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ENVIRONMENTAL BUREAU OIL CONSERVATION DIVISION

Mr. William C. Olson, Hydrologist Environmental Bureau Oil Conservation Division New Mexico Energy, Minerals and Natural Resources Department 1220 South St. Francis Drive Santa Fe, New Mexico 87505

Re: Annual Groundwater Monitoring and Plume Delineation Report, Texaco Exploration and Production Inc., Cooper-Jal Unit Injection Station, NW/4, NW/4, SE/4, Section 24, Township 24 South, Range 36 East, Lea County, New Mexico

Dear Mr. Olson:

Please find enclosed a copy of the above-referenced report. The report is submitted on behalf of ChevronTexaco Exploration and Production, and presents the results of plume delineation and annual groundwater monitoring conducted by Larson and Associates, Inc. Please call Scott Toner at (915) 687-7318 or myself at (915) 687-0901 if you have questions.

Sincerely, Larson and Associates, Inc.

indy K. Crain

Cindy K. Crain Geologist

cc: Scott Toner - Texaco Chris Williams – NMOCD District I

ANNUAL GROUNDWATER MONITORING and PLUME DELINEATION REPORT COOPER-JAL UNIT SOUTH INJECTION STATION LEA COUNTY, NEW MEXICO

Prepared for:

ChevronTexaco Exploration and Production 15 Smith Road Midland, Texas

Prepared by:

Larson and Associates, Inc. 507 North Marienfeld St., Ste. 202 Midland, Texas 79701 (915) 687-0901

April 18, 2003

Cindy K. Crain, Geologist

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1.0 INTRODUCTION

ChevronTexaco Exploration and Production (ChevronTexaco), as successor to Texaco Exploration and Production Inc. (Texaco), has retained Larson and Associates, Inc. (LA) to conduct chloride plume delineation, groundwater remediation and monitoring activities at its former Cooper-Jal Unit South Injection Station (Site). In September of 2001, ChevronTexaco sold its interest in the Cooper-Jal Unit to SDG Resources. However, it retained responsibility to remediate the chloride impact to groundwater. The Site is located approximately 5.5 miles northwest of Jal, New Mexico, and is situated in Unit Letter J (NW/4, NW/4, SE/4), Section 24, Township 24 South, Range 36 East, Lea County, New Mexico. Figure 1 presents a Site location and topographic map.

2.0 BACKGROUND

From September 10, 1997 to May 14, 1998 fourteen (14) monitoring wells were installed at the Site, in order to investigate soil and groundwater impacts. An electromagnetic (EM-34) terrain conductivity survey was initially conducted on January 13-14, 1998 and May 7, 1998, to determine areas of elevated terrain conductivity prior to monitoring well drilling. Details of the investigations were submitted to the New Mexico Oil Conservation Division (NMOCD) in a Subsurface Environmental Assessment Report dated June 1998.

In that report, Texaco proposed to implement a groundwater recovery program to reduce the levels of chloride, total dissolved solids (TDS) and sulfate in the groundwater, by installing approximately three (3) groundwater recovery wells in the area of highest chloride, TDS and sulfate impact. The actual number and location of recovery wells would be determined by a pumping test, to be performed following installation of the initial recovery well. Recovered fluid from the recovery well would be conveyed to the Cooper-Jal Unit South Injection Station for placement into the injection stream. Groundwater monitoring, on a semi-annual basis, was also proposed, with an annual report to be prepared and submitted yearly to the NMOCD.

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The proposed activities were approved by the NMOCD in a letter dated September 17, 1998. In that letter, the NMOCD requested submittal of a work plan to delineate the extent of the chloride, TDS and sulfate impact. On November 18, 1998, a "Work Plan for Plume Delineation and Modification to Proposed Groundwater Monitoring Schedule" was submitted to the NMOCD. In addition to the previously proposed Recovery Wells, the work plan included installation of additional down gradient monitoring wells, in order to delineate the chloride, TDS and sulfate plume at the Site. The groundwater-monitoring schedule was modified to include semi-annual monitoring of down gradient monitoring wells (MW-8, MW-9, MW-9A, MW-10 and MW-11) and annual monitoring of the remaining wells. All monitoring wells will be sampled and analyzed for major anions and cations, and TDS. The proposed activities were approved by the NMOCD in a letter dated February 2, 1999, and included detailed directives for monitoring well installations and reporting requirements. A copy of the September 17, 1998, and February 2, 1999 letters are included in Appendix A.

3.0 CURRENT ACTIVITIES

3.1 Monitoring and Recovery Wells

On January 18, 1999, monitoring well MW-11 was installed southeast (downgradient) of the Site. Recovery well (RW-1) was installed on May 4 and 5, 1999, and recovery well (RW-2) on November 9 and 10, 1999. Highlander Environmental Corp. conducted initial activities at the Site. On September 17, 2001, two additional monitoring wells (MW-12 and MW-13) were installed under direction of Larson and Associates, Inc. (LA) to satisfy concerns by individuals that protested applications for water allocations submitted to the New Mexico State Engineer (NMSE). Scarborough Drilling, Inc., located in Lamesa, Texas, drilled all the wells from 165 to 174 feet below ground surface (bgs) using an air rotary drilling rig. Monitoring well (MW-11) was constructed with 4-inch diameter schedule 40 PVC casing and screen. The screen extends the entire thickness of the aquifer. Recovery wells RW-1 and RW-2 were constructed with 5-inch diameter schedule 40 PVC Annual Groundwater Monitoring Report Cooper-Jal Unit South Injection Station Lea County, New Mexico

casing and screen. The well screens fully penetrate the aquifer. Monitoring wells MW-12 and MW-13 were constructed with 2-inch diameter schedule 40 PVC casing and screen. The well screen, approximately 15 feet in length in MW-12 and MW-13, was placed in the borings to encounter the bottom of the aquifer. Monitoring well MW-11 was constructed with approximately 40 feet of screen, and recovery wells RW-1 and RW-2 were constructed with approximately 45 feet of screen. In each well, graded silica sand was placed in the annular space between the boring and screen to approximately two (2) feet above the screen. A layer of bentonite chips, approximately three (3) feet thick, was placed above the sand, and hydrated with potable water. The remainder of the annulus was filled with cement and bentonite grout to approximately 1-foot bgs. The monitoring wells were secured with locking above-grade covers that were anchored in concrete pads measuring approximately 3' x 3' x 1'. The surface completion of the recovery wells (RW-1 and RW-2) will be performed after approval by the NMSE to initiate remediation. Table 1 presents a summary of well drilling and installation details. Appendix B presents the well logs and well construction diagrams. Figure 2 presents the well locations.

3.2 Groundwater Monitoring

3.2.1 Groundwater Assessment

LA completed monitoring at the Site for the period of May 2002 through October 2002. Depth to groundwater measurements were collected from all deep monitoring wells (MW-1 through MW-13), shallow monitoring wells (MW-2A, MW-4A, MW-5A and MW-9A), and recovery wells (RW-1 and RW-2) on May 10, 2002 and October 22, 2002. On the May 10 groundwater monitoring event, depth to groundwater in the deep wells ranged from 132.40 feet (MW-3) to 144.45 feet (MW-13) below top of casing (TOC), and in the shallow wells, from 134.50 feet (MW-2A) to 137.20 feet (MW-9A) below TOC. On the October 22 event, depth to groundwater ranged from 130.76 feet

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(MW-11) to 144.49 feet (MW-13) below TOC in the deep monitoring wells, and from 132.35 feet (MW-9A) to 137.17 feet (MW-5A) below TOC in the shallow monitoring wells. The groundwater gradient was approximately 0.008 feet per foot in the deep wells during the May event, and 0.004 feet per foot in the shallow wells. During the October event, the groundwater gradient in both the upper and lower wells was approximately 0.004 feet per foot. Groundwater flow at the Site has remained consistent, and is from the northwest to the southeast in both the upper and lower portions of the aquifer. Table 2 provides a summary of depth to groundwater measurements. Figure 3 shows the groundwater gradient of the shallow zone on May 10, 2002. Figure 7 shows the groundwater gradient of the shallow zone on October 22, 2002. Figure 8 shows the groundwater gradient of the deep zone on October 22, 2002.

Groundwater samples were collected on May 13, 15, 16 and 17, 2002, from deep monitoring wells MW-1 through MW-13, and shallow monitoring wells MW-2A, MW-4A, MW-5A and MW-9A. The groundwater samples were submitted under chain-of-custody control to TraceAnalysis, Inc., and analyzed for anions, cations and TDS. Prior to sample collection, the wells were purged of a minimum of three (3) casing volumes of groundwater. The groundwater samples were collected using dedicated disposable PVC bailers. Table 3 presents a summary of the general chemistry analysis. Appendix C presents the laboratory report.

Referring to Table 3, chloride was above the WQCC standard of 250 milligrams per liter (mg/L) in groundwater from MW-2 (3,200 mg/L), MW-4 (11,300 mg/L), MW-4A (577 mg/L), MW-5 (4,040 mg/L) and MW-13 (517 mg/L). Fluoride was above the WQCC standard of 1.6 mg/L in groundwater from MW-1 (5.83 mg/L), MW-2 (1.72 mg/L), MW-4 (2.01 mg/L), MW-6 (1.62 mg/L), MW-9 (2.22 mg/L), MW-10 (1.93 mg/L) and MW-11 (2.13 mg/L). Nitrate was below the WQCC standard of 10 mg/L in all samples.

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Sulfate was below the WQCC standard of 600 mg/L in all samples except MW-4 (1,380 mg/L). TDS exceeded the WQCC standard to 1,000 mg/L in samples from MW-2 (6,040 mg/L), MW-4 (22,600 mg/L), MW-4A (1,610 mg/L), MW-5 (8,340 mg/L) and MW-13 (1,596 mg/L). Figure 5 presents a chloride isopleth map of the shallow zone on May 13 - 17, 2002. Figure 6 presents a chloride isopleth map of the deep zone on May 13 - 17, 2002.

On October 22 and 23, 2002, groundwater samples were collected from all deep monitoring wells (MW-1 through MW-13) and all shallow monitoring wells (MW-2A, MW-4A, MW-5A and MW-9A). The groundwater samples were submitted under chain-of-custody control to Environmental Lab of Texas I, Ltd., and analyzed for chloride, sulfate and TDS. Prior to sample collection, the wells were purged a minimum of three (3) casing volumes of groundwater. The groundwater samples were collected using dedicated disposable PVC bailers. Table 3 presents a summary of the general chemistry analysis. Appendix C presents the laboratory report.

Referring to Table 3, chloride concentrations exceeded the WQCC standard of 250 mg/L in samples from monitoring wells MW-2 (2,920 mg/L), MW-4 (11,300 mg/L), MW-4A (478 mg/L), MW-5A (3,900 mg/L) and MW-13 (549 mg/L). Sulfate exceeded the WQCC standard of 600 mg/L in samples from MW-4 (1,320 mg/L) and MW-5A (616 mg/L). TDS exceeded the WQCC standard of 1,000 mg/L in samples from MW-2 (6,770 mg/L), MW-4 (23,200 mg/L), MW-4A (1,430 mg/L), MW-5A (8,670 mg/L) and MW-13 (1,740 mg/L). Figure 9 presents an isopleth map of chloride concentrations in the shallow zone during the October 2002 sampling event. Figure 10 presents an isopleth map of chloride concentrations in the deep zone during the October 2002 sampling event.

With the installation of monitoring well MW-11, the chloride plume has been delineated to the southeast in both the shallow and deep portions of the aquifer. With the installation of MW-12 and MW-13, a second chloride plume was detected northwest (upgradient) of the Site. Chloride

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concentrations in the upgradient plume (MW-12 and MW-13) exhibited a slight increase during the monitoring period (May 2002 to October 2002). Chloride concentrations in all monitoring wells (MW-1 through MW-10) during the monitoring period decreased in comparison to chloride concentrations reported in the June 1998 Subsurface Environmental Assessment Report. The chloride concentrations reported in MW-1 and MW-4A, during the monitoring period, were considerably less than previously reported concentrations. General chemistry results of groundwater from MW-5 and MW-5A on October 23, 2002 indicate that the samples for these two wells were labeled incorrectly when submitted to the laboratory (i.e., MW-5 results should be for MW-5A, and MW-5A results should be for MW-5). The chloride concentrations in monitoring wells MW-1, MW-4A, MW-5 and MW-5A will be verified during the groundwater sampling event scheduled for April of 2003. Results will be included in the next Annual Groundwater Monitoring Report.

3.2.2 Waste Management and Disposition

Purged groundwater from the sampling activities was disposed at an NMOCD permitted salt water disposal (SWD) facility operated by Chapparel Services, Inc., located in Eunice, New Mexico. Approximately 250 gallons of purged groundwater was disposed following each sampling event, for a total of approximately 500 gallons.

3.3 Remediation System Installation and Start-up

Texaco submitted applications to pump water from wells RW-1 and RW-2 to the State of New Mexico, Office of the State Engineer (NMSE) for remediation of the chlorides, subject to conditions. Upon approval of the applications, ChevronTexaco will initiate chloride remediation in accordance with the conditions stipulated by the NMSE.

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4.0 <u>CONCLUSIONS</u>

- 1. Depth to groundwater ranged from 132.40 feet (MW-3) to 144.45 feet (MW-13) below top of casing (TOC) in the deep monitoring wells on the May 10 event.
- Depth to groundwater ranged from 134.50 feet (MW-2A) to 137.20 feet (MW-9A) below TOC in the shallow monitoring wells on the May 10 event.
- Depth to groundwater ranged from 130.76 feet (MW-11) to 144.49 feet (MW-13) below TOC in the deep monitoring wells on the October 22 event.
- 4. Depth to groundwater ranged from 132.35 feet (MW-9A) to 137.17 feet (MW-5A) below TOC in the shallow monitoring wells on the October 22 event.
- 5. The groundwater gradient was approximately 0.008 feet per foot in the deeper zone during the May event, and 0.004 feet per foot in the shallower zone.
- 6. The groundwater gradient was approximately 0.004 feet per foot in both the shallow and deep zones during the October event.
- 7. Groundwater flow at the Site has remained consistent, and is from northwest to southeast in both the shallow and deep portions of the aquifer.
- From the May 2002 sampling event, chloride was above the WQCC standard of 250 milligrams per liter (mg/L) in groundwater from MW-2 (3,200 mg/L), MW-4 (11,300 mg/L), MW-4A (577 mg/L), MW-5 (4,040 mg/L) and MW-13 (517 mg/L).
- 9. From the May 2002 sampling event, fluoride was above the WQCC standard of 1.6 mg/L in groundwater from MW-1 (5.83 mg/L), MW-2 (1.72 mg/L), MW-4 (2.01 mg/L), MW-6 (1.62 mg/L), MW-9 (2.22 mg/L), MW-10 (1.93 mg/L) and MW-11 (2.13 mg/L).
- 10. From the May 2002 sampling event, nitrate was below the WQCC standard of 10 mg/L in all monitoring wells.
- 11. From the May 2002 sampling event, sulfate was below the WQCC standard of 600 mg/L in all monitoring wells except MW-4 (1,380 mg/L).

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Cooper-Jal Unit Injection Station

Lea County, New Mexico

- From the May 2002 sampling event, TDS exceeded the WQCC standard to 1,000 mg/L in MW-2 (6,040 mg/L), MW-4 (22,600 mg/L), MW-4A (1,610 mg/L), MW-5 (8,340 mg/L) and MW-13 (1,596 mg/L).
- From the October 2002 sampling event, chloride concentrations exceeded the WQCC standard of 250 mg/L in monitoring wells MW-2 (2,920 mg/L), MW-4 (11,300 mg/L), MW-4A (478 mg/L), MW-5A (3,900 mg/L) and MW-13 (549 mg/L).
- From the October 2002 sampling event, sulfate exceeded the WQCC standard of 600 mg/L in MW-4 (1,320 mg/L) and MW-5A (616 mg/L).
- From the October 2002 sampling event, TDS exceeded the WQCC standard of 1,000 mg/L in MW-2 (6,770 mg/L), MW-4 (23,200 mg/L), MW-4A (1,430 mg/L), MW-5A (8,670 mg/L) and MW-13 (1,740 mg/L).
- 16. The chloride plume has been delineated to the southeast in both the shallow and deep portions of the aquifer.
- 17. With the installation of MW-12 and MW-13, a second chloride plume was detected northwest (upgradient) of the Site.
- 18. Chloride concentrations in the upgradient plume (MW-12 and MW-13) exhibited a slight increase during the monitoring period (May 2002 to October 2002).
- Chloride concentrations in all monitoring wells (MW-1 through MW-10) during the monitoring period decreased in comparison to concentrations reported in the June 1998 Subsurface Environmental Assessment Report.

TABLES

Texaco Exploration and Production Inc., Cooper-Jal Unit South Water Station Summary of Monitoring and Recovery Well Drilling and Completion Details NW/4, SE/4, Section 24, Township 24 South, Range 36 East Table 1:

Lea County. New Mexico

	Lea County, No	ew Mexico	I			Page 1 of 1
Well	Date	Depth	Well	Ground	Top-of-Casing	Screen
Number	Drilled	Drilled	Diameter	Elevation	Elevation	Interval
		(Feet BGS)	(Inches)	(Feet AMSL)	(Feet AMSL)	(Feet BGS)
MW-1	10-Sept-97	173	2	3320.17	3320.00	153 - 173
MW-2	12-Feb-98	173	2	3319.86	3319.40	163 - 173
*MW-2A	13-Feb-98	145	2	3319.86	3319.39	130 - 145
MW-3	09-Feb-98	171	2	3316.22	3318.21	161 - 171
MW-4	10-Feb-98	171	2	3317.64	3319.74	161 - 171
*MW-4A	11-Feb-98	143	2	3317.47	3319.58	128 - 143
MW-5	11-Feb-98	171	2	3318.95	3321.10	161 - 171
*MW-5A	12-Feb-98	141	2	3318.96	3321.07	126 - 141
MW-6	13-Feb-98	170	2	3319.13	3321.15	120 - 170
MW-7	14-May-98	166	2	3316.35	3318.39	151 - 166
MW-8	12-May-98	170	2	3314.95	3317.14	155 - 170
0-WM	12-May-98	164	2	3310.79	3312.79	149 - 164
*MW-9A	14-May-98	142	2	3310.44	3312.56	127 - 142
MW-10	13-May-98	166	2	3317.26	3319.30	151 - 166
MW-11	18-Jan-99	165	4	3307.30	3309.69	125 - 165
MW-12	17-Sep-99	174	2	3325.51	3328.43	156.68 - 171.65
MW-13	17-Sep-99	174	2	3335.72	3338.49	156.68 - 171.65
RW-1	05-May-99	174	5	3317.40	3318.50	130.41 - 174.37
RW-2	10-Nov-99	174	5	3316.72	3318.62	134.22 - 172.73

All wells of PVC construction, and installed by Scarborough Drilling Inc., Lamesa, Texas.

Notes:

- Shallow monitoring well ... *.
- Depth in feet below ground surface
- Elevation in feet above mean sea level 2. BGS: 3. AMSL:

i

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i

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Summary of Depth-to-Groundwater Measurements from Monitoring and Recovery Wells Texaco Exploration and Production Inc., Cooper-Jal Unit South Water Station NE/4, NE/4, Section 25, Township 24 South, Range 36 East Table 2:

	A	5			6	7		10
	ю-мм	132.6	1	ł	132.43	132.37	137.2(132.35
	6-WW	132.89	1		132.68	132.52	137.20	132.56
	MW-8	134.36	ł	1	134.21	134.08	133.95	134.18
	MW-7	136.19	1	1	135.98	135.87	135.67	135.89
	MW-6	136.73	ł	1	136.61	136.50	136.40	136.57
	MW-5A	137.20	1	1	137.11	136.99	136.90	137.17
	MW-5	137.42	1	1	137.28	137.18	137.10	137.04
	MW-4A	135.68	1	135.65	135.90	135.34	135.30	135.51
	MW-4	136.01	1	1	135.57	135.87	135.67	135.90
	MW-3	132.65	1	1	132.52	132.40	132.40	132.49
Mexico	MW-2A	134.80	1	1	134.73	134.58	134.50	134.66
nty, New 1	MW-2	135.00	1		134.79	134.63	134.65	134.72
Lea Cou	MW-1	135.05	1		134.93	134.80	134.77	134.89
	Date	05/18/98	03/23/99	05/21/99	05/25/99	02/08/01	05/10/02	10/22/02

Date	MW-10	11-WM	MW-12	MW-13	RW-1	RW-2
05/18/98	137.18	1	ł	-	ł	1
03/23/99		131.12	1	ł	1	ł
05/21/99	1	1	1		134.32	1
05/25/99	137.04	130.91	1	1	134.24	1
02/08/01	136.88	130.11	1	ł	134.15	135.58
05/10/02	136.80	135.60	139.57	144.45	134.00	135.55
10/22/02	136.91	130.76	139.73	144.49	134.17	135.55

Notes: All measurements recorded in feet below top of well casing 1. *: Indicates shallow monitoring well

sis of Groundwater Samples from Monitoring Wells	nc., Cooper-Jal Unit South Water Station	Courth Dange 36 Fast
Summary of General Chemistry And	Texaco Exploration and Production	NW/A SE/A Section 74 Townshin
Table 3:		

	NW/4, SE/ Lea County	4, Section 7, New Mo	24, Township exico	p 24 South, Ra	urge 36 East											age 1 of 2
Well	Sample	Hq	Carbonate	Bicarbonate	Total	Specific	Chloride	Fluoride	Nitrate - N	Sulfate	Calcium	Magnesium	Potassium	Sodium	SQL	Hardness
Number	Date	S.U.	Alkalinity (mg/L)	Alkalinity (mg/L)	Alkalmity (mg/L)	Conductance (umhos/cm)	(mg/L)	(mg/L)	(mg/L)	(mg/r)	(mg/L)	(பஜா)	(mg/L)	(m/Rm)	(11/8m)	
	NMWOCC	Standar					250	1.60	10	600					1000	
I-WM	09/16/97	7.1	•		280		8,500	,	1	1,100	520.0	630.0	50.00	4,300	15,000	3,900
	02/25/98	7.4	1	1	280	1	5,600	1	1	570	285.0	520.0	116.00	2,900	9,300	2,850
	02/14/01	,	<1.0	306	306	28000	11,000	4.4	7.7	1,000	374.0	780.0	236.00	5,236	20,000	1
	05/17/02	1	<1.0	208	208	1	237	5.83	3.28	86.9	45.7	20.1	11.90	184.0	784	,
	10/23/02	•	1	1	1	1	168	1	١	96.8	ł	1	1	ł	696	,
MW-2	02/25/98	7.4	1	;	210	ł	5,900	;	1	760	840.0	380.0	30.00	2,650	9,400	3,660
	04/09/98	7.0	1	;	290	1	8,200	1	1	066	1100	490.0	29.00	3,430	15,000	4,800
	02/14/01		<1.0	184	184	20,000	7,400	2.30	4.10	870	1025	488.0	48.50	3,189	15,000	ł
	05/17/02	,	<1.0	160	160		3,200	1.72	3.18	483	587.0	239.0	35.60	1,160	6,040	1
	10/23/02	1	1	1	1	ı	2,920	1	1	451	ł	1	1	1	6,770	ł
MW-2A	02/26/98	7.9	;	1	190	1	280	1	1	330	144.0	36.0	5.70	215.0	1,200	508
	02/14/01	,	<1.0	162	162	630	44	1.30	2.30	76	64.4	16.7	7.02	45.5	390	1
	05/15/02	1	<1.0	176	176	1	36.6	<1.0	2.34	79.1	57.6	13.9	4.35	43.8	435	1
	10/23/02		1	1	:	1	44.3	•	1	97		1	1	1	425	1
MW-3	02/27/98	7.9	:	1	190	1	452	1	١	406	200.0	50.0	11.00	237.0	1,500	705
	02/14/01		<1.0	158	158	640	34	1.60	2.40	100	54.5	19.0	7.61	48.6	440	1
	05/17/02		<1.0	158	158	1	30.6	1.56	2.35	102	55.6	18.4	5.04	50.0	433	1
	10/23/02	,	1	1	1	1	35.4	:	1	104	1	1	:	1	419	1
MW-4	02/27/98	7.1		1	230	•	12,000	,	1	1,300	1,700	880.0	48.00	5,300	22,000	7,870
	04/09/98	6.7	1	1	240	1	13,000	ı	1	1,500	1,740	840.0	42.00	5,400	23,000	7,800
	02/14/01	•	<1.0	232	232	38000	15,000	1.8	6.8	1,500	:	1	1	1	29,000	ł
	05/17/02	•	<1.0	232	232	1	11,300	2.01	6.09	1,380	1,610	814.0	60.90	4,310	22,600	1
	10/23/02	1	1			1	11,300	1	1	1,320	1	1	1	1	23,200	ł
MW-4A	02/27/98	7.6	;	;	180	1	1,600	1	,	410	470.0	130.0	11.00	620.0	3,300	1,710
	02/14/01		<1.0	154	154	5200	1,600	1.4	2.8	210	1	1	1	1	4,000	1
	05/15/02	1	<1.0	156	156	1	577	<1.0	2.23	121	200.0	49.5	10.30	125.0	1,610	1
	10/23/02		1	ł	1	1	478	1	1	114	;	1	1	ı	1,430	;
MW-5	02/26/98	7.2	:	1	180	1	6,600	1	,	910	1,400	470.0	31.00	2,400	12,000	5,430
	02/14/01	1	<1.0	166	166	21,000	7,700	1.8	4.1	910	;	1	1	;	18,000	1
	05/17/02	•	<1.0	156	156	1	4,040	1.53	4.56	586	757.0	319.0	60.90	1,260	8,340	,
	10/23/02	'	1	1	1	1	2	'	;	y4.8	1	:	1	: ;	477	1
MW-5A	02/26/98	7.9	•	1	170	1	061	1	, ;	180	107.0	0.52	3.50	0./11	140	362
	02/15/01	,	<1.0	164	104 202	1000	€	1.20	2.72	0.51	7.02	1.7	0.10	4.0	2/0	•
	05/15/02	1	<1.0	182	182		3 900	0.1^ -	577	616 616		10.1	40; 1	0.C 1	8.670	
	10/22/02				000		0.00			004	100.0	0.44	90.3	0 200	1 200	631
9-MW	02/26/98	1.7	1		007		700	<mark>، ا</mark>	1000	a ₽ 8	100.0	201	7.67	5.02	470	100
	10/11/20	•	-1·0	1/2	0.11	00	0 - 6	2, T	21-1	00 3	1 63	10.6	<pre></pre>	19.6	201	
	20/21/20	•	<1.0	102	701	:	0./c	707	+1.2	109	1.50	0.CT	71.7	2.04	331	1
	10/22/02	•	*	•			1.01			010	0110	0.22	12 00	166.0	000	010
MW-7	05/14/98	7.5	1	•	230	1 00	430		1 9	340	214.0	00.0	13.00	107.01	1,200	010
	02/14/01	1	<1.0	150	150	2,200	010	1.10	2.40	NCT 0	- 484	73.7		- 543	1,200	
	02/10/07	,	<1.0	15U			1.01	<u>, , , , , , , , , , , , , , , , , , , </u>	1777	t.12	10.0	1.07	cv.0	2	490	
	1 10/22/01	;	:	•	-	-	>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>	-	-		-	-	-		,	-

