

10 of 11

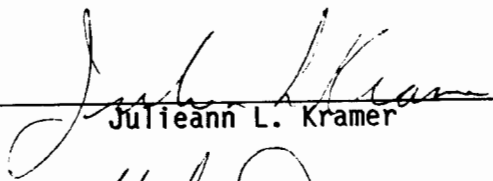
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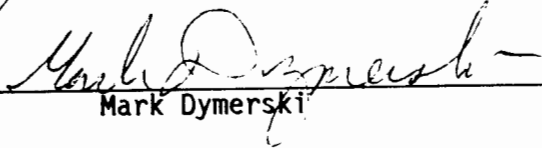
Enseco
Accounting Company

ANALYTICAL RESULTS
FOR
U.S. GEOLOGICAL SURVEY
ENSECO-RMAL NO. 022956

June 24, 1992

Reviewed by:



Julieann L. Kramer


Mark Dymerski

KAFB1230


I. OVERVIEW

On May 23, 1992, Enseco-Rocky Mountain Analytical Laboratory received one aqueous sample from U.S. Geological Survey.

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

- I. Overview
- II. Sample Description Information/Analytical Test Requests
- III. Analytical Results
- IV. Quality Control Report

Standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. All laboratory QC samples analyzed in conjunction with the samples in this project were within established control limits.

II. SAMPLE DESCRIPTION INFORMATION/ANALYTICAL TEST REQUESTS

Sample Description Information

The Sample Description Information lists all of the samples received in this project together with the internal laboratory identification number assigned for each sample. Each project received at 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.

ANALYTICAL TEST REQUESTS
 for
 U.S. Geological Survey

Lab ID: 022956	Group Code	Analysis Description	Custom Test?
0001	A	Nitrate Plus Nitrite Total Organic Carbon (TOC) Total Organic Halogen (TOX)	N N N

SAMPLE DESCRIPTION INFORMATION
for
U.S. Geological Survey

Lab ID	Client ID	Matrix	Sampled Date	Time	Received Date
022956-0001-SA	KAFB.0.107.15.2	AQUEOUS	22 MAY 92	12:50	23 MAY 92

III. 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. The date prepared is typically the date an extraction or digestion was initiated. For volatile organic compounds in water, the date prepared is the date the screening of the sample was performed.

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

In addition, surrogate recovery data is presented for all GC/MS analyses. The surrogate recovery is an indication of the affect of the sample matrix on the performance of the method. The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, is given in Section IV.

The analytical data reported are subject to the following limitations of the analytical methodology:

General Inorganics

Client Name: U.S. Geological Survey
 Client ID: KAFB.0.107.15.2
 Lab ID: 022956-0001-SA
 Matrix: AQUEOUS
 Authorized: 23 MAY 92

Sampled: 22 MAY 92
 Prepared: See Below

Received: 23 MAY 92
 Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Nitrate plus Nitrite	0.051	mg/L	0.050	353.2	NA	14 JUN 92
Total Organic Carbon	0.69	mg/L	0.50	9060	NA	16 JUN 92
Total Organic Halogen as Cl	43.1	ug/L	30.0	9020	NA	17 JUN 92

ND = Not detected
 NA = Not applicable

Reported By: Dan Appelhans

Approved By: Dave Roberts

IV. QUALITY CONTROL REPORT

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 surrogate compounds appropriate to the method being used. In cases where no surrogate is available, (e.g., metals or conventional analyses) a single DCS serves as the control sample. An SCS is prepared for each sample lot for which the DCS pair are not analyzed. The recovery of the SCS is charted in exactly the same manner as described for the DCS, and provides a daily check on the performance of the method.

Accuracy for DCS and SCS is measured by Percent Recovery.

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

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

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

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

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)
022956-0001-SA	AQUEOUS	NO3-A	14 JUN 92-7M	-
022956-0001-SA	AQUEOUS	TOC-A	16 JUN 92-7A	-
022956-0001-SA	AQUEOUS	TOX-A	17 JUN 92-7A	-

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: NO3-A Matrix: AQUEOUS QC Lot: 14 JUN 92-7M Concentration Units: mg/L									
Nitrate as N	2.0	1.95	1.96	1.96	98	91-109	0.5	10	
Category: TOC-A Matrix: AQUEOUS QC Lot: 16 JUN 92-7A Concentration Units: mg/L									
Total Organic Carbon	25	26.1	26.1	26.1	104	91-109	0.0	20	
Category: TOX-A Matrix: AQUEOUS QC Lot: 17 JUN 92-7A Concentration Units: ug Cl/L									
Total Organic Halogen as Cl	100	100	87.6	93.8	94	80-120	13	20	

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

Appendix

2956-01

Special Handling

(Circle as appropriate and explain in record 5)

Hazardous material

SAMPLE
KAFB 010715-2
Station Name

Field ID
USGS/WRD/NM
Field Office

KAFB-IRP
Project

TOM CROUCH
MIKO ROYBAL
Collector

Site Type (circle one)

- SW - Surface Water
 - GW** - Ground Water
 - ME - Meteorological
 - LK - Lake
 - ES - Estuary
 - SP - Spring
 - SS - Special Source
- (505) 262-5399
Phone (FTS)

File Deposition*

- WATSTORE
- Lab File

Sample identification

[Blank Box]
For Laboratory Use Only

KAFB 010715-2
Station ID or Unique Number* 463536001
Project Account #

1992 05 22 1250 N M 035 001
Year* Month* Day* Time* State Code* District/ User Code* County Code

Begin Date Composite End Date

Analysis level codes and schedules

PARAMETER:	APPX IX-VOC	APPX IX-SEMIVOC	APPX IX-PESTICIDES	APPX IX-HERBICIDES
METHOD:	SW5030/SW8240	SW3510/SW8270	SW3520/SW8080	SW3520/SW8150
PARAMETER:	APPX IX-DIOXINS	APPX IX-METALS (TOTAL)	APPX IX-METALS (DISS)	APPX IX-CYANIDE
METHOD:	SW3520/SW8280	SW3005/SW6010	SW3005/SW6010	SW9010
PARAMETER:	APPX IX-SULFIDE	NITRATE & NITRITE	URANIUM, GROSS ALPHA & BETA	VOX
METHOD:	SW 9030	E353.2	D2907, E900	SW5030/SW8010

EXTRA SAMPLES/

Chain-of-Custody Record

TDC, TOX
E415.1, SW9020

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

Relinquished by: (Signature)	Received by: (Signature)	Date	Time
<u>Miko Roybal</u>	FEDERAL EXPRESS	22 MAY 92	1515
_____	<u>Justin Chappell</u>	5/23/92	0830
_____	_____	_____	_____
Relinquished from lab by: (Signature)	Received by: (Signature)	Date	Time

Comments (Only 50 characters stored in NWIS)

Record 5 S.A.M.P.L.E. FROM WELL NR. LANDFILL I.

Record 6 _____

Total number of sample bottles for this request: 2

SHIP TO:

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

ATTENTION: TRACY CONROY / JULIE CRAMER