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ANALYTICAL RESULTS
FOR
U.S. Geological Survey
ENSECO-RMAL NO. 022815



JUNE 19, 1992

Reviewed by: *Julieann L Kramer*
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Reviewed by: *Mark Dymerski*
Mark Dymerski



I. OVERVIEW

On May 16, 1992, Enseco-Rocky Mountain Analytical Laboratory received two aqueous samples 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

Sample 022815-0001, and -0002 were analyzed for TOC outside of the analytical holding times due to instrument failure.

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:	Group Code	Analysis Description	Custom Test?
022815			
0001 - 0002	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
022815-0001-SA	KAFB021313-2	AQUEOUS	15 MAY 92	14:05	16 MAY 92
022815-0002-SA	KAFB021314-2	AQUEOUS	15 MAY 92	10:00	16 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.

General Inorganics

Enseco
A Corning Company

Client Name: U.S. Geological Survey
Client ID: KAFB021313-2
Lab ID: 022815-0001-SA
Matrix: AQUEOUS
Authorized: 16 MAY 92

Sampled: 15 MAY 92
Prepared: See Below

Received: 16 MAY 92
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Nitrate plus Nitrite	4.5	mg/L	0.25	353.2	NA	25 MAY 92
Total Organic Carbon	0.95	mg/L	0.50	9060	NA	16 JUN 92
Total Organic Halogen as Cl	ND	ug/L	30.0	9020	NA	08 JUN 92

ND = Not detected
NA = Not applicable

Reported By: Pam Rosas

Approved By: Dave Roberts

General Inorganics

Client Name: U.S. Geological Survey
Client ID: KAFB021314-2
Lab ID: 022815-0002-SA
Matrix: AQUEOUS
Authorized: 16 MAY 92

Sampled: 15 MAY 92
Prepared: See Below

Received: 16 MAY 92
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Nitrate plus Nitrite	ND	mg/L	0.10	353.2	NA	25 MAY 92
Total Organic Carbon	ND	mg/L	0.50	9060	NA	16 JUN 92
Total Organic Halogen as Cl	ND	ug/L	30.0	9020	NA	08 JUN 92

ND = Not detected
NA = Not applicable

Reported By: Pam Rosas

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 Organic analyses, under the USATHAMA (U.S. Army) program, by the Army Corps of Engineers, and the states of Colorado, New Jersey, 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)
022815-0001-SA	AQUEOUS	NO3-A	25 MAY 92-7D	-
022815-0001-SA	AQUEOUS	TOC-A	16 JUN 92-7A	-
022815-0001-SA	AQUEOUS	TOX-A	08 JUN 92-1A	-
022815-0002-SA	AQUEOUS	NO3-A	25 MAY 92-7D	-
022815-0002-SA	AQUEOUS	TOC-A	16 JUN 92-7A	-
022815-0002-SA	AQUEOUS	TOX-A	08 JUN 92-1A	-

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: NO3-A Matrix: AQUEOUS QC Lot: 25 MAY 92-7D Concentration Units: mg/L									
Nitrate as N	2.0	2.06	2.02	2.04	102	91-109	2.0	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: 08 JUN 92-1A Concentration Units: ug Cl/L									
Total Organic Halogen as Cl	100	84.8	81.1	83.0	83	80-120	4.5	20	

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

Appendix

ENSECO ANALYTICAL SERVICES REQUEST FORM

22815-01

Special Handling

(Circle as appropriate and explain in record 5)

Site Type (circle one)

Hazardous material

SW - Surface Water
 GW - Ground Water
 ME - Meteorological

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

SAMPLE
 KAFB 021313-2
 Station Name

Field ID
 USGS/WRD/NM
 Field Office

Project
 KAFB-IRP

Collector
 TOM CROUCH
 MIKO ROYBAL

Phone (FTS)
 (505) 262-5399

File Deposition*
 (Circle one)

Sample identification

Q - WATSTORE
 X - Lab File

For Laboratory Use Only

KAFB 021313-2
 Station ID or Unique Number*

46 35 36 00 1
 Project Account #

1992
 Year*

05
 Month*

15
 Day*

1405
 Time*

Month

Day

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:	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

TUC, TOX
 E415.1, SW9020

PROJECT NAME KIRTLAND AFB IRP

PROJECT NO. 463536001

P.O. NO.

Relinquished by: (Signature)

Miko Roybal

Received by: (Signature)

FEDERAL EXPRESS

Date

15 MAY 92

Time

1530

Relinquished by: (Signature)

Received by: (Signature)

B. MUSIL RMAL

Date

5-16-92

Time

0815

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 SAMPLE FROM WELL AT LANDFILL 2

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

ENSECO ANALYTICAL SERVICES REQUEST FORM

22815 -02

Special Handling

(Circle as appropriate and explain in record 5)

Site Type (circle one)

Hazardous material

SW - Surface Water
 GW - Ground Water
 ME - Meteorological

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

EQ - BLANK
 KAFB 021314-2

Field ID
 USGS/WRD/NM

Project
 KAFB-IRP

Collector
 TOM CROUCH
 MIKO ROYBAL

Phone (FTS)
 (505) 262-5399

File Deposition*
 (Circle one)

Sample identification

Q - WATSTORE
 X - Lab File

[Blank Box]
 For Laboratory Use Only

Station ID or Unique Number*
 KAFB 021314-2

Project Account #
 46 35 36 00 1

1992
 Year*

05 15 1000
 Month* Day* Time*
 Begin Date

Month Day Time
 Composite End Date

NM
 State Code*

035
 District/ User Code*

001
 County Code

Analysis level codes and schedules

Sample Medium**	Geologic Unit	Analysis Status**	Analysis Source**	Hydrologic Condition**	Sample Type**	Hydrologic Event**
APPX IX-VOC		(H) or 9	9		9	9
METHOD: SW5030/SW8240		APPX IX-SEMIVOC		APPX IX-PESTICIDES		APPX IX-HERBICIDES
METHOD: 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		VOC
METHOD: SW 9030		E353.2		D2907, E900		SW5030/SW8010

EXTRA SAMPLES/

Chain-of-Custody Record

TDC 1 TOX
 E45.1, SW9020

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

Relinquished by: (Signature) Miko Roybal	Received by: (Signature) FEDERAL EXPRESS	Date 15MAY92	Time 1530
Relinquished by: (Signature)	Received by: (Signature) B. MUSIL RMAIL	Date 5-16-92	Time 0815
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 EQUIPMENT BLANK - WELL AT LANDFILL 2

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