3R - 310

REPORTS

DATE:

May 7, 1996

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

May 7, 1996

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

RE: COZZENS B1 GROUNDWATER INVESTIGATION REPORT

Dear Bill:

PNM herein submits the report summarizing our findings of the recent installation and well point sampling at the Cozzens B1 gas wellhead site. PNM excavated the former unlined earthen pit at the site, removed contaminated soil and backfilled with clean fill to surface. The site was then regraded. During and following excavation, PNM installed five well points in order to determine the extent of groundwater contamination, verify groundwater gradient and provide a means for compliance monitoring. This report presents the results of our activities on site related to groundwater and proposes recommendations for future activities at the site.

Please note that the attached hardcopy of the analytical results are a faxed copy of the originals. We are still waiting on the original version but have been told by the laboratory that the results are final. If you require the originals or have any questions, please call me at (505) 241-2974. Thank you, as always.

Sincerely,

Maureen D. Gannon

Maureen Gannon
Project Manager

MDG/COZB104.LTR

Attachments

cc: Colin Adams, PNM
Craig Bock, Meridian Oil
Denver Bearden, PNMGS
Denny Foust, OCD-Aztec Office
Leigh Gooding, WFS
Toni Ristau, PNM

1.0 Introduction

PNM has completed the installation and sampling of five groundwater monitoring wells at the Cozzens B1 gas wellhead site located in section 19, township 29 north, range 11 W. The site is immediately downgradient of the Citizen's Ditch, a clay-lined irrigation channel. Meridian Oil operates this site.

On November 1, 1995, PNM conducted a site assessment at the Cozzens B1. During soil sampling in the pit, groundwater was encountered at approximately 3 feet in depth. We collected a groundwater sample at that time; analytical results provided by On Site Technologies, Farmington, New Mexico, revealed a BTEX concentration of 53 ppm. On December 5, 1995, PNM reported a potential groundwater impact at the site to OCD.

On December 19, PNM performed a second assessment of the site using a backhoe to define the vertical extent of soil contamination. We provided the results of the second investigation and proposed procedures for installing/sampling groundwater monitoring wells to OCD in a letter dated February 15, 1996.[1] We now provide the findings of the installation and sampling of these monitoring wells.

2.0 Soil Remediation

PNM completed source removal of contaminated soil at the Cozzens B1 on February 22, 1996. The final pit excavation was approximately 36 feet by 26 feet by 8 feet. We removed a total of 370 cubic yards of soil; the soil was transported to the Cozzens 5 and Cozzens 2 well pads for landfarming. We excavated a series of trenches to the north, south and southwest of the former pit location and laid 4-inch schedule 80 polyvinyl chloride (PVC) leach line in the bottom of the trenches and excavated pit. Metal turbine caps were installed above grade on each line to complete the passive soil venting network.

3.0 Monitoring Well Installation and Sampling

PNM completed the installation of permanent well points at the Cozzens B1 site on April 10, 1996. Figure 1 provides locations of the new wells and the placement of equipment and operations on site. Where possible, we installed the well points during excavation of contaminated soil. This allowed wells to be strategically placed along and outside the boundaries of the contaminated area. Monitor wells, MW-1 and MW-2 are located on the well pad. Monitor wells, MW-3, MW-4 and MW-5 are located within a 100-foot radius off the well pad to the south and southeast directions, respectively. The Bureau of Land Management granted a temporary use permit for the installation of these wells on March 15, 1996.

Four of the wells (MW-1, MW-2, MW-4 and MW-5) were completed with 2-inch diameter, threaded joint, schedule 40 PVC pipe, precleaned and prepackaged by the manufacturer. The well screens were each 5 feet in length and consisted of 2-inch, 0.020-inch slotted PVC. PNM placed the screens such that the complete saturated zone was screened with an additional 2 to 3 feet of

[1] Installation of Monitoring Wells at the Cozzens B1 Well Site, February 15, 1996.

