3R - 23

REPORTS

DATE:

June 29, 1994

BLAGG ENGINEERING, INC.
P.O. Box 87, Bloomfield, New Mexico 87413
Phone: (505)632-1199 Fax: (505)632-3903

June 29, 1994

Mr. William C. Olson, Hydrologist
New Mexico Oil Conservation Division
Environmental Bureau
P.O. Box 2088
Santa Fe, New Mexico 87504-2088

Re: Quarterly Monitoring Report
Amoco Production Company
Gallegos Canyon Unit (K) #162, Sec. 36-T29N-R12W
San Juan County, New Mexico

Dear Mr. Olson:

Amoco Production Company has retained Blagg Engineering, Inc. to continue environmental monitoring of groundwater reclamation at Gallegos Canyon Unit (K) Well No. 162 (Appendix A, Figure 1). Following are quarterly monitoring results as required by the New Mexico Oil Conservation Division (NMOCD), pursuant to reclamation plan approval by the NMOCD with letter dated January 27, 1994.

The groundwater reclamation system at the site was installed in January - March, 1994. The system was placed into operation on May 9, 1994 following receipt of verbal approval from the State Engineers Office to divert waters from the San Juan Basin Aquifer. Operation of the reclamation system has been continuous since start-up, except for a temporary shut down for electrical repairs on June 21, 1994. An initial sample event of groundwater monitor wells at the site was performed on February 25, 1994 to establish baseline water quality and the first quarterly sample event was performed on June 17, 1994. Presently, modifications to the air stripper and liquid separation systems are being evaluated. These modifications may include stripper scale cleaning, installation of a second stripper in series and separator adjustments.

Following are summary laboratory analytical results and monitoring data concerning product thickness, water table elevations, recovery volumes and infiltration volumes.

Summary Laboratory Analytical Results

A summary of laboratory analytical results for groundwater monitor wells and system effluent is included in Table 1 on the following page. Laboratory data reports are included in Appendix B.

TABLE 1

Summary Laboratory Analytical Results
Amoco Production Company GCU 162
(K) Sec. 36-T29N-R12W

Sample ID	Benzene ug/L	Toluene ug/L	Ethyl Benzene ug/L	Total Xylenes ug/L	Naptha-lene ug/L	Benzo(a) pyrene ug/L	Cations meq/L	Anions meq/L	As mg/L	Ba mg/L	Cd mg/L	Cr mg/L	Pb mg/L	Hg mg/L	Se mg/L	Ag mg/L
MW-3																
2/25/94	476	0.7	ND	1.9	ND	ND	15.80	15.49	ND	3.27	0.0001	ND	0.0034	ND	0.0011	ND
6/17/94	13.6	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-4																
2/25/94	240	3.1	40.2	469	ND	ND	17.74	18.50	0.0022	5.09	0.0016	ND	0.0373	ND	0.0015	ND
6/17/94	273	2.2	34.7	113	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-5																
2/25/95	ND	1.0	ND	2.2	ND	ND	34.59	33.50	0.0064	3.16	0.0034	ND	ND	ND	0.0037	ND
6/17/94	2.1	2.7	4.5	32.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-6																
2/25/94	15.9	3.2	5.3	140	ND	ND	13.39	12.34	ND	2.68	0.0002	ND	ND	ND	0.0007	ND
6/17/94	15.3	1.9	2.6	98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-9																
2/25/94	ND	1.1	ND	1.4	ND	ND	13.73	13.47	ND	1.17	0.0011	ND	ND	ND	0.0012	ND
6/17/94	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-10																
2/25/94	ND	0.7	ND	1.7	ND	ND	15.04	15.45	ND	2.64	0.0140	ND	0.0012	ND	0.0018	ND
6/17/94	ND	ND	ND	ND	NA	NA	NA	NA	NA	NA	ND	NA	NA	NA	NA	NA
Stripper Effluent																
5/11/94	710	920	116	846	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6/17/94	37.5	93	3.6	61.9	WOL	WOL	WOL	WOL	WOL	WOL	WOL	WOL	WOL	WOL	WOL	WOL
WQCC LIMITS	10	750	750	620	30	0.7	——	——	0.1	1.0	0.01	0.05	0.05	0.002	0.05	0.05

ug/L = micrograms per liter, equivalent to parts per billion (ppb)
mg/L= milligrams per liter, equivalent to parts per million (ppm)
ND=not detected at laboratory detection limit
NA=not analyzed
WOL=waiting on laboratory analytical results

Water Table Elevations and Product Thickness Measurements

The depth to water and product thickness measurements in groundwater monitor wells was measured during sample events. Table 2 includes water depth measurements, surface casing relative elevations, groundwater elevations and product thickness measurements for the June 17, 1994 sample event. A contour map of relative water table elevations for this sample event is included in Appendix A, Figure 2.

TABLE 2

Relative Groundwater Elevations
Amoco Production Company GCU 162
(K) Sec. 36-T29N-R12W
June 17, 1994

Monitor Well	Total Depth (feet)	Depth to Fluid (feet)	Relative Casing Elevation (feet)	Relative Groundwater Elevation (feet)	Product Thickness (inches)
MW-1	22.6	21.01	100.00	na	19
MW-2	23.1	21.35	100.16	na	21
MW-3	24.6	21.51	99.10	77.59	0
MW-4	25.0	21.55	98.87	77.32	0
MW-5	24.8	22.25	102.50	80.25	0
MW-6	26.8	20.54	98.68	78.14	0
MW-7	25.3	19.65	97.39	na	8
MW-8	24.1	20.62	99.03	na	17
MW-9	19.6	11.94	88.50	76.56	0
MW-10	20.3	14.51	91.58	77.07	0

na = water table elevation not applicable due to floating product

Fluid Recovery Rates and Infiltration Volumes

Groundwater contaminated with dissolved phase and free phase hydrocarbon is pumped from monitor wells RW-2, RW-3, RW-4, RW-5 and RW-6 (Note: RW-1 is out of service). The total volume of water pumped from these wells from initial start-up on May 9, 1994 to June 23, 1994 was 45,050 gallons. Individual well pump volumes and the percent of free product is determined from periodic well tests. Based on this well test data, the average free product recovered from the reclamation system recovery wells is approximately 0.5% of the total fluid volume. Treated water is diverted to the on-site separator pit for infiltration. Table 3 summarizes the volumes of fluid recovered from the system.

TABLE 3

Recovery Well Fluid Volumes (Approximate)
Amoco Production Company GCU 162
(K) Sec. 36-T29N-R12W
May 9, 1994 through June 23, 1994

Recovery Well	Water Recovery (gallons)	Product Recovery (gallons)	Water Reinjected (gallons)
RW-2	10,011	50	10,011
RW-3	11,262	56	11,262
RW-4	8,760	44	8,760
RW-5	2,503	0	2,503
RW-6	12,514	62	12,514
System Total	45,050	212	45,050

Summary

This report has been prepared by Blagg Engineering, Inc. on behalf of Amoco Production Company. Questions or comments may be directed to Jeff Blagg at (505)632-1199.

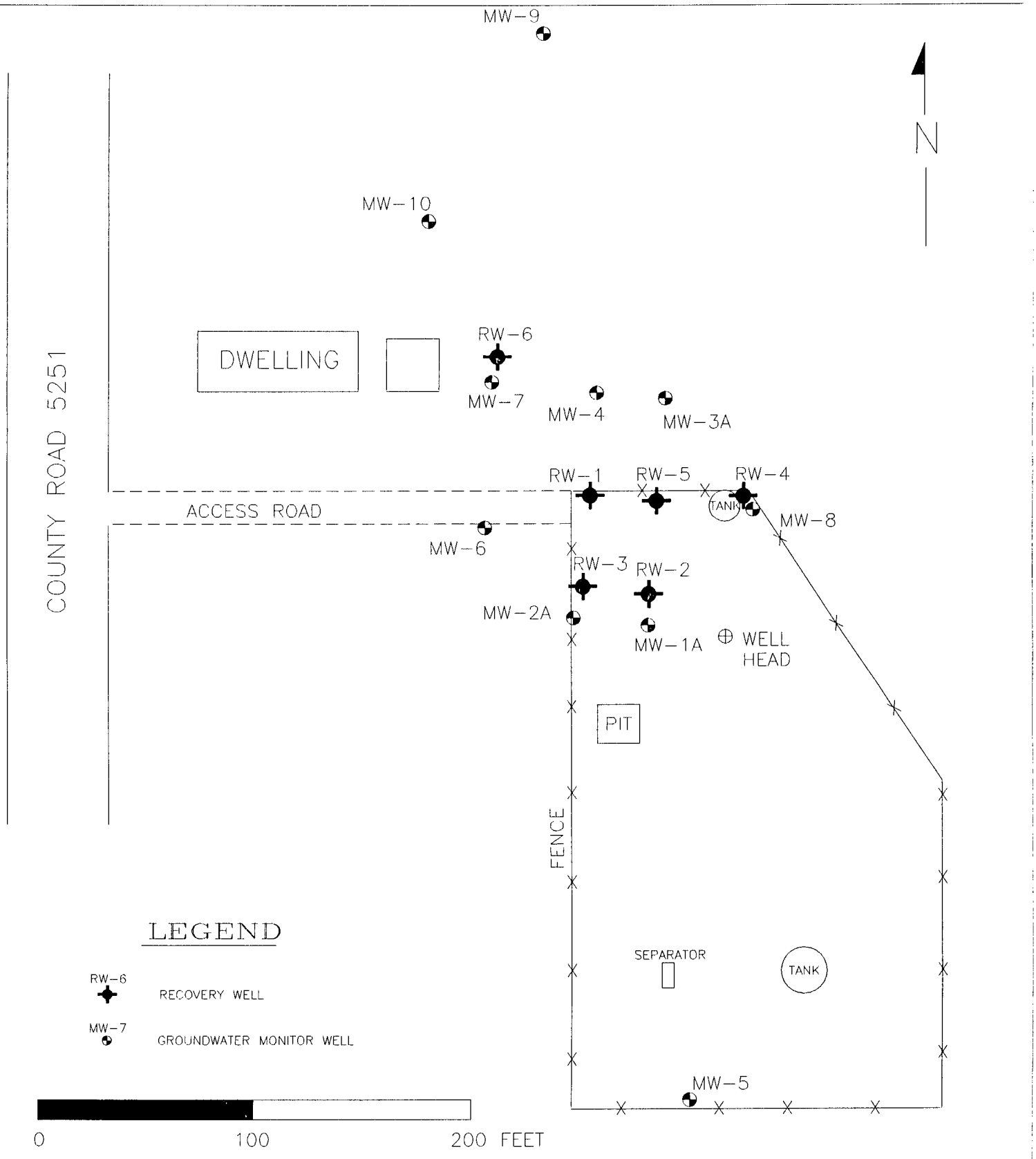
Respectfully submitted:
Blagg Engineering, Inc.

Jeffrey C. Blagg, P.E.
President

CC: Denny Foust, NMOCD
Buddy Shaw, Amoco

APPENDIX A

SITE FIGURES



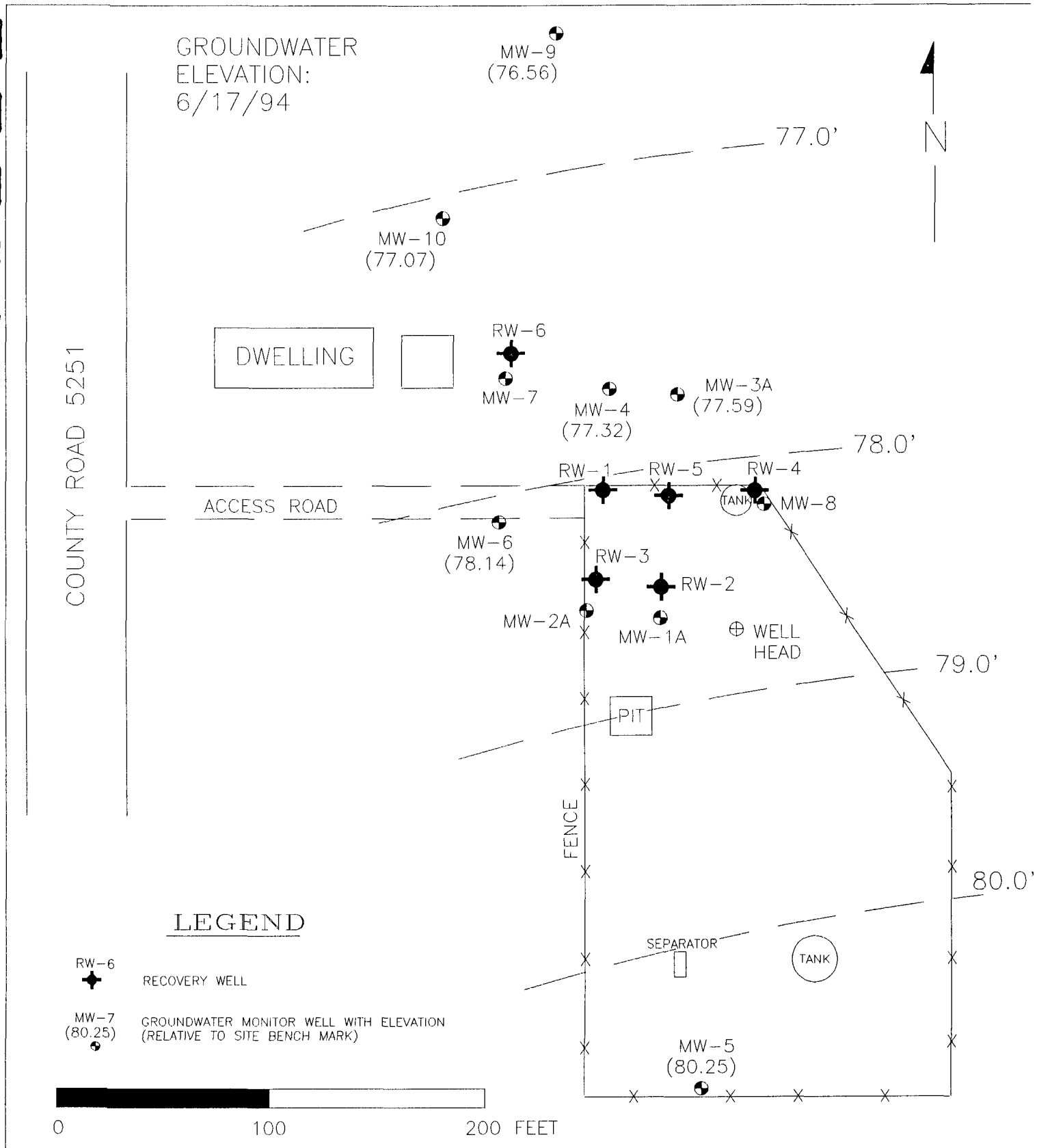
AMOCO PRODUCTION CO.
GCU 162 WELL SITE
SAN JUAN CO., NEW MEXICO

PROJECT NO: 92140 JUNE, 1994

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

SITE MAP

FIGURE 1	DRWN BY: JCB
162REV	PROJ MGR: JCB



AMOCO PRODUCTION CO.
GCU 162 WELL SITE
SAN JUAN CO., NEW MEXICO

PROJECT NO: 92140 JUNE, 1994

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

GROUNDWATER CONTOUR

FIGURE 2	DRWN BY: JCB
162GWE	PROJ MGR: JCB

APPENDIX B

LABORATORY ANALYTICAL DATA REPORTS

CHAIN OF CUSTODY RECORD

№ 1577

ON SITE TECHNOLOGIES LIMITED

657 W. Maple ▪ P. O. Box 2606 ▪ Farmington, NM 87499
LAB: (505) 325-5667 ▪ FAX: (505) 325-6256

Date: 6/17/94

Page 1 of 1

Purchase Order No.:		Reference No.:	
SEND INVOICE TO — Name			
Company	BLAGG ENGINEERING	Dept.	
Address	P.O. BOX 87		
City, State, Zip	BLOOMFIELD, NM 87413		

REPORT RESULTS TO — Name	NELSON VELEZ	Title	PG
Company	SAME		
Mailing Address	SAME		
City, State, Zip	SAME		
Telephone No.	632-1199	Telefax No.	

Special Instructions:

GCU 162

Sampler: Nelson Velez

SAMPLE IDENTIFICATION	DATE/TIME SAMPLED	COMPOSITE/ GRAB	PRESERVATIVES	Number of Containers	BTEX (8020)	PAH (8100)	NAPHTHALENE	METALS	Remarks (matrix)
MW # 5	6/17/94 1100	GRAB	HgCl	2	✓				
MW # 6	6/17/94 1130	GRAB	HgCl	2	✓				
MW # 4	6/17/94 1200	GRAB	HgCl	2	✓				
MW # 3	6/17/94 1230	GRAB	HgCl	2	✓				
MW # 10	6/17/94 1245	GRAB	HgCl	2	✓				
MW # 9	6/17/94 1300	GRAB	HgCl	2	✓				
EFFLUENT	6/17/94 1355	GRAB	HgCl - BTEX ONLY	5	✓	✓	✓	✓	METALS: As, Ba, Cd, Cr, Pb, Hg, Se, Ag

ANALYSIS REQUESTED

Relinquished by:	Nelson Velez	Date/Time 6/17/94 1543	Received by:		Date/Time 6/17/94 1543
Relinquished by:		Date/Time	Received by:		Date/Time
Relinquished by:		Date/Time	Received by:		Date/Time

Method of Shipment:

Authorized by: _____ Date _____
(Client Signature Must Accompany Request)

Rush	5 Working Days	10 Working Days	Sampling Location:

ON SITE TECHNOLOGIES, LTD.

AROMATIC VOLATILE ORGANICS

Attn:	*Nelson Velez*	Date:	6/21/94
Company:	*Blagg Engineering Inc.*	*Lab ID:*	*1577*
Address:	*P.O. Box 87*	*Sample ID:*	*1709*
City, State:	*Bloomfield, NM 87413*	*Job No.*	*2-1000*

Project Name:	***GCU 162***				
Project Location:	***MW #5***				
Sampled by:	NV	Date:	6/17/94	Time:	11:00
Analyzed by:	DC	Date:	6/20/94		
Sample Matrix:	*Liquid*				

Aromatic Volatile Organics

Component	***Measured Concentration ug/L
Benzene	*2.1*
Toluene	*2.7*
Ethylbenzene	*4.5*
m,p-Xylene	*28.2*
o-Xylene	*4.1*
TOTAL	*41.6 ug/L*

ND - Not Detectable
*** - Method Detection Limit, 2 ug/L*

Method *- SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography*

Approved by:
Date: 6/21/94

FAX: (505) 327-1496 ▪ 24 HR. – (505) 327-7105 ▪ OFF.: (505) 325-8786
3005 NORTHRIDGE DRIVE ▪ SUITE F ▪ P. O. BOX 2606 ▪ FARMINGTON, NEW MEXICO 87499

ON SITE TECHNOLOGIES, LTD.

AROMATIC VOLATILE ORGANICS

Attn:	*Nelson Velez*	Date:	6/21/94
Company:	*Blagg Engineering Inc.*	*Lab ID:*	*1577*
Address:	*P.O. Box 87*	*Sample ID:*	*1710*
City, State:	*Bloomfield, NM 87413*	*Job No.*	*2-1000*

Project Name:	***GCU 162***				
Project Location:	***MW #6***				
Sampled by:	NV	Date:	6/17/94	Time:	11:30
Analyzed by:	DC	Date:	6/20/94		
Sample Matrix:	*Liquid*				

Aromatic Volatile Organics

Component	****Measured Concentration ug/L***
Benzene	*15.3*
Toluene	*1.9*
Ethylbenzene	*2.6*
m,p-Xylene	*94*
o-Xylene	*3.7*
TOTAL	*118 ug/L*

ND - Not Detectable
*** - Method Detection Limit, 2 ug/L*

Method *- SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography*

Approved by: D. W.
Date: 6/21/94

FAX: (505) 327-1496 ▪ 24 HR. – (505) 327-7105 ▪ OFF.: (505) 325-8786
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ON SITE TECHNOLOGIES, LTD.

AROMATIC VOLATILE ORGANICS

Attn:	*Nelson Velez*	Date:	6/21/94
Company:	*Blagg Engineering Inc.*	*Lab ID:*	*1577*
Address:	*P.O. Box 87*	*Sample ID:*	*1711*
City, State:	*Bloomfield, NM 87413*	*Job No.*	*2-1000*

Project Name:	***GCU 162***				
Project Location:	***MW #4***				
Sampled by:	NV	Date:	6/17/94	Time:	12:00
Analyzed by:	DC	Date:	6/20/94		
Sample Matrix:	*Liquid*				

Aromatic Volatile Organics

Component	***Measured Concentration ug/L
Benzene	*273*
Toluene	*2.2*
Ethylbenzene	*34.7*
m,p-Xylene	*100*
o-Xylene	*13.0*
TOTAL	*423 ug/L*

ND - Not Detectable
*** - Method Detection Limit, 2 ug/L*

***Method** - SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography*

Approved by:
Date: 6/21/94

FAX: (505) 327-1496 ▪ 24 HR. – (505) 327-7105 ▪ OFF.: (505) 325-8786
3005 NORTHRIDGE DRIVE ▪ SUITE F ▪ P. O. BOX 2606 ▪ FARMINGTON, NEW MEXICO 87499

ON SITE TECHNOLOGIES, LTD.

AROMATIC VOLATILE ORGANICS

Attn:	*Nelson Velez*	Date:	6/21/94
Company:	*Blagg Engineering Inc.*	*Lab ID:*	*1577*
Address:	*P.O. Box 87*	*Sample ID:*	*1712*
City, State:	*Bloomfield, NM 87413*	*Job No.*	*2-1000*

Project Name:	***GCU 162***				
Project Location:	***MW #3***				
Sampled by:	NV	Date:	6/17/94	Time:	12:30
Analyzed by:	DC	Date:	6/20/94		
Sample Matrix:	*Liquid*				

Aromatic Volatile Organics

Component	****Measured Concentration ug/L***
Benzene	*13.6*
Toluene	*ND*
Ethylbenzene	*ND*
m,p-Xylene	*ND*
o-Xylene	*ND*
TOTAL	*13.6 ug/L*

ND - Not Detectable
*** - Method Detection Limit, 2 ug/L*

Method *- SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography*

Approved by:
Date: 6/21/94

FAX: (505) 327-1496 ▪ 24 HR. – (505) 327-7105 ▪ OFF.: (505) 325-8786
3005 NORTHRIDGE DRIVE ▪ SUITE F ▪ P. O. BOX 2606 ▪ FARMINGTON, NEW MEXICO 87499

ON SITE TECHNOLOGIES, LTD.

AROMATIC VOLATILE ORGANICS

Attn:	*Nelson Velez*	Date:	6/21/94
Company:	*Blagg Engineering Inc.*	*Lab ID:*	*1577*
Address:	*P.O. Box 87*	*Sample ID:*	*1713*
City, State:	*Bloomfield, NM 87413*	*Job No.*	*2-1000*

Project Name:	***GCU 162***				
Project Location:	***MW #10***				
Sampled by:	NV	Date:	6/17/94	Time:	13:45
Analyzed by:	DLA	Date:	6/21/94		
Sample Matrix:	*Liquid*				

Aromatic Volatile Organics

Component	***Measured Concentration ug/L
Benzene	*ND*
Toluene	*ND*
Ethylbenzene	*ND*
m,p-Xylene	*ND*
o-Xylene	*ND*
TOTAL	*0.0 ug/L*

ND - Not Detectable
*** - Method Detection Limit, 2 ug/L*

Method *- SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography*

Approved by:
Date: 6/21/94

FAX: (505) 327-1496 ▪ 24 HR. – (505) 327-7105 ▪ OFF.: (505) 325-8786
3005 NORTHRIDGE DRIVE ▪ SUITE F ▪ P. O. BOX 2606 ▪ FARMINGTON, NEW MEXICO 87499

ON SITE TECHNOLOGIES, LTD.

