

3R - 174

REPORTS

DATE:

2002



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ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

El Paso Field Services

**San Juan Basin Pit Program
Groundwater Sites Project**

**2002 Annual Report
Federal Sites (Volume 1)**

March 2003



MWH

10619 South Jordan Gateway, Suite 100
Salt Lake City, Utah 84095

EL PASO FIELD SERVICES ANNUAL GROUNDWATER REPORT

FEDERAL SITES VOLUME I

TABLE OF CONTENTS

Site Map

METER or LINE ID	SITE NAME	TOWNSHIP	RANGE	SECTION	UNIT
89961	Fields A#7A	32N	11W	34	E
89232	Johnston Fed #6A	31N	09W	35	F
94715	James F. Bell #1E	30N	13W	10	P
89620	Sandoval GC A #1A	30N	09W	35	C
87493	W D Heath B-5	30N	09W	31	M
LD151	Lat 0-21 Line Drip	30N	09W	12	O
73220	Fogelson 4-1 Com #14	29N	11W	4	P
97213	Hamner #9	29N	09W	20	A
72890	Ohio C Government #3	28N	11W	26	P
LD169	D Loop Line Drip	28N	08W	33	I
LD174	LAT LD 40	28N	04W	13	H
89894	Hammond #41A	27N	08W	25	O
94810	Miles Fed 1A	26N	07W	5	F
LD072	K27 LD072	25N	06W	4	E
87640	Canada Mesa #2	24N	06W	24	I



MWH

MONTGOMERY WATSON HARZA

ACRONYMS

B	Benzene
E	Ethylbenzene
EPFS	El Paso Field Services
ft	foot/feet
GWEL	groundwater elevation
ID	identifier
MW	Monitoring Well
PSH	Phase Separated Hydrocarbons
NMWQCC	New Mexico Water Quality Control Commission
T	Toluene
TOC	Top Of Casing
NE	not established
NS	not sampled
ORC	oxygen release compound
OCD	Oil Conservation Division
ppb	parts per billion
$\mu\text{g/L}$	micrograms per liter
X	Total Xylenes

TopoQuest Copyright © 1999 Delorme Vermont, ME 0486

Scale 1:60,000 Datum: NAD 83

3 mi Scale: 1 : 600,000 Detail: 2.4 Datum: WGS84

Certified Mail: #7001 1940 0002 1371 7676

February 28, 2003

RECEIVED

MAR 05 2003

ENVIRONMENTAL BUREAU
OIL CONSERVATION DIVISION

Mr. William C. Olson
New Mexico Oil Conservation Division
1220 St. Francis Dr.
Santa Fe, NM 87504

RE: 2002 Pit Project Annual Groundwater Report

Dear Mr. Olson:

In accordance with reporting requirements, El Paso Field Services (EPFS) has enclosed annual reports for the 30 remaining groundwater impacted sites that were identified during our pit closure project of 1994 / 1995.

EPFS has organized the 30 Annual Reports (Volumes 1, 2 and 3) by land type. Volume 1 contains Annual Reports for sites found on Federal land. Volume 2 contains Non Federal sites and Volume 3 contains sites on Navajo land. Of the 30 reports submitted, EPFS is requesting closure of three sites located on Navajo lands. Of the three Navajo sites submitted for closure OCD has closed the Charley Pah #4 and the John Charles #8. The Rementa et al #1 has not been closed by either agency and EPFS reiterates request for closure of this site. EPFS understands closure of groundwater sites on Navajo land falls under jurisdiction of the Navajo Nation Environmental Protection Agency and original documents have been submitted to them for review. Other Navajo sites are included in the report for your information.

Three additional sites were submitted for closure in 2002. EPFS recently has received closure on the W.D. Heath B-5. Closure approval is pending on the D Loop Line Drip and Hammond # 41A. All of these sites are included in the 2002 Annual Report.

If you have any questions concerning the enclosed reports, please call me at (505) 599-2124.

Sincerely,



Scott T. Pope P.G.
Senior Environmental Scientist

xc: Mr. Denny Foust, NMOCD, Aztec - w / enclosures; **Certified Mail # 7001 1940 0002 1371 7669**
Mr. Bill Liesse, BLM - w / enclosures (federal sites only), **Certified Mail # 7001 1940 0002 1371 7652**

**EPFS GROUNDWATER SITES
2002 ANNUAL GROUNDWATER REPORT**

**Fogelson 4-1 Com #14
Meter Code: 73220**

SITE DETAILS

LEGAL DESCRIPTION: Twn: 29N Rng: 11W Sec: 4 Unit: P
NMOCD Haz Ranking: 10 **Land Type:** Federal **Operator:** Burlington Resources

PREVIOUS ACTIVITIES

Site Assessment: 3/94	Excavation: 4/94 (65cy)	Soil Boring: 10/95
Monitor Well: 10/95	Geoprobe: 12/96	Additional MWs: 6/00
Downgradient MWs: 6/00	Replace MW: NA	Quarterly Initiated: 12/96
ORC Nutrient Injection: 8/01	Re-Excavation: NA	PSH Removal Initiated: NA
Annual Initiated: 6/98	Quarterly Resumed: NA	

SUMMARY OF 2002 ACTIVITIES

MW-1:

- Semi-annual groundwater sampling was performed during 2002.
- The ORC socks in MW-1 were inspected during the June sampling event.

MW-2:

- Annual groundwater sampling was performed during 2002.
- Semi-annual water level monitoring was performed during 2002.

MW-3:

- Annual groundwater sampling was performed during 2002.
- Semi-annual water level monitoring was performed during 2002.

Site-Wide Activities: No other activities were performed at this site during 2002.

SUMMARY TABLES AND GRAPHS

- Analytical data are summarized in Table 1 and presented graphically in Figures 3 through 5.
- Laboratory reports are presented in Attachment 1.
- Field documentation is presented in Attachment 2.

**EPFS GROUNDWATER SITES
2002 ANNUAL GROUNDWATER REPORT**

**Fogelson 4-1 Com #14
Meter Code: 73220**

SITE MAP

Site maps are attached as Figures 1 and 2.

GEOLOGIC LOGS AND WELL COMPLETION DIAGRAMS

No subsurface activities were performed at this site during 2002.

DISPOSITION OF GENERATED WASTES

No wastes were generated at this site during 2002.

ISOCONCENTRATION MAPS

No isoconcentration maps were prepared for this site, however, the attached site maps present both the potentiometric surface and analytical data collected during 2002.

