

3R - 329

REPORTS

DATE:

1998

Public Service Company
of New Mexico
Alvarado Square MS 0408
Albuquerque, NM 87158

April 2, 1998

Mr. William Olson
Hydrogeologist
Oil Conservation Division
2040 So. Pacheco
Santa Fe, New Mexico 87505

RECEIVED
APR 03 1998
Oil Conservation Bureau
Oil Conservation Division



RE: 1998 SAN JUAN BASIN ANNUAL GROUNDWATER REPORT

Dear Bill:

PNM is pleased to submit the 1998 Annual Groundwater Report on Unlined Surface Impoundments in the San Juan Basin. Pursuant to PNM's Groundwater Management Program for Unlined Surface Impoundment Closures, the report details the ongoing investigation/remedial activities at unlined surface impoundments having groundwater contamination as identified by PNM. A list of groundwater sites reported in this document is provided below.

Cozzens B1
Dogie Compressor Station East Pit
Dogie Compressor Station North Pit
Florance 32A
Florance Z 40 M
Florance 44
Florance 47X
Florance 124
Hampton 4M
Honolulu Loop Line Drip
Ice Canyon Drip
Jacques 2A
Mangum 1E
McClanahan 22
McClanahan A2E
McCoy Gas Com A1
Miles Federal 1E
Miles Federal 1E Drip
Randleman 1
Reid 16 Drip
Sammons 2
Turner 1A
Turner 3
Zachry 18E

PNM 1998 Groundwater Report

PNM plans to request closure of two of the above sites, the Cozzens B1 and the Sammons 2, in our April 30, 1998 filing of the San Juan Pit Closure Reports to the OCD Santa Fe office. If you have any questions regarding the contents of the report, please contact me at (505) 241-2974.

Sincerely,



Maureen Gannon
Project Manager

Attachment

cc: Ingrid Deklau, WFS
Denny Foust, OCD-Aztec Office
Bill VonDrehle, WFS

PNM 1998 Groundwater Report

bcc: Colin Adams (w/o analytical results)
Kathy Juckes
Ron Johnson (w/o analytical results)
Mark Sikelianos

Groundwater Site Summary Report

Copies: WFS(1)
Operator (1)
NMOCD District Office (1)
NMOCD Santa Fe (1)

Quarter/Year: 2nd/97, 3rd/97, 4th/97 & 1st/98

Operator: Burlington Resources
Sec: 33 Twn: 29N Rng: 11W Unit: F
Canyon: San Juan River

Vulnerable Class: Original
OCD Ranking: 40
Lead Agency: NMOCD

Topo Map: previously submitted
Well Completion Diagram: previously submitted
Site Map with Analysis: Figure 1
Groundwater Contour Map: Figure 2 (April 1997), Figure 3 (July 1997), Figure 4 (October 1997) & Figure 5 (January 1998)
Hydrograph: Figure 6
Full-suite Groundwater Sampling: previously submitted
Analytical Results: attached

Activities for Previous Year:

PNM conducted quarterly groundwater sampling at the Mangum 1E April 17, July 22 and October 15, 1997, and again on January 22, 1998. PNM collected groundwater samples in all wells for chemical analyses of benzene, toluene, ethylbenzene, and xylenes (BTEX). Prior to sampling, water level measurements were taken in each well. All sampling was performed in strict compliance with EPA protocol. PNM delivered the samples to OnSite Technologies, Farmington, New Mexico for chemical analyses of BTEX using EPA method 8020.

Results:

Figure 1 is a site map showing benzene, toluene, ethylbenzene and xylenes (BTEX) analytical data for each monitoring well at the site. BTEX concentrations in MW-1 (the upgradient well) and MW-2 (the source well) have been below standard for five consecutive quarters. BTEX in MW-3 has steadily decreased and is now below WQCC standards. Contamination remains in groundwater from MW-4 but has gradually attenuated over time. Benzene still remains slightly above standard at 11 ppb.

Figure 2(s), 3, 4 and 5 provide a groundwater contour map of the site for the months of April, July and October 1997 and January 1998, respectively. The groundwater flow direction has remained stable and is southwesterly beneath the site. Figure 6 presents the groundwater elevations in each well over time. In general, the groundwater elevation fluctuations are consistent among the four wells and have increased over the past year.

Further Action:

PNM will continue to monitor the groundwater gradient and perform quarterly groundwater sampling at the Mangum 1E.

Public Service Company of New Mexico - Gas Services

Environmental Services Division - Alvarado Square, MS-0408
Albuquerque, NM 87158

Contact: Maureen Gannon

Telephone: 505-241-2974

Figure 1. Mangum 1E Site Map with Analytical Results
(concentrations in ppb)

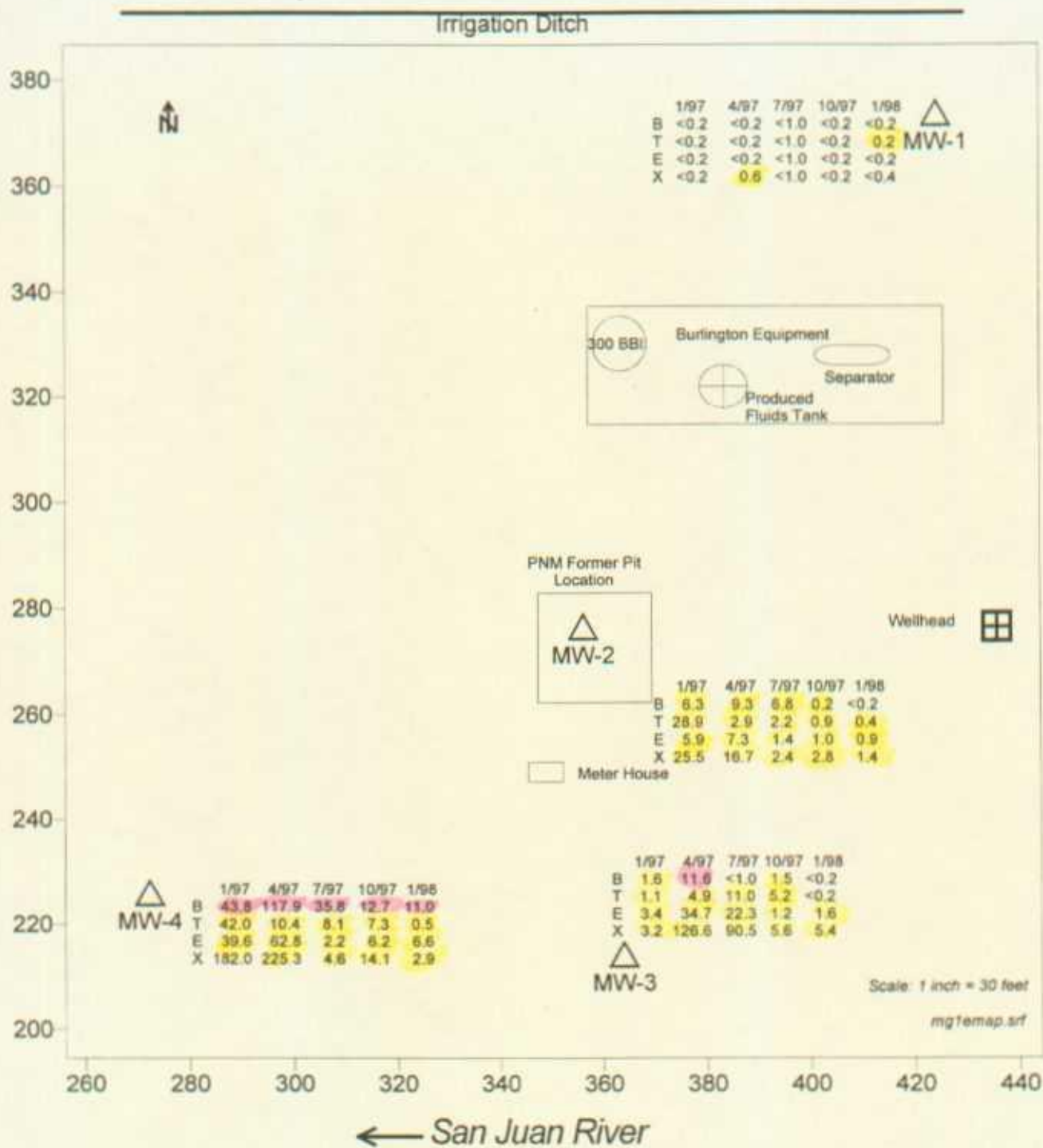


Figure 2. Mangum 1E Groundwater Contour Map (April 17, 1997)

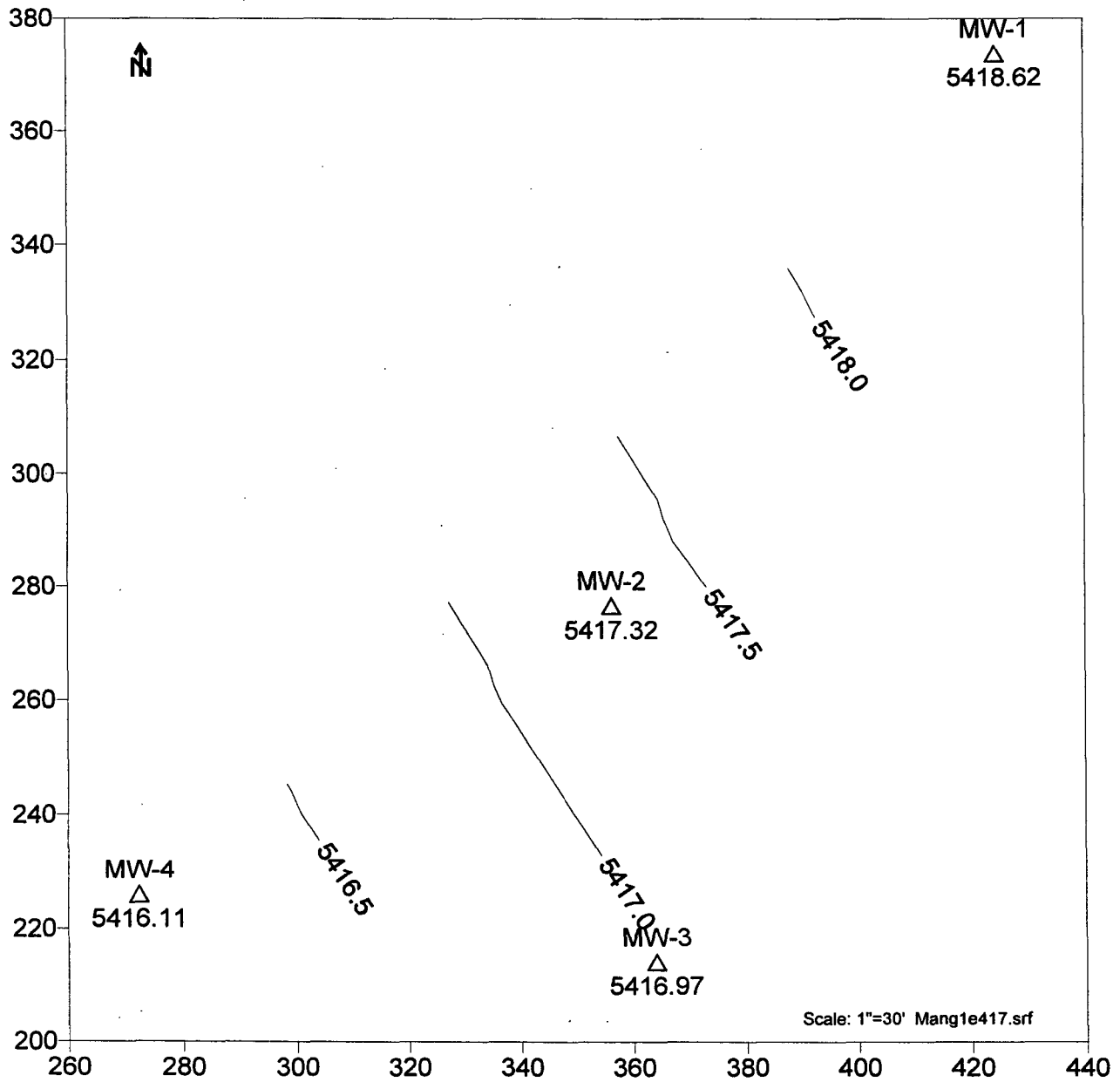


Figure 3. Mangum 1E Groundwater Contour Map (July 22, 1997)

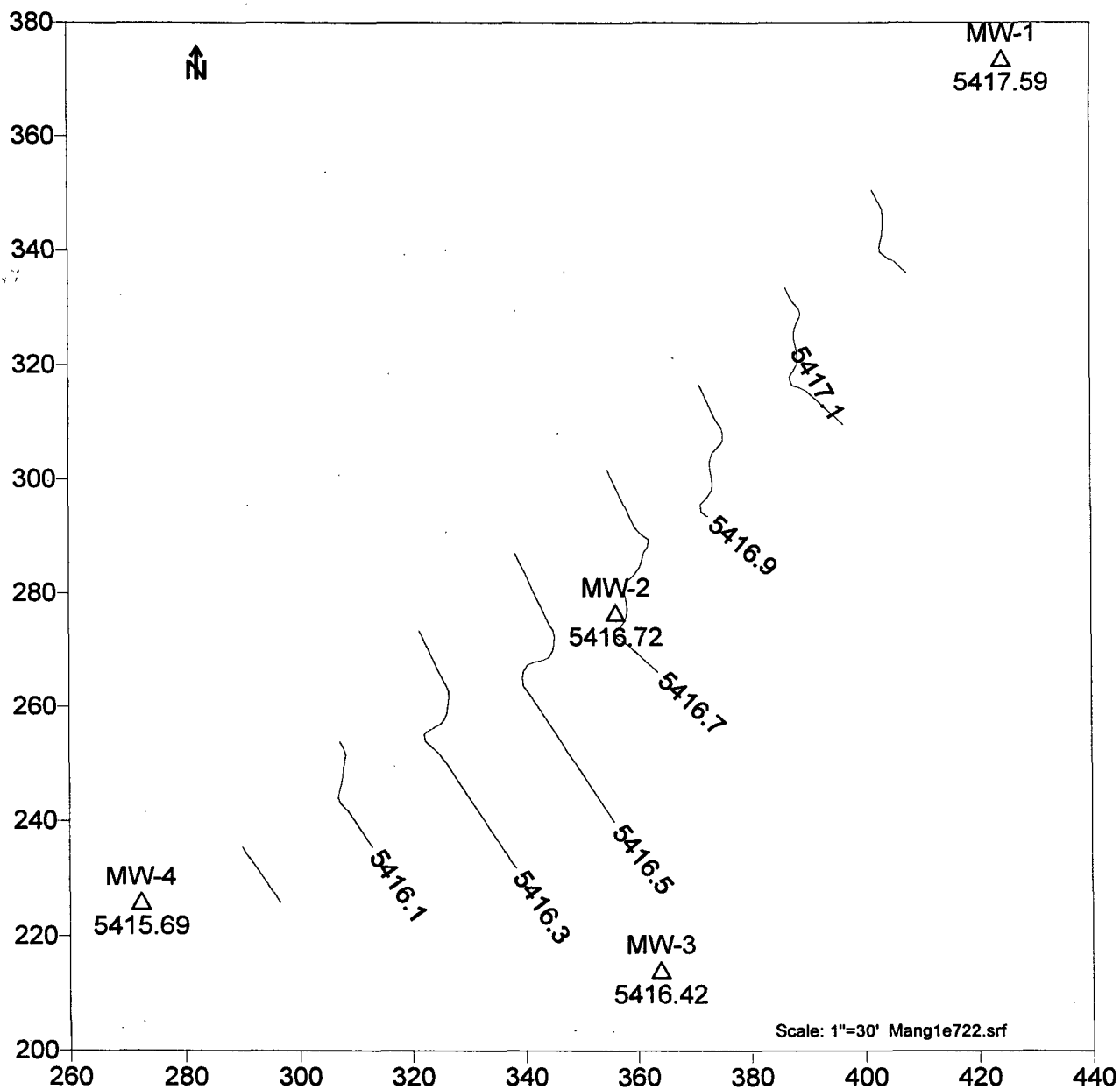


Figure 4. Mangum 1E Groundwater Contour Map (October 15, 1997)

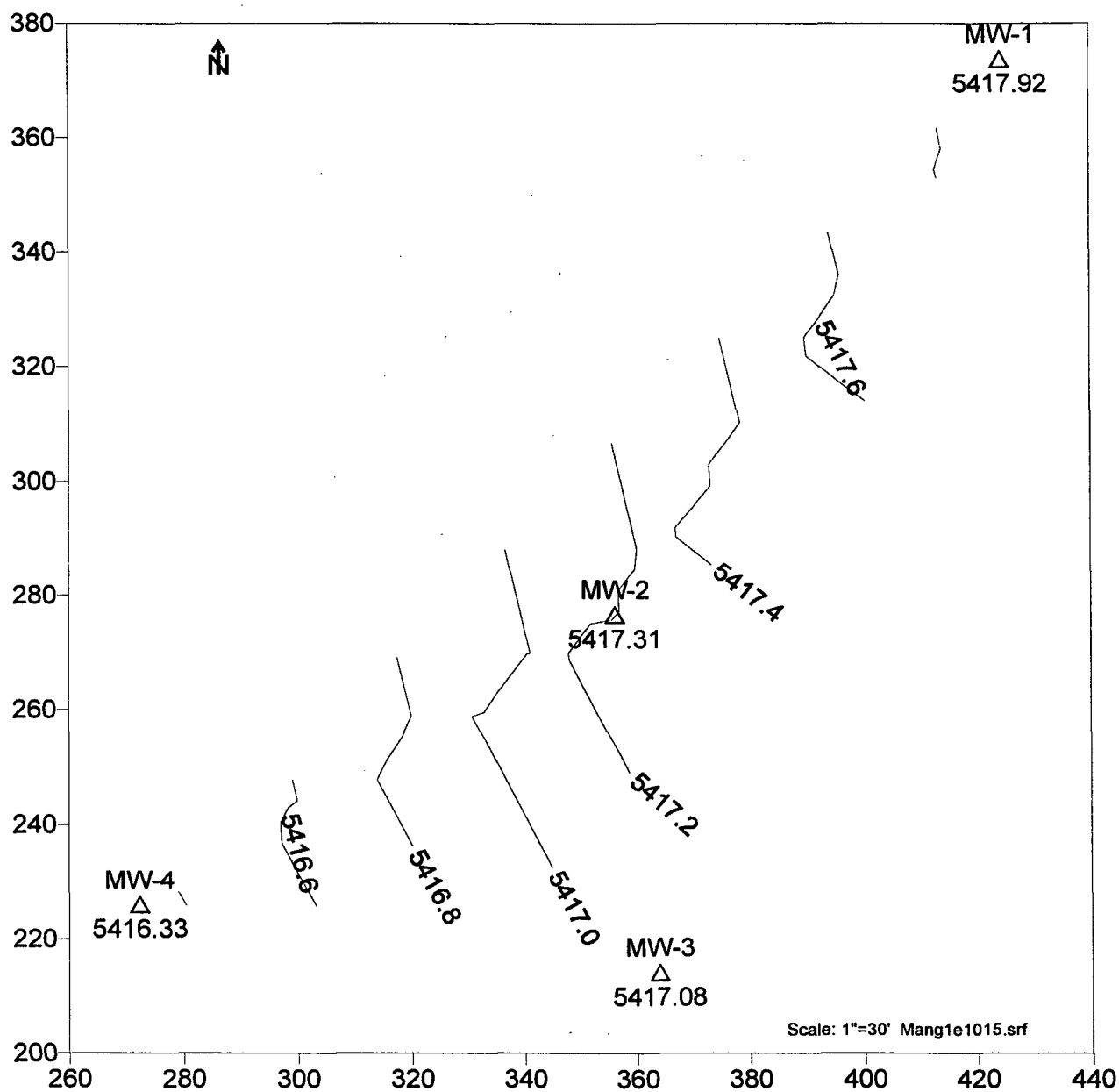


Figure 5. Mangum 1E Groundwater Contour Map (January 22, 1997)

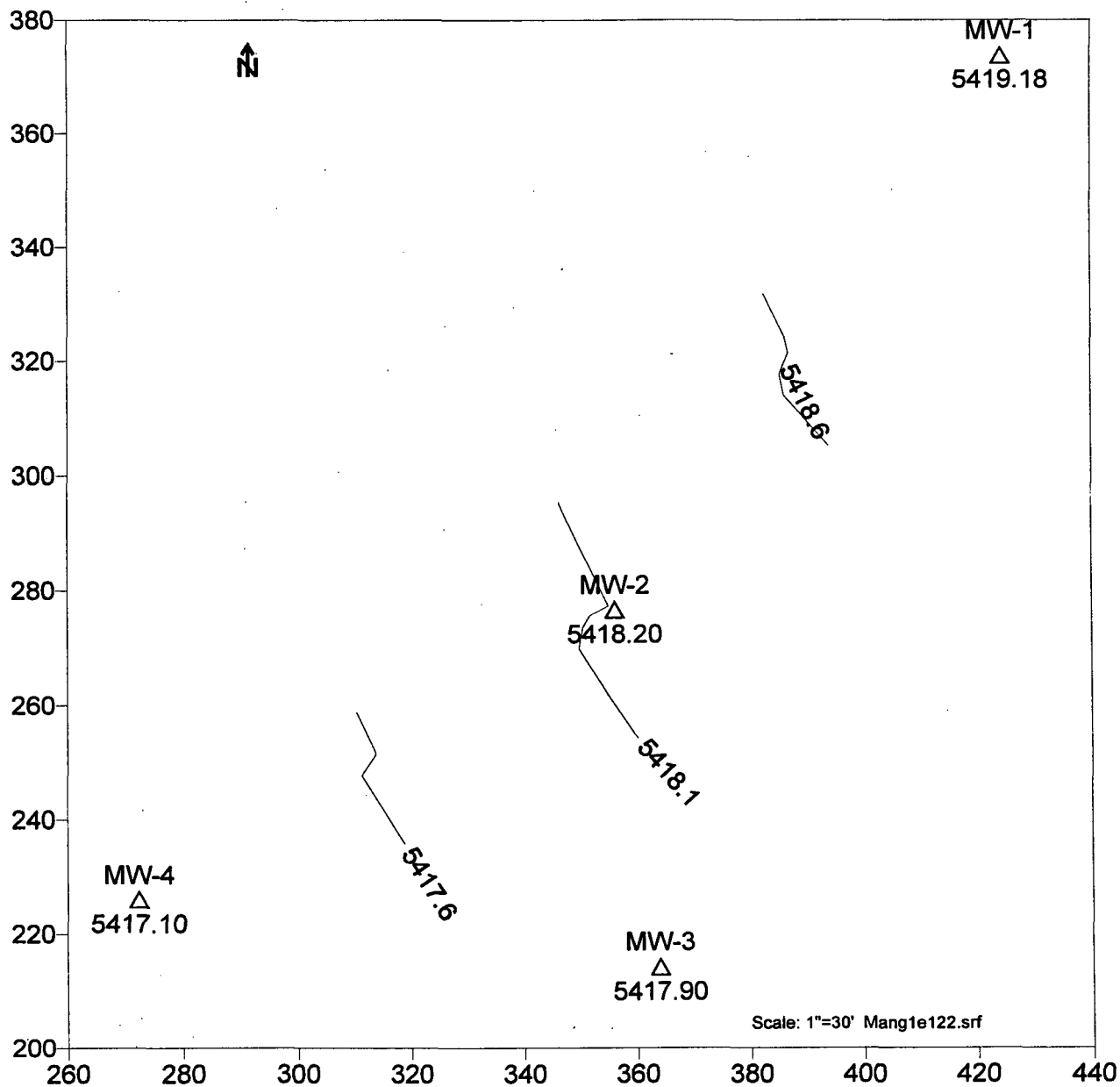
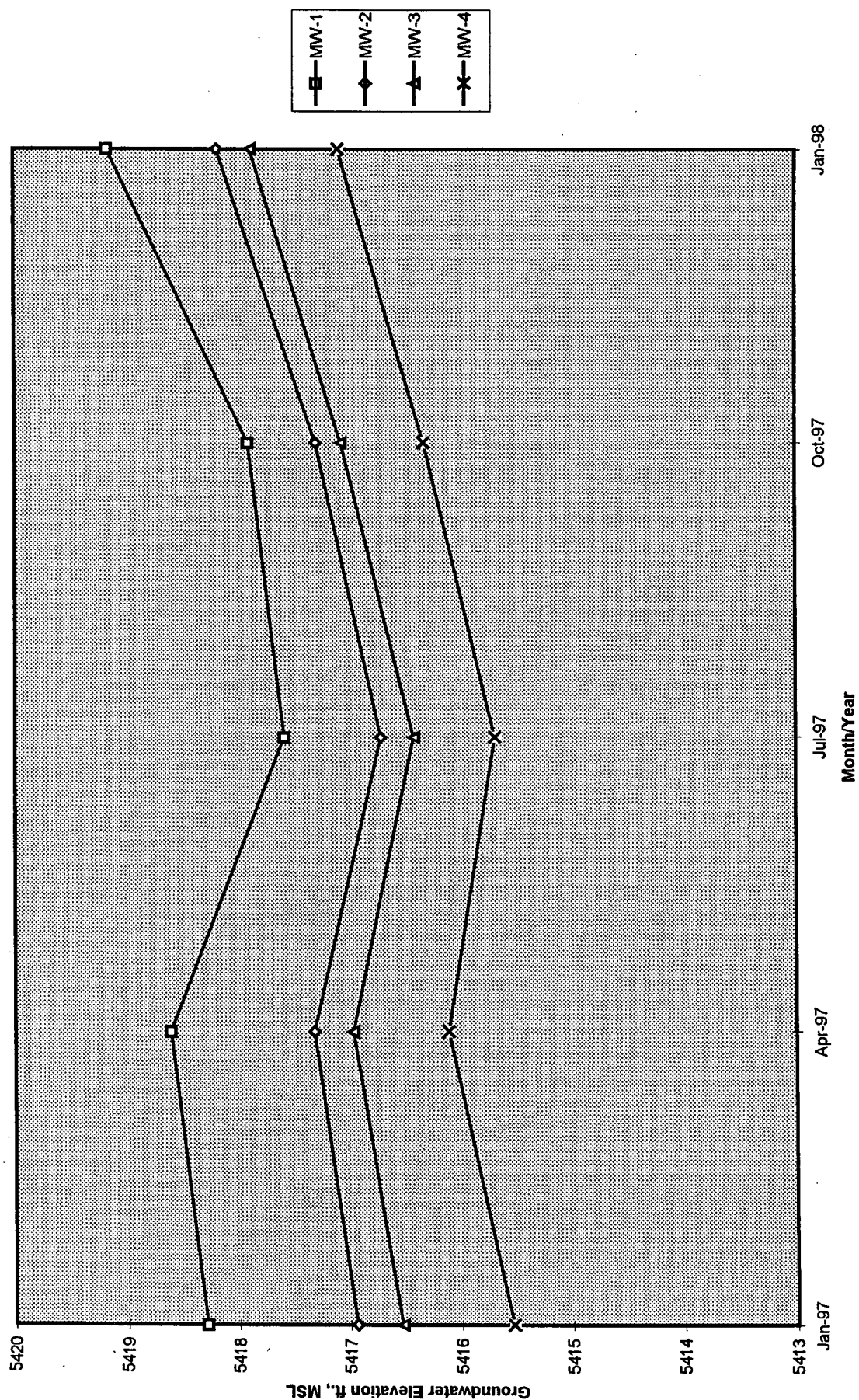


Figure 6. Mangum 1E Hydrograph
(Water level vs. Time)



OFF: (505) 325-5667

ON SITE
TECHNOLOGIES, LTD.

LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *22-Apr-97*
COC No.: *5551*
Sample No.: *14254*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9704171200; MW-1*
Sampled by: *MS/MG* Date: *17-Apr-97* Time: *12:00*
Analyzed by: *DC* Date: *18-Apr-97*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	ND	ug/L	0.2	ug/L
<i>Toluene</i>	ND	ug/L	0.2	ug/L
<i>Ethylbenzene</i>	ND	ug/L	0.2	ug/L
<i>m,p-Xylene</i>	0.6	ug/L	0.2	ug/L
<i>o-Xylene</i>	ND	ug/L	0.2	ug/L
<i>TOTAL</i>	0.6	ug/L		

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*
Date: *4/22/97*

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OFF: (505) 325-5667

ON SITE
TECHNOLOGIES, LTD.

LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *22-Apr-97*
COC No.: *5551*
Sample No.: *14255*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9704171230; MW-2*
Sampled by: *MS/MG* Date: *17-Apr-97* Time: *12:30*
Analyzed by: *DC* Date: *18-Apr-97*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	<i>9.3</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Toluene</i>	<i>2.9</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Ethylbenzene</i>	<i>7.3</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>m,p-Xylene</i>	<i>11.9</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>o-Xylene</i>	<i>4.8</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>TOTAL</i>	<i>36.2</i>	<i>ug/L</i>		

ND - Not Detected at Limit of Quantitation

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

Approved By: *DC*

Date: *4/22/97*

OFF: (505) 325-5667

ON SITE
TECHNOLOGIES, LTD.

LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *22-Apr-97*
COC No.: *5551*
Sample No.: *14256*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9704171300; MW-3*
Sampled by: *MS/MG* Date: *17-Apr-97* Time: *13:00*
Analyzed by: *DC* Date: *18-Apr-97*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	11.6	ug/L	0.2	ug/L
<i>Toluene</i>	4.9	ug/L	0.2	ug/L
<i>Ethylbenzene</i>	34.7	ug/L	0.2	ug/L
<i>m,p-Xylene</i>	76.3	ug/L	0.2	ug/L
<i>o-Xylene</i>	50.3	ug/L	0.2	ug/L
<i>TOTAL</i>	177.7	ug/L		

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*
Date: *4/22/97*

OFF: (505) 325-5667

ON SITE
TECHNOLOGIES, LTD.

LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *22-Apr-97*
COC No.: *5551*
Sample No.: *14257*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9704171330; MW-4*
Sampled by: *MS/MG* Date: *17-Apr-97* Time: *13:30*
Analyzed by: *DC* Date: *18-Apr-97*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	117.9	ug/L	0.2	ug/L
<i>Toluene</i>	10.4	ug/L	0.2	ug/L
<i>Ethylbenzene</i>	62.8	ug/L	0.2	ug/L
<i>m,p-Xylene</i>	206.7	ug/L	0.2	ug/L
<i>o-Xylene</i>	18.6	ug/L	0.2	ug/L
<i>TOTAL</i>	416.3	ug/L		

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*

Date: *4/22/97*

OFF: (505) 325-5667

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TECHNOLOGIES, LTD.

LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *22-Apr-97*
COC No.: *5551*
Sample No.: *14258*
Job No.: *2-1000*

Duplicate MW-4

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9704171400; MW-5*
Sampled by: *MS/MG* Date: *17-Apr-97* Time: *14:00*
Analyzed by: *DC* Date: *18-Apr-97*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	<i>123.4</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Toluene</i>	<i>11.4</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Ethylbenzene</i>	<i>64.4</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>m,p-Xylene</i>	<i>216.3</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>o-Xylene</i>	<i>20.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>TOTAL</i>	<i>435.7</i>	<i>ug/L</i>		

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*
Date: *4/22/97*

OFF: (505) 325-5667

ON SITE
TECHNOLOGIES, LTD.

LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *22-Apr-97*
COC No.: *5551*
Sample No.: *14259*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *Trip Blank*
Sampled by: *DC* Date: *16-Apr-97* Time: *15:00*
Analyzed by: *DC* Date: *18-Apr-97*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	ND	ug/L	0.2	ug/L
<i>Toluene</i>	ND	ug/L	0.2	ug/L
<i>Ethylbenzene</i>	ND	ug/L	0.2	ug/L
<i>m,p-Xylene</i>	0.3	ug/L	0.2	ug/L
<i>o-Xylene</i>	ND	ug/L	0.2	ug/L
<i>TOTAL</i>	0.3	ug/L		

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*
Date: *4/22/97*

OFF: (505) 325-5667



LAB: (505) 325-1556

QUALITY ASSURANCE REPORT
for EPA Method 8020

Date Analyzed: 18-Apr-97

Internal QC No.: 0527-STD

Surrogate QC No.: 0528-STD

Reference Standard QC No.: 0529/30-QC

Method Blank

Parameter	Result	Unit of Measure
Average Amount of All Analytes In Blank	<0.2	ppb

Calibration Check

Parameter	Unit of Measure	True Value	Analyzed Value	% Diff	Limit
Benzene	ppb	20.0	19.2	4	15%
Toluene	ppb	20.0	19.8	1	15%
Ethylbenzene	ppb	20.0	20.3	1	15%
m,p-Xylene	ppb	40.0	38.8	3	15%
o-Xylene	ppb	20.0	20.0	0	15%

Matrix Spike

Parameter	1 - Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Benzene	99	83	(39-150)	12	20%
Toluene	104	88	(46-148)	12	20%
Ethylbenzene	103	86	(32-160)	11	20%
m,p-Xylene	100	83	(35-145)	11	20%
o-Xylene	102	86	(35-145)	11	20%

Surrogate Recoveries

Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered	Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered
Limit Percent Recovered	(70-130)		Limit Percent Recovered	(70-130)	
14254-5551	96				
14255-5551	93				
14256-5551	90				
14257-5551	92				
14258-5551	90				(m)
14259-5551	96				4/12/97

S1: Fluorobenzene

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

CHAIN OF CUSTODY RECORD

Distribution:	White – On Site	Yellow – LAB	Pink – Sampler	Goldenrod – Client
---------------	-----------------	--------------	----------------	--------------------

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *5-Aug-97*
COC No.: *5569*
Sample No.: *15438*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9707221400; MW-1*
Sampled by: *MG/MS* Date: *22-Jul-97* Time: *14:00*
Analyzed by: *DC* Date: *1-Aug-97*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	ND	ug/L	1.0	ug/L
<i>Toluene</i>	ND	ug/L	1.0	ug/L
<i>Ethylbenzene</i>	ND	ug/L	1.0	ug/L
<i>m,p-Xylene</i>	ND	ug/L	1.0	ug/L
<i>o-Xylene</i>	ND	ug/L	1.0	ug/L
<i>TOTAL</i>	ND	ug/L		

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*
Date: *8/5/97*

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *5-Aug-97*
COC No.: *5569*
Sample No.: *15439*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9707221430; MW-2*
Sampled by: *MG/MS* Date: *22-Jul-97* Time: *14:30*
Analyzed by: *DC* Date: *1-Aug-97*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	6.8	ug/L	1.0	ug/L
<i>Toluene</i>	2.2	ug/L	1.0	ug/L
<i>Ethylbenzene</i>	1.4	ug/L	1.0	ug/L
<i>m,p-Xylene</i>	2.4	ug/L	1.0	ug/L
<i>o-Xylene</i>	ND	ug/L	1.0	ug/L
<i>TOTAL</i>	12.8	ug/L		

4-17

7.3

2.9

7.3

11.9

4.8

36.2

ND - Not Detected at Limit of Quantitation

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

Approved By: *DC*

Date: *8/5/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING EQUIPMENT WITH THE FARMINGTON PLANT -

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *5-Aug-97*
COC No.: *5569*
Sample No.: *15440*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9707221500; MW-3*
Sampled by: *MG/MS* Date: *22-Jul-97* Time: *15:00*
Analyzed by: *DC* Date: *1-Aug-97*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	ND	ug/L	1.0	ug/L
<i>Toluene</i>	11.0	ug/L	1.0	ug/L
<i>Ethylbenzene</i>	22.3	ug/L	1.0	ug/L
<i>m,p-Xylene</i>	84.3	ug/L	1.0	ug/L
<i>o-Xylene</i>	6.2	ug/L	1.0	ug/L
<i>TOTAL</i>	123.8	ug/L		

4-17

11.0

4.1

54.7

7.3

52.2

177.7

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*
Date: *8/5/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *5-Aug-97*
COC No.: *5569*
Sample No.: *15441*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9707221530; MW-4*
Sampled by: *MG/MS* Date: *22-Jul-97* Time: *15:30*
Analyzed by: *DC* Date: *1-Aug-97*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	35.8	ug/L	1.0	ug/L
<i>Toluene</i>	8.1	ug/L	1.0	ug/L
<i>Ethylbenzene</i>	2.2	ug/L	1.0	ug/L
<i>m,p-Xylene</i>	4.6	ug/L	1.0	ug/L
<i>o-Xylene</i>	ND	ug/L	1.0	ug/L
<i>TOTAL</i>	50.7	ug/L		

4-17

117.9

10.4

62.8

20.7

18.6

416.3

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*
Date: *8/5/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *5-Aug-97*
COC No.: *5569*
Sample No.: *15442*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9707221600; MW-5*
Sampled by: *MG/MS* Date: *22-Jul-97* Time: *16:00*
Analyzed by: *DC* Date: *1-Aug-97*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	6.5	ug/L	1.0	ug/L
<i>Toluene</i>	2.1	ug/L	1.0	ug/L
<i>Ethylbenzene</i>	1.1	ug/L	1.0	ug/L
<i>m,p-Xylene</i>	2.2	ug/L	1.0	ug/L
<i>o-Xylene</i>	ND	ug/L	1.0	ug/L
<i>TOTAL</i>	12.0	ug/L		

ND - Not Detected at Limit of Quantitation

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

Approved By: *Das*
Date: *8/5/97*

OFF: (505) 325-5667



LAB: (505) 325-1556

QUALITY ASSURANCE REPORT

for EPA Method 8020

Date Analyzed: 1-Aug-97

Internal QC No.: 0527-STD

Surrogate QC No.: 0528-STD

Reference Standard QC No.: 0529/30-QC

Method Blank

Parameter	Result	Unit of Measure
Average Amount of All Analytes In Blank	< 1.0	ppb

Calibration Check

Parameter	Unit of Measure	True Value	Analyzed Value	RPD	Limit
Benzene	ppb	20.0	19.2	4	15%
Toluene	ppb	20.0	20.4	2	15%
Ethylbenzene	ppb	20.0	20.2	1	15%
m,p-Xylene	ppb	40.0	38.7	3	15%
o-Xylene	ppb	20.0	20.5	3	15%

Matrix Spike

Parameter	1 - Percent Recovered	2 - Percent Recovered	Limit	RPD	Limit
Benzene	89	88	(39-150)	1	20%
Toluene	95	95	(46-148)	1	20%
Ethylbenzene	95	94	(32-160)	1	20%
m,p-Xylene	89	87	(35-145)	1	20%
o-Xylene	93	93	(35-145)	0	20%

Surrogate Recoveries

Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered	Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered
Limit Percent Recovered	(70-130)		Limit Percent Recovered	(70-130)	
15438-5569	95				
15439-5569	94				
15440-5569	90				
15441-5569	90				
15442-5569	95				
				7/12 8/5/97	CRD 8/5/97

S1: Fluorobenzene

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -



CHAIN OF CUSTODY RECORD

3569

Date: 7/22/97

Page 1 of 1

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

Purchase Order No.:		Job No.	
Name	Denver Bearden		
Company	PNM Gas Services		
Address	603 W. Elm Street		
City, State, Zip	Farmington, NM 87401		

Name	Maureen Gannon	Title
Company	PNM Gas Services	
Mailing Address	Alverado Square, Mail Stop 0408	
City, State, Zip	Albuquerque, NM 87158	
Telephone No.	505-848-2974	Telefax No.

SEND INVOICE TO

REPORT TO RESULTS

ANALYSIS REQUESTED

Number of Containers

LAB ID

8746020

15438-55869

15439

15440

15441

15442

MAUGUM 1E

Maugum/M Skelians

SAMPLE IDENTIFICATION	SAMPLE		MATRIX	PRES.
	DATE	TIME		
9707221400 MW1			H2O	HCL
9707221430 MW2				
9707221500 MW3				
9707221530 MW4				
9707221600 MW5			H2O	HCL

Relinquished by: HD Gannon

Relinquished by:

Relinquished by:

Method of Shipment:

Authorized by: (Client Signature Must Accompany Request)

Date

Date/Time 7/22/97 1523

Date/Time

Date/Time

Rush

24-48 Hours

10 Working Days

Special Instructions:

Results to be sent to both parties.

Distribution: White - On Site Yellow - LAB Pink - Sampler Goldenrod - Client

LAB: 1160 "hot"

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *22-Oct-97*
COC No.: *5849*
Sample No.: *16599*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9710151330; MW-1*
Sampled by: *MG/MS* Date: *15-Oct-97* Time: *13:30*
Analyzed by: *DC* Date: *20-Oct-97*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	ND	ug/L	0.2	ug/L
<i>Toluene</i>	ND	ug/L	0.2	ug/L
<i>Ethylbenzene</i>	ND	ug/L	0.2	ug/L
<i>m,p-Xylene</i>	ND	ug/L	0.2	ug/L
<i>o-Xylene</i>	ND	ug/L	0.2	ug/L
<i>TOTAL</i>	ND	ug/L		

ND - Not Detected at Limit of Quantitation

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

Approved By: *DAE*
Date: *10/22/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *22-Oct-97*
COC No.: *5849*
Sample No.: *16600*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9710151400; MW-2*
Sampled by: *MG/MS*
Analyzed by: *DC*
Sample Matrix: *Liquid*

Date: *15-Oct-97* Time: *14:00*
Date: *20-Oct-97*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	<i>0.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Toluene</i>	<i>0.9</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Ethylbenzene</i>	<i>1.0</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>m,p-Xylene</i>	<i>1.3</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>o-Xylene</i>	<i>1.5</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>TOTAL</i>	<i>4.8</i>	<i>ug/L</i>		

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*
Date: *10/22/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNICAL SERVICES FOR THE ENERGY INDUSTRY

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *22-Oct-97*
COC No.: *5849*
Sample No.: *16601*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9710151430; MW-3*
Sampled by: *MG/MS*
Analyzed by: *DC*
Sample Matrix: *Liquid*

Date: *15-Oct-97* Time: *14:30*
Date: *20-Oct-97*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	<i>1.5</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Toluene</i>	<i>5.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Ethylbenzene</i>	<i>1.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>m,p-Xylene</i>	<i>2.6</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>o-Xylene</i>	<i>3.0</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>TOTAL</i>	<i>13.5</i>	<i>ug/L</i>		

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*
Date: *10/22/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

- TRUCKING, BLENDING INDUSTRIES WITH THE FINEST OF EQUIPMENT -

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *22-Oct-97*
COC No.: *5849*
Sample No.: *16602*
Job No.: *2-1000*

Project Name: ***PNM Gas Services - Mangum 1E***
Project Location: ***9710151500; MW-4***
Sampled by: *MG/MS* Date: *15-Oct-97* Time: *15:00*
Analyzed by: *DC* Date: *20-Oct-97*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	12.7	ug/L	0.2	ug/L
<i>Toluene</i>	7.3	ug/L	0.2	ug/L
<i>Ethylbenzene</i>	6.2	ug/L	0.2	ug/L
<i>m,p-Xylene</i>	10.3	ug/L	0.2	ug/L
<i>o-Xylene</i>	3.8	ug/L	0.2	ug/L
<i>TOTAL</i>	40.3	ug/L		

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*
Date: *10/22/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

TECHNOLOGIES, LTD. • FARMINGTON, NM 87499

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *22-Oct-97*
COC No.: *5849*
Sample No.: *16603*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9710151530; MW-5*
Sampled by: *MG/MS* Date: *15-Oct-97* Time: *15:30*
Analyzed by: *DC* Date: *20-Oct-97*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	<i>1.0</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Toluene</i>	<i>4.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Ethylbenzene</i>	<i>1.4</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>m,p-Xylene</i>	<i>2.9</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>o-Xylene</i>	<i>3.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>TOTAL</i>	<i>12.7</i>	<i>ug/L</i>		

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*
Date: *10/22/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-5667



LAB: (505) 325-1556

QUALITY ASSURANCE REPORT

for EPA Method 8020

Date Analyzed: 20-Oct-97

Internal QC No.: 0527-STD

Surrogate QC No.: 0528-STD

Reference Standard QC No.: 0529/30-QC

Method Blank

Parameter	Result	Unit of Measure
Average Amount of All Analytes In Blank	< 0.2	ppb

Calibration Check

Parameter	Unit of Measure	True Value	Analyzed Value	RPD	Limit
Benzene	ppb	20.0	18.5	8	15%
Toluene	ppb	20.0	19.2	4	15%
Ethylbenzene	ppb	20.0	19.2	4	15%
m,p-Xylene	ppb	40.0	37.2	7	15%
o-Xylene	ppb	20.0	19.1	5	15%

Matrix Spike

Parameter	1 - Percent Recovered	2 - Percent Recovered	Limit	RPD	Limit
Benzene	91	90	(39-150)	0	20%
Toluene	94	93	(46-148)	1	20%
Ethylbenzene	95	93	(32-160)	2	20%
m,p-Xylene	92	91	(35-145)	1	20%
o-Xylene	94	94	(35-145)	0	20%

Surrogate Recoveries

Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered	Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered
Limit Percent Recovered	(70-130)		Limit Percent Recovered	(70-130)	
16599-5849	96				
16600-5849	95				
16601-5849	94				
16602-5849	90				
16603-5849	94				
				242	(m)
				10/22/97	10/22/97

S1: Fluorobenzene

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

TECHNOLOGIES, LTD.

Job No.

Denver Bearden

PNM Gas Services

PNM Gas Services

603 W. Elm Street

Farmington, NM 87401

~~Ug~~ ~~Bf~~ ~~Bf~~ Magnesium IE

er: Maurice Gawn / Mark Skutumpah

DATE	SAMPLE	MATRIX	PRES.

440 440

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466
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[illegible]

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Date/Time 10/15/97 1330

Date/Time

Date/Time

Date 10/15/97

(Client Signature Must Accompany Request)

Distribution:	White - On Site	Yellow - LAB	Pink - Sampler	Goldenrod - Client
---------------	-----------------	--------------	----------------	--------------------

Results to be sent to both parties.

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *2-Feb-98*
COC No.: *7136*
Sample No.: *17394*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9801221026; MW-1*
Sampled by: *RD* Date: *22-Jan-98* Time: *10:26*
Analyzed by: *DC* Date: *27-Jan-98*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	ND	ug/L	0.2	ug/L
<i>Toluene</i>	0.2	ug/L	0.2	ug/L
<i>Ethylbenzene</i>	ND	ug/L	0.2	ug/L
<i>m,p-Xylene</i>	ND	ug/L	0.2	ug/L
<i>o-Xylene</i>	ND	ug/L	0.2	ug/L
<i>TOTAL</i>	0.2	ug/L		

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*
Date: *2/2/98*

P.O. BOX 2606 • FARMINGTON, NM 87499

OFF: (505) 325-5667

ON SITE
TECHNOLOGIES, LTD.

LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *2-Feb-98*
COC No.: *7136*
Sample No.: *17395*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9801221043; MW-2*
Sampled by: *RD* Date: *22-Jan-98* Time: *10:43*
Analyzed by: *DC* Date: *27-Jan-98*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	ND	ug/L	0.2	ug/L
<i>Toluene</i>	0.4	ug/L	0.2	ug/L
<i>Ethylbenzene</i>	0.9	ug/L	0.2	ug/L
<i>m,p-Xylene</i>	1.4	ug/L	0.2	ug/L
<i>o-Xylene</i>	ND	ug/L	0.2	ug/L
<i>TOTAL</i>	2.7	ug/L		

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*
Date: *2/2/98*

P.O. BOX 2606 • FARMINGTON, NM 87499

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *2-Feb-98*
COC No.: *7136*
Sample No.: *17396*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9801221100; MW-3*
Sampled by: *RD* Date: *22-Jan-98* Time: *11:00*
Analyzed by: *DC* Date: *27-Jan-98*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	ND	ug/L	0.2	ug/L
<i>Toluene</i>	ND	ug/L	0.2	ug/L
<i>Ethylbenzene</i>	1.6	ug/L	0.2	ug/L
<i>m,p-Xylene</i>	4.6	ug/L	0.2	ug/L
<i>o-Xylene</i>	0.8	ug/L	0.2	ug/L
<i>TOTAL</i>	6.9	ug/L		

ND - Not Detected at Limit of Quantitation

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

Approved By: *Jag*
Date: *2/2/98*

P.O. BOX 2606 • FARMINGTON, NM 87499

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *2-Feb-98*
COC No.: *7136*
Sample No.: *17397*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9801221116; MW-4*
Sampled by: *RD* Date: *22-Jan-98* Time: *11:16*
Analyzed by: *DC* Date: *27-Jan-98*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	11.0	ug/L	0.2	ug/L
<i>Toluene</i>	0.5	ug/L	0.2	ug/L
<i>Ethylbenzene</i>	6.6	ug/L	0.2	ug/L
<i>m,p-Xylene</i>	2.2	ug/L	0.2	ug/L
<i>o-Xylene</i>	0.7	ug/L	0.2	ug/L
<i>TOTAL</i>	21.1	ug/L		

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*
Date: *2/2/98*

P.O. BOX 2606 • FARMINGTON, NM 87499

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *2-Feb-98*
COC No.: *7136*
Sample No.: *17398*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9801221136; MW-5*
Sampled by: *RD* Date: *22-Jan-98* Time: *11:36*
Analyzed by: *DC* Date: *27-Jan-98*
Sample Matrix: *Liquid*

Parameter	Results as Received	Unit of Measure	Limit of Quantitation	Unit of Measure
<i>Benzene</i>	9.1	ug/L	0.2	ug/L
<i>Toluene</i>	0.5	ug/L	0.2	ug/L
<i>Ethylbenzene</i>	6.1	ug/L	0.2	ug/L
<i>m,p-Xylene</i>	1.9	ug/L	0.2	ug/L
<i>o-Xylene</i>	0.7	ug/L	0.2	ug/L
<i>TOTAL</i>	18.3	ug/L		

ND - Not Detected at Limit of Quantitation

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

Approved By: *[Signature]*
Date: *2/2/98*

P.O. BOX 2606 • FARMINGTON, NM 87499



QUALITY ASSURANCE REPORT

for EPA Method 8020

Date Analyzed: 27-Jan-98

Internal QC No.: 0559-STD

Surrogate QC No.: 0567-STD

Reference Standard QC No.: 0529/30-QC

Method Blank

Parameter	Result	Unit of Measure
Average Amount of All Analytes In Blank	<0.2	ppb

Calibration Check

Parameter	Unit of Measure	True Value	Analyzed Value	RPD	Limit
Benzene	ppb	20.0	21.3	6	15%
Toluene	ppb	20.0	21.3	6	15%
Ethylbenzene	ppb	20.0	21.6	8	15%
m,p-Xylene	ppb	40.0	41.1	3	15%
o-Xylene	ppb	20.0	21.5	7	15%

Matrix Spike

Parameter	1 - Percent Recovered	2 - Percent Recovered	Limit	RPD	Limit
Benzene	111	103	(39-150)	4	20%
Toluene	119	102	(46-148)	4	20%
Ethylbenzene	110	105	(32-160)	4	20%
m,p-Xylene	110	100	(35-145)	4	20%
o-Xylene	111	105	(35-145)	3	20%

Surrogate Recoveries

Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered	Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered
Limit Percent Recovered	(70-130)		Limit Percent Recovered	(70-130)	
17394-7136	101				
17395-7136	103				
17396-7136	99				
17397-7136	97				
17398-7136	97				
				JK, 2/3/98	(12) 2/2/98

S1: Fluorobenzene

April 15, 1997

Mr. William Olson
Hydrogeologist
Oil Conservation Division
2040 So. Pacheco
Santa Fe, New Mexico 87505



RE: 1997 SAN JUAN BASIN ANNUAL GROUNDWATER REPORT

Dear Bill:

PNM is pleased to submit the 1997 Annual Groundwater Report on Unlined Surface Impoundments in the San Juan Basin. Pursuant to PNM's Groundwater Management Program for Unlined Surface Impoundment Closures, the report details the ongoing investigation/remedial activities at unlined surface impoundments having groundwater contamination as identified by PNM. A list of groundwater sites reported in this document is provided below.

Cozzens B1
Florance 32A
Florance 40
Florance 44
Florance 47X
Florance 124
Hampton 4M
Honolulu Loop-Line Drip
Jacques 2A
Kaufmann 1
Mangum 1E
McClanahan A2E
McClanahan 22
McCoy A1A
Reid 16 Drip
Templeton 1E
Zachry 18E

RECEIVED

APR 16 1997

Environmental Bureau
Oil Conservation Division

PNM plans to request closure of two of the above sites, the Florance 124 and the Templeton 1E, in our April 30, 1997 filing of the San Juan Pit Closure Reports to the OCD Santa Fe office. We did not report on our newest groundwater site, the Sammons 2, since this was discovered in the second quarter of 1997. If you have any questions regarding the contents of the report, please contact me at (505) 241-2974.

Sincerely,

A handwritten signature in cursive script that reads "Maureen Gannon".

Maureen Gannon
Project Manager

Attachment

cc: Denver Bearden, PNMGS
Denny Foust, OCD-Aztec Office
Robin Prisk, WFS

**PNM 1997 San Juan Basin Groundwater Report
April 15, 1997**

Prepared for:

**New Mexico Oil Conservation Division
2040 South Pacheco
Santa Fe, New Mexico 87505**

Prepared by:

**Public Service Company of New Mexico
Environmental Services Department
Alvarado Square - MS 0408
Albuquerque, New Mexico 87158**

PNMGS Well Site: Mangum 1 E

Groundwater Site Summary Report

Quarter/Year: 4/96 & 1/97

Copies: WFS(1)
Operator (1)
NMOCD District Office (1)
NMOCD Santa Fe (1)

Operator: Burlington Resources
Sec: 33 Twn: 29N Rng: 11W Unit: F
Canyon: San Juan River

Vulnerable Class: Original
OCD Ranking: 40
Lead Agency: NMOCD

Topo Map: previously submitted
Well Completion Diagram: Figure 1
Site Map with Analysis: Figure 2
Groundwater Contour Map: Figure 3
Hydrograph: Figure 4
Full-suite Groundwater Sampling: Table 1
Analytical Results: attached

Activities for Previous Two Quarters (Oct. - Dec. 1996 & Jan. - Mar. 1997):

PNM installed four wells at the Magnum 1E on November 11, 1996. All well installations were conducted pursuant to the PNM San Juan Basin Groundwater Management Plan. Figure 1 presents a typical well completion diagram for the site.

The wells were surveyed and sampled on January 24, 1997. Water level measurements were taken in each of the four monitoring wells. PNM conducted groundwater sampling in each well for chemical analyses of benzene, toluene, ethylbenzene, and xylenes (BTEX) and major cations/anions. In addition, MW-1 and MW-2 was sampled for WQCC metals. Sampling was performed in strict compliance with EPA protocol.

PNM delivered the samples to OnSite Technologies, Farmington, New Mexico. The samples were analyzed using the following methods:

- benzene, toluene, ethylbenzene, and xylenes (BTEX) using EPA Method 8020
- major cations/anions using various EPA methods
- WQCC metals- filtered (As, Ba, Cd, Cr, Pb, Se, Ag, and Hg using inductively coupled plasma (ICP) for heavy metals and atomic absorption spectroscopy (AAS) for Hg and Se).

Results:

Figure 2 is a site map showing benzene, toluene, ethylbenzene and xylenes (BTEX) analytical data for each monitoring well at the site. Table 1 provides a complete table of all groundwater sampling results. MW-1, the up-gradient well, shows no signs of BTEX contamination. BTEX concentrations in MW-2 (the source well) are below standard. MW-3, a cross-gradient well, and MW-4, a down-gradient well, contain benzene levels of 16 ppb and 43.8 ppb which are above the WQCC standard of 10 ppb. Metals levels in MW-1 and MW-2 were non-detectable or below state standards.

Figure 3 provides a groundwater contour map of the site for the first quarter of 1997. Groundwater is flowing in a southwest direction beneath the site to the San Juan River. Figure 4 presents one-time groundwater elevations for the site.

Further Action:

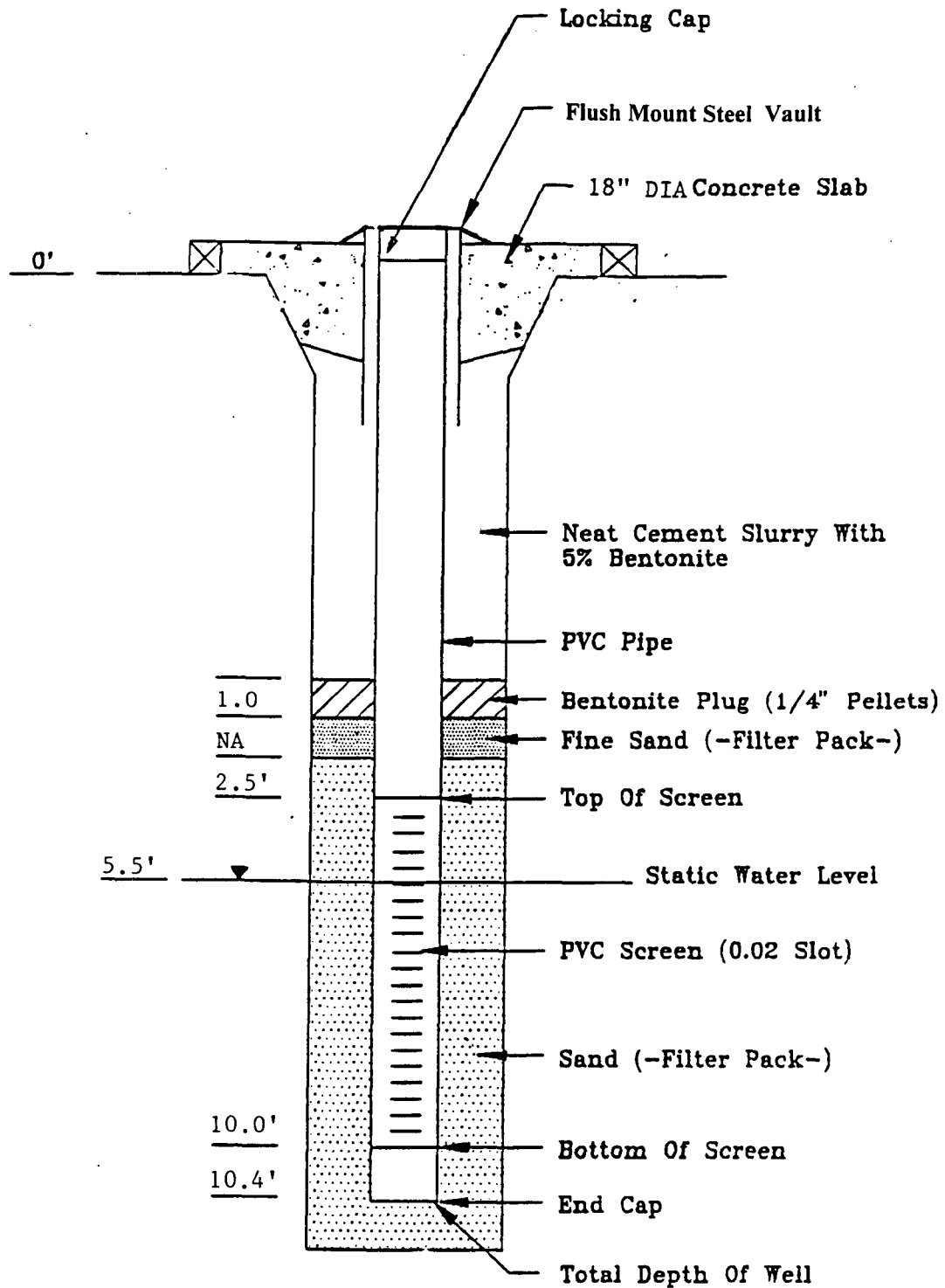
PNM will continue to monitor the groundwater gradient and perform quarterly sampling at the Mangum 1E.

Public Service Company of New Mexico - Gas Services

Environmental Services Division - Alvarado Square, MS-0408
Albuquerque, NM 87158

Contact: Maureen Gannon

Telephone: 505-241-2974



CLIENT: PNM	
DATE:	REV. NO.: 0
AUTHOR: M.D.G.	DRAWN BY: M.P.
CK'D BY: M.D.G.	FILE: .DWG

Figure 1
Well Completion Diagram

Figure 2. Mangum 1E Site Map with Analytical Results
(concentrations in ppb)

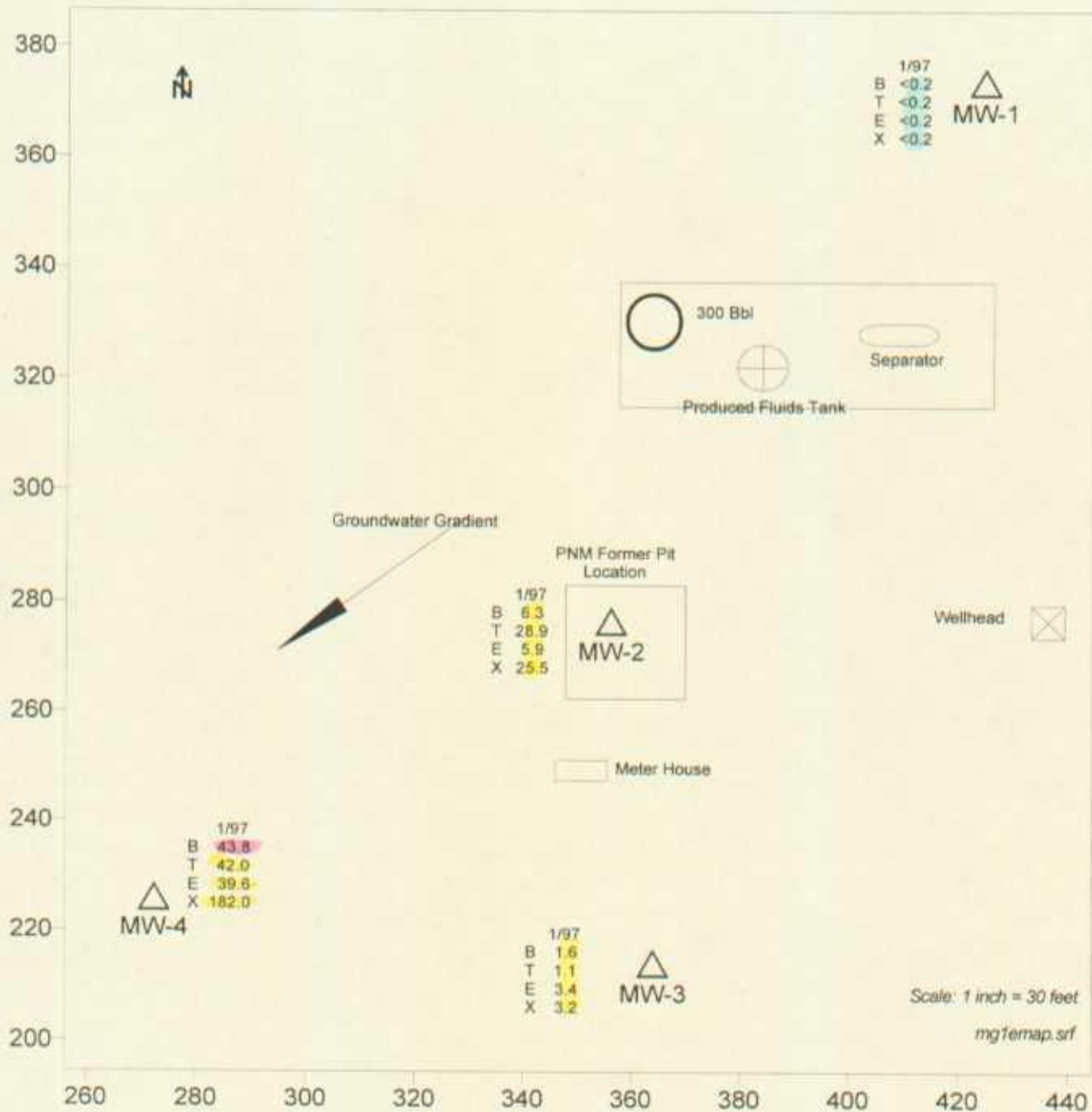


Figure 3. Mangum 1E Groundwater Contour Map (January 1997)

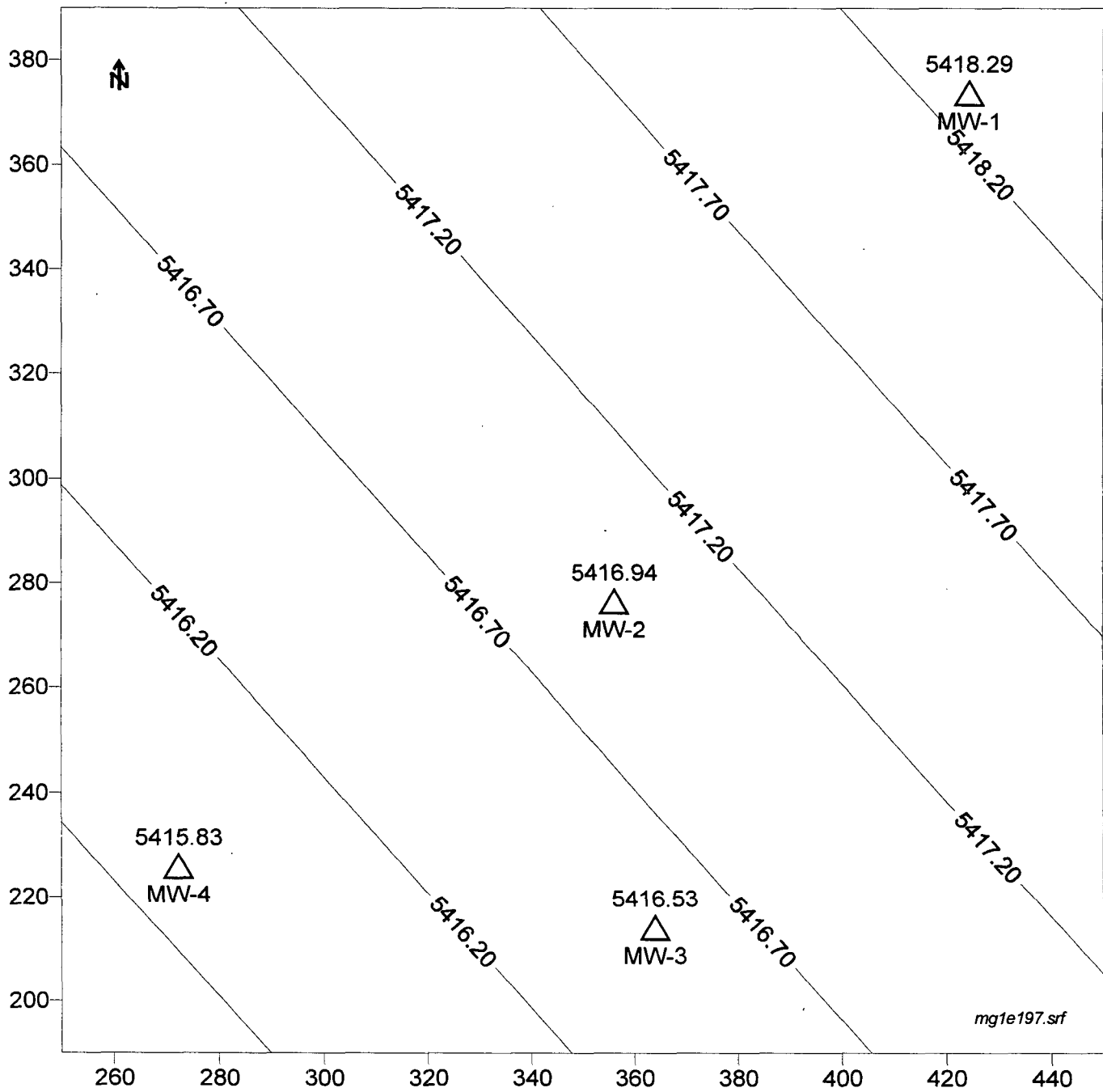


Figure 4. Mangum 1E Hydrograph

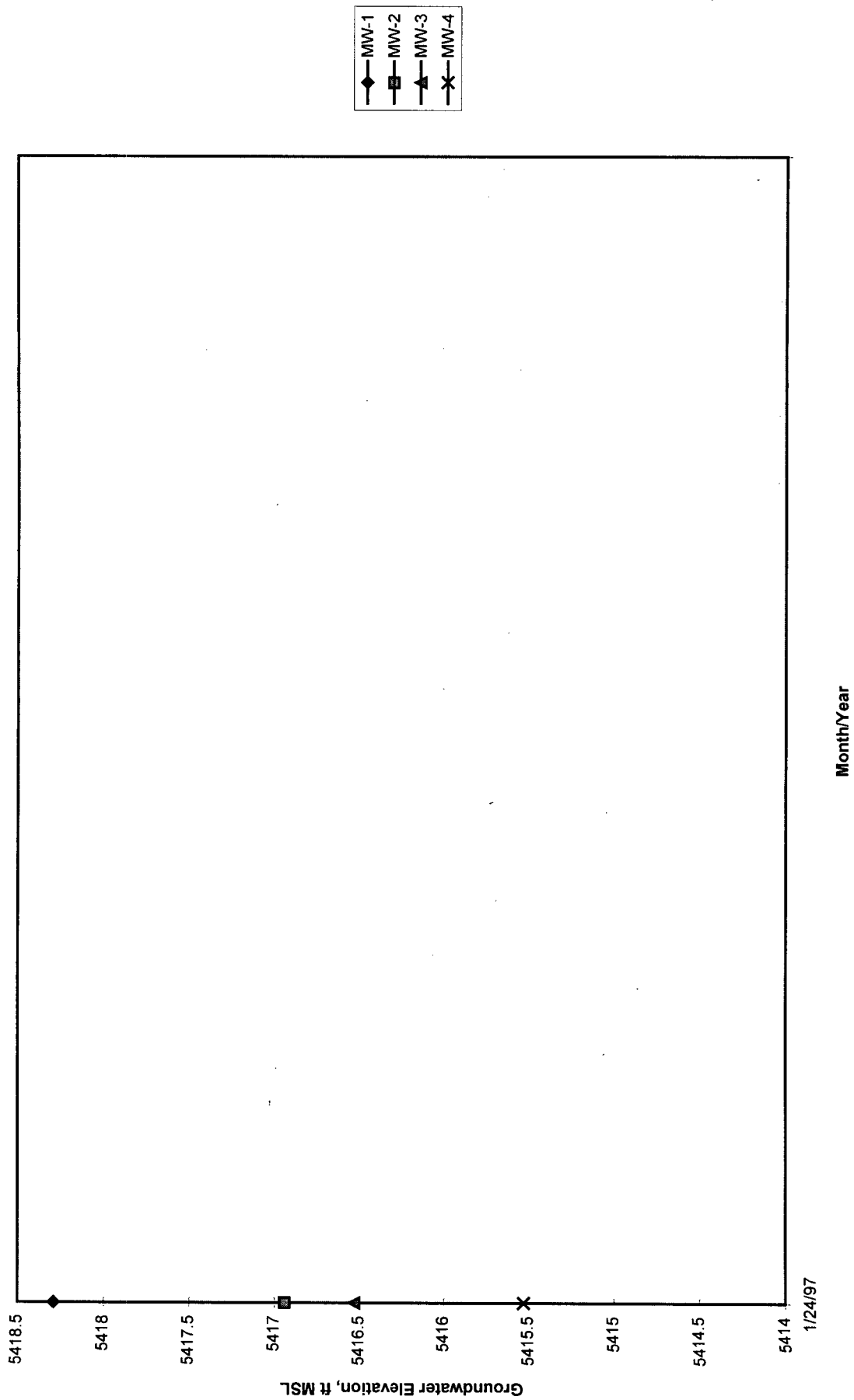


TABLE 1. MANGUM 1E GROUNDWATER SAMPLING RESULTS, mg/l (1/24/97)

Constituent	WQCC Stds.	MW-1	MW-2	MW-3	MW-4	MW-5 (MW-2 duplicate)
<i>B</i>	0.01	<0.0002	0.0063	0.0016	0.0438	0.005
<i>T</i>	0.75	<0.0002	0.0289	0.0011	0.0420	0.029
<i>E</i>	0.75	<0.0002	0.0059	0.0034	0.0396	0.0048
<i>X</i>	0.62	<0.0002	0.0255	0.0032	0.182	0.0255
<i>PAHs</i>	0.03	NA	NA	NA	NA	NA
<i>Metals</i>						
As	0.1	<0.030	<0.030	NA	NA	NA
Ba	1	0.047	0.034	NA	NA	NA
Cd	0.01	<0.004	<0.004	NA	NA	NA
Cr	0.05	<0.010	<0.010	NA	NA	NA
Pb	0.05	<0.040	<0.040	NA	NA	NA
Se	0.05	<0.003	0.003	NA	NA	NA
Ag	0.05	<0.006	<0.006	NA	NA	NA
Hg	0.002	0.0005	<0.0001	NA	NA	NA
<i>Cations/Anions</i>						
Na	NA	105	153	117	112	153
Ca	NA	119	182	194	168	181
Mg	NA	13.9	22.3	24.0	18.6	22.7
K	NA	2.6	3.9	2.7	2.7	3.9
Cl	NA	17.8	22.9	17.5	19.3	20.3
SO4	NA	299	557	462	395	564
CO3	NA	<1	<1	<1	<1	<1
HCO3	NA	302	355	412	360	358
OH	NA	<1	<1	<1	<1	<1
<i>Cation/Anion Balance</i>						
Difference Cation-Anion	NA	0.04	0.39	0.05	0.19	0.53
Total Cation-Anion	NA	23.39	35.73	33.68	29.52	35.84
% Difference	NA	0.2	1.1	0.1	0.6	1.5
TDS, calc	NA	859	1296	1229	1076	1303
TDS, meas	NA	808	1238	1146	1028	1236
Hardness as CaCO3	NA	354	546	583	496	545

NA: Not applicable

BDL: Below detection limit

NS: Not sampled

Bold: Concentration above WQCC standard

** Out of acceptable range, Diff. +/- 5

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *28-Jan-97*
COC No.: *5734*
Sample No.: *13517*
Job No.: *2-1000*

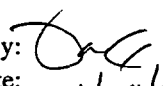
Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9701241000; MW-1*
Sampled by: *MS/MG*
Analyzed by: *DC*
Sample Matrix: *Liquid*

Date: *24-Jan-97* Time: *10:00*
Date: *27-Jan-97*

Laboratory Analysis

Parameter	Result	Unit of Measure	Detection Limit	Unit of Measure
Benzene	<0.2	ug/L	0.2	ug/L
Toluene	<0.2	ug/L	0.2	ug/L
Ethylbenzene	<0.2	ug/L	0.2	ug/L
m,p-Xylene	<0.2	ug/L	0.2	ug/L
o-Xylene	<0.2	ug/L	0.2	ug/L
TOTAL		<0.2		ug/L

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

Approved by: 

Date: *1/28/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *28-Jan-97*
COC No.: *5734*
Sample No.: *13518*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9701241030; MW-2*
Sampled by: *MS/MG*
Analyzed by: *DC*
Sample Matrix: *Liquid*

Date: *24-Jan-97* Time: *10:30*
Date: *27-Jan-97*

Laboratory Analysis

Parameter	Result	Unit of Measure	Detection Limit	Unit of Measure
Benzene	6.3	ug/L	0.2	ug/L
Toluene	28.9	ug/L	0.2	ug/L
Ethylbenzene	5.9	ug/L	0.2	ug/L
m,p-Xylene	25.0	ug/L	0.2	ug/L
o-Xylene	0.5	ug/L	0.2	ug/L
	TOTAL	66.5	ug/L	

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

Approved by: *[Signature]*
Date: *1/28/97*

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- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *28-Jan-97*
COC No.: *5734*
Sample No.: *13519*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9701241100; MW-3*
Sampled by: *MS/MG*
Analyzed by: *DC*
Sample Matrix: *Liquid*

Date: *24-Jan-97* Time: *11:00*
Date: *27-Jan-97*

Laboratory Analysis

<i>Parameter</i>	<i>Result</i>	<i>Unit of Measure</i>	<i>Detection Limit</i>	<i>Unit of Measure</i>
<i>Benzene</i>	<i>1.6</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Toluene</i>	<i>1.1</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Ethylbenzene</i>	<i>3.4</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>m,p-Xylene</i>	<i>2.7</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>o-Xylene</i>	<i>0.5</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>TOTAL</i>	<i>9.4</i>	<i>ug/L</i>		

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

Approved by: *[Signature]*
Date: *1/28/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *28-Jan-97*
COC No.: *5734*
Sample No.: *13520*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9701241130; MW-4*
Sampled by: *MS/MG*
Analyzed by: *DC*
Sample Matrix: *Liquid*

Date: *24-Jan-97* Time: *11:30*
Date: *27-Jan-97*

Laboratory Analysis

Parameter	Result	Unit of Measure	Detection Limit	Unit of Measure
<i>Benzene</i>	<i>43.8</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Toluene</i>	<i>42.0</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Ethylbenzene</i>	<i>39.6</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>m,p-Xylene</i>	<i>161.8</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>o-Xylene</i>	<i>20.2</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>TOTAL</i>	<i>307.4</i>	<i>ug/L</i>		

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

Approved by: *[Signature]*
Date: *1/28/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
Company: *PNM Gas Services*
Address: *603 W. Elm*
City, State: *Farmington, NM 87401*

Date: *28-Jan-97*
COC No.: *5734*
Sample No.: *13521*
Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
Project Location: *9701241200; MW-5*
Sampled by: *MS/MG*
Analyzed by: *DC*
Sample Matrix: *Liquid*

Date: *24-Jan-97* Time: *12:00*
Date: *27-Jan-97*

Laboratory Analysis

<i>Parameter</i>	<i>Result</i>	<i>Unit of Measure</i>	<i>Detection Limit</i>	<i>Unit of Measure</i>
<i>Benzene</i>	<i>5.0</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Toluene</i>	<i>29.0</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>Ethylbenzene</i>	<i>4.8</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>m,p-Xylene</i>	<i>24.7</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
<i>o-Xylene</i>	<i>0.8</i>	<i>ug/L</i>	<i>0.2</i>	<i>ug/L</i>
	<i>TOTAL</i>	<i>64.2</i>		<i>ug/L</i>

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

Approved by: *[Signature]*
Date: *1/28/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-5667



LAB: (505) 325-1556

QUALITY ASSURANCE REPORT

for EPA Method 8020

Date Analyzed: 27-Jan-97

Internal QC No.: 0527-STD

Surrogate QC No.: 0528-STD

Reference Standard QC No.: 0417-QC

Method Blank

Parameter	Result	Unit of Measure
Average Amount of All Analytes In Blank	<0.2	ppb

Calibration Check

Parameter	Unit of Measure	True Value	Analyzed Value	% Diff	Limit
Benzene	ppb	20.0	18.9	6	15%
Toluene	ppb	20.0	19.4	3	15%
Ethylbenzene	ppb	20.0	19.8	1	15%
m,p-Xylene	ppb	40.0	38.5	4	15%
o-Xylene	ppb	20.0	19.5	2	15%

Matrix Spike

Parameter	1 - Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Benzene	98	93	(39-150)	4	20%
Toluene	103	98	(46-148)	4	20%
Ethylbenzene	105	100	(32-160)	4	20%
m,p-Xylene	103	97	(35-145)	4	20%
o-Xylene	104	99	(35-145)	3	20%

Surrogate Recoveries

Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered	Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered
Limit Percent Recovered	(70-130)		Limit Percent Recovered	(70-130)	
13517-5734	97				
13518-5734	94				
13519-5734	91				
13520-5734	92				
13521-5734	95				

S1: Fluorobenzene

PC

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
 Company: *PNM Gas Services*
 Address: *603 W. Elm*
 City, State: *Farmington, NM 87401*

Date: *28-Jan-97*
 COC No.: *5734*
 Sample ID: *13517*
 Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
 Project Location: *9701241000; MW1*
 Sampled by: *MS*
 Analyzed by: *HR*

Date: *24-Jan-97* Time: *10:00*
 Date: *28-Jan-97*

Laboratory Analysis

Parameter	Result	Unit of Measure	Result	Unit of Measure
Cations				
Sodium <i>Na</i>	105	mg/L	4.57	me/L
Calcium <i>Ca</i>	119	mg/L	5.94	me/L
Magnesium <i>Mg</i>	13.9	mg/L	1.14	me/L
Potassium <i>K</i>	2.6	mg/L	0.07	me/L
Anions				
Chloride <i>Cl</i>	17.8	mg/L	0.50	me/L
Sulfate <i>SO4</i>	299	mg/L	6.23	me/L
Carbonate <i>CO3 as CaCO3</i>	< 1	mg/L	< 0.01	me/L
Bicarbonate <i>HCO3 as CaCO3</i>	302	mg/L	4.95	me/L
Hydroxide <i>OH as CaCO3</i>	< 1	mg/L	< 0.01	me/L
Total Dissolved Solids				
Calculated, Sum of Cation/Anion	859	mg/L	Cation-Anion Balance 0.04 Difference Cation-Anion, me/L 23.39 Total Cation-Anion, me/L 0.2 % Difference Cation-Anion Comments	
Total Dissolved Solids Dried @ 180 C	808	mg/L		
pH	7.39			
Conductivity @ 25 C	1114	uS/cm		
Total Hardness as CaCO3	354	mg/L		

Approved by: *[Signature]*Date: *2/3/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: **Denver Bearden**
 Company: **PNM Gas Services**
 Address: **603 W. Elm**
 City, State: **Farmington, NM 87401**

Date: **28-Jan-97**
 COC No.: **5734**
 Sample ID: **13518**
 Job No.: **2-1000**

Project Name: **PNM Gas Services - Mangum 1E**
 Project Location: **9701241030; MW2**
 Sampled by: **MS**
 Analyzed by: **HR**

Date: **24-Jan-97** Time: **10:30**
 Date: **28-Jan-97**

Laboratory Analysis

Parameter	Result	Unit of Measure	Result	Unit of Measure
Cations				
Sodium Na	153	mg/L	6.66	me/L
Calcium Ca	182	mg/L	9.08	me/L
Magnesium Mg	22.3	mg/L	1.84	me/L
Potassium K	3.9	mg/L	0.10	me/L
Anions				
Chloride Cl	22.9	mg/L	0.65	me/L
Sulfate SO4	557	mg/L	11.60	me/L
Carbonate CO3 as CaCO3	< 1	mg/L	< 0.01	me/L
Bicarbonate HCO3 as CaCO3	355	mg/L	5.82	me/L
Hydroxide OH as CaCO3	< 1	mg/L	< 0.01	me/L
Total Dissolved Solids				
Calculated, Sum of Cation/Anion	1296	mg/L	Cation-Anion Balance 0.39 Difference Cation-Anion, me/L 35.73 Total Cation-Anion, me/L 1.1 % Difference Cation-Anion Comments	
Total Dissolved Solids Dried @ 180 C	1238	mg/L		
pH	7.35			
Conductivity @ 25 C	1627	uS/cm		
Total Hardness as CaCO3	546	mg/L		

Approved by: *JaG*
 Date: *2/3/97*

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: *Denver Bearden*
 Company: *PNM Gas Services*
 Address: *603 W. Elm*
 City, State: *Farmington, NM 87401*

Date: *28-Jan-97*
 COC No.: *5734*
 Sample ID: *13519*
 Job No.: *2-1000*

Project Name: *PNM Gas Services - Mangum 1E*
 Project Location: *9701241100; MW3*
 Sampled by: *MS*
 Analyzed by: *HR*

Date: *24-Jan-97* Time: *11:00*
 Date: *28-Jan-97*

Laboratory Analysis

Parameter	Result	Unit of Measure		Result	Unit of Measure	
Cations						
Sodium <i>Na</i>	117	mg/L		5.09	me/L	
Calcium <i>Ca</i>	194	mg/L		9.68	me/L	
Magnesium <i>Mg</i>	24.0	mg/L		1.97	me/L	
Potassium <i>K</i>	2.7	mg/L		0.07	me/L	
Anions						
Chloride <i>Cl</i>	17.5	mg/L		0.49	me/L	
Sulfate <i>SO4</i>	462	mg/L		9.62	me/L	
Carbonate <i>CO3 as CaCO3</i>	<1	mg/L		<0.01	me/L	
Bicarbonate <i>HCO3 as CaCO3</i>	412	mg/L		6.75	me/L	
Hydroxide <i>OH as CaCO3</i>	<1	mg/L		<0.01	me/L	
Total Dissolved Solids			Cation-Anion Balance 0.05 Difference Cation-Anion, me/L 33.68 Total Cation-Anion, me/L 0.1 % Difference Cation-Anion Comments			
Calculated, Sum of Cation/Anion	1229	mg/L				
Total Dissolved Solids						
Dried @ 180 C	1146	mg/L				
pH	7.34					
Conductivity @ 25 C	1531	uS/cm				
Total Hardness as CaCO3	583	mg/L				

Approved by: *DaG*
 Date: *2/3/97*

OFF: (505) 325-5667

ON SITE

TECHNOLOGIES, LTD.

LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: **Denver Bearden**
 Company: **PNM Gas Services**
 Address: **603 W. Elm**
 City, State: **Farmington, NM 87401**

Date: **28-Jan-97**
 COC No.: **5734**
 Sample ID: **13520**
 Job No.: **2-1000**

Project Name: **PNM Gas Services - Mangum 1E**
 Project Location: **9701241130; MW4**
 Sampled by: **MS**
 Analyzed by: **HR**

Date: **24-Jan-97** Time: **11:30**
 Date: **28-Jan-97**

Laboratory Analysis

Parameter	Result	Unit of Measure	Result	Unit of Measure
Cations				
Sodium <i>Na</i>	112	mg/L	4.87	me/L
Calcium <i>Ca</i>	168	mg/L	8.38	me/L
Magnesium <i>Mg</i>	18.6	mg/L	1.53	me/L
Potassium <i>K</i>	2.7	mg/L	0.07	me/L
Anions				
Chloride <i>Cl</i>	19.3	mg/L	0.54	me/L
Sulfate <i>SO4</i>	395	mg/L	8.22	me/L
Carbonate <i>CO3 as CaCO3</i>	<1	mg/L	<0.01	me/L
Bicarbonate <i>HCO3 as CaCO3</i>	360	mg/L	5.90	me/L
Hydroxide <i>OH as CaCO3</i>	<1	mg/L	<0.01	me/L
Total Dissolved Solids				
Calculated, Sum of Cation/Anion	1076	mg/L	Cation-Anion Balance 0.19 Difference Cation-Anion, me/L 29.52 Total Cation-Anion, me/L 0.6 % Difference Cation-Anion	
Total Dissolved Solids				
Dried @ 180 C	1028	mg/L		
pH	7.40			
Conductivity @ 25 C	1373	uS/cm	Comments	
Total Hardness as CaCO3	496	mg/L		

Approved by: *Dale*Date: *2/3/97*

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-5667



LAB: (505) 325-1556

ANALYTICAL REPORT

Attn: **Denver Bearden**
 Company: **PNM Gas Services**
 Address: **603 W. Elm**
 City, State: **Farmington, NM 87401**

Date: **28-Jan-97**
 COC No.: **5734**
 Sample ID: **13521**
 Job No.: **2-1000**

Project Name: **PNM Gas Services - Mangum 1E**
 Project Location: **9701241200; MW5**
 Sampled by: **MS**
 Analyzed by: **HR**

Date: **24-Jan-97** Time: **12:00**
 Date: **28-Jan-97**

Laboratory Analysis

Parameter	Result	Unit of Measure		Result	Unit of Measure	
Cations						
Sodium Na	153	mg/L		6.66	me/L	
Calcium Ca	181	mg/L		9.03	me/L	
Magnesium Mg	22.7	mg/L		1.87	me/L	
Potassium K	3.9	mg/L		0.10	me/L	
Anions						
Chloride Cl	20.3	mg/L		0.57	me/L	
Sulfate SO ₄	564	mg/L		11.74	me/L	
Carbonate CO ₃ as CaCO ₃	<1	mg/L		<0.01	me/L	
Bicarbonate HCO ₃ as CaCO ₃	358	mg/L		5.87	me/L	
Hydroxide OH as CaCO ₃	<1	mg/L		<0.01	me/L	
Total Dissolved Solids			Cation-Anion Balance 0.53 Difference Cation-Anion, me/L 35.84 Total Cation-Anion, me/L 1.5 % Difference Cation-Anion Comments			
Calculated, Sum of Cation/Anion	1303	mg/L				
Total Dissolved Solids						
Dried @ 180 C	1236	mg/L				
pH	7.35					
Conductivity @ 25 C	1630	uS/cm				
Total Hardness as CaCO ₃	545	mg/L				

Approved by: *[Signature]*
 Date: **2/3/97**

P.O. BOX 2606 • FARMINGTON, NM 87499

- TECHNOLOGY BLENDING INDUSTRY WITH THE ENVIRONMENT -

OFF: (505) 325-5667



LAB: (505) 325-1556

QUALITY ASSURANCE REPORT*Cation/Anion Balance***Date: 28-Jan-97****Quality Control Sample**

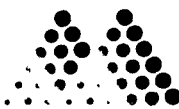
<i>Parameter</i>	<i>Laboratory Identification</i>	<i>True Value</i>	<i>Analyzed Value</i>	<i>Unit of Measure</i>	<i>% Diff</i>	<i>Limit % Diff</i>
Sodium, Na	0509-QC	3.60	3.64	mg/L	1	10
Calcium, Ca	0462-QC	2.18	2.13	mg/L	-2	10
Magnesium, Mg	0462-QC	1.14	1.15	mg/L	1	10*
Potassium, K	0509-QC	2.24	2.19	mg/L	-2	10
Chloride, Cl	0522-QC	95	97	mg/L	2	10
Sulfate, SO ₄	0522-QC	149	145	mg/L	-3	10
Alkalinity	0522-QC	209	224	mg/L	7	10
pH	0522-QC	9.08	9.26		2	10
Conductivity	0522-QC	1280	1144	uS/cm	-11	15
Total Dissolved Solids, 180C	0522-QC	959	938	uS/cm	-2	15

Matrix Spike

<i>Parameter</i>	<i>Laboratory Identification</i>	<i>Analyzed Value</i>	<i>Matrix Spike</i>	<i>Spike Value</i>	<i>Unit of Measure</i>	<i>Spike Recovery</i>
Sodium, Na	13521-5734	1.91	0.50	2.29	mg/L	95%
Calcium, Ca	13521-5734	2.26	0.50	2.72	mg/L	99%
Magnesium, Mg	13521-5734	1.14	0.50	1.67	mg/L	102%
Potassium, K	13521-5734	1.94	0.50	2.40	mg/L	98%

Method Blank

<i>Parameter</i>	<i>Laboratory Identification</i>	<i>Analyzed Value</i>	<i>Unit of Measure</i>
Sodium, Na	LF-Blank	<0.2	mg/L
Calcium, Ca	LF-Blank	<0.05	mg/L
Magnesium, Mg	LF-Blank	<0.05	mg/L
Potassium, K	LF-Blank	<0.05	mg/L
Chloride, Cl	LF-Blank	<3 X DL	mg/L
Sulfate, SO ₄	LF-Blank	<1	mg/L
Conductivity	LF-Blank	<2	uS/cm



Mountain States Analytical

The Quality Solution

RECEIVED FEB 18 1997

RECEIVED FEB 18 1997

February 10, 1997

Mr. David Cox
On Site Technologies, Ltd.
612 E Murray Drive
Farmington, NM 87401

Reference:

Project: Mangum IE
Project No.: PNM 1002
MSAI Group: 15069

Dear Mr. Cox:

Enclosed are the analytical results for your project referenced above. The following samples are included in the report.

13517-5734 (Dissolved)

13518-5734 (Dissolved)

All holding times were met for the tests performed on these samples.

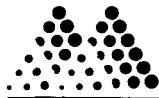
If the report is acceptable, please approve the enclosed invoice and forward it for payment.

Thank you for selecting Mountain States Analytical, Inc. to serve as your analytical laboratory on this project. If you have any questions concerning these results, please feel free to contact me at any time.

We look forward to working with you on future projects.

With Regards,

Rolf E. Larsen
Project Manager



Mountain States Analytical

The Quality Solution

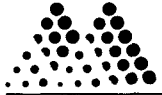
On Site Technologies, Ltd.
612 E Murray Drive
Farmington, NM 87401

Attn: Mr. David Cox
Project: Mangum IE

Sample ID: 13517-5734 (Dissolved)
Matrix: Waste Water

MSAI Sample: 58387
MSAI Group: 15069
Date Reported: 02/10/97
Discard Date: 03/12/97
Date Submitted: 01/28/97
Date Sampled: 01/24/97
Collected by:
Purchase Order: 5734
Project No.: PNM 1002

Test	Analysis	Results as Received	Units	Method Detection Limit
0249D	Cadmium by ICP, Dissolved w/ww Method: SW-846 6010A	ND	mg/l	0.004
0251F	Chromium by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.010
0255F	Lead by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.040
0259F	Mercury by CVAA, w/ww Diss, 245.1 Method: SW-846 245.1	0.0005	mg/l	0.0001
0266D	Silver by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.006
0392I	Flame/ICP Prep for Metals, Waters Method: SW-846 3005A	Complete		
0392M	Mercury Prep CVAA, Waters Method: SW-846 7470	Complete		
0401	Prep for HAA, ww Method: SW-846 7061A	Complete		
1045I	Arsenic by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.030
1450	Selenium by HAA, ww Diss, 7741 Method: SW-846 7741	ND	mg/l	0.003
2541B	Barium by ICP, Dissolved Method: SW-846 6010A	0.047	mg/l	0.003



Mountain States Analytical

The Quality Solution

Page 2

On Site Technologies, Ltd.

