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279

REPORTS

DATE:

2003



Highlander Environmental Corp.

Midland, Texas

December 20, 2002

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ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

Mr. William C. Olson, Hydrogeologist
Environmental Bureau
Oil Conservation Division
Energy, Minerals and Natural Resources Department
2040 S. Pacheco
Santa Fe, New Mexico 87505

Re: 2002 - Groundwater Monitoring Summary and Closure Report at the ChevronTexaco, Buckeye Vacuum Field Unit, Lea County, New Mexico, Section 1, T-18-S, R-34-E.

Dear Mr. Olson:

Highlander Environmental Corp. (Highlander) has been requested by ChevronTexaco Corporation to conduct monitoring of groundwater at the Vacuum Field Unit, located in Buckeye, Lea County, New Mexico. The Site is located in Section 1, Township 18 South, Range 34 East. The Site location is shown in Figure 1. The monitor wells are shown in Figure 2. This report presents the results of groundwater remediation and monitoring activities conducted at the Site during 2002.

Background

In 1989, a total of twenty-three (23) monitor wells were installed at the Site to locate the source and delineate the extent of chloride in groundwater. The wells were drilled to the base of the Ogallala aquifer, which coincides with the top of the Triassic redbed in this area. Based on the investigation, a casing leak was detected in producing well VG SAU #58. This was suspected to be the source for the chloride plume. The casing leak was detected in the well at a depth of 59 feet below ground surface and was repaired in 1990. Two (2) extraction wells #1 and #2 were installed in the plume area to remediate the groundwater impact. These wells were pumped continuously to remediate the groundwater at the Site.

During monitoring events in 1999, the concentrations in selected monitor wells showed chloride levels below the New Mexico Water Quality Control Commission (WQCC) standard of 250 mg/l. Historically, TW-23 has showed fluctuating chloride levels above WQCC standards. Based upon water sampling data, it appeared that the pumping of the initial extraction wells (#1 and #2) had remediated the chloride plume, except in the vicinity of TW-23. As a result, Highlander supervised of the installation of a new water well (Extraction Well #3) to remediate the groundwater in the

vicinity of TW-23, on October 11-12, 2001. The submersible pump from Extraction Well #2 was removed and installed into Extraction Well #3.

As previously approved by the New Mexico Oil Conservation Division (NMOCD), a total of thirteen (13) monitor wells have been plugged at this site, leaving ten (10) monitor wells and three (3) extraction wells at the Site. In 1999, Highlander Environmental performed quarterly sampling of ten (10) monitor wells and two (2) extraction wells at the Site. Based on 1999 sampling results, a total of six (6) monitor wells and two (2) extraction wells were sampled on a semi-annual basis for 2000. In 2001, Highlander Environmental performed quarterly sampling of MW-23, semi-annual sampling of five (5) monitor wells and two (2) extraction wells, and annual sampling of ten (10) monitor wells and three (3) extraction wells at the Site. In 2002, Highlander Environmental performed quarterly sampling of MW-23 and Extraction Well #3, semi-annual sampling of seven (7) monitor wells and three (3) extraction wells, and annual sampling of ten (10) monitor wells and one (1) extraction well at the Site. Historically, the chloride levels in TW-23 (near source well VG SAU #58) have widely fluctuated, but remained well above the WQCC standard of 250 mg/l. Well VG SAU #58 was plugged in 2000.

Groundwater Monitoring Activities

Prior to sampling, static water levels were collected from the monitor wells. No water level measurements were collected from active extraction wells, due to cascading water. Table 1 shows the cumulative water level data and groundwater elevations. Water table maps for the four quarterly sampling events are presented in Figures 2 through 5. The Site shows a north/northeast hydraulic gradient, which shows depression around the extraction wells in Figures 3 and 4. Cumulative depth to water and groundwater elevation measurements can be found in Tables 1 and 2. Hydrographs for each well gauged are shown in Appendix A.

In 2002, the semi-annual and annual sampling were performed on May 15, 2002, and November 6, 2002, respectively. A minimum of three (3)-casing volumes of groundwater were removed from each well and contained in a portable tank. Following purging, groundwater samples were collected from the discharge from the pump. The groundwater samples were carefully transferred to appropriate containers, preserved, and transported under chain-of-custody control to Trace Analysis, Inc., Lubbock, Texas. The samples were analyzed for chloride by method EPA SM 4500 Cl-B. Appendix B presents the laboratory report.

Laboratory Analysis and Results

Referring to Table 3, the most recent chloride levels from the monitor wells were all below the WQCC standard of 250 mg/l, with the exception of TW-15 and TW-23. In 2002, TW-15 had fairly consistent chloride levels ranging from 487 mg/L to 571 mg/L. TW-23, which last year exhibited chloride levels in the thousands, ranged from 77.1 mg/L to 384 mg/L.

In May 2002, the water level in TW-23 had dropped to a new low of 129.67' below ground surface, while chloride levels decreased, presumably in response to pumping Extraction well #3.



Chloride levels did rise with water level elevation in TW-23, at the end of 2002 to a level of 384 mg/L. This could be due to final residual leaching in the unsaturated zone in the vicinity of TW-23. TW-15, however, which is one of the furthest monitor well from the extraction wells, had its highest chloride levels corresponding to the lowest water level elevations recorded, in May and August. As water levels began to rise in November 2002, the chloride levels decreased. This may indicate that there is a cycle between water level fluctuation and chloride content. Chloride in TW-15 may not fully manifest itself until water levels fall and chloride is concentrated in the vicinity of the wellbore.

Conclusions

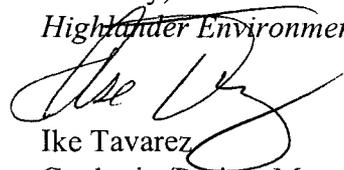
1. Three wells (Extraction Well #3, TW-9 and TW23) showed chloride levels fluctuating above and below the WQCC standard of 250 mg/l for samples taken in 2002. Historically, TW-15 has shown chloride levels below the WQCC standard, however, in 2002, chloride levels peaked, coinciding with the lowest recorded water levels. All other wells, including Extraction Wells #1 and #2, were below WQCC standards.
2. Significant chloride reduction was evident in TW-23 during 2002, due primarily to the pumping of Extraction Well #3. Nearly all monitor wells are exhibiting chloride levels which meet WQCC standards. Residual chloride levels would appear to be contingent on fluctuating water level elevations and should not pose any future significant threat to groundwater in the vicinity of the Site.

Recommendations

1. Based on the remediation performed at this Site, the significant reduction in chloride levels and residual chloride levels which would to not pose any future significant threat to groundwater in the vicinity of the Site, Chevron Texaco requests closure of this Site.
2. All remaining monitor wells and extraction wells, if not to be used in the future, should be properly plugged by a licensed water well driller.

Highlander appreciates the opportunity to support ChevronTexaco on this project. Please call if you have questions.

Sincerely,
Highlander Environmental Corp.



Ike Tavaréz
Geologist/Project Manager

CC: Rodney Bailey - ChevronTexaco Corporation.



**ChevronTexaco Corporation
Buckeye Vacuum Field Unit
Lea County, New Mexico**

Chronology of Events

- 1989 Texaco and NMOCD installed twenty-three (23) monitor wells (TW-1 through TW-23) and two extraction wells (#1 and #2) to locate the source and define the extent of chloride contamination.
- 02-19-90 Unichem International sampled monitor wells (TW-1 through TW-23) for chloride.
- 03-26-90 Unichem International sampled monitor wells (TW-1 through TW-23) for chloride.
- 05-01-90 Unichem International sampled monitor wells (TW-1 through TW-23) for chloride.
- 01-07-98 Highlander personnel performed groundwater monitoring. Sampled monitor wells (TW-1 through TW-23) and two (2) extraction wells (#1 and #2) for chloride.
- 2-24-98 Highlander resampled monitor well TW-23.
- 4-7-98 Highlander performed groundwater monitoring. Sampled monitor wells (TW-1 through TW-23) and two (2) extraction wells (#1 and #2) for chloride.
- May 1998 Highlander submitted Report "Results of Groundwater Monitoring" to the NMOCD. The report contained recommendations for monitor well plugging and future closure of the Site.
- 8-19-98 NMOCD response letter requested BTEX samples from all (23) monitor wells and (2) extraction wells.
- 9-2-98 Highlander performed groundwater monitoring. Sampled monitor wells (TW-1 through TW-23) and two (2) extraction wells (#1 and #2) for chloride and BTEX.
- October 1998 Highlander submitted "Groundwater Monitoring Report" to NMOCD. Proposed to plug sixteen (16) monitor wells and continue to monitor seven (7) monitor wells and two (2) extraction wells (#1 and #2) on a quarterly basis for 1 year.



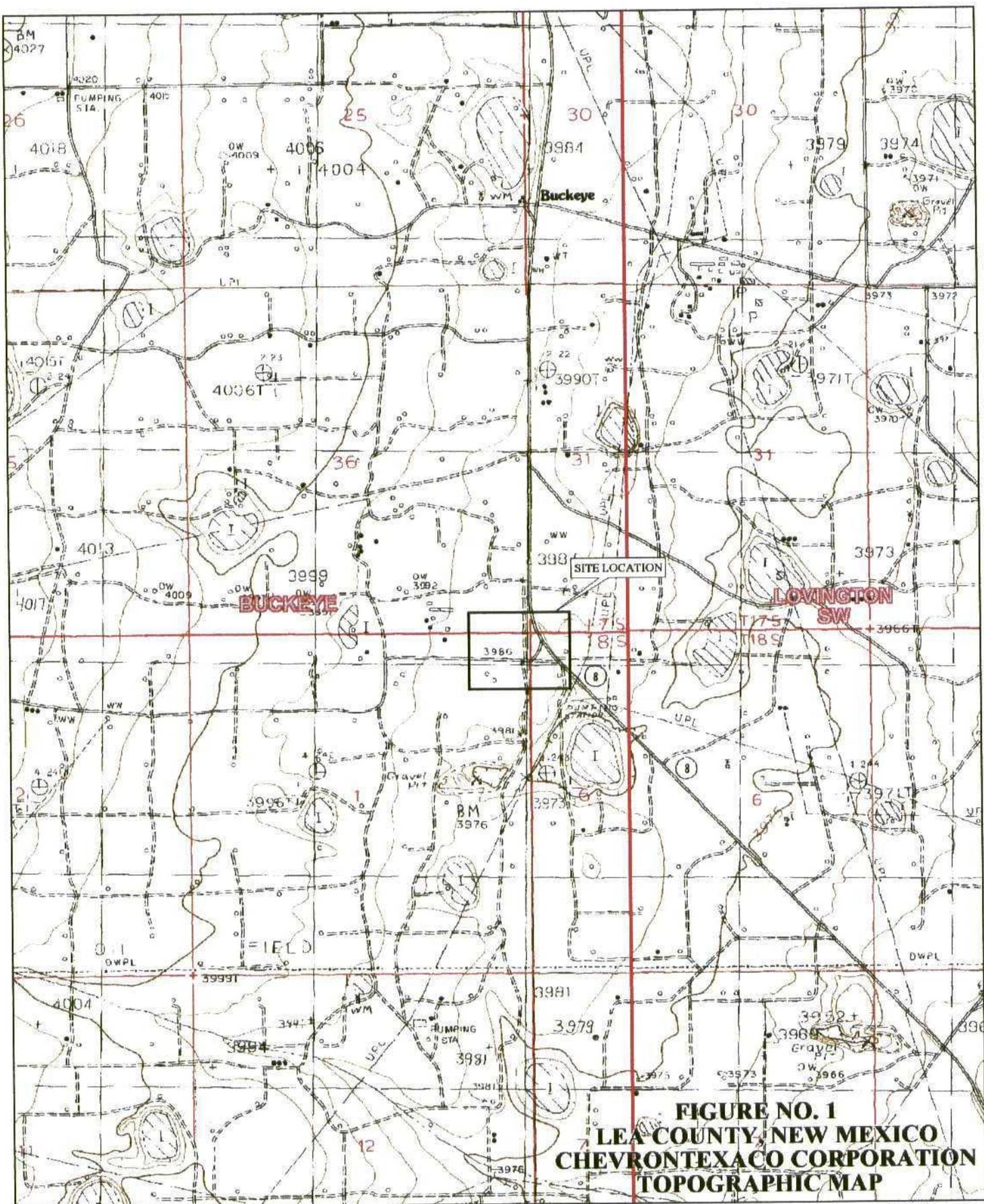
- 01-29-98 NMOCD response letter approved recommendation to monitor the seven (7) monitor wells listed in the Groundwater Monitoring Report. However, three additional monitor wells, TW-10, TW-13, and TW-20, were included in the quarterly monitoring program. NMOCD requested a work plan for the plugging and abandonment of the monitor wells.
- 02-22-99 Highlander performed 1st quarter monitoring, sampling ten (10) monitor wells, and two extraction wells (#1 and #2) at the Site.
- 04-14-99 Highlander submitted "Workplan for Plugging of Monitor wells" to plug 13 monitor wells.
- 05-26-99 Highlander performed 2nd quarter monitoring, sampling ten (10) monitor wells, and two extraction wells (#1 and #2) at the Site.
- 06-14-99 NMOCD response letter approved the workplan for plugging (13) monitor wells.
- 07-22-99
- 11-18-99 Scarborough Drilling Inc. plugged (13) monitor wells. (TW-1, TW-2, TW-3, TW-4, TW-5, TW-6, TW-7, TW-8, TW-12, TW-16, TW-18, TW-21, and TW-22)
- 08-19-99 Highlander performed 3rd quarter monitoring, sampling ten (10) monitor wells, and two extraction wells (#1 and #2) at the Site.
- 09-21-99 Highlander sampled TW-23 (monthly basis).
- 10-25-99 Highlander sampled TW-23 (monthly basis).
- 11-22-99 Highlander performed 4th quarter monitoring, sampling ten (10) monitor wells, and two extraction wells (#1 and #2) at the Site.
- 12-22-99 Surveyed current monitor wells and extraction wells.
- 2000 Texaco plugged VG SAU Well #58.
- 04-26-00 Highlander performed semi-annual monitoring, sampling (6) monitor wells, and two extraction wells (#1 and #2) at the Site. As directed by the NMOCD.
- 11-21-00 Highlander performed annual monitoring, sampling (6) monitor wells, and two extraction wells (#1 and #2) at the Site.
- Dec. 2000 Highlander submitted the 2000 Annual Groundwater Monitoring Report to the NMOCD for review.