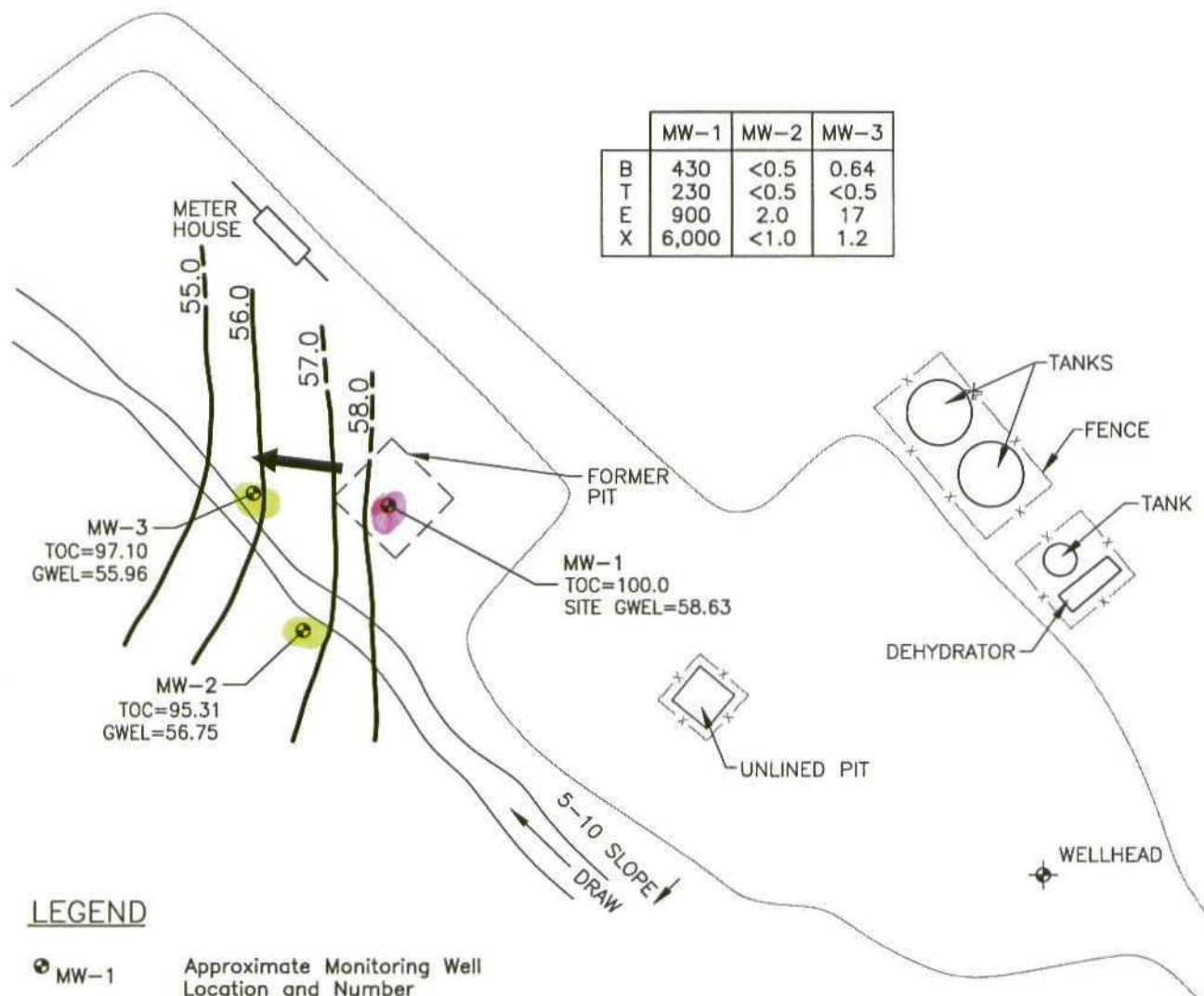
CONCLUSIONS

- The groundwater flow direction trends to the west.
- The groundwater elevation at this site has continued to decrease during 2002.
- The benzene concentrations in MW-1 remained elevated ($>400 \mu\text{g/l}$) during 2002.
- BTEX concentrations in MW-2 and MW-3 have continued to be significantly below closure criteria.
- The ORC socks in MW-1 were replaced during the June sampling event.

RECOMMENDATIONS

- EPFS will continue the use of ORC socks in MW-1 to enhance biodegradation of dissolved-phase contaminants. The ORC socks will continue to be inspected annually and replaced as necessary.
- EPFS will continue semi-annual groundwater sampling at MW-1 until BTEX concentrations approach closure criteria. Sampling will then continue on a quarterly basis until closure criteria are met.
- Because BTEX sampling at MW-2 have historically indicated concentrations less than the analytical detection limits, EPFS recommends that this well not be sampled until closure.
- EPFS will continue annual sampling at MW-3.

	MW-1	MW-2	MW-3
B	430	<0.5	0.64
T	230	<0.5	<0.5
E	900	2.0	17
X	6,000	<1.0	1.2



LEGEND

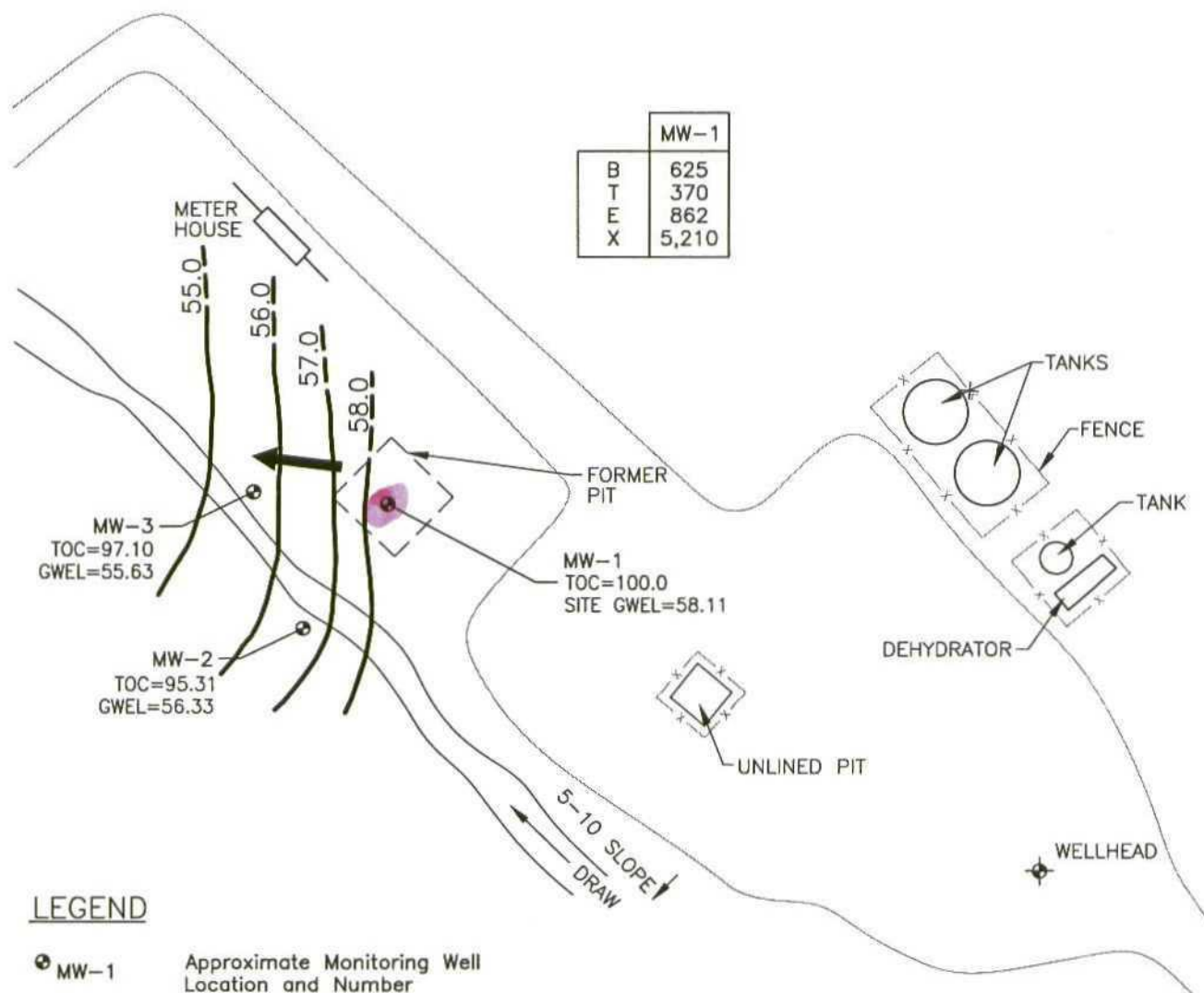
- ⊙ MW-1 Approximate Monitoring Well Location and Number
- x — x — Fence Line
- 6566.0 Potentiometric Surface (Assumed Where Dashed)
- ➔ Direction of Groundwater Flow (Estimated)
- B Benzene ($\mu\text{g/L}$)
- T Toluene ($\mu\text{g/L}$)
- E Ethylbenzene ($\mu\text{g/L}$)
- X Total Xylenes ($\mu\text{g/L}$)
- GWEL Groundwater Elevation (Relative Elevation)
- TOC Top of Casing
- NS Not Sampled

NOT TO SCALE

FOGELSON 4-1 #14, METER 73220
MAY, 2002

GROUNDWATER SITES
EL PASO FIELD SERVICES

FIGURE 1



MW-1	
B	625
T	370
E	862
X	5,210

LEGEND

- ⊙ MW-1 Approximate Monitoring Well Location and Number
- x — x — Fence Line
- 6566.0 Potentiometric Surface (Assumed Where Dashed)
- ➔ Direction of Groundwater Flow (Estimated)
- B Benzene ($\mu\text{g/L}$)
- T Toluene ($\mu\text{g/L}$)
- E Ethylbenzene ($\mu\text{g/L}$)
- X Total Xylenes ($\mu\text{g/L}$)
- GWEL Groundwater Elevation (Relative Elevation)
- TOC Top of Casing
- NS Not Sampled



NOT TO SCALE

FOGELSON 4-1 #14, METER 73220
NOVEMBER, 2002

GROUNDWATER SITES
EL PASO FIELD SERVICES

FIGURE 2

TABLE 1

SUMMARY OF BTEX COMPOUNDS IN GROUNDWATER
FOGELSON 4-1 COM #14 (METER #73220)

(Page 1 of 1)

Sample Identification	Sample Date	MW Identification	Benzene (µg/l)	Toluene (µg/l)	Ethylbenzene (µg/l)	m,p-Xylene (µg/l)	o-Xylene (µg/l)	Total Xylenes (µg/l)
FOG-0205-MW1	15-May-2002	1	430	230	900	NA	NA	6000
02-5860-1	04-Nov-2002	1	625	370	862	4080	1130	5210
FOG-0205-MW2	15-May-2002	2	<0.5	<0.5	2.0	NA	NA	<1.0
FOG-0205-MW3	15-May-2002	3	0.64	<0.5	17	NA	NA	1.2

Figure 3
 BTEX Concentration and Groundwater Elevation vs. Time
 Fogelson 4-1 Com #14 (Meter #73220)
 MW-1

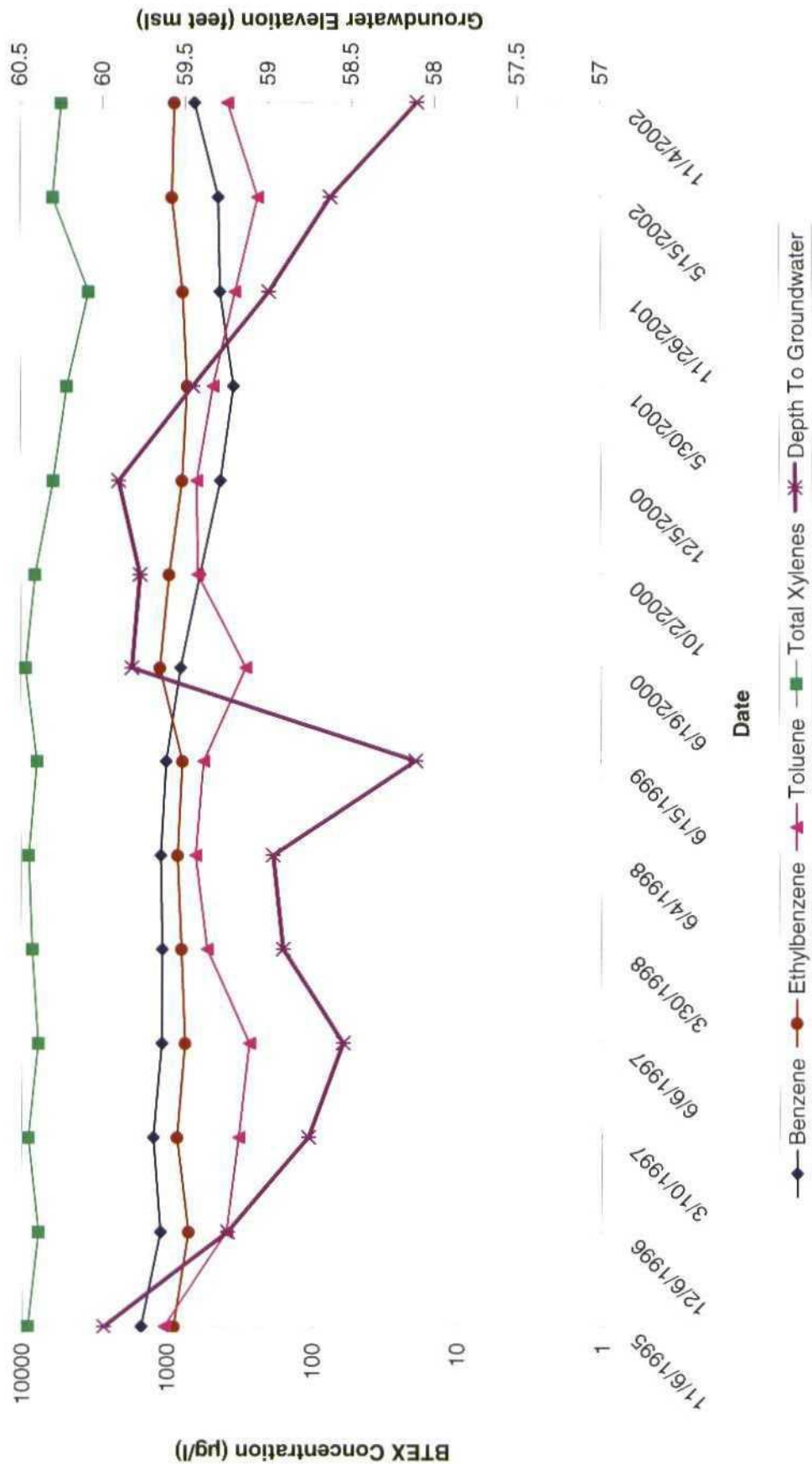


Figure 4
BTEX Concentration and Groundwater Elevation vs. Time
Fogelson 4-1 Com #14 (Meter # 73220)
MW-2

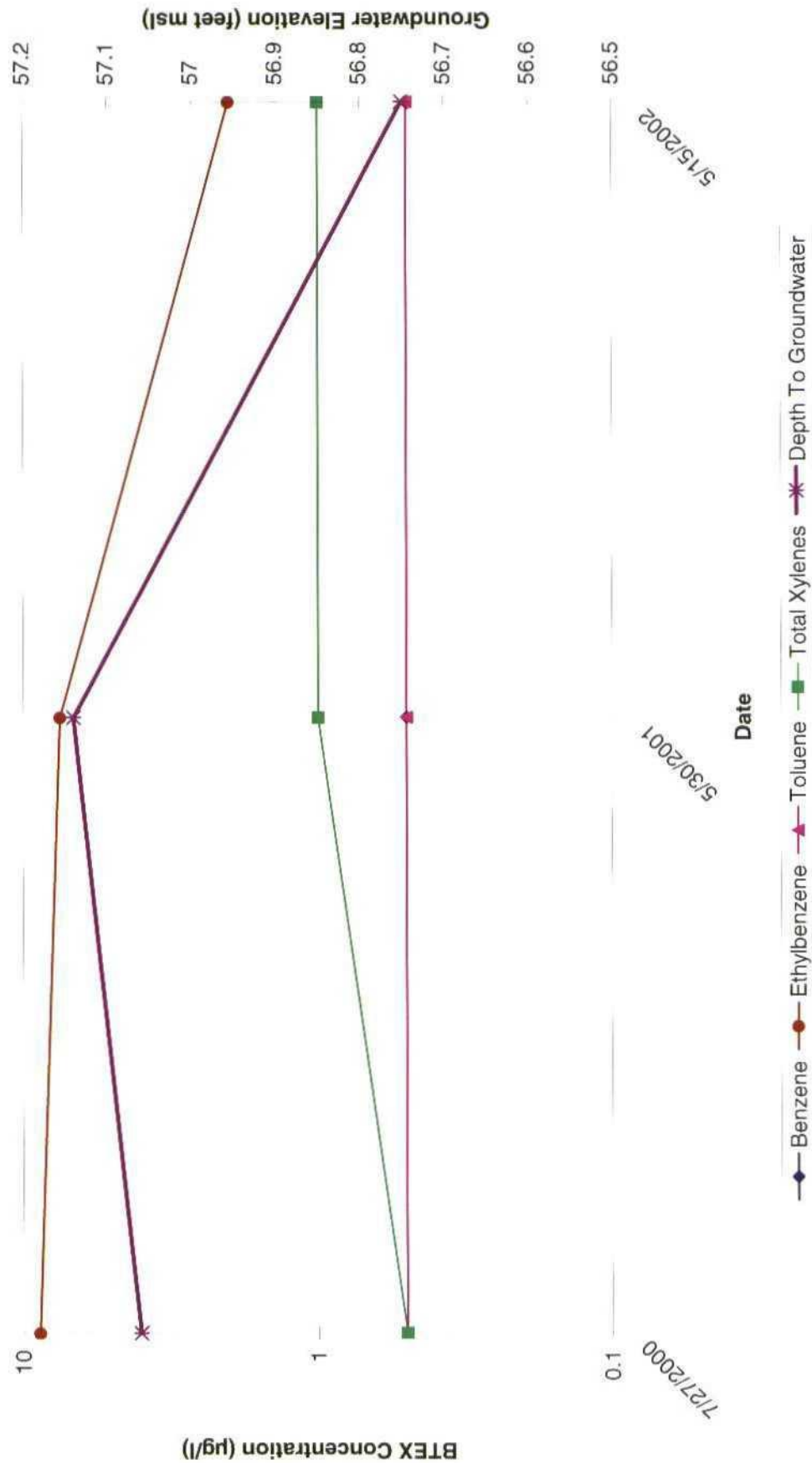
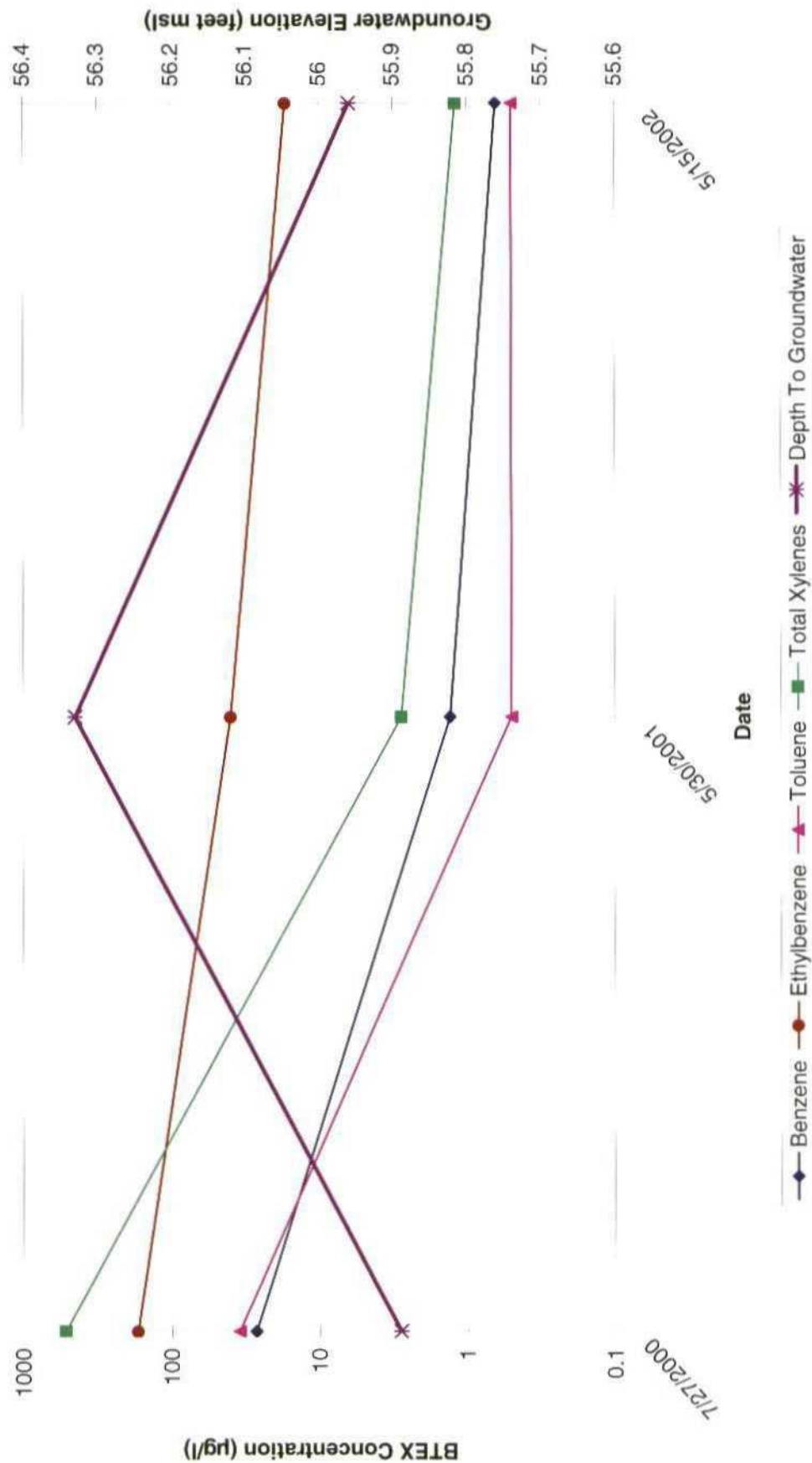


Figure 5
 BTEX Concentration and Groundwater Elevation vs. Time
 Fogelson 4-1 Com #14 (Meter #73220)
 MW-3



ATTACHMENT 1
LABORATORY REPORTS

DATA VALIDATION WORKSHEET

(Page 2 of 2)

Analytical Method: SW-846 8021B (BTEX) MWH Job Number: EPC-SJRB (Groundwater)

Laboratory: APCL Batch Identification: 02-05860

Validation Criteria								
Sample ID	Fogelson MW-1	Hamner MW-1	Standard Oil MW-1	TB 02110401				
Lab ID	02-05860- 01	02-05860- 02	02-05860- 03	02-05860- 04				
Hardcopy vs. Chain-of-Custody	A	A	A	A				
Holding Time	A	A	A	A				
Analyte List	A	A	A	A				
Reporting Limits	A	A	A	A				
Method Blank	A	A	A	A				
Trip Blank	A ¹	A ¹	A ¹	A ¹				
Equipment Rinseate Blanks	N/A	N/A	N/A	N/A				
Field Duplicate/Replicate	N/A	N/A	N/A	N/A				
Initial Calibration	N	N	N	N				
Initial Calibration Verification (ICV)	N	N	N	N				
Continuing Calibration Verification (CCV)	A	A	A	A				
Laboratory Control Sample (LCS)	A	A	A	A				
Laboratory Control Sample Duplicate (LCSD)	N	N	N	N				
Matrix Spike/Matrix Spike Dup. (MS/MSD)	N/A	N/A	N/A	N/A				
Surrogate Spike Recovery	A	A	A	A				
Retention Time Window	N	N	N	N				
Injection Time(s)	N	N	N	N				
EDD vs. Hardcopy	N	N	N	N				
EDD vs. Chain of Custody	N	N	N	N				

(a) List QC batch identification if different than Batch ID

A indicates validation criteria were met

A/L indicates validation criteria met based upon Laboratory's QC Summary Form

X indicates validation criteria were not met

N indicates data review were not a project specific requirement

N/A indicates criteria are not applicable for the specified analytical method or sample

N/R indicates data not available for review

NOTES:

1) The following analytes were detected in the trip blank:

- Ethylbenzene @ 0.8 µg/L, qualify all sample concentrations less than or equal to 4.0 µg/L with a "UB" flag and all sample concentrations greater than 4.0 µg/l with a "B" flag.
- Toluene @ 0.3T µg/L, qualify all sample concentrations less than or equal to 1.5 µg/L with a "UB" flag and all sample concentrations greater than 1.5 µg/l with a "B" flag.
- m/p-Xylene @ 0.9T µg/L, qualify all sample concentrations less than or equal to 4.5 µg/L with a "UB" flag and all sample concentrations greater than 4.5 µg/l with a "B" flag.

