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REPORTS

APRIL DATE:

2002

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April 26, 2002
AMEC Job No. 2-517-000008

Energy, Minerals and Natural Resources Department
New Mexico Oil Conservation Division
1220 St Francis Drive
Santa Fe, New Mexico 87505

OIL CONSERVATION DIV.
02 APR 29 PM 1:

Attention: Mr. Bill Olson

RE: MONITORING WELL SAMPLING
CITY OF CARLSBAD WELL FIELD
CARLSBAD, NEW MEXICO

This letter report presents the results of AMEC Earth and Environmental's (AMEC) ground water sampling from MW-3 in the City of Carlsbad Well Field southwest of Carlsbad, New Mexico. AMEC submitted a work plan to the New Mexico Oil Conservation Division (OCD) dated February 1, 2002 outlining the scope of services to be performed for the investigation. The project was authorized by the OCD in correspondence to AMEC dated February 6, 2002. The project followed the terms and conditions of AMEC's Site Maintenance and Monitoring Contract (PA No. 00-805-09-17658) awarded to AMEC by the State of New Mexico, General Services Department.

The study consisted of developing and purging water from the existing monitor well MW-3, obtaining and submitting ground water samples for laboratory analysis, and disposing of purged water at an OCD approved facility. This report includes a summary of the field activities, presents the laboratory reports, and provides documentation for the purged water disposal.

Field Program

On February 7 and 8, 2002, AMEC personnel traveled to the site and attempted to develop monitor well MW-3 with a Grunfos submersible pump. Depth to ground water was measured at 77.10 feet below the top of casing (toc); the total depth of the well was measured at 125.80 feet below toc. IW, Inc. Vacuum Truck Service was on standby at the site to transport purged water to a disposal facility. After numerous attempts to purge the well, it was determined the pump would not function due to the high density (i.e. high total dissolved solids content) of the ground water.

AMEC personnel returned to the site on March 4, 2002 to develop the well. Geomechanics Southwest provided a drilling rig with a wire line and a clean, PVC bailer to develop the well. The well was developed and purged until the water temperature, pH, and conductivity stabilized. Purged water was containerized for later disposal. Twenty-four hours after development, on March 5, 2002, AMEC personnel returned to the site and purged the well with the rig mounted bailer until water temperature, pH, and conductivity stabilized. Purged water was containerized for later disposal. Ground water samples were obtained from the well with the PVC bailer at that time.

The ground water samples obtained were placed in containers supplied by the laboratory and placed in a cooler with ice. The samples were shipped to Trace Analysis of Lubbock, Texas for chemical analysis by EPA methods listed in the attachments. Each ground water sample was collected, containerized, and preserved according to standard laboratory protocol. Field notes are presented in the attachments.

New Mexico Oil Conservation Division
Monitoring Well Development and Sampling
City of Carlsbad Well Field, Carlsbad, New Mexico
AMEC Project No. 2-517-000008
April 26, 2002

The water samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8021 and for gasoline range total petroleum hydrocarbons (GRO-TPH) and diesel range total petroleum hydrocarbons (DRO-TPH) by EPA Method 8015B. In addition, the samples were tested for pH, alkalinity, specific conductance, chloride, total dissolved solids, fluoride, nitrate, sulfate, calcium, magnesium, potassium, sodium, and a list of 16 metals by approved EPA methods. Copies of the chain-of-custodies and chemical analyses reports for ground water samples are provided in with the laboratory reports in the attachments.

No BTEX or TPH were detected in the water samples. Of note, total dissolved solids were 271,000 mg/L and chlorides were 117,000 mg/L.

The containerized purge water was transported to Controlled Recovery of Hobbs, New Mexico. The waste manifests are included in the attachments.

We appreciate the opportunity to provide environmental services to the Oil Conservation Division for this project. If you have any questions regarding this report, please give me a call at (505) 821-1801.

Respectfully submitted,

AMEC Earth & Environmental, Inc.

Bob Wilcox, P.G.
Senior Project Manager

BW:rrg

Attachments

AMEC Earth & Environmental, Inc.
8519 Jefferson, N.E.
Albuquerque, New Mexico 87113
Telephone: 505/821-1801
Fax: 505/821-7371
www.amec.com

Summary Report

Bob Wilcox
AMEC
8519 Jefferson NE
Albuquerqe, NM 87113

Report Date: April 25, 2002

Order ID Number: A02030711

Project Number: 2517000008
Project Name: Carlsbad Well Development & Sampling
Project Location: Carsbad-City Well

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
192304	MW-3	Water	3/5/02	:	3/7/02

0 This report consists of a total of 2 page(s) and is intended only as a summary of results for the sample(s) listed above.

	BTEX						TPH DRO	TPH GRO
	Benzene	Toluene	Ethylbenzene	M,P,O-Xylene	Total BTEX	Total BTEX	DRO	GRO
Sample - Field Code	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
192304 - MW-3	0.020	<0.020	<0.020	<0.020	0.020	0.020	<5	< 2

Sample: 192304 - MW-3

Param	Flag	Result	Units
Hydroxide Alkalinity		<1.0	mg/L as CaCo3
Carbonate Alkalinity		<1.0	mg/L as CaCo3
Bicarbonate Alkalinity		1518	mg/L as CaCo3
Total Alkalinity		1518	mg/L as CaCo3
Specific Conductance		158000	µMHOS/cm
Fluoride		1.60	mg/L
Total Mercury		<0.0002	mg/L
Chloride	[1]	117000	mg/L
Nitrate-N	[2]	<10.0	mg/L
Sulfate	[3]	29300	mg/L
Dissolved Calcium		226	mg/L
Dissolved Magnesium		8650	mg/L
Dissolved Potassium		2540	mg/L
Dissolved Sodium		78700	mg/L
Total Dissolved Solids		271000	mg/L
Total Aluminum		<1.00	mg/L
Total Arsenic		1.86	mg/L
Total Barium		<1.00	mg/L
Total Boron		1020	mg/L

Continued on next page ...

[1]Chloride was re-ran on IC030802-2.sch (PB18141; QC18713). ICV %IA = 90; CCV %IA = 97; matrix spikes RPD = 0, %EA = 91; LCS spikes RPD = 1, %EA = 93.

[2]Sample ran out of hold time for NO3. Sample came in on the last day of the hold time, but could not be put on the IC before the hold time had expired. Sample was ran the day it was received.

[3]Sulfate was re-ran on IC030802-2.sch (PB18141; QC18713). ICV %IA = 93; CCV %IA = 97; matrix spikes RPD = 0, %EA = 91; LCS spikes RPD = 2, %EA = 94.

This is only a summary. Please, refer to the complete report package for quality control data.

Sample 192304 continued ...

Param	Flag	Result	Units
Total Cadmium		<0.050	mg/L
Total Chromium		<0.100	mg/L
Total Cobalt		<0.250	mg/L
Total Copper		<0.125	mg/L
Total Iron		19.5	mg/L
Total Lead		<0.100	mg/L
Total Manganese		0.344	mg/L
Total Molybdenum		<0.500	mg/L
Total Nickel		<0.250	mg/L
Total Selenium		<0.500	mg/L
Total Silica		2.53	mg/L
Total Silver		<0.125	mg/L
Total Zinc		<0.250	mg/L
pH	[4]	6.9	s.u.

[4]Sample was received out of holding time. pH should be tested in the field. Sample was tested the day it was received.

Analytical and Quality Control Report

Bob Wilcox
AMEC
8519 Jefferson NE
Albuquerqe, NM 87113

Report Date: April 25, 2002

Order ID Number: A02030711

Project Number: 2517000008
Project Name: Carlsbad Well Development & Sampling
Project Location: Carsbad-City 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
192304	MW-3	Water	3/5/02	:	3/7/02

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. Note: the RDL is equal to MQL for all organic analytes including TPH.

for
Dr. Blair Leftwich, Director

Analytical Report

Sample: 192304 - MW-3

Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC18844	Date Analyzed:	3/12/02
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB18253	Date Prepared:	3/12/02

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		1518	mg/L as CaCo3	1	1
Total Alkalinity		1518	mg/L as CaCo3	1	1

Sample: 192304 - MW-3

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18692	Date Analyzed:	3/7/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB18126	Date Prepared:	3/7/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.020	mg/L	20	0.001
Toluene		<0.020	mg/L	20	0.001
Ethylbenzene		<0.020	mg/L	20	0.001
M,P,O-Xylene		<0.020	mg/L	20	0.001
Total BTEX		0.020	mg/L	1	0.001
Total BTEX		0.020	mg/L	20	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.103	mg/L	20	0.10	103	70 - 130
4-BFB		0.083	mg/L	20	0.10	83	70 - 130

Sample: 192304 - MW-3

Analysis:	Conductivity	Analytical Method:	SM 2510B	QC Batch:	QC18833	Date Analyzed:	3/12/02
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB18247	Date Prepared:	3/12/02

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		158000	μMHOS/cm	1	

Sample: 192304 - MW-3

Analysis:	Fl	Analytical Method:	E 340.2	QC Batch:	QC18821	Date Analyzed:	3/13/02
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB18232	Date Prepared:	3/13/02

Param	Flag	Result	Units	Dilution	RDL
Fluoride		1.60	mg/L	2	0.10

Sample: 192304 - MW-3

Analysis:	Hg, Total	Analytical Method:	S 7470A	QC Batch:	QC18737	Date Analyzed:	3/11/02
Analyst:	BC	Preparation Method:	N/A	Prep Batch:	PB18160	Date Prepared:	3/9/02

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 192304 - MW-3

Analysis:	Ion Chromatography (IC)	Analytical Method:	E 300.0	QC Batch:	QC18711	Date Analyzed:	3/7/02
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB18140	Date Prepared:	3/7/02

Param	Flag	Result	Units	Dilution	RDL
Chloride	[1]	117000	mg/L	5000	0.50
Nitrate-N	[2]	<10.0	mg/L	50	0.20
Sulfate	[3]	29300	mg/L	5000	0.50

Sample: 192304 - MW-3

Analysis:	Salts	Analytical Method:	E 200.7	QC Batch:	QC18859	Date Analyzed:	3/15/02
Analyst:	RR	Preparation Method:	S 3005A	Prep Batch:	PB18182	Date Prepared:	3/12/02

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		226	mg/L	11	0.50
Dissolved Magnesium		8650	mg/L	1000	0.50
Dissolved Potassium		2540	mg/L	110	0.50
Dissolved Sodium		78700	mg/L	10000	0.50

Sample: 192304 - MW-3

Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC18681	Date Analyzed:	3/8/02
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB18126	Date Prepared:	3/7/02

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		271000	mg/L	500	10

Sample: 192304 - MW-3

Analysis:	TPH DRO	Analytical Method:	Mod. 8015B	QC Batch:	QC18742	Date Analyzed:	3/10/02
Analyst:	MM	Preparation Method:	3510C - Mod.	Prep Batch:	PB18157	Date Prepared:	3/10/02

Param	Flag	Result	Units	Dilution	RDL
DRO		<5	mg/L	1	50

[1]Chloride was re-ran on IC030802-2.sch (PB18141; QC18713). ICV %IA = 90; CCV %IA = 97; matrix spikes RPD = 0, %EA = 91; LCS spikes RPD = 1, %EA = 93.

[2]Sample ran out of hold time for NO3. Sample came in on the last day of the hold time, but could not be put on the IC before the hold time had expired. Sample was ran the day it was received.

[3]Sulfate was re-ran on IC030802-2.sch (PB18141; QC18713). ICV %IA = 93; CCV %IA = 97; matrix spikes RPD = 0, %EA = 91; LCS spikes RPD = 2, %EA = 94.

