3R - 150

2005 AGWMR

07/27/2005

3R150

elpaso

VIA FEDERAL EXPRESS

July 27, 2005

Mr. William E. Freeman
Navajo Environmental Protection Agency
P. O. Box 1999
Shiprock, New Mexico 87420

RE: 2005 Bisti Flare Pit #1 Annual Report and Closure Request

Dear Mr. Freeman:

El Paso Field Services (EPFS) hereby submits the annual report for the Bisti Flare Pit #1 site (the Site) and a formal request for closure. The annual report details work performed between July 2004 and June 2005, and outlines the rationale for the closure request. As discussed in this, and previous annual reports, there is a very low threat to human health and the environment due to the small mass and isolated nature of residual hydrocarbons remaining at the Site. Given this extremely low risk, additional remediation is not warranted, and it is recommended that no further action be taken at the Site. Therefore, EPFS formally requests to receive a letter of no further action for the Site. Upon receipt of this letter, EPFS will abandon all Site wells according to the NMOCD-approved monitoring well abandonment plan.

Should you have any questions or comments regarding the enclosed report, please feel free to contact me at (719) 520-4433.

Sincerely,

Scott T. Pope, P.G.
Senior Environmental Scientist

Attachments: as stated

c.c. Mr. James Walker; USEPA, Farmington - w / enclosures; VIA FED EX
Mr. Denny Foust; NMOCD, Aztec - w / enclosures; VIA FED EX
Mr. Ed Martin; NMOCD, Santa Fe – w / electronic enclosures; VIA FED EX
NNEPA File Copy

2005 ANNUAL REPORT
BISTI FLARE PIT #1
SAN JUAN COUNTY, NEW MEXICO

Prepared for:

El Paso Field Services

Prepared by:

Engineering Management Support, Inc.

Under Contract to:

MWH Americas, Inc.

July 2005

TABLE OF CONTENTS

Page

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1.0 INTRODUCTION

1.1 SCOPE

At the request of El Paso Field Services (EPFS) and under subcontract to MWH Americas, Inc. (MWH), Engineering Management Support, Inc. (EMSI) has prepared the following annual report for the Bisti Flare Pit #1 Meter Code LD-267 site (the Site). The current report will describe activities that occurred at the Site from July 1, 2004 through June 30, 2005. Figure 1 shows the locations of the existing piezometers and the location of the former Bisti Flare Pit.

1.2 SUMMARY OF ACTIVITIES

Since the production of the previous annual report, the following activities have occurred at the Site:

- Water sampling of selected wells in October 2004 and April 2005;
- Measurement of water levels in selected wells in October 2004 and April 2005; and
- Monthly free-product recovery from three wells (PZ-11, PZ-15 and PZ-35).

A description and results of each of these activities are provided in this report.

2.0 SITE INVESTIGATIONS

2.1 WATER-QUALITY SAMPLING AND FREE PRODUCT REMOVAL

Based upon the analysis of water-quality trends that were presented in the 2000 through 2004 Annual Reports, several monitoring wells were selected for sampling on a semi-annual basis. These wells are located east, southeast, and south of the former pit for the purpose of monitoring water-quality trends downgradient of the former pit. The goal was to monitor wells with potentially elevated concentrations of benzene, toluene, ethylbenzene, and total xylenes (BTEX) adjacent to the former pit, and wells that are located on the edge of the estimated extent of BTEX in perched groundwater. The nine wells selected for monitoring included: PZ-9, PZ-10, PZ-11, PZ-15, PZ-17, PZ-21, PZ-29, PZ-35 and PZ-36 (Figure 1). The wells selected for sampling were jointly chosen between EPFS, the Navajo Nation Environmental Protection Agency (NNEPA) and the U.S. Environmental Protection Agency (USEPA).

Water samples were collected from PZ-21, PZ-29 and PZ-36 on October 21, 2004; and samples were collected on April 19, 2005 from PZ-15, PZ-21, PZ-29, and PZ-36. During the October 2004 sampling event, product was present in PZ-11, PZ-15 and PZ-35, and during the April 2005 event, product was present in PZ-11 and PZ-35; therefore these wells were not sampled. Wells PZ-9, PZ-10, PZ-17 and PZ-23 were dry or had insufficient water to sample during both the October 2004 and April 2005 sampling events. The groundwater samples that were collected during these events were analyzed for BTEX compounds. The results of the analyses are presented in Table 1, and the laboratory data packages are contained in Appendix A. Water-quality graphs are contained in Appendix B.

In addition to water sampling, free product was removed from wells PZ-11, PZ-15, and PZ-35 on a monthly basis. The volumes of free product removed during each event are provided in Table 2, and graphs of the volumes removed are provided in Appendix C of this report.

2.2 WATER-LEVEL MEASUREMENTS

Water levels were measured in all Site wells during the October 2004 and April 2005 sampling events. Figures 2 and 3 are maps that present the elevations of perched groundwater during October 21, 2004 and April 19, 2005, respectively. Table 2 lists the water-level measurements for the wells. Appendix D contains hydrographs for selected wells.

3.0 RESULTS OF DATA COLLECTION

3.1 WATER-QUALITY ANALYSES AND FREE-PRODUCT REMOVAL

As discussed earlier, selected wells have been sampled since 1997. Table 1 lists the wells and the analytical results for the various sampling events. Only the wells that have been sampled during the reporting period are included on Table 1. The historical analyses for other wells are contained in previous annual reports. Appendix B contains graphs of the BTEX concentrations measured in wells PZ-21, PZ-29, and PZ-36. Locations of these wells are presented on Figure 1. On these graphs, a four-point moving average is also displayed. The moving average is a means to reduce variability between sampling events so that trends can be observed.

Well PZ-29 is located on the southeastern edge of the former flare pit. Concentrations of BTEX compounds in perched groundwater samples from PZ-29 have declined with time. Concentrations of total BTEX are elevated in samples from this well (approximately 35,000 µg/L in 1998); however, they have declined to approximately 12,000 µg/L in recent years. The moving average trend shows a continued decline in concentration over the period of sampling. Well PZ-36 is located just east of the former pit edge. The total BTEX concentrations in well PZ-36 showed a significant initial decline; however, concentrations appear to have stabilized.
Well PZ-21 is located to the southeast and further downgradient of the former pit. Water samples from well PZ-21 indicated increasing total BTEX concentrations from approximately late 1998 through early 2001. These increasing concentrations were probably due to injection of treatment fluids that occurred during this time period, which also resulted in water recharge through the former flare pit. After cessation of injections and removal of the former flare pit in March 2001, groundwater flow directions changed and BTEX constituents no longer migrate in an east/southeast direction. The change in groundwater flow directions and in-situ degradation of BTEX compounds (due, in part, to elevated concentrations of sulfates from the process waters) resulted in a decrease in BTEX concentrations at the location of well PZ-21. A "spike" in total BTEX concentrations is noted in October 2004; however, concentrations declined again in the April 2005 water sample.

Figures 4 and 5 show the distribution of BTEX concentrations during October 2004 and April 2005, respectively. No attempt was made to contour the data, as the data points are sparse and there is only an isolated area of elevated total BTEX. These figures show that elevated BTEX concentrations, including free product, remain along the eastern and southern portions of the Site in areas adjacent to the former flare pit. These data are presented in Table 1. A review of data contained in the previous annual reports and graphs contained in Appendix B, demonstrate that the elevated concentrations of BTEX are not migrating, and are declining or have stabilized due to the free-product removal efforts and natural attenuation.

When the water samples are collected, the specific conductance of the water is also measured. The average specific conductance is 9,988 micromhos per centimeter for the October 2004 sampling (corrected to a temperature of 25 ^{o}C). A total dissolved solids (TDS) concentration can be estimated by assuming that the TDS concentration (in mg/L) is approximately 0.75 of the specific conductance (Hem, 1970, Study and Interpretation of the Chemical Characteristics of Natural Waters, United States Geological Survey (USGS) Water Supply Paper 1473). Based upon this assumption, the TDS concentration is estimated to be approximately 7,500 mg/L. The USGS classifies water with a TDS concentration of 7,500 mg/L as being moderately saline. Because of the high TDS concentration (and sulfates), the perched groundwater is unfit for human consumption and irrigation.

Appendix C presents plots of the volumes of free product that have been removed from wells PZ-11, PZ-15 and PZ-35 over time. The volume of free product removed from PZ-11 has been relatively consistent over the past year, at an average of approximately 14 ounces per removal event. A spike of 76 ounces was recorded on June 3, 2004, however there was a subsequent decline and stabilization in the volumes removed. The total cumulative volume of product removed from this well is approximately 376 ounces (2003 - 2005). Oil absorbent socks have been placed in this well to facilitate and potentially expedite product removal.

The volume of free product removed from well PZ-15 has fluctuated around 1 to 2 ounces per month. A spike of 4 ounces per month was recorded in April 2005; however, the small volume

of product extracted is subject to measurement errors. The total cumulative volume of product removed from this well is approximately 19 ounces (2003 - 2005).

The volume of free product removed from well PZ-35 has shown a significant decrease in volume per removal effort, and the extraction rate appears to have stabilized to around 14 to 15 ounces per month. The total cumulative volume of product removed from this well is approximately 703 ounces (2003 - 2005). Oil absorbent socks have been placed in this well to facilitate and potentially expedite product removal.

Free product removal appears to have stabilized at a level of about 15 ounces per month for two wells (PZ-11 and PZ-35), and an inconsequential amount for PZ-15. The total amount of free product removed from the wells is approximately 8.6 gallons (1,098 ounces). Well PZ-35 has yielded 5.5 gallons of free product (with the vast majority occurring during the initial extractions); PZ-11 has yielded 2.9 gallons, and PZ-15 just 0.2 gallons. It appears that the Site is at a point of diminishing returns with respect to free product removal. The USEPA policy on free product is that it should be removed to the extent practicable; this point appears to have been achieved. Additional removal efforts are not warranted as the residual free product and dissolved constituents are not migrating and do not pose a threat to human health or the environment.

3.2 WATER LEVELS AND PERCHED GROUNDWATER FLOW DIRECTIONS

Table 2 is a listing of the water levels for the monitoring wells at the Site. Appendix D contains the hydrographs for various monitoring wells. As shown in Appendix D almost all of the water levels have declined in recent years due to drought conditions; however, increased precipitation in the past year has not overcome the overall decline due to the lack of recharge.

Figures 2 and 3 present perched water levels at the Site during October 2004 and April 2005, respectively. In past reports (e.g. 2003 and 2004) water levels were contoured; however, with continued monitoring over time, a new conceptual model of the Site has been developed. Contouring the water levels implies that there is continuity of the saturated zone. Based upon

water-quality and water-elevation data it appears that the perched water occurs in isolated areas of the Site. These isolated areas may be hydraulically connected when perched groundwater elevations were higher (during the time that the pit existed and in-situ injections were occurring, or when there is sufficient recharge). Under current conditions significant areas of the Site are dry, especially in the Fall. Currently, there appears to be isolated areas of saturation that contain BTEX and free product. It should be noted that the monitoring wells have been screened throughout the perched saturated zone. Therefore, if water is present , it will be monitored by the existing wells. In the past, when the former flare pit was in existence, a significant component of perched groundwater flow was to the south. Recent data indicate there is an easterly component to flow if continuous saturation occurs.

Perched groundwater is contained on property that is controlled. The water-level data indicate that the former pit is no longer acting as a source of recharge and that the perched groundwater flow direction and thickness of saturation is governed by the topography of the top of the silty-clay or silty-sand deposits that were observed in the former excavation and boreholes. These geologic units serve as the base of the perched groundwater system. The decline in water levels also indicates that the transmissivity of the perched groundwater zone has also declined resulting in pockets of water and in some cases, free product. Dissolved BTEX does not appear to be migrating.

Figure 6 presents the estimated area of elevated BTEX concentrations based on recent and historic data. The estimated average thickness of the perched zone (where saturated) for October 2004 was approximately 2 feet. The area of elevated concentrations is approximately 6,900 square feet, assuming continuous saturation. Assuming a porosity of 0.25 and an average concentration of 11,000 µg/L for total BTEX, the amount of dissolved BTEX is approximately 2 pounds (this does not include the volume of free product). These estimates are compared to an average total BTEX concentration of 16,000 µg/L in 2003, and a total estimated mass of 4 pounds (MWH, 2004). The dissolved phase does not appear to be migrating, and residual concentrations are declining due to natural attenuation. The area of elevated BTEX and free product has not changed over time. Because of the low transmissivities and isolated nature of the

perched zone, there is no practicable means to remove the free product with the exception of excavation. However, the costs of such an activity are excessive, compared to the potential risks of leaving the materials in place. EPFS has clearly demonstrated that the residual hydrocarbons are not migrating and are not a threat to human health or the environment. The hydrocarbons are contained by low permeability geologic materials that minimize their migration. In addition, the perched zone is not suitable as a source of fresh water because of its low yield and poor quality.

4.0 SUMMARY AND RECOMMENDATIONS

EMSI and EPFS are of the opinion that the Bisti Site should be closed without further remediation. The rationale for this opinion is summarized in the following bulleted items.

- Field observations from the excavation and boreholes show that the groundwater encountered at the Site is perched and water within the perched zone is isolated.
- The perched groundwater is hydraulically isolated from water-bearing zones that are beneath the perched groundwater. Information provided in previous annual reports indicates that there is at least 60 feet of unsaturated materials beneath the perched zone.
- The perched groundwater is at least 10 feet below land surface, resulting in a very low risk for dermal or inhalation contact.
- EPFS will assume industrial use of the Site for the foreseeable future and will implement de facto institutional controls on the use of the property. No well drilling or contact with the perched groundwater will be allowed without EPFS' permission.
- The property will be used for industrial purposes (as a compressor station) for the foreseeable future.
- The perched groundwater is contained within geologic materials that are of low hydraulic conductivity, transmissivity and isolated saturation. Migration of chemicals of concern is limited.
- Active remediation options are limited because of the low hydraulic conductivity and transmissivity. Free-product removal appears to have reached a point of diminishing returns.
- As demonstrated by over eight years of monitoring, BTEX concentrations and free-product volumes are decreasing through natural attenuation over time. Estimates of residual total dissolved BTEX indicate that about 2 pounds of contaminants currently exist at the Site.
- As discussed in previous annual reports for this Site, there is a very low threat to the environment because of the limited amount of residual hydrocarbons remaining at the Site. Given the extremely low risk that the Site presents, it is recommended that no additional remediation occur at the Site, as it is unwarranted given the small mass and isolated nature of the remaining BTEX.

EPFS formally requests to receive a letter of no further action for the Site so that the Site can be closed.

TABLES

FIGURES

APPENDIX A
LABORATORY CHEMICAL ANALYSIS REPORTS

APPENDIX B
WATER-QUALITY GRAPHS

APPENDIX C
FREE-PRODUCT REMOVAL GRAPHS

APPENDIX D
WATER-LEVEL HYDROGRAPHS

TABLE 1
WATER-QUALITY ANALYSES
2005 BISTI ANNUAL REPORT
EL PASO FIELD SERVICES

Date Sampled	Well #	Benzene	Toluene	Ethyl benzene	Total Xylenes	Total BTEX	Total Nitrate	Sulfate
10/29/2003	PZ-15	8,570	1,510	346	4,010	14,436	NM	NM
4/19/2005	PZ-15	5,200	ND	155	1,900	7,255	NM	NM

Date Sampled	Well #	Benzene	Toluene	Ethyl benzene	Total Xylenes	Total BTEX	Total Nitrate	Sulfate
4/21/1997	PZ-21	1	1	1	3	6	22.3	3780
6/16/1997	PZ-21	1	1	1	3	6	NM	NM
7/15/1997	PZ-21	1	1	1	3	6	27.5	4420
8/18/1997	PZ-21	1	1	1	3	6	NM	NM
9/19/1997	PZ-21	1	1	1	3	6	25.3	4270
10/16/1997	PZ-21	1	1	1	3	6	NM	NM
11/17/1997	PZ-21	1	1	1	3	6	NM	NM
12/16/1997	PZ-21	3	1	1	3	8	NM	NM
1/19/1998	PZ-21	5	1	1	3	10	21.2	4332
3/3/1998	PZ-21	9	1	1	3	14	NM	NM
4/1/1998	PZ-21	11	1	1	3	16	NM	NM
5/7/1998	PZ-21	15	1	1	3	20	NM	NM
6/2/1998	PZ-21	21	1	1	3	26	NM	NM
7/6/1998	PZ-21	21	1	1	3	26	15.9	4674
10/9/1998	PZ-21	49	1	1	3	54	NM	NM
3/23/1999	PZ-21	34	1	1	3	39	NM	NM
10/19/1999	PZ-21	48	2	1	3	53	NM	NM
3/15/2000	PZ-21	39	ND	ND	ND	39	0.6	5400
10/25/2000	PZ-21	55	1	ND	1	56	0.2	76.7
4/9/2001	PZ-21	49	ND	ND	1	50	0.68	5160
10/9/2001	PZ-21	19	1	1	1	21	0.27	5700
10/16/2002	PZ-21	13	2	1	12	28	14.9	5330
4/29/2003	PZ-21	1	ND	ND	ND	1	NM	NM
10/29/2003	PZ-21	1	ND	ND	ND	1	NM	NM
6/8/2004	PZ-21	ND	ND	ND	ND	ND	NM	NM
10/21/2004	PZ-21	6	12	3	21	42	NM	NM
4/19/2005	PZ-21	5	ND	ND	1	7	NM	NM

NM = Not Measured
ND = Not Detected

BTEX constituent concentrations reported in micrograms per liter (ppb)
Sulfate and nitrate concentrations reported in milligrams per liter (ppm)

TABLE 1
WATER-QUALITY ANALYSES
2005 BISTI ANNUAL REPORT
EL PASO FIELD SERVICES

Date Sampled	Well #	Benzene	Toluene	Ethyl benzene	Total Xylenes	Total BTEX	Total Nitrate	Sulfate
5/20/1997	PZ-29	8,790	4,600	318	2,560	16,268	ND	188
6/16/1997	PZ-29	11,900	6,630	335	2,820	21,685	NM	NM
7/16/1997	PZ-29	9,630	7,620	210	2,940	20,400	ND	34
8/18/1997	PZ-29	15,300	14,600	429	4,780	35,109	NM	NM
9/19/1997	PZ-29	13,500	13,100	396	4,760	31,756	ND	9.8
10/16/1997	PZ-29	14,800	14,800	554	5,040	35,194	NM	NM
11/17/1997	PZ-29	14,700	14,800	497	4,680	34,677	NM	NM
12/16/1997	PZ-29	16,100	15,400	550	5,170	37,220	NM	NM
1/19/1998	PZ-29	14,700	13,800	515	4,670	33,685	ND	ND
3/3/1998	PZ-29	15,200	14,000	468	5,020	34,688	NM	NM
4/1/1998	PZ-29	15,100	13,300	485	4,930	33,815	NM	NM
5/7/1998	PZ-29	15,600	13,500	460	4,820	34,380	NM	NM
6/2/1998	PZ-29	14,900	14,100	484	4,780	34,264	NM	NM
7/6/1998	PZ-29	14,900	12,700	484	4,830	32,914	ND	ND
10/9/1998	PZ-29	13,300	10,800	508	4,530	29,138	NM	NM
3/23/1999	PZ-29	11,000	6,980	454	4,000	22,434	NM	NM
10/19/1999	PZ-29	7,500	2,400	440	2,600	12,940	NM	NM
3/15/2000	PZ-29	15,000	9,200	700	5,700	30,600	ND	15
10/25/2000	PZ-29	5,000	2,300	350	1,800	9,450	0.05	322
4/9/2001	PZ-29	8,200	2,300	330	2,200	13,030	ND	6.3
10/9/2001	PZ-29	Had Product No Sample Taken						
10/9/2002	PZ-29	10,100	3,650	929	5,440	20,119	<4	88.9
4/29/2003	PZ-29	8,460	2,010	546	4,110	15,126	NM	NM
10/29/2003	PZ-29	16,200	92	852	1,240	18,384	NM	NM
6/8/2004	PZ-29	8,070	371	349	2,680	11,470	NM	NM
10/21/2004	PZ-29	8,590	369	537	4,060	13,556	NM	NM
4/19/2005	PZ-29	7,520	266	268	4,080	12,134	NM	NM

Date Sampled	Well #	Benzene	Toluene	Ethyl benzene	Total Xylenes	Total BTEX	Total Nitrate	Sulfate
5/1/2001	PZ-36	18,000	16,000	630	5,300	39,930	0.23	540
10/9/2001	PZ-36	14,000	2,200	590	4,100	20,890	0.18	56
4/17/2002	PZ-36	14,000	150	440	2,400	16,990	0.19	140
10/16/2002	PZ-36	<0.5	<0.5	<0.5	1	3	5.4	118
4/29/2003	PZ-36	12,900	100	671	11	13,682	5.4	118
10/29/2003	PZ-36	10,400	2,180	652	4,160	17,392	NM	NM
6/8/2004	PZ-36	13,500	74	694	1,330	15,598	NM	NM
10/21/2004	PZ-36	15,000	79	662	1,060	16,801	NM	NM
4/19/2005	PZ-36	12,700	ND	554	906	14,160	NM	NM

NM = Not Measured
ND = Not Detected

BTEX constituent concentrations reported in micrograms per liter (ppb)
Sulfate and nitrate concentrations reported in milligrams per liter (ppm)

TABLE 2
WATER-LEVEL MEASUREMENTS
2005 BISTI ANNUAL REPORT
EL PASO FIELD SERVICES

PIEZOMETER NUMBER	DATE	TIME	TOP OF CASING ELEVATION (FT)	DEPTH TO PRODUCT OR WATER (FT BTOC)	DEPTH TO WATER (FT BTOC)	PRODUCT THICKNESS (FT)	PRODUCT REMOVED (Ounces)	GROUNDWATER ELEVATION (FT)
PZ-10	05/03/97	NM	NM	DRY	DRY	NM	NM	DRY
PZ-10	06/15/97	NM	6025.40	18.19	18.19	0.00	NM	6007.21
PZ-10	07/15/97	1049	6025.40	18.20	18.20	0.00	NM	6007.20
PZ-10	08/18/97	NM	6025.40	18.02	18.02	0.00	NM	6007.38
PZ-10	09/19/97	1657	6025.40	17.90	17.90	0.00	NM	6007.50
PZ-10	10/16/97	1331	6025.40	18.50	18.50	0.00	NM	6006.90
PZ-10	11/17/97	1245	6025.40	18.05	18.05	0.00	NM	6007.35
PZ-10	12/16/97	1340	6025.40	18.07	18.07	0.00	NM	6007.33
PZ-10	01/19/98	1520	6025.40	17.97	17.97	0.00	NM	6007.43
PZ-10	03/03/98	1505	6025.40	17.98	17.98	0.00	NM	6007.42
PZ-10	04/01/98	1330	6025.40	18.01	18.01	0.00	NM	6007.39
PZ-10	05/07/98	1402	6025.40	18.16	18.16	0.00	NM	6007.24
PZ-10	06/02/98	1445	6025.40	18.21	18.21	NM	NM	6007.19
PZ-10	07/06/98	1125	6025.40	18.30	18.30	NM	NM	6007.10
PZ-10	10/09/98	NM	6025.40	NM	NM	NM	NM	NM
PZ-10	03/23/99	NM	6025.40	18.45	18.45	NM	NM	6006.95
PZ-10	12/07/00	NM	6025.40	18.59	18.59	NM	NM	6006.81
PZ-10	03/16/01	NM	6025.40	18.62	18.62	NM	NM	6006.78
PZ-10	10/28/03	NM	6025.40	19.995	20	0.00	0	6005.40
PZ-10	10/21/04		6025.40	dry	dry	dry	dry	dry

PIEZOMETER NUMBER	DATE	TIME	TOP OF CASING ELEVATION (FT)	DEPTH TO PRODUCT OR WATER (FT BTOC)	DEPTH TO WATER (FT BTOC)	PRODUCT THICKNESS (FT)	PRODUCT REMOVED (Ounces)	GROUNDWATER ELEVATION (FT)
PZ-11	05/03/97	11:28	6023.94	16.84	16.84	0.00	NM	6007.10
PZ-11	06/15/97	NM	6023.94	16.74	16.74	0.00	NM	6007.20
PZ-11	07/15/97	1106	6023.94	16.69	16.69	0.00	NM	6007.25
PZ-11	08/18/97	NM	6023.94	16.51	16.51	0.00	NM	6007.43
PZ-11	09/19/97	1810	6023.94	16.39	16.39	0.00	NM	6007.55
PZ-11	10/16/97	1455	6023.94	16.43	16.43	0.00	NM	6007.51
PZ-11	11/17/97	1415	6023.94	16.48	16.48	0.00	NM	6007.46
PZ-11	12/16/97	1435	6023.94	16.58	16.58	0.00	NM	6007.36
PZ-11	01/19/98	1650	6023.94	16.53	16.53	0.00	NM	6007.41
PZ-11	03/03/98	1615	6023.94	16.54	16.54	0.00	NM	6007.40
PZ-11	04/01/98	1425	6023.94	16.51	16.51	0.00	NM	6007.43
PZ-11	05/07/98	1500	6023.94	16.57	16.57	0.00	NM	6007.37
PZ-11	06/02/98	1525	6023.94	16.65	16.65	NM	NM	6007.29
PZ-11	07/06/98	1255	6023.94	16.75	16.75	NM	NM	6007.19
PZ-11	10/09/98	NM	6023.94	NM	NM	NM	NM	NM
PZ-11	03/23/99	NM	6023.94	17.03	17.03	NM	NM	6006.91
PZ-11	03/16/01	NM	6023.94	17.54	17.54	NM	NM	6006.4
PZ-11	05/05/03	0:00	6023.94	18.38	19.09	0.71	16	6005.37
PZ-11	07/18/03	0:00	6023.94	18.359	19.12	0.76	14	6005.38
PZ-11	09/29/03	0:00	6023.94	18.28	19	0.72	16	6005.47
PZ-11	10/28/03	NM	6023.94	18.22	18.92	0.70	12	6005.53
PZ-11	11/14/03	NM	6023.94	18.25	18.93	0.68	14	6005.51
PZ-11	12/09/03	0:00	6023.94	18.28	18.95	0.67	12	6005.48
PZ-11	01/29/04	0:00	6023.94	18.25	18.98	0.73	12	6005.49
PZ-11	02/18/04	0:00	6023.94	18.36	19	0.64	14	6005.41
PZ-11	03/17/04	0:00	6023.94	18.39	19.04	0.65	16	6005.37
PZ-11	04/15/04	0:00	6023.94	18.43	19.1	0.67	12	6005.33
PZ-11	05/12/04	0:00	6023.94	18.42	19.1	0.68	16	6005.34
PZ-11	06/03/04	0:00	6023.94	18.47	19.18	0.71	76	6005.28
PZ-11	06/08/04	0:00	6023.94	18.43	19.12	0.69	NM	6005.32
PZ-11	07/26/04	0:00	6023.94	18.32	19.04	0.72	14.00	6005.48
PZ-11	08/18/04	0:00	6023.94	18.27	18.96	0.69	16.00	6005.53
PZ-11	09/13/04	0:00	6023.94	18.25	18.89	0.64	16.00	6005.56
PZ-11	10/15/04	0:00	6023.94	18.21	18.83	0.62	10.00	6005.61
PZ-11	10/21/04		6023.94	18.21	18.84	0.63		6005.60
PZ-11	11/16/04	0:00	6023.94	18.22	18.8	0.58	8.00	6005.60
PZ-11	12/15/04	0:00	6023.94	18.2	18.78	0.58	8.00	6005.62
PZ-11	01/17/05	0:00	6023.94	18.24	18.8	0.27	26.00	6005.36
PZ-11	02/21/05	0:00	6023.94	18.28	18.76	0.48	8.00	6005.56
PZ-11	03/22/05	0:00	6023.94	18.28	18.73	0.43	10.00	6005.55
PZ-11	04/15/05	0:00	6023.94	18.92	19.09	0.27	15.00	6005.07
PZ-11	04/19/05	0:00	6023.94	18.25	18.68	0.43	NM	6005.60
PZ-11	05/17/05	17-May	6023.94	18.81	18.97	0.16	15.00	6005.10

NM = Not Measured
BTOC = Below Top of Casing
FT = Feet

TABLE 2
WATER-LEVEL MEASUREMENTS
2005 BISTI ANNUAL REPORT
EL PASO FIELD SERVICES

PIEZOMETER NUMBER	DATE	TIME	TOP OF CASING ELEVATION (FT)	DEPTH TO PRODUCT OR WATER (FT BTOC)	DEPTH TO WATER (FT BTOC)	PRODUCT THICKNESS (FT)	PRODUCT REMOVED (Ounces)	GROUNDWATER ELEVATION (FT)
PZ-15	05/03/97	11:40	6024.87	17.54	17.54	0.00	NM	6007.33
PZ-15	06/15/97	NM	6024.87	17.27	17.27	0.00	NM	6007.60
PZ-15	07/15/97	1058	6024.87	17.14	17.14	0.00	NM	6007.73
PZ-15	08/18/97	NM	6024.87	16.82	16.82	0.00	NM	6008.05
PZ-15	09/19/97	1817	6024.87	16.62	16.63	0.01	NM	6008.24
PZ-15	10/16/97	1504	6024.87	16.70	16.71	0.01	NM	6008.16
PZ-15	11/17/97	1454	6024.87	16.80	16.81	0.01	NM	6008.06
PZ-15	12/16/97	1520	6024.87	16.92	16.92	0.00	NM	6007.95
PZ-15	01/19/98	1720	6024.87	16.89	16.89	0.00	NM	6007.98
PZ-15	03/03/98	1717	6024.87	16.89	16.89	0.00	NM	6007.98
PZ-15	04/01/98	1502	6024.87	16.82	16.82	0.00	NM	6008.05
PZ-15	05/07/98	1537	6024.87	16.83	16.83	0.00	NM	6008.04
PZ-15	06/02/98	1548	6024.87	16.95	16.95	NM	NM	6007.92
PZ-15	07/0698	1310	6024.87	17.10	17.10	NM	NM	6007.77
PZ-15	10/09/98	NM	6024.87	NM	NM	NM	NM	NM
PZ-15	03/23/99	NM	6024.87	17.52	17.52	NM	NM	6007.35
PZ-15	03/16/01	NM	6024.87	18.17	18.17	NM	NM	6006.70
PZ-15	05/05/03	0:00	6024.87	19.23	19.26	0.03	1	6005.61
PZ-15	07/18/03	0:00	6024.87	19.22	19.22	0.00	0	6005.65
PZ-15	09/29/03	0:00	6024.87	19.11	19.13	0.02	1	6005.74
PZ-15	10/28/03	0:00	6024.87	19.215	19.215	0.00	0	6005.66
PZ-15	11/14/03	NM	6024.87	20.4	20.4	0.00	0	6004.47
PZ-15	12/09/03	0:00	6024.87	19.185	19.185	0.00	0	6005.69
PZ-15	01/29/04	0:00	6024.87	19.26	19.26	0.00	0	6005.61
PZ-15	02/18/04	0:00	6024.87	19.32	19.32	0.00	0	6005.55
PZ-15	03/17/04	0:00	6024.87	19.34	19.35	0.01	1	6005.52
PZ-15	04/15/04	0:00	6024.87	19.77	19.77	0.00	0	6005.10
PZ-15	05/12/04	0:00	6024.87	19.39	19.39	0.00	0	6005.48
PZ-15	06/03/04	0:00	6024.87	19.425	19.43	0.00	1	6005.44
PZ-15	06/08/04	0:00	6024.87	22.04*	22.04	0.00	NM	6002.83
PZ-15	07/26/04	0:00	6024.87	19.35	19.37	0.02	<1	6005.52
PZ-15	08/18/04	0:00	6024.87	19.615	19.635	0.02	<1	6005.25
PZ-15	09/13/04	0:00	6024.87	19.44	19.51	0.07	2.00	6005.42
PZ-15	10/15/04	0:00	6024.87	19.35	19.43	0.08	2.00	6005.50
PZ-15	10/21/04		6024.87	22.03	22.08	0.05		6002.83
PZ-15	11/16/04	0:00	6024.87	19.815	19.87	0.06	2.00	6005.04
PZ-15	12/15/04	0:00	6024.87	19.84	19.89	0.05	2.00	6005.02
PZ-15	01/17/05	0:00	6024.87	19.71	19.73	0.02	1.00	6005.14
PZ-15	02/21/05	0:00	6024.87	19.7	19.73	0.03	1.00	6005.14
PZ-15	03/22/05	0:00	6024.87	20	20.03	0.03	1.00	6004.84
PZ-15	04/15/05	0:00	6024.87	NM	20.08	NM	4.00	6004.79
PZ-15	04/19/05	0:00	6024.87	NM	20.44	NM	NM	NM
PZ-15	05/17/05	0:00	6024.87	20.11	20.135	0.03	NM	6004.76

PIEZOMETER NUMBER	DATE	TIME	TOP OF CASING ELEVATION (FT)	DEPTH TO PRODUCT OR WATER (FT BTOC)	DEPTH TO WATER (FT BTOC)	PRODUCT THICKNESS (FT)	PRODUCT REMOVED (Ounces)	GROUNDWATER ELEVATION (FT)
PZ-17	06/15/97	NM	6023.72	16.47	16.47	0.00	NM	6007.25
PZ-17	07/15/97	1100	6023.72	16.37	16.37	0.00	NM	6007.35
PZ-17	08/18/97	NM	6023.72	16.18	16.18	0.00	NM	6007.54
PZ-17	09/19/97	1725	6023.72	16.08	16.08	0.00	NM	6007.64
PZ-17	10/16/97	1512	6023.72	16.10	16.10	0.00	NM	6007.62
PZ-17	11/17/97	1420	6023.72	16.15	16.15	0.00	NM	6007.57
PZ-17	12/16/97	1440	6023.72	16.23	16.23	0.00	NM	6007.49
PZ-17	01/19/98	1635	6023.72	16.32	16.32	0.00	NM	6007.40
PZ-17	03/03/98	1620	6023.72	16.30	16.30	0.00	NM	6007.42
PZ-17	04/01/98	1430	6023.72	16.25	16.25	0.00	NM	6007.47
PZ-17	05/07/98	1505	6023.72	16.24	16.24	0.00	NM	6007.48
PZ-17	06/02/98	1530	6023.72	16.34	16.34	NM	NM	6007.38
PZ-17	07/06/98	1237	6023.72	16.43	16.43	NM	NM	6007.29
PZ-17	10/09/98	NM	6023.72	NM	NM	NM	NM	NM
PZ-17	03/23/99	NM	6023.72	16.74	16.74	NM	NM	6006.98
PZ-17	12/07/00	NM	6023.72	17.20	17.20	NM	NM	6006.52
PZ-17	03/16/01	NM	6023.72	17.28	17.28	NM	NM	6006.44
PZ-17	10/28/03	NM	6023.72	DRY	DRY	DRY	NM	DRY
PZ-17	10/21/04	NM	6024.72	DRY	DRY	DRY	NM	DRY

NM = Not Measured
BTOC = Below Top of Casing
FT = Feet

TABLE 2
WATER-LEVEL MEASUREMENTS
2005 BISTI ANNUAL REPORT
EL PASO FIELD SERVICES

PIEZOMETER NUMBER	DATE	TIME	TOP OF CASING ELEVATION (FT)	DEPTH TO PRODUCT OR WATER (FT BTOC)	DEPTH TO WATER (FT BTOC)	PRODUCT THICKNESS (FT)	PRODUCT REMOVED (Ounces)	GROUNDWATER ELEVATION (FT)
PZ-21	06/15/97	NM	6028.60	21.55	21.55	0.00	NM	6007.05
PZ-21	07/15/97	1043	6028.60	21.68	21.68	0.00	NM	6006.92
PZ-21	08/18/97	NM	6028.60	21.55	21.55	0.00	NM	6007.05
PZ-21	09/19/97	1652	6028.60	21.44	21.44	0.00	NM	6007.16
PZ-21	10/16/97	1337	6028.60	21.59	21.59	0.00	NM	6007.01
PZ-21	11/17/97	1250	6028.60	21.58	21.58	0.00	NM	6007.02
PZ-21	12/16/97	1352	6028.60	21.60	21.60	0.00	NM	6007.00
PZ-21	01/19/98	1553	6028.60	21.40	21.40	0.00	NM	6007.20
PZ-21	03/03/98	1515	6028.60	21.50	21.50	0.00	NM	6007.10
PZ-21	04/01/98	1342	6028.60	21.57	21.57	0.00	NM	6007.03
PZ-21	05/07/98	1415	6028.60	21.71	21.71	0.00	NM	6006.89
PZ-21	06/02/98	1455	6028.60	21.72	21.72	0.00	NM	6006.88
PZ-21	07/06/98	1135	6028.60	21.82	21.82	0.00	NM	6006.78
PZ-21	10/09/98	NM	6028.60	NM	NM	NM	NM	NM
PZ-21	03/23/99	NM	6028.60	21.89	21.89	0.00	NM	6006.71
PZ-21	10/19/99	NM	6028.60	22.09	22.09	0.00	NM	6006.51
PZ-21	03/14/00	NM	6028.60	22.12	22.12	0.00	NM	6006.48
PZ-21	10/25/00	1019	6028.60	22.31	22.31	0.00	NM	6006.29
PZ-21	12/07/00	NM	6028.60	22.41	22.41	0.00	NM	6006.19
PZ-21	03/16/01	NM	6028.60	22.37	22.37	0.00	NM	6006.23
PZ-21	10/16/02	NM	6028.60	22.87	22.87	0.00	NM	6005.73
PZ-21	04/29/03	1035	6028.60	22.93	22.93	0.00	NM	6005.67
PZ-21	10/28/03	0:00	6028.60	22.77	22.77	0.00	NM	6005.83
PZ-21	06/08/04	0:00	6028.60	22.58	22.58	0.00	NM	6006.02
PZ-21	06/09/04	0:00	6028.60	22.72	22.72	0.00	NM	6005.88
PZ-22	10/21/04	0:00	6028.60	22.72	22.72	0.00	NM	6005.88

PIEZOMETER NUMBER	DATE	TIME	TOP OF CASING ELEVATION (FT)	DEPTH TO PRODUCT OR WATER (FT BTOC)	DEPTH TO WATER (FT BTOC)	PRODUCT THICKNESS (FT)	PRODUCT REMOVED (Ounces)	GROUNDWATER ELEVATION (FT)
PZ-29	08/18/97	NM	6023.85	16.54	16.54	0.00	NM	6007.31
PZ-29	09/19/97	1852	6023.85	16.45	16.45	0.00	NM	6007.40
PZ-29	10/16/97	1544	6023.85	16.49	16.49	0.00	NM	6007.36
PZ-29	11/17/97	1444	6023.85	16.53	16.53	0.00	NM	6007.32
PZ-29	12/16/97	1509	6023.85	16.60	16.60	0.00	NM	6007.25
PZ-29	01/19/98	1705	6023.85	16.64	16.64	0.00	NM	6007.21
PZ-29	03/03/98	1643	6023.85	16.62	16.62	0.00	NM	6007.23
PZ-29	04/01/98	1453	6023.85	16.58	16.58	0.00	NM	6007.27
PZ-29	05/07/98	1510	6023.85	16.62	16.62	0.00	NM	6007.23
PZ-29	06/02/98	1535	6023.85	16.70	16.70	0.00	NM	6007.15
PZ-29	07/06/98	1244	6023.85	16.79	16.79	0.00	NM	6007.06
PZ-29	10/09/98	NM	6023.85	NM	NM	NM	NM	NM
PZ-29	03/23/99	NM	6023.85	17.09	17.09	0.00	NM	6006.76
PZ-29	10/19/99	NM	6023.85	17.24	17.24	0.00	NM	6006.61
PZ-29	03/14/00	NM	6023.85	17.37	17.37	0.00	NM	6006.48
PZ-29	10/25/00	12:40	6023.85	17.54	17.54	0.00	NM	6006.31
PZ-29	12/07/00	NM	6023.85	17.58	17.58	0.00	NM	6006.27
PZ-29	03/16/01	NM	6023.85	17.66	17.66	0.00	NM	6006.19
PZ-29	10/16/02	NM	6023.85	18.02	18.02	0.00	NM	6005.83
PZ-29	04/29/03	NM	6023.85	18.31	18.31	0.00	NM	6005.55
PZ-29	10/28/03	0:00	6023.85	19.17	19.17	0.00	NM	6004.68
PZ-29	06/08/04	0:00	6023.85	18.51	18.51	0.00	NM	6005.34
PZ-29	10/21/04	0:00	6023.85	18.28	18.28	0.00	NM	6005.57

NM = Not Measured
BTOC = Below Top of Casing
FT = Feet

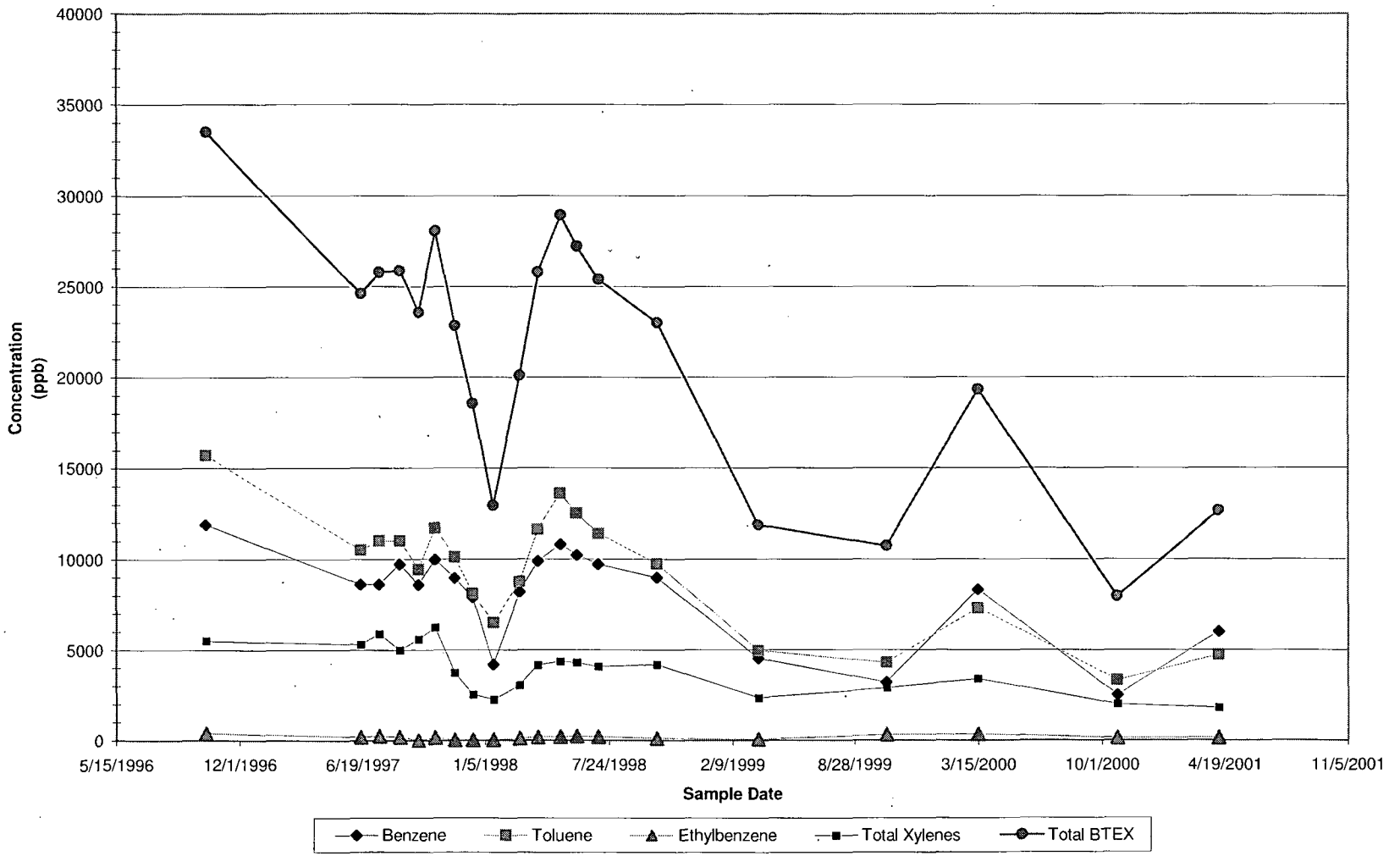
TABLE 2
WATER-LEVEL MEASUREMENTS
2005 BISTI ANNUAL REPORT
EL PASO FIELD SERVICES

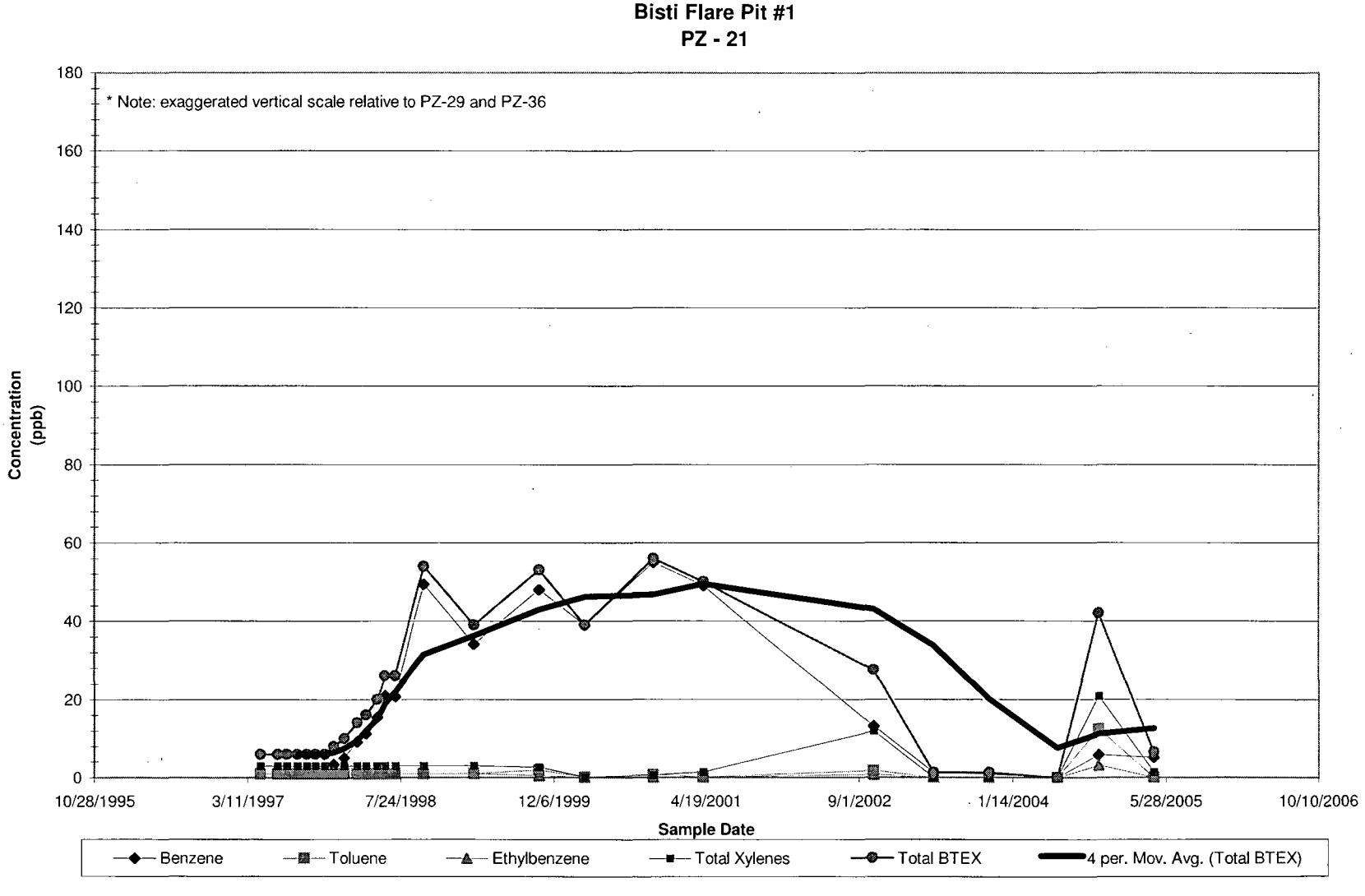
PIEZOMETER NUMBER	DATE	TIME	TOP OF CASING ELEVATION (FT)	DEPTH TO PRODUCT OR WATER (FT BTOC)	DEPTH TO WATER (FT BTOC)	PRODUCT THICKNESS (FT)	PRODUCT REMOVED (Ounces)	GROUNDWATER ELEVATION (FT)
PZ-35	05/01/01	9:55	6025.79	25.17	25.17	NM	NM	6000.62
PZ-35	04/17/02	NM	6025.79	25.27	25.27	NM	NM	6000.52
PZ-35	10/16/02	NM	6025.79	25.665	25.665	NM	NM	6000.13
PZ-35	01/16/03	NM	6025.79	NM	NM	NM	256	NM
PZ-35	05/05/03	0:00	6025.79	25.87	26.59	0.72	128	5999.73
PZ-35	07/18/03	0:00	6025.79	20.39	20.4	0.01	18	6000.40
PZ-35	09/29/03	0:00	6025.79	25.42	25.79	0.37	12	6000.27
PZ-35	10/28/03	NM	6025.79	25.06	25.43	0.37	8	6000.63
PZ-35	11/14/03	NM	6025.79	25.11	25.52	0.41	12	6000.57
PZ-35	12/09/03	0:00	6025.79	25.08	25.55	0.47	12	6000.58
PZ-35	01/29/04	0:00	6025.79	25.24	25.88	0.64	32	6000.38
PZ-35	02/18/04	0:00	6025.79	25.8	26.25	0.45	24	5999.87
PZ-35	03/17/04	0:00	6025.79	25.905	26.22	0.31	9	5999.80
PZ-35	04/15/04	0:00	6025.79	26.18	26.52	0.34	20	5999.52
PZ-35	05/12/04	0:00	6025.79	26.06	26.31	0.25	6	5999.66
PZ-35	06/03/04	0:00	6025.79	26.48	26.84	0.36	16	5999.21
PZ-35	06/08/04	0:00	6025.79	26.27	26.43	0.16	NM	5999.48
PZ-35	07/26/04	0:00	6025.79	26.24	26.54	0.30	8.00	5999.49
PZ-35	08/18/04	0:00	6025.79	25.95	26.26	0.31	4.00	5999.78
PZ-35	09/13/04	0:00	6025.79	25.64	26.01	0.37	12.00	6000.08
PZ-35	10/15/04	0:00	6025.79	25.28	25.76	0.48	10.00	6000.41
PZ-35	10/21/04	0:00	6025.79	25.2	25.58	0.48		6000.59
PZ-35	11/16/04	0:00	6025.79	25.3	25.85	0.55	6.00	6000.38
PZ-35	12/15/04	0:00	6025.79	25.38	26.01	0.63	32.00	6000.28
PZ-35	01/17/05	0:00	6025.79	25.71	26.28	0.57	26.00	5999.97
PZ-35	02/21/05	0:00	6025.79	25.83	26.3	0.47	12.00	5999.87
PZ-35	03/22/05	1225	6025.79	26.01	26.44	0.13	10.00	5999.45
PZ-35	04/15/05	837	6025.79	26.36	26.63	0.27	15.00	5999.38
PZ-35	04/19/05	0:00	6025.79	26.02	26.29	0.27	NM	5999.72
PZ-35	05/17/05	0:00	6025.79	26.21	26.52	0.21	15.00	5999.44

PIEZOMETER NUMBER	DATE	TIME	TOP OF CASING ELEVATION (FT)	DEPTH TO PRODUCT OR WATER (FT BTOC)	DEPTH TO WATER (FT BTOC)	PRODUCT THICKNESS (FT)	PRODUCT REMOVED (Ounces)	GROUNDWATER ELEVATION (FT)
PZ-36	5/1/2001	9:20	6025.78	24.71	24.71	NM	NM	6001.07
PZ-36	4/17/2002	NM	6025.78	24.89	24.89	NM	NM	6000.89
PZ-36	10/16/2002	NM	6025.78	24.465	24.465	NM	NM	6001.32
PZ-36	4/29/2003	NM	6025.78	25.56	25.56	NM	NM	6000.22
PZ-36	10/28/03	0:00	6025.78	24.85	24.85	0.00	NM	6000.93
PZ-36	06/08/04	0:00	6025.78	25.8	25.8	0.00	NM	5999.98
PZ-36	10/21/04	0:00	6025.78	25.02	25.02	0.00	NM	6000.76

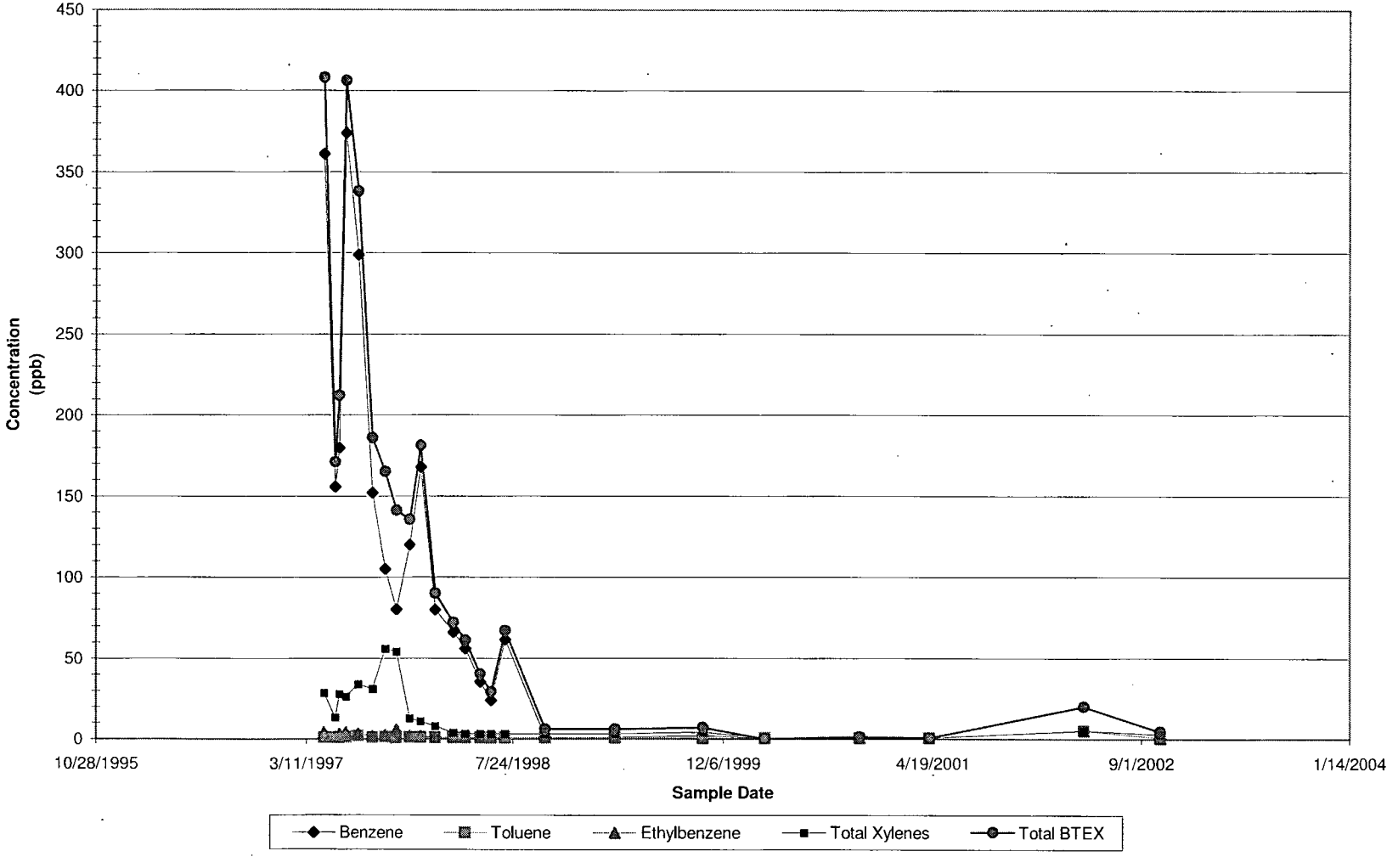
NM = Not Measured
BTOC = Below Top of Casing
FT = Feet
Note: Water levels for PZ-11 and PZ-35 corrected with assumed product density of 0.73
*Water level in PZ-15 for 6/8/04 had not achieved static conditions from sampling on 6/3/04.

Bisti Flare Pit #1
PZ - 9

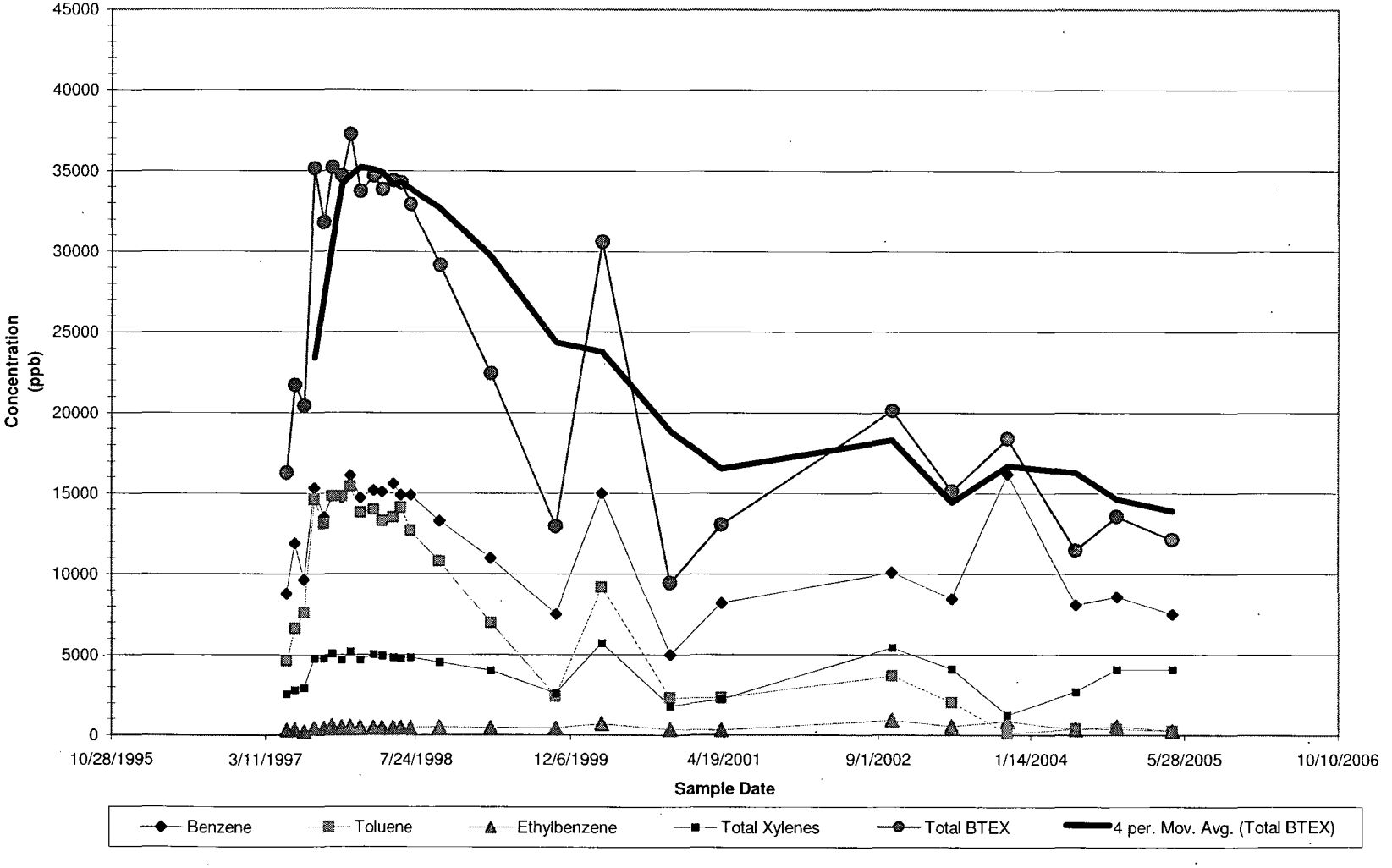



Bisti Flare Pit #1
PZ - 21
* Note: exaggerated vertical scale relative to PZ-29 and PZ-36
Concentration (ppb)
180
160
140
120
100
80
60
40
20
0
10/28/1995
3/11/1997
7/24/1998
12/6/1999
4/19/2001
9/1/2002
1/14/2004
5/28/2005
10/10/2006
Sample Date
Benzene
Toluene
Ethylbenzene
Total Xylenes
Total BTEX
4 per. Mov. Avg. (Total BTEX)

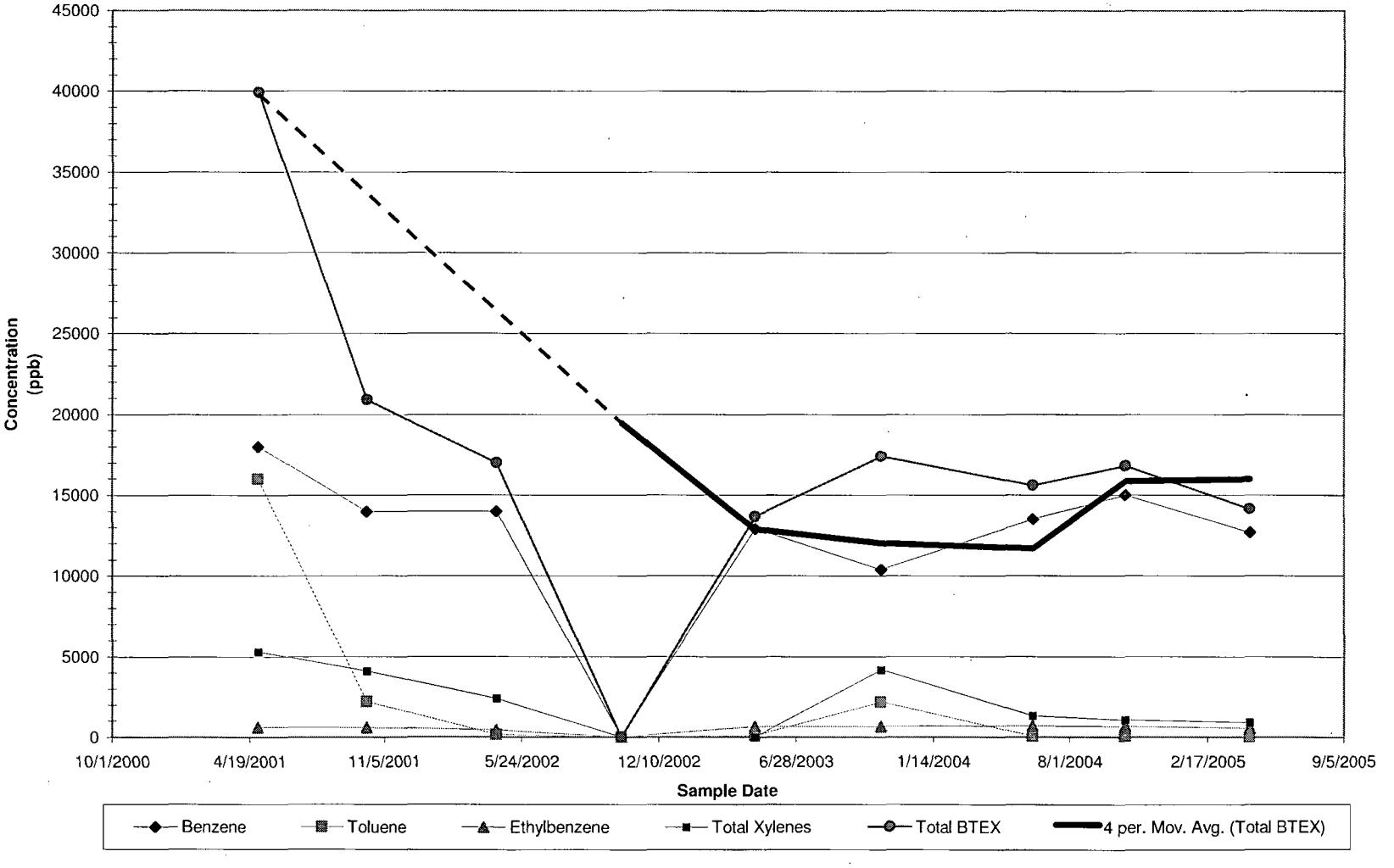
Bisti Flare Pit #1
PZ - 22



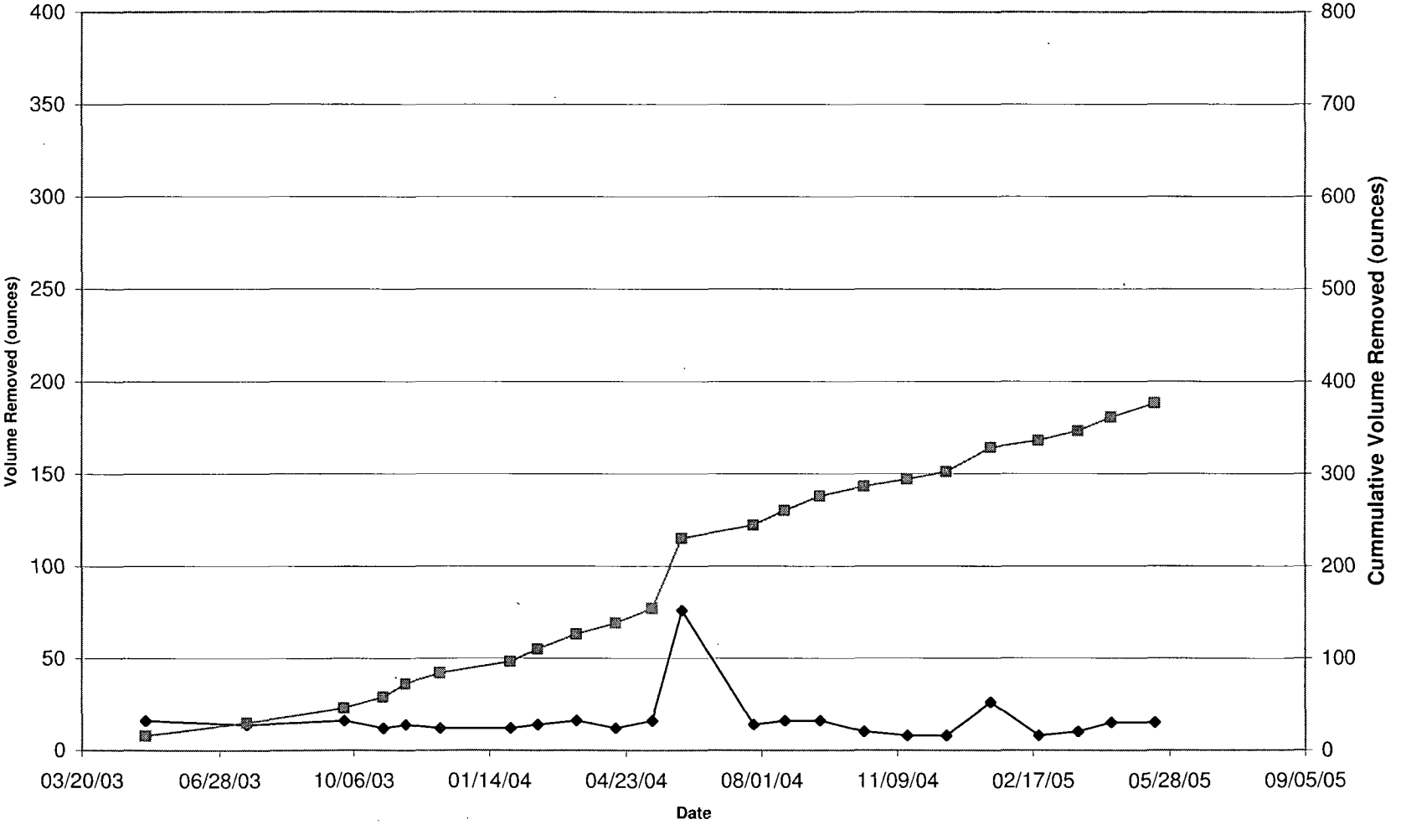
Bisti Flare Pit #1
PZ - 29



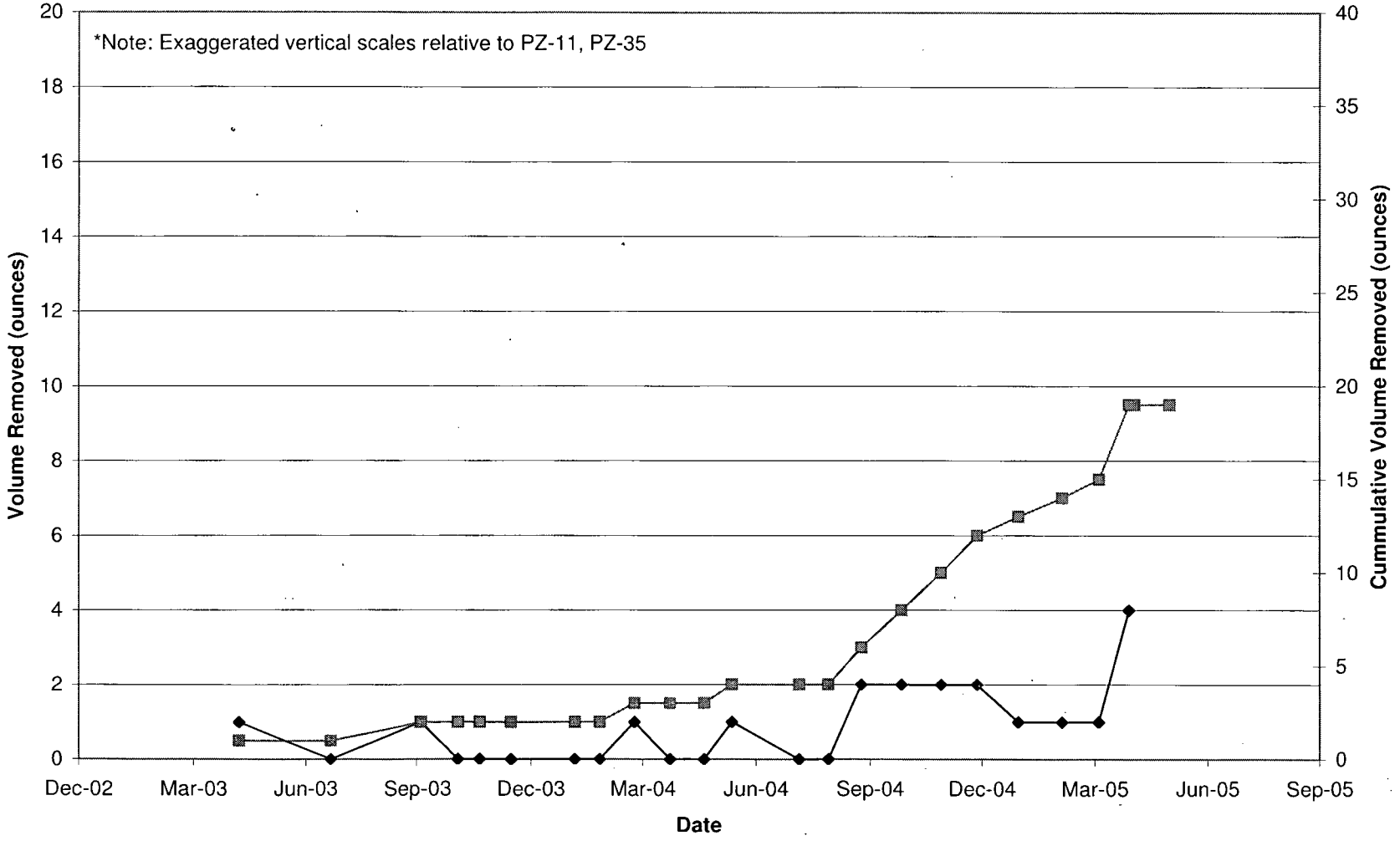
Bisti Flare Pit #1
PZ - 36



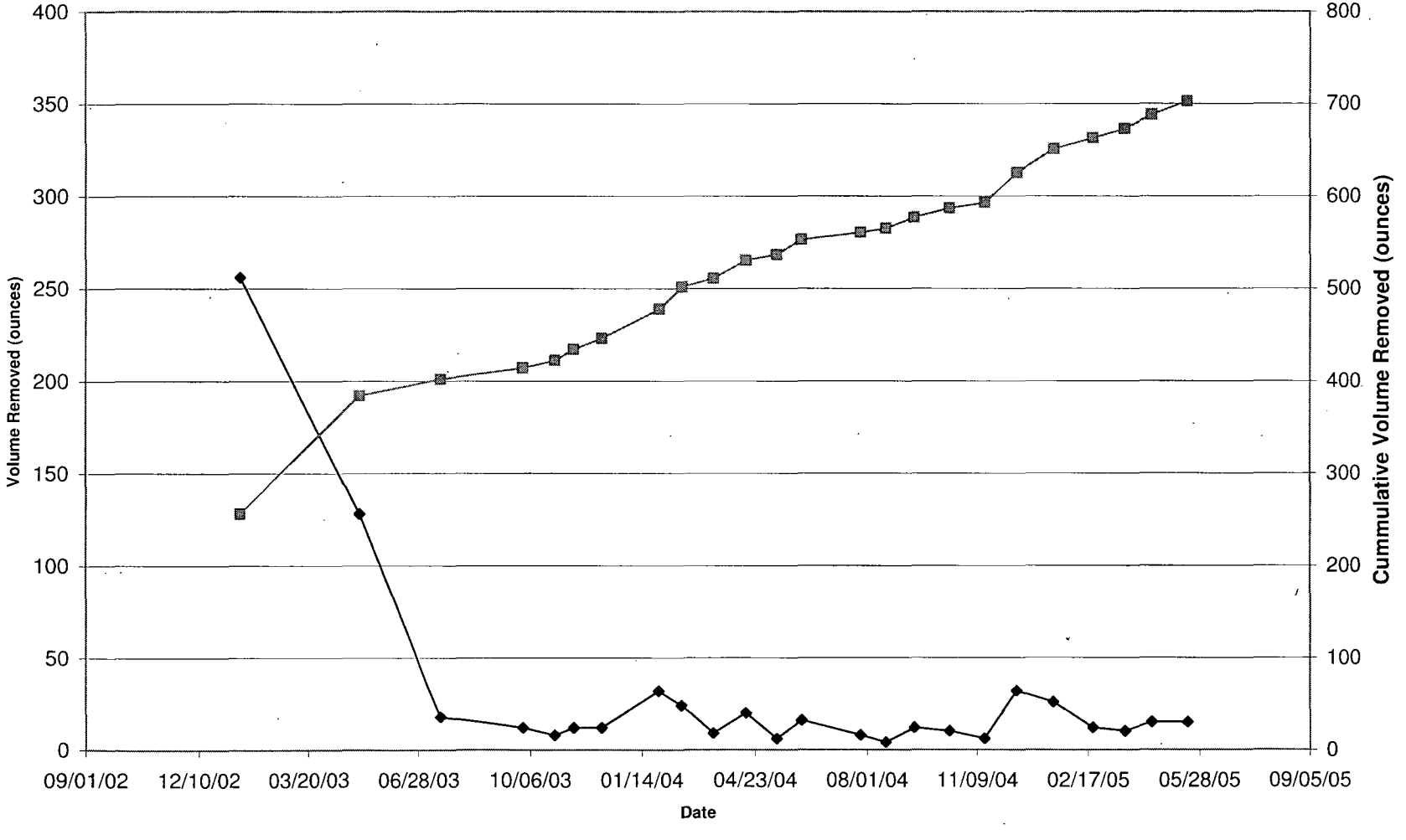
Volume of Free Product Removed from Well PZ-11



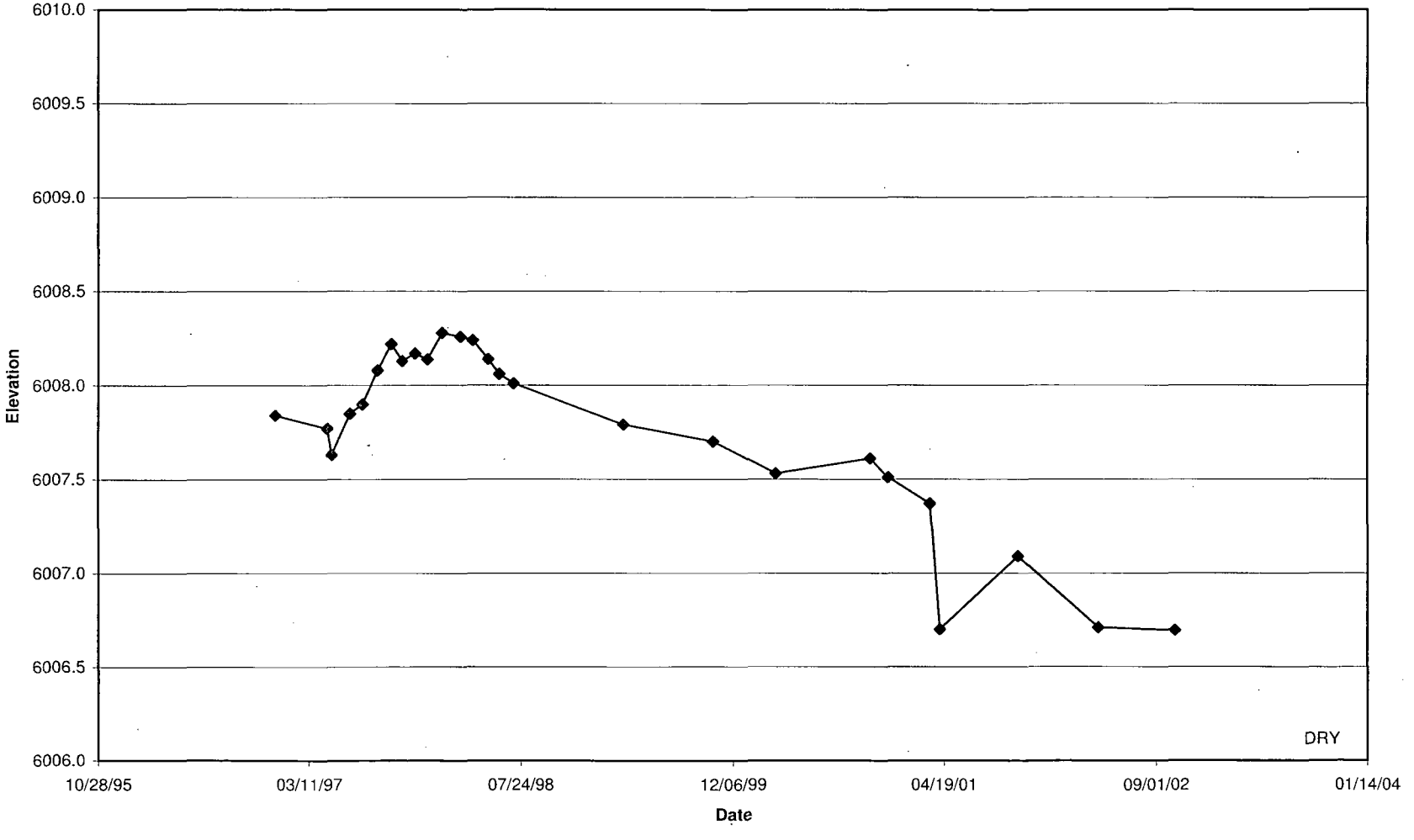
Volume of Free Product Removed from Well PZ-15



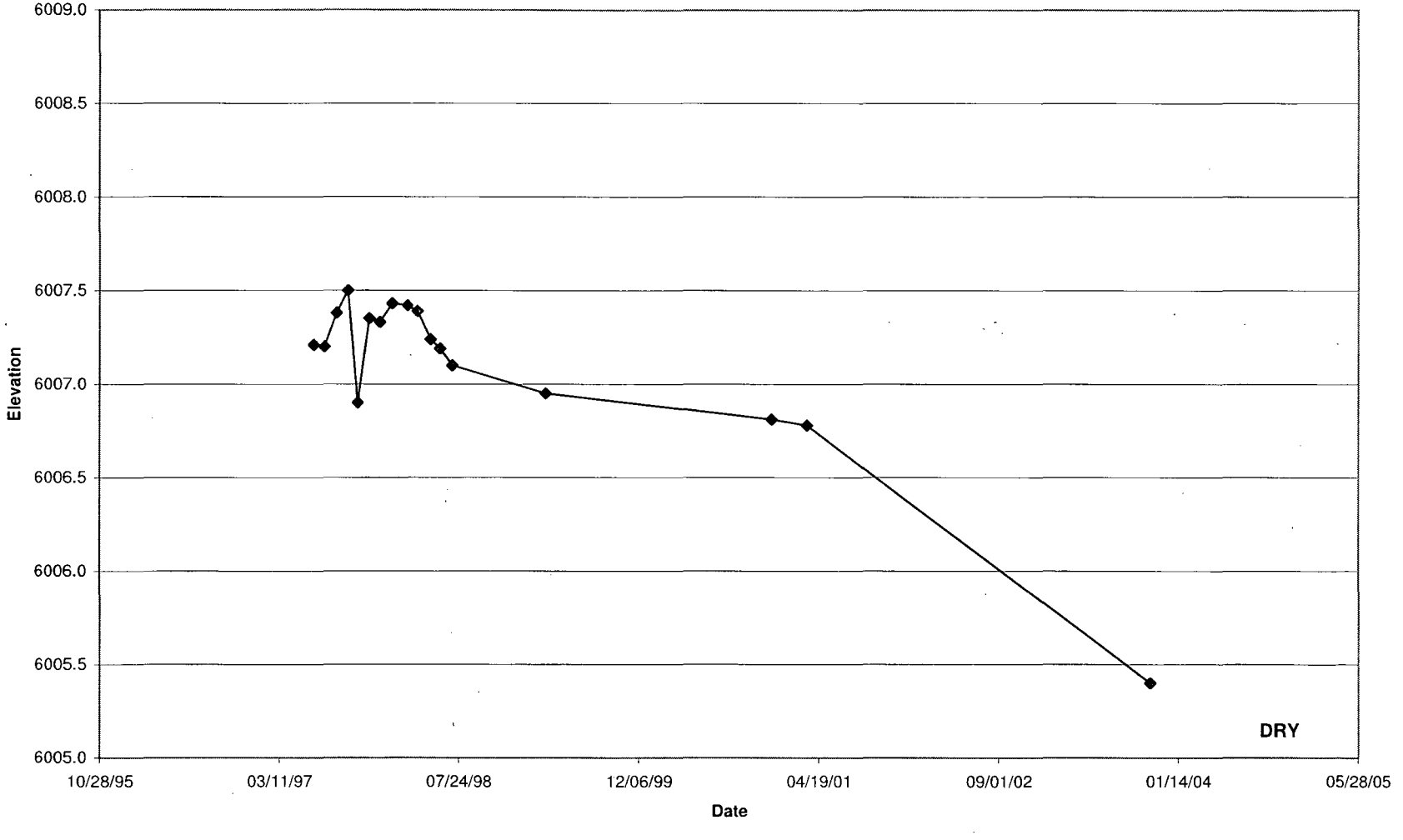
Volume of Free Product Removed from Well PZ-35



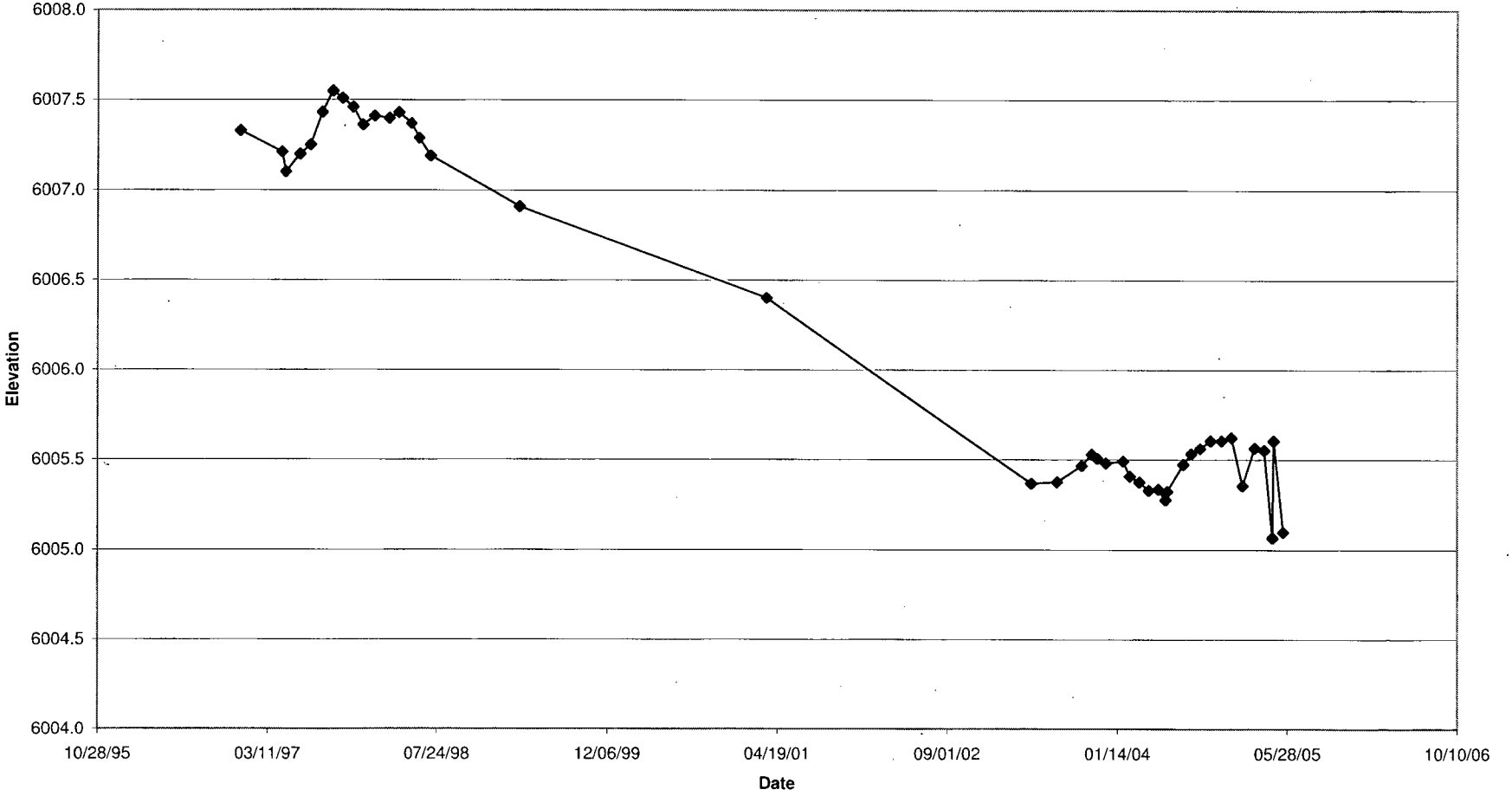
Water Levels Well PZ-9



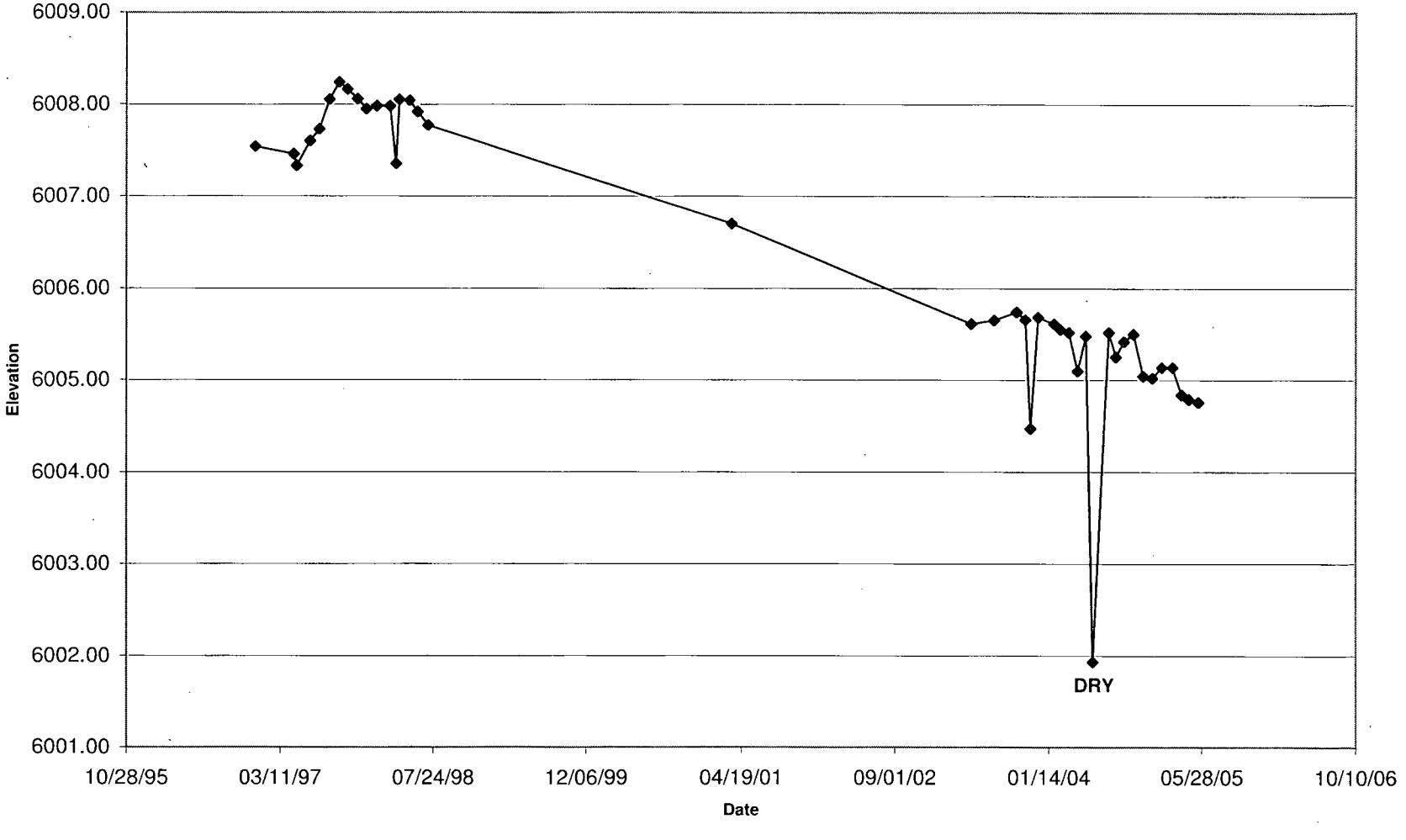
Water Levels Well PZ-10



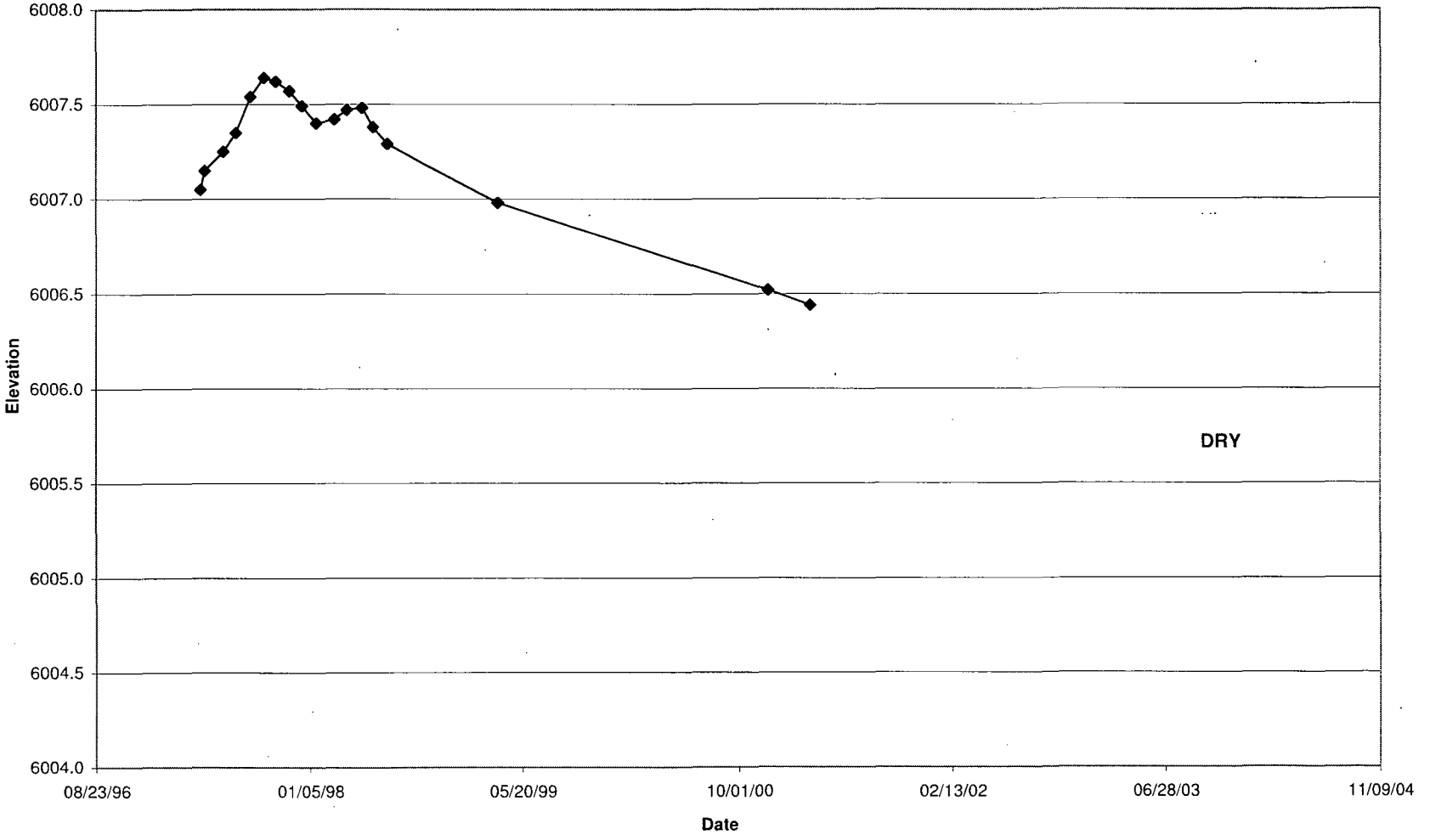
Water Levels Well PZ-11



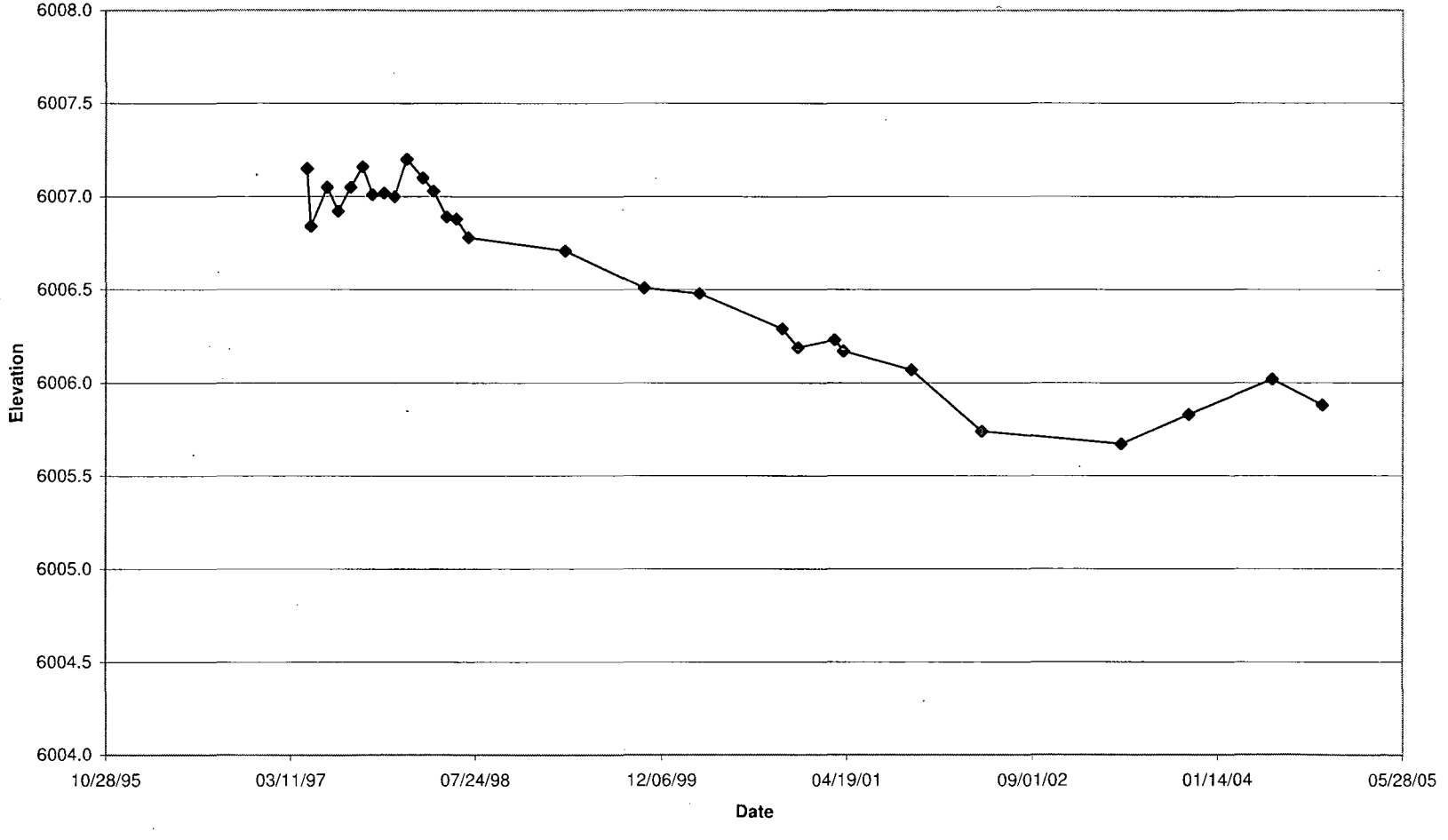
Water Levels Well PZ-15



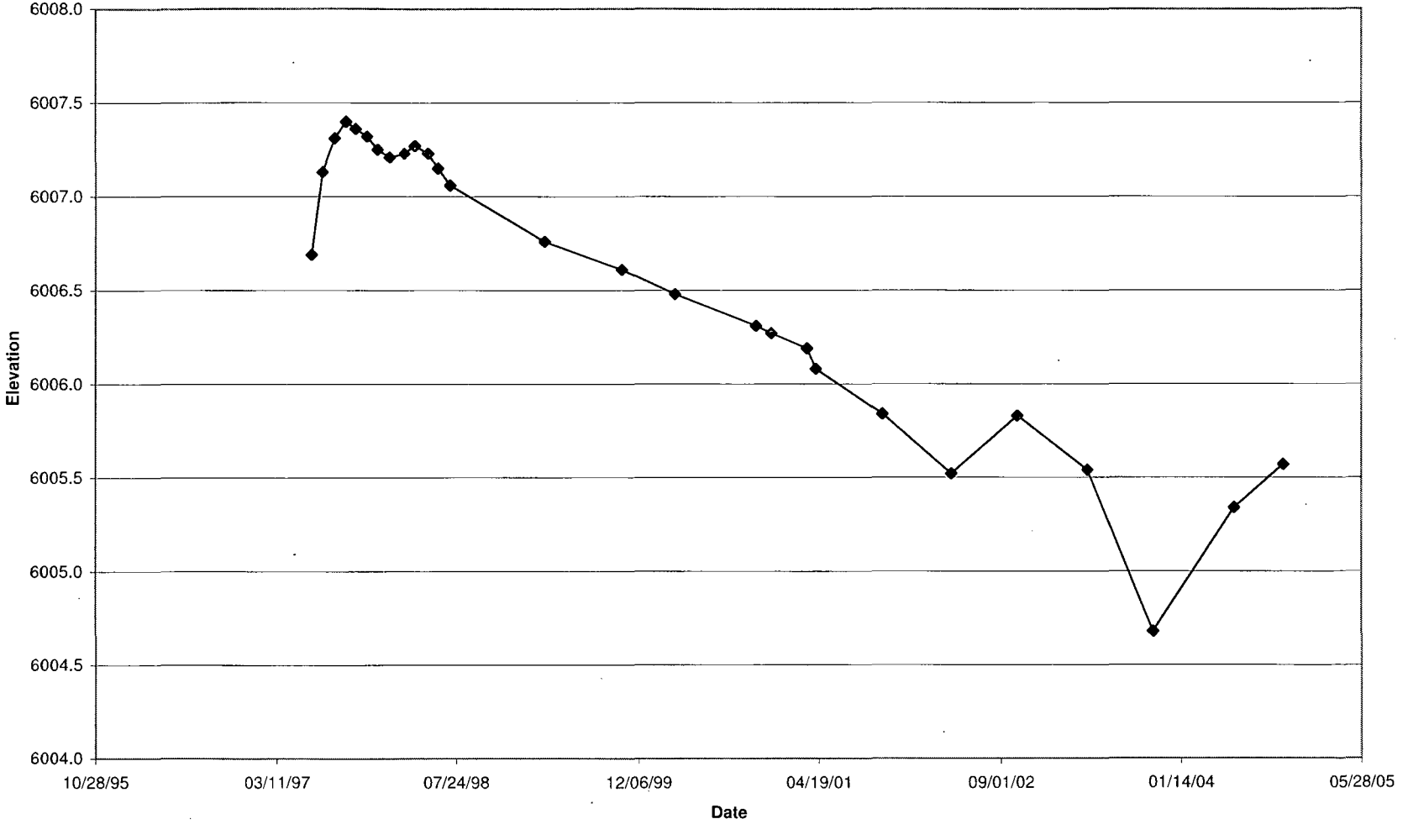
Water Levels Well PZ-17



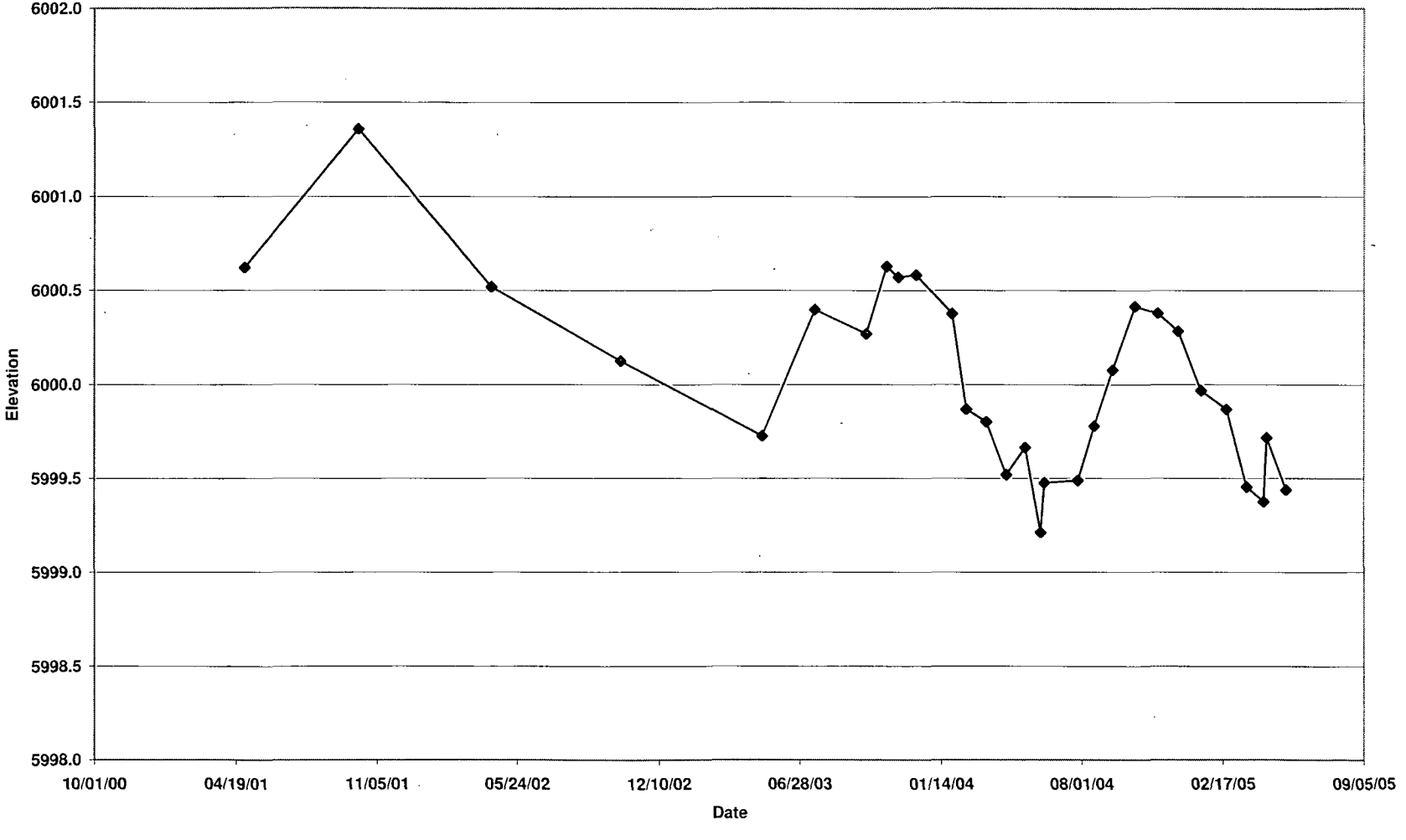
Water Levels Well PZ-21



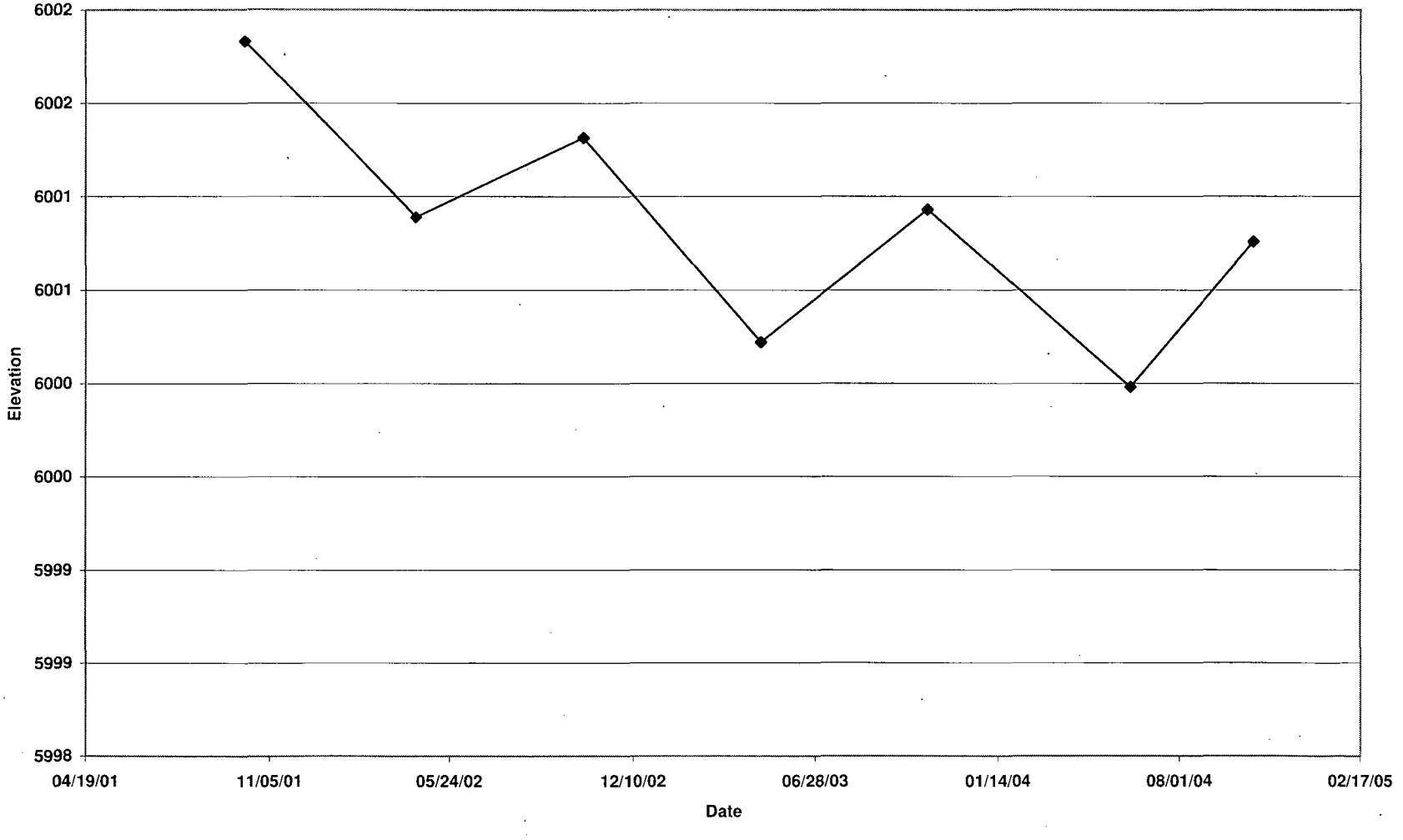
Water Levels Well PZ-29

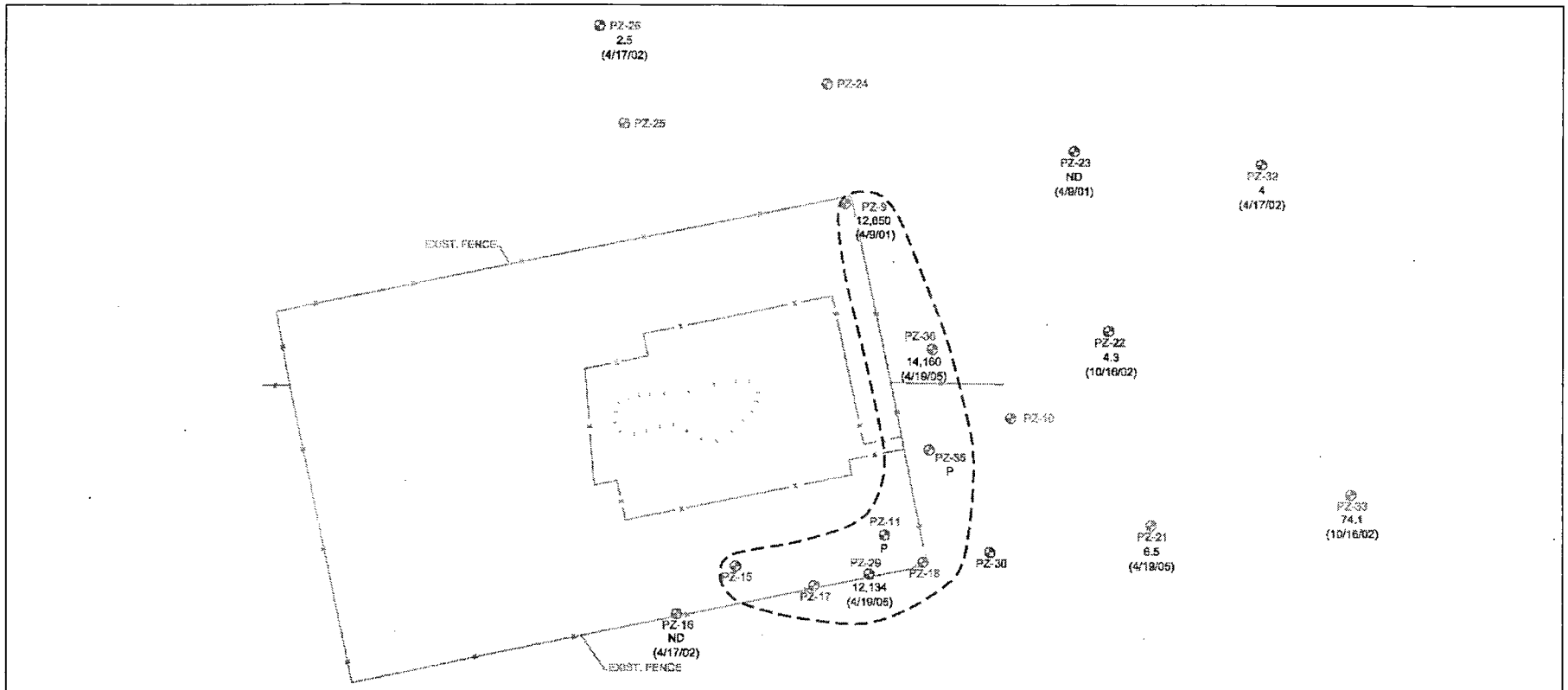


Water Levels Well PZ-35



Water Levels Well PZ-36





elpaso | Field Services

0 40 ft 80 ft

1 inch is approximately equal to 40 feet

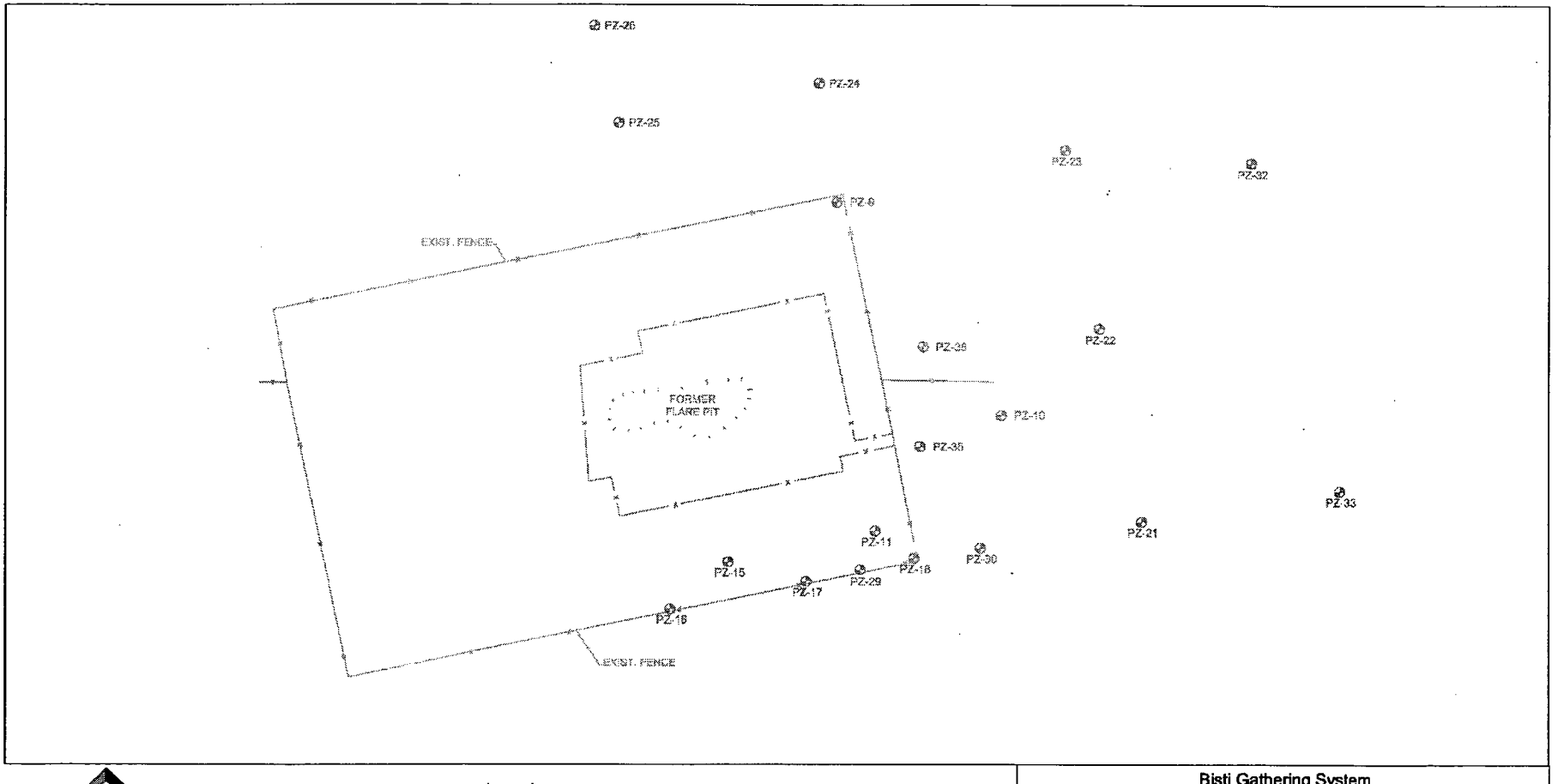
Legend

PZ-16	Well Location
74.1	Total BTEX Concentration (µg/L) (Date of Last Sampling)
ND	Not Detected
P	Free Product Noted

Bisti Gathering System
San Juan County, New Mexico

Drawing Name: Fig9	Historical Summary of Water Quality and Estimated Area of Elevated BTEX Concentrations Based on Historical Data	Figure 6
Drawn By: RJV		
Date: 7/07/05		

EMS\Bisti\07-05\Fig9



elpaso Field Services

Legend

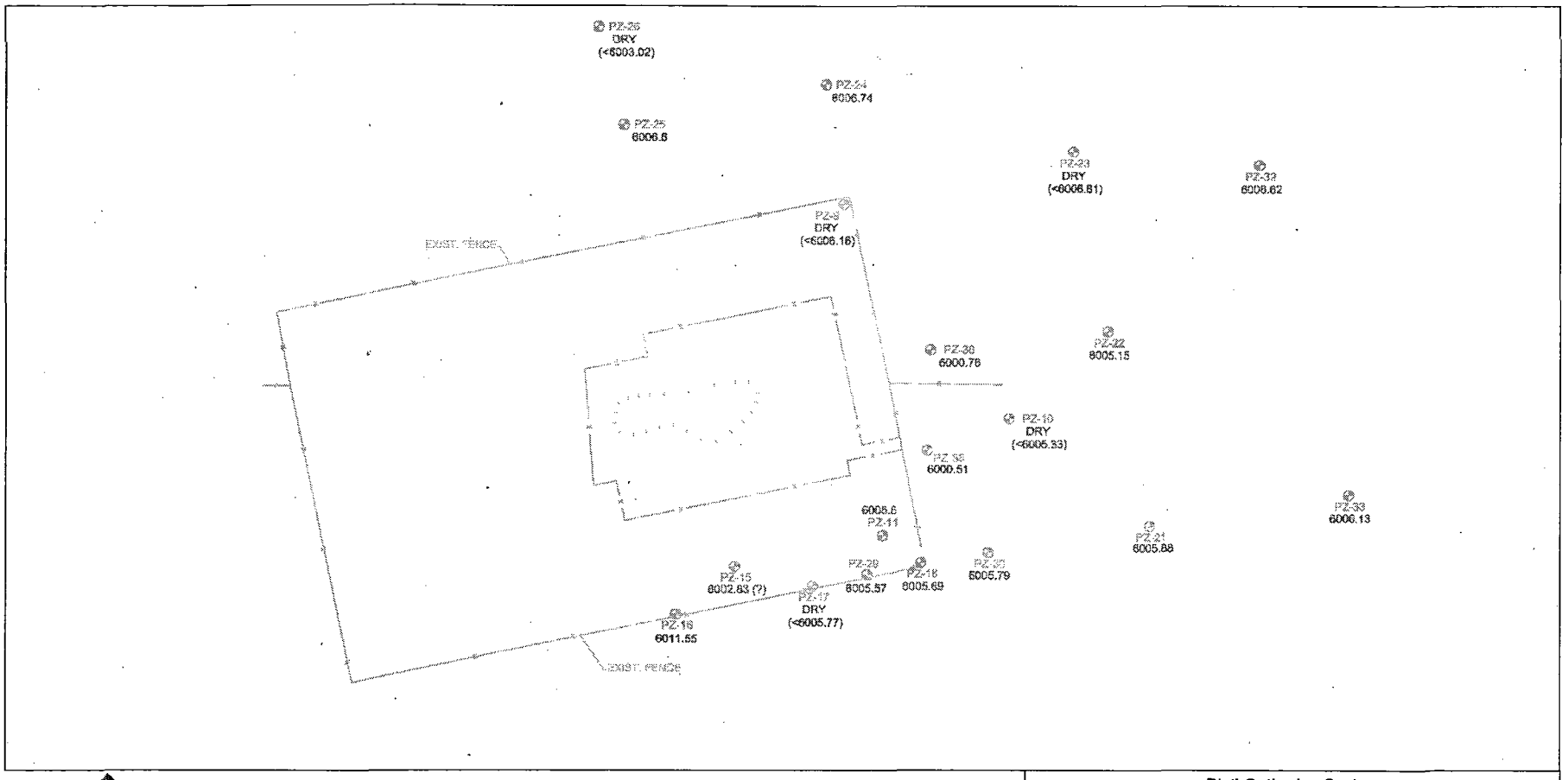
PZ-18 Well Location

0 40 ft 80 ft

1 inch is approximately equal to 40 feet

Bisti Gathering System San Juan County, New Mexico		
Drawing Name: Fig1	Locations of Piezometers	Figure 1
Drawn By: RJV		
Date: 7/07/05		

EM3MBell/7-05Fig1



elpaso | Field Services

N

0 40 ft 80 ft

1 inch is approximately equal to 40 feet

Legend

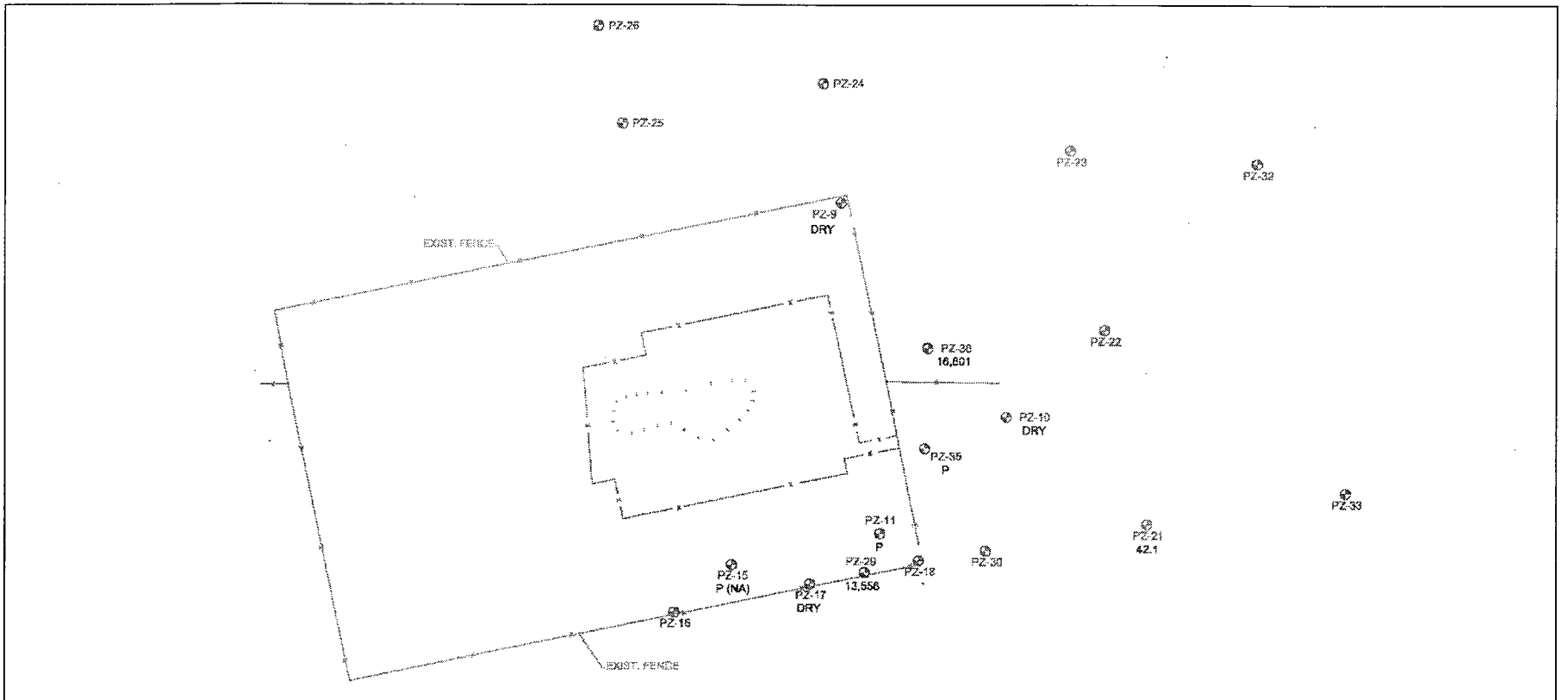
PZ-16 — Well Location

6006.06 — Perched Ground-Water Elevation In Feet Above Mean Sea Level

Bisti Gathering System
San Juan County, New Mexico

Drawing Name: Fig2	Perched Ground-Water Elevations October 21, 2004	Figure 2
Drawn By: RJV		
Date: 7/07/05		

EMS\Bisti\7-05\Fig2



elpaso | Field Services

0 40 ft 80 ft

1 inch is approximately equal to 40 feet

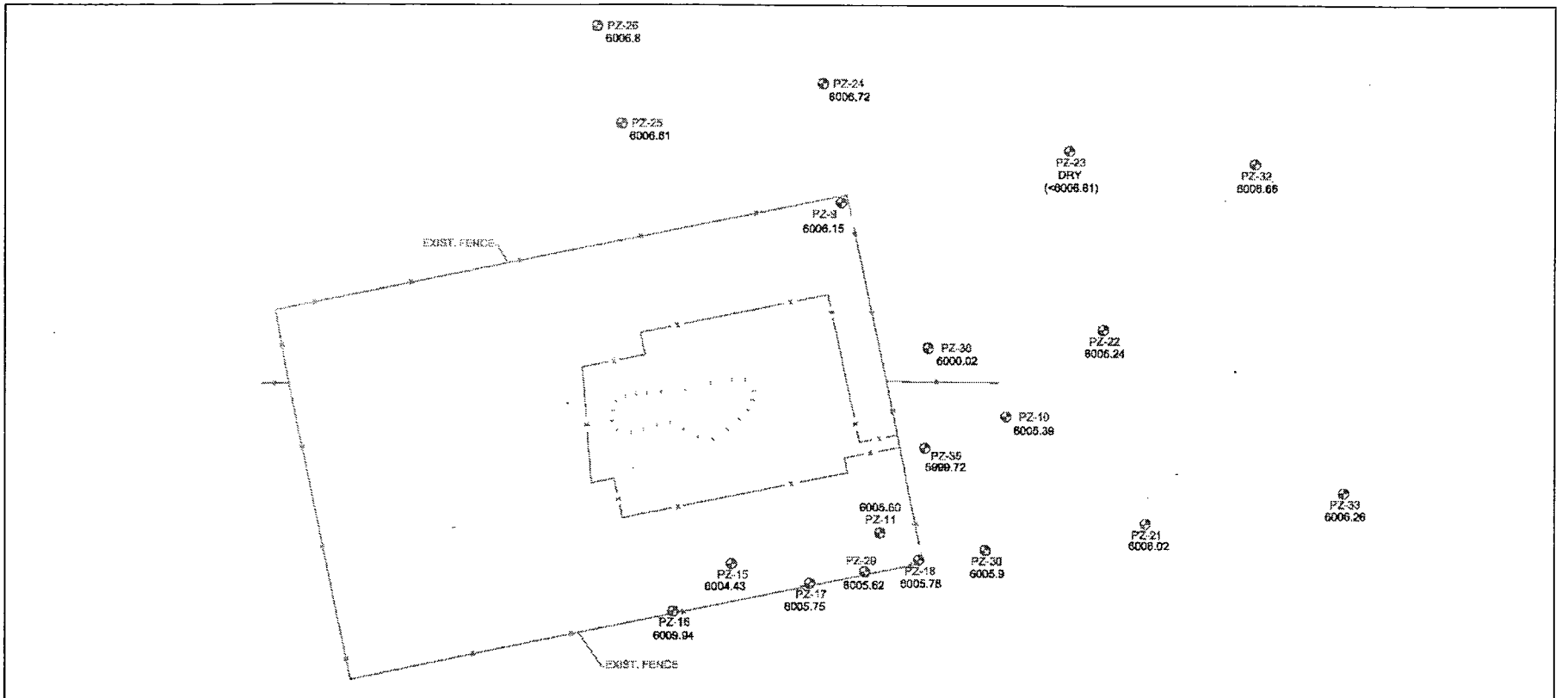
Legend

PZ-16	Well Location
42.1	Total BTEX Concentration (µg/L)
NA	Not Analyzed
P	Product Present

Bisti Gathering System
San Juan County, New Mexico

Drawing Name: Fig4	Total BTEX Concentrations October 21, 2004	Figure 4
Drawn By: RJV		
Date: 7/07/05		

EM3\Bisti\7-05\Fig4



elpaso | Field Services

N

0 40 ft 80 ft

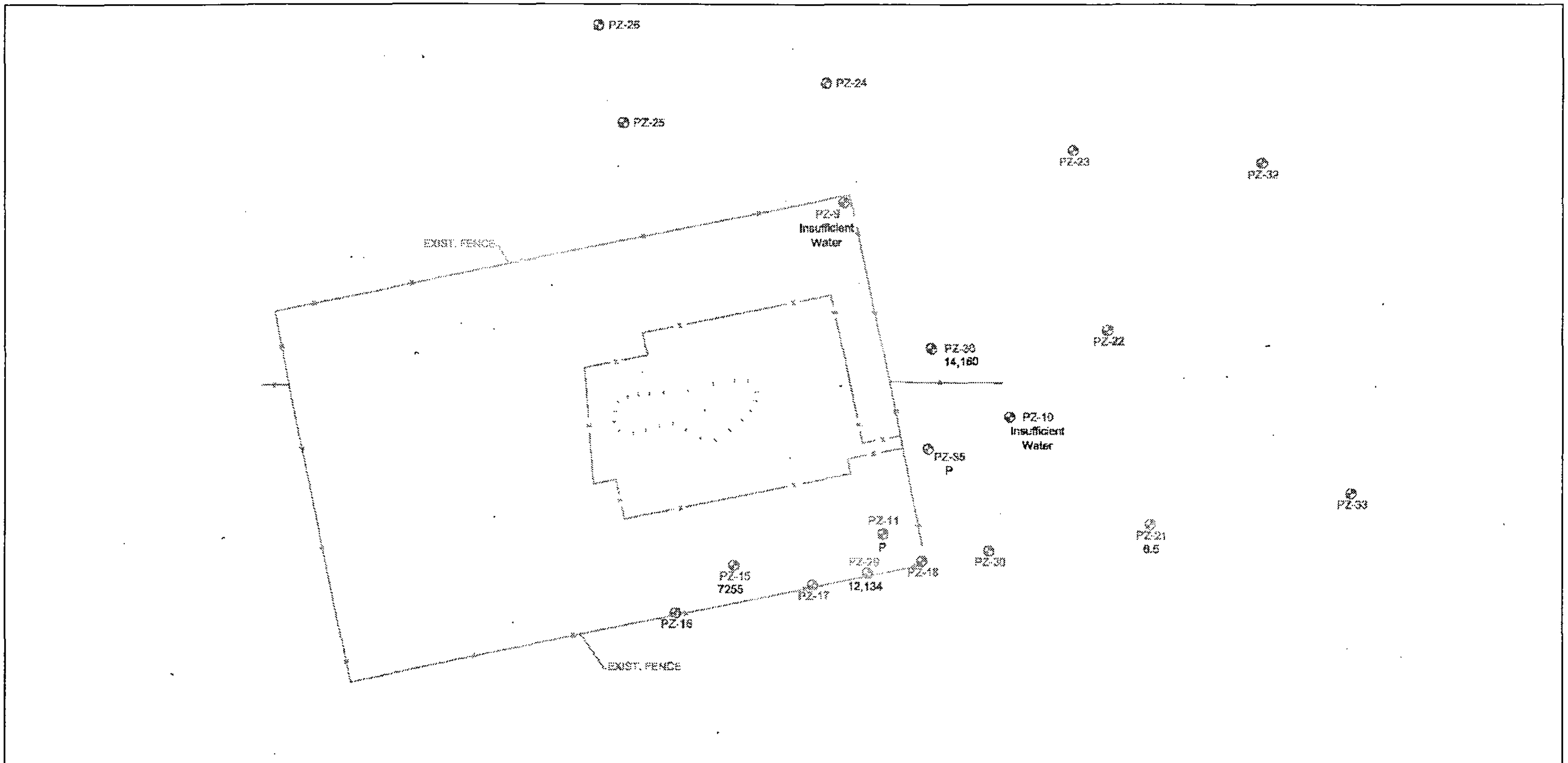
1 inch is approximately equal to 40 feet

Legend

PZ-16 Well Location

6006.06 Perched Ground-Water Elevation in Feet Above Mean Sea Level

Bisti Gathering System San Juan County, New Mexico		
Drawing Name: Fig3	Perched Ground-Water Elevations April 19, 2005	Figure 3
Drawn By: RJV		
Date: 7/07/05		



elpaso | Field Services

0 40 ft 80 ft

1 inch is approximately equal to 40 feet

Legend

PZ-16	Well Location
6.5	Total BTEX Concentration (µg/L)
P	Product Present

Bisti Gathering System
San Juan County, New Mexico

Drawing Name: Fig5	Total BTEX Concentrations April 19, 2005	Figure 5
Drawn By: RJV		
Date: 7/07/05		

EMSNBisti7-05/Fig5