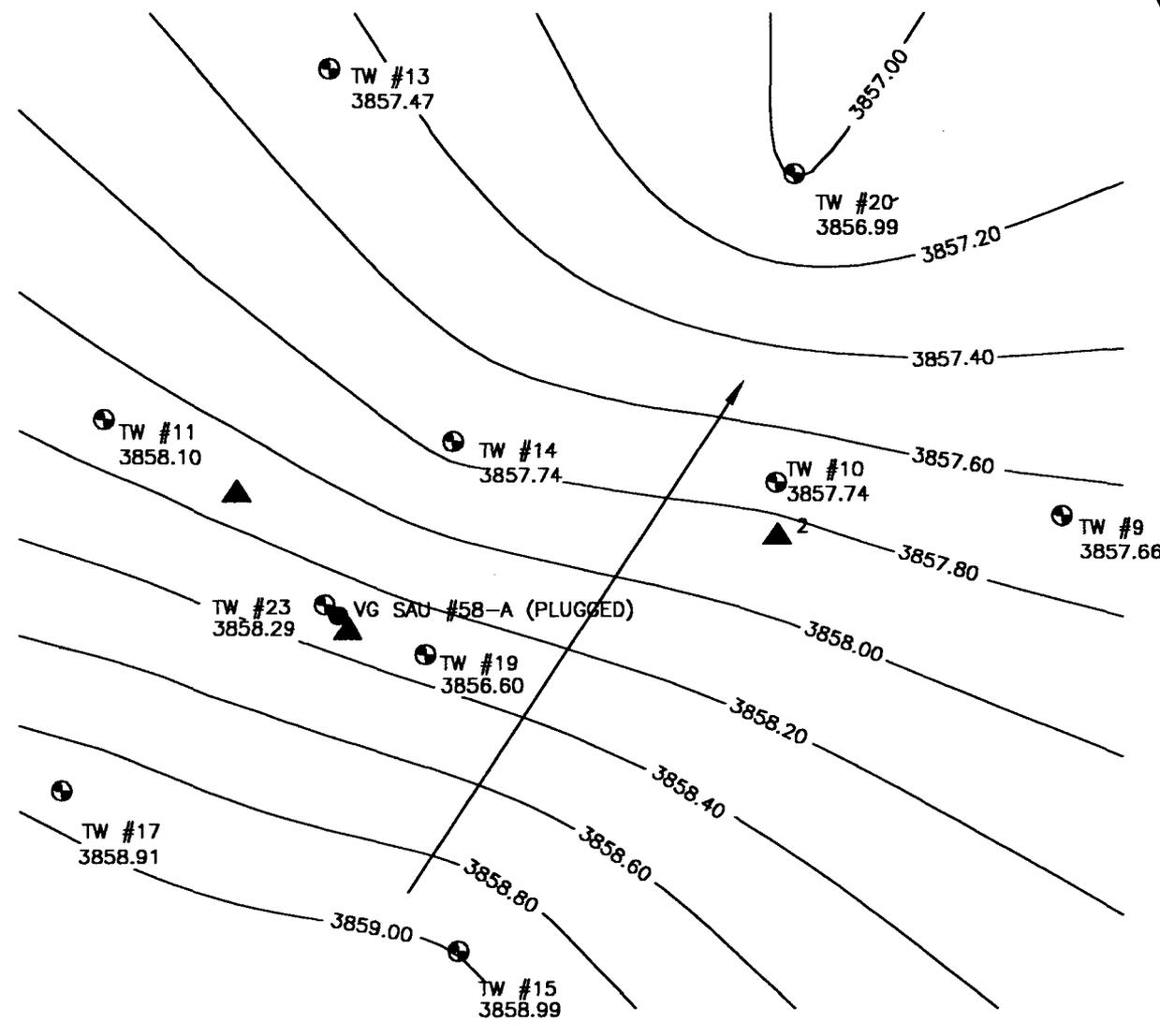
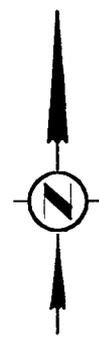
- 02-23-01 Highlander performed quarterly monitoring sampling on TW-23.
- 06-14-01 Highlander performed annual monitoring, sampling (6) monitor wells, and two extraction wells (#1 and #2) at the Site.
- 08-10-01 Highlander performed quarterly monitoring sampling on TW-23.
- 10-11-01 Highlander supervised the installation of water well (extraction well #3) near TW-23 for remediation.
- 11-14-01 Highlander performed annual monitoring, sampling (10) monitor wells and two extraction wells (#1 and #2) at the Site.
- 12-12-01 The submersible pump from extraction well #2 was removed and installed into extraction well #3.
- 12-17-02 ChevronTexaco started pumping Extraction Well #3.
- 02-21-02 Highlander performed quarterly monitoring sampling on TW-23 and Extraction well #3.
- 05-15-02 Highlander performed semi-annual monitoring, sampling (7) monitor wells and three extraction wells at the Site.
- 08-29-02 Highlander performed quarterly monitoring sampling on TW-15, TW-23 and Extraction wells #1 and #3.
- 09-26-02 Highlander samples TW-15.
- 11-06-02 Highlander performed annual monitoring, sampling (10) monitor wells and one extraction well (#2) at the Site.



FIGURES



**FIGURE NO. 1
LEA COUNTY, NEW MEXICO
CHEVRONTXACO CORPORATION
TOPOGRAPHIC MAP**



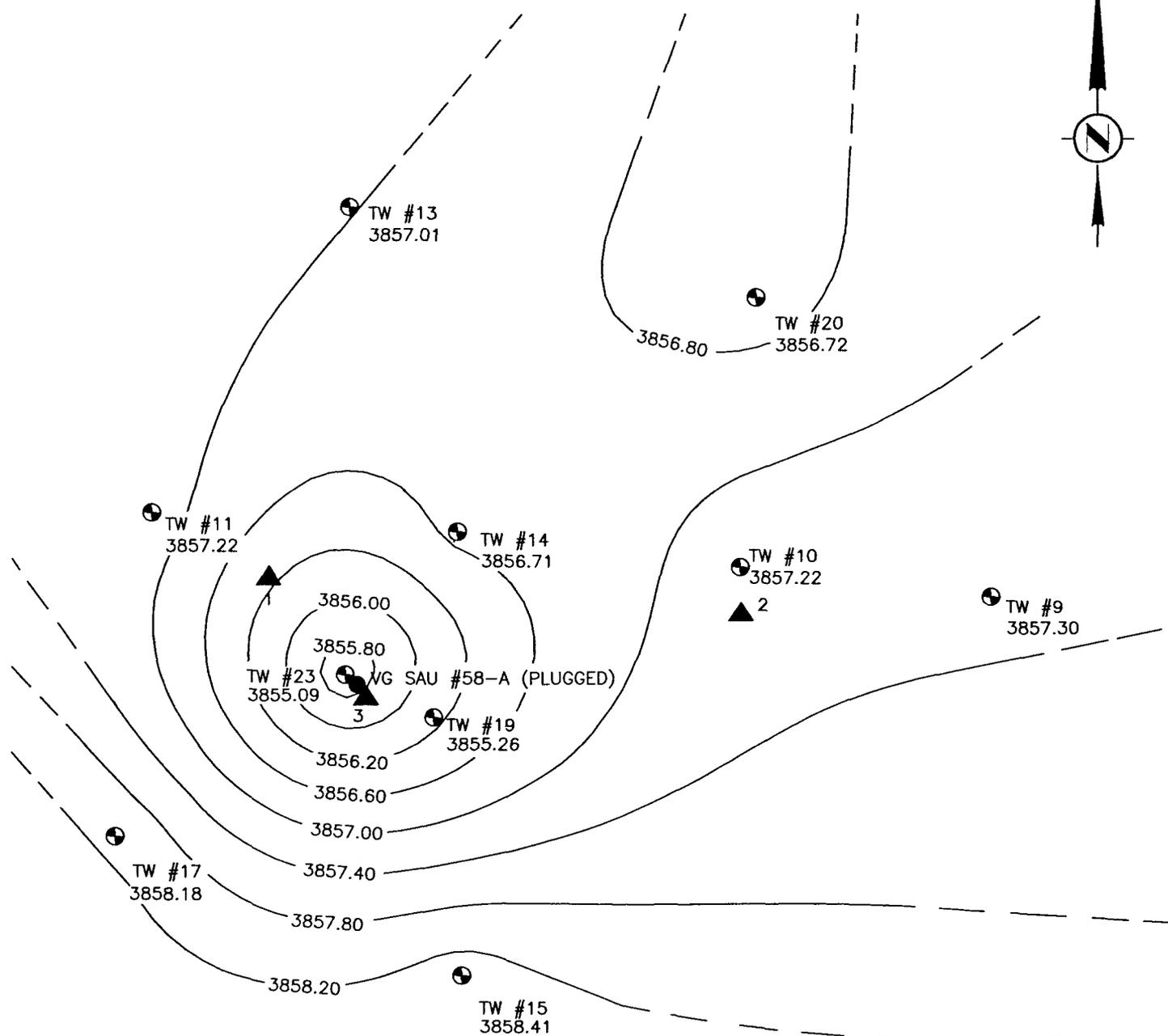
SCALE 1" = 200'

FIGURE NO. 2

LEGEND	
▲	EXTRACTION WELL
⊕	MONITOR WELL
●	PRODUCING WELL

DATE:	12/19/02
DWN. BY:	JDA
FILE:	C:\TEXACO\1057\GW-TABLE-2-02

CHEVRONTEXACO CORPORATION
WATER TABLE MAP (2/21/02) VACUUM FIELD BUCKEYE LEA COUNTY, NEW MEXICO
HIGHLANDER ENVIRONMENTAL CORP. MIDLAND, TEXAS



SCALE 1" = 200'

FIGURE NO. 3

LEGEND

-  EXTRACTION WELL
-  MONITOR WELL
-  PRODUCING WELL

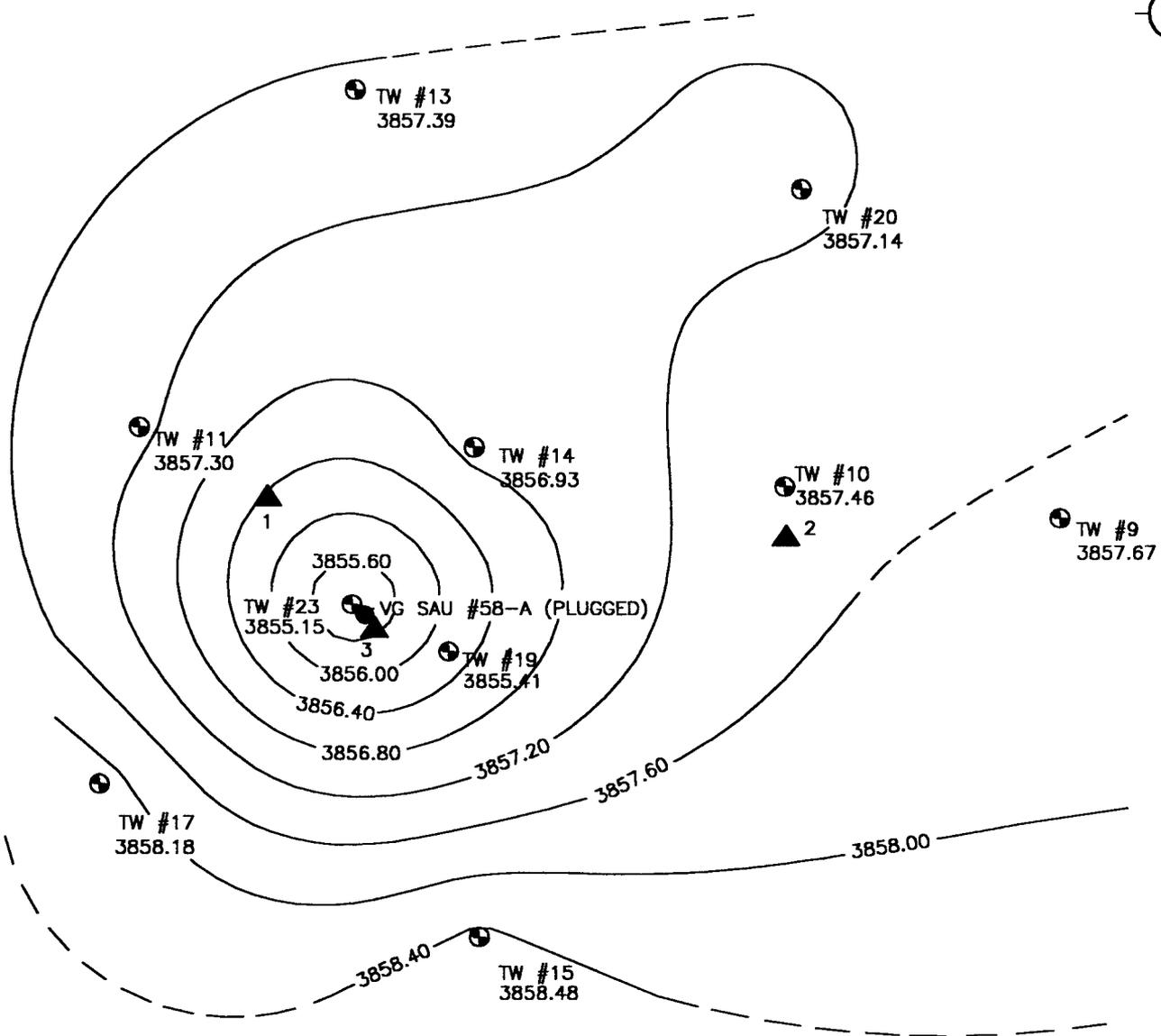
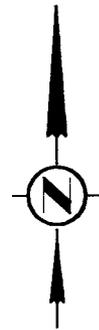
**CHEVRONTEXACO
CORPORATION**