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		12.2	mg/L	0.10	150	81	70 - 130

Sample: 192304 - MW-3

Analysis:	TPH GRO	Analytical Method:	8015B	QC Batch:	QC18694	Date Analyzed:	3/7/02
Analyst:	CG	Preparation Method:	5030	Prep Batch:	PB18126	Date Prepared:	3/7/02

Param	Flag	Result	Units	Dilution	RDL
GRO		< 2	mg/L	20	0.10

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.117	mg/L	20	0.10	117	70 - 130
4-BFB		0.087	mg/L	20	0.10	87	70 - 130

Sample: 192304 - MW-3

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC18772	Date Analyzed:	3/12/02
Analyst:	RR	Preparation Method:	S 3010A	Prep Batch:	PB18163	Date Prepared:	3/11/02

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		<1.00	mg/L	10	0.10
Total Arsenic		1.86	mg/L	10	0.05
Total Barium		<1.00	mg/L	10	0.10
Total Boron		1020	mg/L	10000	0.005
Total Cadmium		<0.050	mg/L	10	0.005
Total Chromium		<0.100	mg/L	10	0.01
Total Cobalt		<0.250	mg/L	10	0.02
Total Copper		<0.125	mg/L	10	0.01
Total Iron		19.5	mg/L	10	0.05
Total Lead		<0.100	mg/L	10	0.01
Total Manganese		0.344	mg/L	10	0.02
Total Molybdenum		<0.500	mg/L	10	0.05
Total Nickel		<0.250	mg/L	10	0.02
Total Selenium		<0.500	mg/L	10	0.05
Total Silica		2.53	mg/L	10	0.05
Total Silver		<0.125	mg/L	10	0.01
Total Zinc		<0.250	mg/L	10	0.02

Sample: 192304 - MW-3

Analysis:	pH	Analytical Method:	E 150.1	QC Batch:	QC18745	Date Analyzed:	3/7/02
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB18169	Date Prepared:	3/7/02

Param	Flag	Result	Units	Dilution	RDL
pH	[4]	6.9	s.u.	1	1

[4]Sample was received out of holding time. pH should be tested in the field. Sample was tested the day it was received.

Quality Control Report
Method Blank

Method Blank

QCBatch: QC18681

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

Method Blank

QCBatch: QC18692

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.094	mg/L	1	0.10	93	70 - 130
4-BFB		0.083	mg/L	1	0.10	83	70 - 130

Method Blank

QCBatch: QC18694

Param	Flag	Results	Units	Reporting Limit
GRO		<0.1	mg/L	0.10

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.095	mg/L	1	0.10	95	70 - 130
4-BFB		0.085	mg/L	1	0.10	85	70 - 130

Method Blank

QCBatch: QC18711

Param	Flag	Results	Units	Reporting Limit
Chloride		<2.0	mg/L	0.50
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<2.0	mg/L	0.50

Method Blank

QCBatch: QC18737

Param	Flag	Results	Units	Reporting Limit
Total Mercury		<0.0002	mg/L	0.0002

Method Blank

QCBatch: QC18742

Param	Flag	Results	Units	Reporting Limit
DRO		<5	mg/L	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		12	mg/L	0.10	150	80	70 - 130

Method Blank

QCBatch: QC18772

Param	Flag	Results	Units	Reporting Limit
Total Aluminum		<0.100	mg/L	0.10
Total Arsenic		<0.050	mg/L	0.05
Total Barium		<0.100	mg/L	0.10
Total Boron		0.00608	mg/L	0.005
Total Cadmium		<0.005	mg/L	0.005
Total Chromium		<0.010	mg/L	0.01
Total Cobalt		<0.025	mg/L	0.02
Total Copper		<0.0125	mg/L	0.01
Total Iron		<0.050	mg/L	0.05
Total Lead		<0.010	mg/L	0.01
Total Manganese		<0.025	mg/L	0.02
Total Molybdenum		<0.050	mg/L	0.05
Total Nickel		<0.025	mg/L	0.02
Total Selenium		<0.050	mg/L	0.05
Total Silica		<0.050	mg/L	0.05
Total Silver		<0.0125	mg/L	0.01
Total Zinc		<0.025	mg/L	0.02

Method Blank

QCBatch: QC18821

Param	Flag	Results	Units	Reporting Limit
Fluoride		<0.1	mg/L	0.10

Method Blank

QCBatch: QC18833

Param	Flag	Results	Units	Reporting Limit
Specific Conductance		7.75	µMHOS/cm	

Method Blank QCBatch: QC18844

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: QC18859

Param	Flag	Results	Units	Reporting Limit
Dissolved Calcium		<0.500	mg/L	0.50
Dissolved Magnesium		<0.500	mg/L	0.50
Dissolved Potassium		<0.500	mg/L	0.50
Dissolved Sodium		<0.500	mg/L	0.50

Quality Control Report
Duplicate Samples

Duplicate QCBatch: QC18681

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids		368	363	mg/L	1	1	9.7

Duplicate QCBatch: QC18745

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
pH		9.1	9.1	s.u.	1	0	0

Duplicate QCBatch: QC18833

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Specific Conductance		98856	99400	µMHOS/cm	1	0	3.5

Duplicate

QCBatch: QC18844

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Hydroxide Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	6.6
Carbonate Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	6.6
Bicarbonate Alkalinity		52	50	mg/L as CaCo3	1	3	6.6
Total Alkalinity		52	50	mg/L as CaCo3	1	3	6.6

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC18692

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.092	0.091	mg/L	1	0.10	<0.001	92	1	70 - 130	20
Benzene	0.1	0.1	mg/L	1	0.10	<0.001	100	0	70 - 130	20
Toluene	0.101	0.101	mg/L	1	0.10	<0.001	101	0	70 - 130	20
Ethylbenzene	0.102	0.102	mg/L	1	0.10	<0.001	102	0	70 - 130	20
M,P,O-Xylene	0.311	0.311	mg/L	1	0.30	<0.001	103	0	70 - 130	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
TFT	0.0944	0.0965	mg/L	1	0.10	94	96	70 - 130
4-BFB	0.0938	0.0945	mg/L	1	0.10	93	94	70 - 130

Laboratory Control Spikes

QCBatch: QC18694

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
GRO	0.866	0.861	mg/L	1	1	<0.1	86	0	70 - 130	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
TFT	0.103	0.103	mg/L	1	0.10	103	103	70 - 130
4-BFB	0.096	0.095	mg/L	1	0.10	96	95	70 - 130

Laboratory Control Spikes

QCBatch: QC18711

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	11.24	11.21	mg/L	1	12.50	<2.0	89	0	90 - 110	20

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Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Fluoride	2.28	2.34	mg/L	1	2.50	<0.2	91	2	90 - 110	20
Nitrate-N	2.31	2.31	mg/L	1	2.50	<0.2	92	0	90 - 110	20
Sulfate	11.46	11.50	mg/L	1	12.50	<2.0	91	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: QC18737

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Mercury	0.00115	0.00115	mg/L	1	0.001	<0.0002	115	0	87 - 125	20

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

Laboratory Control Spikes

QCBatch: QC18742

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
DRO	24.8	23.5	mg/L	0.10	250	<5	99	5	70 - 130	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
n-Triacontane	11.8	11.7	mg/L	0.10	150	78	78	70 - 130

Laboratory Control Spikes

QCBatch: QC18772

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	0.919	0.887	mg/L	1	1	<0.100	91	3	75 - 125	20
Total Arsenic	0.469	0.456	mg/L	1	0.50	<0.050	93	2	75 - 125	20
Total Barium	1.01	0.983	mg/L	1	1	<0.100	101	2	75 - 125	20
Total Boron	0.0497	0.0472	mg/L	1	0.05	0.00608	99	5	75 - 125	20
Total Cadmium	0.232	0.226	mg/L	1	0.25	<0.005	92	2	75 - 125	20
Total Chromium	0.101	0.0988	mg/L	1	0.10	<0.010	101	2	75 - 125	20
Total Cobalt	0.248	0.241	mg/L	1	0.25	<0.025	99	2	75 - 125	20
Total Copper	0.122	0.121	mg/L	1	0.12	<0.0125	97	0	75 - 125	20
Total Iron	0.502	0.712	mg/L	1	0.50	<0.050	100	34	75 - 125	20
Total Lead	0.473	0.461	mg/L	1	0.50	<0.010	94	2	75 - 125	20
Total Manganese	0.253	0.248	mg/L	1	0.25	<0.025	101	1	75 - 125	20
Total Molybdenum	0.509	0.499	mg/L	1	0.50	<0.050	101	1	75 - 125	20
Total Nickel	0.245	0.240	mg/L	1	0.25	<0.025	98	2	75 - 125	20
Total Selenium	0.405	0.393	mg/L	1	0.50	<0.050	81	3	75 - 125	20
Total Silica	0.480	0.467	mg/L	1	0.50	<0.050	96	2	75 - 125	20
Total Silver	0.122	0.120	mg/L	1	0.12	<0.0125	97	1	75 - 125	20
Total Zinc	0.237	0.232	mg/L	1	0.25	<0.025	94	2	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: QC18821

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Fluoride	0.956	0.956	mg/L	1	1	<0.1	95	0	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: QC18859

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Dissolved Calcium	96.5	98.3	mg/L	4	100	<0.500	96	1	75 - 125	20
Dissolved Magnesium	111	114	mg/L	4	100	<0.500	111	2	75 - 125	20
Dissolved Potassium	109	112	mg/L	4	100	<0.500	109	2	75 - 125	20
Dissolved Sodium	111	114	mg/L	4	100	<0.500	111	2	75 - 125	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: QC18711

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	83.77	83.41	mg/L	1	62.50	27.3	90	0	48 - 127	20
Nitrate-N	15.16	15.05	mg/L	1	12.50	3.45	93	1	87 - 100	20
Sulfate	96.09	95.78	mg/L	1	62.50	39.4	90	0	59 - 121	20

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

Matrix Spikes

QCBatch: QC18737

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Mercury	0.00087	[5] 0.00056	mg/L	1	0.001	<0.0002	87	43	40 - 177	20

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

Matrix Spikes

QCBatch: QC18772

[5]msd recovery invalid due to spiking error, use lcs/lcsd to demonstrate the run is under control.