Applied P & Ch Laboratory

13760 Magnolia Ave. Chino CA 91710

Tel: (909) 590-1828 Fax: (909) 590-1498

APCL Analytical Report

Submitted to:

Montgomery Watson Harza

Attention: Brian Buttars

10619 South Jordan Gateway

Salt Lake City UT 84095

Tel: (801)617-3200 Fax: (801)617-4200

Service ID #: 801-025860

Collected by: Ashley Lowe.

Collected on: 11/04/02

Sample Description: Water

Project Description: 220013

Received: 11/05/02

Extracted: N/A

Tested: 11/08-11/02

Reported: 11/15/02

San Juan River Basin

Groundwater

Analysis of Water Samples

Component Analyzed	Method	Unit	PQL	Analysis Result	
				MW-1 GW Fogelson	MW-1 GW Hamner
				02-05860-1	02-05860-2
BTXE					
Dilution Factor				25	1
BENZENE	8021B	µg/L	0.5	625	72.5
ETHYLBENZENE	8021B	µg/L	0.5	862	47.0
TOLUENE	8021B	µg/L	0.5	370	50.0
O-XYLENE	8021B	µg/L	0.5	1,130	60.6
M,P-XYLENE	8021B	µg/L	1	4,080	118

Component Analyzed	Method	Unit	PQL	Analysis Result	
				MW-1 GW Standard Oil	TB02110401
				02-05860-3	02-05860-4
BTXE					
Dilution Factor				5	1
BENZENE	8021B	µg/L	0.5	464	< 0.5
ETHYLBENZENE	8021B	µg/L	0.5	235	0.8
TOLUENE	8021B	µg/L	0.5	207	0.3J
O-XYLENE	8021B	µg/L	0.5	365	< 0.5
M,P-XYLENE	8021B	µg/L	1	720	0.9J

PQL: Practical Quantitation Limit. MDL: Method Detection Limit. CRDL: Contract Required Detection Limit

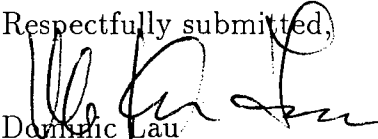
N.D.: Not Detected or less than the practical quantitation limit.

"-": Analysis is not required.

J: Reported between PQL and MDL.

Listed Dilution Factors (DF) are relative to the method default DF. All unlisted DFs are 1.0

Respectfully submitted,


Dominic Lau
Laboratory Director
Applied P & Ch Laboratory

Applied P & Ch Laboratory

13760 Magnolia Ave. Chino CA 91710

Tel: (909) 590-1828 Fax: (909) 590-1498

APCL QA/QC Report

Submitted to:

Montgomery Watson Harza

Attention: Brian Butters

10619 South Jordan Gateway

Salt Lake City, UT 84095

Tel: (801) 617-3200 Fax: (801) 617-4200

Service ID #: 801-025860

Collected by: Ashley Lowe.

Collected on: 11/04/02

Sample description:

Water

Project: San Juan River Basin /220013

Received: 11/05/02

Tested: 11/08-11/02

Reported: 12/03/02

Analysis of Water

801-025860QC

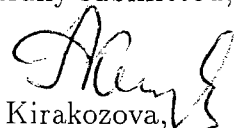
Component Name	Analysis Batch #	CCV (µg/L)	CCV %Rec	M-Blank	Conc. Unit	SP Level	LCS %Rec	MS %Rec	MSD %Rec	MS/MSD %RPD	Control Limit %Rec	%Diff
BTXE												
Benzene	02G4612	100	100	N.D.	µg/L	18.0	85	91	91	0	68-130	31
Toluene	02G4612	100	100	N.D.	µg/L	70.0	89	95	94	1	66-133	33
Ethylbenzene	02G4612	100	103	N.D.	µg/L	18.0	96	97	98	0	65-134	35
m/p-Xylene	02G4612	200	95	N.D.	µg/L	70.0	92	97	96	1	65-134	35
o-Xylene	02G4612	100	96	N.D.	µg/L	25.0	91	100	102	2	65-134	35

Component Name	Analysis Batch #	CCV (µg/L)	CCV %Rec	M-Blank	Conc. Unit	SP Level	LCS %Rec	MS %Rec	MSD %Rec	MS/MSD %RPD	Control Limit %Rec	%Diff
BTXE												
Benzene	02G4636	100	100	N.D.	µg/L	18.0	88	91	90	0	68-130	31
Toluene	02G4636	100	100	N.D.	µg/L	70.0	91	94	94	1	66-133	33
Ethylbenzene	02G4636	100	103	N.D.	µg/L	18.0	96	92	93	0	65-134	35
m/p-Xylene	02G4636	200	95	N.D.	µg/L	70.0	92	94	93	1	65-134	35
o-Xylene	02G4636	100	97	N.D.	µg/L	25.0	92	95	94	1	65-134	35

Notation: ICV - Initial Calibration Verification
CCV - Continuation Calibration Verification
LCS - Lab Control Spike
MS - Matrix Spike
MSD - Matrix Spike Duplicate
ICS - Interference Check Standard
MD - Matrix Duplicate
N.D. - Not detected or less than PQL

CCB - Continuation Calibration Blank
M-blank - Method Blank
SP Level - Spike Level
%Rec - Recovery Percent
%RPD - Relative Percent Differences
%Diff - Control Limit for %RPD
ICP-SD - ICP Serial Dilution
N.A. - Not Applicable

Respectfully submitted,


Regina Kirakozova,
Associate QA/QC Director
Applied P & Ch Laboratory

FORM-2A

Applied P & Ch Laboratory

Surrogate Recovery Summary for Method 8021B

Client Name: Montgomery Watson Harza

Contract No:

Lab Code: APCL

Case No:

SAS No:

SDG Number: 025860

Project ID: San Juan River Basin

Project No: 220013

Sample Matrix: Water

Batch No: 02G4636

#	Client Sample No	Lab Sample ID	S1 % #	TOT OUT
1		02G4636-LCS-01	88	0
2		02G4636-LSD-01	85	0
3		02G4636-MB-02	87	0
4	MW-1 GW FOGELSON	02-5860-1	94	0
5	MW-1 GW STANDARD OIL	02-5860-3	105	0
6	821818-0500	02-5971-1MS	86	0
7	821818-0500	02-5971-1MSD	86	0
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

QC Control Limit

S1 = 4-BROMO-FLUOROBENZENE (PID)

65-134

Column to be used to flag recovery values:

* - Values outside of contract required QC Limits

D - Surrogate diluted out

I - Matrix Interference

FORM-2A

Applied P & Ch Laboratory

Surrogate Recovery Summary for Method 8021B

Client Name: Montgomery Watson Harza

Contract No:

Lab Code:

APCL

Case No:

SAS No:

Service ID:

025860

Project ID: San Juan River Basin

Project No: 220013

Sample Matrix:

Water

Batch No: 02G4612

#	Client Sample No	Lab Sample ID	S1 % #	TOT OUT
1		02G4612-LCS-01	82	0
2		02G4612-LSD-01	83	0
3		02G4612-MB-02	87	0
4	TB02110401	02-5860-4	87	0
5	VR-1	02-5869-4MS	84	0
6	VR-1	02-5869-4MSD	85	0
7	MW-1 GW HAMNER	02-5860-2	104	0
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