Table 3:	Summary of	General	Chemistry A	nalysis of Grou	Indwater Sar	nples from Mor	nitoring We	lls								
	1 exaco Exp NW/4, SE/4 1.ea County.	, Section New Me	and rroducuc 24, Township xico	a me, cuope 24 South, Ra	nge 36 East		10								4	age 2 of 2
Well	Sample	Ha	Carbonate	Bicarbonate	Total	Specific	Chloride	Fluoride	Nitrate - N	Sulfate	Calcium	Magnesium	Potassium	Sodium	TDS	Hardness
Number	Date	2 I I I	Alkalinity	Alkalinity	Alkalinity (mo/T.)	Conductance (umhos/cm)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	
	NMWOCC	Standard	1 1 1	(r/Bm)			250	1.60	 2	999					1000	
MW-8	04/13/08	74			200	,	270		-	390	190.0	60.0	12.00	170.0	1,200	720
	02/14/01		<1.0	156	156	069	49	1.8	2.5	100	59.9	21.5	7.84	52.9	400	1
	05/16/02	,	<1.0	158	158	1	32.9	1.57	2.33	101	56.6	19.2	5.20	49.5	432	1
	10/22/02	•	•	1	1	1	40.8	1	ł	104	ł	1	ı	1	392	1
6-WM	05/14/98	7.6	•	1	190		350	:	1	470	207.0	61.0	12.00	200.0	1,300	770
	02/15/01	1	<1.0	156	156	660	35	2.60	2.40	110	60.4	19.8	7.47	47.0	430	,
	05/16/02	1	<1.0	160	160	1	31.7	2.22	2.28	99.4	60.8	17.6	5.32	50.1	440	
	10/23/02	1		1	;	1	39	1	B	102	1	1	1	1	436	1
MW-9A	05/14/98	7.3		1	280		600		1	770	338.0	96.0	12.00	334.0	2,200	1,240
	02/15/01		<1.0	142	142	710	85	1.40	2.20	71	71.6	19.2	6.94	46.0	400	1
	05/15/02	;	<1.0	136	136		148	<1.0	2.18	65.3	62.9	16.1	4.62	46.8	445	-
	10/23/02	•		:		1	168	1	1	75.5	1	1	1	1	651	:
MW-10	05/14/98	7.3	1	1	240	1	360	1	1	450	211.0	62.0	11.00	190.0	1,400	780
	02/15/01	1	<1.0	140	140	1100	190	2.0	2.30	97	108.0	32.3	8.20	61.0	660	•
	05/17/02	1	<1.0	152	152	1	204	1.93	2.19	99.1	109.0	31.7	7.60	62.4	713	-
	10/22/02	1	1	1	1	1	213	1	1	108	1	ł	ł	,	758	1
II-WM	01/22/99	10.6	30	<1.0	30		46	2.3	4.2	94	33.0	7.0	9.1	58.0	370	110
	02/15/01	1	<1.0	156	156	670	37	2.40	2.40	120	64.0	19.1	7.83	50.1	360	;
	05/16/02	•	<1.0	160	160	1	31.9	2.13	2.33	98.8	63.5	17.2	4.83	47.0	444	1
	10/23/02	1	1	1	1	1	37.2	1	1	102	1	1	1	1	447	1
MW-12	05/15/02	1	<1.0	160	160	1	58.3	1.09	2.44	91.3	53.5	15.9	5.52	50.3	462	1
	10/23/02	1	1	1	1	1	65	1	1	102	1	ł	1	;	477	;
MW-13	05/13/02	'	<1.0	100	100	:	517	1>	1.61	437	116.0	76.0	19.40	269.0	1,596	1
	10/23/02	1	1	1	:	-	549	1	1	370	1	1	•	,	1,740	1
RW-1	05/27/99	6.9	0	224	224	1	8,700	2.70	7.0	840	679.0	521.0	34.00	3290	14,000	2,145
Duplicate	02/14/01	1	<1.0	160	160	640	33	1.5	2.5	100	55.9	19.0	7.74	49.2	490	1
(KW-3)		•		1	1	1	1	1	1	1	1	1	1	1	,	ŧ
Duplicate	02/15/01	1	<1.0	150	150	680	37	2.40	2.40	120	64.1	19.3	7.75	49.1	460	1
(III-MW)		•	1	1	1	1	1	1	1	1	1	1	1	1	1	:
Duplicate	10/22/02	•	•	1	1	1	222	1	1	107	1	1	1	1	802	1
		•	1	:	1	1	1	:	1	1	1	1	1	1	1	ł
Duplicate	10/23/02	•	1	1	1	1	62	1	1	99.2	:	;	1	1	439	:
(MW-12)		1	1	1	1	1	1	'	1	1	1	1	1	,	,	1
		•	1	1	1	:	1	1	1	1	1	1	1	T	;	•

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Notes:

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s.u.: Standard Units mg/L: milligrams per liter urnhos/cm: millimhos per centimeter New Mexico Water Quality Control Standards

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FIGURES











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WELL DATA

Ground Top of Casing Elevation Eelevation Well No. Feet, AMSL Feet, AMSL

		rees, mos	tions the second
	MW-1	3320.17	3320.00
	MW-2	3319,86	3319.40
	MW-2A	3319.86	3319.39
	MW-3	3316.22	3318.21
	MW-4	3317.64	3319.74
	MW-4A	3317.47	3319.58
	MW-5	3318.95	3321.10
	MW-5A	3318.96	3321.07
	MW-6	3319.13	3321.15
	MW-7	3316.35	3318.39
	MW-8	3314.95	3317.14
	MW-9	3310.79	3312.79
	MW-9A	3310,44	3312.56
1	MW-10	3317.26	3319.30
	MW-11	3307.30	3309.69
	MW-12	3325.51	3328.43
1	MW-13	3335.72	3338.49
	RW-1	3317.40	3318.50
	8W.2	3318 72	3318.62





MW-12 58,3

A MW-13 517

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250

LEGEND

MONITORING WELL LOCATION (DEEP), and CHLORIDE CONCENTRATION IN UROLINDWATER (MGAL) \$13 through \$1172002

MONITORING WELL LOCATION (SHALLOW),

COOPER-JAL UNIT OIL WELL LOCATION

GROUNDWATER RECOVERY WELL LOCATION

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LEGEND

MONITORING WELL LOCATION (DEEP)

COOPER-JAL UNIT OIL WELL LOCATION GROUNDWATER RECOVERY WELL LOCATION

MONITORING WELL LOCATION (SHALLOW), and GROUNDWATER POTENTIOMETRIC SURFACE ELEVATION, FEET AMSL, 10/22/02

CONTOUR of GROUNDWATER POTENTIOMETRIC SURFACE ELEVATION. FEET AMSL, 10/22/02

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M₩-2A

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3184.89 \odot

▲^{MW-12}

MW-2 MW-2A MW-3 MW-4 MW-4A

MW-5 MW-5A MW-6 3318.95 3318.96 3319.13 3321.10 3321.07 3321.15 MW-7 MW-8 3316.35 3314.95 3310.79 3318.39 3317.14 3312.79 MW-9 MW-9A MW-10 3310.44 3317.26 MW-11 MW-12 3307.30 3325.51 3335.72 3317.40 MW-13 RW-1

MW-1

3312.56 3319.30 3309.69 3328.43 3338.49 3318.50 RW-2 3316.72 3318.62



5×90 ^{MW-11} FIGURE 7 LEA COUNTY, NEW MEXICO TEXACO EXPLORATION and PRODUCTION, INC. COOPER-JAL SOUTH WATER STATION and TANK BATTERY NW/4, SE/4, SECTION 24, T245, R36E DATE 2/4/03 GROUNDWATER POTENTIOMETRIC (SHALLOW) OCTOBER 22, 2002 DWN.BY: 0 5D 100 SCALE Aarson & Inc. Environmental Consultants FILE

0-0113

WELL DATA

Ground Top of Casing Elevation Eelevation Feet, AMSL Feet, AMSL Well No.

3320.00

3320.17 3319.40 3319.39 3319.86 3319.86 3318.21 3319.74 3319.58 3316.22 3317.64 3317.47

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WELL DATA

Ground Top of Casing Elevation Eelevation

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Well No.	Feet, AMSL	Feet, AMS
MW-1	3320.17	3320.00
MW-2	3319.86	3319.40
MW-2A	3319.86	3319.39
MW-3	3316.22	3318.21
MW-4	3317.64	3319.74
MW-4A	3317.47	3319.58
MW-5	3318.95	3321.10
MW-5A	3318.96	3321.07
MW-6	3319.13	3321.15
MW-7	3316.35	3318.39
MW-8	3314.95	3317.14
MW-9	3310,79	3312.79
MW-9A	3310.44	3312.56
MW-10	3317.26	3319.30
MW-11	3307.30	3309.69
MW-12	3325.51	3328.43
MW-13	3335.72	3338.49
RW-1	3317.40	3318.50
RW-2	3316.72	3318.62



(6.8)

0-0113

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LEGEND

MONITORING WELL LOCATION (DEEPs and CHLORIDE CONCENTRATION IN GROUNEWATER (MGR.) 10/23.38/2

MONETORING WELL LOCATION (SHALLOW)

GROUNDWATER RECOVERY WELL LOCATION

CONTOUR (CONCENTRATION # GROUNDWATER (MIA) 1903-2802

MW-2A MENETORINO WELL LOCATION SHALLOW COOPERIJAL UNIT OL WELL LOCATION

MW-3 A 2.920

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-400-



0 60 100 BCALE

APPENDIX A

NMOCD Correspondence

STATE OF NEW MEXICO



ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OL CONSERVATION DIVISION 2040 S. PACHECO SANTA FE, NEW MEXICO 87505 (505) 827-7131

September 17, 1998

CERTIFIED MAIL RETURN RECEIPT NO. Z-274-520-559

Mr. Rodney Bailey Texaco E&P Inc. 205 E. Bender Hobbs, New Mexico 88240

RE: COOPER-JAL UNIT LEA COUNTY, NEW MEXICO

Dear Mr. Bailey:

The New Mexico Oil Conservation Division (OCD) has reviewed Texaco Exploration & Development's (Texaco) June 12, 1998 "SUBSURFACE ENVIRONMENTAL ASSESSMENT REPORT, TEXACO EXPLORATION AND PRODUCTION, INC., COOPER-JAL UNIT SOUTH INJECTION STATION, LEA COUNTY, NEW MEXICO". This document which was submitted on behalf of Texaco by their consultant Highlander Environmental Corp. contains the results of Texaco's investigation of the extent of ground water contamination related to an unlined emergency pit at the Cooper-Jal Unit South Injection Station located in Unit J, Section 24, T24S, R36E NMPM, Lea County, New Mexico. The document also contains Texaco's recommended ground water remediation plan.

The investigation work conducted to date is satisfactory and the remediation recommendations are approved with the following conditions:

- 1. Texaco will submit a work plan to complete the definition of the extent of ground water contamination which is in excess of New Mexico Water Quality Control Commission standards.
- 2. Texaco will notify the OCD at least 1 week in advance of all scheduled activities such that the OCD has the opportunity to witness the events and split samples.

Please be advised that OCD approval does not relieve Texaco of liability should the investigation actions fail to adequately define the extent of contamination related to Texaco's activities, or if contamination exists which is outside the scope of the work plan. In addition, OCD approval does not relieve Texaco of responsibility for compliance with any other federal, state or local laws and regulations.

Mr. Rodney G. Bailey September 17, 1998 Page 2

If you have any questions, please contact me at (505) 827-7154.

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Sincerely, = n

William C. Olson Hydrologist Environmental Bureau

xc: Wayne Price, OCD Hobbs Office Mark J. Larson, Highlander Environmental Corp.

No.2016 P. 14/23

STATE OF NEW MEXICO



ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

DIL CONSERVATION DIVISION 2040 S. PACHECO 5ANTA FE, NEW MEXICO 87505 (505) 827-7131

February 2, 1999

CERTIFIED MAIL RETURN RECEIPT NO. Z-274-520-612

Mr. Rodney Bailey Texaco E&P Inc. 205 E. Bender Hobbs, New Mexico 88240

RE: COOPER-JAL UNIT LEA COUNTY, NEW MEXICO

Dear Mr. Bailey:

The New Mexico Oil Conservation Division (OCD) has reviewed Texaco Exploration & Development's (Texaco) November 18, 1998 "WORK PLAN FOR PLUME DELINEATION AND MODIFICATION TO PROPOSED GROUNDWATER MONITORING SCHEDULE, TEXACO EXPLORATION AND PRODUCTION, INC., COOPER-JAL UNIT SOUTH INJECTION STATION, LEA COUNTY, NEW MEXICO". This document which was submitted on behalf of Texaco by their consultant Highlander Environmental Corp. contains the Texaco's proposed work plan for additional investigation of the extent of ground water contamination related to an unlined emergency pit at the Cooper-Jal Unit South Injection Station located in Unit J, Section 24, T24S, R36E NMPM, Lea County, New Mexico. The document also contains Texaco's proposed modifications to the site ground water monitoring plan.

The above referenced investigation work plan and proposed ground water monitoring plan modifications are **approved** with the following conditions:

1. Texaco will complete the new monitor wells as follows:

a. An appropriately sized gravel pack will be set in the annulus around the well screen from the bottom of the hole to 2-3 feet above the top of the well screen.

1. A.

Mr. Rodney G. Bailey February 2, 1999 Page 2

- b. A 2-3 foot bentonite plug will be placed above the gravel pack.
- c. The remainder of the hole will be grouted to the surface with cement containing 3-5% bentonite.
- d. A concrete pad and locking well cover will be placed at the surface.
- e. The well will be developed after construction using EPA approved procedures.
- 2. No less than 48 hours after the wells are developed, ground water from all monitor wells at each site will be purged, sampled and analyzed for concentrations of major cations and anions, total dissolved solids (TDS) EPA approved methods and quality assurance/quality control (QA/QC).
- 3 All wastes generated during the investigation will be disposed of at an OCD approved facility.
- . .4. Texaco will submit the results of the additional investigations to the OCD in the annual report. The report will include the following investigative information:
 - A description of the investigation activities which occurred including conclusions and recommendations.
 - b. A geologic/lithologic log and well completion diagram for each monitor well.
 - c. A water table map showing the location of the pit, monitor wells, recovery wells and any other pertinent site features as well as the direction and magnitude of the hydraulic gradient created using the water table elevation from each monitor well.
 - d. Summary tables of all past and present ground water quality sampling results and copies of all recent laboratory analytical data sheets and associated QA/QC data.
 - e. The disposition of all wastes generated.

Please be advised that OCD approval does not relieve Texaco of liability should the investigation actions fail to adequately define the extent of contamination related to Texaco's activities, or if contamination exists which is outside the scope of the work plan. In addition, OCD approval does not relieve Texaco of responsibility for compliance with any other federal, state or local laws and regulations.
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Mr. Rodney G. Bailey February 2, 1999 Page 3

If you have any questions, please contact me at (505) 827-7154.

Sincerely,

William C. Olson Hydrologist Environmental Bureau

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xc: Chris Williams, OCD Hobbs District Office Mark J. Larson, Highlander Environmental Corp.

APPENDIX B

Boring Logs and Well Construction Records

Client: Texaco Exploration and Production, Inc.

Project: Cooper-Jal Unit Injection Station

Project No: 0-0113

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Location: Lea County, New Mexico

Log: MW-11

Geologist: Mark J. Larson

Page: 1 of 1

Sl	JBSURFACE PROFILE		SAMPLE		E	PID Measurement		
Depth Symbol	Description	Elev.	Number	Type	Recovery	(PPM) 10 30 50	Well Detail	Notes Well Secured with Locking Above-Grade Cover
5 10 10 10 10 10 10 10 10 10 10 10 10 10	Silty Sand 7.5 YR 4/6 to 5/6, strong brown, very fine grained quartz sand, poorly sorted. Caliche 10 YR 7/3 to 7/4, very pale brown, sandy, very fine grained quartz sand, moderately hard. Sand 5 YR 6/6 to 7/4, reddish yellow to pink, very fine to fine grained quartz sand, moderately sorted, round. Interbedded with thin units of weakly cemented sandstone from 20 to 30'. Sandstone below 30' is weakly cemented. TD: 165'	3305 3297 3145						1 to 116' bgs: cement-bentonite grout 0 - 125' bgs: 4" Sch. 40 PVC Riser (Threaded) 116 to 120': bentonite chips W. L. 131.12' btoc (3/23/99) 125 to 140' bgs: 4" Sch. 40 PVC Screen, 0.020 slot 120 to 140' bgs: 8/16 graded silica sand 4" Sch. 40 PVC Cap (Threaded)
Drilling	Method: Air Rotary						тос	Elevation: 3309.69
Date Dr	illed: Jan. 18 and 19, 1999		,	•	-		Chec	cked by: CKC
Well Siz	ze: 4"		•		· ·		Drille	ed by: Scarborough Drilling

Project No: 996

Well ID: RW-1

Project: Cooper-Jal South Water Station

Client: Texaco Exploration and Production Inc.

Location: Lea County, New Mexico

Enclosure: 1 of 1

Engineer: MJL



Project No: 996

Well ID: RW-2

Project: Cooper-Jal South Water Station

Client: Texaco Exploration and Production Inc.

Location: Lea County, New Mexico

Enclosure: 1 of 1

Engineer: MJL



Client: Texaco Exploration and Production, Inc.

Project: Cooper-Jal Unit Injection Station

Project No: 0-0113

Location: Lea County, New Mexico

Log: MW-12

Geologist: Mark J. Larson

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Page: 1 of 1

SUBSURFACE PROFILE SAMP		MPL	.E	PID Measurement					
Depth	Symbol	Description	Elev.	Number	Type	Recovery	(PPM)	Well Detail	Notes Well Secured with Locking Above-Grade Cover
$\begin{array}{c} 5\\ 10\\ 15\\ 20\\ 33\\ 40\\ 45\\ 55\\ 60\\ 70\\ 75\\ 8\\ 9\\ 9\\ 100\\ 110\\ 110\\ 120\\ 135\\ 140\\ 100\\ 100\\ 110\\ 125\\ 130\\ 145\\ 155\\ 160\\ 170\\ 170\\ 180\\ 195\\ 200\\ 1\end{array}$		Silty Sand 7.5 YR 4/6 to 5/6, strong brown, very fine grained quartz sand, poorly sorted. Caliche 10 YR 7/3 to 7/4, very pale brown, sandy, very fine grained quartz sand, moderately hard. Sand 5 YR 6/6 to 7/4, reddish yellow to pink, very fine to fine grained quartz sand, moderately sorted, round. Interbedded with thin units of weakly cemented sandstone from 20 to 30'. Sandstone below 30' is weakly cemented.	3323 3315 3160 3154						1 to 147' bgs: cement-bentonite grout 0 - 156.68' bgs: 4" Sch. 40 PVC Riser (Threaded) W. L. 139.57' btoc (5/10/02) 147 to 151': bentonite chips 151 to 171.65' bgs: 8/16 graded silica sand 156.68 to 171.65' bgs: 5" Sch. 40 PVC Screen, 0.020 slot 4" Sch. 40 PVC Cap (Threaded)
Drilling Method: Air Rotary Date Drilled: Sept. 17, 2001 Well Size: 2"			L 507	Larson and Associates, Inc. 7 North Marienfeld St., Ste. 202 Midland, Texas 79701 (915) 687-0901			ociates, Inc. Id St., Ste. 202 as 79701 0901	TOC Elevation: 3328.43 Checked by: CKC Drilled by: Scarborough Drilling	

Client: Texaco Exploration and Production, Inc.

Project: Cooper-Jal Unit Injection Station

Project No: 0-0113

Location: Lea County, New Mexico

Log: MW-13

Geologist: Mark J. Larson

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Page: 1 of 1

SUBSURFACE PROFILE SAMPLE		E.	PID Measurement		N. 4			
Depth Svmbol	Description	Elev.	Number	Type	Recovery	(PPM) 10 30 50	Well Detail	Notes Well Secured with Locking Above-Grade Cover
5 10 25 30 35 40 45 50 55 60 65 70 90 90 105 100 100	Silty Sand 10 YR 5/3, brown, very fine grained quartz sand, loose, moist from rain, poorly sorted. Caliche 10 YR 7/3 to 7/4, pale brown, sandy, very fine grained quartz sand, moderately hard. Sand 5 YR 6/6 to 7/4, reddish yellow to pink, very fine to fine grained quartz sand, moderately sorted, round. Interbedded with thin units of weakly cemented sandstone from 20 to 30'. Sandstone below 30' is weakly cemented. Shale 2.5 YR 4/6, red, silty, fine grained. TD: 174'	3333 3327 3169 3164						1 to 147' bgs: cement-bentonite grout 0 - 156.68' bgs: 4" Sch. 40 PVC Riser (Threaded) W. L. 144.45' btoc (5/10/02) 147 to 151': bentonite chips 151 to 171.65' bgs: 8/16 graded silica sand 156.68 to 171.65' bgs: 5" Sch. 40 PVC Screen, 0.020 slot 4" Sch. 40 PVC Cap (Threaded)
Drilling Method: Air Rotary Date Drilled: Sept. 17, 2001 Well Size: 2"			Larson and Associates, Inc. 07 North Marienfeld St., Ste. 202 Midland, Texas 79701 (915) 687-0901			ociates, Inc. eld St., Ste. 202 as 79701 -0901	TOC Elevation: 3338.49 Checked by: CKC Drilled by: Scarborough Drilling	

APPENDIX C

Laboratory Analyses and Chain of Custody Documentation

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Lubbock, TX 79424-1515

Report Date: May 23, 2002Order Number: A02051507 00-0113 Cooper-Jal

Summary Report

Mark Larson Larson & Associat	es, Inc.			Report Date:	May 23, 2002
P.O. Box 50685	,				
Midland, Tx. 7971	10			Order ID Number:	A02051507
Project Number:	00-0113				
Project Name:	Cooper-Jal				
Project Location:	Lea County, NM				
			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
197052	MW-13	Water	5/13/02	14:45	5/15/02

0 This report consists of a total of 1 page(s) and is intended only as a summary of results for the sample(s) listed above.

Sample: 197052 - MW-13

Param	\mathbf{Flag}	Result	\mathbf{Units}
Hydroxide Alkalinity		<1.0	mg/L as CaCo3
Carbonate Alkalinity		<1.0 ->	mg/L as CaCo3
Bicarbonate Alkalinity		100/	mg/L as CaCo3
Total Alkalinity		100/	mg/L as CaCo3
Chloride		517	m mg/L
Fluoride		< 11	mg/L
Nitrate-N		1.61	mg/L
Sulfate		437~	m mg/L
Dissolved Calcium		116~	mg/L
Dissolved Magnesium		76.0 <	mg/L
Dissolved Potassium		19.4	m mg/L
Dissolved Sodium		2691	m mg/L
Total Dissolved Solids		1596	mg/L

6701 Aberdeen Avenue, Suite 9 155 McCutcheon, Suite H Lubbock, Texas 79424 800•378•1296 El Paso, Texas 79932 888•588•3443 E-Mail: lab@traceanalysis.com 806•794•1296 FAX 8 915•585•3443 FAX 9

FAX 806•794•1298
FAX 915•585•4944

Analytical and Quality Control Report

Mark Larson Larson & Associates, Inc. P.O. Box 50685 Midland, Tx. 79710 Report Date:

May 23, 2002

Order ID Number: A02051507

Project Number:00-0113Project Name:Cooper-JalProject Location:Lea County, NM

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

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
197052	MW-13	Water	5/13/02	14:45	5/15/02

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.

The test results contained within this report meet all requirements of LAC 33:I unless otherwise noted.

This report consists of a total of 6 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

Analytical Report

Sample: 197052 - MW-13

Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC20520	Date Analyzed:	5/21/02
Analyst:	RS	Preparation Method:	N/A	Prep Batch:	PB19589	Date Prepared:	5/21/02
Param		Flag	Result	Un	its	Dilution	RDL
Hydroxide	Alkalinity		<1.0	mg/L as	CaCo3	1	1
Carbonate	Alkalinity		<1.0	mg/L as	s CaCo3	1	1
Bicarbonat	e Alkalinity		100	mg/L as	s CaCo3	1	1
Total Alka	inity		100	mg/L as	CaCo3	1	1

197052 - MW-13 Sample:

Analysis: Ion Chromatography (IC) Analytical Method: Analyst: JSW Preparation Method: N/

300.0) QC Batch:	QC20467 Date Analyzed: 5/15/02
'A	Prep Batch:	PB19545 Date Prepared: 5/15/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		517	mg/L	50	1
Fluoride		< 1	m mg/L	5	0.20
Nitrate-N		1.61	mg/L	5	0.20
Sulfate		437	mg/L	10	1

 \mathbf{E}

Sample: 197052 - MW-13

Analysis:	Salts	Analytical Method:	E 200.7	QC Batch:	QC20504	Date Analyzed:	5/20/02
Analyst:	BC	Preparation Method:	S 3005A	Prep Batch:	PB19459	Date Prepared:	5/16/02
Param		Flag	Result		Units	Dilution	RDL
Dissolved (Calcium		116]	mg/L	1	0.50
Dissolved N	Aagnesium		76.0	1	mg/L	1	0.50
Dissolved H	otassium		19.4	1	mg/L	1	0.50
Dissolved S	odium		269	1	mg/L	1	0.50

Sample: 197052 - MW-13

Analysis: Analyst:	TDS RS	Analytical Method: Preparation Method:	E 160.1 N/A	QC Batch: Prep Batch:	QC20394 PB19489	Date Analyzed: Date Prepared:	5/17/02 5/16/02
Param		Flag	Resul	t	Units	Dilution	RDL
Total Disso	olved Solids		1590	<u></u>	mg/L	2	10

Report Date: May 23, 2002 00-0113 Order Number: A02051507 Cooper-Jal

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Quality Control Report Method Blank

Method Blank	QCBatch:	QC20394		
Deserve	171	Develte	I	Reporting
Param	Flag	Results		
Total Dissolved Solids		<10	mg/L	10
Method Blank	QCBatch:	QC20467		
•				Reporting
Param	Flag	Results	Units	Limit
Chloride		<1.0	mg/L	1
Fluoride		<0.2	mg/L	0.20
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<1.0	mg/L	1

Method Blank QCBatch:

Reporting Results Units Limit Param Flag **Dissolved** Calcium 0.50 < 0.5 mg/L **Dissolved Magnesium** 0.50 $<\!0.5$ mg/L **Dissolved Potassium** 0.50 $<\!0.5$ mg/L **Dissolved Sodium** $<\!0.5$ mg/L 0.50

Method Blank

QCBatch: QC20520

QC20504

				Reporting
Param	Flag	Results	\mathbf{Units}	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

Quality Control Report Duplicate Samples

Duplicate	QCBatch:	QC20394						
Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit	
Total Dissolved Solids		1602	1596	mg/L	1	0	9.7	

Report Date: May 23, 2002 00-0113			Order Numb Cooj	per: A02051507 per-Jal		Page Nu Lea	umber: 4 of 6 County, NM
Duplicate	QCBatch:	QC20520					
Daram	Flog	Duplicate	Sample	Unite	Dilution	RDD	RPD Limit
Hudrovide Alkalinity	Flag		$\frac{100}{10}$	mg/L as CaCo3	1		<u> </u>
Carbonate Alkalinity		<1.0	<1.0 <1.0	mg/L as CaCo3	1	0	9.2 9.2
Bicarbonate Alkalinity		48	46	mg/L as CaCo3	1	4	9.2
Total Alkalinity		48	46	mg/L as CaCo3	_ 1	4	9.2

Quality Control Report Lab Control Spikes and Duplicate Spikes

Laborato	ory Cont	rol Spike	es	QCBatch:	QC20467	,				
	LCS	LCSD			Spike A mount	Matrix			% Bec	RPD
ъ			** •/	D .1			or n	DDD	70 1000	TUL D
Param	Result	Result	Units	Dil.	Added	Result	% Rec	RPD	Limit	Limit
Chloride	11.68	11.8	mg/L	1	12.50	<1.0	93	1	90 - 110	20
Fluoride	2.35	2.39	mg/L	1	2.50	<0.2	94	1	90 - 110	20
Nitrate-N	2.34	2.36	mg/L	1	2.50	< 0.2	93	0	90 - 110	20
Sulfate	11.98	11.98	mg/L	1	12.50	<1.0	95	0	90 - 110	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 S	Spikes
----------	--------

QCBatch: QC20467

					Spike					
	MS	MSD			Amount	Matrix			$\% { m Rec}$	RPD
Param	Result	\mathbf{Result}	Units	Dil.	Added	Result	$\% \mathrm{Rec}$	RPD	\mathbf{Limit}	Limit
Chloride	1102.77	1098.18	mg/L	1	625	517	93	0	48 - 127	20
Fluoride	1 115.54	115.41	$\mathrm{mg/L}$	1	125	0.75	91	0	82 - 101	20
Nitrate-N	2 123.2	123.45	$\mathrm{mg/L}$	1	125	1.61	97	0	87 - 100	20
Sulfate	³ 1002.29	992.06	mg/L	1	625	437	90	1	59 - 121	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: QC20394

¹197052*50 was spiked, but *5 was reported. RPD = 0; %EA = 92

²197052*50 was spiked, but *5 was reported. RPD = 0; %EA = 91.

³197052*50 was spiked, but *10 was reported for sulfate. RPD = 1; %EA = 94.

00-0113	3, 2002	0	rder Nu C	Page Number: 5 of 6 Lea County, NM			
Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solid	ls	mg/L	1000	995	99	90 - 110	5/17/02
ICV (1)	QCBatch:	QC20394					
			CCVs	CCVs	$_{-}$ CCVs	Percent	_
-			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Total Dissolved Solid	18	mg/L	1000	981	98	90 - 110	5/17/02
CCV (1)	QCBatch:	QC20467					
		CCVs		CCVs	CCVs	Percent	
		True		Found	Percent	Recovery	Date
Param Fl	ag Units	Conc.		Conc.	Recovery	Limits	Analyzed
Chloride	mg/L	12.50		12.05	96	90 - 110	5/15/02
Fluoride	mg/L	2.50		2.5	100	90 - 110	5/15/02
Nitrate-N	mg/L	2.50		2.33	93	90 - 110	5/15/02
Sulfate	mg/L	12.50		12.03	96	90 - 110	5/15/02
ICV (1)	QCBatch:	QC20467					
ICV (1)	QCBatch:	ч QC20467 ССУз		CCVe	CCVe	Percent	
ICV (1)	QCBatch:	QC20467 CCVs True		CCVs Found	CCVs Percent	Percent Recovery	Date
ICV (1) Param Fl	QCBatch: ag Units	QC20467 CCVs True Conc.		CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
ICV (1) Param Fl Chloride	QCBatch: ag Units mg/L	QC20467 CCVs True Conc. 12.50		CCVs Found Conc.	CCVs Percent Recovery 91	Percent Recovery Limits 90 - 110	Date Analyzed 5/15/02
ICV (1) Param Fl Chloride Fluoride	QCBatch: ag Units mg/L mg/L	QC20467 CCVs True Conc. 12.50 2.50		CCVs Found Conc. 11.42 2.37	CCVs Percent Recovery 91 94	Percent Recovery Limits 90 - 110 90 - 110	Date Analyzed 5/15/02 5/15/02
ICV (1) Param Fl Chloride Fluoride Nitrate-N	QCBatch: ag Units mg/L mg/L mg/L	QC20467 CCVs True Conc. 12.50 2.50 2.50		CCVs Found Conc. 11.42 2.37 2.37	CCVs Percent Recovery 91 94 94	Percent Recovery Limits 90 - 110 90 - 110 90 - 110	Date Analyzed 5/15/02 5/15/02 5/15/02
ICV (1) Param Fl Chloride Fluoride Nitrate-N Sulfate	QCBatch: ag Units mg/L mg/L mg/L mg/L	QC20467 CCVs True Conc. 12.50 2.50 2.50 12.50		CCVs Found Conc. 11.42 2.37 2.37 12.02	CCVs Percent Recovery 91 94 94 94 96	Percent Recovery Limits 90 - 110 90 - 110 90 - 110 90 - 110	Date Analyzed 5/15/02 5/15/02 5/15/02 5/15/02
ICV (1) Param Fl Chloride Fluoride Nitrate-N Sulfate CCV (1)	QCBatch: ag Units mg/L mg/L mg/L gCBatch:	QC20467 CCVs True Conc. 12.50 2.50 2.50 12.50 12.50		CCVs Found Conc. 11.42 2.37 2.37 12.02	CCVs Percent Recovery 91 94 94 94 96	Percent Recovery Limits 90 - 110 90 - 110 90 - 110 90 - 110	Date Analyzed 5/15/02 5/15/02 5/15/02 5/15/02
ICV (1) Param Fl Chloride Fluoride Nitrate-N Sulfate CCV (1)	QCBatch: ag Units mg/L mg/L mg/L gCBatch:	QC20467 CCVs True Conc. 12.50 2.50 2.50 12.50 12.50	CCVs	CCVs Found Conc. 11.42 2.37 2.37 12.02	CCVs Percent Recovery 91 94 94 94 96 CCVs	Percent Recovery Limits 90 - 110 90 - 110 90 - 110 90 - 110	Date Analyzed 5/15/02 5/15/02 5/15/02 5/15/02
ICV (1) Param Fl Chloride Fluoride Nitrate-N Sulfate CCV (1)	QCBatch: ag Units mg/L mg/L mg/L gCBatch:	QC20467 CCVs True Conc. 12.50 2.50 2.50 12.50 QC20504	CCVs True	CCVs Found Conc. 11.42 2.37 2.37 12.02 CCVs Found	CCVs Percent Recovery 91 94 94 96 CCVs Percent	Percent Recovery Limits 90 - 110 90 - 110 90 - 110 90 - 110 90 - 110	Date Analyzed 5/15/02 5/15/02 5/15/02 5/15/02 Date
ICV (1) Param Fl Chloride Fluoride Nitrate-N Sulfate CCV (1) Param	QCBatch: ag Units mg/L mg/L mg/L Mg/L Scalar Scalar	QC20467 CCVs True Conc. 12.50 2.50 2.50 12.50 QC20504 Units	CCVs True Conc.	CCVs Found Conc. 11.42 2.37 2.37 12.02 CCVs Found Conc.	CCVs Percent Recovery 91 94 94 96 CCVs Percent Recovery	Percent Recovery Limits 90 - 110 90 - 110 90 - 110 90 - 110 90 - 110 Percent Recovery Limits	Date Analyzed 5/15/02 5/15/02 5/15/02 5/15/02 Date Analyzed
ICV (1) Param Fl Chloride Fluoride Nitrate-N Sulfate CCV (1) Param Dissolved Calcium	QCBatch: ag Units mg/L mg/L mg/L QCBatch: Flag	QC20467 CCVs True Conc. 12.50 2.50 2.50 12.50 QC20504 Units mg/L	CCVs True Conc. 25	CCVs Found Conc. 11.42 2.37 2.37 12.02 CCVs Found Conc. 25.9	CCVs Percent Recovery 91 94 94 96 96 CCVs Percent Recovery 103	Percent Recovery Limits 90 - 110 90 - 110 90 - 110 90 - 110 90 - 110 Percent Recovery Limits 90 - 110	Date Analyzed 5/15/02 5/15/02 5/15/02 5/15/02 Date Analyzed 5/20/02
ICV (1) Param Fl Chloride Fluoride Nitrate-N Sulfate CCV (1) Param Dissolved Calcium Dissolved Magnesium	QCBatch: ag Units mg/L mg/L mg/L mg/L Mg/L mg/L	QC20467 CCVs True Conc. 12.50 2.50 2.50 12.50 QC20504 Units mg/L mg/L	CCVs True Conc. 25 25	CCVs Found Conc. 11.42 2.37 2.37 12.02 CCVs Found Conc. 25.9 25.5	CCVs Percent Recovery 91 94 94 96 CCVs Percent Recovery 103 102	Percent Recovery Limits 90 - 110 90 - 110 90 - 110 90 - 110 Percent Recovery Limits 90 - 110 90 - 110	Date Analyzed 5/15/02 5/15/02 5/15/02 5/15/02 5/15/02 5/20/02 5/20/02 5/20/02
ICV (1) Param Fl Chloride Fluoride Fluoride Nitrate-N Sulfate CCV (1) Param Dissolved Calcium Dissolved Magnesiun Dissolved Potassium	QCBatch: ag Units mg/L mg/L mg/L QCBatch: Flag n	QC20467 CCVs True Conc. 12.50 2.50 12.50 12.50 QC20504 Units mg/L mg/L mg/L	CCVs True Conc. 25 25 25 25	CCVs Found Conc. 11.42 2.37 2.37 12.02 CCVs Found Conc. 25.9 25.5 25.2	CCVs Percent Recovery 91 94 94 96 CCVs Percent Recovery 103 102 100	Percent Recovery Limits 90 - 110 90 - 110	Date Analyzed 5/15/02 5/15/02 5/15/02 5/15/02 5/15/02 5/20/02 5/20/02 5/20/02 5/20/02

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ICV (1)

QCBatch: QC20504

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Report Date: May 23, 2002 00-0113			Order Num Coo	ber: A020515 oper-Jal	Page Number: 6 of 6 Lea County, NM		
Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recoverv	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	25	25.4	101	95 - 105	5/20/02
Dissolved Magnesium		mg/L	25	25.4	101	95 - 105	5/20/02
Dissolved Potassium		mg/L	25	24.1	96	95 - 105	5/20/02
Dissolved Sodium		mg/L	25	25.1	100	95 - 105	5/20/02

CCV (1) QCBatch: QC20520

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	<1.0	0	90 - 110	5/21/02
Carbonate Alkalinity		mg/L as CaCo3	0	220	0	90 - 110	5/21/02
Bicarbonate Alkalinity		mg/L as CaCo3	0	24	0	90 - 110	5/21/02
Total Alkalinity		mg/L as CaCo3	250	244	97	90 - 110	5/21/02

ICV (1) QCBatch: QC20520

			CCVs	CCVs	\mathbf{CCVs}	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	<1.0	0	90 - 110	-5/21/02
Carbonate Alkalinity		mg/L as CaCo3	0	220	0	90 - 110	5/21/02
Bicarbonate Alkalinity		mg/L as CaCo3	0	16	0	90 - 110	5/21/02
Total Alkalinity		mg/L as CaCo3	250	236	94	90 - 110	5/21/02

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CLIENT NAME:	SITE MANAGER:	PARAMETERS/METH	IOD NUMBER	CHAIN-OF-CUSTODY	RECORD
TEXALD - LOUPET - JUL PROJECT NO .:	Mark Carson Project Name:	RM S NERS		A arson & hoc. Eav. 015-6	17-0456
0-0113	Cooper . Jul	1147NO: 51432		Environmental Consultants 915-	87-0901
PAGE 1 OF 1 LAB.	PO#			507 N. Marienteld, Ste. 202 • Midla	IQ, IX /9/01
43440 1105 4214M 31441 2140	SAMPLE IDENTIFICATION	JDE onicin number		LAB. I.D. REMARKS NUMBER (I.E., FILTEREO, UNE RESERVED, UNPOS (LAB USE ONLY) GRAB COMPOS	tered, erved, Te)
E-13-02 2:45 X	ESOLPI SI-WM	X X X		Preserved D	
					4
SAMPLED BY: Signaturel	DATE: 5-14-02 RELINQUISH	ED-BY: (Signatione)	DATES /14/02 R	ECENTED BY: (Signature)	DATE:5/14/102- TIME: 1 625-
RELINDUISHED BY, (Signature)	DATE: 5 /14/0 2-RECEIVED BY TIME: 1830	: (Signature)	DATE:S. TIME:FE	KMPLE SHIPPED BY: (Circle) 2000 ARBILL #	12
COMMENTS:		TURNAROUND	TIME NEEDED	and delivered Jops Other: 	
RECEIVING LABORATORY: T'C	<u>L AVERIUSIS</u> A AVE SWITE A STATE TX 712-794724 2	ECEIVED BY: (Signatu/e)	L IN COMPANY	ellow - Receiving Lab (to be returned La After Receipt) Ink - Project Manager	0
CONTACT: HELEN	PHONE: (804) 794 - 1294	DALE: 2 15 40 11ME: 10-2			
SAMPLE CONDITION WHEN RECEIVED: 40 1175, 1163-544-7499.	5-	LA CONTACT PERSON: Mouth Lourson	Ň	AMPLE TYPE:	
				5124 F/	

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Lubbock, TX 79424-1515

5/16/02

5/16/02

Report Date: June 5, 2002Order Number: A02051620 00-0113 Cooper-Jal Page Number: 1 of 3 Lea County, NM

Summary Report

Mark Larson Larson & Associat P.O. Box 50685 Midland, Tx. 7971	es, Inc. 10			Report Date: Order ID Number:	June 5, 2002 A02051620
Project Number: Project Name: Project Location:	00-0113 Cooper-Jal Lea County, NM				
Sample	Description	Matrix	Date Taken	Time Taken	Date Received
197162	MW-12	Water	5/15/02 /	10:50	5/16/02
197163	MW-9A	Water	5/15/02~	11:36	5/16/02
197164	MW-5A	Water	5/15/02/	12:30	5/16/02

0 This report consists of a total of 3 page(s) and is intended only as a summary of results for the sample(s) listed above.

Water

Water

5/15/02~

5/15/02~

13:40

14:42

Sample: 197162 - MW-12

MW4A

MW-2A

197165

197166

Param	Flag	Result	Units
Hydroxide Alkalinity		<1.0	mg/L as CaCo3
Carbonate Alkalinity		<1.0	mg/L as CaCo3
Bicarbonate Alkalinity		160-	mg/L as CaCo3
Total Alkalinity		160-	mg/L as CaCo3
Chloride		58.3~	mg/L
Fluoride		1.09 <	$\mathrm{mg/L}$
Nitrate-N		2.44 ~	mg/L
Sulfate		91.3	m mg/L
Dissolved Calcium		53.5	mg/L
Dissolved Magnesium		15.9 -	$\mathrm{mg/L}$
Dissolved Potassium		5.52	mg/L
Dissolved Sodium		50.3	mg/L
Total Dissolved Solids		462 <	mg/L

Sample: 197163 - MW-9A

Param	Flag	Result	Units
Hydroxide Alkalinity		<1.0	mg/L as CaCo3
Carbonate Alkalinity		<1.0×	mg/L as CaCo3
Bicarbonate Alkalinity		136⁄	mg/L as CaCo3
Total Alkalinity		136/	mg/L as $CaCo3$
Chloride		148	mg/L
Fluoride	·····	<1.0	mg/L
			Continued on next name

Continued on next page ...

Report Date: June 5	, 2002Order Number: A02051620		Page Number: 2 of 3
00-0113	Cooper-Jal		Lea County, NM
Sample 197163 conti	nued		
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Param	Flag	Result	Units
Nitrate-N		2.18 1	mg/L
Sulfate		65.3 /	mg/L
Dissolved Calcium		62.9 <	mg/L
Dissolved Magnesium		16.1	m mg/L
Dissolved Potassium		4.621	mg/L
Dissolved Sodium		46.8	mg/L
Total Dissolved Solids		4451	mg/L

Sample: 197164 - MW-5A

Param	Flag	Result	Units
Hydroxide Alkalinity		<1.0	mg/L as CaCo3
Carbonate Alkalinity		<1.0	mg/L as CaCo3
Bicarbonate Alkalinity		182 /	mg/L as CaCo3
Total Alkalinity		182 <	mg/L as CaCo3
Chloride		53.5	m mg/L
Fluoride	~	<1.0~	mg/L
Nitrate-N	,	2.23	m mg/L
Sulfate		84.4	m mg/L
Dissolved Calcium		63.2 <	mg/L
Dissolved Magnesium		16.1	mg/L
Dissolved Potassium		4.69	m mg/L
Dissolved Sodium		43.6	m mg/L
Total Dissolved Solids		475	mg/L

Sample: 197165 - MW4A

Param	Flag	Result	Units
Hydroxide Alkalinity	······································	<1.0	mg/L as CaCo3
Carbonate Alkalinity		<1.0~	mg/L as CaCo3
Bicarbonate Alkalinity		156 ⁄	mg/L as CaCo3
Total Alkalinity		156~	mg/L as CaCo3
Chloride		577-	m mg/L
Fluoride		<1.0	mg/L
Nitrate-N		2.23 <	mg/L
Sulfate		121 -	mg/L
Dissolved Calcium		200 1	m mg/L
Dissolved Magnesium		49.5 /	m mg/L
Dissolved Potassium		10.3 <	m mg/L
Dissolved Sodium		125 -	m mg/L
Total Dissolved Solids		1610 -	mg/L

Report Date: June	e 5, 2002Order Number: A02051620	
00-0113	Cooper-Jal	

Page Number: 3 of 3 Lea County, NM

Sample: 197166 - MW-2A			
Param	Flag	Result	Units
Hydroxide Alkalinity		<1.0	mg/L as CaCo3
Carbonate Alkalinity		<1.0	mg/L as CaCo3
Bicarbonate Alkalinity		176	mg/L as CaCo3
Total Alkalinity		176	mg/L as CaCo3
Chloride		36.6	mg/L
Fluoride		<1.0	m mg/L
Nitrate-N		2.34	mg/L
Sulfate		79.1	mg/L
Dissolved Calcium		57.6	mg/L
Dissolved Magnesium		13.9	mg/L
Dissolved Potassium		4.35	m mg/L
Dissolved Sodium		43.8	mg/L
Total Dissolved Solids		435	mg/L

6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 7942 800-378-1296 806-794-1296 FAX 806-794-1298

6/01 Aberdeen Avenue, Suite 9 155 McCutcheon, Suite H Lubbock, Texas 79424 800•378•1296 El Paso, Texas 79932 888•588•3443 E-Mail: lab@traceanalysis.com

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Analytical and Quality Control Report

Mark Larson Larson & Associates, Inc. P.O. Box 50685 Midland, Tx. 79710 Report Date:

June 5, 2002

Order ID Number: A02051620

Project Number:00-0113Project Name:Cooper-JalProject Location:Lea County, NM

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

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
197162	MW-12	Water	5/15/02	10:50	5/16/02
197163	MW-9A	Water	5/15/02	11:36	5/16/02
197164	MW-5A	Water	5/15/02	12:30	5/16/02
197165	MW4A	Water	5/15/02	13:40	5/16/02
197166	MW-2A	Water	5/15/02	14:42	5/16/02

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.

The test results contained within this report meet all requirements of LAC 33:I unless otherwise noted.

This report consists of a total of 10 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

Analytical Report

Sample: Analysis: Analyst:	197162 - Alkalinity JSW	MW-12 Analytical Method: Preparation Method:	E 310.1 : N/A	QC Batch: Prep Batch:	QC2058 PB1963	Date Analyzed:Date Prepared:	5/21/02 5/21/02
Param		Flag	Result	Un	its	Dilution	RDL
Hydroxide A	Alkalinity		<1.0	mg/L as	CaCo3	1	1
Carbonate .	Alkalinity		<1.0	mg/L as	CaCo3	1	1
Bicarbonate	e Alkalinity		160	mg/L as	CaCo3	1	1
Total Alkali	inity		160	mg/L as	CaCo3	1	1
Sample: Analysis:	197162 - Ion Chroma	MW-12 tography (IC) Analytic	al Method:	E 300.0 QC 1	Batch:	QC20679 Date Analyzed	d: 5/16/02
Analyst:	MS	Preparat	tion Method:	N/A Prep	Batch:	PB19724 Date Prepared	1:5/16/02
Param	Flag	Result	Units	Dilution			RDL
Chloride	Ÿ	58.3	mg/L	5			1
Fluoride		1.09	mg/L	5			0.20
Nitrate-N		2.44	mg/L	5			0.20
Sulfate		91.3	mg/L	5			1

Sample:	197162	- MW-12

Analysis: Analyst:	Salts BC	Analytical Method: Preparation Method:	E 200.7 S 3005A	QC Batch: Prep Batch:	QC20711 PB19747	Date Analyzed: Date Prepared:	5/28/02 5/20/02
Param		Flag	Result		Units	Dilution	RDL
Dissolved (Calcium	***************************************	53.5]	mg/L	1	0.50
Dissolved N	Magnesium		15.9	1	mg/L	1 .	0.50
Dissolved H	Potassium		5.52	1	mg/L	1,	0.50
Dissolved S	Sodium		50.3	1	mg/L	1	0.50

Sample:	197162 -	MW-12
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Analysis: Analyst:	$ ext{TDS}$ RS	Analytical Method: Preparation Method:	E 160.1 N/A	QC Batch: Prep Batch:	QC20525 PB19596	Date Analyzed: Date Prepared:	5/21/02 5/20/02
Param		Flag	Result	5	Units	Dilution	RDL
Total Disso	olved Solids	;	462	2	mg/L	1	10

Sample:	197163 -	- MW-9A					
Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC20585	Date Analyzed:	5/21/02
Analyst:	JSW	Preparation Method:	N/A	Prep Batch:	PB19638	Date Prepared:	5/21/02
Param		Flag	Result	Un	its	Dilution	RDL
Hydroxide .	ide Alkalinity		<1.0	mg/L as CaCo3		1	1
						Con	ntinued

Report Date: June 5, 2002 00-0113			Order Num Coo	ber: A020516 oper-Jal	Page Number: 3 of 10 Lea County, NM		
Continue	d Sample	: 197163 Analysis	: Alkalinity				
Param		Flag	Result	τ	Units	Dilution	RDL
Carbonate A	lkalinity		<1.0	mg/L	as CaCo3	1	1
Bicarbonate	Alkalinity		136	mg/L	as CaCo3	1	1
Total Alkalir	nity		136	mg/L	as CaCo3	1	1
~ .							
Sample:	197163	- MW-9A					1 = (10,000
Analysis: Analyst:	Ion Chron MS	natography (IC) Ana Pre	alytical Method: eparation Method	E 300.0 Q0 : N/A Pr	C Batch: ep Batch:	QC20679 Date Analyze PB19724 Date Prepare	ed: $5/16/02$ ed: $5/16/02$
Param	Flag	g Result	Units	Dilution			RDL
Chloride		148	mg/L	5			1
Fluoride		<1.0	mg/L	5			0.20
Nitrate-N		2.18	mg/L	5			0.20
Sulfate		65.3	mg/L	5			1
Sample: Analysis: Analyst:	197163 Salts BC	- MW-9A Analytical Method: Preparation Metho	: E 200.7 d: S 3005A	QC Batch: Prep Batch:	QC20711 PB19747	Date Analyzed: Date Prepared:	5/28/02 5/20/02
Param		Flag	Result		Units	Dilution	RDL
Dissolved Ca	alcium		62.9		mg/L	1	0.50
Dissolved M	agnesium		16.1		mg/L	1	0.50
Dissolved Po	otassium		4.62		mg/L	1	0.50
Dissolved Sc	odium		46.8		mg/L	1	0.50
Sample:	197163	- MW-9A Analytical Method	• E 160 1	OC Batch	0020525	Data Analwed.	5/91/09
Analyst:	RS	Preparation Metho	d: N/A	Prep Batch:	QC20020 PB19596	Date Prepared:	5/20/02
Param		Flag	Result		Units	Dilution	RDL
Total Dissol	ved Solids		445) 	mg/L	1	10
Sample: Analysis: Analyst:	19716 4 Alkalinity JSW	- MW-5A Analytical Met Preparation Me	hod: E 310.1 ethod: N/A	QC Batch Prep Batc	: QC2058 h: PB1963	85 Date Analyzed: 88 Date Prepared:	5/21/02 5/21/02
Param		Flag	Result		Units	Dilution	RDL
Hydroxide A	Alkalinity		<1.0	mg/L	as CaCo3	1	1
Carbonate A	Alkalinity		<1.0	m mg/L	as CaCo3	1	1
	A 11		199	mg/T	on CoCo3	1	1
Bicarbonate	Aikainity		102	mg/ L	as Cacos	Ŧ	-

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Report Date: June 5, 2002 00-0113			Order Num Coc	ber: A020516 pper-Jal	20	Page Number: 4 of 10 Lea County, NM		
Sample: Analysis: Analyst:	19716 Ion Chro MS	4 - MW matograp	7 -5A hy (IC) Analyt Prepar	ical Method: ation Method:	E 300.0 QC N/A Pre	C Batch: ep Batch:	QC20679 Date Analyze PB19724 Date Prepare	d: 5/16/02 d: 5/16/02
				 .		•	1	
Param	Fla	lg	Result	Units	Dilution			RDL
Fluorido			00.0 ∕1.0	mg/L	5		,	1 0.20
Nitrato_N			<1.0 2.23	mg/L	5			0.20
Sulfate		····	84.4	mg/L	5			1
Sample: Analysis: Analyst:	19716 Salts BC	4 - MW Analytic Prepara	V-5A cal Method: tion Method:	E 200.7 S 3005A	QC Batch: Prep Batch:	QC20711 PB19747	Date Analyzed: Date Prepared:	5/28/02 5/20/02
Param			Flag	Result	τ	Units	Dilution	RDL
Dissolved (Calcium			63.2	r	ng/L	1	0.50
Dissolved M	Magnesium			16.1	r	ng/L	1	0.50
Dissolved H	Potassium			4.69	r	ng/L	1	0.50
Dissolved S	odium			43.6	r	ng/L	1	0.50
Sample: Analysis: Analyst:	19716 TDS RS	4 - MV Analytic Prepara	V-5A cal Method: tion Method:	E 160.1 N/A	QC Batch: Prep Batch:	QC20525 PB19596	Date Analyzed: Date Prepared:	5/21/02 5/20/02
Param			Flag	Result	1	Units	Dilution	RDL
Total Disso	olved Solids	3		475]	mg/L	1	10
Sample:	19716 Alkalinity JSW	5 - MV y Ana Prej	V4A lytical Method paration Metho	l: E 310.1 od: N/A	QC Batch: Prep Batch	QC2058 a: PB1963	35 Date Analyzed: 18 Date Prepared:	5/21/02 5/21/02
Analysis: Analyst:				Result	τ	Jnits	Dilution	RDL
Analysis: Analyst: Param			Flag	resure				
Analysis: Analyst: Param Hydroxide	Alkalinity		Flag	<1.0	mg/L	as CaCo3	1	1
Analysis: Analyst: Param Hydroxide Carbonate	Alkalinity Alkalinity		Flag	<1.0 <1.0	mg/L mg/L	as CaCo3 as CaCo3	1 1	1
Analysis: Analyst: Param Hydroxide Carbonate Bicarbonat	Alkalinity Alkalinity e Alkalinit	y	Flag	<1.0 <1.0 156	mg/L mg/L mg/L	as CaCo3 as CaCo3 as CaCo3	1 1 1	1 1 1

Sample: 197165 - MW4A

Analysis:Ion Chromatography (IC) Analytical Method:E 300.0 QC Batch:QC20679 Date Analyzed: 5/16/02Analyst:MSPreparation Method:N/APrep Batch:PB19724 Date Prepared: 5/16/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		577	mg/L	50	1
Fluoride		<1.0	mg/L	5	0.20
Nitrate-N		2.23	mg/L	5	0.20
Sulfate		121	mg/L	5	1

Report Date: June 5, 2002 00-0113			Order Number: A02051620 Cooper-Jal			Page Number: 5 of 10 Lea County, NM				
Sample:	Sample: 197165 - MW4A									
Analysis:	Salts	Analytical Method:	E 200.7	QC Batch:	QC20711	Date Analyzed:	5/28/02			
Analyst:	BC	Preparation Method:	S 3005A	Prep Batch:	PB19747	Date Prepared:	5/20/02			
Param		Flag	Result	I	Units	Dilution	RDL			
Dissolved C	alcium		200	1	ng/L	1	0.50			
Dissolved M	lagnesiun	D.	49.5	1	mg/L	1	0.50			
Dissolved P	otassium		10.3	1	mg/L	1	0.50			
Dissolved S	odium		125	1	mg/L	1	0.50			

Sample: 197165 - MW4A

Analysis: Analyst:	TDS RS	Analytical Method: Preparation Method:	E 160.1 N/A	QC Batch: Prep Batch:	QC20525 PB19596	Date Analyzed: Date Prepared:	5/21/02 5/20/02
Param		Flag	Result	;	Units	Dilution	RDL
Total Disso	lved Solids		161()	mg/L	1	10

Sample: 197166 - MW-2A

Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC20585	Date Analyzed:	5/21/02
Analyst:	JSW	Preparation Method:	N/A	Prep Batch:	PB19638	Date Prepared:	5/21/02
D		773		**	•.	D .1	DDI
Param		Flag	Result	Un	1ts	Dilution	RDL
Hydroxide	Alkalinity		<1.0	mg/L as	CaCo3	1	1
Carbonate	Alkalinity		<1.0	mg/L as	CaCo3	1	1
Bicarbonat	e Alkalinity		176	mg/L as	CaCo3	1	1
Total Alkal	linity		176	mg/L as	CaCo3	1	1

Sample: 197166 - MW-2A

Analysis:	Ion Chromatography (IC) Analytical Method:	E 300.0	0 QC Batch:	QC20679 Date Analyzed: 5/16/02
Analyst:	MS	Preparation Method:	N/A	Prep Batch:	PB19724 Date Prepared: 5/16/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		36.6	mg/L	5	1
Fluoride		<1.0	mg/L	5	0.20
Nitrate-N		2.34	mg/L	5	0.20
Sulfate		79.1	mg/L	5	1

Sample: 197166 - MW-2A

Analysis:	Salts	Analytical Method:	E 200.7	QC Batch:	QC20711	Date Analyzed:	5/28/02
Analyst:	BC	Preparation Method:	S 3005A	Prep Batch:	PB19747	Date Prepared:	5/20/02
Param		Flag	Result	I	Units	Dilution	RDL
Dissolved C	alcium		57.6]	mg/L	1	0.50
Dissolved M	lagnesium	L	13.9	1	mg/L	1	0.50
Dissolved Pe	otassium		4.35	1	mg/L	1	0.50
Dissolved So	odium		43.8	3	mg/L	1	0.50

Report Date: June 5, 2002 00-0113			Order Nun Co	nber: A02051 oper-Jal	Page Number: 6 of 10 Lea County, NM		
Sample: Analysis: Analyst:	19716 TDS RS	i6 - MW-2A Analytical Method: Preparation Method:	E 160.1 N/A	QC Batch: Prep Batch:	QC20525 PB19596	Date Analyzed: Date Prepared:	5/21/02 5/20/02
Param		Flag	Result	t	Units	Dilution	RDL
Total Dissolved Solids		435		mg/L	1	10	

.

Report Date: June 5, 2002 00-0113 Order Number: A02051620 Cooper-Jal

Quality Control Report Method Blank

Method Blank	QCBatch:	QC20525		
Param	Flag	Results	Units	Reporting Limit
Total Dissolved Solids		<10	mg/L	10
Method Blank Param	QCBatch: Flag	QC20585 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
				······································

Reporting Param Flag Results Units Limit Chloride <1.0 mg/L 1 Fluoride < 0.2 0.20 mg/Lmg/L Nitrate-N $<\!0.2$ 0.20 Sulfate <1.0 mg/L 1

Method Blank

Method Blank

QCBatch: QC20711

QC20679

QCBatch:

				Reporting
Param	Flag	Results	Units	Limit
Dissolved Calcium		0.941	mg/L	0.50
Dissolved Magnesium		0.719	$\mathrm{mg/L}$	0.50
Dissolved Potassium		< 0.5	mg/L	0.50
Dissolved Sodium		< 0.5	mg/L	0.50

Quality Control Report Duplicate Samples

Duplicate	QCBatch:	QC20525						
_		Duplicate	Sample				RPD	
Param	Flag	\mathbf{Result}	Result	Units	Dilution	RPD	Limit	
Total Dissolved Solids		15050	15800	mg/L	1	4	9.7	

Report Date: June 5, 2 00-0113	0	Order Number: A02051620 Cooper-Jal				Page Number: 8 of 10 Lea County, NM		
Duplicate	QCBatch:	QC20585						
Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit	
Hydroxide Alkalinity	0	<1.0	<1.0	mg/L as CaCo3	1	0	9.2	
Carbonate Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	9.2	
Bicarbonate Alkalinity		174	176	mg/L as CaCo3	1	1	9.2	
Total Alkalinity		174	176	mg/L as CaCo3	1	1	9.2	

Quality Control Report Lab Control Spikes and Duplicate Spikes

QC20679

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	12.67	12.67	mg/L	1	12.50	<1.0	101	0	90 - 110	20
Fluoride	2.43	2.43	mg/L	1	2.50	< 0.2	97	0	90 - 110	20
Nitrate-N	2.36	2.39	mg/L	1	2.50	< 0.2	94	1	90 - 110	20
Sulfate	12.67	12.70	mg/L	1	12.50	<1.0	101	0	90 - 110	20

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

QCBatch:

Quality Control Report Matrix Spikes and Duplicate Spikes

Matrix Spikes

Laboratory Control Spikes

QCBatch: QC20679

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	1210	1210	mg/L	1	625	577	101	0	48 - 127	20
Fluoride	116	109	mg/L	1	125	<1.0	92	6	82 - 101	20
Nitrate-N	126	125	mg/L	1	125	2.23	99	0	87 - 100	20
Sulfate	765	771	mg/L	1	625	121	103	0	59 - 121	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

CONT	111
	(1)

QCBatch: QC20525

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Total Dissolved Solids		mg/L	1000	920	92	90 - 110	5/21/02

Report Date: June 5, 2002 00-0113			rder Num Co	ber: A oper-Ja	Page Number: 9 of 10 Lea County, NM			
ICV (1)	QCBatch:	QC20525						
			CCVs True	C Fe	CVs ound	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	C	onc.	Recovery	Limits	Analyzed
Total Dissolved Se	olids	mg/L	1000		984	98	90 - 110	5/21/02
CCV (1) Param	QCBatch: Flag	QC20585 Units	C	CVs Frue Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalir	nity	mg/L as Ca	Co3	0	<1.0	0	90 - 110	5/21/02
Carbonate Alkalin	nity	mg/L as Ca	Co3	0	224	0	90 - 110	5/21/02
Bicarbonate Alka	linity	mg/L as Ca	Co3	0	14	0	90 - 110	5/21/02
Total Alkalinity		mg/L as Ca	Co3	250	238	95	90 - 110	5/21/02
ICV (1)	QCBatch:	QC20585						

			\mathbf{CCVs}	\mathbf{CCVs}	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	<1.0	0	90 - 110	5/21/02
Carbonate Alkalinity		mg/L as CaCo3	0	220	0	90 - 110	5/21/02
Bicarbonate Alkalinity		mg/L as CaCo3	0	24	0	90 - 110	5/21/02
Total Alkalinity		mg/L as CaCo3	250	244	97	90 - 110	5/21/02

CCV (1) QCBatch: QC20679

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/L	12.50	12.68	101	90 - 110	5/16/02
Fluoride		mg/L	2.50	2.42	96	90 - 110	5/16/02
Nitrate-N		mg/L	2.50	2.37	94	90 - 110	5/16/02
Sulfate		mg/L	12.50	12.80	102	90 - 110	5/16/02

ICV (1)

QCBatch: QC20679

			\mathbf{CCVs}	\mathbf{CCVs}	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/L	12.50	12.66	101	90 - 110	5/16/02
Fluoride		$\mathrm{mg/L}$	2.50	2.36	94	90 - 110	5/16/02
Nitrate-N		mg/L	2.50	2.36	94	90 - 110	5/16/02
Sulfate		mg/L	12.50	12.70	101	90 - 110	5/16/02

Report Date: June 5 00-0113	, 2002	C	rder Numb Coop	er: A0205162 per-Jal	0	Page Nun Lea	ber: 10 of 10 County, NM
CCV (1)	QCBatch:	QC20711					
			CCVs True	CCVs Found	CCVs Percent	Percent	Date
Param	\mathbf{Flag}	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved Calcium	······	mg/L	25	23.6	94	90 - 110	5/28/02
Dissolved Magnesiun	ı	m mg/L	25	23.7	94	90 - 110	5/28/02
Dissolved Potassium		mg/L	25	26.8	107	90 - 110	5/28/02
Dissolved Sodium		mg/L	25	26.7	106	90 - 110	5/28/02
	OCD-4-b	0.000711					
ICV(1)	QCBatch:	QC20711					
			CCVs	CCVs Found	CCVs Percent	Percent	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved Calcium		mg/L	25	24.3	97	95 - 105	5/28/02
Dissolved Magnesiun	a	mg/L	25	25.1	100	95 - 105	5/28/02
Dissolved Potassium		mg/L	25	24.1	96	95 - 105	5/28/02
Dissolved Sodium		mg/L	25	24.8	99	95 - 105	5/28/02

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1162-66				or alsoco y	
CLIENT NAME:	SITE MANAGER:	PARAMETERS/M	ETHOD NUMBER	CHAIN-OF-CUSTODY I	RECORD
Texco	Merk Lerson				Ņ
PROJECT NO.: 0 -0113	PROJECT NAME: COOPER - Jel	NTAINER 2016 July 2016 July		A GISON & SSOCIATES, INC. Fax: 915-687 Environmental Consultants 915-687	-0456
PAGE 1 OF 1 LAB.	PO#	7 / 7 00 40		507 N. Marienfeld, Ste. 202 • Midland	TX 79701
2014 1105 2015 31111 311111 311111	SAMPLE IDENTIFICATION	и и мавек с Вијаји S СТ С		LAB. I.D. REMARKS NUMBER (I.E., FILTERED, UNFILTER PRESERVED, UNPRESER (LAB USE ONLY) GRAB COMPOSITE)	Û, Û,
5-15-20 10:50 X	C91161 21-MM	2 X X		W Dreserv.	
1 11:36 1	WW-9A 197163	•••			
12:30	WU-5A 104				
1,40	1111-21A 165				
* 2h:2 *	WW-2-A 1106	× ×		>	
SAMPLED BY: (Signature)	DATE: 5-15-02 RELINQUISH TIME: 41:50	ED DI Gignofured M	TIME: 4150	tECEIVED BY: (Signature) DA TI/	TE: AE:
RELINQUISHED BY: (Slargature)	DATE:5/15/02 RECEIVED BY	(: (Signature)	DATE	AMPLE SHIPPED BY: (Circle) (Drein Land	
gulin shelto	H TIME: (830		TIME:		
COMMENTS:		TURNARO		Hanu deliyekeu ups oihek: Mhite – Receiving Lab	
RECEIVING LABORATORY: TSPALL	e Analysis R	RECEIVED BY (Signature)		Fellow - Receiving Lab (to be returned to La After Receipt)	
ADDRESS: 10/10/10/10/10/10/10/10/10/10/10/10/10/1	1 AVE 1541 4 STATE: 1 210: 79474	DATE: S-16.02 TIME.	10.001	<pre>NNK - PROJECT MANAGER SOLD - QA/QC COORDINATOR</pre>	
SAMPLE CONDITION WHEN RECEIVED:		LA CONTACT PERSON: Marthe Larsan	(010)(21-010)	AMPLE TYPE: 1(13 ろしんしア1-5	
		₩ α[ungles -	ts A	

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TraceAnalysis, Inc.	6701 Aberdeen Ave., Suite 9	Lubbock, TX 79424-1515	(806) 794-1296
Report Date: June 6, 20 00-0113	02Order Number: A02052008 Cooper-Jal		Page Number: 1 of 2 Lea County, NM

Summary Report

Mark Larson				Report Date:	June 6, 2002
Larson & Associat	es, Inc.				
P.O. Box 50685					
Midland, Tx. 7971	.0			Order ID Number:	A02052008
Project Number:	00-0113				
Project Name:	Cooper-Jal				
Project Location:	Lea County, NM				
			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
197394	MW-7	Water	5/16/02/	14:00	5/16/02
197395	MW-8	Water	5/16/02/	12:27 -	5/16/02

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.

5/16/02/

5/16/02

11:30

10:36

5/16/02

5/16/02

Water

Water

Sample: 197394 - MW-7

MW-9

MW-11

197396

197397

Param	Flag	Result	Units
Hydroxide Alkalinity		<1.0	mg/L as CaCo3
Carbonate Alkalinity		<1.0~	mg/L as CaCo3
Bicarbonate Alkalinity		150 -	mg/L as CaCo3
Total Alkalinity		150~	mg/L as CaCo3
Chloride		75.7~	m mg/L
Fluoride		1.59	mg/L
Nitrate-N		2.27~	mg/L
Sulfate		97.4 ~	mg/L
Dissolved Calcium		68.6 -	mg/L
Dissolved Magnesium		23.2	mg/L
Dissolved Potassium		6.63 ~	mg/L
Dissolved Sodium		54.3 <	m mg/L
Total Dissolved Solids		501 -	mg/L

Sample: 197395 - MW-8

Param	\mathbf{Flag}	Result	\mathbf{Units}
Hydroxide Alkalinity		<1.0	mg/L as CaCo3
Carbonate Alkalinity		<1.0	mg/L as $CaCo3$
Bicarbonate Alkalinity		158 -	mg/L as CaCo3
Total Alkalinity		158~	mg/L as CaCo3
Chloride		32.9 /	mg/L
Fluoride		1.57	m mg/L
Nitrate-N	**	2.33 ′	mg/L

Continued on next page ...

Dissolved Sodium

Total Dissolved Solids

49.5

432~

mg/L mg/L I.

Report Date: June 6, 24 00-0113	002Order Number: A02052008 Cooper-Jal		Page Number: 2 of 2 Lea County, NM
Sample 197395 continue	ed		
Param	Flag	Result	Units
Sulfate		101 -	mg/L
Dissolved Calcium		56.6-	mg/L
Dissolved Magnesium		19.2~	mg/L
Dissolved Potassium		5.201	mg/L

Sample: 197396 - MW-9

Param	Flag	Result	Units
Hydroxide Alkalinity	<u> </u>	<1.0	mg/L as CaCo3
Carbonate Alkalinity		<1.0 -	mg/L as CaCo3
Bicarbonate Alkalinity		160 -	mg/L as CaCo3
Total Alkalinity		160 ~	mg/L as CaCo3
Chloride		31.7-	mg/L
Fluoride		2.22	mg/L
Nitrate-N		2.28	mg/L
Sulfate		99.4 ~	mg/L
Dissolved Calcium		60.8~	mg/L
Dissolved Magnesium		17.6 -	m mg/L
Dissolved Potassium		5.32	mg/L
Dissolved Sodium		50.1 -	mg/L
Total Dissolved Solids		440 ~	mg/L

Sample: 197397 - MW-11

Param	Flag	Result	\mathbf{Units}
Hydroxide Alkalinity		<1.0	mg/L as CaCo3
Carbonate Alkalinity		<1.0	mg/L as CaCo3
Bicarbonate Alkalinity		160~	mg/L as CaCo3
Total Alkalinity		160 -	mg/L as CaCo3
Chloride		31.9	mg/L
Fluoride	,	2.13	mg/L
Nitrate-N		2.33~	m mg/L
Sulfate		98.8 -	mg/L
Dissolved Calcium		63.5~	mg/L
Dissolved Magnesium		17.2	mg/L
Dissolved Potassium		4.83	mg/L
Dissolved Sodium		47.0	m mg/L
Total Dissolved Solids		444	m mg/L

Cation-Anion Balance Sheet

	U U	μMHOs/cm					
	TDS	ррт	501	432	440	444	
	Bromide	mqq					
	Fluoride	ррт	1.59	1.57	2.22	2.13	
	Nitrate	bpm	2.27	2.33	2.28	2.33	
	Chloride	mdd	75.7	32.9	31.7	31.9	
	Sulfate	mqq	97.4	101	99.4	98.8	
	Alkalinity	bpm	150	158	160	160	
	Potassium	bpm	6.63	5.2	5.32	4.83	
	Sodium	bpm	54.3	49.5	50.1	47	
X)	Magnesium	mqq	23.2	19.2	17.6	17.2	
6/10/02	Calcium	mdd	68.6	56.6	60.8	63.5	
DATE:	Sample #		197394	197395	197396	197397	

			TDS/Anion	TDS/Cat	TDS/FC				•		EC/Anion	EC/Cation	
4.803235023	6.44	6.75	0	0.1121232	0.1663387	06.0	2.06	3.20	0.12	2.04	1.42	3.17	197397
5.351002782	6.44	6.80	0	0.1168608	0.1627692	0.89	2.07	3.20	0.14	2.18	1.45	3.03	197396
3.81800781	6.44	69.9	0	0.0826448	0.1663387	0.93	2.10	3.16	0.13	2.15	1.58	2.82	197395
5.955536803	7.41	7.86	0	0.0836976	0.1620553	2.14	2.03	3.00	0.17	2.36	1.91	3.42	197394
Error	in meq/L	in meq/L	in meq/L	in meq/L	in meq/L	in meq/L	in meq/L	in meq/L	in meq/L	in meq/L	in meq/L	in meq/L	
Percentage	Anions	Cations	Bromide	Fluoride	Nitrate	Chloride	Sulfate	Alkalinity	Potassium	Sodium	Magnesium	Calcium	Sample #

	needs to be 0.55-0.77				
TDS/Anion	0.68	0.67	0.68	0.69	
TDS/Cat	0.64	0.65	0.65	0.66	
TDS/EC	i0//IC#	#DIV/0	#DIV/0I	10//NIQ#	
	0	0	0	0	
	9	đ	ę	đ	
	0	0	0	0	
	range	range	range	range	
EC/Anion	740.91179	643.99125	644.3395	643.53769	

679.76596 675.20894

197396

786.39134 669.0574 i i

> 197394 197395 197397

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FAX 915•585•4944

Analytical and Quality Control Report

Mark Larson Larson & Associates, Inc. P.O. Box 50685 Midland, Tx. 79710

Report Date:

June 6, 2002

Order ID Number: A02052008

Project Number: 00-0113 **Project Name:** Cooper-Jal Project Location: Lea County, NM

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

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
197394	MW-7	Water	5/16/02	14:00	5/16/02
197395	MW-8	Water	5/16/02	12:27	5/16/02
197396	MW-9	Water	5/16/02	11:30	5/16/02
197397	MW-11	Water	5/16/02	10:36	5/16/02

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.

The test results contained within this report meet all requirements of LAC 33:I unless otherwise noted.

This report consists of a total of 9 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

Report Date: June 6, 2002 00-0113

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Hydroxide Alkalinity

Analytical Report

Analytical Method:	E 310.1	QC Batch:	QC2064	5 Date Analyzed:	5/30/02
Preparation Method	l: N/A	Prep Batch:	PB19691	1 Date Prepared:	5/30/02
Flag	Result	Un	its	Dilution	RDI
	<1.0	mg/L as	s CaCo3	1	1
	< 1.0	mg/L as	s CaCo3	1	1
	150	mg/L as	s CaCo3	1	1
	150	mg/L as	s CaCo3	1	1
MW-7					
tography (IC) Analytic	cal Method:	E 300.0 QC 1	Batch:	QC20673 Date Analyze	d: 5/20/02
Prepara	tion Method:	N/A Prep	Batch:	PB19717 Date Prepare	d: 5/20/02
Result	Units	Dilution			RDL
75.7	mg/L	5			1
1.59	mg/L	. 5			0.20
2.27	mg/L	5			0.20
97.4	mg/L	5			1
MW-7 nalytical Method: 1	E 200.7	QC Batch:	QC20801	Date Analyzed:	6/3/02
MW-7 nalytical Method: 1 reparation Method: 5	E 200.7 S 3005A	QC Batch: Prep Batch:	QC20801 PB19808	Date Analyzed: Date Prepared:	6/3/02 5/22/02
MW-7 nalytical Method: I reparation Method: S Flag	E 200.7 S 3005A Result	QC Batch: (Prep Batch:) Ui	QC20801 PB19808 nits	Date Analyzed: Date Prepared: Dilution	6/3/02 5/22/02 RDI
MW-7 nalytical Method: 1 reparation Method: 5 Flag	E 200.7 S 3005A Result 68.6	QC Batch: Prep Batch: Un mp	QC20801 PB19808 nits g/L	Date Analyzed: Date Prepared: Dilution 1	6/3/02 5/22/02 RDI 0.50
MW-7 nalytical Method: 1 reparation Method: 5 Flag	E 200.7 S 3005A <u>Result</u> 68.6 23.2	QC Batch: Prep Batch: Un ma ma	QC20801 PB19808 nits g/L g/L	Date Analyzed: Date Prepared: Dilution 1 1	6/3/02 5/22/02 RDI 0.50 0.50
MW-7 nalytical Method: 1 reparation Method: 5 Flag	E 200.7 S 3005A Result 68.6 23.2 6.63	QC Batch: Prep Batch: Un mi mi mi	QC20801 PB19808 nits g/L g/L g/L	Date Analyzed: Date Prepared: Dilution 1 1 1	6/3/02 5/22/02 RDI 0.50 0.50 0.50
MW-7 nalytical Method: 1 reparation Method: 5 Flag	E 200.7 S 3005A <u>Result</u> 68.6 23.2 6.63 54.3	QC Batch: Prep Batch: Un mg mg mg	QC20801 PB19808 nits g/L g/L g/L g/L g/L	Date Analyzed: Date Prepared: Dilution 1 1 1 1 1	6/3/02 5/22/02 RDI 0.50 0.50 0.50
MW-7 nalytical Method: 1 reparation Method: 5 Flag MW-7 nalytical Method: reparation Method:	E 200.7 S 3005A Result 68.6 23.2 6.63 54.3 E 160.1 N/A	QC Batch: Prep Batch: Un mg mg mg QC Batch: Prep Batch:	QC20801 PB19808 nits g/L g/L g/L QC20600 PB19657	Date Analyzed: Date Prepared: Dilution 1 1 1 1 1 Date Analyzed: Date Prepared:	6/3/02 5/22/02 RDI 0.50 0.50 0.50 0.50 5/24/02 5/23/02
MW-7 nalytical Method: 1 reparation Method: 1 Flag MW-7 nalytical Method: reparation Method: Flag	E 200.7 S 3005A Result 68.6 23.2 6.63 54.3 E 160.1 N/A Result	QC Batch: Prep Batch: Un mi mi mi Mi QC Batch: Prep Batch: U	QC20801 PB19808 nits g/L g/L g/L QC20600 PB19657 nits	Date Analyzed: Date Prepared: Dilution 1 1 1 1 1 Date Analyzed: Date Prepared: Dilution	6/3/02 5/22/02 RDI 0.50 0.50 0.50 5/24/02 5/23/02 RDI
	Flag Flag MW-7 tography (IC) Analyti Prepara Result 75.7 1.59 2.27 97.4	Flag Result <1.0	Flag Result Un <1.0	Flag Result Units <1.0	Flag Result Units Dilution <1.0

<1.0

mg/L as CaCo3

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Continued ...

Report Date: June 6, 2002 00-0113		aber: A0205200 oper-Jal	Page Number: 3 of 9 Lea County, NM		
395 Analysis: A	lkalinity				
Flag	Result	Un	its	Dilution	RDL
	<1.0	mg/L as	s CaCo3	1	1
	158	mg/L as	s CaCo3	1	1
	158	mg/L as	s CaCo3	1	1
IW-8 raphy (IC) Analyt Prepar	tical Method: ration Method	E 300.0 QC : : N/A Prep	Batch: 0 Batch: F	QC20673 Date Analyze PB19717 Date Prepare	d: 5/20/02 d: 5/20/02
Result	Units	Dilution			RDL
32.9	mg/L	5			1
1.57	mg/L	5			0.20
2.33	mg/L	5			0.20
101	mg/L	5			1
ytical Method: aration Method: Flag	E 200.7 S 3005A Result 56.6 19.2 5.20 49.5	QC Batch: Prep Batch: Un mi mi mi	QC20801 PB19808 nits g/L g/L g/L g/L	Date Analyzed: Date Prepared: Dilution 1 1 1 1	6/3/02 5/22/02 RDL 0.50 0.50 0.50 0.50
ytical Method: aration Method:	E 160.1 N/A	QC Batch: (Prep Batch: 1	QC20600 PB19657	Date Analyzed: Date Prepared:	5/24/02 5/23/02
Flag	Result	U	nits	Dilution	RDI.
	IW-8 raphy (IC) Analyt Prepar Result 32.9 1.57 2.33 101 IW-8 ytical Method: aration Method: Flag IW-8 ytical Method: aration Method: aration Method: aration Method: aration Method:	158 158 158 IW-8 raphy (IC) Analytical Method: Preparation Method Result Units 32.9 mg/L 1.57 mg/L 2.33 mg/L 101 mg/L IW-8 ytical Method: E 200.7 aration Method: S 3005A Flag Result 56.6 19.2 5.20 49.5 IW-8 ytical Method: E 160.1 aration Method: N/A Flag Result	158 mg/L as 158 mg/L as IW-8 raphy (IC) Analytical Method: E 300.0 QC in Preparation Method: N/A Prep Result Units Dilution 32.9 mg/L 5 1.57 mg/L 5 2.33 mg/L 5 101 mg/L 5 IW-8 ytical Method: E 200.7 QC Batch: anation Method: S 3005A Flag Result Units 5.20 mg 5.20 19.2 mg 5.20 49.5 mg 5.20 Ytical Method: E 160.1 QC Batch: Garation Method: N/A Flag Result U	158 mg/L as CaCo3 158 mg/L as CaCo3 IW-8 raphy (IC) Analytical Method: E 300.0 QC Batch: O Preparation Method: N/A Prep Batch: F Result Units Dilution 32.9 mg/L 5 1.57 mg/L 5 2.33 mg/L 5 101 mg/L 5 101 mg/L 5 IW-8 ytical Method: E 200.7 QC Batch: QC20801 aration Method: S 3005A Prep Batch: PB19808 Flag Result Units 56.6 mg/L 19.2 19.2 mg/L 5.20 19.2 mg/L 49.5 49.5 mg/L 19.2 49.5 mg/L 10.1 49.5 mg/L 10.1 Ytical Method: E 160.1 QC Batch: QC20600 aration Method: N/A Prep Batch: PB19657	158mg/L as CaCo31158mg/L as CaCo31158mg/L as CaCo31158mg/L as CaCo31IW-8Preparation Method:N/APrep Batch:PB19717 Date PreparedResultUnitsDilution32.9mg/L51.57mg/L52.33mg/L5101mg/L5101mg/L5101mg/L110111102mg/L1103111041110511106111071110811109.2mg/L1109.2mg/L1109.2mg/L1109.3mg/L1109.41109.5mg/L1109.61109.71109.81109.91109.21109.21109.31109.41109.51109.51109.61109.71109.81109.81109.91109.91109.91109.91109.91109.91109.91109.91109.91109.91<

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Report Date: June 6, 2002	Order Number: A02052008	Page Number: 4 of 9
00-0113	Cooper-Jal	Lea County, NM

Sample: 197396 - MW-9

Analysis:	Ion Chromatography (IC) Analytical Method:		E 300.0 QC Batch:		QC20673 Date Analyzed: 5/20/02		
Analyst:	MS		Preparation Method:	N/A F	Prep Batch:	PB19717 Date Prepared: 5/20/02	
Param	Flag	Result	Units	Dilution	ı	RDL	
Chloride		31.7	mg/L	5		1	
Fluoride		2.22	mg/L	5		0.20	
Nitrate-N		2.28	mg/L	5		0.20	
Sulfate		99.4	mg/L	5		1	

Sample: 197396 - MW-9

Analysis:	Salts	Analytical Method:	E 200.7	QC Batch:	QC20801	Date Analyzed:	6/3/02
Analyst: BC		Preparation Method:	S 3005A Prep Bate		PB19808	Date Prepared:	5/22/02
Param		Flag	Result		Units	Dilution	RDL
Dissolved (Calcium		60.8	1	mg/L	1	0.50
Dissolved 1	Magnesium		17.6	1	mg/L	1	0.50
Dissolved 1	Potassium		5.32	1	mg/L	1	0.50
Dissolved S	Sodium		50.1	1	mg/L	1	0.50

Sample: 197396 - MW-9

Analysis: Analyst:	TDS JSW	Analytical Method: Preparation Method:	E 160.1 N/A	QC Batch: Prep Batch:	QC20600 PB19657	Date Analyzed: Date Prepared:	5/24/02 5/23/02
Param		Flag	Result	;	Units	Dilution	RDL
Total Disso	lved Solid	S	44()	mg/L	1	10

Sample: 197397 - MW-11

Analysis: Analyst:	Alkalinity JSW	Analytical Method: Preparation Method:	E 310.1 N/A	QC Batch: Prep Batch:	QC20645 PB19691	Date Analyzed: Date Prepared:	5/30/02 5/30/02
Param		Flag	Result	Un	its	Dilution	RDL
Hydroxide A	lkalinity		<1.0	mg/L as	CaCo3	1	1
Carbonate A	lkalinity		<1.0	mg/L as	CaCo3	1	1
Bicarbonate	Alkalinity		160	mg/L as	CaCo3	1	1
Total Alkalin	nity		160	mg/L as	CaCo3	1	1

Sample: 197397 - MW-11

Analysis:	Ion Chromatography (IC) Analytical Method:	E 300.	0 QC Batch:	QC20673 Date Analyzed: 5/20/02
Analyst:	MS	Preparation Method:	N/A	Prep Batch:	PB19717 Date Prepared: 5/20/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		31.9	mg/L	5	1
Fluoride		2.13	mg/L	5	0.20
Nitrate-N		2.33	mg/L	5	0.20
Sulfate		98.8	mg/L	5	1

Report Date: June 6, 2002 00-0113			Order Nur Co	nber: A020520 poper-Jal	Page Number: 5 of 9 Lea County, NM		
Sample: Analysis:	1973 Salts	97 - MW-11 Analytical Method: Propagation Method:	E 200.7	QC Batch:	QC20801	Date Analyzed:	6/3/02
Param	DÜ	Flag	Result		Units	Date Trepared.	3/22/02 RDL
Dissolved C	Calcium		63.5	1	ng/L	1	0.50
Dissolved N	lagnesiur	n	17.2	1	ng/L	1	0.50
Dissolved F	otassium		4.83	1	ng/L	1	0.50
Dissolved S	odium		47.0	' I	ng/L	1	0.50

Sample: 197397 - MW-11

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Analysis: Analyst:	TDS JSW	Analytical Method: Preparation Method:	E 160.1 N/A	QC Batch: Prep Batch:	QC20600 PB19657	Date Analyzed: Date Prepared:	5/24/02 5/23/02
Param		Flag	Result	;	Units	Dilution	RDL
Total Disso	lved Solids		444		mg/L	1	10

Report Date: June 6, 2002 Order Number: A02052008 Page Number: 6 of 9 Cooper-Jal Lea County, NM 00-0113 Quality Control Report Method Blank Method Blank QCBatch: QC20600 Reporting Units Limit Param Flag Results **Total Dissolved Solids** mg/L10 <10 Method Blank QCBatch: QC20645 Reporting Param Flag Results Units Limit Hydroxide Alkalinity mg/L as CaCo3 < 1.01 Carbonate Alkalinity <1.0 mg/L as CaCo3 1 **Bicarbonate Alkalinity** <4.0 mg/L as CaCo3 1 1 **Total Alkalinity** <4.0 mg/L as CaCo3 Method Blank QCBatch: QC20673 Reporting Param Flag Results Units Limit Chloride mg/L <1.0 1 Fluoride < 0.2 0.20 mg/LNitrate-N 0.20 < 0.2mg/LSulfate <1.0 mg/L 1 Method Blank QCBatch: QC20801 Reporting Param Flag Results Units Limit **Dissolved** Calcium < 0.5 mg/L 0.50 Dissolved Magnesium < 0.5mg/L 0.50**Dissolved Potassium** < 0.6 mg/L0.50**Dissolved Sodium** < 0.5mg/L 0.50 **Quality Control Report Duplicate Samples**

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit	
Total Dissolved Solids	<u>v</u>	6115	6040	mg/L	1	1	9.7	

Duplicate

QCBatch:

QC20600

Report Date: June 6, 2002 00-0113			Order Numb Coor	er: A02052008 per-Jal	Page Number: 7 of 9 Lea County, NM		
Duplicate	QCBatch:	QC20645					
Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Hydroxide Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	9.2
Carbonate Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	9.2
Bicarbonate Alkalinity		166	162	mg/L as CaCo3	1	2	9.2
Total Alkalinity		166	162	mg/L as CaCo3	1	2	9.2

Quality Control Report Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes			QCBatch:	QC2067	73					
	LCC	LCOD			Spike	Matuin			Ø Dee	ממת
	LUS	LCSD			Amount	Matrix			70 Rec	RPD
Param	\mathbf{Result}	\mathbf{Result}	Units	Dil.	Added	Result	% Rec	RPD	Limit	Limit
Chloride	11.34	11.34	mg/L	1	12.50	<1.0	90	0	90 - 110	20
Fluoride	2.39	2.43	mg/L	1	2.50	< 0.2	95	1	90 - 110	20
Nitrate-N	2.40	2.39	mg/L	1	2.50	< 0.2	96	0	90 - 110	20
Sulfate	11.59	11.69	mg/L	1	12.50	<1.0	92	0	90 - 110	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: QC20673

					Spike					
	MS	MSD			Amount	Matrix			$\% { m Rec}$	RPD
Param	Result	Result	Units	Dil.	Added	\mathbf{Result}	$\% { m Rec}$	RPD	\mathbf{Limit}	\mathbf{Limit}
Chloride	319.86	319.28	mg/L	1	125	204	92	0	48 - 127	20
Fluoride	25.73	24.07	mg/L	1	25	1.93	95	7	82 - 101	20
Nitrate-N	26.22	26.41	mg/L	1	25	2.19	96	0	87 - 100	20
Sulfate	224.84	224.41	mg/L	1	125	99.1	100	0	59 - 121	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

CON	/1)
UUV	(1)

QCBatch: QC20600

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Total Dissolved Solids		mg/L	1000	1006	100	90 - 110	5/24/02

Report Date: Jun 00-0113	(Order Num Coo	ber: A oper-Ja	Page Number: 8 of 9 Lea County, NM				
ICV (1)	QCBatch:	QC20600						
			CCVs	C	CVs	CCVs	Percent	
			True	\mathbf{Fc}	und	Percent	Recovery	Date
Param	\mathbf{Flag}	Units	Conc.	C	onc.	Recovery	Limits	Analyzed
Total Dissolved S	olids	mg/L	1000	ę	94	99	90 - 110	5/24/02
CCV (1)	QCBatch:	QC20645	C4 T	CVs rue	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	C	onc.	Conc.	Recovery	Limits	Analyzed
Hydroxide Alkalir	nity	mg/L as Ca	Co3	0	<1.0	0	90 - 110	5/30/02
Carbonate Alkalin	nity	mg/L as Ca	Co3	0	224	0	90 - 110	5/30/02
Bicarbonate Alka	linitý	mg/L as Ca	Co3	0	16	0	90 - 110	5/30/02
Total Alkalinity		mg/L as Ca	203 2	250	240	96	90 - 110	5/30/02
ICV (1)	QCBatch:	QC20645					•	

			\mathbf{CCVs}	CCVs	\mathbf{CCVs}	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	<1.0	0	90 - 110	5/30/02
Carbonate Alkalinity		mg/L as CaCo3	0	228	0	90 - 110	5/30/02
Bicarbonate Alkalinity		mg/L as CaCo3	0	12	0	90 - 110	5/30/02
Total Alkalinity		mg/L as CaCo3	250	240	96	90 - 110	5/30/02

CCV (1) QCBatch: QC20673

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/L	12.50	11.30	90	90 - 110	5/20/02
Fluoride		mg/L	2.50	2.44	97	90 - 110	5/20/02
Nitrate-N		mg/L	2.50	2.39	95	90 - 110	5/20/02
Sulfate		mg/L	12.50	11.62	92	90 - 110	5/20/02

ICV (1)

QCBatch: QC20673

			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	\mathbf{Units}	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/L	12.50	11.70	93	90 - 110	5/20/02
Fluoride		m mg/L	2.50	2.50	100	90 - 110	5/20/02
Nitrate-N		m mg/L	2.50	2.40	96	90 - 110	5/20/02
Sulfate		mg/L	12.50	11.75	94	90 - 110	5/20/02

Report Date: June 6, 00-0113	Order Num Coo	ber: A020520 oper-Jal	Page Number: 9 of 9 Lea County, NM				
CCV (1)	QCBatch:	QC20801					
			CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Dissolved Calcium		mg/L	25	26.2	104	90 - 110	6/3/02
Dissolved Magnesium		mg/L	25	25.8	103	90 - 110	6/3/02
Dissolved Potassium		mg/L	25	25.3	101	90 - 110	6/3/02
Dissolved Sodium		mg/L	25	25.7	102	90 - 110	6/3/02
ICV (1)	QCBatch:	QC20801					·

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Calcium		mg/L	25	25.0	100	95 - 105	6/3/02
Dissolved Magnesium		mg/L	25	24.7	98	95 - 105	6/3/02
Dissolved Potassium		mg/L	25	24.9	99	95 - 105	6/3/02
Dissolved Sodium		mg/L	25	25.4	101	95 - 105	6/3/02

HENT NAME: TENT NAME: TENT NO: ROLECT NO: ROLECT NO: ROLECT NO: AGE OF U AGE OF OF U AGE OF OF U AGE OF OF OF OF OF OF OF O	SITE MANAGER: Werde- Leusson PROJECT NAME: Colipaer - Jal AB. PO # MAN - 7 197394 MAN - 8 395		IETERS/METHOD NUMBER	CHAIN- CHAIN- Ssocic Environment 507 N. Marie LAB. LD. NUMBER (LAB. USE ONLY)	ACACEROPY RECORD OFCUSTODY RECORD attes, Inc. Fax: 915-687-0456 hal consultants of 15-687-0901 nfeld, Ste. 202 • Midland, TX 79701 nfeld, Ste. 202 • Midland, TX 79701
10:30 V 10:36 V MPIED BY: ISidmontation	MNW - 9 390 MNW - 1 397 MAN - 11 397 DATES - 16 27 RELINQUISH		DATES-17-22		
MINDUISHED BY: (Signafure)	DATE 5/00 RECEIVED BY TIME 1830	(Signature)	TIME 7:00 A DATE TIME TURNAROUND TIME NEEDED	LeVin K SAMPLE SHIPPED B FEDEX HAND DELIVERED	Circle) Conversion A TIME 7:00
CEIVING LABORATORY: TCENE DRESS: 6701 Arbertage Y: Linbback NTACT: He Je M MECT: He Je M MEC CONDITION WHEN RECEIVED:	PHONE(2016)794-1296	ECEMEDIAY: Sygnod	لللله المحالية المحال 1914 - 1920 - 1	White - Receivity Yellow - Receivity La Afte Dink - Projec Gold - Qa/QC Sample Type: A	ig Lab Ig Lab (to be returned to Receipt) Manager Coordinator
Greymon	10 627 163-566-77	3-7	m 8 do	mgles-	ŧS

Page Number: 1 of 4 Report Date: June 11, 2002Order Number: A02052015 00-0113 Cooper-Jal **Summary Report** Mark Larson **Report Date:** June 11, 2002 Larson & Associates, Inc. P.O. Box 50685 Midland, Tx. 79710 Order ID Number: A02052015 **Project Number:** 00-0113 Project Name: Cooper-Jal Project Location: Lea County, NM Date Time Date Description Matrix Taken Taken Received Sample 197420 MW-1 Water 5/17/02 5/18/02 14:25 5/17/02 < 197421 MW-2 Water 13:555/18/02 5/17/02 1 197422 MW-3 Water 15:005/18/02 197423 Water 5/17/02 / 5/18/02 MW-4 13:10 197424 MW-5 Water 5/17/02 / 12:16 5/18/02 5/17/02 (197425 MW-6 Water 11:07 5/18/02 197426 MW-10 Water 5/17/02 / 10:20 5/18/02

0 This report consists of a total of 4 page(s) and is intended only as a summary of results for the sample(s) listed above.

Sample: 197420 - MW-1

Param	Flag	Result	Units
Hydroxide Alkalinity		<1.0	mg/L as CaCo3
Carbonate Alkalinity		<1.0	mg/L as CaCo3
Bicarbonate Alkalinity		208	mg/L as CaCo3
Total Alkalinity		208	mg/L as CaCo3
Chloride		237	- mg/L
Fluoride		5.83	mg/L
Nitrate-N		3.28	mg/L
Sulfate		86.9	mg/L
Dissolved Calcium		45.7	mg/L
Dissolved Magnesium		20.1	mg/L
Dissolved Potassium		11.9 ′	mg/L
Dissolved Sodium		184 '	mg/L
Total Dissolved Solids		784 1	mg/L

Sample: 197421 - MW-2

Param	Flag	Result	Units
Hydroxide Alkalinity		<1.0	mg/L as CaCo3
Carbonate Alkalinity		<1.0/	mg/L as $CaCo3$
Bicarbonate Alkalinity		160	mg/L as CaCo3
Total Alkalinity		160 ⁄	mg/L as CaCo3
			Continued on next page

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

Lea County, NM

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Lubbock, TX 79424-1515

TraceAnalysis, Inc.

Report Date: June 11, 2002Order Number: A02052015 Page Number: 2 of 4 00-0113 Cooper-Jal Lea County, NM Sample 197421 continued ... Flag Units Param Result Chloride 3200 < mg/L 2 Fluoride 1.72 < mg/L 3 3.18 < Nitrate-N mg/L 483 7 Sulfate mg/L 587 1 **Dissolved** Calcium mg/L239 ′ **Dissolved Magnesium** mg/L **Dissolved Potassium** 35.6 mg/L **Dissolved Sodium** mg/L 1160⁄

Lubbock, TX 79424-1515

6040 ′

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mg/L

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Sample: 197422 - MW-3

Total Dissolved Solids

TraceAnalysis, Inc.

Param	Flag	Result	Units
Hydroxide Alkalinity		<1.0	mg/L as CaCo3
Carbonate Alkalinity		<1.0	mg/L as CaCo3
Bicarbonate Alkalinity		158-	mg/L as CaCo3
Total Alkalinity		158 -	mg/L as CaCo3
Chloride		30.6~	mg/L
Fluoride		1.56 -	mg/L
Nitrate-N		2.35	m mg/L
Sulfate		102⁄	mg/L
Dissolved Calcium		55.6	mg/L
Dissolved Magnesium		18.4	mg/L
Dissolved Potassium		5.04 <	mg/L
Dissolved Sodium		50.0	mg/L
Total Dissolved Solids		433	mg/L

Sample: 197423 - MW-4

Param	Flag	Result	Units
Hydroxide Alkalinity		<1.0 ×	mg/L as CaCo3
Carbonate Alkalinity		<1.0 ×	mg/L as $CaCo3$
Bicarbonate Alkalinity		232 /	mg/L as CaCo3
Total Alkalinity		232 /	mg/L as CaCo3
Chloride		11300 /	mg/L
Fluoride	4	2.01 /	mg/L
Nitrate-N	5	6.09 ⁄	mg/L
Sulfate	6	1380 -	mg/L
Dissolved Calcium		1610 /	mg/L

Continued on next page ...

¹Chloride analysis for sample 197421 was performed on 05/20/02. ICV %IA = 90, CCV %IA = 90, Matrix Spikes RPD = 0, Matrix Spikes %EA = 89, LCS Spikes RPD = 1, LCS Spikes %EA = 90.

²Fluoride analysis for sample 197421 was performed on 05/20/02. ICV %IA = 98, CCV %IA = 96, Matrix Spikes RPD = 0, Matrix Spikes %EA = 93, LCS Spikes RPD = 0, LCS Spikes %EA = 96.

³Nitrate analysis for sample 197421 was performed on 05/20/02. ICV %IA = 96, CCV %IA = 95, Matrix Spikes RPD = 0, Matrix Spikes %EA = 98, LCS Spikes RPD = 1, LCS Spikes %EA = 96.

 4 CCV2 %IA = 96; CCV 3 %IA = 96; Matris Spikes RPD = 2; Matrix Spikes %EA = 92; LCS Spikes RPD = 0; LCS Spikes %EA = 96. 5 CCV2 %IA = 95; CCV 3 %IA = 95; Matris Spikes RPD = 1; Matrix Spikes %EA = 92; LCS Spikes RPD = 0; LCS Spikes %EA = 96.

⁶CCV2 %IA = 92; CCV 3 %IA = 93; Matris Spikes RPD = 1; Matrix Spikes %EA = 91; LCS Spikes RPD = 0; LCS Spikes %EA = 94.

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

TraceAnalysis, Inc. 6701 Aberdeen Ave., Suite 9 Lubbock, TX 79424-1515 Report Date: June 11, 2002Order Number: A02052015 Page Number: 3 of 4 00-0113 Lea County, NM Cooper-Jal Sample 197423 continued ... Param Flag Result Units Dissolved Magnesium 814 mg/L **Dissolved Potassium** 60.9 mg/L **Dissolved Sodium** 4310 / mg/L **Total Dissolved Solids** 22600 ~ mg/L

Sample: 197424 - MW-5

Param	Flag	Result	Units
Hydroxide Alkalinity		<1.0.	mg/L as CaCo3
Carbonate Alkalinity		<1.0~	mg/L as CaCo3
Bicarbonate Alkalinity		1561	mg/L as CaCo3
Total Alkalinity		156~	mg/L as CaCo3
Chloride		4040 -	mg/L
Fluoride		1.53 /	mg/L
Nitrate-N		4.56~	mg/L
Sulfate	7	586 1	mg/L
Dissolved Calcium		757	mg/L
Dissolved Magnesium		319~	m mg/L
Dissolved Potassium		60.9-	mg/L
Dissolved Sodium		1260	mg/L
Total Dissolved Solids		8340	mg/L

Sample: 197425 - MW-6

Param	Flag	Result	Units
Hydroxide Alkalinity		<1.0	mg/L as CaCo3
Carbonate Alkalinity		<1.0-	mg/L as CaCo3
Bicarbonate Alkalinity		162	mg/L as CaCo3
Total Alkalinity		162	mg/L as CaCo3
Chloride		37.8	$\mathrm{mg/L}$
Fluoride		1.62	mg/L
Nitrate-N		2.14	mg/L
Sulfate		99.3	mg/L
Dissolved Calcium		63.1	mg/L
Dissolved Magnesium		19.6	mg/L
Dissolved Potassium		5.12	$\mathrm{mg/L}$
Dissolved Sodium		48.6 /	mg/L
Total Dissolved Solids		427/	mg/L

Sample: 197426 - MW-10

Param	Flag	\mathbf{Result}	Units
Hydroxide Alkalinity		<1.0	mg/L as CaCo3
			Continued on next page

⁷Sulfate analysis for sample 197424 was performed on 05/20/02. ICV %IA = 93, CCV %IA = 92, Matrix Spikes RPD = 1, Matrix Spikes %EA = 91, LCS Spikes RPD = 1, LCS Spikes %EA = 94.

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

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Report Date: June	1, 2002Order Number:	A02052015
00-0113	Cooper	-Jal

Page Number: 4 of 4 Lea County, NM

Sample 197426 continued ...

Param	Flag	Result	Units
Carbonate Alkalinity		<1.0 -	mg/L as CaCo3
Bicarbonate Alkalinity		152 ~	mg/L as CaCo3
Total Alkalinity		152 1	mg/L as CaCo3
Chloride		204 -	mg/L
Fluoride		1.93 ~	mg/L
Nitrate-N		2.19	m mg/L
Sulfate		99.1	mg/L
Dissolved Calcium		109 [mg/L
Dissolved Magnesium		31.7	mg/L
Dissolved Potassium		7.6 🦯	mg/L
Dissolved Sodium		62.4	mg/L
Total Dissolved Solids		713	mg/L

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

Cation-Anion Balance Sheet

EC µMHOs/cm TDS Ppm 784 6040 433 433 22600 8340 8340 427 713 Bromide mqq Fluoride mdd 5.83 1.56 1.53 1.62 1.72 2.01 Nitrate ррт 3.28 2.35 4.56 2.14 3.18 6.09 Chloride 11300 4040 37.8 mdd 30.6 237 3200 Sulfate ppm 86.9 483 1380 586 99.3 102 Alkalinity ppm 208 150 156 155 152 Potassium mdd 5.04 60.9 60.9 11.9 35.6 5.12 Sodium ppm 184 1160 4310 1260 48.6 62.4 30 Magnesium ppm 20.1 239 239 239 814 814 319 319 31.7 6/10/02 Calcium mdd 55.6 1610 45.7 587 757 63.1 DATE: Sample # 197422 197423 197424 197425 197426 197420 197421

Percentage	Error	7.494159918	3.444461941	3.014004634	4.736743211	7.439284874	5.798426973	1.445599676
Anions	in meq/L	13.20	103.85	6.40	352.69	129.69	6.61	11.12
Cations	in meq/L	12.24	100.33	6:59	336.37	120.39	7.01	10.96
Bromide	in meq/L	0	0	0	0	0	0	0
Fluoride	in meq/L	0.3068912	0.0905408	0.0821184	0.1058064	0.0805392	0.0852768	0.1015952
Nitrate	in meq/L	0.2341592	0.2270202	0.1677665	0.4347651	0.3255384	0.1527746	0.1563441
Chloride	in meq/L	69.9	90.27	0.86	318.77	113.97	1.07	5.75
Sulfate	in meq/L	1.81	10.06	2.12	28.73	12.20	2.07	2.06
Alkalinity	in meq/L	4.16	3.20	3.16	4.64	3.12	3.24	3.04
Potassium	in meq/L	0.30	0.91	0.13	1.56	1.56	0.13	0.19
Sodium	in meq/L	8.00	50.46	2.18	187.49	54.81	2.11	2.71
Magnesium	in meq/L	1.65	19.67	1.51	66.98	26.25	1.61	2.61
Calcium	in meq/L	2.28	29.29	2.77	80.34	37.77	3.15	5.44
Sample #		197420	197421	197422	197423	197424	197425	197426

		0	0	0	0	0	0	0
		đ	ę	ę	ę	đ	ę	đ
		0	0	0	0	0	0	0
		range	range	range	range	range	range	range
					20	9		
	EC/Anion	1319.60784	10384.5621	639.67509	35268.5171	12969.4997	661.18154	1111.60413
	EC/Cation	1224.2861	10032.9258	659.24992	33636.5882	12039.2632	700.66436	1095.6501
-		197420	197421	197422	197423	197424	197425	197426

1

:

	needs to be 0.55-0.77						
TDS/Anion	0.59	0.58	0.68	0.64	0.64	0.65	0.64
TDS/Cat	0.64	0.60	0.66	0.67	0.69	0.61	0.65
TDS/EC	10//JQ#	i0//\IC#	i0//\IQ#	10//IC#	;0//\IC#	#DIV/0	10//JC#

1.93

2.19

20

99.1

7.6

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Lubbock, Texas 79424 800 • 378 • 1296 El Paso, Texas 79932 888•588•3443 E-Mail: lab@traceanalysis.com

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FAX 915•585•4944

Analytical and Quality Control Report

Mark Larson Larson & Associates, Inc. P.O. Box 50685 Midland, Tx. 79710

Report Date:

June 11, 2002

Order ID Number: A02052015

Project Number: 00-0113 **Project Name:** Cooper-Jal Project Location: Lea County, NM

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

			Date	Time	Date
Sample	Description	Matrix	Taken	Taken	Received
197420	MW-1	Water	5/17/02	14:25	5/18/02
197421	MW-2	Water	5/17/02	13:55	5/18/02
197422	MW-3	Water	5/17/02	15:00	5/18/02
197423	MW-4	Water	5/17/02	13:10	5/18/02
197424	MW-5	Water	5/17/02	12:16	5/18/02
197425	MW-6	Water	5/17/02	11:07	5/18/02
197426	MW-10	Water	5/17/02	10:20	5/18/02

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.

The test results contained within this report meet all requirements of LAC 33:I unless otherwise noted.

This report consists of a total of 15 pages and shall not be reproduced except in its entirety including the chain of custody (COC), without written approval of TraceAnalysis, Inc.

Director

Report Date: June 11, 2002	Order Number: A02052015	Page Number: 2 of 15
00-0113	Cooper-Jal	Lea County, NM

Analytical Report

Sample: 197420 - MW-1

Analysis: Analyst:	Alkalinity JSW	Analytical Method: Preparation Method:	E 310.1 N/A	QC Batch: Prep Batch:	QC20645 PB19691	Date Analyzed: Date Prepared:	$\frac{5}{30}$
Param		Flag	Result	Un	its	Dilution	RDL
Hydroxide	Alkalinity		<1.0	mg/L as	CaCo3	1	1
Carbonate	Alkalinity		<1.0	mg/L as	s CaCo3	1	1
Bicarbonat	e Alkalinity		208	mg/L as	s CaCo3	1	1
Total Alka	linity		208	mg/L as	CaCo3	1	1

Sample: 197420 - MW-1

Analysis:	Ion Chromatography (IC) Analytical Method:		E 300.0 QC Batch:	QC20673 Date Analyzed: 5/20/02	
Analyst:	MS		Preparation Method:	N/A Prep Batch	: PB19717 Date Prepared: 5/20/02
Param	Flag	Result	Units	Dilution	RDL
Chloride		237	mg/L	5	1
Fluoride		5.83	mg/L	5	0.20
Nitrate-N		3.28	mg/L	5	0.20
Sulfate		86.9	mg/L	5	1

Sample: 197420 - MW-1

Analysis: Salts	Analytical Method:	E 200.7	QC Batch:	QC20802	Date Analyzed:	6/3/02
Analyst: BC	Preparation Method:	S 3005A	Prep Batch:	PB19808	Date Prepared:	5/22/02
Param	Flag	Result		Units	Dilution	RDL
Dissolved Calcium		45.7]	mg/L	1	0.50
Dissolved Magnesium		20.1	1	mg/L	1	0.50
Dissolved Potassium		11.9	1	mg/L	1	0.50
Dissolved Sodium		184]	mg/L	1	0.50

Sample:	19742	20 - MW-1					
Analysis:	TDS	Analytical Method:	E 160.1	QC Batch:	QC20600	Date Analyzed:	5/24/02
Analyst:	JSW	Preparation Method:	N/A	Prep Batch:	PB19657	Date Prepared:	5/23/02
Param		Flag	Result	t	Units	Dilution	RDL
Total Disso	ved Solid	s	784	1	mg/L	1	10

Sample: 197421 - MW-2

Analysis: Analyst:	Alkalinity JSW	Analytical Method: Preparation Method:	E 310.1 N/A	QC Batch: Prep Batch:	QC20645 PB19691	Date Analyzed: Date Prepared:	5/30/02 5/30/02
Param		Flag	Result	Un	its	Dilution	RDL
Hydroxide	Alkalinity		<1.0	mg/L as	CaCo3	1	1
						Con	ntinued

Report Date: June 11, 2002 00-0113	Order	Number: A02052015 Cooper-Jal	Page Number: 3 of 15 Lea County, NM		
Continued Sample: 197421	Analysis: Alkalinity				
Param	Flag Result	Units	Dilution	RDL	
Carbonate Alkalinity	<1.0	mg/L as CaCo3	1	1	
Bicarbonate Alkalinity	160	mg/L as CaCo3	1	1	
Total Alkalinity	160	mg/L as CaCo3	1	1	
Sample: 197421 - MW Analysis: Ion Chromatograph Analyst: JSW	-2 y (IC) Analytical Meth Preparation Met	od: E 300.0 QC Batch: hod: N/A Prep Batch:	QC20602 Date Analyz PB19659 Date Prepar	ed: 5/20/02 ed: 5/20/02	
	-				

Param	Flag	Result	Units	Dilution	RDL
Chloride	1	3200	mg/L	100	1
Fluoride	2	1.72	mg/L	5	0.20
Nitrate-N	3	3.18	mg/L	5	0.20
Sulfate		483	mg/L	10	1

Sample: 197421 - MW-2

Analysis:	Salts	Analytical Method:	E 200.7	QC Batch:	QC20802	Date Analyzed:	6/3/02
Analyst:	BC	Preparation Method:	S 3005A	Prep Batch:	PB19808	Date Prepared:	5/22/02
Damama		Flor	Decult		Unita	Dilution	זרוס
Faram	· · · · · · · · · · · · · · · · · · ·	r lag	nesuit		Units		
Dissolved (Calcium		587	:	mg/L	1	0.50
Dissolved 1	Magnesium		239	:	mg/L	1	0.50
Dissolved 1	Potassium		35.6	:	mg/L	1	0.50
Dissolved S	Sodium		1160	i :	mg/L	1	0.50

Sample: 197421 - MW-2

Analysis: Analyst:	TDS JSW	Analytical Method: Preparation Method:	E 160.1 N/A	QC Batch: Prep Batch:	QC20600 PB19657	Date Analyzed: Date Prepared:	5/24/02 5/23/02
Param		Flag	Result	;	Units	Dilution	RDL
Total Disso	lved Solids		6040)	mg/L	1	10

Sample: 197422 - MW-3

Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC20645	Date Analyzed:	5/30/02
Analyst:	JSW	Preparation Method:	N/A	Prep Batch:	PB19691	Date Prepared:	5/30/02
Param		Flag	Result	Un	its	Dilution	RDL
Hydroxide .	Alkalinity		<1.0	mg/L as	CaCo3	1	1
Carbonate .	Alkalinity		<1.0	mg/L as	CaCo3	1	1
Bicarbonat	e Alkalinity		158	mg/L as	CaCo3	1	1
Total Alkal	inity		158	mg/L as	CaCo3	1	1

¹Chloride analysis for sample 197421 was performed on 05/20/02. ICV %IA = 90, CCV %IA = 90, Matrix Spikes RPD = 0, Matrix Spikes

³Nitrate analysis for sample 197421 was performed on 05/20/02. ICV %IA = 90, CCV %IA = 95, Matrix Spikes RPD = 0, Matrix Spikes
 ³Nitrate analysis for sample 197421 was performed on 05/20/02. ICV %IA = 96, CCV %IA = 96, Matrix Spikes RPD = 0, Matrix Spikes
 ³Nitrate analysis for sample 197421 was performed on 05/20/02. ICV %IA = 96, CCV %IA = 95, Matrix Spikes RPD = 0, Matrix Spikes

%EA = 98, LCS Spikes RPD = 1, LCS Spikes %EA = 96.

Report Date: June 11, 2002	Order Number: A02052015	Page Number: 4 of 15
00-0113	Cooper-Jal	Lea County, NM

Sample: 197422 - MW-3

Analysis:	Ion Chromatography (I	C) Analytical Method:	E 300.0) QC Batch:	QC20673 Date Analyzed: 5/20/02
Analyst:	MS	Preparation Method:	N/A	Prep Batch:	PB19717 Date Prepared: 5/20/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		30.6	mg/L	5	1
Fluoride		1.56	mg/L	5	0.20
Nitrate-N		2.35	mg/L	5	0.20
Sulfate		102	mg/L	5	1

Sample: 197422 - MW-3

Analysis: Analyst:	Salts BC	Analytical Method: Preparation Method:	E 200.7 S 3005A	QC Batch: Prep Batch:	QC20802 PB19808	Date Analyzed: Date Prepared:	6/3/02 5/22/02
Param		Flag	Result		Units	Dilution	RDL
Dissolved	Calcium	· · · · · · · · · · · · · · · · · · ·	55.6		mg/L	1	0.50
Dissolved	Magnesium		18.4		mg/L	1	0.50
Dissolved	Potassium		5.04		mg/L	1	0.50
Dissolved	Sodium		50.0		mg/L	1	0.50

Sample: 197422 - MW-3

Analysis: Analyst:	TDS JSW	Analytical Method: Preparation Method:	E 160.1 N/A	QC Batch: Prep Batch:	QC20600 PB19657	Date Analyzed: Date Prepared:	5/24/02 5/23/02
Param		Flag	Result	ţ	Units	Dilution	RDL
Total Disso	olved Solids	3	433	3	mg/L	1	10

Sample: 197423 - MW-4

Analysis: Analyst:	Alkalinity JSW	Analytical Method: Preparation Method:	E 310.1 N/A	QC Batch: Prep Batch:	QC20645 PB19691	Date Analyzed: Date Prepared:	5/30/02 5/30/02
Param		Flag	Result	Un	its	Dilution	RDL
Hydroxide	Alkalinity		<1.0	mg/L as	CaCo3	1	1
Carbonate	Alkalinity		<1.0	mg/L as	CaCo3	1	1
Bicarbonat	e Alkalinity		232	mg/L as	CaCo3	1	1
Total Alkal	inity		232	mg/L as	CaCo3	1	1

Sample: 197423 - MW-4

Analysis:	Ion Chromatog	raphy (IC) A	Analytical Method:	E 300.	0 QC Batch:	QC20675 Date Analyzed: 5/20/02
Analyst:	MS]	Preparation Method:	N/A	Prep Batch:	PB19718 Date Prepared: 5/20/02
_						
Param	Flag	Result	Units	Dilut	ion	RDL
Chloride		11300	mg/L	500)	1
Fluoride	4	2.01	mg/L	5		0.20
Nitrate-N	5	6.09	mg/L	5		0.20

Continued ...

 4 CCV2 %IA = 96; CCV 3 %IA = 96; Matris Spikes RPD = 2; Matrix Spikes %EA = 92; LCS Spikes RPD = 0; LCS Spikes %EA = 96. 5 CCV2 %IA = 95; CCV 3 %IA = 95; Matris Spikes RPD = 1; Matrix Spikes %EA = 92; LCS Spikes RPD = 0; LCS Spikes %EA = 96.

Report Date: June 11, 2002 00-0113			Order Num Coc	ber: A02052 oper-Jal	Page Number: 5 of 15 Lea County, NM		
Continue	d Sample	: 197423 Analysis:	Ion Chromatogra	aphy (IC)			
Param	Flag	g Result	Units	Dilution			RDL
Sulfate	6	1380	mg/L	50			1
S	107499	5 TATA					
Analugio	197420 Solta	Analytical Mathad	E 200 7	OC Batah	000000	Data Analyzadi	6/2/00
Analysis: Analyst:	BC	Preparation Method:	E 200.7 S 3005A	QC Batch: Prep Batch:	QC20802 PB19808	Date Prepared:	6/3/02 5/22/02
Param		Flag	Result		Units	Dilution	RDL
Dissolved Ca	alcium		1610		mg/L	1	0.50
Dissolved M	agnesium		814		mg/L	1	0.50
Dissolved Po	otassium		60.9		mg/L	1	0.50
Dissolved Sc	odium		4310		mg/L	1	0.50
Sample: Analysis: Analyst:	197423 TDS JSW	3 - MW-4 Analytical Method: Preparation Method	E 160.1 (N/A)	QC Batch: Prep Batch:	QC20600 PB19657	Date Analyzed: Date Prepared:	5/24/02 5/23/02
Param		Flag	Result		Units	Dilution	RDL
					<u> </u>		
Sample:	197424	I - MW-5					
Analysis:	Alkalinity	Analytical Metho	od: E 310.1	QC Batch	: QC20645	5 Date Analyzed:	5/30/02
Analyst:	JSW	Preparation Met	hod: N/A	Prep Bate	h: PB19691	Date Prepared:	5/30/02
Param		Flag	Result		Units	Dilution	RDL
Hydroxide A	lkalinity		<1.0	mg/L	as CaCo3	1	1
Carbonate A	Alkalinity		<1.0	mg/L	as CaCo3	1	1
Bicarbonate	Alkalinity		156	mg/L	as CaCo3	1	1
Total Alkali	nity		156	mg/L	as CaCo3	11	1
Sample: Analysis: Analyst:	197424 Ion Chron MS	l - MW-5 natography (IC) Anal Prep	ytical Method: aration Method:	E 300.0 Q N/A P	C Batch: (rep Batch:)	QC20675 Date Analyze PB19718 Date Prepare	ed: 5/20/02 ed: 5/20/02
Param	Fla	g Result	Units	Dilution			RDL
Chloride		4040	mg/L	100		·····	1
Fluoride		1.53	mg/L	5			0.20
Nitrate-N		4.56	mg/L	5			0.20
Sulfate	7	586	mg/L	50			1

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 6 CCV2 %IA = 92; CCV 3 %IA = 93; Matris Spikes RPD = 1; Matrix Spikes %EA = 91; LCS Spikes RPD = 0; LCS Spikes %EA = 94. ⁷Sulfate analysis for sample 197424 was performed on 05/20/02. ICV %IA = 93, CCV %IA = 92, Matrix Spikes RPD = 1, Matrix Spikes %EA = 94. %EA = 91, LCS Spikes RPD = 1, LCS Spikes %EA = 94.

Report Date: June 11, 2002 00-0113			Order Nur Co	nber: A020520 poper-Jal	Page Number: 6 of 15 Lea County, NM		
Sample: Analysis: Analyst:	19742 Salts BC	4 - MW-5 Analytical Method: Preparation Method:	E 200.7 S 3005A	QC Batch: Prep Batch:	QC20802 PB19919	Date Analyzed: Date Prepared:	6/3/02 6/10/02
Param		Flag	Result		Units	Dilution	RDL
Dissolved C	alcium		757]	mg/L	1	0.50
Dissolved M	lagnesium		319	1	mg/L	1	0.50
Dissolved P	otassium		60.9	1	mg/L	1	0.50
Dissolved S	odium		1260	1	mg/L	1	0.50

Sample: 197424 - MW-5

Analysis: Analyst:	TDS JSW	Analytical Method: Preparation Method:	E 160.1 N/A	QC Batch: Prep Batch:	QC20600 PB19657	Date Analyzed: Date Prepared:	5/24/02 5/23/02
Param		Flag	Result	;	Units	Dilution	RDL
Total Disso	lved Solids		8340)	mg/L	10	10

Sample: 197425 - MW-6

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Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC20645	Date Analyzed:	5/30/02
Analyst:	JSW	Preparation Method:	N/A	Prep Batch:	PB19691	Date Prepared:	5/30/02
Param		Flag	Result	Un	its	Dilution	RDL
Hydroxide	Alkalinity		<1.0	mg/L as	CaCo3	1	1
Carbonate	Alkalinity		<1.0	mg/L as	CaCo3	1	1
Bicarbonat	e Alkalinity		162	mg/L as	CaCo3	1	1
Total Alkal	linity		162	mg/L as	CaCo3	1	1

Sample: 197425 - MW-6

Analysis:	Ion Chromatog	omatography (IC) Analytical Method:			0 QC Batch:	QC20673 Date Analyzed: 5/20/02	
Analyst:	MS	Pr	eparation Method:	N/A	Prep Batch:	PB19717 Date Prepared: 5/20/02	
Param	Flag	Result	Units	Dilut	ion	RDL	
Chloride		37.8	mg/L	5		1	
Fluoride		1.62	mg/L	5		0.20	
Nitrate-N		2.14	mg/L	5		0.20	
Sulfate		99.3	mg/L	5		1	

Sample: 197425 - MW-6

Analysis:	Salts	Analytical Method:	E 200.7	QC Batch:	QC20802	Date Analyzed:	6/3/02
Analyst:	BC	Preparation Method:	S 3005A	Prep Batch:	PB19808	Date Prepared:	5/22/02
Param		Flag	Result		Units	Dilution	RDL
Dissolved	Calcium		63.1		mg/L	1	0.50
Dissolved	Magnesium		19.6		mg/L	1	0.50
Dissolved	Potassium		5.12		mg/L	1	0.50
Dissolved	Sodium		48.6		mg/L	1	0.50

Report Date: June 11, 2002 00-0113			Order Nu C	mber: A02052 ooper-Jal	Page Number: 7 of 15 Lea County, NM		
Sample: Analysis: Analyst:	1974: TDS RS	25 - MW-6 Analytical Method: Preparation Method:	E 160.1 N/A	QC Batch: Prep Batch:	QC20510 PB19580	Date Analyzed: Date Prepared:	5/23/02 5/21/02
Param		Flag	Resul	t	Units	Dilution	RDL
Total Dissolved Solids		427		mg/L	1	10	

Sample: 197426 - MW-10

Analysis:	Alkalinity	Analytical Method:	E 310.1	QC Batch:	QC20646	Date Analyzed:	5/30/02
Analyst:	JSW	Preparation Method:	N/A	Prep Batch:	PB19692	Date Prepared:	5/30/02
Param		Flag	Result	Un	its	Dilution	RDL
Hydroxide	Alkalinity		<1.0	mg/L as	CaCo3	1	1
Carbonate	Alkalinity		<1.0	mg/L as	CaCo3	1	1
Bicarbonat	e Alkalinity		152	mg/L as	CaCo3	1	1
Total Alkal	linity		152	mg/L as	CaCo3	1	1

Sample: 197426 - MW-10

Analysis:	Ion Chromatog	raphy (IC) Anal	ytical Method:	E 300.	0 QC Batch:	QC20673 Date Analyzed: 5/20/02
Analyst:	MS	Prep	aration Method:	N/A	Prep Batch:	PB19717 Date Prepared: 5/20/02
Param	Flag	Result	Units	Dilut	ion	RDL
Chloride	· · · · · · · · · · · · · · · · · · ·	204	mg/L	5		1

Sulfate	99.1	mg/L	5	1
Nitrate-N	2.19	mg/L	5	0.20
Fluoride	1.93	mg/L	5	0.20
Chloride	204	mg/L	5	1

Sample: 197426 - MW-10

Analysis:	Salts	Analytical Method:	E 200.7	QC Batch:	QC20802	Date Analyzed:	6/3/02
Analyst:	BC	Preparation Method:	S 3005A	Prep Batch:	PB19808	Date Prepared:	5/22/02
\mathbf{Param}		Flag	Result	ו	Units	Dilution	RDL
Dissolved (Calcium		109	1	mg/L	1	0.50
Dissolved 1	Magnesium		31.7	1	mg/L	1	0.50
Dissolved I	Potassium		7.6	1	mg/L	1	0.50
Dissolved S	Sodium		62.4	1	mg/L	1	0.50

Sample: 197426 - MW-10

Analysis: Analyst:	TDS RS	Analytical Method: Preparation Method:	E 160.1 N/A	QC Batch: Prep Batch:	QC20510 PB19580	Date Analyzed: Date Prepared:	5/23/02 5/21/02
Param		Flag	Resul	t	Units	Dilution	RDL
Total Disso	lved Solids		713	3	mg/L	1	10

00-0113		Order M	Cooper-Jal	JIƏ	Lea County, NI
	Q	uality C Meth	ontrol Rep od Blank	oort	
Method Blank	QCBatch:	QC20510			
Param	Flag		Results	Units	Reportin Limit
Total Dissolved Solids			<10	mg/L	10
Method Blank	QCBatch:	QC20600			
_					Reportin
Param	Flag		Results	Units	Limit
Total Dissolved Solids			<u> </u>	111g/12	10
Method Blank	QCBatch:	QC20602			
Param	Flag	R	esults	Units	Reportir Limit
Chloride	8		<1.0	mg/L	1
Fluoride			<0.2	mg/L	0.20
Nitrate-N			< 0.2	mg/L	0.20
Sulfate			<1.0	mg/L	1
Method Blank	QCBatch:	QC20645			
					Reportir
Param	Flag]	Results	Units	Limit
nydroxide 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:	QC20646			
Param	T31		Deculto	TT :	Reportin
Hydroxide Alkalinity	r lag		<10	Units mg/L as CaCo3	
Carbonate Alkalinity			<1.0	$m_{\rm g}/L$ as CaCo3	1
Bicarbonate Alkalinity			<4.0	mg/L as CaCo3	1
Total Alkalinity			<4.0	mg/L as CaCo3	1

Method Blank

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QCBatch: QC20673

Report Date: June 11, 2002 00-0113		Order Number: A02052 Cooper-Jal	Page Number: 9 of 15 Lea County, NM	
Param	Flag	Results	Units	Reporting Limit
Chloride		<1.0	mg/L	1
Fluoride		< 0.2	mg/L	0.20
Nitrate-N		<0.2	mg/L	0.20
Sulfate		<1.0	mg/L	1

Method Blank QCBatch: QC20675

Param	Flag	Results	Units	Reporting Limit
Chloride		<1.0	mg/L	1
Fluoride		< 0.2	mg/L	0.20
Nitrate-N		< 0.2	mg/L	0.20
Sulfate		<1.0	mg/L	1

Method Blank

QCBatch: QC20802

•				Reporting
Param	Flag	Results	Units	Limit
Dissolved Calcium		< 0.5	mg/L	0.50
Dissolved Magnesium		< 0.5	mg/L	0.50
Dissolved Potassium		<0.6	mg/L	0.50
Dissolved Sodium		< 0.5	m mg/L	0.50

Quality Control Report Duplicate Samples

Duplicate	QCBatch:	QC20510					
Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids		1730	1720	mg/L	1	0	9.7
Duplicate	QCBatch:	QC20600					
		Duplicate	Sample				RPD
Param	Flag	Result	Result	Units	Dilution	RPD	Limit
Total Dissolved Solids		6115	6040	mg/L	1	1	9.7

Duplicate QCBatch:

1: QC20645

Report Date: June 11, 20 00-0113	(Order Numbe Coop	er: A02052015 er-Jal		Page Number: 10 of 15 Lea County, NM		
Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Hydroxide Alkalinity	·····	<1.0	<1.0	mg/L as CaCo3	1	0	9.2
Carbonate Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	9.2
Bicarbonate Alkalinity		166	162	mg/L as CaCo3	1	2	9.2
Total Alkalinity		166	162	mg/L as CaCo3	1	2	9.2

Param	Flag	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Hydroxide Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	9.2
Carbonate Alkalinity		<1.0	<1.0	mg/L as CaCo3	1	0	9.2
Bicarbonate Alkalinity		106	104	mg/L as CaCo3	1	1	9.2
Total Alkalinity		106	104	mg/L as CaCo3	1	1	9.2

Quality Control Report Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes

Duplicate

QCBatch: QC20602

					Spike					
	LCS	LCSD			Amount	Matrix			% Rec	RPD
Param	Result	Result	Units	Dil.	Added	Result	% Rec	RPD	Limit	Limit
Chloride	11.42	11.39	mg/L	1	12.50	<1.0	91	0	90 - 110	20
Fluoride	2.40	2.39	mg/L	1	2.50	< 0.2	96	0	90 - 110	20
Nitrate-N	2.39	2.38	mg/L	1	2.50	< 0.2	95	0	90 - 110	20
Sulfate	11.69	11.67	mg/L	1	12.50	<1.0	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:

QCBatch:

QC20646

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	11.34	11.34	mg/L	1	12.50	<1.0	90	0	90 - 110	20
Fluoride	2.39	2.43	mg/L	1	2.50	< 0.2	95	1	90 - 110	20
Nitrate-N	2.40	2.39	mg/L	1	2.50	< 0.2	96	0	90 - 110	20
Sulfate	11.59	11.69	mg/L	1	12.50	<1.0	92	0	90 - 110	20

QC20673

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

Laboratory Control Spikes QCBatch: QC20675

	CS LCSD							<u>~</u> _	and the second
-				Amount	Matrix			% Rec	RPD
Param Re	sult Result	Units	Dil.	Added	Result	% Rec	RPD	Limit	Limit
Chloride 11	.26 11.15	mg/L	1	12.50	<1.0	90	0	90 - 110	20
Fluoride 2.	.41 2.42	mg/L	1	2.50	< 0.2	96	00	90 - 110	20

Continued ...

Report Date: June 11, 2002 00-0113				Ord	er Number: A Cooper-J	A02052015 Jal	Page Number: 11 of 15 Lea County, NM			
Continue	ł LCS	LCSD			Spike Amount	Matrix			% Rec	RPD
Param	Result	Result	Units	Dil.	Added	Result	% Rec	RPD	Limit	Limit
Nitrate-N	2.39	2.37	mg/L	1	2.50	< 0.2	95	0	90 - 110	20
Sulfate	11.74	11.68	mg/L	1	12.50	<1.0	93	0	90 - 110	20

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

QC20602

QCBatch:

Quality Control Report Matrix Spikes and Duplicate Spikes

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	1400	1410	mg/L	1	625	841	89	1	48 - 127	20
Fluoride	122	125	mg/L	1	125	3.16	95	2	82 - 101	20
Nitrate-N	125	126	mg/L	1	125	2.95	97	0	87 - 100	20
Sulfate	679	683	mg/L	1	625	100	92	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: QC20673

Matrix Spikes

					Spike					
	MS	MSD			Amount	Matrix			% Rec	RPD
Param	Result	Result	Units	Dil.	Added	Result	$\% { m Rec}$	RPD	Limit	Limit
Chloride	319.86	319.28	mg/L	1	125	204	92	0	48 - 127	20
Fluoride	25.73	24.07	mg/L	1	25	1.93	95	7	82 - 101	20
Nitrate-N	26.22	26.41	mg/L	1	25	2.19	96	0	87 - 100	20
Sulfate	224.84	224.41	mg/L	1	125	99.1	100	0	59 - 121	20

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

QC20675

Matrix Spikes QCBatch:

					Spike					
	MS	MSD			Amount	Matrix			$\% { m Rec}$	RPD
Param	Result	Result	Units	Dil.	Added	Result	% Rec	RPD	Limit	Limit
Chloride	22213	22210	mg/L	1	12500	11300	87	0	48 - 127	20
Fluoride	2463	2454	mg/L	1	2500	2.01	9 8	0	82 - 101	20
Nitrate-N	2454	2465	mg/L	1	2500	6.09	97	0	87 - 100	20
Sulfate	13462	13578	mg/L	1	12500	1380	96	0	59 - 121	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

00-0113	ine 11, 2002	(Order Nur Co	nber: A020520 ooper-Jal)15	Page Nun Lea	ber: 12 of 1 County, NN
CCV (1)	QCBatch:	QC20510					
			CCVs	CCVs	\mathbf{CCVs}	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyze
Total Dissolved	Solids	mg/L	1000	1008	100	90 - 110	5/23/02
ICV (1)	QCBatch:	QC20510					
			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recoverv	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyze
Total Dissolved	Solids	mg/L	1000	967	96	90 - 110	5/23/02
CCV (1)	QCBatch:	QC20600					
			CCVs	\mathbf{CCVs}	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyze
		/+	1000	1006	100	90 - 110	5/24/0
Total Dissolved ICV (1)	Solids QCBatch:	mg/L	1000	1000			0/22/0
ICV (1)	Solids QCBatch:	mg/L	CCVs	CCVs	CCVs	Percent	
ICV (1)	Solids QCBatch:	QC20600	CCVs True	CCVs Found	CCVs Percent	Percent Recovery	Date
ICV (1) Param Total Dissolved	Solids QCBatch: Flag Solids	QC20600 Units mg/L	CCVs True Conc. 1000	CCVs Found Conc. 994	CCVs Percent Recovery 99	Percent Recovery Limits 90 - 110	Date Analyze 5/24/0
ICV (1) Param Total Dissolved	Solids QCBatch: Flag Solids	QC20600 Units mg/L	CCVs True Conc. 1000	CCVs Found Conc. 994	CCVs Percent Recovery 99	Percent Recovery Limits 90 - 110	Date Analyze 5/24/0
ICV (1) Param Total Dissolved CCV (1)	Solids QCBatch: Flag Solids QCBatch:	QC20600 Units mg/L QC20602	CCVs True Conc. 1000	CCVs Found Conc. 994	CCVs Percent Recovery 99	Percent Recovery Limits 90 - 110	Date Analyze 5/24/0
ICV (1) Param Total Dissolved CCV (1)	Solids QCBatch: Flag Solids QCBatch:	QC20600 Units mg/L QC20602 CC	CCVs True Conc. 1000	CCVs Found Conc. 994 CCVs	CCVs Percent Recovery 99	Percent Recovery Limits 90 - 110 Percent	Date Analyze 5/24/0
ICV (1) Param Total Dissolved CCV (1)	Solids QCBatch: Flag Solids QCBatch:	QC20600 Units mg/L QC20602 CC Tru	CCVs True Conc. 1000	CCVs Found Conc. 994 CCVs Found	CCVs Percent Recovery 99 CCVs Percent	Percent Recovery Limits 90 - 110 Percent Recovery	Date Analyze 5/24/0 Date
Total Dissolved ICV (1) Param Total Dissolved CCV (1) Param	Solids QCBatch: Flag Solids QCBatch: Flag Un	QC20600 Units mg/L QC20602 CC Tru its Con	CCVs True Conc. 1000	CCVs Found Conc. 994 CCVs Found Conc.	CCVs Percent Recovery 99 CCVs Percent Recovery	Percent Recovery Limits 90 - 110 Percent Recovery Limits	Date Analyze 5/24/0 Date Analyze
Total Dissolved ICV (1) Param Total Dissolved CCV (1) Param Chloride	Solids QCBatch: Flag Solids QCBatch: Flag Un mg	QC20600 Units mg/L QC20602 CC Tru its Con /L 12.5	CCVs True Conc. 1000 Vs Ie Ic.	CCVs Found Conc. 994 CCVs Found Conc. 11.33	CCVs Percent Recovery 99 CCVs Percent Recovery 90	Percent Recovery Limits 90 - 110 Percent Recovery Limits 90 - 110	Date Analyze 5/24/0 Date Analyze 5/20/0
Total Dissolved ICV (1) Param Total Dissolved CCV (1) Param Chloride Fluoride	Solids QCBatch: Flag Solids QCBatch: Flag Un mg	QC20600 Units mg/L QC20602 CC Tru its Con /L 12.8 /L 2.5	CCVs True Conc. 1000 Vs 1e 1c. 50	CCVs Found Conc. 994 CCVs Found Conc. 11.33 2.41	CCVs Percent Recovery 99 CCVs Percent Recovery 90 96	Percent Recovery Limits 90 - 110 Percent Recovery Limits 90 - 110 90 - 110	Date Analyze 5/24/0 Date Analyze 5/20/0 5/20/0
ICV (1) Param Total Dissolved CCV (1) Param Chloride Fluoride Nitrate-N Sulfate	Solids QCBatch: Flag Solids QCBatch: Flag Un mg mg	QC20600 Units mg/L QC20602 CC Tru its Con /L 12.5 /L 2.5 /L 2.5	CCVs True Conc. 1000	CCVs Found Conc. 994 CCVs Found Conc. 11.33 2.41 2.38 11.63	CCVs Percent Recovery 99 99 CCVs Percent Recovery 90 96 95 93	Percent Recovery Limits 90 - 110 Percent Recovery Limits 90 - 110 90 - 110 90 - 110 90 - 110	Date Analyze 5/24/0 Date Analyze 5/20/0 5/20/0 5/20/0 5/20/0 5/20/0
ICV (1) Param Total Dissolved CCV (1) Param Chloride Fluoride Nitrate-N Sulfate	Solids QCBatch: Flag Solids QCBatch: Flag Un mg mg mg	QC20600 Units mg/L QC20602 CC Tru its Con /L 12.5 /L 2.5 /L 12.5 /L 12.5	CCVs True Conc. 1000	CCVs Found Conc. 994 CCVs Found Conc. 11.33 2.41 2.38 11.63	CCVs Percent Recovery 99 99 CCVs Percent Recovery 90 96 95 93	Percent Recovery Limits 90 - 110 Percent Recovery Limits 90 - 110 90 - 110 90 - 110 90 - 110	Date Analyze 5/24/0 Date Analyze 5/20/0 5/20/0 5/20/0 5/20/0
ICV (1) Param Total Dissolved CCV (1) Param Chloride Fluoride Nitrate-N Sulfate ICV (1)	Solids QCBatch: Flag Solids QCBatch: Flag Un mg mg mg mg	QC20600 Units mg/L QC20602 CC Tru its Con /L 12.8 /L 2.5 /L 2.5 /L 12.8 /L 12.8	CCVs True Conc. 1000 Vs 1e nc. 50 00 50	CCVs Found Conc. 994 CCVs Found Conc. 11.33 2.41 2.38 11.63	CCVs Percent Recovery 99 CCVs Percent Recovery 90 96 95 93	Percent Recovery Limits 90 - 110 Percent Recovery Limits 90 - 110 90 - 110 90 - 110 90 - 110	Date Analyze 5/24/0 Date Analyze 5/20/0 5/20/0 5/20/0 5/20/0
ICV (1) Param Total Dissolved CCV (1) Param Chloride Fluoride Nitrate-N Sulfate ICV (1)	Solids QCBatch: Flag Solids QCBatch: Flag Un mg mg mg mg	QC20600 Units mg/L QC20602 CC Tru its Con /L 12.8 /L 2.5 /L 2.5 /L 12.8 /L 12.8 /L 12.8 /L 12.8	CCVs True Conc. 1000 Vs 1e nc. 50 00 50 Vs	CCVs Found Conc. 994 CCVs Found Conc. 11.33 2.41 2.38 11.63	CCVs Percent Recovery 99 CCVs Percent Recovery 90 96 95 93 CCVs	Percent Recovery Limits 90 - 110 Percent Recovery Limits 90 - 110 90 - 110 90 - 110 90 - 110	Date Analyze 5/24/0 Date Analyze 5/20/0 5/20/0 5/20/0 5/20/0
ICV (1) Param Total Dissolved CCV (1) Param Chloride Fluoride Nitrate-N Sulfate ICV (1)	Solids QCBatch: Flag Solids QCBatch: Flag Un mg mg mg mg	QC20600 Units mg/L QC20602 CC Tru its Con /L 12.5 /L 2.5 /L 12.5 /L 12.5 /L 12.5 /L 12.5 /L 12.5	CCVs True Conc. 1000 Vs 1e 1c. 50 50 Vs 1e	CCVs Found Conc. 994 CCVs Found Conc. 11.33 2.41 2.38 11.63 CCVs Found	CCVs Percent Recovery 99 99 CCVs Percent Recovery 90 96 95 93 93 CCVs Percent	Percent Recovery Limits 90 - 110 Percent Recovery Limits 90 - 110 90 - 110 90 - 110 90 - 110 90 - 110	Date Analyze 5/24/0 Date Analyze 5/20/0 5/20/0 5/20/0 5/20/0 5/20/0
ICV (1) Param Total Dissolved CCV (1) Param Chloride Fluoride Nitrate-N Sulfate ICV (1) Param	Solids QCBatch: Flag Solids QCBatch: Flag Un mg mg mg gggggggggggggggggggggggggggg	QC20600 Units mg/L QC20602 CC Tru its Con /L 12.5 /L 2.5 /L 2.5 /L 12.5 /L 12.5 /L 12.5 /L 12.5 /L 12.5 /L 12.5 /L 12.5 /L 12.5 /L 12.5	CCVs True Conc. 1000 Vs 1e 1c. 50 60 50 50 Vs 1e 1c.	CCVs Found Conc. 994 CCVs Found Conc. 11.33 2.41 2.38 11.63 CCVs Found Conc.	CCVs Percent Recovery 99 CCVs Percent Recovery 90 96 95 93 S S S S S S S S S S S S S S S S S S	Percent Recovery Limits 90 - 110 Percent Recovery Limits 90 - 110 90 - 110 90 - 110 90 - 110 90 - 110 90 - 110	Date Analyze 5/24/0 Date Analyze 5/20/0 5/20/0 5/20/0 5/20/0 5/20/0

Report Date: 00-0113	June 11, 200	12	Order	Number: A020 Cooper-Jal	Page Number: 13 of 15 Lea County, NM		
Continued			COVe	COM	COVe	Domoont	
*			CUVS		COVS	rercent	
			True	Found	Percent	Recovery	Date
Param	\mathbf{Flag}	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Fluoride		mg/L	2.50	2.40	96	90 - 110	5/20/02
Nitrate-N		mg/L	2.50	2.38	95	90 - 110	5/20/02
Sulfate		mg/L	12.50	11.53	92	90 - 110	5/20/02

CCV (1) QCBatch: QC20645

			\mathbf{CCVs}	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	<1.0	0	90 - 110	5/30/02
Carbonate Alkalinity		mg/L as CaCo3	0	224	0	90 - 110	5/30/02
Bicarbonate Alkalinity		mg/L as CaCo3	0	16	0	90 - 110	5/30/02
Total Alkalinity		mg/L as CaCo3	250	240	96	90 - 110	5/30/02

ICV (1) QCBatch: QC20645

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	<1.0	0	90 - 110	5/30/02
Carbonate Alkalinity		mg/L as CaCo3	0	228	0	90 - 110	5/30/02
Bicarbonate Alkalinity		mg/L as CaCo3	0	12	0	90 - 110	5/30/02
Total Alkalinity		mg/L as CaCo3	250	240	96	90 - 110	5/30/02

CCV (1) QCBatch: QC20646

			CCVs	\mathbf{CCVs}	\mathbf{CCVs}	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	<1.0	0	90 - 110	5/30/02
Carbonate Alkalinity		mg/L as CaCo3	0	228	0	90 - 110	5/30/02
Bicarbonate Alkalinity		mg/L as CaCo3	0	16	0	90 - 110	5/30/02
Total Alkalinity		mg/L as CaCo3	250	244	97	90 - 110	5/30/02

ICV (1)

QCBatch: QC20646

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0	<1.0	0	90 - 110	5/30/02
Carbonate Alkalinity		mg/L as CaCo3	0	224	0	90 - 110	5/30/02
Bicarbonate Alkalinity		mg/L as CaCo3	0	16	0	90 - 110	5/30/02

Report Date: Ju 00-0113	ine 11, 200	2	Order	Page Num Lea	Page Number: 14 of 15 Lea County, NM			
Continued								
				CCVs	CCVs	CCVs	Percent	
				True	Found	Percent	Recovery	Date
Param		Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Total Alkalinity		n	ng/L as CaCo3	250	240	96	90 - 110	5/30/02
CCV (1)	QC	Batch:	QC20673					
			CCVs	\mathbf{CCVs}	C	CVs	Percent	
			True	Found	Per	rcent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Rec	overy	Limits	Analyzed
Chloride		mg/L	12.50	11.30		90	90 - 110	5/20/02
Fluoride		mg/L	2.50	2.44	9	97	90 - 110	5/20/02
Nitrate-N		mg/L	2.50	2.39	:	95	90 - 110	5/20/02
Sulfate	<u></u>	mg/L	12.50	11.62		92	90 - 110	5/20/02
ICV (1)	QC	Batch: G	C20673					
			CCVs '	CCVs	C	CVs	Percent	
			True	Found	Per	rcent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Rec	overy	Limits	Analyzed
Chloride		mg/L	12.50	11.70		93	90 - 110	5/20/02
Fluoride		mg/L	2.50	2.50	1	.00	90 - 110	5/20/02
Nitrate-N		mg/L	2.50	2.40	9	96	90 - 110	5/20/02
Sulfate		mg/L	12.50	11.75	1	94	90 - 110	5/20/02

CCV (1) QCBatch: QC20675

			CCVs	CCVs	CCVs	Percent	
			True	Found	Percent	Recovery	Date
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed
Chloride		mg/L	12.50	11.21	89	90 - 110	5/20/02
Fluoride		mg/L	2.50	2.40	96	90 - 110	5/20/02
Nitrate-N		mg/L	2.50	2.38	95	90 - 110	5/20/02
Sulfate		mg/L	12.50	11.53	92	90 - 110	5/20/02

ICV (1)

QCBatch: QC20675

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.30	90	90 - 110	5/20/02
Fluoride		mg/L	2.50	2.44	97	90 - 110	5/20/02
Nitrate-N		mg/L	2.50	2.39	95	90 - 110	5/20/02
Sulfate		mg/L	12.50	11.62	92	90 - 110	5/20/02

Report Date: June 11, 2002 00-0113			Order Numt Cooj	per: A0205201 per-Jal	15	Page Number: 15 of 15 Lea County, NM		
CCV (1)	QCBatch:	QC20802						
			CCVs	CCVs	CCVs	Percent		
			True	Found	Percent	Recovery	Date	
Param	Flag	Units	Conc.	Conc.	Recovery	Limits	Analyzed	
Dissolved Calcium		mg/L	25	26.3	105	90 - 110	6/3/02	
Dissolved Magnesium		mg/L	25	25.8	103	90 - 110	6/3/02	
Dissolved Potassium		mg/L	25	25.3	101	90 - 110	6/3/02	
Dissolved Sodium		mg/L	25	25.7	102	90 - 110	6/3/02	

ICV (1)	QCBatch:	QC20802	
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			CCVs	CCVs Found	CCVs Percent	Percent	Data
Param	Flag	Units	Conc	Conc	Recovery	Limits	Analyzed
Dissolved Calcium	1 100	mg/L	25	25.0	100	95 - 105	6/3/02
Dissolved Magnesium		mg/L	25	24.7	98	95 - 105	6/3/02
Dissolved Potassium		mg/L	25	24.9	99	95 - 105	6/3/02
Dissolved Sodium		mg/L	25	25.4	101	95 - 105	6/3/02
	.						
Dissolved Magnesium Dissolved Potassium Dissolved Sodium		mg/L mg/L mg/L	25 25 25	24.7 24.9 25.4	98 99 101	95 - 105 95 - 105 95 - 105	6 6 6

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Ref Str. nowners. PARAMETERS/METHOD NUMBER CHAIN-O 0: Macrill (Macrill) Macrill (Macrill) Macrill) Macrill 0: Macrill Macrill) Macrill Macrill) 0: Macrill Macrill Macrill) Macrill) 0: Macrill Macrill) Macrill) Macrill) 0: Macrill) Macrill) Macrill) Macrill)	210250er	F-CUSTODY		S, INC. Fax: 915-68 Consultants 915-61	ld, Ste. 202 • Midlan	REMARKS II.E., FILTERED, UNPILIZ PRESERVED, UNPRESI GRAB COMPOSII	Gittered, wrip										HTH	ircle) (See the March	AB AB AB AB AB AB AB AB AB AB AB AB AB A	ad (i'u de keiukineu i' Ceipt) Snager	RDINATOR	
End Site namoer Control March Larsan Control Labor	ВС	CHAIN-O			507 N. Marienfe	LAB. I.D. NUMBER (LAB USE ONLY)										 	RECEIVED BY: (SIGNATURE	sample shipped by: (C Fedex	HAND DELIVERED WHITE - RECEIVING L	LA AFTER RE LA AFTER RE PINK - PRO IFCT MA		SAMPLE TYPE:
ELEMANAGER: PARAMETERS CLUC PROJECT NAME: CLUC PROJECT PROSON: CLUC PROJECT PROJECT PROSON: CLUC PROJECT PROJECT PROSON: CLUC PROJECT PROJECT PROJECT PROSON: PROJECT PROJECT PROJECT PROSON: PROJECT PROJECT PROJECT PROSON: PROJECT PROJECT PROJECT PROSON: PROJECT PROJECT PROJECT PROJECT PROSON: PROJECT PROJECT PROJECT PROJECT PROSON: PROJECT PROJECT P		/METHOD NUMBER															DATE: 5-17.00	DATE: 5/12/22	AROUND TIME NEEDED			(915)687-590)
E SIE MANAGER. SIE MANAGER. SIE MANAGER. MALACK LUKSAN MALACK LUKSAN PROJECT NAME. OILI 2 DAPECT NAME. OILI 2 COOP C5 - Jal OILI 2 COOP C5 - Jal OILI 2 COOP C5 - Jal OILI 2 COOP C5 - Jal MALU-1 197430 TAM 1924 MALU-2 431 MALU-2 431 MALU-2 431 MALU-2 431 MALU-2 431 MALU-2 431 MALU-2 431 MALU-5 432 MALU-5 432 MALU-10 4436 MALU-5 432 MALU-5 432 MALU-5 432 MALU-5 432 MALU-5 432 MALU-5 443 MALU-5 432 MALU-5 5 MALU-5 5 MALU-5 7 MALU-5 7 MALU		PARAMETERS	5	Marta Marta), 2 5	мимвек с 7D<	XX	••••	•	•	· *						BY: (Signoture)	ignatúre)	TURN	EIVED BY: (Signature)	Е:ТIМ	A CONTACT PERSON: When I curso
E SITE MANAGER: SKVALO NLATK PROJECT NAME: OILIZ OILIZ OILIZ OILIZ OILIZ OILIZ COPECT NAME: DOIECT NAME: COPECT NAME			Levison	-3.1		ATION	achubi	164	408	<i>uch</i>	435	A 5					45 RELINQUISHED	2 lot RECEIVED BY: (5	A	BOY ANGLYSIS REC	211-794 1291 DAT	
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		نن	CXCLO	2110	OF	1105 2110M 311EB	25 X	55 **	00	16	100)					3Y: (Signature)	HED BY: (Signation)	с. Х	12 LABORATORY: TS	bock Helen	DITION WHEN RECEIVED:

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ANALYTICAL REPORT

Prepared for:

Cindy Crain LARSON AND ASSOCIATES, INC. P.O. BOX 50685 MIDLAND, TX 79710

Project:Texaco/ Cooper-JalPO#:G0204832

Report Date: 10/29/2002

<u>Certificates</u> US EPA Laboratory Code TX00158

LARSON AND ASSOCIATES, INC. P.O. BOX 50685 MIDLAND, TX 79710

915-687-0456

Order#:G0204832Project:0-0113Project Name:Texaco/ Cooper-JalLocation:None Given

The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas, unless otherwise noted.

			Date / Time	Date / Time		
Lab ID:	Sample :	Matrix:	Collected	Received	Container	Preservativ
0204832-01	MW-10	WATER	10/22/02 15:38	10/23/02 15:00	4 oz Glass	Ice
La	<u>b Testing:</u>	Rejected: No	Temp	: 1.5 C		
	Chloride					
	Sulfate					
	Total Dissolved S	olids (TDS)		·		
0204832-02	Duplicate	WATER	10/22/02 15:38	10/23/02 15:00	4 oz Glass	Ice
La	<u>b Testing:</u>	Rejected: No	Temp	: 1.5 C		
	Chloride					
	Sulfate					
	Total Dissolved S	olids (TDS)				
0204832-03	MW-7	WATER	10/22/02 16:42	10/23/02 15:00	4 oz Glass	Ice
La	<u>b Testing:</u>	Rejected: No	Temp	: 1.5 C		
	Chloride					
	Sulfate					
	Total Dissolved S	olids (TDS)				
0204832-04	MW-8	WATER	10/22/02 17:48	10/23/02 15:00	4 oz Glass	Ice
La	b Testing:	Rejected: No	Temp	n: 1.5 C		
	Chloride					
	Sulfate					
	Total Dissolved S	olids (TDS)				
0204832-05	MW-13	WATER	10/23/02 7:27	10/23/02 15:00	4 oz Glass	Ice
<u>La</u>	<u>b Testing:</u>	Rejected: No	Temp	o: 1.5 C		
	Chloride					
	Sulfate					
	Total Dissolved S	Solids (TDS)				
0204832-06	MW-12	WATER	10/23/02 8:10	10/23/02 15:00	4 oz Glass	Ice
<u>La</u>	<u>b Testing:</u>	Rejected: No	Temp	p: 1.5 C		
	Chloride					
EN	Chloride VIRONMENTAL L	AB OF TEXAS I, LTD.	12600 West I-	20 East, Odes	ssa, TX 79765 Ph	: 915-5

LARSON AND ASSOCIATES, INC. P.O. BOX 50685 MIDLAND, TX 79710

915-687-0456

Order#:G0204832Project:0-0113Project Name:Texaco/ Cooper-JalLocation:None Given

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<u>Lab ID:</u>	<u>Sample :</u> Sulfate	<u>Matrix:</u>	Date / Tim <u>Collected</u>	e Date / T <u>Receiv</u>	lime /ed <u>Container</u>	Preservativ
	Total Dissolved S	Solids (TDS)				
0204832-07	Duplicate	WATER	10/23/02 8:10	10/23/ 15:0	/02 4 oz Glass 0	Ice
La	b Testing:	Rejected: N	10	Temp: 1.5 (C	
	Chloride					
	Sulfate					
	Total Dissolved S	Solids (TDS)				
0204832-08	MW-3	WATER	10/23/02 8:50	10/23/ 15:0	/02 4 oz Giass 0	Ice
La	<u>b Testing:</u>	Rejected: N	40	Temp: 1.5 (C	
	Chloride					
	Sulfate					
	Total Dissolved S	Solids (TDS)				
0204832-09	MW-6	WATER	10/23/02 9:15	10/23/ 15:0	/02 4 oz Glass 0	Ice
<u>La</u>	ib Testing:	Rejected: N	ю	Temp: 1.5	C	
	Chloride					
	Sulfate					
	Total Dissolved S	Solids (TDS)				
0204832-10	MW-5	WATER	10/23/02 9:45	10/23. 15:0	/02 4 oz Glass 0	Ice
<u>La</u>	<u>ıb Testing:</u>	Rejected: 1	No	Temp: 1.5	С	
	Chloride					
	Sulfate					
	Total Dissolved S	Solids (TDS)				
0204832-11	MW-5A	WATER	10/23/02 10:10	10/23 15:0	/02 4 oz Glass 10	Ice
<u>La</u>	ab Testing:	Rejected: 1	No	Temp: 1.5	С	
	Chloride					
	Sulfate					
	Total Dissolved	Solids (TDS)				

LARSON AND ASSOCIATES, INC. P.O. BOX 50685

MIDLAND, TX 79710

915-687-0456

Order#:G0204832Project:0-0113Project Name:Texaco/ Cooper-JalLocation:None Given

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			Date / Time	Date / Time		
<u>Lab ID:</u>	Sample :	Matrix:	Collected	Received	<u>Container</u>	Preservativ
0204832-12	MW-4	WATER	10/23/02	10/23/02	4 oz Glass	Ice
La	h Tastina	Rejected: No	10:40 Temr	15:00 v 15C		
<u>1.4</u>	Oblasida	Rejection	1 cmp	. 1.50		
	Chloride					
	Suitate					
	Total Dissolved Solid	IS (1DS)				
0204832-13	MW-4A	WATER	10/23/02 11:05	10/23/02 15:00	4 oz Glass	Ice
La	<u>b Testing:</u>	Rejected: No	Temp	o: 1.5 C		
	Chloride					
	Sulfate					
	Total Dissolved Solid	is (TDS)				
0204832-14	MW-9	WATER	10/23/02 11:40	10/23/02 15:00	4 oz Glass	Ice
Lai	<u>b Testing:</u>	Rejected: No	Temp	p: 1.5 C		
	Chloride					
	Sulfate					
	Total Dissolved Solid	ds (TDS)				
0204832-15	MW-9A	WATER	10/23/02 11:55	10/23/02 15:00	4 oz Glass	Ice
La	<u>b Testing:</u>	Rejected: No	Tem	p: 1.5 C		
	Chloride					
	Sulfate					
	Total Dissolved Solie	ds (TDS)				
0204832-16	MW-11	WATER	10/23/02 12:20	10/23/02 15:00	4 oz Glass	Ice
<u>La</u>	b Testing:	Rejected: No	Tem	p: 1.5 C		
	Chloride					
	Sulfate					
	Total Dissolved Solie	ds (TDS)				
	MW 2	WATER	10/23/02	10/23/02	4 oz Glass	Ice
0204832-17	IVI W -2		13:50	15:00		
0204832-17 <u>La</u>	<u>ab Testing:</u>	Rejected: No	13:50 Tem	15:00 p: 1.5 C		

ENVIRONMENTAL LAB OF TEXAS I, LTD. 12600 West I-20 East, Odessa, TX 79765 Ph: 915-563-1800

LARSON AND ASSOCIATES, INC. P.O. BOX 50685 MIDLAND, TX 79710

915-687-0456

Order#:G0204832Project:0-0113Project Name:Texaco/ Cooper-JalLocation:None Given

The samples listed below were submitted to Environmental Lab of Texas and were received under chain of custody. Environmental Lab of Texas makes no representation or certification as to the method of sample collection, sample identification, or transportation/handling procedures used prior to the receipt of samples by Environmental Lab of Texas, unless otherwise noted.

<u>Lab ID:</u>	<u>Sample :</u> Sulfate	<u>Matrix:</u>	Date / Time I <u>Collected</u>	Date / Time <u>Received</u>	Container	Preservative
	Total Dissolved S	olids (TDS)				
0204832-18	MW-2A	WATER	10/23/02 14:20	10/23/02 15:00	4 oz Glass	Ice
<u>La</u>	ub Testing:	Rejected: No	Temp:	1.5 C		
	Chloride					
	Sulfate					
	Total Dissolved S	olids (TDS)				······································
0204832-19	MW-1	WATER	10/23/02 15:00	10/23/02 15:00	4 oz Glass	Ice
<u>La</u>	ub Testing:	Rejected: No	Temp:	1.5 C		
	Chloride					
	Sulfate					
	Total Dissolved S	olids (TDS)				
				· · · · ·		

ENVIRONMENTAL LAB OF TEXAS ANALYTICAL REPORT

Cindy Crain LARSON AND A P.O. BOX 50685 MIDLAND, TX	ASSOCIATES, INC 79710		Order#: Project: Project I Location		: G0204832 : 0-0113 Name: Texaco/ Coop on: None Given		per-Jal	<u></u>	
Lab ID: Sample ID:	0204832-01 MW-10								
Test Param	eters				Dilutio	n		Date	
Parameter			<u>Result</u>	Units	Facto	<u>r <u>RL</u></u>	Method	Analyzed	<u>Analyst</u>
Chloride			213	mg/L	1	5.00	9253	10/26/02	SB
Sulfate			108	mg/L	2.5	1.25	375.4	10/25/02	SB
Total Dissolve	ed Solids (TDS)		758	mg/L	1	5.0	160.1	10/25/02	TAL
Lab ID:	0204832-02			^u					
Sample ID:	Duplicate								
Test Param	eters .				Dilutio	n		Date	
Parameter			<u>Result</u>	Units	Factor	<u>r RL</u>	Method	Analyzed	<u>Analyst</u>
Chloride			222	mg/L	1	5.00	9253	10/26/02	SB
Sulfate			107	mg/L	2.5	1.25	375.4	10/25/02	SB
Total Dissolve	ed Solids (TDS)		802	mg/L	1	5.0	160.1	10/25/02	TAL
Lab ID: Sample ID:	0204832-03 MW-7								
Test Param	eters				Dilutio	n		Date	
Parameter		<u></u>	<u>Result</u>	Units	Facto	<u>r RL</u>	Method	Analyzed	<u>Analyst</u>
Chloride			88.6	mg/L	1	5.00	9253	10/26/02	SB
Sulfate			109	mg/L	2.5	1.25	375.4	10/25/02	SB
Total Dissolve	ed Solids (TDS)		490	mg/L	1	5.0	160.1	10/25/02	TAL
Lab ID: Sample ID:	0204832-04 MW-8								
<i>Test Parameters</i> Parameter			Result	Units	Dilutio Facto	n r RL	Method	Date Analyzed	Analyst
Chloride			40.8	mg/L	1	5.00	9253	10/26/02	SB
Sulfate			104	mg/L	2.5	1.25	375.4	10/25/02	SB
Total Dissolve	ed Solids (TDS)		392	mg/L	1	5.0	160.1	10/25/02	TAL
Lab ID: Sample ID:	0204832-05 MW-13								
Test Param	nete r s				Dilutio	n		Date	
Parameter			<u>Result</u>	Units	Facto	r <u>RL</u>	Method	Analyzed	<u>Analyst</u>
Chloride			549	mg/L	1	5.00	9253	10/26/02	SB
Sulfate			370	mg/L	5	2.5	375.4	10/25/02	SB
Total Dissolved Solids (TDS)			1740	mg/L	I	5.0	160.1	10/25/02	TAL
RL =	Reporting Limit	N/A = Not Applicable							Page 1 of 5

ENVIRONMENTAL LAB OF TEXAS I, LTD. 12600 West I-20 East, Odessa, TX 79765 Ph: 915-563-1800

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ENVIRONMENTAL LAB OF TEXAS ANALYTICAL REPORT

Cindy Crain LARSON AND ASSOCIATES, INC. P.O. BOX 50685 MIDLAND, TX 79710			Order#: Project: Project Name: Location:		30204832)-0113 Fexaco/ Coo _l None Given	per-Jal		
Lab ID: Sample ID:	0204832-05 MW-13							
Lab ID: Sample ID:	0204832-06 MW-12							<u></u>
<i>Test Parameters</i> Parameter		Result	<u>Units</u>	Dilution <u>Factor</u>	RL	Method	Date Analyzed	<u>Analyst</u>
Chloride		65.0	mg/L	1	5.00	9253	10/26/02	SB
Sulfate		102	mg/L	2.5	1.25	375.4	10/25/02	SB
Total Dissolv	ved Solids (TDS)	477	mg/L	1	5.0	160.1	10/25/02	TAL
Lab ID: Sample ID:	0204832-07 Duplicate							
<i>Test Parameters</i> Parameter		Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride		62.0	mg/L	1	5.00	9253	10/26/02	SB
Sulfate		99.2	mg/L	2.5	1.25	375.4	10/25/02	SB
Total Dissolv	ved Solids (TDS)	439	mg/L	1	5.0	160.1	10/25/02	TAL
Lab ID: Sample ID:	0204832-08 MW-3							
Test Parameters Parameter		Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Chloride		35.4	mg/L	1	5.00	9253	10/26/02	SB
Sulfate		104	mg/L	2.5	1.25	375.4	10/25/02	SB
Total Dissolv	ved Solids (TDS)	419	mg/L	1	5.0	160.1	10/25/02	TAL
Lab ID: Sample ID:	0204832-09 MW-6							
Test Parameters		Result	Units	Dilution <u>Factor</u>	RL	Method	Date Analyzed	<u>Analyst</u>
Chloride		46.1	mg/L	1	5.00	9253	10/26/02	SB
Sulfate		109	mg/L	2.5	1.25	375.4	10/25/02	SB
Total Dissolved Solids (TDS)			π.					57 4 7

ENVIRONMENTAL LAB OF TEXAS I, LTD.

ENVIRONMENTAL LAB OF TEXAS ANALYTICAL REPORT

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		Order#	ŧ:	G0204832			
NC.		Project:		0-0113			
		Project	Name:	Texaco/ Coo	per-Jal		
		Locatio	on:	None Given			
			Dilutio	n		Date	
	<u>Result</u>	Units	<u>Facto</u>	<u>r RL</u>	Method	Analyzed	<u>Analyst</u>
	49.6	mg/L	1	5.00	9253	10/26/02	SB
	94.8	mg/L	2.5	1.25	375.4	10/25/02	SB
)	422	mg/L	1	5.0	160.1	10/25/02	TAL
			Dilutio	n		Date	
	<u>Result</u>	Units	Facto	<u>r RL</u>	Method	Analyzed	<u>Analyst</u>
	3900	mg/L	1	5.00	9253	10/26/02	SB
	616	mg/L	12.5	6.25	375.4	10/25/02	SB
)	8670	mg/L	1	5.0	160.1	10/28/02	TAL
	D	¥1	Dilutio	n 	M -4h - J	Date	A a locat
	Kesult	Units	Facto	<u>r <u>kl</u></u>	Method	Analyzeu	Analyst
	11300	mg/L	1	5.00	9253	10/26/02	SB
、	1320	mg/L	25	12.5	375.4	10/25/02	SB
)	23200	mg/L	1	5.0	160.1	10/28/02	TAL
			Dilutio	-		Date	
	Result	Units	Facto	r RL	Method	Analyzed	<u>Analyst</u>
	478	me/L	1	<u></u> 5.00	9253	10/26/02	SB
	114	mg/L	2.5	1.25	375.4	10/25/02	SB
)	1430	mg/L	1	5.0	160.1	10/28/02	TAL
							<u></u>
	Decult	T I :4-	Dilutio	n BI	Matha J	Date	A molecut
			<u>racto</u>		<u>Ivietnod</u>		Anaiyst CD
	39.0	mg/L	1	5.00	9255	10/26/02	6D 2R
N N	102	mg/L	2.5	1.25	3/3.4 140 1	10/20/02	50 TAI
)	430	mg/L	1	5.0	100.1	10/20/02	IAL
t N/A = Not Applicable							Page 3 of 5
	INC.	INC. <u>Result</u> 49.6 94.8 94.8 94.2 422 <u>Result</u> 3900 616 9 8670 <u>Result</u> 11300 1320 23200 <u>Result</u> 11300 1320 39.0 102 39.0 102 39.0 102 39.0 102 436	Result Units 49.6 mg/L 94.8 mg/L 94.8 mg/L 422 mg/L 616 mg/L 616 mg/L 11300 mg/L 122 mg/L 1320 mg/L 1320 mg/L 1320 mg/L 1430 mg/L 1430 mg/L 1430 mg/L 102 mg/L 102 mg/L 102 mg/L 102 mg/L 102 mg/L	INC. Project: Project: Project: Project: Name: Location: Project Name: Location: <u>Result</u> Units Factor 94.8 mg/L 2.5 9422 mg/L 1 <u>Project Name: Location:</u> <u>Project Name: Location: Location: Location: Location: Location: Location:</u>	INC. Order#: Project: None Given G0204832 9-0113 Project: None Given Result Units Factor Factor RL RL RL 49.6 mg/L 1 5.00 94.8 mg/L 2.5 1.25) 422 mg/L 1 5.00 Result Units Factor RL 3900 mg/L 1 5.00 616 mg/L 12.5 6.25 9 8670 mg/L 1 5.00 11300 mg/L 1 5.00 1320 mg/L 1 5.00 1320 mg/L 1 5.00 1320 mg/L 1 5.00 1320 mg/L 1 5.0 14 mg/L 1 5.0 1430 mg/L 1 5.0 1430 mg/L 1 5.0 102 mg/L 1 5.0 103 102 mg/L 1 5.0 103 102 <th1< th=""> 5.0 1</th1<>	Order#: G0204832 Project: G0204832 0-0113 Project: 0-0113 Project: 0-0113 Project: 0-0113 Project: 0-0113 Project: None Given 49.6 mg/L 1 94.8 mg/L 2.5 1.25 94.8 mg/L 1 5.00 9253 94.8 mg/L 1 5.00 9253 900 mg/L 1 5.00 9253 900 mg/L 1 5.00 9253 900 mg/L 1 5.00 9253 910 8670 mg/L 1 5.00 9253 91320 mg/L 1 5.00 9253 1320 mg/L 1 5.0 160.1 9 23200 mg/L 1 5.0 9253 9 1320 mg/L 1 5.0 9253 9 1330 mg/L	Order#: G0204832 Project: G0204832 40113 Project: 04113 Project Name: Texac/Cooper-Jal Execut/ Date

ENVIRONMENTAL LAB OF TEXAS I, LTD. 12600 West I-20 East, Odessa, TX 79765 Ph: 915-563-1800
ENVIRONMENTAL LAB OF TEXAS ANALYTICAL REPORT

Cindy Crain LARSON AND P.O. BOX 5068 MIDLAND, TY	ASSOCIATES, INC. 5 K 79710		Order# Project Project Locatio	f: t: t Name: on:	G0204832 0-0113 Texaco/ Coop None Given	per-Jal		
Lab ID: Sample ID:	0204832-14 MW-9							
Lab ID:	0204832-15							
Sample ID:	мич-уа							
Test Paran	neters			Dilution	n		Date	
Parameter	- 11.2	Result	Units	Factor	<u></u>	Method	Analyzed	<u>Analyst</u>
Chloride		168	mg/L	1	5.00	9253	10/26/02	SB
Sulfate		75.5	mg/L	2.5	1.25	375.4	10/25/02	SB
Total Dissolv	red Solids (TDS)	651	mg/L	1	5.0	160.1	10/28/02	TAL
Lab ID:	0204832-16							
Sample ID:	MW-11							
Test Paran Parameter	neters	Result	Units	Dilution <u>Factor</u>	n <u>r RL</u>	Method	Date Analyzed	Analyst
Chloride		37.2	mg/L	1	5.00	9253	10/26/02	SB
Sulfate		102	mg/L	2.5	1.25	375.4	10/25/02	SB
Total Dissolv	ed Solids (TDS)	447	mg/L	1	5.0	160.1	10/28/02	TAL
Lab ID: Sample ID:	0204832-17 MW-2							
Test Paran	neters			Dilutio	-		Date	
Parameter		Result	Units	Factor	<u>RL</u>	Method	Analyzed	<u>Analyst</u>
Chloride		2920	mg/L	1	5.00	9253	10/26/02	SB
Sulfate		451	mg/L	10	5.0	375.4	10/25/02	SB
Total Dissolv	ved Solids (TDS)	6770	mg/L	1	5.0	160.1	10/28/02	TAL
Lab ID: Sample ID:	0204832-18 MW-2A	· · · · · · · · · · · · · · · · · · ·						
Test Parar	neters			Dilutio	n		Date	
Parameter		Result	Units	Factor	 <u>r RL</u>	Method	Analyzed	<u>Analyst</u>
Chloride		44.3	mg/L	1	5.00	9253	10/26/02	SB
Sulfate		97.0	mg/L	2.5	1.25	375.4	10/25/02	SB
		425						TAI

RL = Reporting Limit N/A = Not Applicable

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ENVIRONMENTAL LAB OF TEXAS ANALYTICAL REPORT

Cindy Crain LARSON AND ASSOCIATES, INC. P.O. BOX 50685 MIDLAND, TX 79710		Order# Project Project Locatio	: G : 0 Name: T n: N	0204832 -0113 exaco/ Cooj one Given	per-Jal		
Lab ID: 0204832-19 Sample ID: MW-1							·
Test Parameters	Docult	Timito	Dilution	DI	Mathad	Date	A no livet
Chloride	<u>168</u>	mg/I	<u>ractor</u>	<u>KL</u> 5.00	9253	10/26/02	SB
Sulfate	96.8	mg/L	2.5	1.25	375.4	10/25/02	SB
Total Dissolved Solids (TDS)	696	mg/L	1	5.0	160.1	10/28/02	TAL

aland KJun 10-28-02 Approval: 1 Date

Raland K. Tuttle, Lab Director, QA Officer Celey D. Keene, Org. Tech. Director Jeanne McMurrey, Inorg. Tech. Director Sandra Biezugbe, Lab Tech. Sara Molina, Lab Tech.

RL = Reporting Limit N/A = Not Applicable

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ENVIRONMENTAL LAB OF TEXAS QUALITY CONTROL REPORT

Test Parameters

Order#: G0204832

BLANK water	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/L	0003545-01	, <u>, , , , , , , , , , , , , , , , , , </u>		<5.00		
Sulfate-mg/L	0003543-01			<0.50		
Total Dissolved Solids (TDS)-mg/L	0003548-01			<5.0		
Total Dissolved Solids (TDS)-mg/L	0003556-01			<5.0		
DUPLICATE WATER	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Sulfate-mg/L	0204832-01	108		109		0.9%
Total Dissolved Solids (TDS)-mg/L	0204832-01	758		757		0.1%
Total Dissolved Solids (TDS)-mg/L	0204832-11	8670		8670		0.%
MS water	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/L	0204832-01	213	500	709	99.2%	
MSD water	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/L	0204832-01	213	500	717	100.8%	1.1%
SRM WATER	LAB-ID #	Sample Concentr.	Spike Concentr.	QC Test Result	Pct (%) Recovery	RPD
Chloride-mg/L.	0003545-04		5000	4960	99.2%	
Sulfate-mg/L	0003543-04		50	49.5	99.%	

CLIENT NAME:			Site Manager:		l	PAR	AMETERS/ME	ETHOD NUMBER	CHAIN	OF-CU	STODY RECOR
lexau			lindy (rad	5	5			<u> </u>			
PROJECT NO.:			PROJECT NAME:	6	INEBS	$\frac{1}{1}$				x ites, Inc. F	⁻ ax: 915-687-0456
710-0	Y		25 magoo	イ	ATNO	7	3		Environmen	ital Consultants	915-687-0901
PAGE / OF 7	1	LAB. P	- #Q		 0E CC		5(507 N. Marie	infeld, Ste. 20	2 • Midland, TX 79701
JUIL	NOS VIEK	OTHER	SAMPLE IDENTIFICATION	269	NUMBER	147			LAB. I.D. NUMBER (LAB USE ONLY)	ILE., F PRESEI GI	remarks Hittered, Unfiltered, Ryted, Undreserved, Rab composite)
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11 11 0850			mw-3	C8	1	くメ	//			4	11
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1102			mwath	13	_	/	\mathbf{x}			11	11
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11 11 1155			MW-9A	15	1	$\overline{)}$	· / /			11) (
11 11 1220			M-11	16	~	$\frac{1}{1}$	\ \			11	1 (
11 11 1350			mw-2	Ĺ	_	۱ \	1			17	11
11 11/20			mw-2 A	18	~	\ \	\ \ \			11	11
SAMPLED BY: (Signa	pure)	3	DATE: 20-23-02-1 TIME: 0200	relinguisher) BY: (S	ignaturı	()	Date: Time:	RECEIVED BY: (Signa	Iture)	DATE
RELINQUISHED BY ((jghature)		DATE: 10-23-02-1	RECEIVED BY:	Signat	ure)		DATE:	SAMPLE SHIPPED BY	f: (Circle)	
mital	the second	J	TIME:					TIME:	FEDEX	, BUS	AIRBILL #:
COMMENTS:							TURNAROL	JND TIME NEEDED	HAND DELIVERED	UPS	OTHER:
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CITY: Oblession CONTACT:			STATE: 7-X ZIP: 7 PHONE: 5603-1800	7 <i>65</i>	ATE:	: 0/0	202JIME	1500		COORDINATOR	
SAMPLE CONDITION WHE	N RECEIVED:	50	۔ ا				PERSON:		SAMPLE TYPE:		
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CHAIN-OF-CUSTODY RECORD	507 N. Marienfeld, Ste. 202 • Midland, TX 79701	LAB. I.D. REMARKS NUMBER I.E., FILTERED, UNFILTERED, ILAB USE ONLY) GRAB COMPOSITEJ	Un presued	-							RECEIVED BY: (Signature) DATE:TIME:TIME:	SAMPLE SHIPPED BY: (Circle)	FEDEX BUS AIRBILL #:	HAND DELIVERED UPS OTHER: WHITE - RECEIVING LAB		PINK - PROJECT MANGER		SAMPLE TYPE:
PARAMETERS/METHOD NUMBER	осіда Солтынев Солтынев	2 <u>1</u> MS 140 NINBEK C) BY: (Signature) DATE: TIME:	Signature) DATE:	TIME	TURNAROUND TIME NEEDED	CEIVED BY: (Signature)	Sandre Bingle	11: 10/03/20 IIME: 15 00	LA CONTACT PERSON: Cindy Cain
site MANAGER: Ci roly Crai	PROJECT NAME: Loopu - Jal 28. PO #	Sample IDENTIFICATION	mw-1 19		-						DATE: 10-23-42 RELINQUISHED TIME: 0.700	DATE: 10 23 13 RECEIVED BY: (TIME:		e/	STATE Toxas ZIP: 79765	PHONE: 563-1800	5°C
CLIENT NAME:	PROJECT NO.: 0-01/3 PAGE 2 OF 2 U	105 201 201 201 201 201 201 201 201 201 201	123/62 1500 /								SAMPLED BY: (Signature)	RELINQUISHED By (Signature)	May the	COMMENTS:		ADDRESS: 12600 W 3	CONTACT:	SAMPLE CONDITION WHEN RECEIVED: