REMEDIAL ACTION PLAN

September 13, 1994

FORMER MOBIL STATION 04-H6J
1024 Main Street
Pleasanton, California

Alton Project No. 30-0065

Prepared For:

MOBIL OIL CORPORATION
2063 Main Street, #501
Oakley, California 94561

By:

Ron A. Scheele
Geologist

REGISTERED GEOLOGIST
ALLAN G. CAMPBELL
No. 4920
Expires 7/26/96
STATE OF CALIFORNIA

Allan G. Campbell, RG
Supervising Associate

ALTON GEOSCIENCE
30A Lindbergh Avenue
Livermore, California 94550

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1.0 INTRODUCTION

This report presents the plan of action for remediating hydrocarbon-affected soil and ground water at former Mobil station 04-H6J, located at 1024 Main Street in Pleasanton, California. See Figure 1 for the site location. The objectives of this plan are to review the present site conditions and present an effective solution to remediate the residual hydrocarbons in the soil and ground water.

2.0 SITE DESCRIPTION

Present Site Use:	The site is a vacant lot located on the northeast corner of Main Street and Stanley Boulevard (Figure 2).
Past Site Use:	The site was a gasoline service station until 1989. The former underground storage tanks and associated dispenser islands and product lines were removed in 1989. A former service station building was demolished on August 1, 1994.
Future Site Use:	There are currently no known plans to redevelop the site.
Adjacent Properties:	Private residences are located adjacent to the site to the east; railroad tracks are located to the north. Across Stanley Boulevard to the south is a former Union 76 service station that also has a reported underground storage tank leak. Retail businesses are located across Main Street to the west.
Geography:	The site is located in the Livermore Valley approximately 1.75 miles east of Highway 680 at an elevation of 348 feet above mean sea level (National Geodetic Vertical Datum - 1929).
Regional Geology:	The site is located within the Livermore Valley. This area is underlain by unconsolidated to semiconsolidated Quaternary sediments. These sediments are predominantly fluvial and alluvial deposits composed of gravel, sand, silt, and clay (ACWD-Zone 7, 1989).
Regional Hydrogeology:	The site is located within the Amador Subbasin of the Livermore Valley Ground Water Basin. The main surface water drainages in the Amador Subbasin are the Arroyo Valle and the Arroyo Mocho, both of which flow into the Arroyo de la Laguna, which is on the western edge of the subbasin. Ground water at the site has been encountered at depths of 33 to 48 feet below grade (fbg). Static water levels were unusually high due to a large amount of precipitation during the 1992 and 1993 winter months. The ground water gradient direction at this site has varied from northwest to southeast. The ground water gradient during the last year has been

approximately 0.15 foot per foot to the east. Ground water flow direction may be influenced by the Kaiser Sand & Gravel mining operation discharge (up to 5,670 gallons per minute in water year 1991) into the Arroyo Valle, an intermittent stream approximately 250 feet south of the subject site (ACWD-Zone 7, 1991).

Ground Water Quality and Usage: Ground water in the Livermore Valley Ground Water Basin is designated as beneficial for domestic use. There are three municipal water supply wells within 0.5 mile of the site. The nearest municipal production wells, 16L2, 16L5, and 16L7, are located approximately 945 feet north of the site. These wells were drilled to depths of 151, 685, and 647 fbg, respectively. Monitoring Well 3S/1E 16P5, maintained by the City of Pleasanton, is located approximately 250 feet to the south of the site and is screened from 65 to 70 fbg.

3.0 BACKGROUND

In October 1989, Balch Petroleum removed three underground fuel storage tanks and an underground waste oil tank (Figure 3). Soil samples collected from the western portion of the fuel tank cavity contained between 890 and 2,400 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPH-G). Following removal of the tanks approximately 260 yards of hydrocarbon-affected soil were excavated, sampled and removed for disposal.

On June 1, 1990, Alton Geoscience drilled eight exploratory soil borings, three of which were subsequently converted to Monitoring Wells MW-1, MW-2, and MW-3. The highest hydrocarbon concentrations (up to 3,500 ppm TPH-G) were detected in soil samples collected between 25 and 45 fbg. Two separate water bearing zones were encountered at the site; a perched zone at approximately 25 fbg, and a deeper zone at approximately 45 fbg.

On January 15, 1991, Alton Geoscience installed five additional monitoring wells (MW-4 through MW-8). Two water bearing zones were again encountered, and appeared to be separated vertically and laterally by a less permeable clay. The ground water gradient of the upper water bearing zone was directed toward the northeast, and the lower to the northwest. Adsorbed-phase hydrocarbons appeared to be limited to the vicinity of the former pump islands and northeast of the former underground fuel storage tanks.

On October 24 and 25, 1991, Alton Geoscience supervised Balch Petroleum during trenching operations beneath the location of the former pump islands. Analysis of soil samples collected during the excavation revealed the presence of hydrocarbon-affected soil (maximum TPH-G concentrations of 4,000 ppm at location PS-8). See Figure 3. Approximately 100 yards of soil were excavated and subsequently replaced with clean fill in December 1991.

From August to November 1991, Alton Geoscience continuously monitored ground water levels from several wells using a data logger. Ground water elevations varied by as much as 0.2 feet over a period of five days. Fluctuations in ground water elevations of up to 40 feet have been noted by Alameda County Flood Control and Water Conservation District, in Monitoring Well 3S/1E 16P5, located approximately 250 feet south of the site.

On January 29 and 30, 1992, Alton Geoscience installed Monitoring Well MW-9 (SB-14) and Soil Boring SB-15 inside the former station building.

On March 2 and 3, 1992, Alton Geoscience performed constant rate pumping tests on MW-1 and MW-2. A pumping rate of 16.7 gallons per minute was sustained from MW-1 for 7 hours with approximately 6.0 feet of drawdown. A pumping rate of 6.8 gallons per minute was sustained from MW-2 for 8 hours. An average transmissivity value of approximately 8 ft^2/minute and an average hydraulic conductivity value of 1.6ft/minute was calculated for the site

From November 15 to 19, 1993, Alton Geoscience installed three monitoring wells (MW-10, MW-11, and MW-12), one recovery well (RW-1), and four vapor extraction wells (VMW-1 through VMW-4). Soil and unconsolidated alluvium underlying the site is generally composed of sandy silt to silty clay to a depth of approximately 30 fbg. From a depth of approximately 30 to 55 fbg, the soil consists of silty sand, sandy gravel to gravelly sand, and sandy silt to silty clay. The stratigraphy of this deeper interval includes discontinuous lenses of the above silt and clay resulting in a horizontally and vertically heterogeneous section. Figures 4 and 5 (cross-sections A-A' and B-B', respectively) show the discontinuous nature of the soil beneath the site.

On November 18, 1993, Alton Geoscience performed a vapor extraction test at the site. The results of the test reflect the variable soil types at the site. Laboratory analysis of air (vapor) samples collected during test activities indicates that significant quantities of hydrocarbons can be recovered by vapor extraction. The estimated radius of influence (ERI) for vapor extraction is approximately 41 feet for flow rates of approximately 54 standard cubic feet per minute (scfm) in the vicinity of MW-1. In the vicinity of MW-2, however, the ERI is likely less than 10 feet due to the presence of fine-grained interbeds. The levels of pressure communication detected beneath the site indicate that vapor extraction is a viable alternative for remediation.

On August 1, 1994, Alton Geoscience demolished the former gasoline service station building and abandoned Monitoring Well MW-9.

4.0 CURRENT STATUS OF SITE ASSESSMENT

Field observations and results of laboratory analysis of soil and ground water samples suggest that hydrocarbons were released to the subsurface from the former underground gasoline storage tanks and product lines.

Liquid-phase hydrocarbons have been observed in Monitoring Well MW-2, located approximately 10 feet north of the former tank cavity, and in Recovery Well RW-1 located in the former tank cavity. The lateral extent of free product is characterized in all directions.

Dissolved-phase hydrocarbons have been detected in all monitoring wells. The extent of dissolved-phase hydrocarbons are not yet fully characterized.

Hydrocarbon concentrations in soil have been detected in the vicinity of the former tank cavity and former pump island and associated pipe trenches, and extend vertically to near-surface ground water. The lateral extent of hydrocarbons in soil have been adequately characterized in all directions; to the north by Monitoring Well MW-3 and MW-5, to the northeast by MW-9, to the east by SB-4 and MW-11, to the south by SB-3 and MW-4, and to the west by MW-7, MW-3, and MW-8.

See Figures 4 and 5 for cross-sections of the site, and Figures 6 and 7 for hydrocarbon concentrations in soil and ground water. See Figure 8 for a ground water elevation contour map. Refer to Table 1 for a summary of laboratory analysis of soil samples and Table 2 for historic fluid level monitoring data and a summary of laboratory analysis of ground water samples.

5.0 EVALUATION OF REMEDIATION ALTERNATIVES

The general objective of any remedial action is to reduce the toxicity, mobility, or volume of contaminated materials. This objective is designed to remediate hazardous materials in a manner that will protect both public health and the environment. The recommended goals for the remediation of the site are to reduce gasoline-range hydrocarbon concentrations in soil to levels acceptable to the Alameda County Water Conservation District (ACWCD) and the Regional Water Quality Control Board (RWQCB); to remove free product and to reduce dissolved-phase hydrocarbon concentrations to RWQCB cleanup criteria; or demonstrate by risk assessment and monitoring that the dissolved-phase plume has not significantly migrated and poses minimal risk to human health and the environment.

Remedial action alternatives which historically have been effective and applicable to the removal of adsorbed-phase and dissolved-phase hydrocarbons from soil and water were considered. Public health and safety, and general environmental concerns were also considered. Five remedial action alternatives that were reviewed are as follows:

1) In-situ vapor extraction accompanied by a ground water extraction and treatment/containment program

2) In-situ vapor extraction accompanied by active air sparging and a ground water extraction and treatment/containment program

3) In-situ vapor extraction accompanied by a ground water monitoring program

4) Excavation accompanied by a ground water monitoring program

5) In-situ bioremediation.

Refer to Appendix A for a review of these remedial action alternatives.

Based on the review of remedial action alternatives and the goals of remediation for the site, in-situ vapor extraction accompanied by a ground water extraction and treatment/containment program is the most technically feasible method for site remediation.

6.0 PROPOSED REMEDIATION ACTIVITIES

The objective of the proposed activities is to remove the free product and remediate the hydrocarbon-affected soil and ground water to concentrations acceptable to the ACWCD and the RWQCB. The proposed remediation and site closure plan includes the following: 1) permits for remediation activities; 2) installation of three additional ground water recovery/vapor extraction wells; 3) installation of the vapor extraction and automatic ground water recovery/treatment system (VEARS); 4) operation and maintenance of the VEARS; 5) post remediation confirmation soil sampling and ground water monitoring and sampling; 6) closure report; and 7) regulatory closure.

6.1 REMEDIATION PERMITTING

Prior to starting remediation activities, a Permit To Operate the vapor extraction system (VES) will be obtained from the Bay Area Air Quality Management District (BAAQMD). A National Pollutant Discharge Elimination System (NPDES) permit will be obtained from the RWQCB to discharge treated ground water into the storm drain system. Electrical, mechanical, and plumbing permits will be obtained from the City of Pleasanton Planning, Building, Engineering, and Fire Departments for installation of the VEARS.

6.2 REMEDIATION ACTIVITIES

Three additional ground water monitoring wells will be installed onsite, in the vicinity of the former tank cavity to inhibit further migration of the free product and dissolved-phase hydrocarbons (Figure 9). The VEARS equipment will be moved onsite and installed. Downhole submersible pumps will be installed in four ground water recovery wells (RW-1 through RW-4). Horizontal transfer piping will be installed to move extracted vapors and ground water from the extraction wells to the VEARS process equipment.

Extracted soil vapors will be brought to ground surface by use of a blower, oxidized by a hydrocarbon vapor destruction unit in accordance with the BAAQMD Permit To Operate, and released to the atmosphere. Extracted ground water will be brought to ground surface, processed through an air stripper and carbon adsorption unit, and discharged to the storm drain system in accordance with the discharge permit.

6.3 SYSTEM DESIGN AND INSTALLATION

The VEARS design includes:

> Five vapor extraction wells (VMW-1, VMW-2, VMW-4, MW-1, and MW-2) and four dual-purpose vapor/ground water extraction wells (RW-1 through RW-4). Additional vapor and/or ground water extraction wells may be added to the system to optimize ground water containment and hydrocarbon recovery.
>
> Lateral PVC below-ground conduit from the extraction wells to the above-ground VEARS equipment.
>
> VES equipment includes a blower, vapor treatment unit (catalytic oxidizer), and air discharge unit. A hydrocarbon monitor, temperature controller/recorder, and flow transducer will be mounted in the control panel of the vapor treatment unit.
>
> Ground water recovery/treatment system equipment includes downhole submersible pumps, an air stripper, and a carbon adsorption treatment unit. A flow transducer will be mounted in the control panel of the vapor treatment unit.

Upon obtaining all necessary permits, system installation will be conducted in compliance with the permit requirements.

6.4 SYSTEM START-UP AND TESTING

VEARS start-up procedures include the following:

> The VES system is started following an initial warm-up of the hydrocarbon destruction chamber. System performance is monitored for approximately 2 hours. Fittings, pipes, and joints are inspected for leaks. Vapor hydrocarbon concentrations are measured at the inlet and outlet of the VES.
>
> After the initial start-up, vapor hydrocarbon concentrations and fluid recovery from each individual well are monitored and the well configuration is changed, as necessary, to maximize hydrocarbon recovery. VES influent and effluent vapor samples are collected in Tedlar bags and sent to a state-certified laboratory for analysis to ensure that effluent vapor meets discharge requirements. Influent and effluent water samples are collected and sent to a state certified laboratory for analyses to ensure that effluent water meets discharge requirements.

6.5 SYSTEM OPERATION AND OPTIMIZATION

The VEARS will be monitored and maintained on a weekly basis following system installation and start-up. The following activities are included in the VEARS weekly maintenance schedule:

System is visually checked and inspected for problems and repaired as needed.

Influent and effluent vapor hydrocarbon concentrations are monitored. Frequency ?

Influent and effluent ground water samples are collected.

System operation parameters (such as flow rate, dilution, vacuum level, and system temperatures) are monitored and adjusted, as necessary.

Dissolved-phase hydrocarbon concentrations and fluid recovery rates are monitored in the wells as needed and the well configuration is changed to maximize hydrocarbon recovery. Additional recovery wells may be installed and added to the VEARS system, if needed, for dissolved-phase hydrocarbon containment.

Influent vapor samples are collected every month and sent to a state-certified laboratory for analysis. Vapor samples are analyzed for TPH-G, and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Influent water samples are collected every month and effluent water samples are collected in accordance with the ground water discharge permit. Water samples are analyzed for TPH-G, BTEX, and other analyses that may be required.

Overall VEARS effectiveness will be evaluated by monitoring the extraction well vapor concentrations, extraction well vapor composition, extraction and observation well vacuum levels, fluid flow rates, water influent and effluent hydrocarbon concentrations, and the cumulative volume of hydrocarbons recovered.

6.6 REPORTING

Monthly system status reports and a final system installation report including field and laboratory data and a summary of VEARS operations will be prepared.

7.0 CONFIRMATION SOIL SAMPLING, FLUID-LEVEL MONITORING AND GROUND WATER SAMPLING, AND REGULATORY CLOSURE

After influent vapor concentrations indicate that the VEARS system has reduced hydrocarbon-affected soil to regulatory acceptable levels, a minimum of three confirmation soil borings will be drilled to depths of approximately 50 fbg. Soil samples will be collected at 5-foot intervals for soil description, field hydrocarbon vapor screening, and potential laboratory analysis. Post remediation fluid-level monitoring and ground water sampling will be initiated and performed as required. The General field procedures are detailed in Appendix B.

