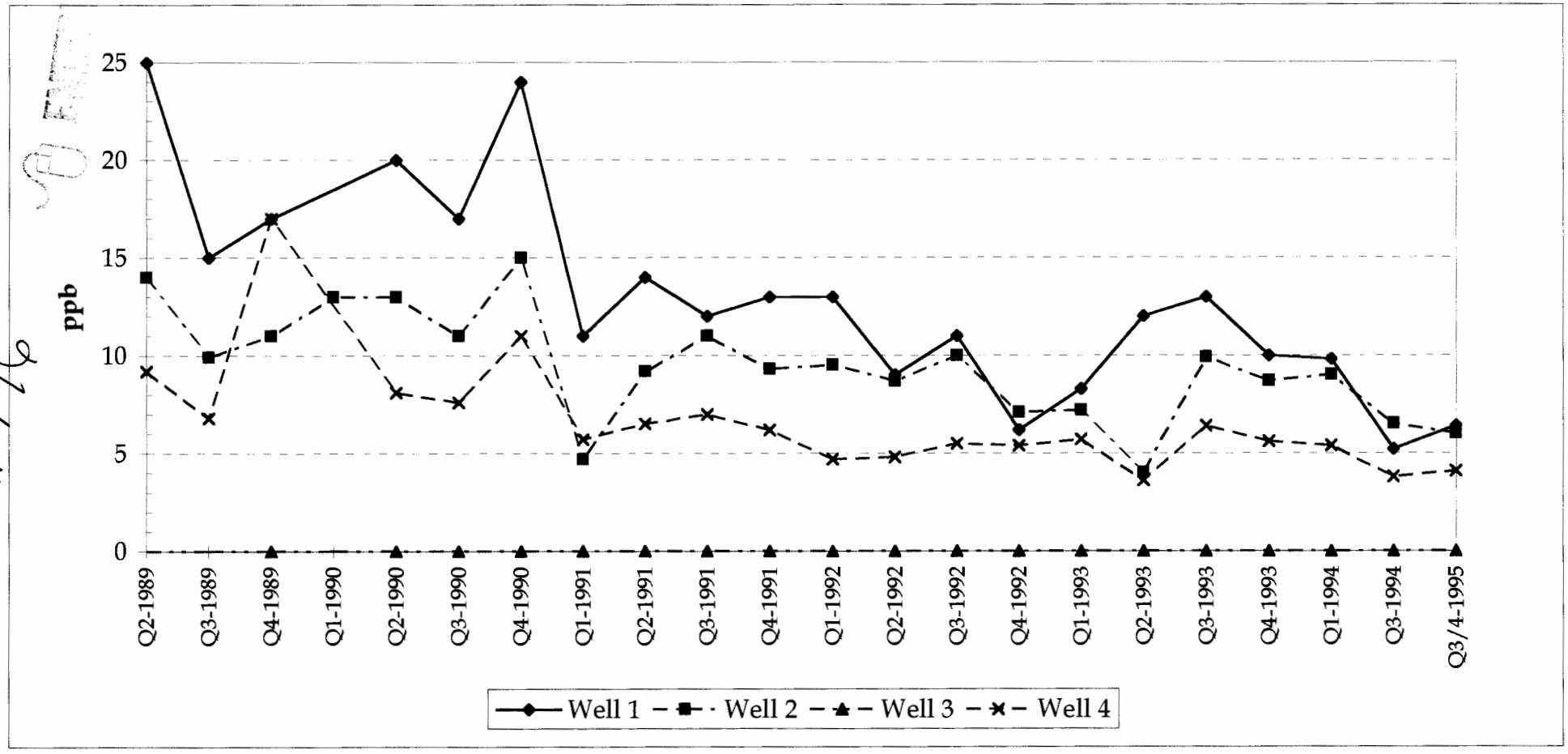
Philips Semiconductors - Albuquerque

Groundwater Analysis

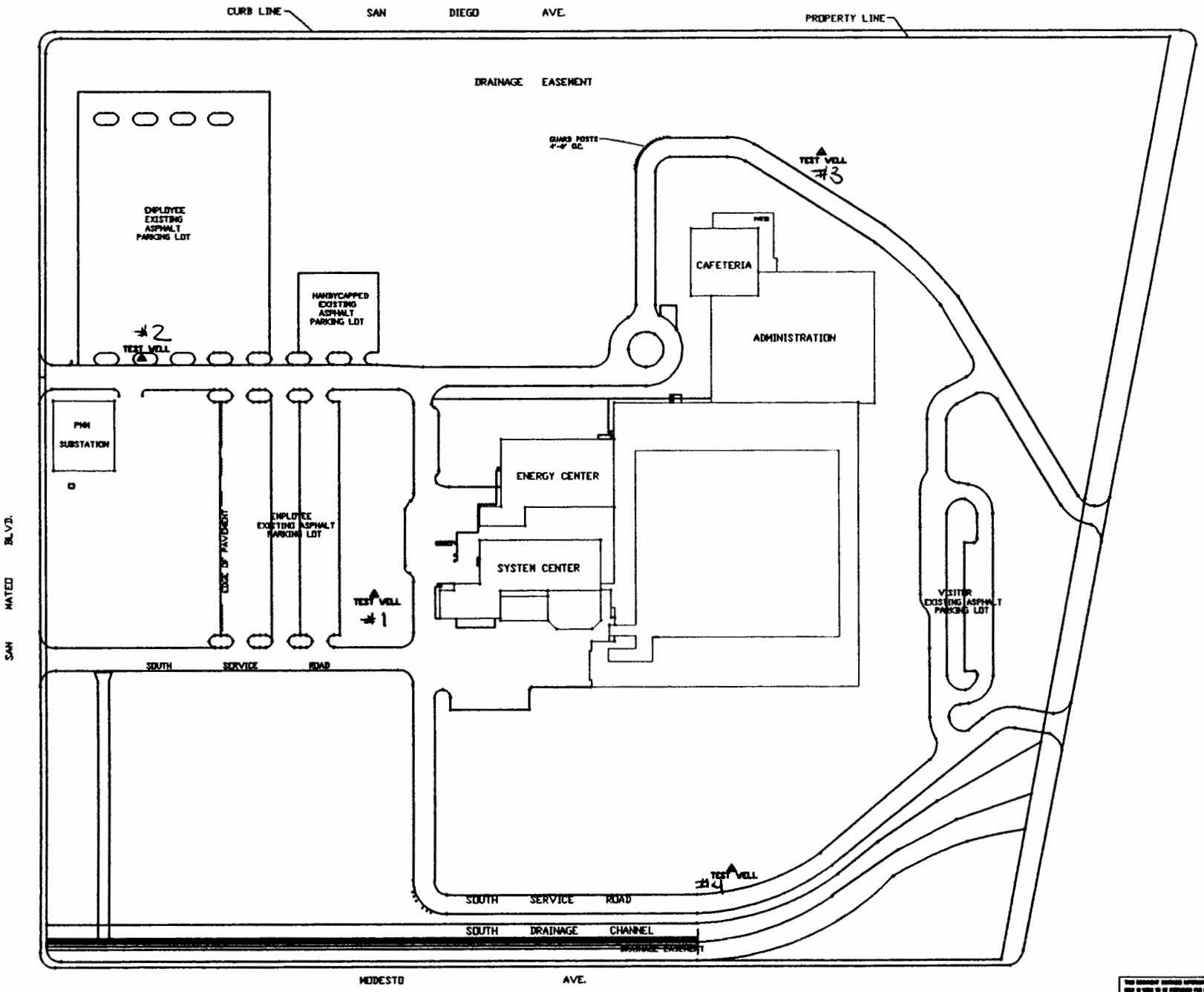
Tetrachloroethylene Concentration in ppb



Year	1989			1990				1991				1992				1993				1994		1995	
Quarter	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q3	Q3	Q4
Date	5/89	9/89	12/89	3/90	6/90	9/90	12/90	4/91	6/91	9/91	12/91	3/92	5/92	9/92	1/93	3/93	6/93	10/93	11/93	3/94	7/94	8/95	11/95
Well 1	25	15	17	NS	20	17	24	11	14	12	13	13	9	11	6.2	8.3	12	13	10	9.8	5.2	NS	6.4
Well 2	14	9.9	11	13	13	11	15	4.7	9.2	11	9.3	9.5	8.7	10	7.1	7.2	4	9.9	8.7	9	6.5	6	NS
Well 3	NS	NS	ND	NS	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NS
Well 4	9.2	6.8	17	NS	8.1	7.6	11	5.7	6.5	7	6.2	4.7	4.8	5.5	5.4	5.7	3.6	6.4	5.6	5.4	3.8	4.1	NS

NS: Not Sampled

ND: Not Detected



SITE TEST WELL POINTS

GROUND WATER MONITORING

PHILIPS

I. OVERVIEW

On September 21, 1988, Enseco-Rocky Mountain Analytical Laboratory received four water samples from Signetics.

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
III. Analytical Results
IV. Quality Control Report
V. Description of Analytical Methodology

The holding time for the Nitrate analyses was missed.

II. 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.

Enseco

SAMPLE DESCRIPTION INFORMATION
for
Signetics

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
001770-0001-SA	SAMPLE POINT #1	AQUEOUS	19 SEP 88	10:55	21 SEP 88
001770-0002-SA	SAMPLE POINT #2	AQUEOUS	20 SEP 88	10:45	21 SEP 88
001770-0003-SA	SAMPLE POINT #3	AQUEOUS	19 SEP 88	11:00	21 SEP 88
001770-0004-SA	TRIP BLANK	AQUEOUS	19 SEP 88		21 SEP 88

III. ANALYTICAL RESULTS

The analytical results for this project are presented in the following data tables. The results are presented by sample, by test, with tests reported in the following order: GC/MS, Chromatography, Metals and Inorganics.

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. All data is "blank corrected", i.e. the level of contamination, if any, found in the laboratory blank is subtracted from the analytical result before it is reported.

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:

Chromatography

Methods 601 and 8010

a) Dichlorodifluoromethane (Freon 12) and vinyl chloride coelute under the specified analytical conditions. All data are reported as a combined value for the two compounds.

b) Dibromochloromethane, cis-1,3-dichloropropene and 1,1,2-trichloroethane are unresolved. The three compounds are reported as a single combined value.

c) Tetrachloroethene and 1,1,2,2-tetrachloroethane coelute and are reported as a combined result.

Rocky Mountain
Analytical Laboratory

Enseco

ANALYTICAL RESULTS

FOR

SIGNETICS

OCTOBER 17, 1988

Reviewed by: Cindy Ingram
Cindy Ingram

Allen J. Medine
Allen J. Medine, Ph.D.

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: SAMPLE POINT #1
Lab ID: 001770-0001-SA Enseco ID: 1014186
Matrix: AQUEOUS Sampled: 19 SEP 88 Received: 21 SEP 88
Authorized: 21 SEP 88 Prepared: NA Analyzed: 23 SEP 88

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane (Methylbromide)	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2, 1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	30	ug/L	1.0
Tetrachloroethene	30	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND=Not Detected
NA=Not Applicable

Reported By: Mike Hoffman Approved By: Kim Zilis

The cover letter is an integral part of this report.
Rev 230787

Enseco

General Inorganics

Client Name: Signetics
Client ID: SAMPLE POINT #1
Lab ID: 001770-0001-SA Enseco ID: 1014186
Matrix: AQUEOUS Sampled: 19 SEP 88 Received: 21 SEP 88
Authorized: 21 SEP 88 Prepared: NA Analyzed: NA

Parameter	Result	Units	Reporting Limit	Analytical Method	Analyzed Date
Nitrate as N	0.3	mg/L	0.1	353.2	06 OCT 88
Total Kjeldahl Nitrogen as N	0.2	mg/L	0.1	351.2	03 OCT 88
Total Organic Carbon	0.8	mg/L	0.1	415.1	03 OCT 88

ND=Not Detected
NA=Not Applicable

Reported By: Kurt Ill Approved By: Kimberly Conroy

The cover letter is an integral part of this report.
Rev 230787

Enseco

Halogenated Volatile Organics

Method 601

lient Name: Signetics
lient ID: SAMPLE POINT #2
ab ID: 001770-0002-SA Enseco ID: 1014187
atrix: AQUEOUS Sampled: 20 SEP 88 Received: 21 SEP 88
uthorized: 21 SEP 88 Prepared: NA Analyzed: 23 SEP 88

arameter	Result	Units	Reporting Limit
hloromethane	ND	ug/L	5.0
romomethane (Methylbromide)	ND	ug/L	5.0
inyl chloride	ND	ug/L	1.0
hloroethane	ND	ug/L	5.0
ethylene chloride	ND	ug/L	5.0
,1-Dichloroethene	ND	ug/L	0.50
,1-Dichloroethane	ND	ug/L	0.50
,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
hloroform	ND	ug/L	0.50
,1,2-Trichloro-2,2, 1-trifluoroethane	ND	ug/L	1.0
,2-Dichloroethane	ND	ug/L	1.0
,1,1-Trichloroethane	ND	ug/L	0.50
arbon tetrachloride	ND	ug/L	0.50
romodichloromethane	ND	ug/L	1.0
,2-Dichloropropane	ND	ug/L	1.0
r 1,3-Dichloropropene	ND	ug/L	1.0
richloroethene	ND	ug/L	0.50
hlorodibromomethane	ND	ug/L	1.0
is-1,3-Dichloropropene	ND	ug/L	2.0
,1,2-Trichloroethane	ND	ug/L	1.0
DB (1,2-Dibromoethane)	ND	ug/L	2.0
romoform	ND	ug/L	5.0
,1,2,2-Tetrachloroethane	14	ug/L	1.0
etrachloroethene	14	ug/L	0.50
hlorobenzene	ND	ug/L	2.0

D=Not Detected
A=Not Applicable

ep ed By: Mike Hoffman Approved By: Kim Zilis

The cover letter is an integral part of this report.
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General Inorganics

Client Name: Signetics
Client ID: SAMPLE POINT #2
Lab ID: 001770-0002-SA Enseco ID: 1014187
Matrix: AQUEOUS Sampled: 20 SEP 88 Received: 21 SEP 88
Authorized: 21 SEP 88 Prepared: NA Analyzed: NA

Parameter	Result	Units	Reporting Limit	Analytical Method	Analyzed Date
Nitrate as N	0.6	mg/L	0.1	353.2	06 OCT 88
Total Kjeldahl Nitrogen as N	ND	mg/L	0.1	351.2	03 OCT 88
Total Organic Carbon	0.7	mg/L	0.1	415.1	03 OCT 88

ND=Not Detected
NA=Not Applicable

Reported By: Kurt Ill Approved By: Kimberly Conroy

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Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: SAMPLE POINT #3
Lab ID: 001770-0003-SA Enseco ID: 1014188
Matrix: AQUEOUS Sampled: 19 SEP 88 Received: 21 SEP 88
Authorized: 21 SEP 88 Prepared: NA Analyzed: 23 SEP 88

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane (Methylbromide)	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2, 1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
t[illegible]-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	30	ug/L	1.0
Tetrachloroethene	30	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND=Not Detected
NA=Not Applicable

Re[illegible]ed By: Mike Hoffman Approved By: Kim Zilis

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General Inorganics

Client Name: Signetics
Client ID: SAMPLE POINT #3
Lab ID: 001770-0003-SA Enseco ID: 1014188
Matrix: AQUEOUS Sampled: 19 SEP 88 Received: 21 SEP 88
Authorized: 21 SEP 88 Prepared: NA Analyzed: NA

Parameter	Result	Units	Reporting Limit	Analytical Method	Analyzed Date
Nitrate as N	0.3	mg/L	0.1	353.2	06 OCT 88
Total Kjeldahl Nitrogen as N	0.1	mg/L	0.1	351.2	03 OCT 88
Total Organic Carbon	0.6	mg/L	0.1	415.1	03 OCT 88

ND=Not Detected
NA=Not Applicable

Reported By: Kurt Ill Approved By: Kimberly Conroy

The cover letter is an integral part of this report.
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Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: TRIP BLANK
Lab ID: 001770-0004-SA Enseco ID: 1014189
Matrix: AQUEOUS Sampled: 19 SEP 88 Received: 21 SEP 88
Authorized: 21 SEP 88 Prepared: NA Analyzed: 23 SEP 88

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane (Methylbromide)	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND=Not Detected
NA=Not Applicable

Reported By: Mike Hoffman Approved By: Kim Zilis

The cover letter is an integral part of this report.
Rev 230787

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 Laboratory Control Samples (LCS) at frequent, well-defined intervals. An LCS 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 LCS 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 LCS 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 Organic analyses an additional control measure is taken in the form of a Surrogate Control Sample (SCS). The SCS is a control sample spiked with surrogate standards which is analyzed with every analytical lot. The recovery of the SCS is charted in exactly the same manner as described for the LCS, and provides a daily check on the performance of the method.

Accuracy for LCS and SCS is measured by Percent Recovery.

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

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

$$\text{RPD} = \frac{\text{Measured Concentration LCS1} - \text{Measured Concentration LCS2}}{(\text{Measured Concentration LCS1} + \text{Measured Concentration LCS2})/2}$$

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, LCS 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. The test codes assigned are defined in Section V, Analytical Methodology.

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QC LOT ASSIGNMENT REPORT
Volatile Organics by GC

Laboratory Sample Number	QC Matrix	Test	QC Lot Number LCS	SCS
001770-0001-SA	AQUEOUS	601-A	880923W	880923W
001770-0002-SA	AQUEOUS	601-A	880923W	880923W
001770-0003-SA	AQUEOUS	601-A	880923W	880923W
001770-0004-SA	AQUEOUS	601-A	880923W	880923W

LABORATORY CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Concentration Measured LCS1	Concentration Measured LCS2	Accuracy(%) LCS1	Accuracy(%) LCS2	Accuracy(%) Limits	Precision(RPD) LCS	Precision(RPD) Limits
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 880923W								
Concentration Units: ug/L								
1,1-Dichloroethane	5.0	5.77	5.56	115	111	60-140	3.5	20
Chloroform	5.0	5.64	5.56	113	111	60-140	1.8	20
Bromodichloromethane	10	11.3	10.7	113	107	60-140	5.4	20
Trichloroethene	5.0	4.86	4.66	97	93	60-140	4.2	20
Chlorobenzene	5.0	5.30	5.10	106	102	60-140	3.8	20

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SURROGATE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix AQUEOUS				
LCS Lot: 880923W SCS Lot: 880923W				
Concentration Units: ug/L				
Bromochloromethane	30.0	26.5	88	20-160

BLANK REPORT
Volatile Organics by GC

Test: 601-A
Matrix: AQUEOUS
LCS Lot: 880923W SCS Lot: 880923W

Analyte	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethan (Methylbromide)	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethen (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2 1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Enseco

QC LOT ASSIGNMENT REPORT
Wet Chemistry Analysis and Preparation

Laboratory Sample Number	QC Matrix	Test	QC Lot Number LCS
001770-0001-SA	AQUEOUS	TOC-A	881003B
001770-0001-SA	AQUEOUS	TKN-A	881003A
001770-0001-SA	AQUEOUS	NO3-A	881006B
001770-0002-SA	AQUEOUS	TOC-A	881003B
001770-0002-SA	AQUEOUS	TKN-A	881003A
001770-0002-SA	AQUEOUS	NO3-A	881006B
001770-0003-SA	AQUEOUS	TOC-A	881003B
001770-0003-SA	AQUEOUS	TKN-A	881003A
001770-0003-SA	AQUEOUS	NO3-A	881006B

LABORATORY CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured LCS1	Measured LCS2	Accuracy(%) LCS1	Accuracy(%) LCS2	Limits	Precision(RPD) LCS	Limits
Category: TOC-A Matrix: AQUEOUS QC Lot: 881003B Concentration Units: mg/L								
Total Organic Carbon	25	25.5	25.4	102	102	91-109	0.0	20
Category: TKN-A Matrix: AQUEOUS QC Lot: 881003A Concentration Units: mg/L								
Total Kjeldahl Nitroge as N	5.0	4.78	4.86	96	97	78-122	1.0	20
Category: NO3-A Matrix: AQUEOUS QC Lot: 881006B Concentration Units: mg/L								
Nitrate as N	5.4	5.01	5.07	92	93	91-109	1.1	10

V. ANALYTICAL METHODOLOGY

Enseco - Rocky Mountain Analytical Laboratory performs analytical services according to methods approved by EPA and other regulatory agencies, whenever possible.

Methods for metals and organic compounds are primarily derived from three sources of EPA methods, 1) the methods promulgated in 40 CFR 136 for priority pollutants, 2) the methods published in SW-846 and 3) methods developed by the EPA-EMSL/LV for Superfund investigations, as well as several documents published by the EPA and Enseco - Rocky Mountain Analytical Laboratory in 1984 and 1985. These methods all use the same generic technology as summarized below:

- Metals: acid digestion followed by analyses by ICP supported by graphite furnace AA

- Volatile Organics: purge and trap GC/MS or purge and trap GC with a selective detector.

- Semivolatile (base/neutral and acid) organics: solvent extraction followed by capillary column GC/MS, and

- Pesticides/Herbicides: solvent extraction, followed by gas chromatography.

Exact method references are given in the following tables.

ANALYTICAL METHODOLOGY - ORGANIC TESTS

Test	Description	Methodology	Reference
VOA	Volatile Organics	Purge & Trap, GC/MS	624(1)/8240(2)
BNA	Semivolatile Organics	Extraction, GC/MS	625(1)/8270(2)
DXN	Dioxin	Extraction, GC/MS	613(1)/8280(2)
601	Halogenated Volatile Organics	Purge & Trap GC/Hall	601(1)/8010(2)
THM	Trihalomethanes	Purge & Trap GC/Hall	601(1)/8010(2)
602	Aromatic Volatile Organics	Purge & Trap GC/PID	602(1)/8020(2)
OCP	Organochlorine Pesticides	Extraction, GC/ECD	608(1)/8080(2)
OPP	Organophosphate Pesticides	Extraction, GC/FPD	614(1)/8140(2)
619	Triazine Pesticides	Extraction, GC/NPD	619(1)
LC CARB	Carbamate and Urea Pesticides	Extraction, HPLC	632(1)
PCB	PCB's	Extraction, GC/ECD	608(1)/8080(2)
HRB	Phenoxyacid Herbicides	Extraction, GC/ECD	615(1)/8150(2)
603	Acrolein & Acrylonitrile	Purge & Trap GC/FID	603(1)/8030(2)
604	Phenols	Extraction, GC/FID	604(1)/8040(2)
605	Benzidines	Extraction, HPLC	605(1)/8050(2)
606	Phthalate Esters	Extraction, GC/FID	606(1)/8060(2)
607	Nitrosamines	Extraction, GC/NPD	607(1)
609	Nitroaromatics & Cyclic Ketones	Extraction, GC/NPD	609(1)/8090(2)
PNA	Polynuclear Aromatic Hydrocarbons	Extraction, HPLC	610(1)/8310(2)
611	Haloethers	Extraction, GC/ECD	611(1)
612	Chlorinated Hydrocarbons	Extraction, GC/ECD	612(1)/8120(2)
GD FID	Hydrocarbon Scan	Extraction, GC/FID	D3328-78(3)
GC BPD	Boiling Point Determination	Extraction, GC/FID	D2887-84(4)

References

(1) Code of Federal Regulations, Chapter 40, Part 136 (40 CFR 136).
(2) SW-846, 2nd Edition, 1984.
(3) "Annual Book of ASTM Standards", Volume 11.01, 1985.
(4) "Annual Book of ASTM Standards", Volume 05.02, 1984.