WATER TABLE MAP (5/15/02)
VACUUM FIELD

BUCKEYE
LEA COUNTY, NEW MEXICO

*HIGHLANDER ENVIRONMENTAL CORP.
MIDLAND, TEXAS*

DATE:
12/19/02
DWN. BY:
JDA
FILE:
C:\TEXACO\1057\
GW-TABLE-5-02



SCALE 1" = 200'

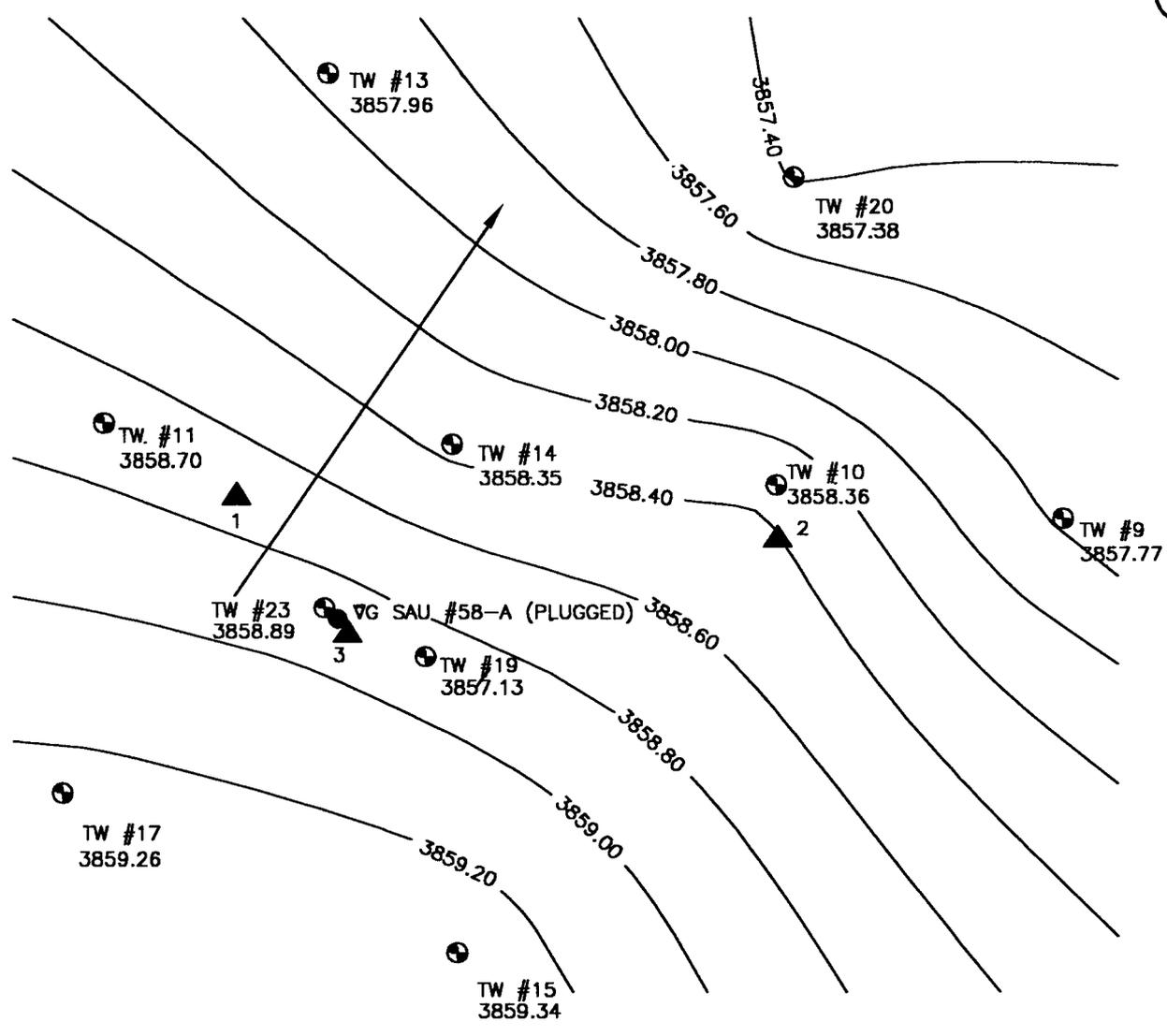
FIGURE NO. 4

CHEVRONTEXACO CORPORATION
WATER TABLE MAP (8/29/02) VACUUM FIELD BUCKEYE LEA COUNTY, NEW MEXICO
HIGHLANDER ENVIRONMENTAL CORP. MIDLAND, TEXAS

DATE: 12/19/02
DWN. BY: JDA
FILE: C:\TEXACO\1057\ CW-TABLE-8-02

LEGEND

-  EXTRACTION WELL
-  MONITOR WELL
-  PRODUCING WELL



SCALE 1" = 200'

FIGURE NO. 5

LEGEND	
▲	EXTRACTION WELL
⊕	MONITOR WELL
●	PRODUCING WELL

CHEVRONTEXACO CORPORATION
WATER TABLE MAP (11/6/02) VACUUM FIELD BUCKEYE LEA COUNTY, NEW MEXICO
HIGHLANDER ENVIRONMENTAL CORP. MIDLAND, TEXAS

DATE: 12/19/02
DWN. BY: JDA
FILE: C:\TEXACO\1057\ GW-TABLE-11-02

TABLES

Table 1
ChevronTexaco Corporation
Cumulative Depth to Water Measurement
Buckeye, Vacuum Field Unit
Lea County, New Mexico

Monitoring Date	TW-9	TW-10	TW-11	TW-13	TW-14	TW-15	TW-17	TW-19	TW-20	TW-23	EW-1	EW-2	EW-3
2/22/99	-	-	-	-	-	-	-	-	-	-	-	-	-
05/26/99	129.97	129.49	130.29	130.20	128.19	124.04	125.26	124.69	130.25	125.82	-	-	-
08/19/99	130.15	129.74	130.50	130.44	128.46	124.23	125.46	124.90	130.42	126.00	-	-	-
11/22/99	129.72	129.25	130.70	129.70	128.03	123.94	125.30	124.55	129.99	125.66	-	-	-
12/22/99	129.93	129.58	130.37	130.20	128.23	124.06	125.38	124.77	130.21	125.89	-	**138.6	-
4/26/00	-	-	129.33	-	127.12	123.46	124.62	123.80	-	124.78	-	-	-
11/21/00	129.97	129.51	130.37	130.34	128.21	124.05	125.32	*	130.31	125.82	-	-	-
2/23/01	-	-	-	-	-	-	-	-	-	125.62	-	-	-
6/14/01	-	-	131.1	-	129.86	124.72	126.01	*127.04	-	127.56	-	-	-
8/10/01	-	-	-	-	-	-	-	-	-	125.86	-	-	-
11/13/01	130.42	129.62	130.86	131.09	128.66	124.62	126.04	*126.6	130.84	126.08	-	-	126.18
2/21/02	130.94	130.03	131.04	131.23	128.93	125.08	126.31	*127.13	131.40	126.47	-	129.25	-
5/15/02	131.30	130.60	131.92	131.69	129.96	125.66	127.04	*128.47	131.67	129.67	-	129.88	-
8/29/02	130.93	130.31	131.84	131.31	129.74	125.59	127.04	*128.32	131.25	129.61	-	129.60	-
9/26/02	-	-	-	-	-	125.43	-	-	-	-	-	-	-
11/6/02	130.83	129.41	130.44	130.74	128.32	124.73	125.96	*126.6	131.01	125.87	-	128.91	125.47

Measurements collected top of casing

** Pumping level

(-) No Data

* Damaged Top Casing

EW - extraction well

Table 2
 ChevronTexaco Corporation
 Cumulative Groundwater Elevation
 Buckeye, Vacuum Field Unit
 Lea County, New Mexico

Elevation of Top of Casing (ft)	TW-9	TW-10	TW-11	TW-13	TW-14	TW-15	TW-17	TW-19	TW-20	TW-23	EW-1	EW-2	EW-3
	3988.60	3987.77	3989.14	3988.70	3986.67	3984.07	3985.22	3983.73	3988.39	3984.76	3986.90	3986.99	-

02/21/02													
Elevation of Top of Groundwater (ft)	TW-9	TW-10	TW-11	TW-13	TW-14	TW-15	TW-17	TW-19	TW-20	TW-23	EW-1	EW-2	EW-3
	3857.66	3857.74	3858.10	3857.47	3857.74	3858.99	3858.91	3856.60	3856.99	3858.29	-	-	-

05/15/02													
Elevation of Top of Groundwater (ft)	TW-9	TW-10	TW-11	TW-13	TW-14	TW-15	TW-17	TW-19	TW-20	TW-23	EW-1	EW-2	EW-3
	3857.30	3857.17	3857.22	3857.01	3856.71	3858.41	3858.18	3855.26	3856.72	3855.09	-	-	-

08/29/02													
Elevation of Top of Groundwater (ft)	TW-9	TW-10	TW-11	TW-13	TW-14	TW-15	TW-17	TW-19	TW-20	TW-23	EW-1	EW-2	EW-3
	3857.67	3857.46	3857.30	3857.39	3856.93	3858.48	3858.18	3855.41	3857.14	3855.15	-	-	-

11/06/02													
Elevation of Top of Groundwater (ft)	TW-9	TW-10	TW-11	TW-13	TW-14	TW-15	TW-17	TW-19	TW-20	TW-23	EW-1	EW-2	EW-3
	3857.77	3858.36	3858.70	3857.96	3858.35	3859.34	3859.26	3857.13	3857.38	3858.89	-	-	-

Table 3
 ChevronTexaco Corporation
 2001 and 2002 Cumulative Groundwater Sample Results

Buckeye, Vacuum Field Unit
 Lea County, New Mexico

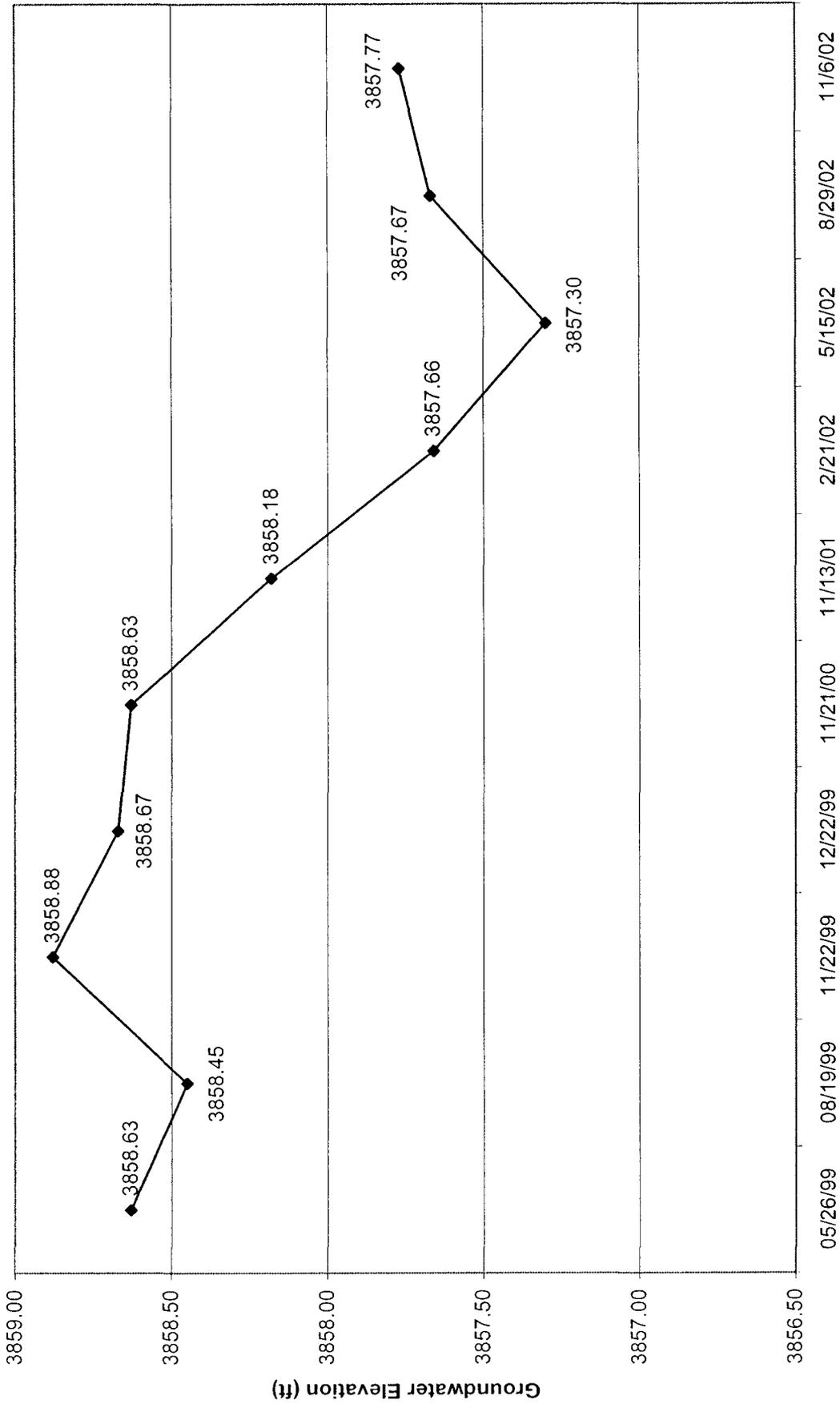
Sample ID	1st Quarter	Semi-Annual Sampling	3rd Quarter	Semi-Annual Sampling	1st Quarter	Semi-Annual Sampling	3rd Quarter	8/29/02	9/26/02	4th Quarter
	2/23/01	6/14/01	8/10/01	11/14/01	2/21/02	5/15/02	8/29/02	9/26/02	11/6/02	
	Chloride (mg/l)									
TW-9	-	-	-	303	-	360	-	-	-	173
TW-10	-	-	-	39.2	-	-	-	-	-	44.3
TW-11	-	39.6	-	34.8	-	30.6	-	-	-	25.1
TW-13	-	-	-	47.8	-	-	-	-	-	24.3
TW-14	-	39.4	-	41.5	-	91.1	-	-	-	30.4
TW-15	-	233	-	383	-	562	571	487	494	
TW-17	-	31.9	-	27.2	-	27.5	-	-	-	26.1
TW-19	-	-	-	25.8	-	29.2	-	-	-	27.5
TW-20	-	-	-	37	-	-	-	-	-	45.9
TW-23	2700 3100	5330	2729	1070	77.1	157.0	276	-	-	384
Ex. Well #1	-	156	-	217	-	273	239	-	-	-
Ex. Well #2	-	205	-	223	-	68.6	-	-	-	89
Ex. Well #3	-	-	-	7050	247	386	289	-	-	-

