1R - 322

GENERAL CORRESPONDENCE

YEAR(S):

2001

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON
Governor
Jennifer A. Salisbury
Cabinet Secretary

Lori Wrotenbery
Director
Oil Conservation Division

August 10, 2001

Mr. Charles Oldaker
P.O. Box 1274
Hobbs, New Mexico 88240

RE: WATER WELL SAMPLE ANALYSES

Dear Mr. Oldaker:

Enclosed you will find a copy of the laboratory analytical results of the water samples that the New Mexico Oil Conservation Division (OCD) obtained from your water well in Hobbs, New Mexico on March 20, 2001. The sample analyses did not detect any petroleum hydrocarbon contaminants in your well water. However, total dissolved solids (TDS) were found to be 1100 mg/l which is slightly above the New Mexico Water Quality Control Commission (WQCC) drinking water standard of 1000 mg/l, the fluoride concentrations were 2.0 mg/l which is in excess of the WQCC drinking water standard of 1.6 mg/l and the nitrates were 8.9 mg/l which is elevated over natural ground water concentrations but below the WQCC standard of 10 mg/l. In addition, low levels of tetrachloroethene, a chlorinated solvent, was found to be present at a concentration of 2.24 mg/l which is below the WQCC standard of 20 mg/l.

Nitrate contamination is commonly associated with wastes from household septic tanks. Due to the elevated nature of the nitrates, it is possible that the TDS and tetrachloroethene contamination are also a result of septic tank contamination. To date the OCD has not found tetrachloroethene associated with contamination from oil and gas production sites. Elevated levels of fluoride are also naturally present in ground water in the southeastern New Mexico. Please contact the New Mexico Environment Department if you have questions regarding nitrates, tetrachloroethene and fluoride in ground water as these constituents are not related to oilfield activities.

At the time of OCD's sampling, you stated that this well water is not used for drinking water. Since some of these constituents are in excess of WQCC standards, the OCD recommends that you do not use this well as a source of drinking water.

If you have any questions regarding the laboratory analyses of your water, please feel free to call me at (505) 476-3491.

Sincerely,

William C. Olson
Hydrologist
Environmental Bureau

Enclosure

cc w/enclosure: Chris Williams, OCD Hobbs District Supervisor
Dennis McQuillan, NMED Ground Water Quality Bureau

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
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E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Bill Olson
OCD
1220 S. Saint Francis Dr.
Santa Fe, NM 87504

Report Date: April 4, 2001

Order ID Number: A01032215

Project Number: N/A
Project Name: Charles Oldaker
Project Location: Water Well

Enclosed are the Analytical Results and Quality Control Data Reports for the following samples submitted to Trace-Analysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
167358	0103201440	Water	3/20/01	14:40	3/22/01

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 13 pages and shall not be reproduced except in its entirety including the chain of custody (COC), without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

Cation-Anion Balance Sheet

Sample # 167358 Date: 4/12/01 MA

Cations	ppm	meq/L
Calcium	196	9.7804
Magnesium	38.5	3.168165
Sodium	178	7.743
Potassium	8.4	0.214872

Total Cations
20.9064 in meq/L

Anions	ppm	meq/L
Alkalinity	312	6.24
Sulfate	300	6.246
Chloride	220	6.2062
Nitrate as N	8.9	0.635371
Fluoride	2	0.10528

Total Anions
19.4329 in meq/L

Percentage Error
7.30596 %
(needs to be <10%)

OTHER INFORMATION

TDS	1100
EC	1800

Measure EC and Cation Sums	2090.6437	Range should be:	1620	to	1980
Measure EC and Anion Sums	1943.2851	Range should be:	1620	to	1980
Calculated TDS/Conductivity	0.6111111	Range should be:	0.55	to	0.77
Measure TDS and Cation Sums	0.5261537	Range should be:	0.55	to	0.77
Measure TDS and Anion Sums	0.5660518	Range should be:	0.55	to	0.77

Analytical Report

Sample: 167358 - 0103201440

Analysis:	8260	Analytical Method:	S 8260B	QC Batch:	QC10004	Date Analyzed:	3/25/01
Analyst:	JG	Preparation Method:	E 5030B	Prep Batch:	PB08593	Date Prepared:	3/25/01