QC Control Limit

S1 = 4-BROMO-FLUOROBENZENE (PID)

65-134

Column to be used to flag recovery values:

* - Values outside of contract required QC Limits

D - Surrogate diluted out

I - Matrix Interference

CHAIN OF CUSTODY RECORD/LAB WORK REQUEST

LABORATORY APCL
Contract El Paso Corp., San Juan River Basin

MWH

Phone (801) 617-3200 FAX (801) 617-4200

MWH Contact Brian Butters

Project San Juan River Basin

Project Number 220613

Date Due 21 days

Sampler's Name Ashley Lowe
(print clearly)

Chain of Custody ID 021104 AL01
Page 1 of 1
Air Bill No. 8363816 76598

Location ID	Sample ID	Depth Interval (ft)	Date Collected	Time Collected	Matrix (a)	Sampling Technique (b)	ANALYSES REQUESTED													
							BTEX SW-846 8021B	Alkalinity SM 2320B	TDS USEPA 160.1	NM WQCC Metals SW-846 6010B & 7470A	Cations SW-846 6010B	Anions USEPA 300.0	Nitrate USEPA 300.0	Nitrite USEPA 300.0	No Preservative					
GW Standard Oil Com	MW-1		11-04-02 13:28	11:57	WG B	✓														
GW Hammer	MW-1		11-04-02 10:45	11:57	WG B	✓														
GW Fogelson	MW-1		11-04-02		WG B	✓														
TB02110401																				

5860

(a) Matrix: SO - Soil AA - Air
WS - Surface Water WQ - Trip Blank/ Equipment Blanks
WG - Ground Water WW - Wastewater

(b) Sampling Technique: Composite=C Grab=G Hand Auger=HA
Submersible Pump=SP Bladder Pump=BP Bailor=B Wellhead Faucet=WF Hydropunch=HP

Location IDs: North Flare Pit=NF South Flare Pit=SF San Juan River Plant=SJ
Bisli=BI Jaquez=JA

Relinquished by/Affiliation	Received by/Affiliation	Date	Time
<u>Adley & Lowe/AESE</u>	<u>Paul K</u>	11-04-02	4:00
		11/5/02	10:00

LABORATORY USE ONLY	
SAMPLES WERE: 1 Shipped or hand delivered Notes: 2 Ambient or Chilled Notes: 3 Temperature _____ 4 Received Broken/Leaking (Improperly Sealed) Y N Notes: 5 Properly Preserved Y N Notes: 6 Received Within Holding Times Y N Notes:	
COC Tape Was: 1 Present on Outer Package Y N NA 2 Unbroken on Outer Package Y N NA 3 Present on Sample Y N NA 4 Unbroken on Sample Y N NA Notes:	
Discrepancies Between Sample Labels and COC Record? Y N Notes:	



2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

Pinnacle Lab ID number **205134**
June 04, 2002

AMEC EARTH & ENVIRONMENTAL
2060 AFTON PLACE
FARMINGTON, NM 87401

EL PASO FIELD SERVICES
614 RIELLY STREET
FARMINGTON, NM 87401

Project Name FOGELSON 4-1
Project Number 1517000121

Attention: LISA WINN/SCOTT POPE

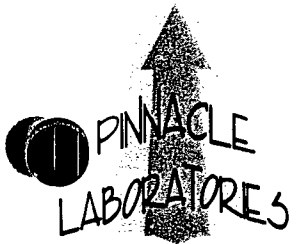
On 05/17/02 Pinnacle Laboratories, Inc., (ADHS License No. AZ0592 pending), received a request to analyze **aqueous** samples. The samples were analyzed with EPA methodology or equivalent methods. The results of these analyses and the quality control data, which follow each set of analyses, are enclosed.

If you have any questions or comments, please do not hesitate to contact us at (505)344-3777.

H. Mitchell Rubenstein, Ph. D.
General Manager

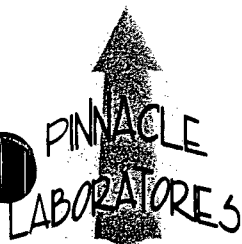
MR: jt

Enclosure



2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

CLIENT	: AMEC EARTH & ENVIRONMENTAL	PINNACLE ID	: 205134
PROJECT #	: 1517000121	DATE RECEIVED	: 05/17/02
PROJECT NAME	: FOGELSON 4-1	REPORT DATE	: 06/04/02
PINNACLE			DATE
ID #	CLIENT DESCRIPTION	MATRIX	COLLECTED
205134 - 01	FOG-0205-MW1	AQUEOUS	05/15/02
205134 - 02	FOG-0205-MW2	AQUEOUS	05/15/02
205134 - 03	FOG-0205-MW3	AQUEOUS	05/15/02



2709-D Pan American Freeway NE
Albuquerque, New Mexico 87107
Phone (505) 344-3777
Fax (505) 344-4413

GAS CHROMATOGRAPHY RESULTS

TEST : EPA 8021 MODIFIED
CLIENT : AMEC EARTH & ENVIRONMENTAL
PROJECT # : 1517000121
PROJECT NAME : FOGELSON 4-1

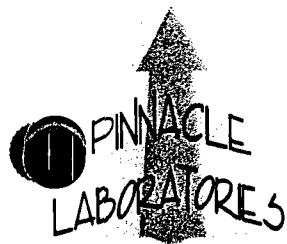
PINNACLE I.D.: 205134

SAMPLE			DATE	DATE	DATE	DIL.
ID. #	CLIENT I.D.	MATRIX	SAMPLED	EXTRACTED	ANALYZED	FACTOR
01	FOG-0205-MW1	AQUEOUS	05/15/02	NA	05/18/02	50
02	FOG-0205-MW2	AQUEOUS	05/15/02	NA	05/21/02	1
03	FOG-0205-MW3	AQUEOUS	05/15/02	NA	05/21/02	1

PARAMETER	DET. LIMIT	UNITS	FOG-0205-MW1	FOG-0205-MW2	FOG-0205-MW3
BENZENE	0.5	UG/L	430	< 0.5	0.64
TOLUENE	0.5	UG/L	230	< 0.5	< 0.5
ETHYLBENZENE	0.5	UG/L	900	2.0	17
TOTAL XYLENES	1.0	UG/L	6000	< 1.0	1.2

SURROGATE:
BROMOFLUOROBENZENE (%) 114 102 114
SURROGATE LIMITS (80 - 120)

CHEMIST NOTES:
N/A



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GAS CHROMATOGRAPHY RESULTS
REAGENT BLANK

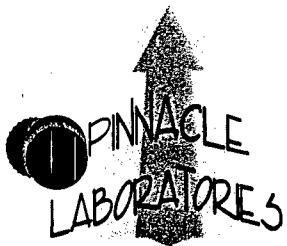
TEST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 205134
BLANK I. D.	: 051802	DATE EXTRACTED	: N/A
CLIENT	: AMEC EARTH & ENVIRONMENTAL	DATE ANALYZED	: 05/18/02
PROJECT #	: 1517000121	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: FOGELSON 4-1		

PARAMETER	UNITS	
BENZENE	UG/L	<0.5
TOLUENE	UG/L	<0.5
ETHYLBENZENE	UG/L	<0.5
TOTAL XYLENES	UG/L	<1.0

SURROGATE:
BROMOFLUOROBENZENE (%) 108

SURROGATE LIMITS: (80 - 120)

ANALYST NOTES:
N/A



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GAS CHROMATOGRAPHY RESULTS
REAGENT BLANK

EST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 205134
BLANK I. D.	: 052102	DATE EXTRACTED	: N/A
CLIENT	: AMEC EARTH & ENVIRONMENTAL	DATE ANALYZED	: 05/21/02
PROJECT #	: 1517000121	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: FOGELSON 4-1		