Not Sampled (-)
 Ex. Well #1 and #3 - (pumping)

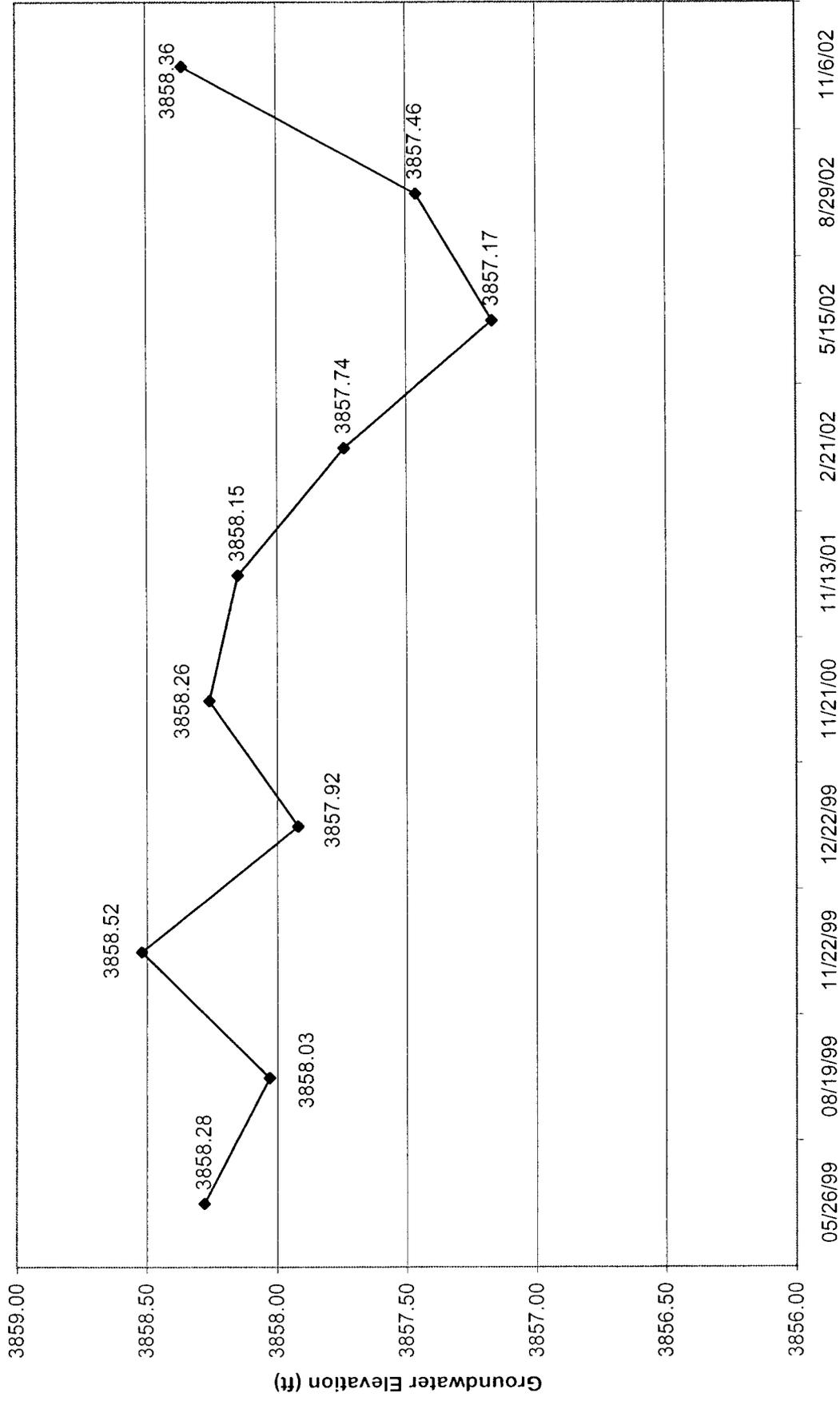
APPENDIX A

GRAPHS

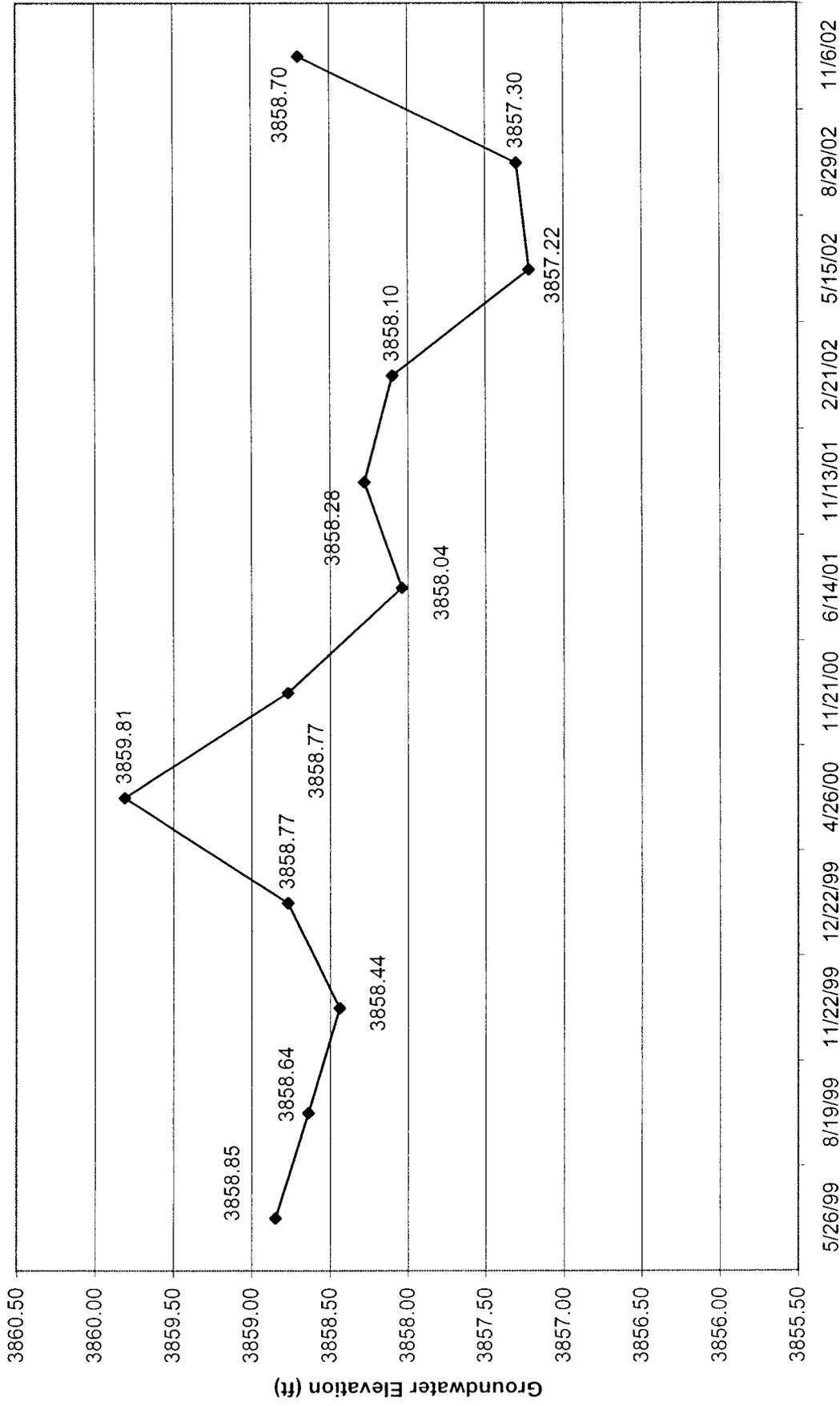
TW-9 Hydrograph



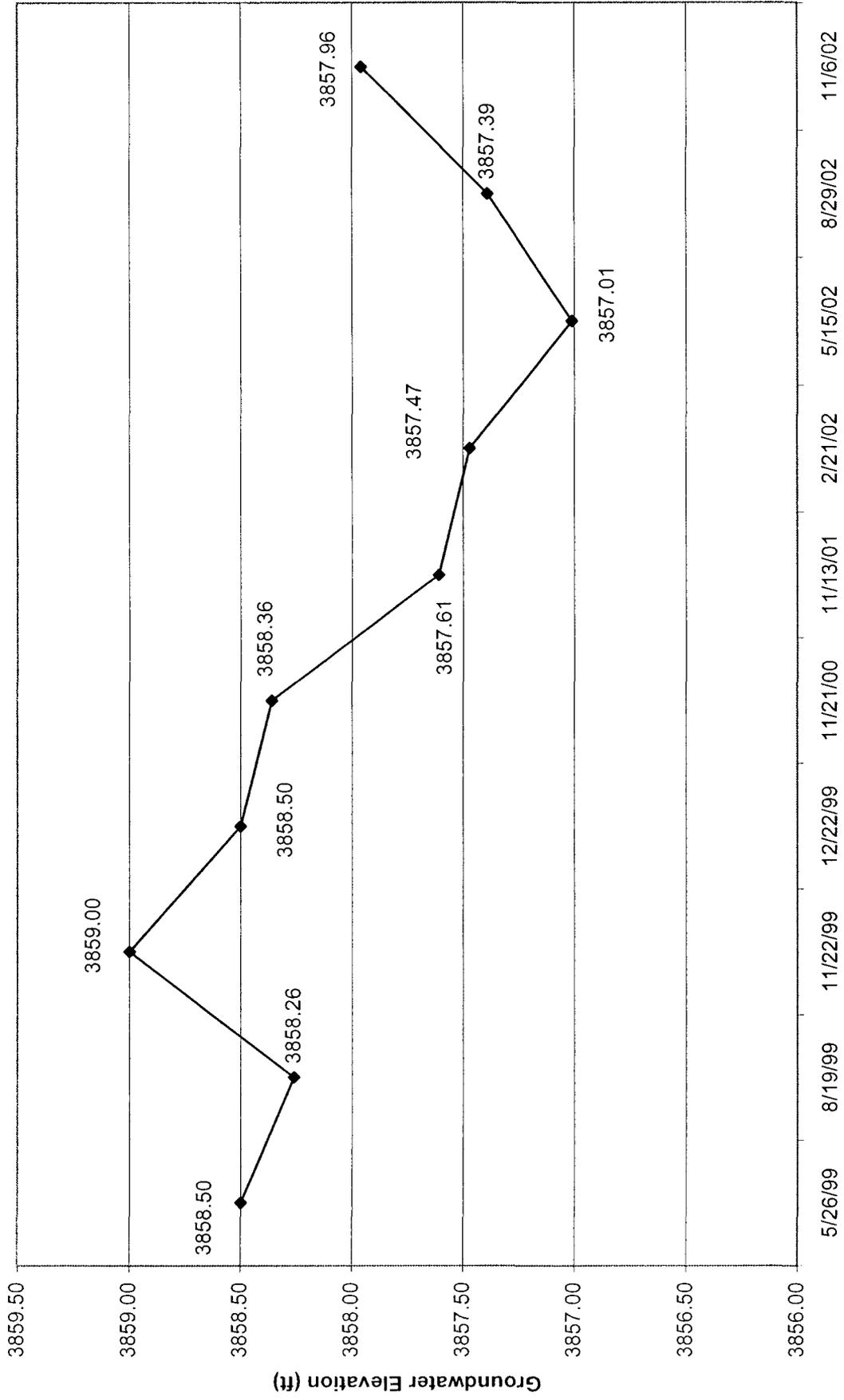
TW-10 Hydrograph



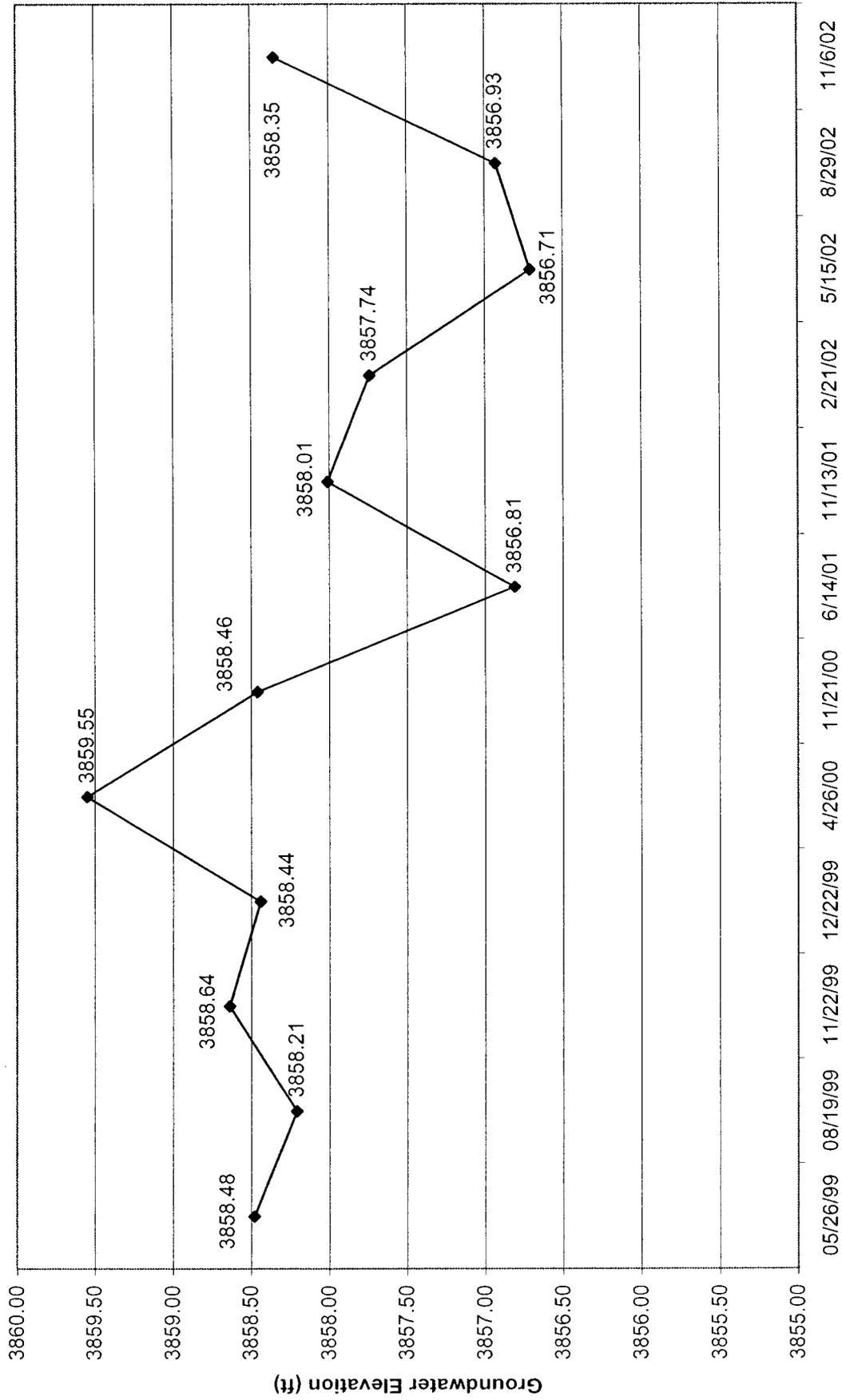
TW-11 Hydrograph