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	12.5	12.7	mg/L	10	10	<1.00	125	1	75 - 125	20
Total Arsenic	5.95	5.88	mg/L	10	5	1.86	81	1	75 - 125	20
Total Barium	[6] 6.38	6.34	mg/L	10	10	<1.00	63	0	75 - 125	20
Total Boron	[7] 1170	1130	mg/L	10000	0.05	1020	30	4	75 - 125	20
Total Cadmium	[8] 1.37	1.36	mg/L	10	2.50	<0.050	54	0	75 - 125	20
Total Chromium	[9] 0.622	0.618	mg/L	10	1	<0.100	62	0	75 - 125	20
Total Cobalt	[10] 1.38	1.38	mg/L	10	2.50	<0.250	55	0	75 - 125	20
Total Copper	1.09	1.08	mg/L	10	1.25	<0.125	87	0	75 - 125	20
Total Iron	[11] 22.8	23.8	mg/L	10	5	19.5	66	26	75 - 125	20
Total Lead	[12] 2.31	2.30	mg/L	10	5	<0.100	46	0	75 - 125	20
Total Manganese	[13] 1.91	1.92	mg/L	10	2.50	0.344	62	0	75 - 125	20
Total Molybdenum	[14] 3.18	3.15	mg/L	10	5	<0.500	63	0	75 - 125	20
Total Nickel	[15] 1.26	1.25	mg/L	10	2.50	<0.250	50	0	75 - 125	20
Total Selenium	4.33	4.35	mg/L	10	5	<0.500	86	0	75 - 125	20
Total Silica	6.75	6.90	mg/L	10	5	2.53	84	3	75 - 125	20
Total Silver	1.29	1.30	mg/L	10	1.25	<0.125	103	0	75 - 125	20
Total Zinc	[16] 1.64	1.66	mg/L	10	2.50	<0.250	65	1	75 - 125	20

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

Matrix Spikes

QCBatch: QC18821

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Fluoride	3.11	3.14	mg/L	1	2	1.42	84	1	60 - 120	20

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

Matrix Spikes

QCBatch: QC18859

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Dissolved Calcium	333	337	mg/L	10	100	129	89	4	75 - 125	20
Dissolved Magnesium	143	148	mg/L	10	100	23.1	112	4	75 - 125	20
Dissolved Potassium	116	120	mg/L	10	100	4.24	108	3	75 - 125	20
Dissolved Sodium	163	167	mg/L	10	100	48.5	110	3	75 - 125	20

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

[6] Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.
[7] Matrix spike recovery invalid due to required dilution. LCS demonstrates process under control.
[8] Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.
[9] Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.
[10] Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.
[11] Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.
[12] Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.
[13] Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.
[14] Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.
[15] Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.
[16] Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.

Quality Control Report
Continuing Calibration Verification Standards

CCV (1) QCBatch: QC18681

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1007	100	90 - 110	3/8/02

ICV (1) QCBatch: QC18681

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1005	100	90 - 110	3/8/02

CCV (1) QCBatch: QC18692

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.095	95	85 - 115	3/7/02
Benzene		mg/L	0.10	0.099	99	85 - 115	3/7/02
Toluene		mg/L	0.10	0.1	100	85 - 115	3/7/02
Ethylbenzene		mg/L	0.10	0.101	101	85 - 115	3/7/02
M,P,O-Xylene		mg/L	0.30	0.308	102	85 - 115	3/7/02

ICV (1) QCBatch: QC18692

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.092	92	85 - 115	3/7/02
Benzene		mg/L	0.10	0.1	100	85 - 115	3/7/02
Toluene		mg/L	0.10	0.102	102	85 - 115	3/7/02
Ethylbenzene		mg/L	0.10	0.102	102	85 - 115	3/7/02
M,P,O-Xylene		mg/L	0.30	0.313	104	85 - 115	3/7/02

CCV (1) QCBatch: QC18694

Continued ...

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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/L	1	0.946	94	75 - 125	3/7/02

ICV (1) QCBatch: QC18694

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/L	1	0.887	88	75 - 125	3/7/02

CCV (1) QCBatch: QC18711

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.26	90	90 - 110	3/7/02
Fluoride		mg/L	2.50	2.29	91	90 - 110	3/7/02
Nitrate-N		mg/L	2.50	2.33	93	90 - 110	3/7/02
Sulfate		mg/L	12.50	11.43	91	90 - 110	3/7/02

ICV (1) QCBatch: QC18711

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.27	90	90 - 110	3/7/02
Fluoride		mg/L	2.50	2.28	91	90 - 110	3/7/02
Nitrate-N		mg/L	2.50	2.30	92	90 - 110	3/7/02
Sulfate		mg/L	12.50	11.43	91	90 - 110	3/7/02

CCV (1) QCBatch: QC18737

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		mg/L	0.001	0.00102	102	80 - 120	3/11/02

ICV (1) QCBatch: QC18737

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		mg/L	0.001	0.00103	103	80 - 120	3/11/02

CCV (1) QCBatch: QC18742

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/L	250	250	100	85 - 115	3/10/02

ICV (1) QCBatch: QC18742

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/L	250	241	96	85 - 115	3/10/02

CCV (1) QCBatch: QC18745

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		s.u.	7	7.0	100	-0.1 s.u. - +0.1 s.u.	3/7/02

ICV (1) QCBatch: QC18745

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		s.u.	7	7.0	100	-0.1 s.u. - +0.1 s.u.	3/7/02

CCV (1) QCBatch: QC18772

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Aluminum		mg/L	2	1.91	95	90 - 110	3/12/02
Total Arsenic		mg/L	1	0.956	95	90 - 110	3/12/02
Total Barium		mg/L	2	1.97	98	90 - 110	3/12/02
Total Boron		mg/L	0.10	0.106	106	90 - 110	3/12/02
Total Cadmium		mg/L	0.50	0.492	98	90 - 110	3/12/02
Total Chromium		mg/L	0.20	0.199	99	90 - 110	3/12/02

Continued ...

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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Cobalt		mg/L	0.50	0.494	98	90 - 110	3/12/02
Total Copper		mg/L	0.25	0.249	99	90 - 110	3/12/02
Total Iron		mg/L	1	1.03	103	90 - 110	3/12/02
Total Lead		mg/L	1	0.982	98	90 - 110	3/12/02
Total Manganese		mg/L	0.50	0.499	99	90 - 110	3/12/02
Total Molybdenum		mg/L	1	0.979	97	90 - 110	3/12/02
Total Nickel		mg/L	0.50	0.494	98	90 - 110	3/12/02
Total Selenium		mg/L	1	0.994	99	90 - 110	3/12/02
Total Silica		mg/L	1	1.01	101	90 - 110	3/12/02
Total Silver		mg/L	0.25	0.244	97	90 - 110	3/12/02
Total Zinc		mg/L	0.50	0.498	99	90 - 110	3/12/02

ICV (1) QCBatch: QC18772

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Aluminum		mg/L	2	1.99	99	90 - 110	3/12/02
Total Arsenic		mg/L	1	1.00	100	90 - 110	3/12/02
Total Barium		mg/L	2	1.98	99	90 - 110	3/12/02
Total Boron		mg/L	0.10	0.103	103	90 - 110	3/12/02
Total Cadmium		mg/L	0.50	0.504	100	90 - 110	3/12/02
Total Chromium		mg/L	0.20	0.201	100	90 - 110	3/12/02
Total Cobalt		mg/L	0.50	0.500	100	90 - 110	3/12/02
Total Copper		mg/L	0.25	0.259	103	90 - 110	3/12/02
Total Iron		mg/L	1	1.01	101	90 - 110	3/12/02
Total Lead		mg/L	1	1.00	100	90 - 110	3/12/02
Total Manganese		mg/L	0.50	0.506	101	90 - 110	3/12/02
Total Molybdenum		mg/L	1	1.00	100	90 - 110	3/12/02
Total Nickel		mg/L	0.50	0.500	100	90 - 110	3/12/02
Total Selenium		mg/L	1	0.999	99	90 - 110	3/12/02
Total Silica		mg/L	1	1.01	101	90 - 110	3/12/02
Total Silver		mg/L	0.25	0.256	102	90 - 110	3/12/02
Total Zinc		mg/L	0.50	0.502	100	90 - 110	3/12/02

CCV (1) QCBatch: QC18821

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Fluoride		mg/L	1	0.964	96	85 - 115	3/13/02

ICV (1) QCBatch: QC18821

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Fluoride		mg/L	1	0.927	92	85 - 115	3/13/02

CCV (1) QCBatch: QC18833

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Specific Conductance		µMHOS/cm	97097	96765	99	90 - 110	3/12/02

ICV (1) QCBatch: QC18833

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Specific Conductance		µMHOS/cm	111900	106860	95	90 - 110	3/12/02

CCV (1) QCBatch: QC18844

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	4.0	0	90 - 110	3/12/02
Carbonate Alkalinity		mg/L as CaCo3	0	240	0	90 - 110	3/12/02
Bicarbonate Alkalinity		mg/L as CaCo3	0	<1.0	0	90 - 110	3/12/02
Total Alkalinity		mg/L as CaCo3	250	244	97	90 - 110	3/12/02

ICV (1) QCBatch: QC18844

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	3/12/02
Carbonate Alkalinity		mg/L as CaCo3	0	232	0	90 - 110	3/12/02
Bicarbonate Alkalinity		mg/L as CaCo3	0	10	0	90 - 110	3/12/02
Total Alkalinity		mg/L as CaCo3	250	242	96	90 - 110	3/12/02

CCV (1) QCBatch: QC18859

Continued ...

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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	25	25.3	101	90 - 110	3/15/02
Dissolved Magnesium		mg/L	25	24.6	98	90 - 110	3/15/02
Dissolved Potassium		mg/L	25	23.7	94	90 - 110	3/15/02
Dissolved Sodium		mg/L	25	24.1	96	90 - 110	3/15/02

ICV (1) QCBatch: QC18859

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	25	24.8	99	95 - 105	3/15/02
Dissolved Magnesium		mg/L	25	25.8	103	95 - 105	3/15/02
Dissolved Potassium		mg/L	25	26.0	104	95 - 105	3/15/02
Dissolved Sodium		mg/L	25	25.9	103	95 - 105	3/15/02

03-4-02

Page 1 of 1

GROUND-WATER SAMPLING LOG

amec

PROJECT NUMBER: 2517000008 LOCATION: CARLSBAD (CITY WELL FIELD) ~ 3/4 MILE E" OF MOUTH OF DARK CANYON WELL: MW-3

TIME	TEMP (C)	pH	CONDUCT. TURB. (NTU)	COND. (uS/cm)	ORP (mV)	DO (ppm)	flow rate (ml/min)	draw down (ft)	COMMENTS
MW-3 SE-SE SECT. 12 23 S 25 E									COORDIN.
WARM, MODERATE W WIND, CLEAR									
14:05 3 POINT CALIBR					#7 = 7.02				
					#4 = 4.06				
					#10 = 9.98				
14:30 H_2O LEVEL = 79.10 (tenth)									
14:40 WELL DEPTH = 125.8									
15:35 START BAILING					PIC #5		H_2O QUALITY (FIRS 20gal)		
15:45	18.9°C	7.46	144.3 (mS)		1) HEAVY SULFUR ODOR				
60gal 16:30	18.3	7.39	143.0		2) CHLORIDES & SALT CRYSTALIZING IN 5 MIN.				
80 16:45	18.4	7.30	141.9		OR LESS WHEN EXPOSED TO SUN/AIR.				
125 17.00	18.0	7.26	142.0						
150' 17:15	18.0	7.24	139.2						
175' 17:30	18.0	7.24	136.2						
180 17:40	H_2O LEVEL = 82 4½								
200' 17:45	17.7	7.27	123.0 ?						
220' 18:00	17.4	7.32	139.2						
							RECOVERY RATE:		
							18:00	83.1 (tenth)	
USED PVC BAILER (SCH 80)							18:02	82.9	
ϕ 3½" L = 9'6"							18:03	82.8	
							18:04	82.7	
ϕ 6" BOREHOLE = 1.47 LINEAR FT. (VOL-GAL)							18:05	82.6	
							18:06	N. Recovered	
125.8							18:07	N. — " —	
- 77.10							18:09	84.4½	
45.10 ft. H_2O									
X 1.47									
66.3 gal = 1 WELL VOLUME									
X 3									
198.9 GAL	200 GAL = 3 WELL VOLS.								

#30.

03.5.02

Page 1 of 1

GROUND-WATER SAMPLING LOG

amec

PROJECT NUMBER: 25170000 08 LOCATION: CARLSBAD WELL: MW-3

TIME	TEMP (C)	pH	COND. TURB (NTU)	COND. (uS/cm)	ORP (mV)	DO (ppm)	flow rate (ml/min)	draw down (ft)	COMMENTS
12:00	1 POINT CALIBR				#7 = 7.01				V. WARM. LT WIND (VARIOUS)
12:30	H_2O LEVEL = 80.1 BGS								CLEAR
~0gal 13:00	19.8°C	7.28	1461	mS					
13:15	20.1	7.23	1478						
10.0 13:30	19.7	7.22	1468						
35.0 13:45	19.8	7.15	1467						
165.0 14:00	19.5	7.14	1465		PICT #12				(AVERAGE AMOUNT OF SEDIMENT
180.0 14:15	19.4	7.13	1456						GENERATED FROM EACH BAILER)
200.0 14:30	19.3	7.11	1451						
14:35	LOST PUC BAILER								
14:40	COLLECT H_2O SAMPLE (SPLIT WITH DCD WOLSEN)								
~15:10	RETRIVED LOST BAILER								

PBO.

CONTROLLED RECOVERY, INC.

P.O. Box 388 • Hobbs, New Mexico 88241-0388
(505) 393-1079

Bill to AMEC

Address

Company/Generator NM Oil Conservation Division

Lease Name MW 3 City of Carlsbad Well Field

Trucking Company GSI | Vehicle Number 53 | Driver (Print) Jerry Nazmen

Date 3 5 02 | Time 530 a.m. / p.m.

Type of Material

- ☐ Exempt
- ☐ Non-Exempt
- C138 _____
- ☐ Tank Bottoms
- C117 _____
- ☐ Soils
- ☐ Fluids
- ☐ Other Material
- List Description Below

EID C

DESCRIPTION # 1745

Non Hazardous Purged Ground Water

Volume of Material ☐ Bbls. _____ ☐ Yard _____ ☐ Gallons 200

☐ Wash Out ☐ Call Out ☐ After Hours ☐ Debris Charge @ 20¢/gal.

This statement applicable to exempt waste only.
I represent and warrant that the wastes are: generated from oil and gas exploration and production operations: exempt from Resource Conservation and Recover Act (RCRA) Subtitle C Regulations; and not mixed with non-exempt wastes.

Agent _____ (Signature)

CRI Representative _____ (Signature)

TANK BOTTOMS

	Feet	Inches				
1st Gauge			BBLS Received		BS&W	%
2nd Gauge			Free Water			
Received			Total Received			

No 39213

White - CRI | Canary - CRI Accounting | Pink - CRI Plant | Gold - Transporter

SUPERIOR PRINTING SERVICE, INC.

CONTROLLED RECOVERY, INC.

P.O. Box 388 • Hobbs, New Mexico 88241-0388
(505) 393-1079

Bill to Amec

Address

Company/Generator Geo Mechanics Southwest Inc

Lease Name well # MW3

Trucking Company GSI | Vehicle Number 53 | Driver (Print) Jerry Norman

Date 3 5 02 | Time 1000 a.m. / p.m.

Type of Material

- ☐ Exempt
- ☐ Non-Exempt
- C138 _____
- ☐ Tank Bottoms
- C117 _____
- ☐ Soils
- ☒ Fluids
- ☐ Other Material
- List Description Below

EID C

DESCRIPTION # 1744

Non Hazardous Purged Ground Water

Volume of Material ☐ Bbls. _____ ☐ Yard _____ ☒ Gallons 200

☐ Wash Out ☐ Call Out ☐ After Hours ☐ Debris Charge

This statement applicable to exempt waste only.
I represent and warrant that the wastes are: generated from oil and gas exploration and production operations: exempt from Resource Conservation and Recover Act (RCRA) Subtitle C Regulations; and not mixed with non-exempt wastes.

Agent _____ (Signature)

CRI Representative _____ (Signature)

TANK BOTTOMS

	Feet	Inches				
1st Gauge			BBLS Received		BS&W	%
2nd Gauge			Free Water			
Received			Total Received			

No 39185

White - CRI | Canary - CRI Accounting | Pink - CRI Plant | Gold - Transporter

SUPERIOR PRINTING SERVICE, INC.

NON-HAZARDOUS WASTE MANIFEST

1744

PART I: Generator NM Oil Conservation Division
Address 1220 St. Francis Dr.
City/State Santa Fe, NM 87505
(505) 476-3491
Telephone No.

ORGINATION OF WASTE:

Operations Center MW-3 Permit No. _____

Property Name City of Carlsbad Well Field
(Well,Tank Battery,Plant,Facility)

WASTE IDENTIFICATION AND AMOUNT (BARRELS, YARDS, TONS, CU.FT.,LBS., UNITS, ETC.)					
Drilling Fluids	_____	Tank Bottoms	_____	Exempt Fluids	_____
Completion Fluids	_____	Gas Plant Waste	_____	C117 No.	_____
Contaminated Soil	_____	Other Material	200 G	Pit No.	_____

DESCRIPTION / NOTES
Non Hazardous Purged Groundwater

CERTIFICATION: The waste described above is not hazardous pursuant to 40 CFR Part 261 and was consigned to the transporter named below. I certify the the foregoing is true and correct to the best of my knowledge.

[signature] 3/5/02
Signature of Generator's Authorized Agent — Date and time of Shipment

PART II: TRANSPORTER: (To be completed in full by Transporter)

Name Geo Mechanics Southwest Inc 505 345 5594
Address 416 B Menaul Blvd NW
City/State Alb NM 87107
Telephone No.
53
Truck No.

CERTIFICATION: I certify that the waste in quantity above was received by me for shipment to the destination below.

[signature] 3 402 8:30 f
Signature of Transporter's Agent — Date and time of Received

PART III: DISPOSAL OR RECLAMATION SITE:

Name Controlled Recovery, Inc. (505)393-1079
Address P.O. Box 388
City/State Hobbs, N.M. 88241-0388
Telephone No.

CERTIFICATION: I certify that the waste described in Part I was received by me via the transporter described in Part II.

[signature] 3 502 1000 A
Signature of Facility Agent — Date and time of Received

B-27958

NON-HAZARDOUS WASTE MANIFEST

No. 1745

PART I: Generator NM Oil Conservation Div.
Address 1220 St. Francis Dr.
City/State Santa Fe, NM 87505
(505) 476-3491 Telephone No.

ORGINATION OF WASTE:

Operations Center MW-3 Permit No. _____

Property Name City of Carlsbad Well Field
(Well, Tank Battery, Plant, Facility)

WASTE IDENTIFICATION AND AMOUNT (BARRELS, YARDS, TONS, CU.FT., LBS., UNITS, ETC.)					
Drilling Fluids	_____	Tank Bottoms	_____	Exempt Fluids	_____
Completion Fluids	_____	Gas Plant Waste	_____	C117 No.	_____
Contaminated Soil	_____	Other Material	200 G	Pit No.	_____
DESCRIPTION / NOTES					
Non Hazardous Purged Groundwater					

CERTIFICATION: The waste described above is not hazardous pursuant to 40 CFR Part 261 and was consigned to the transporter named below. I certify the the foregoing is true and correct to the best of my knowledge.

Will Olson — Signature of Generator's Authorized Agent
3/5/02 — Date and time of Shipment

PART II: TRANSPORTER: (To be completed in full by Transporter)

Name GeoMechanics Southwest Inc
Address 416 B Menaul Blvd NW
City/State Alb NM 87107
505 345 5594 Telephone No.
53 Truck No.

CERTIFICATION: I certify that the waste in quantity above was received by me for shipment to the destination below.

_____ Signature of Transporter's Agent
_____ Date and time of Received

PART III: DISPOSAL OR RECLAMATION SITE:

Name Controlled Recovery, Inc.
Address P.O. Box 388
City/State Hobbs, N.M. 88241-0388
(505)393-1079 Telephone No.

CERTIFICATION: I certify that the waste described in Part I was received by me via the transporter described in Part II.

_____ Signature of Facility Agent
3 5 02 530 P Date and time of Received

B-27958

amec

AMEC Earth & Environmental, Inc.
P.O. Box 24445
Seattle, Washington 98124-0445

OIL CONSERVATION DIV.
02 APR 22 PM 3:07

INVOICE

518459

APR-18-2002
Page Number 1

Energy Conservation & Mnmt Division
NM Oil Conservation Div.
1220 St. Francis, NM
Santa Fe, NM 87505

ATTENTION: Mr. Bill Olson

Professional Services Through MAR-30-2002

Project 2-517-000008 Monitor Well Development-Sampling

Carlsbad,NM
Client Project Manager: Mr. Bill Olson
PA NO 00-805-09-17658

LABOR		902.00
OTHER EXPENSES		1,016.94
	CURRENT BILLING	1,918.94
	NMGRT @ 5.8125 %	111.54
	AMOUNT DUE THIS INVOICE	2,030.48

TOTAL CONTRACT	5,162.25
PRIOR BILLINGS	1,338.45
CURRENT INVOICE	1,918.94
TOTAL REMAINING	1,904.86

Project Manager: Wilcox, Robert E.

LABOR/PROJECT MANAGEMENT:

SENIOR PROJECT SCIENTIST:	DATE	HOURS	RATE	AMOUNT
Wilcox, Robert E.	03-02-02 / 03-08-02	1.00		
		0.00		
		1.00	$75.00	$75.00

LABOR/DEVELOPMENT & SAMPLING TRAVEL:

STAFF SCIENTIST

Strzelczyk, Bogdan M	03-02-02 / 03-08-02	14.00	$ 57.00	$ 798.00

PROJECT ADMINISTRATION:

Trujillo, Robert J	03-02-02 / 03-08-02	1.00	$29.00	$29.00
	TOTAL LABOR			$902.00

EXPENSES:

	DATE	QTY	RATE	AMOUNT
Mileage:				
Strzelczyk, Bogdan M	03/04/02	91.0 Miles		
Strzelczyk, Bogdan M	03/05/02	161.0 Miles		
Strzelczyk, Bogdan M	03/06/02	343.0 Miles		
		595.0	0.25	$ 148.75
Per Diem				
Strzelczyk, Bogdan M	03-04-02 / 03-05-02	2.0 day(s)	$60.00	$120.00

Supplies/Equipment: (Supplies for Water Disposal)

Vacuum Truck Standby	$507.64	
United Parcel Service (Pump Shipping)	$240.55	
	$748.19	
Total Supplies/Equipment		$748.19
Total Charges:		$1,918.94

P.O. BOX 99

INVOICE

I W Inc

LOCO HILLS, NEW MEXICO

DAY OR NITE LOCO HILLS 677-2111
ARTESIA 746-4214
TOLL FREE 1-800-748-1972

ORDER NO. 19320

PAGE: 1

[illegible]ered by: BILL SMITH

IWIN

DATE 2/13/02

TO: AMEC
125 MONTOYA RD.
EL PASO, TX 79932

INVOICE NO. 127807

LEASE MONITOR WELL

WELL NO. #3

TERMS NET 30 DAYS

DATE	TICKET NUMBER	DESCRIPTION	RATES	AMOUNT
/07/02	124512	4.50 HRS STAND BY	70.00	315.00
/08/02	113882	2.50 HRS STAND BY	65.00	162.50

APPROVED BY: 02-19-02
PROJECT NO. 2-5[illegible] TASK
DEPT. NO. 6717 5750
ACCOUNT: 50[illegible]

POSTED MAR 26 2002

Sub-Total:	477.50
Sales Tax:	30.14
Total Invoice:	507.64

United Parcel Service

w.ups.com

Delivery Service Invoice

Invoice date **February 16, 2002**
Invoice number 0000F7087F072
Shipper number F7087F

Outbound

Air Shipping Document

Pickup Date	Tracking Number	Service	ZIP Code	Zone	Weight	Published Charge	Incentive Credit	Billed Charge
02/04	1ZF7087F2210007722	Next Day Air Commercial	75229	104	1	20.25	-6.22	14.03
		Fuel Surcharge				0.10	-0.03	0.07
		Total				20.35	-6.25	14.10
	1st ref: 1-717-000 348-80A							
	Sender : UNREADABLE AMEC INC EL PASO TX 79906				Receiver: MARK IMHOLT CERTIS LABORATORY DALLAS TX 75229			
02/07	J1189591016	Next Day Air Commercial	75229	104	44	99.75	-30.62	69.13
		Fuel Surcharge				0.50	-0.15	0.35
		Total				100.25	-30.77	69.48
	Sender : VICTOR VALDIVIA JR AMEC EARTH EL PASO TX 79906				Receiver: TRACY M DALLAS TX 75229			
	1ZF7087F2210007611	Next Day Air Commercial	78043	104	Letter	14.75	-4.91	9.84
		Fuel Surcharge				0.07	-0.02	0.05
		Total				14.82	-4.93	9.89
	1st ref: 2729-UNITS							
	Sender : ARMANDO GARCIA AMEC INC EL PASO TX 79906				Receiver: SERGIO REYNA TXPDT DISTRIC LABORA LAREDO TX 78043			
02/08	1ZF7087F2210007802	Next Day Air Commercial	78753	104	Letter	14.75	-4.91	9.84
		Fuel Surcharge				0.07	-0.02	0.05
		Total				14.82	-4.93	9.89
	1st ref: 1717001767							
	Sender : BRENDA BARNES AMEC INC EL PASO TX 79906				Receiver: TIM WOOD TNRC AUSTIN TX 78753			
	1ZF7087F2210008221	Next Day Air Commercial	87710	103	1	17.25	-5.30	11.95
		Fuel Surcharge				0.09	-0.03	0.06
		Total				17.34	-5.33	12.01
	1st ref: UNREADABLE 1-717-000304							
	Sender : JAMIE BARNES AMEC INC EL PASO TX 79906				Receiver: UNREADABLE UNREADABLE ANGEL FIRE NM 87710			
	1ZF7087F2210008338	Next Day Air Commercial	98104	106	Letter	15.25	-5.08	10.17
		Fuel Surcharge				0.08	-0.03	0.05
		Total				15.33	-5.11	10.22
	1st ref: 6717/3719							
	Sender : UNREADABLE AMEC INC EL PASO TX 79906				Receiver: AMEC SEATTLE WA 98104			
	1ZF7087F3710000746	2nd Day Air Commercial	97223	206	28	51.90	-11.21	40.69
		Insured Value (7)				2.45		2.45
		Fuel Surcharge				0.26	-0.06	0.20
		Total				54.61	-11.27	43.34
	1st ref: 2-517-000008							
	Sender : UNREADABLE UNREADABLE EL PASO TX 79906				Receiver: JOE ROCK AMEC-PORTLAND PORTLAND OR 97223			

United Parcel Service

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Delivery Service Invoice

Invoice date February 16, 2002
Invoice number 0000F7087F072
Shipper number F7087F

Outbound

Air Shipping Document (continued)

Pickup Date	Tracking Number	Service	ZIP Code	Zone	Weight	Published Charge	Incentive Credit	Billed Charge
02/08	1ZF7087F3710000755	2nd Day Air Commercial	97223	206	62	101.90	-22.01	79.89
		Insured Value (11)				3.85		3.85
		Fuel Surcharge				0.51	-0.11	0.40
		Total				106.26	-22.12	84.14
	1st ref: 7-517-000008							
	Sender : UNREADABLE UNREADABLE EL PASO TX 79906					Receiver: JOE ROCK AMEC-PORTLAND PORTLAND OR 97223		
02/11	1ZF7087F2210008249	Next Day Air Commercial	80011	104	Letter	14.75	-4.91	9.84
		Fuel Surcharge				0.07	-0.02	0.05
		Total				14.82	-4.93	9.89
	1st ref: 1717-000296							
	Sender : ADRIAN STRESOW AMEC INC EL PASO TX 79905					Receiver: ANDREA KARP PROLOGIS AURORA CO 80011		
	1ZF7087F2210008258	Next Day Air Commercial	60603	106	Letter	15.25	-5.08	10.17
		Fuel Surcharge				0.08	-0.03	0.05
		Total				15.33	-5.11	10.22
	1st ref: 1717-000296							
	Sender : ADRIAN STRESOW AMEC INC EL PASO TX 79906					Receiver: MICHAEL RISSMAN MAYER AND BROWN AND CHICAGO IL 60603		
	1ZF7087F2210008267	Next Day Air Commercial	98034	106	Letter	15.25	-5.08	10.17
		Fuel Surcharge				0.08	-0.03	0.05
		Total				15.33	-5.11	10.22
	1st ref: 6717-3719							
	Sender : SANDRA DOMINGO AMEC INC EL PASO TX 79906					Receiver: HOA LAM AMEC KIRKLAND WA 98034		
	1ZF7087F2210008276	Next Day Air Commercial	78711	104	Letter	14.75	-4.91	9.84
		Fuel Surcharge				0.07	-0.02	0.05
		Total				14.82	-4.93	9.89
	1st ref: 1-717-000095							
	Sender : BRENDA BARNES AMEC INC EL PASO TX 79906					Receiver: BOB DESCAMPS UNREADABLE AUSTIN TX 78711		
	1ZF7087F2210008285	Next Day Air Commercial	81321	104	Letter	14.75	-4.91	9.84
		Fuel Surcharge				0.07	-0.02	0.05
		Total				14.82	-4.93	9.89
	1st ref: 6717							
	Sender : SHOLA M AMEC INC EL PASO TX 79906					Receiver: NIELSON SKANSKA RALPH WAGNER CORTEZ CO 81321		
	1ZF7087F2210008301	Next Day Air Commercial	87502	103	Letter	14.00	-4.66	9.34
		Fuel Surcharge				0.07	-0.02	0.05
		Total				14.07	-4.68	9.39
	1st ref: 1717000281							
	Sender : BRENDA BARNES AMEC INC EL PASO TX 79906					Receiver: JOHN KOVACS NMED-UST BUREAU SANTA FE NM 87502		

United Parcel Service

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Delivery Service Invoice

Invoice date **February 16, 2002**
Invoice number 0000F7087F072
Shipper number F7087F

Adjustments & Other Charges

Shipping Charge Corrections

Pickup Date	Tracking Number	Original Service/ Corrected Service	ZIP Code	Zone	Weight	Published Charge	Incentive Credit	Billed Charge	Adjustment Amount
02/07	J1189591016	Next Day Air	75229	104					
		Next Day Air	75229	104					
		Additional Handling				5.00		5.00	5.00
		Sender : VICTOR VALDIVIA JR AMEC EARTH EL PASO TX 79906				Receiver: TRACY M DALLAS TX 75229			
02/08	1ZF7087F3710000746	2nd Day Air	97223	206					
		2nd Day Air	97223	206					
		Additional Handling				5.00		5.00	5.00
		1st ref: 2-517-000008							
		Sender : UNREADABLE UNREADABLE EL PASO TX 79906				Receiver: JOE ROCK AMEC-PORTLAND PORTLAND OR 97223			
	1ZF7087F3710000755	2nd Day Air	97223	206	62	101.89	-22.01	79.89	
		2nd Day Air	97223	206	110	175.60	-37.93	137.67	
		Over Maximum Size 33 x 28 x 23				50.00		50.00	
		Fuel Surcharge				0.37	-0.08	0.29	108.07
		1st ref: 7-517-000008							
		Sender : UNREADABLE UNREADABLE EL PASO TX 79906				Receiver: JOE ROCK AMEC-PORTLAND PORTLAND OR 97223			
02/11	1ZF7087F2210008249	Next Day Air	80011	104	Letter	14.75	-4.91	9.84	
		Next Day Air	80011	104	5	29.75	-9.13	20.62	
		Fuel Surcharge				0.08	-0.03	0.05	10.83
		1st ref: 1717-000295							
		Sender : ADRIAN STRESOW AMEC INC EL PASO TX 79906				Receiver: ANDREA KARP PROLOGIS AURORA CO 80011			
Total Shipping Charge Corrections						**4 Package(s)**			128.90
Total Adjustments & Other Charges									128.90

United Parcel Service

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Delivery Service Invoice

Invoice date February 23, 2002
Invoice number 0000F7087F082
Shipper number F7087F

800 811 1648

Adjustments & Other Charges

Address Corrections

Tracking Number	Service	Published Charge	Incentive Credit	Billed Charge
1ZF7087F3710000746	2nd Day Air	10.00		10.00
1st ref: 2-517-000008				
Recorded: ACME SW 7477 TECH CENTER DR TIGARD OR 97224		Corrected: AMEC-PORTLAND SW 7376 DURHAM RD TIGARD OR 97224		
1ZF7087F3710000755	2nd Day Air	10.00		10.00
1st ref: 7-517-000008				
Recorded: ACME SW 7477 TECH CENTER DR TIGARD OR 97224		Corrected: AMEC-PORTLAND SW 7376 DURHAM RD TIGARD OR 97224		
Total Address Corrections		20.00		20.00

Shipping Charge Corrections

Pickup Date	Tracking Number	Original Service/ Corrected Service	ZIP Code	Zone	Weight	Published Charge	Incentive Credit	Billed Charge	Adjustment Amount
02/16	08695587123	Next Day Air	75229	104					
		Next Day Air	75229	104					
		Additional Handling				5.00		5.00	5.00
		Sender : VICTOR H VALDIVIA JR AMEC EL PASO TX 79906				Receiver: LAB DALLAS TX 75229			
Total Shipping Charge Corrections					1 Package(s)				5.00
Total Adjustments & Other Charges									25.00

IMPORTANT MESSAGE

FOR ______________________

DATE 4/11 TIME 3:30 A.M. P.M.

M Blair

OF Trace

PHONE 8

AREA CODE	NUMBER	EXTENSION

☐ FAX

☐ MOBILE

AREA CODE	NUMBER	TIME TO CALL

TELEPHONED		PLEASE CALL	
CAME TO SEE YOU		WILL CALL AGAIN	
WANTS TO SEE YOU		RUSH	
RETURNED YOUR CALL		SPECIAL ATTENTION	

MESSAGE

They have corrected TDS typo and have sent corrected data sheet.

OCD will await results to

Amy

SIGNED

TOPS FORM 3002P LITHO IN U.S.A.

Summary Report

Bob Wilcox
AMEC Inc.
1712-A W Hadley Ave.
Las Cruces, NM 88005

Report Date: March 19, 2002

Order ID Number: A02030711

Project Number: 2517000008
Project Name: Carlsbad Well Developement & Sampling
Project Location: Carsbad-City Well

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
192304	MW-3	Water	3/5/02	:	3/7/02

0 This report consists of a total of 2 page(s) and is intended only as a summary of results for the sample(s) listed above.

	BTEX					TPH DRO	TPH GRO
Sample - Field Code	Benzene (ppm)	Toluene (ppm)	Ethylbenzene (ppm)	M,P,O-Xylene (ppm)	Total BTEX (ppm)	DRO (ppm)	GRO (ppm)
192304 - MW-3	0.020	<0.020	<0.020	<0.020	0.020	<5	< 2

Sample: 192304 - MW-3

Param	Flag	Result	Units
Hydroxide Alkalinity		<1.0	mg/L as CaCo3
Carbonate Alkalinity		<1.0	mg/L as CaCo3
Bicarbonate Alkalinity		1518	mg/L as CaCo3
Total Alkalinity		1518	mg/L as CaCo3
Specific Conductance		158000	µMHOS/cm
Fluoride		1.60	mg/L
Total Mercury		<0.0002	mg/L
Chloride	[1]	117000	mg/L
Nitrate-N	[2]	<10.0	mg/L
Sulfate	[3]	29300	mg/L
Dissolved Calcium		226	mg/L
Dissolved Magnesium		8650	mg/L
Dissolved Potassium		2540	mg/L
Dissolved Sodium		78700	mg/L
Total Dissolved Solids		27100 ← Error	mg/L
Total Aluminum		<1.00	mg/L
Total Arsenic		1.86	mg/L
Total Barium		<1.00	mg/L
Total Boron		1020	mg/L

Continued on next page ...

[1]Chloride was re-ran on IC030802-2.sch (PB18141; QC18713). ICV %IA = 90; CCV %IA = 97; matrix spikes RPD = 0, %EA = 91; LCS spikes RPD = 1, %EA = 93.

[2]Sample ran out of hold time for NO3. Sample came in on the last day of the hold time, but could not be put on the IC before the hold time had expired. Sample was ran the day it was received.

[3]Sulfate was re-ran on IC030802-2.sch (PB18141; QC18713). ICV %IA = 93; CCV %IA = 97; matrix spikes RPD = 0, %EA = 91; LCS spikes RPD = 2, %EA = 94.

Sample 192304 continued ...

Param	Flag	Result	Units
Total Cadmium		<0.050	mg/L
Total Chromium		<0.100	mg/L
Total Cobalt		<0.250	mg/L
Total Copper		<0.125	mg/L
Total Iron		19.5	mg/L
Total Lead		<0.100	mg/L
Total Manganese		0.344	mg/L
Total Molybdenum		<0.500	mg/L
Total Nickel		<0.250	mg/L
Total Selenium		<0.500	mg/L
Total Silica		2.53	mg/L
Total Silver		<0.125	mg/L
Total Zinc		<0.250	mg/L
pH	[4]	6.9	s.u.

[4]Sample was received out of holding time. pH should be tested in the field. Sample was tested the day it was received.

Cation-Anion Balance Sheet

Sample # 192304 Date: 3/19/02

Cations

	ppm	meq/L
Calcium	226	11.2774
Magnesium	8650	711.8085
Sodium	78700	3423.45
Potassium	2540	64.9732

Total Cations 4211.51 in meq/L

Anions

	ppm	meq/L
Alkalinity	1518	30.36
Sulfate	29300	610.026
Chloride	117000	3300.57
Nitrate as N	0	0
Fluoride	1.6	0.084224

Total Anions 3941.04 in meq/L

Percentage Error
6.6352 %
(needs to be <10%)

OTHER INFORMATION

TDS	27100
EC	158000

Measure EC and Cation Sums	421150.91	Range should be:	142200	to	173800
Measure EC and Anion Sums	394104.02	Range should be:	142200	to	173800
Calculated TDS/Conductivity	0.171519	Range should be:	0.55	to	0.77
Measure TDS and Cation Sums	0.0643475	Range should be:	0.55	to	0.77
Measure TDS and Anion Sums	0.0687636	Range should be:	0.55	to	0.77

TRACEANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1298
155 McCutcheon, Suite H El Paso, Texas 79932 888•588•3443 915•585•3443 FAX 915•585•4944
E-Mail: lab@traceanalysis.com

Analytical and Quality Control Report

Bob Wilcox
AMEC Inc.
1712-A W Hadley Ave.
Las Cruces, NM 88005

Report Date: March 19, 2002

Order ID Number: A02030711

Project Number: 2517000008
Project Name: Carlsbad Well Developement & Sampling
Project Location: Carsbad-City 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
192304	MW-3	Water	3/5/02	:	3/7/02

0
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. Note: the RDL is equal to MQL for all organic analytes including TPH.

Dr. Blair Leftwich, Director

Analytical Report

Sample: 192304 - MW-3

Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC18844	Date Analyzed:	3/12/02
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB18253	Date Prepared:	3/12/02

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		1518	mg/L as CaCo3	1	1
Total Alkalinity		1518	mg/L as CaCo3	1	1

Sample: 192304 - MW-3

Analysis:	BTEX	Analytical Method:	S 8021B	QC Batch:	QC18692	Date Analyzed:	3/7/02
Analyst:	CG	Preparation Method:	S 5030B	Prep Batch:	PB18126	Date Prepared:	3/7/02

Param	Flag	Result	Units	Dilution	RDL
Benzene		0.020	mg/L	20	0.001
Toluene		<0.020	mg/L	20	0.001
Ethylbenzene		<0.020	mg/L	20	0.001
M,P,O-Xylene		<0.020	mg/L	20	0.001
Total BTEX		0.020	mg/L	20	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.103	mg/L	20	0.10	103	70 - 130
4-BFB		0.083	mg/L	20	0.10	83	70 - 130

Sample: 192304 - MW-3

Analysis:	Conductivity	Analytical Method:	SM 2510B	QC Batch:	QC18833	Date Analyzed:	3/12/02
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB18247	Date Prepared:	3/12/02

Param	Flag	Result	Units	Dilution	RDL
Specific Conductance		158000	μMHOS/cm	1	

Sample: 192304 - MW-3

Analysis:	Fl	Analytical Method:	E 340.2	QC Batch:	QC18821	Date Analyzed:	3/13/02
Analyst:	JS	Preparation Method:	N/A	Prep Batch:	PB18232	Date Prepared:	3/13/02

Param	Flag	Result	Units	Dilution	RDL
Fluoride		1.60	mg/L	2	0.10

Sample: 192304 - MW-3

Analysis:	Hg, Total	Analytical Method:	S 7470A	QC Batch:	QC18737	Date Analyzed:	3/11/02
Analyst:	BC	Preparation Method:	N/A	Prep Batch:	PB18160	Date Prepared:	3/9/02

Param	Flag	Result	Units	Dilution	RDL
Total Mercury		<0.0002	mg/L	1	0.0002

Sample: 192304 - MW-3

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC18711 Date Analyzed: 3/7/02
Analyst: JS Preparation Method: N/A Prep Batch: PB18140 Date Prepared: 3/7/02

Param	Flag	Result	Units	Dilution	RDL
Chloride	[1]	117000	mg/L	5000	0.50
Nitrate-N	[2]	<10.0	mg/L	50	0.20
Sulfate	[3]	29300	mg/L	5000	0.50

Sample: 192304 - MW-3

Analysis: Salts Analytical Method: E 200.7 QC Batch: QC18859 Date Analyzed: 3/15/02
Analyst: RR Preparation Method: S 3005A Prep Batch: PB18182 Date Prepared: 3/12/02

Param	Flag	Result	Units	Dilution	RDL
Dissolved Calcium		226	mg/L	11	0.50
Dissolved Magnesium		8650	mg/L	1000	0.50
Dissolved Potassium		2540	mg/L	110	0.50
Dissolved Sodium		78700	mg/L	10000	0.50

Sample: 192304 - MW-3

Analysis: TDS Analytical Method: E 160.1 QC Batch: QC18681 Date Analyzed: 3/8/02
Analyst: JS Preparation Method: N/A Prep Batch: PB18126 Date Prepared: 3/7/02

Param	Flag	Result	Units	Dilution	RDL
Total Dissolved Solids		27100	mg/L	500	10

Sample: 192304 - MW-3

Analysis: TPH DRO Analytical Method: Mod. 8015B QC Batch: QC18742 Date Analyzed: 3/10/02
Analyst: MM Preparation Method: 3510C - Mod. Prep Batch: PB18157 Date Prepared: 3/10/02

Param	Flag	Result	Units	Dilution	RDL
DRO		<5	mg/L	1	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		12.2	mg/L	0.10	150	81	70 - 130

[1]Chloride was re-ran on IC030802-2.sch (PB18141; QC18713). ICV %IA = 90; CCV %IA = 97; matrix spikes RPD = 0, %EA = 91; LCS spikes RPD = 1, %EA = 93.

[2]Sample ran out of hold time for NO3. Sample came in on the last day of the hold time, but could not be put on the IC before the hold time had expired. Sample was ran the day it was received.

[3]Sulfate was re-ran on IC030802-2.sch (PB18141; QC18713). ICV %IA = 93; CCV %IA = 97; matrix spikes RPD = 0, %EA = 91; LCS spikes RPD = 2, %EA = 94.

Sample: 192304 - MW-3

Analysis:	TPH GRO	Analytical Method:	8015B	QC Batch:	QC18694	Date Analyzed:	3/7/02
Analyst:	CG	Preparation Method:	5030	Prep Batch:	PB18126	Date Prepared:	3/7/02

Param	Flag	Result	Units	Dilution	RDL
GRO		< 2	mg/L	20	0.10

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.117	mg/L	20	0.10	117	70 - 130
4-BFB		0.087	mg/L	20	0.10	87	70 - 130

Sample: 192304 - MW-3

Analysis:	Total Metals	Analytical Method:	S 6010B	QC Batch:	QC18772	Date Analyzed:	3/12/02
Analyst:	RR	Preparation Method:	S 3010A	Prep Batch:	PB18163	Date Prepared:	3/11/02

Param	Flag	Result	Units	Dilution	RDL
Total Aluminum		<1.00	mg/L	10	0.10
Total Arsenic		1.86	mg/L	10	0.05
Total Barium		<1.00	mg/L	10	0.10
Total Boron		1020	mg/L	10000	0.005
Total Cadmium		<0.050	mg/L	10	0.005
Total Chromium		<0.100	mg/L	10	0.01
Total Cobalt		<0.250	mg/L	10	0.02
Total Copper		<0.125	mg/L	10	0.01
Total Iron		19.5	mg/L	10	0.05
Total Lead		<0.100	mg/L	10	0.01
Total Manganese		0.344	mg/L	10	0.02
Total Molybdenum		<0.500	mg/L	10	0.05
Total Nickel		<0.250	mg/L	10	0.02
Total Selenium		<0.500	mg/L	10	0.05
Total Silica		2.53	mg/L	10	0.05
Total Silver		<0.125	mg/L	10	0.01
Total Zinc		<0.250	mg/L	10	0.02

Sample: 192304 - MW-3

Analysis:	pH	Analytical Method:	E 150.1	QC Batch:	QC18745	Date Analyzed:	3/7/02
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB18169	Date Prepared:	3/7/02

Param	Flag	Result	Units	Dilution	RDL
pH	[4]	6.9	s.u.	1	1

[4]Sample was received out of holding time. pH should be tested in the field. Sample was tested the day it was received.

Quality Control Report
Method Blank

Method Blank

QCBatch: QC18681

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

Method Blank

QCBatch: QC18692

Param	Flag	Results	Units	Reporting Limit
Benzene		<0.001	mg/L	0.001
Toluene		<0.001	mg/L	0.001
Ethylbenzene		<0.001	mg/L	0.001
M,P,O-Xylene		<0.001	mg/L	0.001
Total BTEX		<0.001	mg/L	0.001

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.094	mg/L	1	0.10	93	70 - 130
4-BFB		0.083	mg/L	1	0.10	83	70 - 130

Method Blank

QCBatch: QC18694

Param	Flag	Results	Units	Reporting Limit
GRO		<0.1	mg/L	0.10

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
TFT		0.095	mg/L	1	0.10	95	70 - 130
4-BFB		0.085	mg/L	1	0.10	85	70 - 130

Method Blank

QCBatch: QC18711

Param	Flag	Results	Units	Reporting Limit
Chloride		<2.0	mg/L	0.50
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<2.0	mg/L	0.50

Method Blank

QCBatch: QC18737

Param	Flag	Results	Units	Reporting Limit
Total Mercury		<0.0002	mg/L	0.0002

Method Blank

QCBatch: QC18742

Param	Flag	Results	Units	Reporting Limit
DRO		<5	mg/L	50

Surrogate	Flag	Result	Units	Dilution	Spike Amount	Percent Recovery	Recovery Limits
n-Triacontane		12	mg/L	0.10	150	80	70 - 130

Method Blank

QCBatch: QC18772

Param	Flag	Results	Units	Reporting Limit
Total Aluminum		<0.100	mg/L	0.10
Total Arsenic		<0.050	mg/L	0.05
Total Barium		<0.100	mg/L	0.10
Total Boron		0.00608	mg/L	0.005
Total Cadmium		<0.005	mg/L	0.005
Total Chromium		<0.010	mg/L	0.01
Total Cobalt		<0.025	mg/L	0.02
Total Copper		<0.0125	mg/L	0.01
Total Iron		<0.050	mg/L	0.05
Total Lead		<0.010	mg/L	0.01
Total Manganese		<0.025	mg/L	0.02
Total Molybdenum		<0.050	mg/L	0.05
Total Nickel		<0.025	mg/L	0.02
Total Selenium		<0.050	mg/L	0.05
Total Silica		<0.050	mg/L	0.05
Total Silver		<0.0125	mg/L	0.01
Total Zinc		<0.025	mg/L	0.02

Method Blank

QCBatch: QC18821

Param	Flag	Results	Units	Reporting Limit
Fluoride		<0.1	mg/L	0.10

Method Blank

QCBatch: QC18833

Param	Flag	Results	Units	Reporting Limit
Specific Conductance		7.75	μMHOS/cm	

Method Blank QCBatch: QC18844

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: QC18859

Param	Flag	Results	Units	Reporting Limit
Dissolved Calcium		<0.500	mg/L	0.50
Dissolved Magnesium		<0.500	mg/L	0.50
Dissolved Potassium		<0.500	mg/L	0.50
Dissolved Sodium		<0.500	mg/L	0.50

Quality Control Report
Duplicate Samples

Duplicate QCBatch: QC18681

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids		368	363	mg/L	1	1	8.9

Duplicate QCBatch: QC18745

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
pH		9.1	9.1	s.u.	1	0	0.99

Duplicate QCBatch: QC18833

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Specific Conductance		98856	99400	μMHOS/cm	1	0	5.9

Duplicate QCBatch: QC18844

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

Continued ...

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Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Bicarbonate Alkalinity		52	50	mg/L as CaCo3	1	3	7
Total Alkalinity		52	50	mg/L as CaCo3	1	3	7

Quality Control Report
Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

QCBatch: QC18692

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
MTBE	0.092	0.091	mg/L	1	0.10	<0.001	92	1	82 - 111	20
Benzene	0.1	0.1	mg/L	1	0.10	<0.001	100	0	86 - 106	20
Toluene	0.101	0.101	mg/L	1	0.10	<0.001	101	0	82 - 108	20
Ethylbenzene	0.102	0.102	mg/L	1	0.10	<0.001	102	0	86 - 115	20
M,P,O-Xylene	0.311	0.311	mg/L	1	0.30	<0.001	103	0	79 - 122	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
TFT	0.0944	0.0965	mg/L	1	0.10	94	96	70 - 130
4-BFB	0.0938	0.0945	mg/L	1	0.10	93	94	70 - 130

Laboratory Control Spikes

QCBatch: QC18694

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
GRO	0.866	0.861	mg/L	1	1	<0.1	86	0	78 - 113	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
TFT	0.103	0.103	mg/L	1	0.10	103	103	70 - 130
4-BFB	0.096	0.095	mg/L	1	0.10	96	95	70 - 130

Laboratory Control Spikes

QCBatch: QC18711

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	11.24	11.21	mg/L	1	12.50	<2.0	89	0	90 - 110	20
Fluoride	2.28	2.34	mg/L	1	2.50	<0.2	91	2	90 - 110	20
Nitrate-N	2.31	2.31	mg/L	1	2.50	<0.2	92	0	90 - 110	20
Sulfate	11.46	11.50	mg/L	1	12.50	<2.0	91	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: QC18737

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Mercury	0.00115	0.00115	mg/L	1	0.001	<0.0002	115	0	84 - 125	20

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

Laboratory Control Spikes

QCBatch: QC18742

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
DRO	24.8	23.5	mg/L	0.10	250	<5	99	5	70 - 130	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
n-Triacontane	11.8	11.7	mg/L	0.10	150	78	78	70 - 130

Laboratory Control Spikes

QCBatch: QC18772

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	0.919	0.887	mg/L	1	1	<0.100	91	3	75 - 125	20
Total Arsenic	0.469	0.456	mg/L	1	0.50	<0.050	93	2	75 - 125	20
Total Barium	1.01	0.983	mg/L	1	1	<0.100	101	2	75 - 125	20
Total Boron	0.0497	0.0472	mg/L	1	0.05	0.00608	99	5	75 - 125	20
Total Cadmium	0.232	0.226	mg/L	1	0.25	<0.005	92	2	75 - 125	20
Total Chromium	0.101	0.0988	mg/L	1	0.10	<0.010	101	2	75 - 125	20
Total Cobalt	0.248	0.241	mg/L	1	0.25	<0.025	99	2	75 - 125	20
Total Copper	0.122	0.121	mg/L	1	0.12	<0.0125	97	0	75 - 125	20
Total Iron	0.502	0.712	mg/L	1	0.50	<0.050	100	34	75 - 125	20
Total Lead	0.473	0.461	mg/L	1	0.50	<0.010	94	2	75 - 125	20
Total Manganese	0.253	0.248	mg/L	1	0.25	<0.025	101	1	75 - 125	20
Total Molybdenum	0.509	0.499	mg/L	1	0.50	<0.050	101	1	75 - 125	20
Total Nickel	0.245	0.240	mg/L	1	0.25	<0.025	98	2	75 - 125	20
Total Selenium	0.405	0.393	mg/L	1	0.50	<0.050	81	3	75 - 125	20
Total Silica	0.480	0.467	mg/L	1	0.50	<0.050	96	2	75 - 125	20
Total Silver	0.122	0.120	mg/L	1	0.12	<0.0125	97	1	75 - 125	20
Total Zinc	0.237	0.232	mg/L	1	0.25	<0.025	94	2	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: QC18821

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Fluoride	0.956	0.956	mg/L	1	1	<0.1	95	0	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: QC18859

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Dissolved Calcium	96.5	98.3	mg/L	4	100	<0.500	96	1	75 - 125	20
Dissolved Magnesium	111	114	mg/L	4	100	<0.500	111	2	75 - 125	20
Dissolved Potassium	109	112	mg/L	4	100	<0.500	109	2	75 - 125	20
Dissolved Sodium	111	114	mg/L	4	100	<0.500	111	2	75 - 125	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: QC18711

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	83.77	83.41	mg/L	1	62.50	27.3	90	0	52 - 131	20
Nitrate-N	15.16	15.05	mg/L	1	12.50	3.45	93	1	84 - 105	20
Sulfate	96.09	95.78	mg/L	1	62.50	39.4	90	0	79 - 104	20

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

Matrix Spikes

QCBatch: QC18737

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Mercury	0.00087	[5] 0.00056	mg/L	1	0.001	<0.0002	87	43	84 - 127	20

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

Matrix Spikes

QCBatch: QC18772

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Aluminum	12.5	12.7	mg/L	10	10	<1.00	125	1	75 - 125	20
Total Arsenic	5.95	5.88	mg/L	10	5	1.86	81	1	75 - 125	20
Total Barium	[6] 6.38	6.34	mg/L	10	10	<1.00	63	0	75 - 125	20
Total Boron	[7] 1170	1130	mg/L	10000	0.05	1020	30	4	75 - 125	20
Total Cadmium	[8] 1.37	1.36	mg/L	10	2.50	<0.050	54	0	75 - 125	20
Total Chromium	[9] 0.622	0.618	mg/L	10	1	<0.100	62	0	75 - 125	20
Total Cobalt	[10] 1.38	1.38	mg/L	10	2.50	<0.250	55	0	75 - 125	20

Continued ...

[5]msd recovery invalid due to spiking error, use lcs/lcsd to demonstrate the run is under control.
[6]Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.
[7]Matrix spike recovery invalid due to required dilution. LCS demonstrates process under control.
[8]Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.
[9]Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.
[10]Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.

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Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Total Copper	1.09	1.08	mg/L	10	1.25	<0.125	87	0	75 - 125	20
Total Iron	[11] 22.8	23.8	mg/L	10	5	19.5	66	26	75 - 125	20
Total Lead	[12] 2.31	2.30	mg/L	10	5	<0.100	46	0	75 - 125	20
Total Manganese	[13] 1.91	1.92	mg/L	10	2.50	0.344	62	0	75 - 125	20
Total Molybdenum	[14] 3.18	3.15	mg/L	10	5	<0.500	63	0	75 - 125	20
Total Nickel	[15] 1.26	1.25	mg/L	10	2.50	<0.250	50	0	75 - 125	20
Total Selenium	4.33	4.35	mg/L	10	5	<0.500	86	0	75 - 125	20
Total Silica	6.75	6.90	mg/L	10	5	2.53	84	3	75 - 125	20
Total Silver	1.29	1.30	mg/L	10	1.25	<0.125	103	0	75 - 125	20
Total Zinc	[16] 1.64	1.66	mg/L	10	2.50	<0.250	65	1	75 - 125	20

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

Matrix Spikes

QCBatch: QC18821

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Fluoride	3.11	3.14	mg/L	1	2	1.42	84	1	71 - 112	20

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

Matrix Spikes

QCBatch: QC18859

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Dissolved Calcium	333	337	mg/L	10	100	244	89	4	75 - 125	20
Dissolved Magnesium	143	148	mg/L	10	100	30.3	112	4	75 - 125	20
Dissolved Potassium	116	120	mg/L	10	100	7.78	108	3	75 - 125	20
Dissolved Sodium	163	167	mg/L	10	100	52.5	110	3	75 - 125	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: QC18681

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1007	100	90 - 110	3/8/02

[11]Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.
[12]Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.
[13]Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.
[14]Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.
[15]Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.
[16]Matrix spike recovery low due to matrix effects. LCS demonstrates process under control.

ICV (1) QCBatch: QC18681

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	1005	100	90 - 110	3/8/02

CCV (1) QCBatch: QC18692

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.095	95	85 - 115	3/7/02
Benzene		mg/L	0.10	0.099	99	85 - 115	3/7/02
Toluene		mg/L	0.10	0.1	100	85 - 115	3/7/02
Ethylbenzene		mg/L	0.10	0.101	101	85 - 115	3/7/02
M,P,O-Xylene		mg/L	0.30	0.308	102	85 - 115	3/7/02

ICV (1) QCBatch: QC18692

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
MTBE		mg/L	0.10	0.092	92	85 - 115	3/7/02
Benzene		mg/L	0.10	0.1	100	85 - 115	3/7/02
Toluene		mg/L	0.10	0.102	102	85 - 115	3/7/02
Ethylbenzene		mg/L	0.10	0.102	102	85 - 115	3/7/02
M,P,O-Xylene		mg/L	0.30	0.313	104	85 - 115	3/7/02

CCV (1) QCBatch: QC18694

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/L	1	0.946	94	85 - 115	3/7/02

ICV (1) QCBatch: QC18694

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
GRO		mg/L	1	0.887	88	85 - 115	3/7/02

CCV (1) QCBatch: QC18711

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.26	90	90 - 110	3/7/02
Fluoride		mg/L	2.50	2.29	91	90 - 110	3/7/02
Nitrate-N		mg/L	2.50	2.33	93	90 - 110	3/7/02
Sulfate		mg/L	12.50	11.43	91	90 - 110	3/7/02

ICV (1) QCBatch: QC18711

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.27	90	90 - 110	3/7/02
Fluoride		mg/L	2.50	2.28	91	90 - 110	3/7/02
Nitrate-N		mg/L	2.50	2.30	92	90 - 110	3/7/02
Sulfate		mg/L	12.50	11.43	91	90 - 110	3/7/02

CCV (1) QCBatch: QC18737

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		mg/L	0.001	0.00102	102	80 - 120	3/11/02

ICV (1) QCBatch: QC18737

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		mg/L	0.001	0.00103	103	80 - 120	3/11/02

CCV (1) QCBatch: QC18742

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/L	250	250	100	75 - 125	3/10/02

ICV (1) QCBatch: QC18742

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
DRO		mg/L	250	241	96	75 - 125	3/10/02

CCV (1) QCBatch: QC18745

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		s.u.	7	7.0	100	-0.1 s.u. - +0.1 s.u.	3/7/02

ICV (1) QCBatch: QC18745

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		s.u.	7	7.0	100	-0.1 s.u. - +0.1 s.u.	3/7/02

CCV (1) QCBatch: QC18772

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Aluminum		mg/L	2	1.91	95	90 - 110	3/12/02
Total Arsenic		mg/L	1	0.956	95	90 - 110	3/12/02
Total Barium		mg/L	2	1.97	98	90 - 110	3/12/02
Total Boron		mg/L	0.10	0.106	106	90 - 110	3/12/02
Total Cadmium		mg/L	0.50	0.492	98	90 - 110	3/12/02
Total Chromium		mg/L	0.20	0.199	99	90 - 110	3/12/02
Total Cobalt		mg/L	0.50	0.494	98	90 - 110	3/12/02
Total Copper		mg/L	0.25	0.249	99	90 - 110	3/12/02
Total Iron		mg/L	1	1.03	103	90 - 110	3/12/02
Total Lead		mg/L	1	0.982	98	90 - 110	3/12/02
Total Manganese		mg/L	0.50	0.499	99	90 - 110	3/12/02
Total Molybdenum		mg/L	1	0.979	97	90 - 110	3/12/02
Total Nickel		mg/L	0.50	0.494	98	90 - 110	3/12/02
Total Selenium		mg/L	1	0.994	99	90 - 110	3/12/02
Total Silica		mg/L	1	1.01	101	90 - 110	3/12/02
Total Silver		mg/L	0.25	0.244	97	90 - 110	3/12/02
Total Zinc		mg/L	0.50	0.498	99	90 - 110	3/12/02

ICV (1) QCBatch: QC18772

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Aluminum		mg/L	2	1.99	99	90 - 110	3/12/02
Total Arsenic		mg/L	1	1.00	100	90 - 110	3/12/02
Total Barium		mg/L	2	1.98	99	90 - 110	3/12/02
Total Boron		mg/L	0.10	0.103	103	90 - 110	3/12/02
Total Cadmium		mg/L	0.50	0.504	100	90 - 110	3/12/02
Total Chromium		mg/L	0.20	0.201	100	90 - 110	3/12/02
Total Cobalt		mg/L	0.50	0.500	100	90 - 110	3/12/02
Total Copper		mg/L	0.25	0.259	103	90 - 110	3/12/02

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Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Iron		mg/L	1	1.01	101	90 - 110	3/12/02
Total Lead		mg/L	1	1.00	100	90 - 110	3/12/02
Total Manganese		mg/L	0.50	0.506	101	90 - 110	3/12/02
Total Molybdenum		mg/L	1	1.00	100	90 - 110	3/12/02
Total Nickel		mg/L	0.50	0.500	100	90 - 110	3/12/02
Total Selenium		mg/L	1	0.999	99	90 - 110	3/12/02
Total Silica		mg/L	1	1.01	101	90 - 110	3/12/02
Total Silver		mg/L	0.25	0.256	102	90 - 110	3/12/02
Total Zinc		mg/L	0.50	0.502	100	90 - 110	3/12/02

CCV (1) QCBatch: QC18821

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Fluoride		mg/L	1	0.964	96	85 - 115	3/13/02

ICV (1) QCBatch: QC18821

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Fluoride		mg/L	1	0.927	92	85 - 115	3/13/02

CCV (1) QCBatch: QC18833

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Specific Conductance		μMHOS/cm	97097	96765	99	90 - 110	3/12/02

ICV (1) QCBatch: QC18833

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Specific Conductance		μMHOS/cm	111900	106860	95	90 - 110	3/12/02

CCV (1) QCBatch: QC18844

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	4.0	0	90 - 110	3/12/02
Carbonate Alkalinity		mg/L as CaCo3	0	240	0	90 - 110	3/12/02
Bicarbonate Alkalinity		mg/L as CaCo3	0	<1.0	0	90 - 110	3/12/02
Total Alkalinity		mg/L as CaCo3	250	244	97	90 - 110	3/12/02

ICV (1) QCBatch: QC18844

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	3/12/02
Carbonate Alkalinity		mg/L as CaCo3	0	232	0	90 - 110	3/12/02
Bicarbonate Alkalinity		mg/L as CaCo3	0	10	0	90 - 110	3/12/02
Total Alkalinity		mg/L as CaCo3	250	242	96	90 - 110	3/12/02

CCV (1) QCBatch: QC18859

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	25	25.3	101	90 - 110	3/15/02
Dissolved Magnesium		mg/L	25	24.6	98	90 - 110	3/15/02
Dissolved Potassium		mg/L	25	23.7	94	90 - 110	3/15/02
Dissolved Sodium		mg/L	25	24.1	96	90 - 110	3/15/02

ICV (1) QCBatch: QC18859

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	25	24.8	99	95 - 105	3/15/02
Dissolved Magnesium		mg/L	25	25.8	103	95 - 105	3/15/02
Dissolved Potassium		mg/L	25	26.0	104	95 - 105	3/15/02
Dissolved Sodium		mg/L	25	25.9	103	95 - 105	3/15/02

192304

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

TraceAnalysis, Inc.

155 McCutcheon, Suite H
El Paso, Texas 79932
Tel (915) 585-3443
Fax (915) 585-4944
1 (888) 588-3443

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

LAB Order ID # A0203071

Company Name: AMEC
Phone #: 505 821-1801
Address: (Street, City, Zip) 8519 JEFFERSON NE / ALBUQUERQUE
Fax #: 505 821-7371
Contact Person: BOB WILCOX 505/821-1801 OR 505/327-7928
Invoice to: (If different from above) WILLIAM OLSON 505/476-3491
Project #: 2517000008
Project Name: CARLSBAD - WELL DEVEL + SAMPLING
Project Location: CARLSBAD - CITY WELL FIELD
Sampler Signature: S. M. [signature]

LAB # (LAB USE ONLY)	FIELD CODE	# CONTAINERS	Volume/Amount	MATRIX: WATER	SOIL	AIR	SLUDGE		PRESERVATIVE METHOD: HCl	HNO_3	H_2SO_4	NaOH	ICE	NONE		SAMPLING: DATE	TIME
192304	MW-3	1	1000	X									X				
		1	500	X						X							
		2	40	X					X								

ANALYSIS REQUEST (Circle or Specify Method No.)

Row	MTBE 8021B/602	BTEX 8021B/602	TPH ~~418.1/TX1005~~ TPH DRO/GRO	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	MAJOR CAT/ANIONS	MHWQCC	TDS			Turn Around Time if different from standard	Hold
1 (MW-3, 1000)																X		X				
2 (500)																	X					
3 (40)		X	X																			

Relinquished by: MARK SIRZELCZYK [signature] Date: 03.6.02 Time: 08:20
Received by: Date: Time:
Relinquished by: Date: Time:
Received by: Date: Time:
Relinquished by: Date: Time:
Received at Laboratory by: [signature] Date: 3.7.02 Time: 10:00

LAB USE ONLY
Intact Y / N
Headspace Y / N
Temp 4°
Log-in Review [initials]

REMARKS:
3/19 P

☐ Check If Special Reporting Limits Are Needed

Carrier # [illegible] 902-796-223-0

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

ORIGINAL COPY

PINNACLE LABORATORIES

Pinnacle Laboratories Inc.

CHAIN OF CUSTODY

DATE: 3/6/02 PAGE: 1 OF 1

PLI Accession #:

SHADED AREAS ARE FOR LAB USE ONLY.

PLEASE FILL THIS FORM IN COMPLETELY.

PROJECT MANAGER: Bill Olson

COMPANY: NM Oil Conservation Division
ADDRESS: 1220 St. Francis Dr.
Santa Fe, NM 87505
PHONE: (505) 476-3491
FAX: (505) 476-3462

BILL TO: Sams
COMPANY:
ADDRESS:

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB I.D.	Petroleum Hydrocarbons (418.1) TRPH	(MOD.8015) Diesel/Direct Inject	(M8015) Gas/Purge & Trap	8021 (BTEX)/8015 (Gasoline) MTBE	8021 (BTEX) ☐ MTBE ☐ TMB ☐ PCE	8021 (TCL)	8021 (EDX)	8021 (HALO)	8021 (CUST)	504.1 EDB ☐ / DBCP ☐	8260 (TCL) Volatile Organics	8260 (Full) Volatile Organics	8260 (CUST) Volatile Organics	8260 (Landfill) Volatile Organics	Pesticides /PCB (608/8081/8082)	Herbicides (615/8151)	Base/Neutral/Acid Compounds GC/MS (625/8270)	Polynuclear Aromatics (610/8310/8270-SIMS)	General Chemistry: Cations/Anions	Priority Pollutant Metals (13)	Target Analyte List Metals (23)	RCRA Metals (8)	RCRA Metals by TCLP (Method 1311)	Metals: TCP Metals	NUMBER OF CONTAINERS
020305 1440 (MW-3)	3/5/02	1440	water						2														1					1	

PROJECT INFORMATION

PROJ. NO.:
PROJ. NAME: Carlsbad Well Field
P.O. NO.:
SHIPPED VIA:

SAMPLE RECEIPT

NO. CONTAINERS	
CUSTODY SEALS	Y / N / NA
RECEIVED INTACT	
BLUE ICE/ICE	

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK (NORMAL) ☒

CERTIFICATION REQUIRED: ☐ NM ☐ SDWA ☐ OTHER

METHANOL PRESERVATION ☐

COMMENTS: FIXED FEE ☐
Saturated brine water

RELINQUISHED BY: 1.
Signature: William Olson Time: 1135
Printed Name: William Olson Date: 3/6/02
Company: NMOCD
See reverse side (Force Majeure)

RECEIVED BY: 1.
Signature: Time:
Printed Name: Date:
Company:

RELINQUISHED BY: 2.
Signature: Time:
Printed Name: Date:
Company:

RECEIVED BY: (LAB) 2.
Signature: Time:
Printed Name: Date:

Pinnacle Laboratories Inc.