ANALYTICAL METHODOLOGY - INORGANIC TESTS

Test	Description	Methodology	Reference
ICP	Trace Metals	ICP Emission Spectroscopy	200.7(1)/6010(2)
FSB	Antimony	Furnace Atomic Absorption	204.2(1)/7041(2)
FAS	Arsenic	Furnace Atomic Absorption	206.2(1)/7060(2)
FCD	Cadmium	Furnace Atomic Absorption	213.2(1)/7131(2)
FPB	Lead	Furnace Atomic Absorption	239.2(1)/7421(2)
FSE	Selenium	Furnace Atomic Absorption	270.2(1)/7740(2)
FAG	Silver	Furnace Atomic Absorption	272.2(1)/7761(2)
FTL	Thallium	Furnace Atomic Absorption	279.2(1)/7841(2)
CVHG	Mercury	Cold Vapor Atomic	245.1(1)/7471(2)
CR + 6	Chromium (VI)	Colorimetric	312B(3)
IC CL	Chloride	Ion Chromatography	300.0(1)
BURCL	Chloride	Manual Titrimetric	325.3(1)
METF	Fluoride	Electrode	340.2(1)
IC SO4	Sulfate	IC	300.0(1)
SPESO4	Sulfate	Manual Turbidimetric	375.4(1)
METALK	Alkalinity, Total	Titrimetric	310.1(1)
METACK	Alkalinity, Forms	Titrimetric	403(3)
TECNOXT	Nitrate+Nitrite as N	Cd Reduction Colorimetric	353.2(1)
METPH	pH	Meter	150.1(1)/9045(2)
CELSP	Specific Conductance @ 25°C	Bridge	120.1(1)
BALTDS	Total Dissolved Solids	Gravimetric, 180°C	160.1(1)
BALTSS	Total Suspended Solids	Gravimetric, 105°C	160.2(1)
BALTS	Total Solids	Gravimetric, 105°C	160.3(1)
BALTVS	Total Volatile Solids	Gravimetric, 550°C	160.4(1)
TECO P	Ortho-Phosphate as P	Two Reagent Colorimetric	365.3(1)
TECT P	Total Phosphorus as P	Digestion-Colorimetric	365.3(1)
ICP	Total Phosphorus as P	Digestion-ICP/AES	200.7(1)
ICP	Silica as SiO_2	ICP/AES	200.7(1)
SPESIO2	Silica as SiO_2	Colorimetric	370.1(1)
METBOD	Biochemical Oxygen Demand	Dilution Bottle-D.O. probe	405.1(1)
METCOD	Chemical Oxygen Demand	Micro Colorimetric	410.4(1)
TOCTOC	Total Organic Carbon	UV Oxidation-IR	415.2(1)
METNH3	Ammonia as N	Electrode	350.3(1)
TECNH3	Ammonia as N	Automated Colorimetric	350.1(1)
METTKN	Total Kjeldahl Nitrogen as N	Digestion-Electrode	351.4(1)
TECTKN	Total Kjeldahl Nitrogen as N	Digestion-Colorimetric	351.2(1)
TOXTOX	Total Organic Halogen	Combustion-Titrimetric	9020(2)
TONO1	Total Organic Nitrogen	Calculation (TKN-NH_3)	-
BAL O&G	Oil and Grease	Freon Extraction-Gravimetric	413.1(1)
IR AO&G	Oil and Grease	Freon Extraction-IR	413.2(1)
TECCN F	Cyanide Amendable to Chlorination	Chlorination-Distillation-Colorimetric	335.1(1)
TECCN W	Weak & Dissolved Cyanide	Distillation-Colorimetric	412H(3)
TECCN T	Total Cyanide	Distillation-Colorimetric	335.2(1)/9010(2)
STEPHEN	Phenolics	Distillation-Colorimetric	420.1(1)
COLIF F	Fecal Coliform	Membrane Filter	909C(3)
COLIF T	Total Coliform	Membrane Filter	909A(3)

ANALYTICAL METHODOLOGY - INORGANIC TESTS (CONT.)

Test	Description	Methodology	Reference
IC BR	Bromide	Ion Chromatography	300.0(1)
POTCL2R	Residual Chlorine	Amperometric	330.2(1)
NESCOLR	Color	Pt-Co Colorimetric	110.2(1)
ICPHAR	Hardness as $CaCo_3$	Calculation	200.7(1)/314A(3)
TECNO2	Nitrite as N	Colorimetric	354.1(1)
SPES	Sulfide	Colorimetric	376.2(1)/9030(2)
BURSO3	Sulfite	Titrimetric	377.1(1)
SPEMBAS	MBAS (Surfactants)	Colorimetric	425.1(1)
SPETURB	Turbidity	Turbidimeter	180.1(1)
Gross Alpha		Proportional Counter	703(3)
Gross Beta		Proportional Counter	703(3)
Radium 226		Separation - Counter	705(3)
Radium 228		Separation - Counter	707(3)
Uranium		Fluorimetric	D2907.75(4)

References

(1) Code of Federal Regulations, Chapter 40, Part 136 (40 CFR 136).
(2) SW-846, 2nd Edition, 1984.
(3) "Standard Methods for the Examination of Water and Wastewater", 15th Edition, 1980.
(4) "Annual Book of ASTM Standards", Part 31, Water, 1980.

To: Gary Mavrakis
From: Cathy Weber
Date: September 13, 1989
Subject: Quarter 2 Groundwater Results

The results are compiled for the Quarter 2 groundwater testing. We were able to sample Well #4 this time but we are still having problems with Well #3. We have found a crack in the air line and therefore were not getting the pressure required to pump the well. Parts have been ordered to repair the line and hopefully we will be able to sample before the end of this year.

Kerry Luhr has been trained on sampling of the groundwater wells and he will be doing the sampling part of this monitoring program in the future.

Attached are the results from ENSECO (Rocky Mountain Analytical) and from the testing here at Signetics.

	Well #1	Well #2	Well #4
pH	11.1	6.6	6.9
conductivity	2430	735	788
temperature	64 F	63 F	58 F
color	opague	clear	clear
total solids	1012 mg/l	418 mg/l	493 mg/l
fluoride	0.6 mg/l	0.5 mg/l	0.5 mg/l
chloride	25.2 mg/l	23.6 mg/l	19.9 mg/l
sulfate	67.6 mg/l	122.5 mg/l	154.9 mg/l
sodium	40.0 mg/l	30.7 mg/l	30.0 mg/l
potassium	10.3 mg/l	3.3 mg/l	3.7 mg/l
calcium	184.2 mg/l	103.7 mg/l	115.7 mg/l
magnesium	0.1 mg/l	11.6 mg/l	13.2 mg/l

Enseco

June 15, 1989

Cathy Weber
Signetics Inc.
9201 Panamerica Freeway N.E.
Albuquerque, NM 87113

Dear Ms. Weber:

Enclosed is the report for three aqueous samples received at Rocky Mountain Analytical Laboratory on May 18, 1989.

If you have any questions, the Program Administrator assigned to this project is Cindy Ingram.

Sincerely,

Ramona Power

Ramona Power
Data Control

Enclosures

cc: Cindy Ingram, Program Administrator

RMAL #004978

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

Discussion

This report contains results and supporting quality control and sample identification information associated with analyses performed on this project. The results and supporting information are contained in tables following this section, arranged in the following order:

- Sample Description Information
- Analytical Test Requests
- Analytical Results
- Quality Control Report
- Data Quality Assessment

Analyses were performed in accordance with EPA methods and with Enseco's current Quality Assurance Program Plan for Environmental Chemical Monitoring. The specific analytical methods used are presented with each result. The first four sections below describes the format, content, and organization for the four corresponding separate components of this report. The fifth section provides an overall data quality assessment of the results.

Sample Description Information

The Sample Description Information lists all 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 Results

The analytical results for this project are presented in data tables. Each data table includes sample identification information, and where available and appropriate, dates sampled, received, authorized, prepared, and analyzed.

Data sheets contain a listing of the parameters measured in each test, the analytical results, the analytical method, 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, April, 1989.

Quality Control Reports

As documented in more detail in Enseco's QAPP, various internal quality control checks are performed to assure that the laboratory was in control during the time that samples on this project were analyzed. The QC checks include analysis of method blanks, duplicate control samples (DCS), and single control samples (SCS). Results from these analyses are presented along with the control limits.

Method Blank Results: A method blank is a laboratory generated sample used to assess the degree to which laboratory operations and procedures cause false positive analytical results.

Duplicate Control Samples (DCS): Each DCS consists of a standard control matrix that is spiked with a group of target analytes representative of the method analytes. One Duplicate Control Sample is prepared for every twenty (20) samples.

Single Control Samples (SCS): An SCS is a spiked sample analyzed with each batch of samples.

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).

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

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in Enseco's Quality Assurance Project Plan for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered.

Tetrachloroethene and 1,1,2,2-tetrachloroethane coelute and are reported as a combined result.

SAMPLE DESCRIPTION INFORMATION
for
Signetics

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
004978-0001-SA	Well #1	AQUEOUS	16 MAY 89	14:50	18 MAY 89
004978-0002-SA	Well #2	AQUEOUS	16 MAY 89	11:10	18 MAY 89
004978-0003-SA	Well #4	AQUEOUS	17 MAY 89	09:40	18 MAY 89

ANALYTICAL TEST REQUESTS
for
Signetics

Lab ID: 004978	Group Code	Analysis Description	Custom Test?
0001 - 0003	A	Total Organic Carbon (TOC)	N
		Total Kjeldahl Nitrogen (TKN)	N
		Halogenated Volatile Organics	N

Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: Well #1
Lab ID: 004978-0001-SA Enseco ID: 1038564
Matrix: AQUEOUS Sampled: 16 MAY 89 Received: 18 MAY 89
Authorized: 18 MAY 89 Prepared: NA Analyzed: 23 MAY 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	25	ug/L	1.0
Tetrachloroethene	25	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

N.D. = Not Detected
N.A. = Not Applicable

Reported By: Duane Newell Approved By: Kim Zilis

Ensec

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: Well #2
Lab ID: 004978-0002-SA Enseco ID: 1038565
Matrix: AQUEOUS Sampled: 16 MAY 89 Received: 18 MAY 89
Authorized: 18 MAY 89 Prepared: NA Analyzed: 23 MAY 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2, 1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	14	ug/L	1.0
Tetrachloroethene	14	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

N.D. = Not Detected
N.A. = Not Applicable

Reported By: Duane Newell Approved By: Kim Zilis

Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: Well #4
Lab ID: 004978-0003-SA Enseco ID: 1038566
Matrix: AQUEOUS Sampled: 17 MAY 89 Received: 18 MAY 89
Authorized: 18 MAY 89 Prepared: NA Analyzed: 23 MAY 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	9.2	ug/L	1.0
Tetrachloroethene	9.2	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

N.D. = Not Detected
N.A. = Not Applicable

Reported By: Duane Newell Approved By: Kim Zilis

Enseco

General Inorganics

Client Name: Signetics
Client ID: Well #1
Lab ID: 004978-0001-SA Enseco ID: 1038564
Matrix: AQUEOUS Sampled: 16 MAY 89 Received: 18 MAY 89
Authorized: 18 MAY 89 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.1	351.2	NA	23 MAY 89
Total Organic Carbon	0.1	mg/L	0.1	415.1	NA	31 MAY 89

N.D. = Not Detected
N.A. = Not Applicable

Reported By: Cheryl Jones Approved By: Kim Zilis

Enseco

General Inorganics

Client Name: Signetics
Client ID: Well #2
Lab ID: 004978-0002-SA Enseco ID: 1038565
Matrix: AQUEOUS Sampled: 16 MAY 89 Received: 18 MAY 89
Authorized: 18 MAY 89 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.1	351.2	NA	23 MAY 89
Total Organic Carbon	0.7	mg/L	0.1	415.1	NA	30 MAY 89

N.D. = Not Detected
N.A. = Not Applicable

Reported By: Cheryl Jones Approved By: Kim Zilis

Enseco

General Inorganics

Client Name: Signetics
Client ID: Well #4
Lab ID: 004978-0003-SA Enseco ID: 1038566
Matrix: AQUEOUS Sampled: 17 MAY 89 Received: 18 MAY 89
Authorized: 18 MAY 89 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.1	351.2	NA	23 MAY 89
Total Organic Carbon	0.7	mg/L	0.1	415.1	NA	30 MAY 89

N.D. = Not Detected
N.A. = Not Applicable

Reported By: Cheryl Jones Approved By: Kim Zilis

QC LOT ASSIGNMENT REPORT
Volatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
004978-0001-SA	AQUEOUS	601-A	23 MAY 89-P	23 MAY 89-P
004978-0002-SA	AQUEOUS	601-A	23 MAY 89-P	23 MAY 89-P
004978-0003-SA	AQUEOUS	601-A	23 MAY 89-P	23 MAY 89-P

DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Limit
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 23 MAY 89-P								
Concentration Units: ug/L								
1,1-Dichloroethane	5.0	5.40	5.24	5.32	107	80-130	3.0	20
Chloroform	5.0	4.81	4.67	4.74	95	80-120	3.0	20
Bromodichloromethane	10	8.91	8.60	8.76	88	80-120	3.5	20
Trichloroethene	5.0	4.25	4.26	4.26	85	70-120	0.2	20
Chlorobenzene	5.0	4.43	4.22	4.32	87	80-120	4.9	20

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

SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 23 MAY 89-P QC Run: 23 MAY 89-P				
Concentration Units: ug/L				
Bromochloromethane	30.0	40.1	134	20-160

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

METHOD BLANK REPORT
Volatile Organics by GC

Test: 601-A
Matrix: AQUEOUS
QC Lot: 23 MAY 89-P QC Run: 23 MAY 89-P

Analyte	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2, 1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Enseco

QC LOT ASSIGNMENT REPORT
Wet Chemistry Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)
004978-0001-SA	AQUEOUS	TOC-A	31 MAY 89-A
004978-0001-SA	AQUEOUS	TKN-A	22 MAY 89-A
004978-0002-SA	AQUEOUS	TOC-A	30 MAY 89-A
004978-0002-SA	AQUEOUS	TKN-A	22 MAY 89-A
004978-0003-SA	AQUEOUS	TOC-A	30 MAY 89-A
004978-0003-SA	AQUEOUS	TKN-A	22 MAY 89-A

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: TOC-A Matrix: AQUEOUS QC Lot: 31 MAY 89-A Concentration Units: mg/L								
Total Organic Carbon	25	25.2	25.2	25.2	101	91-109	0.0	20
Category: TKN-A Matrix: AQUEOUS QC Lot: 22 MAY 89-A Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	2.6	2.31	2.27	2.29	88	78-122	1.7	20
Category: TOC-A Matrix: AQUEOUS QC Lot: 30 MAY 89-A Concentration Units: mg/L								
Total Organic Carbon	25	25.4	25.8	25.6	103	91-109	1.6	20

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

PHILIPS/CITY OF ALBUQUERQUE
POSITIVE ANALYTICAL RESULTS, 2ND QUARTER 1989
Coronado Landfill Monitor Well Sample Test Results

Analyte & NM WQ STNDRD (Units in mg/l unless Otherwise Stated)	Test Well One	Test Well Two	Test Well Three	Test Well Four
Date of Quarterly Sampling	16MAY89			
Date Analyses Performed	23MAY89			
pH (6 - 9 NM WQ STNDRD)	11.1	6.6	No Sample	6.9
Conductivity	2430.0	735.0	No Sample	788.0
Temp F	64.0	63.0	No Sample	58.0
Color	Opaque	Clear	No Sample	Clear
Total Solids (TDS<1,001)	1012.0	418.0	No Sample	493.0
Fluoride (1.6)	0.6	0.5	No Sample	0.5
Chloride (250 aesthetic)	25.2	23.6	No Sample	19.9
Sulfate (600 aesthetic)	67.6	122.5	No Sample	154.9
Sodium (20 Health Advsry)	40.0	30.7	No Sample	30.0
Potassium (none)	10.3	3.3	No Sample	3.7
Calcium (none)	184.2	103.7	No Sample	115.7
Magnesium (none)	0.1	11.6	No Sample	13.2
1,1,2,2-Tetrachloroethane* Reporting Limit=0.001 (0.01)	0.0250	0.0140	No Sample	0.0092
Tetrachloroethene (PCE)* Reporting Limit = 0.0005 (0.02)	0.0250	0.0140	No Sample	0.0092
Total Kjeldahl Nitrogen as N 0.1 RL, 10=EPA (nitrate+nitrite)	ND	ND	No Sample	ND
Total Organic Carbon Reporting Limit=0.1	0.1	0.7	No Sample	0.7

*Tetrachloroethene & 1,1,2,2-tetrachloroethane coelute with method used and are reported as a combined result.

PHILIPS/CITY OF ALBUQUERQUE
POSITIVE ANALYTICAL RESULTS
Coronado Landfill Monitor Well Sample Test Results

02/22/96
Vs.

Analyte & NM WQ STNDRD (Units in mg/l unless Otherwise Stated)	Date/ Sampled Analyzed	Test Well One	Two	Three	Four
pH (6 - 9)	16MAY89 23MAY89	11.1	6.6	No Sample	6.9
Conductivity		2430.0	735.0	No Sample	788.0
Temp F		64.0	63.0	No Sample	58.0
Color		Opaque	Clear	No Sample	Clear
Total Solids (TDS<1,001)		1012.0	418.0	No Sample	493.0
Fluoride (1.6)		0.6	0.5	No Sample	0.5
Chloride (250 aesthetic)		25.2	23.6	No Sample	19.9
Sulfate (600 aesthetic)		67.6	122.5	No Sample	154.9
Sodium (20 Health Advsry)		40.0	30.7	No Sample	30.0
Potassium (none)		10.3	3.3	No Sample	3.7
Calcium (none)		184.2	103.7	No Sample	115.7
Magnesium (none)		0.1	11.6	No Sample	13.2
1,1,2,2-Tetrachloroethane* 0.001 Reporting Limit=1.0? (0.01)		0.0250	0.0140	No Sample	0.0092
Tetrachloroethene (PCE)* 0.0005 Reporting Limit = 0.50? (0.02)		0.0250	0.0140	No Sample	0.0092
Total Kjeldahl Nitrogen as N 0.1 RL, 10=EPA (nitrate+nitrite		ND	ND	No Sample	ND
Total Organic Carbon Reporting Limit=0.1		0.1	0.7	No Sample	0.7

* From where did these reporting limits come from? Source?

Tetrachloroethene + 1,1,2,2 - tetrachloroethane coelute and are reported as a combined result.

a:/phildec1.wb2

To: Gary Mavrakis
From: Cathy Weber
Date: October 31, 1989
Subject: Quarter 3 Groundwater Results

The results are compiled for the Quarter 3 groundwater testing. We were able to sample wells 1, 2, and 4 but we still had problems with well #3 at the time of sampling for Enseco. We were able to pump well #3 for our inhouse testing and it will be pumped for the quarter 4 testing.

Kerry Luhr has been trained on sampling of the groundwater wells and he will be doing the sampling part of this monitoring program in the future. Bertha Stange has been trained in sampling and in the inhouse testing.

Attached are the results from ENSECO (Rocky Mountain Analytical) and from the testing here at Signetics.

	Well #1	Well #2	Well #3	Well #4
pH	10.8	6.6	6.8	6.9
conductivity	1670	669	460	804
temperature	66 F	64 F	64 F	64 F
color	clear	clear	milky	clear
total solids	940 mg/l	307 mg/l	488 mg/l	578 mg/l
fluoride	0.4 mg/l	0.1 mg/l	0.3 mg/l	0.7 mg/l
chloride	19.5 mg/l	25.7 mg/l	13.5 mg/l	18.2 mg/l
sulfate	89.5 mg/l	117.9 mg/l	65.0 mg/l	144.6mg/l
sodium	37.2 mg/l	31.6 mg/l	23.7 mg/l	41.1 mg/l
potassium				
calcium	291.6 mg/l	125.9 mg/l	38.9 mg/l	119.0mg/l
magnesium	0.1 mg/l	7.4 mg/l	6.9 mg/l	7.6 mg/l

We were unable to test potassium at this time due to contamination problems.

Discussion

This report contains results and supporting quality control and sample identification information associated with analyses performed on this project. The results and supporting information are contained in tables following this section, arranged in the following order:

- Sample Description Information
- Analytical Test Requests
- Analytical Results
- Quality Control Report
- Data Quality Assessment

Analyses were performed in accordance with EPA methods and with Enseco's current Quality Assurance Program Plan for Environmental Chemical Monitoring. The specific analytical methods used are presented with each result. The first four sections below describes the format, content, and organization for the four corresponding separate components of this report. The fifth section provides an overall data quality assessment of the results.

Sample Description Information

The Sample Description Information lists all 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 Results

The analytical results for this project are presented in data tables. Each data table includes sample identification information, and where available and appropriate, dates sampled, received, authorized, prepared, and analyzed.

Data sheets contain a listing of the parameters measured in each test, the analytical results, the analytical method, 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, April, 1989.

Quality Control Reports

As documented in more detail in Enseco's QAPP, various internal quality control checks are performed to assure that the laboratory was in control during the time that samples on this project were analyzed. The QC checks include analysis of method blanks, duplicate control samples (DCS), and single control samples (SCS). Results from these analyses are presented along with the control limits.

Method Blank Results: A method blank is a laboratory generated sample used to assess the degree to which laboratory operations and procedures cause false positive analytical results.

Duplicate Control Samples (DCS): Each DCS consists of a standard control matrix that is spiked with a group of target analytes representative of the method analytes. One Duplicate Control Sample is prepared for every twenty (20) samples.

Single Control Samples (SCS): An SCS is a spiked sample analyzed with each batch of samples.

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).

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

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in Enseco's Quality Assurance Project Plan for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered.

Enseco

SAMPLE DESCRIPTION INFORMATION
for
Signetics

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
006599-0001-SA	WELL #2	AQUEOUS	13 SEP 89	13:30	15 SEP 89
006599-0002-SA	WELL #1	AQUEOUS	13 SEP 89	14:00	15 SEP 89
006599-0003-SA	WELL #4	AQUEOUS	14 SEP 89	09:20	15 SEP 89
006599-0004-SA	TRIP BLANK	AQUEOUS			15 SEP 89

ANALYTICAL TEST REQUESTS
for
Signetics

Lab ID: 006599	Group Code	Analysis Description	Custom Test?
0001 - 0003	A	Total Organic Carbon (TOC)	N
		Total Kjeldahl Nitrogen (TKN)	N
		Halogenated Volatile Organics	N
0004	B	Halogenated Volatile Organics	N

Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: WELL #2
Lab ID: 006599-0001-SA Enseco ID: 1052713
Matrix: AQUEOUS Sampled: 13 SEP 89 Received: 15 SEP 89
Authorized: 15 SEP 89 Prepared: NA Analyzed: 19 SEP 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	9.9	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

N.D. = Not Detected
N.A. = Not Applicable

Reported By: William Sullivan Approved By: Kim Zilis

Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: WELL #1
Lab ID: 006599-0002-SA Enseco ID: 1052714
Matrix: AQUEOUS Sampled: 13 SEP 89 Received: 15 SEP 89
Authorized: 15 SEP 89 Prepared: NA Analyzed: 19 SEP 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2, 1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	15	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

N.D. = Not Detected
N.A. = Not Applicable

Reported By: William Sullivan Approved By: Kim Zilis

Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: WELL #4
Lab ID: 006599-0003-SA Enseco ID: 1052715
Matrix: AQUEOUS Sampled: 14 SEP 89 Received: 15 SEP 89
Authorized: 15 SEP 89 Prepared: NA Analyzed: 19 SEP 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2, 1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	6.8	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

N.D. = Not Detected
N.A. = Not Applicable

Reported By: William Sullivan Approved By: Kim Zilis

Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: TRIP BLANK
Lab ID: 006599-0004-SA Enseco ID: 1052716
Matrix: AQUEOUS Sampled: Unknown Received: 15 SEP 89
Authorized: 15 SEP 89 Prepared: NA Analyzed: 19 SEP 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	1.0	ug/L	0.50
1,1,2-Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

N.D. = Not Detected
N.A. = Not Applicable

Reported By: William Sullivan Approved By: Kim Zilis

Enseco

General Inorganics

Client Name: Signetics
Client ID: WELL #2
Lab ID: 006599-0001-SA
Enseco ID: 1052713
Matrix: AQUEOUS
Sampled: 13 SEP 89
Received: 15 SEP 89
Authorized: 15 SEP 89
Prepared: See Below
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	0.9	mg/L	0.5	351.2	NA	26 SEP 89
Total Organic Carbon	1.1	mg/L	0.5	415.1	NA	19 SEP 89

N.D. = Not Detected
N.A. = Not Applicable

Reported By: Mike Settell

Approved By: Tammy Bailey

Enseco

General Inorganics

Client Name: Signetics
Client ID: WELL #1
Lab ID: 006599-0002-SA
Enseco ID: 1052714
Matrix: AQUEOUS
Sampled: 13 SEP 89
Received: 15 SEP 89
Authorized: 15 SEP 89
Prepared: See Below
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.5	351.2	NA	26 SEP 89
Total Organic Carbon	0.7	mg/L	0.5	415.1	NA	19 SEP 89

N.D. = Not Detected
N.A. = Not Applicable

Reported By: Mike Settell

Approved By: Tammy Bailey

Enseco

General Inorganics

Client Name: Signetics
Client ID: WELL #4
Lab ID: 006599-0003-SA
Enseco ID: 1052715
Matrix: AQUEOUS
Sampled: 14 SEP 89
Received: 15 SEP 89
Authorized: 15 SEP 89
Prepared: See Below
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.5	351.2	NA	26 SEP 89
Total Organic Carbon	1.1	mg/L	0.5	415.1	NA	19 SEP 89

N.D. = Not Detected
N.A. = Not Applicable

Reported By: Mike Settell

Approved By: Tammy Bailey

C LOT ASSIGNMENT REPORT
volatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
006599-0001-SA	AQUEOUS	601-A	19 SEP 89-J	19 SEP 89-J
006599-0002-SA	AQUEOUS	601-A	19 SEP 89-J	19 SEP 89-J
006599-0003-SA	AQUEOUS	601-A	19 SEP 89-J	19 SEP 89-J
006599-0004-SA	AQUEOUS	601-A	19 SEP 89-J	19 SEP 89-J

Enseco

DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 19 SEP 89-J								
Concentration Units: ug/L								
1,1-Dichloroethane	5.0	4.05	3.92	3.98	80	80-130	3.3	20
Chloroform	5.0	4.40	4.43	4.42	88	80-120	0.7	20
Bromodichloromethane	10	9.58	9.09	9.34	93	80-120	5.2	20
Trichloroethene	5.0	5.76	5.31	5.54	111	70-120	8.1	20
Chlorobenzene	5.0	5.43	5.08	5.26	105	80-120	6.7	20

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

Enseco

SINGLE CONTROL SAMPLE REPORT
olatile Organics by GC

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 19 SEP 89-J QC Run: 19 SEP 89-J				
Concentration Units: ug/L				
Bromochloromethane	30.0	28.7	96	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-A			
Matrix: AQUEOUS			
QC Lot: 19 SEP 89-J QC Run: 19 SEP 89-J			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2, 1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 19 SEP 89-J QC Run: 19 SEP 89-J			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50

METHOD BLANK REPORT
olatile Organics by GC (cont.)