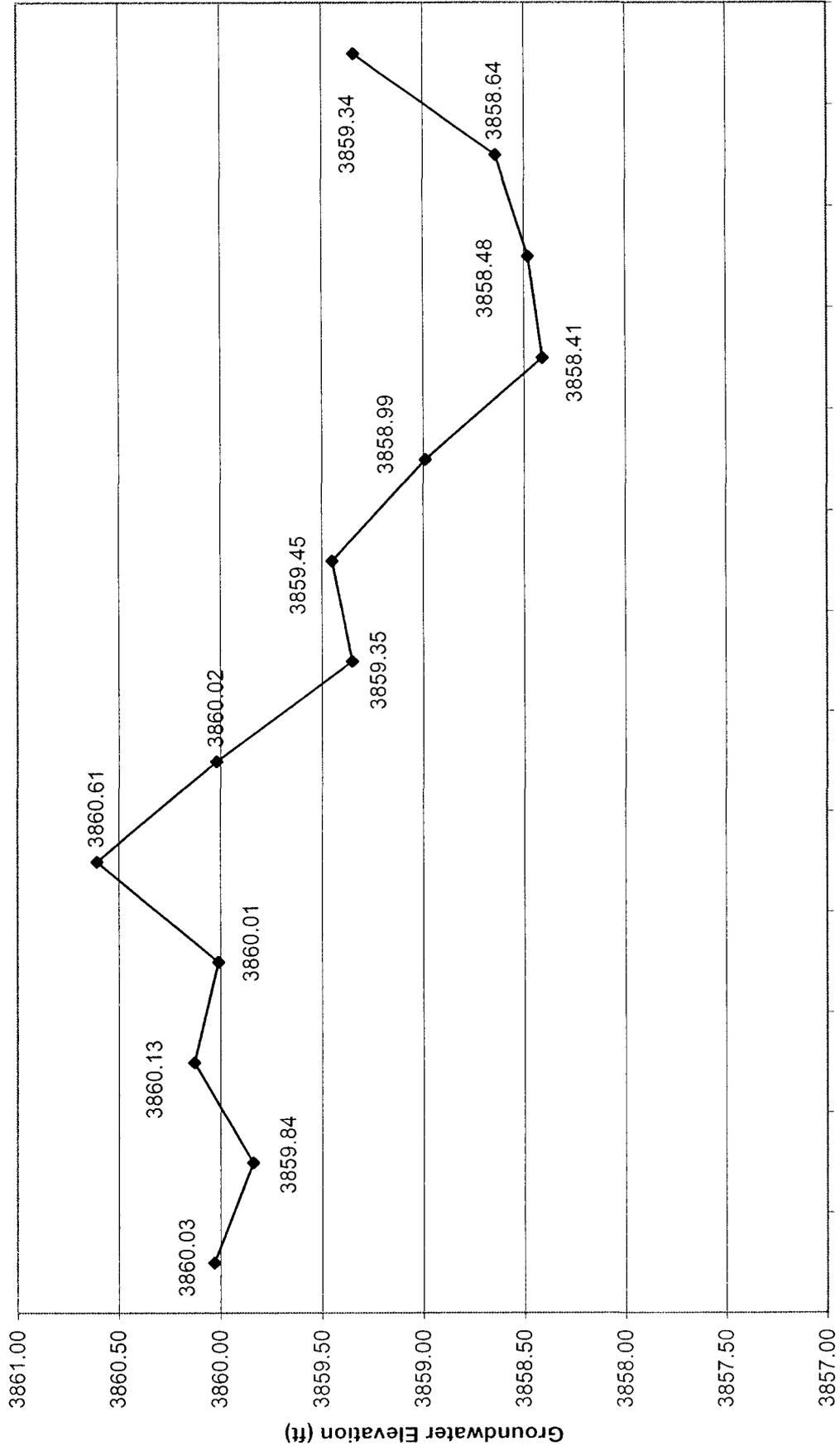
TW-13 Hydrograph



TW-14 Hydrograph

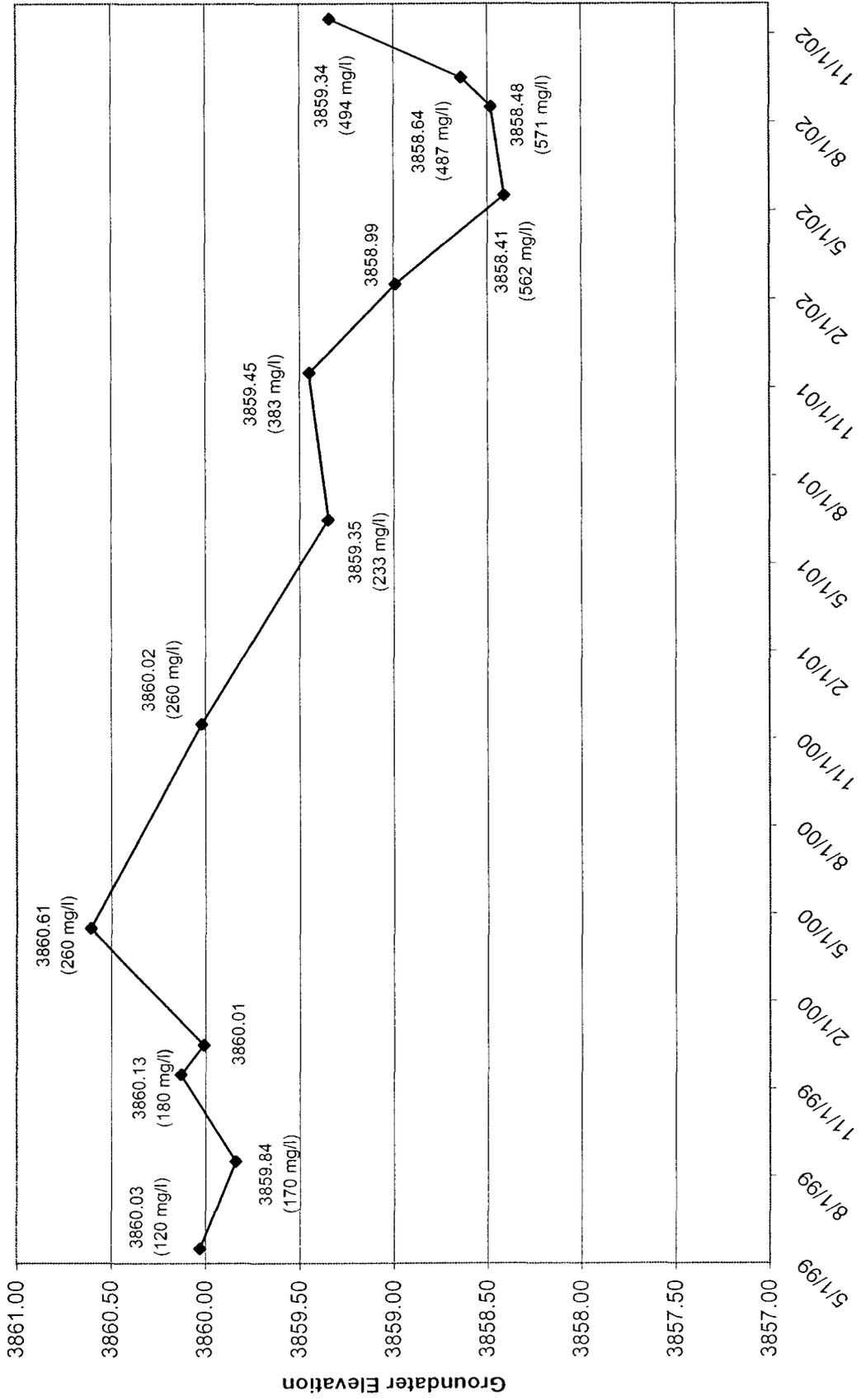


TW-15 Hydrograph

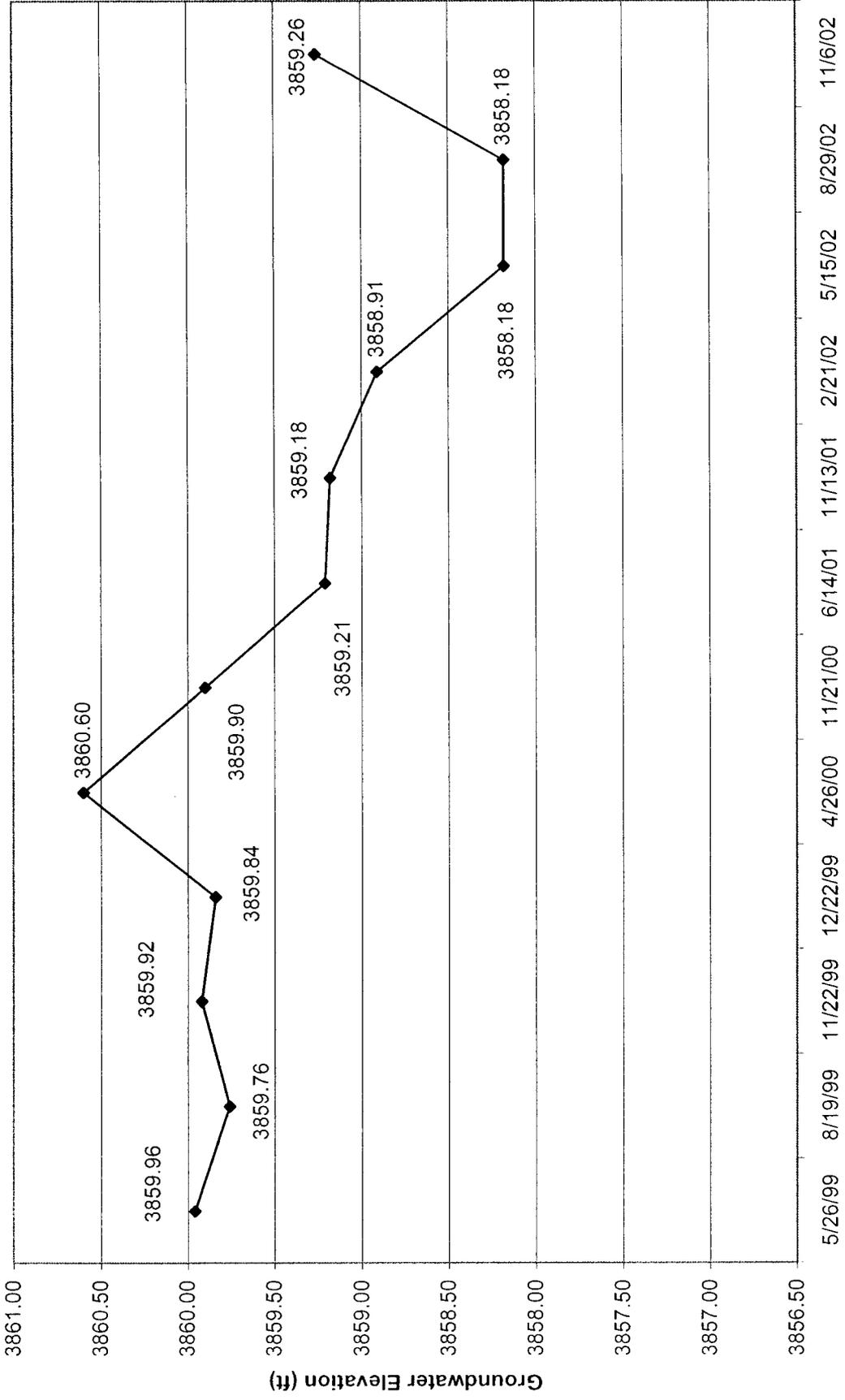


05/26/99 08/19/99 11/22/99 12/22/99 04/26/00 11/21/00 06/14/01 11/13/01 02/21/02 05/15/02 08/29/02 09/26/02 11/16/02

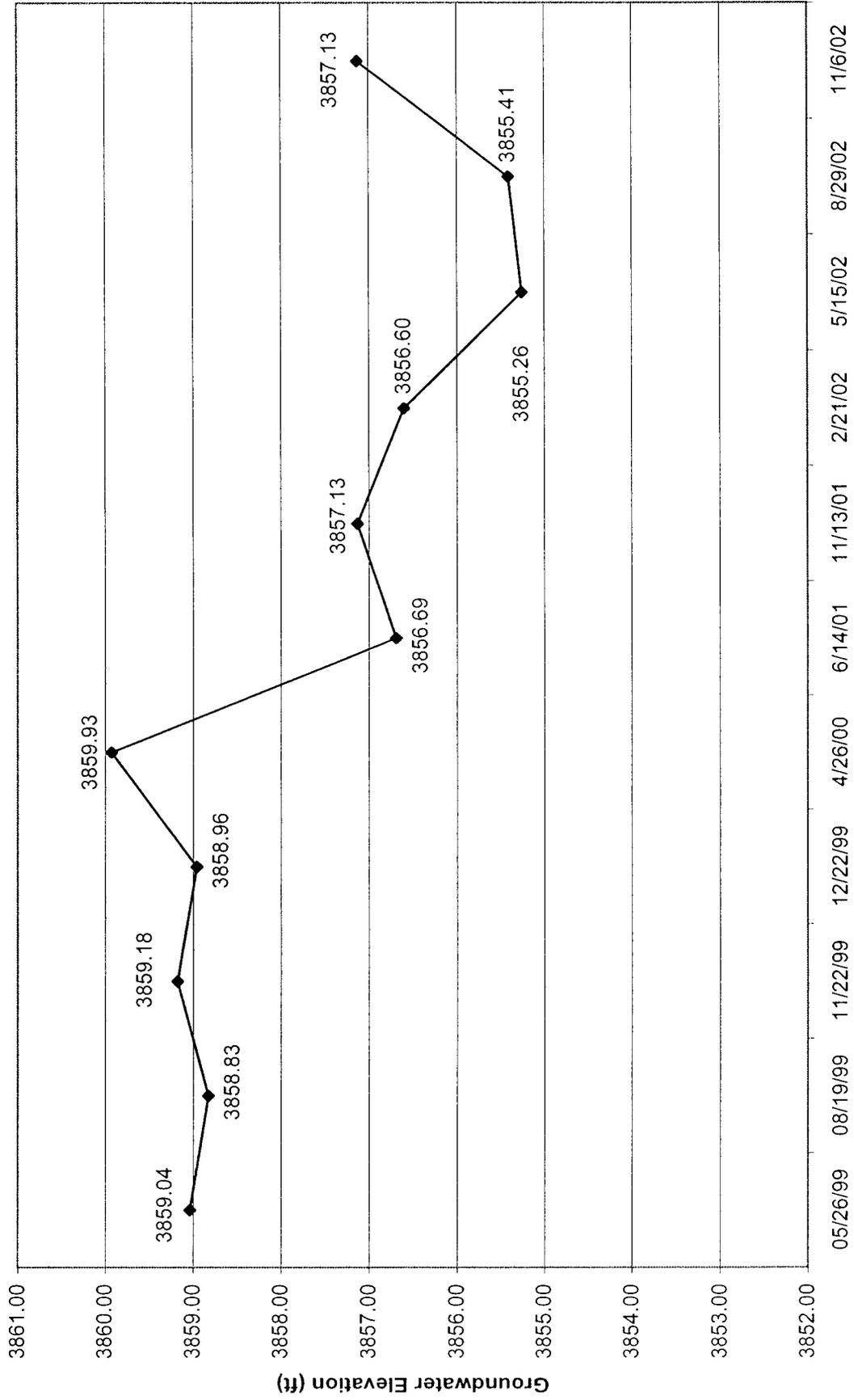
TW-15 Groundwater Elevation vs Chloride Concentrations



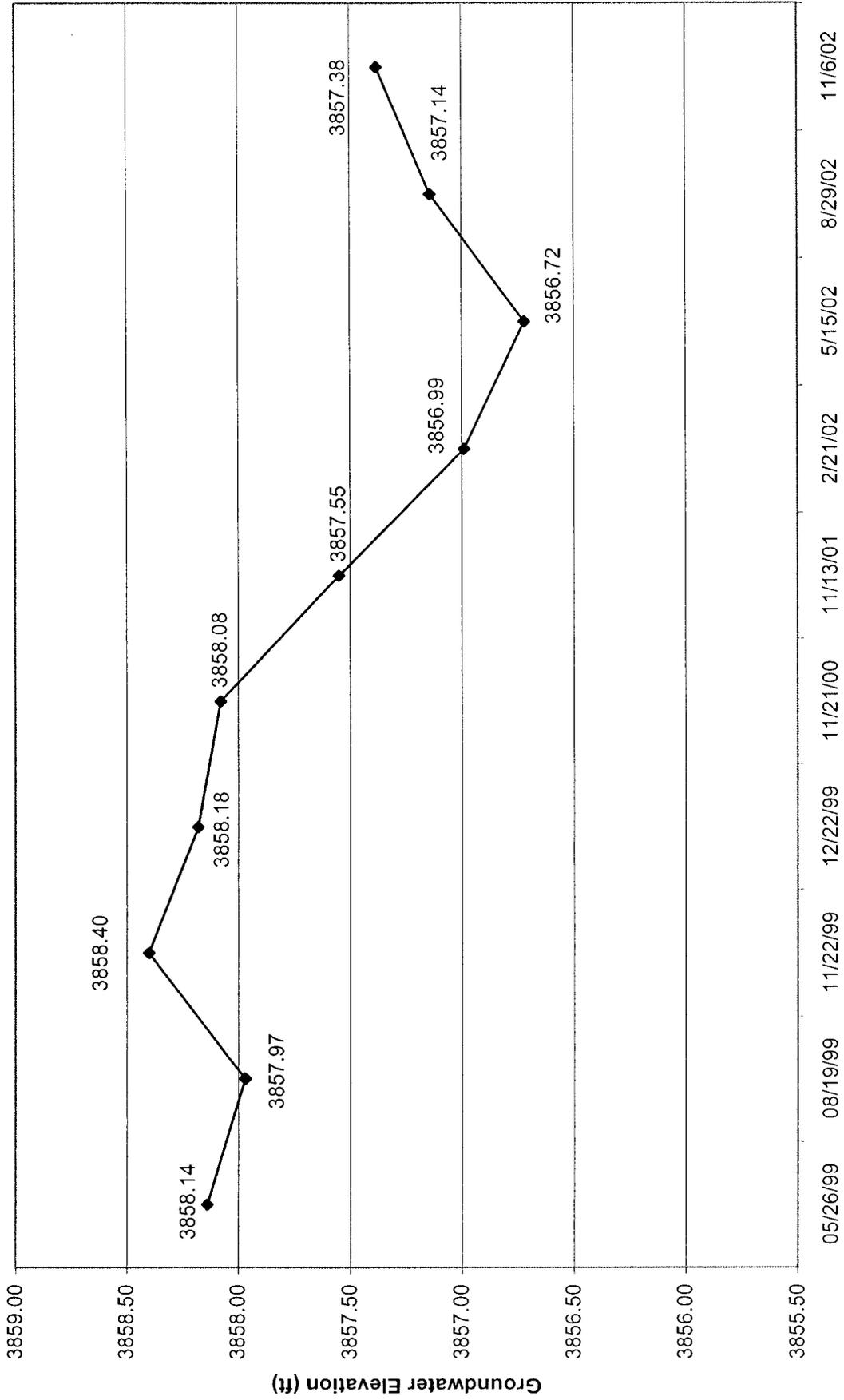
TW-17 Hydrograph



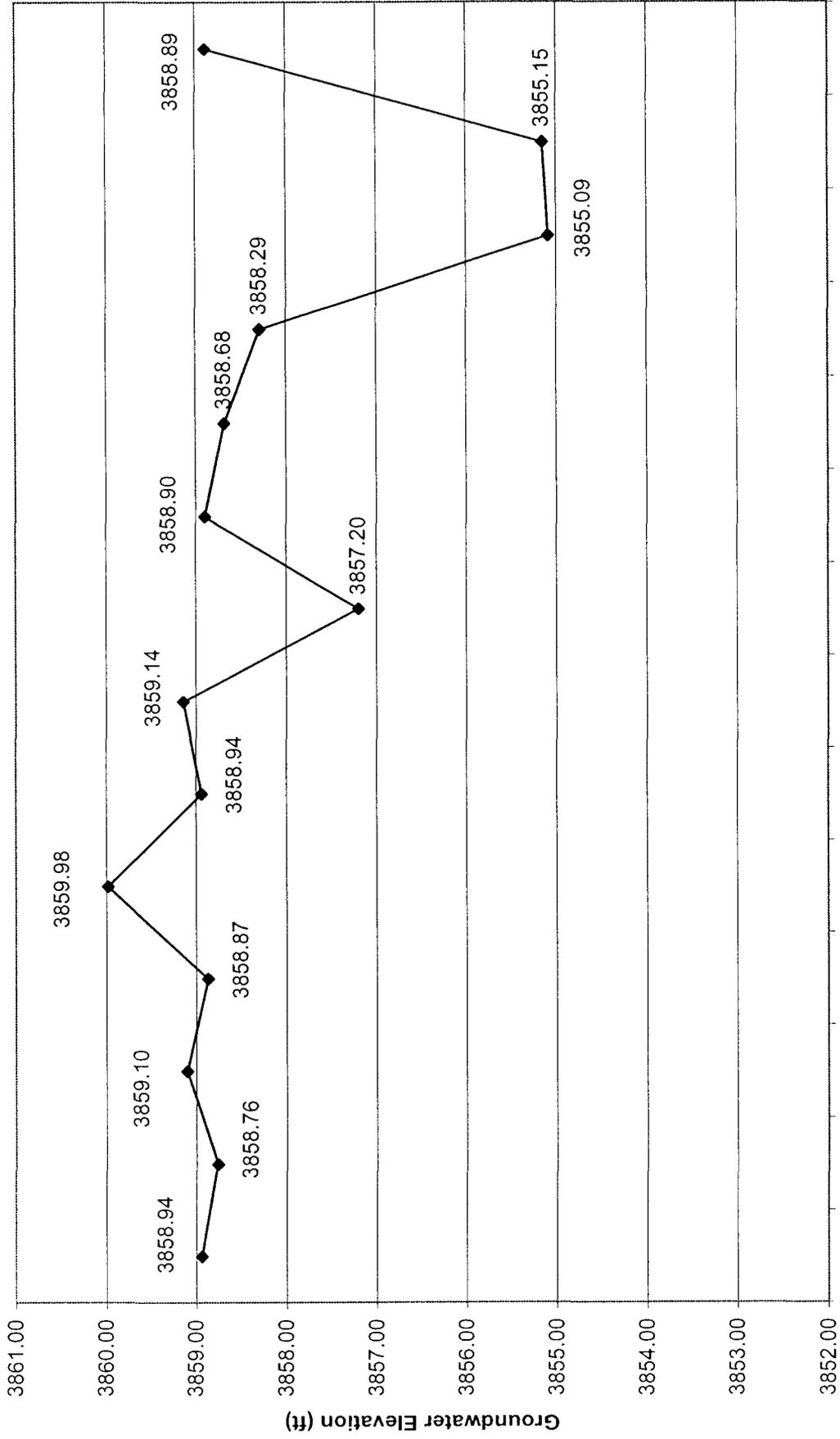
TW-19 Hydrograph



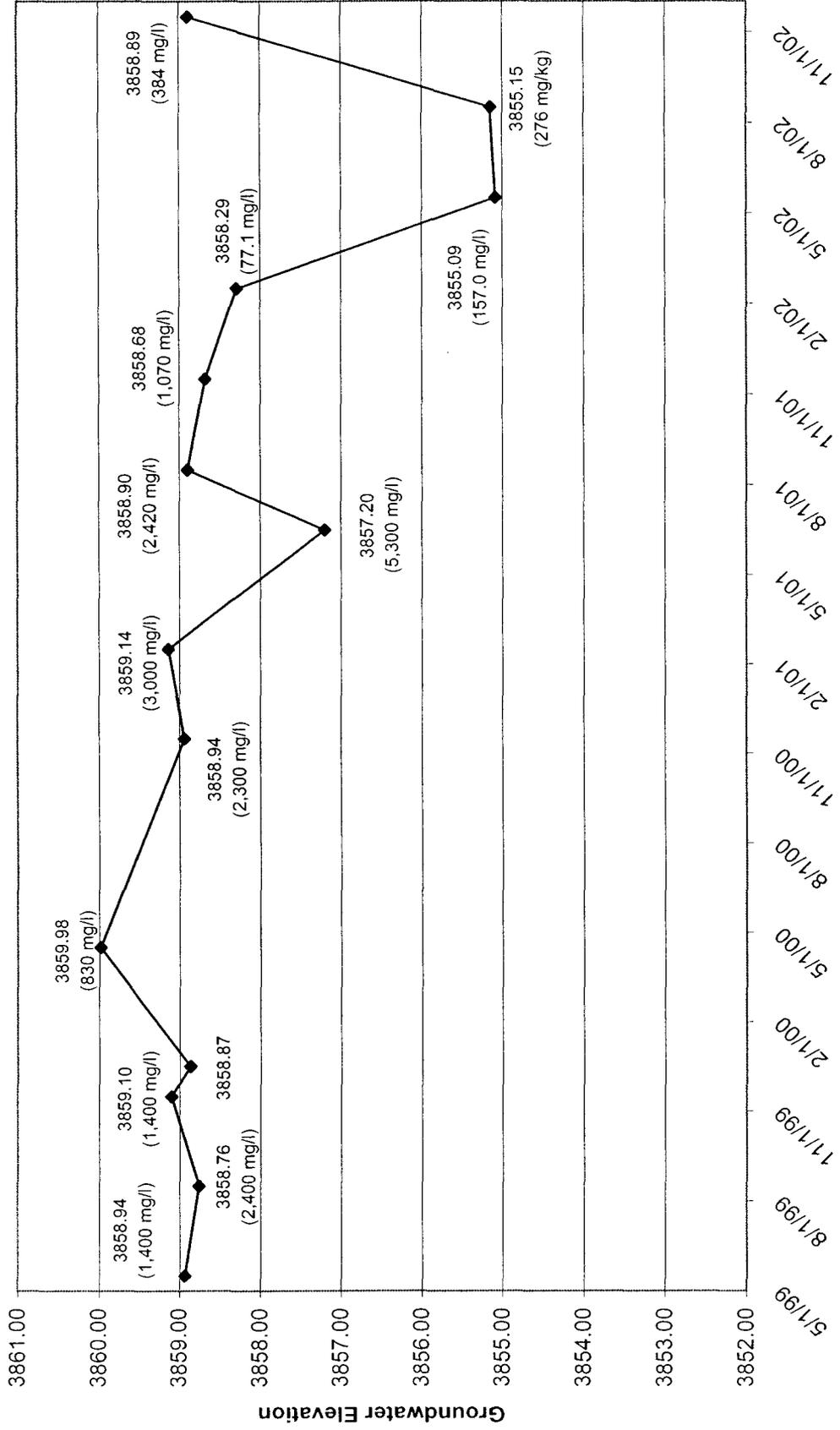
TW-20 Hydrograph



TW-23 Hydrograph



TW-23 Hydrograph Groundwater Elevations vs Chloride Concentrations



APPENDIX B

SUMMARY REPORTS & LAB ANALYSIS

First Quarter

Report Date: February 27, 2002 Order Number: A02022516
1057 Texaco/Texaco-Vacuum Field Bukeye

Page Number: 1 of 1
Lea County, New Mexico

Summary Report

Ike Tavarez
Highlander Environmental Services
1910 N. Big Spring St.
Midland, TX 79705

Report Date: February 27, 2002

Order ID Number: A02022516

Project Number: 1057
Project Name: Texaco/Texaco-Vacuum Field Bukeye
Project Location: Lea County, New Mexico

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
191581	TW-23	Water	2/21/02	14:30	2/23/02
191582	EW-3	Water	2/21/02	14:45	2/23/02

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: 191581 - TW-23

Param	Flag	Result	Units
Chloride		77.1	mg/L

Sample: 191582 - EW-3

Param	Flag	Result	Units
Chloride		247	mg/L



TRACE ANALYSIS, INC.

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

Analytical and Quality Control Report

Ike Tavarez
 Highlander Environmental Services
 1910 N. Big Spring St.
 Midland, TX 79705

Report Date: February 27, 2002

Order ID Number: A02022516

Project Number: 1057
 Project Name: Texaco/Texaco-Vacuum Field Bukeye
 Project Location: Lea County, New Mexico

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

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
191581	TW-23	Water	2/21/02	14:30	2/23/02
191582	EW-3	Water	2/21/02	14:45	2/23/02

0
 These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed. Note: the RDL is equal to MQL for all organic analytes including TPH.

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 Dr. Blair Leftwich, Director

Analytical Report

Sample: 191581 - TW-23

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC18454 Date Analyzed: 2/25/02
Analyst: JS Preparation Method: N/A Prep Batch: PB17927 Date Prepared: 2/25/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		77.1	mg/L	10	0.50

Sample: 191582 - EW-3

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC18454 Date Analyzed: 2/25/02
Analyst: JS Preparation Method: N/A Prep Batch: PB17927 Date Prepared: 2/25/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		247	mg/L	10	0.50

Quality Control Report Method Blank

Method Blank QCBatch: QC18454

Param	Flag	Results	Units	Reporting Limit
Chloride		<2.0	mg/L	0.50

Quality Control Report Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes QCBatch: QC18454

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	11.37	11.63	mg/L	1	12.50	<2.0	90	2	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: QC18454

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	357.95	358.26	mg/L	1	125	247	88	0	52 - 131	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: QC18454

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.32	90	90 - 110	2/25/02

ICV (1) QCBatch: QC18454

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.36	90	90 - 110	2/25/02

Second Quarter

Report Date: June 5, 2002
1057Order Number: A02052122
Texaco/Texaco-Vacuum Field BukeyePage Number: 1 of 2
Lea County, New Mexico

Summary Report

Ike Tavarez
Highlander Environmental Services
1910 N. Big Spring St.
Midland, TX 79705

Report Date: June 5, 2002

Order ID Number: A02052122

Project Number: 1057
Project Name: Texaco/Texaco-Vacuum Field Bukeye
Project Location: Lea County, New Mexico

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
197518	TW-9	Water	5/15/02	13:35	5/21/02
197519	TW-11	Water	5/15/02	17:05	5/21/02
197520	TW-14	Water	5/15/02	16:00	5/21/02
197521	TW-15	Water	5/16/02	10:30	5/21/02
197522	TW-17	Water	5/16/02	9:30	5/21/02
197523	TW-19	Water	5/16/02	12:00	5/21/02
197524	TW-23	Water	5/16/02	17:16	5/21/02
197525	EW-1	Water	5/16/02	13:35	5/21/02
197526	EW-2	Water	5/15/02	14:35	5/21/02
197527	EW-3	Water	5/16/02	13:15	5/21/02

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.

Sample: 197518 - TW-9

Param	Flag	Result	Units
Chloride		360	mg/L

Sample: 197519 - TW-11

Param	Flag	Result	Units
Chloride		30.6	mg/L

Sample: 197520 - TW-14

Param	Flag	Result	Units
Chloride		91.1	mg/L

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

Report Date: June 5, 2002
1057Order Number: A02052122
Texaco/Texaco-Vacuum Field BukeyePage Number: 2 of 2
Lea County, New Mexico**Sample: 197521 - TW-15**

Param	Flag	Result	Units
Chloride	1	562	mg/L

Sample: 197522 - TW-17

Param	Flag	Result	Units
Chloride		27.5	mg/L

Sample: 197523 - TW-19

Param	Flag	Result	Units
Chloride		29.2	mg/L

Sample: 197524 - TW-23

Param	Flag	Result	Units
Chloride		157	mg/L

Sample: 197525 - EW-1

Param	Flag	Result	Units
Chloride		273	mg/L

Sample: 197526 - EW-2

Param	Flag	Result	Units
Chloride		68.6	mg/L

Sample: 197527 - EW-3

Param	Flag	Result	Units
Chloride		386	mg/L

¹This sample was reran on IC060302-1 with matrix spikes: %EA = 91 and RPD = 0 Blank spikes: %EA = 92 and RPD = 1. For Chloride

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



TRACE ANALYSIS, INC.

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Analytical and Quality Control Report

Ike Tavarez
Highlander Environmental Services
1910 N. Big Spring St.
Midland, TX 79705

Report Date: June 5, 2002

Order ID Number: A02052122

Project Number: 1057
Project Name: Texaco/Texaco-Vacuum Field Bukeye
Project Location: Lea County, New Mexico

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

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
197518	TW-9	Water	5/15/02	13:35	5/21/02
197519	TW-11	Water	5/15/02	17:05	5/21/02
197520	TW-14	Water	5/15/02	16:00	5/21/02
197521	TW-15	Water	5/16/02	10:30	5/21/02
197522	TW-17	Water	5/16/02	9:30	5/21/02
197523	TW-19	Water	5/16/02	12:00	5/21/02
197524	TW-23	Water	5/16/02	17:16	5/21/02
197525	EW-1	Water	5/16/02	13:35	5/21/02
197526	EW-2	Water	5/15/02	14:35	5/21/02
197527	EW-3	Water	5/16/02	13:15	5/21/02

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 5 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: 197518 - TW-9

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC20426 Date Analyzed: 5/29/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB19519 Date Prepared: 5/29/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		360	mg/L	10	1

Sample: 197519 - TW-11

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC20426 Date Analyzed: 5/29/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB19519 Date Prepared: 5/29/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		30.6	mg/L	5	1

Sample: 197520 - TW-14

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC20426 Date Analyzed: 5/29/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB19519 Date Prepared: 5/29/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		91.1	mg/L	5	1

Sample: 197521 - TW-15

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC20426 Date Analyzed: 5/29/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB19519 Date Prepared: 5/29/02

Param	Flag	Result	Units	Dilution	RDL
Chloride	1	562	mg/L	50	1

Sample: 197522 - TW-17

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC20426 Date Analyzed: 5/29/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB19519 Date Prepared: 5/29/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		27.5	mg/L	5	1

Sample: 197523 - TW-19

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC20426 Date Analyzed: 5/29/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB19519 Date Prepared: 5/29/02

¹This sample was reran on IC060302-1 with matrix spikes: %EA = 91 and RPD = 0 Blank spikes: %EA = 92 and RPD = 1. For Chloride

Param	Flag	Result	Units	Dilution	RDL
Chloride		29.2	mg/L	5	1

Sample: 197524 - TW-23

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC20426 Date Analyzed: 5/29/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB19519 Date Prepared: 5/29/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		157	mg/L	5	1

Sample: 197525 - EW-1

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC20426 Date Analyzed: 5/29/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB19519 Date Prepared: 5/29/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		273	mg/L	10	1

Sample: 197526 - EW-2

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC20426 Date Analyzed: 5/29/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB19519 Date Prepared: 5/29/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		68.6	mg/L	5	1

Sample: 197527 - EW-3

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC20426 Date Analyzed: 5/29/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB19519 Date Prepared: 5/29/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		386	mg/L	10	1

Quality Control Report Method Blank

Method Blank QCBatch: QC20426

Param	Flag	Results	Units	Reporting Limit
Chloride		<1.0	mg/L	1

Quality Control Report Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes QCBatch: QC20426

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	11.50	11.55	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: QC20426

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	499.98	497.14	mg/L	1	125	386	91	2	48 - 127	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: QC20426

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.60	92	90 - 110	5/29/02

ICV (1) QCBatch: QC20426

Report Date: June 5, 2002
1057

Order Number: A02052122
Texaco/Texaco-Vacuum Field Bukeye

Page Number: 5 of 5
Lea County, New Mexico

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.52	92	90 - 110	5/29/02

Third Quarter

Report Date: September 4, 2002
1057Order Number: A02090305
Texaco/Texaco-Vacuum Field BukeyePage Number: 1 of 1
Lea County, New Mexico

Summary Report

Ike Tavarez
Highlander Environmental Services
1910 N. Big Spring St.
Midland, TX 79705

Report Date: September 4, 2002

Order ID Number: A02090305

Project Number: 1057
Project Name: Texaco/Texaco-Vacuum Field Bukeye
Project Location: Lea County, New Mexico

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
207004	TW-15	Water	8/29/02	12:15	8/31/02
207005	TW-23	Water	8/29/02	13:25	8/31/02
207006	RW-1 (Extraction Well)	Water	8/29/02	13:40	8/31/02
207007	RW-3 (Extraction Well)	Water	8/29/02	13:30	8/31/02

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: 207004 - TW-15

Param	Flag	Result	Units
Chloride		571	mg/L

Sample: 207005 - TW-23

Param	Flag	Result	Units
Chloride		276	mg/L

Sample: 207006 - RW-1 (Extraction Well)

Param	Flag	Result	Units
Chloride		239	mg/L

Sample: 207007 - RW-3 (Extraction Well)

Param	Flag	Result	Units
Chloride		289	mg/L

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



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Analytical and Quality Control Report

Ike Tavarez
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1910 N. Big Spring St.
Midland, TX 79705

Report Date: September 4, 2002

Order ID Number: A02090305

Project Number: 1057
Project Name: Texaco/Texaco-Vacuum Field Bukeye
Project Location: Lea County, New Mexico

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

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
207004	TW-15	Water	8/29/02	12:15	8/31/02
207005	TW-23	Water	8/29/02	13:25	8/31/02
207006	RW-1 (Extraction Well)	Water	8/29/02	13:40	8/31/02
207007	RW-3 (Extraction Well)	Water	8/29/02	13:30	8/31/02

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This report consists of a total of 3 pages and shall not be reproduced except in its entirety including the chain of custody (COC), without written approval of Trace Analysis, Inc.

Note: Samples will be disposed of 30 days from the report date unless the lab is contacted before the 30 days has past.



Dr. Blair Leftwich, Director

Analytical Report

Sample: 207004 - TW-15

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC23282 Date Analyzed: 9/3/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB21846 Date Prepared: 9/3/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		571	mg/L	50	1

Sample: 207005 - TW-23

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC23282 Date Analyzed: 9/3/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB21846 Date Prepared: 9/3/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		276	mg/L	10	1

Sample: 207006 - RW-1 (Extraction Well)

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC23282 Date Analyzed: 9/3/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB21846 Date Prepared: 9/3/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		239	mg/L	10	1

Sample: 207007 - RW-3 (Extraction Well)

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC23282 Date Analyzed: 9/3/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB21846 Date Prepared: 9/3/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		289	mg/L	10	1

Quality Control Report Method Blank

Method Blank QCBatch: QC23282

Param	Flag	Results	Units	Reporting Limit
Chloride		<1.0	mg/L	1

Quality Control Report Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes QCBatch: QC23282

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	11.33	11.30	mg/L	1	12.50	<1.0	90	0	90 - 110	20
Fluoride	2.28	2.27	mg/L	1	2.50	<0.2	91	0	90 - 110	20
Nitrate-N	2.25	2.25	mg/L	1	2.50	<0.2	90	0	90 - 110	20
Sulfate	11.63	11.79	mg/L	1	12.50	<0.2	93	1	90 - 110	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: QC23282

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.35	90	90 - 110	9/3/02
Fluoride		mg/L	2.50	2.30	92	90 - 110	9/3/02
Nitrate-N		mg/L	2.50	2.26	90	90 - 110	9/3/02
Sulfate		mg/L	12.50	11.74	93	90 - 110	9/3/02

ICV (1) QCBatch: QC23282

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.24	89	90 - 110	9/3/02
Fluoride		mg/L	2.50	2.35	94	90 - 110	9/3/02
Nitrate-N		mg/L	2.50	2.24	89	90 - 110	9/3/02
Sulfate		mg/L	12.50	13.53	108	90 - 110	9/3/02

TRACE ANALYSIS, INC.

