GW site

District I
P.O. Box 1980, Hobbs, NM

District II
P.O. Drawer DD, Artesia, NM 88221

District III
1000 Rio Brazos Rd, Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION

2040 South Pacheco Street
Santa Fe, New Mexico 87505

SUBMIT 1 COPY TO APPROPRIATE DISTRICT OFFICE AND 1 COPY TO SANTA FE OFFICE

RECEIVED
NOV - 1 1999
OIL CON. DIV.
DIST. 3

PIT REMEDIATION AND CLOSURE REPORT

Operator: PNM Gas Services (Burlington) **Telephone:** 324-3764

Address: 603 W. Elm Street Farmington, NM 87401

Facility or Well Name: Mangum #1E

Location: Unit F Sec 27 T 29 N R 11 W County San Juan

Pit Type: Separator ☐ Dehydrator ☑ Other

Land Type: BLM ☐ State ☐ Fee ☑ Other

Pit Location: (Attach diagram)

Pit dimensions: length 16 ' width 16 ' depth 3 '

Reference: wellhead ☑ other

Footage from reference: 75'

Direction from reference: Due Degrees ☐ East North ☐ of ☑ West South ☐

Depth to Ground Water: (Vertical distance from contaminants to seasonal high water elevation of ground water)	Less than 50 feet 50 feet to 99 feet Greater than 100 feet	(20 points) (10 points) (0 points)	20
Wellhead Protection Area: (Less than 200 feet from a private domestic water source, or; less than 1,000 feet from all other water sources)	Yes No	(20 points) (0 points)	0
Distance to Surface Water: (Horizontal distance to perennial lakes, ponds, rivers, streams, creeks, irrigation canals and ditches)	Less than 200 feet 200 feet to 1,000 feet Greater than 1,000 feet	(20 points) (10 points) (0 points)	20
RANKING SCORE (TOTAL POINTS) :			40

Mangum #1E

Date Remediation Started: 11/11/1996 **Date Completed:** 11/12/1996

Remediation Method: (Check all appropriate sections)
Excavation X Approx. Cubic Yard 972
Landfarmed ____ Amount Landfarmed (cubic yds) 912
Other 60 cu yds clean overburden.

Remediation Location: (i.e., landfarmed onsite, name and location of offsite facility)
Onsite ____ Offsite 912 cu yds - Tierra Environmental.

Backfill Material Location: ____

General Description of Remedial Action:
Excavated contaminated soil to a a pit size of 50' X 75' X 7' and transported soil to an offsite commercial landfarm.

Ground Water Encountered: No ☐ Yes ☑ Depth 7'

Final Pit Closure Sampling: (if multiple samples, attach sample result and diagram of sample locations and depths.)
Sample Location North, east, south and west side walls.
Sample depth 6'
Sample date 11/12/1996 Sample time 2:30:00 PM

Sample Results
Benzene (ppm) 0.031
Total BTEX (ppm) 1.9681
Field headspace (ppm) ____
TPH (ppm) < 5.00 Method 8015A

Vertical Extent (ft) ____ Risk Analysis form attached Yes ____ No ____

Ground Water Sample: Yes ☑ No ____ (If yes, see attached Groundwater Site Summary Report)

I HEREBY CERTIFY THAT THE INFORMATION ABOVE IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE AND MY BELIEF

DATE **October 28, 1999**
SIGNATURE Maureen Gannon
PRINTED NAME AND TITLE **Maureen Gannon, Project Manager**

PNMGS Well Site: **Mangum 1 E**

Groundwater Site Summary Report

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

Quarter/Year: 4th/98, 1st/99, 2nd/99 & 3rd/99

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: Figure 1
Site Map with Analysis: Figure 2
Groundwater Contour Map: Figure 3a (April 1998), Figure 3b (July 1998), Figure 3c (October 1978) & Figure 3d (January 1999)
Hydrograph: Figure 4
Analytical Results: See 1999 Annual Groundwater Report. Results for temporary monitor well, TMW-1, are attached.
Well Completion Log/Diagram: TMW-1 only

Site Hydrology:

The Mangum 1E site lies about 100 feet from the San Juan River, on the north bank just east of the bridge near Bloomfield, New Mexico. The elevation of the site is about 5420 ft. amsl, with the river being 5 to 10 feet lower in elevation. Depth to water is only a few feet at the site, as evidenced by the four monitor wells installed there (see Figure 1).

The valley floor of the San Juan River is more than one-half mile wide near the Mangum 1E site. Alluvial cobbles and gravels, similar to the modern river's bedload, would be expected to be encountered in the subsurface alluvium, which may reach thicknesses of 100 feet or more (Stone et al., 1983; Pastuszak, 1968). However, owing to the extremely shallow groundwater at the site, the depths of the monitor wells are not great, and much clay (presumably from overbank deposits) was found in shallow soils during well installation.

An irrigation ditch bounds the northern side of the Mangum 1E site, while the San Juan River lies just south. Surface topography drops towards the river (south) and along the river's axis (west). Recharge from the irrigation ditch would tend to provide recharge during the spring and summer months, causing groundwater flow towards the river (as also described by Stone et al., 1983).

Groundwater contour maps were prepared from data collected during the quarterly sampling events. Figures 3a through 3c show the elevation of the water table during April, July, and October, 1998, respectively, and Figure 3d for January, 1999. Flow direction is consistently southwestward, with gradient values of about 0.01 (1 ft. per 100 ft.) regardless of the season.

The hydrograph of the site (Figure 4) suggests that groundwater elevations are strongly influenced by the operation of the irrigation ditch in spring and summer months; hydrographs at the site show lowest elevations in the wintertime. Flow direction does not vary appreciably from season to season, as indicated by the "tracking" of water level changes by each well.

Activities for Previous Year:

PNM conducted quarterly groundwater sampling at the Mangum 1E on April 28, July 9 and October 16, 1998, and again on January 18, 1999. In the last sampling round, 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 8021B.

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**

On July 26, 1999, PNM installed a temporary monitor well due west of our former pit. This well was installed as requested to alleviate any concerns regarding potential impacts to the west of PNM's former dehydrator pit. Figure 2 shows the exact location of this well. On August 5, 1999, this well was sampled and analyzed for BTEX by method 8021B.

Results:

Figure 2 is a site map showing 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 since they were installed after the initial source removal activities in January, 1997. BTEX in downgradient well MW-3 decreased over time, and has remained below WQCC standards for four quarterly sampling events. Contamination in downgradient monitor well MW-4 decreased over time, and has been below standards for the last four consecutive quarterly sampling events. BTEX concentrations in temporary monitor well TMW-1, were slightly above detection levels. However, concentrations were well below WQCC standards.

Further Action:

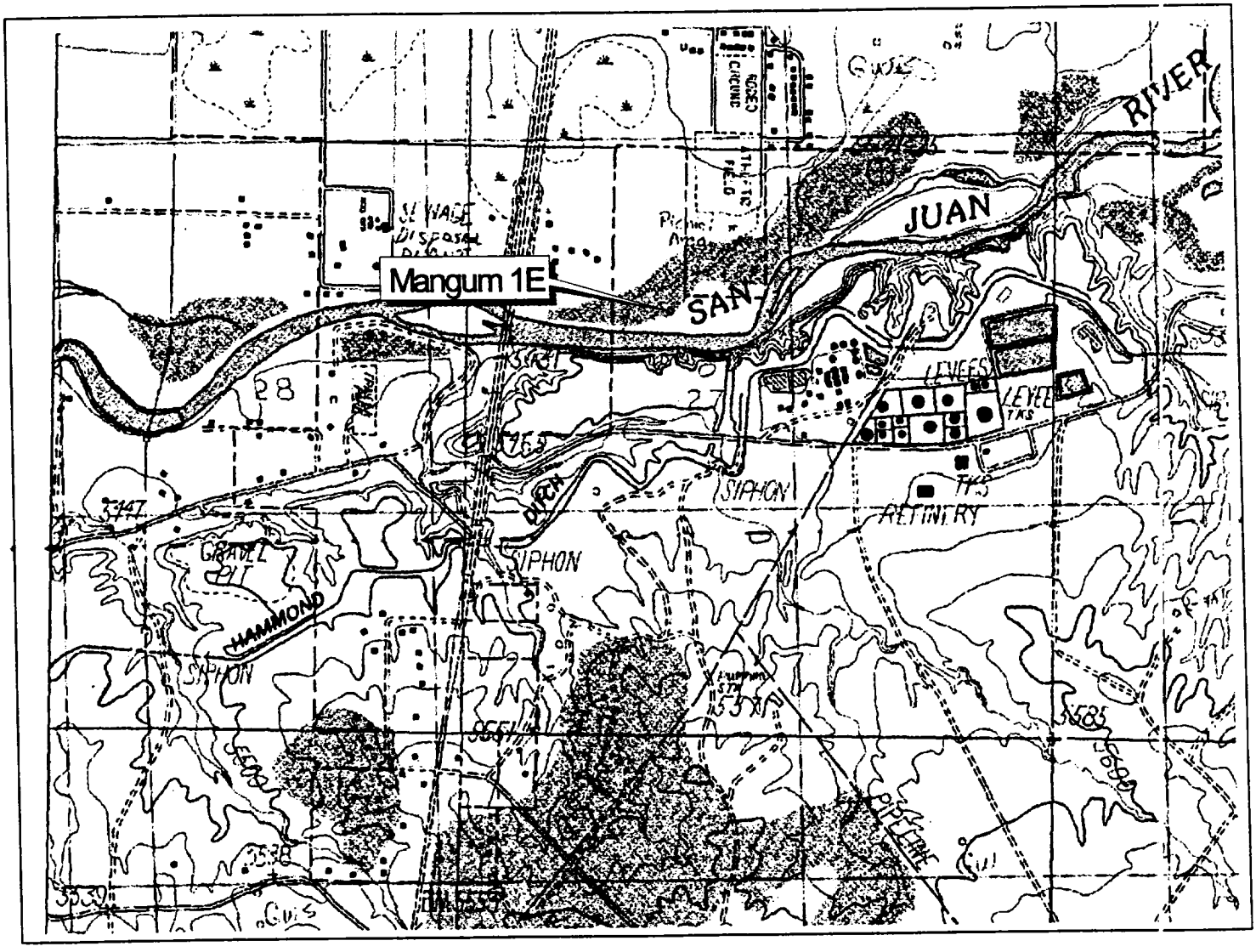
Consistent with PNM's San Juan Basin Groundwater Management Plan, PNM requests closure of the Mangum 1E. This request is based upon the analytical data collected over the last two years at the site. The excavation of source materials was successful in achieving clean-up at the Mangum 1E BTEX concentrations in downgradient well MW-4 have been below standards for four consecutive quarters. Wells, MW-2 and -3, have shown downward trends in BTEX concentration over the last two years and have been below standards for the last four quarters. Resampling of all monitor wells, including temporary monitor well, TMW-1, show that BTEX compounds are below standards at the site.

Upon approval of the groundwater closure report, PNM will plug and abandon the four groundwater monitoring wells at the site. The concrete pad and metal vault surrounding each well will be removed. The well casing will be cut to ground surface and each well will be plugged o the surface with cement containing 5% bentonite.

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 Groundwater Site
Twn. 29N Rng. 11W Sec. 27 Unit F



Bloomfield, NM Quadrangle

0 900 1800 2700 3600 4500 Feet

N
W E
S

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

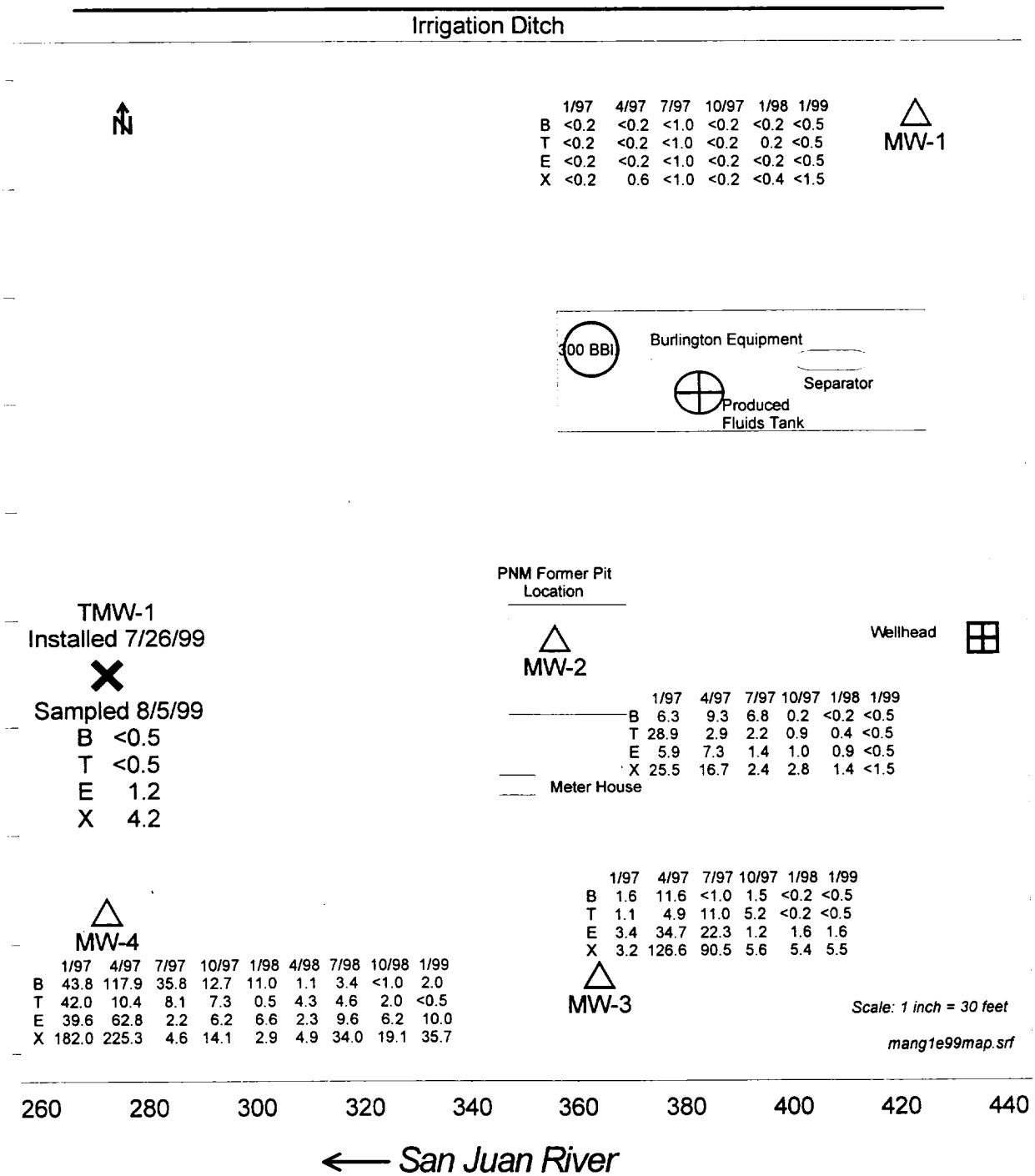
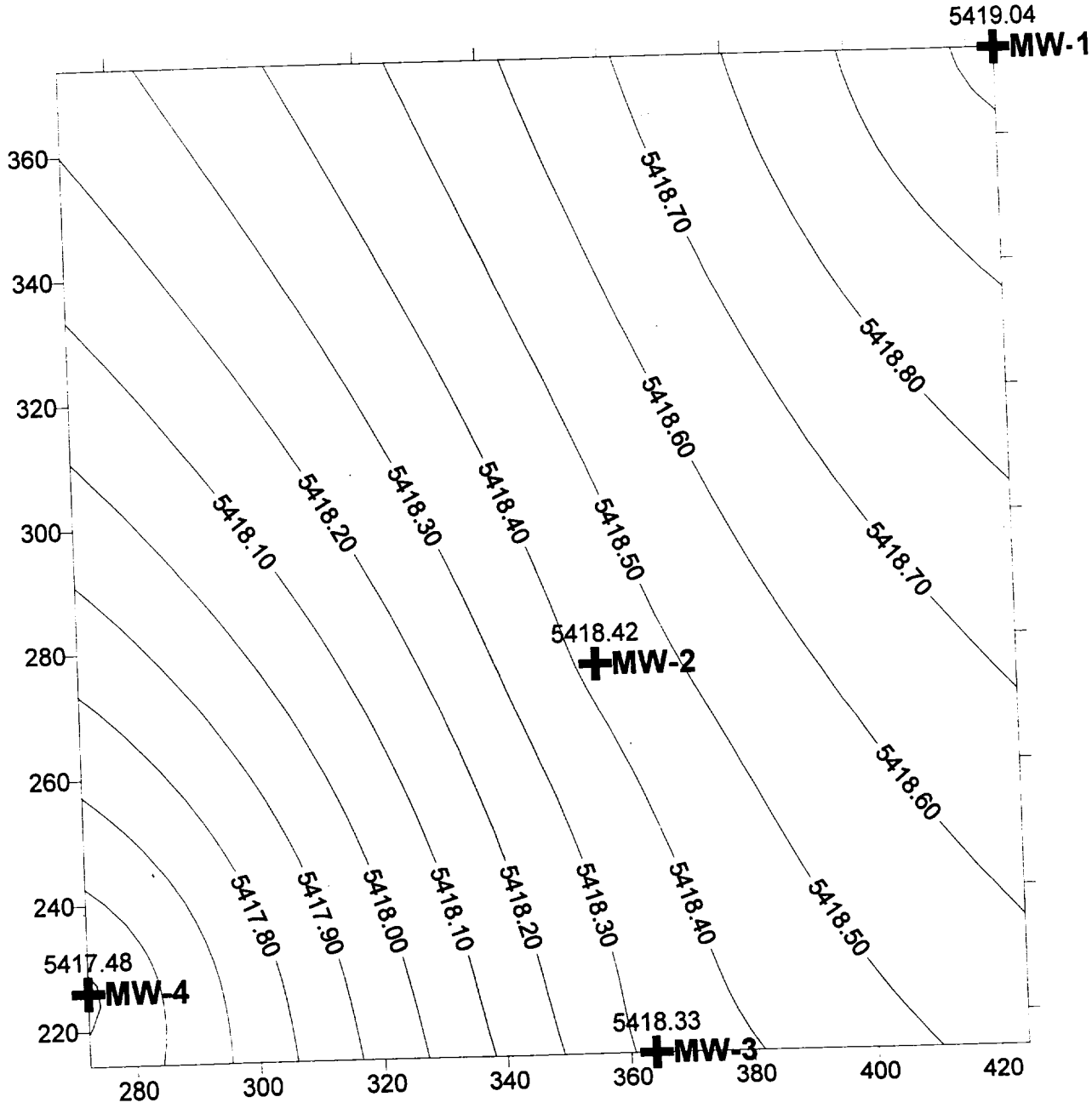
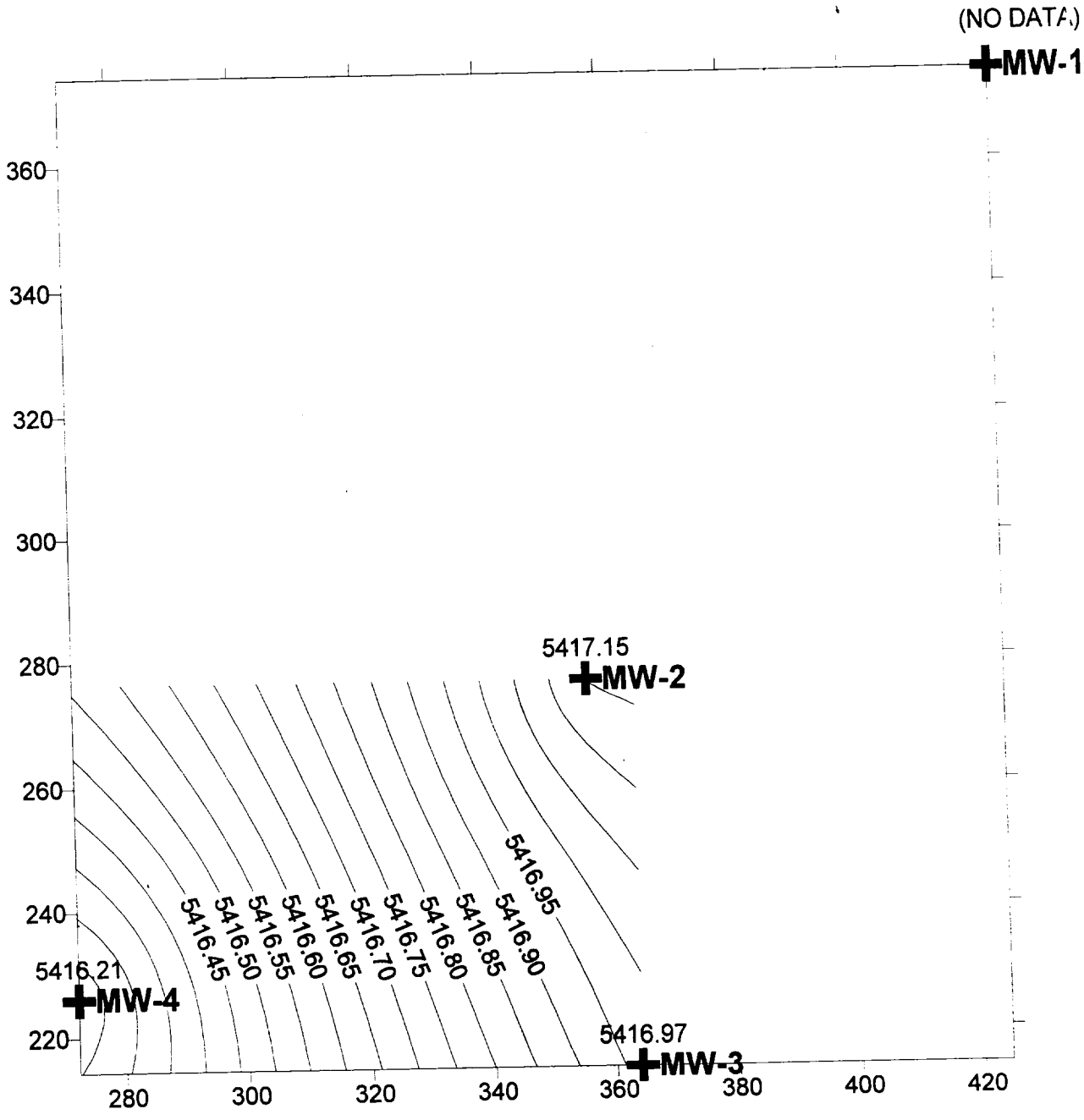


