WESTERN
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REGISTERED GEOLOGISTS

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May 17, 1999

Mr. John Rutherford
Desert Petroleum Inc.
P.O. Box 1601
Oxnard, California 93032
(805) 644-6784: FAX (805) 654-0720

RE: May 1999 Quarterly Groundwater Sampling for Former Desert Petroleum Station #796, 2844 Mountain Boulevard, Oakland, California.

Dear Mr. Rutherford:

As you requested Western Geo-Engineers (WEGE) has performed the quarterly monitoring/sampling of this site. The following report represents WEGE's May 1999 Quarterly Groundwater. To verify the elevations of the groundwater compared to the underground utilities, WEGE had the top of well casings resurveyed by a licensed surveyor along with the storm drain catch basins near the site. The survey datum used is the same used by the City of Oakland in plotting the underground utilities, City of Oakland benchmark #2804, elevation 676.08 feet.

INTRODUCTION

A WEGE sample technician monitored and sampled the four existing groundwater monitoring wells on May 5, 1999.

LOCATION

The site is an operating "Compare Price Gas Station" that retails regular unleaded, super-unleaded gasoline and diesel. The site is located East of Highway 13 at 2844 Mountain Blvd., Oakland, California, west of Joaquin Miller Park, see Figures 1 and 2. Top of casing elevations, top of traffic box rim elevations, top of rim of catch basins and storm drain flow line elevations were measured to the nearest 0.01 foot by Mr. Wade Hammond, Licensed Land Survey No. 6163 on March 4, 1999.

GROUNDWATER SAMPLING

Table 1 is a summary of groundwater monitoring of this site since May 1990. The most recent sampling/monitoring, May 5, 1999 found 0.04 feet of free product floating on top of the groundwater at RS-1. RS-2 continues to contain high levels of Methyl tertiary Butyl Ether (MTBE), 270 mg/L, which was confirmed using EPA Method 8260. All well samples were analyzed for dissolved gasoline range hydrocarbons, see Appendix B for Laboratory report and Table 1 with Charts showing historic TPHg and MTBE levels for the wells

All wells contained MTBE, see Table 1 and Appendix B for Laboratory Report

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ENVIRONMENTAL PROTECTION

GROUNDWATER GRADIENT "FLOW DIRECTION"

Figure 4 depicts groundwater elevations as measured on May 5, 1999. This figure shows a gradient flow predominantly to the southwest with a high ridge extending from RS-3 towards RS-1.

To evaluate the lateral extent of free product beneath the site, a workplan was developed and approved (December 10, 1996) to perform a soil probe survey (SPS). The SPS was conducted on January 17, 1997 with findings submitted February 27, 1997 as part of the Interim Remedial Workplan. To further this investigation, Mr. Scott Searry of Alameda County Health requested a subsurface conduit study, due to the shallow groundwater found beneath the site. This study was presented in the February 1999 report.

MTBE

The charts presented with Table 1 show that MTBE was present in the groundwater since June 1995. The ratio as compared to gasoline concentrations in groundwater indicates that a leak was occurring at that time with substantial increases in September 1996, May and November 1997, May 1998 and February 1999. Concern of the increasing MTBE prompted a site visit on August 6, 1997. A WEGE geologist interviewed the site owner, Mr. Sharahn Shenazi, concerning what may be the cause of elevated MTBE found during quarterly sampling. Mr. Shenazi felt that the MTBE was introduced to the groundwater during washing down of the station. The wash water would drain to the water meter box which is depressed in the station asphalt down slope of the pump islands, see Figure 3. Mr. Shenazi stated that he has had no inventory losses and that the product lines are double contained and the leak detectors indicate everything is fine. The three existing tanks are two 6,000-gallon previously lined single walled steel tanks and a 10,000-gallon single wall fiberglass tank. During testing of the tanks prior to lining one tank (diesel tank) showed a pressure increase but then tested fine, see September 1997 Quarterly Report.

The water meter box was inspected. The bottom of the box was not sealed and open to the subsurface, no odors were present and field screening with a MiniRae PID showed only 0.5 ppmv existed in the soils beneath the water meter. A soil sample was obtained at approximately one foot beneath the station surface and approximately six inches below the water meter and chain of custody delivered to North State Environmental Analytical Laboratory (NSE). NSE analyzed the soil sample for Total Petroleum Hydrocarbons as gasoline (TPHg), Benzene, Toluene, Ethylbenzene, Xylenes (BTEX) and MTBE. The laboratory results showed 1.9 mg/Kg of TPHg, trace amounts of BTEX, with MTBE below laboratory lower detection limits.

Mr. Scott Seary of Alameda County Health requested Mr. John Rutherford of Desert Petroleum, Mr. Shenazi, current owner of the property and Mr. George Converse of Western Geo- Engineers to meet with him at his office on October 20, 1998. Discussions involved the June 7, 1998 removal of the 6000 gallon single wall steel tank closest to the pump islands, see Figure 3, and the evidence supporting the ongoing release of gasoline range hydrocarbons at the site since February 1995. As of this meeting Mr. Shenazi is delinquent in providing the required UST removal report and will be named as a responsible party for the release at the site. Mr. Scott Seary also directed Desert Petroleum to conduct a subsurface conduit study involving the underground utilities and the Hayward Fault situated near the site. This study was presented in the February 1999 report.

DISCUSSION

Free phase floating product exists at and near RS-1 and on August 6, 1997 at Soil Probe Hole M7. There was a dramatic increase in MTBE concentration at RS-2 in September 1996, which coincides with the first measurable presence of free phase floating product in RS-1. Even though the stations washing practice drains the wash water to the water meter box, the soil sample obtained beneath the water meter box was below laboratory lower detection limits for MTBE. This strongly suggests that the MTBE influence was not caused by the "wash down" procedures. A meeting at the Alameda County Health Office on October 20, 1998 revealed that one of the 6,000 gallon UST's had been removed and the inspection revealed holes in the tank (the required UST decommission/sampling report has not been submitted to Alameda County Health as of 10/20/98).

Based on the laboratory analysis and stated observations by Alameda County Health during tank removal Western Geo-Engineers feels that a new release has occurred or is occurring at this site and is the source for gasoline with MTBE being introduced into the shallow groundwater.

Figure 5 represents the present lateral extent of the dissolved gasoline plume.

Figure 6 represents the present lateral extent of the MTBE plume.

A water sample obtained from one of the drains in the retaining wall at the on ramp to Highway 13 northwest of the site contained only trace amounts of Xylenes, see Figure 3. The absence of MTBE and Benzene, the more mobile of the gasoline additives, indicate that the downgradient extent of the gasoline plume is limited and probably has not intercepted the underground utility trenches.

RECOMMENDATIONS

1. All tank and line tightness tests should be review from early 1995 to the present.
2. Review of tanks lining test procedures and comments.
3. Conduct a line tightness test.
4. Check continuity and integrity of vapor return lines and system.
5. Check integrity of overspill system.
6. Review inventory records from January 1995 to the present.
7. **Relieve Desert Petroleum Inc. of involvement as a responsible party based on the following:**
   - Desert Petroleum Inc. does not own or operate the site and has no control on how the site is operated and managed
   - Desert Petroleum Inc. has actively investigated and remediated this site since May 1990, with reasonable contaminant decline until mid 1994, see Tables 1 with associated graphs. This decline, projected, would have allowed site closure by mid 1996.
   - Desert Petroleum Inc. has performed source removal on four different occasions:

a. July 1989, excavated and removed gasoline-tainted soils from west and southwest of the UST's.
b. April 1994, removed the waste oil UST and limited over-excavation and removal of oil and gasoline tainted soils.
c. Performed vapor extraction and groundwater treatment using the RSI S.A.V.E.
d. October – December 1996, interim free product removal at RS-1 removing 30.4 gallons of gasoline and 1077 gallons of gasoline tainted groundwater.

8. Desert Petroleum Inc. should be relieved of the mandatory 1/4ly groundwater sampling of this site and the current groundwater monitoring wells should be assigned to the current owner Mr. Sharahn Shenazi.

HEALTH AND SAFETY

This site is being treated as a class D site, normal common sense is to be used.

SAMPLE METHODS

A WEGE technician working directly under California Registered Geologist #3037 using approved methods gauged, purged and sampled the monitor, see Appendix D for procedures and field notes.

SAMPLE PRESERVATION.

Each sample was placed into two, certified clean, glass, 40 ml VOAs with laboratory installed HCl preservative. The samples were then labeled and place on ice and Chain of Custody delivered to North State Environmental laboratories.

ANALYTICAL METHODS AND DHS LABORATORY SELECTED.

WEGE contracted North State Environmental (NSE), (ELAP Certificate No. 1753), P.O. Box 5624, South San South San Francisco, CA. 94083 (415) 588-2838, to perform the analysis of the groundwater samples.

NSE analyzed the samples for Total Petroleum Hydrocarbons as gasoline (TPHg) w/ BTEX distinction utilizing EPA Methods 8020 (GCFID) with 3050 extraction method as described on page 17, Table 2 of the TRI-REGIONAL BOARD STAFF RECOMMENDATIONS FOR PRELIMINARY EVALUATION AND INVESTIGATION OF UNDERGROUND TANK SITES, 10 AUGUST 1990.

NSE noted that Methyl tertiary-Butyl Ether (MTBE) was evident in all samples. During this sampling MTBE was confirmed for sample RS-2 by EPA method 8260, see Table 1 and Appendix B. The detection limits in water are: TPH-G, 50 ug/L; Benzene, Toluene, Ethylbenzene and MTBE, 0.5 ug/L; Xylenes, 2 ug/L.

RINSEATES AND PURGED GROUNDWATER STORAGE/TREATMENT.

All rinseates and purged water produced from the groundwater sampling and weekly purging of the wells is transferred into 55 gallon DOT H17 drums for later removal, by Evergreen Services to be recycled.

LIMITATIONS

The information presented in this report is based on the following:

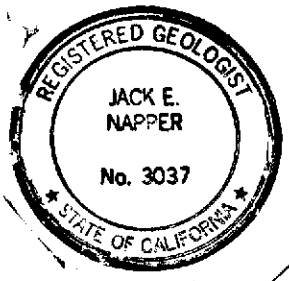
1. The observations and data collected by field personnel.
2. The results of laboratory analyses performed by a state certified analytical laboratory.
3. Our understanding of the regulations of Alameda County, the City of Oakland and the State of California.
4. References reviewed for this report.

Changes in groundwater conditions can occur due to variations in rainfall, temperature, local and regional water use, and local construction practices. In addition, variations in the soil and groundwater conditions could exist beyond the points explored in this investigation.

State Certified Laboratory analytical results are included in this report. This laboratory follows EPA and State of California approved procedures; however, WEGE is not responsible for errors in these laboratory results.

The services performed by Western Geo-Engineers, a corporation under California Registered Geologist #3037 and/or Contractors License #513857, have been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the State of California, the City of Oakland and Alameda County. Our work and/or supervision of remediation and/or abatement operations, active or preliminary at this site is no way meant to imply that we are owners or operators of this site. Please note that the known contamination of soil and/or groundwater must be reported to the appropriate agencies in a timely manner. No other warranty expressed or implied is made.