Param	Flag	Result	Units	Dilution	RDL
Bromochloromethane		<1.00	µg/L	1	1
Dichlorodifluoromethane		<1.00	µg/L	1	1
Chloromethane (methyl chloride)		<1.00	µg/L	1	1
Vinyl Chloride		<1.00	µg/L	1	1
Bromomethane (methyl bromide)		<1.00	µg/L	1	1
Chloroethane		<1.00	µg/L	1	1
Trichlorofluoromethane		<1.00	µg/L	1	1
Acetone		<10.0	µg/L	1	10
Iodomethane (methyl iodide)		<1.00	µg/L	1	1
Carbon Disulfide		<1.00	µg/L	1	1
Acrylonitrile		<1.00	µg/L	1	1
2-Butanone (MEK)		<5.00	µg/L	1	5
4-methyl-2-pentanone (MIBK)		<5.00	µg/L	1	5
2-hexanone		<5.00	µg/L	1	5
trans 1,4-Dichloro-2-butene		<10.0	µg/L	1	10
1,1-Dichloroethene		<1.00	µg/L	1	1
Methylene chloride		<5.00	µg/L	1	5
MTBE		<1.00	µg/L	1	1
trans-1,2-Dichloroethene		<1.00	µg/L	1	1
1,1-Dichloroethane		<1.00	µg/L	1	1
cis-1,2-Dichloroethene		<1.00	µg/L	1	1
2,2-Dichloropropane		<1.00	µg/L	1	1
1,2-Dichloroethane (EDC)		<1.00	µg/L	1	1
Chloroform		<1.00	µg/L	1	1
1,1,1-Trichloroethane		<1.00	µg/L	1	1
1,1-Dichloropropene		<1.00	µg/L	1	1
Benzene		<1.00	µg/L	1	1
Carbon Tetrachloride		<1.00	µg/L	1	1
1,2-Dichloropropane		<1.00	µg/L	1	1
Trichloroethene (TCE)		<1.00	µg/L	1	1
Dibromomethane (methylene bromide)		<1.00	µg/L	1	1
Bromodichloromethane		<1.00	µg/L	1	1
2-Chloroethyl vinyl ether		<5.00	µg/L	1	5
cis-1,3-Dichloropropene		<1.00	µg/L	1	1
trans-1,3-Dichloropropene		<1.00	µg/L	1	1
Toluene		<1.00	µg/L	1	1
1,1,2-Trichloroethane		<1.00	µg/L	1	1
1,3-Dichloropropane		<1.00	µg/L	1	1
Dibromochloromethane		<1.00	µg/L	1	1
1,2-Dibromoethane (EDB)		<1.00	µg/L	1	1
Tetrachloroethene (PCE)		2.24	µg/L	1	1
Chlorobenzene		<1.00	µg/L	1	1
1,1,1,2-Tetrachloroethane		<1.00	µg/L	1	1
Ethylbenzene		<1.00	µg/L	1	1
m,p-Xylene		<1.00	µg/L	1	1
Bromoform		<1.00	µg/L	1	1
Styrene		<1.00	µg/L	1	1
o-Xylene		<1.00	µg/L	1	1

Continued ...

... *Continued* Sample: 167358 Analysis: 8260

Param	Flag	Result	Units	Dilution	RDL
1,1,2,2-Tetrachloroethane		<1.00	µg/L	1	1
2-Chlorotoluene		<1.00	µg/L	1	1
1,2,3-Trichloropropane		<1.00	µg/L	1	1
Isopropylbenzene		<1.00	µg/L	1	1
Bromobenzene		<1.00	µg/L	1	1
n-Propylbenzene		<1.00	µg/L	1	1
1,3,5-Trimethylbenzene		<1.00	µg/L	1	1
tert-Butylbenzene		<1.00	µg/L	1	1
1,2,4-Trimethylbenzene		<1.00	µg/L	1	1
1,4-Dichlorobenzene (para)		<1.00	µg/L	1	1
sec-Butylbenzene		<1.00	µg/L	1	1
1,3-Dichlorobenzene		<1.00	µg/L	1	1
p-Isopropyltoluene		<1.00	µg/L	1	1
4-Chlorotoluene		<1.00	µg/L	1	1
1,2-Dichlorobenzene (ortho)		<1.00	µg/L	1	1
n-Butylbenzene		<1.00	µg/L	1	1
1,2-Dibromo-3-chloropropane		<5.00	µg/L	1	5
1,2,3-Trichlorobenzene		<5.00	µg/L	1	5
1,2,4-Trichlorobenzene		<5.00	µg/L	1	5
Naphthalene		<5.00	µg/L	1	5
Hexachlorobutadiene		<5.00	µg/L	1	5

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Dibromofluoromethane		48.99	µg/L	1	50	97	89 - 110
Toluene-d8		50.37	µg/L	1	50	100	95 - 107
4-Bromofluorobenzene		43.56	µg/L	1	50	87	81 - 105

Sample: 167358 - 0103201440

Analysis: Alkalinity Analytical Method: E 310.1 QC Batch: QC10095 Date Analyzed: 3/29/01
Analyst: RS Preparation Method: N/A Prep Batch: PB08682 Date Prepared: 3/29/01

Param	Flag	Result	Units	Dilution	RDL
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1	1
Bicarbonate Alkalinity		312	mg/L as CaCo3	1	1
Total Alkalinity		312	mg/L as CaCo3	1	1