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 19 SEP 89-J QC Run: 19 SEP 89-J			
Chloroform	ND	ug/L	0.50
1,1,2-Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
hlorobenzene	ND	ug/L	2.0

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)
006599-0001-SA	AQUEOUS	TOC-A	19 SEP 89-A	
006599-0001-SA	AQUEOUS	TKN-A	25 SEP 89-A	25 SEP 89-A
006599-0002-SA	AQUEOUS	TOC-A	19 SEP 89-A	
006599-0002-SA	AQUEOUS	TKN-A	25 SEP 89-A	25 SEP 89-A
006599-0003-SA	AQUEOUS	TOC-A	19 SEP 89-A	
006599-0003-SA	AQUEOUS	TKN-A	25 SEP 89-A	25 SEP 89-A

DUPLICATE CONTROL SAMPLE REPORT
'et Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Limits	Precision (RPD) DCS	Limit
Category: TOC-A Matrix: AQUEOUS QC Lot: 19 SEP 89-A Concentration Units: mg/L								
Total Organic Carbon	23	22.3	22.6	22.4	98	91-109	1.3	20
Category: TKN-A Matrix: AQUEOUS QC Lot: 25 SEP 89-A Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	2.6	2.86	2.84	2.85	110	78-122	0.7	20

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

Enseco

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 25 SEP 89-A QC Run: 25 SEP 89-A			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.5

Rocky Mountain
Analytical Laboratory

Enseco

December 29, 1989

Catherine Weber
Signetics
9201 Panamerican Freeway NE
Albuquerque, NM 87113

Dear Ms. Weber:

Enclosed is the report for the three aqueous samples received at Rocky Mountain Analytical Laboratory on December 8, 1989.

If you have any questions, the Program Administrator assigned to this project is Joel Holtz.

Sincerely,

John Laferty
Director, Production Planning

Enclosures

cc: Joel Holtz, PA

RMAL #007771

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

Discussion

This report contains results and supporting quality control and sample identification information associated with analyses performed on this project. The results and supporting information are contained in tables following this section, arranged in the following order:

- Sample Description Information
- Analytical Test Requests
- Analytical Results
- Quality Control Report
- Data Quality Assessment

Analyses were performed in accordance with EPA methods and with Enseco's current Quality Assurance Program Plan for Environmental Chemical Monitoring. The specific analytical methods used are presented with each result. The first four sections below describes the format, content, and organization for the four corresponding separate components of this report. The fifth section provides an overall data quality assessment of the results.

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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 Results

The analytical results for this project are presented in data tables. Each data table includes sample identification information, and where available and appropriate, dates sampled, received, authorized, prepared, and analyzed.

Data sheets contain a listing of the parameters measured in each test, the analytical results, the analytical method, 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, April, 1989.

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Method Blank Results: A method blank is a laboratory generated sample used to assess the degree to which laboratory operations and procedures cause false positive analytical results.

Duplicate Control Samples (DCS): Each DCS consists of a standard control matrix that is spiked with a group of target analytes representative of the method analytes. One Duplicate Control Sample is prepared for every twenty (20) samples.

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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).

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

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in Enseco's Quality Assurance Project Plan for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered.

Ensec

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: Well #1
Lab ID: 007771-0001-SA Enseco ID: 1062243
Matrix: AQUEOUS Sampled: 06 DEC 89 Received: 08 DEC 89
Authorized: 08 DEC 89 Prepared: NA Analyzed: 12 DEC 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	17	ug/L	1.0
Tetrachloroethene	17	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: William Sullivan Approved By: Barbara Sullivan

Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: Well #3
Lab ID: 007771-0002-SA Enseco ID: 1062244
Matrix: AQUEOUS Sampled: 06 DEC 89 Received: 08 DEC 89
Authorized: 08 DEC 89 Prepared: NA Analyzed: 12 DEC 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: William Sullivan Approved By: Barbara Sullivan

Ensec

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: Well #4
Lab ID: 007771-0003-SA Enseco ID: 1062245
Matrix: AQUEOUS Sampled: 06 DEC 89 Received: 08 DEC 89
Authorized: 08 DEC 89 Prepared: NA Analyzed: 12 DEC 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	17	ug/L	1.0
Tetrachloroethene	17	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: William Sullivan Approved By: Barbara Sullivan

Enseco

General Inorganics

Client Name: Signetics
Client ID: Well #1
Lab ID: 007771-0001-SA Enseco ID: 1062243
Matrix: AQUEOUS Sampled: 06 DEC 89 Received: 08 DEC 89
Authorized: 08 DEC 89 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.5	351.2	NA	20 DEC 89
Total Organic Carbon	1.7	mg/L	0.5	415.1	NA	12 DEC 89

ND = Not detected
NA = Not applicable

Reported By: Cheryl Jones Approved By: Kimberly Conroy

Enseco

General Inorganics

Client Name: Signetics
Client ID: Well #3
Lab ID: 007771-0002-SA Enseco ID: 1062244
Matrix: AQUEOUS Sampled: 06 DEC 89 Received: 08 DEC 89
Authorized: 08 DEC 89 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.5	351.2	NA	20 DEC 89
Total Organic Carbon	0.7	mg/L	0.5	415.1	NA	27 DEC 89

ND = Not detected
NA = Not applicable

Reported By: Cheryl Jones Approved By: Kimberly Conroy

Enseco

General Inorganics

Client Name: Signetics
Client ID: Well #4
Lab ID: 007771-0003-SA Enseco ID: 1062245
Matrix: AQUEOUS Sampled: 06 DEC 89 Received: 08 DEC 89
Authorized: 08 DEC 89 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.5	351.2	NA	20 DEC 89
Total Organic Carbon	1.3	mg/L	0.5	415.1	NA	12 DEC 89

ND = Not detected
NA = Not applicable

Reported By: Cheryl Jones Approved By: Kimberly Conroy

SAMPLE DESCRIPTION INFORMATION
for
Signetics

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
007771-0001-SA	Well #1	AQUEOUS	06 DEC 89	14:00	08 DEC 89
007771-0002-SA	Well #3	AQUEOUS	06 DEC 89	14:35	08 DEC 89
007771-0003-SA	Well #4	AQUEOUS	06 DEC 89	12:50	08 DEC 89

ANALYTICAL TEST REQUESTS
for
Signetics

Lab ID: 007771	Group Code	Analysis Description	Custom Test?
0001 - 0003	A	Total Organic Carbon (TOC)	N
		Total Kjeldahl Nitrogen (TKN)	N
		Halogenated Volatile Organics	N

QC LOT ASSIGNMENT REPORT
Volatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
007771-0001-SA	AQUEOUS	601-A	12 DEC 89-F	12 DEC 89-F
007771-0002-SA	AQUEOUS	601-A	12 DEC 89-F	12 DEC 89-F
007771-0003-SA	AQUEOUS	601-A	12 DEC 89-F	12 DEC 89-F

DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precision (RPD) DCS	Precision (RPD) Limit
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 12 DEC 89-F								
Concentration Units: ug/L								
1,1-Dichloroethane	5.0	4.82	4.36	4.59	92	80-130	10	20
Chloroform	5.0	5.98	5.41	5.70	114	80-120	10	20
Bromodichloromethane	10	9.39	8.51	8.95	90	80-120	9.8	20
Trichloroethene	5.0	5.05	4.36	4.70	94	70-120	15	20
Chlorobenzene	5.0	5.00	4.93	4.96	99	80-120	1.4	20

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

SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 12 DEC 89-F QC Run: 12 DEC 89-F				
Concentration Units: ug/L				
Bromochloromethane	30.0	31.0	103	20-160

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

Enseco

METHOD BLANK REPORT
Volatile Organics by GC

Test: 601-A
Matrix: AQUEOUS
QC Lot: 12 DEC 89-F QC Run: 12 DEC 89-F

Analyte	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

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)
007771-0001-SA	AQUEOUS	TOC-A	12 DEC 89-A	-
007771-0001-SA	AQUEOUS	TKN-A	19 DEC 89-A	19 DEC 89-A
007771-0002-SA	AQUEOUS	TOC-A	27 DEC 89-A	-
007771-0002-SA	AQUEOUS	TKN-A	19 DEC 89-A	19 DEC 89-A
007771-0003-SA	AQUEOUS	TOC-A	12 DEC 89-A	-
007771-0003-SA	AQUEOUS	TKN-A	19 DEC 89-A	19 DEC 89-A

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: TOC-A Matrix: AQUEOUS QC Lot: 12 DEC 89-A Concentration Units: mg/L								
Total Organic Carbon	25	24.3	24.5	24.4	98	91-109	0.8	20
Category: TKN-A Matrix: AQUEOUS QC Lot: 19 DEC 89-A Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	4.7	4.42	4.21	4.32	92	78-122	4.9	20
Category: TOC-A Matrix: AQUEOUS QC Lot: 27 DEC 89-A Concentration Units: mg/L								
Total Organic Carbon	25	23.1	23.7	23.4	94	91-109	2.6	20

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

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 19 DEC 89-A QC Run: 19 DEC 89-A			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.5

Rocky Mountain
Analytical Laboratory

Enseco

January 2, 1990

Catherine Weber
Signetics
9201 Panamerican Freeway N.E.
Albuquerque, NM 87113

Dear Ms. Weber:

Enclosed is the report for the one aqueous sample received at Rocky Mountain Analytical Laboratory on December 14, 1989.

If you have any questions, the Program Administrator assigned to this project is Joel Holtz.

Sincerely,

Ramona Power

Ramona Power
Data Control

Enclosures

cc: Joel Holtz, PA

RMAL #007845

Enseco Incorporated
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Accuracy for DCS and SCS is measured by Percent Recovery.

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

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

Data Quality Assessment

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For 007845-0001 method 601 tetrachloroethene and 1,1,2,2-tetrachloroethane coelute and are reported as a combined result.

SAMPLE DESCRIPTION INFORMATION
for
Signetics

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
007845-0001-SA	GROUNDWATER WELL #2	AQUEOUS	13 DEC 89	16:00	14 DEC 89

ANALYTICAL TEST REQUESTS
for
Signetics

Lab ID: 007845	Group Code	Analysis Description	Custom Test?
0001	A	Total Organic Carbon (TOC)	N
		Total Kjeldahl Nitrogen (TKN)	N
		Halogenated Volatile Organics	N

Enseco

Halogenated Volatile Organics

Method 601

Client Name: Signetics
Client ID: GROUNDWATER WELL #2
Lab ID: 007845-0001-SA Enseco ID: 1062679
Matrix: AQUEOUS Sampled: 13 DEC 89 Received: 14 DEC 89
Authorized: 14 DEC 89 Prepared: NA Analyzed: 18 DEC 89

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	11	ug/L	1.0
Tetrachloroethene	11	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: William Sullivan Approved By: Barbara Sullivan

Enseco

General Inorganics

Client Name: Signetics
Client ID: GROUNDWATER WELL #2
Lab ID: 007845-0001-SA Enseco ID: 1062679
Matrix: AQUEOUS Sampled: 13 DEC 89 Received: 14 DEC 89
Authorized: 14 DEC 89 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.5	351.2	NA	28 DEC 89
Total Organic Carbon	2.4	mg/L	0.5	415.1	NA	27 DEC 89

ND = Not detected
NA = Not applicable

Reported By: Cheryl Jones Approved By: Kimberly Conroy

QC LOT ASSIGNMENT REPORT
Volatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
007845-0001-SA	AQUEOUS	601-A	18 DEC 89-L	18 DEC 89-L

DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 18 DEC 89-L								
Concentration Units: ug/L								
1,1-Dichloroethane	5.0	5.30	5.38	5.34	107	80-130	1.5	20
Chloroform	5.0	5.60	5.62	5.61	112	80-120	0.4	20
Bromodichloromethane	10	8.75	8.99	8.87	89	80-120	2.7	20
Trichloroethene	5.0	4.54	4.60	4.57	91	70-120	1.3	20
Chlorobenzene	5.0	4.94	5.23	5.08	102	80-120	5.7	20

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

SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 18 DEC 89-L QC Run: 18 DEC 89-L				
Concentration Units: ug/L				
Bromochloromethane	30.0	31.5	105	20-160

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

Enseco

METHOD BLANK REPORT
Volatile Organics by GC

Test: 601-A
Matrix: AQUEOUS
QC Lot: 18 DEC 89-L QC Run: 18 DEC 89-L

Analyte	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
1,2-Dichloroethene (cis/trans)	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-2,2,1-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

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)
007845-0001-SA	AQUEOUS	TOC-A	27 DEC 89-A	-
007845-0001-SA	AQUEOUS	TKN-A	27 DEC 89-A	27 DEC 89-A

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: TOC-A Matrix: AQUEOUS QC Lot: 27 DEC 89-A Concentration Units: mg/L								
Total Organic Carbon	25	23.1	23.7	23.4	94	91-109	2.6	20
Category: TKN-A Matrix: AQUEOUS QC Lot: 27 DEC 89-A Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	5.2	5.98	5.43	5.70	110	78-122	9.6	20

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

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 27 DEC 89-A QC Run: 27 DEC 89-A			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.5

Rocky Mountain
Analytical Laboratory

Enseco

April 23, 1990

Catherine Weber
Signetics Company
9201 Pan American Freeway, NE
Albuquerque, NM 87113

Dear Ms. Weber:

Enclosed is the report for the two aqueous samples received at Rocky Mountain Analytical Laboratory on March 30, 1990.

If you have any questions, the Program Administrator assigned to this project is Joel Holtz.

Sincerely,

Ramona Power

Ramona Power
Data Control

Enclosures

cc: Joel Holtz, PA

RMAL #008888

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

Discussion

This report contains results and supporting quality control and sample identification information associated with analyses performed on this project. The results and supporting information are contained in tables following this section, arranged in the following order:

- Sample Description Information
- Analytical Test Requests
- Analytical Results
- Quality Control Report
- Data Quality Assessment

Analyses were performed in accordance with EPA methods and with Enseco's current Quality Assurance Program Plan for Environmental Chemical Monitoring. The specific analytical methods used are presented with each result. The first four sections below describes the format, content, and organization for the four corresponding separate components of this report. The fifth section provides an overall data quality assessment of the results.

Sample Description Information

The Sample Description Information lists all 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 Results

The analytical results for this project are presented in data tables. Each data table includes sample identification information, and where available and appropriate, dates sampled, received, authorized, prepared, and analyzed.

Data sheets contain a listing of the parameters measured in each test, the analytical results, the analytical method, 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, April, 1989.

Quality Control Reports

As documented in more detail in Enseco's QAPP, various internal quality control checks are performed to assure that the laboratory was in control during the time that samples on this project were analyzed. The QC checks include analysis of method blanks, duplicate control samples (DCS), and single control samples (SCS). Results from these analyses are presented along with the control limits.

Method Blank Results: A method blank is a laboratory generated sample used to assess the degree to which laboratory operations and procedures cause false positive analytical results.

Duplicate Control Samples (DCS): Each DCS consists of a standard control matrix that is spiked with a group of target analytes representative of the method analytes. One Duplicate Control Sample is prepared for every twenty (20) samples.

Single Control Samples (SCS): An SCS is a spiked sample analyzed with each batch of samples.

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).

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

Data Quality Assessment

The results contained in this report were reviewed relative to data acceptance criteria as specified in Enseco's Quality Assurance Project Plan for completeness, precision, accuracy, representativeness and defensibility of the data. Unless otherwise stated below, no quality control problems or technical difficulties were encountered.

Each sample was analyzed to achieve the lowest possible reporting limits within the constraints of method 8010. Due to interferences or high levels of target compounds, sample #008888-0001 was diluted and the reporting limits have been raised accordingly.

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SAMPLE DESCRIPTION INFORMATION
for
Signetics

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
008888-0001-SA	GROUNDWATER WELL #2	AQUEOUS	28 MAR 90	17:30	30 MAR 90
008888-0002-SA	TRIP BLANK	AQUEOUS			30 MAR 90

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ANALYTICAL TEST REQUESTS
for
Signetics

Lab ID: 008888	Group Code	Analysis Description	Custom Test?
0001	A	Total Organic Carbon (TOC)	N
		Total Kjeldahl Nitrogen (TKN)	N
		Halogenated Volatile Organics	N
0002	B	Halogenated Volatile Organics	N

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Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #2
Lab ID: 008888-0001-SA Enseco ID: 1070426
Matrix: AQUEOUS Sampled: 28 MAR 90 Received: 30 MAR 90
Authorized: 30 MAR 90 Prepared: NA Analyzed: 03 APR 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	33
Bromomethane	ND	ug/L	33
Vinyl chloride	ND	ug/L	6.7
Chloroethane	ND	ug/L	33
Methylene chloride	ND	ug/L	33
1,1-Dichloroethene	ND	ug/L	3.3
1,1-Dichloroethane	ND	ug/L	3.3
trans-1,2-Dichloroethene	ND	ug/L	3.3
Chloroform	ND	ug/L	3.3
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	6.7
1,2-Dichloroethane	ND	ug/L	6.7
1,1,1-Trichloroethane	ND	ug/L	3.3
Carbon tetrachloride	ND	ug/L	3.3
Bromodichloromethane	ND	ug/L	6.7
1,2-Dichloropropane	ND	ug/L	6.7
trans-1,3-Dichloropropene	ND	ug/L	6.7
Trichloroethene	ND	ug/L	3.3
Chlorodibromomethane	ND	ug/L	6.7
cis-1,3-Dichloropropene	ND	ug/L	13
1,1,2-Trichloroethane	ND	ug/L	6.7
EDB (1,2-Dibromoethane)	ND	ug/L	13
Bromoform	ND	ug/L	33
1,1,2,2-Tetrachloroethane	ND	ug/L	6.7
Tetrachloroethene	13	ug/L	3.3
Chlorobenzene	ND	ug/L	13

ND = Not detected
NA = Not applicable

Reported By: Nathaniel Biah Approved By: Kim Zilis

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Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: TRIP BLANK
Lab ID: 008888-0002-SA Enseco ID: 1070427
Matrix: AQUEOUS Sampled: Unknown Received: 30 MAR 90
Authorized: 30 MAR 90 Prepared: NA Analyzed: 04 APR 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: Nathaniel Biah Approved By: Kim Zilis

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General Inorganics

Client Name: Signetics
Client ID: GROUNDWATER WELL #2
Lab ID: 008888-0001-SA Enseco ID: 1070426
Matrix: AQUEOUS Sampled: 28 MAR 90 Received: 30 MAR 90
Authorized: 30 MAR 90 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	05 APR 90
Total Organic Carbon	2.0	mg/L	1.0	9060	NA	10 APR 90

ND = Not detected
NA = Not applicable

Reported By: Toni Lusk Approved By: Toni Lusk

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)C LOT ASSIGNMENT REPORT
Volatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
008888-0001-SA	AQUEOUS	601-A	03 APR 90-F	03 APR 90-F
008888-0002-SA	AQUEOUS	601-A	04 APR 90-F	04 APR 90-F

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DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precision (RPD) DCS	Precision (RPD) Limit
Category: 601-A Matrix: AQUEOUS QC Lot: 03 APR 90-F Concentration Units: ug/L								
1,1-Dichloroethane	5.0	4.75	5.07	4.91	98	80-130	6.5	20
Chloroform	5.0	4.79	5.02	4.90	98	80-120	4.7	20
Bromodichloromethane	10	9.64	10.0	9.82	98	80-120	3.7	20
Trichloroethene	5.0	5.24	5.37	5.30	106	70-120	2.5	20
Chlorobenzene	5.0	4.69	4.96	4.82	97	80-120	5.6	20
Category: 601-A Matrix: AQUEOUS QC Lot: 04 APR 90-F Concentration Units: ug/L								
1,1-Dichloroethane	5.0	4.45	4.62	4.54	91	80-130	3.7	20
Chloroform	5.0	4.29	4.71	4.50	90	80-120	9.3	20
Bromodichloromethane	10	9.31	10.3	9.80	98	80-120	10	20
Trichloroethene	5.0	4.73	5.04	4.88	98	70-120	6.3	20
Chlorobenzene	5.0	4.59	4.88	4.74	95	80-120	6.1	20

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

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SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 03 APR 90-F QC Run: 03 APR 90-F				
Concentration Units: ug/L				
Bromochloromethane	5.00	4.51	90	20-160
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 04 APR 90-F QC Run: 04 APR 90-F				
Concentration Units: ug/L				
Bromochloromethane	5.00	4.36	87	20-160

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

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METHOD BLANK REPORT
Volatile Organics by GC

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 03 APR 90-F QC Run: 03 APR 90-F			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 04 APR 90-F QC Run: 04 APR 90-F			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50

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METHOD BLANK REPORT
Volatile Organics by GC (cont.)