Sincerely yours,



George L. Converse
Project Manager/Geologist-WEGE

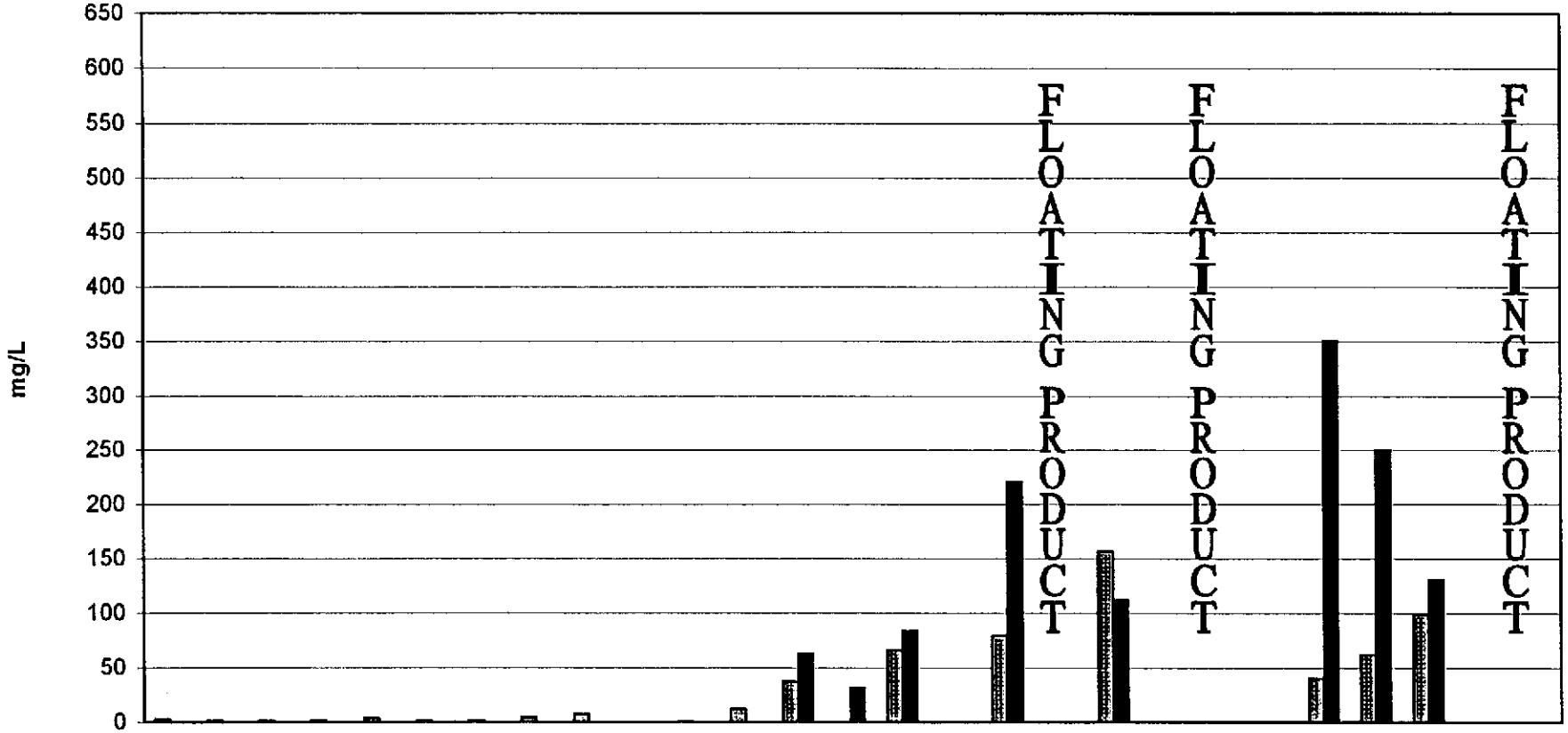
Jack E. Napper
Calif. Reg. Geologist #3037

cc: Mr. Scott Seary, Alameda County Health (510) 567-6774
Mr. Leroy Griffin, City of Oakland

TABLE 1
SUMMARY OF GROUNDWATER MONITORING
DP796
2844 MOUNTAIN BOULEVARD, OAKLAND, CALIFORNIA 94602

WELL	DATE	CASING ELEVATION	DEPTH TO TOP FLUID	DEPTH TO TOP WATER	FREE PRODUCT THICKNESS	GROUND WATER ELEVATION	TPH GASOLINE mg/L	BENZENE ug/L	TOLUENE ug/L	ETHYL-BENZENE ug/L	XYLENES ug/L	MTBE mg/L	SAMPLED BY
RS-1	MAY-90	675.63	7.2	7.2	0.00	668.43	2.7	370	420	40	320		RSI
	MAY-91	675.63	8.35	8.35	0.00	667.28	1.3	580	130	62	240		RSI
	OCT.-91	675.63	10.22	10.22	0.00	665.41	1.1	140	100	45	210		RSI
	JAN.-92	675.63	8.06	8.06	0.00	667.57	1.7	9.9	31	9.7	170		RSI
	JAN.-93	675.63	5.3	5.3	0.00	670.33	3.7	650	9.2	51	170		RSI
	AUG.-93	675.63	8.56	8.56	0.00	667.07	0.9	14	0.6	2.1	8		RSI
	NOV.-93	675.63	8.44	8.44	0.00	667.19	1.4	9.6	ND	0.9	5		RSI
	Jan-94	675.63	6.88	6.88	0.00	668.75	4.2	95	3.1	58	130		RSI
	May-94	675.63	7.87	7.87	0.00	667.76	7.5	270	11	37	96		RSI
	Aug-94	675.63	16.28	16.28	0.00	659.35	0.13	12	0.5	2.6	5		RSI
	Nov-94	675.63	8.02	8.02	0.00	667.61	0.27	4.7	0.7	0.6	15		RSI
	Feb-95	675.63	6.51	6.51	0.00	669.12	12	81	2.3	1	12		RSI
	Jun-95	675.63	7.34	7.34	0.00	668.29	37	460	ND	ND	ND	63	RSI
	Nov-95	675.63	8.71	8.71	0.00	666.92	ND	660	16	140	330	31	RSI
	Feb-96	675.63	6.95	6.95	0.00	668.68	66	110	ND	12	21	84	RSI
	09/18/96	675.63	8.44	8.52	0.08	667.17	1 INCH FREE PRODUCT						WEGE
	12/11/96	675.63	6.42	6.62	0.20	669.17	79	4000	37000	8000	45000	220	WEGE*
	02/21/97	675.63	6.88	6.92	0.04	668.74	1/2 INCH FLOATING PRODUCT						WEGE
	05/28/97	675.63	7.88	7.96	0.08	667.73	156	9400	51000	7000	45000	112	WEGE*
	09/02/97	675.63	8.34	8.38	0.04	667.28	1/2 INCH FLOATING PRODUCT						WEGE*
	11/24/97	675.63	6.98	7	0.02	668.65	1/4 INCH FLOATING PRODUCT						WEGE*
	02/25/98	675.63	3.51	3.52	0.01	672.12	1/8 INCH FLOATING PRODUCT						WEGE*
	05/27/98	675.63	7.31	7.31	0.00	668.32	40	2200	4000	2300	19000	350	WEGE*
	09/16/98	675.63	8.10	8.1	0.00	667.53	62	2400	2300	2100	14000	250	WEGE*
	11/23/98	675.63	7.10	7.1	0.00	668.53	99	2600	5800	2500	18000	130	WEGE*
resur	02/23/99	675.67	4.82	4.87	0.05	670.84	5/8 INCH FLOATING PRODUCT						WEGE*
	05/05/99	675.67	6.86	6.9	0.04	668.80	FLOATING PRODUCT						WEGE*

DP796 - RS1



	MAY-90	MAY-91	JAN.-92	JAN.-93	NOV.-93	Jan-94	Aug-94	Nov-94	Feb-95	Nov-95	Feb-96	12/11/96	02/21/97	05/28/97	11/24/97	02/25/98	09/16/98	11/23/98	05/05/99
TPHg	2.7	1.3	1.7	3.7	1.4	4.2	0.13	0.27	12	0	66	79	0	156	0	0	62	99	0
MTBE										31	84	220		112			250	130	