Sample: 167358 - 0103201440

Analysis: Conductivity Analytical Method: SM 2510B QC Batch: QC10021 Date Analyzed: 3/27/01
Analyst: JS Preparation Method: N/A Prep Batch: PB08610 Date Prepared: 3/27/01

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		1800	µMHOS/cm	1	

Sample: 167358 - 0103201440

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC09959 Date Analyzed: 3/22/01
Analyst: JS Preparation Method: N/A Prep Batch: PB08556 Date Prepared: 3/22/01

Param	Flag	Result	Units	Dilution	RDL
CL		220	mg/L	5	0.50
Fluoride		2.0	mg/L	5	0.20
Sulfate		300	mg/L	10	0.50

Sample: 167358 - 0103201440

Analysis:	NO3	Analytical Method:	SM 4500-NO3 E	QC Batch:	QC10171	Date Analyzed:	4/2/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB08744	Date Prepared:	4/2/01

Param	Flag	Result	Units	Dilution	RDL
NO3-NO2-N		8.9	mg/L	50	0.10

Sample: 167358 - 0103201440

Analysis:	Salts	Analytical Method:	E 200.7	QC Batch:	QC10033	Date Analyzed:	3/27/01
Analyst:	LDB	Preparation Method:	E 3005 A	Prep Batch:	PB08572	Date Prepared:	3/27/01

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		196	mg/L	1	5
Dissolved Magnesium		38.5	mg/L	1	5
Dissolved Potassium		8.4	mg/L	1	5
Dissolved Sodium		178	mg/L	1	5

Sample: 167358 - 0103201440

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC10043	Date Analyzed:	3/27/01
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB08634	Date Prepared:	3/27/01

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		1100	mg/L	2	10

Sample: 167358 - 0103201440

Analysis:	TKN	Analytical Method:	E 351.3	QC Batch:	QC10029	Date Analyzed:	3/27/01
Analyst:	CG	Preparation Method:	N/A	Prep Batch:	PB08618	Date Prepared:	3/27/01

Param	Flag	Result	Units	Dilution	RDL
Total Kjeldahl Nitrogen - N		<4.0	mg/L	1	12.50

Sample: 167358 - 0103201440

Analysis:	pH	Analytical Method:	E 150.1	QC Batch:	QC10059	Date Analyzed:	3/22/01
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB08643	Date Prepared:	3/22/01

Param	Flag	Result	Units	Dilution	RDL
pH	[1]	7.5	s.u.	1	1

[1] Sample run out of holding time

Quality Control Report
Method Blank

Method Blank

QCBatch: QC09959

Param	Flag	Results	Units	Reporting Limit
CL		<0.5	mg/L	0.50
Fluoride		<0.2	mg/L	0.20
Sulfate		<0.5	mg/L	0.50

Method Blank

QCBatch: QC10004

Param	Flag	Results	Units	Reporting Limit
Bromochloromethane		<1.00	µg/L	1
Dichlorodifluoromethane		<1.00	µg/L	1
Chloromethane (methyl chloride)		<1.00	µg/L	1
Vinyl Chloride		<1.00	µg/L	1
Bromomethane (methyl bromide)		<1.00	µg/L	1
Chloroethane		<1.00	µg/L	1
Trichlorofluoromethane		<1.00	µg/L	1
Acetone		<10.0	µg/L	10
Iodomethane (methyl iodide)		<1.00	µg/L	1
Carbon Disulfide		<1.00	µg/L	1
Acrylonitrile		<1.00	µg/L	1
2-Butanone (MEK)		<5.00	µg/L	5
4-methyl-2-pentanone (MIBK)		<5.00	µg/L	5
2-hexanone		<5.00	µg/L	5
trans 1,4-Dichloro-2-butene		<10.0	µg/L	10
1,1-Dichloroethene		<1.00	µg/L	1
Methylene chloride		<5.00	µg/L	5
MTBE		<1.00	µg/L	1
trans-1,2-Dichloroethene		<1.00	µg/L	1
1,1-Dichloroethane		<1.00	µg/L	1
cis-1,2-Dichloroethene		<1.00	µg/L	1
2,2-Dichloropropane		<1.00	µg/L	1
1,2-Dichloroethane (EDC)		<1.00	µg/L	1
Chloroform		<1.00	µg/L	1
1,1,1-Trichloroethane		<1.00	µg/L	1
1,1-Dichloropropene		<1.00	µg/L	1
Benzene		<1.00	µg/L	1
Carbon Tetrachloride		<1.00	µg/L	1
1,2-Dichloropropane		<1.00	µg/L	1
Trichloroethene (TCE)		<1.00	µg/L	1
Dibromomethane (methylene bromide)		<1.00	µg/L	1
Bromodichloromethane		<1.00	µg/L	1
2-Chloroethyl vinyl ether		<5.00	µg/L	5
cis-1,3-Dichloropropene		<1.00	µg/L	1
trans-1,3-Dichloropropene		<1.00	µg/L	1
Toluene		<1.00	µg/L	1
1,1,2-Trichloroethane		<1.00	µg/L	1

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Param	Flag	Results	Units	Reporting Limit
1,3-Dichloropropane		<1.00	µg/L	1
Dibromochloromethane		<1.00	µg/L	1
1,2-Dibromoethane (EDB)		<1.00	µg/L	1
Tetrachloroethene (PCE)		<1.00	µg/L	1
Chlorobenzene		<1.00	µg/L	1
1,1,1,2-Tetrachloroethane		<1.00	µg/L	1
Ethylbenzene		<1.00	µg/L	1
m,p-Xylene		<1.00	µg/L	1
Bromoform		<1.00	µg/L	1
Styrene		<1.00	µg/L	1
o-Xylene		<1.00	µg/L	1
1,1,2,2-Tetrachloroethane		<1.00	µg/L	1
2-Chlorotoluene		<1.00	µg/L	1
1,2,3-Trichloropropane		<1.00	µg/L	1
Isopropylbenzene		<1.00	µg/L	1
Bromobenzene		<1.00	µg/L	1
n-Propylbenzene		<1.00	µg/L	1
1,3,5-Trimethylbenzene		<1.00	µg/L	1
tert-Butylbenzene		<1.00	µg/L	1
1,2,4-Trimethylbenzene		<1.00	µg/L	1
1,4-Dichlorobenzene (para)		<1.00	µg/L	1
sec-Butylbenzene		<1.00	µg/L	1
1,3-Dichlorobenzene		<1.00	µg/L	1
p-Isopropyltoluene		<1.00	µg/L	1
4-Chlorotoluene		<1.00	µg/L	1
1,2-Dichlorobenzene (ortho)		<1.00	µg/L	1
n-Butylbenzene		<1.00	µg/L	1
1,2-Dibromo-3-chloropropane		<5.00	µg/L	5
1,2,3-Trichlorobenzene		<5.00	µg/L	5
1,2,4-Trichlorobenzene		<5.00	µg/L	5
Naphthalene		<5.00	µg/L	5
Hexachlorobutadiene		<5.00	µg/L	5

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
Dibromofluoromethane		45.05	µg/L	1	50	90	89 - 110
Toluene-d8		50.25	µg/L	1	50	100	95 - 107
4-Bromofluorobenzene		42.28	µg/L	1	50	84	81 - 105

Method Blank

QCBatch: QC10021

Param	Flag	Results	Units	Reporting Limit
Specific Conductance		7.3	µMHOS/cm	

Method Blank

QCBatch: QC10029

Param	Flag	Results	Units	Reporting Limit
Total Kjeldahl Nitrogen - N		<4.0	mg/L	12.50

Method Blank

QCBatch: QC10033

Param	Flag	Results	Units	Reporting Limit
Dissolved Calcium		<5.0	mg/L	5
Dissolved Magnesium		<5.0	mg/L	5
Dissolved Potassium		<5.0	mg/L	5
Dissolved Sodium		<5.0	mg/L	5

Method Blank

QCBatch: QC10043

Param	Flag	Results	Units	Reporting Limit
Total Dissolved Solids		<10	mg/L	10

Method Blank

QCBatch: QC10095

Param	Flag	Results	Units	Reporting Limit
Hydroxide Alkalinity		<1.0	mg/L as CaCo3	1
Carbonate Alkalinity		<1.0	mg/L as CaCo3	1
Bicarbonate Alkalinity		<4.0	mg/L as CaCo3	1
Total Alkalinity		<4.0	mg/L as CaCo3	1

Method Blank

QCBatch: QC10171

Param	Flag	Results	Units	Reporting Limit
NO3-NO2-N		<0.10	mg/L	0.10

Quality Control Report
Duplicate Samples

Duplicate

QCBatch: QC10021

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Specific Conductance		1462	1500	µMHOS/cm	1	2	4.6

Duplicate

QCBatch: QC10043

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids		2714	2700	mg/L	1	0	20

Duplicate

QCBatch: QC10059

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
pH		7.8	7.8	s.u.	1	0	0.99

Duplicate

QCBatch: QC10095

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Hydroxide Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	7
Carbonate Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	7
Bicarbonate Alkalinity		224	220	mg/L as CaCo3	1	1	7
Total Alkalinity		224	220	mg/L as CaCo3	1	1	7

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC09959

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
CL	11.57	11.59	mg/L	1	12.50	<0.5	92	0	90 - 110	20
Fluoride	2.33	2.35	mg/L	1	2.50	<0.2	93	0	90 - 110	20
Nitrate-N	2.38	2.38	mg/L	1	2.50	<0.2	95	0	90 - 110	20
Sulfate	11.74	11.79	mg/L	1	12.50	<0.5	93	0	90 - 110	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes

QCBatch: QC10004

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
1,1-Dichloroethene	102	109	µg/L	1	100	<1.00	102	6	71 - 132	20
Benzene	101	104	µg/L	1	100	<1.00	101	2	81 - 114	20
Trichloroethene (TCE)	90	92	µg/L	1	100	<1.00	90	2	79 - 111	20
Toluene	99	102	µg/L	1	100	<1.00	99	2	81 - 110	20
Chlorobenzene	96	99	µg/L	1	100	<1.00	96	3	88 - 112	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
Dibromofluoromethane	46.34	46.45	µg/L	1	50	92	92	89 - 110

Continued . . .