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 04 APR 90-F QC Run: 04 APR 90-F			
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Chlorodibromomethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

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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)
008888-0001-SA	AQUEOUS	TKN-A	04 APR 90-A	04 APR 90-A

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DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precision (RPD) DCS	Precision (RPD) Limit
Category: TKN-A								
Matrix: AQUEOUS								
QC Lot: 04 APR 90-A								
Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	5.2	4.96	5.63	5.30	102	78-122	13	20

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

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METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 04 APR 90-A QC Run: 04 APR 90-A			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

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LOT ASSIGNMENT REPORT
Wet Chemistry Analysis and Preparation

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)
008888-0001-SA	AQUEOUS	TOC-A	10 APR 90-Z

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DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limit	Precision (RPD) DCS	Precision (RPD) Limit
Category: TOC-A								
Matrix: AQUEOUS								
QC Lot: 10 APR 90-Z								
Concentration Units: mg/L								
Total Organic Carbon	200	216	216	216	108	70-130	0	30

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

Rocky Mountain
Analytical Laboratory

Enseco

ANALYTICAL RESULTS

FOR

SIGNETICS

ENSECO-RMAL NO. 009979

JUNE 28, 1990

Reviewed by: Joel E. Holtz

Joel E. Holtz

Sue Dalla

Sue Dalla

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

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METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 22 JUN 90-A QC Run: 22 JUN 90-A			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precisio (RPD) DCS	Limi
Category: TOC-A Matrix: AQUEOUS QC Lot: 20 JUN 90-A Concentration Units: mg/L								
Total Organic Carbon	25	24.7	24.8	24.8	99	91-109	0.4	2
Category: TKN-A Matrix: AQUEOUS QC Lot: 22 JUN 90-A Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	4.7	5.20	5.13	5.16	110	78-122	1.4	2

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

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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)
009979-0001-SA	AQUEOUS	TOC-A	20 JUN 90-A	-
009979-0001-SA	AQUEOUS	TKN-A	22 JUN 90-A	22 JUN 90-A
009979-0002-SA	AQUEOUS	TOC-A	20 JUN 90-A	-
009979-0002-SA	AQUEOUS	TKN-A	22 JUN 90-A	22 JUN 90-A
009979-0003-SA	AQUEOUS	TOC-A	20 JUN 90-A	-
009979-0003-SA	AQUEOUS	TKN-A	22 JUN 90-A	22 JUN 90-A
009979-0004-SA	AQUEOUS	TOC-A	20 JUN 90-A	-
009979-0004-SA	AQUEOUS	TKN-A	22 JUN 90-A	22 JUN 90-A

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METHOD BLANK REPORT
Volatile Organics by GC

Test: 601-A
Matrix: AQUEOUS
QC Lot: 15 JUN 90-F QC Run: 15 JUN 90-F

Analyte	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Enseco
A CORNING Company

SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 15 JUN 90-F QC Run: 15 JUN 90-F				
Concentration Units: ug/L				
Bromochloromethane	5.00	5.67	113	20-160

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

Enseco
A CORNING Company

DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precision (RPD) DCS	Precision (RPD) Limit
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 15 JUN 90-F								
Concentration Units: ug/L								
1,1-Dichloroethane	5.0	4.91	5.01	4.96	99	80-130	2.0	20
Chloroform	5.0	4.97	5.66	5.32	106	80-120	13	20
Bromodichloromethane	10	9.34	10.1	9.72	97	80-120	7.8	20
Trichloroethene	5.0	5.76	6.06	5.91	118	70-120	5.1	20
Chlorobenzene	5.0	4.64	5.09	4.86	97	80-120	9.2	20

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

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A CORNING Company

QC LOT ASSIGNMENT REPORT
Volatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
009979-0001-SA	AQUEOUS	601-A	15 JUN 90-F	15 JUN 90-F
009979-0002-SA	AQUEOUS	601-A	15 JUN 90-F	15 JUN 90-F
009979-0003-SA	AQUEOUS	601-A	15 JUN 90-F	15 JUN 90-F
009979-0004-SA	AQUEOUS	601-A	15 JUN 90-F	15 JUN 90-F

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.

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).

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

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.

Enseco
A CORNING Company

General Inorganics

Client Name: Signetics
Client ID: GROUNDWATER WELL #4
Lab ID: 009979-0004-SA Enseco ID: 1079659
Matrix: AQUEOUS Sampled: 12 JUN 90 Received: 14 JUN 90
Authorized: 14 JUN 90 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	25 JUN 90
Total Organic Carbon	1.0	mg/L	0.50	9060	NA	20 JUN 90

ND = Not detected
NA = Not applicable

Reported By: Pam Rosas Approved By: Roxanne Sullivan

Enseco
A CORNING Company

General Inorganics

Client Name: Signetics
Client ID: GROUNDWATER WELL #3
Lab ID: 009979-0003-SA Enseco ID: 1079658
Matrix: AQUEOUS Sampled: 13 JUN 90 Received: 14 JUN 90
Authorized: 14 JUN 90 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	25 JUN 90
Total Organic Carbon	ND	mg/L	0.50	9060	NA	20 JUN 90

ND = Not detected
NA = Not applicable

Reported By: Pam Rosas Approved By: Roxanne Sullivan

Enseco
A CORNING Company

General Inorganics

Client Name: Signetics
Client ID: GROUNDWATER WELL #2
Lab ID: 009979-0002-SA Enseco ID: 1079647
Matrix: AQUEOUS Sampled: 13 JUN 90 Received: 14 JUN 90
Authorized: 14 JUN 90 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	25 JUN 90
Total Organic Carbon	1.4	mg/L	0.50	9060	NA	20 JUN 90

ND = Not detected
NA = Not applicable

Reported By: Pam Rosas Approved By: Roxanne Sullivan

Enseco
A CORNING Comp

General Inorganics

Client Name: Signetics
Client ID: GROUNDWATER WELL #1
Lab ID: 009979-0001-SA Enseco ID: 1079645
Matrix: AQUEOUS Sampled: 12 JUN 90 Received: 14 JUN 90
Authorized: 14 JUN 90 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	25 JUN 90
Total Organic Carbon	0.59	mg/L	0.50	9060	NA	20 JUN 90

ND = Not detected
NA = Not applicable

Reported By: Pam Rosas Approved By: Roxanne Sullivan

Enseco
A CORNING Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #4
Lab ID: 009979-0004-SA Enseco ID: 1079659
Matrix: AQUEOUS Sampled: 12 JUN 90 Received: 14 JUN 90
Authorized: 14 JUN 90 Prepared: NA Analyzed: 15 JUN 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	8.1	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: Nathaniel Biah Approved By: Greg Gustina

Enseco
A CORNING Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #3
Lab ID: 009979-0003-SA Enseco ID: 1079658
Matrix: AQUEOUS Sampled: 13 JUN 90 Received: 14 JUN 90
Authorized: 14 JUN 90 Prepared: NA Analyzed: 15 JUN 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: Nathaniel Biah Approved By: Greg Gustina

Enseco
A CORNING Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #2
Lab ID: 009979-0002-SA Enseco ID: 1079647
Matrix: AQUEOUS Sampled: 13 JUN 90 Received: 14 JUN 90
Authorized: 14 JUN 90 Prepared: NA Analyzed: 15 JUN 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	13	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: Nathaniel Biah Approved By: Greg Gustina

Enseco
A CORNING Compan

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #1
Lab ID: 009979-0001-SA Enseco ID: 1079645
Matrix: AQUEOUS Sampled: 12 JUN 90 Received: 14 JUN 90
Authorized: 14 JUN 90 Prepared: NA Analyzed: 15 JUN 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	20	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: Nathaniel Biah Approved By: Greg Gustina

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:

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

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SAMPLE DESCRIPTION INFORMATION
for
Signetics

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
009979-0001-SA	GROUNDWATER WELL #1	AQUEOUS	12 JUN 90	12:30	14 JUN 90
009979-0002-SA	GROUNDWATER WELL #2	AQUEOUS	13 JUN 90	11:10	14 JUN 90
009979-0003-SA	GROUNDWATER WELL #3	AQUEOUS	13 JUN 90	14:00	14 JUN 90
009979-0004-SA	GROUNDWATER WELL #4	AQUEOUS	12 JUN 90	17:00	14 JUN 90

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, April, 1989.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, is provided subsequently.

Enseco
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ANALYTICAL TEST REQUESTS
for
Signetics

Lab ID: 009979	Group Code	Analysis Description	Custom Test?
0001 - 0004	A	Total Organic Carbon (TOC)	N
		Total Kjeldahl Nitrogen (TKN)	N
		Halogenated Volatile Organics	N

Rocky Mountain
Analytical Laboratory

Enseco

ANALYTICAL RESULTS

FOR

SIGNETICS

ENSECO-RMAL NO. 010988

SEPTEMBER 29, 1990

Reviewed by: Susan C Wyatt for
Joel E. Holtz

Sue Dalla
Sue Dalla

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

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:

- Sample Description Information
- Analytical Test Requests
- Analytical Results
- Quality Control Report

Each sample was analyzed to achieve the lowest possible reporting limits within the constraints of the method. Sample 010988-0004 was diluted for Method 8010 due to the concentration of target compounds and the reporting limits were raised accordingly.

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.

Enseco
A Corning Company

SAMPLE DESCRIPTION INFORMATION
for
Signetics

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
010988-0001-SA	GROUNDWATER WELL #1	AQUEOUS	12 SEP 90	11:15	14 SEP 90
010988-0002-SA	GROUNDWATER WELL #4	AQUEOUS	12 SEP 90	14:10	14 SEP 90
010988-0003-SA	GROUNDWATER WELL #3	AQUEOUS	12 SEP 90	16:00	14 SEP 90
010988-0004-SA	GROUNDWATER WELL #2	AQUEOUS	13 SEP 90	10:20	14 SEP 90
010988-0005-SA	TRIP BLANK	AQUEOUS			14 SEP 90

Enseco
A Corning Company

ANALYTICAL TEST REQUESTS
for
Signetics

Lab ID: 010988	Group Code	Analysis Description	Custom Test?
0001 - 0004	A	Total Organic Carbon (TOC)	N
		Total Kjeldahl Nitrogen (TKN)	N
		Halogenated Volatile Organics	N
0005	B	Halogenated Volatile Organics	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.

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #1
Lab ID: 010988-0001-SA
Matrix: AQUEOUS Sampled: 12 SEP 90 Received: 14 SEP 90
Authorized: 14 SEP 90 Prepared: NA Analyzed: 20 SEP 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	17	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: Leewaphath Xaiyasang Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #4
Lab ID: 010988-0002-SA
Matrix: AQUEOUS Sampled: 12 SEP 90 Received: 14 SEP 90
Authorized: 14 SEP 90 Prepared: NA Analyzed: 20 SEP 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	7.6	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: Leewaphath Xaiyasang Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #3
Lab ID: 010988-0003-SA
Matrix: AQUEOUS Sampled: 12 SEP 90 Received: 14 SEP 90
Authorized: 14 SEP 90 Prepared: NA Analyzed: 20 SEP 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: Leewaphath Xaiyasang Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #2
Lab ID: 010988-0004-SA
Matrix: AQUEOUS Sampled: 13 SEP 90 Received: 14 SEP 90
Authorized: 14 SEP 90 Prepared: NA Analyzed: 20 SEP 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	12
Bromomethane	ND	ug/L	12
Vinyl chloride	ND	ug/L	2.5
Chloroethane	ND	ug/L	12
Methylene chloride	ND	ug/L	12
1,1-Dichloroethene	ND	ug/L	1.2
1,1-Dichloroethane	ND	ug/L	1.2
trans-1,2-Dichloroethene	ND	ug/L	1.2
Chloroform	ND	ug/L	1.2
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	2.5
1,2-Dichloroethane	ND	ug/L	2.5
1,1,1-Trichloroethane	ND	ug/L	1.2
Carbon tetrachloride	ND	ug/L	1.2
Bromodichloromethane	ND	ug/L	2.5
1,2-Dichloropropane	ND	ug/L	2.5
trans-1,3-Dichloropropene	ND	ug/L	2.5
Trichloroethene	ND	ug/L	1.2
Dibromochloromethane	ND	ug/L	2.5
cis-1,3-Dichloropropene	ND	ug/L	5.0
1,1,2-Trichloroethane	ND	ug/L	2.5
EDB (1,2-Dibromoethane)	ND	ug/L	5.0
Bromoform	ND	ug/L	12
1,1,2,2-Tetrachloroethane	ND	ug/L	2.5
Tetrachloroethene	11	ug/L	1.2
Chlorobenzene	ND	ug/L	5.0

ND = Not detected
NA = Not applicable

Reported By: Leewaphath Xaiyasang Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: TRIP BLANK
Lab ID: 010988-0005-SA
Matrix: AQUEOUS Sampled: Unknown Received: 14 SEP 90
Authorized: 14 SEP 90 Prepared: NA Analyzed: 20 SEP 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

ND = Not detected
NA = Not applicable

Reported By: Leewaphath Xaiyasang Approved By: Jeff Lowry

Enseco
A Corning Company

General Inorganics

Client Name: Signetics
Client ID: GROUNDWATER WELL #1
Lab ID: 010988-0001-SA
Matrix: AQUEOUS Sampled: 12 SEP 90 Received: 14 SEP 90
Authorized: 14 SEP 90 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	20 SEP 90
Total Organic Carbon	ND	mg/L	0.50	9060	NA	17 SEP 90

ND = Not detected
NA = Not applicable

Reported By: Blake Besser Approved By: Mary Grehl

Enseco
A Corning Company

General Inorganics

Client Name: Signetics
Client ID: GROUNDWATER WELL #4
Lab ID: 010988-0002-SA
Matrix: AQUEOUS Sampled: 12 SEP 90 Received: 14 SEP 90
Authorized: 14 SEP 90 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	20 SEP 90
Total Organic Carbon	1.2	mg/L	0.50	9060	NA	17 SEP 90

ND = Not detected
NA = Not applicable

Reported By: Blake Besser Approved By: Mary Grehl

Enseco
A Corning Company

General Inorganics

Client Name: Signetics
Client ID: GROUNDWATER WELL #3
Lab ID: 010988-0003-SA
Matrix: AQUEOUS Sampled: 12 SEP 90 Received: 14 SEP 90
Authorized: 14 SEP 90 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	20 SEP 90
Total Organic Carbon	0.68	mg/L	0.50	9060	NA	17 SEP 90

ND = Not detected
NA = Not applicable

Reported By: Blake Besser Approved By: Mary Grehl

Enseco
A Corning Company

General Inorganics

Client Name: Signetics
Client ID: GROUNDWATER WELL #2
Lab ID: 010988-0004-SA
Matrix: AQUEOUS Sampled: 13 SEP 90 Received: 14 SEP 90
Authorized: 14 SEP 90 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	20 SEP 90
Total Organic Carbon	1.0	mg/L	0.50	9060	NA	17 SEP 90

ND = Not detected
NA = Not applicable

Reported By: Blake Besser Approved By: Mary Grehl

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.

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QC LOT ASSIGNMENT REPORT
Volatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
010988-0001-SA	AQUEOUS	601-A	19 SEP 90-F	19 SEP 90-F
010988-0002-SA	AQUEOUS	601-A	19 SEP 90-F	19 SEP 90-F
010988-0003-SA	AQUEOUS	601-A	19 SEP 90-F	19 SEP 90-F
010988-0004-SA	AQUEOUS	601-A	19 SEP 90-F	19 SEP 90-F
010988-0005-SA	AQUEOUS	601-A	19 SEP 90-F	19 SEP 90-F

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DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precisi (RPD) DCS Lim
Category: 601-A							
Matrix: AQUEOUS							
QC Lot: 19 SEP 90-F							
Concentration Units: ug/L							
1,1-Dichloroethane	5.0	4.24	4.07	4.16	83	80-130	4.1
Chloroform	5.0	5.51	5.35	5.43	109	80-120	2.9
Bromodichloromethane	10	9.72	9.34	9.53	95	80-120	4.0
Trichloroethene	5.0	4.86	4.67	4.76	95	70-120	4.0
Chlorobenzene	5.0	4.44	4.28	4.36	87	80-120	3.7

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

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SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 19 SEP 90-F QC Run: 19 SEP 90-F				
Concentration Units: ug/L				
Bromochloromethane	5.00	6.26	125	20-160

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

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METHOD BLANK REPORT
Volatile Organics by GC

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 19 SEP 90-F QC Run: 19 SEP 90-F			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 19 SEP 90-F QC Run: 19 SEP 90-F			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50

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METHOD BLANK REPORT
Volatile Organics by GC (cont.)

Test: 601-A
Matrix: AQUEOUS
QC Lot: 19 SEP 90-F QC Run: 19 SEP 90-F

Analyte	Result	Units	Reporting Limit
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

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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)
010988-0001-SA	AQUEOUS	TOC-A	17 SEP 90-A	-
010988-0001-SA	AQUEOUS	TKN-A	19 SEP 90-C	19 SEP 90-C
010988-0002-SA	AQUEOUS	TOC-A	17 SEP 90-A	-
010988-0002-SA	AQUEOUS	TKN-A	19 SEP 90-C	19 SEP 90-C
010988-0003-SA	AQUEOUS	TOC-A	17 SEP 90-A	-
010988-0003-SA	AQUEOUS	TKN-A	19 SEP 90-C	19 SEP 90-C
010988-0004-SA	AQUEOUS	TOC-A	17 SEP 90-A	-
010988-0004-SA	AQUEOUS	TKN-A	19 SEP 90-C	19 SEP 90-C

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DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: TOC-A Matrix: AQUEOUS QC Lot: 17 SEP 90-A Concentration Units: mg/L								
Total Organic Carbon	25.0	25.3	25.3	25.3	101	91-109	0.0	20
Category: TKN-A Matrix: AQUEOUS QC Lot: 19 SEP 90-C Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	2.9	3.17	2.96	3.06	106	78-122	6.9	20

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

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METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 19 SEP 90-C QC Run: 19 SEP 90-C			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

Rocky Mountain
Analytical Laboratory

Enseco

ANALYTICAL RESULTS

FOR

SIGNETICS

ENSECO-RMAL NO. 012745

DECEMBER 29, 1990

Reviewed by: Joel E. Holtz

Sue Dalla

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
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One

I. OVERVIEW

On December 7, 1990, Enseco-Rocky Mountain Analytical Laboratory received four aqueous samples from Signetics.

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.

Two

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.

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SAMPLE DESCRIPTION INFORMATION
for
Signetics

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
012745-0001-SA	GROUNDWATER WELL #1	AQUEOUS	05 DEC 90	11:55	07 DEC 90
012745-0002-SA	GROUNDWATER WELL #4	AQUEOUS	05 DEC 90	14:45	07 DEC 90
012745-0003-SA	GROUNDWATER WELL #3	AQUEOUS	06 DEC 90	10:45	07 DEC 90
012745-0004-SA	GROUNDWATER WELL #2	AQUEOUS	06 DEC 90	13:30	07 DEC 90

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ANALYTICAL TEST REQUESTS
for
Signetics

Lab ID: 012745	Group Code	Analysis Description	Custom Test?
0001 - 0004	A	Total Organic Carbon (TOC)	N
		Total Kjeldahl Nitrogen (TKN)	N
		Halogenated Volatile Organics	N

Three

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:

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Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #1
Lab ID: 012745-0001-SA
Matrix: AQUEOUS Sampled: 05 DEC 90 Received: 07 DEC 90
Authorized: 07 DEC 90 Prepared: NA Analyzed: 11 DEC 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	24	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	99	%

ND = Not detected
NA = Not applicable

Reported By: Tina Pieper Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #4
Lab ID: 012745-0002-SA
Matrix: AQUEOUS Sampled: 05 DEC 90 Received: 07 DEC 90
Authorized: 07 DEC 90 Prepared: NA Analyzed: 11 DEC 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	11	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	100	%

ND = Not detected
NA = Not applicable

Reported By: Tina Pieper Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #3
Lab ID: 012745-0003-SA
Matrix: AQUEOUS Sampled: 06 DEC 90 Received: 07 DEC 90
Authorized: 07 DEC 90 Prepared: NA Analyzed: 11 DEC 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	94	%

ND = Not detected
NA = Not applicable

Reported By: Tina Pieper Approved By: Jeff Lowry

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: GROUNDWATER WELL #2
Lab ID: 012745-0004-SA
Matrix: AQUEOUS Sampled: 06 DEC 90 Received: 07 DEC 90
Authorized: 07 DEC 90 Prepared: NA Analyzed: 11 DEC 90

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	15	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	88	%

ND = Not detected
NA = Not applicable

Reported By: Tina Pieper Approved By: Jeff Lowry

Enseco
A Corning Company

General Inorganics

Client Name: Signetics
Client ID: GROUNDWATER WELL #1
Lab ID: 012745-0001-SA
Matrix: AQUEOUS Sampled: 05 DEC 90 Received: 07 DEC 90
Authorized: 07 DEC 90 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	20 DEC 90
Total Organic Carbon	0.53	mg/L	0.50	9060	NA	17 DEC 90

ND = Not detected
NA = Not applicable

Reported By: Blake Besser Approved By: Lindsay Breyer

Enseco
A Corning Company

General Inorganics

Client Name: Signetics
Client ID: GROUNDWATER WELL #4
Lab ID: 012745-0002-SA
Matrix: AQUEOUS Sampled: 05 DEC 90 Received: 07 DEC 90
Authorized: 07 DEC 90 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	20 DEC 90
Total Organic Carbon	0.81	mg/L	0.50	9060	NA	17 DEC 90

ND = Not detected
NA = Not applicable

Reported By: Blake Besser Approved By: Lindsay Breyer

Enseco
A Corning Company

General Inorganics

Client Name: Signetics
Client ID: GROUNDWATER WELL #2
Lab ID: 012745-0004-SA
Matrix: AQUEOUS Sampled: 06 DEC 90 Received: 07 DEC 90
Authorized: 07 DEC 90 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	20 DEC 90
Total Organic Carbon	0.67	mg/L	0.50	9060	NA	17 DEC 90

ND = Not detected
NA = Not applicable

Reported By: Blake Besser Approved By: Lindsay Breyer

Enseco
A Corning Company

General Inorganics

Client Name: Signetics
Client ID: GROUNDWATER WELL #3
Lab ID: 012745-0003-SA
Matrix: AQUEOUS Sampled: 06 DEC 90 Received: 07 DEC 90
Authorized: 07 DEC 90 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	20 DEC 90
Total Organic Carbon	ND	mg/L	0.50	9060	NA	17 DEC 90

ND = Not detected
NA = Not applicable

Reported By: Blake Besser Approved By: Lindsay Breyer

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.

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QC LOT ASSIGNMENT REPORT
Volatile Organics by GC

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
012745-0001-SA	AQUEOUS	601-A	10 DEC 90-H	10 DEC 90-H
012745-0002-SA	AQUEOUS	601-A	10 DEC 90-H	10 DEC 90-H
012745-0003-SA	AQUEOUS	601-A	10 DEC 90-H	10 DEC 90-H
012745-0004-SA	AQUEOUS	601-A	10 DEC 90-H	10 DEC 90-H

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DUPLICATE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 10 DEC 90-H								
Concentration Units: ug/L								
1,1-Dichloroethane	5.0	5.58	5.42	5.50	110	80-130	2.9	20
Chloroform	5.0	6.53	6.08	6.30	126	80-120	7.1	20
Bromodichloromethane	10	11.5	11.1	11.3	113	80-120	3.5	20
Trichloroethene	5.0	5.73	5.54	5.64	113	70-120	3.4	20
Chlorobenzene	5.0	5.28	5.41	5.34	107	80-120	2.4	20

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

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SINGLE CONTROL SAMPLE REPORT
Volatile Organics by GC

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 10 DEC 90-H QC Run: 10 DEC 90-H				
Concentration Units: ug/L				
Bromochloromethane	5.00	4.79	96	20-160

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

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METHOD BLANK REPORT
Volatile Organics by GC

Test: 601-A
Matrix: AQUEOUS
QC Lot: 10 DEC 90-H QC Run: 10 DEC 90-H

Analyte	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

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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)
012745-0001-SA	AQUEOUS	TOC-A	17 DEC 90-A	-
012745-0001-SA	AQUEOUS	TKN-A	19 DEC 90-Q	19 DEC 90-Q
012745-0002-SA	AQUEOUS	TOC-A	17 DEC 90-A	-
012745-0002-SA	AQUEOUS	TKN-A	19 DEC 90-Q	19 DEC 90-Q
012745-0003-SA	AQUEOUS	TOC-A	17 DEC 90-A	-
012745-0003-SA	AQUEOUS	TKN-A	19 DEC 90-Q	19 DEC 90-Q
012745-0004-SA	AQUEOUS	TOC-A	17 DEC 90-A	-
012745-0004-SA	AQUEOUS	TKN-A	19 DEC 90-Q	19 DEC 90-Q

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DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precision (RPD) DCS	Precision (RPD) 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: TKN-A Matrix: AQUEOUS QC Lot: 19 DEC 90-Q Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	2.9	2.98	2.87	2.92	101	78-122	3.8	20

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

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METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 19 DEC 90-Q QC Run: 19 DEC 90-Q			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

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DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precision (RPD) DCS	Precision (RPD) Limit
Category: TOC-A Matrix: AQUEOUS QC Lot: 30 MAR 92-6A Concentration Units: mg/L								
Total Organic Carbon	25	24.6	24.6	24.6	98	91-109	0.0	20
Category: TKN-A Matrix: AQUEOUS QC Lot: 02 APR 92-6A Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	5.0	4.00	4.02	4.01	80	78-122	0.5	20

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

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METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 02 APR 92-6A QC Run: 02 APR 92-6A			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

Rocky Mountain
Analytical Laboratory

Enseco
A CORNING Company

ANALYTICAL RESULTS

FOR

SIGNETICS

ENSECO-RMAL NO. 022991

JUNE 19, 1992

Reviewed by: Kathy McKeeta
Kathy McKeeta

Dave Roberts
Dave Roberts

Enseco Incorporated
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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:

- Sample Description Information
- Analytical Test Requests
- Analytical Results
- Quality Control Report

Sample 022911-0005TB by Method 8010 was analyzed twice with similar results; therefore, the original data has been reported.

