97	80-120	1.0	20	
Category: CL-IC-A Matrix: AQUEOUS QC Lot: 16 JUN 91-N Concentration Units: mg/L									
Chloride	20.0	20.0	20.4	20.2	101	92-108	2.0	20	
Category: TOC-A Matrix: AQUEOUS QC Lot: 08 JUN 91-C Concentration Units: mg/L									
Total Organic Carbon	25	24.9	24.7	24.8	99	91-109	0.8	20	

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

# Appendix

ENSECO ANALYTICAL SERVICES REQUEST FORM

15290-31

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

Hazardous material  
SAMPLE

Station Name: KAFB050410-2

Site Type (circle one)

- SW - Surface Water
- GW** - Ground Water
- ME - Meteorological
- LK - Lake
- ES - Estuary
- SP - Spring
- SS - Special Source

Field ID: USGS/WRD/NEW MEX  
Field Office: USGS/WRD/NEW MEX  
Project: KIRTLAND AFB IRP-SWMU'S  
Collector: MIKO ROYBAL  
Phone (FTS): (505) 262-5341

File Deposition\*

Circle one)  
Q - WATSTORE  
X - Lab File

Sample identification

For Laboratory Use Only

Station ID or Unique Number\*: KAFB050410-2  
Project Account #: 463536001

Year\*: 1991 Month\*: 06 Day\*: 05 Time\*: 1443  
Begin Date: 06/05/1443  
Month: 06 Day: 05 Time: 1455  
Composite End Date: 06/05/1455  
State Code\*: NM District/User Code\*: 035 County Code: 001

Analysis level codes and schedules

PARAMETER:	6 Sample Medium**	Geologic Unit	(H) or 9 Analysis Status**	9 Analysis Source**	Hydrologic Condition	9 Sample Type**	9 Hydrologic Event**
PARAMETER:	<u>CHROMIUM, TOTAL</u>		<u>CHROMIUM, DISS</u>		<u>CHROMIUM HEXAVALENT TOTAL</u>	<u>CHROMIUM HEXAVALENT DISS.</u>	<u>NITRATE &amp; NITRITE</u>
METHOD:	<u>SW3020/SW7191</u>		<u>SW3005/SW7191</u>		<u>SW7196</u>	<u>SW7196</u>	<u>E353.2</u>
PARAMETER:	<u>URANIUM, GROSS</u>	<u>ALPHA &amp; BETA</u>		<u>VOC</u>	<u>VOC</u>		<u>TOC/TOX</u>
METHOD:	<u>A711B, E900</u>		<u>SW5030/SW8240</u>		<u>SW5030/SW8010</u>		<u>E415.1/SW9020</u>
PARAMETER:	<u>CHLORIDE, DISS</u>						
METHOD:	<u>A429</u>						

Chain-of-Custody Record

PROJECT NAME KIRTLAND AFB-IRP, SWMU'S PROJECT NO. 463536001 P.O. NO. \_\_\_\_\_

Relinquished by: (Signature)	Received by: (Signature)	Date	Time
<u>Miko Roybal</u>	FEDERAL EXPRESS	<u>6/5/91</u>	<u>1630</u>
Relinquished by: (Signature)	Received by: (Signature)	Date	Time
	<u>R. M. B. Breyer</u>	<u>6/6/91</u>	<u>0800</u>
Relinquished by: (Signature)	Received at lab by: (Signature)	Date	Time
Relinquished from lab by: (Signature)	Received by: (Signature)	Date	Time

Comments (Only 50 characters stored in NWIS)

Record 5 WELL NR. SW CNR. OF SEWAGE LAGOON.  
Record 6 \_\_\_\_\_

Total number of sample bottles for this request: 7

SHIP TO:

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

ENSECO ANALYTICAL SERVICES REQUEST FORM

15290-52

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

Hazardous material  
EQUIPMENT BLANK  
KAFB090212-2

Station Name

Site Type (circle one)

SW - Surface Water  
**GW** - Ground Water  
ME - Meteorological

LK - Lake  
ES - Estuary  
SP - Spring  
SS - Special Source

Field ID  
USGS/WRD/NEW MEX

Project  
KIRTLAND AFB  
IRP-SWMU'S

Collector  
Miko Royal  
Bill Dam

Phone (FTS)  
(505) 262-5341

File Deposition\*  
Circle one)

Q - WATSTORE  
X - Lab File

Sample identification

[Empty box for Laboratory Use Only]

Station ID or Unique Number\*  
K A F B 0 9 0 2 1 2 - 2

Project Account #  
4 6 3 5 3 6 0 0 1

Year\*  
1 9 9 1

Month\*  
0 6

Day\*  
0 5

Time\*  
1 4 0 8

Month  
0 6

Day  
0 5

Time  
1 4 1 9

State Code\*  
N M

District/ User Code\*  
0 3 5

County Code  
0 0 1

Begin Date

Composite End Date

Analysis level codes and schedules

PARAMETER:	6 Sample Medium**	Geologic Unit	(H) or 9 Analysis Status**	9 Analysis Source**	Hydrologic Condition*	9 Sample Type**	9 Hydrologic Event**
CHROMIUM, TOTAL	SW3020/SW7191		CHROMIUM, DISS	SW3005/SW7191	CHROMIUM HEXAVALENT TOTAL	CHROMIUM HEXAVALENT DISS.	NITRATE & NITRITE
METHOD:					SW7196	SW7196	E353.2
PARAMETER:	URANIUM, GROSS	ALPHA & BETA	VOC		VOX		TOC/TOX
METHOD:	A711B, E900		SW3030/SW8240		SW5030/SW8010		E415.1/SW9020
PARAMETER:	CHLORIDE, DISS						
METHOD:	A429						

Chain-of-Custody Record

PROJECT NAME KIRTLAND AFB-IRP, SWMU'S PROJECT NO. 463536001 P.O. NO.

Relinquished by: (Signature) Miko Royal Received by: (Signature) FEDERAL EXPRESS Date 6/5/91 Time 1630

Relinquished by: (Signature) Received by: (Signature) Rmax Bman Date 6/6/91 Time 0900

Relinquished by: (Signature) Received at lab by: (Signature) Date Time

Relinquished from lab by: (Signature) Received by: (Signature) Date Time

Comments (Only 50 characters stored in NWIS)

Record 5 T. JERAS ARROYO-WEST

Record 6

Total number of sample bottles for this request: 10

SHIP TO:

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

ENSECO ANALYTICAL SERVICES REQUEST FORM

15290-03

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

**Hazardous material**

SAMPLE

KAFB090213-2

Station Name

Field ID

USGS/WRD/NEW MEX

Field Office

KIRTLAND AFB IRP-SWMU'S

Project

SW - Surface Water  
GW - Ground Water  
ME - Meteorological

Site Type (circle one)  
LK - Lake  
ES - Estuary  
SP - Spring  
SS - Special Source

MIKO ROYBAL

Collector

(505) 262-5341  
Phone (FTS)

**File Deposition\***

**Sample identification**

Circle one)

Q - WATSTORE

X - Lab File

[Empty box for Laboratory Use Only]

For Laboratory Use Only

KAFB090213-2

Station ID or Unique Number\*

463536001

Project Account #

1991 06 05 1318 06 05 1334 N M 035 001  
Year\* Month\* Day\* Time\* Month\* Day\* Time State Code\* District/User Code\* County Code

**Analysis level codes and schedules**

	6 Sample Medium**	Geologic Unit	(H) or 9 Analysis Status**	9 Analysis Source**	9 Hydrologic Condition**	9 Sample Type	9 Hydrologic Event**
PARAMETER:	CHROMIUM, TOTAL		CHROMIUM, DISS		CHROMIUM HEXAVALENT TOTAL	CHROMIUM HEXAVALENT DISS.	NITRATE & NITRITE
METHOD:	SW3020/SW7191		SW3005/SW7191		SW7196	SW7196	E353.2
PARAMETER:	URANIUM, GROSS	ALPHA & BETA		VOC	VOC		TOC/TOX
METHOD:	A711B, E900			SW5030/SW8240	SW5030/SW8010		E415.1/SW9020
PARAMETER:	CHLORIDE, DISS						
METHOD:	A429						

**Chain-of-Custody Record**

PROJECT NAME KIRTLAND AFB-IRP, SWMU'S PROJECT NO. 463536001 P.O. NO.

Relinquished by: (Signature)	Received by: (Signature)	Date	Time
MIKO ROYBAL	FEDERAL EXPRESS	6/5/91	1630
	Rmax B Major	6/6/91	0800

**Comments (Only 50 characters stored in NWIS)**

Record 5 WELL NR TIJERRAS WEST-SAMPLE  
Record 6

Total number of sample bottles for this request: 10

SHIP TO:

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