3R - 134

REPORTS

DATE:

1996-1998

CROSS TIMBERS OIL COMPANY

GROUNDWATER REMEDIATION REPORT

1996-1998

VALDEZ A # 1E
(G) SECTION 24, T29N, R11W, NMPM
SAN JUAN COUNTY, NEW MEXICO

RECEIVED
APR 27 2000
ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

PREPARED FOR:
MR. WILLIAM C. OLSON
NEW MEXICO OIL CONSERVATION DIVISION

MARCH 2000

PREPARD BY:
BLAGG ENGINEERING, INC.

Consulting Petroleum / Reclamation Services
P.O. Box 87
Bloomfield, New Mexico 87413

Cross Timbers Oil Company (CTOC)
Valdez A # 1E - Separator Pit
Sw/4 Ne/4 Sec. 24, T29N, R11W

Monitor Well Sampling Dates: **May 26, Aug. 25, Nov. 30, 1999**

Groundwater Monitor Well Sampling Procedures:

Groundwater samples were collected from site monitor wells (MW's) following USEPA: SW-846 protocol. The samples were collected using new disposable bailers and placed in new laboratory supplied 40 ml glass vials with teflon septa caps. Samples were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) per USEPA Method 8021. The samples were preserved cool and with mercuric chloride, then hand delivered to a qualified laboratory for testing. Waste generated during monitor well sampling and development was disposed of utilizing the production tank steel pit located on the well site.

Water Quality Information:

The BTEX results for 1999 and historically are summarized in the following table. MW #9 and #10 continue to test below the New Mexico Water Quality Control Commission's (NMWQCC) regulatory standards, however, there appears to be an anomaly within MW #9 on the May 26, 1999 sampling event. MW #6 benzene level did exceeded the allowable concentration for groundwater during the May 26, 1999 sampling event, but has shown a substantial decrease since 1993. Finally, free product has been observed in MW #7 since June, 1998, but appears to be in a steady state condition up to the present time.

Summary and/or Recommendations:

Based on the enclosed documentation, Blagg Engineering, Inc. recommends the following;

1. Sampling MW #9 on a biannual basis (spring and winter events).
2. Sampling MW #6 on an annual basis.
3. Initiate free product removal in MW #7 on a daily basis until its status indicates a different approach (i.e. sampling) or a schedule modification.
4. Upon the conclusion of the aforementioned, CTOC will take the appropriate measures following the NMOCD previously approved groundwater management plan.

CROSS TIMBERS GROUNDWATER MONITOR WELL LABORATORY RESULTS

SUBMITTED BY BLAGG ENGINEERING, INC.

VALDEZ A #1E
UNIT G, SEC. 24, T29N, R11W

REVISED DATE: NOVEMBER 30, 1999

FILENAME: (VA-4Q-99.WK4) NJV

								BTEX EPA METHOD 8020 (PPB)			
SAMPLE DATE	MONITOR WELL #	D.T.W. (ft)	T.D. (ft)	TDS (mg/L)	COND. (umhos/cm)	pH	PRODUCT (ft)	Benzene	Toluene	Ethyl Benzene	Total Xylene
23-Feb-93	MW #6	15.06	19.40		2,700	6.9		2090	7800	578	4080
07-Jun-93		14.72	19.50		1,600	7.1		1300	444	293	840
08-Sep-93		14.27	18.35		1,120	7.3		770	980	174	783
02-Dec-93		14.69			2,900	7.3		540	1140	144	867
09-Mar-94		15.49			3,100	7.2		580	1520	130	888
24-Jun-94		14.05			2,800	7.1		542	1923	164	1172
23-Sep-94		13.40			2,600	7.2		484	1696	170	1300
09-Dec-94		14.02			2,300	7.4		593	2242	183	1707
10-Jan-95		14.28			3,200	7.4		450	1380	153	1248
09-Feb-95		14.58			3,400	7.4		710	2160	271	2297
13-Mar-95		14.85			2,500	7.4		19.8	2471	289	2460
10-Apr-95		15.00			2,700	7.3		525	1840	222	1502
19-Jun-95		14.48			2,400	7.2		299.3	998.8	114.5	1045.4
07-Aug-95		14.08			2,400	7.5		593	1650	247	2111
12-Sep-95		13.89			2,200	7.4		412	1390	259	1549
10-Oct-95		13.74			2,200	7.4		176	970	191	1552
15-Nov-95		13.98			2,300	6.9		598	1370	339	2819
07-Dec-95		14.12			2,700	7.1		599	1310	304	2322
07-Mar-96		15.07			1,900	7.1		426	467	234	1876
18-Jun-96		14.40			2,000	7.1		462	773	305	2540
17-Jun-97		14.97			2,400	7.6		110	19.6	37.6	288.9
12-Jun-98		14.92			2,000	7.8		55.6	25.2	45.9	296.1
25-Sep-98		14.36			2,700	7.3		42.7	17.7	68.3	469
26-May-99		15.12			2,000	7.3		78.9	22	51.6	273.9
23-Feb-93	MW #7	13.37	23.32		2,400	6.9		ND	1	ND	2
07-Jun-93		14.54	19.33		1,700	7.1		640	2270	330	2430
08-Sep-93		14.15	18.85		1,120	7.4		820	1660	306	1780
02-Dec-93		14.56			2,500	7.3		319	366	35.1	242
09-Mar-94		15.30			2,900	6.9		103	88	10.3	74
24-Jun-94		14.04			2,500	7.1		569	2090	288	3094
23-Sep-94		13.51			2,500	7.1		627	1805	189	1755
09-Dec-94		13.94	18.83		2,000	7.2		707	1220	161	1342
10-Jan-95		14.23			3,300	7.2		298	394	54.8	365.4
09-Feb-95		14.50			3,000	7.2		465	624	92	582
13-Mar-95		14.73			2,700	7.2		997.8	813.2	168.4	1015.9
10-Apr-95		14.87			2,700	7.3		648	456	104	623
19-Jun-95		14.39			2,400	7.1		366.7	414.7	66.1	602.2
07-Aug-95		14.04			2,400	7.4		869	1000	171	1431
12-Sep-95		13.85			2,500	7.4		1725	846	141	1035
10-Oct-95		13.73			2,600	7.2		143	689	93.6	925
15-Nov-95		13.94			2,400	6.9		710	1000	178	1642
07-Dec-95		14.05			2,800	7.2		1050	606	167	996
07-Mar-96		14.94			2,000	6.9		101	10.3	8.69	42.27
18-Jun-96		14.34			2,200	6.9		128	65.5	11.5	175.3
17-Jun-97		14.83			2,700	7.6		360	16.3	16.5	127.5
12-Jun-98							0.88				
25-Sep-98							0.88				
26-May-99							0.05				
25-Aug-99							0.62				
30-Nov-99							0.70				

CROSS TIMBERS GROUNDWATER MONITOR WELL LABORATORY RESULTS

SUBMITTED BY BLAGG ENGINEERING, INC.