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.

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SAMPLE DESCRIPTION INFORMATION
for
Signetics

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
022911-0001-SA	Groundwater Well #1	AQUEOUS	19 MAY 92	13:45	21 MAY 92
022911-0002-SA	Groundwater Well #2	AQUEOUS	19 MAY 92	15:45	21 MAY 92
022911-0003-SA	Groundwater Well #3	AQUEOUS	20 MAY 92	09:40	21 MAY 92
022911-0004-SA	Groundwater Well #4	AQUEOUS	20 MAY 92	11:30	21 MAY 92
022911-0005-SA	Trip Blank	AQUEOUS			21 MAY 92

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ANALYTICAL TEST REQUESTS
for
Signetics

Lab ID: 022911	Group Code	Analysis Description	Custom Test?
0001 - 0004	A	Total Organic Carbon (TOC)	N
		Total Kjeldahl Nitrogen (TKN)	N
		Halogenated Volatile Organics	N
0005	B	Halogenated Volatile Organics	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.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, are provided subsequently.

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Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #1
Lab ID: 022911-0001-SA
Matrix: AQUEOUS Sampled: 19 MAY 92 Received: 21 MAY 92
Authorized: 21 MAY 92 Prepared: NA Analyzed: 28 MAY 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	9.0	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	86	%

ND = Not detected
NA = Not applicable

Reported By: Anne Yardy Approved By: Mike Hoffman

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #2
Lab ID: 022911-0002-SA
Matrix: AQUEOUS Sampled: 19 MAY 92 Received: 21 MAY 92
Authorized: 21 MAY 92 Prepared: NA Analyzed: 28 MAY 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	8.7	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	83	%

ND = Not detected
NA = Not applicable

Reported By: Anne Yardy Approved By: Mike Hoffman

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #3
Lab ID: 022911-0003-SA
Matrix: AQUEOUS Sampled: 20 MAY 92 Received: 21 MAY 92
Authorized: 21 MAY 92 Prepared: NA Analyzed: 28 MAY 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	91	%

ND = Not detected
NA = Not applicable

Reported By: Anne Yardy Approved By: Mike Hoffman

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #4
Lab ID: 022911-0004-SA
Matrix: AQUEOUS Sampled: 20 MAY 92 Received: 21 MAY 92
Authorized: 21 MAY 92 Prepared: NA Analyzed: 28 MAY 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
bromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	4.8	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	77	%

ND = Not detected
NA = Not applicable

Reported By: Anne Yardy Approved By: Mike Hoffman

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Trip Blank
Lab ID: 022911-0005-SA
Matrix: AQUEOUS Sampled: Unknown Received: 21 MAY 92
Authorized: 21 MAY 92 Prepared: NA Analyzed: 01 JUN 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	16	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	4.6	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	108	%

ND = Not detected
NA = Not applicable

Reported By: Tina Pieper Approved By: Mike Hoffman

Enseco
A Corning Company

General Inorganics

Client Name: Signetics
Client ID: Groundwater Well #1
Lab ID: 022911-0001-SA
Matrix: AQUEOUS Sampled: 19 MAY 92 Received: 21 MAY 92
Authorized: 21 MAY 92 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	10 JUN 92
Total Organic Carbon	1.3	mg/L	0.50	9060	NA	15 JUN 92

ND = Not detected
NA = Not applicable

Reported By: Roxanne Sullivan Approved By: Pam Rosas

Enseco
A Corning Company

General Inorganics

Client Name: Signetics
Client ID: Groundwater Well #2
Lab ID: 022911-0002-SA
Matrix: AQUEOUS Sampled: 19 MAY 92 Received: 21 MAY 92
Authorized: 21 MAY 92 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	0.69	mg/L	0.50	351.2	NA	10 JUN 92
Total Organic Carbon	1.4	mg/L	0.50	9060	NA	15 JUN 92

ND = Not detected
NA = Not applicable

Reported By: Roxanne Sullivan Approved By: Pam Rosas

Enseco
A Corning Company

General Inorganics

Client Name: Signetics
Client ID: Groundwater Well #3
Lab ID: 022911-0003-SA
Matrix: AQUEOUS Sampled: 20 MAY 92 Received: 21 MAY 92
Authorized: 21 MAY 92 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	10 JUN 92
Total Organic Carbon	0.83	mg/L	0.50	9060	NA	15 JUN 92

ND = Not detected
NA = Not applicable

Reported By: Roxanne Sullivan Approved By: Pam Rosas

Enseco
A Corning Company

General Inorganics

Client Name: Signetics
Client ID: Groundwater Well #4
Lab ID: 022911-0004-SA
Matrix: AQUEOUS Sampled: 20 MAY 92 Received: 21 MAY 92
Authorized: 21 MAY 92 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	0.81	mg/L	0.50	351.2	NA	10 JUN 92
Total Organic Carbon	1.1	mg/L	0.50	9060	NA	15 JUN 92

ND = Not detected
NA = Not applicable

Reported By: Roxanne Sullivan Approved By: Pam Rosas

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 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 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.

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A Corning Company

QC LOT ASSIGNMENT REPORT
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
022911-0001-SA	AQUEOUS	601-A	09 MAY 92-5J	28 MAY 92-8J
022911-0002-SA	AQUEOUS	601-A	09 MAY 92-5J	28 MAY 92-8J
022911-0003-SA	AQUEOUS	601-A	09 MAY 92-5J	28 MAY 92-8J
022911-0004-SA	AQUEOUS	601-A	09 MAY 92-5J	28 MAY 92-8J
022911-0005-SA	AQUEOUS	601-A	09 MAY 92-5J	01 JUN 92-8J

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DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precision (RPD) DCS	Precision (RPD) Limit
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 09 MAY 92-5J								
Concentration Units: ug/L								
1,1-Dichloroethane	5.0	6.51	6.81	6.66	133	68-122	4.5	13
Chloroform	5.0	5.16	5.18	5.17	103	71-145	0.4	13
Bromodichloromethane	10	8.83	9.04	8.94	89	62-118	2.4	15
Trichloroethene	5.0	4.42	4.52	4.47	89	70-129	2.2	14
Chlorobenzene	5.0	4.36	4.65	4.50	90	62-115	6.4	19

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

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SINGLE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A Matrix: AQUEOUS QC Lot: 09 MAY 92-5J QC Run: 28 MAY 92-8J Concentration Units: ug/L				
Bromochloromethane	5.00	4.49	90	50-144
Category: 601-A Matrix: AQUEOUS QC Lot: 09 MAY 92-5J QC Run: 01 JUN 92-8J Concentration Units: ug/L				
Bromochloromethane	5.00	4.53	91	50-144

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

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METHOD BLANK REPORT
Organics by Chromatography

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 09 MAY 92-5J QC Run: 28 MAY 92-8J			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 09 MAY 92-5J QC Run: 01 JUN 92-8J			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50

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METHOD BLANK REPORT
Organics by Chromatography (cont.)

Test: 601-A
Matrix: AQUEOUS
QC Lot: 09 MAY 92-5J QC Run: 01 JUN 92-8J

Analyte	Result	Units	Reporting Limit
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

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A Corning Company

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)
022911-0001-SA	AQUEOUS	TOC-A	15 JUN 92-6A	-
022911-0001-SA	AQUEOUS	TKN-A	05 JUN 92-6A	-
022911-0002-SA	AQUEOUS	TOC-A	15 JUN 92-6A	-
022911-0002-SA	AQUEOUS	TKN-A	05 JUN 92-6A	-
022911-0003-SA	AQUEOUS	TOC-A	15 JUN 92-6A	-
022911-0003-SA	AQUEOUS	TKN-A	05 JUN 92-6A	-
022911-0004-SA	AQUEOUS	TOC-A	15 JUN 92-6A	-
022911-0004-SA	AQUEOUS	TKN-A	05 JUN 92-6A	-

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precisi (RPD) DCS Lim
Category: TOC-A Matrix: AQUEOUS QC Lot: 15 JUN 92-6A Concentration Units: mg/L							
Total Organic Carbon	25	25.9	26.4	26.2	105	91-109	2.1
Category: TKN-A Matrix: AQUEOUS QC Lot: 05 JUN 92-6A Concentration Units: mg/L							
Total Kjeldahl Nitrogen as N	3.7	3.96	4.08	4.02	109	78-122	3.0

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

ANALYTICAL RESULTS

FOR

SIGNETICS

ENSECO-RMAL NO. 025301

OCTOBER 21, 1992

Enseco
A Corning Company

Reviewed by: Kathy McKeeta

Dave Roberts

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

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:

- Sample Description Information
- Analytical Test Requests
- Analytical Results
- Quality Control Report

The surrogate recoveries for samples 025301-0003 and -0004 by Method 8010 were outside the QC control limits; therefore, the samples were reanalyzed outside of holding times. The results from the reanalysis of sample 025301-003 have been reported. The results from the reanalysis of sample 025301-0004 confirmed the original results so the original results have been reported.

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.

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SAMPLE DESCRIPTION INFORMATION
for
Signetics

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
025301-0001-SA	Groundwater Well #2	AQUEOUS	22 SEP 92	11:25	24 SEP 92
025301-0002-SA	Groundwater Well #1	AQUEOUS	22 SEP 92	16:25	24 SEP 92
025301-0003-SA	Groundwater Well #4	AQUEOUS	23 SEP 92	10:25	24 SEP 92
025301-0004-SA	Groundwater Well #3	AQUEOUS	23 SEP 92	12:15	24 SEP 92
025301-0005-SA	Bottle 51222	AQUEOUS	22 SEP 92	11:25	24 SEP 92
025301-0006-SA	Bottle 51231	AQUEOUS	22 SEP 92	11:25	24 SEP 92

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ANALYTICAL TEST REQUESTS
for
Signetics

Lab ID: 025301	Group Code	Analysis Description	Custom Test?
0001 - 0004	A	Total Kjeldahl Nitrogen (TKN)	N
		Total Organic Carbon (TOC)	N
		Halogenated Volatile Organics	N
0005 - 0006	B	Halogenated Volatile Organics	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.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, are provided subsequently.

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Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #2
Lab ID: 025301-0001-SA
Matrix: AQUEOUS Sampled: 22 SEP 92 Received: 24 SEP 92
Authorized: 25 SEP 92 Prepared: NA Analyzed: 05 OCT 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	10	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	104	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Audrey Verniero

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #1
Lab ID: 025301-0002-SA
Matrix: AQUEOUS Sampled: 22 SEP 92 Received: 24 SEP 92
Authorized: 25 SEP 92 Prepared: NA Analyzed: 05 OCT 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	11	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	106	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Audrey Verniero

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Groundwater Well #4
Lab ID: 025301-0003-SA
Matrix: AQUEOUS Sampled: 23 SEP 92 Received: 24 SEP 92
Authorized: 25 SEP 92 Prepared: NA Analyzed: 16 OCT 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Bromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	5.5	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	94	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Audrey Verniero

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

ient Name: Signetics
ient ID: Groundwater Well #3
b ID: 025301-0004-SA
trix: AQUEOUS Sampled: 23 SEP 92 Received: 24 SEP 92
thorized: 25 SEP 92 Prepared: NA Analyzed: 05 OCT 92

rameter	Result	Units	Reporting Limit
loromethane	ND	ug/L	5.0
omomethane	ND	ug/L	5.0
nyl chloride	ND	ug/L	1.0
loroethane	ND	ug/L	5.0
thylene chloride	ND	ug/L	5.0
1-Dichloroethene	ND	ug/L	0.50
1-Dichloroethane	ND	ug/L	0.50
ans-1,2-Dichloroethene	ND	ug/L	0.50
loroform	ND	ug/L	0.50
1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
2-Dichloroethane	ND	ug/L	1.0
1,1-Trichloroethane	ND	ug/L	0.50
rbon tetrachloride	ND	ug/L	0.50
omodichloromethane	ND	ug/L	1.0
2-Dichloropropane	ND	ug/L	1.0
ans-1,3-Dichloropropene	ND	ug/L	1.0
ichloroethene	ND	ug/L	0.50
bromochloromethane	ND	ug/L	1.0
s-1,3-Dichloropropene	ND	ug/L	2.0
1,2-Trichloroethane	ND	ug/L	1.0
)B (1,2-Dibromoethane)	ND	ug/L	2.0
omoform	ND	ug/L	5.0
1,2,2-Tetrachloroethane	ND	ug/L	1.0
trachloroethene	ND	ug/L	0.50
lorobenzene	ND	ug/L	2.0

irrogate	Recovery	
omochloromethane	220	%

) = Not detected
A = Not applicable

eported By: Bret Collins Approved By: Audrey Verniero

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Bottle 51222
Lab ID: 025301-0005-SA
Matrix: AQUEOUS Sampled: 22 SEP 92 Received: 24 SEP 92
Authorized: 25 SEP 92 Prepared: NA Analyzed: 05 OCT 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	88	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Audrey Verniero

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Signetics
Client ID: Bottle 51231
Lab ID: 025301-0006-SA
Matrix: AQUEOUS Sampled: 22 SEP 92 Received: 24 SEP 92
Authorized: 25 SEP 92 Prepared: NA Analyzed: 05 OCT 92

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	105	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Audrey Verniero

Enseco
A Corning Company

General Inorganics

lient Name: Signetics
lient ID: Groundwater Well #2
ab ID: 025301-0001-SA
atrix: AQUEOUS Sampled: 22 SEP 93 Received: 24 SEP 92
uthorized: 25 SEP 92 Prepared: See Below Analyzed: See Below

arameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
otal Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	13 OCT 92
otal Organic Carbon	1.1	mg/L	0.50	9060	NA	28 SEP 92

ND = Not detected
NA = Not applicable

Reported By: Rodney Smith Approved By: Blake Besser

Enseco
A Corning Company

General Inorganics

Client Name: Signetics
Client ID: Groundwater Well #1
Lab ID: 025301-0002-SA
Matrix: AQUEOUS Sampled: 22 SEP 92 Received: 24 SEP 92
Authorized: 25 SEP 92 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	13 OCT 92
Total Organic Carbon	0.94	mg/L	0.50	9060	NA	28 SEP 92

ND = Not detected
NA = Not applicable

Reported By: Rodney Smith Approved By: Blake Besser

Enseco
A Corning Company

General Inorganics

ient Name: Signetics
ient ID: Groundwater Well #4
b ID: 025301-0003-SA
trix: AQUEOUS Sampled: 23 SEP 92 Received: 24 SEP 92
thorized: 25 SEP 92 Prepared: See Below Analyzed: See Below

rameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
tal Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	13 OCT 92
tal Organic Carbon	1.3	mg/L	0.50	9060	NA	28 SEP 92

D = Not detected
A = Not applicable

eported By: Rodney Smith Approved By: Blake Besser

Enseco
A Corning Company

General Inorganics

Client Name: Signetics
Client ID: Groundwater Well #3
Lab ID: 025301-0004-SA
Matrix: AQUEOUS Sampled: 23 SEP 92 Received: 24 SEP 92
Authorized: 25 SEP 92 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	13 OCT 92
Total Organic Carbon	0.61	mg/L	0.50	9060	NA	28 SEP 92

ND = Not detected
NA = Not applicable

Reported By: Rodney Smith Approved By: Blake Besser

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 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 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.

Enseco
A Corning Company

QC LOT ASSIGNMENT REPORT
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
025301-0001-SA	AQUEOUS	601-A	01 OCT 92-1J	05 OCT 92-6J
025301-0002-SA	AQUEOUS	601-A	01 OCT 92-1J	05 OCT 92-6J
025301-0003-SA	AQUEOUS	601-A	07 OCT 92-1F	16 OCT 92-6F
025301-0004-SA	AQUEOUS	601-A	01 OCT 92-1J	05 OCT 92-6J
025301-0005-SA	AQUEOUS	601-A	01 OCT 92-1J	05 OCT 92-6J
025301-0006-SA	AQUEOUS	601-A	01 OCT 92-1J	05 OCT 92-6J

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precision (RPD) DCS	Precision (RPD) Limit
Category: 601-A Matrix: AQUEOUS QC Lot: 01 OCT 92-1J Concentration Units: ug/L								
1,1-Dichloroethane	5.0	4.75	5.01	4.88	98	68-122	5.3	13
Chloroform	5.0	4.94	5.00	4.97	99	71-145	1.2	13
Bromodichloromethane	10	8.33	8.73	8.53	85	62-118	4.7	15
Trichloroethene	5.0	4.17	4.37	4.27	85	70-129	4.7	14
Chlorobenzene	5.0	6.26	10.8	8.53	171	62-115	53	19
Category: 601-A Matrix: AQUEOUS QC Lot: 07 OCT 92-1F Concentration Units: ug/L								
1,1-Dichloroethane	5.0	4.44	4.44	4.44	89	68-122	0.0	13
Chloroform	5.0	4.89	4.97	4.93	99	71-145	1.6	13
Bromodichloromethane	10	9.19	9.62	9.40	94	62-118	4.6	15
Trichloroethene	5.0	5.03	5.12	5.08	102	70-129	1.8	14
Chlorobenzene	5.0	4.74	4.87	4.80	96	62-115	2.7	19

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

Enseco
A Corning Company

SINGLE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A Matrix: AQUEOUS QC Lot: 01 OCT 92-1J QC Run: 05 OCT 92-6J Concentration Units: ug/L				
Bromochloromethane	5.00	5.76	115	50-144
Category: 601-A Matrix: AQUEOUS QC Lot: 07 OCT 92-1F QC Run: 16 OCT 92-6F Concentration Units: ug/L				
Bromochloromethane	5.00	4.79	96	50-144

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

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A Corning Company

METHOD BLANK REPORT
Organics by Chromatography

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 01 OCT 92-1J QC Run: 05 OCT 92-6J			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 07 OCT 92-1F QC Run: 16 OCT 92-6F			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50

METHOD BLANK REPORT
Organics by Chromatography (cont.)

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 07 OCT 92-1F QC Run: 16 OCT 92-6F			
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 01 OCT 92-1J QC Run: 05 OCT 92-6J			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50

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A Corning Company

METHOD BLANK REPORT
Organics by Chromatography (cont.)

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 01 OCT 92-1J QC Run: 05 OCT 92-6J			
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

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A Corning Company

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)
025301-0001-SA	AQUEOUS	TKN-A	09 OCT 92-6A	09 OCT 92-6A
025301-0001-SA	AQUEOUS	TOC-A	28 SEP 92-6A	-
025301-0002-SA	AQUEOUS	TKN-A	09 OCT 92-6A	09 OCT 92-6A
025301-0002-SA	AQUEOUS	TOC-A	28 SEP 92-6A	-
025301-0003-SA	AQUEOUS	TKN-A	09 OCT 92-6A	09 OCT 92-6A
025301-0003-SA	AQUEOUS	TOC-A	28 SEP 92-6A	-
025301-0004-SA	AQUEOUS	TKN-A	09 OCT 92-6A	09 OCT 92-6A
025301-0004-SA	AQUEOUS	TOC-A	28 SEP 92-6A	-

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DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: TKN-A Matrix: AQUEOUS QC Lot: 09 OCT 92-6A Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	5.28	5.21	5.32	5.26	100	78-122	2.1	20
Category: TOC-A Matrix: AQUEOUS QC Lot: 28 SEP 92-6A Concentration Units: mg/L								
Total Organic Carbon	25	23.1	22.9	23.0	92	91-109	0.7	20

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

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METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 09 OCT 92-6A QC Run: 09 OCT 92-6A			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

Rocky Mountain
Analytical Laboratory

Enseco
A CORNING Company

ANALYTICAL RESULTS
FOR
PHILIPS SEMICONDUCTORS
ENSECO-RMAL NO. 027075

JANUARY 21, 1993

Reviewed by: Kathy McKeeta

Randy Greaves

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

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:

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

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.

Enseco
A Corning Company

SAMPLE DESCRIPTION INFORMATION
for
Philips Semiconductors

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
027075-0001-SA	Well #1	AQUEOUS	06 JAN 93	11:55	08 JAN 93
027075-0002-SA	Well #2	AQUEOUS	06 JAN 93	11:35	08 JAN 93
027075-0003-SA	Well #3	AQUEOUS	07 JAN 93	13:00	08 JAN 93
027075-0004-SA	Well #4	AQUEOUS	07 JAN 93	11:55	08 JAN 93
027075-0005-SA	Trip Blank	AQUEOUS	07 JAN 93	13:00	08 JAN 93

Enseco
A Corning Company

ANALYTICAL TEST REQUESTS
for
Philips Semiconductors

Lab ID: 027075	Group Code	Analysis Description	Custom Test?
0001 - 0004	A	Total Kjeldahl Nitrogen (TKN)	N
		Total Organic Carbon (TOC)	N
		Halogenated Volatile Organics	N
0005	B	Halogenated Volatile Organics	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.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, are provided subsequently.

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Well #1
Lab ID: 027075-0001-SA
Matrix: AQUEOUS Sampled: 06 JAN 93 Received: 08 JAN 93
Authorized: 08 JAN 93 Prepared: NA Analyzed: 19 JAN 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	6.2	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	124	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Well #2
Lab ID: 027075-0002-SA
Matrix: AQUEOUS Sampled: 06 JAN 93 Received: 08 JAN 93
Authorized: 08 JAN 93 Prepared: NA Analyzed: 19 JAN 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	7.1	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	110	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Well #3
Lab ID: 027075-0003-SA
Matrix: AQUEOUS Sampled: 07 JAN 93 Received: 08 JAN 93
Authorized: 08 JAN 93 Prepared: NA Analyzed: 19 JAN 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	100	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Well #4
Lab ID: 027075-0004-SA
Matrix: AQUEOUS Sampled: 07 JAN 93 Received: 08 JAN 93
Authorized: 08 JAN 93 Prepared: NA Analyzed: 20 JAN 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	5.4	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	108	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Trip Blank
Lab ID: 027075-0005-SA
Matrix: AQUEOUS Sampled: 07 JAN 93 Received: 08 JAN 93
Authorized: 08 JAN 93 Prepared: NA Analyzed: 20 JAN 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	112	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: Well #1
Lab ID: 027075-0001-SA
Matrix: AQUEOUS
Authorized: 08 JAN 93

Sampled: 06 JAN 93
Prepared: See Below

Received: 08 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	15 JAN 93
Total Organic Carbon	1.1	mg/L	0.50	9060	NA	11 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Moroschan

Approved By: Will Pratt

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: Well #2
Lab ID: 027075-0002-SA
Matrix: AQUEOUS
Authorized: 08 JAN 93

Sampled: 06 JAN 93
Prepared: See Below

Received: 08 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	15 JAN 93
Total Organic Carbon	1.7	mg/L	0.50	9060	NA	11 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Moroschan

Approved By: Will Pratt

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: Well #3
Lab ID: 027075-0003-SA
Matrix: AQUEOUS
Authorized: 08 JAN 93

Sampled: 07 JAN 93
Prepared: See Below

Received: 08 JAN 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	15 JAN 93
Total Organic Carbon	0.82	mg/L	0.50	9060	NA	11 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Moroschan

Approved By: Will Pratt

Enseco
A Coming Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: Well #4
Lab ID: 027075-0004-SA
Matrix: AQUEOUS Sampled: 07 JAN 93 Received: 08 JAN 93
Authorized: 08 JAN 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	15 JAN 93
Total Organic Carbon	2.1	mg/L	0.50	9060	NA	11 JAN 93

ND = Not detected
NA = Not applicable

Reported By: Scott Moroschan Approved By: Will Pratt

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 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 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.

Enseco
A Corning Company

QC LOT ASSIGNMENT REPORT
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
027075-0001-SA	AQUEOUS	601-A	19 JAN 93-6J	19 JAN 93-6J
027075-0002-SA	AQUEOUS	601-A	19 JAN 93-6J	19 JAN 93-6J
027075-0003-SA	AQUEOUS	601-A	19 JAN 93-6J	19 JAN 93-6J
027075-0004-SA	AQUEOUS	601-A	19 JAN 93-6J	19 JAN 93-6J
027075-0005-SA	AQUEOUS	601-A	19 JAN 93-6J	19 JAN 93-6J

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 19 JAN 93-6J								
Concentration Units: ug/L								
1,1-Dichloroethane	5.0	5.22	5.08	5.15	103	68-122	2.7	13
Chloroform	5.0	5.51	5.19	5.35	107	71-145	6.0	13
Bromodichloromethane	10	9.57	9.53	9.55	96	62-118	0.4	15
Trichloroethene	5.0	4.73	4.91	4.82	96	70-129	3.7	14
Chlorobenzene	5.0	4.76	4.85	4.80	96	62-115	1.9	19

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

Enseco
A Corning Company

SINGLE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 19 JAN 93-6J QC Run: 19 JAN 93-6J				
Concentration Units: ug/L				
Bromochloromethane	5.00	5.91	118	50-144

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

Enseco
A Corning Company

METHOD BLANK REPORT
Organics by Chromatography

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 19 JAN 93-6J QC Run: 19 JAN 93-6J			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 19 JAN 93-6J QC Run: 19 JAN 93-6J			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50

Enseco
A Corning Company

METHOD BLANK REPORT
Organics by Chromatography (cont.)