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Analytical and Quality Control Report

Ike Tavarez
Highlander Environmental Services
1910 N. Big Spring St.
Midland, TX 79705

Report Date: October 2, 2002

Order ID Number: A02093022

Project Number: 1057
Project Name: Texaco/Texaco-Vacuum Field Bukeye
Project Location: Lea County, New Mexico

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

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
209328	TW-15	Water	9/26/02	11:00	9/28/02

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.

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Note: Samples will be disposed of 30 days from the report date unless the lab is contacted before the 30 days has past.



Dr. Blair Leftwich, Director

TraceAnalysis, Inc.

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(806) 794-1296

Report Date: October 2, 2002
1057

Order Number: A02093022
Texaco/Texaco-Vacuum Field Bukeye

Page Number: 1 of 1
Lea County, New Mexico

Summary Report

Ike Tavarez
Highlander Environmental Services
1910 N. Big Spring St.
Midland, TX 79705

Report Date: October 2, 2002

Order ID Number: A02093022

Project Number: 1057
Project Name: Texaco/Texaco-Vacuum Field Bukeye
Project Location: Lea County, New Mexico

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
209328	TW-15	Water	9/26/02	11:00	9/28/02

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: 209328 - TW-15

Param	Flag	Result	Units
Chloride		487	mg/L

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

Report Date: October 2, 2002
1057

Order Number: A02093022
Texaco/Texaco-Vacuum Field Bukeye

Page Number: 2 of 4
Lea County, New Mexico

Analytical Report

Sample: 209328 - TW-15

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC23892 Date Analyzed: 10/1/02

Analyst: JSW Preparation Method: N/A Prep Batch: PB22338 Date Prepared: 10/1/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		487	mg/L	50	1

Quality Control Report Method Blank

Method Blank QCBatch: QC23892

Param	Flag	Results	Units	Reporting Limit
Chloride		<1.0	mg/L	1

Quality Control Report Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes QCBatch: QC23892

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	11.88	11.85	mg/L	1	12.50	<1.0	95	0	90 - 110	20
Fluoride	2.41	2.36	mg/L	1	2.50	<0.2	96	2	90 - 110	20
Sulfate	11.92	11.92	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 Spikes QCBatch: QC23892

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	¹ 3125	² 3116	mg/L	1	1250	2170	76	0	48 - 127	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: QC23892

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.88	95	90 - 110	10/1/02

Continued ...

¹This sample was spiked at a different dilution. MS %EA = 91 and RPD = 0.

²This sample was spiked at a different dilution. MS %EA = 91 and RPD = 0.

... Continued

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Fluoride		mg/L	2.50	2.38	95	90 - 110	10/1/02
Sulfate		mg/L	12.50	12.03	96	90 - 110	10/1/02

ICV (1)

QCBatch: QC23892

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.84	94	90 - 110	10/1/02
Fluoride		mg/L	2.50	2.39	95	90 - 110	10/1/02
Sulfate		mg/L	12.50	11.95	95	90 - 110	10/1/02

209328

AC0093022

Analysis Request and Chain of Custody Record

HIGHLANDER ENVIRONMENTAL CORP.

1910 N. Big Spring St.
Midland, Texas 79705

(915) 682-4559 Fax (915) 682-3946

CLIENT NAME: Chevron Refaco SITE MANAGER: Ike Tavares

PROJECT NO.: 1057 PROJECT NAME: Chevron Refaco / Vacuum Field Unit

LAB I.D. NUMBER: 20928 DATE: 9/26/02 TIME: 11:00 MATRIX: W COMP: GRAB

SAMPLE IDENTIFICATION: Lee County, Am.

LAB I.D. NUMBER	DATE	TIME	MATRIX	COMP	GRAB
20928	9/26/02	11:00	W		

NUMBER OF CONTAINERS	PRELIMINARY METHOD	DATE	TIME
1	HCL	9/26/02	11:20
	HNO3		
	ICE		
	NONE		

RELINQUISHED BY: (Signature) [Signature] Date: 9/27/02 Time: 11:20

RELINQUISHED BY: (Signature) [Signature] Date: 9/27/02 Time: 11:30

RELINQUISHED BY: (Signature) [Signature] Date: 9/27/02 Time: 11:30

RECEIVED BY: (Signature) [Signature] Date: 9/27/02 Time: 11:20

RECEIVED BY: (Signature) [Signature] Date: 9/30/02 Time: 10:00

RECEIVED BY: (Signature) [Signature] Date: 9/27/02 Time: 11:20

RECEIVED BY: (Signature) [Signature] Date: 9/27/02 Time: 11:20

RECEIVING LABORATORY: TRC STATE: TX ZIP: 79705

ADDRESS: 11113-516-883-7845

CITY: Midland

CONTACT: Ike Tavares PHONE: (915) 682-3946

PAGE: 1 OF: 1

ANALYSIS REQUEST (Circle or Specify Method No.)

RCRA Metals Ag As Ba Cd Cr Pb Hg Se PAH 8270

TCP Volatiles

TCP Semi Volatiles

PCB's 8080/808

GC/MS Vol. 8240/8260/824

GC/MS Semi Vol. 8270/825

PCB's 8080/808

Perf. 808/808

BOD, TSS, pH, TDS, Chloride

Gamma Spec

Alpha Beta (Air)

PLM (Asbestos)

Chloride

DATE	TIME	INITIALS
9/27/02	11:20	[Signature]
9/30/02	10:00	[Signature]
9/27/02	11:20	[Signature]
9/27/02	11:20	[Signature]

SAMPLED BY: (Print & Sign) Ike Tavares Date: 9/27/02 Time: 11:20

SAMPLE SHIPPED BY: (Circle) Hand Delivered

FEDEx BUS AIRBILL #

HAND DELIVERED UPS OTHER:

HIGHLANDER CONTACT PERSON: Ike Tavares

RESULTS BY:

RUSH Charges Authorized: Yes No

REMARKS: 1 sample - HCS MB

Please fill out all copies - Laboratory retains yellow copy - Return original copy to Highlander Environmental Corp. - Project Manager retains pink copy - Accounting receives Gold copy.

Fourth Quarter

Report Date: November 14, 2002
1057Order Number: A02111212
Texaco/Texaco-Vacuum Field BukeyePage Number: 1 of 2
Lea County, New Mexico

Summary Report

Ike Tavarez
Highlander Environmental Services
1910 N. Big Spring St.
Midland, TX 79705

Report Date: November 14, 2002

Order ID Number: A02111212

Project Number: 1057
Project Name: Texaco/Texaco-Vacuum Field Bukeye
Project Location: Lea County, New Mexico

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
213118	TW-#9	Water	11/6/02	12:30	11/12/02
213119	TW-#10	Water	11/6/02	17:00	11/12/02
213120	TW-#11	Water	11/7/02	13:20	11/12/02
213121	TW-#13	Water	11/6/02	16:00	11/12/02
213122	TW-#14	Water	11/7/02	12:25	11/12/02
213123	TW-#15	Water	11/7/02	17:25	11/12/02
213124	TW-#17	Water	11/7/02	15:00	11/12/02
213125	TW-#19	Water	11/7/02	16:10	11/12/02
213126	TW-#20	Water	11/6/02	13:35	11/12/02
213127	TW-#23	Water	11/8/02	10:40	11/12/02
213128	EW-#2 (Extraction Well)	Water	11/7/02	11:30	11/12/02

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.

Sample: 213118 - TW-#9

Param	Flag	Result	Units
Chloride		173	mg/L

Sample: 213119 - TW-#10

Param	Flag	Result	Units
Chloride		44.1	mg/L

Sample: 213120 - TW-#11

Param	Flag	Result	Units
Chloride		25.1	mg/L

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

Report Date: November 14, 2002
1057Order Number: A02111212
Texaco/Texaco-Vacuum Field BukeyePage Number: 2 of 2
Lea County, New Mexico**Sample: 213121 - TW-#13**

Param	Flag	Result	Units
Chloride		24.3	mg/L

Sample: 213122 - TW-#14

Param	Flag	Result	Units
Chloride		30.4	mg/L

Sample: 213123 - TW-#15

Param	Flag	Result	Units
Chloride		494	mg/L

Sample: 213124 - TW-#17

Param	Flag	Result	Units
Chloride		26.1	mg/L

Sample: 213125 - TW-#19

Param	Flag	Result	Units
Chloride		27.5	mg/L

Sample: 213126 - TW-#20

Param	Flag	Result	Units
Chloride		45.9	mg/L

Sample: 213127 - TW-#23

Param	Flag	Result	Units
Chloride		384	mg/L

Sample: 213128 - EW-#2 (Extraction Well)

Param	Flag	Result	Units
Chloride		89.0	mg/L

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



TRACE ANALYSIS, INC.

6701 Aberdeen Avenue, Suite 9
155 McCutcheon, Suite H

Lubbock, Texas 79424
El Paso, Texas 79932

800•378•1296
888•588•3443
E-Mail: lab@traceanalysis.com

806•794•1296
915•585•3443

FAX 806•794•1298
FAX 915•585•4944

Analytical and Quality Control Report

Ike Tavarez
Highlander Environmental Services
1910 N. Big Spring St.
Midland, TX 79705

Report Date: November 14, 2002

Order ID Number: A02111212

Project Number: 1057
Project Name: Texaco/Texaco-Vacuum Field Bukeye
Project Location: Lea County, New Mexico

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

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
213118	TW-#9	Water	11/6/02	12:30	11/12/02
213119	TW-#10	Water	11/6/02	17:00	11/12/02
213120	TW-#11	Water	11/7/02	13:20	11/12/02
213121	TW-#13	Water	11/6/02	16:00	11/12/02
213122	TW-#14	Water	11/7/02	12:25	11/12/02
213123	TW-#15	Water	11/7/02	17:25	11/12/02
213124	TW-#17	Water	11/7/02	15:00	11/12/02
213125	TW-#19	Water	11/7/02	16:10	11/12/02
213126	TW-#20	Water	11/6/02	13:35	11/12/02
213127	TW-#23	Water	11/8/02	10:40	11/12/02
213128	EW-#2 (Extraction Well)	Water	11/7/02	11:30	11/12/02

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.

Note: Samples will be disposed of 30 days from the report date unless the lab is contacted before the 30 days has past.

Michael T. And
Dr. Blair Leftwich, Director

Analytical Report

Sample: 213118 - TW-#9

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC24916 Date Analyzed: 11/13/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB23172 Date Prepared: 11/13/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		173	mg/L	5	1

Sample: 213119 - TW-#10

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC24916 Date Analyzed: 11/13/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB23172 Date Prepared: 11/13/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		44.1	mg/L	5	1

Sample: 213120 - TW-#11

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC24916 Date Analyzed: 11/13/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB23172 Date Prepared: 11/13/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		25.1	mg/L	5	1

Sample: 213121 - TW-#13

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC24916 Date Analyzed: 11/13/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB23172 Date Prepared: 11/13/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		24.3	mg/L	5	1

Sample: 213122 - TW-#14

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC24916 Date Analyzed: 11/13/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB23172 Date Prepared: 11/13/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		30.4	mg/L	5	1

Sample: 213123 - TW-#15

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC24916 Date Analyzed: 11/13/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB23172 Date Prepared: 11/13/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		494	mg/L	50	1

Sample: 213124 - TW-#17

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC24916 Date Analyzed: 11/13/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB23172 Date Prepared: 11/13/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		26.1	mg/L	5	1

Sample: 213125 - TW-#19

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC24916 Date Analyzed: 11/13/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB23172 Date Prepared: 11/13/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		27.5	mg/L	5	1

Sample: 213126 - TW-#20

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC24916 Date Analyzed: 11/13/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB23172 Date Prepared: 11/13/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		45.9	mg/L	5	1

Sample: 213127 - TW-#23

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC24916 Date Analyzed: 11/13/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB23172 Date Prepared: 11/13/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		384	mg/L	10	1

Sample: 213128 - EW-#2 (Extraction Well)

Analysis: Ion Chromatography (IC) Analytical Method: E 300.0 QC Batch: QC24915 Date Analyzed: 11/13/02
Analyst: JSW Preparation Method: N/A Prep Batch: PB23173 Date Prepared: 11/13/02

Param	Flag	Result	Units	Dilution	RDL
Chloride		89.0	mg/L	5	1

Quality Control Report Method Blank

Method Blank QCBatch: QC24915

Param	Flag	Results	Units	Reporting Limit
Chloride		<1.0	mg/L	1

Method Blank QCBatch: QC24916

Param	Flag	Results	Units	Reporting Limit
Chloride		<1.0	mg/L	1

Quality Control Report Lab Control Spikes and Duplicate Spikes

Laboratory Control Spikes QCBatch: QC24915

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	11.78	11.84	mg/L	1	12.50	<1.0	94	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: QC24916

Param	LCS Result	LCSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	11.70	11.77	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.

Quality Control Report Matrix Spikes and Duplicate Spikes

Matrix Spikes QCBatch: QC24915

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	11080	11020	mg/L	1	6250	4940	98	0	48 - 127	20

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

Matrix Spikes QCBatch: QC24916

Param	MS Result	MSD Result	Units	Dil.	Spike Amount Added	Matrix Result	% Rec	RPD	% Rec Limit	RPD Limit
Chloride	1090	1090	mg/L	I	625	494	95	0	48 - 127	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: QC24915

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.93	95	90 - 110	11/13/02

ICV (1) QCBatch: QC24915

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.88	95	90 - 110	11/13/02

CCV (1) QCBatch: QC24916

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.88	95	90 - 110	11/13/02

ICV (1) QCBatch: QC24916

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.50	11.80	94	90 - 110	11/13/02