Surrogate	LCS Result	LCSD Result	Units	Dilution	Spike Amount	LCS % Rec	LCSD % Rec	Recovery Limits
Toluene-d8	50.16	50.33	µg/L	1	50	100	100	95 - 107
4-Bromofluorobenzene	44.75	44.37	µg/L	1	50	89	88	81 - 105

Laboratory Control Spikes

QCBatch: QC10029

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Kjeldahl Nitrogen - N	48.2	49.0	mg/L	1	50	<4.0	96	1	85 - 115	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes

QCBatch: QC10033

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Dissolved Calcium	1093	1106	mg/L	1	1000	<5.0	109	1	75 - 125	20
Dissolved Magnesium	1055	1074	mg/L	1	1000	<5.0	105	1	75 - 125	20
Dissolved Potassium	1011	1026	mg/L	1	1000	<5.0	101	1	75 - 125	20
Dissolved Sodium	1067	1084	mg/L	1	1000	<5.0	106	1	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Laboratory Control Spikes

QCBatch: QC10171

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
NO3-NO2-N	0.139	0.168	mg/L	1	0.16	<0.10	86	18	85 - 115	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Quality Control Report
Matrix Spikes and Duplicate Spikes

Matrix Spikes

QCBatch: QC09959

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
CL	[2] 828.65	838.5	mg/L	1	625	240	94	1	52 - 131	20
Fluoride	131.50	125.33	mg/L	1	125	13	94	5	80 - 113	20
Sulfate	2145.62	2158.31	mg/L	1	625	1600	87	2	71 - 121	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

QCBatch: QC10029

[2] I spiked the *50 dilution for 167359, but reported the *10 dilution. The correct %EA = 89.

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Kjeldahl Nitrogen - N	50.4	[3] 35.6	mg/L	1	50		100	34	57 - 131	20
Total Kjeldahl Nitrogen - N	50.4	[4] 35.6	mg/L	1	50	<4.0	100	34	57 - 131	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

QCBatch: QC10033

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Dissolved Calcium	1190	1306	mg/L	1	1000	190	100	10	75 - 125	20
Dissolved Magnesium	1288	1406	mg/L	1	1000	322	96	11	75 - 125	20
Dissolved Potassium	1000	1086	mg/L	1	1000	41.1	95	8	75 - 125	20
Dissolved Sodium	1260	1346	mg/L	1	1000	326	93	8	75 - 125	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Matrix Spikes

QCBatch: QC10171

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
NO3-NO2-N	0.158	0.170	mg/L	1	0.16	<0.10	98	7	53 - 150	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Quality Control Report
Continuing Calibration Verification Standards

CCV (1)

QCBatch: QC09959

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.27	90	90 - 110	3/22/01
CL		mg/L	12.50	11.69	93	90 - 110	3/22/01
Fluoride		mg/L	2.50	2.36	94	90 - 110	3/22/01
Nitrate-N		mg/L	2.50	2.38	95	90 - 110	3/22/01
Sulfate		mg/L	12.50	11.95	95	90 - 110	3/22/01

ICV (1)

QCBatch: QC09959

[3]RPD on MS/MSD too high. LCS/LCSD show that the method was in control. Data flagged.
[4]RPD on MS/MSD too high. LCS/LCSD show that the method was in control. Data flagged.

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Bromide		mg/L	2.50	2.33	93	90 - 110	3/22/01
CL		mg/L	12.50	11.57	92	90 - 110	3/22/01
Fluoride		mg/L	2.50	2.41	96	90 - 110	3/22/01
Nitrate-N		mg/L	2.50	2.38	95	90 - 110	3/22/01
Sulfate		mg/L	12.50	11.81	94	90 - 110	3/22/01

CCV (1) QCBatch: QC10004

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Vinyl Chloride		µg/L	100	103	103	-	3/25/01
1,1-Dichloroethene		µg/L	100	114	114	80 - 120	3/25/01
Chloroform		µg/L	100	99	99	-	3/25/01
1,2-Dichloropropane		µg/L	100	102	102	-	3/25/01
Toluene		µg/L	100	100	100	80 - 120	3/25/01
Chlorobenzene		µg/L	100	99	99	80 - 120	3/25/01
Ethylbenzene		µg/L	100	98	98	-	3/25/01
Dibromofluoromethane		µg/L	50	45.99	91	80 - 120	3/25/01
Toluene-d8		µg/L	50	49.96	99	80 - 120	3/25/01
4-Bromofluorobenzene		µg/L	50	48.84	97	80 - 120	3/25/01

CCV (1) QCBatch: QC10021

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Specific Conductance		µMHOS/cm	1413	1370	96	90 - 110	3/27/01

ICV (1) QCBatch: QC10021

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Specific Conductance		µMHOS/cm	1413	1387	98	90 - 110	3/27/01

CCV (1) QCBatch: QC10029

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Kjeldahl Nitrogen - N		mg/L	5	4.48	89	80 - 120	3/27/01

ICV (1) QCBatch: QC10029

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Kjeldahl Nitrogen - N		mg/L	5	4.65	93	80 - 120	3/27/01

CCV (1) QCBatch: QC10033

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	25	27.1	108	75 - 125	3/27/01
Dissolved Magnesium		mg/L	25	25.4	101	75 - 125	3/27/01
Dissolved Potassium		mg/L	25	23.4	93	75 - 125	3/27/01
Dissolved Sodium		mg/L	25	25.0	100	75 - 125	3/27/01

ICV (1) QCBatch: QC10033

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	25	25.8	103	75 - 125	3/27/01
Dissolved Magnesium		mg/L	25	25.6	102	75 - 125	3/27/01
Dissolved Potassium		mg/L	25	23.8	95	75 - 125	3/27/01
Dissolved Sodium		mg/L	25	24.9	99	75 - 125	3/27/01

CCV (1) QCBatch: QC10043

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	919	91	90 - 110	3/27/01

ICV (1) QCBatch: QC10043

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	915	91	90 - 110	3/27/01

CCV (1) QCBatch: QC10059

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		s.u.	7	7.1	101	-0.1 s.u. - +0.1 s.u.	3/22/01

ICV (1) QCBatch: QC10059

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		s.u.	7	7.1	101	-0.1 s.u. - +0.1 s.u.	3/22/01

CCV (1) QCBatch: QC10095

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	<1.0	0	90 - 110	3/29/01
Carbonate Alkalinity		mg/L as CaCo3	0	228	0	90 - 110	3/29/01
Bicarbonate Alkalinity		mg/L as CaCo3	0	8.0	0	90 - 110	3/29/01
Total Alkalinity		mg/L as CaCo3	250	236	94	90 - 110	3/29/01

ICV (1) QCBatch: QC10095

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	<1.0	0	90 - 110	3/29/01
Carbonate Alkalinity		mg/L as CaCo3	0	232	0	90 - 110	3/29/01
Bicarbonate Alkalinity		mg/L as CaCo3	0	8.0	0	90 - 110	3/29/01
Total Alkalinity		mg/L as CaCo3	250	240	96	90 - 110	3/29/01

CCV (1) QCBatch: QC10171

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
NO3-NO2-N		mg/L	0.16	0.173	108	85 - 115	4/2/01

ICV (1) QCBatch: QC10171

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
NO3-NO2-N		mg/L	0.16	0.181	113	85 - 115	4/2/01

167358

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6701 Aberdeen Avenue, Ste. 9
Lubbock, Texas 79424
Tel (806) 794-1296
Fax (806) 794-1298
1 (800) 378-1296

TraceAnalysis, Inc.

4725 Ripley Dr., Ste A
El Paso, Texas 79922-1028
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # A0103205

Company Name: NM Oil Conservation Division
Phone #: (505) 476-3491
Address: (Street, City, Zip) 1220 St. Francis Dr., Santa Fe, NM 87505
Fax #: (505) 476-3462
Contact Person: Bill Olson
Invoice to: (If different from above)
Project #:
Project Name: Charles Oldaker
Project Location: Water Well
Sampler Signature: Bill Olson

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE	PRESERVATIVE METHOD: HCL	HNO3	NaHSO4	H2SO4	NaOH	ICE	NONE	SAMPLING: DATE	TIME
167358	0103201440	2	40ml	✓				✓					✓		3/20/01	1440
	0103201440	1	liter	✓									✓		3/20/01	1440
	0103201440	1	250ml	✓							✓		✓		3/20/01	1440

ANALYSIS REQUEST (Circle or Specify Method No.)

MTBE 8021B/602	
BTEX 8021B/602	
TPH 418.1/TX1005	
PAH 8270C	
Total Metals Ag As Ba Cd Cr Pb Se Hg 6010B/200.7	
TCLP Metals Ag As Ba Cd Cr Pb Se Hg	
TCLP Volatiles	
TCLP Semi Volatiles	
TCLP Pesticides	
RCI	
GC-MS Vol. 8260B/624	
GC/MS Semi. Vol. 8270C/625	
PCB's 8082/608	
Pesticides 8081A/608	
BOD, TSS, pH	
✓ 8021 Full TCLC Aromatic & Halo)	
✓ Gen Chem (COD contact item #24)	✓
Nitrates COD contact item #25)	✓
Turn Around Time if different from standard	
Hold	

	Date:	Time:		Date:	Time:
Relinquished by: Bill Olson	3/21/01	1080 hrs.	Received by:		
Relinquished by:			Received by:		
Relinquished by:			Received at Laboratory by: Vicki Neely	3-22-0	10:0

LAB USE ONLY
Intact Y / N
Headspace Y / N
Temp 3° °
Log-in Review MS

REMARKS:

Carrier # TNT 902 565 514-4

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C.O.C.

ORIGINAL COPY

TraceAnalysis , Inc.
General Terms and Conditions

Article 1: General

1.1 The words "we", "us", and "our" refer to TraceAnalysis. You will deliver samples to us for analysis, accompanied, or preceded by, a signed Chain of Custody/Analysis Request defining the scope and timing of our work and stating either the testing criteria you require or identifying the agency to which the results will be submitted.

Article 2: Our General Responsibilities

2.1 We agree to provide the professional services described in this agreement. We will provide you with written reports containing analytical results. In performing our service, we will use that degree of care and skill ordinarily exercised under similar circumstances by reputable members of our profession practicing in the same locality.

2.2 Test and observations will be conducted using test procedures and laboratory protocols as specified in accepted Chain of Custody/Analysis Request. If you direct a manner of making tests that varies from our standard or recommended procedures, you agree to hold us harmless from all claims, damages, and expenses arising out of your direction.

2.3 We will not release information regarding our services for you or any information that we receive from you, except for information that is in the public domain and except as we are required by law.

Article 3: Your General Responsibilities

3.1 On each Chain of Custody/Analysis Request you will designate a representative who has authority to transmit instructions, receive information, and make decisions relative to our work.

3.2 You will respond in a reasonable time to our request for decisions, authorization for changes, additional compensation, or schedule extensions.

3.3 For each Chain of Custody/Analysis Request you will either provide us with the exact methods for analysis of each fraction or you will identify the regulations and agency under which or for which the analysis are to be prepared. If permits, consent orders, work plans, quality assurance plans, or correspondence with regulatory agencies address laboratory requirements, you will provide us with copies of the relevant provisions prior to our initiation of the analyses.

Article 4: Reports and Records

4.1 We will furnish copies of each report to you as specified in the Chain of Custody and Analysis Request. We will retain analytical data for seven years and financial data for three years relating to the services performed following transmittal of our final report.

4.2 If you do not pay for our services as agreed, you agree that we may retain all reports and work not yet delivered to you. You also agree that our work will not be used by you for any purpose unless paid for.

Article 5: Delivery and Acceptance of Samples

5.1 Until we accept delivery of samples by notation on chain of custody documents or otherwise in writing accept the samples, you are responsible for loss of or damage to samples. Until so accepted, we have no responsibility as to samples.

5.2 As to any samples that are suspected of containing hazardous substances or radioactive material, such that would make special handling required, you will specify the suspected or known substances and level and type of radioactive activity. This information will be given to us in writing as a part of the Chain of Custody/Analysis Request and will precede or accompany samples suspected of containing hazardous substances.

5.3 Samples accepted by us remain your property while in our custody. We will retain samples for a period of 14 days following the date of submission or our report. We will extend the retention period if you so direct. Following the retention period we will dispose of non-hazardous samples. We may return highly hazardous, acutely toxic, or radioactive samples and samples containers and residues to you. You agree to accept them.

5.4 Regardless of a prior acceptance, we may refuse acceptance or revoke acceptance of samples if we determine that the samples present a risk to health, safety, or the environment, or that we are not authorized to accept them. If we revoke acceptance of any sample, you will have it removed from our facilities promptly.

Article 6: Changes to Task Orders

6.1 No persons other than the designated representatives for each Chain of Custody/Analysis Request are authorized to act regarding changes to a Chain of Custody/Analysis Request. We will notify you promptly if we identify any activity that we regard as a change to the terms and conditions of a Chain of Custody/Analysis Request. Our notice will include the date, nature, circumstance, and cause of the activity regarded as a change. We will specify the particular elements of project performance for which we may seek an equitable adjustment.

6.2 You will respond to the notice provided for in paragraph 6.1 promptly. Changes may be made to a Chain of Custody/Analysis Request through issuance of an amendment. The amendment will specify the reason for the change and, as appropriate, include any modified budgets, schedules, scope of work, and other necessary provisions.

6.3 Until agreement is reached concerning the proposed change, we may regard the situation as a suspension directed by you.

Article 7: Compensation

7.1 Our pricing for the work is predicated upon your acceptance of the conditions and allocations of risks and responsibilities described in this agreement. You agree to pay for services as stated in our proposal and accepted by you or according to our then current standard pricing documents if there is no other written agreement as to price. An estimate or statement of probable cost is not a firm figure unless stated as such.

7.2 Unless otherwise agreed to elsewhere, you agree to pay invoices within 30 days of receipt unless, within 15 days from receipt of the invoice, you notify us in writing of a particular item that is alleged to be incorrect. You agree to pay the uncontested portions of the invoices within 30 days of receipt. You agree to pay interest on unpaid balances beginning 60 days after receipt of invoice at the rate of 1.5% per month, but not to exceed the maximum rate allowed by law.

7.3 If you direct us to invoice another, we will do so, but you agree to be ultimately responsible for our compensation until you provide us with that third party's written acceptance of all terms of our agreement and until we agree to the substitution.

7.4 You agree to compensate us for our services and expenses if we are required to respond to legal process related to our services for you. Compensable services include hourly charges for all personnel involved in the response and attorney fees reasonably incurred in obtaining advice concerning the response, the preparation of the testifier, and appearances related to the legal process.

7.5 If we are delayed by, or the period of performance is materially extended because of, factors beyond our control, or if project condition or the scope or amount of work change, or if the standards or methods of testing change, we will give you timely notice of the change and we will receive an equitable adjustment of our compensation.

Article 8: Risk Allocation, Disputes, and Damages

8.1 Neither we nor you will be liable to the other for special, incidental, consequential or punitive losses or damages, including but not limited to those arising from delay, loss of use, loss of profits or revenue, or the cost of capital.

8.2 We will not be liable to you for damages unless suit is commenced within two years of injury or loss or within two years of the date of the completion of our services, whichever is earlier. In no event will we be liable to you unless you have notified us of the discovery of the negligent act, error, omission or breach within 30 days of the date of its discovery and unless you have given us an opportunity to investigate and to recommend ways of mitigating your damages.

8.3 In the event you fail to pay us within 90 days following the invoice date, we may consider the default a total breach of our agreement and we may, at our option, terminate all of our duties without liability to you or to others.

8.4 If it is claimed by a third party that we did not complete an acceptable analysis, at your request will seek further review and acceptance of the completed work by the third party and use your best efforts to obtain that acceptance. We will assist you as directed.

8.5 You and we agree that disputes will be submitted to "Alternative Dispute Resolution" (ADR) as a condition precedent to litigation and other remedies provided by law. Each of us agrees to exercise good faith efforts to resolve disputes through mediation unless we both agree upon another ADR procedure. All disputes will be governed by the law of the place where our services are rendered, or if our services are rendered in more than one state, you and we agree that the law of the place that services were first rendered will govern.

8.6 If either of us makes a claim against the other as to issues out of the performance of this agreement, the prevailing party will be entitled to recover its reasonable expenses of litigation, including reasonable attorney's fees. If we bring lawsuit against you to collect our invoiced fees and expenses, you agree to pay our reasonable collection expenses including attorney fees.

Article 9: Indemnities

9.1 We will indemnify and hold you harmless from and against demands, damages, and expenses caused by our negligent acts and omissions and breach of contract and by the negligent acts and omissions and breach of contract of persons for whom we are legally responsible. You will indemnify and hold us harmless from and against demands, damages, and expenses caused by your negligent act and omissions and breach of contract and by the negligent acts and omissions and breach of contract of persons for whom you are legally responsible. These indemnities are subject to specific limitations provided for in this agreement.

Article 10: Miscellaneous Provisions

10.1 This agreement constitutes the entire agreement between you and us, and it supersedes all prior agreements. Any term, condition, prior course of dealing, course of performance, usage of trade, understanding, purchase order conditions, or other agreement purporting to modify, vary, supplement, or explain any provision of this agreement is of no effect until placed in writing and signed by both parties subsequent to the date of this agreement. In no event will the printed terms or conditions stated in a purchase or work order, other than an agreed upon Chain of Custody/Analysis Request, be considered a part of this agreement, even if the document is signed by both of us.

10.2 Neither party will assign this agreement without the express written approval of the other, but we may subcontract laboratory procedures with your approval as we deem necessary to meet our obligations to you.

10.3 If any of the provisions of this agreement are held to be invalid or unenforceable in any respect, the remaining terms will be in full effect and the agreement will be construed as if the invalid or unenforceable matters were never included in it. No waiver of any default will be waiver of any future default.

10.4 Neither you or we will have any liability for nonperformance caused in whole or in part by causes beyond our reasonable control. Such causes include but are not limited to Acts of God, civil unrest and war, labor unrest and strikes, equipment failures, matrix interference, acts of authorities, and failures of subcontractors that could not be reasonably anticipated.

10.5 You may stop our work by giving a written suspension or termination directive, but once work has been suspended, we need not resume work until we agree to change in scope, schedule, and compensation. Upon suspension or termination, we will use reasonable care to preserve samples provided that you agree to compensate us for any additional effort, but we will have no responsibility for meeting holding time limitations after the effective time of a suspension or termination directive. We will be compensated for service rendered and expenses incurred prior to termination that cannot reasonably be avoided.