

Enseco Incorporated

RECEIVED

ANALYTICAL RESULTS
FOR
U.S. GEOLOGICAL SURVEY
ENSECO-RMAL NO. 012656



JANUARY 11, 1991

KAFB1074



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
012656-0001-SA	KAFB060805-2	AQUEOUS	30 NOV 90	08:49	01 DEC 90

ANALYTICAL TEST REQUESTS
for
U.S. Geological Survey

Lab ID: 012656	Group Code	Analysis Description	Custom Test?
0001	A	Total Organic Carbon (TOC)	N
		Total Organic Halogen (TOX)	N
		Chromium, Furnace AA (Total)	N
		Prep - Total Metals, ICP	N
		Chromium, Furnace AA	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: KAFB060805-2
Lab ID: 012656-0001-SA
Matrix: AQUEOUS
Authorized: 01 DEC 90

Sampled: 30 NOV 90
Prepared: See Below

Received: 01 DEC 90
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Chromium	0.0083	mg/L	0.0010	7191	31 DEC 90	09 JAN 91

ND = Not detected
NA = Not applicable

Reported By: Richard Persichitte

Approved By: Dave Roberts

Metals

Dissolved Metals

Client Name: U.S. Geological Survey

Client ID: KAFB060805-2

Lab ID: 012656-0001-SA

Matrix: AQUEOUS

Authorized: 01 DEC 90

Sampled: 30 NOV 90

Prepared: See Below

Received: 01 DEC 90

Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Chromium	0.0096	mg/L	0.0010	7191	NA	09 JAN 91

ND = Not detected
NA = Not applicable

Reported By: Richard Persichitte

Approved By: Dave Roberts

General Inorganics

Client Name: U.S. Geological Survey

Client ID: KAFB060805-2

Lab ID: 012656-0001-SA

Matrix: AQUEOUS

Authorized: 01 DEC 90

Sampled: 30 NOV 90

Prepared: See Below

Received: 01 DEC 90

Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Organic Carbon	9.6	mg/L	0.50	9060	NA	17 DEC 90
Total Organic Halogen as Cl	ND	ug/L	30.0	9020	NA	13 DEC 90

ND = Not detected
NA = Not applicable

Reported By: Steve Pope

Approved By: John Laferty

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)
012656-0001-SA	AQUEOUS	CR-FAA-AT	31 DEC 90-A	31 DEC 90-A
012656-0001-SA	AQUEOUS	CR-FAA-AD	09 JAN 91-A	-

DUPLICATE CONTROL SAMPLE REPORT
Metals Analysis and Preparation

Analyte	Spiked	Concentration		AVG	Accuracy		Precision	
		DCS1	Measured DCS2		DCS	Average(%) Limits	(RPD) DCS Limit	DCS Limit
Category: CR-FAA-AT Matrix: AQUEOUS QC Lot: 31 DEC 90-A Concentration Units: mg/L								

Chromium	0.20	0.153	0.149	0.151	76	75-125	2.6	20
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Category: CR-FAA-AD
Matrix: AQUEOUS
QC Lot: 09 JAN 91-A
Concentration Units: mg/L

Chromium	0.02	0.0234	0.0208	0.0221	111	75-125	12	20
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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: 31 DEC 90-A	QC Run: 31 DEC 90-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)
012656-0001-SA	AQUEOUS	TOC-A	17 DEC 90-A	-
012656-0001-SA	AQUEOUS	TOX-A	13 DEC 90-A	-

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Spiked	Concentration		AVG	Accuracy		Precision		
		DCS1	Measured DCS2		DCS	Average(%) Limits	(RPD) DCS Limit	DCS Limit	
Category: TOC-A Matrix: AQUEOUS QC Lot: 17 DEC 90-A Concentration Units: mg/L									
Total Organic Carbon	25	25.2	25.7	25.4	102	91-109	2.0	20	
Category: TOX-A Matrix: AQUEOUS QC Lot: 13 DEC 90-A Concentration Units: ug Cl/L									
Total Organic Halogen as Cl	100	97.1	92.8	95.0	95	80-120	4.5	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# 12636-01

Site Type (circle one)

Hazardous material

SW - Surface Water
GW - Ground Water
ME - Meteorological

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

KAFB 060805-2

Field ID

KIRTLAND

USGS/WRD/NEW MEXICO

AFB IRP

R. Wilcox

(305) 262-5340

Station Name

Field Office

Project

Collector

Phone (FTS)

File Deposition*

(Circle one)

Q - WATSTORE

X - Lab File

[Empty box for Laboratory Use Only]

For Laboratory Use Only

Sample identification

KAFB 060805-2

463536001

Station ID or Unique Number*

Project Account #

1990
Year*

11
Month*

30
Day*

0849
Time*

11
Month

30
Day

0910
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:

SW 9060

SW 9020

SW 3005 / SW 7191

SW 3020 / SW 7191

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

11/30/90

Time

1740

Relinquished by: (Signature)

Received by: (Signature)

Date

Time

Relinquished by: (Signature)

Received at lab by: (Signature)

Date

Time 1030

Relinquished from lab by: (Signature)

Received by: (Signature)

Date

Time

Comments (Only 50 characters stored in NWIS)

Record 5 MONITORING WELL AT NW CNR OF GOLF COURSE POND

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