DATE SAMPLED

DP796 - RS1 GROUNDWATER WITH UTILITY ELEVATIONS

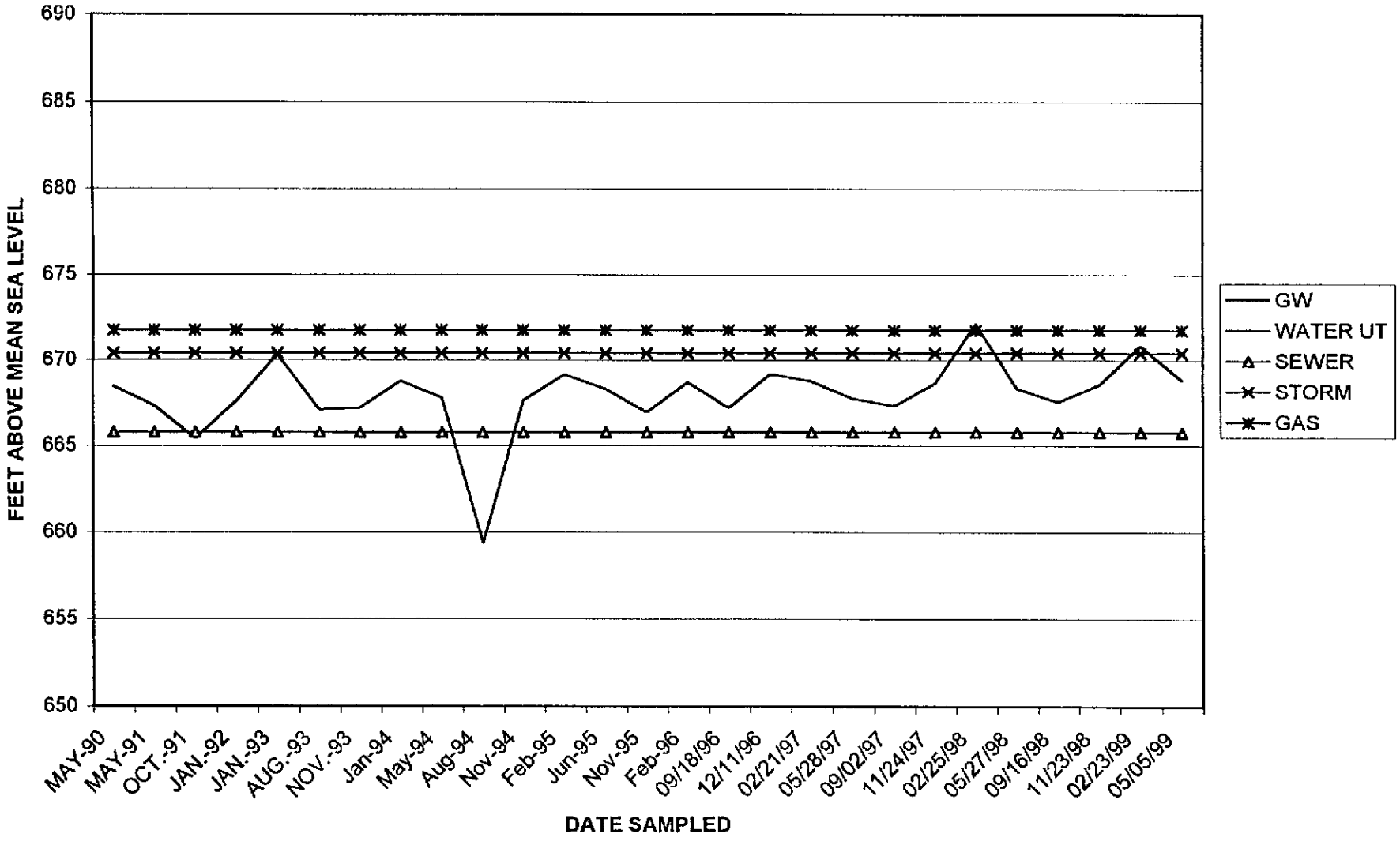


TABLE 1
SUMMARY OF GROUNDWATER MONITORING
DP796
2844 MOUNTAIN BOULEVARD, OAKLAND, CALIFORNIA 94602

WELL	DATE	CASING ELEVATION	DEPTH TO TOP FLUID	DEPTH TO TOP WATER	FREE PRODUCT THICKNESS	GROUND WATER ELEVATION	TPH GASOLINE mg/L	BENZENE ug/L	TOLUENE ug/L	ETHYL-BENZENE ug/L	XYLENES ug/L	MTBE mg/L	SAMPLED BY
RS-2	MAY-90	689	7.06	7.06	0.00	681.94	23	7200	4800	300	3300		RSI
	MAY-91	689	7.14	7.14	0.00	681.86	26	14000	1800	750	2900		RSI
	OCT.-91	688.89	8.84	8.84	0.00	680.05	13	4300	910	300	2300		RSI
	JAN.-92	688.89	7.34	7.34	0.00	681.55	8.3	1800	920	140	1700		RSI
	JAN.-93	688.89	4.1	4.1	0.00	684.79	41	7000	210	1200	4200		RSI
	AUG.-93	688.89	7.32	7.32	0.00	681.57	19	5300	62	810	1600		RSI
	NOV.-93	688.89	7.34	7.34	0.00	681.55	9.3	2400	3.9	46	800		RSI
	JAN.-94	688.89	5.52	5.52	0.00	683.37	30	4900	ND	880	2600		RSI
	MAY-94	675.25	6.4	6.4	0.00	668.85	120	3300	330	ND	2200		RSI
	AUG.-94	675.25	22.11	22.11	0.00	653.14	0.51	7.3	3.8	3.5	32		RSI
	NOV.-94	675.25	9.82	9.82	0.00	665.43	0.62	6.6	3.9	1.1	47		RSI
	FEB.-95	675.25	4.81	4.81	0.00	670.44	22	228	80	2	463		RSI
	JUN.-95	675.25	5.8	5.8	0.00	669.45	49	1300	160	200	1600	71	RSI
	NOV.-95	675.25	7.64	7.64	0.00	667.61	ND	670	25	150	360	65	RSI
	FEB.-96	675.25	4.69	4.69	0.00	670.56	75	1400	170	59	460	71	RSI
	09/18/96	675.25	7.34	7.34	0.00	667.91	6.3	2000	48	350	570	160	WEGE
	12/11/96	675.25	5.08	5.08	0.00	670.17	16	2000	840	200	3200	180	WEGE
	02/21/97	675.25	5.42	5.42	0.00	669.83	22	2100	1300	600	5100	56	WEGE*
	05/28/97	675.25	6.4	6.4	0.00	668.85	156	4200	89	1000	6900	390	WEGE*
	09/02/97	675.25	6.93	6.93	0.00	668.32	<0.05	1300	25	360	1400	180	WEGE*
	11/24/97	675.25	5.93	5.93	0.00	669.32	<0.05	600	ND	ND	ND	610	WEGE*
	02/25/98	675.25	4.59	4.59	0.00	670.66	11	1100	<50	320	2400	330	WEGE*
	05/27/98	675.25	5.61	5.61	0.00	669.64	13	2000	150	600	2700	380	WEGE*
	09/16/98	675.25	6.84	6.84	0.00	668.41	11	1600	20	1600	1600	280	WEGE*
	11/23/98	675.25	6.24	6.24	0.00	669.01	12	1200	84	<5	960	140	WEGE*
resur	02/23/99	675.28	4.62	4.62	0.00	670.66	8.8	1500	650	640	1500	450	WEGE*
	05/05/99	675.28	7.55	7.55	0.00	667.73	29	2000	1300	500	3700	270	WEGE*

270,000 ug/L

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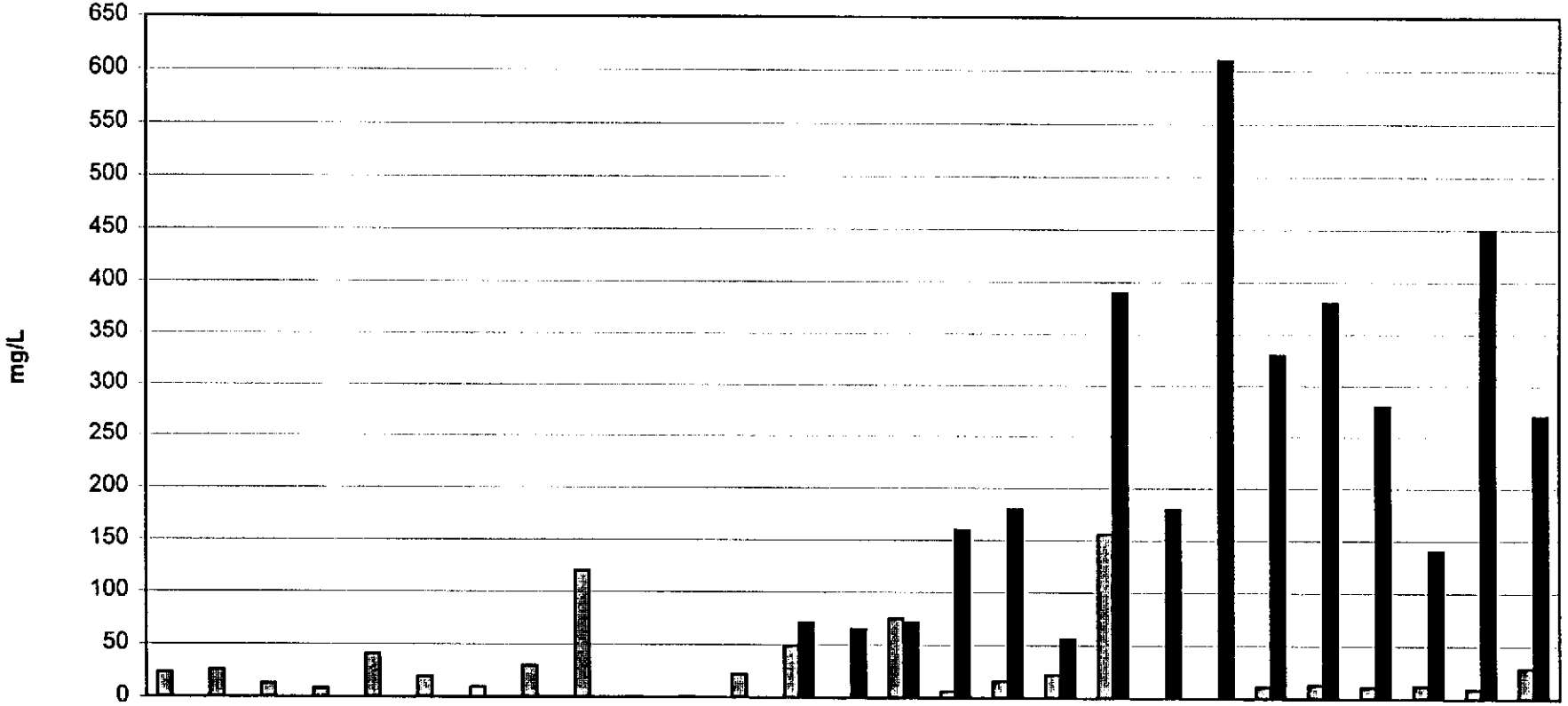
DP796 - RS2



	MAY-90	MAY-91	JAN.-92	JAN.-93	NOV.-93	JAN.-94	AUG.-94	NOV.-94	FEB.-95	NOV.-95	FEB.-96	12/11/96	02/21/97	05/28/97	11/24/97	02/25/98	09/16/98	11/23/98	05/05/99
TPHg	23	26	8.3	41	9.3	30	0.51	0.62	22	0	75	16	22	156	0	11	11	12	29
MTBE										65	71	180	56	390	610	330	280	140	270

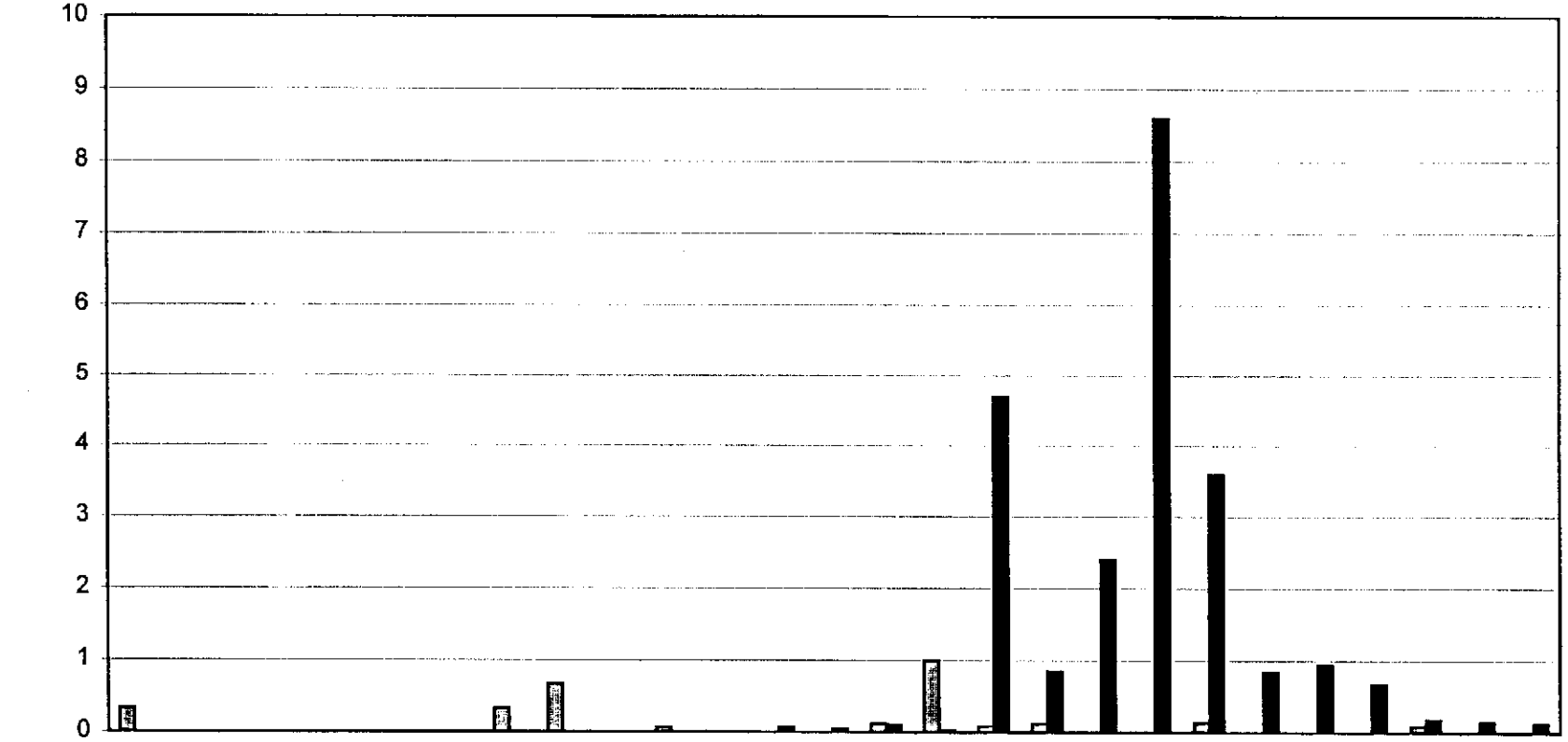
DATE SAMPLED

10

TABLE 1
SUMMARY OF GROUNDWATER MONITORING
DP796
2844 MOUNTAIN BOULEVARD, OAKLAND, CALIFORNIA 94602

WELL #	DATE	CASING ELEVATION	DEPTH TO TOP FLUID	DEPTH TO TOP WATER	FREE PRODUCT THICKNESS	GROUND WATER ELEVATION	TPH GASOLINE mg/L	BENZENE ug/L	TOLUENE ug/L	ETHYL-BENZENE ug/L	XYLENES ug/L	MTBE mg/L	SAMPLED BY
RS-3	MAY-90	670	6	6	0.00	664.00	0.33	2	1	1	150		RSI
	MAY-91	670	6.76	6.76	0.00	663.24	ND	0.4	ND	0.8	8		RSI
	OCT.-91	670	8.98	8.98	0.00	661.02	ND	ND	ND	ND	ND		RSI
	JAN.-92	670	6.81	6.81	0.00	663.19	ND	2.2	7.2	0.6	4		RSI
	JAN.-93	670	4.05	4.05	0.00	665.95	ND	ND	ND	ND	ND		RSI
	AUG.-93	670	7.19	7.19	0.00	662.81	ND	30	6	2.4	5		RSI
	NOV.-93	670	7.12	7.12	0.00	662.88	ND	4.8	0.4	0.6	2		RSI
	JAN.-94	670	5.42	5.42	0.00	664.58	0.33	25	3.2	3.9	12		RSI
	MAY-94	676.2	5.78	5.78	0.00	670.42	0.67	34	4	28	70		RSI
	AUG.-94	676.2	5.86	5.86	0.00	670.34	ND	ND	ND	ND	ND		RSI
	NOV.-94	676.2	5.08	5.08	0.00	671.12	0.069	2.5	3.1	1	4		RSI
	FEB.-95	676.2	4.51	4.51	0.00	671.69	ND	0.3	0.4	ND	1		RSI
	JUN.-95	676.2	5.29	5.29	0.00	670.91	ND	ND	ND	ND	ND	0.066	RSI
	NOV.-95	676.2	7.1	7.1	0.00	669.10	ND	ND	ND	ND	ND	0.044	RSI
	FEB.-96	676.2	4.48	4.48	0.00	671.72	0.12	ND	ND	ND	ND	0.11	RSI
	09/18/96	676.2	6.92	6.92	0.00	669.28	1	13	8.6	10	17	0.033	WEGE
	12/11/96	676.2	4.9	4.9	0.00	671.30	0.085	20	2	<0.5	14	4.7	WEGE
	02/21/97	676.2	4.94	4.94	0.00	671.26	0.12	5	2	2	6	0.85	WEGE*
	05/28/97	676.2	7.92	7.92	0.00	668.28	<0.05	6	<0.5	<0.5	<2	2.4	WEGE
	09/02/97	676.2	6.6	6.6	0.00	669.60	<0.05	0.9	<0.5	<0.5	<2	8.6	WEGE*
	11/24/97	676.2	5.89	5.89	0.00	670.31	0.14	13	2	1	12	3.6	WEGE*
	02/25/98	676.2	4.29	4.29	0.00	671.91	<0.05	<0.5	<0.5	<0.5	4	0.85	WEGE*
	05/27/98	676.2	5.01	5.01	0.00	671.19	<0.05	7	<0.5	<0.5	11	0.94	WEGE*
	09/16/98	676.2	6.21	6.21	0.00	669.99	<0.05	2	2	2	10	0.67	WEGE*
	11/24/98	676.2	5.58	5.58	0.00	670.62	0.085	9	23	<0.5	19	0.18	WEGE*
resur	02/24/99	676.23	4.3	4.3	0.00	671.93	<0.05	<0.5	0.9	<0.5	<1.0	0.15	WEGE
	05/05/99	676.23	4.92	4.92	0.00	671.31	<0.05	1	2	1	6	0.13	WEGE

DP796 - RS3



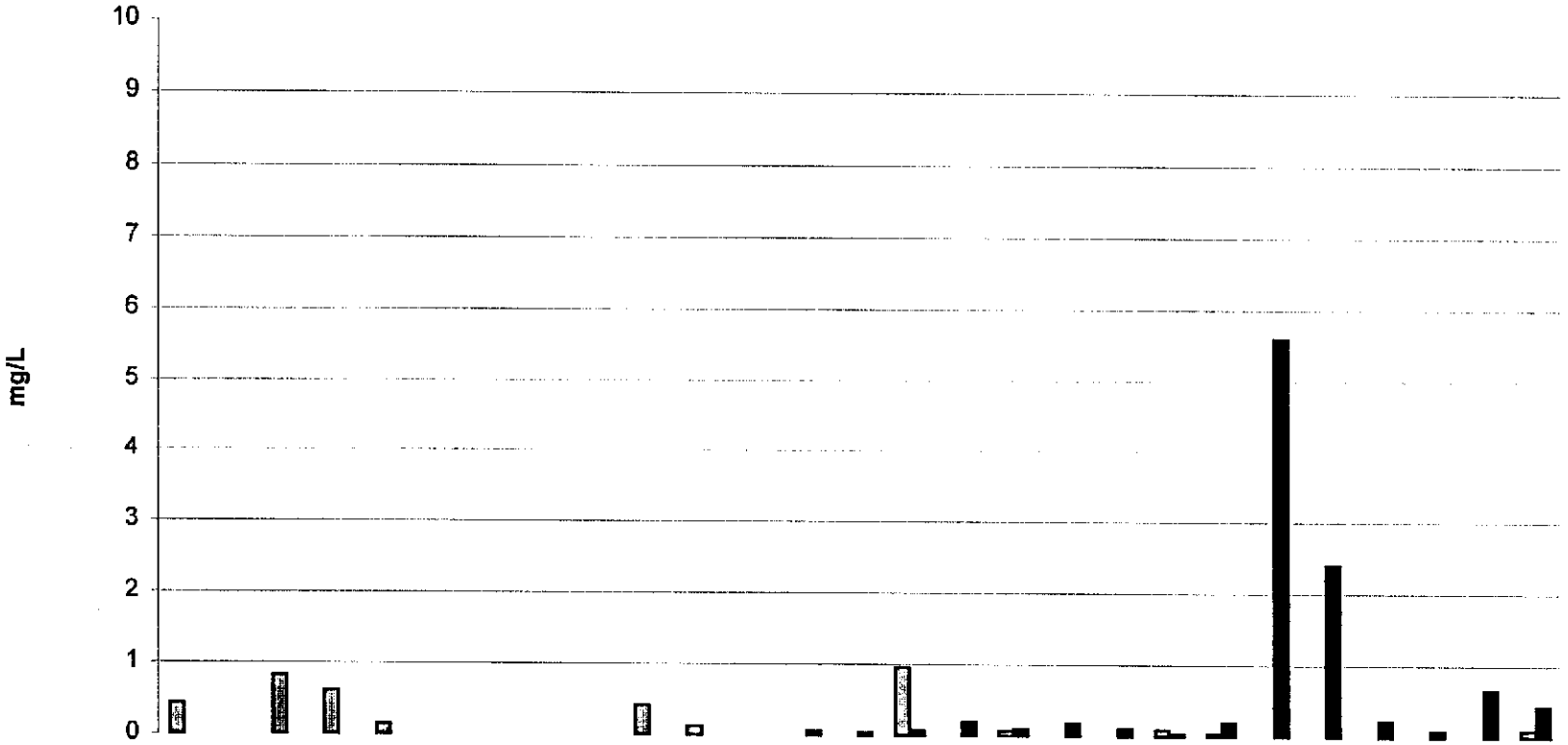
	MAY-90	MAY-91	JAN.-92	JAN.-93	NOV.-93	JAN.-94	AUG.-94	NOV.-94	FEB.-95	NOV.-95	FEB.-96	12/11/96	02/21/97	05/28/97	11/24/97	02/25/98	09/16/98	11/24/98	05/05/99
TPHg	0.33	0	0	0	0	0.33	0	0.069	0	0	0.12	0.085	0.12	0	0.14	0	0	0.085	0
MTBE										0.044	0.11	4.7	0.85	2.4	3.6	0.85	0.67	0.18	0.13

DATE SAMPLED

TABLE 1
SUMMARY OF GROUNDWATER MONITORING
DP796
2844 MOUNTAIN BOULEVARD, OAKLAND, CALIFORNIA 94602

WELL	DATE	CASING ELEVATION	DEPTH TO TOP FLUID	DEPTH TO TOP WATER	FREE PRODUCT THICKNESS	GROUND WATER ELEVATION	TPH GASOLINE mg/L	BENZENE ug/L	TOLUENE ug/L	ETHYL-BENZENE ug/L	XYLENES ug/L	MTBE mg/L	SAMPLED BY
RS-4	MAY-90	675.38	8.34	8.34	0.00	667.04	0.44	9	11	9	49		RSI
	MAY-91	675.38	9.5	9.5	0.00	665.88	ND	8	4	3	5		RSI
	OCT.-91	675.38	10.82	10.82	0.00	664.56	0.83	280	120	24	170		RSI
	JAN.-92	675.38	9.31	9.31	0.00	666.07	0.62	34	8.3	2.1	21		RSI
	JAN.-93	675.38	6.89	6.89	0.00	668.49	0.15	32	1.7	5.8	13		RSI
	AUG.-93	675.38	9.68	9.68	0.00	665.7	ND	0.9	0.7	ND	0		RSI
	NOV.-93	675.38	9.83	9.83	0.00	665.55	ND	ND	ND	ND	ND		RSI
	JAN.-94	675.38	8.17	8.17	0.00	667.21	ND	1.7	ND	0.81	2		RSI
	MAY-94	675.38	8.69	8.69	0.00	666.69	ND	ND	ND	ND	1		RSI
	AUG.-94	675.38	9.04	9.04	0.00	666.34	0.42	6.5	4.1	1.9	40		RSI
	NOV.-94	675.38	8	8	0.00	667.38	0.13	4.1	0.7	1.7	8		RSI
	FEB.-95	675.38	7.93	7.93	0.00	667.45	ND	6	1.2	3.5	13		RSI
	JUN.-95	675.38	8.61	8.61	0.00	666.77	ND	ND	ND	ND	ND	0.069	RSI
	NOV.-95	675.38	10.43	10.43	0.00	664.95	ND	ND	ND	ND	ND	0.047	RSI
	FEB.-96	675.38	7.44	7.44	0.00	667.94	0.96	ND	ND	0.6	ND	0.08	RSI
	09/18/96	675.38	9.58	9.58	0.00	665.80	<0.05	<0.5	<0.5	<0.5	<2	0.2	WEGE
	12/11/96	675.38	7.5	7.5	0.00	667.88	0.075	<0.5	0.6	<0.5	<0.5	0.104	WEGE
	02/21/97	675.38	8.26	8.26	0.00	667.12	<0.05	1	1	<0.5	1	0.19	WEGE*
	05/28/97	675.38	8.92	8.92	0.00	666.46	<0.05	6	<0.5	<0.5	<2	0.11	WEGE
	09/02/97	675.38	9.39	9.39	0.00	665.99	0.1	3	<0.5	<0.5	<2	0.039	WEGE*
	11/24/97	675.38	8.22	8.22	0.00	667.16	0.041	<0.5	2	<0.5	<2	0.21	WEGE*
	02/25/98	675.38	7.19	7.19	0.00	668.19	<0.05	3	<0.5	<0.5	<1	5.6	WEGE*
	05/27/98	675.38	8.4	8.4	0.00	666.98	<0.05	<0.5	<0.5	<0.5	<1	2.4	WEGE*
	09/16/98	675.38	9.26	9.26	0.00	666.12	<0.05	<0.5	<0.5	<0.5	<1	0.23	WEGE*
	11/24/98	675.38	8.5	8.5	0.00	666.88	<0.05	2	<0.5	<0.5	<1	0.1	WEGE*
resur	02/24/99	675.42	7.2	7.2	0.00	668.22	<0.05	2	3	0.8	5	0.67	WEGE
	05/05/99	675.42	8.37	8.37	0.00	667.05	0.1	<0.5	<0.5	<0.5	<1	0.44	WEGE

DP796 - RS4



	MAY-90	OCT.-91	JAN.-92	AUG.-93	NOV.-93	MAY-94	NOV.-94	FEB.-95	NOV.-95	FEB.-96	12/11/96	02/21/97	09/02/97	02/25/98	05/27/98	11/24/98	02/24/99
TPHg	0.44	0.83	0.62	0	0	0	0.13	0	0	0.96	0.075	0	0.1	0	0	0	0
MTBE									0.047	0.08	0.104	0.19	0.039	5.6	2.4	0.1	0.67

DATE SAMPLED

DP796 - RS4 GROUNDWATER WITH UTILITY ELEVATIONS

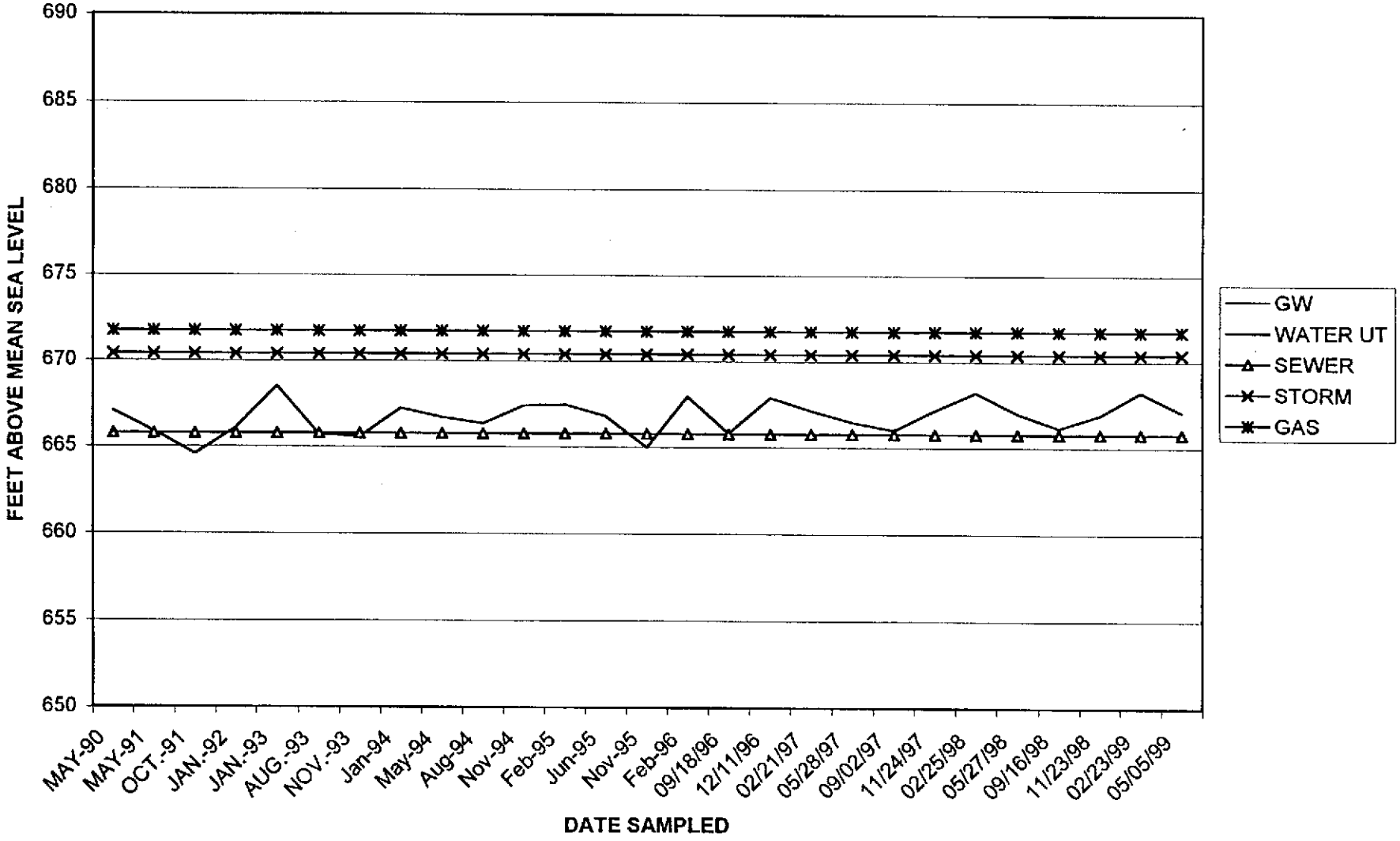


TABLE 1
SUMMARY OF GROUNDWATER MONITORING
DP796
2844 MOUNTAIN BOULEVARD, OAKLAND, CALIFORNIA 94602

WELL	DATE	CASING ELEVATION	DEPTH TO TOP FLUID	DEPTH TO TOP WATER	FREE PRODUCT THICKNESS	GROUND WATER ELEVATION	TPH GASOLINE mg/L	BENZENE ug/L	TOLUENE ug/L	ETHYL-BENZENE ug/L	XYLENES ug/L	MTBE mg/L	SAMPLED BY
WATER METER BOX													
							mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	
	08/06/97	SOIL AT ONE FOOT DEPTH BELOW SURFACE					1900	0.45	0.6	6.5	9.9	ND	WEGE
WATER FROM RETAINING WALL DRAIN WEST OF STATION													
							mg/L	ug/L	ug/L	ug/L	ug/L	ug/L	
	11/09/98						<0.05	<0.5	<0.5	<0.5	3.1	<1	WEGE*

MTBE Methyl t-Butyl Ether
TPH Total Petroleum Hydrocarbons
mg/L Milligrams per liter (ppm)
ug/L Micrograms per liter (ppb)
ND or < Below laboratory detection limits
* MTBE confirmed by GC/MS 8260 method.

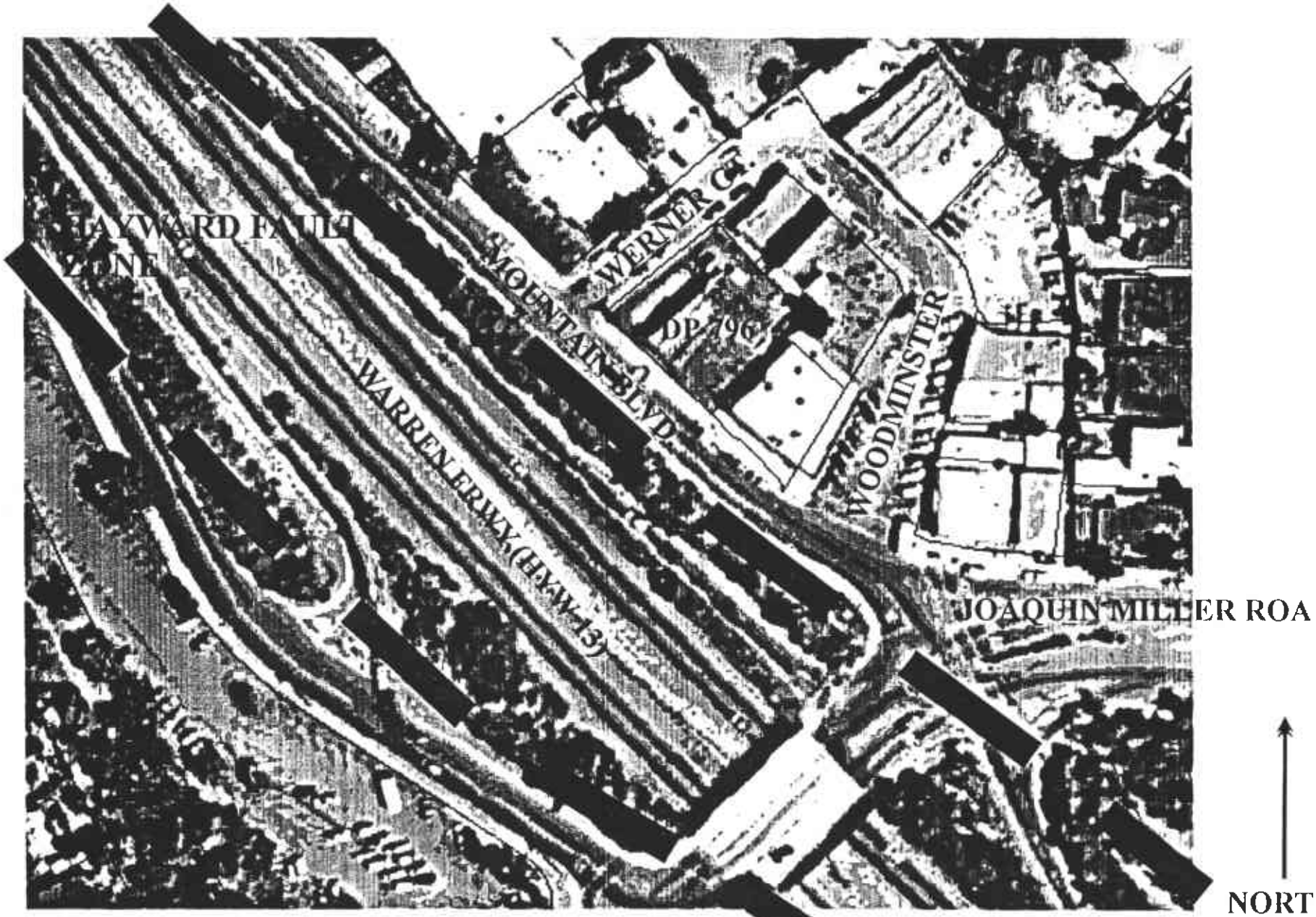


FIGURE 1 PARCEL MAP ON AERIAL PHOTO SHOWING LOCATION OF DP 796, 2844 MOUNTAIN BLVD., OAKLAND, CALIFORNIA AND HAYWARD FAULT.

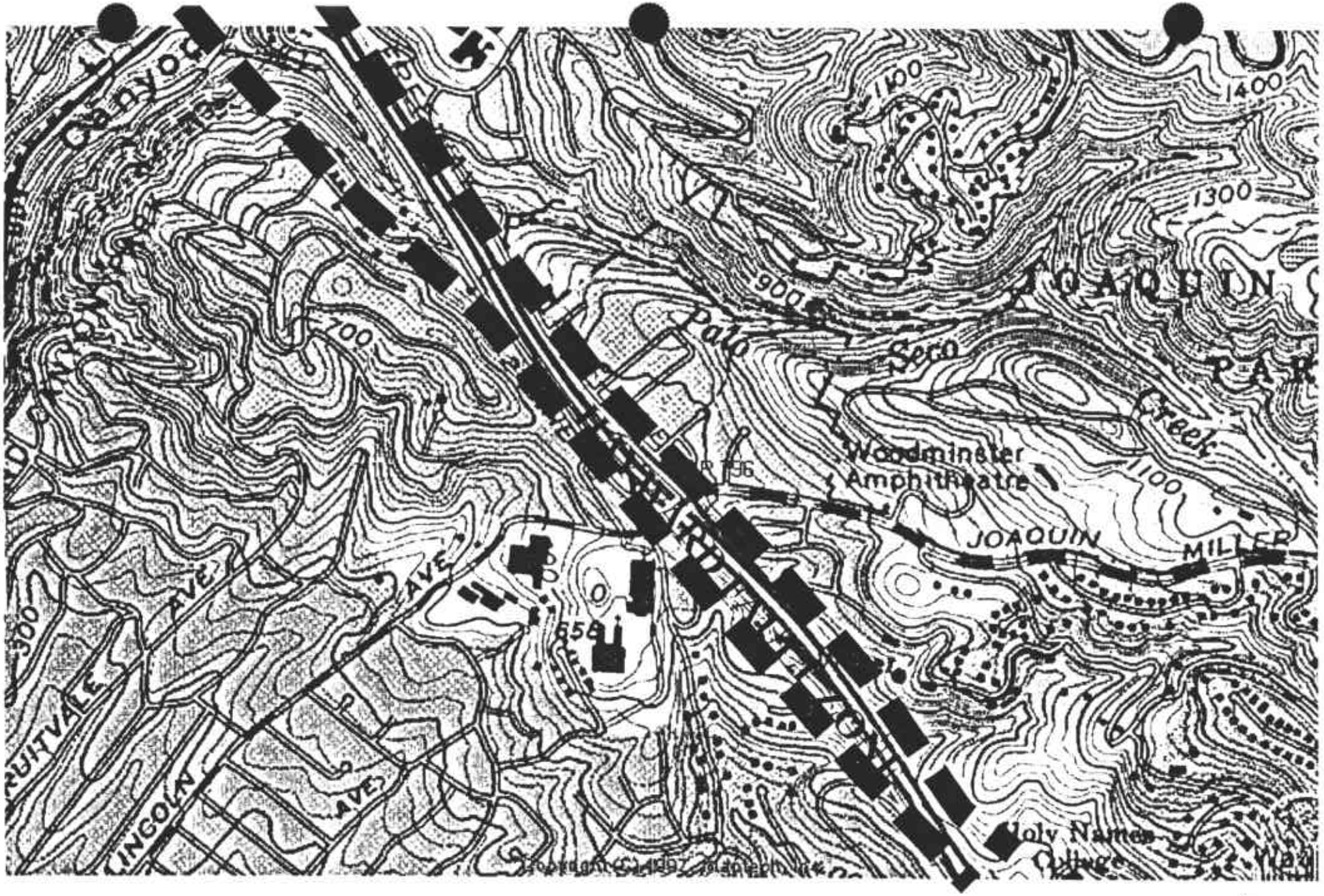
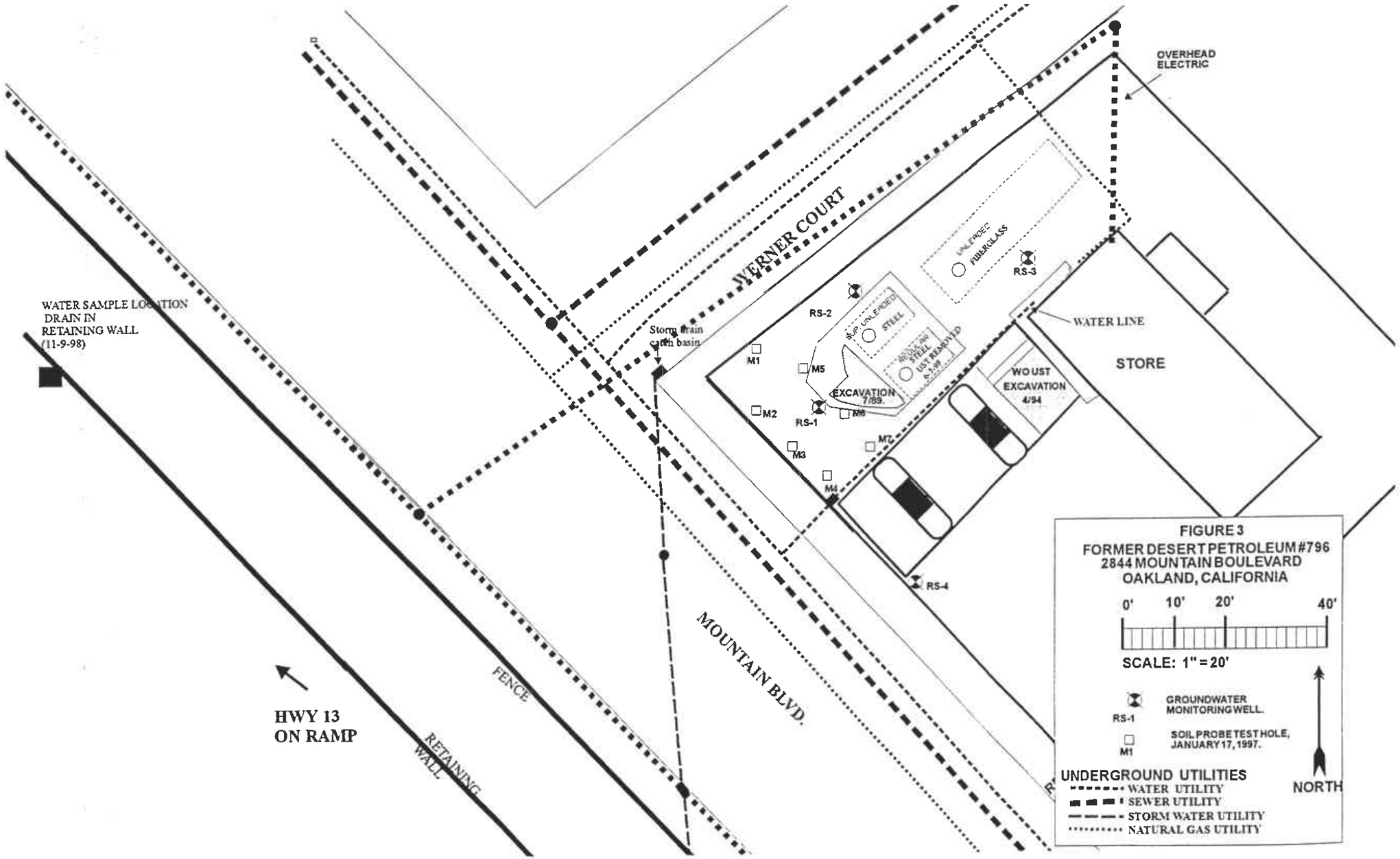


FIGURE 2
PORTION OF OAKLAND EAST 7.5 MINUTE QUADRANGLE
WITH LOCATION OF DP 796 IN RESPECT TO HAYWARD FAULT

NORTH


WATER SAMPLE LOCATION
DRAIN IN
RETAINING WALL
(11-9-98)
HWY 13
ON RAMP
RETAINING WALL
FENCE
MOUNTAIN BLVD.
JVERNER COURT
Storm drain
catch basin
OVERHEAD
ELECTRIC
WATER LINE
STORE
WO UST
EXCAVATION
4/94
EXCAVATION
7/89.
UNLEADED
FIBERGLASS
SUP UNLEADED
STEEL
REGULAR
STEEL
UST REMOVED
RS-1
RS-2
RS-3
RS-4
M1
M2
M3
M4
M5
M6
M7
FIGURE 3
FORMER DESERT PETROLEUM #796
2844 MOUNTAIN BOULEVARD
OAKLAND, CALIFORNIA
0'
10'
20'
40'
SCALE: 1" = 20'
GROUNDWATER
MONITORING WELL.
SOIL PROBE TEST HOLE,
JANUARY 17, 1997.
UNDERGROUND UTILITIES
WATER UTILITY
SEWER UTILITY
STORM WATER UTILITY
NATURAL GAS UTILITY
NORTH

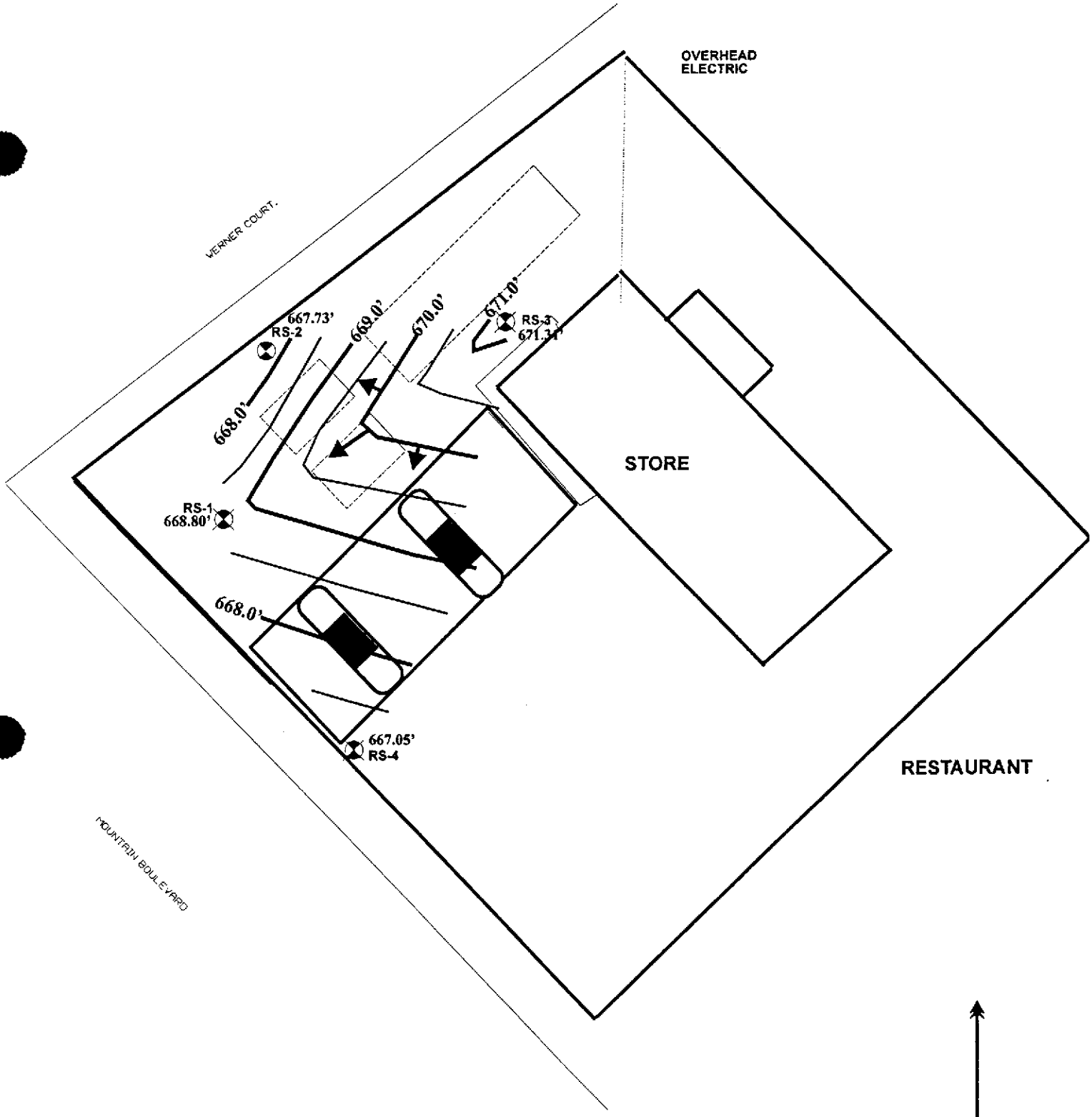
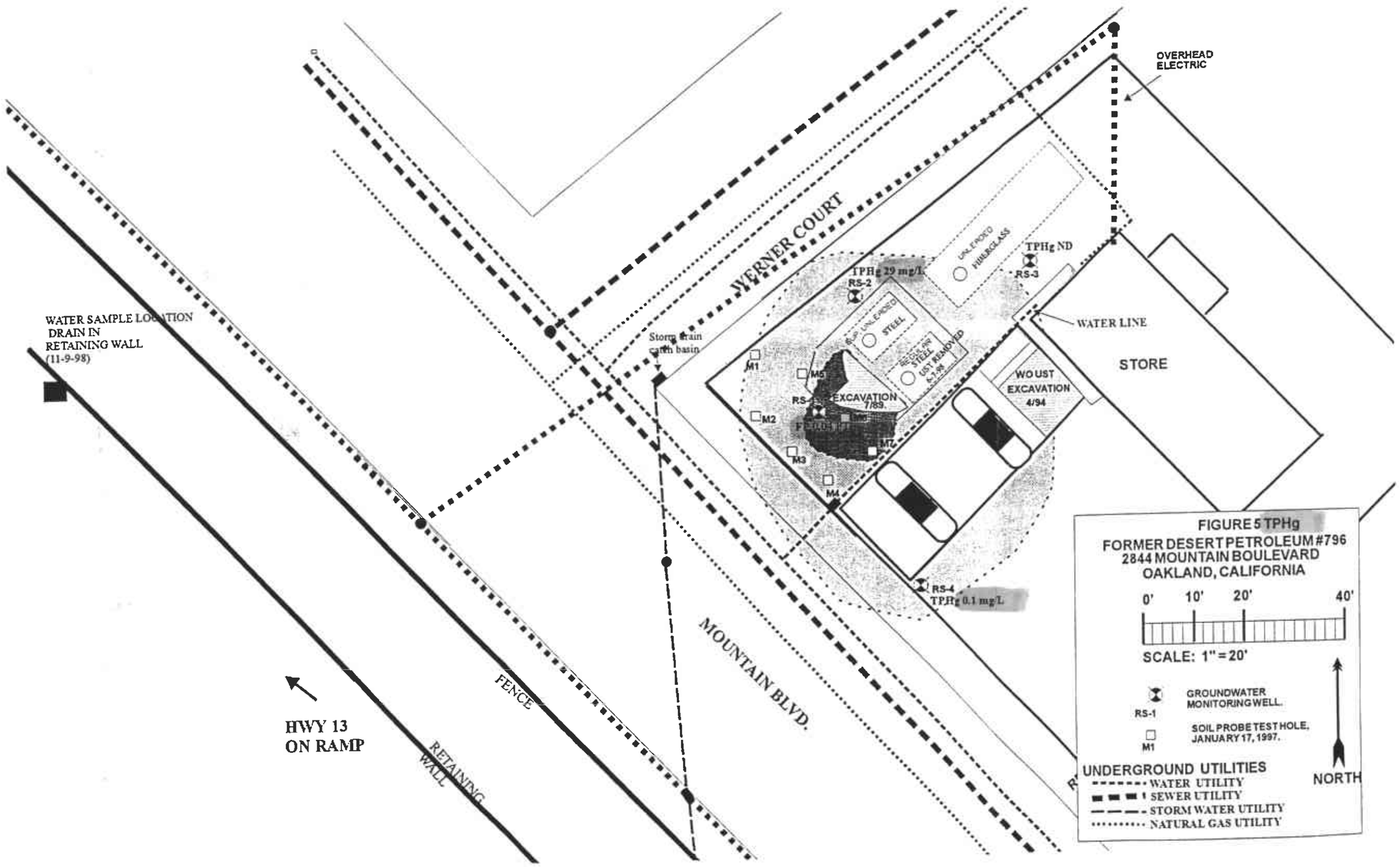
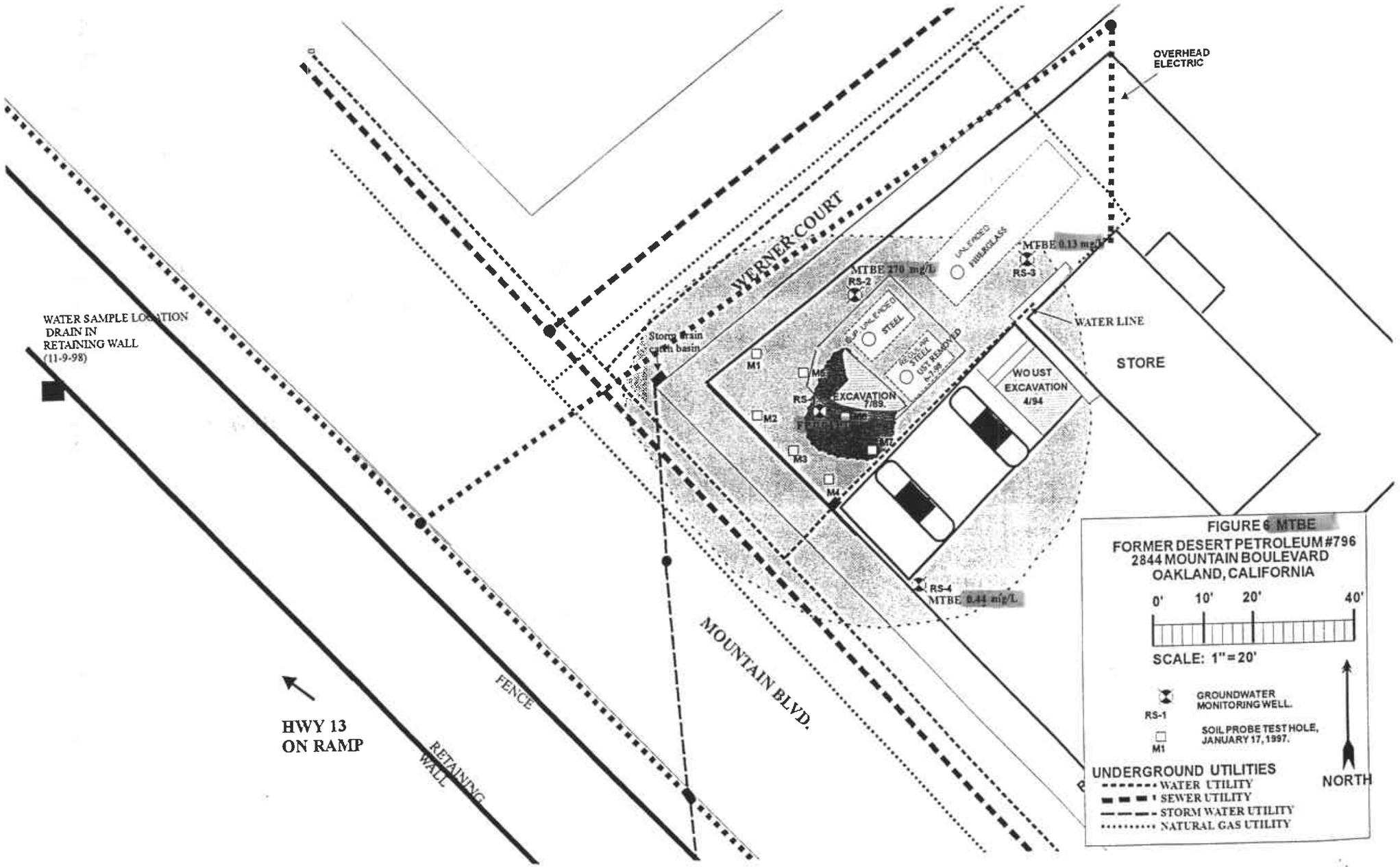


FIGURE 4

FORMER DESERT PETROLEUM #796
2844 MOUNTAIN BOULEVARD
OAKLAND, CALIFORNIA

GROUNDWATER GRADIENT
MAY 5, 1999


WATER SAMPLE LOCATION
DRAIN IN
RETAINING WALL
(11-9-98)
HWY 13
ON RAMP
RETAINING WALL
FENCE
MOUNTAIN BLVD.
WERNER COURT
OVERHEAD ELECTRIC
WATER LINE
STORE
Storm drain
catch basin
TPHg 29 mg/L
RS-2
TPHg ND
RS-3
UNLEADED
FIBERGLASS
6,000 GAL UNLEADED
STEEL
REGULAR
STEEL
UST REMOVED
6-1-98
WO UST
EXCAVATION
4/94
EXCAVATION
7/89
RS-1
M1
M2
M3
M4
M5
M6
RS-4
TPHg 0.1 mg/L
FIGURE 5 TPHg
FORMER DESERT PETROLEUM #796
2844 MOUNTAIN BOULEVARD
OAKLAND, CALIFORNIA
0'
10'
20'
40'
SCALE: 1" = 20'
GROUNDWATER MONITORING WELL.
SOIL PROBE TEST HOLE, JANUARY 17, 1997.
UNDERGROUND UTILITIES
WATER UTILITY
SEWER UTILITY
STORM WATER UTILITY
NATURAL GAS UTILITY
NORTH


OVERHEAD ELECTRIC
WERNER COURT
WATER SAMPLE LOCATION
DRAIN IN
RETAINING WALL
(11-9-98)
Storm drain
catch basin
MTBE 270 mg/L
RS-2
MTBE 0.13 mg/L
RS-3
UNLEADED
FIBERGLASS
SUP UNLEADED
STEEL
REGULAR
STEEL
UST REMOVED
5-7-98
M1
M5
RS-
EXCAVATION
7/89.
M2
M3
M4
M7
WATER LINE
STORE
WO UST
EXCAVATION
4/94
RS-4
MTBE 0.41 mg/L
MOUNTAIN BLVD.
FENCE
RETAINING
WALL
HWY 13
ON RAMP
FIGURE 6 MTBE
FORMER DESERT PETROLEUM #796
2844 MOUNTAIN BOULEVARD
OAKLAND, CALIFORNIA
0'
10'
20'
40'
SCALE: 1"=20'
RS-1
GROUNDWATER
MONITORING WELL.
M1
SOIL PROBE TEST HOLE,
JANUARY 17, 1997.
UNDERGROUND UTILITIES
WATER UTILITY
SEWER UTILITY
STORM WATER UTILITY
NATURAL GAS UTILITY
NORTH

North State Environmental Laboratory
CA ELAP # 1753
90 South Spruce Avenue, Suite V • South San Francisco, CA 94080 • (650) 266-4563 • FAX (650) 266-4560

C E R T I F I C A T E O F A N A L Y S I S

Lab Number: 99-0674
Client: Western Geo-Engineers
Project: DP796 2844 Mountain Blvd

Date Reported: 05/13/99

Gasoline,BTEX and MTBE by Methods 8015M and 8020

Analyte	Method	Result	Unit	Date Sampled	Date Analyzed
Sample: 99-0674-01 Client ID: RS-2				05/05/99	WATER
Gasoline	8015M	29000	ug/L		05/10/99
Benzene	8020	2000	ug/L		
Ethylbenzene	8020	500	ug/L		
MTBE	8020	*270000	ug/L		
Toluene	8020	1300	ug/L		
Xylenes	8020	3700	ug/L		
Sample: 99-0674-02 Client ID: RS-3				05/05/99	WATER
Gasoline	8015M	ND			05/10/99
Benzene	8020	1	ug/L		
Ethylbenzene	8020	1	ug/L		
MTBE	8020	130	ug/L		
Toluene	8020	2	ug/L		
Xylenes	8020	6	ug/L		
Sample: 99-0674-03 Client ID: RS-4				05/05/99	WATER
Gasoline	8015M	100	ug/L		05/10/99
Benzene	8020	ND			
Ethylbenzene	8020	ND			
MTBE	8020	440	ug/L		
Toluene	8020	ND			
Xylenes	8020	ND			

*Confirmed by GC/MS method 8260.

North State Environmental Laboratory
CA ELAP # 1753
90 South Spruce Avenue, Suite V • South San Francisco, CA 94080 • **(650) 266-4563** • FAX (650) 266-4560

C E R T I F I C A T E O F A N A L Y S I S

Quality Control/Quality Assurance

Lab Number: 99-0674
Client: Western Geo-Engineers
Project: DP796 2844 Mountain Blvd

Date Reported: 05/13/99

Gasoline,BTEX and MTBE by Methods 8015M and 8020

Analyte	Method	Reporting Limit	Unit	Blank	MS/MSD Recovery	RPD
Gasoline	8015M	50	ug/L	ND	100	1
Benzene	8020	0.5	ug/L	ND	100	3
Ethylbenzene	8020	0.5	ug/L	ND	104	2
Toluene	8020	0.5	ug/L	ND	103	2
Xylenes	8020	1.0	ug/L	ND	102	2
MTBE	8020	0.5	ug/L	ND	106	0

ELAP Certificate NO:1753
Reviewed and Approved

John A.Murphy,Laboratory Director

North State Environmental Analytical Laboratory

90 South Spruce Avenue, Suite W, South San Francisco, CA 94080
Phone: (650) 266-4563 Fax: (650) 266-4560

99-0674

Chain of Custody / Request for Analysis
Lab Job No.:_____ Page___ of___

Client: Desert Petroleum	Report to: Roy Butler	Phone: 530 668 5300	Turnaround Time
Mailing Address: Western Geo-Engineers 1386 E. Beamer St. Woodland, CA 95776	Billing to: Same	Fax: 530 662 0273	
		PO# / Billing Reference:	Date: 5-5-98
			Sampler: Brandwig

Project / Site Address: DP 796 2877 Mountain Blvd

Analysis Requested

Sample ID	Sample Type	Container No. / Type	Pres.	Sampling Date / Time	TPHg BTEX	MTBE						Comments / Hazards
RS-2	H_2O	2/VOAs	HCL	5-5-98 1135	✓	✓						
RS-3	H_2O	″	″	″ 1116	✓	✓						
RS-4	H_2O	″	″	″ 1204	✓	✓						

Relinquished by: Kristin Brandwig	Date: 5-5-98 Time: 1530	Received by: Roy Butler	Lab Comments
Relinquished by: Roy Butler	Date: 5/6/98 Time: 1410	Received by: NSE Labs	
Relinquished by:	Date: Time:	Received by:	

David Pittman Well Purge

Post Office Box 90, Goodyears Bar, CA 95944-0090
530/289-3133

INVOICE 0018

DATE MAY 5 99
Mailed 5/10/99 - Gd Pt. B
Rec 5/11/99 - Woodland

SITE NAME DP 796 CUSTOMER WESTERN GEO ENG

ADDRESS MOUNTAIN OAKLAND
CITY/STATE
PHONE

WELL	#	DESCRIPTION OF WORK PERFORMED
RS	3	30 GALLONS PURGED
RS	2	20 ✓
RS	1	15
RS	4	25

to Colusa 5/11/99

	HOURS	MINUTES
ARRIVAL TIME	11	00
DEPARTURE TIME	12	30
TOTAL TIME AT SITE	1	30

@ $45.00 PER HOUR

TOTAL LABOR $ 67.50

TRAVEL TIME FROM OAK. TO OAK. TO SAC
2 HOURS @ $45.00 PER HOUR

TOTAL TRAVEL $ 90.00

100 MILES @ $.40 PER MILE

TOTAL MILEAGE $ 40.00

INVOICE TOTAL = $ 197.50

WESTERN GEO-ENGINEERS
WOODLAND, CALIFORNIA 95695
(916) 668-5300, FAX (916) 662-0273

WELL SAMPLING DATA SHEET

SITE DP 796	DATE 5-5-99	TIME 1140
WELL RS-1	SAMPLED BY. Broadway	
WELL ELEVATION		
PRODUCT THICKNESS	13mm	
DEPTH TO WATER	6.10 DTB 29.66	
FLUID ELEVATION		
BAILER TYPE	Disposable Bailer	
PUMP	GTT David	

WELL PURGING RECORD				
TIME	VOLUME REMOVED	TEMP.	pH	COND.
1143	1st Bailer			
	gal			

FINAL VOLUME PURGED	14 gal
TIME SAMPLED	
SAMPLE ID.	RS-1
SAMPLE CONTAINERS	40cc VOAs
ANALYSIS TO BE RUN	TPHg BTEX / MTBE
LABORATORY	NSE
NOTES:	1st Bailer Floating Product

WESTERN GEO-ENGINEERS
WOODLAND, CALIFORNIA 95695
(916) 668-5300, FAX (916) 662-0273

WELL SAMPLING DATA SHEET

SITE DP 796	DATE 5 5 99	TIME 1122
WELL RS 2	SAMPLED BY. Broadway	
WELL ELEVATION		
PRODUCT THICKNESS		
DEPTH TO WATER 7.55	DTB 25.05	
FLUID ELEVATION		
BAILER TYPE Disposable Bailed		
PUMP ETT David		

WELL PURGING RECORD				
TIME	VOLUME REMOVED	TEMP.	pH	COND.
1123	1st Bailer	70.7	6.40	6.18
1128	20 gal	69.5	6.18	6.26
1130	1	69.3	6.26	6.13
1132	1	69.4	6.33	6.06
1134	1	69.5	6.34	6.04