Figure 3a. Mangum 1E Groundwater Contour Map (April 28, 1998)



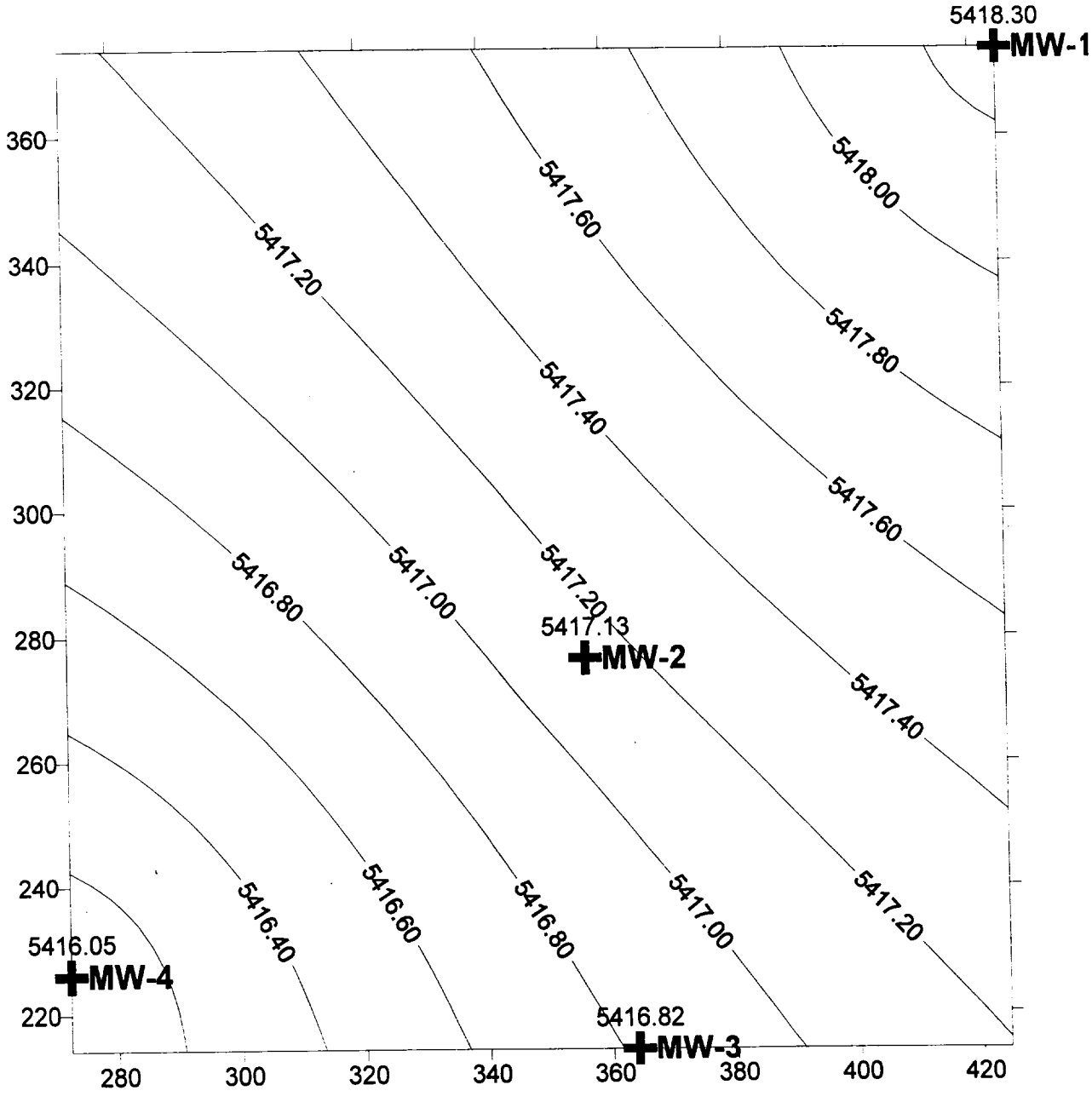
SCALE IN FEET
(X-axis = Easting,
Y-axis = Northing)

Figure 3b. Mangum 1E Groundwater Contour Map (July 9, 1998)



SCALE IN FEET
(X-axis = Easting,
Y-axis = Northing)

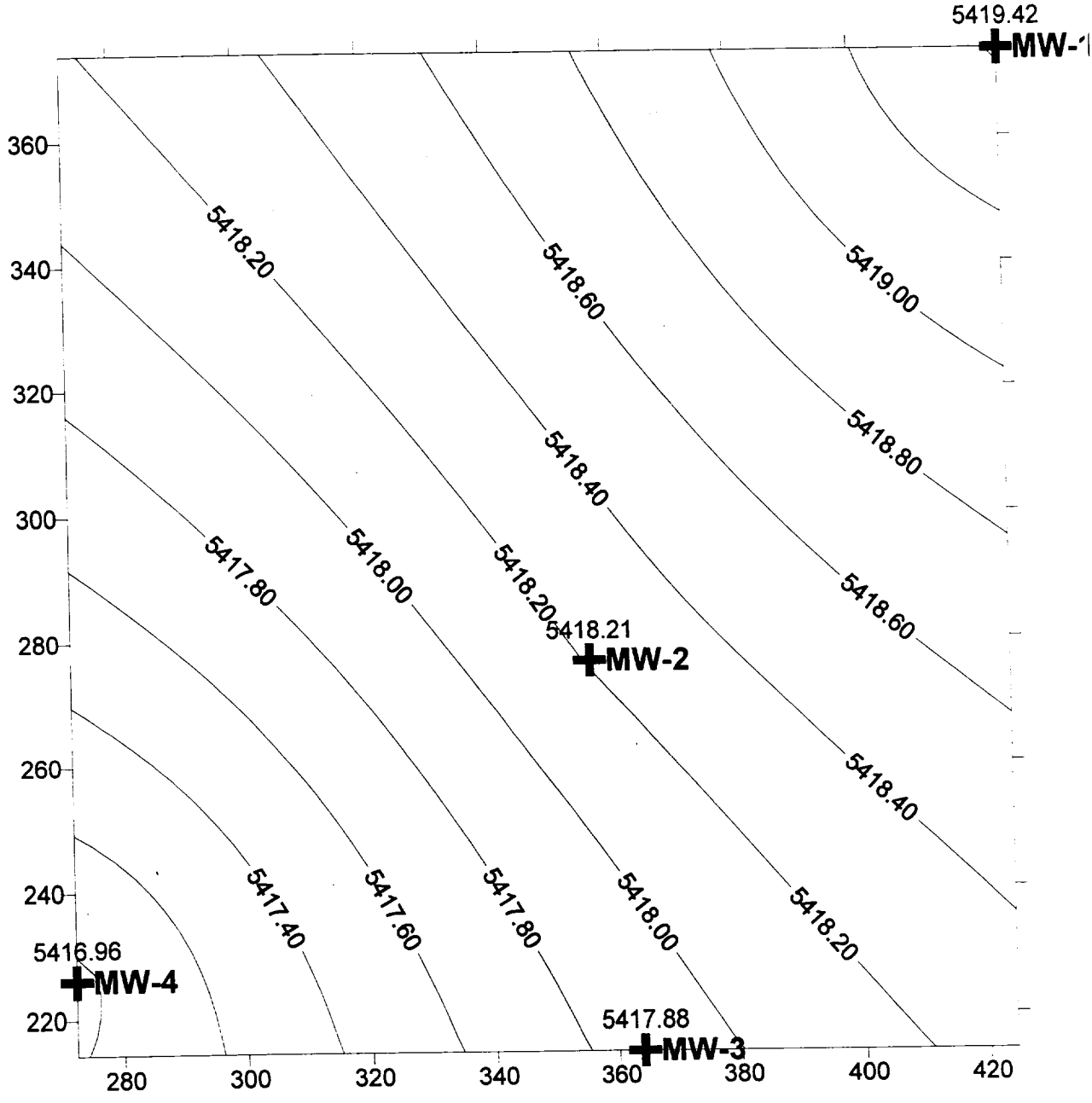
Figure 3c. Mangum 1E Groundwater Contour Map (October 16, 1998)



SCALE IN FEET
(X-axis = Easting,
Y-axis = Northing)

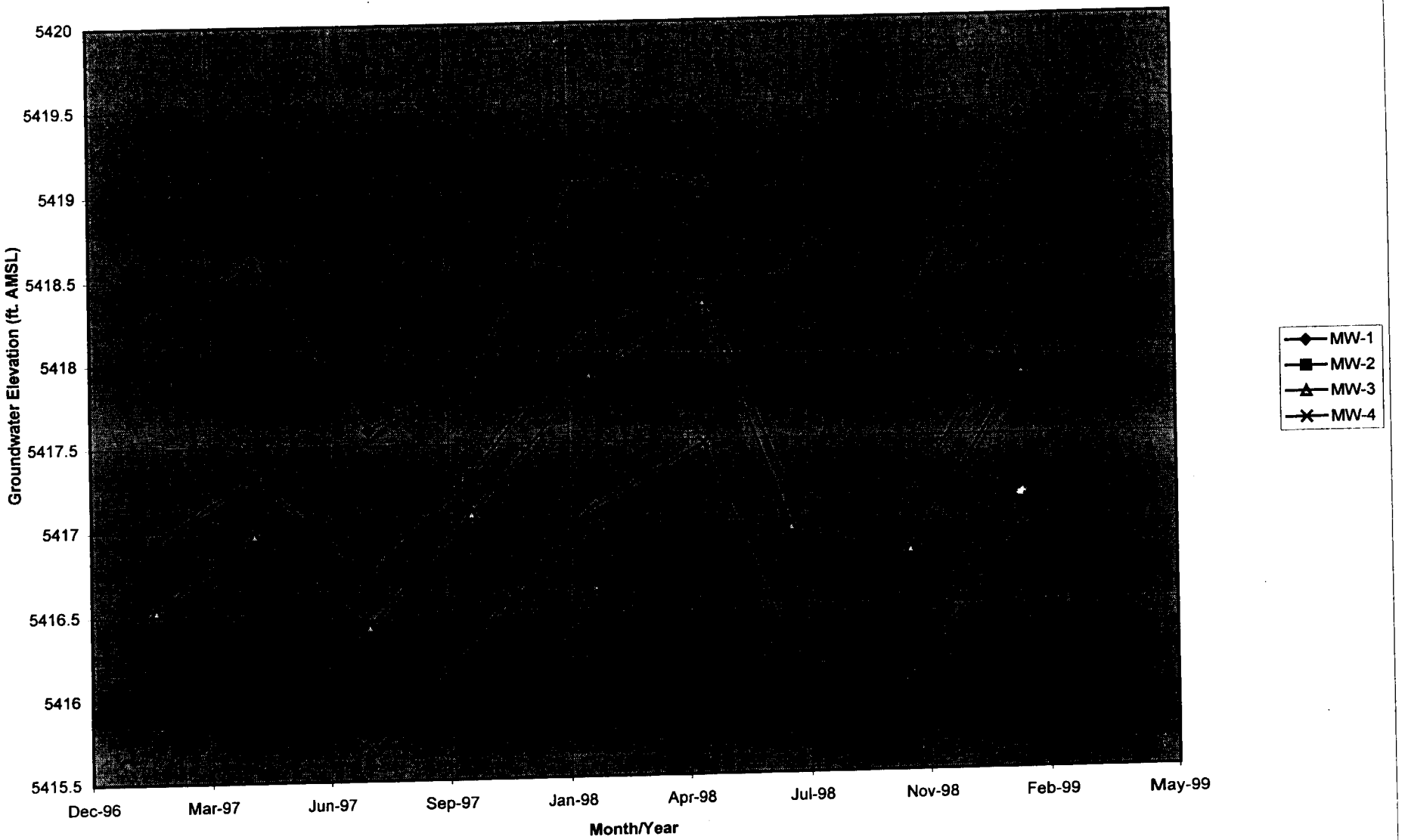
Mangum1E - 1098

Figure 3d. Mangum 1E Groundwater Contour Map (January 18, 1999)



SCALE IN FEET
(X-axis = Easting,
Y-axis = Northing)

Figure 4. Mangum 1E Hydrograph
(Water Level vs. Time)



Mang1e99.XLS

OFF: (505) 325-5667

ON SITE
TECHNOLOGIES, LTD.

LAB: (505) 325-1556

August 19, 1999

Maureen Gannon
PNM - Public Service Company of NM
Alvarado Square Mail Stop 0408
Albuquerque, NM 87158
TEL: (505) 241-2974
FAX (505) 241-2340

RE: Mangum 1E

Order No.: 9908[illegible]

Dear Maureen Gannon,

On Site Technologies, LTD. received 1 sample on 08/06/1999 for the analyses presented in the following report.

The Samples were analyzed for the following tests:
Aromatic Volatiles by GC/PID (SW8021B)

There were no problems with the analyses and all data for associated QC met EPA or laboratory specifications except where noted in the Case Narrative.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

David Cox

OFF: (505) 325-5667

ON SITE TECHNOLOGIES, LTD.

LAB: (505) 325-155€

On Site Technologies, LTD.

Date: *19-Aug-99*

CLIENT: PNM - Public Service Company of NM
Project: Mangum 1E
Lab Order: 9908011

CASE NARRATIVE

Samples were analyzed using the methods outlined in the following references:

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, 3rd Edition

All method blanks, laboratory spikes, and/or matrix spikes met quality assurance objectives.

P.O. BOX 2606 • FARMINGTON, NM 87499

OFF: (505) 325-5667

ON SITE TECHNOLOGIES, LTD.

LAB: (505) 325-1556

ANALYTICAL REPORT

Date: *19-Aug-99*

Client: PNM - Public Service Company of NM
Work Order: 9908011
Lab ID: 9908011-01A **Matrix:** AQUEOUS
Project: Mangum 1E

Client Sample Info: Mangum 1E
Client Sample ID: 9908051140; TMW-1
Collection Date: 08/05/1999 11:40:00 AM
COC Record: 7819

Parameter	Result	PQL	Qual	Units	DF	Date Analyzed
AROMATIC VOLATILES BY GC/PID		**SW8021B**				Analyst: **DC**
Benzene	ND	0.5		µg/L	1	08/12/1999
Toluene	ND	0.5		µg/L	1	08/12/1999
Ethylbenzene	1.2	0.5		µg/L	1	08/12/1999
m,p-Xylene	3.6	1		µg/L	1	08/12/1999
o-Xylene	0.6	0.5		µg/L	1	08/12/1999

5.4 ppm

Qualifiers:

PQL - Practical Quantitation Limit
ND - Not Detected at Practical Quantitation Limit
J - Analyte detected below Practical Quantitation Limit
B - Analyte detected in the associated Method Blank
S - Spike Recovery outside accepted recovery limits
R - RPD outside accepted recovery limits
E - Value above quantitation range
Surr: - Surrogate

P.O. BOX 2606 • FARMINGTON, NM 87499

7819

CHAIN OF CUSTODY RECORD

ON SITE TECHNOLOGIES, LTD.

612 E. Murphy Dr. • P.O. Box 2606 • Farmington, NM 87499
LAB: (505) 325-5667 • FAX: (505) 325-6256

Date: 8/5/99

Page: 1 of 1

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	Alverado Square, Mail Stop 0408	
	City, State, Zip	Albuquerque, NM 87158	
	Telephone No.	505-848-2974	Telefax No.

Sampling Location: Mangum 1E

Sampler: Mark S. Kelianos

SAMPLE IDENTIFICATION	SAMPLE DATE	SAMPLE TIME	MATRIX	PRES.	Number of Containers	BTEX 8021B	LAB ID
990805 1140 TMW-1			H_2O	HCL	2	X	

Relinquished by: Mark S.	Date/Time 8/6/99 1440	Received by:	Date/Time
Relinquished by:	Date/Time	Received by:	Date/Time
Relinquished by:	Date/Time	Received by:	Date/Time

Method of Shipment:

Authorized by: _____ Date 8/5/99

(Client Signature Must Accompany Request)

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

RECORD OF SUBSURFACE E[illegible] ORATION

Borehole # 1
Well # MW1
Page 1 of 2

Philip Services Corporation

4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Project Name: PNM ~~Vertical Extent~~ Well Installation
Project Number: ~~2078~~ 21300 Phase ~~6003~~ 6001.77
Project Location: ~~Pritchard #2~~ Mangum #1E, Fee

Elevation:
Borehole Location: ~~L: J S: 2 T: 30N R: 8W~~ S27, T29N, R11, W
GWL Depth:
Logged By: C. Irby
Drilled By: K. Padilla
Date Started: 7-2[illegible]-98 8:00Am
Date Completed: 7-2[illegible]-98

On-Site Geologist: C. Irby, Cathy Cullie, OTT
Personnel On-Site: K. Padilla, ~~A. Werito~~ D. Padilla
Contractors On-Site:
Client Personnel On-Site: ~~R. Burnham~~ Gary Cook

Drilling Method: 4 1/4 ID HSA
Air Monitoring Method: PID

Depth (Feet)	Sample Number	Sample Interval	Sample Type & Recovery (inches)	Sample Description Classification System: USCS	USCS Symbol	Depth Lithology Change (feet)	Air Monitoring Units: NDU BZ	BH	S	Drilling Conditions & Blow Counts
0				HoT, Sunny, Clear						SS = Split Spoon Sample
5	1	[ ]	10"	VF-MG, angular, unconsolidated Clean, Sand, Black Stained.			0		550 PPm	SS = 315 ppm ±20 Blows
10		[ ]		Gravel in bottom of Sample, Gravel - WeT,					N/A	20 Blows [illegible]
				no more samples collected						
20				cuttings show a [illegible] Clayey Sand stiff Gray TD						
25										
30										
35										
40										

Comments:

Geologist Signature: [signature]

MONITORING WELL INSTALLATION RECORD

Phillip Environmental Services Corp.
4000 Monroe Road
Farmington, New Mexico 87401
(505) 326-2262 FAX (505) 326-2388

Borehole # 1
Well # MW1
Page 2 of 2

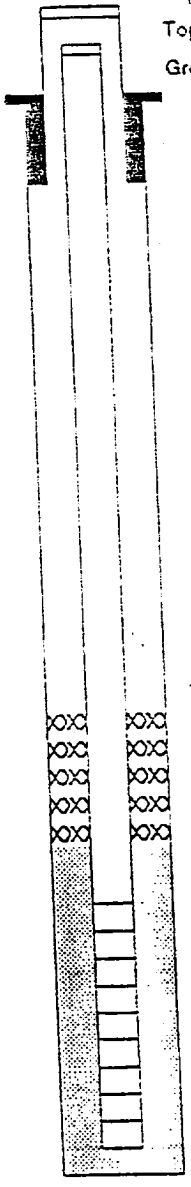
Project Name PNM Well Installation
Project Number 21300 Phase 6001.7
Project Location Mangum #1E, Fee

On-Site Geologist C. Irby, C. Cullicott
Personnel On-Site
Contractors On-Site
Client Personnel On-Site Gary Cook

Elevation
Well Location S22, T29N, R11W
GWL Depth
Installed By K Padilla
D Padilla
Date/Time Started 7-27-94 8AM
Date/Time Completed 7-28-94

Depths in Reference to Ground Surface

Item	Material	Depth
Top of Protective Casing		
Bottom of Protective Casing		
Top of Permanent Borehole Casing		
Bottom of Permanent Borehole Casing		
Top of Concrete		
Bottom of Concrete		
Top of Grout		
Bottom of Grout		
Top of Well Riser		
Bottom of Well Riser		
Top of Well Screen		
Bottom of Well Screen		
Top of Peltonite Seal		ES
Bottom of Peltonite Seal	1 Sack	3
Top of Gravel Pack	4 Sacks	
Bottom of Gravel Pack		
Top of Natural Cave-In		
Bottom of Natural Cave-In		
Top of Groundwater		
Total Depth of Borehole		



Top of Protective Casing N/A
Top of Riser
Ground Surface
Top of Seal GS
Top of Gravel Pack 3
Top of Screen 5
▽ 9.1
Bottom of Screen 20'
Bottom of Borehole 20'

Comments:

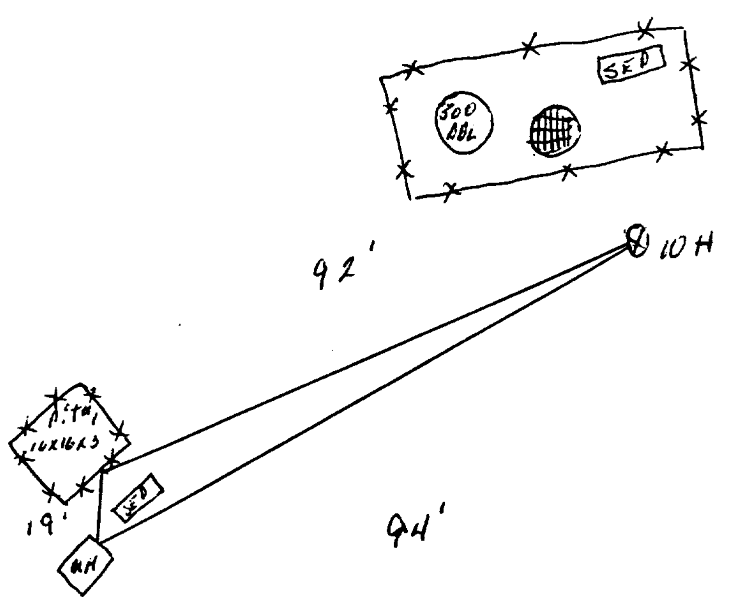
Geologist Signature Cecil Cullicott

N

Mcwgum #1E

68° W of S

92' from Wellhead



↗ to WH

33'
From MH

100'

85' from WH
55' from MH
0 ppm

OFF: (505) 325-5667

ON SITE TECHNOLOGIES, LTD.

LAB: (505) 325-1556

Diesel Range Organics

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

Date: 14-Nov-96
COC No.: 5135
Sample No. 12841
Job No. 2-1000

Project Name: **PNM Gas Services - Mangum #1E**
Project Location: **9611121430; Pit Excavation Composite, Wall Sample**
Sampled by: RH Date: 12-Nov-96 Time: 14:30
Analyzed by: DC/HR Date: 13-Nov-96
Sample Matrix: Soil

Laboratory Analysis

Parameter	Result	Unit of Measure	Detection Limit	Unit of Measure
Diesel Range Organics (C10 - C28)	<5.0	mg/kg	5.0	mg/kg

Quality Assurance Report

DRO QC No.: 0512-QC

Calibration Check

Parameter	Method Blank	Unit of Measure	True Value	Analyzed Value	% Diff	Limit
Diesel Range (C10 - C28)	<5.0	ppm	100	100	0.5	15%

Matrix Spike

Parameter	1- Percent Recovered	2 - Percent Recovered	Limit	%RSD	Limit
Diesel Range (C10-C28)	93	92	(70-130)	1	20%

Method - SW-846 EPA Method 8015A mod. - Nonhalogenated Volatile Hydrocarbons by Gas Chromatography

Approved by:
Date: 11/14/96

OFF: (505) 325-5667

ON SITE TECHNOLOGIES, LTD.

LAB: (505) 325-155

AROMATIC VOLATILE ORGANICS

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

Date: 14-Nov-96
COC No.: 5135
Sample No.: 12841
Job No.: 2-1000

Project Name: PNM Gas Services - Mangum #1E
Project Location: 9611121430; Pit Excavation Composite, Wall Sample
Sampled by: RH Date: 12-Nov-96 Time: 14:30
Analyzed by: DC Date: 13-Nov-96
Sample Matrix: Soil

Laboratory Analysis

Parameter	Result	Unit of Measure	Detection Limit	Unit of Measure
Benzene	31.0	ug/kg	0.2	ug/kg
Toluene	616.7	ug/kg	0.2	ug/kg
Ethylbenzene	128.1	ug/kg	0.2	ug/kg
m,p-Xylene	967.0	ug/kg	0.2	ug/kg
o-Xylene	225.5	ug/kg	0.2	ug/kg
TOTAL	1968.1	ug/kg		

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

Approved by:
Date: 11/14/96

OFF: (505) 325-5667

ON SITE TECHNOLOGIES, LTD.

LAB: (505) 325-1556

AROMATIC VOLATILE ORGANICS

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

Date: 12-Nov-96
COC No.: *5134*
Sample No.: *12828*
Job No.: *2-1000*

Project Name: ***PNM Gas Services - Magnum #1E***
Project Location: ***9611120730; Pit Excavation Ground Water Sample***
Sampled by: RH Date: 12-Nov-96 Time: 7:30
Analyzed by: DC Date: 12-Nov-96
Sample Matrix: *Water*

Laboratory Analysis

Parameter	*Result*	*Unit of Measure*	*Detection Limit*	*Unit of Measure*
Benzene	128.3	ug/L	0.2	ug/L
Toluene	501.4	ug/L	0.2	ug/L
Ethylbenzene	157.8	ug/L	0.2	ug/L
m,p-Xylene	1866.8	ug/L	0.2	ug/L
o-Xylene	509.9	ug/L	0.2	ug/L
TOTAL	3164.3	ug/L		

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

Approved by:
Date: 11/12/96