AROMATIC VOLATILE ORGANICS

Attn:	*Nelson Velez*	Date:	6/21/94
Company:	*Blagg Engineering Inc.*	*Lab ID:*	*1577*
Address:	*P.O. Box 87*	*Sample ID:*	*1714*
City, State:	*Bloomfield, NM 87413*	*Job No.*	*2-1000*

Project Name:	***GCU 162***				
Project Location:	***MW #9***				
Sampled by:	NV	Date:	6/17/94	Time:	13:00
Analyzed by:	DLA	Date:	6/21/94		
Sample Matrix:	*Liquid*				

Aromatic Volatile Organics

Component	****Measured Concentration ug/L***
Benzene	*ND*
Toluene	*ND*
Ethylbenzene	*ND*
m,p-Xylene	*ND*
o-Xylene	*ND*
TOTAL	*0.0 ug/L*

ND - Not Detectable
*** - Method Detection Limit, 2 ug/L*

Method *- SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography*

Approved by:
Date: 6/21/94

FAX: (505) 327-1496 ▪ 24 HR. – (505) 327-7105 ▪ OFF.: (505) 325-8786
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ON SITE TECHNOLOGIES, LTD.

QUALITY ASSURANCE REPORT

for EPA Method 8020

Date Analyzed: 6/20/94

Internal QC No.: 0222-STD
Surrogate QC No.: 0223-STD
Reference Standard QC No.: 0300-STD

Method Blank

Analytes in Blank	Amount
Average Amount of All Analytes In Blank	<1 ppb

Calibration Check

Calibration Standards	Units of Measure	*True Value	Analyzed Value	% Diff	Limit
Benzene	ppb	20	22	9	15%
Toluene	ppb	20	20	2	15%
Ethylbenzene	ppb	20	19	4	15%
m,p-Xylene	ppb	40	38	6	15%
o-Xylene	ppb	20	19	3	15%

Spike Results

Analyte	1- Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Benzene	102	102	(39-150)	0	20%
Toluene	103	100	(46-148)	2	20%
Ethylbenzene	101	99	(32-160)	2	20%
m,p-Xylene	101	99	(35-145)	1	20%
o-Xylene	101	98	(35-145)	2	20%

Surrogate Recoveries

Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered	S3 Percent Recovered
Limits	(70-130)		
1709-1577	99		

S1: Flourobenzene

FAX: (505) 327-1496 ▪ 24 HR. – (505) 327-7105 ▪ OFF.: (505) 325-8786
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ON SITE TECHNOLOGIES, LTD.

AROMATIC VOLATILE ORGANICS

Attn:	*Nelson Velez*	Date:	6/21/94
Company:	*Blagg Engineering Inc.*	*Lab ID:*	*1577*
Address:	*P.O. Box 87*	*Sample ID:*	*1715*
City, State:	*Bloomfield, NM 87413*	*Job No.*	*2-1000*

Project Name:	***GCU 162***				
Project Location:	***Effluent***				
Sampled by:	NV	Date:	6/17/94	Time:	13:55
Analyzed by:	DLA	Date:	6/21/94		
Sample Matrix:	*Liquid*				

Aromatic Volatile Organics

Component	*****Measured Concentration ug/L***
Benzene	37.5
Toluene	93
Ethylbenzene	3.6
m,p-Xylene	46.3
o-Xylene	15.6
	TOTAL 196 ug/L

ND - Not Detectable
*** - Method Detection Limit, 2 ug/L*

Method - *SW-846 EPA Method 8020 Aromatic Volatile Organics by Gas Chromatography*

Approved by: [signature]
Date: 6/21/94

FAX: (505) 327-1496 ▪ 24 HR. – (505) 327-7105 ▪ OFF.: (505) 325-8786
3005 NORTHRIDGE DRIVE ▪ SUITE F ▪ P. O. BOX 2606 ▪ FARMINGTON, NEW MEXICO 87499

ON SITE TECHNOLOGIES, LTD.

QUALITY ASSURANCE REPORT

for EPA Method 8020

Date Analyzed: 6/21/94

Internal QC No.: 0222-STD
Surrogate QC No.: 0223-STD
Reference Standard QC No.: 0300-STD

Method Blank

Analytes in Blank	*Amount*
Average Amount of All Analytes In Blank	<1 ppb

Calibration Check

Calibration Standards	*Units of Measure*	**True Value*	*Analyzed Value*	*% Diff*	*Limit*
Benzene	ppb	20	20	0	15%
Toluene	ppb	20	19	4	15%
Ethylbenzene	ppb	20	19	7	15%
m,p-Xylene	ppb	40	36	9	15%
o-Xylene	ppb	20	19	7	15%

Spike Results

Analyte	*1- Percent Recovered*	*2 - Percent Recovered*	*Limit*	*%RSD*	*Limit*
Benzene	97	99	(39-150)	2	20%
Toluene	99	101	(46-148)	1	20%
Ethylbenzene	100	99	(32-160)	1	20%
m,p-Xylene	99	99	(35-145)	0	20%
o-Xylene	100	100	(35-145)	0	20%

Surrogate Recoveries

Laboratory Identification	*S1 Percent Recovered*	*S2 Percent Recovered*	*S3 Percent Recovered*
Limits	(70-130)		
1715-1577	99		

S1: Flourobenzene

FAX: (505) 327-1496 ▪ 24 HR. – (505) 327-7105 ▪ OFF.: (505) 325-8786
3005 NORTHRIDGE DRIVE ▪ SUITE F ▪ P. O. BOX 2606 ▪ FARMINGTON, NEW MEXICO 87499

3604

CHAIN OF COUSTODY RECORD

Client/Project Name: Amoco 04034	Project Location: GCU 162
Sampler: (Signature) J. C. Blagg	Chain of Custody Tape No. 92140 - C21495

ANALYSIS/PARAMETERS

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	BTEX						Remarks
STRIPPER EFFLUENT	5-11-94	0851	7381	WATER	1	X						

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
J. C. Blagg	5-11-94	0924	Denise L. Ojeda	5-11-94	0924
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.
5796 U.S. Highway 64-3014
Farmington, New Mexico 87401
(505) 632-0615

san juan repro Form 578-81

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco / Blagg	Project #:	04034
Sample ID:	Stripper Effluent	Date Reported:	05-11-94
Laboratory Number:	7381	Date Sampled:	05-11-94
Sample Matrix:	Water	Date Received:	05-11-94
Preservative:	HgCl and Cool	Date Analyzed:	05-11-94
Condition:	Cool and Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	710	0.2
Toluene	920	0.6
Ethylbenzene	116	0.3
p,m-Xylene	590	0.5
o-Xylene	256	0.4

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	101 %
Bromofluorobenzene	100 %

Method: Method 5030A, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 92140 - C4495

Analyst

Review

3382

CHAIN OF CUSTODY RECORD

C4495

Client/Project Name	Project Location
AMOCO # 92140	GCU 162

Sampler: (Signature)	Chain of Custody Tape No.
R. E. O'Neill	

Sample No./ Identification	Sample Date	Sample Time	Lab Number	Sample Matrix	No. of Containers	BTEX	PAH	CATION / ANION	METALS As, Ba, Cd, Cr, Pb, Hg, Se, Ag (DISS.)	CONDUCT		Remarks
MW # 3	2-25-94	1120	6906	WATER	5	✓	✓	✓	✓	✓		
MW # 4	2-25-94	1100	6907	"	5	✓	✓	✓	✓	✓		
MW # 5	2-25-94	1004	6908	"	5	✓	✓	✓	✓	✓		
MW # 6	2-25-94	1030	6909	"	5	✓	✓	✓	✓	✓		
MW # 9	2-25-94	1230	6910	"	5	✓	✓	✓	✓	✓		
MW # 10	2-25-94	1210	6911	"	5	✓	✓	✓	✓	✓		

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
R. E. O'Neill	2-25-94	1310	Ellen L. Gleason	2-25-94	1310
Relinquished by: (Signature)			Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)		

ENVIROTECH INC.
5796 U.S. Highway 64-3014
Farmington, New Mexico 87401
(505) 632-0615

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EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW #3	Date Reported:	02-28-94
Laboratory Number:	6906	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Preservative:	HgCl & Cool	Date Analyzed:	02-28-94
Condition:	Cool & Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	476	0.2
Toluene	0.7	0.4
Ethylbenzene	ND	0.5
p,m-Xylene	1.1	0.3
o-Xylene	0.8	0.2

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	96 %
Bromofluorobenzene	97 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 C4495

Analyst

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EPA METHOD 8100
POLYNUCLEAR AROMATIC HYDROCARBONS

Client:	Amoco	Project #:	92140
Sample ID:	MW #3	Date Reported:	03-04-94
Laboratory Number:	6906	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Preservative:	Cool	Date Analyzed:	03-04-94
Condition:	Cool & Intact	Analysis Requested:	8100

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Naphthalene	ND	0.20
Acenaphthylene	ND	0.20
Acenaphthene	ND	0.20
Fluorene	ND	0.20
Phenanthrene	ND	0.20
Anthracene	ND	0.20
Fluoranthene	ND	0.20
Pyrene	ND	0.20
Benzo(a)anthracene	ND	0.20
Chrysene	ND	0.20
Benzo(b) & Benzo(k) fluoranthene	ND	0.20
Benzo(a)pyrene	ND	0.20
Indeno(1,2,3-cd) pyrene & Dibenzo(a,h)anthracene	ND	0.20
Benzo(g,h,i)perylene	ND	0.20

SURROGATE RECOVERY	Parameter	Percent Recovery
	1-fluoronapthalene	100 %

Methods: Method 8100, Polynuclear Aromatic Hydrocarbons, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 C4495

Analyst

Review

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Client:	ENVIROTECH			
Project:	GCU 162		Date Reported:	03/25/94
Sample ID:	MW #3		Date Sampled:	02/25/94
Laboratory ID:	4884		Time Sampled:	1120
Sample Matrix:	Water		Date Received:	03/03/94
Condition:	Cool/Intact			

Parameter	Analytical Result	Units		Units
Lab pH	7.9	s.u.		
Lab Conductivity @ 25° C	1,450	umhos/cm		
Total Dissolved Solids @ 180°C	978	mg/L		
Total Dissolved Solids (Calc)	909	mg/L		
Total Alkalinity as CaCO3	379	mg/L		
Total Hardness as CaCO3	473	mg/L		
Bicarbonate as HCO3	462	mg/L	7.57	meq/L
Carbonate as CO3	0	mg/L	0.00	meq/L
Hydroxide as OH	0	mg/L	0.00	meq/L
Chloride	47	mg/L	1.33	meq/L
Sulfate	316	mg/L	6.58	meq/L
Calcium	142	mg/L	7.10	meq/L
Magnesium	29	mg/L	2.36	meq/L
Potassium	3.4	mg/L	0.09	meq/L
Sodium	144	mg/L	6.25	meq/L
Cations			15.80	meq/L
Anions			15.49	meq/L
Cation/Anion Difference			1.00	%

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
"Standard Methods For The Examination Of Water And Waste Water", 17th ed., 1989.

Comment:

Reviewed by ____

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DISSOLVED TRACE METAL ANALYSIS

Client:	Amoco	Project #:	92140
Sample ID:	MW #3	Date Reported:	03-02-94
Laboratory Number:	6906	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Preservative:	Cool	Date Analyzed:	03-01-94
Condition:	Cool & Intact	Analysis Needed:	Trace metals

Parameter	Concentration (mg/L)	Det. Limit (mg/L)
ARSENIC	ND	0.0001
BARIUM	3.27	0.01
CADMIUM	0.0001	0.0001
CHROMIUM	ND	0.0001
LEAD	0.0034	0.0001
MERCURY	ND	0.0002
SELENIUM	0.0011	0.0001
SILVER	ND	0.0001

Method: Methods 3010A, 3020A, Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, USEPA 1992

Methods 7060A, 7080, 7131, 7191, 7470, 7421, 7740, 7760A Analysis of Metals by GFAA and FLAA, SW-846, USEPA 1992

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 C4495

Analyst

Review

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EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW #4	Date Reported:	02-28-94
Laboratory Number:	6907	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Preservative:	HgCl & Cool	Date Analyzed:	02-28-94
Condition:	Cool & Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	240	0.2
Toluene	3.1	0.4
Ethylbenzene	40.2	0.5
p,m-Xylene	347	0.3
o-Xylene	122	0.2

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	94 %
Bromofluorobenzene	95 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 C4495

Analyst

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EPA METHOD 8100
POLYNUCLEAR AROMATIC HYDROCARBONS

Client:	Amoco	Project #:	92140
Sample ID:	MW #4	Date Reported:	03-04-94
Laboratory Number:	6907	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Preservative:	Cool	Date Analyzed:	03-04-94
Condition:	Cool & Intact	Analysis Requested:	8100

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Naphthalene	ND	0.20
Acenaphthylene	ND	0.20
Acenaphthene	ND	0.20
Fluorene	ND	0.20
Phenanthrene	ND	0.20
Anthracene	ND	0.20
Fluoranthene	ND	0.20
Pyrene	ND	0.20
Benzo(a)anthracene	ND	0.20
Chrysene	ND	0.20
Benzo(b) & Benzo(k) fluoranthene	ND	0.20
Benzo(a)pyrene	ND	0.20
Indeno(1,2,3-cd) pyrene & Dibenzo(a,h)anthracene	ND	0.20
Benzo(g,h,i)perylene	ND	0.20

SURROGATE RECOVERY	Parameter	Percent Recovery
	1-fluoronapthalene	101 %

Methods: Method 8100, Polynuclear Aromatic Hydrocarbons, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 C4495

Analyst

Review

Inter-Mountain Laboratories, Inc.

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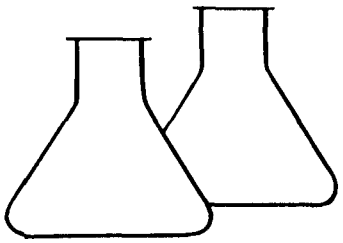
Client:	**ENVIROTECH**		
Project:	GCU 162	Date Reported:	03/25/94
Sample ID:	MW #4	Date Sampled:	02/25/94
Laboratory ID:	4885	Time Sampled:	1100
Sample Matrix:	Water	Date Received:	03/03/94
Condition:	Cool/Intact		

Parameter	Analytical Result	Units		Units
Lab pH	7.7	s.u.		
Lab Conductivity @ 25° C	1,520	umhos/cm		
Total Dissolved Solids @ 180°C	994	mg/L		
Total Dissolved Solids (Calc)	998	mg/L		
Total Alkalinity as CaCO3	588	mg/L		
Total Hardness as CaCO3	613	mg/L		
Bicarbonate as HCO3	717	mg/L	11.75	meq/L
Carbonate as CO3	0	mg/L	0.00	meq/L
Hydroxide as OH	0	mg/L	0.00	meq/L
Chloride	52	mg/L	1.48	meq/L
Sulfate	253	mg/L	5.26	meq/L
Calcium	164	mg/L	8.17	meq/L
Magnesium	50	mg/L	4.10	meq/L
Potassium	3.2	mg/L	0.08	meq/L
Sodium	124	mg/L	5.39	meq/L
Cations			17.74	meq/L
Anions			18.50	meq/L
Cation/Anion Difference			2.08	%

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
"Standard Methods For The Examination Of Water And Waste Water", 17th ed., 1989.

Comment:

Reviewed by JEFF



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DISSOLVED TRACE METAL ANALYSIS

Client:	Amoco	Project #:	92140
Sample ID:	MW #4	Date Reported:	03-02-94
Laboratory Number:	6907	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Preservative:	Cool	Date Analyzed:	03-01-94
Condition:	Cool & Intact	Analysis Needed:	Trace metals

Parameter	Concentration (mg/L)	Det. Limit (mg/L)
ARSENIC	0.0022	0.0001
BARIUM	5.09	0.01
CADMIUM	0.0016	0.0001
CHROMIUM	ND	0.0001
LEAD	0.0373	0.0001
MERCURY	ND	0.0002
SELENIUM	0.0015	0.0001
SILVER	ND	0.0001

Method: Methods 3010A, 3020A, Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, USEPA 1992

Methods 7060A, 7080, 7131, 7191, 7470, 7421, 7740, 7760A Analysis of Metals by GFAA and FLAA, SW-846, USEPA 1992

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 C4495

Analyst

Review

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EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW #5	Date Reported:	02-28-94
Laboratory Number:	6908	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Preservative:	HgCl & Cool	Date Analyzed:	02-28-94
Condition:	Cool & Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.2
Toluene	1.0	0.4
Ethylbenzene	ND	0.5
p,m-Xylene	1.8	0.3
o-Xylene	0.4	0.2

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	94 %
Bromofluorobenzene	97 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 C4495

Analyst

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EPA METHOD 8100
POLYNUCLEAR AROMATIC HYDROCARBONS

Client:	Amoco	Project #:	92140
Sample ID:	MW #5	Date Reported:	03-04-94
Laboratory Number:	6908	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Preservative:	Cool	Date Analyzed:	03-04-94
Condition:	Cool & Intact	Analysis Requested:	8100

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Naphthalene	ND	0.20
Acenaphthylene	ND	0.20
Acenaphthene	ND	0.20
Fluorene	ND	0.20
Phenanthrene	ND	0.20
Anthracene	ND	0.20
Fluoranthene	ND	0.20
Pyrene	ND	0.20
Benzo(a)anthracene	ND	0.20
Chrysene	ND	0.20
Benzo(b) & Benzo(k) fluoranthene	ND	0.20
Benzo(a)pyrene	ND	0.20
Indeno(1,2,3-cd) pyrene & Dibenzo(a,h)anthracene	ND	0.20
Benzo(g,h,i)perylene	ND	0.20

SURROGATE RECOVERY	Parameter	Percent Recovery
	1-fluoronapthalene	101 %

Methods: Method 8100, Polynuclear Aromatic Hydrocarbons, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 C4495

Analyst

Review

Inter·Mountain Laboratories, Inc.

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Client:	**ENVIROTECH**		
Project:	GCU 162	Date Reported:	03/25/94
Sample ID:	MW #5	Date Sampled:	02/25/94
Laboratory ID:	4886	Time Sampled:	1004
Sample Matrix:	Water	Date Received:	03/03/94
Condition:	Cool/Intact		

Parameter	Analytical Result	Units		Units
Lab pH	7.2	s.u.		
Lab Conductivity @ 25° C	2,780	umhos/cm		
Total Dissolved Solids @ 180°C	2,420	mg/L		
Total Dissolved Solids (Calc)	2,150	mg/L		
Total Alkalinity as CaCO3	243	mg/L		
Total Hardness as CaCO3	1,450	mg/L		
Bicarbonate as HCO3	296	mg/L	4.86	meq/L
Carbonate as CO3	0	mg/L	0.00	meq/L
Hydroxide as OH	0	mg/L	0.00	meq/L
Chloride	94	mg/L	2.66	meq/L
Sulfate	1,250	mg/L	25.98	meq/L
Calcium	442	mg/L	22.08	meq/L
Magnesium	83	mg/L	6.83	meq/L
Potassium	4.5	mg/L	0.11	meq/L
Sodium	128	mg/L	5.57	meq/L
Cations			34.59	meq/L
Anions			33.50	meq/L
Cation/Anion Difference			1.61	%

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
"Standard Methods For The Examination Of Water And Waste Water", 17th ed., 1989.

Comment:

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DISSOLVED TRACE METAL ANALYSIS

Client:	Amoco	Project #:	92140
Sample ID:	MW #5	Date Reported:	03-02-94
Laboratory Number:	6908	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Preservative:	Cool	Date Analyzed:	03-01-94
Condition:	Cool & Intact	Analysis Needed:	Trace metals

Parameter	Concentration (mg/L)	Det. Limit (mg/L)
ARSENIC	0.0064	0.0001
BARIUM	3.16	0.01
CADMIUM	0.0034	0.0001
CHROMIUM	ND	0.0001
LEAD	ND	0.0001
MERCURY	ND	0.0002
SELENIUM	0.0037	0.0001
SILVER	ND	0.0001

Method: Methods 3010A, 3020A, Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, USEPA 1992

Methods 7060A, 7080, 7131, 7191, 7470, 7421, 7740, 7760A Analysis of Metals by GFAA and FLAA, SW-846, USEPA 1992

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 C4495

Analyst

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EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW #6	Date Reported:	02-28-94
Laboratory Number:	6909	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Preservative:	HgCl & Cool	Date Analyzed:	02-28-94
Condition:	Cool & Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	15.9	0.2
Toluene	3.2	0.4
Ethylbenzene	5.3	0.5
p,m-Xylene	131	0.3
o-Xylene	8.8	0.2

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	98 %
Bromofluorobenzene	99 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 C4495

Analyst

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EPA METHOD 8100
POLYNUCLEAR AROMATIC HYDROCARBONS

Client:	Amoco	Project #:	92140
Sample ID:	MW #6	Date Reported:	03-04-94
Laboratory Number:	6909	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Preservative:	Cool	Date Analyzed:	03-04-94
Condition:	Cool & Intact	Analysis Requested:	8100

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Naphthalene	ND	0.20
Acenaphthylene	ND	0.20
Acenaphthene	ND	0.20
Fluorene	ND	0.20
Phenanthrene	ND	0.20
Anthracene	ND	0.20
Fluoranthene	ND	0.20
Pyrene	ND	0.20
Benzo(a)anthracene	ND	0.20
Chrysene	ND	0.20
Benzo(b) & Benzo(k) fluoranthene	ND	0.20
Benzo(a)pyrene	ND	0.20
Indeno(1,2,3-cd) pyrene & Dibenzo(a,h)anthracene	ND	0.20
Benzo(g,h,i)perylene	ND	0.20

SURROGATE RECOVERY	Parameter	Percent Recovery
	1-fluoronapthalene	99 %

Methods: Method 8100, Polynuclear Aromatic Hydrocarbons, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 C4495

Analyst

Review

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Client:	**ENVIROTECH**		
Project:	GCU 162	Date Reported:	03/25/94
Sample ID:	MW #6	Date Sampled:	02/25/94
Laboratory ID:	4887	Time Sampled:	1030
Sample Matrix:	Water	Date Received:	03/03/94
Condition:	Cool/Intact		

Parameter	Analytical Result	Units		Units
Lab pH	8.0	s.u.		
Lab Conductivity @ 25° C	1,270	umhos/cm		
Total Dissolved Solids @ 180°C	842	mg/L		
Total Dissolved Solids (Calc)	761	mg/L		
Total Alkalinity as CaCO3	260	mg/L		
Total Hardness as CaCO3	356	mg/L		
Bicarbonate as HCO3	317	mg/L	5.20	meq/L
Carbonate as CO3	0	mg/L	0.00	meq/L
Hydroxide as OH	0	mg/L	0.00	meq/L
Chloride	33	mg/L	0.94	meq/L
Sulfate	298	mg/L	6.21	meq/L
Calcium	109	mg/L	5.42	meq/L
Magnesium	21	mg/L	1.71	meq/L
Potassium	2.3	mg/L	0.06	meq/L
Sodium	143	mg/L	6.20	meq/L
Cations			13.39	meq/L
Anions			12.34	meq/L
Cation/Anion Difference			4.06	%

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
"Standard Methods For The Examination Of Water And Waste Water", 17th ed., 1989.

Comment:

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DISSOLVED TRACE METAL ANALYSIS

Client:	Amoco	Project #:	92140
Sample ID:	MW #6	Date Reported:	03-02-94
Laboratory Number:	6909	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Preservative:	Cool	Date Analyzed:	03-01-94
Condition:	Cool & Intact	Analysis Needed:	Trace metals

Parameter	Concentration (mg/L)	Det. Limit (mg/L)
ARSENIC	ND	0.0001
BARIUM	2.68	0.01
CADMIUM	0.0002	0.0001
CHROMIUM	ND	0.0001
LEAD	ND	0.0001
MERCURY	ND	0.0002
SELENIUM	0.0007	0.0001
SILVER	ND	0.0001

Method: Methods 3010A, 3020A, Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, USEPA 1992

Methods 7060A, 7080, 7131, 7191, 7470, 7421, 7740, 7760A Analysis of Metals by GFAA and FLAA, SW-846, USEPA 1992

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 C4495

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW #9	Date Reported:	02-28-94
Laboratory Number:	6910	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Preservative:	HgCl & Cool	Date Analyzed:	02-28-94
Condition:	Cool & Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.2
Toluene	1.1	0.4
Ethylbenzene	ND	0.5
p,m-Xylene	1.2	0.3
o-Xylene	0.2	0.2

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	98 %
Bromofluorobenzene	100 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 C4495

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8100
POLYNUCLEAR AROMATIC HYDROCARBONS

Client:	Amoco	Project #:	92140
Sample ID:	MW #9	Date Reported:	03-04-94
Laboratory Number:	6910	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Preservative:	Cool	Date Analyzed:	03-04-94
Condition:	Cool & Intact	Analysis Requested:	8100

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Naphthalene	ND	0.20
Acenaphthylene	ND	0.20
Acenaphthene	ND	0.20
Fluorene	ND	0.20
Phenanthrene	ND	0.20
Anthracene	ND	0.20
Fluoranthene	ND	0.20
Pyrene	ND	0.20
Benzo(a)anthracene	ND	0.20
Chrysene	ND	0.20
Benzo(b) & Benzo(k) fluoranthene	ND	0.20
Benzo(a)pyrene	ND	0.20
Indeno(1,2,3-cd) pyrene & Dibenzo(a,h)anthracene	ND	0.20
Benzo(g,h,i)perylene	ND	0.20

SURROGATE RECOVERY	Parameter	Percent Recovery
	1-fluoronapthalene	99 %

Methods: Method 8100, Polynuclear Aromatic Hydrocarbons, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 C4495

Analyst

Review

Inter-Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	**ENVIROTECH**		
Project:	GCU 162	Date Reported:	03/25/94
Sample ID:	MW #9	Date Sampled:	02/25/94
Laboratory ID:	4888	Time Sampled:	1230
Sample Matrix:	Water	Date Received:	03/03/94
Condition:	Cool/Intact		

Parameter	Analytical Result	Units		Units
Lab pH	8.1	s.u.		
Lab Conductivity @ 25° C	1,280	umhos/cm		
Total Dissolved Solids @ 180°C	834	mg/L		
Total Dissolved Solids (Calc)	816	mg/L		
Total Alkalinity as CaCO3	316	mg/L		
Total Hardness as CaCO3	287	mg/L		
Bicarbonate as HCO3	386	mg/L	6.33	meq/L
Carbonate as CO3	0	mg/L	0.00	meq/L
Hydroxide as OH	0	mg/L	0.00	meq/L
Chloride	21	mg/L	0.59	meq/L
Sulfate	314	mg/L	6.55	meq/L
Calcium	92	mg/L	4.61	meq/L
Magnesium	14	mg/L	1.13	meq/L
Potassium	1.6	mg/L	0.04	meq/L
Sodium	183	mg/L	7.95	meq/L
Cations			13.73	meq/L
Anions			13.47	meq/L
Cation/Anion Difference			0.96	%

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
"Standard Methods For The Examination Of Water And Waste Water", 17th ed., 1989.

Comment:

Reviewed by JEFF Thomas

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

DISSOLVED TRACE METAL ANALYSIS

Client:	Amoco	Project #:	92140
Sample ID:	MW #9	Date Reported:	03-02-94
Laboratory Number:	6910	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Preservative:	Cool	Date Analyzed:	03-01-94
Condition:	Cool & Intact	Analysis Needed:	Trace metals

Parameter	Concentration (mg/L)	Det. Limit (mg/L)
ARSENIC	ND	0.0001
BARIUM	1.17	0.01
CADMIUM	0.0011	0.0001
CHROMIUM	ND	0.0001
LEAD	ND	0.0001
MERCURY	ND	0.0002
SELENIUM	0.0012	0.0001
SILVER	ND	0.0001

Method: Methods 3010A, 3020A, Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, USEPA 1992

Methods 7060A, 7080, 7131, 7191, 7470, 7421, 7740, 7760A Analysis of Metals by GFAA and FLAA, SW-846, USEPA 1992

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 C4495

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	Amoco	Project #:	92140
Sample ID:	MW #10	Date Reported:	02-28-94
Laboratory Number:	6911	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Preservative:	HgCl & Cool	Date Analyzed:	02-28-94
Condition:	Cool & Intact	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.2
Toluene	0.7	0.4
Ethylbenzene	ND	0.5
p,m-Xylene	1.4	0.3
o-Xylene	0.3	0.2

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	97 %
Bromofluorobenzene	96 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 C4495

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8100
POLYNUCLEAR AROMATIC HYDROCARBONS

Client:	Amoco	Project #:	92140
Sample ID:	MW #10	Date Reported:	03-04-94
Laboratory Number:	6911	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Preservative:	Cool	Date Analyzed:	03-04-94
Condition:	Cool & Intact	Analysis Requested:	8100

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Naphthalene	ND	0.20
Acenaphthylene	ND	0.20
Acenaphthene	ND	0.20
Fluorene	ND	0.20
Phenanthrene	ND	0.20
Anthracene	ND	0.20
Fluoranthene	ND	0.20
Pyrene	ND	0.20
Benzo(a)anthracene	ND	0.20
Chrysene	ND	0.20
Benzo(b) & Benzo(k) fluoranthene	ND	0.20
Benzo(a)pyrene	ND	0.20
Indeno(1,2,3-cd) pyrene & Dibenzo(a,h)anthracene	ND	0.20
Benzo(g,h,i)perylene	ND	0.20

SURROGATE RECOVERY	Parameter	Percent Recovery
	1-fluoronapthalene	98 %

Methods: Method 8100, Polynuclear Aromatic Hydrocarbons, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 C4495

Analyst

Review

Inter·Mountain Laboratories, Inc.

2506 W. Main Street
Farmington, New Mexico 87401

Client:	**ENVIROTECH**		
Project:	GCU 162	Date Reported:	03/25/94
Sample ID:	MW #10	Date Sampled:	02/25/94
Laboratory ID:	4889	Time Sampled:	1210
Sample Matrix:	Water	Date Received:	03/03/94
Condition:	Cool/Intact		

Parameter	Analytical Result	Units		Units
Lab pH	7.7	s.u.		
Lab Conductivity @ 25° C	1,470	umhos/cm		
Total Dissolved Solids @ 180°C	1,010	mg/L		
Total Dissolved Solids (Calc)	901	mg/L		
Total Alkalinity as CaCO3	367	mg/L		
Total Hardness as CaCO3	492	mg/L		
Bicarbonate as HCO3	448	mg/L	7.35	meq/L
Carbonate as CO3	0	mg/L	0.00	meq/L
Hydroxide as OH	0	mg/L	0.00	meq/L
Chloride	46	mg/L	1.30	meq/L
Sulfate	327	mg/L	6.81	meq/L
Calcium	171	mg/L	8.52	meq/L
Magnesium	16	mg/L	1.32	meq/L
Potassium	3.6	mg/L	0.09	meq/L
Sodium	117	mg/L	5.11	meq/L
Cations			15.04	meq/L
Anions			15.45	meq/L
Cation/Anion Difference			1.36	%

Reference: U.S.E.P.A. 600/4-79-020, "Methods for Chemical Analysis of Water and Wastes", 1983.
"Standard Methods For The Examination Of Water And Waste Water", 17th ed., 1989.

Comment:

Reviewed by JEFF Thomas

ENVIROTECH LABS

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PHONE: (505) 632-0615 • FAX: (505) 632-1865

DISSOLVED TRACE METAL ANALYSIS

Client:	Amoco	Project #:	92140
Sample ID:	MW #10	Date Reported:	03-02-94
Laboratory Number:	6911	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Preservative:	Cool	Date Analyzed:	03-01-94
Condition:	Cool & Intact	Analysis Needed:	Trace metals

Parameter	Concentration (mg/L)	Det. Limit (mg/L)
ARSENIC	ND	0.0001
BARIUM	2.64	0.01
CADMIUM	0.0140	0.0001
CHROMIUM	ND	0.0001
LEAD	0.0012	0.0001
MERCURY	ND	0.0002
SELENIUM	0.0018	0.0001
SILVER	ND	0.0001

Method: Methods 3010A, 3020A, Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, USEPA 1992

Methods 7060A, 7080, 7131, 7191, 7470, 7421, 7740, 7760A Analysis of Metals by GFAA and FLAA, SW-846, USEPA 1992

ND - Parameter not detected at the stated detection limit.

Comments: GCU 162 C4495

Analyst

Review

ENVIROTECH LABS

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PHONE: (505) 632-0615 • FAX: (505) 632-1865

CONDUCTIVITY

Client:	Amoco	Project #:	92140
Sample Matrix:	Water	Date Reported:	03-02-94
Condition:	Cool and Intact	Date Sampled:	02-25-94
		Date Received:	02-25-94
		Date Analyzed:	02-28-94

Laboratory Number	Sample ID.	Conductivity (uS)
6906	MW #3	1,450
6907	MW #4	1,510
6908	MW #5	2,760
6909	MW #6	1,290
6910	MW #9	1,250
6911	MW #10	1,450

Comments: GCU 162 C4495

Analyst

Review

ENVIROTECH LABORATORIES

5796 U.S. HIGHWAY 64-3014
FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615

QUALITY ASSURANCE/QUALITY CONTROL

DOCUMENTATION

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8100
POLYNUCLEAR AROMATIC HYDROCARBONS

Client:	NA	Project #:	NA
Sample ID:	Laboratory Blank	Date Reported:	03-07-94
Laboratory Number:	0304PAH.BLK	Date Sampled:	NA
Sample Matrix:	Water	Date Received:	NA
Preservative:	NA	Date Analyzed:	03-04-94
Condition:	NA	Analysis Requested:	8100

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Naphthalene	ND	0.2
Acenaphthylene	ND	0.2
Acenaphthene	ND	0.2
Fluorene	ND	0.2
Phenanthrene	ND	0.2
Anthracene	ND	0.2
Fluoranthene	ND	0.2
Pyrene	ND	0.2
Benzo(a)anthracene	ND	0.2
Chrysene	ND	0.2
Benzo(b) & Benzo(k) fluoranthene	ND	0.2
Benzo(a)pyrene	ND	0.2
Indeno(1,2,3-cd) pyrene & Dibenzo(a,h)anthracene	ND	0.2
Benzo(g,h,i)perylene	ND	0.2

SURROGATE RECOVERY:	Parameter	Percent Recovery
	1-fluoronapthalene	102 %

Methods: Method 8100, Polynuclear Aromatic Hydrocarbons, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

ND - Parameter not detected at the stated detection limit.

Comments:

Analyst

Review

ENVIROTECH LABS

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PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8020
AROMATIC VOLATILE ORGANICS

Client:	NA	Project #:	NA
Sample ID:	Laboratory Blank	Date Reported:	02-28-94
Laboratory Number:	0228am.blk	Date Sampled:	NA
Sample Matrix:	Water	Date Received:	NA
Preservative:	NA	Date Analyzed:	02-28-94
Condition:	NA	Analysis Requested:	BTEX

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Benzene	ND	0.2
Toluene	ND	0.4
Ethylbenzene	ND	0.5
p,m-Xylene	ND	0.3
o-Xylene	ND	0.2

SURROGATE RECOVERIES:

Parameter	Percent Recovery
Trifluorotoluene	99 %
Bromofluorobenzene	102 %

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments:

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

TRACE METAL ANALYSIS - BLANKS

Client:	NA	Project #:	NA
Sample ID:	Blanks	Date Reported:	03-02-94
Laboratory Number:	NA	Date Sampled:	NA
Sample Matrix:	Water	Date Received:	NA
Preservative:	Cool	Date Analyzed:	03-01-94
Condition:	NA	Analysis Needed:	Trace Metals

Parameter	Instrument Blank (mg/L)	Method Blank (mg/L)	Det. Limit (mg/L)
ARSENIC	ND	ND	0.0001
BARIUM	ND	ND	0.01
CADMIUM	ND	ND	0.0001
CHROMIUM	ND	ND	0.0001
LEAD	ND	ND	0.0001
MERCURY	ND	ND	0.0002
SELENIUM	ND	ND	0.0001
SILVER	ND	ND	0.0001

Method: Methods 3010A, 3020A, Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, USEPA, Sept. 1992

Methods 7060A, 7080, 7131, 7191, 7470, 7421, 7740, 7760A Analysis of Metals by GFAA and FLAA, SW-846, USEPA, 1992

ND - Parameter not detected at the stated detection limit.

Comments:

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

EPA METHOD 8100
POLYNUCLEAR AROMATIC HYDROCARBONS

Client:	NA	Project #:	NA
Sample ID:	Method Blank	Date Reported:	03-04-94
Laboratory Number:	0304PAH.MB	Date Sampled:	NA
Sample Matrix:	Water	Date Received:	NA
Preservative:	Cool	Date Analyzed:	03-04-94
Condition:	Cool & Intact	Analysis Requested:	8100

Parameter	Concentration (ug/L)	Det. Limit (ug/L)
Naphthalene	ND	0.20
Acenaphthylene	ND	0.20
Acenaphthene	ND	0.20
Fluorene	ND	0.20
Phenanthrene	ND	0.20
Anthracene	ND	0.20
Fluoranthene	ND	0.20
Pyrene	ND	0.20
Benzo(a)anthracene	ND	0.20
Chrysene	ND	0.20
Benzo(b) & Benzo(k) fluoranthene	ND	0.20
Benzo(a)pyrene	ND	0.20
Indeno(1,2,3-cd) pyrene & Dibenzo(a,h)anthracene	ND	0.20
Benzo(g,h,i)perylene	ND	0.20

SURROGATE RECOVERY	Parameter	Percent Recovery
	1-fluoronapthalene	97 %

Methods: Method 8100, Polynuclear Aromatic Hydrocarbons, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992.

ND - Parameter not detected at the stated detection limit.

Comments:

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

** QUALITY ASSURANCE EPA METHOD 8020
MATRIX SPIKE - AROMATIC VOLATILE ORGANICS

Client:	NA	Project #:	NA
Sample ID:	Sample Spike	Date Reported:	02-28-94
Laboratory Number:	6906-S-BTEX	Date Sampled:	02-25-94
Sample Matrix:	Water	Date Received:	02-25-94
Analysis Requested:	BTEX	Date Analyzed:	02-28-94
Condition:	NA		

Parameter	Sample Result (ug/L)	Spike Added (ug/L)	Spiked Sample Result (ug/L)	Det. Limit (ug/L)	Percent Recovery	SW-846 % Rec. Accept. Range
Benzene	476	20.0	494	0.2	100	39-150
Toluene	0.7	20.0	20.5	0.4	99	46-148
Ethylbenzene	ND	20.0	20.2	0.5	100	32-160
p,m-Xylene	1.1	20.0	20.2	0.3	96	46-148
o-Xylene	0.8	20.0	20.2	0.2	97	46-148

Method: Method 5030, Purge-and-Trap, Test Methods for Evaluating Solid Waste, SW-846, USEPA, July 1992

Method 8020, Aromatic Volatile Organics, Test Methods for Evaluating Solid Waste, SW-846, USEPA, Sept. 1986

ND - Parameter not detected at the stated detection limit.

Comments:

Analyst

Review

ENVIROTECH LABS

5796 US HIGHWAY 64-3014 • FARMINGTON, NEW MEXICO 87401
PHONE: (505) 632-0615 • FAX: (505) 632-1865

QUALITY ASSURANCE REPORT

TRACE METAL ANALYSIS - MATRIX SPIKE

Client:	NA	Project #:	NA
Sample ID:	NA	Date Reported:	03-02-94
Laboratory Number:	NA	Date Sampled:	NA
Sample Matrix:	Water	Date Received:	NA
Analysis Requested:	Trace Metals	Date Analyzed:	03-01-94
Condition:	NA		

Parameter	Spike Added (mg/L)	Sample Result (mg/L)	Spiked Sample Result (mg/L)	Percent Recovery
ARSENIC	0.1000	ND	0.0982	98
BARIUM	10.00	3.27	13.4	101
CADMIUM	0.1000	0.0001	0.0982	98
CHROMIUM	0.1000	ND	0.0998	100
LEAD	0.1000	0.0034	0.1030	100
MERCURY	0.1000	ND	0.0996	100
SELENIUM	0.1000	0.0011	0.1008	100
SILVER	1.000	ND	0.993	99

QA ACCEPTANCE CRITERIA:

Parameter	Acceptance Range %
Trace Metals	80 - 120

Method: Methods 3010, 3020, Acid Digestion of Aqueous Samples and Extracts for Total Metals, SW-846, USEPA, July 1992.

Methods 7060, 7080, 7131, 7191, 7470, 7421, 7740, 7760A Analysis of Metals by GFAA and FLAA, SW-846, USEPA

ND - Parameter not detected at the stated detection limit.

Comments:

Analyst

Review