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 19 JAN 93-6J QC Run: 19 JAN 93-6J			
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Enseco
A Corning Company

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)
027075-0001-SA	AQUEOUS	TKN-A	14 JAN 93-6A	14 JAN 93-6A
027075-0001-SA	AQUEOUS	TOC-A	11 JAN 93-6A	-
027075-0002-SA	AQUEOUS	TKN-A	14 JAN 93-6A	14 JAN 93-6A
027075-0002-SA	AQUEOUS	TOC-A	11 JAN 93-6A	-
027075-0003-SA	AQUEOUS	TKN-A	14 JAN 93-6A	14 JAN 93-6A
027075-0003-SA	AQUEOUS	TOC-A	11 JAN 93-6A	-
027075-0004-SA	AQUEOUS	TKN-A	14 JAN 93-6A	14 JAN 93-6A
027075-0004-SA	AQUEOUS	TOC-A	11 JAN 93-6A	-

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precisi (RPD) DCS	Lim
Category: TKN-A Matrix: AQUEOUS QC Lot: 14 JAN 93-6A Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	5.28	5.67	5.10	5.38	102	78-122	11	
Category: TOC-A Matrix: AQUEOUS QC Lot: 11 JAN 93-6A Concentration Units: mg/L								
Total Organic Carbon	25	25.2	24.6	24.9	100	91-109	2.4	

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

Enseco
A Corning Company

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 14 JAN 93-6A QC Run: 14 JAN 93-6A			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

Relinquished By: K. Ul
Shipped By: D. Bradsh

Philips Semiconductors 1-7-93

Well #1
Sample VOA: 1-6-93 / 1:55 pm
Container #'s: 085512, 085537, 085511 ø1

Sample TKN, TOC 1-6-93 / 1:55 pm
Container #: ——

Well #2

Sample VOA: 1-6-93 / 11:35 am
Container #'s: 085491, 085470, 085493 ø2
Sample TKN, TOC: 11:35 am

Well #3

Sample VOA: 1-7-93 / 1:00 pm
Container #'s: 085471, 071524, 071588
Sample TKN, TOC: 1:00 pm ø3

Well #4

Sample VOA: 1-7-93 / 11:55 am
Container #'s: 085468, 085494, 085469 ø4
Sample TKN, TOC: 11:35 am

* Did Not Receive a "Chain of Custody" Form

Ken Uhler

1-7-93 ✓

Received, 14:45

COC on Cooler okay.
Cooler Temp. 1.5°C.

1/8/93

Proj # 027075

Enseco
A Corning Company

ANALYTICAL RESULTS

FOR

PHILIPS SEMICONDUCTORS

ENSECO-RMAL NO. 028444

APRIL 14, 1993

Reviewed by: Kathy McKeeta

Randy Greaves

Enseco Incorporated
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

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:

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

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.

Enseco
A Corning Company

SAMPLE DESCRIPTION INFORMATION
for
Philips Semiconductors

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
028444-0001-SA	Groundwater Well #1	AQUEOUS	30 MAR 93	13:30	01 APR 93
028444-0002-SA	Groundwater Well #2	AQUEOUS	30 MAR 93	11:05	01 APR 93
028444-0003-SA	Well #3	AQUEOUS	31 MAR 93	14:10	01 APR 93
028444-0004-SA	Well #4	AQUEOUS	31 MAR 93	11:45	01 APR 93
028444-0005-SA	Trip Blank	AQUEOUS	31 MAR 93		01 APR 93

Enseco
A Corning Company

ANALYTICAL TEST REQUESTS
for
Philips Semiconductors

Lab ID: 028444	Group Code	Analysis Description	Custom Test?
0001 - 0004	A	Total Kjeldahl Nitrogen (TKN)	N
		Total Organic Carbon (TOC)	N
		Halogenated Volatile Organics	N
0005	B	Halogenated Volatile Organics	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.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, are provided subsequently.

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Groundwater Well #1
Lab ID: 028444-0001-SA
Matrix: AQUEOUS Sampled: 30 MAR 93 Received: 01 APR 93
Authorized: 01 APR 93 Prepared: NA Analyzed: 09 APR 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	8.3	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	108	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Groundwater Well #2
Lab ID: 028444-0002-SA
Matrix: AQUEOUS Sampled: 30 MAR 93 Received: 01 APR 93
Authorized: 01 APR 93 Prepared: NA Analyzed: 09 APR 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	7.2	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	107	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Well #3
Lab ID: 028444-0003-SA
Matrix: AQUEOUS Sampled: 31 MAR 93 Received: 01 APR 93
Authorized: 01 APR 93 Prepared: NA Analyzed: 09 APR 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	108	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Well #4
Lab ID: 028444-0004-SA
Matrix: AQUEOUS Sampled: 31 MAR 93 Received: 01 APR 93
Authorized: 01 APR 93 Prepared: NA Analyzed: 09 APR 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	5.7	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	108	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Trip Blank
Lab ID: 028444-0005-SA
Matrix: AQUEOUS Sampled: 31 MAR 93 Received: 01 APR 93
Authorized: 01 APR 93 Prepared: NA Analyzed: 09 APR 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	103	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: Groundwater Well #1
Lab ID: 028444-0001-SA
Matrix: AQUEOUS Sampled: 30 MAR 93 Received: 01 APR 93
Authorized: 01 APR 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	08 APR 93
Total Organic Carbon	1.1	mg/L	0.50	9060	NA	05 APR 93

ND = Not detected
NA = Not applicable

Reported By: Blake Besser Approved By: Will Pratt

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: Groundwater Well #2
Lab ID: 028444-0002-SA
Matrix: AQUEOUS Sampled: 30 MAR 93 Received: 01 APR 93
Authorized: 01 APR 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	08 APR 93
Total Organic Carbon	1.7	mg/L	0.50	9060	NA	05 APR 93

ND = Not detected
NA = Not applicable

Reported By: Blake Besser Approved By: Will Pratt

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: Well #3
Lab ID: 028444-0003-SA
Matrix: AQUEOUS Sampled: 31 MAR 93 Received: 01 APR 93
Authorized: 01 APR 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	08 APR 93
Total Organic Carbon	0.78	mg/L	0.50	9060	NA	05 APR 93

ND = Not detected
NA = Not applicable

Reported By: Blake Besser Approved By: Will Pratt

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: Well #4
Lab ID: 028444-0004-SA
Matrix: AQUEOUS Sampled: 31 MAR 93 Received: 01 APR 93
Authorized: 01 APR 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	08 APR 93
Total Organic Carbon	1.9	mg/L	0.50	9060	NA	05 APR 93

ND = Not detected
NA = Not applicable

Reported By: Blake Besser Approved By: Will Pratt

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 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 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.

Enseco
A Corning Company

QC LOT ASSIGNMENT REPORT
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
028444-0001-SA	AQUEOUS	601-A	09 APR 93-6J	09 APR 93-6J
028444-0002-SA	AQUEOUS	601-A	09 APR 93-6J	09 APR 93-6J
028444-0003-SA	AQUEOUS	601-A	09 APR 93-6J	09 APR 93-6J
028444-0004-SA	AQUEOUS	601-A	09 APR 93-6J	09 APR 93-6J
028444-0005-SA	AQUEOUS	601-A	09 APR 93-6J	09 APR 93-6J

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precis (RPD) DCS Li
Category: 601-A							
Matrix: AQUEOUS							
QC Lot: 09 APR 93-6J							
Concentration Units: ug/L							
1,1-Dichloroethane	5.00	5.40	5.25	5.32	107	68-122	2.8
Chloroform	5.00	5.18	5.16	5.17	103	71-145	0.4
Bromodichloromethane	10.0	9.00	9.14	9.07	91	62-118	1.5
Trichloroethene	5.00	4.28	4.44	4.36	87	70-129	3.7
Chlorobenzene	5.00	4.90	5.07	4.98	100	62-115	3.4

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

Enseco
A Corning Company

SINGLE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 09 APR 93-6J QC Run: 09 APR 93-6J				
Concentration Units: ug/L				
Bromochloromethane	5.00	5.46	109	50-144

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

Enseco
A Corning Company

METHOD BLANK REPORT
Organics by Chromatography

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 09 APR 93-6J QC Run: 09 APR 93-6J			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 09 APR 93-6J QC Run: 09 APR 93-6J			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50

Enseco
A Corning Company

METHOD BLANK REPORT
Organics by Chromatography (cont.)

Test: 601-A
Matrix: AQUEOUS
QC Lot: 09 APR 93-6J QC Run: 09 APR 93-6J

Analyte	Result	Units	Reporting Limit
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Enseco
A Corning Company

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)
028444-0001-SA	AQUEOUS	TKN-A	07 APR 93-6A	07 APR 93-6A
028444-0001-SA	AQUEOUS	TOC-A	05 APR 93-6A	-
028444-0002-SA	AQUEOUS	TKN-A	07 APR 93-6A	07 APR 93-6A
028444-0002-SA	AQUEOUS	TOC-A	05 APR 93-6A	-
028444-0003-SA	AQUEOUS	TKN-A	07 APR 93-6A	07 APR 93-6A
028444-0003-SA	AQUEOUS	TOC-A	05 APR 93-6A	-
028444-0004-SA	AQUEOUS	TKN-A	07 APR 93-6A	07 APR 93-6A
028444-0004-SA	AQUEOUS	TOC-A	05 APR 93-6A	-

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: TKN-A Matrix: AQUEOUS QC Lot: 07 APR 93-6A Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	5.00	4.55	4.83	4.69	94	78-122	6.0	20
Category: TOC-A Matrix: AQUEOUS QC Lot: 05 APR 93-6A Concentration Units: mg/L								
Total Organic Carbon	25.0	24.8	24.8	24.8	99	91-109	0.0	20

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

Enseco
A Corning Company

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 07 APR 93-6A QC Run: 07 APR 93-6A			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

Rocky Mountain
Analytical Laboratory

ANALYTICAL RESULTS

FOR

Philips Semiconductors

ENSECO-RMAL NO. 029880

July 16, 1993

Enseco
A CORNING Company

Reviewed by: Karen Germann
Karen Germann

Debra Henderer
Debra Henderer

Enseco Incorporated
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I. OVERVIEW

On July 2, 1993 Enseco-Rocky Mountain Analytical Laboratory received five aqueous samples from Philips Semiconductors.

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

The information listed on the Chain of Custody was amended by the client on July 2. The corrections included: (1) adding the Trip Blank, sample 029880-0005; (2) denoting date and time of collection of each sample; and (3) denoting analytical test requests for each sample.

Samples 029880-0001 and -0002 were analyzed for volatile organics by method 601. These samples were collected on June 29 and analyzed one day beyond the 14 day holding time (July 14). The data are submitted per the client's request of July 15.

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 for each sample. The Custom Test column indicates whether tests have been modified to conform to the specific requirements of this project.

Enseco
A Corning Company

SAMPLE DESCRIPTION INFORMATION
for
Philips Semiconductors

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
029880-0001-SA	WELL 1	AQUEOUS	29 JUN 93		02 JUL 93
029880-0002-SA	WELL 2	AQUEOUS	29 JUN 93	10:40	02 JUL 93
029880-0003-SA	WELL 3	AQUEOUS	30 JUN 93	11:20	02 JUL 93
029880-0004-SA	WELL 4	AQUEOUS	30 JUN 93	09:00	02 JUL 93
029880-0005-TB	TRIP BLANK	AQUEOUS	02 JUL 93		02 JUL 93

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: WELL 1
Lab ID: 029880-0001-SA
Matrix: AQUEOUS Sampled: 29 JUN 93 Received: 02 JUL 93
Authorized: 02 JUL 93 Prepared: NA Analyzed: 14 JUL 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	12	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	103	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: WELL 2
Lab ID: 029880-0002-SA
Matrix: AQUEOUS Sampled: 29 JUN 93 Received: 02 JUL 93
Authorized: 02 JUL 93 Prepared: NA Analyzed: 14 JUL 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	4.0	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	82	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: WELL 3
Lab ID: 029880-0003-SA
Matrix: AQUEOUS Sampled: 30 JUN 93 Received: 02 JUL 93
Authorized: 02 JUL 93 Prepared: NA Analyzed: 14 JUL 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	108	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: WELL 4
Lab ID: 029880-0004-SA
Matrix: AQUEOUS Sampled: 30 JUN 93 Received: 02 JUL 93
Authorized: 02 JUL 93 Prepared: NA Analyzed: 14 JUL 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	3.6	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	104	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: TRIP BLANK
Lab ID: 029880-0005-TB
Matrix: AQUEOUS Sampled: 02 JUL 93 Received: 02 JUL 93
Authorized: 02 JUL 93 Prepared: NA Analyzed: 14 JUL 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	106	%

ND = Not detected
NA = Not applicable

Reported By: Bret Collins Approved By: Mark Pokorny

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: WELL 1
Lab ID: 029880-0001-SA
Matrix: AQUEOUS
Authorized: 02 JUL 93

Sampled: 29 JUN 93
Prepared: See Below

Received: 02 JUL 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	15 JUL 93
Total Organic Carbon	0.73	mg/L	0.50	9060	NA	14 JUL 93

ND = Not detected
NA = Not applicable

Reported By: Pam Rosas

Approved By: Blake Besser

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: WELL 2
Lab ID: 029880-0002-SA
Matrix: AQUEOUS
Authorized: 02 JUL 93

Sampled: 29 JUN 93
Prepared: See Below

Received: 02 JUL 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	15 JUL 93
Total Organic Carbon	0.92	mg/L	0.50	9060	NA	14 JUL 93

ND = Not detected
NA = Not applicable

Reported By: Pam Rosas

Approved By: Blake Besser

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: WELL 3
Lab ID: 029880-0003-SA
Matrix: AQUEOUS
Authorized: 02 JUL 93

Sampled: 30 JUN 93
Prepared: See Below

Received: 02 JUL 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	15 JUL 93
Total Organic Carbon	0.51	mg/L	0.50	9060	NA	14 JUL 93

ND = Not detected
NA = Not applicable

Reported By: Pam Rosas

Approved By: Blake Besser

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: WELL 4
Lab ID: 029880-0004-SA
Matrix: AQUEOUS
Authorized: 02 JUL 93

Sampled: 30 JUN 93
Prepared: See Below

Received: 02 JUL 93
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	0.61	mg/L	0.50	351.2	NA	15 JUL 93
Total Organic Carbon	0.99	mg/L	0.50	9060	NA	14 JUL 93

ND = Not detected
NA = Not applicable

Reported By: Pam Rosas

Approved By: Blake Besser

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.

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 that 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 that 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.

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A Corning Company

QC LOT ASSIGNMENT REPORT
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
029880-0001-SA	AQUEOUS	601-A	14 JUL 93-F	14 JUL 93-F
029880-0002-SA	AQUEOUS	601-A	14 JUL 93-F	14 JUL 93-F
029880-0003-SA	AQUEOUS	601-A	14 JUL 93-F	14 JUL 93-F
029880-0004-SA	AQUEOUS	601-A	14 JUL 93-F	14 JUL 93-F
029880-0005-TB	AQUEOUS	601-A	14 JUL 93-F	14 JUL 93-F

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DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Limits	Precisi (RPD) DCS Lim
Category: 601-A							
Matrix: AQUEOUS							
QC Lot: 14 JUL 93-F							
Concentration Units: ug/L							
1,1-Dichloroethane	5.00	4.60	4.74	4.67	93	68-122	3.0
Chloroform	5.00	5.01	5.24	5.12	103	71-145	4.5
Bromodichloromethane	10.0	9.61	9.91	9.76	98	62-118	3.1
Trichloroethene	5.00	4.81	4.92	4.86	97	70-129	2.3
Chlorobenzene	5.00	4.60	4.66	4.63	93	62-115	1.3

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

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Limits	Precision (RPD) DCS	Limit
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 14 JUL 93-F								
Concentration Units: ug/L								
1,1-Dichloroethane	5.00	4.60	4.74	4.67	93	68-122	3.0	13
Chloroform	5.00	5.01	5.24	5.12	103	71-145	4.5	13
Bromodichloromethane	10.0	9.61	9.91	9.76	98	62-118	3.1	15
Trichloroethene	5.00	4.81	4.92	4.86	97	70-129	2.3	14
Chlorobenzene	5.00	4.60	4.66	4.63	93	62-115	1.3	19

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

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SINGLE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 14 JUL 93-F QC Run: 14 JUL 93-F				
Concentration Units: ug/L				
Bromochloromethane	5.00	5.66	113	50-144

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

Enseco
A Corning Company

METHOD BLANK REPORT
Organics by Chromatography

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 14 JUL 93-F QC Run: 14 JUL 93-F			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 14 JUL 93-F QC Run: 14 JUL 93-F			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50

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METHOD BLANK REPORT
Organics by Chromatography (cont.)

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 14 JUL 93-F QC Run: 14 JUL 93-F			
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

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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)
029880-0001-SA	AQUEOUS	TKN-A	12 JUL 93-6A	12 JUL 93-6A
029880-0001-SA	AQUEOUS	TOC-A	14 JUL 93-1A	-
029880-0002-SA	AQUEOUS	TKN-A	12 JUL 93-6A	12 JUL 93-6A
029880-0002-SA	AQUEOUS	TOC-A	14 JUL 93-1A	-
029880-0003-SA	AQUEOUS	TKN-A	12 JUL 93-6A	12 JUL 93-6A
029880-0003-SA	AQUEOUS	TOC-A	14 JUL 93-1A	-
029880-0004-SA	AQUEOUS	TKN-A	12 JUL 93-6A	12 JUL 93-6A
029880-0004-SA	AQUEOUS	TOC-A	14 JUL 93-1A	-

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A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precisi (RPD) DCS	Precisi (RPD) Lim
Category: TKN-A Matrix: AQUEOUS QC Lot: 12 JUL 93-6A Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	4.77	5.39	5.61	5.50	115	78-122	4.0	
Category: TOC-A Matrix: AQUEOUS QC Lot: 14 JUL 93-1A Concentration Units: mg/L								
Total Organic Carbon	25.0	24.0	24.6	24.3	97	91-109	2.5	

Calculations are performed before rounding to avoid round-off errors in calculated res s

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METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 12 JUL 93-6A QC Run: 12 JUL 93-6A			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

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ANALYTICAL TEST REQUESTS
for
Philips Semiconductors

Lab ID: 029880	Group Code	Analysis Description	Custom Test?
0001 - 0004	A	Total Kjeldahl Nitrogen (TKN)	N
		Total Organic Carbon (TOC)	N
		Halogenated Volatile Organics	N
0005	B	Halogenated Volatile Organics	N

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 date 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 3.5, May, 1992.

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

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

Volatile Organics

a) The cis- and trans-isomers of 1,2-dichloroethene cannot be distinguished using EPA Method 624 or 8240. All dichloroethene present is reported as 1,2-dichloroethene (total).

b) Due to the chemical nature of ethanol, this component cannot be consistently recovered using EPA Method 624 or 8240. This component is reported as NR (Not Recoverable) instead of stating a reporting limit.

c) Methylene chloride and acetone are common laboratory contaminants in GC/MS analysis. Although we have programs in place to minimize contamination, occasionally these compounds will be found at low levels in samples.

ANALYTICAL RESULTS

FOR

PHILIPS SEMICONDUCTORS

ENSECO-RMAL NO. 031610

OCTOBER 25, 1993

Reviewed by: Cindy Patterson

Cindy Patterson

Gary Walters

Gary Walters

Enseco
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

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:

- Sample Description Information
- Analytical Test Requests
- Analytical Results
- Quality Control Report

All analyses at Enseco are performed so that the maximum concentration of sample consistent with the method is analyzed. Dilutions are at times required to avoid saturation of the detector, to achieve linearity for a specific target compound, or to reduce matrix interferences. In this event, reporting limits are adjusted proportionately. Surrogate compounds may not be measurable in samples which have been diluted.

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.

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SAMPLE DESCRIPTION INFORMATION
for
Philips Semiconductors

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
031610-0001-SA	GROUND WATER SAMPLES WELL#1	AQUEOUS	08 OCT 93	14:20	09 OCT 93
031610-0002-SA	GROUND WATER SAMPLES WELL#2	AQUEOUS	08 OCT 93	14:20	09 OCT 93
031610-0003-SA	GROUND WATER SAMPLES WELL#3	AQUEOUS	08 OCT 93	14:20	09 OCT 93
031610-0004-SA	GROUND WATER SAMPLES WELL#4	AQUEOUS	08 OCT 93	14:20	09 OCT 93
031610-0005-TB	TRIP BLANK	AQUEOUS	08 OCT 93		09 OCT 93

Enseco
A Corning Company

ANALYTICAL TEST REQUESTS
for
Philips Semiconductors

Lab ID: 031610	Group Code	Analysis Description	Custom Test?
0001 - 0004	A	Total Kjeldahl Nitrogen (TKN)	N
		Total Organic Carbon (TOC)	N
		Halogenated Volatile Organics	N
0005	B	Halogenated Volatile Organics	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.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, are provided subsequently.

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL#1
Lab ID: 031610-0001-SA
Matrix: AQUEOUS Sampled: 08 OCT 93 Received: 09 OCT 93
Authorized: 09 OCT 93 Prepared: NA Analyzed: 11 OCT 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	13	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	102	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL#2
Lab ID: 031610-0002-SA
Matrix: AQUEOUS Sampled: 08 OCT 93 Received: 09 OCT 93
Authorized: 09 OCT 93 Prepared: NA Analyzed: 11 OCT 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	9.9	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	116	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL#3
Lab ID: 031610-0003-SA
Matrix: AQUEOUS Sampled: 08 OCT 93 Received: 09 OCT 93
Authorized: 09 OCT 93 Prepared: NA Analyzed: 11 OCT 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	108	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL#4
Lab ID: 031610-0004-SA
Matrix: AQUEOUS Sampled: 08 OCT 93 Received: 09 OCT 93
Authorized: 09 OCT 93 Prepared: NA Analyzed: 11 OCT 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	6.4	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	107	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: TRIP BLANK
Lab ID: 031610-0005-TB
Matrix: AQUEOUS Sampled: 08 OCT 93 Received: 09 OCT 93
Authorized: 09 OCT 93 Prepared: NA Analyzed: 11 OCT 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	116	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL#1
Lab ID: 031610-0001-SA
Matrix: AQUEOUS Sampled: 08 OCT 93 Received: 09 OCT 93
Authorized: 09 OCT 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	19 OCT 93
Total Organic Carbon	0.84	mg/L	0.50	9060	NA	21 OCT 93

ND = Not detected
NA = Not applicable

Reported By: Kaye Ryman Approved By: Steve Shurgot

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL#2
Lab ID: 031610-0002-SA
Matrix: AQUEOUS Sampled: 08 OCT 93 Received: 09 OCT 93
Authorized: 09 OCT 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	19 OCT 93
Total Organic Carbon	ND	mg/L	0.50	9060	NA	21 OCT 93

ND = Not detected
NA = Not applicable

Reported By: Kaye Ryman Approved By: Steve Shurgot

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL#3
Lab ID: 031610-0003-SA
Matrix: AQUEOUS Sampled: 08 OCT 93 Received: 09 OCT 93
Authorized: 09 OCT 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	19 OCT 93
Total Organic Carbon	1.1	mg/L	0.50	9060	NA	21 OCT 93

ND = Not detected
NA = Not applicable

Reported By: Kaye Ryman Approved By: Steve Shurgot

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL#4
Lab ID: 031610-0004-SA
Matrix: AQUEOUS Sampled: 08 OCT 93 Received: 09 OCT 93
Authorized: 09 OCT 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	19 OCT 93
Total Organic Carbon	ND	mg/L	0.50	9060	NA	21 OCT 93

ND = Not detected
NA = Not applicable

Reported By: Kaye Ryman Approved By: Steve Shurgot

Enseco
A Corning Company

METHOD BLANK REPORT
Organics by Chromatography

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 11 OCT 93-1F QC Run: 11 OCT 93-1F			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 11 OCT 93-1F QC Run: 11 OCT 93-1F			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50

Enseco
A Corning Company

SINGLE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 11 OCT 93-1F QC Run: 11 OCT 93-1F				
Concentration Units: ug/L				
Bromochloromethane	5.00	6.03	121	50-144

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

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precision (RPD) DCS	Precision (RPD) Limit
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 11 OCT 93-1F								
Concentration Units: ug/L								
1,1-Dichloroethane	5.00	4.31	4.36	4.34	87	68-122	1.2	13
Chloroform	5.00	4.69	4.89	4.79	96	71-145	4.2	13
Bromodichloromethane	10.0	8.07	8.45	8.26	83	62-118	4.6	15
Trichloroethene	5.00	4.51	4.82	4.66	93	70-129	6.6	14
Chlorobenzene	5.00	4.43	4.81	4.62	92	62-115	8.2	19

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

Enseco
A Corning Company

QC LOT ASSIGNMENT REPORT
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
031610-0001-SA	AQUEOUS	601-A	11 OCT 93-1F	11 OCT 93-1F
031610-0002-SA	AQUEOUS	601-A	11 OCT 93-1F	11 OCT 93-1F
031610-0003-SA	AQUEOUS	601-A	11 OCT 93-1F	11 OCT 93-1F
031610-0004-SA	AQUEOUS	601-A	11 OCT 93-1F	11 OCT 93-1F
031610-0005-TB	AQUEOUS	601-A	11 OCT 93-1F	11 OCT 93-1F

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 Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

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.

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A Corning Company

METHOD BLANK REPORT
Organics by Chromatography (cont.)

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 11 OCT 93-1F QC Run: 11 OCT 93-1F			
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

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A Corning Company

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)
031610-0001-SA	AQUEOUS	TKN-A	18 OCT 93-1M	18 OCT 93-1M
031610-0001-SA	AQUEOUS	TOC-A	21 OCT 93-1A	-
031610-0002-SA	AQUEOUS	TKN-A	18 OCT 93-1M	18 OCT 93-1M
031610-0002-SA	AQUEOUS	TOC-A	21 OCT 93-1A	-
031610-0003-SA	AQUEOUS	TKN-A	18 OCT 93-1M	18 OCT 93-1M
031610-0003-SA	AQUEOUS	TOC-A	21 OCT 93-1A	-
031610-0004-SA	AQUEOUS	TKN-A	18 OCT 93-1M	18 OCT 93-1M
031610-0004-SA	AQUEOUS	TOC-A	21 OCT 93-1A	-

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: TKN-A Matrix: AQUEOUS QC Lot: 18 OCT 93-1M Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	4.77	5.21	5.14	5.18	108	78-122	1.4	20
Category: TOC-A Matrix: AQUEOUS QC Lot: 21 OCT 93-1A Concentration Units: mg/L								
Total Organic Carbon	25.0	25.1	24.9	25.0	100	91-109	0.7	20

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

Enseco
A Corning Company

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 18 OCT 93-1M QC Run: 18 OCT 93-1M			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

ANALYTICAL RESULTS

FOR

PHILIPS SEMICONDUCTORS

ENSECO-RMAL NO. 032131

NOVEMBER 16, 1993

Reviewed by: Cindy Patterson

Cindy Patterson

Gary Walters

Gary Walters

Enseco
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

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:

- Sample Description Information
- Analytical Test Requests
- Analytical Results
- Quality Control Report

All analyses at Enseco are performed so that the maximum concentration of sample consistent with the method is analyzed. Dilutions are at times required to avoid saturation of the detector, to achieve linearity for a specific target compound, or to reduce matrix interferences. In this event, reporting limits are adjusted proportionately. Surrogate compounds may not be measurable in samples which have been diluted.

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.

Enseco
A Corning Company

SAMPLE DESCRIPTION INFORMATION
for
Philips Semiconductors

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
032131-0001-SA	GROUND WATER SAMPLES WELL #1	AQUEOUS	05 NOV 93	13:00	06 NOV 93
032131-0002-SA	GROUND WATER SAMPLES WELL #2	AQUEOUS	05 NOV 93	13:00	06 NOV 93
032131-0003-SA	GROUND WATER SAMPLES WELL #3	AQUEOUS	05 NOV 93	13:00	06 NOV 93
032131-0004-SA	GROUND WATER SAMPLES WELL #4	AQUEOUS	05 NOV 93	13:00	06 NOV 93
032131-0005-TB	TRIP BLANK	AQUEOUS	05 NOV 93	13:00	06 NOV 93

Enseco
A Corning Company

ANALYTICAL TEST REQUESTS
for
Philips Semiconductors

Lab ID: 032131	Group Code	Analysis Description	Custom Test?
0001 - 0004	A	Total Kjeldahl Nitrogen (TKN)	N
		Total Organic Carbon (TOC)	N
		Halogenated Volatile Organics	N
0005	B	Halogenated Volatile Organics	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.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, are provided subsequently.

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL #1
Lab ID: 032131-0001-SA
Matrix: AQUEOUS Sampled: 05 NOV 93 Received: 06 NOV 93
Authorized: 06 NOV 93 Prepared: NA Analyzed: 11 NOV 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	10	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	86	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL #2
Lab ID: 032131-0002-SA
Matrix: AQUEOUS Sampled: 05 NOV 93 Received: 06 NOV 93
Authorized: 06 NOV 93 Prepared: NA Analyzed: 12 NOV 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	8.7	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	81	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL #3
Lab ID: 032131-0003-SA
Matrix: AQUEOUS Sampled: 05 NOV 93 Received: 06 NOV 93
Authorized: 06 NOV 93 Prepared: NA Analyzed: 12 NOV 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	74	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL #4
Lab ID: 032131-0004-SA
Matrix: AQUEOUS Sampled: 05 NOV 93 Received: 06 NOV 93
Authorized: 06 NOV 93 Prepared: NA Analyzed: 12 NOV 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	5.6	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	77	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: TRIP BLANK
Lab ID: 032131-0005-TB
Matrix: AQUEOUS Sampled: 05 NOV 93 Received: 06 NOV 93
Authorized: 06 NOV 93 Prepared: NA Analyzed: 12 NOV 93

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	80	%

ND = Not detected
NA = Not applicable

Reported By: Stan Dunlavy Approved By: Denise Howe

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL #1
Lab ID: 032131-0001-SA
Matrix: AQUEOUS Sampled: 05 NOV 93 Received: 06 NOV 93
Authorized: 06 NOV 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	12 NOV 93
Total Organic Carbon	1.1	mg/L	0.50	9060	NA	11 NOV 93

ND = Not detected
NA = Not applicable

Reported By: Kaye Ryman Approved By: Lavon Trujillo

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL #2
Lab ID: 032131-0002-SA
Matrix: AQUEOUS Sampled: 05 NOV 93 Received: 06 NOV 93
Authorized: 06 NOV 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	12 NOV 93
Total Organic Carbon	1.1	mg/L	0.50	9060	NA	11 NOV 93

ND = Not detected
NA = Not applicable

Reported By: Kaye Ryman Approved By: Lavon Trujillo

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL #3
Lab ID: 032131-0003-SA
Matrix: AQUEOUS Sampled: 05 NOV 93 Received: 06 NOV 93
Authorized: 06 NOV 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	12 NOV 93
Total Organic Carbon	1.3	mg/L	0.50	9060	NA	11 NOV 93

ND = Not detected
NA = Not applicable

Reported By: Kaye Ryman Approved By: Lavon Trujillo

Enseco
A Corning Company

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER SAMPLES WELL #4
Lab ID: 032131-0004-SA
Matrix: AQUEOUS Sampled: 05 NOV 93 Received: 06 NOV 93
Authorized: 06 NOV 93 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	12 NOV 93
Total Organic Carbon	3.8	mg/L	0.50	9060	NA	11 NOV 93

ND = Not detected
NA = Not applicable

Reported By: Kaye Ryman Approved By: Lavon Trujillo

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 Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

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.

Enseco
A Corning Company

QC LOT ASSIGNMENT REPORT
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
032131-0001-SA	AQUEOUS	601-A	11 NOV 93-4F	11 NOV 93-4F
032131-0002-SA	AQUEOUS	601-A	11 NOV 93-4F	11 NOV 93-4F
032131-0003-SA	AQUEOUS	601-A	11 NOV 93-4F	11 NOV 93-4F
032131-0004-SA	AQUEOUS	601-A	11 NOV 93-4F	11 NOV 93-4F
032131-0005-TB	AQUEOUS	601-A	11 NOV 93-4F	11 NOV 93-4F

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precisio (RPD) DCS	Precisio (RPD) Limi
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 11 NOV 93-4F								
Concentration Units: ug/L								
1,1-Dichloroethane	5.00	4.82	4.78	4.80	96	68-122	0.8	1
Chloroform	5.00	4.92	4.93	4.92	99	71-145	0.2	1
Bromodichloromethane	10.0	8.96	8.84	8.90	89	62-118	1.3	1
Trichloroethene	5.00	5.45	5.44	5.44	109	70-129	0.2	1
Chlorobenzene	5.00	4.85	4.67	4.76	95	62-115	3.8	1

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

Enseco
A Corning Company

SINGLE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 11 NOV 93-4F QC Run: 11 NOV 93-4F				
Concentration Units: ug/L				
Bromochloromethane	5.00	4.65	93	50-144

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

Enseco
A Corning Company

METHOD BLANK REPORT
Organics by Chromatography

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 11 NOV 93-4F QC Run: 11 NOV 93-4F			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 11 NOV 93-4F QC Run: 11 NOV 93-4F			
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50

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METHOD BLANK REPORT
Organics by Chromatography (cont.)

Analyte	Result	Units	Reporting Limit
Test: 601-A			
Matrix: AQUEOUS			
QC Lot: 11 NOV 93-4F QC Run: 11 NOV 93-4F			
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Enseco
A Corning Company

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)
032131-0001-SA	AQUEOUS	TKN-A	09 NOV 93-1M	09 NOV 93-1M
032131-0001-SA	AQUEOUS	TOC-A	11 NOV 93-1T	-
032131-0002-SA	AQUEOUS	TKN-A	09 NOV 93-1M	09 NOV 93-1M
032131-0002-SA	AQUEOUS	TOC-A	11 NOV 93-1T	-
032131-0003-SA	AQUEOUS	TKN-A	09 NOV 93-1M	09 NOV 93-1M
032131-0003-SA	AQUEOUS	TOC-A	11 NOV 93-1T	-
032131-0004-SA	AQUEOUS	TKN-A	09 NOV 93-1M	09 NOV 93-1M
032131-0004-SA	AQUEOUS	TOC-A	11 NOV 93-1T	-

Enseco
A Corning Company

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: TKN-A Matrix: AQUEOUS QC Lot: 09 NOV 93-1M Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	4.77	5.07	5.06	5.06	106	78-122	0.2	20
Category: TOC-A Matrix: AQUEOUS QC Lot: 11 NOV 93-1T Concentration Units: mg/L								
Total Organic Carbon	25.0	25.7	26.0	25.9	103	91-109	1.0	20

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

Enseco
A Corning Company

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 09 NOV 93-1M QC Run: 09 NOV 93-1M			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

Rocky Mountain
Analytical Laboratory

Enseco
A CORNING Company

ANALYTICAL RESULTS

FOR

PHILIPS SEMI-CONDUCTORS

ENSECO-RMAL NO. 034371

MARCH 31, 1994

Reviewed by: Cindy Patterson
Cindy Patterson

Gary Walters
Gary Walters

Enseco Incorporated
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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:

- Sample Description Information
- Analytical Test Requests
- Analytical Results
- Quality Control Report

All analyses at Enseco are performed so that the maximum concentration of sample consistent with the method is analyzed. Dilutions are at times required to avoid saturation of the detector, to achieve linearity for a specific target compound, or to reduce matrix interferences. In this event, reporting limits are adjusted proportionately. Surrogate compounds may not be measurable in samples which have been diluted.

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
Philips Semiconductors

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
034371-0001-SA	Ground Water Well 3	AQUEOUS	18 MAR 94	07:40	19 MAR 94
034371-0002-SA	Ground Water Well 4	AQUEOUS	17 MAR 94	07:35	19 MAR 94
034371-0003-SA	Ground Water Well 1	AQUEOUS	16 MAR 94	07:50	19 MAR 94
034371-0004-SA	Ground Water Well 2	AQUEOUS	14 MAR 94	13:10	19 MAR 94
034371-0005-SA	Trip Blank	AQUEOUS			19 MAR 94

Enseco

ANALYTICAL TEST REQUESTS
for
Philips Semiconductors

Lab ID: 034371	Group Code	Analysis Description	Custom Test?
0001 - 0004	A	Total Kjeldahl Nitrogen (TKN)	N
		Total Organic Carbon (TOC)	N
		Halogenated Volatile Organics	N
0005	B	Halogenated Volatile Organics	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.

The results from the Standard Enseco QA/QC Program, which generates data which are independent of matrix effects, are provided subsequently.

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Ground Water Well 1
Lab ID: 034371-0003-SA
Matrix: AQUEOUS Sampled: 16 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: NA Analyzed: 28 MAR 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	9.8	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	82	%

ND = Not detected
NA = Not applicable

Reported By: Vernon Yost Approved By: Audrey Verniero

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Ground Water Well 2
Lab ID: 034371-0004-SA
Matrix: AQUEOUS Sampled: 14 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: NA Analyzed: 28 MAR 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	9.0	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	86	%

ND = Not detected
NA = Not applicable

Reported By: Vernon Yost Approved By: Audrey Verniero

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Ground Water Well 3
Lab ID: 034371-0001-SA
Matrix: AQUEOUS Sampled: 18 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: NA Analyzed: 28 MAR 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	100	%

ND = Not detected
NA = Not applicable

Reported By: Vernon Yost Approved By: Audrey Verniero

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Ground Water Well 4
Lab ID: 034371-0002-SA
Matrix: AQUEOUS Sampled: 17 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: NA Analyzed: 28 MAR 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	5.4	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	95	%

ND = Not detected
NA = Not applicable

Reported By: Vernon Yost Approved By: Audrey Verniero

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Trip Blank
Lab ID: 034371-0005-SA
Matrix: AQUEOUS Sampled: Unknown Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: NA Analyzed: 28 MAR 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	90	%

ND = Not detected
NA = Not applicable

Reported By: Vernon Yost Approved By: Audrey Verniero

Enseco

General Inorganics

Client Name: Philips Semiconductors
Client ID: Ground Water Well 1
Lab ID: 034371-0003-SA
Matrix: AQUEOUS Sampled: 16 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	24 MAR 94
Total Organic Carbon	1.2	mg/L	1.0	9060	NA	23 MAR 94

ND = Not detected
NA = Not applicable

Reported By: John Land

Approved By: Lavon Trujillo

Enseco

General Inorganics

Client Name: Philips Semiconductors
Client ID: Ground Water Well 2
Lab ID: 034371-0004-SA
Matrix: AQUEOUS Sampled: 14 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	24 MAR 94
Total Organic Carbon	1.3	mg/L	1.0	9060	NA	23 MAR 94

ND = Not detected
NA = Not applicable

Reported By: John Land Approved By: Lavon Trujillo

Enseco

General Inorganics

Client Name: Philips Semiconductors
Client ID: Ground Water Well 3
Lab ID: 034371-0001-SA
Matrix: AQUEOUS Sampled: 18 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	24 MAR 94
Total Organic Carbon	ND	mg/L	1.0	9060	NA	23 MAR 94

ND = Not detected
NA = Not applicable

Reported By: John Land Approved By: Lavon Trujillo

Enseco

General Inorganics

Client Name: Philips Semiconductors
Client ID: Ground Water Well 4
Lab ID: 034371-0002-SA
Matrix: AQUEOUS Sampled: 17 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	24 MAR 94
Total Organic Carbon	1.2	mg/L	1.0	9060	NA	23 MAR 94

ND = Not detected
NA = Not applicable

Reported By: John Land Approved By: Lavon Trujillo

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 Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

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.

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QC LOT ASSIGNMENT REPORT
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
034371-0001-SA	AQUEOUS	601-A	28 MAR 94-1F	28 MAR 94-1F
034371-0002-SA	AQUEOUS	601-A	28 MAR 94-1F	28 MAR 94-1F
034371-0003-SA	AQUEOUS	601-A	28 MAR 94-1F	28 MAR 94-1F
034371-0004-SA	AQUEOUS	601-A	28 MAR 94-1F	28 MAR 94-1F
034371-0005-SA	AQUEOUS	601-A	28 MAR 94-1F	28 MAR 94-1F

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DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precisio (RPD) DCS	Precisio (RPD) Limi
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 28 MAR 94-1F								
Concentration Units: ug/L								
1,1-Dichloroethane	5.00	4.33	4.38	4.36	87	68-122	1.1	1
Chloroform	5.00	4.93	5.09	5.01	100	71-145	3.2	1
Bromodichloromethane	10.0	9.72	9.76	9.74	97	62-118	0.4	1
Trichloroethene	5.00	5.22	5.19	5.20	104	70-129	0.6	1
Chlorobenzene	5.00	4.87	4.85	4.86	97	62-115	0.4	1

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

Enseco

SINGLE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 28 MAR 94-1F QC Run: 28 MAR 94-1F				
Concentration Units: ug/L				
Bromochloromethane	5.00	4.31	86	50-144

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

METHOD BLANK REPORT
Organics by Chromatography

Test: 601-A
Matrix: AQUEOUS
QC Lot: 28 MAR 94-1F QC Run: 28 MAR 94-1F

Analyte	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Test: 601-A
Matrix: AQUEOUS
QC Lot: 28 MAR 94-1F QC Run: 28 MAR 94-1F

Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50

METHOD BLANK REPORT
Organics by Chromatography (cont.)

Test: 601-A
Matrix: AQUEOUS
QC Lot: 28 MAR 94-1F QC Run: 28 MAR 94-1F

Analyte	Result	Units	Reporting Limit
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Enseco

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)
034371-0001-SA	AQUEOUS	TKN-A	23 MAR 94-9L	23 MAR 94-9L
034371-0001-SA	AQUEOUS	TOC-A	23 MAR 94-1A	-
034371-0002-SA	AQUEOUS	TKN-A	23 MAR 94-9L	23 MAR 94-9L
034371-0002-SA	AQUEOUS	TOC-A	23 MAR 94-1A	-
034371-0003-SA	AQUEOUS	TKN-A	23 MAR 94-9L	23 MAR 94-9L
034371-0003-SA	AQUEOUS	TOC-A	23 MAR 94-1A	-
034371-0004-SA	AQUEOUS	TKN-A	23 MAR 94-9L	23 MAR 94-9L
034371-0004-SA	AQUEOUS	TOC-A	23 MAR 94-1A	-

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: TKN-A Matrix: AQUEOUS QC Lot: 23 MAR 94-9L Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	7.92	9.00	9.07	9.04	114	78-122	0.8	20
Category: TOC-A Matrix: AQUEOUS QC Lot: 23 MAR 94-1A Concentration Units: mg/L								
Total Organic Carbon	25.0	24.4	24.5	24.4	98	90-111	0.4	10

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

Enseco

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 23 MAR 94-9L QC Run: 23 MAR 94-9L			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

ANALYTICAL RESULTS

FOR

PHILIPS SEMICONDUCTORS

QUANTERRA'S DENVER LABORATORY NO. 037013

AUGUST 10, 1994

Reviewed by: _____
Anthony D. Palizzi

Enseco
4955 Yarrow Street
Arvada, Colorado 80002
303/421-6611 Fax: 303/431-7171

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:

- Sample Description Information
- Analytical Test Requests
- Analytical Results
- Quality Control Report

All analyses at Quanterra's Denver laboratory are performed so that the maximum concentration of sample consistent with the method is analyzed. Dilutions are at times required to avoid saturation of the detector, to achieve linearity for a specific target compound, or to reduce matrix interferences. In this event, reporting limits are adjusted proportionately. Surrogate compounds may not be measurable in samples which have been diluted.

There were no reportable anomalies with this project.

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 Quanterra's Denver laboratory 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.

Enseco

SAMPLE DESCRIPTION INFORMATION
for
Philips Semiconductors

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
037013-0001-SA	940701-Well#1	AQUEOUS	19 JUL 94	12:30	21 JUL 94
037013-0002-SA	940701-Well#2	AQUEOUS	19 JUL 94	14:50	21 JUL 94
037013-0003-SA	940701-Well#3	AQUEOUS	20 JUL 94	10:33	21 JUL 94
037013-0004-SA	940701-Well#4	AQUEOUS	20 JUL 94	08:43	21 JUL 94
037013-0005-TB	Trip Blank	AQUEOUS			21 JUL 94

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.

Enseco

ANALYTICAL TEST REQUESTS
for
Philips Semiconductors

Lab ID: 037013	Group Code	Analysis Description	Custom Test?
0001 - 0004	A	Total Kjeldahl Nitrogen (TKN)	N
		Total Organic Carbon (TOC)	N
		Halogenated Volatile Organics	N
0005	B	Halogenated Volatile Organics	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 date 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 Quanterra's Denver laboratory 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.

The results from Quanterra's Denver laboratory Standard QA/QC Program, which generates data which are independent of matrix effects, are provided subsequently.

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: 940701-Well#1
Lab ID: 037013-0001-SA
Matrix: AQUEOUS Sampled: 19 JUL 94 Received: 21 JUL 94
Authorized: 21 JUL 94 Prepared: NA Analyzed: 31 JUL 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	5.2	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	97	%

ND = Not detected
NA = Not applicable

Reported By: Mike Faught Approved By: Linnet Ohanlon

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: 940701-Well#2
Lab ID: 037013-0002-SA
Matrix: AQUEOUS Sampled: 19 JUL 94 Received: 21 JUL 94
Authorized: 21 JUL 94 Prepared: NA Analyzed: 31 JUL 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	6.5	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	93	%

ND = Not detected
NA = Not applicable

Reported By: Mike Faught Approved By: Linnet Ohanlon

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: 940701-Well#3
Lab ID: 037013-0003-SA
Matrix: AQUEOUS Sampled: 20 JUL 94 Received: 21 JUL 94
Authorized: 21 JUL 94 Prepared: NA Analyzed: 31 JUL 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	94	%

ND = Not detected
NA = Not applicable

Reported By: Mike Faught Approved By: Linnet Ohanlon

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: 940701-Well#4
Lab ID: 037013-0004-SA
Matrix: AQUEOUS Sampled: 20 JUL 94 Received: 21 JUL 94
Authorized: 21 JUL 94 Prepared: NA Analyzed: 31 JUL 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	3.8	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	101	%

ND = Not detected
NA = Not applicable

Reported By: Mike Faught Approved By: Linnet Ohanlon

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Trip Blank
Lab ID: 037013-0005-TB
Matrix: AQUEOUS Sampled: Unknown Received: 21 JUL 94
Authorized: 21 JUL 94 Prepared: NA Analyzed: 31 JUL 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	98	%

ND = Not detected
NA = Not applicable

Reported By: Mike Faught Approved By: Linnet Ohanlon

Enseco

General Inorganics

Client Name: Philips Semiconductors
Client ID: 940701-Well#1
Lab ID: 037013-0001-SA
Matrix: AQUEOUS Sampled: 19 JUL 94 Received: 21 JUL 94
Authorized: 21 JUL 94 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	03 AUG 94
Total Organic Carbon	1.0	mg/L	1.0	9060	NA	24 JUL 94

ND = Not detected
NA = Not applicable

Reported By: Eileen Burke Approved By: Linda Sullivan

Enseco

General Inorganics

Client Name: Philips Semiconductors
Client ID: 940701-Well#2
Lab ID: 037013-0002-SA
Matrix: AQUEOUS Sampled: 19 JUL 94 Received: 21 JUL 94
Authorized: 21 JUL 94 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	03 AUG 94
Total Organic Carbon	1.0	mg/L	1.0	9060	NA	24 JUL 94

ND = Not detected
NA = Not applicable

Reported By: Eileen Burke Approved By: Linda Sullivan

Enseco

General Inorganics

Client Name: Philips Semiconductors
Client ID: 940701-Well#3
Lab ID: 037013-0003-SA
Matrix: AQUEOUS Sampled: 20 JUL 94 Received: 21 JUL 94
Authorized: 21 JUL 94 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	03 AUG 94
Total Organic Carbon	ND	mg/L	1.0	9060	NA	24 JUL 94

ND = Not detected
NA = Not applicable

Reported By: Eileen Burke Approved By: Linda Sullivan

Enseco

General Inorganics

Client Name: Philips Semiconductors
Client ID: 940701-Well#4
Lab ID: 037013-0004-SA
Matrix: AQUEOUS
Authorized: 21 JUL 94

Sampled: 20 JUL 94
Prepared: See Below

Received: 21 JUL 94
Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	03 AUG 94
Total Organic Carbon	1.2	mg/L	1.0	9060	NA	24 JUL 94

ND = Not detected
NA = Not applicable

Reported By: Eileen Burke

Approved By: Linda Sullivan

Quality Control Report

Quanterra 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 Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

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.

Quanterra's Denver laboratory 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.

Enseco

QC LOT ASSIGNMENT REPORT
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
037013-0001-SA	AQUEOUS	601-A	31 JUL 94-F	31 JUL 94-F
037013-0002-SA	AQUEOUS	601-A	31 JUL 94-F	31 JUL 94-F
037013-0003-SA	AQUEOUS	601-A	31 JUL 94-F	31 JUL 94-F
037013-0004-SA	AQUEOUS	601-A	31 JUL 94-F	31 JUL 94-F
037013-0005-TB	AQUEOUS	601-A	31 JUL 94-F	31 JUL 94-F

Enseco

DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precisio (RPD) DCS	Limi
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 31 JUL 94-F								
Concentration Units: ug/L								
1,1-Dichloroethane	5.00	4.03	3.89	3.96	79	68-122	3.5	1
Chloroform	5.00	4.58	4.41	4.50	90	71-145	3.8	1
Bromodichloromethane	10.0	8.74	8.80	8.77	88	62-118	0.7	1
Trichloroethene	5.00	4.95	5.09	5.02	100	70-129	2.8	1
Chlorobenzene	5.00	4.66	4.60	4.63	93	62-115	1.3	1

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

Enseco

SINGLE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 31 JUL 94-F QC Run: 31 JUL 94-F				
Concentration Units: ug/L				
Bromochloromethane	5.00	4.95	99	50-144

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

Enseco

METHOD BLANK REPORT
Organics by Chromatography

Test: 601-A
Matrix: AQUEOUS
QC Lot: 31 JUL 94-F QC Run: 31 JUL 94-F

Analyte	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Test: 601-A
Matrix: AQUEOUS
QC Lot: 31 JUL 94-F QC Run: 31 JUL 94-F

Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50

METHOD BLANK REPORT
Organics by Chromatography (cont.)

Test: 601-A
Matrix: AQUEOUS
QC Lot: 31 JUL 94-F QC Run: 31 JUL 94-F

Analyte	Result	Units	Reporting Limit
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Enseco

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)
037013-0001-SA	AQUEOUS	TKN-A	01 AUG 94-1M	01 AUG 94-1M
037013-0001-SA	AQUEOUS	TOC-A	24 JUL 94-4B	-
037013-0002-SA	AQUEOUS	TKN-A	01 AUG 94-1M	01 AUG 94-1M
037013-0002-SA	AQUEOUS	TOC-A	24 JUL 94-4B	-
037013-0003-SA	AQUEOUS	TKN-A	01 AUG 94-1M	01 AUG 94-1M
037013-0003-SA	AQUEOUS	TOC-A	24 JUL 94-4C	-
037013-0004-SA	AQUEOUS	TKN-A	01 AUG 94-1M	01 AUG 94-1M
037013-0004-SA	AQUEOUS	TOC-A	24 JUL 94-4C	-

Enseco

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: TKN-A Matrix: AQUEOUS QC Lot: 01 AUG 94-1M Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	9.88	10.8	11.3	11.0	112	78-122	4.5	20
Category: TOC-A Matrix: AQUEOUS QC Lot: 24 JUL 94-4B Concentration Units: mg/L								
Total Organic Carbon	25.0	23.4	24.0	23.7	95	90-111	2.5	10
Category: TOC-A Matrix: AQUEOUS QC Lot: 24 JUL 94-4C Concentration Units: mg/L								
Total Organic Carbon	25.0	23.7	24.0	23.8	95	90-111	1.3	10

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

Enseco

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 01 AUG 94-1M QC Run: 01 AUG 94-1M			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Ground Water Well 1
Lab ID: 034371-0003-SA
Matrix: AQUEOUS Sampled: 16 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: NA Analyzed: 28 MAR 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	9.8	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	82	%

ND = Not detected
NA = Not applicable

Reported By: Vernon Yost Approved By: Audrey Verniero

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Ground Water Well 2
Lab ID: 034371-0004-SA
Matrix: AQUEOUS Sampled: 14 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: NA Analyzed: 28 MAR 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	9.0	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	86	%

ND = Not detected
NA = Not applicable

Reported By: Vernon Yost Approved By: Audrey Verniero

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Ground Water Well 3
Lab ID: 034371-0001-SA
Matrix: AQUEOUS Sampled: 18 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: NA Analyzed: 28 MAR 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	100	%

ND = Not detected
NA = Not applicable

Reported By: Vernon Yost Approved By: Audrey Verniero

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Ground Water Well 4
Lab ID: 034371-0002-SA
Matrix: AQUEOUS Sampled: 17 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: NA Analyzed: 28 MAR 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	5.4	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	95	%

ND = Not detected
NA = Not applicable

Reported By: Vernon Yost Approved By: Audrey Verniero

Enseco

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Trip Blank
Lab ID: 034371-0005-SA
Matrix: AQUEOUS Sampled: Unknown Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: NA Analyzed: 28 MAR 94

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2 Trichloro-1,2,2-trifluoroethane	ND	ug/L	1.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	90	%

ND = Not detected
NA = Not applicable

Reported By: Vernon Yost Approved By: Audrey Verniero

Enseco

General Inorganics

Client Name: Philips Semiconductors
Client ID: Ground Water Well 1
Lab ID: 034371-0003-SA
Matrix: AQUEOUS Sampled: 16 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	24 MAR 94
Total Organic Carbon	1.2	mg/L	1.0	9060	NA	23 MAR 94

ND = Not detected
NA = Not applicable

Reported By: John Land Approved By: Lavon Trujillo

Enseco

General Inorganics

Client Name: Philips Semiconductors
Client ID: Ground Water Well 2
Lab ID: 034371-0004-SA
Matrix: AQUEOUS Sampled: 14 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	24 MAR 94
Total Organic Carbon	1.3	mg/L	1.0	9060	NA	23 MAR 94

ND = Not detected
NA = Not applicable

Reported By: John Land Approved By: Lavon Trujillo

Enseco

General Inorganics

Client Name: Philips Semiconductors
Client ID: Ground Water Well 3
Lab ID: 034371-0001-SA
Matrix: AQUEOUS Sampled: 18 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	24 MAR 94
Total Organic Carbon	ND	mg/L	1.0	9060	NA	23 MAR 94

ND = Not detected
NA = Not applicable

Reported By: John Land Approved By: Lavon Trujillo

Enseco

General Inorganics

Client Name: Philips Semiconductors
Client ID: Ground Water Well 4
Lab ID: 034371-0002-SA
Matrix: AQUEOUS Sampled: 17 MAR 94 Received: 19 MAR 94
Authorized: 19 MAR 94 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	24 MAR 94
Total Organic Carbon	1.2	mg/L	1.0	9060	NA	23 MAR 94

ND = Not detected
NA = Not applicable

Reported By: John Land Approved By: Lavon Trujillo

Quanterra
Environmental Services

ANALYTICAL RESULTS
FOR
PHILIPS SEMICONDUCTORS
QUANTERRA ENVIRONMENTAL SERVICES
DENVER NO. 044223
SEPTEMBER 14, 1995

Reviewed by: Susan H. McCool

Susan H. McCool

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:

- Sample Description Information
- Analytical Test Requests
- Analytical Results
- 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 analyzed in conjunction with the samples in this project were within established control limits.

The Quanterra chain of custody does not have a signature or date for the "relinquished" information by the sampler.

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 Quanterra's Denver laboratory 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
Philips Semiconductors

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
044223-0001-SA	GROUND WATER WELL-2	AQUEOUS	22 AUG 95	12:30	25 AUG 95
044223-0002-SA	GROUND WATER WELL-3	AQUEOUS	23 AUG 95	14:00	25 AUG 95
044223-0003-SA	GROUND WATER WELL-4	AQUEOUS	23 AUG 95	09:30	25 AUG 95
044223-0004-TB	TRIP BLANK	AQUEOUS	23 AUG 95		25 AUG 95

ANALYTICAL TEST REQUESTS
for
Philips Semiconductors

Lab ID: 044223	Group Code	Analysis Description	Custom Test?
0001 - 0003	A	Total Kjeldahl Nitrogen (TKN)	N
		Total Organic Carbon (TOC)	N
		Halogenated Volatile Organics	N
0004	B	Halogenated Volatile Organics	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 Quanterra 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.

The results from the Standard Quanterra QA/QC Program, which generates data which are independent of matrix effects, are provided subsequently.

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER WELL-2
Lab ID: 044223-0001-SA
Matrix: AQUEOUS Sampled: 22 AUG 95 Received: 25 AUG 95
Authorized: 25 AUG 95 Prepared: NA Analyzed: 29 AUG 95

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-trichloro-1,2,2-trifluoroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	6.0	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	102	%

ND = Not detected
NA = Not applicable

Reported By: Tina Carroll Approved By: Linnet Ohanlon

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER WELL-3
Lab ID: 044223-0002-SA
Matrix: AQUEOUS Sampled: 23 AUG 95 Received: 25 AUG 95
Authorized: 25 AUG 95 Prepared: NA Analyzed: 29 AUG 95

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-trichloro-1,2,2-trifluoroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	106	%

ND = Not detected
NA = Not applicable

Reported By: Tina Carroll Approved By: Linnet Ohanlon

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: GROUND WATER WELL-4
Lab ID: 044223-0003-SA
Matrix: AQUEOUS Sampled: 23 AUG 95 Received: 25 AUG 95
Authorized: 25 AUG 95 Prepared: NA Analyzed: 29 AUG 95

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-trichloro-1,2,2-trifluoroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	4.1	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	100	%

ND = Not detected
NA = Not applicable

Reported By: Tina Carroll Approved By: Linnet Ohanlon

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: TRIP BLANK
Lab ID: 044223-0004-TB
Matrix: AQUEOUS Sampled: 23 AUG 95 Received: 25 AUG 95
Authorized: 25 AUG 95 Prepared: NA Analyzed: 29 AUG 95

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-trichloro-1,2,2-trifluoroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	110	%

ND = Not detected
NA = Not applicable

Reported By: Tina Carroll Approved By: Linnet Ohanlon

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER WELL-2
Lab ID: 044223-0001-SA
Matrix: AQUEOUS Sampled: 22 AUG 95 Received: 25 AUG 95
Authorized: 25 AUG 95 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	13 SEP 95
Total Organic Carbon	ND	mg/L	1.0	9060	NA	30 AUG 95

ND = Not detected
NA = Not applicable

Reported By: Todd Manes Approved By: Janice Collins

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER WELL-3
Lab ID: 044223-0002-SA
Matrix: AQUEOUS Sampled: 23 AUG 95 Received: 25 AUG 95
Authorized: 25 AUG 95 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	13 SEP 95
Total Organic Carbon	ND	mg/L	1.0	9060	NA	30 AUG 95

ND = Not detected
NA = Not applicable

Reported By: Todd Manes Approved By: Janice Collins

General Inorganics

Client Name: Philips Semiconductors
Client ID: GROUND WATER WELL-4
Lab ID: 044223-0003-SA
Matrix: AQUEOUS Sampled: 23 AUG 95 Received: 25 AUG 95
Authorized: 25 AUG 95 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	13 SEP 95
Total Organic Carbon	ND	mg/L	1.0	9060	NA	30 AUG 95

ND = Not detected
NA = Not applicable

Reported By: Todd Manes Approved By: Janice Collins

Quality Control Report

The Quanterra 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 Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

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 Quanterra 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
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
044223-0001-SA	AQUEOUS	601-A	29 AUG 95-F	29 AUG 95-F
044223-0002-SA	AQUEOUS	601-A	29 AUG 95-F	29 AUG 95-F
044223-0003-SA	AQUEOUS	601-A	29 AUG 95-F	29 AUG 95-F
044223-0004-TB	AQUEOUS	601-A	29 AUG 95-F	29 AUG 95-F

DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: 601-A								
Matrix: AQUEOUS								
QC Lot: 29 AUG 95-F								
Concentration Units: ug/L								
1,1-Dichloroethane	5.00	3.87	3.90	3.88	78	65-115	0.8	10
Chloroform	5.00	4.65	4.75	4.70	94	78-117	2.1	10
Bromodichloromethane	10.0	8.81	8.76	8.78	88	71-116	0.6	11
Trichloroethene	5.00	4.98	5.00	4.99	100	76-129	0.4	10
Chlorobenzene	5.00	4.44	4.50	4.47	89	70-122	1.3	10

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

SINGLE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 29 AUG 95-F QC Run: 29 AUG 95-F				
Concentration Units: ug/L				
Bromochloromethane	5.00	4.68	94	66-136

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

METHOD BLANK REPORT
Organics by Chromatography

Test: 8010-A
Matrix: AQUEOUS
QC Lot: 29 AUG 95-F QC Run: 29 AUG 95-F

Analyte	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-trichloro-1,2,2-trifluoroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Test: 8010-A
Matrix: AQUEOUS
QC Lot: 29 AUG 95-F QC Run: 29 AUG 95-F

Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50

METHOD BLANK REPORT
Organics by Chromatography (cont.)

Analyte	Result	Units	Reporting Limit
Test: 8010-A			
Matrix: AQUEOUS			
QC Lot: 29 AUG 95-F QC Run: 29 AUG 95-F			
1,1,2-trichloro-1,2,2-trifluoroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

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)
044223-0001-SA	AQUEOUS	TKN-A	12 SEP 95-4A	12 SEP 95-4A
044223-0001-SA	AQUEOUS	TOC-A	30 AUG 95-4B	-
044223-0002-SA	AQUEOUS	TKN-A	12 SEP 95-4A	12 SEP 95-4A
044223-0002-SA	AQUEOUS	TOC-A	30 AUG 95-4B	-
044223-0003-SA	AQUEOUS	TKN-A	12 SEP 95-4A	12 SEP 95-4A
044223-0003-SA	AQUEOUS	TOC-A	30 AUG 95-4B	-

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Limits	Precision (RPD) DCS	Precision Limit
Category: TKN-A Matrix: AQUEOUS QC Lot: 12 SEP 95-4A Concentration Units: mg/L								
Total Kjeldahl Nitrogen as N	4.76	4.70	4.42	4.56	96	90-110	6.1	16
Category: TOC-A Matrix: AQUEOUS QC Lot: 30 AUG 95-4B Concentration Units: mg/L								
Total Organic Carbon	25.0	26.6	26.8	26.7	107	90-113	0.8	10

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

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 12 SEP 95-4A QC Run: 12 SEP 95-4A			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

Quanterra
Environmental Services

ANALYTICAL RESULTS
FOR
PHILIPS SEMICONDUCTORS
QUANTERRA ENVIRONMENTAL SERVICES
DENVER NO. 046095
DECEMBER 18, 1995

Reviewed by: Susan H. McCool

Susan H. McCool

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:

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

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 Quanterra's Denver laboratory 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.

Quanterra
Environmental Services

SAMPLE DESCRIPTION INFORMATION
for
Philips Semiconductors

Lab ID	Client ID	Matrix	Sampled Date	Sampled Time	Received Date
046095-0001-SA	WELL #1	AQUEOUS	24 NOV 95	15:00	01 DEC 95
046095-0002-TB	Trip	AQUEOUS			01 DEC 95

Quanterra
Environmental Services

ANALYTICAL TEST REQUESTS
for
Philips Semiconductors

Lab ID: 046095	Group Code	Analysis Description	Custom Test?
0001 - 0002	A	Total Kjeldahl Nitrogen (TKN)	N
		Total Organic Carbon (TOC)	N
		Halogenated Volatile Organics	N

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Environmental Services

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 Quanterra 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.

The results from the Standard Quanterra QA/QC Program, which generates data which are independent of matrix effects, are provided subsequently.

Quanterra
Environmental Services

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: WELL #1
Lab ID: 046095-0001-SA
Matrix: AQUEOUS Sampled: 24 NOV 95 Received: 01 DEC 95
Authorized: 02 DEC 95 Prepared: NA Analyzed: 07 DEC 95

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-trichloro-1,2,2-trifluoroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	6.4	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	96	%

ND = Not detected
NA = Not applicable

Reported By: Steve Shurgot Approved By: Kristin Tollefson

Quanterra
Environmental Services

Halogenated Volatile Organics

Method 8010

Client Name: Philips Semiconductors
Client ID: Trip
Lab ID: 046095-0002-TB
Matrix: AQUEOUS Sampled: Unknown Received: 01 DEC 95
Authorized: 02 DEC 95 Prepared: NA Analyzed: 07 DEC 95

Parameter	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-trichloro-1,2,2-trifluoroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Surrogate	Recovery	
Bromochloromethane	104	%

ND = Not detected
NA = Not applicable

Reported By: Steve Shurgot Approved By: Kristin Tollefson

Quanterra
Environmental Services

General Inorganics

Client Name: Philips Semiconductors
Client ID: WELL #1
Lab ID: 046095-0001-SA
Matrix: AQUEOUS Sampled: 24 NOV 95 Received: 01 DEC 95
Authorized: 02 DEC 95 Prepared: See Below Analyzed: See Below

Parameter	Result	Units	Reporting Limit	Analytical Method	Prepared Date	Analyzed Date
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50	351.2	NA	13 DEC 95
Total Organic Carbon	1.9	mg/L	1.0	9060	NA	15 DEC 95

ND = Not detected
NA = Not applicable

Reported By: Judy Lange Approved By: Roxanne Sullivan

Quanterra
Environmental Services

Quality Control Report

The Quanterra 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 Control Samples to assess the precision and accuracy of the methodology on a routine basis, and a rigorous system of data review.

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 Quanterra 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.

Quanterra
Environmental Services

QC LOT ASSIGNMENT REPORT
Organics by Chromatography

Laboratory Sample Number	QC Matrix	QC Category	QC Lot Number (DCS)	QC Run Number (SCS/BLANK)
046095-0001-SA	AQUEOUS	601-A	07 DEC 95-F1	07 DEC 95-F1
046095-0002-TB	AQUEOUS	601-A	07 DEC 95-F1	07 DEC 95-F1

Quanterra
Environmental Services

DUPLICATE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precis (RPD) DCS Li
Category: 601-A							
Matrix: AQUEOUS							
QC Lot: 07 DEC 95-F1							
Concentration Units: ug/L							
1,1-Dichloroethane	5.00	4.94	4.83	4.88	98	65-115	2.3
Chloroform	5.00	5.02	4.92	4.97	99	78-117	2.0
Bromodichloromethane	10.0	9.48	9.57	9.52	95	71-116	0.9
Trichloroethene	5.00	5.54	5.63	5.58	112	76-129	1.6
Chlorobenzene	5.00	4.50	4.77	4.64	93	70-122	5.8

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

Quanterra
Environmental Services

SINGLE CONTROL SAMPLE REPORT
Organics by Chromatography

Analyte	Concentration Spiked	Concentration Measured	Accuracy(%) SCS	Accuracy(%) Limits
Category: 601-A				
Matrix: AQUEOUS				
QC Lot: 07 DEC 95-F1 QC Run: 07 DEC 95-F1				
Concentration Units: ug/L				
Bromochloromethane	5.00	4.88	98	66-136

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

Quanterra
Environmental Services

METHOD BLANK REPORT
Organics by Chromatography

Test: 8010-A
Matrix: AQUEOUS
QC Lot: 07 DEC 95-F1 QC Run: 07 DEC 95-F1

Analyte	Result	Units	Reporting Limit
Chloromethane	ND	ug/L	5.0
Bromomethane	ND	ug/L	5.0
Vinyl chloride	ND	ug/L	1.0
Chloroethane	ND	ug/L	5.0
Methylene chloride	ND	ug/L	5.0
1,1-Dichloroethene	ND	ug/L	0.50
1,1-Dichloroethane	ND	ug/L	0.50
trans-1,2-Dichloroethene	ND	ug/L	0.50
Chloroform	ND	ug/L	0.50
1,1,2-trichloro-1,2,2-trifluoroethane	ND	ug/L	5.0
1,2-Dichloroethane	ND	ug/L	1.0
1,1,1-Trichloroethane	ND	ug/L	0.50
Carbon tetrachloride	ND	ug/L	0.50
Bromodichloromethane	ND	ug/L	1.0
1,2-Dichloropropane	ND	ug/L	1.0
trans-1,3-Dichloropropene	ND	ug/L	1.0
Trichloroethene	ND	ug/L	0.50
Dibromochloromethane	ND	ug/L	1.0
cis-1,3-Dichloropropene	ND	ug/L	2.0
1,1,2-Trichloroethane	ND	ug/L	1.0
EDB (1,2-Dibromoethane)	ND	ug/L	2.0
Bromoform	ND	ug/L	5.0
1,1,2,2-Tetrachloroethane	ND	ug/L	1.0
Tetrachloroethene	ND	ug/L	0.50
Chlorobenzene	ND	ug/L	2.0

Quanterra
Environmental Services

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)
046095-0001-SA	AQUEOUS	TKN-A	11 DEC 95-N1	11 DEC 95-N1
046095-0001-SA	AQUEOUS	TOC-A	15 DEC 95-N1	-

Quanterra
Environmental Services

DUPLICATE CONTROL SAMPLE REPORT
Wet Chemistry Analysis and Preparation

Analyte	Concentration Spiked	Measured DCS1	Measured DCS2	Measured AVG	Accuracy Average(%) DCS	Accuracy Average(%) Limits	Precisi (RPD) DCS Lim
Category: TKN-A Matrix: AQUEOUS QC Lot: 11 DEC 95-N1 Concentration Units: mg/L							
Total Kjeldahl Nitrogen as N	3.50	3.79	3.50	3.64	104	90-110	8.0
Category: TOC-A Matrix: AQUEOUS QC Lot: 15 DEC 95-N1 Concentration Units: mg/L							
Total Organic Carbon	25.0	24.1	23.9	24.0	96	90-113	0.9

Calculations are performed before rounding to avoid round-off errors in calculated re ts

Quanterra
Environmental Services

METHOD BLANK REPORT
Wet Chemistry Analysis and Preparation

Analyte	Result	Units	Reporting Limit
Test: TKN-TEC-A			
Matrix: AQUEOUS			
QC Lot: 11 DEC 95-N1 QC Run: 11 DEC 95-N1			
Total Kjeldahl Nitrogen as N	ND	mg/L	0.50

Philips Semiconductors
9201 Pan American Fwy NE
Albuquerque, NM 87113

Philips Semiconductors
Environmental Health and Safety Department
Sampling and Analytical Record

Page 1 of 1

PROJECT NAME OR NUMBER: 951104-6 SAMPLED BY: Dave Paulson DATE: 11-29-95 DISTRIBUTION TO: _____ MAIL STOP: _____

SAMPLE CODE:
- __ WW
- ✓ GW
- __ WC
- __ _____

SAMPLING DEVICE:
- __ PLUNGE BOTTLE
- __ KECK PUMP
- __ _____

SAMPLE TYPE:
- ✓ GRAB
- __ COMPOSITE
- __ _____

INITIATOR:
- ✓ ROUTINE
- __ INSPECTION
- __ DISPOSAL
- __ _____

QDL#46095

FIELD I.D.	LAB I.D.	DATE	TIME	LOCATION	# CONTAINER	PRESERVATIVES	ANALYSIS REQUESTED		
951105		11-24-95	3:00pm	well #1	1		TKN		-01
951104			↓	well #1	1		TOC		↓
951106				well #1	3-40ml		VOA		
951107				Trip	3-40ml		Trip		-02TB

COMMENTS: last well sample - Complete project number (QuanTerra) 044223

SKETCH: Ground water Samples

RELINQUISHED BY:
NAME: [signature] DATE: 11-29-95 TIME: 3:40pm

ACCEPTED BY:
LABORATORY: [signature] DATE: 12-1-95 TIME: 16:00