FINAL VOLUME PURGED	23 gal
TIME SAMPLED	1135
SAMPLE ID.	RS-2
SAMPLE CONTAINERS	3/40cc VOAs
ANALYSIS TO BE RUN	TPHg BTEX / MTBE
LABORATORY	NSE
NOTES:	1st Bailer Turbid Petroleum Odor

2b1

GEO-ENGINEERS
(916) 668-5300, FAX (916) 662-0273

WELL SAMPLING DATA SHEET

SITE DP 796	DATE 5-5-99	TIME 1057
WELL RS 3	SAMPLED BY. Broadway	
WELL ELEVATION		
PRODUCT THICKNESS		
DEPTH TO WATER 9.92	DTB 21.46	
FLUID ELEVATION		
BAILER TYPE Disposable Bailer		
PUMP QTT David		

WELL PURGING RECORD

TIME	VOLUME REMOVED	TEMP.	pH	COND.
1100	1st Bailer	67.1	5.92	2.04
1105	30 gal	68.3	5.83	6.00
1107	1	68.4	6.01	6.06
1109	1	68.2	6.17	6.15
1111	1	68.0	6.27	6.22
1113	1	67.5	6.30	6.24
1114	1	67.4	6.30	6.24

FINAL VOLUME PURGED	35 gal
TIME SAMPLED	1116
SAMPLE ID.	RS 3
SAMPLE CONTAINERS	2/40cc VOAs
ANALYSIS TO BE RUN	TPHg BTEX / MTBE
LABORATORY	NSE
NOTES:	1st Bailer Particulate Slight odor

WESTERN GEO-ENGINEERS
WOODLAND, CALIFORNIA 95695
(916) 668-5300, FAX (916) 662-0273

WELL SAMPLING DATA SHEET

SITE DP 796	DATE 5/5	TIME 1149
WELL RS 4	SAMPLED BY. Broadway	
WELL ELEVATION		
PRODUCT THICKNESS		
DEPTH TO WATER	8.37 DTB 25.14	
FLUID ELEVATION		
BAILER TYPE	Disposable Bailed	
PUMP	ETT David	

WELL PURGING RECORD				
TIME	VOLUME REMOVED	TEMP.	pH	COND.
1152	1st Bailer	72.6	6.56	7.73 x100
1158	25 gal	71.6	6.43	7.79
1159	1	70.6	6.49	7.79
1200	1	70.5	6.49	7.84
1202	1	70.3	6.50	7.85

FINAL VOLUME PURGED	28 gal
TIME SAMPLED	1204
SAMPLE ID.	RS 4
SAMPLE CONTAINERS	2/40cc VOAs
ANALYSIS TO BE RUN	TPHg BTEX/MTBE
LABORATORY	NSE
NOTES:	1st Bailer Clear Some Odor

Appendix C
Methods and Procedures
QA/QC

This Appendix documents the specific methods, procedures, and materials used to collect and analyze groundwater samples.

Gauging and Measuring Monitor Wells

Prior to sampling a well, WEGE personnel obtain three measurements:

1. the depth to groundwater (DTW);
2. the product thickness using a battery powered depth to water-product interface probe and/or by using a specially designed bailer;
3. the total depth of casing, to calculate the total water volume in the well.

The DTW-product interface probe is lowered into the well casing until the instrument signals when the top of free phase floating product (if present) and/or the top of water is reached. The distance from the top of free phase floating product and/or water to the top of casing is read from the tape that is attached to the probe. The probe is then lowered to the bottom of the well and the tape is read again. The tape is calibrated in 0.01-foot intervals for accuracy to 0.01 foot. The measured distance is subtracted from the established elevation at the top of casing to determine the elevation of groundwater with respect to mean sea level and the difference between the top of groundwater and the base of the well is noted to establish water volume in the well. The probe and tape is washed with TSP (Tri Sodium Phosphate) and rinsed in distilled water before each measurement. WEGE has designed and built bailers that will collect a sample of the contents of a well to show the exact thickness of any floating product. Some of the abbreviations used in water sampling and or measuring or monitoring are: BGS, Below Ground Surface; DTW, Depth to Water (from surface reference i.e. usually TOC); TOC, Top of Casing; MSL, Mean Sea Level; AMSL and BMSL, Above and Below MSL; BS, Below Surface; TOW, Top of Water; TSP, Tri Sodium Phosphate.

Purging Standing Water from Monitor Wells

If no product is present, WEGE personnel purge the well by removing groundwater until the water quality parameters (temperature, pH, and conductivity) stabilize, or until the well is emptied of water. Periodic measurements of groundwater temperature, pH, and conductivity are taken with a Hydac Monitor or other meter and recorded along with the volume of groundwater removed from the well. Purging is done by one or more methods singularly or in combination. Bailers, pneumatic or electric sample pumps, or vacuum pump tanks or trucks may be used. The usual amount of water removed is three borehole volumes, unless otherwise stated.

$$BV = (7.48/4) \times (CD2+P\ (BD2-CD)\ 2) \times (WD-GW)$$

BV borehole volume (gallons)
CD casing diameter (feet)
GW depth to groundwater (feet)
BD borehole diameter (feet)
WD well depth (feet)
P porosity of the gravel pack, 25%

Table of Common Boring and Casing Diameters

Boring diameter inches	Casing diameter inches	Volume gallons/ foot	3 Volumes X (WD-GW) gallons /foot
4	1	0.042	0.126
6	1	0.082	0.246
6	2	0.173	0.519
8	2	0.277	0.831
8	4	0.671	2.013
10	2	0.572	1.716
10	4	0.844	2.532

EXAMPLE: An 8 inch boring with 2 inch casing requires removal of 0.831 gallons of water per foot of water column.

The water collected during purging is either safely stored on- site in 55 gallon DOT 17H drums for later disposition, transported to an approved on-site/off-site treatment facility or to a sewer discharge system.

Collection of Water Sample for Analysis

The groundwater in the well is allowed to recover, to at least 80% of its volume prior to purging, if practical, before the groundwater sample is collected.

$$\text{Percent Recovery} = (1 - \frac{\text{Residual drawdown}}{\text{Maximum drawdown}}) \times 100.$$

A fresh bailer is used to collect enough water for the requirements of the laboratory for the analyses needed or required. The water samples are decanted from the bailer into the appropriate number and size containers. These containers are furnished pre-cleaned to exact EPA protocols, with and without preservatives added, by the analytical laboratory or a chemical supply company. The bottles are filled, with no headspace, and then capped with plastic caps with teflon liners.

The vials or bottles containing the groundwater samples are labeled with site name, station, date, time, sampler, and analyses to be performed, and documented on a chain of custody form. They are placed in ziplock bags and stored in a chest cooled to 4 °C with ice. The preserved samples are COC (chain of custody) delivered to the chosen laboratory.

Analytical Results

TPH is the abbreviations used for Total Petroleum Hydrocarbons used by the laboratories for water and soil analyses. The letter following TPH indicates a particular distinction or grouping for the results. The letters "g", "d", "k", or "o" indicate gasoline, diesel, kerosene, or oil, respectively, i.e. TPH-d for diesel ranges TPH.

BTEX or MTBE are acronyms or abbreviations used for Benzene, Toluene, Ethylbenzene and all of the Xylenes (BTEX) and Methyl tertiary-Butyl Ether (MTBE), respectively.

MBTEX is the designation for the combination of the above five compounds.

Laboratory lower detection limits unless otherwise noted, due to matrix interference or elevated concentrations of target compounds, are as follows:

TPHg	50 ug/L	MTBE	0.5 ug/L
Benzene	0.5 ug/L	Toluene	0.5 ug/L
Ethyl Benzene	0.5 ug/L	Total Xylenes	1.0 ug/L

The less than symbol, <, used with a "parts per value" indicates the lower detection limit for a given analytical result and the level, if present, of that particular analyte is below or less than that lower detection limit.

Other abbreviations commonly used are ppm, ppb, mg/Kg, ug/Kg, ml/l and ul/l are parts per million, parts per billion, milligrams per kilogram, micrograms per kilogram, milliliters per liter, microliters per liter, respectively.

Vapor Recovery System Monitoring and Sampling

INFLUENT SAMPLE

The influent sample is obtained from a sample port located on the

Sample ports are located at the orifice plate of the well adapter-venting tree. This lateral is under vacuum. A 1-liter tedlar bag fitted with a special septum "valve" and tubing bib is placed within an air tight vacuum sample box (ATVSB). Sterile poly tubing is then used to attach the intake port of the ATVSB to the tedlar bag.

Sterile poly tubing is also used to attach the intake of the ATVSB to the sample port of the orifice plate. The exhaust port for the ATVSB is then attached to a vacuum pump, which creates a vacuum inside the ATVSB allowing the tedlar bag to pull the sample from the valved manifold sample port without the danger of cross contamination, as could occur when using an in-line pump. Once the tedlar bag is filled, its valve is closed and locked and the appropriate label is placed on the tedlar bag.

The label for the tedlar bag sample show the date, time, sample ID# and analyses to be run.

The tedlar bag sample is Chain of Custody hand delivered to WEGE's laboratory that same day.

WEGE's laboratory analyzes the vapor samples by injection into a FID (Flame Ionizing Detector) chromatograph. The resulting chromatogram is compared to standard chromatograms of known TFH (Total Fuel Hydrocarbons, gasoline) and BTEX (benzene, toluene, ethylbenzene, and xylenes) concentrations. CO2 measurement is obtained with a Draager tube.

The standards are produced by injecting measured volumes of known density gasoline or BTEX compounds into tedlar bags filled with a measured amount of air, usually one liter. Injecting 10 microliters (ul) of 0.75-mg/L gasoline makes the gasoline standard into one liter of air, the density was previously determined by weighing a know volume of gasoline. The resulting concentration is 10 ul x 0.75 mg/L / 1l = 7.5 mg/L. The BTEX standard is made by injecting 5 ul of each compound into one liter of air, and using the following densities to calculate the concentration:

- Benzene, 0.88 mg/ul;
- Toluene, 0.87 mg/ul;
- Ethylbenzene, 0.87 mg/ul
- Xylenes, 0.87 mg/ul.

The following are the resulting concentrations: Benzene, 4.4 mg/l; Toluene, 4.35 mg/l; Ethylbenzene, 4.35 mg/l; and Xylenes 4.35 mg/l.

CALCULATIONS

To calculate the pounds (lb) per day the concentration is multiplied by the volume of air produced in one day.

The lab reports the Concentrations (C) of the air sampling in ug/liter. The first step is to convert this value to lbs/cf (pounds per cubic foot). 1 ug/l x 0.000001g/ug x 0.002205l/g x 28.32l/cf = 0.0000000621lb/cf

The volume of air produced in one day, equals the flow rate (Q) x the time of flow.

$V = Q \times T$ = cf/day = cf/min x 1440min/day

The volume must be corrected to standard temperature and pressure (STP).

P = Pressure = 14.7 lb/in^2 @ STP

V = Volume cf
T = Temperature in degrees above absolute Zero = 491.58oR @ STP.

Using the Ideal Gas Law P1V1/T1 = P2V2/T2
Solving for V2 =P1V1T2/P2T1
Assuming P1 = P2 = 14.7 lb/in^2, P cancels from the equation
Leaving V2 = V1T2/T1.

V1 = Q cf/m x 1440 min/day
T2 = 491.58oR T1 = 459.58 + T^{0F} at site.
V2 = Q cf/min x 1440 min/day x 491.58oR/(459.58o + T^{0F})

X lb/day = C ug/l x 0.0000000621 lb l/ug cf x Q cf/min x
1440 min/day x 491.58oR/(459.58o + T^{0F})
Q for the Influent sample = The well flow rate.

Chain of Custody Documentation

All water samples that are collected by WEGE and transported to a certified analytical laboratory are accompanied by chain-of- custody (COC) documentation. This documentation is used to record the movement and custody of a sample from collection in the field to final analysis and storage. Samples to be analyzed at the certified laboratory were logged on the COC sheet provided by the laboratory. The same information provided on the sample labels (site name, sample location, date, time, and analysis to be performed) is also noted on the COC form. Each person relinquishing custody of the sample set signs the COC form indicating the date and time of the transfer to the recipient. A copy of the COC follows the samples or their extracts throughout the laboratory to aid the analyst in identifying the samples and to assure analysis within holding times.

Copies of the COC documentation are included with the laboratory results in Appendix B of the sampling report.