LEGAL DESCRIPTION: NW 1/4 SW 1/4 SEC. 19, T-29-N, R-11-W - 1600' FSL & 990' FWL

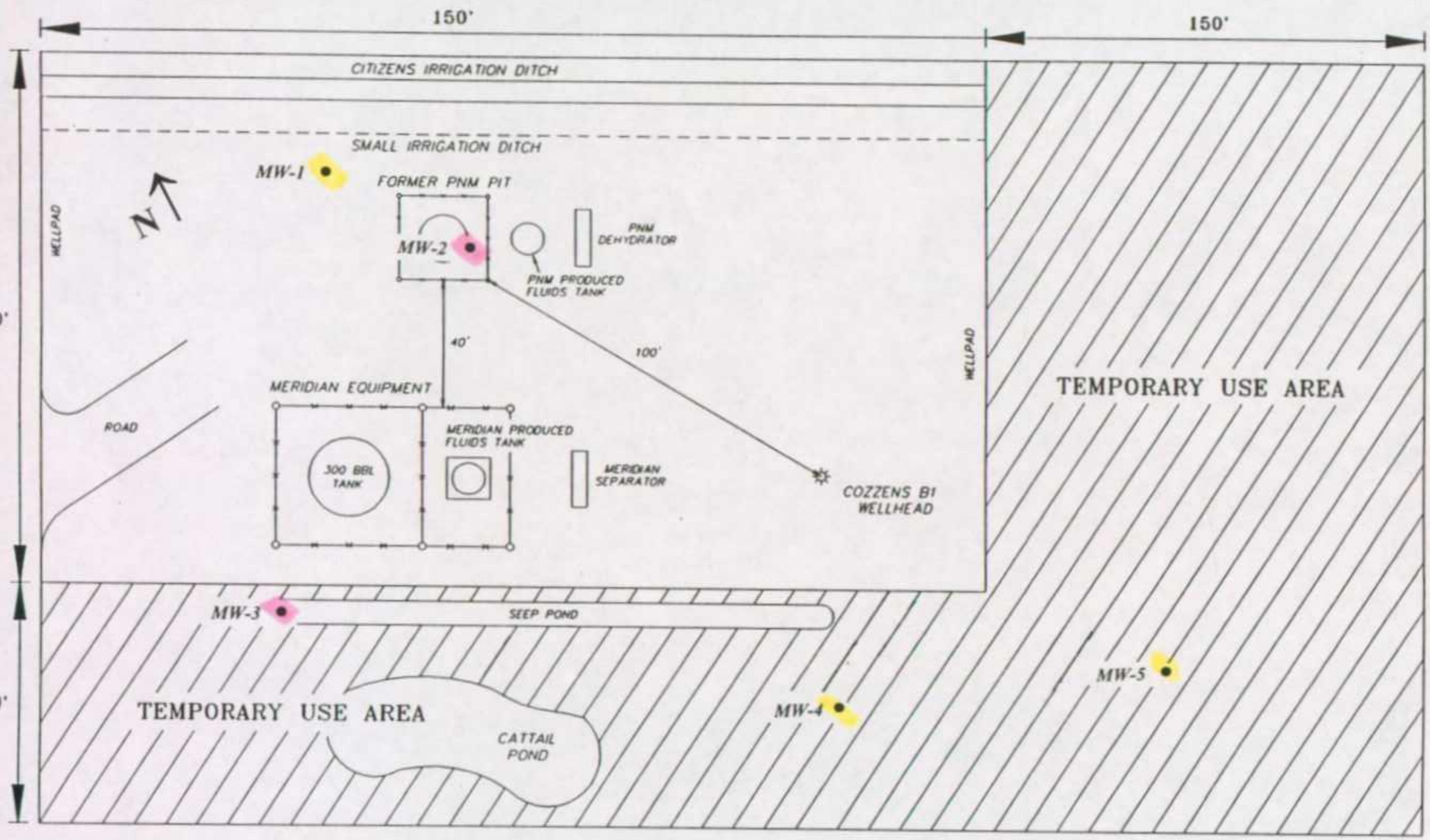


FIGURE 1

PNM GAS SERVICES P.O. BOX 4750 FARMINGTON, NEW MEXICO 87499 PH. 324-3749					TITLE: COZZENS B1 MONITOR WELL LOCATIONS				
DRAWING APPROVALS				SCALE NONE	REVISION APPROVALS				
DEPARTMENT APPROVAL	APPROVAL DATE	ENGINEERING APPROVAL	APPROVAL DATE	ACAD FILE NAME: [illegible]	REVISED BY	DEPARTMENT APPROVAL	APPROVAL DATE	ENGINEERING APPROVAL	APPROVAL DATE
				DRAWN BY: F.C. LAWRENCE					
				DATE: MARCH [illegible]					
				AFE No.					
				R.O. No.					
				PAGE 1 of 1					

PNM Gas Services

screen above the air/water interface. Monitor well, MW-3, was completed with a 2-inch diameter, stainless steel drive point attached to a 5-foot screen of 2-inch, 0.020-inch stainless steel wire wrap construction, precleaned and prepackaged by the manufacturer. The screen with endpoint was driven across the air/water interface. A 5 foot-long, 2-inch diameter galvanized steel blank pipe was then connected to the well screen.

PNM poured precleaned 10/20 silica sand around the auger annulus to fill the void. We then brought the sand filter pack to a level approximately 2 feet above the top of the well screen. We placed a bentonite pellet seal on top of the filter pack all the way to the surface. Each well was fitted with locking cap above the ground surface. Figure 2 provides a typical groundwater monitoring well diagram.

PNM purged the standard three well volumes from each well until indicator parameters of pH, temperature and electrical conductance of water stabilized over three consecutive measurements. We sampled the wells. One well, MW-2, was duplicated on all parameters as a quality assurance measure. Samples were stored in a cooler and hand-delivered to On Site Laboratories and analyzed for the following WQCC parameters:

In the source area:

BTEX (EPA Method 8020)
Major Cations/Anions (various EPA or standard methods)
PAHs (EPA or standard method)
WQCC metals (As, Ba, Cd, Cr, Pb, Se, Ag, and Hg [inductively coupled plasma (ICP) for heavy metals, atomic absorption spectroscopy (AAS) for Hg and Se]

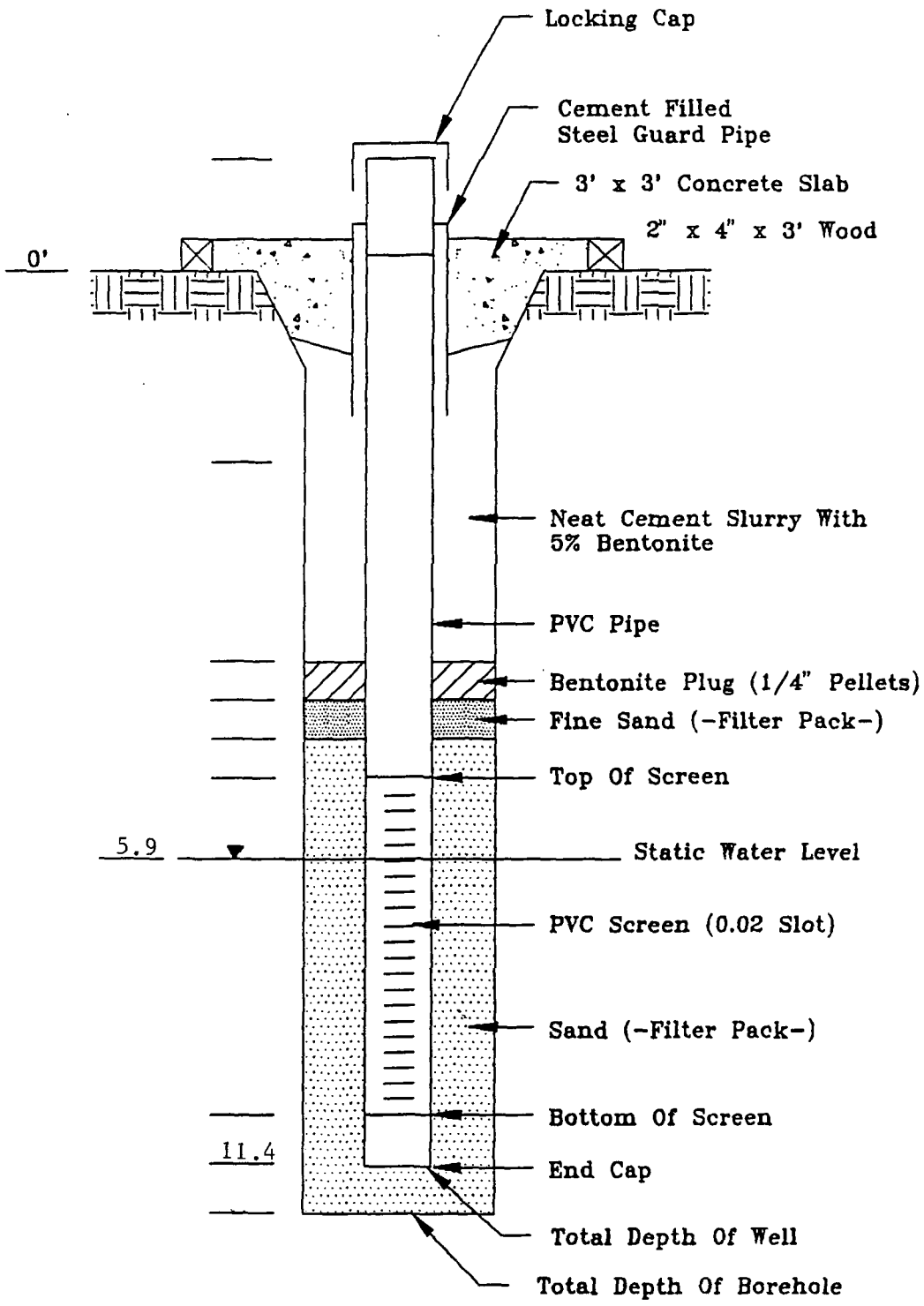
Outside the source area:

BTEX (EPA Method 8020)
Major Cations/Anions (various EPA or standard methods)

3.0 Groundwater Sampling Results

PNM collected water level measurements in each of the five new wells. Free product was not encountered in any well. A land survey was conducted to obtain monitoring well elevations. From the water level measurements and the survey, we developed a groundwater contour map of the site that is presented in figure 3. The groundwater gradient lies in a southerly direction beneath the site.

Table 1 provides the groundwater sampling results and the Water Quality Control Commission (WQCC) standard for each measured constituent.



GCL

CLIENT: PNM	
DATE: 5/02/96	REV. NO.: 0
AUTHOR: M.D.G.	DRAWN BY: M.P.
CK'D BY: M.D.G.	FILE: .DWG

FIGURE 2
MONITOR WELL DESIGN

COZZENS B1

Figure 3. COZZENS B1 GROUNDWATER CONTOUR MAP, April 1996
(Water level in feet above mean sea level)

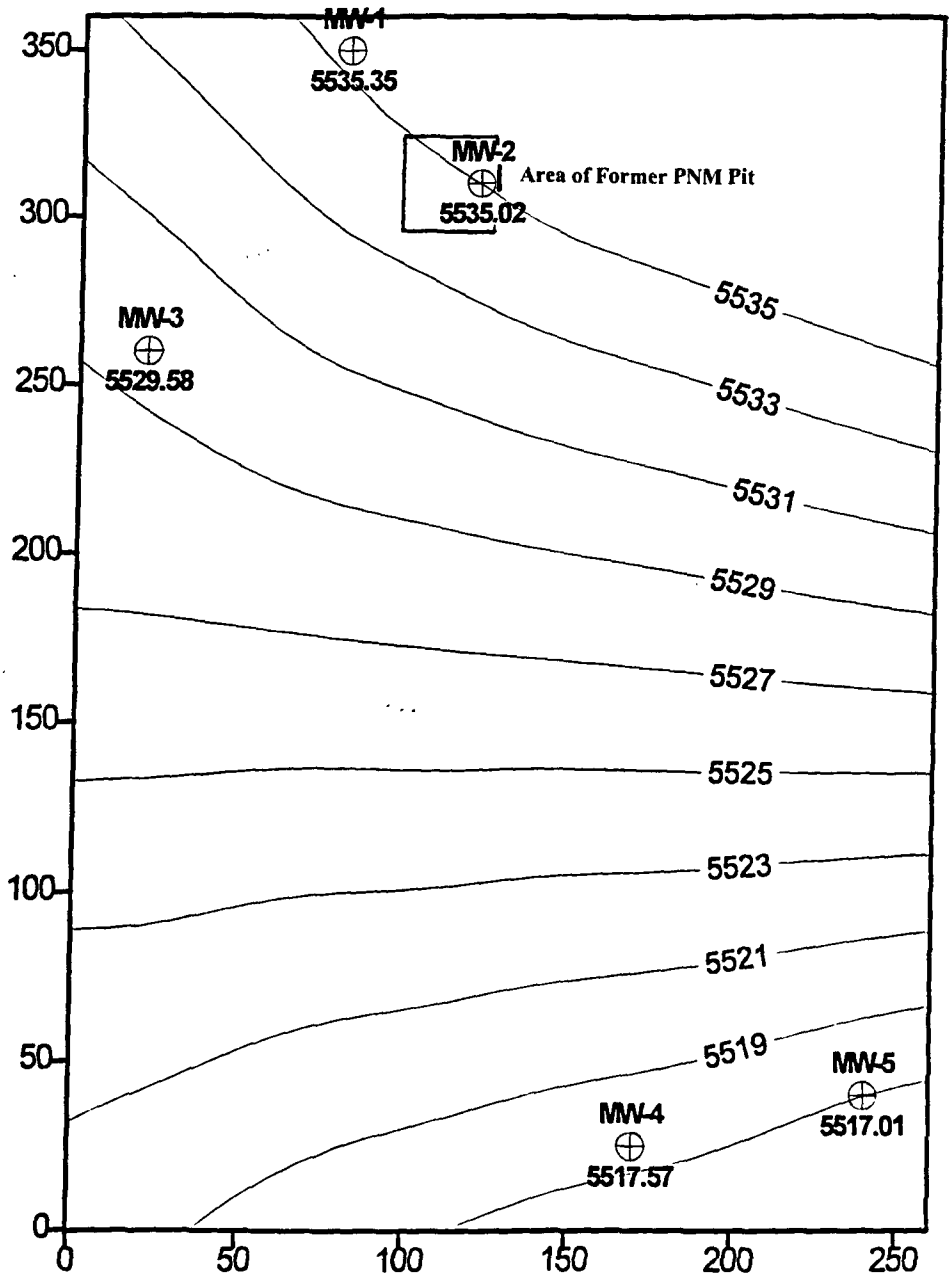


Table 1. COZZENS B1 GROUNDWATER SAMPLING RESULTS, mg/l

	WQCC Stds.	MW-1	MW-2	MW-2 (dup)	MW-3	MW-4	MW-5
B	0.01	BDL	**0.0523**	**0.0539**	**0.1817**	BDL	BDL
T	0.75	BDL	0.0106	0.0106	0.0263	BDL	0.0002
E	0.75	BDL	0.0343	0.0366	0.1596	BDL	BDL
X	0.62	0.9	**0.6423**	**0.6544**	**0.7011**	0.0004	0.0004
PAHs	0.3	NS	0.004	BDL	NS	NS	NS
As	0.1	NS	BDL	BDL	NS	NS	NS
Ba	1	NS	**3.8**	**2.13**	NS	NS	NS
Cd	0.01	NS	0.003	0.002	NS	NS	NS
Cr	0.05	NS	**0.08**	0.05	NS	NS	NS
Pb	0.05	NS	**0.14**	**0.11**	NS	NS	NS
Se	0.05	NS	BDL	BDL	NS	NS	NS
Ag	0.05	NS	BDL	BDL	NS	NS	NS
Hg	0.002	NS	0.0012	0.0015	NS	NS	NS
Anions	NA	3.45	16.86	18.50	2.10	2.61	0.84
Cations	NA	1,313.48	1,395.04	1,390.48	26.93	1,163.35	671.96

NA: Not Applicable
BDL: Below Detection Limit
NS: Not Sampled
Bold: Concentration Above WQCC Standard

6.0 Conclusions and Recommendations

BTEX contamination above WQCC standards is present in groundwater samples taken from MW-2 and MW-3. MW-2 lies in the area of the former pit and elevated BTEX levels can be expected for some time in this location. MW-3 is located downgradient of Meridian's equipment and operations that, in turn, are downgradient of PNM's former pit location. BTEX concentrations from this well are higher than expected considering the well's location relative to PNM's former pit location. We believe this may indicate that there is another source of contamination at the site.

PNM concludes that remediation of our former pit has been addressed by performing source removal of contaminated soil and taking the additional measure of installing a soil venting network. We recommend the initiation of quarterly monitoring for BTEX. Monitoring BTEX in groundwater will provide a means to ensure the plume is not migrating and serves as a measure of the natural attenuation of BTEX at the site.

To address the elevated metals concentrations, PNM will resample groundwater in MW-2 for barium, chromium and lead during the next sampling event. After retrieving the sample from the well, PNM will filter the sample in the field prior to submittal to the laboratory for analysis. This methodology was not applied during the April event. The presence of barium, chromium and lead appears to be the result of naturally-occurring background concentrations in groundwater within this region. We have observed similar levels of these metals at some of the other sites currently undergoing groundwater investigation/remediation in the San Juan Basin.[1] [2]

[1] Gas Company of New Mexico Gas/Com L1 Groundwater Investigation Report: Abrams Gas/Com L1, July 31, 1995.

[2] Results & Recommendations of McCoy A1A Monitoring Well Installation and Sampling, April 4, 1996.

OFF: (505) 325-8786

ON SITE TECHNOLOGIES, LTD.

LAB: (505) 325-5667

WATER ANALYSIS

Attn:	*Maureen Gannon*	Date:	2-May-96
Company:	*PNM Gas Services*	*COC No.:*	*4644*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample ID:*	*10615*
City, State:	*Albuquerque, NM 87158*	*Job No.:*	*2-1000*

Project Name:	***PNM Gas Services - Cozzens B1***				
Project Location:	***9604101800; MW-1***				
Sampled by:	MG/MS	Date:	10-Apr-96	Time:	18:00
Analyzed by:	OSL/IML/MWL	Date:	30-Apr-96		
Sample Matrix:	Water				

Laboratory Analysis

Parameter	*Result*	*Detection Limit*	*Unit of Measure*	*Method*
Copper (Cu), Total	<0.05	0.05	mg/L	EPA Method 220.1
Iron (Fe), Total	0.25	0.05	mg/L	EPA Method 236.1
Manganese (Mn), Total	3.20	0.05	mg/L	EPA Method 243.1
Zinc (Zn), Total	<0.05	0.05	mg/L	EPA Method 289.1
Chloride (Cl)	3.7	0.5	mg/L	EPA Method 325.3
Fluoride (F)	0.78	0.01	mg/L	EPA Method 340.2
Nitrate (NO3 as N)	<0.05	0.05	mg/L	EPA Method 352.1
Sulfate (SO4)	1309	1	mg/L	EPA Method 375.3
Cyanide (CN), Total	<0.02	0.02	mg/L	EPA Method 335.2
Total Dissolved Solids	2158	1	mg/L	EPA Method 160.1
pH	7.14			EPA Method 150.1

Approved by: Da 4

Date: 5/2/96

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TECHNOLOGIES, LTD.

OFF: (505) 325-8786 LAB: (505) 325-5667

WATER ANALYSIS

Attn:	*Maureen Gannon*	Date:	2-May-96
Company:	*PNM Gas Services*	*COC No.:*	*4644*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample ID:*	*10616*
City, State:	*Albuquerque, NM 87158*	*Job No.:*	*2-1000*

Project Name:	***PNM Gas Services - Cozzens B1***				
Project Location:	***9604101830; MW-2***				
Sampled by:	MG/MS	Date:	10-Apr-96	Time:	18:30
Analyzed by:	OSL/IML/MWL	Date:	30-Apr-96		
Sample Matrix:	Water				

Laboratory Analysis

Parameter	*Result*	*Detection Limit*	*Unit of Measure*	*Method*
Copper (Cu), Total	<0.05	0.05	mg/L	EPA Method 220.1
Iron (Fe), Total	1.16	0.05	mg/L	EPA Method 236.1
Manganese (Mn), Total	15.7	0.05	mg/L	EPA Method 243.1
Zinc (Zn), Total	<0.05	0.05	mg/L	EPA Method 289.1
Chloride (Cl)	8.7	0.5	mg/L	EPA Method 325.3
Fluoride (F)	0.34	0.01	mg/L	EPA Method 340.2
Nitrate (NO3 as N)	<0.05	0.05	mg/L	EPA Method 352.1
Sulfate (SO4)	1386	1	mg/L	EPA Method 375.3
Cyanide (CN), Total	<0.02	0.02	mg/L	EPA Method 335.2
Total Dissolved Solids	2312	1	mg/L	EPA Method 160.1
pH	6.98			EPA Method 150.1

Approved by: DaG
Date: 5/2/96

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OFF: (505) 325-8786 LAB: (505) 325-5667

WATER ANALYSIS

Attn:	*Maureen Gannon*	Date:	2-May-96
Company:	*PNM Gas Services*	*COC No.:*	*4644*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample ID:*	*10617*
City, State:	*Albuquerque, NM 87158*	*Job No.:*	*2-1000*

Project Name:	***PNM Gas Services - Cozzens B1***				
Project Location:	***9604110930; MW-3***				
Sampled by:	MG/MS	Date:	11-Apr-96	Time:	9:30
Analyzed by:	OSL/IML/MWL	Date:	30-Apr-96		
Sample Matrix:	Water				

Laboratory Analysis

Parameter	*Result*	*Detection Limit*	*Unit of Measure*	*Method*
Copper (Cu), Total	<0.05	0.05	mg/L	EPA Method 220.1
Iron (Fe), Total	0.72	0.05	mg/L	EPA Method 236.1
Manganese (Mn), Total	1.10	0.05	mg/L	EPA Method 243.1
Zinc (Zn), Total	0.28	0.05	mg/L	EPA Method 289.1
Chloride (Cl)	7.8	0.5	mg/L	EPA Method 325.3
Fluoride (F)	1.13	0.01	mg/L	EPA Method 340.2
Nitrate (NO3 as N)	<0.05	0.05	mg/L	EPA Method 352.1
Sulfate (SO4)	18	1	mg/L	EPA Method 375.3
Cyanide (CN), Total	<0.02	0.02	mg/L	EPA Method 335.2
Total Dissolved Solids	415	1	mg/L	EPA Method 160.1
pH	7.19			EPA Method 150.1

Approved by: Jack

Date: 5/2/96

OFF: (505) 325-8786

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TECHNOLOGIES, LTD.

LAB: (505) 325-5667

WATER ANALYSIS

Attn:	*Maureen Gannon*	Date:	2-May-96
Company:	*PNM Gas Services*	*COC No.:*	*4644*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample ID:*	*10618*
City, State:	*Albuquerque, NM 87158*	*Job No.:*	*2-1000*

Project Name:	***PNM Gas Services - Cozzens B1***				
Project Location:	***9604110945; MW-4***				
Sampled by:	MG/MS	Date:	11-Apr-96	Time:	9:45
Analyzed by:	OSL/IML/MWL	Date:	30-Apr-96		
Sample Matrix:	Water				

Laboratory Analysis

Parameter	*Result*	*Detection Limit*	*Unit of Measure*	*Method*
Copper (Cu), Total	<0.05	0.05	mg/L	EPA Method 220.1
Iron (Fe), Total	0.08	0.05	mg/L	EPA Method 236.1
Manganese (Mn), Total	2.46	0.05	mg/L	EPA Method 243.1
Zinc (Zn), Total	0.07	0.05	mg/L	EPA Method 289.1
Chloride (Cl)	9.0	0.5	mg/L	EPA Method 325.3
Fluoride (F)	1.35	0.01	mg/L	EPA Method 340.2
Nitrate (NO3 as N)	<0.05	0.05	mg/L	EPA Method 352.1
Sulfate (SO4)	1153	1	mg/L	EPA Method 375.3
Cyanide (CN), Total	<0.02	0.02	mg/L	EPA Method 335.2
Total Dissolved Solids	1963	1	mg/L	EPA Method 160.1
pH	7.13			EPA Method 150.1

Approved by: JAG
Date: 5/2/96

P. O. BOX 2606 • FARMINGTON, NM 87499

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WATER ANALYSIS

Attn:	*Maureen Gannon*	Date:	2-May-96
Company:	*PNM Gas Services*	*COC No.:*	*4644*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample ID:*	*10619*
City, State:	*Albuquerque, NM 87158*	*Job No.:*	*2-1000*

Project Name:	***PNM Gas Services - Cozzens B1***				
Project Location:	***9604111000; MW-5***				
Sampled by:	MG/MS	Date:	11-Apr-96	Time:	10:00
Analyzed by:	OSL/IML/MWL	Date:	30-Apr-96		
Sample Matrix:	Water				

Laboratory Analysis

Parameter	*Result*	*Detection Limit*	*Unit of Measure*	*Method*
Copper (Cu), Total	<0.05	0.05	mg/L	EPA Method 220.1
Iron (Fe), Total	0.27	0.05	mg/L	EPA Method 236.1
Manganese (Mn), Total	0.32	0.05	mg/L	EPA Method 243.1
Zinc (Zn), Total	0.25	0.05	mg/L	EPA Method 289.1
Chloride (Cl)	22.1	0.5	mg/L	EPA Method 325.3
Fluoride (F)	1.68	0.01	mg/L	EPA Method 340.2
Nitrate (NO3 as N)	0.18	0.05	mg/L	EPA Method 352.1
Sulfate (SO4)	648	1	mg/L	EPA Method 375.3
Cyanide (CN), Total	<0.02	0.02	mg/L	EPA Method 335.2
Total Dissolved Solids	1381	1	mg/L	EPA Method 160.1
pH	8.03			EPA Method 150.1

Approved by: DAL

Date: 5/2/96

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OFF: (505) 325-8786 LAB: (505) 325-5667

Duplicate HW2

WATER ANALYSIS

Attn:	*Maureen Gannon*	Date:	2-May-96
Company:	*PNM Gas Services*	*COC No.:*	*4644*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample ID:*	*10620*
City, State:	*Albuquerque, NM 87158*	*Job No.:*	*2-1000*

Project Name:	***PNM Gas Services - Cozzens B1***				
Project Location:	***9604101835; MW-6***				
Sampled by:	MG/MS	Date:	10-Apr-96	Time:	18:35
Analyzed by:	OSL/IML/MWL	Date:	30-Apr-96		
Sample Matrix:	Water				

Laboratory Analysis

Parameter	*Result*	*Detection Limit*	*Unit of Measure*	*Method*
Copper (Cu), Total	<0.05	0.05	mg/L	EPA Method 220.1
Iron (Fe), Total	1.90	0.05	mg/L	EPA Method 236.1
Manganese (Mn), Total	16.6	0.05	mg/L	EPA Method 243.1
Zinc (Zn), Total	<0.05	0.05	mg/L	EPA Method 289.1
Chloride (Cl)	9.0	0.5	mg/L	EPA Method 325.3
Fluoride (F)	0.32	0.01	mg/L	EPA Method 340.2
Nitrate (NO3 as N)	0.16	0.05	mg/L	EPA Method 352.1
Sulfate (SO4)	1381	1	mg/L	EPA Method 375.3
Cyanide (CN), Total	<0.02	0.02	mg/L	EPA Method 335.2
Total Dissolved Solids	2298	1	mg/L	EPA Method 160.1
pH	6.95			EPA Method 150.1

Approved by: DA
Date: 5/2/96

OFF: (505) 325-8786

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LAB: (505) 325-5667

QUALITY ASSURANCE REPORT

Water Analysis

Date: 30-Apr-96

Quality Control Sample

Parameter	Laboratory Identification	True Value	Analyzed Value	Units of Measure	% Diff	Limit % Diff
Copper, Cu	0422-QC	2.00	2.07	mg/L	3	10
Iron, Fe	0422-QC	2.00	2.14	mg/L	7	10
Manganese, Mn	0422-QC	1.00	0.98	mg/L	-2	10
Zinc, Zn	0422-QC	0.40	0.42	mg/L	5	10
Chloride, Cl	0437-QC	50.0	53.5	mg/L	7	10
Fluoride, F	IML-429	0.40	0.34	mg/L	-15	30
Nitrate, NO3 as N	IML-429	10.30	9.84	mg/L	-4	10
Sulfate, SO4	0456-QC	105	104	mg/L	-1	10
Cyanide, CN	MWL-502	0.20	0.19	mg/L	-6	15
Total Dissolved Solids	0443-QC	1661	1730	mg/L	4	10
pH	0456-QC	9.09	8.90		-2	5

Matrix Spike

Parameter	Laboratory Identification	Analyzed Value	Matrix Spike	Spike Value	Units of Measure	Spike Recovery
Copper (Cu), Total	10620-4644	0.00	1.00	1.00	mg/L	100%
Iron (Fe), Total	10620-4644	1.90	1.00	2.91	mg/L	100%
Manganese (Mn), Total	10620-4644	1.66	1.00	1.86	mg/L	70%
Zinc (Zn), Total	10620-4644	0.00	1.00	0.99	mg/L	99%

Method Blank

Parameter	Laboratory Identification	Analyzed Value	Units of Measure
Copper (Cu), Total	LF-Blank	<0.05	mg/L
Iron (Fe), Total	LF-Blank	<0.05	mg/L
Manganese (Mn), Total	LF-Blank	<0.05	mg/L
Zinc (Zn), Total	LF-Blank	<0.05	mg/L
Chloride, Cl	LF-Blank	< 2 X DL	mg/L
Fluoride, F	LF-Blank	<0.01	mg/L
Nitrate, NO3 as N	LF-Blank	<0.05	mg/L
Sulfate, SO4	LF-Blank	<1	mg/L
Cyanide (CN), Total	LF-Blank	<0.02	mg/L
Total Dissolved Solids	LF-Blank	<1	mg/L

ON SITE
TECHNOLOGIES, LTD.

OFF: (505) 325-8786 LAB: (505) 325-5667

METALS ANALYSIS

Attn:	*Maureen Gannon*	Date:	30-Apr-96
Company:	*PNM Gas Services*	*COC No.:*	*4644*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample No.*	*10616*
City, State:	*Albuquerque, NM 87158*	*Job No.*	*2-1000*

Project Name:	***PNM Gas Services - Cozzens B1***				
Project Location:	***9604101830; MW-2***				
Sampled by:	MG/MS	Date:	10-Apr-96	Time:	18:30
Analyzed by:	MWL	Date:	30-Apr-96		
Sample Matrix:	*Water*				

Laboratory Analysis

Parameter	*Result*	*Detection Limit*	*Units of Measure*	*Method*
Arsenic (As), Total	<0.002	0.10	mg/L	EPA Method 200.7
Barium (Ba), Total	3.80	0.005	mg/L	EPA Method 200.7
Cadmium (Cd), Total	0.003	0.002	mg/L	EPA Method 200.7
Chromium (Cr), Total	0.08	0.01	mg/L	EPA Method 200.7
Lead (Pb), Total	0.14	0.05	mg/L	EPA Method 200.7
Selenium (Se), Total	<0.002	0.002	mg/L	EPA Method 270.2
Silver (Ag), Total	<0.01	0.01	mg/L	EPA Method 200.7
Mercury (Hg), Total	0.0012	0.0004	mg/L	EPA Method 245.1

Approved by:
Date: 4/30/96

OFF: (505) 325-8786

ON SITE TECHNOLOGIES, LTD.

LAB: (505) 325-5667

POLYNUCLEAR AROMATIC HYDROCARBONS

Attn:	*Maureen Gannon*	Date:	23-Apr-96
Company:	*PNM Gas Services*	*Lab ID:*	*4644*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample ID:*	*10616*
City, State:	*Albuquerque, NM 87158*	*Job No.*	*2-1000*

Project Name:	***PNM Gas Services - Cozzens B1***				
Project Location:	***9604101830; MW-2***				
Sampled by:	MG/MS	Date:	10-Apr-96	Time:	18:30
Analyzed by:	ILFC	Date:	23-Apr-96		
Sample Matrix:	*Water*				

Laboratory Analysis

Component	*Result*	*Unit of Measure*	*Detection Limit*	*Unit of Measure*
Acenaphthene	<1	ug/L	1	ug/L
Acenaphthylene	<1	ug/L	1	ug/L
Benzo (a) anthracene	<1	ug/L	1	ug/L
Benzo (a) pyrene	<1	ug/L	1	ug/L
Pyrene	<1	ug/L	1	ug/L
Benzo (b) fluoranthene	<1	ug/L	1	ug/L
Benzo (ghi) perylene	<5	ug/L	5	ug/L
Benzo (k) flouranthene	<1	ug/L	1	ug/L
Chrysene	<1	ug/L	1	ug/L
Dibenzo (a,h) anthrace	<5	ug/L	5	ug/L
Flouranthene	<1	ug/L	1	ug/L
Fluorene	<1	ug/L	1	ug/L
Indeno (1,2,3-cd) pyre	<5	ug/L	5	ug/L
Naphthalene	4	ug/L	1	ug/L
Phenanthrene	<1	ug/L	1	ug/L

Method - *SW-846 EPA Method 8100 - Polynuclear Aromatic Hydrocarbons*

Approved by: DaG

Date: 4/23/96

ON SITE TECHNOLOGIES, LTD.

OFF: (505) 325-8786

LAB: (505) 325-5667

Duplicate MW2

POLYNUCLEAR AROMATIC HYDROCARBONS

Attn:	*Maureen Gannon*	Date:	23-Apr-96
Company:	*PNM Gas Services*	*Lab ID:*	*4644*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample ID:*	*10620*
City, State:	*Albuquerque, NM 87158*	*Job No.*	*2-1000*

Project Name:	***PNM Gas Services - Cozzens B1***				
Project Location:	***9604101835; MW-6***				
Sampled by:	MG/MS	Date:	10-Apr-96	Time:	18:35
Analyzed by:	ILFC	Date:	23-Apr-96		
Sample Matrix:	*Water*				

Laboratory Analysis

Component	*Result*	*Unit of Measure*	*Detection Limit*	*Unit of Measure*
Acenaphthene	<1	ug/L	1	ug/L
Acenaphthylene	<1	ug/L	1	ug/L
Benzo (a) anthracene	<1	ug/L	1	ug/L
Benzo (a) pyrene	<1	ug/L	1	ug/L
Pyrene	<1	ug/L	1	ug/L
Benzo (b) fluoranthene	<1	ug/L	1	ug/L
Benzo (ghi) perylene	<5	ug/L	5	ug/L
Benzo (k) flouranthene	<1	ug/L	1	ug/L
Chrysene	<1	ug/L	1	ug/L
Dibenzo (a,h) anthrace	<5	ug/L	5	ug/L
Flouranthene	<1	ug/L	1	ug/L
Fluorene	<1	ug/L	1	ug/L
Indeno (1,2,3-cd) pyre	<5	ug/L	5	ug/L
Naphthalene	<1	ug/L	1	ug/L
Phenanthrene	<1	ug/L	1	ug/L

Method - *SW-846 EPA Method 8100 - Polynuclear Aromatic Hydrocarbons*

Approved by: DaG
Date: 4/23/96

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LAB: (505) 325-5667

QUALITY ASSURANCE REPORT

EPA Method 8100

Date: 23-Apr-96

Method Blank / Calibration Check

Component	Result	Unit of Measure		% RPD	Limit
Acenaphthene	<1	ug/L		11%	25%
Acenaphthylene	<1	ug/L		6%	25%
Benzo (a) anthracene	<1	ug/L		9%	25%
Benzo (a) pyrene	<1	ug/L		3%	25%
Pyrene	<1	ug/L		9%	25%
Benzo (b) fluoranthene	<1	ug/L		25%	25%
Benzo (ghi) perylene	<5	ug/L		5%	25%
Benzo (k) flouranthene	<1	ug/L		5%	25%
Chrysene	<1	ug/L		18%	25%
Dibenzo (a,h) anthrace	<5	ug/L		10%	25%
Flouranthene	<1	ug/L		5%	25%
Fluorene	<1	ug/L		1%	25%
Indeno (1,2,3-cd) pyre	<5	ug/L		2%	25%
Naphthalene	<1	ug/L		2%	25%
Phenanthrene	<1	ug/L		1%	25%

Matrix Spike

Component	1- Percent Recovered	2 - Percent Recovered	% RSD
Acenaphthene	34%	34%	0%
Pyrene	36%	34%	6%

Surrogate Recoveries

Laboratory Identification	S1 Nitrobenzene-d5	S2 2-Fluorbiphenyl	S3 Terphenyl-d14
10616-4644	85%	89%	80%
10620-4644	84%	90%	81%

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LAB: (505) 325-5667

AROMATIC VOLATILE ORGANICS

Attn:	*Maureen Gannon*	Date:	12-Apr-96
Company:	*PNM Gas Services*	*COC No.:*	*4644*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample No.*	*10615*
City, State:	*Albuquerque, NM 87158*	*Job No.*	*2-1000*

Project Name:	***PNM Gas Services - Cozzens B1***				
Project Location:	***9604101800; MW-1***				
Sampled by:	MG/MS	Date:	10-Apr-96	Time:	18:00
Analyzed by:	DC	Date:	11-Apr-96		
Type of Sample:	*Liquid*				

Aromatic Volatile Organics

Component	*Result*	*Units of Measure*	*Detection Limit*	*Units 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	0.9	ug/L	0.2	ug/L
o-Xylene	<0.2	ug/L	0.2	ug/L
TOTAL	0.9	ug/L		

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

Approved by: JaG
Date: 4/12/96

ON SITE TECHNOLOGIES, LTD.

OFF: (505) 325-8786 LAB: (505) 325-5667

AROMATIC VOLATILE ORGANICS

Attn:	*Maureen Gannon*	Date:	12-Apr-96
Company:	*PNM Gas Services*	*COC No.:*	*4644*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample No.*	*10616*
City, State:	*Albuquerque, NM 87158*	*Job No.*	*2-1000*

Project Name:	***PNM Gas Services - Cozzens B1***				
Project Location:	***9604101830; MW-2***				
Sampled by:	MG/MS	Date:	10-Apr-96	Time:	18:30
Analyzed by:	DC	Date:	11-Apr-96		
Type of Sample:	*Liquid*				

Aromatic Volatile Organics

Component	*Result*	*Units of Measure*	*Detection Limit*	*Units of Measure*
Benzene	52.3	ug/L	0.2	ug/L
Toluene	10.6	ug/L	0.2	ug/L
Ethylbenzene	34.3	ug/L	0.2	ug/L
m,p-Xylene	519.1	ug/L	0.2	ug/L
o-Xylene	123.2	ug/L	0.2	ug/L
TOTAL	739.5	ug/L		

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

Approved by: DA
Date: 4/12/96

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AROMATIC VOLATILE ORGANICS

Attn: *Maureen Gannon*
Company: *PNM Gas Services*
Address: *Alevardo Square, Mail Stop 0408*
City, State: *Albuquerque, NM 87158*

Date: 12-Apr-96
COC No.: *4644*
Sample No. *10617*
Job No. *2-1000*

Project Name: ***PNM Gas Services - Cozzens B1***
Project Location: ***9604110930; MW-3***
Sampled by: MG/MS Date: 11-Apr-96 Time: 9:30
Analyzed by: DC Date: 11-Apr-96
Type of Sample: *Liquid*

Aromatic Volatile Organics

Component	*Result*	*Units of Measure*	*Detection Limit*	*Units of Measure*
Benzene	181.7	ug/L	0.2	ug/L
Toluene	26.3	ug/L	0.2	ug/L
Ethylbenzene	159.6	ug/L	0.2	ug/L
m,p-Xylene	651.2	ug/L	0.2	ug/L
o-Xylene	49.9	ug/L	0.2	ug/L
TOTAL	1068.7	ug/L		

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

Approved by: DaG
Date: 4/12/96

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AROMATIC VOLATILE ORGANICS

Attn:	*Maureen Gannon*	Date:	12-Apr-96
Company:	*PNM Gas Services*	*COC No.:*	*4644*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample No.*	*10618*
City, State:	*Albuquerque, NM 87158*	*Job No.*	*2-1000*

Project Name:	***PNM Gas Services - Cozzens B1***				
Project Location:	***9604110945; MW-4***				
Sampled by:	MG/MS	Date:	11-Apr-96	Time:	9:45
Analyzed by:	DC	Date:	11-Apr-96		
Type of Sample:	*Liquid*				

Aromatic Volatile Organics

Component	*Result*	*Units of Measure*	*Detection Limit*	*Units 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	0.4	ug/L	0.2	ug/L
o-Xylene	<0.2	ug/L	0.2	ug/L
TOTAL	0.4	ug/L		

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

Approved by: DA
Date: 4/12/96

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AROMATIC VOLATILE ORGANICS

Attn:	*Maureen Gannon*	Date:	12-Apr-96
Company:	*PNM Gas Services*	*COC No.:*	*4644*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample No.*	*10619*
City, State:	*Albuquerque, NM 87158*	*Job No.*	*2-1000*

Project Name:	***PNM Gas Services - Cozzens B1***				
Project Location:	***9604111000; MW-5***				
Sampled by:	MG/MS	Date:	11-Apr-96	Time:	10:00
Analyzed by:	DC	Date:	11-Apr-96		
Type of Sample:	*Liquid*				

Aromatic Volatile Organics

Component	*Result*	*Units of Measure*	*Detection Limit*	*Units 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	0.4	ug/L	0.2	ug/L
o-Xylene	<0.2	ug/L	0.2	ug/L
TOTAL	0.6	ug/L		

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

Approved by: DaG
Date: 4/12/96

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LAB: (505) 325-5667

Duplicate MW2

AROMATIC VOLATILE ORGANICS

Attn:	*Maureen Gannon*	Date:	12-Apr-96
Company:	*PNM Gas Services*	*COC No.:*	*4644*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample No.*	*10620*
City, State:	*Albuquerque, NM 87158*	*Job No.*	*2-1000*

Project Name:	***PNM Gas Services - Cozzens B1***				
Project Location:	***9604101835; MW-6***				
Sampled by:	MG/MS	Date:	10-Apr-96	Time:	18:35
Analyzed by:	DC	Date:	11-Apr-96		
Type of Sample:	*Liquid*				

Aromatic Volatile Organics

Component	*Result*	*Units of Measure*	*Detection Limit*	*Units of Measure*
Benzene	53.9	ug/L	0.2	ug/L
Toluene	10.6	ug/L	0.2	ug/L
Ethylbenzene	36.6	ug/L	0.2	ug/L
m,p-Xylene	529.5	ug/L	0.2	ug/L
o-Xylene	124.9	ug/L	0.2	ug/L
TOTAL	755.5	ug/L		

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

Approved by: JaC

Date: 4/12/96

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AROMATIC VOLATILE ORGANICS

Attn:	*Maureen Gannon*	Date:	12-Apr-96
Company:	*PNM Gas Services*	*COC No.:*	*4644*
Address:	*Alevardo Square, Mail Stop 0408*	*Sample No.*	*10621*
City, State:	*Albuquerque, NM 87158*	*Job No.*	*2-1000*

Project Name:	***PNM Gas Services - Cozzens B1***				
Project Location:	***Trip Blank***				
Sampled by:	DC	Date:	19-Mar-96	Time:	16:00
Analyzed by:	DC	Date:	11-Apr-96		
Type of Sample:	*Liquid*				

Aromatic Volatile Organics

Component	*Result*	*Units of Measure*	*Detection Limit*	*Units 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	0.8	ug/L	0.2	ug/L
o-Xylene	0.3	ug/L	0.2	ug/L
TOTAL	1.1	ug/L		

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

Approved by: DaG
Date: 4/12/96

OFF: (505) 325-8786

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LAB: (505) 325-5667

QUALITY ASSURANCE REPORT
for EPA Method 8020

Date Analyzed: 11-Apr-96

Internal QC No.: 0444-STD
Surrogate QC No.: 0445-STD
Reference Standard QC No.: 0355-STD

Method Blank

Analyte	Result	Units of Measure
Average Amount of All Analytes In Blank	<0.2	ppb

Calibration Check

Analyte	Units of Measure	True Value	Analyzed Value	% Diff	Limit
Benzene	ppb	20.0	20.0	0	15%
Toluene	ppb	20.0	19.8	1	15%
Ethylbenzene	ppb	20.0	20.0	0	15%
m,p-Xylene	ppb	40.0	39.4	1	15%
o-Xylene	ppb	20.0	19.9	1	15%

Matrix Spike

Analyte	1- Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Benzene	111	113	(39-150)	2	20%
Toluene	111	114	(46-148)	2	20%
Ethylbenzene	111	114	(32-160)	2	20%
m,p-Xylene	107	112	(35-145)	3	20%
o-Xylene	105	107	(35-145)	1	20%

Surrogate Recoveries

Laboratory Identification	S1 Percent Recovered	S2 Percent Recovered
Limit Percent Recovered	(70-130)	
10615-4644	95	
10616-4644	90	
10617-4644	89	
10618-4644	93	
10619-4644	94	
10620-4644	90	
10621-4644	93	

S1: Flourobenzene

CHAIN OF CUSTODY RECORD

4644

ON SITE TECHNOLOGIES, LTD.

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LAB: (505) 325-5667 • FAX: (505) 325-6256

Date: 4-11-96

Page 1 of X1

Purchase Order No.:		Job No.	
SEND INVOICE TO	Name: Denver Bearden		
	Company: PNM Gas Services	Dept. 324-3763	
	Address: 603 W. Elm Street		
	City, State, Zip: Farmington, NM 87401		

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

Sampling Location: COZZENS B1

Sampler: Maureen Gannon

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION	SAMPLE DATE	SAMPLE TIME	MATRIX	PRES.	Number of Containers	BTEX 8020	CATIONS/ ANIONS	WQCC METALS	PAHS	LAB ID
MW-1 9604101800			H2O	None	3	X	X	MC		10615-4644
MW-2 9604101830			H2O	None	5	X	X	X	X	10616
MW-3 9604110930			H2O	None	3	X	X			10617
MW-4 9604110945			H2O	None	3	X	X			10618
MW-5 9604111000			H2O	None	3	X	X			10619
MW-6 9604101835			H2O	None	5	X	X	X	X	10620
TRIP BLANK (na)	3/19/96	1600	H2O	None	1	X				10621

Relinquished by: Maureen Gannon	Date/Time 4/11/96	Received by:	Date/Time		
Relinquished by:	Date/Time	Received by:	Date/Time 4/11/96 1433		
Relinquished by:	Date/Time 1433 4/11/96	Received by:	Date/Time 4/11/96 1900		
Method of Shipment:		Rush	24-48 Hours	10 Working Days	Special Instructions: Results to be sent to both parties.
Authorized by: Maureen Gannon (Client Signature Must Accompany Request)	Date 4-11-96				

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