

AP - 32

STAGE 1 & 2 REPORTS

DATE:

MARCH 10, 2004



Tipperary CORPORATION

633 Seventeenth Street
Suite 1550
Denver, Colorado 80202-3622

March 10, 2004

VIA OVERNIGHT MAIL

Mr. Roger C. Anderson
New Mexico Oil Conservation Division
1220 S. St. Francis Drive
Santa Fe, NM 87505

**RE: Stage 1 Investigation Report
And Stage 2 Abatement Proposal
Collier #1 Pit
Section 9F-T11S-R33E
Lea County, NM**

Dear Mr. Anderson:

As a follow up to your correspondence of June 11, 2003, please find enclosed our Stage 1 investigation report and proposed Stage 2 abatement plan for the subject site. We have included the following information:

- Executive Summary of all site investigation and ground water monitoring activities to date. This summary includes our proposed Stage 2 abatement plan.
- The following data in the Exhibits Section:
 - Base maps of the site and monitor wells.
 - Water table potentiometric contour maps for each event.
 - Isopleth map for benzene.
 - Survey data for all monitor well locations.
 - Water well inventory from the W.A.T.E.R.S. database.
- Geologic/lithologic logs and well construction logs for all of the monitor wells including the new wells: MW1 (proposed as MW37), MW2 (proposed as MW36) and MW5 (proposed as MW35).
- Well bailing records for each well with water level data and volumes.
- Summary and detailed results from 2003 quarterly monitoring activities for the site. This includes results from the first quarter of 2004.

We apologize for the delay in submitting these results, the construction and investigation activities took longer than expected. Please advise if the proposed abatement plan is acceptable. We will then proceed accordingly. If you have any questions, please call me at (303) 293-9379.

Very truly yours,

Larry G. Sugano
Vice President - Engineering

Enclosure

cc: NMOCD Hobbs Office
Whole Earth Environmental

Tipperary Oil & Gas Corporation Collier #1 Pit Site

Executive Summary Phase I Investigation Results

Location

The pit closure site is located within Section 9F, T11S, Range 33E west of Tatum, New Mexico on fee land owned by Mr. Ricky Pearce. The primary land use is that of grazing cattle. Significant oilfield development is present within the area and several oil wells, storage tanks, flow lines and ancillary structures are present on and under the landholdings. A 7.5' map is enclosed within this section to define the location.

The topography is unremarkable. There are no surface streams within one mile of the site. A list of water wells within one mile of the site is enclosed in the Exhibits section.

Discovery and Notification

On December 9, 1999, Tipperary Corporation was notified of the presence of an old, unlined pit on the site. Tipperary Corporation responded on January 31, 2000 that they were of the belief that the pit was closed some thirty years under Order 3221. On September 22, 2000, the NMOCD directed Tipperary to demonstrate "that contaminants have not and will not migrate vertically so as to cause groundwater to exceed standards." On October 3, 2000, Tipperary submitted an investigation protocol, PR-56, covering the site to the NMOCD for approval. On November 16, 2000, Tipperary submitted a revised protocol, PR-56A for approval. The work plan was approved on November 22, 2000.

Excavation of the site began on November 27th and continued through December 11th. Due to mechanical and safety limitations, the excavation was not able to adequately determine the depth of contamination at the site. The pit closure proceeded in accordance with the approved protocol and was completed on December 20, 2000.

Containment

The main plume source was encapsulated in December 2000. The method involved excavating the contaminated soils to an overall depth of 30' below ground surface with a test hole advanced an additional 10' to the top of the water table. A 30 mil high density polyethylene liner was placed with the excavation and all contaminated soils were replaced within it. An additional top liner was placed over the excavation with fresh topsoils covering it to a minimum depth of 3'.

On January 11, 2001, Tipperary submitted the results of the site excavation and submitted a work plan to install monitor wells. On June 5, 2001, the NMOCD approved our plan.

Testing

Water Testing

On July 2, 2001, Atkins Engineering drilled and completed two water monitoring wells designated on the enclosed plat map as the source well and monitoring well MW3. Water samples were collected in accordance with the conditions specified within the protocol approval and Whole Earth Quality procedure QP-76. Field testing revealed that the chloride concentrations within the outer delineation well exceeded NMWQCC standards. Resultantly, two additional delineation wells were drilled on August 9, 2001. These wells are designated as monitor wells MW4 and MW6. On December 21, 2001 the results of our site investigation and our proposed abatement plan was submitted for approval. On April 29, 2002, the NMOCD requested a State 1 investigation proposal. The Stage 1 proposal was submitted on June 28, 2002. The NMOCD approved our Stage 1 abatement plan on June 11, 2003. An additional set of three monitor wells were drilled on June 16, 2003 to confirm the southern and eastern edges of the plume. These wells are designated as monitor wells: MW1 (proposed as MW 37), MW2 (proposed as MW 36), and MW5 (proposed as MW 35).

Each of the recovery and monitor wells was tested for the presence of BTEX on a quarterly basis. The results of the most recent organic compound testing, conducted on January 24, 2004 are included within this report. Additionally, each well was tested at the time it was drilled and completed for the presence and concentrations of chlorides, major cations, anions and hardness. The results of the inorganic laboratory analyses for 2003 are included in the report.

Conclusions

The extensive delineation activities conducted on this site show that the portion of the contaminant plume exceeding NMOCD and NMWQCC standards for BTEX is relatively small – extending from the recovery well located within the pit area to monitor well MW1. Further, the BTEX concentrations within these two wells are relatively minor. The recovery well contains benzene concentrations of only 412 parts per billion, (down from 671 parts per billion recorded February, 2002). Monitor well MW1 shows a benzene concentration of 148 parts per billion. Based on our experience with other sites in the immediate area, these concentrations will eventually naturally attenuate to acceptable levels within a few years.

The chloride concentrations surrounding the site range from a background of 58 parts per million in well MW6 to 14,700 parts per million in well MW3. The chlorides will not attenuate to any appreciable degree on their own leaving only dilution or removal as the only available remediation options.

Proposed Stage 2 Abatement Plan

The affected area surrounding Collier #1 has been effectively delineated by a series of six monitoring wells situated to the east and south of the pit. Additionally, a 4" recovery well has been advanced into the water table within the southwest corner of the pit excavation.

A down hole electric pump has been installed into the recovery well and piped into the Burro Saltwater Disposal System. Additionally, a flow meter has been installed between the pump and the disposal system to measure the volumes of fluids removed from the aquifer.

Our proposed remediation procedure is to pump the groundwater contaminated with hydrocarbons and brine into the disposal system and to regularly check the six monitor wells for the presence and concentrations of BTEX and chlorides. This testing will occur on a quarterly basis and continue until we have achieved four consecutive quarter in which the criteria contaminant concentrations meet or exceed the NMOCD and NMWECC standards.

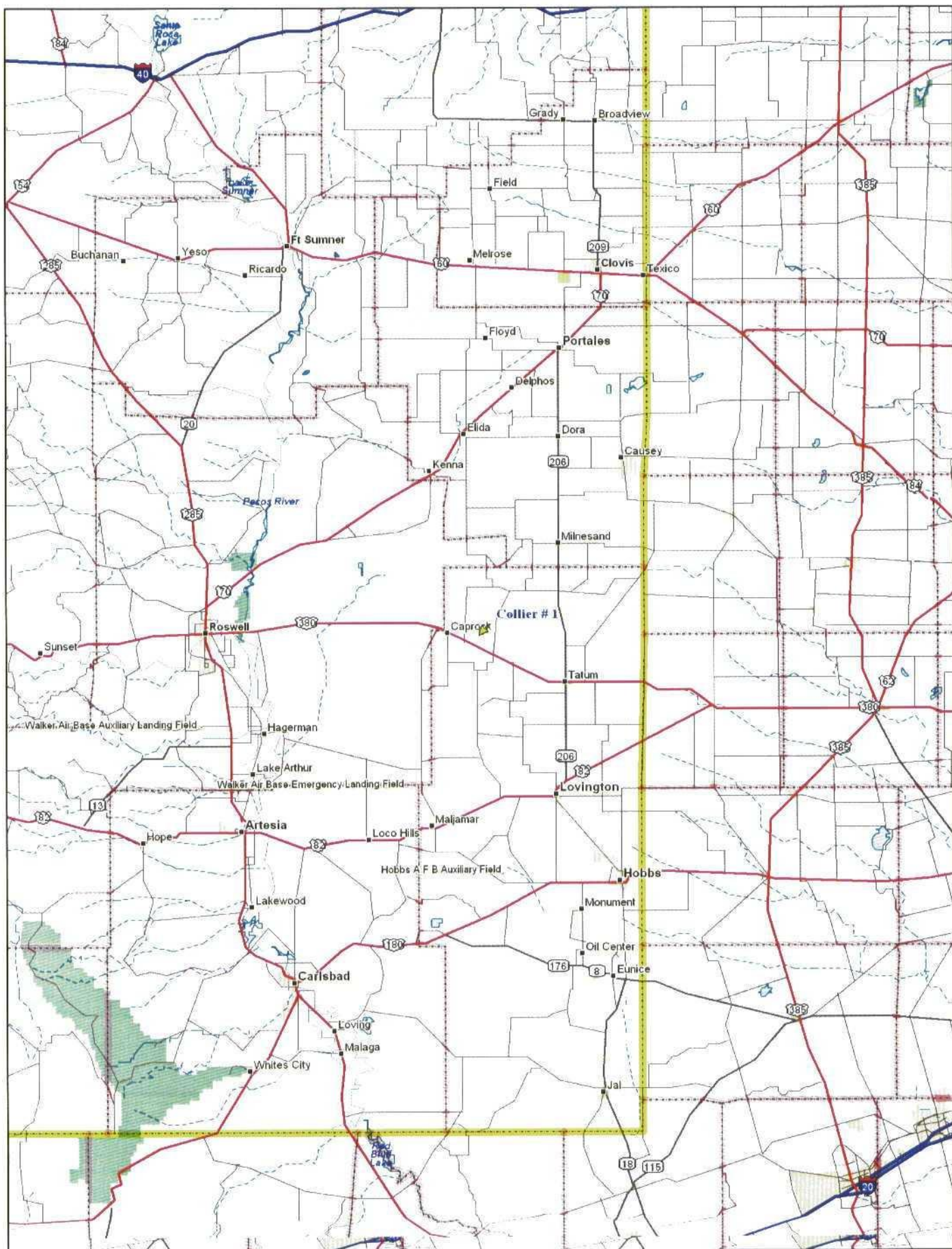
Tipperary will provide the NMOCD with an annual summary of the test results and a total of the fluid volumes removed during the year. If this is acceptable, please advise so we can put this proposal into action.

**Tipperary Oil & Gas Corporation
Collier #1 Pit Site**

Exhibits

This section contains several exhibits relating to the remediation project.

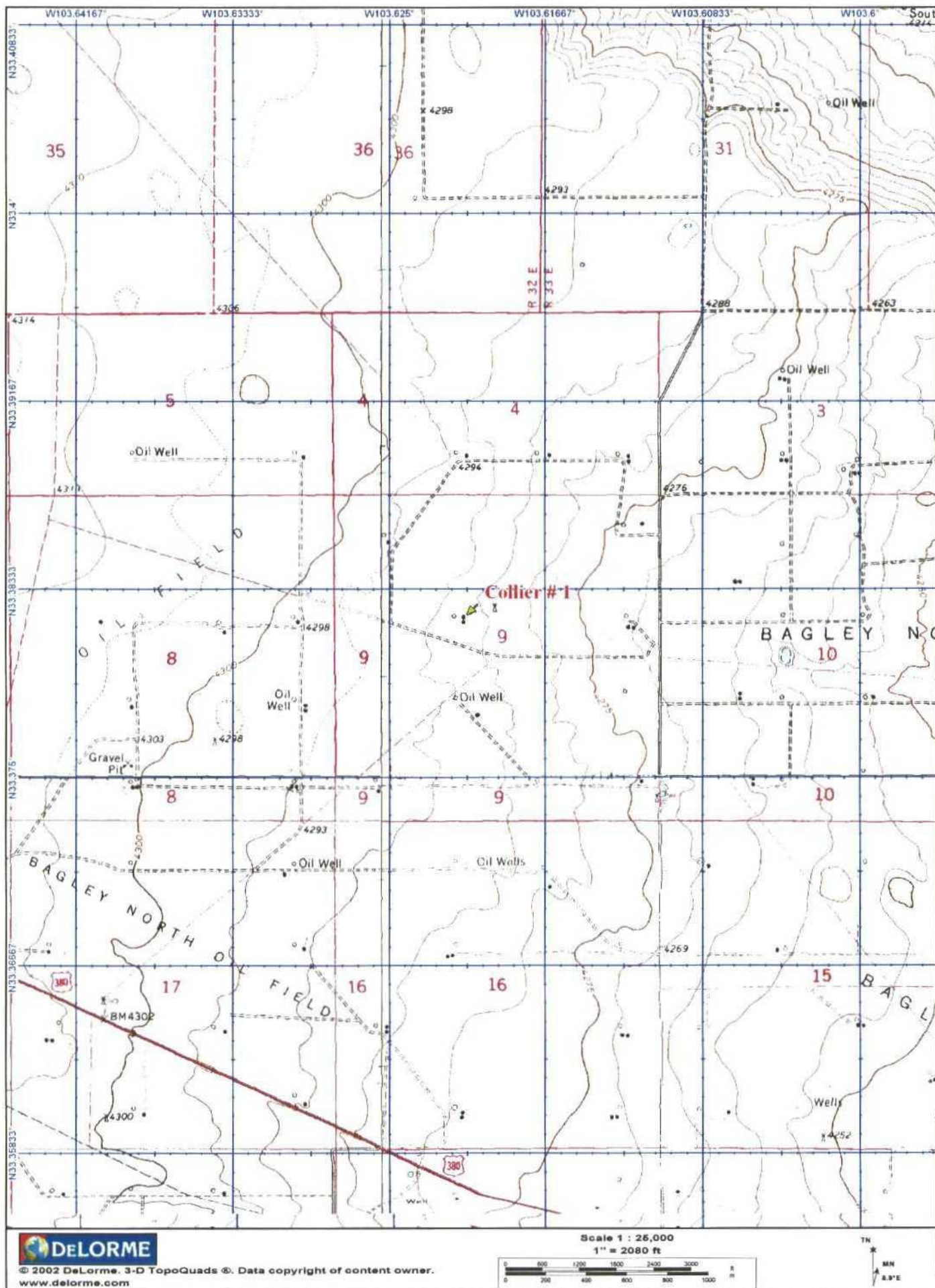
1. U.S.G.S. 7.5' map showing the overall location of the site.
2. U.S.G.S. 7.5' map showing the well location within the Bagley Field.
3. Site map showing the individual monitor well locations.
4. Water table potentiometric contour maps with direction and magnitude of hydraulic gradient for each sampling event.
5. Isopleth map for contaminants of concern.
6. Survey data for all monitor well locations.
7. Water well inventory of all wells within one mile of the Collier 1 pit site.



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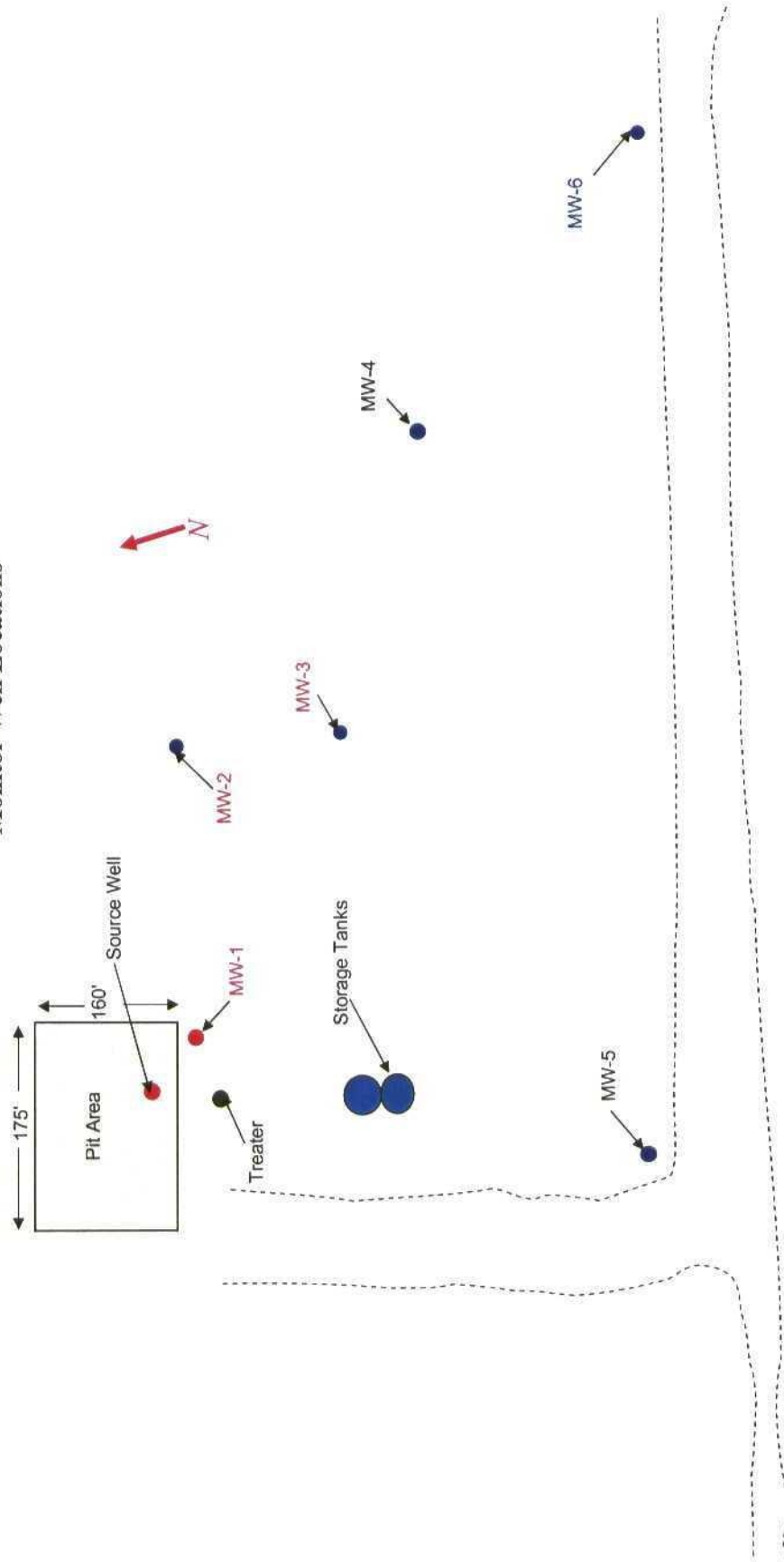
Scale 1 : 1,600,000
1" = 26.3 mi

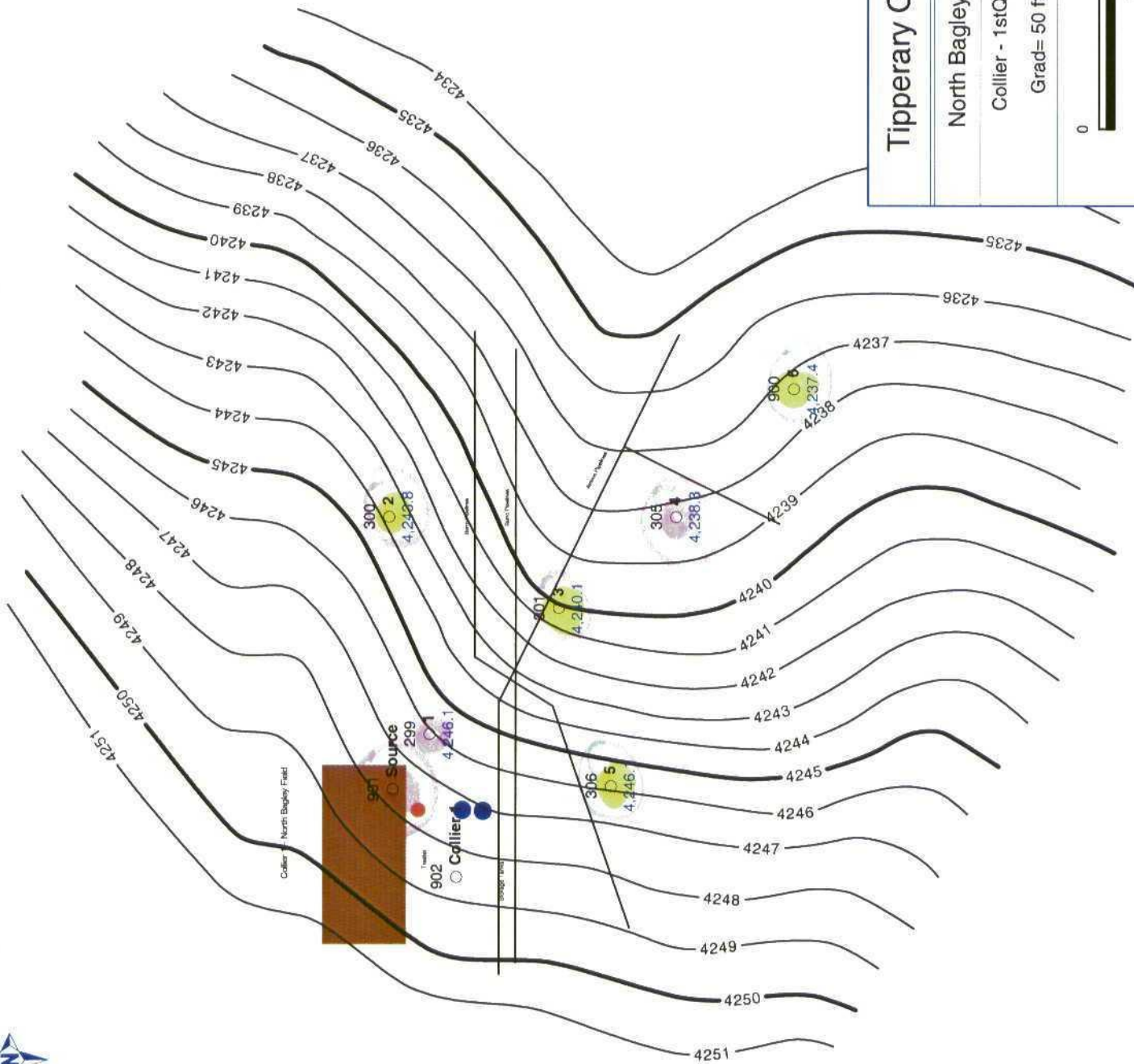




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**Tipperary Corporation
Collier # 1
Monitor Well Locations**





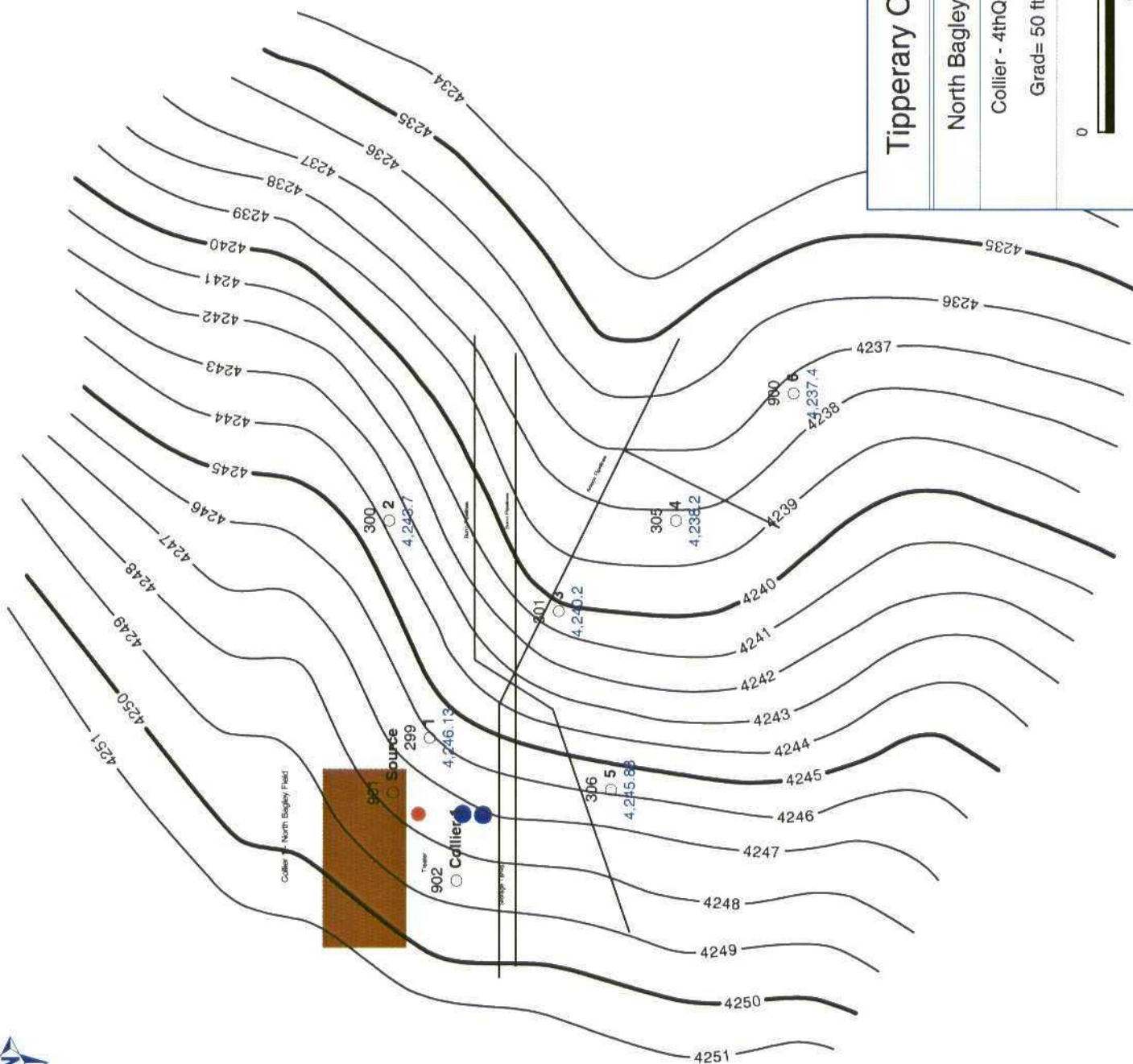
Tipperary Oil & Gas Corp.

North Bagley Field Pit Closure

Collier - 1stQ 2004 Water Level

Grad= 50 ft./mi. @ 122° Az.





Tipperary Oil & Gas Corp.

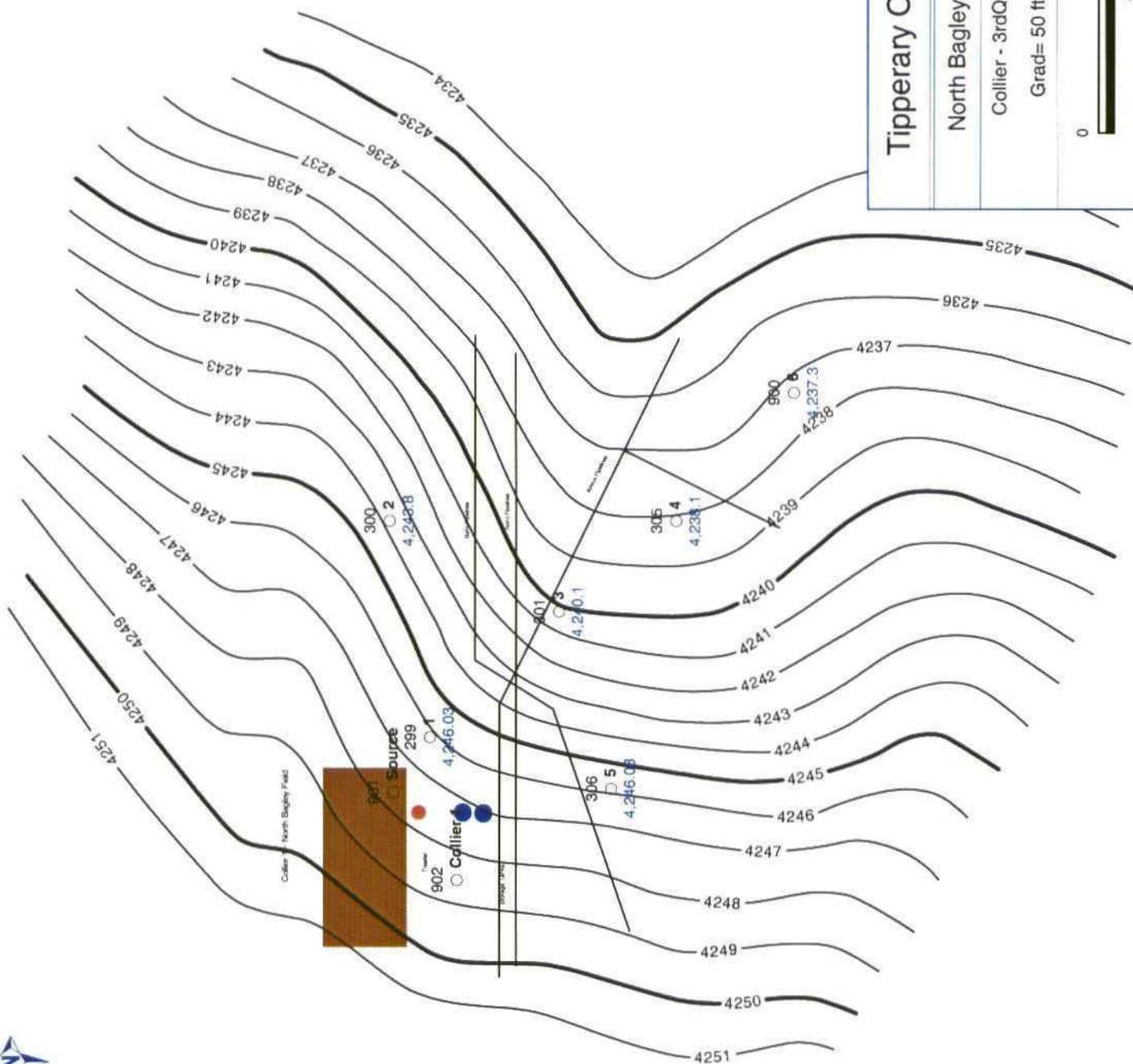
North Bagley Field Pit Closure

Collier - 4thQ 2003 Water Level

Grad= 50 ft./mi. @ 122° Az.

0 250 500

FEET

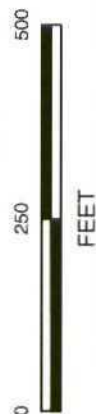


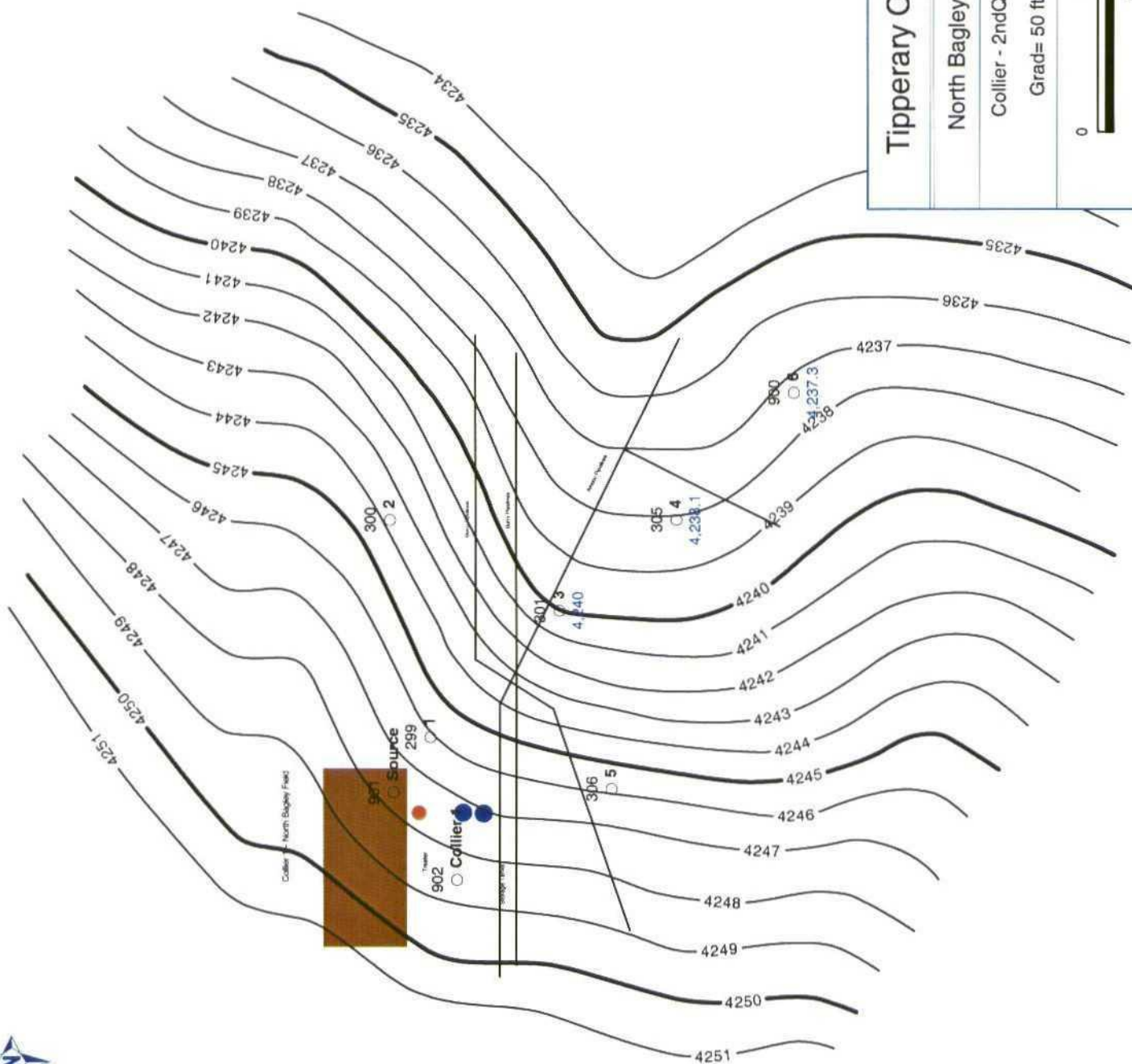
Tipperary Oil & Gas Corp.

North Bagley Field Pit Closure

Collier - 3rdQ 2003 Water Level

Grad= 50 ft./mi. @ 122° Az.



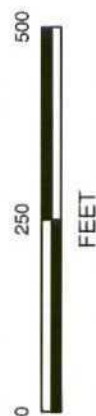


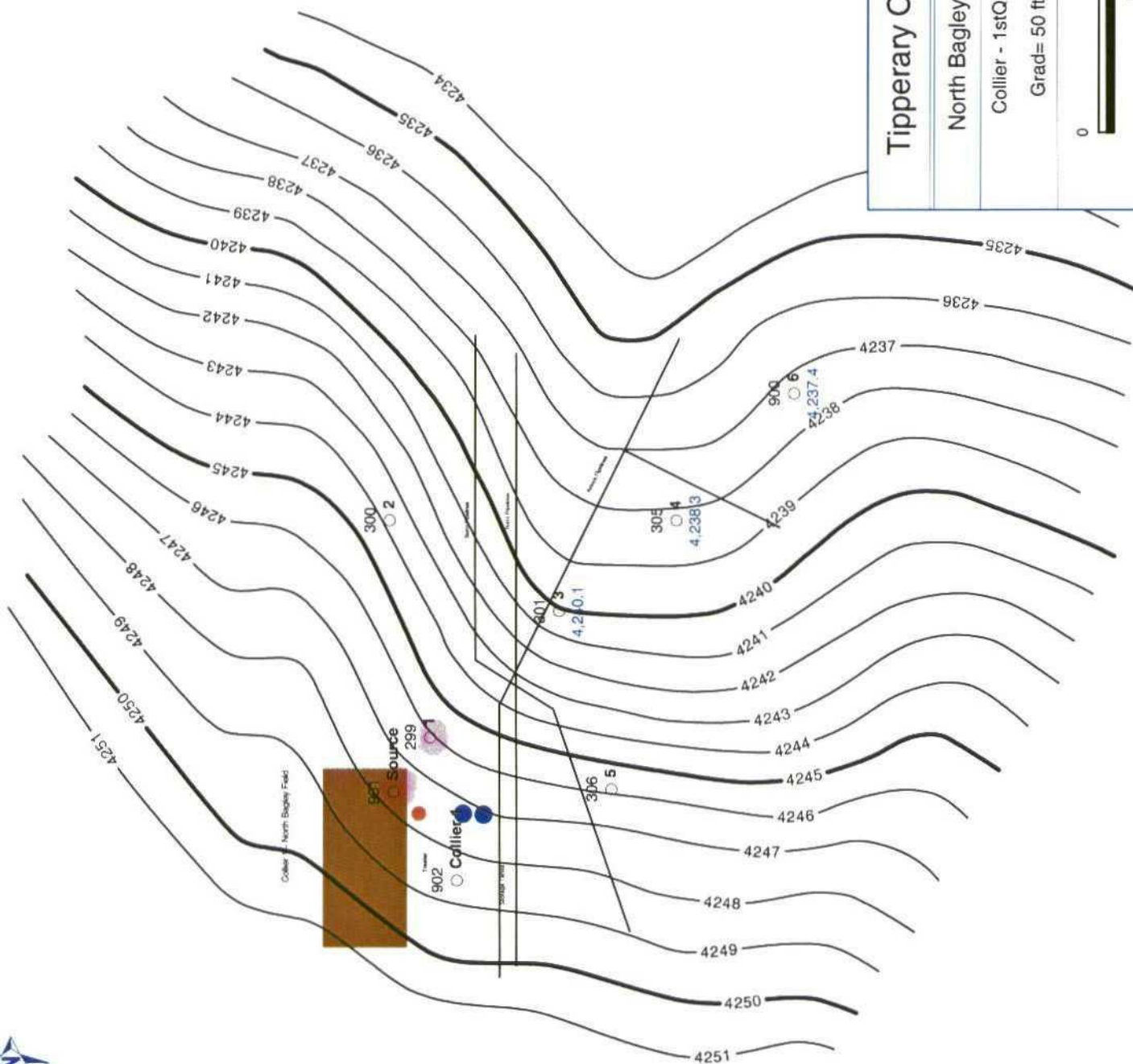
Tipperary Oil & Gas Corp.

North Bagley Field Pit Closure

Collier - 2ndQ 2003 Water Level

Grad= 50 ft./mi. @ 122° Az.





Tipperary Oil & Gas Corp.

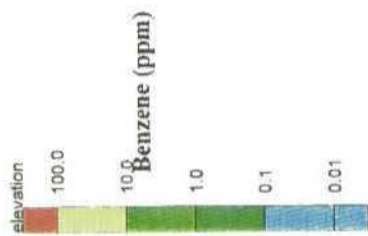
North Bagley Field Pit Closure

Collier - 1stQ 2003 Water Level

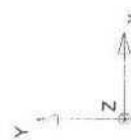
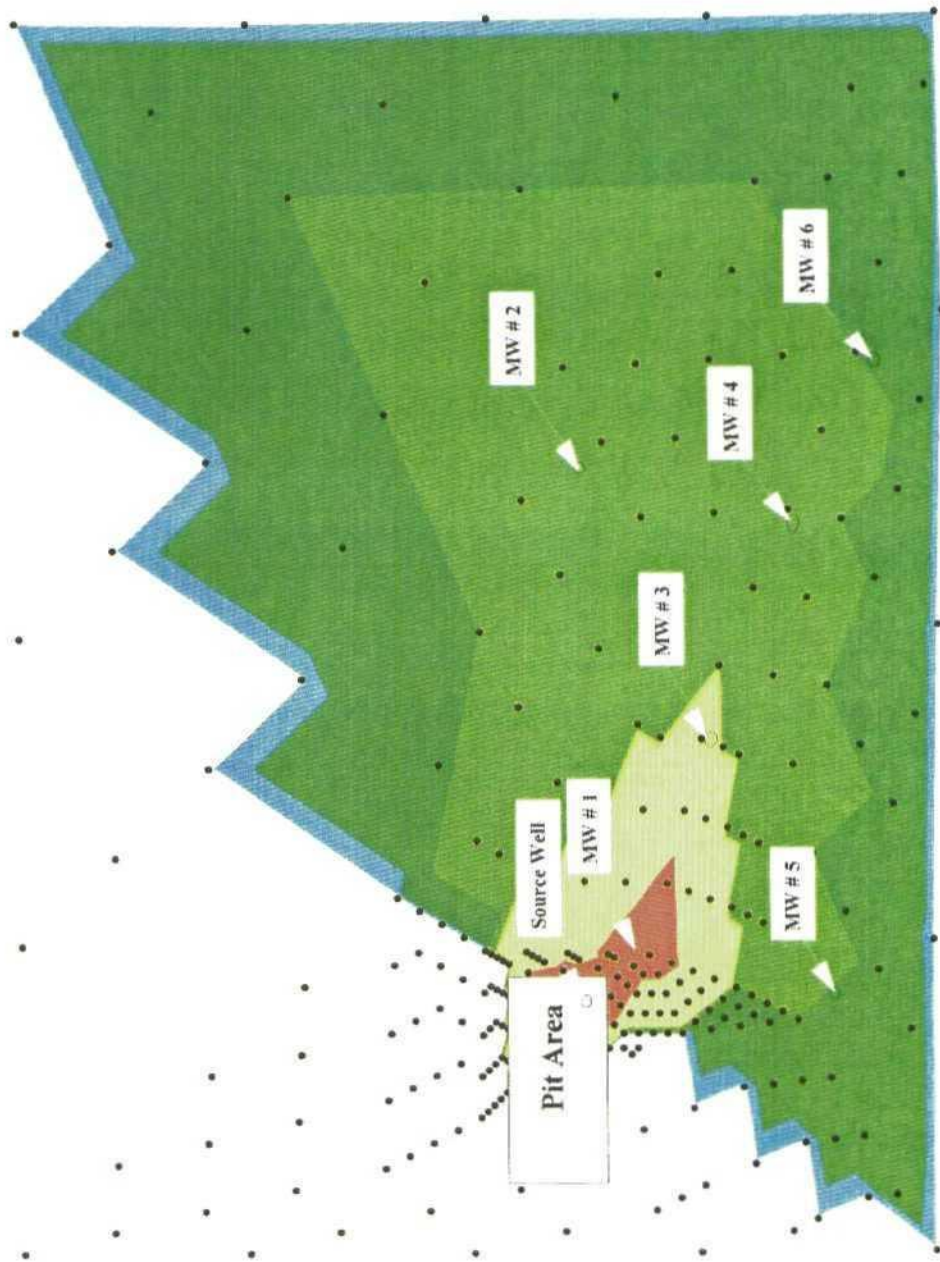
Grad= 50 ft./mi. @ 122° Az.

0 250 500

FEET



Tipperary Corporation Collier # 1 Isopleth



Collier 1 Pit Site
Sec 9F-T11S-R33E
Survey Data

Well	Old Well Name	Latitude	Longitude	Elevation
MW1	MW37	N 33° 22' 55.89915"	W 103° 37' 14.87439"	4290.13
MW2	MW36	N 33° 22' 56.31201"	W 103° 37' 10.72284"	4286.90
MW3	MW32	N 33° 22' 53.8"	W 103° 37' 12.5"	4284.00
MW4	MW33	N 33° 22' 51.9"	W 103° 37' 10.8"	4281.20
MW5	MW35	N 33° 22' 51.16167"	W 103° 37' 15.53811"	4290.58
MW6	MW34	N 33° 22' 50.0"	W 103° 37' 08.4"	4280.80
Recovery Well		N 33° 22' 56.5"	W 103° 37' 15.9"	4292.10
Collier 1		N 33° 22' 55.5"	W 103° 37' 17.6"	4290.70

All coordinates are based on NMSPCE (NAD83)

Water Inventory
 Collier 1 Pit Site
 Sec 9F-T11S-R33E
 Lea County, NM

(acre ft per annum)		(quarters are 1=NW 2=NE 3=SW 4=SE)										(X Y are in feet)		(UTM are in meters)		Start Date		Finish Date		Depth (ft)	
DB File Nbr	Use	Diversion	Owner	Well Number	Source	Tws	Rng	Sec	q	q	q	Zone	X	Y	UTM_Zone	Eastings	Northings	Start Date	Finish Date	Well	Water
L 06140	PRO	0	MCVAY DRILLING COMPANY	L 06140	Shallow	11S	33E	5	4	4					13	627455	3695089	5/18/1967	5/18/1967	75	40
L 06249	PRO	0	M.G.G. DRILLING COMPANY	L 06249	Shallow	11S	33E	8	3	2					13	626669	3693880	12/24/1967	12/24/1967	105	48
L 10567	PRO	0	YATES PETROLEUM	L 10567	Shallow	11S	33E	8	4	1					13	626870	3693984	6/3/1996	6/3/1996	130	58
L 05493	PRO	0	TRI-SERVICE DRILLING CO.	L 05493	Shallow	11S	33E	9	2	2					13	629071	3694714	10/14/1965	10/15/1965	160	45
L 06139	PRO	0	FORSTER DRILLING COMPANY	L 06139	Shallow	11S	33E	9	3						13	627881	3693695	5/5/1967	5/5/1967	80	40
L 06235	PRO	0	FORSTER DRILLING CORP.	L 06235	Shallow	11S	33E	9	3	3					13	627881	3693494	11/3/1967	11/6/1967	90	50
L 06242	PRO	0	SHARP DRILLING COMPANY	L 06242	Shallow	11S	33E	9	3	3					13	627780	3693393	11/13/1967	11/13/1967	100	80
L 10225	PRO	0	NORTON DRILLING	L 10225	Shallow	11S	33E	9	3	1					13	627774	3693798	10/14/1991	10/14/1991	115	45
L 05393	PRO	0	LYMAN GRAHAM	L 05393	Shallow	11S	33E	9	4	2					13	629083	3693910	5/19/1964	5/20/1964	105	70
L 03470	PRO	3	ROWAN DRILLING CO.	L 03470	Shallow	11S	33E	10	1	4	1				13	629782	3694420	4/14/1957	4/14/1957	116	54
L 03470	APPRO			L 03470	Shallow	11S	33E	10	1	4	1				13	629782	3694420	4/17/1957	4/17/1957	116	54
L 03483	APPRO			L 03483	Shallow	11S	33E	10	1	4	1				13	629782	3694420	4/17/1957	4/17/1957	140	80
L 03483	APPRO EXP			L 03483	Shallow	11S	33E	10	1	4	1				13	629782	3694420	4/17/1957	4/17/1957	140	80
L 06173	PRO	0	CACTUS DRILLING CORP.	L 06173	Shallow	11S	33E	15	1	1					13	629497	3693109	7/29/1967	7/29/1967	85	55
L 05113	PRO	0	LYMAN R. GRAHAM	L 05113	Shallow	11S	33E	15							13	630118	3692506	4/14/1963	4/15/1963	105	45
L 06098	PRO	0	TRI-SERVICE DRILLING COMPAN	L 06098	Shallow	11S	33E	16	1	2					13	628289	3693096	1/25/1967	1/25/1967	100	55
L 06060	PRO	0	TRT - SERVICE DRILLING CO.	L 06060	Shallow	11S	33E	16	2	4					13	629100	3692703				
L 06060 (1)	PRO	0	TRT - SERVICE DRILLING CO.	L 06060 (1)	Shallow	11S	33E	16	2	4					13	629100	3692703	10/16/1966	10/16/1966	95	45

From W.A.T.E.R.S. Database



Well Construction Schematics

This section contains copies of the well construction logs for each of the six monitor and one recovery well within the Collier Remediation Project.

Atkins Engineering
Associates, Inc.

2904 W. 2nd St., Roswell, NM 88202-3156

LOG OF BORING MW-1

Formerly MW 37

(Page 1 of 1)

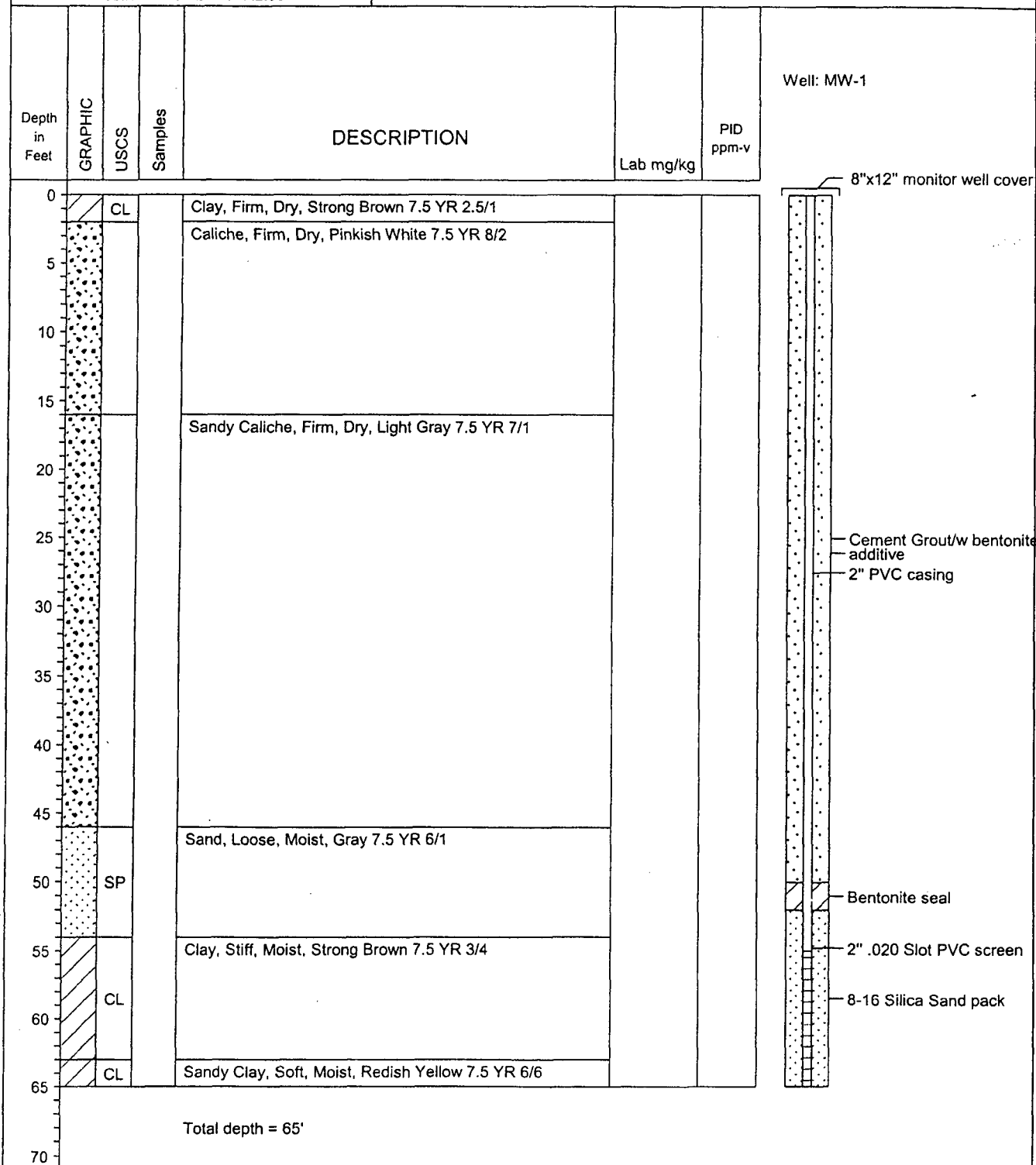
Whole Earth Environmental
19606 San Gabriel
Houston, TX 77084

Contact: Mike Griffin

Job#: WHOLENV.DRL.03

Date : 6/16/03
Drill Start/Drill End :
Boring Location :

Site Location : Collier SE SW Sec. 9
: T11S., R33E
Auger Type : Hollow stem
Logged By : Mort Bates



Atkins Engineering
Associates, Inc.

2904 W. 2nd St., Roswell, NM 88202-3156

LOG OF BORING MW-2

Formerly MW 36

(Page 1 of 1)

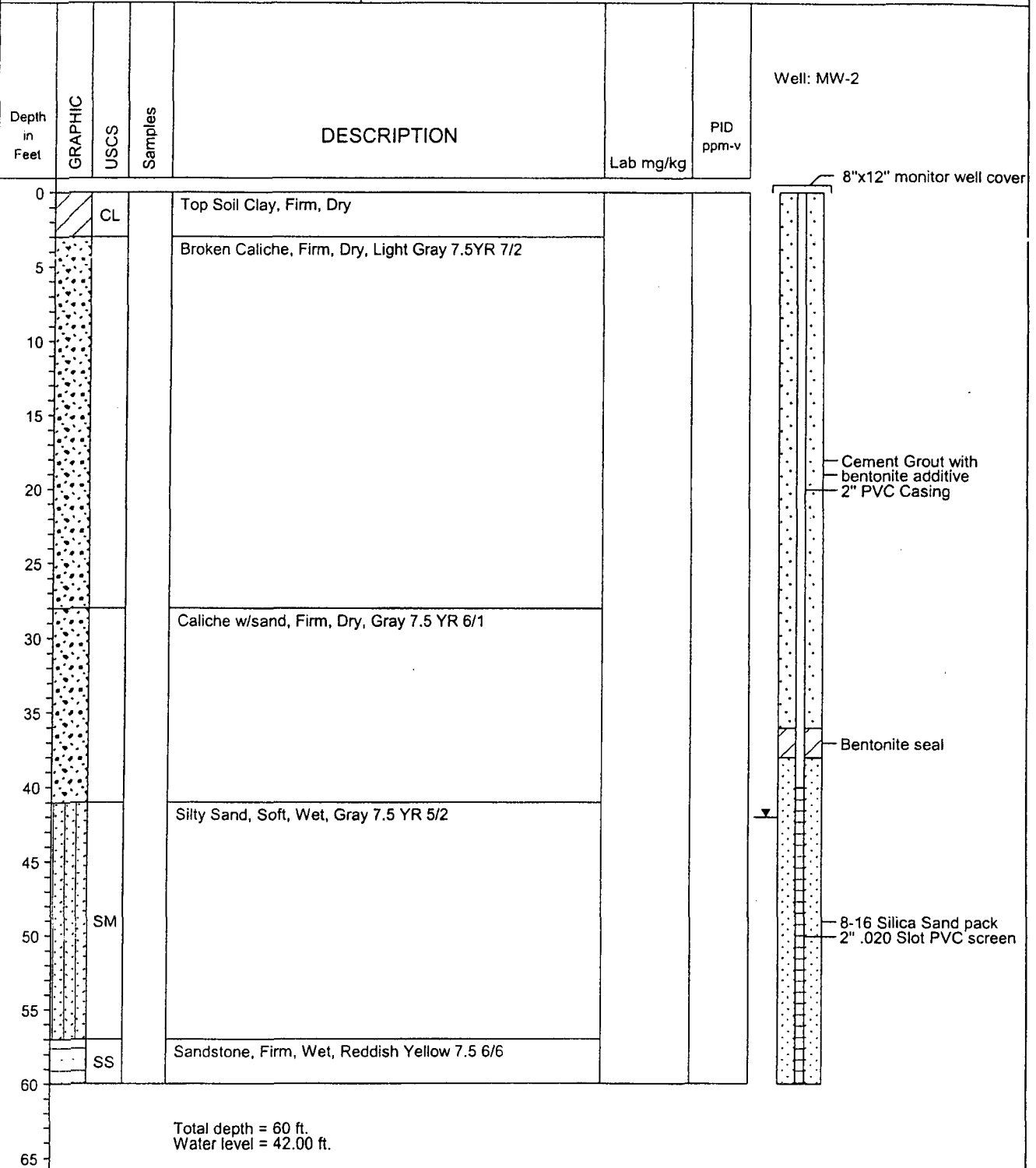
Whole Earth Environmental
19606 San Gabriel
Houston, TX 77084

Contact: Mike Griffin

Job#: WHOLENV.DRL.03

Date : 6/14/03
Drill Start/Drill End :
Boring Location :

Site Location : Collier SE SW Sec. 9
: T11S., R33E
Auger Type : Hollow stem
Logged By : Mori Bates



Atkins Engineering
Associates, Inc.

2904 W. 2nd St., Roswell, NM 88202-3156

LOG OF BORING MW-3
Formerly MW 32

(Page 1 of 1)

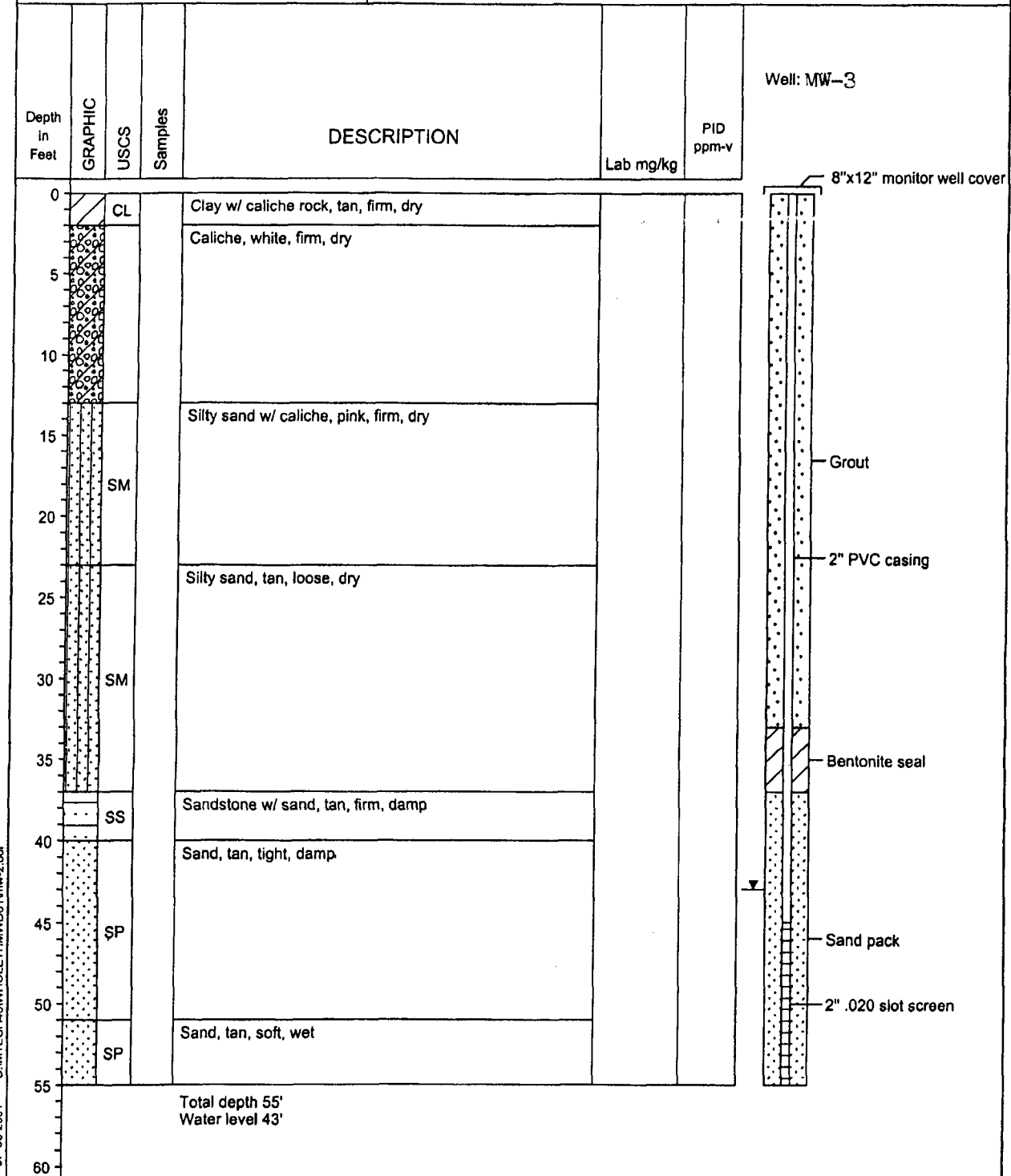
Whole Earth Environmental
19606 San Gabriel
Houston, TX 77084

Contact: Mike Griffin

Job#: WHOLETH.MWD.01

Date : 07-02-01
Drill Start : 1400
Drill End : 1800
Boring Location : 200' SE of MW-1

Site Location : Caprock, NM
Sec. 9, T11S, R33E
Auger Type : Hollow Stem
Logged By : Mort Bates



Atkins Engineering Associates, Inc. 2904 W. 2nd St., Roswell, NM 88202-3156				LOG OF BORING MW-4 Formerly MW 33 (Page 1 of 1)			
Whole Earth 19606 San Gabriel Houston, TX 77084				Date : 08-09-01 Drill Start : 0800 Drill End : 1030 Boring Location : 254'SE of MW-2		Site Location : Caprock, NM : T11S, R33E, Sec. 9 Auger Type : Hollow Stem Logged By : Mort Bates	
Contact: Mike Griffin Job#: WHOLETH.MWE!01							

Depth in Feet	GRAPHIC	USCS	Samples	DESCRIPTION	Lab	PID ppm-v
0	CL			Clay w/ caliche rock, brown, loose, damp		
5				Silty sand w/ caliche, tan, firm, dry		
10	SM					
15						
20						
25	SP			Poorly graded sand, tan, loose, dry		
30						
35	SP			Sand w/ sandstone, tan, loose, dry		
40	SS			Sandstone w/ sand, tan, firm, dry		
45	SP			Sand, tan, loose, damp		
50	SP			Sand, tan, loose, moist		
55						
				Total depth 55' Water level 43.00'		

08-10-2001 C:\MTECH\46\WEMWE01\mw-3.bor

8"x12" monitor well cover

Grout
 2" PVC casing
 Bentonite seal
 Sand pack
 2" .020 Slot screen

**Atkins Engineering
Associates, Inc.**

2904 W. 2nd St., Roswell, NM 88202-3156

LOG OF BORING MW-5

Formerly MW 35

(Page 1 of 1)

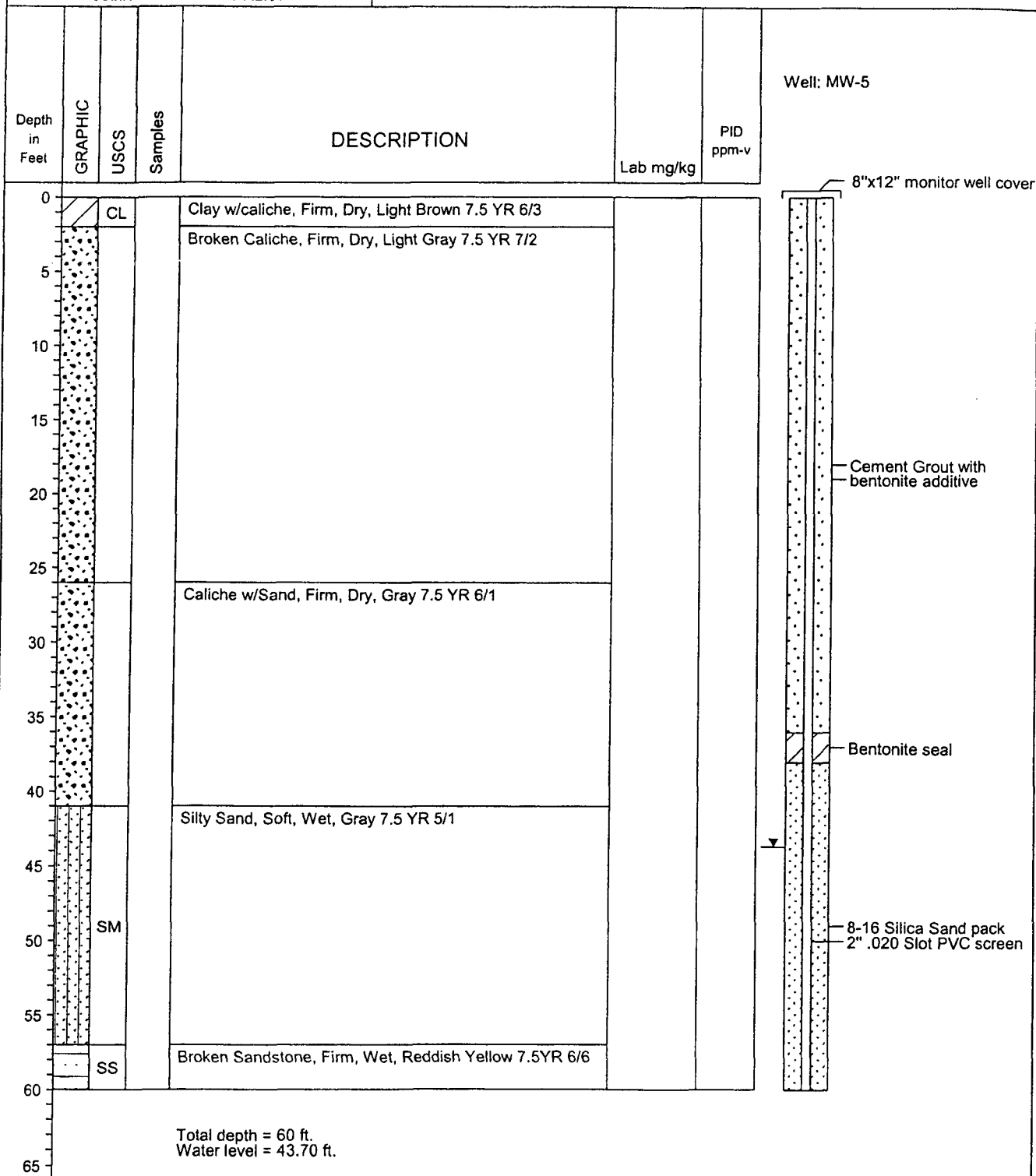
Whole Earth Environmental
19606 San Gabriel
Houston, TX 77084

Contact: Mike Griffin

Job#: WHOLENV.DRL.03

Date : 6/13/03
Drill Start/Drill End :
Boring Location :

Site Location : Collier SE SW Sec. 9
: T11S., R33E
Auger Type : Hollow stem
Logged By : Mort Bates



Atkins Engineering Associates, Inc. 2904 W. 2nd St., Roswell, NM 88202-3156				LOG OF BORING MW-6 Formerly MW 34				(Page 1 of 1)
Whole Earth 19606 San Gabriel Houston, TX 77084				Date : 08-09-01		Site Location : Caprock, NM		
Contact: Mike Griffin				Drill Start : 1100		: T11S, R33E, Sec. 9		
Job#: WHOLETH.MWE.01				Drill End : 1500		Auger Type : Hollow Stem		
				Boring Location : 250'SE of MW-3		Logged By : Mort Bates		

Depth in Feet	GRAPHIC	USCS	Samples	DESCRIPTION	Lab	PID ppm-v	
0		CL		Clay w/ caliche rock, brown, loose, dry			
2.5				Caliche rock, tan, hard, dry			
5				Silty sand w/ caliche, tan, firm, dry			
10							
15		SM					
20							
25				Poorly graded, sand, tan, loose, dry			
30		SP					
35				Sand w/ sandstone, tan, loose, dry			
40		SS		Cemented sandstone, tan, firm, dry			
45				Sand, tan, loose, moist			
50		SP					
55							
				Total depth 55' Water level 44.0'			

Well: MW- 6

8"x12" monitor well cover

Grout

2" PVC casing

Bentonite seal

Sand pack

2" .020 Slot screen

08-10-2001 C:\MTECH\46\WEM\MWE01\mw-4.bor

Atkins Engineering Associates, Inc. 2904 W. 2nd St., Roswell, NM 88202-3156				LOG OF BORING SOURCE WELL				(Page 1 of 2)	
Whole Earth Environmental 19606 San Gabriel Houston, TX 77084				Date : 07-02-01 Drill Start : 0800 Drill End : 1330 Boring Location : SE of old pit		Site Location : Caprock, NM : Sec. 9, T11S, R33E Auger Type : Hollow Stem Logged By : Mort Bates			
Contact: Mike Griffin									
Job#: WHOLETH.MWD.01									

Depth in Feet	GRAPHIC	USCS	Samples	DESCRIPTION	Lab mg/kg	PID ppm-v
0				Caliche w/ rock, tan & white, loose, dry		
5						
10						
15						
20						
25				Caliche w/ sand, tan, firm, dry		
30				Silty sand, tan, loose, dry		
35						
40						
45				Sandstone w/ sand, tan, firm, dry		
50						

07-05-2001 C:\MTECH\48\WHOLETH.MWD01\mw-1.bor

Grout
 Bentonite seal
 4" PVC Casing
 Silica sand pack
 4" .020 slot screen

**Atkins Engineering
Associates, Inc.**

2904 W. 2nd St., Roswell, NM 88202-3156

**LOG OF BORING
SOURCE WELL**

(Page 2 of 2)

Whole Earth Environmental
19606 San Gabriel
Houston, TX 77084

Contact: Mike Griffin

Job#: WHOLETH.MWD.01

Date : 07-02-01
Drill Start : 0800
Drill End : 1330
Boring Location : SE of old pit

Site Location : Caprock, NM
Sec. 9, T11S, R33E
Auger Type : Hollow Stem
Logged By : Mort Bates

Depth in Feet	GRAPHIC	USCS	Samples	DESCRIPTION	Lab mg/kg	PID ppm-v
50		SS				
55				Clayey sand, ted, tight, damp		
60						
65		SC				
70						
75				Sandy clay, tan, soft, wet		
80		CL				
85				Clayey sand, tan, soft, wet		
90		SC				
95						
100						

Total depth 95'
Water level 44.0'

4" .020 slot screen

Silica sand pack

Open hole

07-05-2001 C:\MTECH\46\WHOLETH\MWD01\mw-1.bor



Bailing Logs

This section contains copies of the bailing logs for each monitor and recovery well located within the Collier Remediation Project.

**Collier Source**

Lat:	<u>N33° 22' 57.6"</u>
Long.	<u>W103° 37' 9.9"</u>
Surf. Elev.	<u>4284 Ft.</u>

Date:	7/2/2001	Date:	12/28/02	04/12/03	06/12/03	10/25/03	
Top of Water	44 Ft.	Top of Water	NA	NA	NA	NA	Ft.
Bottom of Bore	95 Ft.	Bottom of Bore	NA	NA	NA	NA	Ft.
		LPNL Top	NA	NA	NA	NA	Ft.
		LPNL Bottom	NA	NA	NA	NA	Ft.
		DPNL Top	NA	NA	NA	NA	Ft.
		DPNL Bottom	NA	NA	NA	NA	Ft.
		Min. Bailing Vol.	NA	NA	NA	NA	Gal.
		Actual Bailing Vol.	NA	NA	NA	NA	Gal.

Comments

[illegible]



Collier

Monitor Well Bailing Log

Collier Source

Lat: N33° 22' 57.6"
Long. W103° 37' 9.9"
Surf. Elev. 4284 Ft.

As Drilled	As Measured
------------	-------------

Date: 7/2/2001
Top of Water 44 Ft.
Bottom of Bore 95 Ft.

Date:	01/25/04				
Top of Water	NA	NA	NA	NA	Ft.
Bottom of Bore	NA	NA	NA	NA	Ft.
LPNL Top	NA	NA	NA	NA	Ft.
LPNL Bottom	NA	NA	NA	NA	Ft.
DPNL Top	NA	NA	NA	NA	Ft.
DPNL Bottom	NA	NA	NA	NA	Ft.
Min. Bailing Vol.	NA	NA	NA	NA	Gal.
Actual Bailing Vol.	NA	NA	NA	NA	Gal.

Comments



Collier

Monitor Well Bailing Log

Collier MW #1

Lat: N33° 22.93165'
Long. W103° 37.24791
Surf. Elev. 4290.13 Ft.

As Drilled	As Measured
------------	-------------

Date: 6/13/2003
Top of Water 44 Ft.
Bottom of Bore 65 Ft.

Date:			6/12/03	10/25/03	
Top of Water			44.10	44.00	Ft.
Bottom of Bore			63.20	63.30	Ft.
Bore Volumn			3.08	3.11	Gal.
LPNL Top			NA	NA	Ft.
LPNL Bottom			NA	NA	Ft.
DPNL Top			NA	NA	Ft.
DPNL Bottom			NA	NA	Ft.
Min. Bailing Vol.			9.24	9.34	Gal.
Actual Bailing Vol.			20.00	10.00	Gal.

Comments



Collier

Monitor Well Bailing Log

Collier MW #1

Lat: N33° 22.93165'
Long. W103° 37.24791
Surf. Elev. 4290.13 Ft.

As Drilled	As Measured
------------	-------------

Date: 6/13/2003
Top of Water 44 Ft.
Bottom of Bore 65 Ft.

Date:	<u>1/24/04</u>			
Top of Water	<u>44.00</u>			Ft.
Bottom of Bore	<u>63.20</u>			Ft.
Bore Volumn	<u>3.10</u>			Gal.
LPNL Top	<u>NA</u>			Ft.
LPNL Bottom	<u>NA</u>			Ft.
DPNL Top	<u>NA</u>			Ft.
DPNL Bottom	<u>NA</u>			Ft.
Min. Bailing Vol.	<u>9.29</u>			Gal.
Actual Bailing Vol.	<u>15.00</u>			Gal.

Comments



Collier

Monitor Well Bailing Log

Collier MW #2

Lat: N33⁰ 22.93853'
Long. W103⁰ 37.17871
Surf. Elev. 4286.9 Ft.

As Drilled	As Measured
------------	-------------

Date: 6/14/2003
Top of Water 42 Ft.
Bottom of Bore 60 Ft.

Date:			6/12/03	10/25/03	
Top of Water			43.10	43.20	Ft.
Bottom of Bore			58.70	58.90	Ft.
Bore Volume			2.52	2.53	Gal.
LPNL Top			NA	NA	Ft.
LPNL Bottom			NA	NA	Ft.
DPNL Top			NA	NA	Ft.
DPNL Bottom			NA	NA	Ft.
Min. Bailing Vol.			7.55	7.60	Gal.
Actual Bailing Vol.			15.00	10.00	Gal.

Comments



Collier

Monitor Well Bailing Log

Collier MW #2

Lat: N33° 22.93853'
Long. W103° 37.17871
Surf. Elev. 4286.9 Ft.

As Drilled	As Measured
------------	-------------

Date: 6/14/2003
Top of Water 42 Ft.
Bottom of Bore 60 Ft.

Date:	<u>1/24/04</u>			
Top of Water	<u>43.10</u>			Ft.
Bottom of Bore	<u>58.70</u>			Ft.
Bore Volume	<u>2.52</u>			Gal.
LPNL Top	<u>NA</u>			Ft.
LPNL Bottom	<u>NA</u>			Ft.
DPNL Top	<u>NA</u>			Ft.
DPNL Bottom	<u>NA</u>			Ft.
Min. Bailing Vol.	<u>7.55</u>			Gal.
Actual Bailing Vol.	<u>15.00</u>			Gal.

Comments



Collier

Monitor Well Bailing Log

Collier MW #3

Lat: N33' 22' 53.8"
Long. W103' 37' 12.5"
Surf. Elev. 4284

As Drilled	As Measured
------------	-------------

Date: 7/2/2001
Top of Water 43 Ft.
Bottom of Bore 55 Ft.

Date:	1/28/02	4/12/03	6/12/03	10/25/03	
Top of Water	43.90	44.00	43.90	43.80	Ft.
Bottom of Bore	54.90	54.90	54.80	54.80	Ft.
Bore Volumn	1.77	1.76	1.76	1.77	Gal.
LPNL Top	NA	NA	NA	NA	Ft.
LPNL Bottom	NA	NA	NA	NA	Ft.
DPNL Top	NA	NA	NA	NA	Ft.
DPNL Bottom	NA	NA	NA	NA	Ft.
Min. Bailing Vol.	5.32	5.27	5.27	5.32	Gal.
Actual Bailing Vol.	20.00	20.00	20.00	10.00	Gal.

Comments



Collier

Monitor Well Bailing Log

Collier MW #3

Lat: N33' 22' 53.8"
Long. W103' 37' 12.5"
Surf. Elev. 4284

As Drilled	As Measured
------------	-------------

Date: 7/2/2001
Top of Water 43 Ft.
Bottom of Bore 55 Ft.

Date:	<u>1/24/04</u>			
Top of Water	<u>43.90</u>			Ft.
Bottom of Bore	<u>54.90</u>			Ft.
Bore Volumn	<u>1.77</u>			Gal.
LPNL Top	<u>NA</u>			Ft.
LPNL Bottom	<u>NA</u>			Ft.
DPNL Top	<u>NA</u>			Ft.
DPNL Bottom	<u>NA</u>			Ft.
Min. Bailing Vol.	<u>5.32</u>			Gal.
Actual Bailing Vol.	<u>15.00</u>			Gal.

Comments



Collier

Monitor Well Bailing Log

Collier MW #4

Lat: N33' 22' 51.9"
Long. W103' 37' 10.8"
Surf. Elev. 4281

As Drilled	As Measured
------------	-------------

Date: 8/9/2001
Top of Water 43 Ft.
Bottom of Bore 55 Ft.

Date:	1/28/02	4/12/03	6/12/03	10/25/03	
Top of Water	42.70	42.90	42.90	42.80	Ft.
Bottom of Bore	52.50	52.40	52.80	53.00	Ft.
Bore Volume	1.58	1.53	1.60	1.65	Gal.
LPNL Top	NA	NA	NA	NA	Ft.
LPNL Bottom	NA	NA	NA	NA	Ft.
DPNL Top	NA	NA	NA	NA	Ft.
DPNL Bottom	NA	NA	NA	NA	Ft.
Min. Bailing Vol.	4.74	4.60	4.79	4.94	Gal.
Actual Bailing Vol.	15.00	20.00	20.00	10.00	Gal.

Comments



Collier

Monitor Well Bailing Log

Collier MW #4

Lat: N33' 22' 51.9"
Long. W103' 37' 10.8"
Surf. Elev. 4281

As Drilled	As Measured
------------	-------------

Date: 8/9/2001
Top of Water 43 Ft.
Bottom of Bore 55 Ft.

Date:	<u>1/24/04</u>			
Top of Water	<u>42.70</u>			Ft.
Bottom of Bore	<u>52.50</u>			Ft.
Bore Volumn	<u>1.58</u>			Gal.
LPNL Top	<u>NA</u>			Ft.
LPNL Bottom	<u>NA</u>			Ft.
DPNL Top	<u>NA</u>			Ft.
DPNL Bottom	<u>NA</u>			Ft.
Min. Bailing Vol.	<u>4.74</u>			Gal.
Actual Bailing Vol.	<u>15.00</u>			Gal.

Comments



Collier

Monitor Well Bailing Log

Collier MW #5

Lat: _____
Long. _____
Surf. Elev. _____

As Drilled	As Measured
------------	-------------

Date: 6/13/2003
Top of Water 43.7 Ft.
Bottom of Bore 60 Ft.

Date:			6/12/03	10/25/03	
Top of Water			44.50	44.70	Ft.
Bottom of Bore			58.10	58.60	Ft.
Bore Volume			2.19	2.24	Gal.
LPNL Top			NA	NA	Ft.
LPNL Bottom			NA	NA	Ft.
DPNL Top			NA	NA	Ft.
DPNL Bottom			NA	NA	Ft.
Min. Bailing Vol.			6.58	6.73	Gal.
Actual Bailing Vol.			15.00	15.00	Gal.

Comments



Collier

Monitor Well Bailing Log

Collier MW #5

Lat: _____
Long. _____
Surf. Elev. _____

As Drilled	As Measured
------------	-------------

Date: 6/13/2003
Top of Water 43.7 Ft.
Bottom of Bore 60 Ft.

Date:	1/24/04			
Top of Water	44.50			Ft.
Bottom of Bore	58.10			Ft.
Bore Volume	2.19			Gal.
LPNL Top	NA			Ft.
LPNL Bottom	NA			Ft.
DPNL Top	NA			Ft.
DPNL Bottom	NA			Ft.
Min. Bailing Vol.	6.58			Gal.
Actual Bailing Vol.	15.00			Gal.

Comments



Collier

Monitor Well Bailing Log

Collier MW #6

Lat: _____
Long. _____
Surf. Elev. _____

As Drilled	As Measured
------------	-------------

Date: 8/9/2001
Top of Water 44 Ft.
Bottom of Bore 55 Ft.

Date:	12/28/03	4/12/03	6/12/03	10/25/03	
Top of Water	43.40	43.50	43.50	43.40	Ft.
Bottom of Bore	47.10	46.90	44.80	44.90	Ft.
Bore Volumn	0.60	0.55	0.21	0.24	Gal.
LPNL Top	NA	NA	NA	NA	Ft.
LPNL Bottom	NA	NA	NA	NA	Ft.
DPNL Top	NA	NA	NA	NA	Ft.
DPNL Bottom	NA	NA	NA	NA	Ft.
Min. Bailing Vol.	1.79	1.65	0.63	0.73	Gal.
Actual Bailing Vol.	5.00	10.00	10.00	5.00	Gal.

Comments



Collier

Monitor Well Bailing Log

Collier MW #6

Lat: _____
Long. _____
Surf. Elev. _____

As Drilled	As Measured
------------	-------------

Date: 8/9/2001
Top of Water 44 Ft.
Bottom of Bore 55 Ft.

Date:	1/24/04			
Top of Water	43.40			Ft.
Bottom of Bore	44.80			Ft.
Bore Volume	0.23			Gal.
LPNL Top	NA			Ft.
LPNL Bottom	NA			Ft.
DPNL Top	NA			Ft.
DPNL Bottom	NA			Ft.
Min. Bailing Vol.	0.68			Gal.
Actual Bailing Vol.	5.00			Gal.

Comments



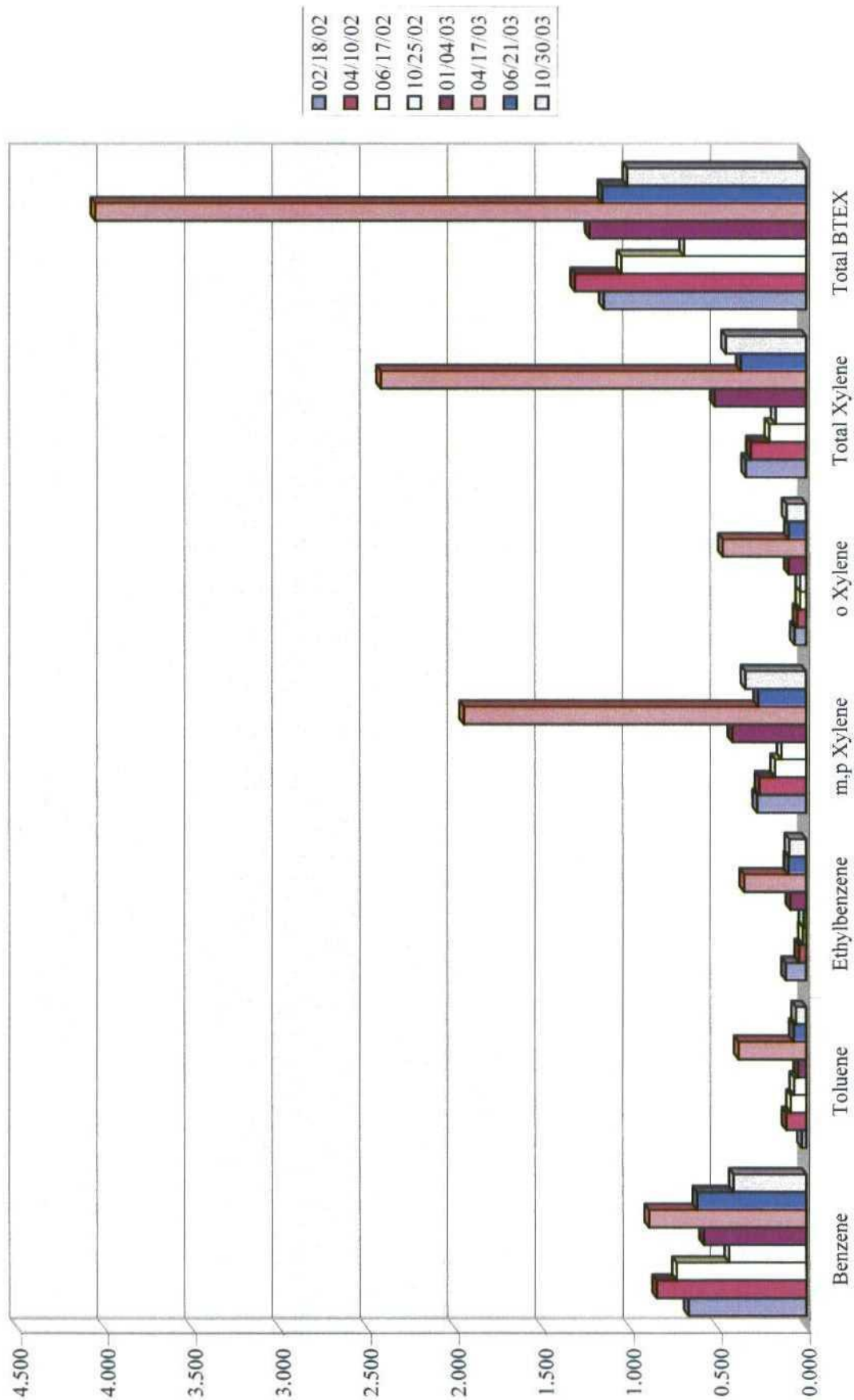
Organic Compound Analytical Summary

This section contains the summary results of the organic laboratory analyses of six monitor and one recovery well located within the Collier Remediation Project.

Collier Source Well

Lab. #	Sample Date	Benzene	Toluene	Ethylbenzene	m,p Xylene	o Xylene	Total Xylene	Total BTEX
0202618-4	02/18/02	0.671	0.025	0.115	0.277	0.065	0.342	1.153
0203001-30	04/10/02	0.852	0.113	0.040	0.264	0.049	0.313	1.318
0203602-31	06/17/02	0.739	0.087	0.018	0.176	0.033	0.209	1.053
0204814-01	10/25/02	0.439	0.068	0.016	0.139	0.033	0.172	0.695
0205349-35	01/04/03	0.583	0.044	0.089	0.419	0.100	0.519	1.235
0306249-36	04/17/03	0.895	0.384	0.351	1.950	0.474	2.424	4.054
0306733-39	06/21/03	0.621	0.071	0.100	0.272	0.098	0.370	1.162
0307790-07	10/30/03	0.412	0.057	0.095	0.344	0.112	0.456	1.020

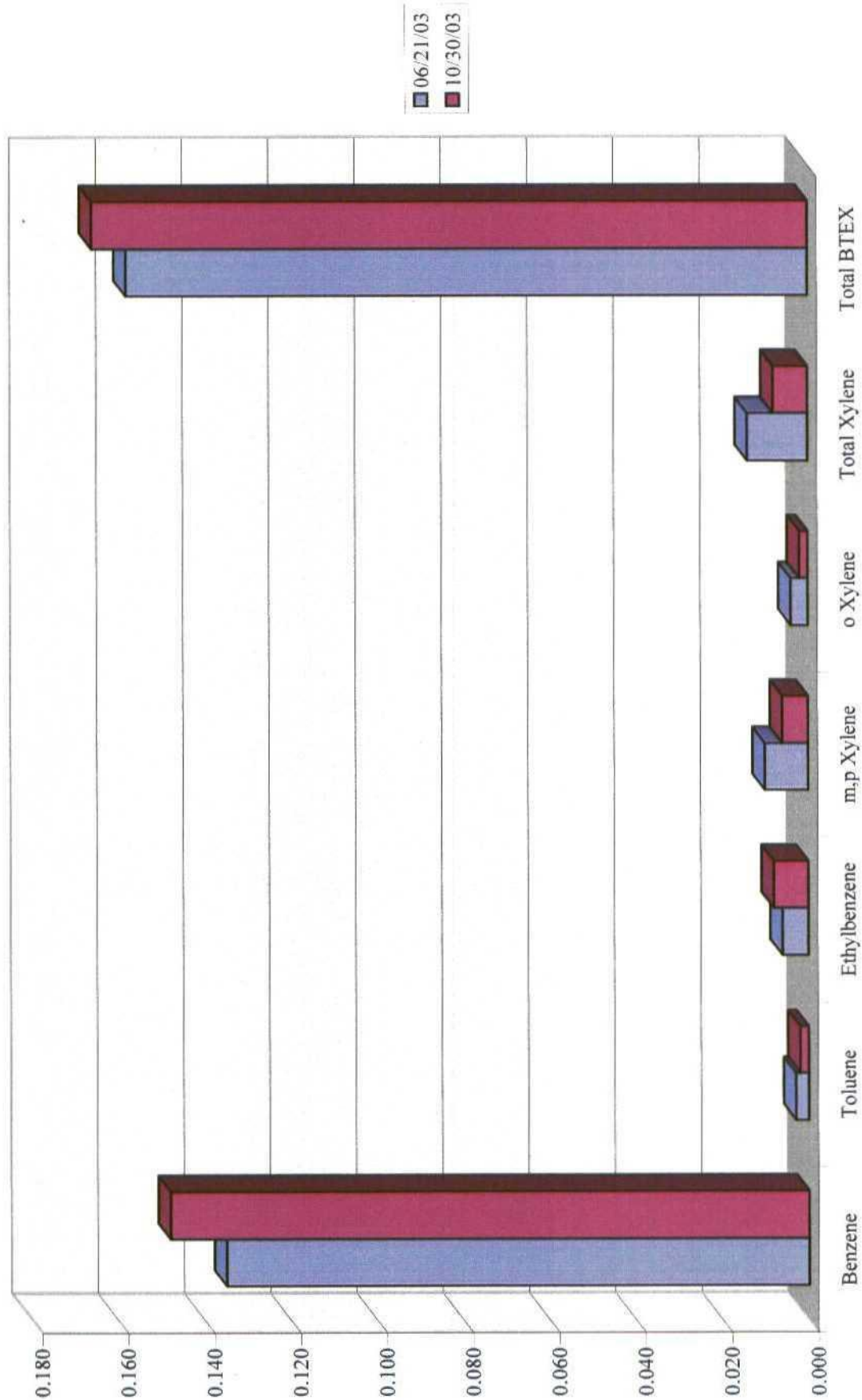
Collier Source Well



Collier
Monitor Well #1

Lab. #	Sample Date	Benzene	Toluene	Ethylbenzene	m,p Xylene	o Xylene	Total Xylene	Total BTEX
0306749-01	06/21/03	0.135	0.003	0.006	0.010	0.004	0.014	0.158
0307790-08	10/30/03	0.148	0.002	0.008	0.006	0.002	0.008	0.166
4A 26010-01	01/24/04	0.131	0.001	0.006	0.002	0.001	0.003	0.141

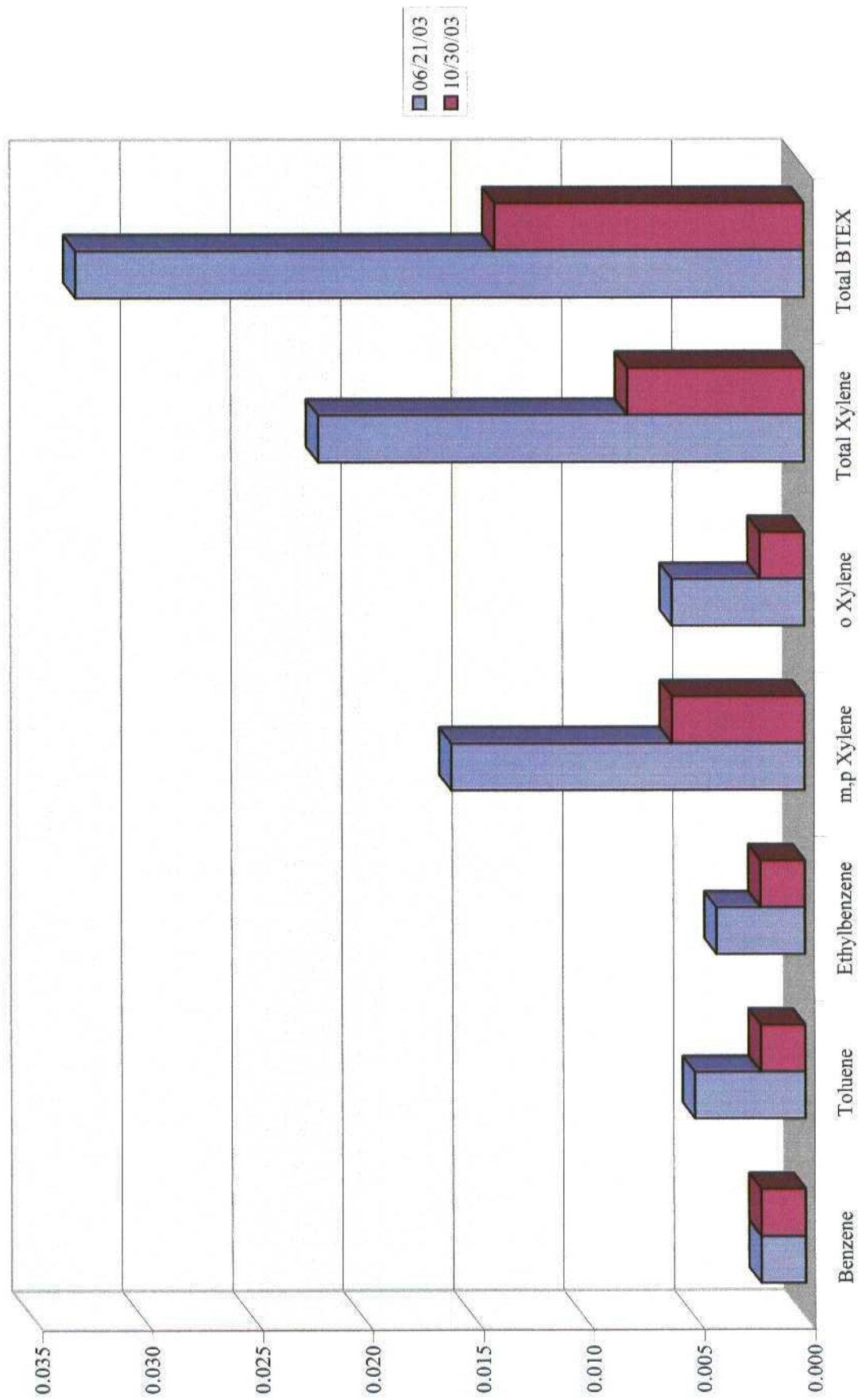
Collier MW #1



**Collier
Monitor Well #2**

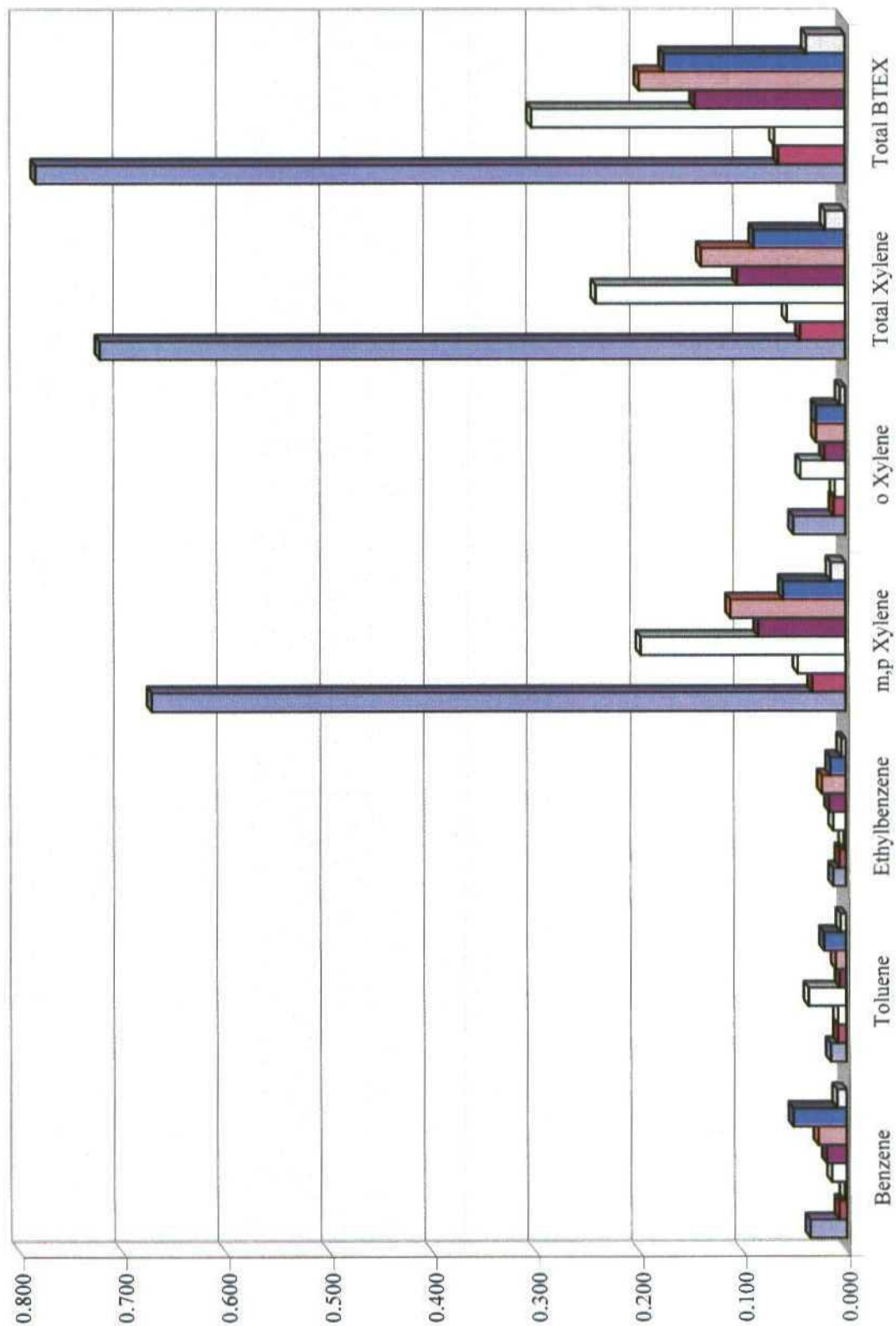
Lab. #	Sample Date	Benzene	Toluene	Ethylbenzene	m,p Xylene	o Xylene	Total Xylene	Total BTEX
0306749-02	06/21/03	0.002	0.005	0.004	0.016	0.006	0.022	0.033
0307790-09	10/30/03	0.002	0.002	0.002	0.006	0.002	0.008	0.014
4A 26010-02	01/24/04	0.001	0.001	0.001	0.004	0.001	0.005	0.008

Collier MW #2



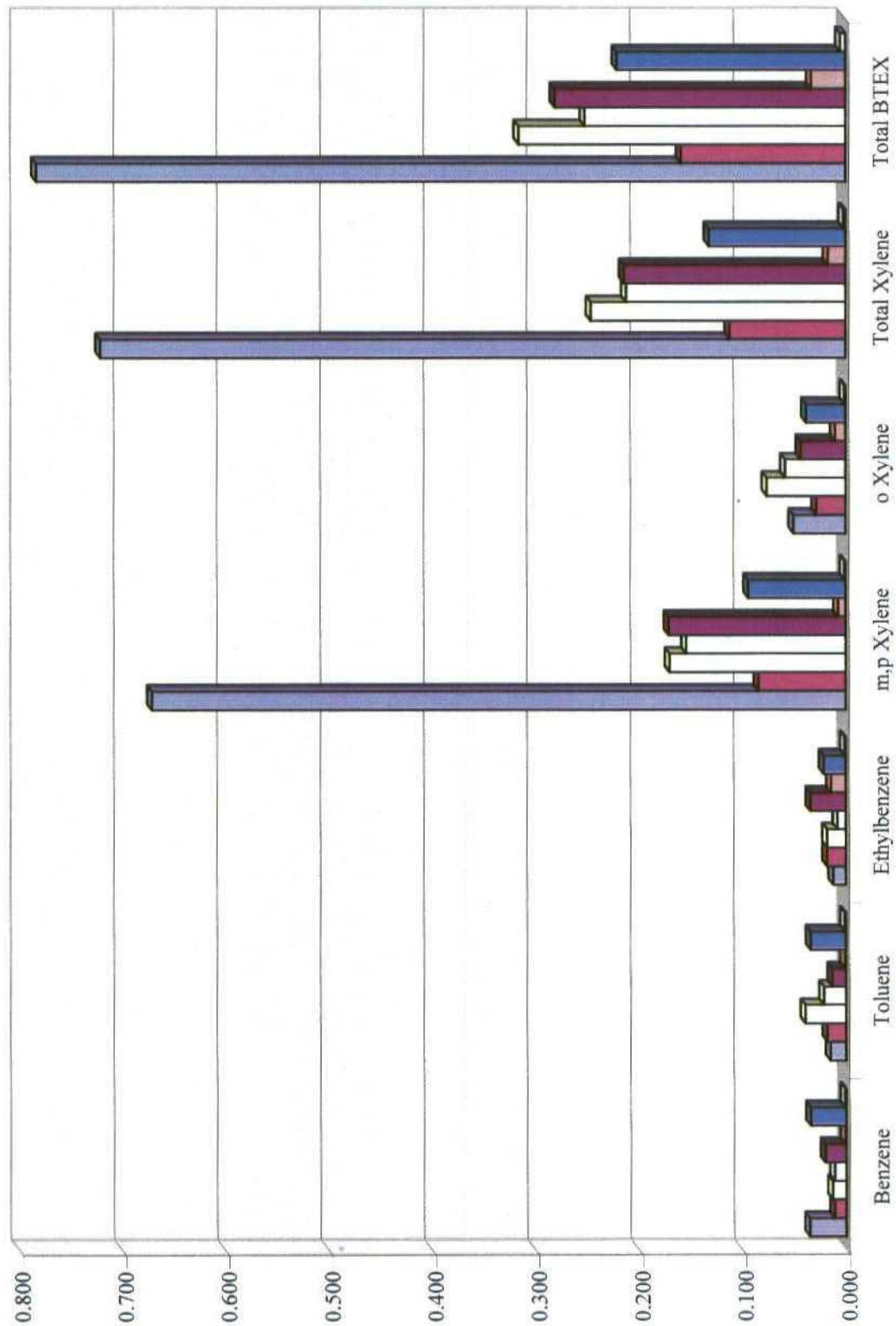
**Collier
Monitor Well #3**

Lab. #	Sample Date	Benzene	Toluene	Ethylbenzene	m,p Xylene	o Xylene	Total Xylene	Total BTEX
0202618-1	02/18/02	0.035	0.015	0.012	0.671	0.050	0.721	0.783
0203000-01	04/06/02	0.007	0.008	0.006	0.032	0.011	0.043	0.064
0002051-02	06/17/02	0.002	0.008	0.002	0.046	0.010	0.056	0.068
0204814-02	10/25/02	0.014	0.036	0.012	0.198	0.043	0.241	0.303
0205349-36	01/04/03	0.019	0.006	0.016	0.084	0.020	0.104	0.145
0306249-37	04/17/03	0.027	0.010	0.023	0.111	0.028	0.139	0.199
0306733-40	06/21/03	0.051	0.021	0.015	0.060	0.028	0.088	0.175
0307790-10	10/30/03	0.009	0.005	0.004	0.014	0.005	0.019	0.037
4A 26010-03	01/24/04	0.002	0.002	0.001	0.006	0.002	0.008	0.013

[illegible]

**Collier
Monitor Well #4**

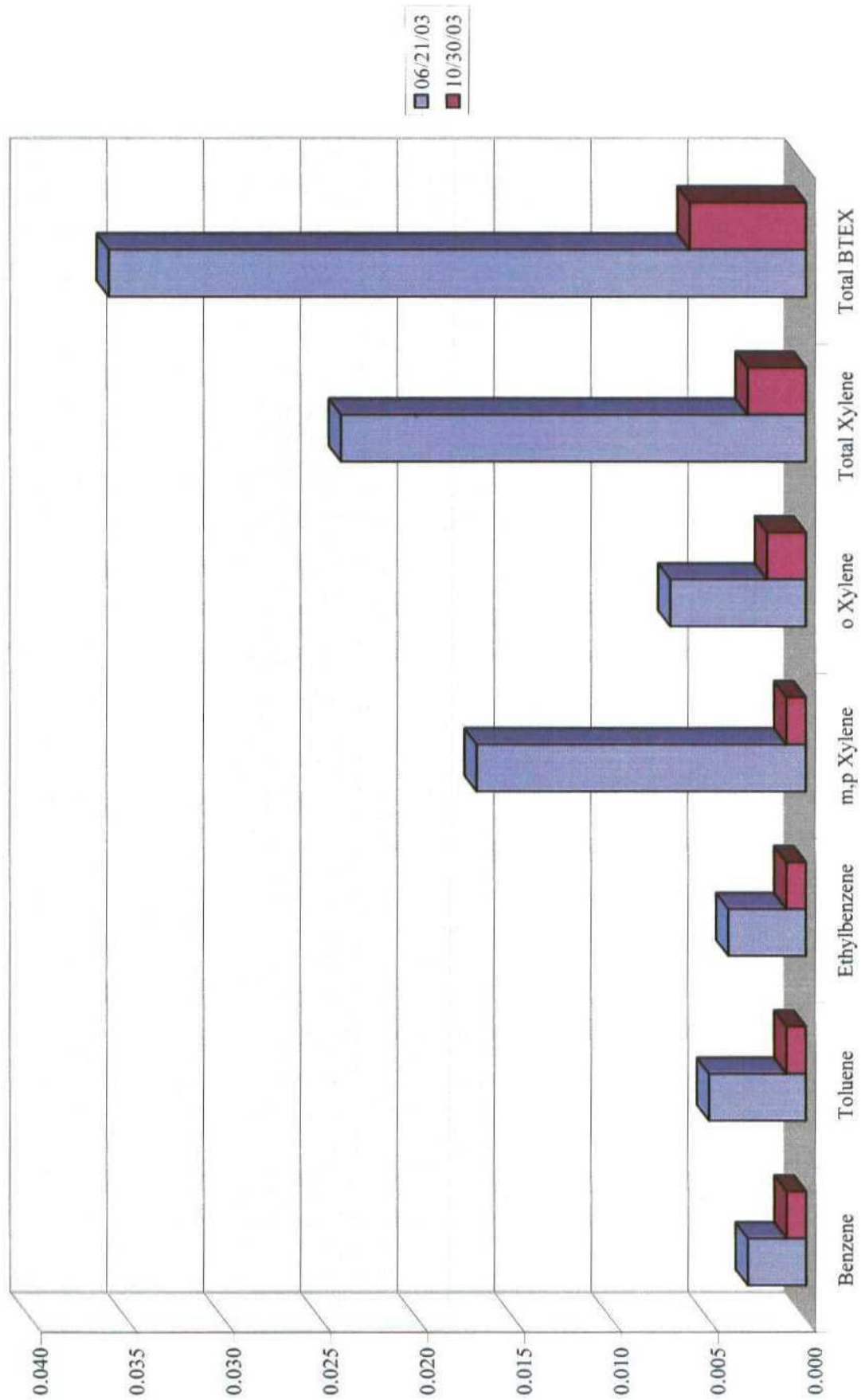
Lab. #	Sample Date	Benzene	Toluene	Ethylbenzene	m,p Xylene	o Xylene	Total Xylene	Total BTEX
0202618-1	02/18/02	0.035	0.015	0.012	0.671	0.050	0.721	0.783
0203000-2	04/06/02	0.011	0.018	0.018	0.084	0.028	0.112	0.159
0203602-33	06/17/02	0.013	0.039	0.018	0.170	0.076	0.246	0.316
0204814-02	10/28/02	0.011	0.021	0.008	0.154	0.058	0.212	0.252
0205349-37	01/04/03	0.020	0.013	0.034	0.171	0.043	0.214	0.281
0306249-38	04/17/03	0.001	0.001	0.014	0.007	0.010	0.017	0.033
0306733-41	06/21/03	0.034	0.034	0.021	0.094	0.038	0.132	0.221
0307790-11	10/30/03	0.001	0.001	0.001	0.001	0.001	0.002	0.005
4A 26010-04	01/24/04	0.011	0.013	0.005	0.024	0.010	0.034	0.063

[illegible]

Collier
Monitor Well #5

Lab. #	Sample Date	Benzene	Toluene	Ethylbenzene	m,p Xylene	o Xylene	Total Xylene	Total BTEX
0306749-03	06/21/03	0.003	0.005	0.004	0.017	0.007	0.024	0.036
0307790-12	10/30/03	0.001	0.001	0.001	0.001	0.002	0.003	0.006
4A 26010-05	01/24/04	0.003	0.003	0.004	0.021	0.006	0.027	0.037

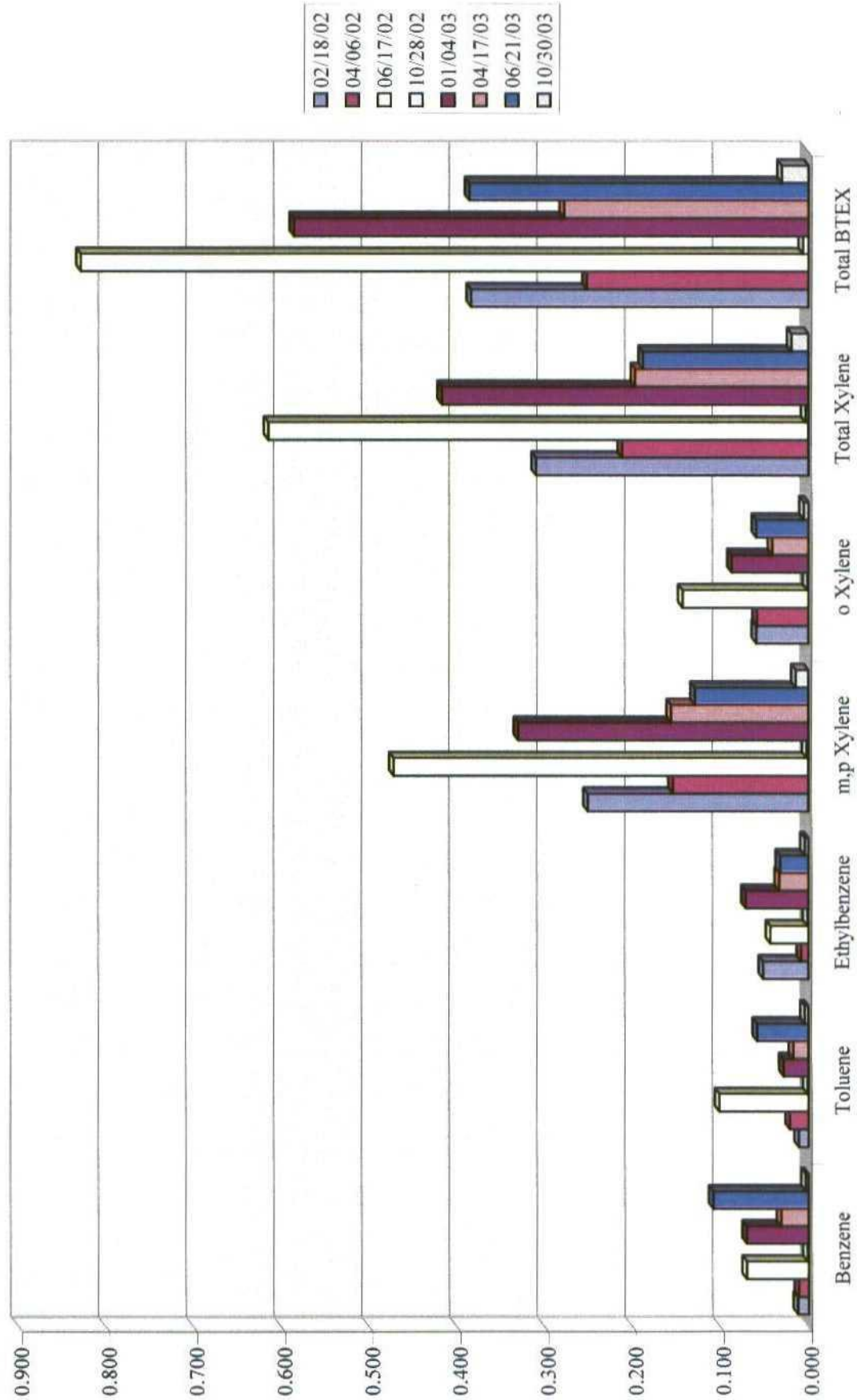
Collier MW #5



**Collier
Monitor Well #6**

Lab. #	Sample Date	Benzene	Toluene	Ethylbenzene	m,p Xylene	o Xylene	Total Xylene	Total BTEX
0202618-1	02/18/02	0.012	0.011	0.051	0.251	0.059	0.310	0.384
1204814-04	04/06/02	0.011	0.021	0.008	0.154	0.058	0.212	0.252
0203602-33	06/17/02	0.070	0.101	0.043	0.472	0.143	0.615	0.829
0204814-05	10/28/02	0.001	0.001	0.001	0.002	0.001	0.003	0.006
0205349-38	01/04/03	0.070	0.028	0.071	0.330	0.087	0.417	0.586
0306249-39	04/17/03	0.031	0.017	0.033	0.156	0.041	0.197	0.278
0306733-42	06/21/03	0.108	0.058	0.032	0.129	0.059	0.188	0.386
0307790-13	10/30/03	0.003	0.004	0.004	0.014	0.005	0.019	0.030
4A 26010-06	01/24/04	0.007	0.010	0.009	0.049	0.017	0.066	0.092

Collier MW #6





Organic Laboratory Analytical Results

This section contains a copy of the chain of custody, quality assurance and analytical results of testing conducted on the recovery and monitor wells within the Collier Remediation Project on October 30th, 2003.

ENVIRONMENTAL LAB OF TEXAS

SAMPLE WORK LIST

WHOLE EARTH
19606 SAN GABRIEL
HOUSTON, TX 77084
281-646-8996

Order#: G0306733
Project:
Project Name: 2003 3rd Qtr. Water Sampling
Location: Tatum, New Mexico

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>	<u>Matrix:</u>	<u>Date / Time</u> <u>Collected</u>	<u>Date / Time</u> <u>Received</u>	<u>Container</u>	<u>Preservative</u>
	Cations Total Dissolved Solids (TDS)					
0306733-35	GS MW-1 (12)	WATER	6/12/03	6/14/03 10:25	See COC	See COC
	<u>Lab Testing:</u> 8021B/5030 BTEX Anions Cations Total Dissolved Solids (TDS)	Rejected: No		Temp: 3.5 C		
0306733-36	GS MW-2 (22)	WATER	6/12/03	6/14/03 10:25	See COC	See COC
	<u>Lab Testing:</u> 8021B/5030 BTEX Anions Cations Total Dissolved Solids (TDS)	Rejected: No		Temp: 3.5 C		
0306733-37	GS MW-3 (21)	WATER	6/12/03	6/14/03 10:25	See COC	See COC
	<u>Lab Testing:</u> 8021B/5030 BTEX Anions Cations Total Dissolved Solids (TDS)	Rejected: No		Temp: 3.5 C		
0306733-38	GS MW-4 (29)	WATER	6/12/03	6/14/03 10:25	See COC	See COC
	<u>Lab Testing:</u> 8021B/5030 BTEX Anions Cations Total Dissolved Solids (TDS)	Rejected: No		Temp: 3.5 C		
0306733-39	Collier Source	WATER	6/13/03	6/14/03 10:25	See COC	See COC
	<u>Lab Testing:</u> 8021B/5030 BTEX	Rejected: No		Temp: 3.5 C		

ENVIRONMENTAL LAB OF TEXAS

SAMPLE WORK LIST

WHOLE EARTH
19606 SAN GABRIEL
HOUSTON, TX 77084
281-646-8996

Order#: G0306733
Project:
Project Name: 2003 3rd Qtr. Water Sampling
Location: Tatum, New Mexico

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>	<u>Matrix:</u>	<u>Date / Time</u> <u>Collected</u>	<u>Date / Time</u> <u>Received</u>	<u>Container</u>	<u>Preservative</u>
	Anions					
	Cations					
	Total Dissolved Solids (TDS)					
0306733-40	Collier MW-3 (32)	WATER	6/13/03	6/14/03 10:25	See COC	See COC
	<u>Lab Testing:</u>	Rejected: No		Temp: 3.5 C		
	8021B/5030 BTEX					
	Anions					
	Cations					
	Total Dissolved Solids (TDS)					
0306733-41	Collier MW-4 (33)	WATER	6/13/03	6/14/03 10:25	See COC	See COC
	<u>Lab Testing:</u>	Rejected: No		Temp: 3.5 C		
	8021B/5030 BTEX					
	Anions					
	Cations					
	Total Dissolved Solids (TDS)					
0306733-42	Collier MW-6 (34)	WATER	6/13/03	6/14/03 10:25	See COC	See COC
	<u>Lab Testing:</u>	Rejected: No		Temp: 3.5 C		
	8021B/5030 BTEX					
	Anions					
	Cations					
	Total Dissolved Solids (TDS)					
0306733-43	GS MW 5 (38)	WATER		6/14/03 10:25	See COC	See COC
	<u>Lab Testing:</u>	Rejected: No		Temp: 3.5 C		
	8021B/5030 BTEX					
	Anions					
	Cations					
	Total Dissolved Solids (TDS)					

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MIKE GRIFFIN
WHOLE EARTH
19606 SAN GABRIEL
HOUSTON, TX 77084

Order#: G0306733
Project:
Project Name: 2003 3rd Qtr. Water Sampling
Location: Tatum, New Mexico

Lab ID: 0306733-39
Sample ID: Collier Source

8021B/5030 BTEX

Method	Date	Date	Sample	Dilution		
<u>Blank</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Amount</u>	<u>Factor</u>	<u>Analyst</u>	<u>Method</u>
0005930-02		6/21/03 0:06	1	25	CK	8021B

Parameter	Result mg/L	RL
Benzene	0.621	0.025
Toluene	0.071	0.025
Ethylbenzene	0.100	0.025
p/m-Xylene	0.272	0.025
o-Xylene	0.098	0.025

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	116%	80	120
Bromofluorobenzene	106%	80	120

Lab ID: 0306733-40
Sample ID: Collier MW-3 (32)

8021B/5030 BTEX

Method	Date	Date	Sample	Dilution		
<u>Blank</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Amount</u>	<u>Factor</u>	<u>Analyst</u>	<u>Method</u>
0005930-02		6/21/03 0:27	1	1	CK	8021B

Parameter	Result mg/L	RL
Benzene	0.051	0.001
Toluene	0.021	0.001
Ethylbenzene	0.015	0.001
p/m-Xylene	0.060	0.001
o-Xylene	0.028	0.001

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	124%	80	120
Bromofluorobenzene	114%	80	120

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

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ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MIKE GRIFFIN
WHOLE EARTH
19606 SAN GABRIEL
HOUSTON, TX 77084

Order#: G0306733
Project:
Project Name: 2003 3rd Qtr. Water Sampling
Location: Tatum, New Mexico

Lab ID: 0306733-41
Sample ID: Collier MW-4 (33)

8021B/5030 BTEX

Method	Date	Date	Sample	Dilution		
<u>Blank</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Amount</u>	<u>Factor</u>	<u>Analyst</u>	<u>Method</u>
0005931-02		6/21/03 2:12	1	1	CK	8021B

Parameter	Result mg/L	RL
Benzene	0.034	0.001
Toluene	0.034	0.001
Ethylbenzene	0.021	0.001
p/m-Xylene	0.084	0.001
o-Xylene	0.038	0.001

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	95%	80	120
Bromofluorobenzene	84%	80	120

Lab ID: 0306733-42
Sample ID: Collier MW-6 (34)

8021B/5030 BTEX

Method	Date	Date	Sample	Dilution		
<u>Blank</u>	<u>Prepared</u>	<u>Analyzed</u>	<u>Amount</u>	<u>Factor</u>	<u>Analyst</u>	<u>Method</u>
0005931-02		6/21/03 2:33	1	1	CK	8021B

Parameter	Result mg/L	RL
Benzene	0.108	0.001
Toluene	0.058	0.001
Ethylbenzene	0.032	0.001
p/m-Xylene	0.129	0.001
o-Xylene	0.059	0.001

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	105%	80	120
Bromofluorobenzene	93%	80	120

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

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Analytical Report

Prepared for:

Mike Griffin

WHOLE EARTH ENVIRONMENTAL

2103 Arbor Cove

Katy, TX 77494

Project: 2004 1st Quarter

Project Number: None Given

Location: Tatum, N.M.

Lab Order Number: 4A26010

Report Date: 02/02/04

WHOLE EARTH ENVIRONMENTAL
2103 Arbor Cove
WHOLE EARTH ENVIRONMENTAL

Project: 2004 1st Quarter
Project Number: None Given
Project Manager: Mike Griffin

(281) 394-2051
Reported:
02/02/04 09:45

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Collier MW 1 (37)	4A26010-01	Water	01/24/04 00:00	01/26/04 08:00
Collier MW 2 (36)	4A26010-02	Water	01/24/04 00:00	01/26/04 08:00
Collier MW 3 (32)	4A26010-03	Water	01/24/04 00:00	01/26/04 08:00
Collier MW 4 (33)	4A26010-04	Water	01/24/04 00:00	01/26/04 08:00
Collier MW 5 (35)	4A26010-05	Water	01/23/04 00:00	01/26/04 08:00
Collier MW 6 (34)	4A26010-06	Water	01/23/04 00:00	01/26/04 08:00

WHOLE EARTH ENVIRONMENTAL
2103 Arbor Cove
WHOLE EARTH ENVIRONMENTAL

Project: 2004 1st Quarter
Project Number: None Given
Project Manager: Mike Griffin

(281) 394-2051
Reported:
02/02/04 09:45

Organics by GC
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Collier MW 1 (37) (4A26010-01) Water Sampled: 01/24/04 00:00 Received: 01/26/04 08:00									
Benzene	0.131	0.00100	mg/L	1	EA42811	01/28/04	01/28/04	EPA 8021B	
Toluene	J [0.000799]	0.00100	"	"	"	"	"	"	J
Ethylbenzene	0.00573	0.00100	"	"	"	"	"	"	
Xylene (p/m)	0.00177	0.00100	"	"	"	"	"	"	
Xylene (o)	J [0.000876]	0.00100	"	"	"	"	"	"	J
Surrogate: <i>a,a,a</i> -Trifluorotoluene		108 %	80-120		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		86.0 %	80-120		"	"	"	"	
Collier MW 2 (36) (4A26010-02) Water Sampled: 01/24/04 00:00 Received: 01/26/04 08:00									
Benzene	J [0.000954]	0.00100	mg/L	1	EA42811	01/28/04	01/28/04	EPA 8021B	J
Toluene	0.00149	0.00100	"	"	"	"	"	"	
Ethylbenzene	0.00110	0.00100	"	"	"	"	"	"	
Xylene (p/m)	0.00375	0.00100	"	"	"	"	"	"	
Xylene (o)	0.00159	0.00100	"	"	"	"	"	"	
Surrogate: <i>a,a,a</i> -Trifluorotoluene		106 %	80-120		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		88.5 %	80-120		"	"	"	"	
Collier MW 3 (32) (4A26010-03) Water Sampled: 01/24/04 00:00 Received: 01/26/04 08:00									
Benzene	0.00181	0.00100	mg/L	1	EA42811	01/28/04	01/28/04	EPA 8021B	
Toluene	0.00241	0.00100	"	"	"	"	"	"	
Ethylbenzene	0.00143	0.00100	"	"	"	"	"	"	
Xylene (p/m)	0.00646	0.00100	"	"	"	"	"	"	
Xylene (o)	0.00232	0.00100	"	"	"	"	"	"	
Surrogate: <i>a,a,a</i> -Trifluorotoluene		118 %	80-120		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		110 %	80-120		"	"	"	"	

Environmental Lab of Texas

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Quality Assurance Review

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WHOLE EARTH ENVIRONMENTAL
2103 Arbor Cove
WHOLE EARTH ENVIRONMENTAL

Project: 2004 1st Quarter
Project Number: None Given
Project Manager: Mike Griffin

(281) 394-2051
Reported:
02/02/04 09:45

Organics by GC
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
Collier MW 4 (33) (4A26010-04) Water Sampled: 01/24/04 00:00 Received: 01/26/04 08:00									
Benzene	0.0113	0.00100	mg/L	1	EA42811	01/28/04	01/28/04	EPA 8021B	
Toluene	0.0128	0.00100	"	"	"	"	"	"	
Ethylbenzene	0.00529	0.00100	"	"	"	"	"	"	
Xylene (p/m)	0.0239	0.00100	"	"	"	"	"	"	
Xylene (o)	0.00984	0.00100	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		102 %	80-120		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		87.5 %	80-120		"	"	"	"	
Collier MW 5 (35) (4A26010-05) Water Sampled: 01/23/04 00:00 Received: 01/26/04 08:00									
Benzene	0.00286	0.00100	mg/L	1	EA42811	01/28/04	01/28/04	EPA 8021B	
Toluene	0.00346	0.00100	"	"	"	"	"	"	
Ethylbenzene	0.00412	0.00100	"	"	"	"	"	"	
Xylene (p/m)	0.0208	0.00100	"	"	"	"	"	"	
Xylene (o)	0.00552	0.00100	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		119 %	80-120		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		92.0 %	80-120		"	"	"	"	
Collier MW 6 (34) (4A26010-06) Water Sampled: 01/23/04 00:00 Received: 01/26/04 08:00									
Benzene	0.00688	0.00100	mg/L	1	EA42811	01/28/04	01/28/04	EPA 8021B	
Toluene	0.0105	0.00100	"	"	"	"	"	"	
Ethylbenzene	0.00904	0.00100	"	"	"	"	"	"	
Xylene (p/m)	0.0486	0.00100	"	"	"	"	"	"	
Xylene (o)	0.0166	0.00100	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		112 %	80-120		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		91.5 %	80-120		"	"	"	"	

Environmental Lab of Texas

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Quality Assurance Review

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WHOLE EARTH ENVIRONMENTAL
2103 Arbor Cove
WHOLE EARTH ENVIRONMENTAL

Project: 2004 1st Quarter
Project Number: None Given
Project Manager: Mike Griffin

(281) 394-2051
Reported:
02/02/04 09:45

Organics by GC - Quality Control
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch EA42811 - EPA 5030C (GC)

Blank (EA42811-BLK1)

Prepared: 01/28/04 Analyzed: 01/29/04

Benzene	ND	0.00100	mg/L							
Toluene	ND	0.00100	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00100	"							
Xylene (o)	ND	0.00100	"							
Surrogate: a,a,a-Trifluorotoluene	23.2		ug/l	20.0		116	80-120			
Surrogate: 4-Bromofluorobenzene	18.1		"	20.0		90.5	80-120			

LCS (EA42811-BS1)

Prepared & Analyzed: 01/28/04

Benzene	87.9		ug/l	100		87.9	80-120			
Toluene	94.4		"	100		94.4	80-120			
Ethylbenzene	93.5		"	100		93.5	80-120			
Xylene (p/m)	200		"	200		100	80-120			
Xylene (o)	98.3		"	100		98.3	80-120			
Surrogate: a,a,a-Trifluorotoluene	16.1		"	20.0		80.5	80-120			
Surrogate: 4-Bromofluorobenzene	19.4		"	20.0		97.0	80-120			

Calibration Check (EA42811-CCV1)

Prepared: 01/28/04 Analyzed: 01/29/04

Benzene	85.5		ug/l	100		85.5	80-120			
Toluene	90.5		"	100		90.5	80-120			
Ethylbenzene	91.4		"	100		91.4	80-120			
Xylene (p/m)	198		"	200		99.0	80-120			
Xylene (o)	97.9		"	100		97.9	80-120			
Surrogate: a,a,a-Trifluorotoluene	18.3		"	20.0		91.5	80-120			
Surrogate: 4-Bromofluorobenzene	23.0		"	20.0		115	80-120			

Duplicate (EA42811-DUP1)

Source: 4A26007-05

Prepared & Analyzed: 01/28/04

Benzene	0.0320	0.00100	mg/L		0.0298			7.12	20	
Toluene	ND	0.00100	"		ND				20	
Ethylbenzene	0.00101	0.00100	"		0.00103			1.96	20	
Xylene (p/m)	0.00217	0.00100	"		0.00223			2.73	20	
Xylene (o)	0.00149	0.00100	"		0.00147			1.35	20	
Surrogate: a,a,a-Trifluorotoluene	22.4		ug/l	20.0		112	80-120			
Surrogate: 4-Bromofluorobenzene	19.3		"	20.0		96.5	80-120			

Environmental Lab of Texas

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Quality Assurance Review

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WHOLE EARTH ENVIRONMENTAL
2103 Arbor Cove
WHOLE EARTH ENVIRONMENTAL

Project: 2004 1st Quarter
Project Number: None Given
Project Manager: Mike Griffin

(281) 394-2051
Reported:
02/02/04 09:45

Notes and Definitions

J Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
DET Analyte DETECTED
ND Analyte NOT DETECTED at or above the reporting limit
NR Not Reported
dry Sample results reported on a dry weight basis
RPD Relative Percent Difference

Environmental Lab of Texas

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Quality Assurance Review

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Items for Project Manager Review

LabNumber	Analysis	Analyte	Exception
4A26010-02	8021B BTEX	Benzene	A-01b
4A26010-01	8021B BTEX	Xylene (o)	A-01a
4A26010-01	8021B BTEX	Toluene	A-01
	8021B BTEX	(Water)	J-Flags used
	8021B BTEX	(Water)	RPD calculations based on %Recovery
	8021B BTEX	(Water)	Result calculations based on MDL
			Default Report (not modified)



Inorganic Compound Analytical Summary

This section contains the summary results of the inorganic laboratory analyses of six monitor and one recovery well located within the Collier Remediation Project.

Tipperary Corporation
Collier # 1
Inorganic Laboratory Analysis Summary

Location	Anions				Anions				TDS
	Bicarbonate Alkalinity	Carbonate Alkalinity	Chlorides	Hydroxide Alkalinity	Sulfate	Calcium	Magnesium	Potassium	
Source Well	356	<.2	8,860	<.2	70	391	76	31	15,500
MW # 1	236	<.2	4,340	<.2	256	269	48	27	8,270
MW # 2	104	<.2	1,770	<.2	526	420	79	26	4,060
MW # 3	124	<.2	14,700	<.2	217	3,440	423	67	15,300
MW # 4	118	<.2	709	<.2	121	386	45	12	2,340
MW # 5	132	<.2	137	<.2	490	125	40	13	1,140
MW # 6	528	104	58	<.2	160	30	11	12	1,230



Inorganic Laboratory Analytical Results

This section contains a copy of the chain of custody, quality assurance and analytical results of testing conducted on the recovery and monitor wells within the Collier Remediation Project on June 12th, 2003.

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MIKE GRIFFIN
WHOLE EARTH
19606 SAN GABRIEL
HOUSTON, TX 77084

Order#: G0306733
Project:
Project Name: 2003 3rd Qtr. Water Sampling
Location: Tatum, New Mexico

Lab ID: 0306733-39
Sample ID: Collier Source

Anions

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Bicarbonate Alkalinity	356	mg/L	1	2.00	310.1	6/14/03	SB
Carbonate Alkalinity	< 0.20	mg/L	1	0.20	310.1	6/14/03	SB
Chloride	8860	mg/L	1	5.00	9253	6/19/03	SB
Hydroxide Alkalinity	< 0.20	mg/L	1	0.20	310.1	6/14/03	SB
SULFATE, 375.4	70.1	mg/L	1	0.5	375.4	6/16/03	SB

Cations

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Calcium	391	mg/L	100	1.0	6010B	6/21/03	SM
Magnesium	76.3	mg/L	10	0.010	6010B	6/21/03	SM
Potassium	31.0	mg/L	10	0.50	6010B	6/21/03	SM
Sodium	6000	mg/L	1000	10.0	6010B	6/21/03	SM

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Total Dissolved Solids (TDS)	15,500	mg/L	1	5.0	160.1	6/17/03	TAL

Lab ID: 0306733-40
Sample ID: Collier MW-3 (32)

Anions

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Bicarbonate Alkalinity	124	mg/L	1	2.00	310.1	6/14/03	SB
Carbonate Alkalinity	< 0.20	mg/L	1	0.20	310.1	6/14/03	SB
Chloride	14700	mg/L	1	5.00	9253	6/19/03	SB
Hydroxide Alkalinity	< 0.20	mg/L	1	0.20	310.1	6/14/03	SB
SULFATE, 375.4	217	mg/L	5	2.5	375.4	6/16/03	SB

Cations

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Calcium	3440	mg/L	1000	10.0	6010B	6/21/03	SM
Magnesium	423	mg/L	100	0.10	6010B	6/21/03	SM
Potassium	66.5	mg/L	10	0.50	6010B	6/21/03	SM
Sodium	7120	mg/L	1000	10.0	6010B	6/21/03	SM

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Total Dissolved Solids (TDS)	15300	mg/L	1	5.0	160.1	6/17/03	TAL

RL = Reporting Limit N/A = Not Applicable

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ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MIKE GRIFFIN
WHOLE EARTH
19606 SAN GABRIEL
HOUSTON, TX 77084

Order#: G0306749
Project:
Project Name: 2003 3rd Qtr. Water Sampling
Location: Tatum, New Mexico

Lab ID: 0306749-01
Sample ID: Collier MW 1 (37)

Anions

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Bicarbonate Alkalinity	236	mg/L	1	2.00	310.1	6/18/03	SB
Carbonate Alkalinity	< 0.20	mg/L	1	0.20	310.1	6/18/03	SB
Chloride	4340	mg/L	1	5.00	9253	6/18/03	SB
Hydroxide Alkalinity	< 0.20	mg/L	1	0.20	310.1	6/18/03	SB
SULFATE, 375.4	256	mg/L	5	2.5	375.4	6/18/03	CK

Cations

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Calcium	269	mg/L	100	1.0	6010B	6/21/03	SM
Magnesium	47.7	mg/L	10	0.010	6010B	6/21/03	SM
Potassium	26.5	mg/L	10	0.50	6010B	6/21/03	SM
Sodium	2490	mg/L	1000	10.0	6010B	6/21/03	SM

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Total Dissolved Solids (TDS)	8270	mg/L	1	5.0	160.1	6/23/03	SB

Lab ID: 0306749-02
Sample ID: Collier MW 2 (36)

Anions

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Bicarbonate Alkalinity	104	mg/L	1	2.00	310.1	6/18/03	SB
Carbonate Alkalinity	< 0.20	mg/L	1	0.20	310.1	6/18/03	SB
Chloride	1770	mg/L	1	5.00	9253	6/18/03	SB
Hydroxide Alkalinity	< 0.20	mg/L	1	0.20	310.1	6/18/03	SB
SULFATE, 375.4	526	mg/L	12.5	6.25	375.4	6/18/03	CK

Cations

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Calcium	420	mg/L	100	1.0	6010B	6/21/03	SM
Magnesium	78.6	mg/L	10	0.010	6010B	6/21/03	SM
Potassium	25.8	mg/L	10	0.50	6010B	6/21/03	SM
Sodium	666	mg/L	100	1.0	6010B	6/21/03	SM

Test Parameters

Parameter	Result	Units	Dilution Factor	RL	Method	Date Analyzed	Analyst
Total Dissolved Solids (TDS)	4060	mg/L	1	5.0	160.1	6/23/03	SB

RL = Reporting Limit N/A = Not Applicable

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ENVIRONMENTAL LAB OF TEXAS I, LTD.

12600 West I-20 East, Odessa, TX 79765 Ph: 915-563-1800

ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MIKE GRIFFIN
WHOLE EARTH
19606 SAN GABRIEL
HOUSTON, TX 77084

Order#: G0306733
Project:
Project Name: 2003 3rd Qtr. Water Sampling
Location: Tatum, New Mexico

Lab ID: 0306733-41
Sample ID: Collier MW-4 (33)

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0005931-02		6/21/03 2:12	1	1	CK	8021B

Parameter	Result mg/L	RL
Benzene	0.034	0.001
Toluene	0.034	0.001
Ethylbenzene	0.021	0.001
p/m-Xylene	0.084	0.001
o-Xylene	0.038	0.001

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	95%	80	120
Bromofluorobenzene	84%	80	120

Lab ID: 0306733-42
Sample ID: Collier MW-6 (34)

8021B/5030 BTEX

Method Blank	Date Prepared	Date Analyzed	Sample Amount	Dilution Factor	Analyst	Method
0005931-02		6/21/03 2:33	1	1	CK	8021B

Parameter	Result mg/L	RL
Benzene	0.108	0.001
Toluene	0.058	0.001
Ethylbenzene	0.032	0.001
p/m-Xylene	0.129	0.001
o-Xylene	0.059	0.001

Surrogates	% Recovered	QC Limits (%)	
aaa-Toluene	105%	80	120
Bromofluorobenzene	93%	80	120

DL = Diluted out N/A = Not Applicable RL = Reporting Limit

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ENVIRONMENTAL LAB OF TEXAS

ANALYTICAL REPORT

MIKE GRIFFIN
WHOLE EARTH
19606 SAN GABRIEL
HOUSTON, TX 77084

Order#: G0306749
Project:
Project Name: 2003 3rd Qtr. Water Sampling
Location: Tatum, New Mexico

Lab ID: 0306749-03
Sample ID: Collier MW 5 (35)

Anions

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Bicarbonate Alkalinity	132	mg/L	1	2.00	310.1	6/18/03	SB
Carbonate Alkalinity	< 0.20	mg/L	1	0.20	310.1	6/18/03	SB
Chloride	137	mg/L	1	5.00	9253	6/18/03	SB
Hydroxide Alkalinity	< 0.20	mg/L	1	0.20	310.1	6/18/03	SB
SULFATE, 375.4	490	mg/L	12.5	6.25	375.4	6/18/03	CK

Cations

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Calcium	125	mg/L	100	1.0	6010B	6/21/03	SM
Magnesium	39.9	mg/L	10	0.010	6010B	6/21/03	SM
Potassium	12.6	mg/L	10	0.50	6010B	6/21/03	SM
Sodium	135	mg/L	100	1.0	6010B	6/21/03	SM

Test Parameters

<u>Parameter</u>	<u>Result</u>	<u>Units</u>	<u>Dilution Factor</u>	<u>RL</u>	<u>Method</u>	<u>Date Analyzed</u>	<u>Analyst</u>
Total Dissolved Solids (TDS)	1140	mg/L	1	5.0	160.1	6/23/03	SB

Approval:

Raland K. Tuttle 6-26-03
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

Page 2 of 2

Environmental Lab of Texas, Inc.

12600 West I-20 East
Odessa, Texas 79763
Phone: 915-563-1800
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CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager:

Project Name: 2003 3rd Qtr. Water Sampling

Company Name Whole Earth Environmental, Inc.

Project #:

Company Address: 19606 San Gabriel

Project Loc: Tatum, New Mexico

City/State/Zip: Houston, Tx. 77084

PO#:

Telephone No: (800) 854-4358

Fax No: (281) 646-8996

Sampler Signature:

LAB # (lab use only)	FIELD CODE	Date Sampled	Time Sampled	No. of Containers	Preservative								Matrix				Analyze For:						Y	N					
					Ice	HNO ₃	HCl	NaOH	H ₂ SO ₄	None	Other (Specify)	Water	Sludge	Soil	Other (specify):	TDS / CL / SAR / EC	TPH 418.1	TPH TX 1005/1006	TPH 8015M GRO/DRO	Metals: As Ag Ba Cd Cr Pb Hg Se	Volatiles	Semivolatiles			BTEX 8021B/5030	Chlorides	Cations/Anions,TDS		
																RUSH TAT Pre-Schedule	Standard TAT												
-07	Collier Source	10-25-03		2	X		X						X								X								
-08	Collier MW 1 (37)			2	X		X						X								X								
-09	Collier MW 2 (36)			2	X		X						X								X								
-10	Collier MW 3 (32) (clear)			2	X		X						X								X								
-11	Collier MW 4 (33)			2	X		X						X								X								
-12	Collier MW 5 (35) (sediment)			2	X		X						X								X								
-13	Collier MW 6 (34)			2	X		X						X								X								
Special Instructions:																													
Relinquished by: [Signature]		Date: 10-26-03	Time: 1900	Received by: [Signature]		Date:	Time:	Sample Containers Intact?		Temperature Upon Receipt:		Laboratory Comments:																	
Relinquished by: [Signature]		Date:	Time:	Received by: [Signature]		Date:	Time:	Sample Containers Intact?		Temperature Upon Receipt:		Laboratory Comments:																	