PARAMETER	UNITS	
BENZENE	UG/L	<0.5
TOLUENE	UG/L	<0.5
ETHYLBENZENE	UG/L	<0.5
TOTAL XYLENES	UG/L	<1.0

SURROGATE:
BROMOFLUOROBENZENE (%) 102
SURROGATE LIMITS: (80 - 120)
ADDITIONAL NOTES:
N/A



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GAS CHROMATOGRAPHY QUALITY CONTROL
LCS/LCSD

EST : EPA 8021 MODIFIED
ATCH# : 051802
CLIENT : AMEC EARTH & ENVIRONMENTAL
PROJECT # : 1517000121
PROJECT NAME : FOGELSON 4-1

PINNACLE I.D. : 205134
DATE EXTRACTED : N/A
DATE ANALYZED : 05/18/02
SAMPLE MATRIX : AQUEOUS
UNITS : UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	<0.5	40.0	41.6	104	41.1	103	1	(80 - 120)	20
TOLUENE	<0.5	40.0	41.9	105	41.5	104	1	(80 - 120)	20
ETHYLBENZENE	<0.5	40.0	42.8	107	42.5	106	1	(80 - 120)	20
TOTAL XYLENES	<1.0	120	132	110	130	108	2	(80 - 120)	20

ANALYST NOTES:
N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



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GAS CHROMATOGRAPHY QUALITY CONTROL
LCS/LCSD

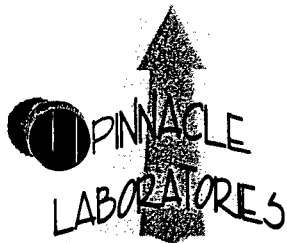
EST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 205134
ATCH#	: 052102	DATE EXTRACTED	: N/A
LIENT	: AMEC EARTH & ENVIRONMENTAL	DATE ANALYZED	: 05/21/02
ROJECT #	: 1517000121	SAMPLE MATRIX	: AQUEOUS
ROJECT NAME	: FOGELSON 4-1	UNITS	: UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
ENZENE	<0.5	20.0	20.0	100	19.8	99	1	(80 - 120)	20
OLUENE	<0.5	20.0	20.2	101	20.1	101	0	(80 - 120)	20
THYLBENZENE	<0.5	20.0	20.6	103	20.5	103	0	(80 - 120)	20
OTAL XYLENES	<1.0	60.0	63.5	106	63.2	105	0	(80 - 120)	20

NOTES:
I/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\% \text{ RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



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GAS CHROMATOGRAPHY QUALITY CONTROL
MSMSD

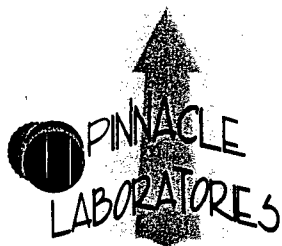
EST	: EPA 8021 MODIFIED	PINNACLE I.D.	: 205134
ISMSD #	: 205131-01	DATE EXTRACTED	: N/A
CLIENT	: AMEC EARTH & ENVIRONMENTAL	DATE ANALYZED	: 05/19/02
PROJECT #	: 1517000121	SAMPLE MATRIX	: AQUEOUS
PROJECT NAME	: FOGELSON 4-1	UNITS	: UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
BENZENE	33.7	40.0	69.3	89	72.1	96	4	(80 - 120)	20
TOLUENE	4.92	40.0	42.6	94	44.1	98	3	(80 - 120)	20
ETHYLBENZENE	1.02	40.0	39.8	97	41.2	100	3	(80 - 120)	20
TOTAL XYLENES	3.33	120	124	101	128	104	3	(80 - 120)	20

CHEMIST NOTES:
N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$



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GAS CHROMATOGRAPHY QUALITY CONTROL
MSMSD

EST : EPA 8021 MODIFIED
MSMSD # : 205132-02
CLIENT : AMEC EARTH & ENVIRONMENTAL
PROJECT # : 1517000121
PROJECT NAME : FOGELSON 4-1

PINNACLE I.D. : 205134
DATE EXTRACTED : N/A
DATE ANALYZED : 05/21/02
SAMPLE MATRIX : AQUEOUS
UNITS : UG/L

PARAMETER	SAMPLE RESULT	CONC SPIKE	SPIKED SAMPLE	% REC	DUP SPIKE	DUP % REC	RPD	REC LIMITS	RPD LIMITS
ENZENE	<0.5	20.0	19.7	99	20.1	101	2	(80 - 120)	20
OLUENE	<0.5	20.0	20.1	101	20.3	102	1	(80 - 120)	20
THYLBENZENE	<0.5	20.0	20.4	102	20.7	104	1	(80 - 120)	20
OTAL XYLENES	<1.0	60.0	63.1	105	63.9	107	1	(80 - 120)	20

NOTES:
N/A

$$\text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

[illegible]

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111098 P.L.I.: Pinnacle Laboratories, Inc. • 2709-D Pan American Freeway, NE • Albuquerque, New Mexico 87107 • (505) 344-3777 • Fax (505) 344-4413 • E-mail: PIN_LAB@WORLDNET.ATT.NET

DISTRIBUTION: White - PLI, Canary - Originator

ATTACHMENT 2
FIELD DOCUMENTATION

WELL DEVELOPMENT AND SAMPLING LOG

Project No: 220013 Project Name: San Juan River Basin Client: MWH
 Location: Fogelson Well No: MW-1 Development ☐ Sampling ☒
 Project Manager Ashley Lowe Date 11-4-02 Start Time 9:45 Weather 40° Rain/Snow
 Depth to Water 41.895 Depth to Product NA Product Thickness NA Measuring Point TDC
 Water Column Height 5.8' Well Dia. 4" TD 47.70

Sampling Method: Submersible Pump ☐ Centrifugal Pump ☐ Peristaltic Pump ☐ Other ☐
 Bottom Valve Bailer ☒ Double Check Valve Bailer ☐ Stainless-Steel Kemmerer ☐
 Criteria: 3 to 5 Casing Volumes of Water Removal ☒ Stabilization of Indicator Parameters ☐ Other or bail/dry

Gal/ft x ft of water	Water Volume In Well		Gal/oz to be removed
	Gallons	Ounces	
<u>0.65 x 5.8</u>	<u>3.77 x 3</u>		<u>11.3 g</u>

Time (military)	pH	SC (umhos/cm)	Temp (°C)	Eh-ORP (millivolts)	D.O. (mg/L)	Turbidity (NTU)	Vol Evac. (gal.)	Comments/Flow rate
<u>9:50</u>	<u>5.89</u>	<u>>19,000</u>	<u>13.1</u>				<u>1/2 g</u>	<u>light yellow, clear, v.s. odor,</u>
	<u>5.19</u>	<u>>19,000</u>	<u>13.7</u>				<u>2</u>	<u>sheen on top</u>
	<u>5.19</u>	<u>"</u>	<u>13.5</u>				<u>3</u>	<u>conductivity out of</u>
	<u>5.24</u>	<u>"</u>	<u>12.9</u>				<u>4</u>	<u>range of pH-T-SC meter</u>
	<u>5.30</u>	<u>"</u>	<u>13.2</u>				<u>6</u>	
	<u>5.40</u>	<u>"</u>	<u>12.9</u>				<u>8</u>	
	<u>5.42</u>	<u>"</u>	<u>14.8</u>				<u>9</u>	
	<u>5.41</u>	<u>"</u>	<u>15.1</u>				<u>10</u>	
	<u>5.42</u>	<u>"</u>	<u>15.0</u>				<u>11</u>	
	<u>5.42</u>	<u>"</u>	<u>15.0</u>				<u>12</u>	

Final:

Time	pH	SC	Temp	Eh-ORP	D.O.	Turbidity	Ferrous Iron	Vol Evac.	Comments/Flow rate
<u>10:45</u>	<u>5.42</u>	<u>>19,000</u>	<u>15.0</u>					<u>12 gal</u>	

COMMENTS: HCl preservative rinsed out of sample bottle before filling
(reacted w/ CO2 in water)

INSTRUMENTATION: pH Meter ☒ Temperature Meter ☒
 DO Monitor ☐ Other ☐
 Conductivity Meter ☒

Water Disposal Kutz Plant
 Sample ID Fogelson MW-1 Sample Time 10:45 BTEX ☒ VOCs ☐ Alkalinity ☐
 TDS ☐ Cations ☐ Anions ☐ Nitrate ☐ Nitrite ☐ Ammonia ☐ TKN ☐ NM WQCC Metals ☐
 Total Phosphorus ☐ MS/MSD ☐ BD ☐ BD Name/Time ☐ TB 1002110401

Product Recovery and Well Observation Data

Project Name: San Juan River Basin
 Project Manager: Ashley Lowe
 Client Company: MWH
 Site Name: Fogelson

Project No: 220013
 Date: 11-04-02

Well	Time	Depth to Water (ft)	Depth to Product (ft)	Total Well Depth (ft)	Product Thickness (ft)	Volume Removed	Comments
MW-3	9:52	41.475	—	52.14	—	—	
MW-2	9:57	38.985	—	47.14	—	—	
MW-1	10:05	41.895	—	47.70	—	—	sampled

COMMENTS: _____

Signature: Ashley L Lowe Date: 11-04-02

Chain of Custody ID 021104ALD
 Page 1 of 1
 Air Bill No. 83638176598

FedEx

USA Airbill
Express

FedEx
Tracking
Number

836381676598

1 From Please print and press hard

Date 11-04-02 Sender's FedEx Account Number 236245993

Sender's Name Ashley Lowe Phone (505) 566-9116

Company AESE

Address 906 San Juan Blvd, Ste D

City Farmington State MN ZIP 55401

2 Your Internal Billing Reference

3 To Recipient's Name Eric Wendland Phone (909) 590 1828

Company APCL

Address 13760 Magnolia Ave

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address

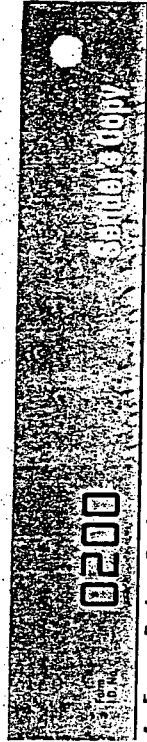
City Chino State CA ZIP 91710



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or call 1.800.Go.FedEx® 800.463.3339.

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4a Express Package Service

☒ FedEx Priority Overnight ☐ FedEx Standard Overnight ☐ FedEx First Overnight
Next business morning Next business afternoon Earliest next business morning delivery to select locations

Packages up to 150 lbs.

Delivery commitment may be later in some areas.

☐ FedEx 2Day ☐ FedEx Express Saver
Second business day Next business day
FedEx Envelope rate not available. Minimum charge, one pound rate.

4b Express Freight Service

☐ FedEx 1Day Freight* ☐ FedEx 2Day Freight ☐ FedEx 3Day Freight
Next business day Second business day Third business day

* Call for Confirmation.

Packages over 150 lbs.

Delivery commitment may be later in some areas.

5 Packaging

☐ FedEx Envelope* ☐ FedEx Pak* ☒ Other
Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak

* Declared value limit \$500

6 Special Handling

☐ SATURDAY Delivery Available ONLY for FedEx Priority Overnight and FedEx 2Day to select ZIP codes.
☐ HOLD Weekday at FedEx Location (NLI) Available for FedEx First Overnight.
☐ HOLD Saturday at FedEx Location Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.
In boxes with a label in Series 7.

Does this shipment contain dangerous goods?

☒ No ☐ Yes ☐ Yes Shipper's Declaration not required ☐ Yes Shipper's Declaration required
Dangerous Goods (including Dry Ice) cannot be shipped in FedEx packaging.
☐ Dry Ice Dry Ice, 3 UN 1845 ☐ Cargo Aircraft Only

7 Payment Bill to:

☐ Sender ☒ Recipient ☐ Third Party ☐ Credit Card ☐ Cash/Check
I will be paid I will be paid

FedEx Act No. 1421-27-695 Exp. Date 15/13
Credit Card No. 1513 s. .00

Total Packages 1 Total Weight 1513 s. .00 Total Declared Value 1513 s. .00

8 Release Signature

Your liability is limited to \$100 unless you declare a higher value. See back for details.

Sign to authorize delivery without obtaining signature.

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

Rev. Date 10/01/01 Form 1578/12-©1994-2001 FedEx® PRINTED IN U.S.A. WCS 02

446

amec

Project No.: 15/7000121

Task:

Date: 6 10 02

Site Name: Fogelson 4-1 (73220)

[illegible]

Reason Not Measured: D = Dry; O = Obstructed; N = Not Accessible

Comments: INSTALLED 7 1FT O.R.C. SOCKS

Signature: Elisa A. M. J.

Date: 6-10-02

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Pinnacle Laboratories Inc.

CHAIN OF CUSTODY

DATE: 5-16-02 PAGE: 1 OF 1

ANALYSIS REQUEST

PROJECT MANAGER: LISA WINN

COMPANY: AMEC

ADDRESS: 2060 AFTON PLACE

FARMINGTON NM. 87401

PHONE: (505) 323-7929

FAX: (505) 326-5721

BILL TO: SCOTT POPE

COMPANY: EL PASO FIELD SERVICES

ADDRESS: Farmington NM 87401

614 Reilly AVE

SAMPLE ID

DATE TIME

Petroleum Hydrocarbons (418.1) TRPH
(MOD.8015) Diesel/Direct Inject

(M8015) Gas/Purge & Trap

8021 (BTEX)/8015 (Gasoline) MTBE

8021 (BTEX) ☐ MTBE ☐ TMB ☐ PCE

8021 (TCL)

8021 (EDX)

8021 (HALO)

8021 (CUST)

504.1 EDB ☐ / DBCP ☐

8260 (TCL) Volatile Organics

8260 (Full) Volatile Organics

8260 (CUST) Volatile Organics

8260 (Landfill) Volatile Organics

Pesticides /PCB (608/8081/8082)

Herbicides (615/8151)

Base/Neutral/Acid Compounds GC/MS (625/8270)

Polynuclear Aromatics (610/8310/8270-SIMS)

General Chemistry:

Priority Pollutant Metals (13)

Target Analyte List Metals (23)

RCRA Metals (8)

RCRA Metals by TCLP (Method 1311)

Metals:

NUMBER OF CONTAINERS

PROJECT INFORMATION

PROJ. NO: 517000121

PROJ. NAME: PFS GR. PROJ.

P.O. NO:

SHIPPED VIA: FedEx

SAMPLE RECEIPT

NO. CONTAINERS

CUSTOMER SEALS

RECEIVED IN LAB

DATE

PRIORITY DELIVERY SPECIFIED FOR RUSH PROJECTS

(RUSH) ☐ 24hr ☐ 48hr ☐ 72hr ☐ 1 WEEK

CERTIFICATION REQUIRED: ☐ NM ☐ SDWA ☐ OTHER

METHANOL PRESERVATION ☐

COMMENTS: FIXED FEE ☐

Ferguson 4-1
meter # (933220)

RECEIVED BY

Signature: [Signature] Time: 1530

Printed Name: [Name] Date: 5-16-02

Company: AMEC

See (reverse side) (Forc Majeure)

Signature: [Signature] Time:

Printed Name: [Name] Date:

Company:

RECEIVED BY

Signature: [Signature] Time:

Printed Name: [Name] Date:

Company:

See (reverse side) (Forc Majeure)

Signature: [Signature] Time:

Printed Name: [Name] Date:

Company: