

Enseco Incorporated

RECEIVED

ANALYTICAL RESULTS  
FOR  
U.S. GEOLOGICAL SURVEY  
ENSECO-RMAL NO. 012762



JANUARY 25, 1991

KAFB1077



## **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**

<b>Lab ID</b>	<b>Client ID</b>	<b>Matrix</b>	<b>Sampled</b>		<b>Received</b>
			<b>Date</b>	<b>Time</b>	<b>Date</b>
<b>012762-0001-SA</b>	<b>KAFB090109-2</b>	<b>AQUEOUS</b>	<b>07 DEC 90</b>	<b>13:42</b>	<b>08 DEC 90</b>
<b>012762-0002-SA</b>	<b>KAFB061004-2</b>	<b>AQUEOUS</b>	<b>06 DEC 90</b>	<b>16:55</b>	<b>08 DEC 90</b>

**ANALYTICAL TEST REQUESTS**  
for  
**U.S. Geological Survey**

Lab ID: 012762	Group Code	Analysis Description	Custom Test?
0001 - 0002	A	Total Organic Carbon (TOC) Total Organic Halogen (TOX) Chromium, Furnace AA Chromium, Furnace AA (Total) Prep - Total Metals, ICP	N N N N 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.

Metals

Total Metals

Client Name: U.S. Geological Survey  
Client ID: KAFB090109-2  
Lab ID: 012762-0001-SA  
Matrix: AQUEOUS  
Authorized: 09 DEC 90

Sampled: 07 DEC 90  
Prepared: See Below

Received: 08 DEC 90  
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Chromium	0.013	mg/L	0.0010	7191	21 JAN 91	22 JAN 91

ND = Not detected  
NA = Not applicable

Reported By: Fred Velasquez

Approved By: Roxanne Sullivan

**Metals**

**Dissolved Metals**

Client Name: U.S. Geological Survey  
 Client ID: KAFB090109-2  
 Lab ID: 012762-0001-SA  
 Matrix: AQUEOUS  
 Authorized: 09 DEC 90

Sampled: 07 DEC 90  
 Prepared: See Below

Received: 08 DEC 90  
 Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Chromium	0.0023	mg/L	0.0010	7191	NA	21 JAN 91

ND = Not detected  
 NA = Not applicable

Reported By: Debra Hosford

Approved By: Roxanne Sullivan

**Metals**

**Total Metals**

Client Name: U.S. Geological Survey

Client ID: KAFB061004-2

Lab ID: 012762-0002-SA

Matrix: AQUEOUS

Authorized: 09 DEC 90

Sampled: 06 DEC 90

Prepared: See Below

Received: 08 DEC 90

Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Chromium	0.014	mg/L	0.0010	7191	21 JAN 91	22 JAN 91

ND = Not detected  
NA = Not applicable

Reported By: Fred Velasquez

Approved By: Roxanne Sullivan



Metals

Dissolved Metals

Client Name: U.S. Geological Survey  
Client ID: KAFB061004-2  
Lab ID: 012762-0002-SA  
Matrix: AQUEOUS  
Authorized: 09 DEC 90

Sampled: 06 DEC 90  
Prepared: See Below

Received: 08 DEC 90  
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Chromium	ND	mg/L	0.0010	7191	NA	21 JAN 91

ND = Not detected  
NA = Not applicable

Reported By: Debra Hosford

Approved By: Roxanne Sullivan

General Inorganics

Client Name: U.S. Geological Survey  
 Client ID: KAFB090109-2  
 Lab ID: 012762-0001-SA  
 Matrix: AQUEOUS  
 Authorized: 09 DEC 90

Sampled: 07 DEC 90  
 Prepared: See Below

Received: 08 DEC 90  
 Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Organic Carbon	0.62	mg/L	0.50	9060	NA	18 DEC 90
Total Organic Halogen as Cl	56.9	ug/L	30.0	9020	NA	19 DEC 90

ND = Not detected  
 NA = Not applicable

Reported By: Steve Pope

Approved By: Roxanne Sullivan

General Inorganics

Client Name: U.S. Geological Survey  
 Client ID: KAFB061004-2  
 Lab ID: 012762-0002-SA  
 Matrix: AQUEOUS  
 Authorized: 09 DEC 90

Sampled: 06 DEC 90  
 Prepared: See Below

Received: 08 DEC 90  
 Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Organic Carbon	ND	mg/L	0.50	9060	NA	18 DEC 90
Total Organic Halogen as Cl	ND	ug/L	30.0	9020	NA	19 DEC 90

ND = Not detected  
 NA = Not applicable

Reported By: Steve Pope

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  
Metals Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
012762-0001-SA	AQUEOUS	CR-FAA-AD	21 JAN 91-A	-
012762-0001-SA	AQUEOUS	CR-FAA-AT	21 JAN 91-A	21 JAN 91-A
012762-0002-SA	AQUEOUS	CR-FAA-AD	21 JAN 91-A	-
012762-0002-SA	AQUEOUS	CR-FAA-AT	21 JAN 91-A	21 JAN 91-A

DUPLICATE CONTROL SAMPLE REPORT  
Metals Analysis and Preparation

Analyte	Concentration Spiked	Concentration Measured		AVG	Accuracy Average(%)		Precision (RPD)		
		DCS1	DCS2		DCS	Limits	DCS	Limit	
Category: CR-FAA-AD Matrix: AQUEOUS QC Lot: 21 JAN 91-A Concentration Units: mg/L									
Chromium	0.02	0.0202	0.0202	0.0202	101	75-125	0.0	20	
Category: CR-FAA-AT Matrix: AQUEOUS QC Lot: 21 JAN 91-A Concentration Units: mg/L									
Chromium	0.20	0.203	0.214	0.208	104	75-125	5.3	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: CR-FAA-AT			
Matrix: AQUEOUS			
QC Lot: 21 JAN 91-A	QC Run: 21 JAN 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)
012762-0001-SA	AQUEOUS	TOC-A	18 DEC 90-X	-
012762-0001-SA	AQUEOUS	TOX-A	19 DEC 90-M	-
012762-0002-SA	AQUEOUS	TOC-A	18 DEC 90-X	-
012762-0002-SA	AQUEOUS	TOX-A	19 DEC 90-M	-

DUPLICATE CONTROL SAMPLE REPORT  
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Concentration Measured		AVG	Accuracy Average(%)		Precision (RPD)		
		DCS1	DCS2		DCS	Limits	DCS	Limit	
Category: TOC-A Matrix: AQUEOUS QC Lot: 18 DEC 90-X Concentration Units: mg/L									
Total Organic Carbon	25.0	24.1	24.0	24.0	96	91-109	0.4	20	
Category: TOX-A Matrix: AQUEOUS QC Lot: 19 DEC 90-M Concentration Units: ug Cl/L									
Total Organic Halogen	100	95.3	98.8	97.0	97	80-120	3.6	20	

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

# Appendix

Special Handling

(Circle as appropriate and explain in record 5)

RMA # 12762  
-01

Site Type (circle one)

Hazardous material

SW - Surface Water  
GW - Ground Water  
ME - Meteorological

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

KA FB 090109-2

Station Name

Field ID

KIRTLAND

USGS/WRD/NEW MEXICO

Field Office

AFB IRP

Project

R. Wilcox

Collector

(305) 262-5340

Phone (FTS)

File Deposition\*

(Circle one)

Q - WATSTORE

X - Lab File

Sample identification

[Empty box for Laboratory Use Only]

For Laboratory Use Only

KA FB 090109-2

Station ID or Unique Number\*

463536001

Project Account #

1990  
Year\*

12  
Month\*

07  
Day\*

13.42  
Time\*

12  
Month

07  
Day

13.51  
Time

NM  
State Code\*

035  
District/  
User Code\*

001  
County Code

Begin Date

Composite End Date

Analysis level codes and schedules

6  
Sample Medium\*\*

Geologic Unit

H or 9  
Analysis Status\*\*

9  
Analysis Source\*\*

Hydrologic Condition\*\*

9  
Sample Type\*\*

9  
Hydrologic Event\*\*

PARAMETER:

TDC TOX

DISSOLVED CHROMIUM

TOTAL CHROMIUM

METHOD:

SW9060

SW9020

SW3005/SW7191

SW3020/SW7191

PARAMETER:

METHOD:

PARAMETER:

METHOD:

Chain-of-Custody Record

PROJECT NAME KIRTLAND AFB IRP PROJECT NO. 463536001 P.O. NO.

Relinquished by: (Signature)

[Signature]

Received by: (Signature)

AIRBORNE EXPRESS

Date

12/7/90

Time

1515

Relinquished by: (Signature)

Received by: (Signature)

Date

Time

Relinquished by: (Signature)

Received at lab by: (Signature)

Date

Time

JMO

Relinquished from lab by: (Signature)

Received by: (Signature)

Date

Time

12.8.90

091000

Comments (Only 50 characters stored in NWIS)

Record 5 WELC N.R. TIJERAS ARROYO UPSTREAM

Record 6

Total number of sample bottles for this request: 3

SHIP TO:

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

ATTENTION:

LINDSAY BRYER

**Special Handling**

(Circle as appropriate and explain in record 5)

RMA # 12762  
-02

**Site Type (circle one)**

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

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

Hazardous material

Field ID

KIRTLAND

KAFB061004-2

Station Name

USGS/WRD/NEWMEX

Field Office

AFB IRP

Project

R. Wilcox

Collector

(305) 262-5340

Phone (FTS)

**File Deposition\***

(Circle one)

Q - WATSTORE

X - Lab File

**Sample identification**

[Empty box for Laboratory Use Only]

For Laboratory Use Only

KAFB061004-2

Station ID or Unique Number\*

463536001

Project Account #

1990  
Year\*

12  
Month\*

06  
Day\*

1655  
Time\*

12  
Month

06  
Day

1702  
Time

NM  
State Code\*

035  
District/ User Code\*

001  
County Code

Begin Date

Composite End Date

**Analysis level codes and schedules**

6  
Sample Medium\*\*

Geologic Unit

H or 9  
Analysis Status\*\*

9  
Analysis Source\*\*

Hydrologic Condition\*\*

9  
Sample Type\*\*

9  
Hydrologic Event\*\*

PARAMETER:

TOC TOX

DISSOLVED  
CHROMIUM

TOTAL  
CHROMIUM

METHOD:

SW9060 SW9020

SW3005/SW7191

SW3020/SW7191

PARAMETER:

METHOD:

PARAMETER:

METHOD:

**Chain-of-Custody Record**

PROJECT NAME KIRTLAND AFB IRP PROJECT NO. 463536001 P.O. NO. \_\_\_\_\_

Relinquished by: (Signature) [Signature] Received by: (Signature) AIRBORNE EXPRESS Date 12/7/90 Time 1515  
Relinquished by: (Signature) \_\_\_\_\_ Received by: (Signature) \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

Relinquished by: (Signature) \_\_\_\_\_ Received at lab by: (Signature) [Signature] Date 12-8-90 Time 1000  
Relinquished from lab by: (Signature) \_\_\_\_\_ Received by: (Signature) \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

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

Record 5 WELL AT SW CNR OF GOLF COURSE

Record 6 \_\_\_\_\_

Total number of sample bottles for this request: 3

**SHIP TO:**

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

ATTENTION: LINDSAY BRYER