Sample ID: 13517-5734 (Dissolved)

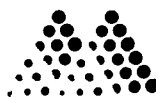
MSAI Sample: 58387

MSAI Group: 15069

Test	Analysis	Results as Received	Units	Method Detection Limit
-----	-----	-----	-----	-----
0939	Sample Filtering Method: MSAI IN-HOUSE	Complete		

Respectfully Submitted,
Reviewed and Approved by:

Rolf E. Larsen
Project Manager



Mountain States Analytical

The Quality Solution

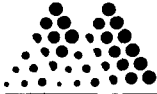
On Site Technologies, Ltd.
612 E Murray Drive
Farmington, NM 87401

Attn: Mr. David Cox
Project: Mangum IE

Sample ID: 13518-5734 (Dissolved)
Matrix: Waste Water

MSAI Sample: 58388
MSAI Group: 15069
Date Reported: 02/10/97
Discard Date: 03/12/97
Date Submitted: 01/28/97
Date Sampled: 01/24/97
Collected by:
Purchase Order: 5734
Project No.: PNM 1002

Test Analysis	Results as Received	Units	Method Detection Limit
0249D Cadmium by ICP, Dissolved w/ww Method: SW-846 6010A	ND	mg/l	0.004
0251F Chromium by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.010
0255F Lead by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.040
0259F Mercury by CVAA, w/ww Diss, 245.1 Method: SW-846 245.1	ND	mg/l	0.0001
0266D Silver by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.006
0392I Flame/ICP Prep for Metals, Waters Method: SW-846 3005A	Complete		
0392M Mercury Prep CVAA, Waters Method: SW-846 7470	Complete		
0401 Prep for HAA, ww Method: SW-846 7061A	Complete		
045I Arsenic by ICP, Dissolved Method: SW-846 6010A	ND	mg/l	0.030
450 Selenium by HAA, ww Diss, 7741 Method: SW-846 7741	ND	mg/l	0.003
541B Barium by ICP, Dissolved Method: SW-846 6010A	0.034	mg/l	0.003



Mountain States Analytical

The Quality Solution

On Site Technologies, Ltd.

Sample ID: 13518-5734 (Dissolved)

Page 2

MSAI Sample: 58388

MSAI Group: 15069

Test	Analysis	Results as Received	Units	Method Detection Limit
----	-----	-----	-----	-----
0939	Sample Filtering Method: MSAI IN-HOUSE	Complete		

Respectfully Submitted,
Reviewed and Approved by:


Rolf E. Larsen
Project Manager

Analysis Batch Number: 0259B-02/07/97-107 -1

Test Identification : 0259B-Mercury by CVAA, w/ww, SW-846

Sequence : 0259T-1

Number of Samples : 19

Batch Data-Date/Time : 02/10/97 / 11:10:41

BLANK#	ANALYTE	CONC FOUND #	CONC LIMIT
PBW-895	Mercury	0.0400	0.1000
PBW-894-2	Mercury	0.0600	0.1000

						QC LIMITS	
SAMPLE#	ANALYTE	CONC ADDED	CONC SAMPLE	CONC SPIKE	% REC #	LOWER	UPPER
15164-58758	Mercury	1.0000	0.0700	0.9300	86.0	80.0	120.0
15088-58436-2	Mercury	1.0000	0.1500	1.0100	86.0	80.0	120.0

						QC LIMITS			
SAMPLE#	ANALYTE	CONC ADDED	CONC SAMPLE	RESULT 2	%REC2 #	LOWER	UPPER	RPD #	LIMIT
15164-58758	Mercury	1.0000	0.0700	0.9200	85.0	80.0	120.0	1.2	20.0
15088-58436-2	Mercury	1.0000	0.1500	0.9700	82.0	80.0	120.0	4.8	20.0

DUPLICATE						
SAMPLE#	ANALYTE	RESULT 1	RESULT 2	RPD #	LIMIT	DILUTION
15164-58758	Mercury	0.0000	0.0000	0.0	20.0	1.00
15088-58436-2	Mercury	0.1500	0.1000	40.0(3a)	20.0	1.00

					QC LIMITS	
SAMPLE#	ANALYTE	CONC FOUND	CONC KNOWN	% REC #	LOWER	UPPER
LCSW-895	Mercury	2.5500	2.5000	102.0	80.0	120.0
LCSW-894-2	Mercury	2.5400	2.5000	101.6	80.0	120.0

QC LIMITS						
CCV #	ANALYTE	TRUE VALUE	BATCH READ	% REC #	LOWER	UPPER
ICV-	Mercury	3.0000	3.1800	106.0	90.0	110.0
CCV--2	Mercury	5.0000	5.0100	100.2	80.0	120.0
CCV--3	Mercury	5.0000	5.2800	105.6	80.0	120.0
CCV--4	Mercury	5.0000	5.2000	104.0	80.0	120.0
ICV--5	Mercury	3.0000	2.9300	97.7	90.0	110.0
CCV--6	Mercury	5.0000	5.0200	100.4	80.0	120.0
CCV--7	Mercury	5.0000	5.1700	103.4	80.0	120.0
CCV--8	Mercury	5.0000	5.0700	101.4	80.0	120.0
CCV--9	Mercury	5.0000	5.1000	102.0	80.0	120.0

CB#	ANALYTE	CONC FOUND #	CONC LIMIT
CB-	Mercury	0.0100	0.1000
CB-	Mercury	-0.0300	0.1000
CB-	Mercury	-0.0300	0.1000
CB-	Mercury	-0.0400	0.1000
CB-	Mercury	-0.0400	0.1000
CB-	Mercury	ND	0.1000
CB-	Mercury	0.0200	0.1000
CB-	Mercury	0.0100	0.1000

----- Result Footnotes -----

3a) - Duplicate is valid because result is <5x the detection limit

Mountain States Analytical, Inc.
Daily QC Batching Data
Data Released for Reporting

02/10/97
11:45:33
Group: 15069

Analysis Batch Number: 0259B-02/07/97-107 -1

Test Identification : 0259B-Mercury by CVAA, w/ww, SW-846

Sequence : 0259T-1

Number of Samples : 19

Batch Data-Date/Time : 02/10/97 / 11:10:41

Groups & Samples

15028-58161	15028-58162	15028-58163	15046-58297	15046-58298	15046-58299	15046-58300	15069-58387
15069-58388	15088-58436	15088-58437	15088-58662	15088-58663	15132-58595	15164-58758	15164-58761
15164-58762	15164-58763	15164-58764					

Mountain States Analytical, Inc.
Daily QC Batching Data
Data Released for Reporting

02/10/97
11:45:34
Group: 15069

Analysis Batch Number: 1458 -02/04/97-061 -1

Test Identification : 1458 -Selenium by HAA, ww, SW846 7741

Sequence : DAAB035

Number of Samples : 7

Batch Data-Date/Time : 02/07/97 / 17:39:35

		QC LIMITS				
CCV #	ANALYTE	TRUE VALUE	BATCH READ	% REC #	LOWER	UPPER
ICV-	Selenium	0.0500	0.0503	100.6	80.0	120.0
CCV1--2	Selenium	0.0500	0.0407	81.4	80.0	120.0

CCB#	ANALYTE	CONC FOUND #	CONC LIMIT
ICB-	Selenium	0.0013	0.0030
CCB1-	Selenium	0.0026	0.0030

Groups & Samples

14906-57650 14906-57651 14906-57663 14906-57664 14917-57699 15069-58387 15069-58388

Analysis Batch Number: ICPWA-02/03/97-061 -1

Test Identification : ICPWA-Metals by ICP

Sequence : DATC034

Number of Samples : 12

Batch Data-Date/Time : 02/04/97 / 09:02:21

BLANK#	ANALYTE	CONC FOUND #	CONC LIMIT
PBW1-886	Silver	0.0017	0.0060
	Aluminum	0.0024	0.0500
	Arsenic	0.0010	0.0300
	Boron	ND	0.0400
	Barium	0.0011	0.0030
	Beryllium	0.0001	0.0002
	Cadmium	ND	0.0040
	Cobalt	0.0008	0.0040
	Chromium	0.0022	0.0100
	Copper	0.0033	0.0100
	Manganese	0.0001	0.0020
	Lead	0.0108	0.0400
	Antimony	ND	0.1000
	Selenium	0.0335	0.0700
	Thallium	0.0570	0.1000
	Vanadium	0.0005	0.0030
	Zinc	ND	0.0300
PBW2-886-2	Silver	0.0004	0.0060
	Aluminum	ND	0.0500
	Arsenic	ND	0.0300
	Boron	ND	0.0400
	Barium	0.0004	0.0030
	Beryllium	ND	0.0002
	Cadmium	ND	0.0040
	Cobalt	ND	0.0040
	Chromium	0.0022	0.0100
	Copper	0.0028	0.0100
	Manganese	0.0020	0.0020
	Lead	0.0080	0.0400
	Antimony	ND	0.1000
	Selenium	ND	0.0700
	Thallium	0.0040	0.1000
	Vanadium	ND	0.0030
	Zinc	0.0020	0.0300

SPIKE

SAMPLE#	ANALYTE	CONC ADDED	CONC SAMPLE	CONC SPIKE	% REC #	QC LIMITS	
						LOWER	UPPER
5069-58387	Silver	0.0500	-0.0010	0.0477	97.4	80.0	120.0
	Aluminum	2.0000	0.0050	2.0207	100.8	80.0	120.0
	Arsenic	2.0000	0.0009	2.0069	100.3	80.0	120.0
	Boron	0.5000	0.0835	0.6428	111.9	80.0	120.0
	Barium	2.0000	0.0472	1.9585	95.6	80.0	120.0
	Beryllium	0.0500	0.0000	0.0493	98.6	80.0	120.0
	Cadmium	0.0500	-0.0008	0.0464	94.4	80.0	120.0
	Cobalt	0.5000	0.0010	0.4714	94.1	80.0	120.0
	Chromium	0.2000	0.0017	0.1939	96.1	80.0	120.0
	Copper	0.2500	0.0024	0.2456	97.3	80.0	120.0
	Manganese	0.5000	2.1011	2.5507	89.9	80.0	120.0
	Lead	0.5000	-0.0131	0.4916	100.9	80.0	120.0
	Antimony	0.5000	0.0338	0.4643	86.1	80.0	120.0

Mountain States Analytical, Inc.
Daily QC Batching Data
Data Released for Reporting

02/10/97
11:45:40
Group: 15069

Analysis Batch Number: ICPWA-02/03/97-061 -1

Test Identification : ICPWA-Metals by ICP

Sequence : DATC034

Number of Samples : 12

Batch Data-Date/Time : 02/04/97 / 09:02:21

						QC LIMITS	
SAMPLE#	ANALYTE	CONC ADDED	CONC SAMPLE	CONC SPIKE	% REC #	LOWER	UPPER
15069-58387	Selenium	2.0000	-0.0058	1.9913	99.9	80.0	120.0
	Thallium	2.0000	0.0502	1.9975	97.4	80.0	120.0
	Vanadium	0.5000	-0.0003	0.4923	98.5	80.0	120.0
	Zinc	0.5000	0.0251	0.5237	99.7	80.0	120.0

						QC LIMITS			
SAMPLE#	ANALYTE	CONC ADDED	CONC SAMPLE	RESULT 2	%REC2 #	LOWER	UPPER	RPD #	LIMIT
15069-58387	Silver	0.0500	-0.0010	0.0495	101.0	80.0	120.0	3.6	20.0
	Aluminum	2.0000	0.0050	1.9859	99.0	80.0	120.0	1.8	20.0
	Arsenic	2.0000	0.0009	1.9775	98.8	80.0	120.0	1.5	20.0
	Boron	0.5000	0.0835	0.5905	101.4	80.0	120.0	9.8	20.0
	Barium	2.0000	0.0472	1.9334	94.3	80.0	120.0	1.4	20.0
	Beryllium	0.0500	0.0000	0.0483	96.6	80.0	120.0	2.0	20.0
	Cadmium	0.0500	-0.0008	0.0478	97.2	80.0	120.0	2.9	20.0
	Cobalt	0.5000	0.0010	0.4654	92.9	80.0	120.0	1.3	20.0
	Chromium	0.2000	0.0017	0.1905	94.4	80.0	120.0	1.8	20.0
	Copper	0.2500	0.0024	0.2435	96.4	80.0	120.0	0.9	20.0
	Manganese	0.5000	2.1011	2.5190	83.6	80.0	120.0	7.3	20.0
	Lead	0.5000	-0.0131	0.4835	99.3	80.0	120.0	1.6	20.0
	Antimony	0.5000	0.0338	0.4774	88.7	80.0	120.0	3.0	20.0
	Selenium	2.0000	-0.0058	1.9427	97.4	80.0	120.0	2.5	20.0
	Thallium	2.0000	0.0502	1.9504	95.0	80.0	120.0	2.5	20.0
	Vanadium	0.5000	-0.0003	0.4848	97.0	80.0	120.0	1.5	20.0
	Zinc	0.5000	0.0251	0.5006	95.1	80.0	120.0	4.7	20.0

SAMPLE#	ANALYTE	RESULT 1	RESULT 2	RPD #	LIMIT	DILUTION
15069-58387	Silver	-0.0010	0.0000	200.0(11)	20.0	1.00
	Aluminum	0.0050	0.0000	200.0(11)	20.0	1.00
	Arsenic	0.0009	0.0023	87.5(11)	20.0	1.00
	Boron	0.0835	0.0814	2.5	20.0	1.00
	Barium	0.0472	0.0467	1.1	20.0	1.00
	Beryllium	0.0000	0.0000	0.0	20.0	1.00
	Cadmium	-0.0008	0.0000	200.0(11)	20.0	1.00
	Cobalt	0.0010	0.0020	66.7(11)	20.0	1.00
	Chromium	0.0017	0.0035	69.2(11)	20.0	1.00
	Copper	0.0024	0.0038	45.2(11)	20.0	1.00
	Manganese	2.1011	2.0926	0.4	20.0	1.00
	Lead	-0.0131	0.0000	200.0(11)	20.0	1.00
	Antimony	0.0338	0.0187	57.5(11)	20.0	1.00
	Selenium	-0.0058	0.0096	810.5(11)	20.0	1.00
	Thallium	0.0502	0.0537	6.7	20.0	1.00
	Vanadium	-0.0003	0.0000	200.0(11)	20.0	1.00
	Zinc	0.0251	0.0243	3.2	20.0	1.00

					QC LIMITS	
SAMPLE#	ANALYTE	CONC FOUND	CONC KNOWN	% REC #	LOWER	UPPER
15069-886	Silver	0.0542	0.0500	108.4	80.0	120.0
	Aluminum	1.9775	2.0000	98.9	80.0	120.0

Analysis Batch Number: ICPWA-02/03/97-061 -1

Test Identification : ICPWA-Metals by ICP

Sequence : DATC034

Number of Samples : 12

Batch Data-Date/Time : 02/04/97 / 09:02:21

CONTROL						QC LIMITS	
SAMPLE#	ANALYTE	CONC FOUND	CONC KNOWN	% REC #		LOWER	UPPER
LCSW-886	Arsenic	2.0167	2.0000	100.8		80.0	120.0
	Boron	0.5172	0.5000	103.4		80.0	120.0
	Barium	1.9523	2.0000	97.6		80.0	120.0
	Beryllium	0.0504	0.0500	100.8		80.0	120.0
	Cadmium	0.0492	0.0500	98.4		80.0	120.0
	Cobalt	0.4851	0.5000	97.0		80.0	120.0
	Chromium	0.1987	0.2000	99.4		80.0	120.0
	Copper	0.2514	0.2500	100.6		80.0	120.0
	Manganese	0.4892	0.5000	97.8		80.0	120.0
	Lead	0.4978	0.5000	99.6		80.0	120.0
	Antimony	0.4312	0.5000	86.2		80.0	120.0
	Selenium	2.0252	2.0000	101.3		80.0	120.0
	Thallium	1.9723	2.0000	98.6		80.0	120.0
	Vanadium	0.5001	0.5000	100.0		80.0	120.0
	Zinc	0.5039	0.5000	100.8		80.0	120.0

						QC LIMITS	
CCV #	ANALYTE	TRUE VALUE	BATCH READ	% REC #		LOWER	UPPER
ICV-	Silver	0.4000	0.3795	94.9		90.0	110.0
	Aluminum	20.0000	19.3909	97.0		90.0	110.0
	Arsenic	1.6000	1.5801	98.8		90.0	110.0
	Boron	0.8000	0.7855	98.2		90.0	110.0
	Barium	4.0000	3.7291	93.2		90.0	110.0
	Beryllium	0.4000	0.3875	96.9		90.0	110.0
	Cadmium	4.0000	3.7817	94.5		90.0	110.0
	Cobalt	0.8000	0.7565	94.6		90.0	110.0
	Chromium	4.0000	3.8150	95.4		90.0	110.0
	Copper	4.0000	3.7864	94.7		90.0	110.0
	Manganese	4.0000	3.7644	94.1		90.0	110.0
	Lead	20.0000	18.6474	93.2		90.0	110.0
	Antimony	4.0000	3.8254	95.6		90.0	110.0
	Selenium	1.6000	1.5227	95.2		90.0	110.0
	Thallium	4.0000	3.8074	95.2		90.0	110.0
	Vanadium	1.6000	1.5412	96.3		90.0	110.0
CV1--2	Zinc	4.0000	3.8291	95.7		90.0	110.0
	Silver	0.4000	0.3789	94.7		90.0	110.0
	Aluminum	20.0000	19.6006	98.0		90.0	110.0
	Arsenic	1.6000	1.5679	98.0		90.0	110.0
	Boron	0.8000	0.7843	98.0		90.0	110.0
	Barium	4.0000	3.7754	94.4		90.0	110.0
	Beryllium	0.4000	0.3903	97.6		90.0	110.0
	Cadmium	4.0000	3.8012	95.0		90.0	110.0
	Cobalt	0.8000	0.7614	95.2		90.0	110.0
	Chromium	4.0000	3.8451	96.1		90.0	110.0
	Copper	4.0000	3.8267	95.7		90.0	110.0
	Manganese	4.0000	3.7956	94.9		90.0	110.0
	Lead	20.0000	18.8509	94.3		90.0	110.0
	Antimony	4.0000	3.8293	95.7		90.0	110.0
	Selenium	1.6000	1.5530	97.1		90.0	110.0

Analysis Batch Number: ICPWA-02/03/97-061 -1

Test Identification : ICPWA-Metals by ICP

Sequence : DATC034

Number of Samples : 12

Batch Data-Date/Time : 02/04/97 / 09:02:21

CCV #	ANALYTE	TRUE VALUE	BATCH READ	% REC #	QC LIMITS	
					LOWER	UPPER
CCV1--2	Thallium	4.0000	3.7893	94.7	90.0	110.0
	Vanadium	1.6000	1.5559	97.2	90.0	110.0
	Zinc	4.0000	3.8502	96.3	90.0	110.0
CCV2--3	Silver	0.4000	0.3785	94.6	90.0	110.0
	Aluminum	20.0000	19.8847	99.4	90.0	110.0
	Arsenic	1.6000	1.5961	99.8	90.0	110.0
	Boron	0.8000	0.7997	100.0	90.0	110.0
	Barium	4.0000	3.8573	96.4	90.0	110.0
	Beryllium	0.4000	0.3940	98.5	90.0	110.0
	Cadmium	4.0000	3.7922	94.8	90.0	110.0
	Cobalt	0.8000	0.7645	95.6	90.0	110.0
	Chromium	4.0000	3.8384	96.0	90.0	110.0
	Copper	4.0000	3.8996	97.5	90.0	110.0
	Manganese	4.0000	3.7959	94.9	90.0	110.0
	Lead	20.0000	18.7112	93.6	90.0	110.0
	Antimony	4.0000	3.9356	98.4	90.0	110.0
	Selenium	1.6000	1.5475	96.7	90.0	110.0
	Thallium	4.0000	3.8025	95.1	90.0	110.0
	Vanadium	1.6000	1.5629	97.7	90.0	110.0
	Zinc	4.0000	3.8456	96.1	90.0	110.0
CCV3--4	Silver	0.4000	0.3748	93.7	90.0	110.0
	Aluminum	20.0000	19.4989	97.5	90.0	110.0
	Arsenic	1.6000	1.5642	97.8	90.0	110.0
	Boron	0.8000	0.7863	98.3	90.0	110.0
	Barium	4.0000	3.7557	93.9	90.0	110.0
	Beryllium	0.4000	0.3874	96.9	90.0	110.0
	Cadmium	4.0000	3.7459	93.6	90.0	110.0
	Cobalt	0.8000	0.7526	94.1	90.0	110.0
	Chromium	4.0000	3.7881	94.7	90.0	110.0
	Copper	4.0000	3.8133	95.3	90.0	110.0
	Manganese	4.0000	3.7369	93.4	90.0	110.0
	Lead	20.0000	18.5734	92.9	90.0	110.0
	Antimony	4.0000	3.7774	94.4	90.0	110.0
	Selenium	1.6000	1.5764	98.5	90.0	110.0
	Thallium	4.0000	3.7847	94.6	90.0	110.0
	Vanadium	1.6000	1.5377	96.1	90.0	110.0
	Zinc	4.0000	3.7928	94.8	90.0	110.0
CCV4--5	Silver	0.4000	0.3718	93.0	90.0	110.0
	Aluminum	20.0000	19.3314	96.7	90.0	110.0
	Arsenic	1.6000	1.5454	96.6	90.0	110.0
	Boron	0.8000	0.7759	97.0	90.0	110.0
	Barium	4.0000	3.7131	92.8	90.0	110.0
	Beryllium	0.4000	0.3795	94.9	90.0	110.0
	Cadmium	4.0000	3.6782	92.0	90.0	110.0
	Cobalt	0.8000	0.7440	93.0	90.0	110.0
	Chromium	4.0000	3.7333	93.3	90.0	110.0
	Copper	4.0000	3.7701	94.3	90.0	110.0
	Manganese	4.0000	3.6899	92.2	90.0	110.0
	Lead	20.0000	18.3589	91.8	90.0	110.0

Mountain States Analytical, Inc.
Daily QC Batching Data
Data Released for Reporting

02/10/97
11:45:44
Group: 15069

Analysis Batch Number: ICPWA-02/03/97-061 -1

Test Identification : ICPWA-Metals by ICP

Sequence : DATC034

Number of Samples : 12

Batch Data-Date/Time : 02/04/97 / 09:02:21

CCV #	ANALYTE	QC LIMITS			
		TRUE VALUE	BATCH READ	% REC #	LOWER UPPER
CCV4--5	Antimony	4.0000	3.8479	96.2	90.0 110.0
	Selenium	1.6000	1.5392	96.2	90.0 110.0
	Thallium	4.0000	3.7287	93.2	90.0 110.0
	Vanadium	1.6000	1.5156	94.7	90.0 110.0
	Zinc	4.0000	3.7512	93.8	90.0 110.0

CCB#	ANALYTE	CONC FOUND #	CONC LIMIT
ICB-	Silver	ND	0.0060
	Aluminum	ND	0.0500
	Arsenic	0.0035	0.0300
	Boron	0.0007	0.0400
	Barium	0.0004	0.0030
	Beryllium	ND	0.0002
	Cadmium	ND	0.0040
	Cobalt	0.0007	0.0040
	Chromium	ND	0.0100
	Copper	0.0003	0.0100
	Manganese	ND	0.0020
	Lead	ND	0.0400
	Antimony	0.0167	0.1000
	Selenium	ND	0.0700
	Thallium	0.0293	0.1000
	Vanadium	ND	0.0030
	Zinc	ND	0.0300
CCB1-	Silver	ND	0.0060
	Aluminum	ND	0.0500
	Arsenic	ND	0.0300
	Boron	ND	0.0400
	Barium	ND	0.0030
	Beryllium	ND	0.0002
	Cadmium	0.0001	0.0040
	Cobalt	ND	0.0040
	Chromium	ND	0.0100
	Copper	ND	0.0100
	Manganese	ND	0.0020
	Lead	ND	0.0400
	Antimony	0.0217	0.1000
	Selenium	ND	0.0700
	Thallium	0.0537	0.1000
	Vanadium	ND	0.0030
	Zinc	ND	0.0300
CCB2-	Silver	ND	0.0060
	Aluminum	ND	0.0500
	Arsenic	ND	0.0300
	Boron	ND	0.0400
	Barium	0.0004	0.0030
	Beryllium	ND	0.0002
	Cadmium	ND	0.0040
	Cobalt	ND	0.0040

Analysis Batch Number: ICPWA-02/03/97-061 -1

Test Identification : ICPWA-Metals by ICP

Sequence : DATC034

Number of Samples : 12

Batch Data-Date/Time : 02/04/97 / 09:02:21

CCB#	ANALYTE	CONC FOUND #	CONC LIMIT
CCB2-	Chromium	0.0003	0.0100
	Copper	0.0003	0.0100
	Manganese	ND	0.0020
	Lead	0.0079	0.0400
	Antimony	ND	0.1000
	Selenium	0.0187	0.0700
	Thallium	0.0563	0.1000
	Vanadium	ND	0.0030
	Zinc	ND	0.0300
CCB3-	Silver	0.0005	0.0060
	Aluminum	0.0035	0.0500
	Arsenic	0.0037	0.0300
	Boron	ND	0.0400
	Barium	0.0007	0.0030
	Beryllium	ND	0.0002
	Cadmium	0.0024	0.0040
	Cobalt	ND	0.0040
	Chromium	0.0017	0.0100
	Copper	0.0025	0.0100
	Manganese	0.0004	0.0020
	Lead	0.0249	0.0400
	Antimony	0.0198	0.1000
	Selenium	0.0067	0.0700
	Thallium	0.0101	0.1000
	Vanadium	0.0005	0.0030
	Zinc	ND	0.0300
CCB4-	Silver	0.0026	0.0060
	Aluminum	0.0059	0.0500
	Arsenic	0.0046	0.0300
	Boron	0.0159	0.0400
	Barium	0.0016	0.0030
	Beryllium	ND	0.0002
	Cadmium	0.0008	0.0040
	Cobalt	0.0022	0.0040
	Chromium	0.0057	0.0100
	Copper	0.0066	0.0100
	Manganese	0.0001	0.0020
	Lead	0.0113	0.0400
	Antimony	ND	0.1000
	Selenium	0.0409	0.0700
	Thallium	ND	0.1000
	Vanadium	0.0022	0.0030
	Zinc	ND	0.0300

----- Result Footnotes -----

11) - Both Duplicate results are less than the LOQ.

Mountain States Analytical, Inc.
Daily QC Batching Data
Data Released for Reporting

02/10/97
11:45:46
Group: 15069

Analysis Batch Number: ICPWA-02/03/97-061 -1

Test Identification : ICPWA-Metals by ICP

Sequence : DATC034

Number of Samples : 12

Batch Data-Date/Time : 02/04/97 / 09:02:21

Groups & Samples

14937-57764 14937-57765 14937-57766 14937-57767 14937-57768 14937-57769 14937-57770 15069-58387
15069-58388 15104-58520 15113-58534 15114-58535

Mountain States Analytical, Inc.
Daily QC Batching Data
Data Released for Reporting

02/10/97
11:45:49
Group: 15069

Analysis Batch Number: ICPWA-02/04/97-010 -1

Test Identification : ICPWA-Metals by ICP

Sequence : DATB035

Number of Samples : 3

Batch Data-Date/Time : 02/04/97 / 11:33:03

BLANK#	ANALYTE	CONC FOUND #	CONC LIMIT
PBW1-886	Nickel	0.0037	0.0300
PBW2-886-2	Nickel	0.0055	0.0300

						QC LIMITS	
SAMPLE#	ANALYTE	CONC ADDED	CONC SAMPLE	CONC SPIKE	% REC #	LOWER	UPPER
15069-58387	Nickel	0.5000	0.0080	0.4809	94.6	80.0	120.0

						QC LIMITS			
SAMPLE#	ANALYTE	CONC ADDED	CONC SAMPLE	RESULT 2	%REC2 #	LOWER	UPPER	RPD #	LIMIT
15069-58387	Nickel	0.5000	0.0080	0.4682	92.0	80.0	120.0	2.8	20.0

DUPLICATE						
SAMPLE#	ANALYTE	RESULT 1	RESULT 2	RPD #	LIMIT	DILUTION
15069-58387	Nickel	0.0080	0.0000	200.0(11)	20.0	1.00

					QC LIMITS	
SAMPLE#	ANALYTE	CONC FOUND	CONC KNOWN	% REC #	LOWER	UPPER
LCSW-886	Nickel	0.4816	0.5000	96.3	80.0	120.0

						QC LIMITS	
CCV #	ANALYTE	TRUE VALUE	BATCH READ	% REC #	LOWER	UPPER	
ICV-	Nickel	8.0000	7.4563	93.2	90.0	110.0	
CCV1--2	Nickel	8.0000	7.4165	92.7	90.0	110.0	
CCV2--3	Nickel	8.0000	7.4816	93.5	90.0	110.0	
CCV3--4	Nickel	8.0000	7.4933	93.7	90.0	110.0	
CCV4--5	Nickel	8.0000	7.5007	93.8	90.0	110.0	

ICB#	ANALYTE	CONC FOUND #	CONC LIMIT
ICB-	Nickel	0.0151	0.0300
ICB1-	Nickel	ND	0.0300
ICB2-	Nickel	ND	0.0300
ICB3-	Nickel	0.0085	0.0300
ICB4-	Nickel	ND	0.0300

----- Result Footnotes -----

11) - Both Duplicate results are less than the LOQ.

Groups & Samples

15069-58387 15113-58534 15114-58535

[illegible]

Distribution:	White – On Site	Yellow – LAB	Pink – Sampler	Goldenrod – Client
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CHAIN OF CUSTODY RECORD

5734

Date: 1/24/97

Page 1 of 1

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

Purchase Order No.:		Job No.	
Name: Denver Bearden		Name: Maureen Gannon	
Company: PNM Gas Services		Company: PNM Gas Services	
Address: 603 W. Elm Street		Mailing Address: Alverado Square, Mail Stop 0408	
City, State, Zip: Farmington, NM 87401		City, State, Zip: Albuquerque, NM 87158	
Sampling Location: Mangum 1E		Telephone No.: 505-848-2974	
Telefax No.:		Title:	

Sample ID	LAB ID	ANALYSIS REQUESTED	
		Number of Containers	REPORT RESULTS TO
MW-1 9701241000	13517-5734	4	X
MW-2 9701241030	13578	4	X
MW-3 9701241100	13515	2	X
MW-4 9701241130	13520	2	X
MW-5 9701241200	13521	2	X

Sample ID	LAB ID	ANALYSIS REQUESTED	
		Number of Containers	REPORT RESULTS TO
MW-1 9701241000	13517-5734	4	X
MW-2 9701241030	13578	4	X
MW-3 9701241100	13515	2	X
MW-4 9701241130	13520	2	X
MW-5 9701241200	13521	2	X

Relinquished by:	Date/Time	Received by:	Date/Time
<i>[Signature]</i>	1/24/97 1530	<i>[Signature]</i>	1/24/97 1530
Relinquished by:	Date/Time	Received by:	Date/Time
Relinquished by:	Date/Time	Received by:	Date/Time

Method of Shipment:	24-48 Hours	10 Working Days	Special Instructions:
Authorized by: <i>[Signature]</i> (Client Signature Must Accompany Request)	Date: 1/24/97		Results to be sent to both parties.