VALDEZ A #1E
UNIT G, SEC. 24, T29N, R11W

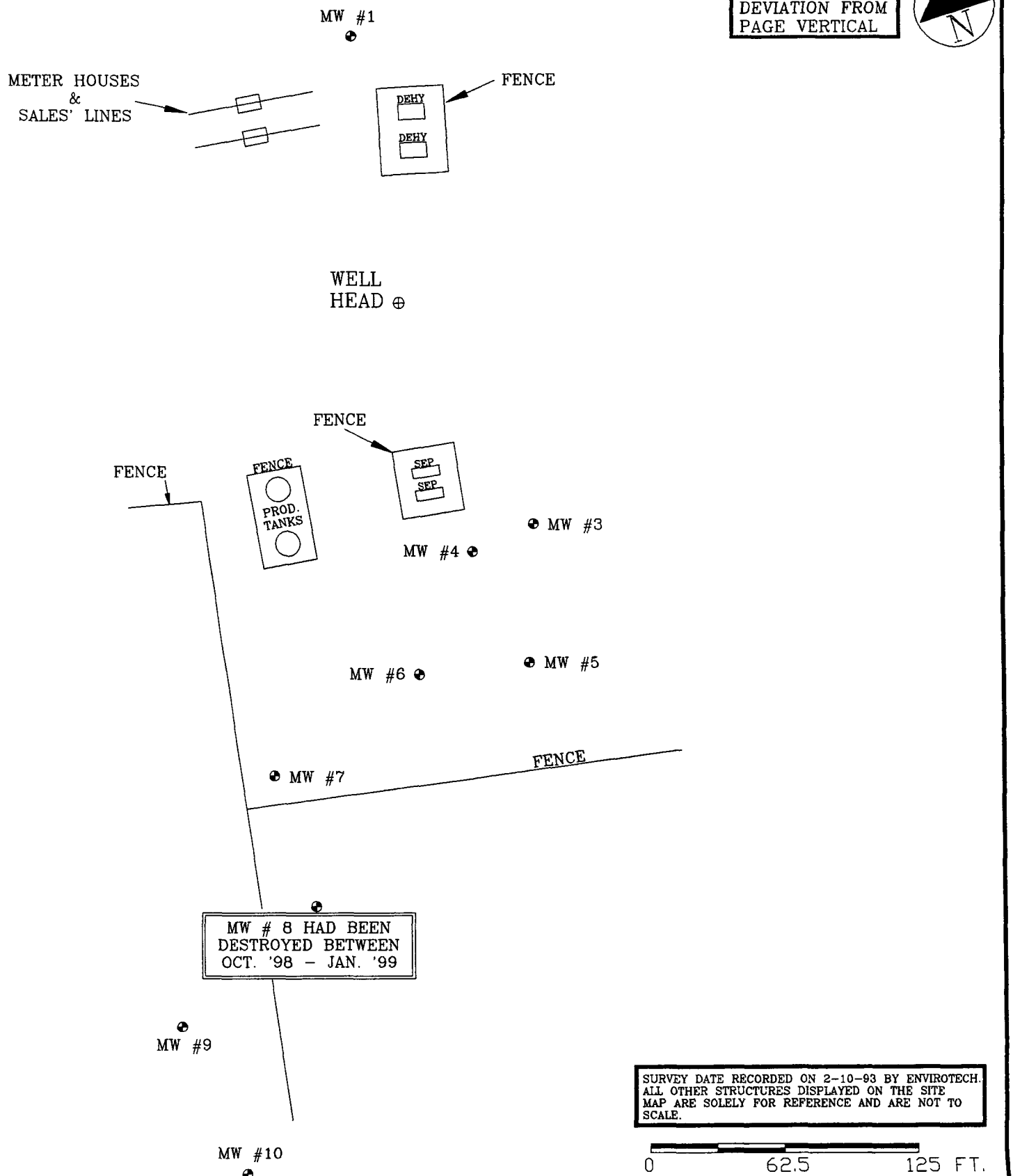
REVISED DATE: NOVEMBER 30, 1999

FILENAME: (VA-4Q-99.WK4) NJV

SAMPLE DATE	MONITOR WELL #	D.T.W. (ft)	T.D. (ft)	TDS (mg/L)	COND. (umhos/cm)	pH	PRODUCT (ft)	BTEX EPA METHOD 8020 (PPB) Benzene	Toluene	Ethyl Benzene	Total Xylene
23-Feb-93	MW #8	15.68	17.00		3,200	7.1		2830	25500	1680	5430
08-Jun-93		15.36	17.01		1,300	6.9		3220	1940	1110	4960
09-Sep-93		15.16	17.73		1,070	7.6		245	2040	135	1499
02-Dec-93		15.44			2,200	7.5		307	2520	119	1388
09-Mar-94		15.98			2,700	7.1		223	340	61	232.9
24-Jun-94		14.86			2,300	7.1		375	1750	108	1001
23-Sep-94		14.31			2,400	7.1		236	1827	90	864
09-Dec-94		14.78	18.60		1,900	7.3		307	1608	105	734
10-Jan-95		15.02			2,800	7.3		320	2410	119	1016
09-Feb-95		15.24						183	760	90.9	452
13-Mar-95		15.42			2,400	7.2		415	3943	202	2037
10-Apr-95		15.54			2,600	7.3		239	2780	128	1245
19-Jun-95					2,300	7.1		148.9	1448.2	72.8	681.2
07-Aug-95		14.86			2,400	7.4		168	1590	92.7	893
12-Sep-95		14.71			2,100	7.3		499	1420	74.1	788
10-Oct-95		14.60			2,300	7.3		88.1	817	52.1	614
15-Nov-95		14.78			2,400	6.9		158	2110	150	1488
07-Dec-95		14.87			2,700	7.0		156	1920	135	1277
07-Mar-96		15.60			1,900	6.9		98.1	1320	82.5	778
18-Jun-96		15.15			2,100	7.1		5.45	2.25	ND	3.5
27-Dec-96		15.12	18.28		2,500	7.3		105.0	569	51.0	421
17-Jun-97		14.01			2,600	7.6		45.4	83.0	29.8	88.9
12-Jun-98		15.54			2,000	7.9		5.4	5.1	1.1	9.1
25-Sep-98		15.03			2,700	7.1		0.3	0.3	0.2	2.4
25-Sep-93	MW #9	8.56	11.00		1,500	7.5		ND	1.0	ND	2.0
08-Jun-93		8.19			1,900	6.5		ND	2.1	0.3	2.3
09-Sep-93		8.00	10.92		1,200	7.3		0.9	0.6	ND	0.4
09-Mar-94		8.83			3,000	6.9		ND	2.1	0.7	7.0
24-Jun-94		7.80			2,500	7.1		1.6	5.5	4.1	3.1
25-Sep-98		7.93	11.08		2,900	6.9		0.6	0.2	ND	1.1
26-May-99		8.49			2,100	7.1		25.1	13.7	4.3	47.0
25-Aug-99		8.12			2,300	7.1		0.7	2.0	ND	2.7
30-Nov-99		7.99			2,500	7.1		4.2	2.9	0.3	4.6
23-Feb-93	MW #10	8.65	9.80		3,600	7.4		ND	ND	ND	1.0
08-Jun-93		8.43	9.80		1,800	7.0		ND	0.7	ND	0.9
09-Sep-93		7.76			1,180	7.3		ND	0.3	ND	1.1
09-Mar-94		8.98			2,900	7.0		ND	2.3	ND	0.4
24-Jun-94		8.00	12.15		2,700	7.0		2.2	ND	ND	ND
23-Sep-94		7.56			2,400	7.1		0.7	0.7	ND	ND
09-Dec-94		7.88	12.44		2,000	7.5		ND	0.2	ND	ND
13-Mar-95		8.46			2,800	7.1		ND	ND	ND	ND
19-Jun-95		8.22			2,200	7.1		ND	ND	ND	ND
12-Sep-95		7.84			2,200	7.3		ND	ND	ND	ND
07-Dec-95		7.93			2,600	6.9		ND	ND	ND	ND
07-Mar-96		8.62			1,900	6.9		ND	ND	ND	ND
18-Jun-96		8.22			2,200	6.9		ND	ND	ND	ND
25-Aug-99		8.30			2,200	7.3		1.7	0.9	ND	1.2

FIGURE 1

N15W DIRECTION DEVIATION FROM PAGE VERTICAL

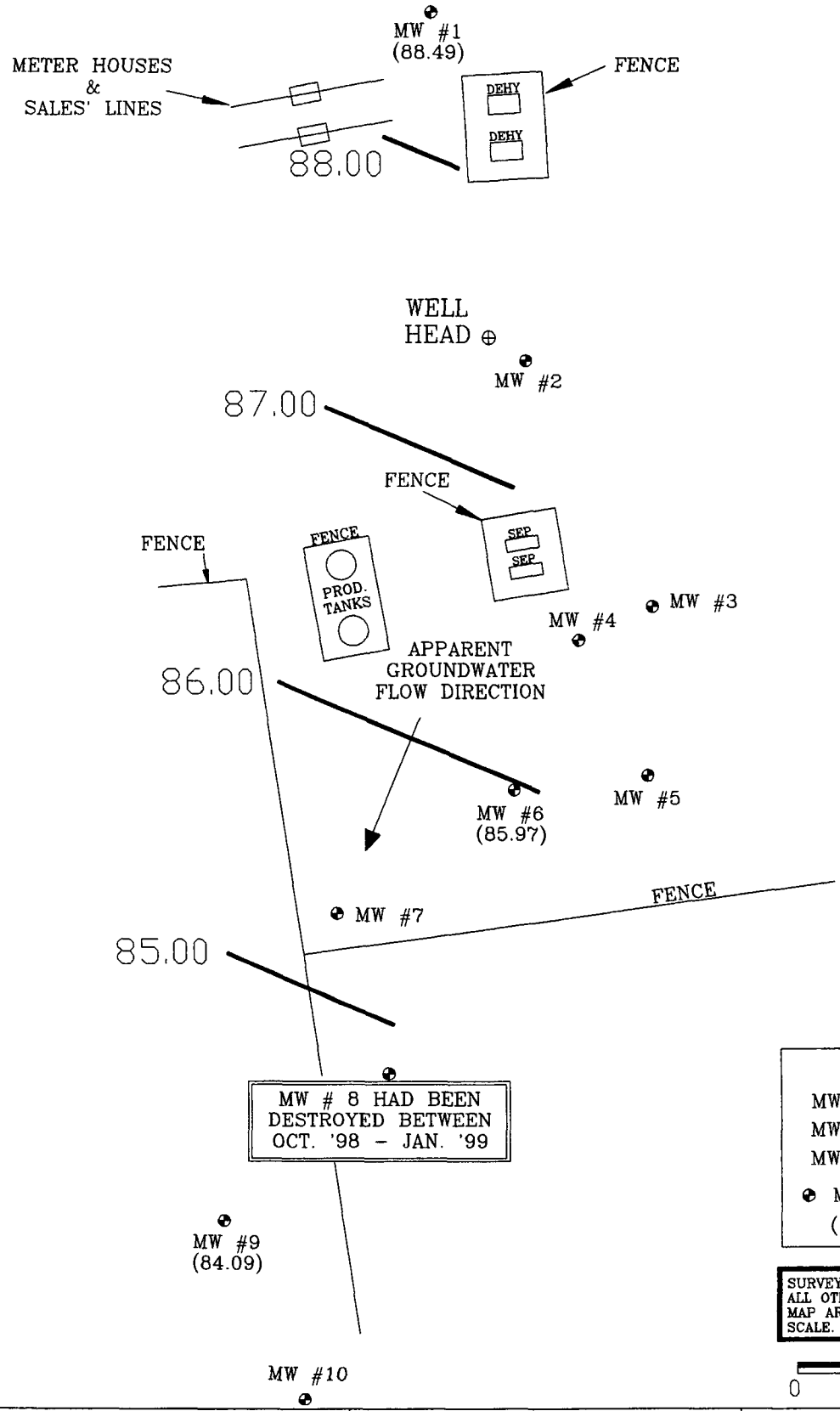


SURVEY DATE RECORDED ON 2-10-93 BY ENVIROTECH. ALL OTHER STRUCTURES DISPLAYED ON THE SITE MAP ARE SOLELY FOR REFERENCE AND ARE NOT TO SCALE.

AMOCO PRODUCTION COMPANY VALDEZ A1E SW/4 NE/4 SEC. 24, T29N, R11W SAN JUAN COUNTY, NEW MEXICO	BLAGG ENGINEERING, INC. CONSULTING PETROLEUM / RECLAMATION SERVICES P.O. BOX 87 BLOOMFIELD, NEW MEXICO 87413 PHONE: (505) 632-1199	PROJECT: MW SAMP. DRAWN BY: NJV FILENAME: 05-26-SM REVISED: 6/11/99 NJV	SITE MAP 05/99

FIGURE 2
(2nd 1/4, 1999)

N15W DIRECTION DEVIATION FROM PAGE VERTICAL



Top of Well Elevation	
MW #1	(102.56)
MW #6	(101.09)
MW #9	(92.59)

MW #1 (88.49) Groundwater Elevation as of 05/26/99.

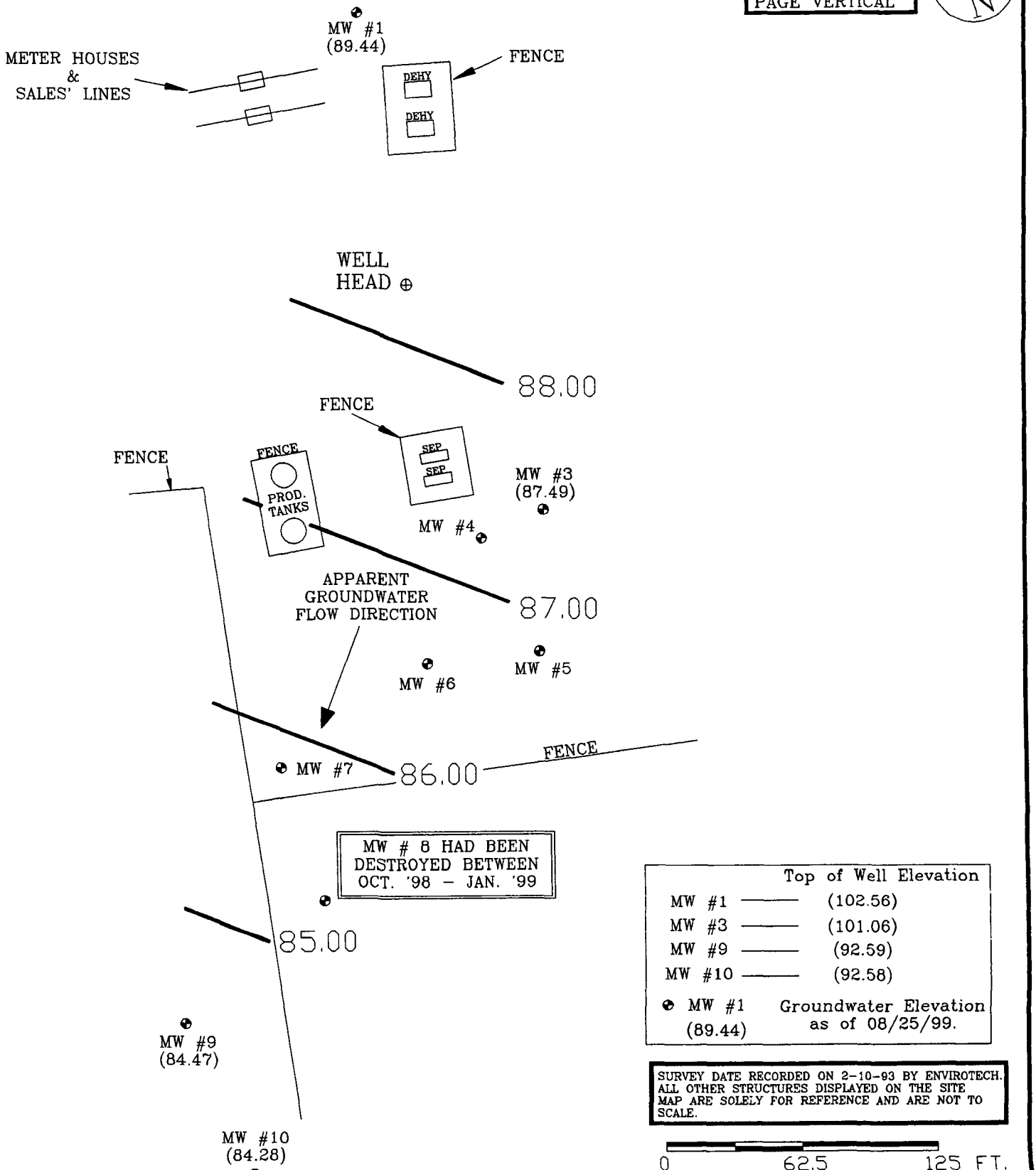
SURVEY DATE RECORDED ON 2-10-93 BY ENVIROTECH. ALL OTHER STRUCTURES DISPLAYED ON THE SITE MAP ARE SOLELY FOR REFERENCE AND ARE NOT TO SCALE.

0 62.5 125 FT.

AMOCO PRODUCTION COMPANY VALDEZ A1E SW/4 NE/4 SEC. 24, T29N, R11W SAN JUAN COUNTY, NEW MEXICO	BLAGG ENGINEERING, INC. CONSULTING PETROLEUM / RECLAMATION SERVICES P.O. BOX 87 BLOOMFIELD, NEW MEXICO 87413 PHONE: (505) 632-1199	PROJECT: 1/4ly Monitor. DRAWN BY: NJV FILENAME: 05-26-GW REVISED: 6/11/99 NJV	GROUNDWATER GRADIENT MAP 05/99

FIGURE 3
(3rd 1/4, 1999)

N15W DIRECTION DEVIATION FROM PAGE VERTICAL



	Top of Well Elevation
MW #1	(102.56)
MW #3	(101.06)
MW #9	(92.59)
MW #10	(92.58)
MW #1 (89.44)	Groundwater Elevation as of 08/25/99.

SURVEY DATE RECORDED ON 2-10-93 BY ENVIROTECH. ALL OTHER STRUCTURES DISPLAYED ON THE SITE MAP ARE SOLELY FOR REFERENCE AND ARE NOT TO SCALE.

0 62.5 125 FT.

AMOCO PRODUCTION COMPANY

VALDEZ A1E

SW/4 NE/4 SEC. 24, T29N, R11W

SAN JUAN COUNTY, NEW MEXICO

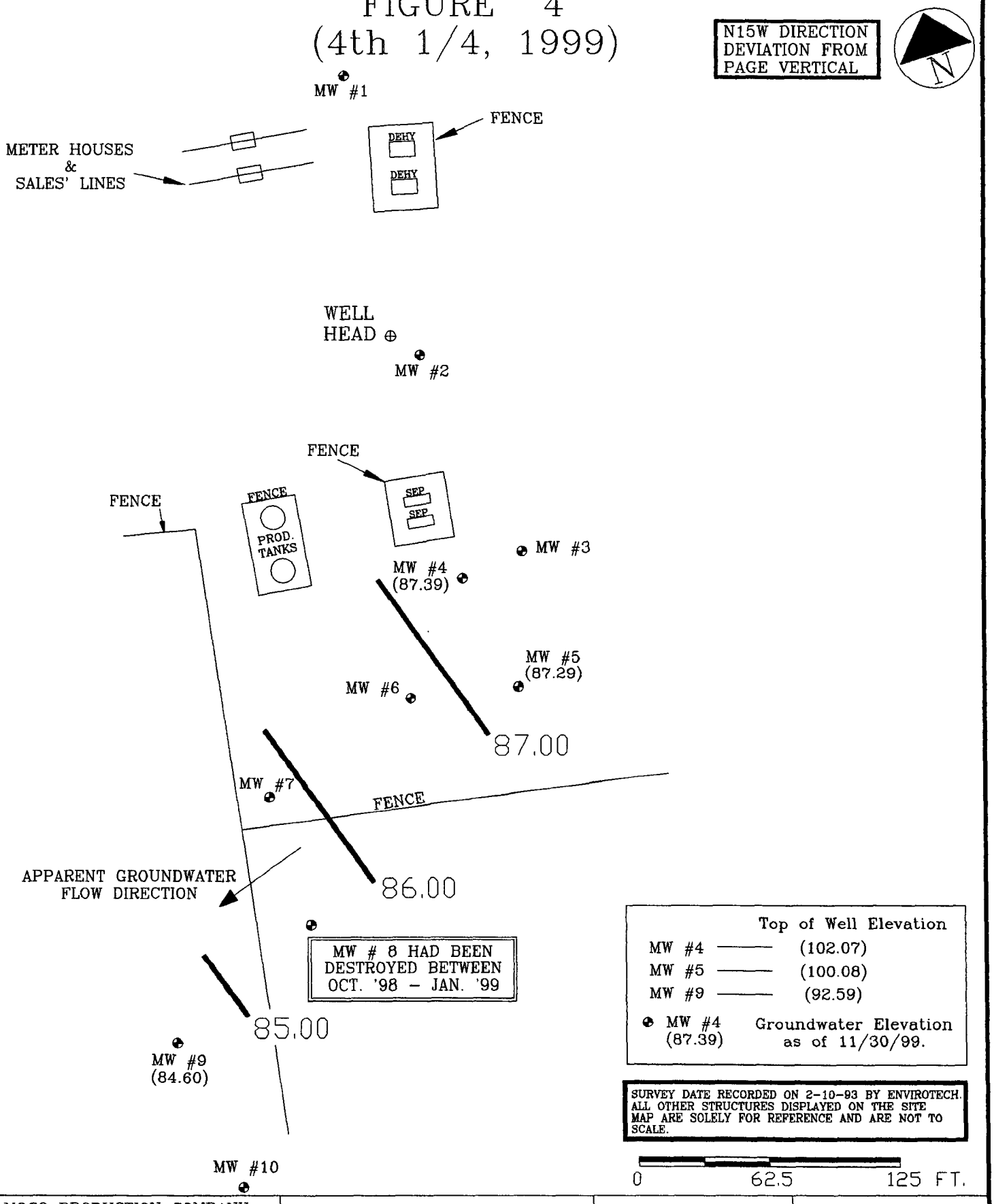
BLAGG ENGINEERING, INC.
CONSULTING PETROLEUM / RECLAMATION SERVICES
P.O. BOX 87
BLOOMFIELD, NEW MEXICO 87413
PHONE: (505) 632-1199

PROJECT: 1/4ly SAMP.
DRAWN BY: NJV
FILENAME: 08-25-GW
REVISED: 2/2/00 NJV

GROUNDWATER GRADIENT MAP 08/99

FIGURE 4
(4th 1/4, 1999)

N15W DIRECTION DEVIATION FROM PAGE VERTICAL



AMOCO PRODUCTION COMPANY VALDEZ A1E SW/4 NE/4 SEC. 24, T29N, R11W SAN JUAN COUNTY, NEW MEXICO	BLAGG ENGINEERING, INC. CONSULTING PETROLEUM / RECLAMATION SERVICES P.O. BOX 87 BLOOMFIELD, NEW MEXICO 87413 PHONE: (505) 632-1199	PROJECT: 1/4ly Monitor. DRAWN BY: NJV FILENAME: 11-30-GW REVISED: 12/3/99 NJV	GROUNDWATER GRADIENT MAP 11/99

BLAGG ENGINEERING, INC.

MONITOR WELL SAMPLING DATA

CLIENT : CROSS TIMBERS OIL CO.

CHAIN-OF-CUSTODY # : 6684

VALDEZ A # 1E
UNIT G, SEC. 24, T29N, R11W

LABORATORY (S) USED : ENVIROTECH, INC.

Date : May 26, 1999

Filename : 05-26-99.WK4

SAMPLER : N J V

PROJECT MANAGER : N J V

WELL #	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	SAMPLING	pH TIME	CONDUCT (umhos)	VOLUME PURGED (gal.)	FREE PRODUCT (ft)
1	102.56	88.49	14.07	22.78	-	-	-	-	-
6	101.09	85.97	15.12	18.35	0740	7.3	2,000	1.50	-
7	-	-	-	18.83	-	-	-	-	0.05
9	92.58	84.09	8.49	11.08	0810	7.1	2,100	1.25	-

NOTES : Volume of water purged from well prior to sampling: V = pi X r2 X h X 7.48 gal./ft3) X 3 (wellbores).

Ideally a minimum of three (3) wellbore volumes:

1.25 " well diameter = 0.19 gallons per foot of water (or 24 oz.).

2 bails per foot - small teflon bailer.

3 bails per foot - 3 / 4 " teflon bailer.

2.00 " well diameter = 0.49 gallons per foot of water.

4.00 " well diameter = 1.95 gallons per foot of water.

Comments or note well diameter if not standard 2 ".

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS

Client:	Blagg / Cross Timbers	Project #:	403410
Sample ID:	MW # 6	Date Reported:	05-27-99
Chain of Custody:	6684	Date Sampled:	05-26-99
Laboratory Number:	F398	Date Received:	05-27-99
Sample Matrix:	Water	Date Analyzed:	05-27-99
Preservative:	HgCl2 & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	**78.9**	**1**	**0.2**
Toluene	**22.0**	**1**	**0.2**
Ethylbenzene	**51.6**	**1**	**0.2**
p,m-Xylene	**207**	**1**	**0.2**
o-Xylene	**66.9**	**1**	**0.1**
Total BTEX	**426**		

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	**97 %**
	Bromofluorobenzene	**97 %**

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **Valdez A # 1E.**

Analyst

Review

5796 U.S. Highway 64 • Farmington, NM 87401 • Tel 505 • 632 • 0615 • Fax 505 • 632 • 1865

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS

Client:	Blagg / Cross Timbers	Project #:	403410
Sample ID:	MW # 9	Date Reported:	05-27-99
Chain of Custody:	6684	Date Sampled:	05-26-99
Laboratory Number:	F399	Date Received:	05-27-99
Sample Matrix:	Water	Date Analyzed:	05-27-99
Preservative:	HgCl2 & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	**25.1**	**1**	**0.2**
Toluene	**13.7**	**1**	**0.2**
Ethylbenzene	**4.3**	**1**	**0.2**
p,m-Xylene	**40.4**	**1**	**0.2**
o-Xylene	**6.6**	**1**	**0.1**
Total BTEX	**90.1**		

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	**99 %**
	Bromofluorobenzene	**99 %**

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **Valdez A # 1E.**

Analyst

Review

5796 U.S. Highway 64 • Farmington, NM 87401 • Tel 505 • 632 • 0615 • Fax 505 • 632 • 1865

CHAIN OF CUSTODY RECORD

6684

Client / Project Name	Project Location	ANALYSIS / PARAMETERS
BLAGG / CROSS TIMBERS	VALDEZ A #1E	
Sampler: NJV	Client No. 403410	

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	BTEX (8021)						Remarks
												Both samples preserv.
												$HgCl_2$ & cool
MW #6	5/26/99	0740	F398	WATER	1	✓						
MW #9	5/26/99	0810	F399	WATER	1	✓						

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
[signature]	5/27/99	0740	[signature]	5.27.99	0740
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.

5796 U.S. Highway 64
Farmington, New Mexico 87401
(505) 632-0615

Sample Receipt	Y	N	N/A
Received Intact	✓		
Cool - Ice/Blue Ice	✓		

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS
QUALITY ASSURANCE REPORT

Client:	N/A	Project #:	N/A
Sample ID:	05-27-BTEX QA/QC	Date Reported:	05-27-99
Laboratory Number:	F398	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	N/A	Date Analyzed:	05-27-99
Condition:	N/A	Analysis:	BTEX

Calibration and Detection Limits (ug/L)	[illegible] Cal RF:	C-Cal RF:	%Diff. Accept. Range is 15%	[illegible]
Benzene	1.6360E-002	1.6412E-002	0.32%	ND	0.2
Toluene	1.7563E-002	1.7566E-002	0.02%	ND	0.2
Ethylbenzene	7.1313E-003	7.1398E-003	0.12%	ND	0.2
p,m-Xylene	8.5740E-003	8.5758E-003	0.02%	ND	0.2
o-Xylene	7.9281E-003	7.9520E-003	0.30%	ND	0.1

Duplicate Conc. (ug/L)	Sample	Duplicate	%Diff.	Accept.
Benzene	78.9	79.0	0.1%	0 - 30%
Toluene	22.0	22.2	0.9%	0 - 30%
Ethylbenzene	51.6	52.1	1.0%	0 - 30%
p,m-Xylene	207	216	4.4%	0 - 30%
o-Xylene	66.9	67.4	0.7%	0 - 30%

Spike Conc. (ug/L)	Sample	Amount Spiked	Spiked Sample	% Recovery	Accept.
Benzene	78.9	50.0	128	99%	39 - 150
Toluene	22.0	50.0	72.0	100%	46 - 148
Ethylbenzene	51.6	50.0	102	100%	32 - 160
p,m-Xylene	207	100.0	305	99%	46 - 148
o-Xylene	66.9	50.0	117	100%	46 - 148

ND - Parameter not detected at the stated detection limit.

* - Administrative Limits set at 80 - 120%.

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.
Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **QA/QC for samples F398 - F400, F405 - F406 and F408 - F409.**

Analyst

Review

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BLAGG ENGINEERING, INC.

MONITOR WELL SAMPLING DATA

CLIENT : CROSS TIMBERS OIL CO.

CHAIN-OF-CUSTODY # : 6703

VALDEZ A # 1E
UNIT G, SEC. 24, T29N, R11W

LABORATORY (S) USED : ENVIROTECH, INC.

Date : August 25, 1999

Filename : 08-25-99.WK4

SAMPLER : N J V

PROJECT MANAGER : N J V

WELL #	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	SAMPLING	pH TIME	CONDUCT (umhos)	VOLUME PURGED (gal.)	FREE PRODUCT (ft)
1	102.56	89.44	13.12	22.78	-	-	-	-	-
3	101.06	87.49	13.57	18.35	-	-	-	-	-
7	-	-	-	18.83	-	-	-	-	0.62
9	92.59	84.47	8.12	11.08	1415	7.1	2,300	1.50	-
10	92.58	84.28	8.30	11.08	1445	7.3	2,200	2.00	-

NOTES : Volume of water purged from well prior to sampling: V = pi X r2 X h X 7.48 gal./ft3) X 3 (wellbores).

Ideally a minimum of three (3) wellbore volumes:

1.25 " well diameter = 0.19 gallons per foot of water (or 24 oz.).

2 bails per foot - small teflon bailer.

3 bails per foot - 3 / 4 " teflon bailer.

2.00 " well diameter = 0.49 gallons per foot of water.

4.00 " well diameter = 1.95 gallons per foot of water.

Comments or note well diameter if not standard 2 ".

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS

Client:	Blagg / Cross Timbers	Project #:	403410
Sample ID:	MW # 9	Date Reported:	08-27-99
Chain of Custody:	6703	Date Sampled:	08-25-99
Laboratory Number:	G003	Date Received:	08-26-99
Sample Matrix:	Water	Date Analyzed:	08-26-99
Preservative:	HgCl2 & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	**0.7**	**1**	**0.2**
Toluene	**2.0**	**1**	**0.2**
Ethylbenzene	**ND**	**1**	**0.2**
p,m-Xylene	**2.2**	**1**	**0.2**
o-Xylene	**0.5**	**1**	**0.1**
Total Xylene	**2.7**		
Total BTEX	**5.4**		

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	**98 %**
	Bromofluorobenzene	**98 %**

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **Valdez A # 1 E.**

Analyst

Review

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ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS

Client:	Blagg / Cross Timbers	Project #:	403410
Sample ID:	MW # 10	Date Reported:	08-27-99
Chain of Custody:	6703	Date Sampled:	08-25-99
Laboratory Number:	G004	Date Received:	08-26-99
Sample Matrix:	Water	Date Analyzed:	08-26-99
Preservative:	HgCl2 & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	**1.7**	**1**	**0.2**
Toluene	**0.9**	**1**	**0.2**
Ethylbenzene	**ND**	**1**	**0.2**
p,m-Xylene	**1.0**	**1**	**0.2**
o-Xylene	**0.2**	**1**	**0.1**
Total Xylene	**1.2**		
Total BTEX	**3.8**		

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	**100 %**
	Bromofluorobenzene	**100 %**

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **Valdez A # 1 E.**

Analyst

Review

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CHAIN OF CUSTODY RECORD

67[illegible]

Client / Project Name	Project Location	ANALYSIS / PARAMETERS
BLAGG / CROSS TIMBERS	VALDEZ A #1E	
Sampler: NJV	Client No. 405[illegible]10	

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	BTEX (8021)						Remarks
MW #9	8/25/99	1415	G003	WATER	2	✓						BOTH SAMPLES
												PRESERV. - $HgCl_2$
MW #10	8/25/99	1445	G004	WATER	2	✓						& COOL

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Nelson Velez	8/26/99	0714	L. Ogden	8.26.99	0714
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.

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Sample Receipt	Y	N	N/A
Received Intact	✓		
Cool - Ice/Blue Ice	✓		

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS
QUALITY ASSURANCE REPORT

Client:	N/A	Project #:	N/A
Sample ID:	08-26-PM-BTEX QA/QC	Date Reported:	08-27-99
Laboratory Number:	F994	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	N/A	Date Analyzed:	08-26-99
Condition:	N/A	Analysis:	BTEX

Calibration and Detection Limits (ug/L)	I-Cal RF:	C-Cal RF:	%Diff. Accept. Range 0 - 15%	Blank Conc	Detect. Limit
Benzene	3.6219E-001	3.6335E-001	0.32%	ND	0.2
Toluene	2.7867E-002	2.7872E-002	0.02%	ND	0.2
Ethylbenzene	4.1931E-002	4.1981E-002	0.12%	ND	0.2
p,m-Xylene	3.6569E-002	3.6576E-002	0.02%	ND	0.2
o-Xylene	3.1955E-002	3.2051E-002	0.30%	ND	0.1

Duplicate Conc. (ug/L)	Sample	Duplicate	%Diff.	Accept. Limit
Benzene	1.5	1.4	6.7%	0 - 30%
Toluene	2.1	2.0	4.8%	0 - 30%
Ethylbenzene	0.2	0.2	0.0%	0 - 30%
p,m-Xylene	2.8	2.8	0.0%	0 - 30%
o-Xylene	0.7	0.7	0.0%	0 - 30%

Spike Conc. (ug/L)	Sample	Amount Spiked	Spiked Sample	% Recovery	Accept. Limits
Benzene	1.5	50.0	51.5	100%	39 - 150
Toluene	2.1	50.0	52.1	100%	46 - 148
Ethylbenzene	0.2	50.0	50.2	100%	32 - 160
p,m-Xylene	2.8	100.0	103	100%	46 - 148
o-Xylene	0.7	50.0	50.7	100%	46 - 148

ND - Parameter not detected at the stated detection limit.

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.
Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: QA/QC for samples F994 - F998 and G000 - G004.

Analyst

Review

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BLAGG ENGINEERING, INC.

MONITOR WELL SAMPLING DATA

CLIENT : CROSS TIMBERS OIL CO.

CHAIN-OF-CUSTODY # : 7445

VALDEZ A # 1E
UNIT G, SEC. 24, T29N, R11W

LABORATORY (S) USED : ENVIROTECH, INC.

Date : November 30, 1999

Filename : 11-30-99.WK4

SAMPLER : N J V

PROJECT MANAGER : N J V

WELL #	WELL ELEV. (ft)	WATER ELEV. (ft)	DEPTH TO WATER (ft)	TOTAL DEPTH (ft)	SAMPLING	pH TIME	CONDUCT (umhos)	VOLUME PURGED (gal.)	FREE PRODUCT (ft)
4	102.07	87.39	14.68	19.98	-	-	-	-	-
5	100.08	87.29	12.79	22.78	-	-	-	-	-
7	-	-	-	18.83	-	-	-	-	0.70
9	92.59	84.60	7.99	11.08	1245	7.1	2,500	1.50	-

NOTES : Volume of water purged from well prior to sampling: V = pi X r2 X h X 7.48 gal./ft3) X 3 (wellbores).

Ideally a minimum of three (3) wellbore volumes:

1.25 " well diameter = 0.19 gallons per foot of water (or 24 oz.).

2 bails per foot - small teflon bailer.

3 bails per foot - 3 / 4 " teflon bailer.

2.00 " well diameter = 0.49 gallons per foot of water.

4.00 " well diameter = 1.95 gallons per foot of water.

Comments or note well diameter if not standard 2".

Collected BTEX sample in MW #

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS

Client:	Blagg / Cross Timbers	Project #:	403410
Sample ID:	MW # 9	Date Reported:	12-01-99
Chain of Custody:	7445	Date Sampled:	11-30-99
Laboratory Number:	G516	Date Received:	11-30-99
Sample Matrix:	Water	Date Analyzed:	12-01-99
Preservative:	HgCl2 & Cool	Analysis Requested:	BTEX
Condition:	Cool & Intact		

Parameter	Concentration (ug/L)	Dilution Factor	Det. Limit (ug/L)
Benzene	**4.2**	**1**	**0.2**
Toluene	**2.9**	**1**	**0.2**
Ethylbenzene	**0.3**	**1**	**0.2**
p,m-Xylene	**3.9**	**1**	**0.2**
o-Xylene	**0.7**	**1**	**0.1**
Total Xylene	**4.6**		
Total BTEX	**12.0**		

ND - Parameter not detected at the stated detection limit.

Surrogate Recoveries:	Parameter	Percent Recovery
	Trifluorotoluene	**100 %**
	Bromofluorobenzene	**100 %**

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.

Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **Valdez A # 1E.**

Analyst

Review

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CHAIN OF CUSTODY RECORD

7445

Client / Project Name	Project Location	ANALYSIS / PARAMETERS
BLAGG/ CROSS TIMBERS	VALDEZ A #1E	
Sampler: NJV	Client No. 403410	

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	BTEX (8021)					Remarks
MW #9	11/30/99	1245	G516	WATER	2	✓					PRESERV. - $HgCl_2$ + COOL

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Nelson Velez	11/30/99	1355	[signature]	11.30.99	1355
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.

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Sample Receipt	Y	N	N/A
Received Intact	✓		
Cool - Ice/Blue Ice	✓		

ENVIROTECH LABS

PRACTICAL SOLUTIONS FOR A BETTER TOMORROW

EPA METHOD 8021
AROMATIC VOLATILE ORGANICS
QUALITY ASSURANCE REPORT

Client:	N/A	Project #:	N/A
Sample ID:	12-01-BTEX QA/QC	Date Reported:	12-01-99
Laboratory Number:	G512	Date Sampled:	N/A
Sample Matrix:	Water	Date Received:	N/A
Preservative:	N/A	Date Analyzed:	12-01-99
Condition:	N/A	Analysis:	BTEX

Calibration and Detection Limits (ug/L)	I-Cal RF:	C-Cal RF:	%Diff. Accept. Range 0 - 15%	Blank Conc	Detect. Limit
Benzene	1.5148E-001	1.5197E-001	0.32%	ND	0.2
Toluene	1.3889E-001	1.3892E-001	0.02%	ND	0.2
Ethylbenzene	4.5310E-002	4.5364E-002	0.12%	ND	0.2
p,m-Xylene	1.6102E-002	1.6105E-002	0.02%	ND	0.2
o-Xylene	1.5199E-002	1.5244E-002	0.30%	ND	0.1

Duplicate Conc. (ug/L)	Sample	Duplicate	%Diff.	Accept Limit
Benzene	8.7	8.8	1.1%	0 - 30%
Toluene	7.6	7.9	3.9%	0 - 30%
Ethylbenzene	ND	ND	0.0%	0 - 30%
p,m-Xylene	7.6	7.9	3.9%	0 - 30%
o-Xylene	1.3	1.3	0.0%	0 - 30%

Spike Conc. (ug/L)	Sample	Amount Spiked	Spiked Sample	% Recovery	Accept Limits
Benzene	8.7	50.0	58.7	100%	39 - 150
Toluene	7.6	50.0	57.6	100%	46 - 148
Ethylbenzene	ND	50.0	50.0	100%	32 - 160
p,m-Xylene	7.6	100.0	108	100%	46 - 148
o-Xylene	1.3	50.0	51.3	100%	46 - 148

ND - Parameter not detected at the stated detection limit.

* - Administrative level set at 80 - 120.

References: Method 5030B, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, December 1996.
Method 8021B, Aromatic and Halogenated Volatiles by Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors, SW-846, USEPA December 1996.

Comments: **QA/QC for samples G512 - G517.**

Analyst

Review

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STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
2040 S. PACHECO
SANTA FE, NEW MEXICO 87505
(505) 827-7131

April 21, 1999

CERTIFIED MAIL
RETURN RECEIPT NO: Z-274-520-641

Ms. Nina Hutton
Cross Timbers Oil Company
810 Houston St., Suite 2000
Fort Worth, Texas 76102-6298

RE: SAN JUAN BASIN GROUND WATER MONITORING REPORTS

Dear Ms. Hutton:

The New Mexico Oil Conservation Division (OCD) has reviewed Cross Timbers Oil Company's (CTOC) February 11, 1999 "CROSS TIMBERS OIL CO. GROUNDWATER MONITORING (AMOCO) 1996-1998 REPORTS, SAN JUAN COUNTY, NEW MEXICO" which was submitted on behalf of CTOC by their consultant Blagg Engineering, Inc. This document contains the results of CTOC's investigation, remediation and monitoring of ground water contamination related to the disposal of oilfield wastes in unlined pits at 7 sites in the San Juan Basin.

Based upon a review of the above referenced documents, the OCD has the following comments and requirements:

1. The downgradient and/or lateral extent of chloride and/or total dissolved solids contamination at the sites listed below has not been completely defined. The OCD requires that CTOC completely define the extent of these contaminants at each site pursuant to the previously approved ground water management plan for these sites.

   - Bergin GC #1E — Unit F, Sec. 21, T29N, R11W
   - Rowland GC #1 — Unit P, Sec. 25, T30N, R12W
   - State GC BS #1 — Unit F, Sec. 21, T29N, R11W
   - Sullivan GC D#1 — Unit B, Sec. 26, T29N, R11W

2. The downgradient and/or lateral extent of benzene, toluene, ethylbenzene, xylene (BTEX), chloride and/or total dissolved solids contamination at the sites listed below has not been completely defined. The OCD requires that CTOC completely define the extent of these contaminants at each site pursuant to the previously approved ground water management plan for these sites.

   - Bruington GC #1 — Unit E, Sec. 14, T29N, R11W
   - Valdez A #1E — Unit G, Sec. 24, T29N, R11W

3. A review of the sampling data shows that during some samplings only ground water from the monitor wells at the source is sampled and there is no downgradient monitoring to show that contaminated ground water is contained. In order to effectively monitor contaminant migration, the OCD requires that the ground water monitoring plan be modified to include additional ground water sampling of all monitor wells at each site on an annual basis. During the annual sampling event ground water from all monitor wells will be sampled and analyzed for BTEX, TDS, polynuclear aromatic hydrocarbons (PAH) and New Mexico Water Quality Control Commission (WQCC) cations and anions and metals using EPA approved methods and quality assurance/quality control procedures. Specific analytes may be dropped from the annual sampling event for certain sites if that analyte has not been found to be above WQCC standard in the sites source areas and the reasons for dropping those analytes are included in the annual reports. This sampling requirement will also be added to the ground water monitoring plan for all future ground water sampling at all CTOC sites with contaminated ground water.

4. CTOC recently purchased a number of well sites in the San Juan Basin from Amoco. Some of these sites were found to have ground water contamination which was discovered by Amoco during pit closure activities. The OCD does not have a listing of status of these sites. Please provide the OCD with a listing of all CTOC well sites in the San Juan Basin at which the presence of ground water was discovered during pit assessment or closure activities and the status of each site.

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

Sincerely,

William C. Olson
Hydrologist
Environmental Bureau

xc: Denny Foust, OCD Aztec District Office
Nelson Velez, Blagg Engineering, Inc.