Soil and water samples will be submitted to a state-certified laboratory and analyzed for TPH-G and BTEX using EPA Methods 8015 and 8020, respectively.

Results of the laboratory analysis will be used to confirm the effectiveness of the remediation action. A report outlining confirmation drilling activities, soil sampling, ground water sampling, laboratory analytical results, and conclusions will be submitted to the ACWCD for approval of site closure.

8.0 SITE SAFETY PLAN

A site safety plan for the activities described in this workplan is included in Appendix C.

9.0 REFERENCES

Alameda County Flood Control and Water Conservation District, Zone 7, June 24, 1992, Memorandum: Spring 1993 Ground Water Contour Map.

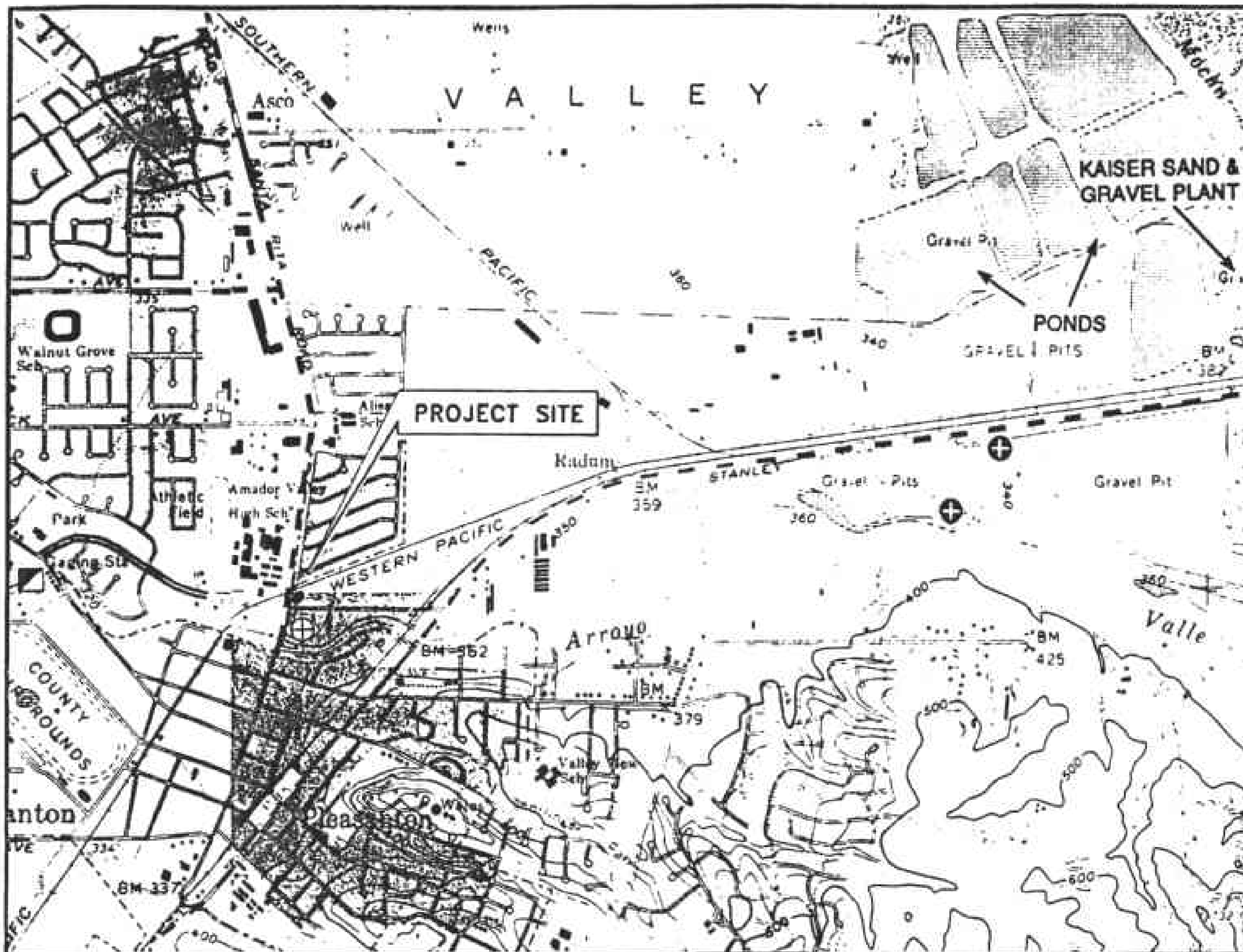
Alton Geoscience, October 27, 1989 Tank Report on Tank Removal and Soil Sampling, Former Mobil Station 04-H6J, 1024 Main Street, Pleasanton, California.

Alton Geoscience, July 31, 1992, Supplemental Site Investigation Report, Former Mobil Station 04-H6J, 1024 Main Street, Pleasanton, California.

Alton Geoscience, July 27, 1994, Quarterly Ground Water Monitoring and Sampling Report, Third Quarter 1994, Former Mobil Station 04-H6J, 1024 Main Street, Pleasanton, California.

Johnson, P.C., Kemblowski, M.W., and Colthart, J.D. (1990) Quantitative Analysis for the Cleanup of Hydrocarbon-Contaminated Soils by In-situ Vapor Extraction, in Ground Water, Vol. 28, No. 3, May-June 1990.

United States Geological Survey, 1961 (Photorevised 1980), Livermore and Dublin Quadrangles, 7.5 Minute Series, USGS, Denver, Colorado.



1 MILE 3/4 1/2 1/4 0 1 MILE

SCALE 1:24,000

N

Source: U.S.G.S. Map
Livermore Quadrangle
California
7.5 Minute Series

LEGEND

- U.S.G.S. Gauging Station
- ⊕ City of Pleasanton Monitoring Well
- Kaiser Discharge to Arroyo Valle

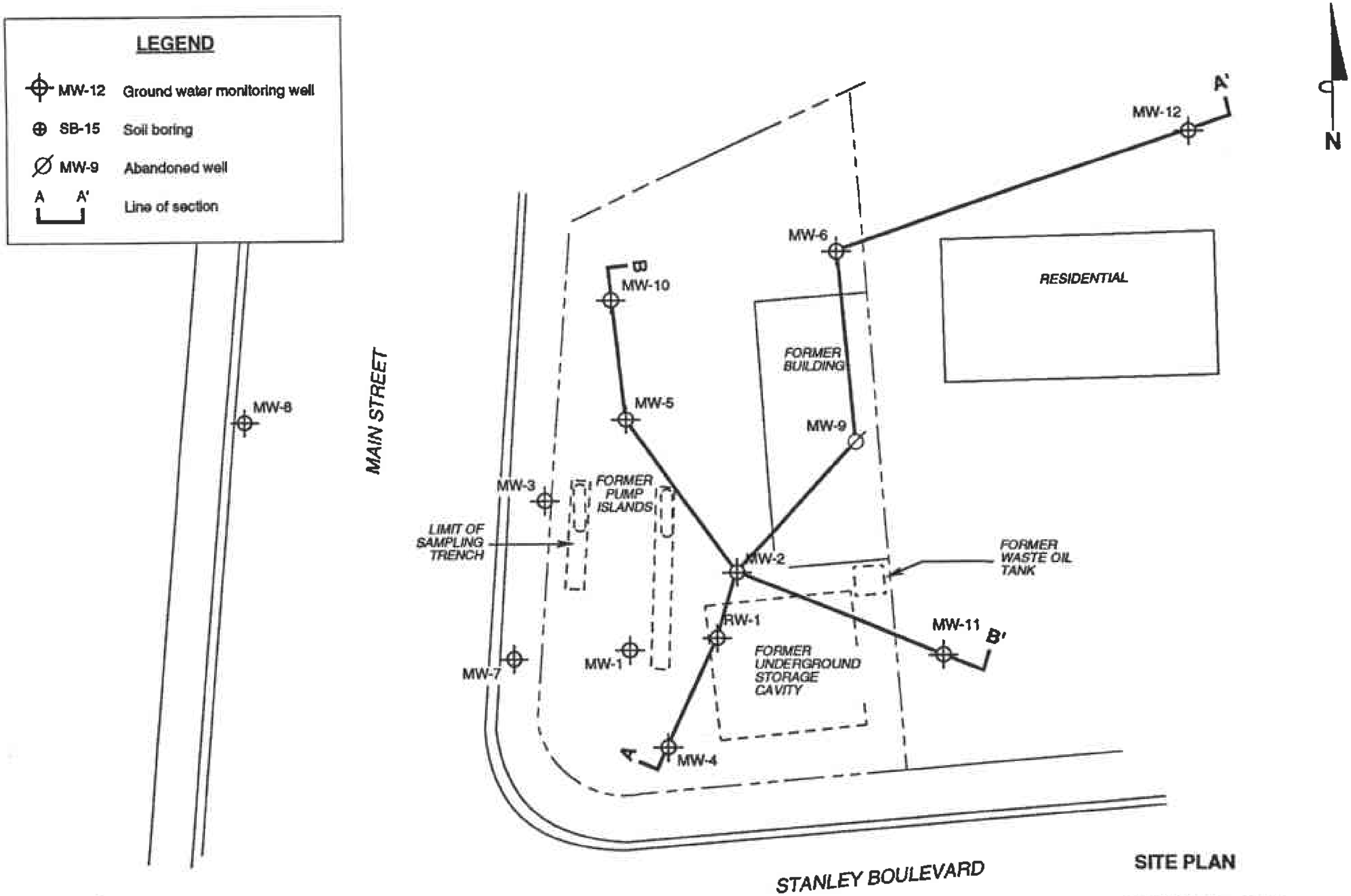
VICINITY MAP

Former Mobil Station 04-H6J
1024 Main Street
Pleasanton, California

FIGURE 1

ALTON GEOSCIENCE
Livermore, California

Project No. 30-0065



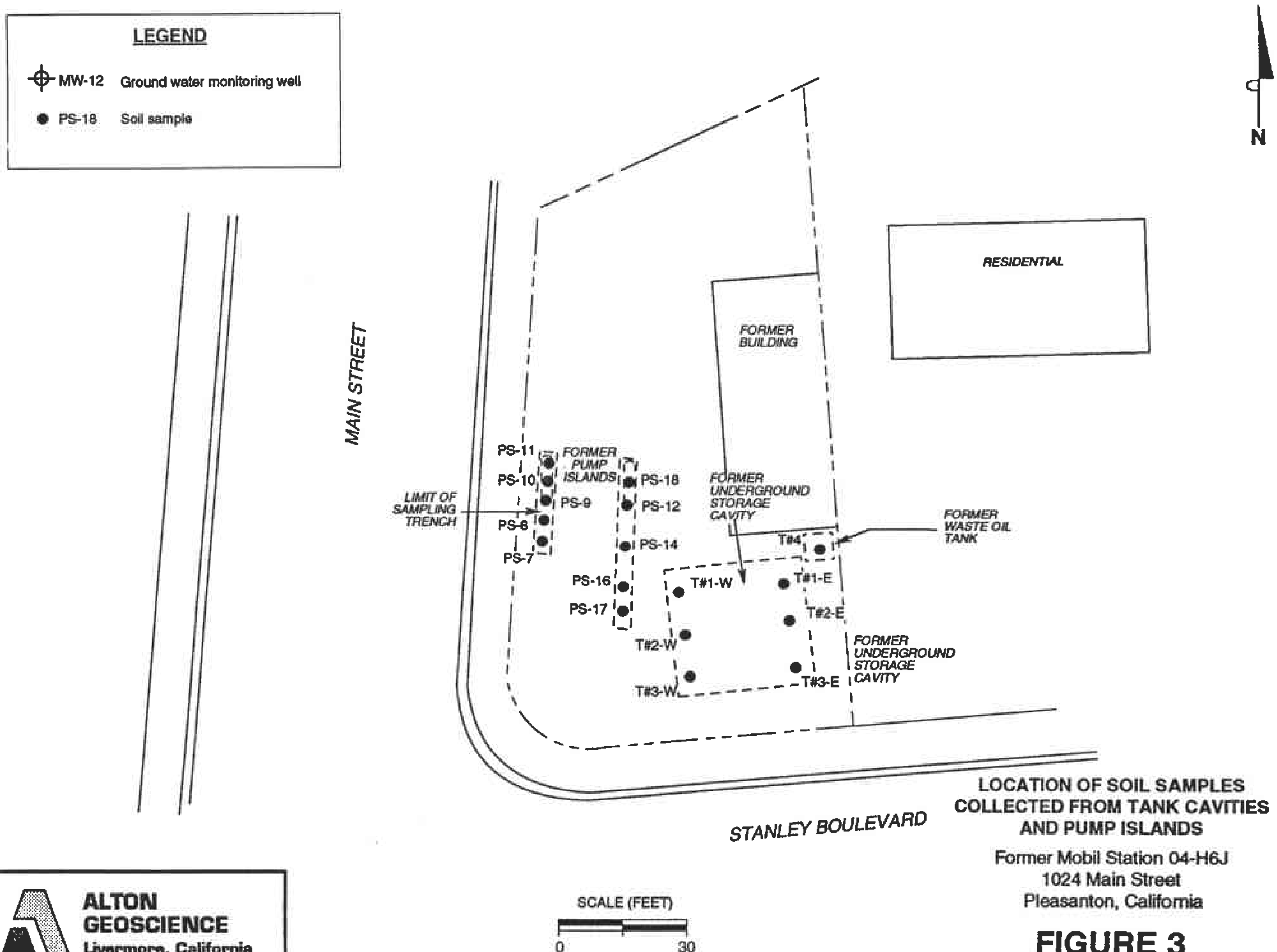
SITE PLAN

Former Mobil Station 04-H6J
1024 Main Street
Pleasanton, California

ALTON GEOSCIENCE
Livermore, California

FIGURE 2

30-0065 9/2/94

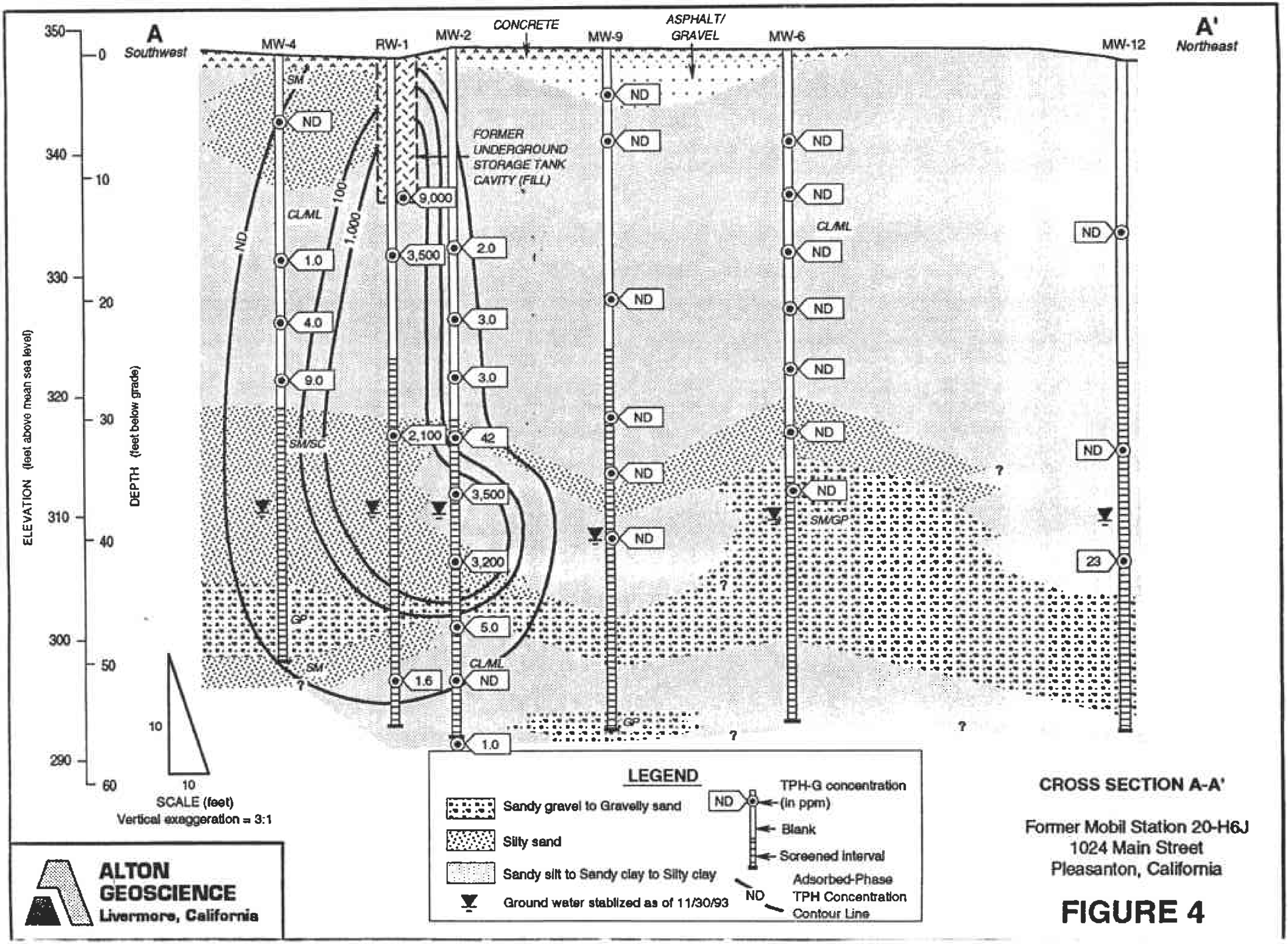


LOCATION OF SOIL SAMPLES COLLECTED FROM TANK CAVITIES AND PUMP ISLANDS

Former Mobil Station 04-H6J
1024 Main Street
Pleasanton, California

FIGURE 3

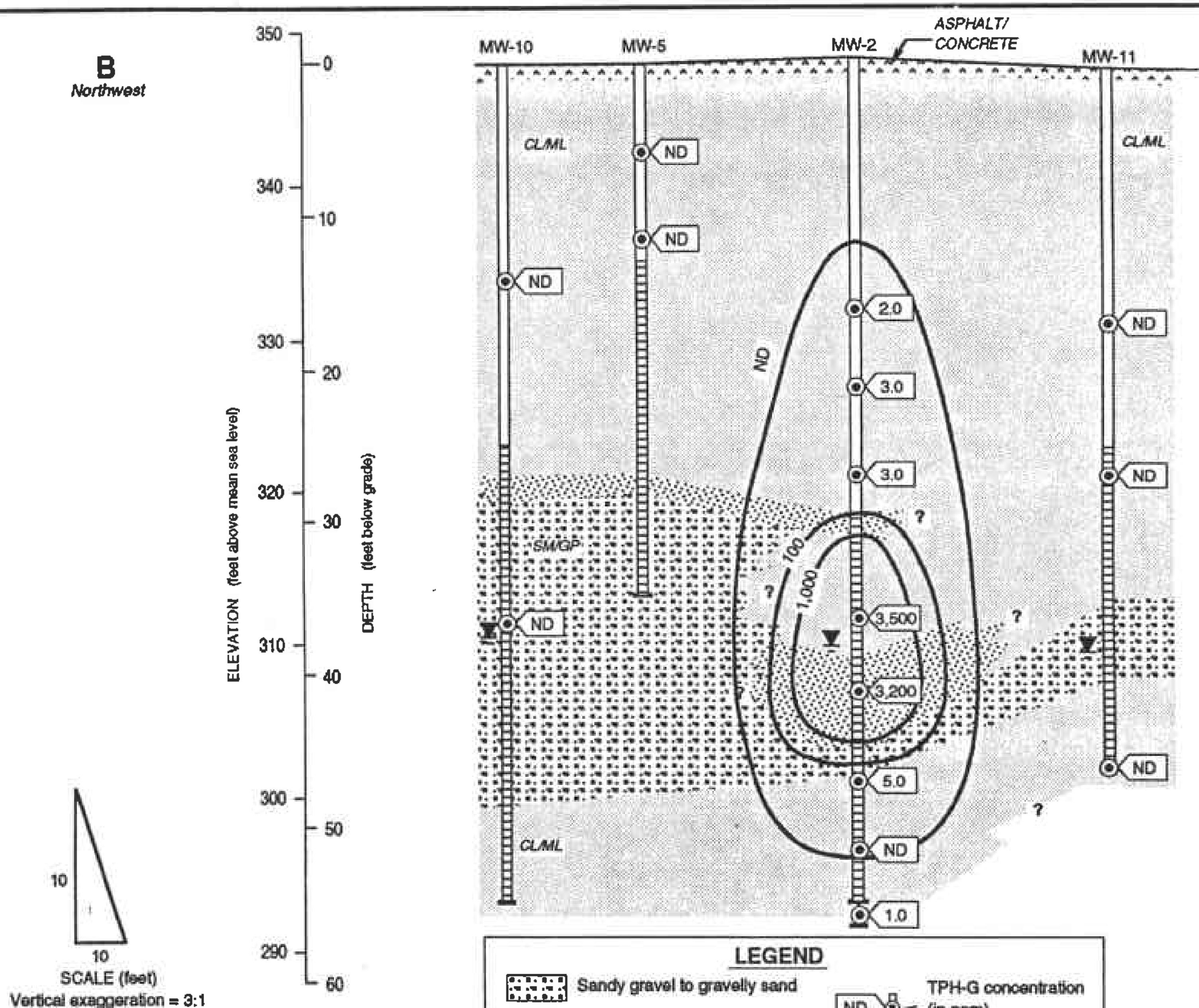
ALTON GEOSCIENCE
Livermore, California



CROSS SECTION A-A'

Former Mobil Station 20-H6J
1024 Main Street
Pleasanton, California

FIGURE 4



LEGEND

- Sandy gravel to gravelly sand
- Silty sand
- Sandy silt to Sandy clay to Silty clay
- Ground water stablized as of 11/30/93
- ND — TPH-G concentration (in ppm)
- Blank
- Screened interval
- ND — Adsorbed-Phase TPH Concentration Contour Line

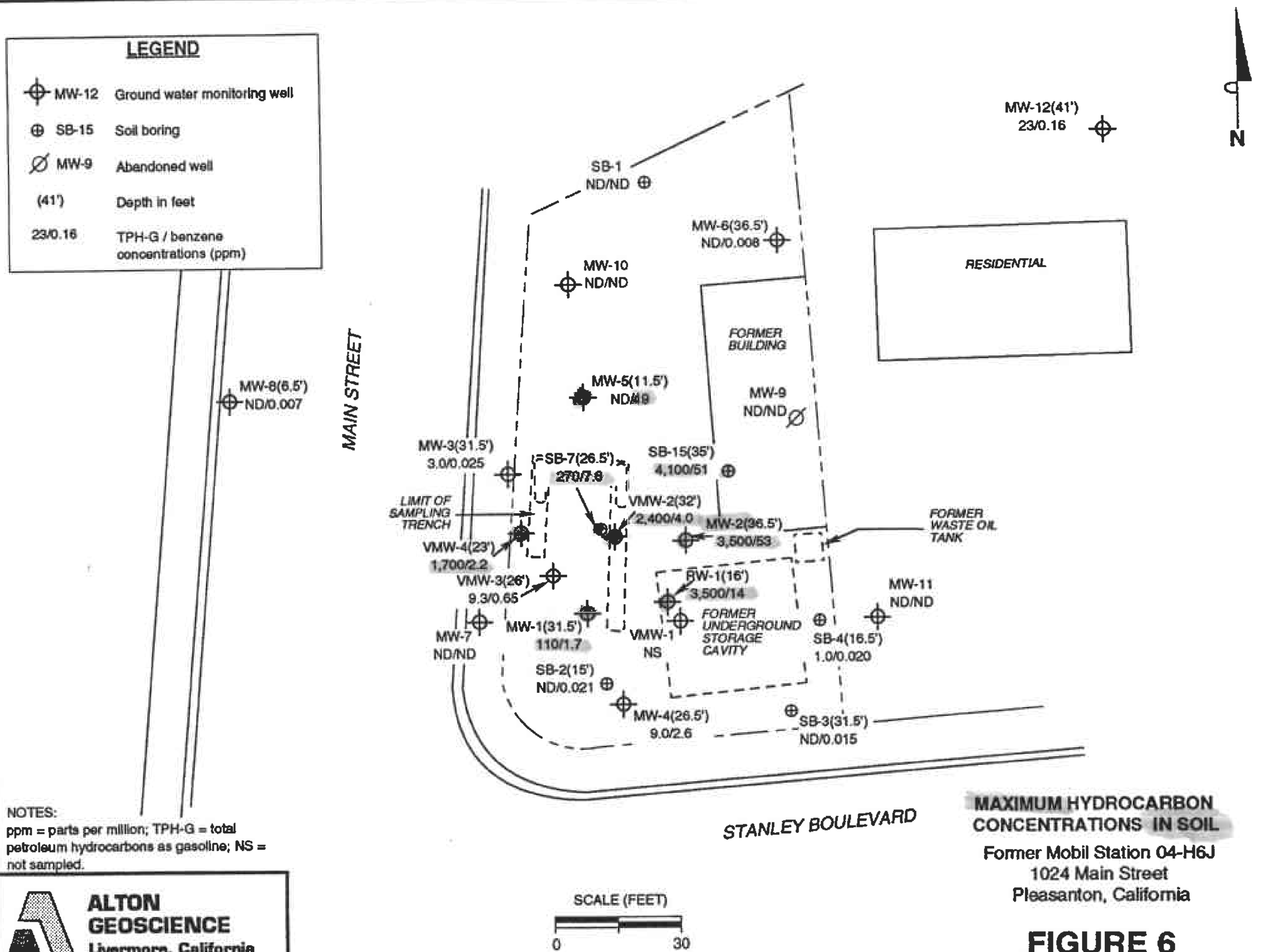
ALTON GEOSCIENCE
Livermore, California

CROSS SECTION B-B'

Former Mobil Station 20-H6J
1024 Main Street
Pleasanton, California

FIGURE 5

30-0065/B-B' 8/18/94



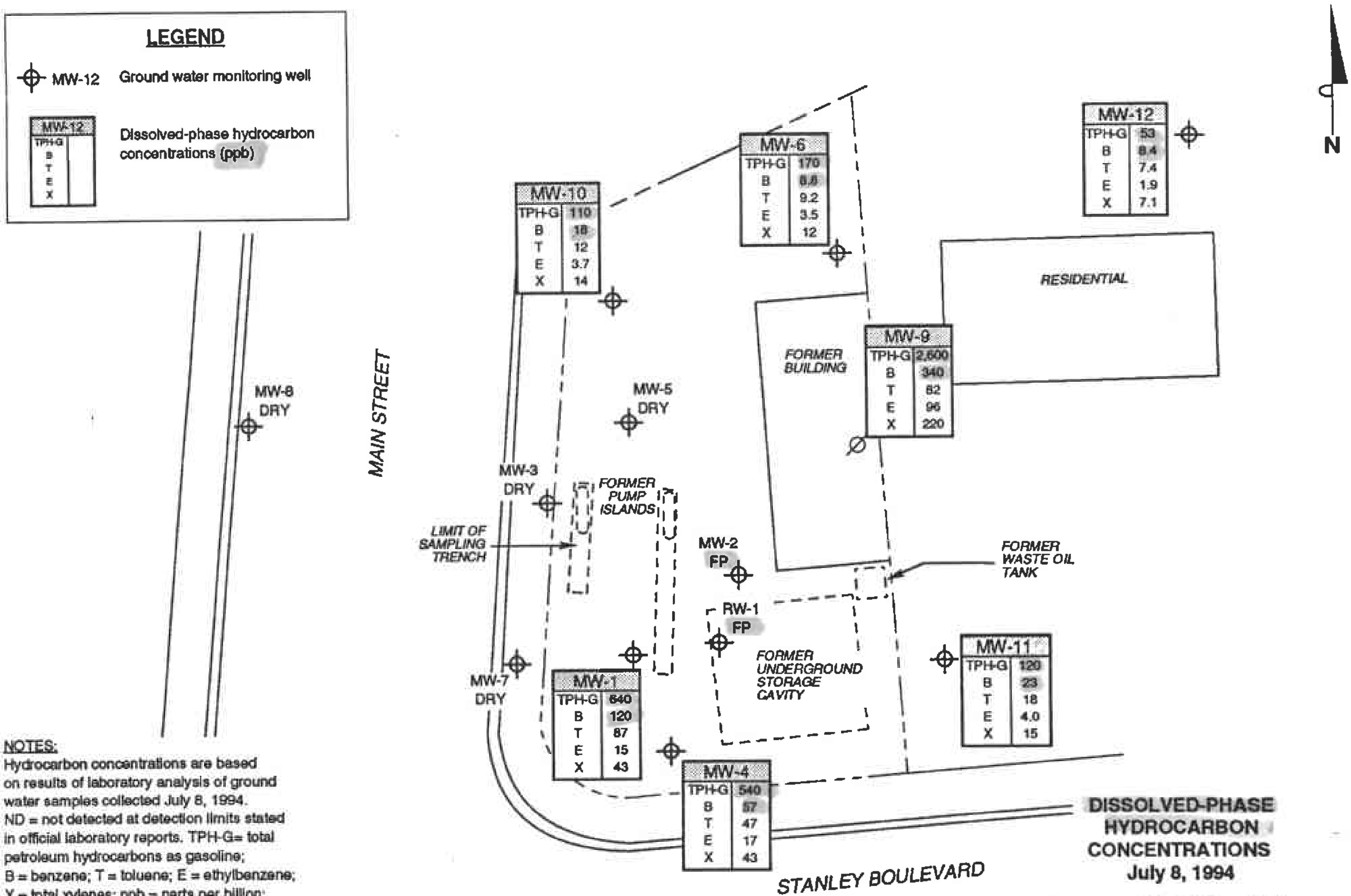
NOTES:
ppm = parts per million; TPH-G = total petroleum hydrocarbons as gasoline; NS = not sampled.

ALTON GEOSCIENCE
Livermore, California

MAXIMUM HYDROCARBON CONCENTRATIONS IN SOIL
Former Mobil Station 04-H6J
1024 Main Street
Pleasanton, California

FIGURE 6

30-0065 9/2/94



NOTES:
Hydrocarbon concentrations are based on results of laboratory analysis of ground water samples collected July 8, 1994.
ND = not detected at detection limits stated in official laboratory reports. TPH-G= total petroleum hydrocarbons as gasoline;
B = benzene; T = toluene; E = ethylbenzene;
X = total xylenes; ppb = parts per billion;
FP = trace or free product observed in well.

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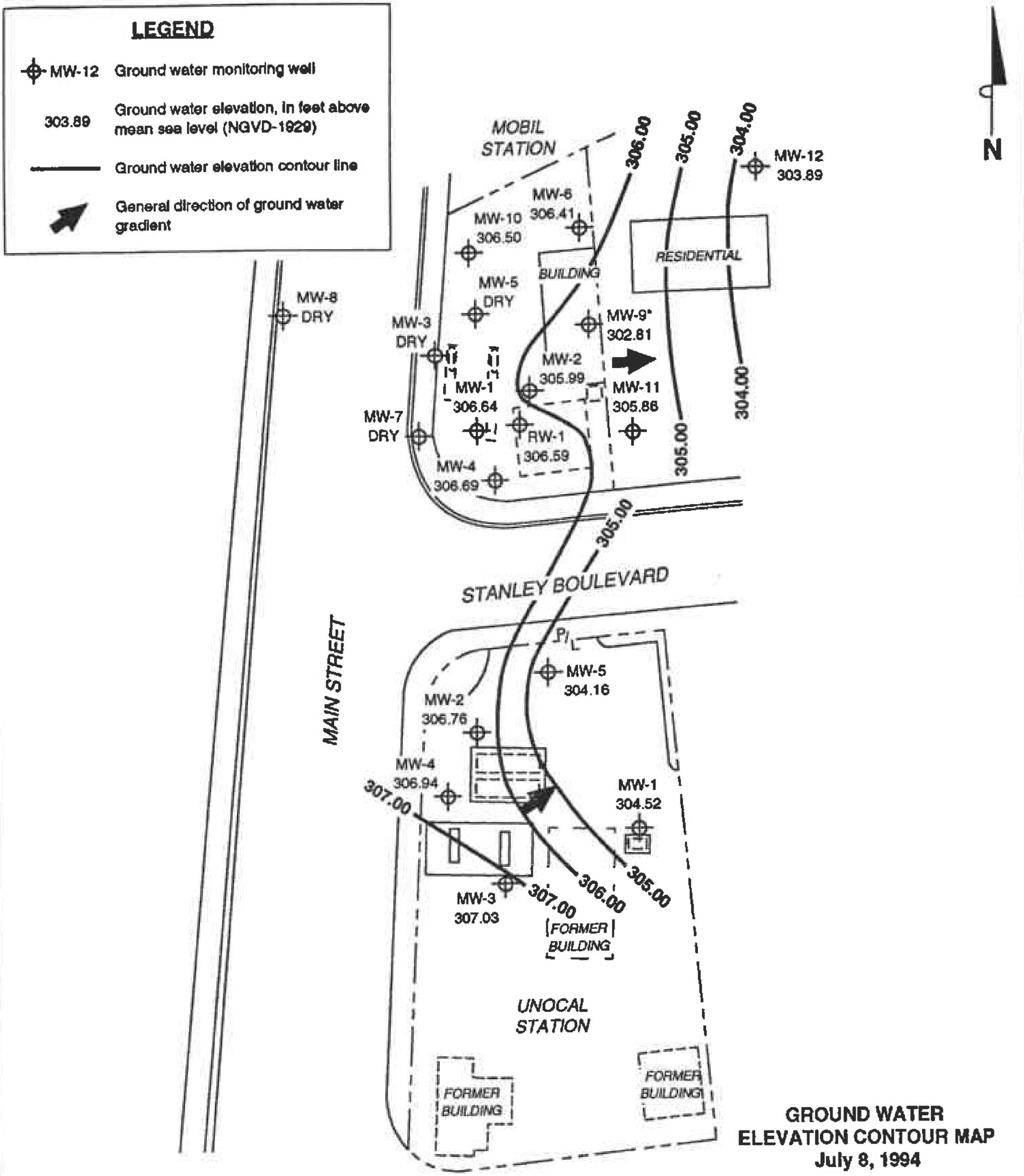
Livermore, California

DISSOLVED-PHASE HYDROCARBON CONCENTRATIONS
July 8, 1994

Former Mobil Station 04-H6J
1024 Main Street
Pleasanton, California

FIGURE 7

30-0065 9/2/94



NOTES:
Contours are interpretive based on fluid level measurements collected July 8, 1994.
Contour interval = 1.0 foot.
* = anomalous data; monitoring well not used in contouring.

ALTON GEOSCIENCE
Livermore, California

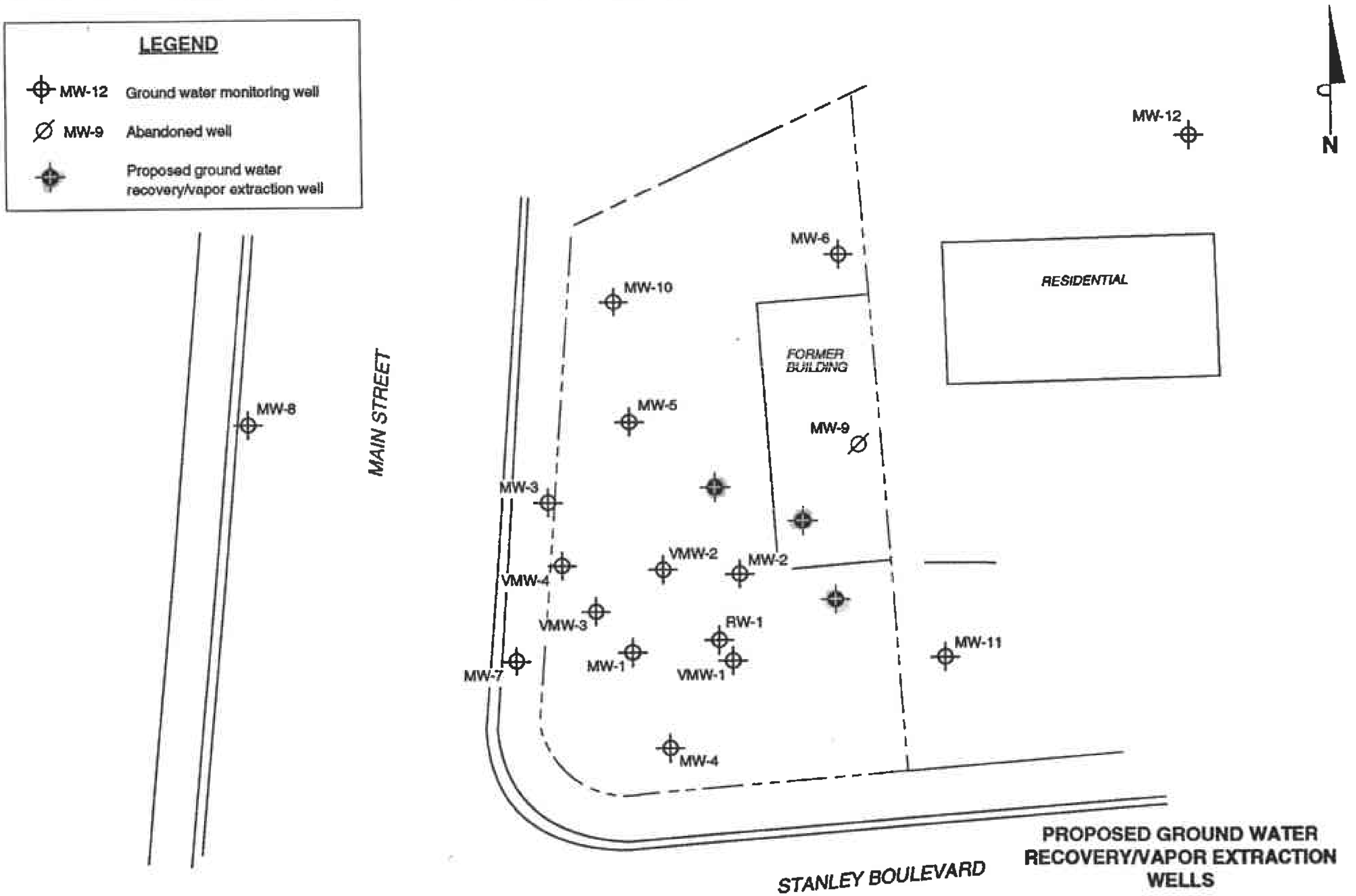
SCALE (feet)
0 30 60

GROUND WATER ELEVATION CONTOUR MAP
July 8, 1994

Former Mobil Station 04-H6J
1024 Main Street
Pleasanton, California
and
Unocal Station #0543
922 Main Street
Pleasanton, California

FIGURE 8

30-0065/Site Plan 7-25-94



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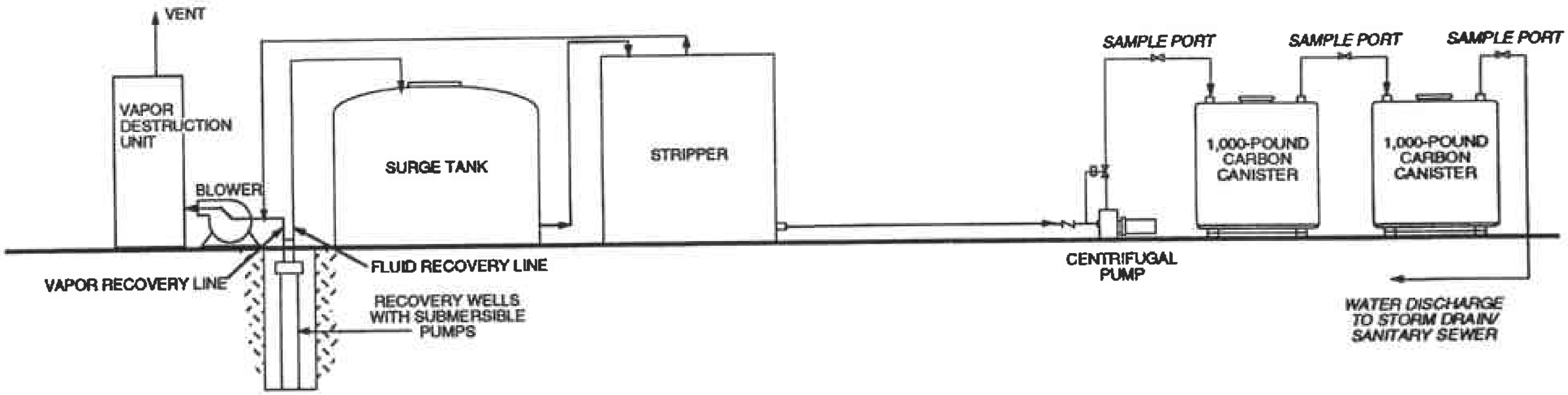
Livermore, California

PROPOSED GROUND WATER RECOVERY/VAPOR EXTRACTION WELLS

Former Mobil Station 04-H6J
1024 Main Street
Pleasanton, California

FIGURE 9

30-0065 8/22/94



PROPOSED SYSTEM DESIGN

Former Mobil Station 04-H6J
1024 Main Street
Pleasanton, California

FIGURE 10

ALTON GEOSCIENCE
Livermore, California

DRAWING NOT TO SCALE

30-0065 ARS SCHEMATIC 08/11/94

Table 1

Summary of Soil Sampling and Analysis

Former Mobil Station 04-H6J

Boring ID	Date	Depth (feet)	TPH-G (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Total Xylenes (ppm)	TOG (ppm)	HVOCs (ppm)
SB-1	12/28/89	4.5-5.0	ND	ND	ND	ND	ND	—	—
		9.5-10.0	ND	ND	ND	ND	ND	—	—
		14.5-15.0	ND	ND	ND	ND	ND	—	—
		29.5-30.0	ND	ND	ND	ND	ND	—	—
SB-2	12/28/89	4.5-5.0	ND	0.013	0.021	0.011	0.040	—	—
		9.5-10.0	ND	0.009	0.010	ND	0.021	—	—
		14.5-15.0	ND	0.021	0.009	ND	0.012	—	—
		19.5-20.0	ND	ND	ND	ND	ND	—	—
		29.5-30.0	ND	0.014	0.014	0.005	0.006	—	—
		38.5-39.0	ND	ND	ND	ND	ND	—	—
SB-3	3/26/90	16.0-16.5	ND	ND	ND	ND	ND	—	—
		21.0-21.5	ND	ND	ND	ND	ND	—	—
		26.0-26.5	ND	ND	ND	ND	ND	—	—
		31.0-31.5	ND	0.015	0.007	ND	0.005	—	—
		51.0-51.5	ND	ND	ND	ND	ND	—	—
SB-4	3/21/90	16.0-16.5	1.0	0.020	0.010	0.008	0.140	—	—
		21.0-21.5	ND	0.086	0.005	0.052	0.016	—	—
		26.0-26.5	ND	0.25	0.006	0.050	ND	—	—
		31.0-31.5	ND	ND	ND	ND	ND	—	—
		56.0-56.5	ND	ND	ND	ND	ND	—	—
SB-5/MW-2	3/22/90	16.0-16.5	2.0	0.11	0.055	0.063	0.350	—	—
		21.0-21.5	3.0	0.26	0.53	0.090	0.510	—	—
		26.0-26.5	3.0	0.47	0.79	0.079	0.450	—	—

Table 1

Summary of Soil Sampling and Analysis

Former Mobil Station 04-H6J

Boring ID	Date	Depth (feet)	TPH-G (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Total Xylenes (ppm)	TOG (ppm)	HVOCs (ppm)
SB-5/MW-2 (con't)		31.0-31.5	42	2.1	5.2	1.1	5.3	—	—
		36.0-36.5	3,500	53	340	120	610	—	—
		41.0-41.5	3,200	18	130	94	450	—	—
	3/23/90	46.0-46.5	5.0	0.079	0.040	0.051	0.053	—	—
		51.0-51.5	ND	0.016	0.026	0.018	0.065	—	—
		56.0-56.5	1.0	0.032	0.058	0.033	0.094	—	—
SB-6/MW-1	3/21/90	15.0-15.5	6.0	0.15	0.67	0.12	0.720	—	—
		21.0-21.5	7.0	1.2	2.5	0.18	1.1	—	—
		26.0-26.5	10	1.1	2.2	0.24	1.3	—	—
		31.0-31.5	110	1.7	8.1	2.7	13	—	—
		36.0-36.5	42	0.16	0.73	0.72	3.6	—	—
		41.0-41.5	1.0	0.004	0.009	0.005	0.016	—	—
		55.0-55.5	ND	0.005	0.007	0.003	0.009	—	—
SB-7	3/23/90	6.0-6.5	25	0.032	0.32	0.52	3.2	—	—
		21.0-21.5	5.0	0.67	1.6	0.150	0.78	—	—
		26.0-26.5	270	7.8	28	5.9	25	—	—
		31.0-31.5	3.0	0.38	0.76	0.083	0.46	—	—
		36.0-36.5	ND	0.009	0.014	0.050	0.024	—	—
SB-8/MW-3	3/23/90	6.0-6.5	ND	ND	ND	ND	ND	—	—
		21.0-21.5	ND	ND	ND	ND	ND	—	—
		26.0-26.5	2.0	ND	0.024	0.011	0.017	—	—
		31.0-31.5	3.0	0.025	0.006	0.18	0.29	—	—
		36.0-36.5	ND	0.030	0.006	ND	0.021	—	—

Table 1

Summary of Soil Sampling and Analysis

Former Mobil Station 04-H6J

Boring ID	Date	Depth (feet)	TPH-G (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Total Xylenes (ppm)	TOG (ppm)	HVOCs (ppm)
SB-9/MW-4	10/8/90	6.0-6.5	ND	ND	ND	ND	ND	—	ND*
		16.0-16.5	1.0	0.30	0.074	0.010	0.19	30	0.015a
		21.0-21.5	4.0	1.5	0.20	0.14	0.27	—	0.066a
		26.0-26.5	9.0	2.6	0.044	0.84	0.069	ND	0.13a
SB-10/MW-5	10/8/90	6.0-6.5	ND	ND	0.006	ND	0.015	—	ND*
		11.0-11.5	ND	19	6.0	ND	61	—	ND*
SB-11/MW-6	10/9/90	6.0-6.5	ND	ND	ND	ND	ND	—	ND*
		11.0-11.5	ND	ND	0.005	ND	ND	ND	ND*
		16.0-16.5	ND	ND	0.004	ND	ND	—	ND*
		21.0-21.5	ND	ND	ND	ND	ND	30	ND*
		26.0-26.5	ND	ND	ND	ND	ND	—	ND*
		31.0-31.5	ND	ND	ND	ND	ND	ND	ND*
		36.0-36.5	ND	0.008	ND	ND	ND	—	ND*
SB-12/MW-7	10/10/90	6.0-6.5	ND	ND	ND	ND	ND	—	ND*
		11.0-11.5	ND	ND	ND	ND	ND	—	ND*
SB-13/MW-8	10/10/90	6.0-6.5	ND	0.007	ND	ND	ND	—	ND*
SB-14/MW-9	1/21/92	3.0-3.5	ND	ND	ND	ND	ND		
		6.0-6.5	ND	ND	ND	ND	ND	ND	ND*
	1/31/92	19.5-20.0	ND	ND	ND	ND	ND	ND	ND*
		29.5-30.0	ND	ND	ND	ND	ND	ND	ND*
		34.5-35.0	ND	ND	ND	ND	ND	ND	ND*
		39.5-40.0	ND	ND	ND	ND	ND	ND	ND*

Table 1

Summary of Soil Sampling and Analysis

Former Mobil Station 04-H6J

Boring ID	Date	Depth (feet)	TPH-G (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Total Xylenes (ppm)	TOG (ppm)	HVOCs (ppm)
SB-15	1/21/92	3.0-3.5	ND	ND	ND	ND	ND	—	—
		6.0-6.5	ND	ND	ND	ND	ND	—	ND*
	1/30/92	11.5-12.0	ND	ND					ND*
		17.5-18.0	ND	ND	ND	ND	ND	ND	ND*
		25.0-25.5	6.2	0.013	1.3	0.16	1.0	ND	23a
		34.5-35.0	4,100	51	270	130	540	ND	390a
		37.0-37.5	740	7.2	29	18	73	ND	65a
T#1-E	10/18/89	12.0	ND	—	—	—	—	—	—
T#1-W	10/18/89	12.0	20	ND	—	—	—	—	—
T#2-E	10/18/89	12.0	8,100	—	—	—	—	—	—
		16.0	30	—	—	—	—	—	—
T#2-W	10/18/89	19.0	890	—	—	—	—	—	—
		12.0	6,000	—	—	—	—	—	—
T#3-E	10/18/89	12.0	20	—	—	—	—	—	—
T#3-W	10/18/89	12.0	9,000	—	—	—	—	—	—
		22.0	2,400	—	—	—	—	—	—
T#4	10/18/89	8.0	ND	—	—	—	—	—	—
PS-1	10/31/90	3.0	6.0	0.003	0.007	0.020	0.27		
PS-2	10/31/90	3.0	ND	ND	ND	ND	ND	—	—
PS-3	10/31/90	3.0	ND	ND	ND	ND	ND	—	—
PS-4	10/31/90	3.0	110	ND	0.10	0.43	5.6	—	—
PS-5	10/31/90	3.0	9,700	2.9	180	180	1,200	—	—
PS-6	10/31/90	3.0	2,200	0.010	6.0	15	80	—	—

Table 1

Summary of Soil Sampling and Analysis

Former Mobil Station 04-H6J

Boring ID	Date	Depth (feet)	TPH-G (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Total Xylenes (ppm)	TOG (ppm)	HVOCs (ppm)
PS-7	10/24/91	6.0	ND	ND	ND	ND	ND	—	—
		10.0	11	0.041	0.015	0.47	1.5	—	—
		13.0	17	0.11	0.76	0.65	2.0	—	—
PS-8	10/24/91	8.5	4,000	2.6	130	100	650	—	—
		13.0	630	2.3	40	16	93	—	—
PS-9	10/24/91	11.0	16	0.12	0.004	0.51	1.2	—	—
		14.5	310	0.88	15	9.6	50	—	—
PS-10	10/24/91	3.0	4.3	0.0064	0.064	ND	0.38	—	—
		7.0	60	0.29	ND	0.82	6.7	—	—
		16.0	670	1.9	38	16	100	—	—
PS-11	10/24/94	2.0	ND	ND	0.16	ND	0.05	—	—
		14.0	ND	ND	ND	ND	ND	—	—
PS-12	10/25/91	3.0	ND	ND	ND	ND	ND	—	—
		13.5	ND	ND	ND	ND	ND	—	—
		15.0	ND	ND	ND	ND	ND	—	—
PS-14	10/25/91	5.0	ND	ND	ND	ND	ND	—	—
		10.0	3.3	0.029	0.016	0.027	0.073	—	—
		14.0	1.1	ND	ND	0.006	0.018	—	—
PS-16	10/25/91	8.0	1,500	ND	38	59	310	—	—
		12.5	2,900	10	360	120	560	—	—

Table 1

Summary of Soil Sampling and Analysis

Former Mobil Station 04-H6J

Boring ID	Date	Depth (feet)	TPH-G (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Total Xylenes (ppm)	TOG (ppm)	HVOCs (ppm)
PS-17	10/25/91	5.0	ND	ND	ND	ND	ND	—	—
		10.0	1.3	ND	ND	ND	ND	—	—
		14.0	2.5	ND	ND	0.024	0.027	—	—
PS-18	10/25/91	2.0	ND	ND	ND	ND	ND	—	—
		5.0	ND	ND	ND	ND	ND	—	—
		7.0	ND	ND	ND	ND	ND	—	—
		10.0	22	0.011	0.062	0.097	0.74	—	—
		14.0	ND	ND	ND	ND	ND	—	—
RW-1	11/15/93	16.0	3,500	14	220	62	300	—	—
	11/15/93	31.0	2,100	20	140	49	200	—	—
	11/15/93	51.0	1.6	0.025	0.037	0.066	0.050	—	—
VMW-2	11/15/93	9.5	ND	ND	0.0095	ND	0.0099	—	—
	11/15/93	23.0	4.9	0.42	0.069	0.15	0.30	—	—
	11/15/93	32.0	2,400	4.0	83	50	230	—	—
								—	—
VMW-3	11/16/93	21.5	2.7	0.22	0.012	0.084	0.033	—	—
	11/16/93	26.0	9.3	0.65	0.30	0.44	0.78	—	—
	11/16/93	36.0	0.98	0.026	0.011	0.014	0.12	—	—
VMW-4	11/16/93	11.5	680	0.27	2.6	11	88	—	—
	11/16/93	23.0	1,700	2.2	44	31	176	—	—
	11/16/93	36.5	630	0.12	3.4	6.3	38	—	—
MW-10	11/17/93	14.0	ND	ND	0.0073	ND	0.014	—	—
	11/17/93	36.5	ND	ND	ND	ND	ND	—	—

Table 1

Summary of Soil Sampling and Analysis

Former Mobil Station 04-H6J

Boring ID	Date	Depth (feet)	TPH-G (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Total Xylenes (ppm)	TOG (ppm)	HVOCs (ppm)
MW-11	11/18/93	16.5	ND	ND	ND	ND	ND	—	—
	11/18/93	26.5	ND	ND	0.0070	ND	0.0050	—	—
	11/18/93	45.5	ND	ND	ND	ND	ND	—	—
MW-12	11/17/93	14.0	ND	ND	0.018	0.011	0.058	—	—
	11/17/93	32.0	ND	ND	ND	ND	ND	—	—
	11/17/93	41.0	23	0.16	0.043	0.053	0.31	—	—

NOTES:

ppm = parts per million

TPH-G = total petroleum hydrocarbons as gasoline

TOG = total oil and grease

HVOC = halogenated volatile organic compounds

ND = not detected at or above method detection limit

— = not analyzed

* = detection limits vary dependent upon compound

a = 1,2-dichloroethane

Table 2

Summary of Ground Water Monitoring and Analysis

Former Mobil Station 04-H6J

Sample ID	Date	Casing Elevation (feet)	Product Thickness (feet)	Depth To Water	Ground Water Elevation	TPH-G (ppb)	TPH-D (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	1,2-DCE (ppb)	Organic Lead (ppb)	Total Lead (ppb)
MW-1	04/12/90	348.03	0.00	43.57	304.46	3,600	—	73	13	3	180	45	ND<10	—
	10/18/90		0.00	43.18	304.85	5,000	ND<1000	700	360	170	480	54	—	—
	08/06/91		0.00	38.65	309.38	2,600	—	310	340	110	340	ND<25	—	ND<5.0
	01/08/92		0.00	38.68	309.35	2,400	—	270	370	18	340	14	ND<50	
	04/30/92		0.00	39.93	308.10	1,300	—	150	120	12	160	4.3	—	—
	07/31/92		0.00	43.05	304.98	ND<50	—	ND<0.5	ND<0.5	ND<0.5	ND<0.5	—	—	—
	10/27/92		0.00	42.86	305.17	2,700	—	320	310	84	310	—	—	—
	01/22/93		0.00	34.88	313.15	2,800	—	190	340	87	320	—	—	—
	04/05/93		0.00	33.71	314.32	6,000	—	410	460	51	500	—	—	—
	07/06/93		0.00	35.46	312.57	2,200	—	140	240	32	180	—	—	—
	11/30/93		0.00	37.81	310.22	450	—	68	34	ND<0.5	48	—	—	—
	01/27/94		0.00	42.10	305.93	1,000	—	270	330	44	190	—	—	—
	04/25/94		0.00	40.33	307.70	—	—	—	—	—	—	—	—	—
	04/26/94		—	—	—	3,500	—	310	370	22	320	—	—	—
	07/08/94		0.00	41.39	306.64	640	—	120	87	15	43	—	—	—
MW-2	04/12/90	348.45	0.00	44.14	304.31	64,000	—	5,500	7,600	1,900	7,800	200	ND<10	—
	10/18/90		0.00	43.18	305.27	83,000	10,000	6,800	9,100	2,400	11,000	460	—	—
	08/06/91		0.00	39.19	309.26	160,000	—	16,000	25,000	4,300	19,000	330	—	330
	01/08/92		0.02	39.40	309.07	—	—	—	—	—	—	—	—	—
	04/30/92		0.00	40.50	307.95	71,000	—	9,200	19,000	3,700	15,000	420	—	—
	07/31/92		0.15	43.64	304.92	—	—	—	—	—	—	—	—	—
	10/27/92		Trace	43.53	304.92	—	—	—	—	—	—	—	—	—
	01/22/93		Trace	35.55	312.90	—	—	—	—	—	—	—	—	—

Table 2

Summary of Ground Water Monitoring and Analysis

Former Mobil Station 04-H6J

Sample ID	Date	Casing Elevation (feet)	Product Thickness (feet)	Depth To Water	Ground Water Elevation	TPH-G (ppb)	TPH-D (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	1,2-DCE (ppb)	Organic Lead (ppb)	Total Lead (ppb)
MW-2	04/05/93		Trace	34.41	314.04	—	—	—	—	—	—	—	—	—
(con't)	07/06/93		Trace	35.98	312.47	—	—	—	—	—	—	—	—	—
	11/30/93		0.48	38.78	310.03	—	—	—	—	—	—	—	—	—
	01/27/94		0.01	42.50	305.96	—	—	—	—	—	—	—	—	—
	04/25/94		Trace	40.32	308.13	—	—	—	—	—	—	—	—	—
	07/08/94		Trace	42.46	305.99	—	—	—	—	—	—	—	—	—
MW-3	04/12/90	347.97	0.00	23.18	324.79	2,100	—	32	56	31	170	117	ND<10	—
	10/18/90		0.00	14.28	333.69	110	ND<1000	3	3	1	5	2	—	—
	08/06/91		—	Dry	—	—	—	—	—	—	—	—	—	—
	01/08/92		0.00	32.36	315.61	680	—	8.9	26	8.5	72	5.7	—	—
	04/30/92		—	Dry	—	—	—	—	—	—	—	—	—	—
	07/31/92		—	Dry	—	—	—	—	—	—	—	—	—	—
	10/27/92		—	Dry	—	—	—	—	—	—	—	—	—	—
	01/22/93		0.00	27.30	320.67	2,600	—	240	300	170	440	—	—	—
	04/05/93		—	Dry	—	—	—	—	—	—	—	—	—	—
	07/06/93		—	Dry	—	—	—	—	—	—	—	—	—	—
	11/30/93		—	Dry	—	—	—	—	—	—	—	—	—	—
	01/27/94		—	Dry	—	—	—	—	—	—	—	—	—	—
	04/25/94		—	Dry	—	—	—	—	—	—	—	—	—	—
	07/08/94		—	Dry	—	—	—	—	—	—	—	—	—	—
MW-4	10/18/90	348.07	0.00	43.16	304.91	9,600	2,000	180	500	200	1,200	9	—	—
	08/06/91		0.00	38.65	309.42	8,600	—	320	420	220	650	ND<25	—	ND<5.0

Table 2

Summary of Ground Water Monitoring and Analysis

Former Mobil Station 04-H6J

Sample ID	Date	Casing Elevation (feet)	Product Thickness (feet)	Depth To Water	Ground Water Elevation	TPH-G (ppb)	TPH-D (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	1,2-DCE (ppb)	Organic Lead (ppb)	Total Lead (ppb)
MW-4	01/08/92		0.00	38.65	309.42	3,400	—	600	880	220	1,100	9.2	ND<50	—
(con't)	04/30/92		0.00	39.88	308.19	7,200	—	650	1,200	210	1,200	ND<50	—	—
	07/31/92		0.00	43.07	305.00	3,800	—	320	340	120	360	—	—	—
	10/27/92		0.00	42.78	305.29	9,000	—	440	750	190	900	—	—	—
	01/22/93		0.00	34.76	313.31	12,000	—	540	1,200	320	1,900	—	—	—
	04/05/93		0.00	33.61	314.46	1,100	—	34	18	12	31	—	—	—
	07/06/93		0.00	35.37	312.70	4,000	—	220	300	43	440	—	—	—
	11/30/93		0.00	37.78	310.29	1,400	—	140	83	54	110	—	—	—
	01/27/94		0.00	42.10	305.97	910	—	140	75	24	94	—	—	—
	04/25/94		0.00	40.28	307.79	—	—	—	—	—	—	—	—	—
	04/26/94		—	—	—	27,000	—	1,200	1,800	580	2,500	—	—	—
	07/08/94		0.00	41.38	306.69	540	—	57	47	17	43	—	—	—
MW-5	10/18/90	347.97	—	**	—	—	—	—	—	—	—	—	—	—
	08/06/91		0.00	34.25	313.72	—	—	—	—	—	—	—	—	—
	01/08/92		0.00	34.22	313.75	—	—	—	—	—	—	—	—	—
	04/30/92		—	Dry	—	—	—	—	—	—	—	—	—	—
	07/31/92		—	Dry	—	—	—	—	—	—	—	—	—	—
	10/27/92		—	Dry	—	—	—	—	—	—	—	—	—	—
	01/22/93		—	Dry	—	—	—	—	—	—	—	—	—	—
	04/05/93		—	Dry	—	—	—	—	—	—	—	—	—	—
	07/06/93		—	Dry	—	—	—	—	—	—	—	—	—	—
	11/30/93		—	Dry	—	—	—	—	—	—	—	—	—	—
	01/27/94		—	Dry	—	—	—	—	—	—	—	—	—	—

Table 2

Summary of Ground Water Monitoring and Analysis

Former Mobil Station 04-H6J

Sample ID	Date	Casing Elevation (feet)	Product Thickness (feet)	Depth To Water	Ground Water Elevation	TPH-G (ppb)	TPH-D (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	1,2-DCE (ppb)	Organic Lead (ppb)	Total Lead (ppb)
MW-5	04/25/94		0.00	34.23	313.74	—	—	—	—	—	—	—	—	—
(con't)	07/08/94		—	Dry	—	—	—	—	—	—	—	—	—	—
MW-6	10/18/90	348.23	0.00	43.60	304.63	3,000	ND<1000	1,300	150	120	85	140	—	—
	08/06/91		0.00	39.07	309.16	1,600	—	220	10	5.2	14	8.3	—	ND<5.0
	01/08/92		0.00	39.18	309.05	370	—	81	3.9	4.5	2.9	5.4	ND<50	—
	04/30/92		0.00	40.46	307.77	610	—	180	8.4	6.8	3.3	7.0	—	—
	07/31/92		0.00	43.61	304.62	96	—	1,500	1,500	370	1,100	—	—	—
	10/27/92		0.00	43.68	304.55	9,400	—	27	ND<0.5	6	10	—	—	—
	01/22/93		0.00	35.66	312.57	250	—	12	2.4	1.4	1.9	—	—	—
	04/05/93		0.00	34.41	313.82	190	—	2.3	0.99	ND<0.5	0.5	—	—	—
	07/06/93		0.00	36.01	312.22	99	—	1.4	0.54	ND<0.5	ND<0.5	—	—	—
	11/30/93		0.00	38.36	309.87	86	—	9.1	ND<0.5	ND<0.5	ND<0.5	—	—	—
	01/27/94		0.00	42.57	305.66	140	—	1.7	ND<0.5	ND<0.5	ND<0.5	—	—	—
	04/25/94		0.00	40.77	307.46	—	—	—	—	—	—	—	—	—
	04/26/94		—	—	—	330	—	40	ND	ND	ND	—	—	—
	07/08/94		0.00	41.82	306.41	170	—	8.8	9.2	3.5	12	—	—	—
MW-7	10/18/90	347.90	0.00	9.26	338.64	ND<50	ND<1000	0	0.5	ND<0.3	0.8	ND<0.5	—	—
	08/06/91		—	Dry	—	—	—	—	—	—	—	—	—	—
	01/08/92		0.00	23.79	324.11	220	—	7.8	1.7	ND<0.3	0.55	—	—	—
	04/30/92		—	Dry	—	—	—	—	—	—	—	—	—	—
	07/31/92		—	Dry	—	—	—	—	—	—	—	—	—	—
	10/27/92		—	Dry	—	—	—	—	—	—	—	—	—	—

Table 2

Summary of Ground Water Monitoring and Analysis

Former Mobil Station 04-H6J

Sample ID	Date	Casing Elevation (feet)	Product Thickness (feet)	Depth To Water	Ground Water Elevation	TPH-G (ppb)	TPH-D (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	1,2-DCE (ppb)	Organic Lead (ppb)	Total Lead (ppb)
MW-7	01/22/93		—	Dry	—	—	—	—	—	—	—	—	—	—
(con't)	04/05/93		—	Dry	—	—	—	—	—	—	—	—	—	—
	07/06/93		—	Dry	—	—	—	—	—	—	—	—	—	—
	11/30/93		—	Dry	—	—	—	—	—	—	—	—	—	—
	01/27/94		—	Dry	—	—	—	—	—	—	—	—	—	—
	04/25/94		—	Dry	—	—	—	—	—	—	—	—	—	—
	07/08/94		—	Dry	—	—	—	—	—	—	—	—	—	—
MW-8	10/18/90	348.90	0.00	11.30	337.60	900	ND<1000	3	5	7	62	ND<0.5	—	—
	08/06/91		—	Dry	—	—	—	—	—	—	—	—	—	—
	01/08/92		—	Dry	—	—	—	—	—	—	—	—	—	—
	04/30/92		—	Dry	—	—	—	—	—	—	—	—	—	—
	07/31/92		0.00	12.04	336.86	270*	—	ND<0.5	ND<0.5	ND<0.5	1.3	—	—	—
	10/27/92		—	Dry	—	—	—	—	—	—	—	—	—	—
	01/22/93		—	Dry	—	—	—	—	—	—	—	—	—	—
	04/05/93		—	Dry	—	—	—	—	—	—	—	—	—	—
	07/06/93		0.00	7.48	341.42	ND<50	—	ND<0.5	ND<0.5	ND<0.5	ND<0.5	—	—	—
	11/30/93		—	Dry	—	—	—	—	—	—	—	—	—	—
	01/27/94		—	Dry	—	—	—	—	—	—	—	—	—	—
	04/25/94		—	Dry	—	—	—	—	—	—	—	—	—	—
	07/08/94		—	Dry	—	—	—	—	—	—	—	—	—	—
MW-9	02/04/92	348.53	0.00	43.54	304.99	16,000	—	3,000	740	1,200	2,500	68	—	ND<5.0
	04/30/92		0.00	42.83	305.70	5,600	—	1,000	120	410	350	ND<50	—	—

Table 2

Summary of Ground Water Monitoring and Analysis

Former Mobil Station 04-H6J

Sample ID	Date	Casing Elevation (feet)	Product Thickness (feet)	Depth To Water	Ground Water Elevation	TPH-G (ppb)	TPH-D (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	1,2-DCE (ppb)	Organic Lead (ppb)	Total Lead (ppb)
MW-9	07/31/92		0.00	47.36	301.17	93	—	1,800	1,900	620	940	—	—	—
(con't)	10/27/92		0.00	48.32	300.21	13,000	—	2,400	1,600	680	1,100	—	—	—
	01/22/93		0.00	39.11	309.42	5,600	—	1,200	200	510	350	—	—	—
	04/05/93		0.00	37.10	311.43	7,900	—	1,300	510	620	670	—	—	—
	07/06/93		0.00	39.21	309.32	3,200	—	510	46	170	150	—	—	—
	11/30/93		0.00	40.58	307.95	2,800	—	610	28	220	65	—	—	—
	01/27/94		0.00	44.32	304.21	11,000	—	1,400	130	230	700	—	—	—
	04/25/94		0.00	43.05	305.48	—	—	—	—	—	—	—	—	—
	04/26/94		—	—	—	3,900	—	460	56	160	220	—	—	—
	07/08/94		0.00	45.72	302.81	2,600	—	340	82	96	220	—	—	—
MW-10	11/30/93	347.95	0.00	37.97	309.98	ND<50	—	ND<0.5	ND<0.5	ND<0.5	ND<0.5	—	—	—
	01/27/94		0.00	42.16	305.79	ND<50	—	ND<0.5	ND<0.5	ND<0.5	1.2	—	—	—
	04/25/94		0.00	40.39	307.56	—	—	—	—	—	—	—	—	—
	04/26/94		—	—	—	810	—	17	0.84	ND	ND	—	—	—
	07/08/94		0.00	41.45	306.50	110	—	18	12	3.7	14	—	—	—
MW-11	11/30/93	347.56	0.00	38.41	309.15	ND<50	—	ND<0.5	ND<0.5	ND<0.5	1.6	—	—	—
	01/27/94		0.00	38.02	309.54	ND<50	—	ND<0.5	ND<0.5	ND<0.5	ND<0.5	—	—	—
	04/25/94		0.00	38.77	308.79	—	—	—	—	—	—	—	—	—
	04/26/94		—	—	—	ND	—	ND	ND	ND	1.7	—	—	—
	07/08/94		0.00	41.70	305.86	120	—	23	18	4.0	15	—	—	—

Table 2

Summary of Ground Water Monitoring and Analysis

Former Mobil Station 04-H6J

Sample ID	Date	Casing Elevation (feet)	Product Thickness (feet)	Depth To Water	Ground Water Elevation	TPH-G (ppb)	TPH-D (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	1,2-DCE (ppb)	Organic Lead (ppb)	Total Lead (ppb)
MW-12	11/30/93	347.15	0.00	37.97	309.18	55	—	1.8	4.3	2.5	11	—	—	—
	01/27/94		0.00	44.02	303.13	ND<50	—	ND<0.5	ND<0.5	ND<0.5	ND<0.5	—	—	—
	04/25/94		0.00	42.27	304.88	—	—	—	—	—	—	—	—	—
	04/26/94		—	—	—	ND	—	ND	ND	ND	1.4	—	—	—
	07/08/94		0.00	43.26	303.89	53	—	8.4	7.4	1.9	7.1	—	—	—
VMW-1	11/30/93	348.05	—	Dry	—	—	—	—	—	—	—	—	—	—
	01/27/94		—	Dry	—	—	—	—	—	—	—	—	—	—
	04/25/94		—	Dry	—	—	—	—	—	—	—	—	—	—
	07/08/94		—	Dry	—	—	—	—	—	—	—	—	—	—
VMW-2	11/30/93	347.90	—	Dry	—	—	—	—	—	—	—	—	—	—
	01/27/94		—	Dry	—	—	—	—	—	—	—	—	—	—
	04/25/94		0.00	33.82	314.08	—	—	—	—	—	—	—	—	—
	07/08/94		—	Dry	—	—	—	—	—	—	—	—	—	—
VMW-3	11/30/93	348.10	—	Dry	—	—	—	—	—	—	—	—	—	—
	01/27/94		—	Dry	—	—	—	—	—	—	—	—	—	—
	04/25/94		Trace	31.23	316.87	—	—	—	—	—	—	—	—	—
	07/08/94		—	Dry	—	—	—	—	—	—	—	—	—	—
VMW-4	11/30/93	347.95	—	Dry	—	—	—	—	—	—	—	—	—	—
	01/27/94		—	Dry	—	—	—	—	—	—	—	—	—	—

Table 2

Summary of Ground Water Monitoring and Analysis

Former Mobil Station 04-H6J

Sample ID	Date	Casing Elevation (feet)	Product Thickness (feet)	Depth To Water	Ground Water Elevation	TPH-G (ppb)	TPH-D (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	1,2-DCE (ppb)	Organic Lead (ppb)	Total Lead (ppb)
VMW-4	04/25/94		—	31.41	316.54	—	—	—	—	—	—	—	—	—
(con't)	07/08/94		—	Dry	—	—	—	—	—	—	—	—	—	—
RW-1	11/30/93	347.89	Trace	37.75	310.14	—	—	—	—	—	—	—	—	—
	01/27/94		Trace	42.00	305.89	—	—	—	—	—	—	—	—	—
	04/25/94		0.02	40.24	307.67	—	—	—	—	—	—	—	—	—
	07/08/94		0.15	41.41	306.59	—	—	—	—	—	—	—	—	—
MW-1#	12/16/92	351.18	—	—	—	ND	ND	ND	ND	ND	ND	—	—	—
	02/02/93		0.00	37.76	313.42	—	—	—	—	—	—	—	—	—
	03/01/93		0.00	36.26	314.92	—	—	—	—	—	—	—	—	—
	04/14/93		0.00	36.56	314.62	ND	ND	ND	ND	ND	ND	—	—	—
	05/14/93		0.00	37.27	313.91	—	—	—	—	—	—	—	—	—
	06/15/93		0.00	38.02	313.16	—	—	—	—	—	—	—	—	—
	07/06/93		0.00	38.06	313.12	ND	ND	ND	ND	ND	ND	—	—	—
	11/30/93	350.78	—	—	—	—	—	—	—	—	—	—	—	—
	01/27/94		0.00	43.41	307.37	ND<50	—	ND<0.5	ND<0.5	ND<0.5	ND<0.5	—	—	—
	04/25/94		0.00	45.32	305.46	ND	—	ND	3.5	ND	3.4	—	—	—
	07/08/94		0.00	46.26	304.52	—	—	—	—	—	—	—	—	—
MW-2#	12/16/92	349.83	—	—	—	1,600	—	28	ND	5.1	5.6	—	—	—
	02/02/93		0.00	39.18	310.65	—	—	—	—	—	—	—	—	—
	03/01/93		0.00	34.33	315.50	—	—	—	—	—	—	—	—	—
	04/14/93		0.00	37.56	312.27	4,300	—	7.2	5.8	13	10	—	—	—

Table 2

Summary of Ground Water Monitoring and Analysis

Former Mobil Station 04-H6J

Sample ID	Date	Casing Elevation (feet)	Product Thickness (feet)	Depth To Water	Ground Water Elevation	TPH-G (ppb)	TPH-D (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	1,2-DCE (ppb)	Organic Lead (ppb)	Total Lead (ppb)
MW-2#	05/14/93		0.00	37.49	312.34	—	—	—	—	—	—	—	—	—
(con't)	06/15/93		0.00	39.34	310.49	—	—	—	—	—	—	—	—	—
	07/06/93		0.00	37.82	312.01	4,700	—	17	15	30	28	—	—	—
	11/30/93	349.51	—	—	—	—	—	—	—	—	—	—	—	—
	01/27/94		0.00	43.15	306.36	1,500	—	28	9.0	ND<0.5	20	—	—	—
	04/25/94		0.00	41.90	307.61	1,100	—	19	1.7	2.5	8.8	—	—	—
	07/08/94		0.00	42.75	306.76	—	—	—	—	—	—	—	—	—
MW-3#	12/16/92	351.35	—	—	—	ND	—	ND	ND	ND	ND	—	—	—
	02/02/93		0.00	40.62	310.73	—	—	—	—	—	—	—	—	—
	03/01/93		0.00	35.7	315.65	—	—	—	—	—	—	—	—	—
	04/14/93		0.00	38.97	312.38	ND	—	ND	ND	ND	ND	—	—	—
	05/14/93		0.00	39.07	312.28	—	—	—	—	—	—	—	—	—
	06/15/93		0.00	40.68	310.67	—	—	—	—	—	—	—	—	—
	07/06/93		0.00	37.82	313.53	ND	—	ND	ND	ND	ND	—	—	—
	11/30/93	351.04	—	—	—	—	—	—	—	—	—	—	—	—
	01/27/94		0.00	44.25	306.79	ND<50	—	ND<0.5	ND<0.5	ND<0.5	ND<0.5	—	—	—
	04/25/94		0.00	43.23	307.81	ND	—	ND	1.4	ND	1.8	—	—	—
	07/08/94		0.00	44.01	307.03	—	—	—	—	—	—	—	—	—
MW-4#	01/27/94	350.14	0.00	43.37	306.77	ND<50	—	ND<0.5	ND<0.5	ND<0.5	ND<0.5	—	—	—
	04/25/94		0.00	42.28	307.86	ND	—	ND	1.2	ND	1.5	—	—	—
	07/08/94		0.00	43.2	306.94	—	—	—	—	—	—	—	—	—

Table 2

Summary of Ground Water Monitoring and Analysis

Former Mobil Station 04-H6J

Sample ID	Date	Casing Elevation (feet)	Product Thickness (feet)	Depth To Water	Ground Water Elevation	TPH-G (ppb)	TPH-D (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	1,2-DCE (ppb)	Organic Lead (ppb)	Total Lead (ppb)
MW-5#	01/27/94	349.33	0.00	44.76	304.57	320	—	1.8	1.3	2.6	4.5	—	—	—
	04/25/94		0.00	44.30	305.03	160	—	ND	1.9	1.4	1.9	—	—	—
	07/08/94		0.00	45.17	304.16	—	—	—	—	—	—	—	—	—

NOTES:

ppb =	parts per billion
TPH-G =	total petroleum hydrocarbons as gasoline
TPH-D =	total petroleum hydrocarbons as diesel
ND =	not detected at or above method detection limits
— =	not measured/not analyzed
1,2-DCE =	1,2-Dichloroethane
* =	reported by laboratory as non-gasoline mixture
** =	well inaccessible
# =	wells installed by Kaprealian Engineering at former Unocal Station #0543; resurveyed by Kier & Wright Civil Engineers & Surveyors, Inc. 09/20/93.

APPENDIX A

REVIEW OF REMEDIAL ACTION ALTERNATIVES

This review of remedial action alternatives was performed to evaluate alternatives for site closure. A discussion of each alternative and the advantages and disadvantages of each is provided below.

A.1 IN-SITU VAPOR EXTRACTION ACCOMPANIED BY A GROUND WATER EXTRACTION AND TREATMENT PROGRAM

Discussion: This method encompasses two stages of remediation. The first of these includes the drilling and installation of a vapor extraction well(s) within the central area of the hydrocarbon-affected soil. The vapor extraction wells are constructed of slotted casing, surrounded by a porous sand filter pack, opposite unsaturated soil zones containing vapor, liquid, and/or adsorbed-phase hydrocarbons. A vacuum is exerted on the well, volatile hydrocarbon vapors are pulled from the soil through the slotted casing and filter pack, and treated onsite by catalytic oxidation. The second of these stages involves the drilling and installation of ground water well(s) within the central area of the hydrocarbon-affected zone. The wells are constructed of slotted casing, surrounded by a porous sand filter pack, opposite saturated soil zones containing ground water with dissolved-phase hydrocarbons. A water pump is inserted in the well and water containing dissolved-phase hydrocarbons is pumped from the well and treated onsite by an air stripper and carbon filtration system, or other suitable treatment system.

Advantages: This method has been proven successful in removing volatile gasoline components from permeable soils. Installation of the system allows site operation or development to proceed with only minor disruptions. The combination of vapor extraction with ground water pumping enhances the effectiveness of free product and dissolved-phase remediation.

Disadvantages: Vapor extraction is less successful in remediating volatile hydrocarbons in low permeability soils (clay and silt). In addition, vapor extraction is less effective in remediating the less volatile hydrocarbons (e.g. diesel-range hydrocarbons) and older weathered gasolines. A ground water treatment program generates large quantities of ground water needing proper treatment and discharge.

Site-Specific Concerns: A portion of the hydrocarbons beneath the site may be present in fine grained matrix of the silts and clays which have low permeability. Additional ground water monitoring wells may have to be installed to ensure the dissolved-phase plume is not migrating further offsite.

A.2 IN-SITU VAPOR EXTRACTION ACCOMPANIED BY ACTIVE AIR SPARGING, AND A GROUND WATER EXTRACTION AND TREATMENT/PLUME CONTAINMENT PROGRAM

Discussion: Air sparging involves the injection of air into the saturated zone below the areas of contamination. The contaminants dissolved in the ground water and adsorbed onto soil particles partition into the advective air phase, effectively simulating an in-situ air stripping system. The stripped contaminants are transported in the gas phase to the vadose zone, within the radius of influence of a vapor extraction and vapor treatment system.

Advantages: High removal rates can be achieved at a site with ideal conditions (homogeneous, permeable soils). This technology has been used successfully in pilot studies in sandy aquifers. This technology is best suited for sites which have contaminants below the ground water table. These contaminants may exist due to water table fluctuations, or drawdown associated with pump-and-treat techniques. Air sparging techniques are most effective in highly permeable aquifers.

Disadvantages: This technology relies on the complex interplay of a multi-fluid phase process. Vertical gas channelling may occur in heterogeneous soils or along fractures which would not allow for the remediation of the silts encountered at the site. This technology could increase lateral migration of the dissolved-phase hydrocarbons, and may also increase the biofouling potential of the site. A large number of extraction wells will be required to effectively collect the hydrocarbon-affected vapors. In addition, vapor extraction is less effective in remediating older weathered gasolines.

Site-Specific Concerns:

A portion of the hydrocarbons beneath the site are present in low permeability silts and clays.

Additional air injection and vapor extraction wells would be needed to effectively implement air sparging.

No air sparge pilot test has been conducted at the site to estimate the effectiveness of air sparging.

Due to the lateral extent of the dissolved-phase plume, a large quantity of air injection probes may have to be installed to effectively conduct sparging at the site.

Additional dissolved-phase plume containment wells would have to be installed to prevent further offsite migration of the dissolved-phase-hydrocarbons.

The soil below the site is heterogeneous. This allows for preferential flow of sparged air and would limit the effectiveness of sparging.

A.3 IN-SITU VAPOR EXTRACTION ACCOMPANIED BY A GROUND WATER MONITORING PROGRAM

Discussion: This method encompasses the drilling and installation of a vapor extraction well(s) within the central area of the hydrocarbon-affected soil zone. The vapor extraction wells are constructed of slotted casing, surrounded by a porous sand filter pack, opposite unsaturated soil zones containing vapor, liquid, and/or adsorbed-phase hydrocarbons. A vacuum is exerted on the well, volatile hydrocarbon vapors are pulled from the soil through the slotted casing and filter pack, and treated onsite by catalytic oxidation, thermal oxidation, or other suitable treatment system. Dissolved-phase hydrocarbons are remediated passively by demonstrating negligible plume migration and progressively decreasing hydrocarbon concentrations over time.

Advantages: This method has been proven successful in removing volatile gasoline components from permeable soils. Installation of the system allows site operation or development to proceed with only minor disruptions. Ground water monitoring offers continuing information on the dissolved-phase hydrocarbon concentrations at the site without the costs of ground water treatment.

Disadvantages: Vapor extraction is less successful in remediating volatile hydrocarbons in low permeability soils (clay and silt). In addition, vapor extraction would not be capable of remediating hydrocarbon concentrations that become trapped below the ground water because of ground water upwelling while vapor extracting from the wells. A ground water monitoring program offers no form of active remediation or containment of plume migration for free product or dissolved-phase hydrocarbons at the site.

Site-Specific Concerns: A portion of the hydrocarbons beneath the site may be present in fine grained silts and clays which have low permeability. Additional ground water monitoring wells will have to be installed to ensure the dissolved-phase hydrocarbons are not migrating further offsite. Ground water upwelling of approximately 3 to 5 feet may result during vapor extraction.

A.4 EXCAVATION FOLLOWED BY A GROUND WATER MONITORING PROGRAM

Discussion: This method would involve excavation of the hydrocarbon-affected soil to levels determined by negotiation with the Regional Water Quality Control Board (RWQCB) or lithological constraints beneath the site. A comprehensive health-based risk assessment would be performed before the excavation to determine appropriate clean-up criteria. These criteria would be selected to protect public health and the environment, and would be negotiated with the RWQCB.

Advantages: Excavation can be used to remove the majority of the adsorbed-phase hydrocarbons. Excavated soil can then be transported to a disposal or treatment facility. Risk assessments are scientifically defensible and based on the best and most current understanding of toxicity and exposure databases. In addition, a risk assessment provides a documented, logical transition from the database to site-specific conditions and potential exposures. Risk assessment is based on the methodologies of the U.S. Environmental Protection Agency (EPA) and California Department of Health Services (DHS). Ground water monitoring offers continuing information on the dissolved-phase hydrocarbon concentrations at the site without the costs of ground water treatment.

Disadvantages: This alternative is not appropriate if significant health risks are posed to members of the general population. The decision to accept site closure based on risk assessment is contingent upon the discretion of the lead regulatory agency and could be subject to review if regulations change on either the health risk potential or minimum toxicity levels. There is some long-term liability potential associated with offsite disposal or treatment. A ground water monitoring program offers no form active remediation for dissolved-phase hydrocarbons at the site.

Site Specific Comments: Hydrocarbon-affected soil at this site extends to near surface ground water (approximately 40fbg). High concentration of dissolved-phase hydrocarbons are present at the site. To excavate to 40 fbg, specifically engineered shoring including pilings, would need to be designed and constructed. The costs for excavation activities including proper shoring would not be feasible. The space needed onsite to perform excavation activities is severally restricted.

A.5 IN-SITU BIOREMEDIATION

Discussion: A typical in-situ bioremediation system consists of recovery wells, a mixing tank for nutrients, and injection wells or an infiltration gallery to introduce nutrients and bacteria to the subsurface. Bioremediation relies on indigenous or introduced bacteria to break down hydrocarbons in the soil into carbon dioxide and water (Torpy, Stroo, and Brubaker, 1989). The activity of the aerobic bacterial population is controlled by several environmental factors, notably: nutrient supply, bacteria enumeration, water and oxygen availability, temperature, and pH. Biological processes can be inhibited by the presence of toxic organic substances, metals, or high salt content. In-situ bioremediation is most applicable to sites with homogenous, relatively coarse-grained soils and shallow ground water conditions. In-situ bioremediation is not recommended for sites with free product.

Advantages: Installation of the system allows site operation or development to proceed with only minor disruptions. This method can breakdown a full range of hydrocarbons, including used motor oil.

Disadvantages: In-situ bioremediation is less successful in remediating volatile hydrocarbons in low permeability soils (clay and silt). This process involves the addition of nutrients, water, and oxygen to the subsurface. A fluid recovery system would be required to control the migration of fluids. The addition of water may contribute to hydrocarbon migration. In-situ bioremediation is not a proven successful technology.

Site-Specific Concerns: The site-specific concerns are as follows:

The dissolved-phase hydrocarbons beneath the site occur in heterogeneous soils. Control of injected water under these geologic conditions would prove difficult and could contribute to further dissolved-phase migration.

The dissolved-phase hydrocarbons at the site extend offsite towards the east, therefore the installation of offsite fluid recovery wells would be required to contain further migration of the dissolved-phase hydrocarbons.

APPENDIX B

GENERAL FIELD PROCEDURES

B.1 DRILLING AND SOIL SAMPLING

Soil borings are drilled using 8-inch diameter, continuous-flight, hollow-stem augers. Soil samples are obtained for soil description, field hydrocarbon vapor screening, and laboratory analysis. Soil samples are retrieved ahead of the augers by one of the following methods:

1. A 5-foot long, continuous-core barrel sampler is advanced into the soil with the lead auger, and sample tubes are driven into the core with a mallet, or

2. Soil samples are collected at 5-foot intervals using a standard split-spoon sampler lined with four 1.5-inch diameter stainless steel sample inserts. The split-spoon sampler is driven approximately 18 inches beyond the lead auger with a 140-pound hammer dropped from a height of 30 inches.

Upon retrieval, the soil samples are immediately removed from the sampler and sealed with Teflon sheeting and polyurethane caps. Each sample is labeled with sample identification, boring/well number, sample depth, geologist's initials, and date of collection. Soil samples are kept on ice prior to and during transport to a state-certified laboratory for analysis. Chain of Custody procedures are observed for all samples selected for analysis.

Soil adjacent to the laboratory sample is screened for combustible vapors using a combustible gas indicator (CGI) or equivalent instrument. For each hydrocarbon vapor screening event, a 6-inch long by 2.5-inch diameter sample insert is filled approximately 1/3 full with the soil sample, capped at both ends, and shaken. The probe is then inserted through a small opening in the cap. The combustible gas (parts per million) or lower explosive limit (percent LEL) reading is taken after approximately 15 seconds and recorded on the boring logs. The remaining soil recovered is removed from the sample insert or sampler, and described in accordance with the Unified Soil Classification System. For each soil type, field estimates of density/consistency, moisture, color, and grading are recorded on the boring logs.

B.2 GROUND WATER MONITORING WELL INSTALLATION

Ground water monitoring/recovery wells are constructed of 4- or 6-inch-diameter, flush-threaded Schedule 40 PVC blank and screened casing. Where possible, the screened interval will extend 10 feet above and 20 feet below the water table. The annular space surrounding the screened casing is backfilled with a sand filter pack to at least 1 foot above the top of the screened section. During the well construction, the filter pack is completed by surging with a manual or rig-mounted surge block. A 3-foot thick bentonite annular seal is placed above the filter pack. The remaining annular space is grouted to the surface. Utility boxes are installed slightly above grade to limit infiltration of surface waters. Locking caps are installed in accordance with Los Angeles County well construction guidelines.

B.3 GROUND WATER PURGING AND SAMPLING PROCEDURES

Typically, all ground water monitoring wells which do not contain free product are purged of ground water prior to sampling so that the fluids sampled are representative of the formation. Temperature, pH, and specific conductance are typically measured after one well and annular sand pack volume have been removed, and after every 1/2 volume thereafter. Purging is complete when these parameters vary less than 10% from the previous readings or when three borehole volumes of fluid has been removed. Samples are collected without further purging if the well does not recharge within 2 hours to 80% of its volume before purging.

The purging equipment that could contact well fluids is either dedicated to a particular well or cleaned prior to each use in a Liqui-nox solution followed by two tap water rinses. The purged water is either pumped directly into a licensed vacuum truck or temporarily stored in labeled barrels prior to transport to an appropriate treatment or recycling facility.

Ground water samples are collected by lowering a 2-inch diameter bottom-fill disposable bailer just below static water level in the well. The sample is carefully transferred from the check-valve-equipped bailer to 1-liter and 40-milliliter glass containers. These containers are filled to zero headspace and fitted with Teflon-sealed caps. Each sample is labeled with the project number, well number, sample date, and the collector's initials. Samples are placed on ice until laboratory analysis. Chain of Custody procedures are observed for all samples selected for analysis.

B.4 FLUID-LEVEL MONITORING

Fluid levels are monitored in the wells using an electronic sounder with optical and conductance sensors. The presence of free product is verified using a hydrocarbon-reactive paste.

B.5 MONITORING WELL SURVEYING

Well box or casing elevations are surveyed to within 0.01 foot relative to a county or city benchmark.

APPENDIX C
SITE SAFETY PLAN

FORMER MOBIL STATION 04-H6J
1024 Main Street
Pleasanton, California

1.0 INTRODUCTION

This Site Safety Plan (SSP) has been prepared in conformity with the Alton Geoscience Health and Safety Plan, Hazard Communication Program (HCP), and Illness and Injury Prevention Program (IIPP), and addresses those activities associated with field work to be performed at the above-referenced site. Compliance with this SSP is required of all Alton Geoscience personnel and subcontractors who enter the site. The requirements and parameters identified in this SSP will be subject to modification as warranted by existing site-specific conditions or as work progresses; however, no changes will be made without the prior approval of the Site Safety Officer (SSO).

2.0 GENERAL SAFETY REQUIREMENTS

The following general requirements will be observed at all times at the site; specific requirements are presented within this SSP:

The SSO will conduct a tailgate safety meeting for all personnel that enter the site. The SSO has the authority to correct unsafe site conditions. Accidents, injuries, and potentially unsafe working conditions shall be reported to the SSO immediately.

Project personnel will wear personal protective equipment to minimize exposure to hazards encountered at the site; equipment is to be maintained, cleaned, and inspected by each employee before and after each use.

Flammable and explosive atmospheres and airborne contaminants will be monitored.

Eating, smoking, and drinking will be allowed only in designated offsite areas. Site personnel will wash their hands and faces thoroughly prior to eating or drinking. Food should never be stored where it may be contaminated by petroleum products or other toxic materials.

Fire extinguishers will be onsite for use on equipment or small fires only.

An adequately stocked first aid kit will be onsite during work activities.

Practical engineering and geological information, experience, and accepted practices will be employed, as necessary, to control site safety while carrying out the proposed site assessment, remediation and/or construction work.

3.0 SITE SAFETY OFFICER AND PROJECT PERSONNEL

An SSO will be assigned to supervise field work. The SSO has overall responsibility for the development, coordination, and implementation of this SSP. This will include communicating the site-specific requirements to the project personnel and assuring compliance with all Corporate Health and Safety Plans and Programs. In the event that the SSO is unable to perform these duties, the designated Alternate Safety Officer will be responsible.

All project personnel for this site will be responsible for understanding and complying with the SSP requirements. The SSO, or a designated alternate, will ensure that onsite personnel have assigned responsibilities and have reviewed a copy of this SSP. Additionally, the SSO will oversee compliance with this SSP and be responsible for initiating emergency response procedures, if necessary.

Prior to commencement of work, the SSO will conduct the site-specific training session (tailgate meeting) to make personnel aware of potential physical and chemical hazards, and safe work practices. Additionally, personnel will be required to document their full understanding of this SSP before admission to the site by signing the compliance log at the end of this SSP. Appropriate personal protective equipment will be made available and used, as necessary, by onsite project personnel.

Onsite personnel must initially complete a 40-hour hazardous materials training course, as required by the Code of Federal Regulations (CFR) 1910.120. Thereafter, personnel are required to complete an annual 8-hour refresher course, and any other courses as required by OSHA.

4.0 SITE BACKGROUND

Liquid-phase, adsorbed-phase, and dissolved-phase hydrocarbons have been detected in soil and ground water beneath the site. Ground water is present at a depth of approximately 40 feet below grade.

5.0 POTENTIAL HAZARDS

Consistent efforts will be made throughout the project to evaluate the physical, chemical, and environmental hazards. Physical and chemical hazards that may be encountered onsite include those associated with operating mechanical equipment and dealing with potentially hazardous chemicals. Environmental hazards to personnel may include heat stress, cold exposure, biological hazards, and high noise levels. Probably the most immediate hazard is that of physical injury to onsite personnel from machinery. Hydrocarbons in various phases (adsorbed, dissolved, liquid, and/or vapor) may be present in the subsurface at the site. The hazard potential associated with the presence of hydrocarbons includes vapor build-up in, and/or escaping from, well bores, excavations, and contaminated soil stockpiled and moved around the site.

5.1 PHYSICAL HAZARDS

In order to minimize physical hazards, Alton Geoscience has developed standard safety protocols, which will be followed at all times. In general, accidents will be prevented by personal protective equipment, environmental controls, engineering controls, and the exercise of reasonable caution during work activities. Failure to follow safety protocols or continued negligence of these policies will result in expulsion of a crew member from the site as well as possible termination of employment.

Alton personnel assigned to this project are required to be familiar with the field activities to be conducted at the site. They are trained to work safely under various field conditions and will use work practices designed to minimize physical hazards.

Hard hats, safety glasses, and steel-toe boots will be required in all areas of the site.

Potential hazards to personal safety at the site are described in the following sections.

5.1.1 Explosion and Fire

Petroleum products are highly flammable. Liquid petroleum product readily vaporizes from standing pools or saturated soil. Ignition sources of any kind (e.g., engines, impact sparking, and heat or arc from inappropriate equipment or instrumentation) pose a major explosion and fire hazard.

A direct-reading portable combustible gas indicator (CGI), which measures volatile organic compound (VOC) concentrations in parts per million (ppm) or as a percentage of the lower explosive limit (LEL), will be used to evaluate the possible formation of flammable atmospheres in and around the work area. Measurements will be obtained periodically at the top of each borehole throughout drilling operations and during any construction activities in which hydrocarbon-affected soil in encountered. Periodic measurements will also be taken in any confined areas that may contain and accumulate combustible vapors.

5.1.2 Tripping, Slipping, and Falling Hazards

Personnel will be reminded daily to maintain sure footing on all surfaces. Use of safety harnesses will be required for any personnel working 6 or more feet above any surface, including on manlifts. Use of handrails when climbing stairs will be enforced, and handrails will remain secure until the support structure itself is removed and lowered to ground level.

Work surfaces of unknown or suspect integrity will be strengthened or overlain with a work platform capable of supporting all personnel and equipment in use in that area.

In order to minimize tripping hazards caused by construction debris, material will be removed daily from the work areas and stockpiled in appropriate designated storage areas. This "house cleaning" effort will be enforced by the SSO at the end of each day.

5.1.3 Head, Eye, and Back Injuries

As minimum requirements, hard hats and safety glasses will be donned prior to performing any site activities. This will prevent minor injuries caused by bumping one's head while working around and under construction equipment. Personnel will be trained in and required to use proper lifting techniques for lifting heavy objects.

5.1.4 Falling Objects

Tasks should be accomplished without allowing any object to free-fall to the ground. All equipment and material will be slowly lowered to the ground using a grapple and/or skip bucket. No personnel shall work under this equipment at any time and adequate space shall be clear of personnel while the equipment is in operation.

5.1.5 Heavy Equipment and Traffic

The use of heavy equipment onsite presents the greatest potential for injury to personnel. In order to minimize these hazards, designated routes will be established for mobilization through the facility and specific traffic patterns will be established. All trucks will use spotters for backing procedures. Personnel needing to approach heavy equipment during operation will observe the following protocols: make eye contact with the operator, signal the operator to cease heavy equipment activity, and approach the equipment and inform the operator of intentions.

Only qualified personnel will operate heavy equipment. Subcontractors will supply proof of operators' qualifications to operate the equipment in a safe manner. Those crew members directly involved with spotting for the operator will be the only personnel allowed within the operating radius of the heavy equipment. All other personnel will remain a safe distance away from these operations.

Project personnel are required to follow all traffic rules. Vehicles will yield to all bikes, pedestrians, and railroad crossings.

5.1.6 Electrical Hazards

In order to prevent accidents caused by electric shock, all electrical connections will be inspected on a daily basis. Any equipment that is found to have frayed wiring or loose connections will be shut down and locked-out until a qualified electrician has repaired the equipment.

Electrical equipment will be de-energized and tested before any electrical work is done. All equipment will be properly grounded prior to and during all work.

In addition, ground fault circuit interrupters (GFCIs) will be installed whenever possible in each circuit between the power source and tool, unless the presence of a potentially explosive atmosphere precludes this procedure. In the event that generators are used to supply power, these generators will be equipped with GFCIs.

5.1.7 Welding Hazards

Personnel who will be performing or observing welding operations are required to use approved welding shields or glasses. Welding shields and glasses are to be inspected prior to each use for scratches and pits that would inhibit their ability to shield harmful ultraviolet light.

Personnel will be required to wear protective clothing to shield the skin from the harmful ultraviolet light produced by welding operations. Personnel working near welding operations which could ignite chemical protective clothing must wear flame retardant outer apparel (Nomex or equivalent).

5.2 CHEMICAL HAZARDS

Hazardous chemicals that may be encountered onsite include diesel and gasoline hydrocarbons. These chemicals are volatile, flammable, and moderately to extremely toxic. Potential hazards associated with petroleum hydrocarbons include inhalation, ingestion, and skin absorption of toxic vapors, liquids, or dusts.

Gasoline vapors in high concentrations (greater than 300 ppm) can cause eye, nose, and throat irritation, headaches, dizziness, and anesthesia. Skin contact with liquid gasoline may result in irritation and dermatitis, and absorption of specific toxic petroleum fractions. Toxic petroleum hydrocarbon substances include the following VOCs: benzene, toluene, ethylbenzene, and total xylenes (BTEX). Benzene is a suspected human carcinogen and, along with toluene and xylenes, can cause damage to an unprotected individual's liver, kidneys, and central nervous system. Ethylbenzene is a skin irritant in vapor and liquid form.

Workers who must come in direct contact with VOC-contaminated soil or ground water for sampling purposes will be required to wear protective gloves and/or necessary protective clothing to prevent skin contact.

5.3 ENVIRONMENTAL HAZARDS

5.3.1 Heat Stress

Heat stress may be caused by the combination of ambient factors such as high air temperature, high relative humidity, and low air movement. This condition can result in heat rash, heat cramps, heat exhaustion, and/or heat stoke; it can impair worker coordination and judgement and directly impact health and safety. Heat stress is more likely when personal protective equipment is in use. Project personnel will be provided with beverages, shaded rest areas, and breaks, as needed, to prevent heat stress.

5.3.2 Cold Exposure

To guard against cold injury (frostbite and hypothermia), which is a danger when the temperature and wind-chill factor are low, employees will wear appropriate clothing, have warm shelter readily available, and maintain carefully scheduled work and rest periods.

5.3.3 Biological Hazards

The only biological factors anticipated during operations would be those posed by poisonous plants, insects, animals, and indigenous pathogens. Protective clothing and respiratory equipment can help reduce the chances of exposure. Thorough washing of any exposed body parts and equipment will help protect against infection.

5.3.4 Noise Exposure

Hearing protection will be worn when project personnel enter high-noise areas. In addition, audiograms will be included in annual physicals and personnel will be restricted from high noise exposure should a standard threshold shift be detected. The Alton hearing conservation program is in compliance with both California and Federal Hearing Conservation Standards. Subcontractors are required to have a similar hearing conservation program.

6.0 CONFINED SPACES

A confined space is any space that has one or more of the following characteristics:

Limited openings for entry and exit
Unfavorable natural ventilation
Increased risk for hazardous atmospheres
Not designed for continuous worker occupancy

No confined space entry is anticipated during the course of these operations. However, if such a situation is encountered, workers are prohibited from entering confined spaces until the company plan dealing with confined spaces has been implemented.

7.0 HAZARD REDUCTION

7.1 PERSONAL PROTECTIVE EQUIPMENT

Field personnel involved in site assessment, remediation, and construction activities are required to be prepared with the following personal protective equipment:

Hard hats
Half-face air purifying respirators with organic vapor cartridges and dust/mist filters
Safety glasses with side-shields, or splash goggles

Tyvek coveralls and other suitable work clothing
Chemical-resistant gloves
Steel-toe boots or boot covers
Ear plugs or other suitable hearing protection
Traffic safety vests

7.2 AIR MONITORING

7.2.1 Personal and Ambient Air Monitoring

Personal and ambient air monitoring will be conducted as necessary in order to characterize airborne contamination levels. Air monitoring will ensure that respiratory protection is adequate to protect personnel against chemicals encountered.

Personal air sampling for volatile organic vapors will be conducted to assist in selecting appropriate respiratory protective equipment. A photoionization detector (PID) will be used for monitoring of volatile organics in accordance with the requirements outlined in Title 8 CCR 5192.

All personal and ambient sampling will be in accordance with either National Institute for Occupational Safety and Health (NIOSH)/OSHA or EPA methods.

7.2.2 Environmental Controls

Airborne concentrations of VOCs will be monitored with the CGI described above in Section 5.1.1 (Explosion and Fire). In the event that CGI readings anywhere on the site exceed 10 percent of the LEL, work will be suspended, monitoring will be continued as necessary to isolate the area of concern, and any or all of the following environmental controls will be implemented as appropriate:

1. Vapors from pooled petroleum product will be suppressed (if necessary) by spraying with foam, appropriate chemical suppressant, or carbon dioxide in gas form or dry ice.

2. Air movers will be used to ventilate the areas of concentration to below 10 percent LEL.

3. Borings emitting excessive VOC concentrations will be ventilated, capped, or shut in as necessary.

4. Contaminated soil will be covered with clean soil and/or sprayed with water or deodorizing chemicals in order to reduce vaporization of VOCs.

5. Drilling equipment will be bonded and grounded during the operations to control ignition sources.

7.2.3 Protection from Airborne Toxic Chemicals

Workers will be required to wear half-face, air-purifying respirators with organic vapor cartridges under the following circumstances:

1. If the worker is continuously exposed throughout the day to VOC vapors that exceed the permissible exposure level time-weighted average (PEL-TWA) for gasoline (300 ppm).

2. If the worker is exposed at any time to VOC vapors that exceed the permissible exposure level short-term exposure limit (PEL-STEL) for gasoline (500 ppm).

Similar precautions will be taken with regard to other toxic chemicals, such as BTEX components. If VOC vapors exceed 1,000 ppm, full-face air purifying respirators with organic vapor canisters will be worn.

7.3 ENGINEERING CONTROLS

7.3.1 Site Pre-Inspection of Equipment

Underground utilities will be located and identified prior to any operation; power lines and pipelines will be shut down, locked out, and tagged, as appropriate. When operating heavy equipment (such as cranes) near overhead power lines, care will be taken to insure that the crane boom or rigging always maintains a distance of at least 10 feet from the power lines.

Only equipment that is in safe working order will be used. To maintain this policy, all equipment brought onto the project site will be inspected for structural integrity, smooth operational performance, and proper functioning of all critical safety devices in accordance with the manufacturer's specifications. Equipment not conforming to the operational and safety requirements during this inspection will not be put into service until all necessary repairs are made to the satisfaction of the inspection group.

7.3.2 Excavation Soil Handling, Access/Egress Ramps, and Trenching

Excavation, handling, stockpiling, and backfilling will not be conducted whenever the average wind speed is greater than 15 miles per hour (mph), or when the wind speed instantaneously exceeds 25 mph. During these activities, the working areas, excavated material, and unpaved roadways will be watered down (if necessary) until the surface is moist, and maintained in a moist condition to minimize dust.

Access and egress ramps shall be designed by a qualified soils engineer, and maintained in areas of excavation or trenching greater than 4 feet in depth. The ramps will be positioned so that no more than 25 feet of lateral travel is necessary to access them. The stability of adjacent structures must be determined prior to entering a trench or excavation greater than 4 feet in depth. All trenches more that 4 feet in depth will be shored or have the sides sloped. All trenching and shoring will be inspected daily.

Workers shall not be permitted underneath loads handled by excavation or loading equipment. Barriers shall be constructed to keep equipment and personnel away from the edge of the excavation.

7.4 SAFETY INSPECTIONS

Walk-through safety inspections of the work area will be conducted daily before the start of work and as conditions change. The results of these surveys will be communicated to the work crews during regularly scheduled "tailgate" safety meetings. The safety procedures and the day's planned operations will be discussed at these sessions.

7.5 ACCESS TO WORK AREA AND DISPOSITION OF MATERIALS

Access to work areas will be limited by the SSO to essential personnel. Excavation, drilling, and construction areas will be cordoned off with delineators, barriers, and/or taping. Excavated soil will be stockpiled and covered, or stored in closed drums or roll-off bins. Purged water will be stored in closed drums. Drums and/or roll-off bins containing soil or water will be clearly labeled. Hydrocarbon-affected soil and/or water will be removed from the site at the earliest opportunity.

8.0 EMERGENCY RESPONSE

The SSO will have controlling authority during an emergency. In the event that this person is not available, the Alternate Safety Officer will be in charge. Prior to field activities, the SSO shall plan emergency egress routes and discuss them with all personnel who will be conducting the field work. Initial planning includes establishing and posting of emergency warning signals and evacuation routes in case of an emergency. Emergency response organizations, locations, and contacts are listed at the end of this SSP.

9.0 LIST OF KEY PERSONNEL

Site Safety Officer:	Ron Scheele Alton Geoscience
Alternate Safety Officer:	Alan Lopez Alton Geoscience
Supervisor/Offsite Coordinator: (510) 606- 9150	Ron Scheele Alton Geoscience
Client Contact: (510) 625-1173	Cherine Foutch Mobil Oil Corporation

EMERGENCY SERVICES

The following list provides the location and telephone number for emergency services in the vicinity of the project site. Directions to medical facilities are included below, and a map is attached at the end of this site safety plan.

LOCATION	TELEPHONE
Emergency Situation:	911
Medical Facilities:	
Valley Care Medical Center 5555 West Las Positas Boulevard Pleasanton, California	(510) 847-3000

Directions:

NORTH on Santa Rita Road, LEFT onto West Las Positas Boulevard, hospital on north side of West Las Positas Boulevard.

Fire Department:	
Pleasanton Fire Department 200 Old Bernal Avenue Pleasanton, California	(510) 484-8114
Police Department:	
Pleasanton Police Department-City Hall 200 Old Bernal Avenue Pleasanton, California	(510) 484-8127
Poison Control Center:	(800) 662-9886
Office of Emergency Services	(800) 852-7550
USA Dig Alert:	(800) 227-2600

SITE SAFETY PLAN COMPLIANCE LOG

For Activities Performed at:

FORMER MOBIL STATION 04-H6J
1024 Main Street
Pleasanton, California

I have read and understand this Site Safety Plan and hereby agree to comply with all safety requirements outlined herein.

Signature: ______________________________ Date: ________________
Site Safety Officer, Alton Geoscience, Inc.

Signature: ______________________________ Date: ________________
Alternate Safety Officer, Alton Geoscience, Inc.

Print Name: ____
Signature: ______________________________ Date: ________________
Company: ______________________________ Title: ________________

Print Name: ____
Signature: ______________________________ Date: ________________
Company: ______________________________ Title: ________________

Print Name: ____
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