

KAPREALIAN ENGINEERING
I N C O R P O R A T E D

KEI-P93-0603.QR6
June 12, 1996

Paradiso Mechanical, Inc.
P.O. Box 1836
2600 Williams Street
San Leandro, California 94577

Attention: Mr. Rick Montesano

RE: Quarterly Report
Berkeley Land Company
51st Street & Telegraph Avenue
Oakland, California

Dear Mr. Montesano:

This Kaprealian Engineering, Inc. (KEI) report presents the results of the recent quarter of monitoring and sampling of the monitoring wells at the referenced site. The wells are currently monitored and sampled on a quarterly basis. This report covers the work performed by KEI during May of 1996.

BACKGROUND

The subject property was reported to have contained a 'street car barn' for the "Key System," a former regional public transit system. All buildings and above ground improvements have been removed from the property. Five on-site monitoring wells (MW1 through MW5) exist at the site. Twenty-one exploratory borings (EB1 through EB6A, and EB6B through EB20) were drilled and sampled by KEI at the site on July 26 through July 30, 1993. Soil sampling and excavation was conducted by KEI at and around the locations of seven of these exploratory borings (EB3, EB6A, EB6B, EB8, EB15, EB16, and EB20) during September and October of 1993. Approximately 1,500 gallons of ground water were pumped from the excavation in the vicinity of exploratory boring EB3. Three 500 gallon underground fuel (kerosene) storage tanks were removed from the site in October of 1995.

KEI's extensive file reviews at the Regional Water Quality Control Board (RWQCB) and site reconnaissance indicate that a number of nearby sites, including two dry cleaners, two service stations, and a public utility facility, are situated within 100 to 1,000 feet of the subject Berkeley Land Company (BLC) site. The file reviews indicate that a regional volatile organic compounds (VOC) problem appears to exist in the upgradient vicinity of the subject BLC property.

A site description, detailed background information including a summary of all of the soil and ground water subsurface investigation/remediation work conducted to date, site hydrogeologic conditions, and tables that summarize all of the soil and ground water sample analytical results are presented in KEI's reports (KEI-P93-0603.R2, KEI-P93-0603.R3, and "Site Investigation Summary Report") dated November 9, 1993, February 8, 1996, and February 8, 1994, respectively.

In a letter dated March 2, 1994, the Alameda County Health Care Services (ACHCS) Agency noted that the site no longer posed a threat to human health. The ACHCS also acknowledged the potential for a regional VOC contaminant plume upgradient of the BLC property and directed the implementation of a quarterly ground water monitoring and sampling plan for the subject site, for one year, in order to address this issue. On March 16, 1994, KEI submitted a work plan/proposal (KEI-P93-0603.P3) for the implementation of a ground water monitoring and sampling program.

On February 29, 1996, MW3 was properly destroyed in accordance with KEI's work plan (KEI-P93-0603.P4) dated February 16, 1996. The well was destroyed to allow site development.

RECENT FIELD ACTIVITIES - MONITORING AND SAMPLING

Wells MW1, MW2, and MW5 were monitored and sampled once during the quarter. Monitoring well MW4 was inaccessible due to soil covering the well. During monitoring, the wells were checked for depth to water and the presence of any free phase product. Prior to sampling, the wells were also checked for the presence of a sheen. No free product or sheen was noted in any of the wells during the quarter. The monitoring data collected this quarter are summarized in Table 1.

Water samples were collected from the wells on May 21, 1996. Prior to sampling, the wells were each purged of between 5 and 11 gallons of water by the use of a pump. During purging operations, the field parameters pH, temperature, and electrical conductivity were recorded and are presented in Table 2. Once the field parameters were observed to stabilize and a minimum of approximately four casing volumes had been removed from each well, water samples were then collected by the use of a clean Teflon bailer. The samples were decanted into clean VOA vials and/or one-liter amber bottles, as appropriate, which were then sealed with Teflon-lined screw caps and stored in a cooler, on ice, until delivery to the state-certified laboratory.

HYDROLOGY

The measured depth to ground water at the site on February 19, 1996, ranged between 12.55 and 15.75 feet below the top of the well casings. Based on the water level data gathered on that date, the ground water flow direction appeared to be southwest, as shown on the attached Figure 1. The flow direction reported this quarter is generally similar to the previous six quarters. The hydraulic gradient at the site on May 21, 1996, was approximately 0.05 in the predominant direction of flow, based on the water level data collected from the monitoring wells prior to purging.

ANALYTICAL RESULTS

The ground water samples were analyzed at Sequoia Analytical Laboratory and were accompanied by properly executed Chain of Custody documentation. The samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline by EPA method 5030/modified 8015, benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA method 8020, total oil and grease (TOG) by Standard Methods 5520B&F, and EPA method 8010 constituents. In addition, the ground water sample from monitoring well MW5 was also analyzed for TPH as kerosene by EPA method 3510/modified 8015.

The ground water sample analytical results are summarized in Tables 3 and 4. Copies of the laboratory analytical results and Chain of Custody documentation are attached to this report.

DISCUSSION AND RECOMMENDATIONS

As discussed previously, monitoring well MW3 was previously destroyed in order to allow commercial site development in the vicinity of the former well. As seen in the attached Tables 2 and 3, concentrations of dissolved constituents in the subject well have historically been relatively low or non-detectable. Therefore, KEI does not recommend replacement of MW3. In addition, during grating and site development activities, the remaining four wells (MW1, MW2, MW4, and MW5) were damaged to varying degrees.

In previous reports, KEI discussed the results of our file reviews. The file reviews indicate that a volatile organic compounds (VOC) problem appears to exist in the upgradient vicinity, and may have impacted the ground water at the subject site.

This site appears to meet the "low risk" criteria for petroleum hydrocarbons as described in the recent RWQCB interim guidelines and Senate Bill SB-1764. The specific criteria that appears to qualify this site as a low risk include:

- Source removal has been conducted at the subject site.
- The extent of hydrocarbon impacted soil and ground water appears to be well defined.
- No ongoing leak is occurring, the USTs have been removed.
- No significant migration of dissolved hydrocarbons appears to be occurring.
- Based on the results of KEI's 1/2-mile radius well survey, no water producing wells were identified within 250 feet of the subject site. The nearest known water production well is approximately 1,000 feet from and in the cross-gradient direction of the site.

A risk-based closure analysis (RBCA) for fuel-oil related sites includes concentration action levels for the constituents naphthalene and benzo(a)pyrene. As seen in the attached Table 3, ground water samples collected from all of the five wells, during the June 1993 sampling event, were analyzed for EPA method 8270 constituents. The analytical results of the samples indicated non-detectable concentrations of all of the EPA method 8270 constituents (including naphthalene and benzo(a)pyrene). In addition, benzene has essentially been non-detectable in all samples, except for one anomalous sampling event (February 1996).

Based on the discussion presented above, along with the current state of the wells, KEI recommends that Berkeley Land Company formerly request low risk closure status for the site from the ACHCS. In the interim, ground water monitoring and sampling has been suspended pending site closure. Once site closure has been granted, KEI will submit a work plan to properly destroy the remaining four monitoring wells.

DISTRIBUTION

A copy of this report should be sent to Ms. Madhulla Logan of the ACHCS.

LIMITATIONS

Environmental changes, either naturally-occurring or artificially-induced, may cause changes in ground water levels and flow paths, thereby changing the extent and concentration of any contaminants.

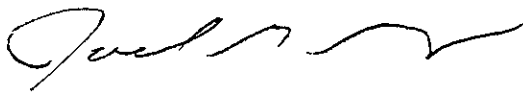
Our studies assume that the field and laboratory data are reasonably representative of the site as a whole, and assume that subsurface conditions are reasonably conducive to interpolation and extrapolation.

The results of this study are based on the data obtained from the field and laboratory analyses obtained from a state-certified laboratory. We have analyzed these data using what we believe to be currently applicable engineering techniques and principles in the Northern California region. We make no warranty, either expressed or implied, regarding the above, including laboratory analyses, except that our services have been performed in accordance with generally accepted professional principles and practices existing for such work.

If you have any questions regarding this report, please do not hesitate to call me at (510) 602-5100.

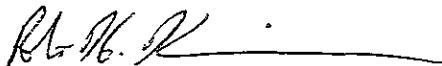
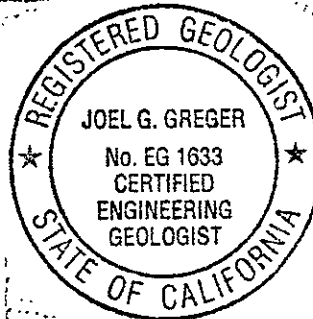
Sincerely,

Kaprealian Engineering, Inc.



Joel G. Greger, C.E.G.
Senior Engineering Geologist

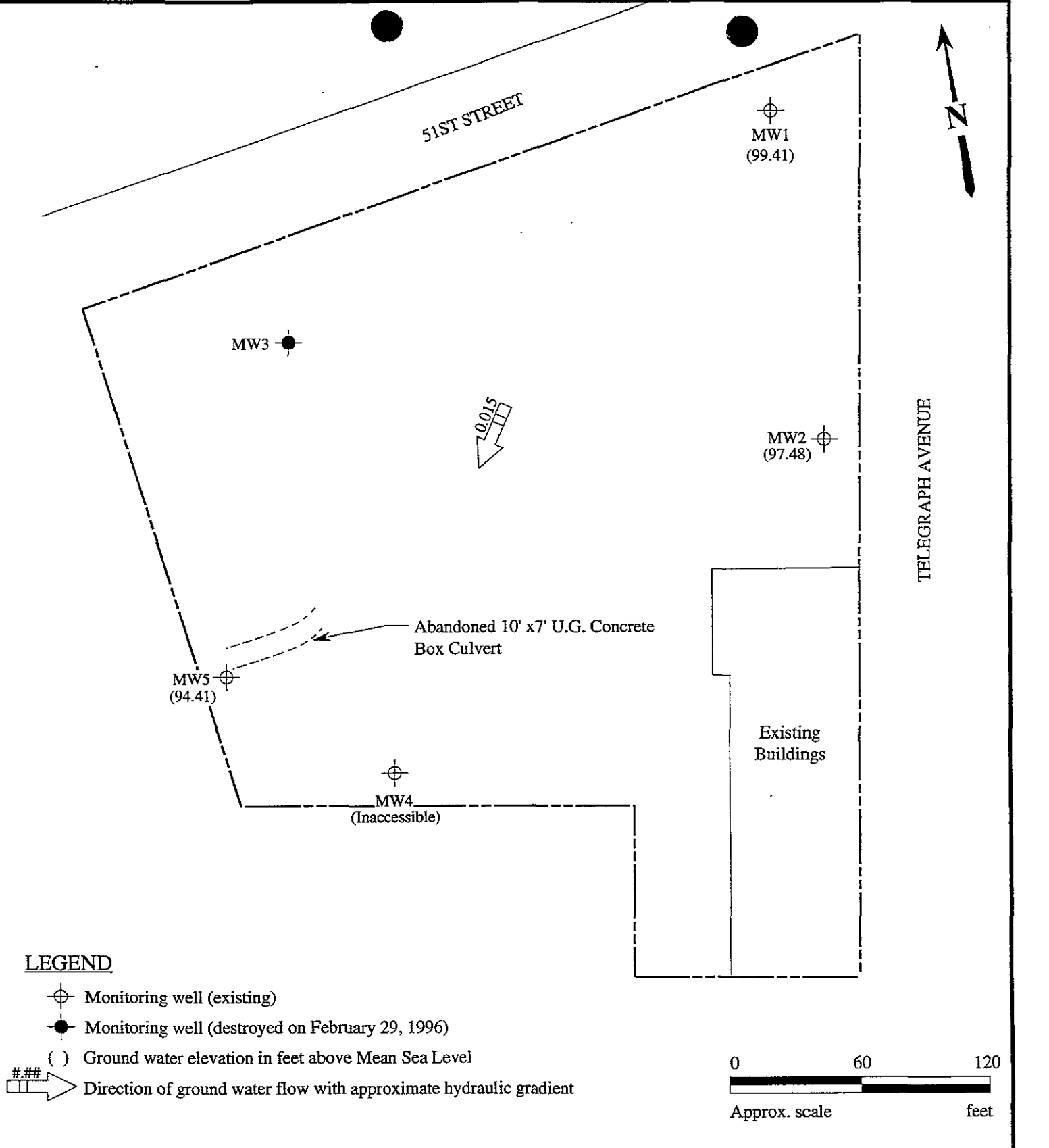
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Exp. Date 8/31/96



Robert H. Kezerian
Project Manager

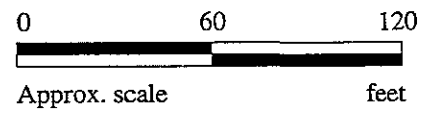
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Attachments: Tables 1 through 4
Location Map
Figures 1 & 2
Laboratory Analyses
Chain of Custody documentation



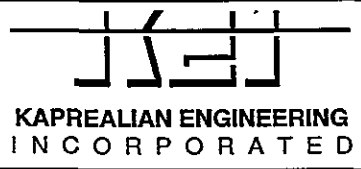
LEGEND

- ⊕ Monitoring well (existing)
- Monitoring well (destroyed on February 29, 1996)
- () Ground water elevation in feet above Mean Sea Level
- ➔ Direction of ground water flow with approximate hydraulic gradient



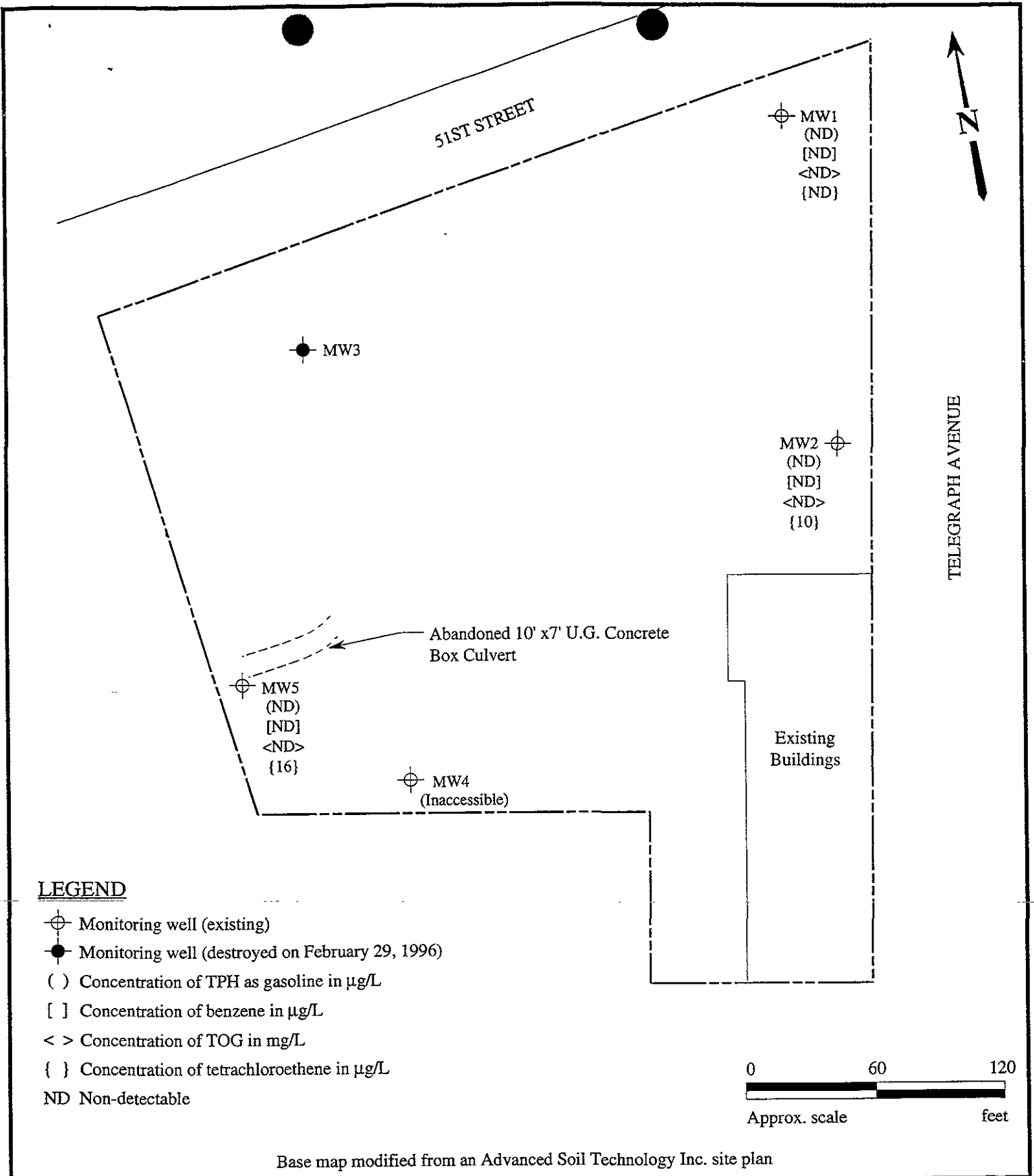
Base map modified from an Advanced Soil Technology Inc. site plan

GROUND WATER FLOW DIRECTION MAP FOR THE MAY 21, 1996 MONITORING EVENT



**BERKELEY LAND COMPANY
51ST STREET & TELEGRAPH AVE.
OAKLAND, CALIFORNIA**

**FIGURE
1**



PETROLEUM HYDROCARBON CONCENTRATIONS IN GROUND WATER ON MAY 21, 1996



**BERKELEY LAND COMPANY
51ST STREET & TELEGRAPH AVE.
OAKLAND, CALIFORNIA**

**FIGURE
2**

TABLE 1

SUMMARY OF MONITORING DATA

<u>Well #</u>	<u>Ground Water Elevation (feet)</u>	<u>Depth to Water (feet)♦</u>	<u>Product Thickness (feet)</u>	<u>Sheen</u>	<u>Water Purged (gallons)</u>	<u>Well Depth (feet)♦</u>
(Monitored and Sampled on May 21, 1996)						
MW1	99.41	15.75	0	No	5	23.58
MW2	97.48	13.29	0	No	7.5	23.88
MW3	DESTROYED					
MW4	WELL WAS INACCESSIBLE					
MW5	94.41	12.55	0	No	11	28.40

<u>Well #</u>	<u>Top of Casing Elevation (feet)*</u>
MW1	115.16
MW2	110.77
MW3	111.84
MW4	108.00
MW5	106.96

♦ The depth to water level and total well depth measurements were taken from the top of the well casings.

* Based on the City of Oakland Benchmark #2874 (elevation = 116.41 feet MSL).

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TABLE 2

RECORD OF THE TEMPERATURE, CONDUCTIVITY, AND pH VALUES
 IN THE MONITORING WELLS DURING PURGING AND PRIOR TO SAMPLING

(Measured on May 21, 1996)

<u>Well #</u>	<u>Gallons per Casing Volume</u>	<u>Time</u>	<u>Gallons Purged</u>	<u>Casing Volumes Purged</u>	<u>Temperature (°F)</u>	<u>Conductivity ([μmhos/cm]x100)</u>	<u>pH</u>
MW1	1.33	14:10	0	0	64.1	6.01	6.92
			1.5	1.12	63.3	5.32	7.08
			2.5	1.88	62.5	5.18	6.97
		14:25	4	3.01	62.3	5.16	6.95
			5	3.76	62.2	5.09	6.92
MW2	1.80	13:15	0	0	68.4	5.34	7.21
			1.5	0.83	69.3	5.51	7.04
			3.5	1.94	68.2	4.89	6.86
		13:30	5.5	3.05	67.7	4.72	6.92
			7.5	4.17	67.3	4.68	6.87
MW3	DESTROYED						
MW4	WELL WAS INACCESSIBLE						
MW5	2.70	15:00	0	0	63.05	4.87	7.41
			2.5	0.92	62.91	4.91	7.25
			5	1.85	62.85	4.85	7.18
		15:15	8	2.96	62.81	4.78	7.02
			11	4.07	62.82	4.82	6.99

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TABLE 3
 SUMMARY OF LABORATORY ANALYSES
 WATER

<u>Date</u>	<u>Sample Number</u>	<u>TPH as Kerosene</u>	<u>TOG</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl-benzene</u>	<u>Xylenes</u>
5/21/96	MW1	--	ND	ND	ND	ND	ND	ND
	MW2	--	ND	ND	ND	ND	ND	ND
	MW3	WELL DESTROYED						
	MW4	WELL WAS INACCESSIBLE						
	MW5	200+	ND	ND	ND	ND	ND	ND
2/19/96	MW1	--	ND	ND	1.0	6.2	0.60	3.9
	MW2	--	ND	ND	0.82	4.8	0.52	3.5
	MW3	--	ND	ND	1.4	8.1	0.73	4.4
	MW4	WELL WAS INACCESSIBLE						
	MW5	ND	ND	ND	1.1	6.7	0.63	4.2
10/06/95	MW1	--	ND	69♦	ND	ND	ND	ND
	MW2	--	ND	ND	ND	ND	ND	ND
	MW3	--	ND	ND	ND	ND	ND	ND
	MW4	--	ND	ND	ND	ND	ND	ND
	MW5	--	ND	ND	ND	ND	ND	ND
9/18/95**	MW1	--	ND	81♦	ND	ND	ND	ND
	MW2	--	ND	ND	ND	ND	ND	ND
	MW3	--	ND	ND	ND	ND	ND	ND
	MW4	--	ND	ND	ND	ND	ND	ND
	MW5	--	ND	ND	ND	ND	ND	ND
8/24/95**	MW1	---	---	63	ND	1.1	ND	0.86
	MW2	---	---	ND	ND	0.57	ND	0.56
	MW3	---	---	ND	ND	0.50	ND	0.70
	MW4	---	---	ND	ND	0.53	ND	0.60
	MW5	---	---	ND	ND	0.81	ND	0.72
5/23/95	MW1	--	ND	100♦	ND	ND	ND	ND
	MW2	--	ND	ND	ND	ND	ND	ND
	MW3	--	ND	ND	ND	ND	ND	ND
	MW4	--	ND	ND	ND	ND	ND	ND
	MW5	--	ND	ND	ND	ND	ND	ND
2/25/95	MW1	--	ND	81♦	ND	ND	ND	ND
	MW2	--	ND	ND	ND	ND	ND	ND
	MW3	--	ND	ND	ND	ND	ND	ND
	MW4	--	ND	ND	ND	ND	ND	ND
	MW5	--	ND	ND	ND	ND	ND	ND

TABLE 3 (Continued)

SUMMARY OF LABORATORY ANALYSES
 WATER

<u>Date</u>	<u>Sample Number</u>	<u>TPH as Kerosene</u>	<u>TOG</u>	<u>TPH as Gasoline</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl-benzene</u>	<u>Xylenes</u>
6/29/93	MW1*	--	ND	76♦	ND	ND	ND	ND
	MW2*	--	ND	ND	ND	ND	ND	ND
	MW3*	--	ND	ND	ND	ND	ND	ND
	MW4*	--	ND	ND	ND	ND	ND	ND
	MW5*	--	ND	ND	0.64	ND	ND	ND

♦ Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be gasoline.

* TPH as diesel and all EPA method 8270 constituents were non-detectable.

** TOG was sampled on September 8, 1995, instead of August 24, 1995. Furthermore, the analytical results of the ground water samples (toluene and xylenes) collected on August 24, 1995, were inconsistent with the previous analytical results for these wells. Therefore, MPDS re-sampled these wells on September 18, 1995.

+ Sequoia Analytical Laboratory reported that the hydrocarbons detected appeared to be a kerosene and non-kerosene mixture.

ND = Non-detectable.

-- Indicates analysis was not performed.

Results are in micrograms per liter ($\mu\text{g/L}$), except for TOG, which is in milligrams per liter (mg/L).

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TABLE 4

SUMMARY OF LABORATORY ANALYSES
WATER

<u>Date</u>	<u>Sample Number</u>	<u>cis-1,2-Dichloro-ethene</u>	<u>Tetrachloro-ethene</u>	<u>Trichloro-ethene</u>	<u>Vinyl Chloride</u>	<u>Chloroform</u>
5/21/96	MW1+	4.1	ND	4.8	ND	53
	MW2++	ND	10	ND	ND	16
	MW3	WELL DESTROYED				
	MW4	WELL WAS INACCESSIBLE				
	MW5+++	14	15	8.3	ND	13
2/19/96	MW1	ND	8.7	ND	ND	2.9
	MW2	ND	8.0	ND	ND	2.6
	MW3	ND	ND	ND	ND	ND
	MW4	WELL WAS INACCESSIBLE				
	MW5	2.1	9.3	1.9	ND	ND
10/06/95	MW1	1.7	19	3.7	ND	1.3
	MW2	ND	8.9	1.0	ND	5.9
	MW3	5.7	13	6.2	ND	1.1
	MW4	5.4	12	6.1	ND	0.53
	MW5	9.1	8.2	5.3	ND	ND
8/24/95	MW1	3.4	240	5.0	ND	3.2
	MW2*	ND	28	1.1	ND	15
	MW3**	5.1	50	9	ND	0.78
	MW4	ND	9.7	ND	ND	2.4
	MW5**	17	49	11	ND	ND
5/23/95	MW1	ND	450	ND	ND	ND
	MW2	ND	45	ND	ND	ND
	MW3	5.1	74	9.1	ND	ND
	MW4	ND	8.8	ND	ND	ND
	MW5	16	58	11	ND	ND

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TABLE 4 (Continued)

SUMMARY OF LABORATORY ANALYSES
WATER

<u>Date</u>	<u>Sample Number</u>	<u>cis-1,2-Dichloro-ethene</u>	<u>Tetrachloro-ethene</u>	<u>Trichloro-ethene</u>	<u>Vinyl Chloride</u>	<u>Chloroform</u>
2/25/95	MW1	ND	360	ND	ND	ND
	MW2	ND	41	1.9	ND	ND
	MW3	6.9	52	9.4	ND	ND
	MW4	ND	6.4	ND	ND	ND
	MW5	8.3	25	6.6	ND	ND
6/29/93	MW1	ND	250	ND	ND	ND
	MW2	ND	78	ND	ND	ND
	MW3	5.5	130	11	ND	ND
	MW4	ND	16	0.68	ND	ND
	MW5	24	17	5.9	3.0	ND

All EPA method 8010 constituents were non-detectable, except for the above compounds.

* 1,1,1-Trichlorethane was detected at a concentration of 0.73 $\mu\text{g/L}$.

** Trans-1,2-Dichlorethane was detected at concentrations of 0.59 $\mu\text{g/L}$ and 0.76 $\mu\text{g/L}$ in MW3 and MW5, respectively.

+ Bromodichloromethane was detected at 19 $\mu\text{g/L}$ and Dibromochloromethane at 5.7 $\mu\text{g/L}$.

++ Bromodichloromethane was detected at 5.8 $\mu\text{g/L}$ and Dibromochloromethane at 3.3 $\mu\text{g/L}$.

+++ Bromodichloromethane was detected at 5.0 $\mu\text{g/L}$ and Dibromochloromethane at 4.3 $\mu\text{g/L}$.

ND = Non-detectable.

Results are in micrograms per liter ($\mu\text{g/L}$), unless otherwise indicated.