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Gene N. Ortega
Territory Manager
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ExxonMobil
Refining & Supply

November 15, 2002

Alameda County
NOV 22 2002
Environmental Health

Mr. Barney Chan
Alameda County Environmental Health Services Agency
1131 Harbor Bay Parkway
Alameda, California 94502

Subject: **Former Mobil Station 99-105, 6301 San Pablo Avenue, Oakland, California**

Dear Mr. Chan:

In accordance with your request, please find enclosed a copy of the Risk-Based Corrective Action Report for the above-referenced site. The report was prepared by TRC of Concord, California to determine if additional remedial activities are warranted to address residual hydrocarbons in the soil and groundwater at the site.

If you have any questions or comments, please call me at (925) 246-8747 or Mr. Jonathan Scheiner at (925) 688-2473.

Sincerely,

Gene N. Ortega
Territory Manager

Enclosure

cc: Ms. Connie Lam, Property Owner
Mr. Jonathan Scheiner, TRC

TRC
Customer-Focused Solutions

RISK-BASED CORRECTIVE ACTION REPORT

FORMER MOBIL STATION 99-105
6301 San Pablo Avenue
Oakland, California

Prepared For:

EXXONMOBIL OIL CORPORATION

By:

TRC
5052 Commercial Circle
Concord, California 94520
(925) 688-1200

October 2002

TRC
Customer-Focused Solutions

RISK-BASED CORRECTIVE ACTION REPORT

FORMER MOBIL STATION 99-105
6301 San Pablo Avenue
Oakland, California

TRC Project No. 41-0123

Prepared For:

EXXONMOBIL OIL CORPORATION

By:

Kristie Wilkie
Project Engineer

Jonathan Scheiner
Associate

Reviewed by

Tracy Walker, R.G.
Associate

REGISTERED GEOLOGIST
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1.0 INTRODUCTION

On behalf of ExxonMobil Oil Corporation, TRC has prepared this Risk-Based Corrective Action (RBCA) Report for the former Mobil Station 99-105, located at 6301 San Pablo Avenue, Oakland, California (Figure 1). This report has been prepared pursuant to requirements of Alameda County Environmental Health Services (ACEHS), as specified in a letter dated December 7, 2001 (Appendix A). The findings presented in this report demonstrate that there are no significant risks to human health or the environment due to existing site conditions. TRC, therefore, recommends continuation of quarterly monitoring and sampling for four quarters followed by site closure.

The purpose of this RBCA evaluation is to determine if additional remedial actions are warranted to address residual hydrocarbons present in the soil and groundwater at the site. This evaluation was performed in accordance with the procedures of the American Society for Testing and Materials standard guide for *Risk-Based Corrective Action Applied to Petroleum Hydrocarbon Sites* (ASTM, 1995) as modified by the City of Oakland for the Oakland region (Oakland, 2001). The 3-tiered Oakland RBCA uses Oakland-specific input parameters in the ASTM equations where appropriate, and is analogous to the 3-tiered format of the ASTM RBCA guide. Tier 1 uses generic information applicable to all sites in the Oakland area (Oakland, 2001). Tier 1 established risk-based screening levels (RBSLs) which can be used to determine if further evaluation is necessary. Tier 2 allows for the incremental addition of site specific information and is accompanied by a checklist of criteria as a guide to ensure matching of site conditions to the Tier 2 parameter values. If a site does not match all of the Tier 2 checklist requirements, then site specific information must be used for those items that do not match the checklist requirements. A Tier 3 evaluation involves analyses of site specific conditions, including but not limited to site investigations to collect information for use in site specific analytical models.

The RBCA evaluation presented herein includes Tier 1 and Tier 2 screening procedures; a Tier 3 evaluation was not warranted. As described below, the screening procedures involve the following components:

- Identification of Constituents of Potential Concern (COPCs)
- Identification of Potential Human Receptors
- Evaluation of Potential Exposure Pathways (i.e., by which COPCs may impact identified receptors)

Both commercial and residential indoor air exposure scenarios were identified as areas of focus in the RBCA evaluation. Specifically, the following have been evaluated: (1) the Oakland RBCA Tier 1 RBSLs; and (2) the Oakland RBCA Tier 2 Site Specific Target Levels (SSTLs) for Oakland Merritt Sands, silty sands, and clayey sands.

2.0 SITE DESCRIPTION

2.1 OVERVIEW

Present Site Use: The property is currently being used as an automobile oil change facility. A Site Plan is presented in Figure 2.

Past Site Uses: The site was a Mobil service station from 1951 until 1980 after which it was used as a car rental lot. The former underground storage tanks (USTs) were not in use after 1980, and were removed in 1994. Methyl tertiary butyl ether (MTBE) has not been reported to have ever been used at the site.

Adjacent Property And Site Uses: The site is located on the northwest corner of San Pablo Avenue and 63rd Street in Oakland, California (Figure 1). Commercial properties are situated to the north along San Pablo Avenue. To the east, across San Pablo Avenue, is an elementary school, and to the west and south are residential properties.

Geography: San Francisco Bay is located approximately 5,000 feet to the west of the site. Topography in the vicinity of the site is relatively flat but slopes gently west. The site has an elevation of approximately 22 feet above mean sea level (USGS, 1959).

Soil Lithology: Soils encountered beneath the site generally consist of clayey sand, sandy clay, gravely silts, and minor fine gravels and sand lenses from the surface to approximately 18 feet below grade (fbg) (Alton Geoscience, 1999b). Inorganic silts, clayey sands, and inorganic clays of low to medium plasticity extend beneath the Site to a depth of approximately 10-20 fbg, based on geologic logging of soils during monitoring well installation activities conducted in 1996. Monitoring well boring logs are presented in Appendix B. Geologic cross sections based on boring logs for these monitoring wells are presented in Figures 3 and 4.

Regional Geology The site is underlain by the Quaternary Temescal Formation, which consists of interfingering layers of clayey gravel, sandy silty clay, and various clay-silt-sand mixtures. The formation varies in thickness to a maximum of approximately 60 feet. Underlying the Temescal Formation is the Quaternary Alameda Formation, which consists of unconsolidated continental and marine gravels, sands, silts, and clays, with some shells and organic material in places. The formation has a maximum known thickness

of 1,050 feet (Radbruck, 1957).

Regional Hydrogeology: The site is located in the East Bay Plain Groundwater Basin. Groundwater generally flows westward toward the San Francisco Bay (RWQCB, 1995). A groundwater elevation contour map is presented in Figure 5.

Sensitive Receptors: A sensitive receptor survey conducted in September 2001 indicated that no supply wells are located within a 1/2-mile radius of the site. San Francisco Bay is located approximately 5,000 feet to the west of the site. To the east, across San Pablo Avenue, is an elementary school.

2.2 BACKGROUND AND CURRENT SITE CONDITIONS

- Four gasoline USTs and one used oil UST were excavated and removed from the site in 1994 (Figure 2). The product piping was removed from the site in February 1996. An estimated 367 cubic yards of soil was excavated and removed from the site during the UST and piping removals (Alisto, 1996).

- Four groundwater monitoring wells (MW-1 through MW-4) were installed in March 1996 (Figure 2) (Alisto, 1996).

- Thirteen soil borings (AB-1 through AB-13) were drilled at the site in March 1998 (Figure 2) (Alton Geoscience, 1998).

- On November 19, 1998, a dual-phase vacuum extraction (DPVE) event was conducted. Six temporary monitoring points (MP-1 through MP-6) were advanced to further characterize the extent of hydrocarbon-impacted vadose zone soil and to obtain vacuum readings and groundwater depths during the DPVE event. Groundwater and vapors were extracted from wells MW-3 and MW-4. Vacuum response and groundwater depths were measured in the temporary monitoring points and monitoring wells during the DPVE event. Approximately 21 pounds of vapor-phase hydrocarbons and 75 gallons of hydrocarbon-impacted groundwater were recovered during the event (Alton Geoscience, 1999b). Following the extraction event, monitoring points MP-1 through MP-6 were abandoned in place.

- In early 1999, over 200 cubic yards of soil were removed from the north area of the Site during redevelopment activities conducted by the current property owner (i.e., as part of the construction of the current oil change facility - See Figure 2 for location of facility). Monitoring well MW-4 was inadvertently destroyed during these construction activities.
- During and shortly after soil excavation and site development activities were completed,

communications between responsible parties and ACEHS were conducted to determine the disposition of excavated soil and to ensure the absence of residual hydrocarbons in soils following excavation activities. Copies of these communications which are included in Appendix C, document discussions regarding sampling of soils excavated by the property owner and associated confirmation analyses, and include the following letters:

- ACEHS to Mobil Oil Company (Mobil) and Ms. Connie Lam[b] (property owner), dated July 9, 1999.
- ACEHS to Mobil and Ms. Connie Lam[b], dated October 28, 1999.
- ACEHS to Mobil and Ms. Connie Lam[b], dated January 25, 2000.
- ACEHS to Mobil and Ms. Connie Lam[b], dated March 3, 2000.

- MW-1 was properly abandoned during July 1999 in preparation of the construction activities (TRC Alton Geoscience, 1999).

- In January 2000, one soil boring (HA-1) was advanced in the footprint area of the oil change facility (i.e., prior to construction of the building) to confirm the absence of hydrocarbon impacts in this area (Figure 2).

- Two of the three monitoring wells damaged during construction activities conducted by the current property owner in 1999 (MW-2 and MW-3) were rehabilitated in Fall 2000, and the third (MW-4) was replaced by newly installed MW-5 at this time. As indicated above, monitoring well MW-1 was properly abandoned in place. The remaining three wells (MW-2, -3, -5) constitute the current monitoring well network and have been monitored on a quarterly basis (Figure 2).

- Twenty quarters of groundwater monitoring and sampling have been conducted at the Site since the initial installation of MW-1 through MW-4 in March 1996. Elevated levels of hydrocarbons have been reported in monitoring well MW-3. Free product hydrocarbons have been reported in MW-4 since the third quarter of 1996. On January 27, 1999, 0.07 foot of free product was measured in MW-4 (Alton Geoscience, 1999a), prior to destruction of the monitoring well during construction activities at the site. To date, no detectable levels of MTBE have been reported in any of the monitoring wells by EPA Method 8020, nor by confirmation analyses using EPA Method 8260.

- The average depth to groundwater at the site is approximately 7.15 fbg, based on water level monitoring conducted on January 18, 2002 (TRC, 2002). Historical groundwater depths have ranged from 3.83 fbg (MW-1: January 31, 1997) to 11.57 fbg (MW-3: October 20, 1998). The groundwater gradient was calculated to be 0.25 foot per foot (ft/ft) toward the west in January 2002. The groundwater flow direction has varied from the northwest (April, 1997) to the southwest (January, 1999) (Alton Geoscience, 1997; 1999a).

3.0 RISK-BASED CORRECTIVE ACTION EVALUATION

3.1 CONCEPTUAL MODEL

Results of previous site assessment and groundwater monitoring and sampling activities indicate the presence of hydrocarbons in the vicinity of the former gasoline USTs and dispenser island. Petroleum hydrocarbons detected in onsite soil borings were generally encountered at depths between 5 and 10 fbg. Measurable levels of free-phase hydrocarbons were detected onsite in MW-4 prior to the destruction of the well in 1999. Free-phase hydrocarbons have not been detected in the other wells.

3.2 CHEMICALS OF POTENTIAL CONCERN, POTENTIAL EXPOSURE PATHWAYS, EXPOSURE SCENARIOS, AND POTENTIAL PREFERENTIAL PATHWAYS

3.2.1 Chemicals of Potential Concern

Consistent with a gasoline release, BTEX and MTBE represent the COPCs for the RBCA analysis.

3.2.2 Potential Exposure Pathways

There are two secondary sources of COPCs: (1) impacted subsurface soils, and (2) impacted shallow subsurface groundwater. Potential exposure pathways by which current workers or future building occupants could be impacted by these contaminant sources include:

- Ingestion of Impacted Soils
- Dermal Contact with Impacted Soils
- Inhalation of Dust Containing COPCs
- Ingestion of Impacted Shallow Groundwater
- Dermal Contact with Impacted Shallow Groundwater
- Indoor Inhalation of Volatile Components in Shallow Soils and/or Shallow Groundwater

Since the site is paved, exposure pathways involving direct contact with shallow soils are not viable or complete for the purposes of this analysis. Similarly, exposure pathways involving direct contact with shallow groundwater are not viable, since the shallow groundwater beneath the site is not potable and potable water is available from surface water sources obtained from regional providers. Therefore, the only viable exposure pathways involve indirect contact with COPCs in shallow soils or groundwater (i.e., via inhalation of volatile components in indoor air emanating from sources in the shallow soil or groundwater).

Based on the absence of utilized municipal or domestic groundwater wells, the potential ingestion of groundwater from an offsite groundwater well is not considered a complete exposure pathway and will not be quantitatively evaluated.

3.2.3 Exposure Scenarios

Sensitive Receptors

The nearest potential sensitive receptor for exposure to contaminated groundwater is the inspection pit located below grade within the oil change facility onsite. Workers at the oil change facility could be exposed to vapors migrating into the inspection pit or building. Given the previous soil excavation (to an approximate depth of six feet below grade) by the current property owner during construction of the existing facility, it is likely that residual impacts to subsurface soil in this area have been mitigated.

Potential future occupants of structures built directly above impacted areas of the site are considered sensitive receptors due to the potential for indoor air inhalation of volatile hydrocarbon components.

Sensitive receptors may also include occupants of the church located adjacent to and down-gradient of the Site. Since the gradient is defined to be in the westerly direction, low levels of volatile hydrocarbon components could potentially migrate through the vadose zone and into overlying structures.

Land Use

The site is currently being used as an oil change facility and is surrounded by other commercial properties and residences. Both San Pablo Avenue and 63rd Street are highly traveled and busy streets. It is likely that land use on the site will remain commercial. The current oil change facility was constructed in 1999, and there are no plans for future site construction or redevelopment.

3.2.4 Potential Preferential Migration Pathways

Preferential pathways for the migration of free- and dissolved-phase chemicals may occur where either natural (i.e., stream beds) or man-made (i.e., subsurface utilities) features exist. Of primary concern are features which are more permeable or transmissive than the native soil conditions. Generally, the presence of man-made features can be determined by completing a survey of nearby subsurface utilities. Specific details regarding these features that are important in evaluating the potential influence of a preferential pathway include the depth and dimensions of the feature.

Subsurface utility research has been performed for features adjacent to the site. Specifically, north-south trending subsurface public utilities in the vicinity of San Pablo Avenue and east-west trending subsurface public utilities beneath 63rd Street were investigated. The utilities servicing the site originate beneath San Pablo Avenue. Utility vaults are located adjacent to the site along San Pablo Avenue.

Previous site investigations reveal low to non-detectable levels of hydrocarbons in groundwater east and south of the site, adjacent to San Pablo Avenue and 63rd Street. Specifically, borings AB-8, AB-10, and AB-13 (March, 1998) indicate low to non-detectable levels of petroleum hydrocarbons in the groundwater in these areas. In addition, San Pablo Avenue and 63rd Street are up-gradient from the area impacted by hydrocarbons. Therefore, utilities servicing the onsite facility and nearby public utilities are not considered to be a complete pathway.

Groundwater beneath the site is generally present at depths between 5 and 12 fbg in site monitoring wells. Subsurface utilities at depths shallower than 5 fbg would therefore not serve as preferential pathways for the migration of groundwater.

3.3 DEFAULT AND SITE SPECIFIC PARAMETERS

This evaluation incorporates ASTM default parameter values, except where the Oakland RBCA has modified those default values or site specific information is available. The following assumptions are made in this evaluation:

- Available laboratory results of soil samples collected and analyzed since 1996 are considered reliable and appropriate for the purpose of evaluating the indoor air exposure risk.
- To evaluate the indoor air exposure risk to workers at the current oil change facility and residents or workers in a potential future building onsite, analytical results from soil borings MW-1 through MW-4, AB-1 through AB-13, MP-1 through MP-6, and HA-1 have been evaluated. The highest concentration of hydrocarbons in soil was reported in two samples collected from MW-2 and MW-4 at 5-10 fbg.
- Volatile secondary soil sources may not be continuously exposed to soil pores in the vadose zone due to fluctuating groundwater levels at the site. Nonetheless, in this evaluation, volatile components of secondary soil sources are assumed to be continuously available to propagate through the vadose zone.
- The Site consists predominantly of sandy silts based on boring and monitoring well logs from previous onsite drilling activities. However, to be conservative, Tier 2 analyses compare site concentrations with a range of Oakland area soil conditions.

3.4 EVALUATION OF INDOOR AIR EXPOSURE RISKS

The BTEX and MTBE compounds in the soil and groundwater are compared to the Oakland RBCA RBSLs and SSTLs for both commercial and residential scenarios to (Tables 3 and 4). This conservative approach includes the evaluation of health risks associated with potential exposures to (maximum reported) BTEX and MTBE concentrations in soil and groundwater.

Use of the Oakland RBCA default values requires matching site conditions to the default values therein. The Oakland RBCA Eligibility Checklist is included in Appendix D. As indicated in the checklist, the site meets the listed criteria, and therefore, the Oakland default RBSLs and SSTLs are applicable (included in Appendix E).

3.4.1 Tier 1 Analysis

Maximum soil and groundwater concentrations of BTEX and MTBE were compared to the Oakland RBCA Tier 1 residential and commercial target levels. Of the COPCs, only benzene in the soil and groundwater exceeds the residential or commercial RBSL. Toluene, ethylbenzene, total xylenes, and MTBE in the soil and groundwater are not present at concentrations great enough to present health risks via the identified exposure pathways above thresholds established by the City of Oakland (see Tables 3 and 4). Therefore, these chemical compounds are excluded from further consideration.

3.4.2 Tier 2 Analysis

Maximum soil and groundwater concentrations of BTEX and MTBE were compared to the Oakland RBCA Tier 2 residential and commercial SSTLs (Tables 3 and 4). The maximum concentrations of benzene in the groundwater detected at the site are below the applicable Oakland SSTLs over a wide range of Oakland area soil conditions. Therefore, the dissolved-phase benzene at the site is not considered to pose health risks above thresholds established by the City of Oakland (see Table 4), and is excluded from further consideration.

The maximum benzene concentration in soil (1.2 ppm [MW-2 @ 10 fbg and MW-4 @ 5 fbg]) exceeds the Oakland RBCA residential SSTL for Merritt Sands (0.07 ppm) and Sandy Silts (1.1 ppm).

In assessing the potential human health risk associated with exposure to benzene in the shallow soil, it is important to note the following:

- Site development activities in 1999 resulted in the removal of approximately 200 cubic yards of soil in the central area of the site (i.e., including impacted soils in the vicinity of MW-4). Therefore, although the reported benzene concentration in a soil sample collected from MW-4 in 1996 exceeded the Oakland RBCA residential SSTLs, current soil conditions likely have lower levels of benzene and other COPCs.
- Comparisons are based on maximum soil concentrations of benzene at the Site. Average benzene concentrations are likely lower than the maximum levels.
- Boring logs of MW-2 indicate predominantly sandy silts. The maximum benzene concentration in soil (1.2 ppm from MW-2 in 1996) exceeds the Oakland RBCA residential SSTL of 1.1 ppm for sandy silts by 0.1 ppm.

- The site was recently redeveloped and is currently commercially operated. Maximum benzene concentrations in soil are below the Oakland RBCA commercial/industrial SSTLs for the wide range of Oakland soil conditions considered.
- The maximum benzene soil concentration cited above was obtained during drilling activities in March 1996. Natural attenuation processes have been in effect for six years and have likely resulted in reduced soil benzene concentrations.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The COPCs identified in this evaluation are BTEX and MTBE in the soil and groundwater beneath the Site. Although a number of potential exposure pathways were evaluated for the COPCs (e.g., groundwater ingestion, dermal contact), only the pathway involving indoor inhalation of volatile components is considered complete. Potential receptors associated with this vapor migration pathway include: (1) current workers at the existing onsite oil change facility; and (2) potential future occupants of a structure built in the central area of the site. The results of the evaluation of the potential indoor air exposure risks to these sensitive receptors can be summarized as follows:

1. Toluene, ethylbenzene, total xylenes, and MTBE concentrations in the soil and groundwater are below the respective Oakland RBCA RBSLs (Tier 1).
2. The maximum benzene concentration in the groundwater is below the Oakland RBCA SSTLs (Tier 2) for a wide range of soil conditions (Merritt Sands, sandy silts, and clayey sands).
3. The maximum benzene concentration in the soil is below the Oakland commercial RBCA SSTLs for the wide range of soil conditions evaluated.
4. The maximum benzene concentration in the soil (1.2 ppm) is above the Oakland residential RBCA SSTL for sandy silts (1.1 ppm), the predominant site soil type.

This evaluation has assumed a non-diminishing secondary source and a constant vapor flux rate over the entire potential exposure duration assessed. However, historical monitoring and sampling has demonstrated that the dissolved-phase hydrocarbons have decreased over time, and the hydrocarbons are expected to continue to decrease in the future.

Based on these findings and the issues addressed in Section 3.4.2, Tier 2 Analysis, potential health risks posed to either current site workers or future residents/workers are likely not significant.

TRC requests that quarterly monitoring and sampling be continued for one additional year to confirm observed long term trends in hydrocarbon concentrations. Pending regulatory approval, TRC recommends site closure.

5.0 REFERENCES

Alisto Engineering Group, 1996, Additional Tank Closure and Preliminary Site Investigation Report, Former Mobil Oil Corporation, Station 99-105, 6301 San Pablo Avenue, Oakland, California, April 15.

Alton Geoscience, 1997, Quarterly Progress Report, Former Mobil Station 99-105, 6301 San Pablo Avenue, Oakland, California, July 15.

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Alton Geoscience, 1999a, Quarterly Progress Report, Former Mobil Station 99-105, 6301 San Pablo Avenue, Oakland, California, April 15.

Alton Geoscience, 1999b, Interim Remedial Action Report, Former Mobil Station 99-105, 6301 San Pablo Avenue, Oakland, California, May 18.

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TRC , 2002, Quarterly Progress Report, Former Mobil Station 99-105, 6301 San Pablo Avenue, Oakland, California, January 18.

United States Geological Survey (USGS), 1959 (Photorevised 1980), Oakland West Quadrangle, California, 7.5 Minute Series, USGS, Denver, Colorado.

Table 1
Summary of Soil Sample Analysis
Former Mobil Station 99-105

Sample ID	Depth (feet)	Date	TPH-G (ppm)	TPH-D (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Total Xylenes (ppm)	TOG (ppm)	Lead (ppm)	MTBE (ppm)	MTBE 8260 (ppm)
MW-1	5-5.5'	03/01/96	ND<1.0	3.4	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	—	ND<2.5	—	—
MW-1	10-10.5'	03/01/96	ND<1.0	ND<1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	—	ND<2.5	—	—
MW-1	15-15.5'	03/01/96	ND<1.0	4.2	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	—	ND<2.5	—	—
MW-2	5-5.5'	03/01/96	ND<1.0	2.4	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	—	ND<2.5	—	—
MW-2	10-10.5'	03/01/96	220	57	1.2	1.4	2.7	14	—	ND<2.5	—	—
MW-2	15-15.5'	03/01/96	ND<1.0	ND<1.0	ND<0.0050	ND<0.0050	0.0063	0.035	—	ND<2.5	—	—
MW-3	5.5-6'	03/01/96	ND<1.0	1.1	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	9.0	ND<2.5	—	—
MW-3	10.5-11'	03/01/96	53	72	0.032	0.43	0.65	0.93	290	ND<2.5	—	—
MW-3	15.5-16'	03/01/96	ND<1.0	ND<1.0	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.0050	10	ND<2.5	—	—
MW-4	5.5-6'	03/01/96	280	34	1.2	1.0	4.1	19	—	ND<2.5	—	—
MW-4	10.5-11'	03/01/96	5.8	7.7	0.11	ND<0.0050	0.11	0.093	—	ND<2.5	—	—
MW-4	15.5-16'	03/01/96	5.6	2.1	0.076	0.023	0.083	0.070	—	ND<2.5	—	—
AB-1	5-6'	03/05/98	ND	—	ND	ND	ND	ND	—	—	ND	—
AB-2	4-5'	03/05/98	ND	—	ND	ND	ND	ND	—	—	ND	—
AB-3	5.5'	03/05/98	ND	—	ND	ND	ND	ND	—	—	ND	—
AB-4	5-6'	03/05/98	18	—	ND	ND	ND	ND	—	—	ND	—
AB-5	3-4'	03/05/98	170	—	ND	ND	0.65	ND	—	—	ND	—
AB-6	5'	03/05/98	230	—	ND	ND	ND	ND	—	—	ND	—
AB-7	4-5'	03/05/98	19	—	ND	ND	0.032	ND	—	—	ND	—
AB-8	5'	03/05/98	ND	—	ND	ND	ND	ND	—	—	ND	—
AB-9	4'	03/05/98	16	—	0.006	ND	0.028	ND	—	—	ND	—
AB-10	4'	03/05/98	ND	—	ND	ND	ND	ND	—	—	ND	—

Table 1
Summary of Soil Sample Analysis
Former Mobil Station 99-105

Sample ID	Depth (feet)	Date	TPH-G (ppm)	TPH-D (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Total Xylenes (ppm)	TOG (ppm)	Lead (ppm)	MTBE (ppm)	MTBE 8260 (ppm)
AB-11	5-6'	03/05/98	3.9	—	ND	ND	ND	ND	—	—	ND	—
AB-12	5-6'	03/16/98	ND	—	ND	ND	ND	ND	—	—	ND	—
AB-13	5-6'	03/16/98	ND	—	ND	ND	ND	ND	—	—	ND	—
MP-1	7.5'	11/16/98	10	—	ND	0.007	0.013	ND	—	—	ND	—
MP-2	7'	11/16/98	270	—	ND	0.03	0.29	2.1	—	—	ND	—
MP-2	10.5'	11/16/98	140	—	0.08	ND	0.31	ND	—	—	0.15	—
MP-3	7.5'	11/16/98	230	—	ND	0.10	1.6	ND	—	—	0.28	—
MP-4	5'	11/16/98	120	—	ND	ND	0.35	ND	—	—	0.19	—
MP-4	10'	11/16/98	18	—	ND	0.013	0.070	0.086	—	—	ND	—
MP-5	6.5'	11/16/98	6.4	—	ND	ND	0.015	0.022	—	—	ND	—
MP-5	10.5'	11/16/98	220	—	ND	ND	1.4	3.0	—	—	0.52	—
MP-6	7'	11/16/98	ND	—	ND	ND	ND	ND	—	—	ND	—
MP-6	10'	11/16/98	240	—	ND	ND	1.6	4.2	—	—	0.92	ND
HA-1	5'	01/25/00	ND<0.50	—	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	—	—	ND<0.025	—
Comp-1	Composite	01/25/00	ND<0.50	—	ND<0.0050	ND<0.0050	ND<0.0050	ND<0.010	—	8.04	ND<0.025	—

NOTES:

ppm = parts per million
TPH-G = total petroleum hydrocarbons as gasoline
TPH-D = total petroleum hydrocarbons as diesel
TOG = total oil and grease
MTBE = methyl tert butyl ether

— = not measured/not analyzed
ND = not detected at or above method detection limit

Table 2
Summary of Groundwater Levels and Chemical Analysis
Former Mobil Station 99-105

Well ID	Date	Top of Casing Elevation (feet)	Depth to Water (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	TPH-G (ppb)	TPH-D (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	MTBE 8020 (ppb)	MTBE 8240 or 8260 (ppb)	TOG (ppb)	Lead (ppb)	Dissolved Oxygen (mg/L)
TW-1	01/04/96	—	6.00	—	0.00	ND	700	ND	ND	ND	ND	—	—	—	—	—
WW-1	01/04/96	—	3.00	—	0.00	ND	—	ND	ND	ND	ND	—	—	ND	—	—
MW-1	03/14/96	32.79	4.50	28.29	0.00	610	450	0.75	0.54	1.5	59	—	—	—	ND	—
MW-1	05/21/96	32.79	5.64	27.15	0.00	ND	ND	ND	ND	ND	ND	—	—	—	—	—
MW-1	08/13/96	32.79	9.76	23.03	0.00	ND	ND	ND	ND	ND	ND	—	—	—	—	—
MW-1	11/08/96	32.79	10.24	22.55	0.00	ND	ND	ND	0.92	ND	2.1	ND	—	—	—	—
MW-1	01/31/97	32.79	3.83	28.96	0.00	ND	ND	ND	0.85	ND	ND	2.6	ND	—	—	—
MW-1	04/22/97	32.79	9.14	23.65	0.00	ND	ND	ND	ND	ND	ND	ND	—	—	—	—
MW-1†	07/29/97	32.79	10.18	22.61	0.00	ND	60****	0.84	0.95	ND	1.6	36	—	—	—	—
MW-1†	10/09/97	32.79	10.46	22.33	0.00	ND	56****	ND	ND	ND	ND	ND	—	—	—	—
MW-1†	01/23/98	32.79	3.95	28.84	0.00	ND	33	ND	ND	ND	ND	ND	—	—	—	—
MW-1	04/22/98	32.79	5.33	27.46	0.00	ND	ND	ND	ND	ND	ND	ND	—	—	—	1.25
MW-1	07/21/98	32.79	9.17	23.62	0.00	ND	—	ND	ND	ND	ND	ND	—	—	—	4.34
MW-1	10/20/98	32.79	10.41	22.38	0.00	ND	—	ND	ND	ND	ND	ND	—	—	—	2.49
MW-1	01/27/99	32.79	5.51	27.28	0.00	ND	—	ND	ND	ND	ND	ND	—	—	—	5.25
MW-1	Destroyed during construction activities in April 1999															
MW-2	03/14/96	32.80	4.51	28.29	0.00	560	250	2.0	0.96	4.3	11	—	—	—	ND	—
MW-2	05/21/96	32.80	5.65	27.15	0.00	730	560	5.1	1.4	6.7	5.9	—	—	—	—	—
MW-2	08/13/96	32.80	10.14	22.66	0.00	490	380*	25	3.5	7.2	13	—	—	—	—	—
MW-2	11/08/96	32.80	10.70	22.10	0.00	520	160***	80	2.7	14	66	6.1	—	—	—	—
MW-2	01/31/97	32.80	3.84	28.96	0.00	74	130*	ND	ND	ND	ND	ND	—	—	—	—
MW-2	04/22/97	32.80	9.61	23.19	0.00	260	430	2.7	ND	2.5	ND	ND	—	—	—	—
MW-2†	07/29/97	32.80	10.53	22.27	0.00	320	150***	28	1.2	10	ND	ND	—	—	—	—
MW-2†	10/09/97	32.80	10.87	21.93	0.00	460	160*	43	2.8	2.0	2.6	2.6	—	—	—	—
MW-2†	01/23/98	32.80	3.75	29.05	0.00	ND	54	ND	ND	ND	ND	ND	—	—	—	—
MW-2	04/22/98	32.80	5.36	27.44	0.00	180	540	1.2	0.3	0.4	ND	ND	—	—	—	0.85
MW-2	07/21/98	32.80	9.55	23.25	0.00	80	—	8.9	2.1	0.6	2.5	ND	—	—	—	1.04
MW-2	10/20/98	32.80	10.75	22.05	0.00	50	—	0.8	0.7	ND	0.8	ND	—	—	—	1.12
MW-2	01/27/99	32.80	5.53	27.27	0.00	ND	—	0.6	ND	ND	ND	ND	—	—	—	0.99
MW-2	07/27/99	32.80	6.20	26.60	0.00	ND	—	ND	0.6	ND	ND	ND	—	—	—	0.30
MW-2	12/08/99	32.80	9.98	22.82	0.00	ND	—	1.2	0.43	ND	ND	ND	—	—	—	1.83
MW-2	Sep-00	39.34	Well resurveyed after repair by Alisto Engineering													
MW-2	10/25/00	39.34	11.30	28.04	0.00	<20	—	2.0	0.59	0.46	1.3	<0.30	—	—	—	0.35
MW-2	01/15/01	39.34	9.41	29.93	0.00	<20	—	<0.20	0.46	<0.20	<0.60	<0.30	—	—	—	—
MW-2	04/10/01	39.34	6.16	33.18	0.00	23	—	0.28	<0.20	<0.20	<0.60	<1.0	—	—	—	1.72
MW-2	07/24/01	39.34	10.70	28.64	0.00	<50	—	<0.20	0.93	<0.20	0.82	<0.30	—	—	—	3.39
MW-2	11/27/01	39.34	10.15	29.19	0.00	<50	—	1.2	0.22	<0.20	<0.60	<0.30	—	—	—	—
MW-2	11/27/01	42.02	Well resurveyed													
MW-2	01/18/02	39.34	5.46	33.88	0.00	<50.0	—	<0.50	<0.50	<0.50	<0.50	1.40	—	—	—	—
MW-3	03/14/96	32.80	9.55	23.25	0.00	4,200	1,200	220	30	140	520	—	—	ND	ND	—
MW-3	05/21/96	32.80	10.16	22.64	0.00	8,500	2,800	710	110	440	1,700	—	—	—	—	—
MW-3	08/13/96	32.80	11.18	21.62	0.00	5,000	2,300**	430	ND	200	360	—	—	—	—	—
MW-3	11/08/96	32.80	11.51	21.29	0.00	8,400	2,900*	890	82	790	1,700	73	ND	—	—	—
MW-3	01/31/97	32.80	7.90	24.90	0.00	16,000	7,500*	660	85	960	1,800	ND	—	—	—	—

Table 2
Summary of Groundwater Levels and Chemical Analysis
Former Mobil Station 99-105

Well ID	Date	Top of Casing Elevation (feet)	Depth to Water (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	TPH-G (ppb)	TPH-D (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	MTBE 8020 (ppb)	MTBE 8240 or 8260 (ppb)	TOG (ppb)	Lead (ppb)	Dissolved Oxygen (mg/L)
MW-3	04/22/97	32.80	10.64	22.16	0.00	8,000	2,700	340	33	400	490	200	ND	—	—	—
MW-3†	07/29/97	32.80	11.36	21.44	0.00	9,800	2,300*	330	ND	530	530	ND	—	—	—	—
MW-3†	10/09/97	32.80	11.52	21.28	0.00	7,300	2,600*	300	ND	430	460	270	ND	—	—	—
MW-3†	01/23/98	32.80	7.50	25.30	0.00	6,100	2,300	190	23	330	320	ND	—	—	—	—
MW-3	04/22/98	32.80	6.81	25.99	0.00	4,900	2,600	140	12	250	230	ND	ND	—	—	0.45
MW-3	07/21/98	32.80	10.65	22.15	0.00	7,400	—	250	16	400	370	74	ND	—	—	0.78
MW-3	10/20/98	32.80	11.57	21.23	0.00	6,700	—	200	18	350	350	ND	ND	—	—	0.69
MW-3	01/27/99	32.80	9.11	23.69	0.00	3,100	—	74	4	94	39	13	—	—	—	1.20
MW-3	07/27/99	32.80	7.27	25.53	0.00	8,900	—	170	21	360	440	ND	—	—	—	0.33
MW-3	12/08/99	32.80	10.63	22.17	0.00	4,800	—	94	13	170	210	ND	—	—	—	1.12
MW-3	Sep-00	39.27	Well resurveyed after repair by Alisto Engineering													
MW-3	10/25/00	39.27	12.08	27.19	0.00	3,800	—	63	2.9	100	65	<50	<5	—	—	0.96
MW-3	01/15/01	39.27	10.29	28.98	0.00	4,300	—	76	9.5	47	76	<5.0	—	—	—	0.60
MW-3	04/10/01	39.27	10.11	29.16	0.00	2,700	—	55	4.4	100	37	<20	—	—	—	1.63
MW-3	07/24/01	39.27	11.57	27.70	0.00	3,100	—	110	6.9	110	81	<1.0	—	—	—	4.25
MW-3	11/27/01	39.27	10.93	28.34	0.00	2,400	—	47	8.9	25	35	<0.30	—	—	—	—
MW-3	11/27/01	41.74	Well resurveyed													
MW-3	01/18/02	39.27	9.47	29.80	0.00	1,130	—	15.3	2.30	42.0	24.6	13.6	—	—	—	—
MW-4	03/14/96	31.50	4.92	26.58	0.00	12,000	3,500	2,200	140	880	2,000	—	—	—	ND	—
MW-4	05/21/96	31.50	8.60	22.90	0.00	11,000	4,200	1,700	ND	930	470	—	—	—	—	—
MW-4	08/13/96	31.50	10.02	21.50	0.02	—	—	—	—	—	—	—	—	—	—	—
MW-4	11/08/96	31.50	10.28	21.33	0.15	—	—	—	—	—	—	—	—	—	—	—
MW-4	01/31/97	31.50	7.88	23.62	0.00	23,000	8,200*	980	68	1,100	1,400	ND	—	—	—	—
MW-4	04/22/97	31.50	7.40	24.10	0.00	8,800	4,500	950	ND	610	130	ND	—	—	—	—
MW-4	07/29/97	31.50	9.85	21.74	0.12	—	—	—	—	—	—	—	—	—	—	—
MW-4	10/09/97	31.50	10.35	21.38	0.30	—	—	—	—	—	—	—	—	—	—	—
MW-4	01/23/98	31.50	4.68	27.51	0.92	—	—	—	—	—	—	—	—	—	—	—
MW-4	04/22/98	31.50	6.39	25.22	0.14	—	—	—	—	—	—	—	—	—	—	—
MW-4	07/21/98	31.50	7.10	24.55	0.20	—	—	—	—	—	—	—	—	—	—	—
MW-4	10/20/98	31.50	9.03	22.60	0.17	—	—	—	—	—	—	—	—	—	—	—
MW-4	01/27/99	31.50	5.37	26.18	0.07	—	—	—	—	—	—	—	—	—	—	—
MW-4	Destroyed during construction activities in April 1999															
MW-5	Sep-00	39.18	Well surveyed after installation by Alisto Engineering													
MW-5	10/25/00	39.18	10.92	28.26	0.00	2,500	—	79	3.8	66	<20	<20	—	—	—	0.50
MW-5	01/15/01	39.18	8.32	30.86	0.00	3,900	—	120	7.9	280	52	<5.0	—	—	—	0.69
MW-5	04/10/01	39.18	7.21	31.97	0.00	8,000	—	280	4.4	410	100	<50	<5	—	—	1.90
MW-5	07/24/01	39.18	9.54	29.64	0.00	7,000	—	360	7.4	380	67	<1.0	—	—	—	5.91
MW-5	11/27/01	39.18	8.84	30.34	0.00	5,000	—	64	11	340	52	8.9	<2	—	—	—
MW-5	11/27/01	57.77	Well resurveyed													
MW-5	01/18/02	39.18	6.52	32.66	0.00	6,330	—	99.1	2.30	103	19.6	21.8	—	—	—	—
AB-1	03/05/98	—	—	—	—	1,600	—	31	5.3	79	130	ND	—	—	—	—
AB-2	03/05/98	—	—	—	—	ND	—	ND	2.9	0.9	5.7	ND	—	—	—	—
AB-3	03/05/98	—	—	—	—	6,800	—	680	100	1,500	2,300	230	—	—	—	—

Table 2
Summary of Groundwater Levels and Chemical Analysis
Former Mobil Station 99-105

Well ID	Date	Top of Casing Elevation (feet)	Depth to Water (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	TPH-G (ppb)	TPH-D (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)	MTBE 8020 (ppb)	MTBE 8240 or 8260 (ppb)	TOG (ppb)	Lead (ppb)	Dissolved Oxygen (mg/L)
AB-4	03/05/98	—	—	—	—	8,500	—	240	ND	260	720	ND	—	—	—	—
AB-6	03/05/98	—	—	—	—	12,000	—	350	ND	310	100	ND	—	—	—	—
AB-9	03/05/98	—	—	—	—	1,000	—	57	12	44	93	ND	—	—	—	—
AB-10	03/05/98	—	—	—	—	200	—	3.0	1.2	3.2	2.8	ND	—	—	—	—
AB-11	03/05/98	—	—	—	—	ND	—	ND	ND	ND	ND	ND	—	—	—	—
AB-12	03/05/98	—	—	—	—	8,800	—	660	50	630	940	37	—	—	—	—
AB-13	03/05/98	—	—	—	—	210	—	11	0.8	10	15	ND	—	—	—	—
HA-1	01/25/00	—	—	—	—	ND<500	—	ND<0.3	ND<0.3	ND<0.3	ND<0.6	ND<5.0	—	—	—	—

NOTES:

ppb = parts per billion
mg/L = milligrams per liter
TPH-G = total petroleum hydrocarbons as gasoline
TPH-D = total petroleum hydrocarbons as diesel
TOG = total oil and grease
MTBE = methyl tert-butyl ether

— = not measured/not analyzed
ND = not detected at or above method detection limit
* = diesel and unidentified hydrocarbons <C15
** = diesel and unidentified hydrocarbons <C15>C25
*** = diesel and unidentified hydrocarbons >C20
**** = unidentified hydrocarbons >C18

† = well sampled using no-purge method

Table 3
Comparison of Maximum Site Subsurface Soil Concentrations
to Oakland Tier 1 RBSLs and Tier 2 SSTLs
(Residential = R and Commercial = C)
Former Mobil Station 99-105

		RBCA TARGET LEVELS			
		RBSL	SSTLs		
	Maximum Concentration Reported (mg/kg)	Tier 1	Tier 2 Merrit Sands	Tier 2 Sandy Silts	Tier 2 Clayey Silts
Benzene	1.2 (MW-2 @ 10' MW-4 @ 5')	**R = 0.069 C = 1.1**	**R = 0.70** C = 11	**R = 1.1** C = 17	R = 1.9 C= 30
Toluene	1.4 (MW-2 @ 10')	R =360 C = SAT	R = 370 C = SAT	R = 570 C = SAT	R = 930 C = SAT
Ethylbenzene	4.1 (MW-4 @ 5')	R = SAT C = SAT	R = SAT C = SAT	R = SAT C = SAT	R = SAT C = SAT
Xylene	19 (MW-4 @ 5')	R = SAT C = SAT	R = SAT C = SAT	R = SAT C = SAT	R = SAT C = SAT
MTBE	0.5 (MW-5 @ 10')	R = 4,400 C = SAT	R = 4,800 C = SAT	R = 8,100 C = SAT	R = 14,000 C = SAT

Notes: **Bold** indicates RBSL or SSTL value less than maximum onsite concentration.

SAT = Value exceeds solubility of chemical in water.

Values represent carcinogenic levels (most conservative) of COPCs for residential and commerical land use via exposure pathway of inhalation of indoor air vapors.
(see Section 3.2.2, Potential Exposure Pathways)

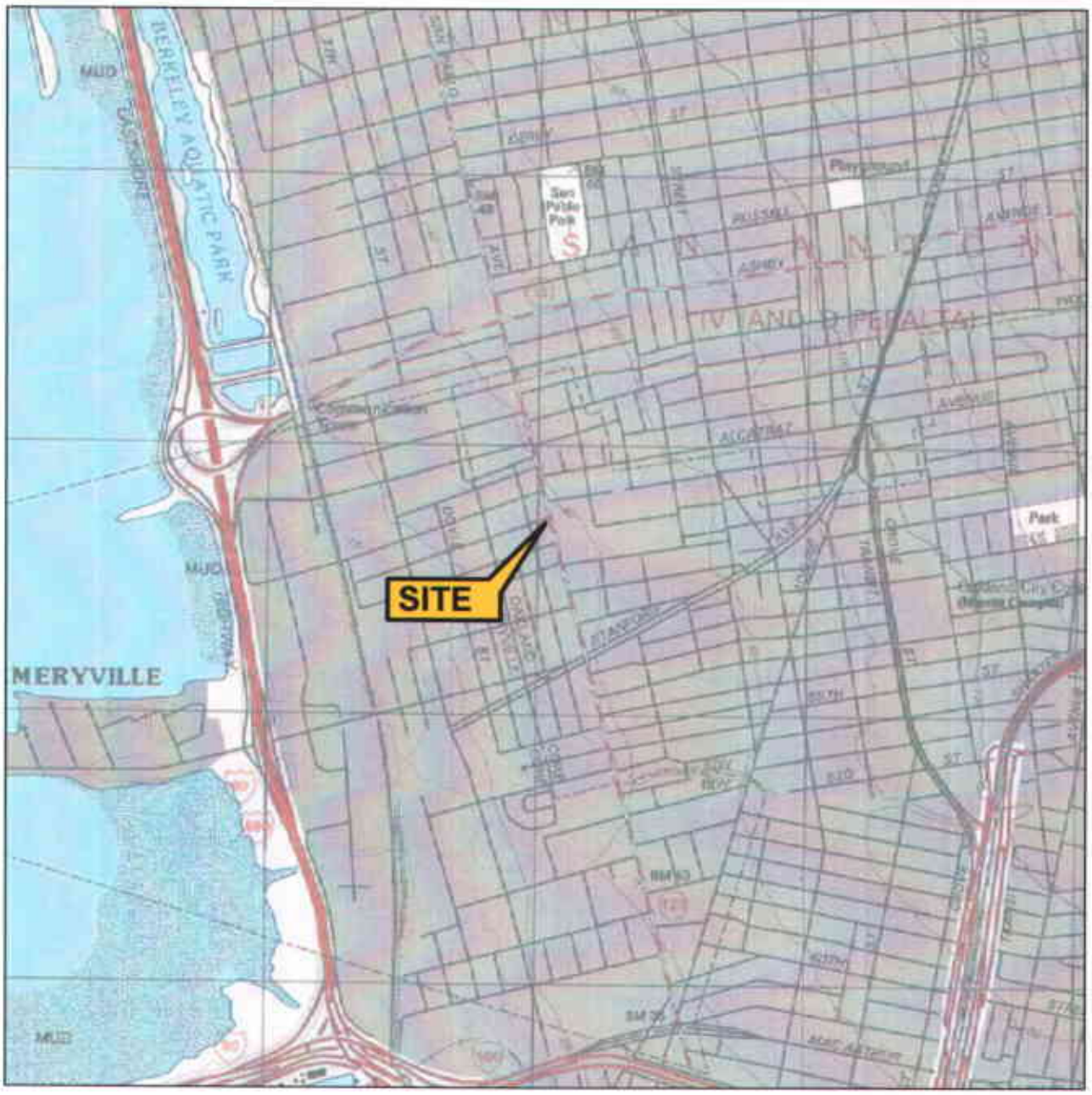
Table 4
Comparison of Maximum Site Groundwater Concentrations
to Oakland Tier 1 RBSLs and Tier 2 SSTLs
(Residential = R and Commercial = C)
Former Mobil Station 99-105

		RBCA TARGET LEVELS			
		RBSL	SSTLs		
	Maximum Concentration Reported (mg/L)	Tier 1	Tier 2 Merrit Sands	Tier 2 Sandy Silts	Tier 2 Clayey Silts
Benzene	0.064 (MW-5, 11/27/01)	R = 0.11 C = 1.8	R = 1.4 C = 22	R =3.4 C = 53	R = 5.6 C = 89
Toluene	0.011 (MW-5, 11/27/01)	R = 210 C = >SOL	R = 280 C = >SOL	R = >SOL C = >SOL	R = >SOL C = >SOL
Ethylbenzene	0.340 (MW-5, 11/27/01)	R = >SOL C = >SOL	R = >SOL C = >SOL	R = >SOL C = >SOL	R = >SOL C = >SOL
Xylene	0.052 (MW-5, 11/27/01)	R = >SOL C = >SOL	R = >SOL C = >SOL	R = >SOL C = >SOL	R = >SOL C = >SOL
MTBE	<2 (MW-5, 11/27/01)	R =24,000 C = >SOL	R = 25,000 C = >SOL	R =30,000 C = >SOL8	R =36,000 C = >SOL

Note: **Bold** indicates RBSL or SSTL value less than maximum onsite concentration.

SOL = < value exceeds solubility of chemical in water.

Values represent carcinogenic levels (most conservative) of COPCs for residential and commerical land use via exposure pathway of inhalation of indoor air vapors.
(see Section 3.2.2, Potential Exposure Pathways)



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

SCALE 1 : 24,000

N

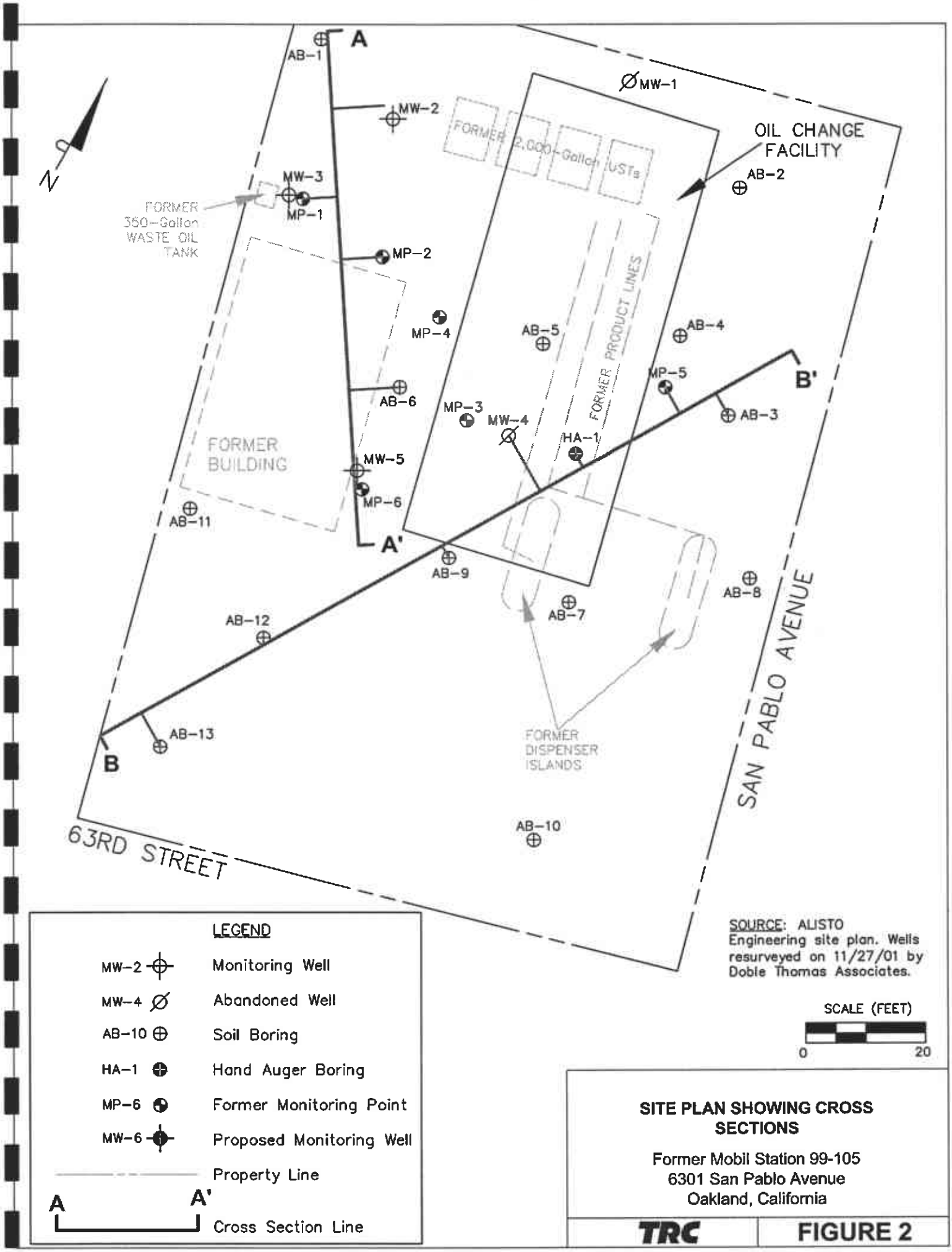
SOURCE:
United States Geological Survey
7.5 Minute Topographic Maps:
Oakland West Quadrangle

VICINITY MAP

Former Mobil Station 99-105
6301 San Pablo Avenue
Oakland, California

TRC

FIGURE 1



LEGEND

MW-2 ⊕	Monitoring Well
MW-4 ∅	Abandoned Well
AB-10 ⊕	Soil Boring
HA-1 ⊕	Hand Auger Boring
MP-6 ◕	Former Monitoring Point
MW-6 ⊕	Proposed Monitoring Well
	Property Line
A A'	Cross Section Line

SOURCE: ALISTO Engineering site plan. Wells resurveyed on 11/27/01 by Doble Thomas Associates.

SCALE (FEET)

0 20

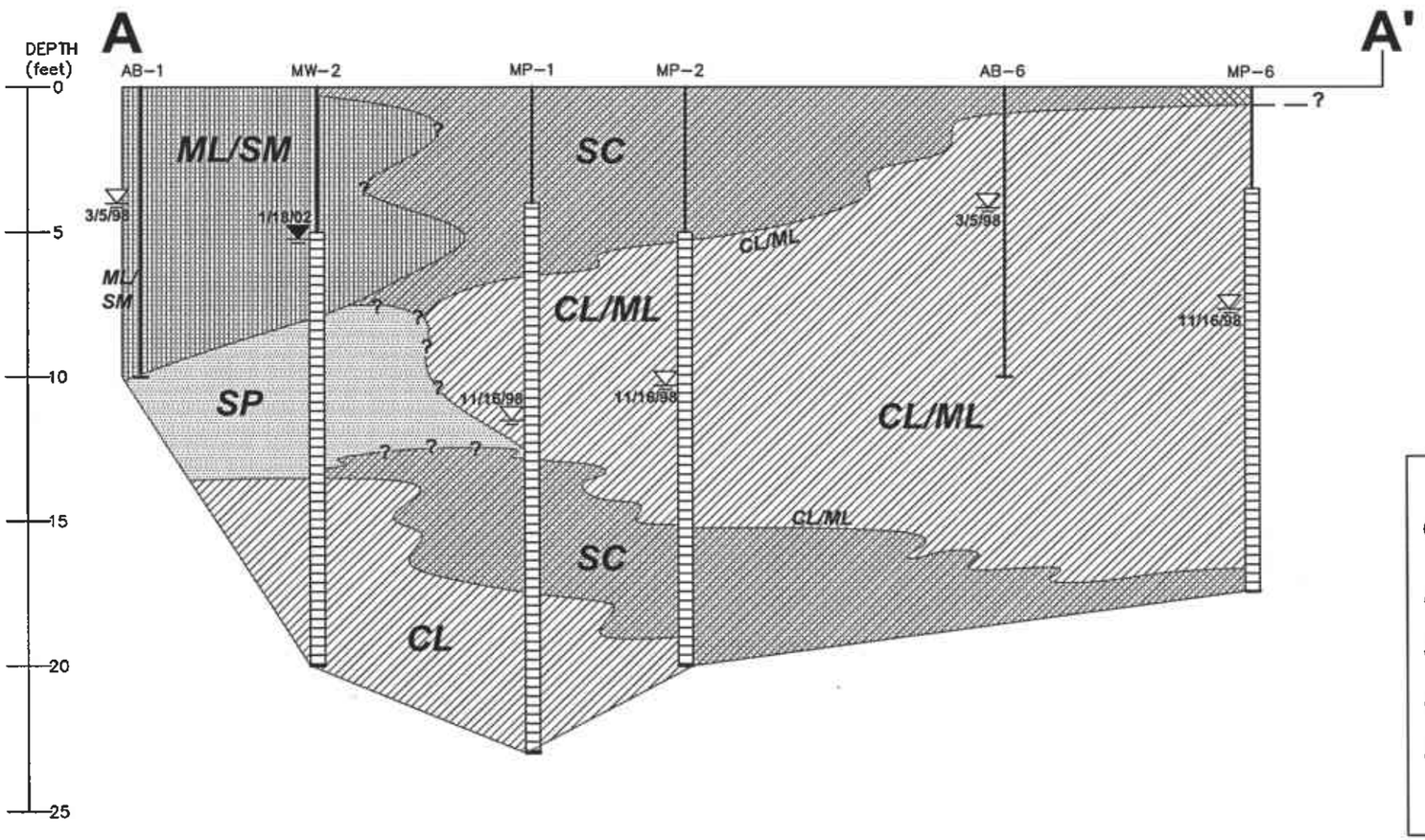
SITE PLAN SHOWING CROSS SECTIONS

Former Mobil Station 99-105
6301 San Pablo Avenue
Oakland, California

TRC | **FIGURE 2**

← APPROXIMATE NORTH

APPROXIMATE SOUTH →



LEGEND

CL	Inorganic clays of low to medium plasticity		Blank
ML	Inorganic silts		Screened interval
SC	Clayey sands		Total boring depth
SM	Silty sands	11/16/98	First encountered water during drilling
SP	Poorly graded sands		Stabilized groundwater level on 1/18/02
	Fill		

NOTE: See Figure 2 for location of cross section.

5 SCALE (feet) 5

VERTICAL EXAGGERATION = 2:1

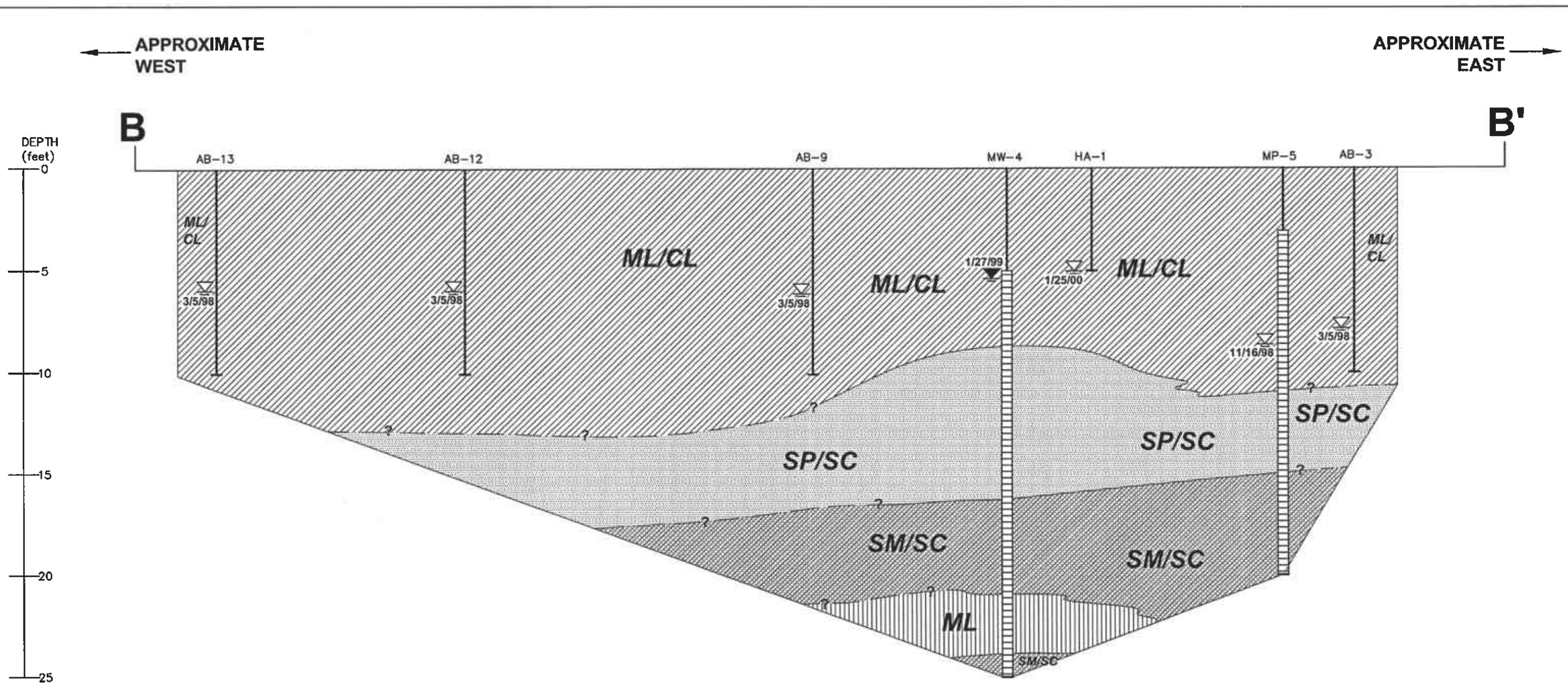
SCALE (FEET) 0 5 10

Source: ALISTO Engineering

CROSS SECTION A-A'

Former Mobil Station 99-105
6301 San Pablo Avenue
Oakland, California

TRC | **FIGURE 3**



LEGEND

CL	Inorganic clays of low to medium plasticity
ML	Inorganic silts
SC	Clayey sands
SM	Silty sands
SP	Poorly graded sands
	Fill
	Blank
	Screened interval
	Total boring depth
3/5/98	First encountered water during drilling
	Stabilized groundwater level on 1/27/99

5 SCALE (feet)
5
VERTICAL EXAGGERATION = 2:1

NOTE: See Figure 2 for location of cross section.

Source: ALISTO Engineering

SCALE (FEET)
0 5 10

CROSS SECTION B-B'

Former Mobil Station 99-105
6301 San Pablo Avenue
Oakland, California

TRC

FIGURE 4

APPENDIX A
ALAMEDA COUNTY HEALTH CARE SERVICES LETTER DATED DECEMBER 7, 2001

TRC

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

December 7, 2001
StID 1683/RO0000445

Mr. Gene Ortega
ExxonMobil Remediation Services
2400 San Ramon Valley Blvd.
San Ramon, CA 94583

Re: Former Mobil Station 99-105, 6301 San Pablo Ave., Oakland CA 94608

Dear Mr. Otega:

Our office has received and reviewed the November 2001 TRC Conceptual Site Model Report for the referenced site. Included in the report is a site description, a summary of site investigations, an evaluation of soil and groundwater findings and a proposal for future work. Based upon the data presented our office does not recommend the installation of the proposed monitoring well. Please prepare a risked-based corrective action (RBCA) evaluation for the site. You should use the City of Oakland Technical Background Document as a guide for determining health risk.

In addition, please provide in a tabular form a list of all soil and groundwater disposed, destroyed or reused from the site, including the date and location of disposal. In the meanwhile, please continue quarterly groundwater monitoring.

You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M Chan

Barney M. Chan
Hazardous Materials Specialist

C: B.Chan, files
Ms. Connie Lamb, 200 Dorado Terrace, San Francisco, CA 94112
Mr. J. Scheiner, TRC, 5052 Commercial Circle, Concord, CA 94520

RBCArq6301SanPablo

APPENDIX B
SOIL BORING AND MONITORING WELL LOGS

TRC

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

LOG OF BORING MW-1

SEE SITE PLAN

ALISTO PROJECT NO: 10-309-01 DATE DRILLED: 03/01/96
CLIENT: Mobil Oil Corporation
LOCATION: 6301 San Pablo Avenue, Oakland, California
DRILLING METHOD: Hollow-Stem Auger (10")
DRILLING COMPANY: V & W Drilling CASING ELEVATION: 32.79 'MSL
LOGGED BY: C. Ladd APPROVED BY: Al Sevilla

BLOWS/6 IN.	PID VALUES	WELL DIAGRAN	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							2.5" asphalt
						ML	
10,12,14			5				sandy SILT: light brown mottled Fe oxide stain, damp to moist, very stiff; fine-grained sand.
10,11,13			10				Same: reddish brown, damp to moist, very stiff; very fine-grained sand; some fill gravels (pea gravel).
						SM	
9,12,13			15				silty SAND: tan occasional black mottling, damp to moist, medium dense; fine-grained sand.
						ML	clayey SILT: reddish brown mottled tan, damp, very stiff; minor fines; occasional rootlets.
10,12,15			20				
							Stabilized water level measured on March 14, 1996.
			25				
			30				

WELL DIAGRAN: 4" Sch. 40 PVC; Neat Cement; Bentonite Seal; 4" 0.010" Slotted PVC Screen; #12 Sand

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

LOG OF BORING MW-2

SEE SITE PLAN

ALISTO PROJECT NO: 10-309-01 DATE DRILLED: 03/01/98
CLIENT: Mobil Oil Corporation
LOCATION: 6301 San Pablo Avenue, Oakland, California
DRILLING METHOD: Hollow-Stem Auger (10")
DRILLING COMPANY: V & W Drilling CASING ELEVATION: 32.80 'MSL
LOGGED BY: C. Ladd APPROVED BY: Al Sevilla

BLOWS/6 IN.	PID VALUES	WELL DIAGRAM	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
							2.5" asphalt
14,15,18		4" Sch. 40 PVC; Neat Cement; Bentonite Seal; #12 Sand; 4" 0.010" Slotted PVC Screen	5			SM	silty SAND: reddish brown mottled blue green, damp to moist, dense; fine- to medium-grained sand; occasional pea gravels.
5,7,10			10				sandy SILT: brownish tan, damp to moist, medium stiff; fine-grained sand; some Fe oxide stain.
17,35,35			15			SP	gravelly SAND: brown, moist, very dense; fine- to medium-grained sand; gravels to 3/4"-diameter.
11,17,22			20			CL	silty CLAY: reddish brown mottled tan, damp, hard; some rootlets and Fe oxide staining.
			25				Stabilized water level measured on March 14, 1998.
			30				

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

LOG OF BORING MW-3

SEE SITE PLAN

ALISTO PROJECT NO: 10-309-01 DATE DRILLED: 03/01/96

CLIENT: Mobil Oil Corporation

LOCATION: 6301 San Pablo Avenue, Oakland, California

DRILLING METHOD: Hollow-Stem Auger (10")

DRILLING COMPANY: V & W Drilling CASING ELEVATION: 32.80 'MSL

LOGGED BY: C. Ladd APPROVED BY: Al Sevilla

BLOWS/6 IN.	PID VALUES	WELL DIAGRAM	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						SM	Native soil with some pea gravel
						SM	silty SAND: dark brown, damp; some pea gravel. Observed from cuttings
27,50			5			CL	silty CLAY: tan, damp, hard; minor pea gravel and sand.
4,10,24			10			SM	silty SAND: gray, damp to moist, dense; fine-grained sand; Fe oxide stain to approximately 5%; 3% gravels to 1/4"-diameter.
17,23,24			15			SP	gravelly SAND: reddish brown with Fe oxide stain, wet, dense; medium-grained sand; subrounded gravels to 1"-diameter.
						SM	sandy SILT: reddish brown, damp to moist, hard; fine-grained sand; Fe oxide stain.
13,21,45			20			SP	gravelly SAND: reddish brown, wet, very dense; medium-grained sand; subrounded gravels to 1"-diameter; Fe oxide stain.
			25				Stabilized water level measured on March 14, 1998.
			30				

WELL DIAGRAM: 4" Sch. 40 PVC; Neat Cement; 4" 0.010" Slotted PVC Screen; Bentonite Seal; #12 Sand

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

LOG OF BORING MW-4

SEE SITE PLAN

ALISTO PROJECT NO: 10-309-01 DATE DRILLED: 03/01/96

CLIENT: Mobil Oil Corporation

LOCATION: 6301 San Pablo Avenue, Oakland, California

DRILLING METHOD: Hollow-Stem Auger (10")

DRILLING COMPANY: V & W Drilling CASING ELEVATION: 31.50 'MSL

LOGGED BY: C. Ladd APPROVED BY: Al Sevilla

BLOWS/6 IN.	PID VALUES	WELL DIAGRAM	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						CL	2.5" asphalt
10,15,21			5				CLAY: gray, gry, hard.
						SC	
7,10,10			10				clayey SAND: gray mottled brown, damp, medium dense; fine- to medium-grained sand; some silt.
7,23,25			15				Same: wet to saturated lense at 15 feet.
						SM	silty SAND: reddish brown mottled with some clay, wet, dense; fine-grained sand.
5,7,13			20				Same: wet to saturated lense at 19.7 feet.
						ML	clayey SILT: reddish brown mottled tan, damp to moist, very stiff; some fines.
						SC	
7,12,25			25				clayey SAND: reddish brown mottled tan, moist, dense; fine-grained sand.
			30				Stabilized water level measured on March 14, 1996.

WELL DIAGRAM: 4" Sch.40 PVC; Neat Cement; Bentonite Seal; #12 Sand; 0.010" Slotted PVC Screen

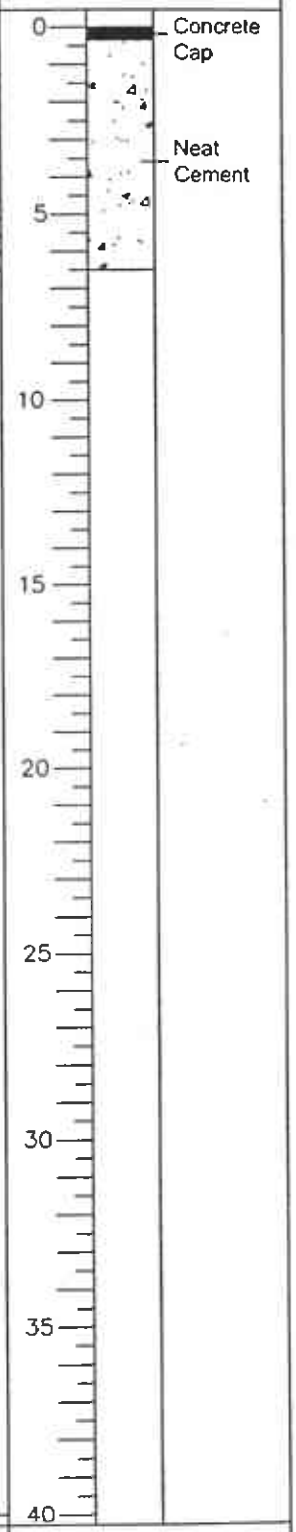
PROJECT NO.: 41-0123
LOCATION: Former Mobil Station 99-105
6301 San Pablo Avenue
Oakland, California

DATE DRILLED: 1/25/00
LOGGED BY: S. Pasek
APPROVED BY: T. Walker, RG
DRILLING CO.: N/A

DRILLING METHOD: Hand Auger
SAMPLER TYPE: Slide Hammer
TOTAL DEPTH: 6.5 feet
DEPTH TO WATER: 5.0 feet

BLOWS PER 6 INCHES	PID / FID (ppm)	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY
	0			0	6 inches concrete. Hand-augered to 6.5 feet.		
					FILL: Silty sand with gravel, light brown, loose, dry.	Fill	
	0	ND		5	- @ 5': becomes wet.		
	0						
				10			
				15			
				20		CL	
						ML	
				25			
				30			
				35			
				40			

BORING BACKFILL DETAIL



ALTON GEOSCIENCE
Northern California

LOG OF EXPLORATORY BORING

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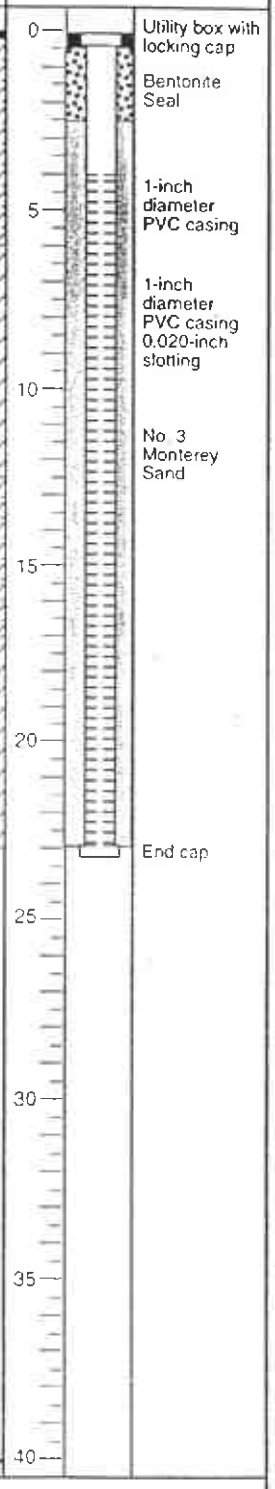
PAGE 1 OF 1

PROJECT NO.: 41-0123	DATE DRILLED: 11/16/98
LOCATION: Former Mobil Station 99-105	LOGGED BY: K. Racke
6301 San Pablo Avenue	APPROVED BY: M. Kalen, RG
Oakland, California	DRILLING CO.: V&W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe
SAMPLER TYPE: 1-inch Macro-Core Sampler
TOTAL DEPTH: 23.0 feet DEPTH TO WATER: 10.8 feet

BLOWS PER 6 INCHES	CGI (ppm)	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY
				0	3 inches of concrete.		
					CLAYEY SAND: dark grayish-brown, hard, moist, medium plasticity.	SC	
	100			5			
	150	10			SANDY CLAY: dark gray, firm, moist, medium plasticity, moderate petroleum odor.	CL	
	700				CLAY: olive gray, firm, moist, medium plasticity, strong petroleum odor.		
	80			10			
					CLAYEY SAND: olive gray, weak cementation, moist, fine-grained, strong hydrocarbon odor.	SC	
				15	Yellowish brown, moderate cementation, moist, medium-grained, fine gravels, slight hydrocarbon odor.		
	30				SANDY CLAY: yellowish brown, firm consistency, fine gravels, no petroleum odor.	CL	
	40			20			
	10						
				25			
				30			
				35			
				40			

MONITORING POINT CONSTRUCTION DETAIL



ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

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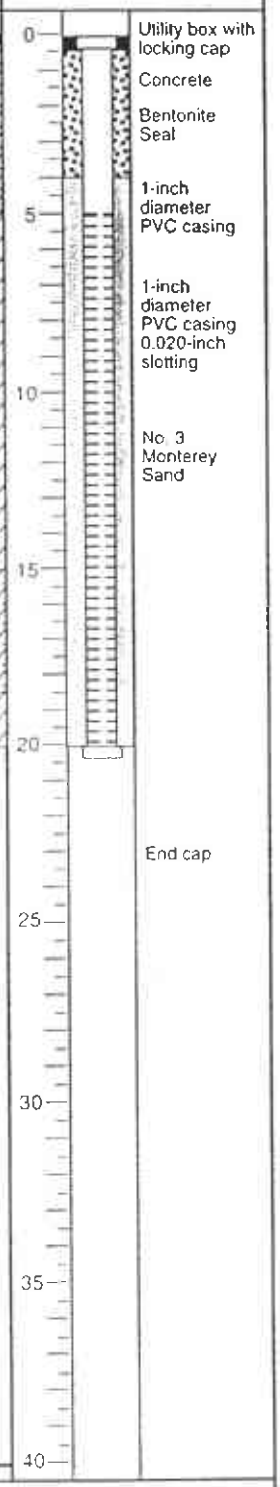
PROJECT NO.: 41-0123	DATE DRILLED: 11/16/98
LOCATION: Former Mobil Station 99-105	LOGGED BY: K. Racke
6301 San Pablo Avenue	APPROVED BY: M. Katen, RG
Oakland, California	DRILLING CO.: V&W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe
SAMPLER TYPE: 1-inch Macro-Core Sampler
TOTAL DEPTH: 20.0 feet DEPTH TO WATER: 10.2 feet

BLOWS PER 6 INCHES	CGI (ppm)	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY
				0	Hand augured to 5 feet. 3 inches of concrete. CLAYEY SAND: dark grayish-brown, hard, moist, medium plasticity.	SC	
				5	SANDY CLAY: dark gray, firm, moist, medium plasticity, moderate petroleum odor.	CL	
	100	270			Olive gray.		
	150	140		10			
	0			15	CLAYEY SAND: yellowish brown, weak cementation, moist, medium-grained, slight petroleum odor.	SC	
				20	SANDY CLAY: reddish brown, soft, moist, low plasticity, no petroleum odor.	CL	
				25			
				30			
				35			
				40			

MONITORING POINT CONSTRUCTION DETAIL



ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

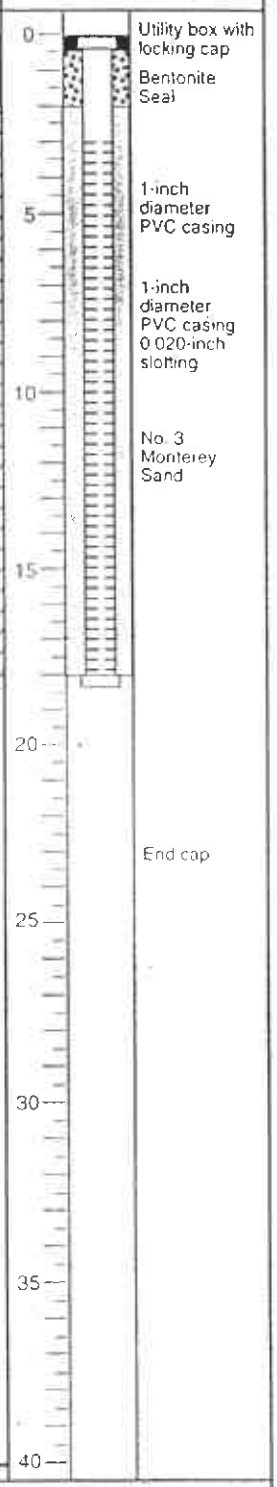
MP-2
PAGE 1 OF 1

PROJECT NO.: 41-0123	DATE DRILLED: 11/16/98
LOCATION: Former Mobil Station 99-105	LOGGED BY: K. Racke
6301 San Pablo Avenue	APPROVED BY: M. Katen, RG
Oakland, California	DRILLING CO.: V&W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe
SAMPLER TYPE: 1-inch Macro-Core Sampler
TOTAL DEPTH: 18.0 feet DEPTH TO WATER: 8.5 feet

BLOWS PER 6 INCHES	CGI (ppm)	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY
				0	Hand augured to 5 feet. Gravelly fill.	Fill	
	50			5	CLAY: dark gray, hard, moist, medium plasticity, moderate petroleum odor.	CL	
		230			Very hard, strong petroleum odor.		
	20			10	Fine gravels.		
	25 80			15	GRAVELLY CLAY: yellowish brown, firm, medium-grained sand. SANDY CLAY: yellowish brown.		
				20			
				25			
				30			
				35			
				40			

MONITORING POINT CONSTRUCTION DETAIL



ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

MP-3
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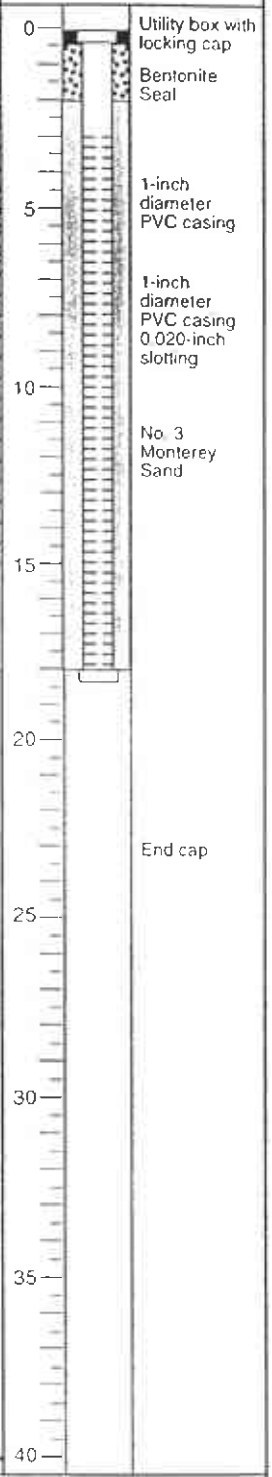
PROJECT NO.: 41-0123	DATE DRILLED: 11/16/98
LOCATION: Former Mobil Station 99-105	LOGGED BY: K. Racke
6301 San Pablo Avenue	APPROVED BY: M. Katen, RG
Oakland, California	DRILLING CO.: V&W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe
SAMPLER TYPE: 1-inch Macro-Core Sampler
TOTAL DEPTH: 18.0 feet DEPTH TO WATER: 8.8 feet

BLOWS PER 6 INCHES	CGI (ppm)	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY
				0	Hand augured to 5 feet. Gravelly fill.	Fill	
					CLAY: dark gray, hard, moist, medium plasticity, moderate petroleum odor.	CL	
	400	120		5	CLAYEY SAND: olive gray, soft, moist, fine-grained, strong hydrocarbon odor.	SC	
	375				SANDY CLAY: olive gray, firm, moist, medium plasticity.	CL	
		18		10	Fine gravels.		
	200						
	70			15	SAND: brownish yellow, weak cementation, moist, medium-grained, no petroleum odor.	SW	
				20			
				25			
				30			
				35			
				40			

MONITORING POINT CONSTRUCTION DETAIL



ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

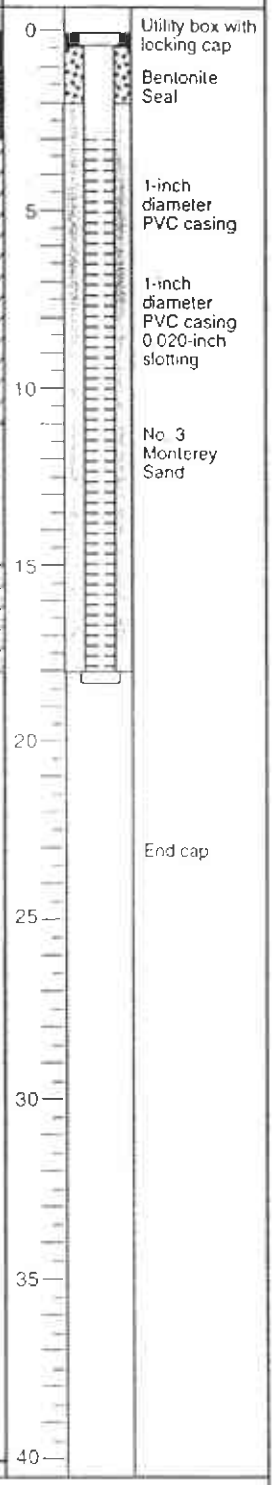
MP-4
PAGE 1 OF 1

PROJECT NO.: 41-0123	DATE DRILLED: 11/16/98
LOCATION: Former Mobil Station 99-105	LOGGED BY: K. Racke
6301 San Pablo Avenue	APPROVED BY: M. Katen, RG
Oakland, California	DRILLING CO.: V&W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe
SAMPLER TYPE: 1-inch Macro-Core Sampler
TOTAL DEPTH: 18.0 feet DEPTH TO WATER: 8.2 feet

BLOWS PER 6 INCHES	CGI (ppm)	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY
				0	Hand augured to 5 feet. 1 foot of concrete. Gravelly fill.	F#	
	200	6.4		5	SANDY CLAY: dark gray, firm, moist, medium plasticity.	CL	
	800	220		10	SAND: dark gray, weak cementation, moist, fine-grained, poorly graded, moderate hydrocarbon odor.	SP	
	45			15	CLAYEY SAND: brownish yellow, weak cementation, moist, well graded with fine gravels, no hydrocarbon odor.	SC	
				20			
				25			
				30			
				35			
				40			

MONITORING POINT CONSTRUCTION DETAIL



ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

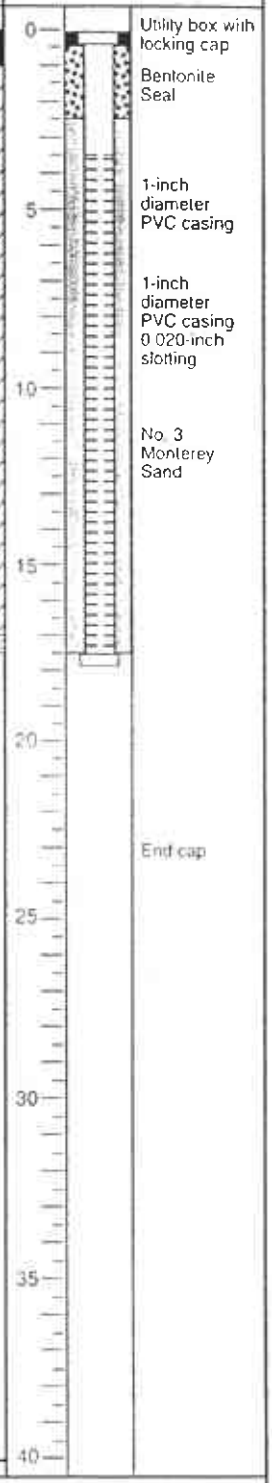
MP-5
PAGE 1 OF 1

PROJECT NO.: 41-0123	DATE DRILLED: 11/16/98
LOCATION: Former Mobil Station 99-105	LOGGED BY: K. Racke
6301 San Pablo Avenue	APPROVED BY: M. Katen, RG
Oakland, California	DRILLING CO.: V&W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe
SAMPLER TYPE: 1-inch Macro-Core Sampler
TOTAL DEPTH: 17.5 feet DEPTH TO WATER: 7.95 feet

BLOWS PER 6 INCHES	CGI (ppm)	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY
				0	Hand augured to 5 feet. 6 inches asphalt. Gravelly fill to 1 foot.	Fill	
	0	ND		5	GRAVELLY CLAY: dark grayish brown, firm, moist, medium plasticity, no petroleum odor.	CL	
	110	240		10			
	0			15	SILTY SAND: reddish brown, moderate cementation, moist, fine gravels, no petroleum odor.	SM	
				20			
				25			
				30			
				35			
				40			

MONITORING POINT CONSTRUCTION DETAIL



ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

MP-6
PAGE 1 OF 1

PROJECT NO.:	41-0123	DATE DRILLED:	3/5/98
LOCATION:	Former Mobil Station 99-105	LOGGED BY:	J. Madden
	6301 San Pablo Avenue	APPROVED BY:	M. Katen, RG
	Oakland, California	DRILLING CO.:	V & W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe
SAMPLER TYPE: 4-inch Macro-Core Sampler
TOTAL DEPTH: 10.0 feet DEPTH TO WATER: 4.0 feet

BLOWS PER 6 INCHES	TLV	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY	BORING DETAIL
	0	ND		0	CLAYEY SILT WITH GRAVEL: brownish yellow, moist, low plasticity.	ML		Cement
	20			5				
				10				
				15				
				20				
				25				
				30				
				35				
				40				

ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

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PAGE 1 OF 1

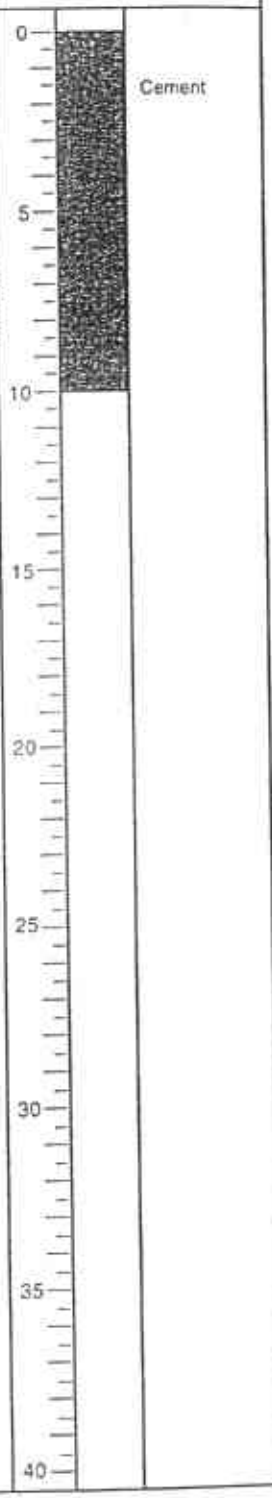
41.0123/99-105 Boring Log AB-1

PROJECT NO.: 41-0123	DATE DRILLED: 3/5/98
LOCATION: Former Mobil Station 99-105	LOGGED BY: J. Madden
6301 San Pablo Avenue	APPROVED BY: M. Katen, RG
Oakland, California	DRILLING CO.: V & W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe
SAMPLER TYPE: 4-inch Macro-Core Sampler
TOTAL DEPTH: 10.0 feet DEPTH TO WATER: 6.0 feet

BLOWS PER 6 INCHES	TLV	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY
	0	ND		0	CLAYEY SILT WITH GRAVEL: brown, stiff, moist, low plasticity.	ML	
				5	SANDY GRAVEL LENS: medium brown, loose, wet, fine-grained, poorly graded.	GP	
				10	CLAYEY SILT	ML	
				15			
				20			
				25			
				30			
				35			
				40			

BORING DETAIL



ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

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41-0123/99-105 Boring Log AB-2

PROJECT NO.: 41-0123	DATE DRILLED: 3/5/98
LOCATION: Former Mobil Station 99-105	LOGGED BY: J. Madden
6301 San Pablo Avenue	APPROVED BY: M. Katen, RG
Oakland, California	DRILLING CO.: V & W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe
SAMPLER TYPE: 4-inch Macro-Core Sampler
TOTAL DEPTH: 10.0 feet DEPTH TO WATER: 5.5 feet

BLOWS PER 6 INCHES	TLV	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY	BORING DETAIL
	10 150 1,000	ND		0 5 10 15 20 25 30 35 40	CLAYEY SILT WITH GRAVEL: olive green, stiff, wet, low plasticity.	ML		0 Cement 5 10 15 20 25 30 35 40

ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

AB-3
PAGE 1 OF 1

41-0123\9-105 Boring Log AB-3

PROJECT NO.: 41-0123	DATE DRILLED: 3/5/98
LOCATION: Former Mobil Station 99-105	LOGGED BY: J. Madden
6301 San Pablo Avenue	APPROVED BY: M. Katen, RG
Oakland, California	DRILLING CO.: V & W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe
SAMPLER TYPE: 4-inch Macro-Core Sampler
TOTAL DEPTH: 10.0 feet DEPTH TO WATER: 4.0 feet

BLOWS PER 6 INCHES	TLV	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY
	20			0	CLAYEY SILT: mottled brown and green, stiff, moist, low plasticity, 5-10% minor sand.	ML	
	100	18		5			
				10			
				15			
				20			
				25			
				30			
				35			
				40			

BORING DETAIL

ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

AB-4
PAGE 1 OF 1

41-0123/99-105 Boring Log AB-4

PROJECT NO.: 41-0123	DATE DRILLED: 3/5/98
LOCATION: Former Mobil Station 99-105	LOGGED BY: J. Madden
6301 San Pablo Avenue	APPROVED BY: M. Katen, RG
Oakland, California	DRILLING CO.: V & W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe

SAMPLER TYPE: 4-inch Macro-Core Sampler

TOTAL DEPTH: 10.0 feet DEPTH TO WATER: 6.0 feet

BLOWS PER 6 INCHES	TLV	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY	BORING DETAIL
	20 100 500 1,000	170		0 5 10 15 20 25 30 35 40	CLAYEY SILT WITH GRAVEL: brown to 3 feet below grade and green from 3 to 10 feet below grade, hard, moist to wet, low plasticity, less than 6 inches minor sandy gravel lenses.	ML		0 5 10 15 20 25 30 35 40 Cement

ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

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41-0123/99-105 Boring Log AB-5

PROJECT NO.: 41-0123

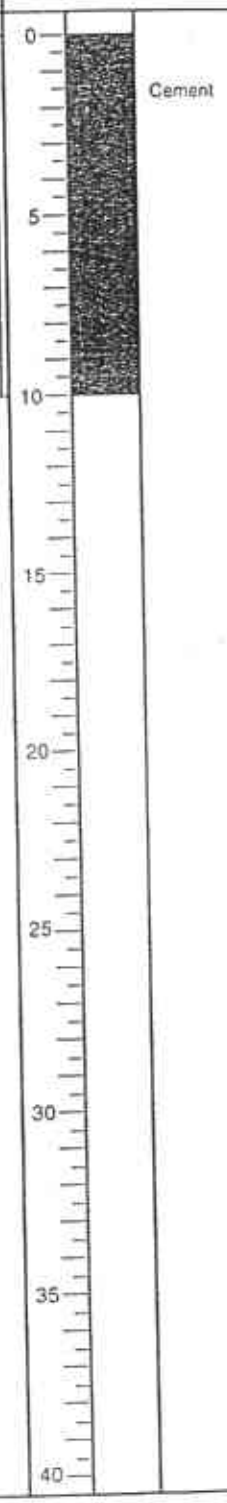
LOCATION: Former Mobil Station 99-105
6301 San Pablo Avenue
Oakland, California

DATE DRILLED: 3/5/98
LOGGED BY: J. Madden
APPROVED BY: M. Katen, RG
DRILLING CO.: V & W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe
SAMPLER TYPE: 4-inch Macro-Core Sampler
TOTAL DEPTH: 10.0 feet DEPTH TO WATER: 4.5 feet

BLOWS PER 6 INCHES	TLV	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY
	30 7,000	230		0 5 10 15 20 25 30 35 40	CLAYEY SILT WITH GRAVEL: mottled green and brown, stiff, moist, low plasticity, less than 5% minor sand.	ML	

BORING DETAIL



ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

AB-6
PAGE 1 OF 1

41-0123\99-105 Boring Log AB-6

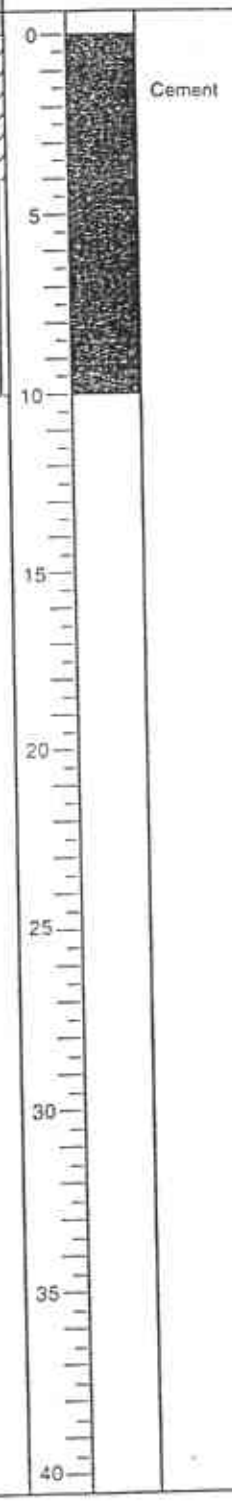
PROJECT NO.: 41-0123
LOCATION: Former Mobil Station 99-105
6301 San Pablo Avenue
Oakland, California

DATE DRILLED: 3/5/98
LOGGED BY: J. Madden
APPROVED BY: M. Katen, RG
DRILLING CO.: V & W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe
SAMPLER TYPE: 4-inch Macro-Core Sampler
TOTAL DEPTH: 10.0 feet DEPTH TO WATER: 5.0 feet

BLOWS PER 6 INCHES	TLV	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY
				0	SILTY CLAY: dark brown, soft, wet, high plasticity.	CL	
	100	19		5	CLAYEY SILT WITH GRAVEL: mottled brown and green, hard, wet, low plasticity.	ML	
				10			
				15			
				20			
				25			
				30			
				35			
				40			

BORING DETAIL



ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

AB-7
PAGE 1 OF 1

41-0123\Logs.tm\ Retrim Log AB-7

PROJECT NO.:	41-0123	DATE DRILLED:	3/5/98
LOCATION:	Former Mobil Station 99-105	LOGGED BY:	J. Madden
	6301 San Pablo Avenue	APPROVED BY:	M. Katen, RG
	Oakland, California	DRILLING CO.:	V & W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe
SAMPLER TYPE: 4-inch Macro-Core Sampler
TOTAL DEPTH: 10.0 feet DEPTH TO WATER: 4.5 feet

BLOWS PER 6 INCHES	TLV	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY	BORING DETAIL
	100	ND		0	CLAYEY SILT: mottled reddish brown and green, soft, moist, low plasticity, minor sandy gravel lenses.	ML		Cement
	7,000			5				
				10				
				15				
				20				
				25				
				30				
				35				
				40				

ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

AB-8
PAGE 1 OF 1

PROJECT NO.: 41-0123

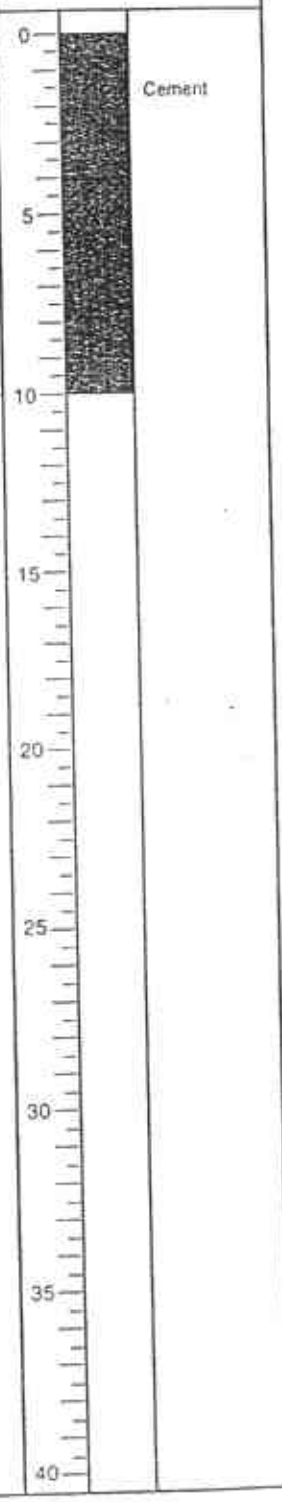
LOCATION: Former Mobil Station 99-105
6301 San Pablo Avenue
Oakland, California

DATE DRILLED: 3/5/98
LOGGED BY: J. Madden
APPROVED BY: M. Katen, RG
DRILLING CO.: V & W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe
SAMPLER TYPE: 4-inch Macro-Core Sampler
TOTAL DEPTH: 10.0 feet DEPTH TO WATER: 6.0 feet

BLOWS PER 6 INCHES	TLV	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY
				0	GRAVEL FILL to 2 feet below grade.	Fill	
	5,000	16		5	CLAYEY SILT WITH GRAVEL: light reddish brown, hard, moist, low plasticity, 70% clay, 30% gravel.	ML	
				10			
				15			
				20			
				25			
				30			
				35			
				40			

BORING DETAIL



ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

AB-9
PAGE 1 OF 1

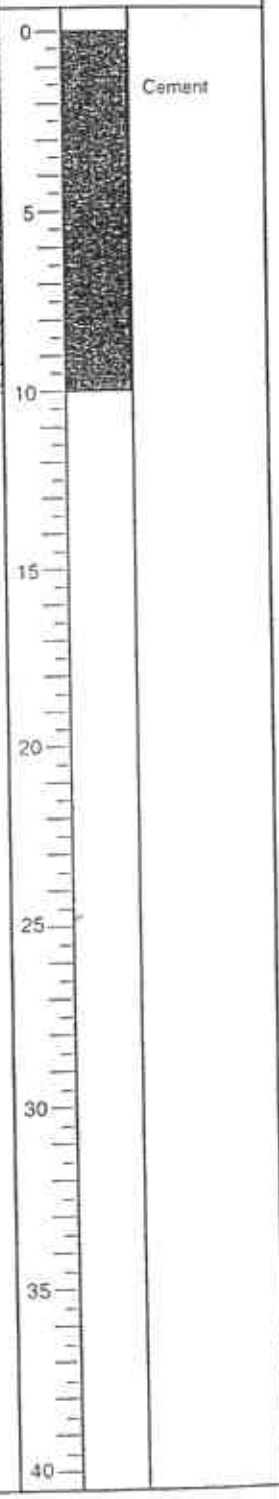
41-0123\09-105 Boring Log AB-9

PROJECT NO.: 41-0123	DATE DRILLED: 3/5/98
LOCATION: Former Mobil Station 99-105	LOGGED BY: J. Madden
6301 San Pablo Avenue	APPROVED BY: M. Katen, RG
Oakland, California	DRILLING CO.: V & W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe
SAMPLER TYPE: 4-inch Macro-Core Sampler
TOTAL DEPTH: 10.0 feet DEPTH TO WATER: 2.0 feet

BLOWS PER 6 INCHES	TLV	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY
	150	ND		0	SILTY CLAY: light brown, soft, wet, medium plasticity, 5-10% minor gravel.	CL	

BORING DETAIL



ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

AB-10
PAGE 1 OF 1

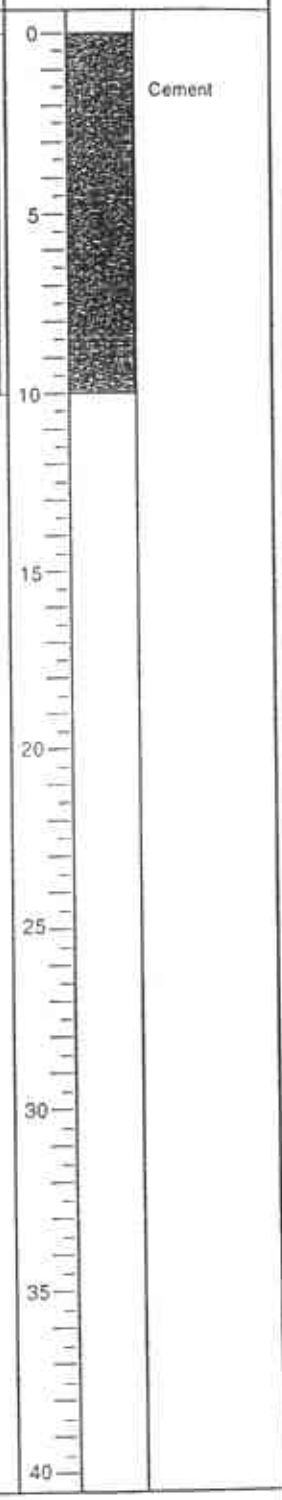
41-0123-105 Boring Log AB-10

PROJECT NO.: 41-0123	DATE DRILLED: 3/5/98
LOCATION: Former Mobil Station 99-105	LOGGED BY: J. Madden
6301 San Pablo Avenue	APPROVED BY: M. Katen, RG
Oakland, California	DRILLING CO.: V & W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe
SAMPLER TYPE: 4-inch Macro-Core Sampler
TOTAL DEPTH: 10.0 feet DEPTH TO WATER: 8.5 feet

BLOWS PER 6 INCHES	TLV	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY
	500	3.9		0	CLAYEY SILT: mottled greenish brown, stiff, moist, low plasticity, <5% minor gravel.	ML	
				5			
				10			
				15			
				20			
				25			
				30			
				35			
				40			

BORING DETAIL



ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

AB-11
PAGE 1 OF 1

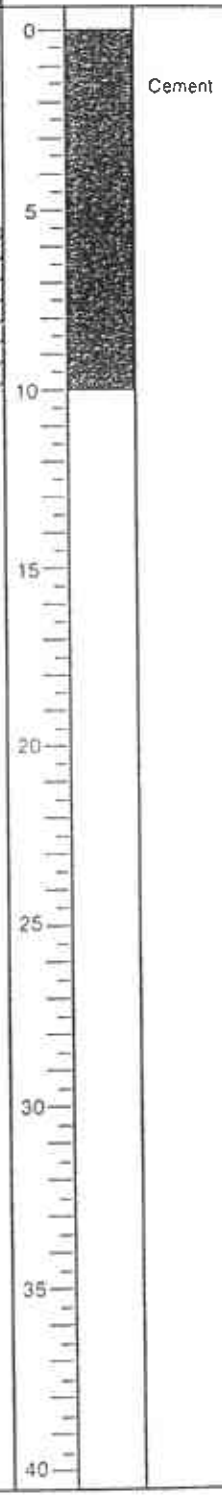
41-0123/99-105 Boring Log AB-11

PROJECT NO.: 41-0123	DATE DRILLED: 3/5/98
LOCATION: Former Mobil Station 99-105	LOGGED BY: J. Madden
6301 San Pablo Avenue	APPROVED BY: M. Katen, RG
Oakland, California	DRILLING CO.: V & W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe
SAMPLER TYPE: 4-inch Macro-Core Sampler
TOTAL DEPTH: 10.0 feet DEPTH TO WATER: 6.0 feet

BLOWS PER 6 INCHES	TLV	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY
				0			
					CLAYEY SILT: mottled greenish brown, soft, moist, low plasticity.	ML	
	100	ND		5			
					SILTY CLAY: dark brown, soft, wet, high plasticity (Bay mud).	CL	
				10			
				15			
				20			
				25			
				30			
				35			
				40			

BORING DETAIL



ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

AB-12
PAGE 1 OF 1

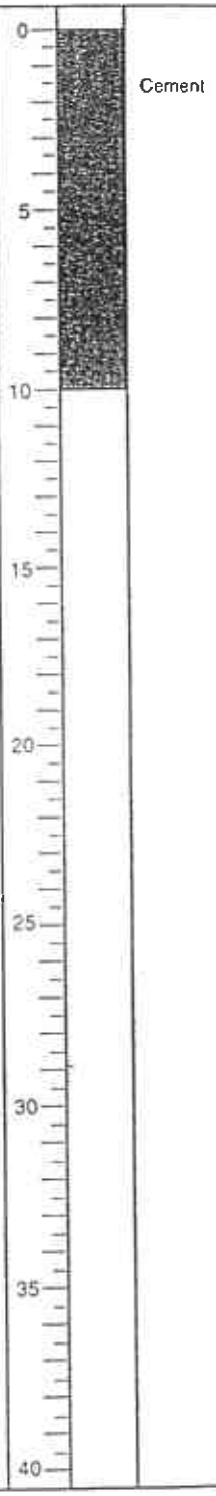
41-0123\99-105 Boring Log AB-12

PROJECT NO.:	41-0123	DATE DRILLED:	3/5/98
LOCATION:	Former Mobil Station 99-105	LOGGED BY:	J. Madden
	6301 San Pablo Avenue	APPROVED BY:	M. Katen, RG
	Oakland, California	DRILLING CO.:	V & W Drilling

DRILLING METHOD: 1.5-inch Diameter Direct-Push Geoprobe
SAMPLER TYPE: 4-inch Macro-Core Sampler
TOTAL DEPTH: 10.0 feet DEPTH TO WATER: 6.0 feet

BLOWS PER 6 INCHES	TLV	TPH (ppm)	SAMPLE	DEPTH (feet below grade)	DESCRIPTION	USCS	LITHOLOGY
	10	ND		0	CLAYEY SILT: light brown, moist, low plasticity.	ML	
				5	SILTY CLAY: dark brown, soft, wet, high plasticity (Bay mud).	CL	
				10			
				15			
				20			
				25			
				30			
				35			
				40			

BORING DETAIL



ALTON GEOSCIENCE
Livermore, California

LOG OF EXPLORATORY BORING

AB-13
PAGE 1 OF 1

41-0123/99-105 Boring Log AB-13

APPENDIX C
REGULATORY COMMUNICATIONS – EXCAVATED SITE SOILS AND SITE DEVELOPMENT ACTIVITIES

TRC

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
(510) 337-9335 (FAX)

July 9, 1999
StID # 1683

Ms. Cherine Foutch
Mobil Oil Co.
2063 Main St.
Oakley, CA 95641

Ms. Connie Lamb
200 Dorado Terrace
San Francisco, CA 94112

1999

Re: Health and Safety Plan for Field Activities at 6301 San Pablo Ave., Oakland CA 94608

Dear Ms. Foutch and Ms. Lamb:

Our office has received and reviewed the June 28, 1999 report submitted by Alisto Engineering Group in your behalf responding to my May 5, 1999 letter, which requested an appropriate Risk Management Plan prior to continuing development at the above referenced site. I have also spoke with Mr. Brady Nagle of Alisto.

My letter was primarily concerned with providing a health and safety plan for the construction workers, providing a soil and groundwater management plan and the proper closure of monitoring wells. It was agreed that a health risk evaluation would not be required at this time and would be more appropriate in the later stage of investigation. The report received included a health and safety plan, documentation of proper closure of MW-1 and reference to the sampling of the soil stockpiles. Additional clarification was provided on the sampling of the stockpiled soils, which verify that it is okay to reuse onsite. Because no further excavation is anticipated, a specific soil and management plan is not necessary for further construction.

I requested that a plot plan be submitted that showed the original site overlaid by that of the newly proposed building. Please also indicate the depth of the current construction. I was also informed that during excavation, monitoring well MW-4 was buried and thus lost. Please be aware that if this well cannot be located and properly closed, its location must be included in your deed notice. In addition, future site investigation will require the replacement of all wells needed to properly characterize the site.

Before additional construction continues, you will need to obtain at a minimum, two vadose soil and two groundwater samples in the general location of former product lines (near MW-4) and near the fore dispenser areas. These locations are within the proposed mezzanine and may be within a gasoline plume. It is then recommended that a Tier 1 or Tier 2 risk-based corrective action (RBCA) evaluation be done to estimate human health risk. The need for future remediation in this area will be determined by the results of the RBCA evaluation. You may want to collect geotechnical data from additional borings outside this area to use in your RBCA.

To expedite the proposed construction, please provide the plot plan and a work plan for the requested soil and groundwater sampling as soon as possible. You should also propose the installation of your replacement wells.

You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M. Chan
Hazardous Materials Specialist

C: B. Chan, files
Mr. B. Nagle, Alisto Engineering, 1575 Treat Boulevard, Suite 201, Walnut Creek, CA 94598
Mr. T. Seeliger, Alton Geoscience, 30A Lindbergh Ave., Livermore, CA 94550-9503

Rmp6301SPAve

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700

October 28, 1999
StID # 1683

Ms. Cherine Foutch
Mobil Oil Co.
2063 Main St.
Oakley, CA 95641

Ms. Connie Lamb
200 Dorado Terrace
San Francisco, CA 94112

Re: Request for Technical Report for 6301 San Pablo Ave., Oakland CA 94608

Dear Ms. Foutch and Ms. Lamb:

Our office has received and reviewed the **October 20, 1999 Third Quarter 1999 Progress Report** for the above site prepared by TRC Alton Geoscience. Please be aware that I, not Ms. Susan Hugo, am your contact for oversight of this site. This report gives some indication of the subsurface conditions, however, as you are aware, our office is still waiting for a work plan for the installation of replacement wells for those destroyed during the recent development of the site.

In addition, my prior July 9, 1999 letter requested additional soil and groundwater sampling near the location of well MW-4. Such information would be used to estimate human health risk through a risk-based corrective action (RBCA) evaluation. A subsequent conversation with your consultant, provided evidence that soil contamination was not significant, therefore, only groundwater samples would be necessary. Please resolve the need to obtain this groundwater sampling.

Please update our office on the construction of the proposed building. Were all the excavated soils reused? What type of vapor barrier was installed during the construction?

Please provide your work plan and response to this letter **within 30 days or no later than November 29, 1999.**

You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M Chan

Barney M. Chan
Hazardous Materials Specialist

C: B. Chan, files
Mr. T. Seeliger, TRC Alton Geoscience, 5052 Commercial Circle, Concord, CA 94520
Mr. B. Nagle, Alisto Engineering, 1575 Treat Blvd, Suite 201, Walnut Creek, CA 94598

2stat6301

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION (LOP)
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

March 3, 2000
StID # 1683

Ms. Connie Lam
200 Dorado Terrace
San Francisco, CA 94112

Re: Work Plan for Monitoring Well Destruction and/or Replacement, 6301 San Pablo Ave., Oakland CA 94608

Dear Ms. Lamb:

This letter serves to comment on the February 28, 2000 work plan referenced above and also on past activities at this site. As you are aware, this work plan responds to the County's request to repair or reinstall monitoring wells. It is unclear whether any of the former wells can be repaired, therefore, the number of new wells may vary from one to three. Our office concurs that former well MW-1 will not require replacement.

Our office, however, requests that the location(s) of the monitoring wells be reconsidered based on past and current information. Previous and new soil and groundwater information near former well MW4 indicates that the petroleum contamination has been defined east of this well, therefore, the replacement well should be located to the west of MW-4, as close to the new building as possible. In addition, if MW-2 is not able to be repaired, a better location for this well would be the west of the new MW-4 location, as close to the property boundary as possible. The location proposed for the replacement well for MW-3 is appropriate. Please have your consultant comment on these observations prior to scheduling this work.

Our office has received the re-analysis of the accumulated water within the garage bay and concur that this water can be used on-site for watering or dust control.

You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M Chan

Barney M. Chan
Hazardous Materials Specialist

C: B. Chan, files
Mr. B. Nagle, Alisto Engineering, 1575 Treat Blvd., Suite 201, Walnut Creek, CA 94598
Mr. B. Ledesma, ExxonMobil Corp. Remediation Services, 3700 W. 190th St., TPT 2, Torrance, CA 90509-2929
Mr. T. Seeliger, TRC Alton Geoscience, 5052 Commercial Circle, Concord, CA 94520

Wells6301SP

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION (LOP)
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

January 25, 2000
StID # 1683

Ms. Cherine Foutch
Mobil Oil Co.
2063 Main St.
Oakley, CA 95641

Ms. Connie Lamb
200 Dorado Terrace
San Francisco, CA 94112

Re: Activities and Site Investigation at 6301 San Pablo Ave., Oakland CA 94608

Dear Ms. Foutch and Ms. Lamb:

Our office has been made aware of recent activities at the above site, which our office should have but was not informed as they were happening. As you are aware, the construction of the oil change facility has caused some concern. This project was initiated without any concern of it environmental or public health consequence. Neither our office nor Mobil Oil was made aware of this activity. During the initial work, two monitoring wells were destroyed, of which have yet to be replaced. Over 200 cubic yards of potentially contaminated soil was excavated without any precaution taken to monitor petroleum concentrations. When our office finally was informed of these activities, our request for a soil and groundwater management plan, a health and safety plan for construction workers, the proper closure of monitoring wells and a health risk assessment was, as we now know, not adequately addressed.

It was believed that all excavation activities had been concluded in mid 1999, therefore, a health risk evaluation for construction workers was not necessary. However, our office learned from an outside party, additional construction activities including the removal of hydraulic lift reservoir and piping recently occurred. During this time, apparent hydraulic oil contaminated soil was encountered. What happened to this material? Was any sampling or testing done?

Our office was again informed that the remaining two monitoring wells had been damaged or destroyed without permit, permission and without using proper abandonment procedures. It appears that **all** wells at the site are no longer viable. The monitoring wells should be properly abandoned according to Alameda County Public Works guidelines. What will be done to locate and close the formerly remaining wells? In addition, you must replace a minimum of three wells at this site, one of which has been previously approved by our office. **Please submit your well replacement work plan within 30 days, or no later than February 28, 2000.**

We were also notified that a great deal of water, either groundwater and/or rainwater had entered the sump within the new oil change building. There appeared be an attempt to dispose of this water improperly. Be aware, this water must be properly characterized and disposed with documentation. It cannot be directly discharged to the storm or sanitary sewers without the appropriate permit.

It would appear that construction activities require additional supervision and regulatory agency notification to avoid these situations. Please have an environmental consultant oversee all future construction activities and notify our office of future activities.

You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M Chan

Barney M. Chan
Hazardous Materials Specialist

C: B. Chan, files
Mr. T. Seeliger, TRC Alton Geoscience, 5052 Commercial Circle, Concord CA 94520
Mr. B. Nagle, Alisto Engineering, 1575 Treat Blvd., Suite 201, Walnut Creek, CA 94598
Mr. H. Gomez, City of Oakland OES, 1605 Martin Luther King Dr., Oakland CA 94612

constr6301San Pablo

Oakland RBCA Eligibility Checklist

The Oakland Tier 1 RBSLs and Tier 2 SSTLs are intended to address human health concerns at the majority of sites in Oakland where commonly-found contaminants are present. Complicated sites—especially those with continuing releases, ecological concerns or unusual subsurface conditions—will likely require a Tier 3 analysis. The following checklist is designed to assist you in determining your site's eligibility for the Oakland RBCA levels.

CRITERIA	YES	NO
1. Is there a continuing, *primary* source of a chemical of concern, such as a leaking container, tank or pipe? (This does *not* include residual sources.)	☐	☒
2. Is there any mobile or potentially-mobile free product?	☐	☒
3. Are there more than five chemicals of concern at the site at a concentration greater than the lowest applicable Oakland RBCA level?	☐	☒
4. Are there any preferential vapor migration pathways—such as gravel channels or utility corridors—that are potential conduits for the migration, on-site or off-site, of a volatilized chemical of concern?	☐	☒
5. Do both of the following conditions exist? (a) Groundwater is at depths less than 300 cm (10 feet) (b) Inhalation of volatilized chemicals of concern from groundwater in indoor or outdoor air is a pathway of concern but groundwater ingestion is *not**	☐	☒
6. Are there any existing on-site or off-site structures intended for future use where exposure to indoor air vapors from either soil or groundwater is of concern *and* one of the following three conditions is present? (a) A slab-on-grade foundation that is less than 15 cm (6 inches) thick (b) An enclosed, below-grade space (e.g., a basement) that has floors or walls less than 15 cm (6 inches) thick (c) A crawl space that is not ventilated	☐	☒
7. Are there any immediate, acute health risks to humans associated with contamination at the site, including explosive levels of a chemical?	☐	☒
8. Are there any complete exposure pathways to nearby ecological receptors, such as endangered species, wildlife refuge areas, wetlands, surface water bodies or other protected areas?	☐	☒

*If groundwater ingestion *is* a pathway of concern, the associated Oakland RBCA levels will be more stringent than those for any groundwater-related inhalation scenario, rendering depth to groundwater irrelevant in the risk analysis.

If you answer "no" to all questions, your site is eligible for the Oakland RBCA levels. If you answer "yes" to any of the questions, your site is *not* eligible for the Oakland RBCA levels at this time.

APPENDIX E
OAKLAND TIER 1 RBSLS AND TIER 2 SSTLS

TRC

Oakland Tier 1 RBSLs

Medium	Exposure Pathway	Land Use	Type of Risk	Benzene	Ethyl-benzene	MTBE	Toluene	Xylenes
Surficial Soil (mg/kg)	Ingestion/ Dermal/ Inhalation	Residential	Carcinogenic	2.7E+00				
			Hazard	8.1E+01	5.1E+03	2.6E+02	9.0E+03	5.4E+04
		Commercial/ Industrial	Carcinogenic	8.5E+00				
			Hazard	5.1E+02	3.3E+04	1.7E+03	5.6E+04	3.0E+05
Subsurface Soil (mg/kg)	Inhalation of Indoor Air Vapors	Residential	Carcinogenic	6.9E-02				
			Hazard	2.3E+00	SAT	4.4E+03	3.6E+02	SAT
		Commercial/ Industrial	Carcinogenic	1.1E+00				
			Hazard	6.6E+01	SAT	SAT	SAT	SAT
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic	1.9E-01				
			Hazard	7.6E+00	SAT	SAT	SAT	SAT
		Commercial/ Industrial	Carcinogenic	7.3E-01				
			Hazard	4.4E+01	SAT	SAT	SAT	SAT
	Ingestion of Groundwater Impacted by Leachate	Residential	Carcinogenic	*2.1E-03*	*8.0E+00*	*7.6E-03*	*8.8E-01*	*1.3E+01*
			Hazard	*2.1E-03*	*8.0E+00*	*7.6E-03*	*8.8E-01*	*1.3E+01*
		Commercial/ Industrial	Carcinogenic	*2.1E-03*	*8.0E+00*	*7.6E-03*	*8.8E-01*	*1.3E+01*
			Hazard	*2.1E-03*	*8.0E+00*	*7.6E-03*	*8.8E-01*	*1.3E+01*
Groundwater (mg/l)	Inhalation of Indoor Air Vapors	Residential	Carcinogenic	1.1E-01				
			Hazard	3.7E+00	>SOL	2.4E+04	2.1E+02	>SOL
		Commercial/ Industrial	Carcinogenic	1.8E+00				
			Hazard	1.1E+02	>SOL	>SOL	>SOL	>SOL
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic	5.6E+00				
			Hazard	2.2E+02	>SOL	>SOL	>SOL	>SOL
		Commercial/ Industrial	Carcinogenic	2.1E+01				
			Hazard	1.3E+03	>SOL	>SOL	>SOL	>SOL
	Ingestion of Groundwater	Residential	Carcinogenic	*1.0E-03*	*7.0E-01*	*1.3E-02*	*1.5E-01*	*1.8E+00*
			Hazard	*1.0E-03*	*7.0E-01*	*1.3E-02*	*1.5E-01*	*1.8E+00*
		Commercial/ Industrial	Carcinogenic	*1.0E-03*	*7.0E-01*	*1.3E-02*	*1.5E-01*	*1.8E+00*
			Hazard	*1.0E-03*	*7.0E-01*	*1.3E-02*	*1.5E-01*	*1.8E+00*
Water Used for Recreation (mg/l)	Ingestion/ Dermal	Residential	Carcinogenic	6.3E-03				
			Hazard	1.8E-01	3.6E+00	1.5E+00	1.1E+01	6.6E+01

Italicized concentrations based on California MCLs

SAT = RBSL exceeds saturated soil concentration of chemical

>SOL = RBSL exceeds solubility of chemical in water

Note: Recreated from Table 5, Oakland Urban Land Development Program: Guidance Document, City of Oakland, Public Works Agency, Jan 1, 2000.

Oakland Tier 2 SSTLs for Merrit Sands

Medium	Exposure Pathway	Land Use	Type of Risk	Benzene	Ethyl-benzene	MTBE	Toluene	Xylenes
Surficial Soil (mg/kg)	Ingestion/ Dermal/ Inhalation	Residential	Carcinogenic	3.7E+01				
			Hazard	9.9E+01	6.3E+03	3.3E+02	1.1E+04	6.0E+04
		Commercial/ Industrial	Carcinogenic	1.5E+02				
			Hazard	9.2E+02	6.3E+04	3.4E+03	9.4E+04	3.8E+05
Subsurface Soil (mg/kg)	Inhalation of Indoor Air Vapors	Residential	Carcinogenic	7.0E-01				
			Hazard	2.3E+00	SAT	4.8E+03	3.7E+02	SAT
		Commercial/ Industrial	Carcinogenic	1.1E+01				
			Hazard	6.7E+01	SAT	SAT	SAT	SAT
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic	3.9E+00				
			Hazard	1.6E+01	SAT	SAT	SAT	SAT
		Commercial/ Industrial	Carcinogenic	1.5E+01				
			Hazard	9.1E+01	SAT	SAT	SAT	SAT
	Inhalation of Groundwater Impacted by Leachate	Residential	Carcinogenic	*1.0E-02*	*3.8E+01*	*4.0E-02*	*4.2E+00*	*6.4E+01*
			Hazard	*1.0E-02*	*3.8E+01*	*4.0E-02*	*4.2E+00*	*6.4E+01*
		Commercial/ Industrial	Carcinogenic	*1.0E-02*	*3.8E+01*	*4.0E-02*	*4.2E+00*	*6.4E+01*
			Hazard	*1.0E-02*	*3.8E+01*	*4.0E-02*	*4.2E+00*	*6.4E+01*
Groundwater (mg/l)	Inhalation of Indoor Air Vapors	Residential	Carcinogenic	1.4E+00				
			Hazard	4.7E+00	>SOL	2.5E+04	2.8E+02	>SOL
		Commercial/ Industrial	Carcinogenic	2.2E+01				
			Hazard	1.4E+02	>SOL	>SOL	>SOL	>SOL
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic	1.8E+02				
			Hazard	7.2E+02	>SOL	>SOL	>SOL	>SOL
		Commercial/ Industrial	Carcinogenic	6.9E+02				
			Hazard	>SOL	>SOL	>SOL	>SOL	>SOL
	Ingestion of Groundwater	Residential	Carcinogenic	*1.0E-03*	*7.0E-01*	*1.3E-02*	*1.5E-01*	*1.8E+00*
			Hazard	*1.0E-03*	*7.0E-01*	*1.3E-02*	*1.5E-01*	*1.8E+00*
		Commercial/ Industrial	Carcinogenic	*1.0E-03*	*7.0E-01*	*1.3E-02*	*1.5E-01*	*1.8E+00*
			Hazard	*1.0E-03*	*7.0E-01*	*1.3E-02*	*1.5E-01*	*1.8E+00*
Water Used for Recreation (mg/l)	Ingestion/ Dermal	Residential	Carcinogenic	6.3E-02				
			Hazard	1.8E-01	3.6E+00	1.5E+00	1.1E+01	6.6E+01

*Italicized concentrations based on California MCLs

SAT = RBSL exceeds saturated soil concentration of chemical

>SOL = RBSL exceeds solubility of chemical in water

Note: Recreated from Table 6, Oakland Urban Land Development Program: Guidance Document, City of Oakland, Public Works Agency, Jan 1, 2000.

Oakland Tier 2 SSTLs for Sandy Silts

Medium	Exposure Pathway	Land Use	Type of Risk	Benzene	Ethyl-benzene	MTBE	Toluene	Xylenes
Surficial Soil (mg/kg)	Ingestion/ Dermal/ Inhalation	Residential	Carcinogenic	2.7E+01				
			Hazard	8.2E+01	5.1E+03	2.6E+02	9.0E+03	5.6E+04
		Commercial/ Industrial	Carcinogenic	8.5E+01				
			Hazard	5.2E+02	3.3E+04	1.7E+03	5.6E+04	3.1E+05
Subsurface Soil (mg/kg)	Inhalation of Indoor Air Vapors	Residential	Carcinogenic	1.1E+00				
			Hazard	3.6E+00	SAT	8.1E+03	5.7E+02	SAT
		Commercial/ Industrial	Carcinogenic	1.7E+01				
			Hazard	1.1E+02	SAT	SAT	SAT	SAT
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic	2.0E+01				
			Hazard	8.0E+01	SAT	SAT	SAT	SAT
		Commercial/ Industrial	Carcinogenic	7.7E+01				
			Hazard	4.7E+02	SAT	SAT	SAT	SAT
	Inhalation of Groundwater Impacted by Leachate	Residential	Carcinogenic	*6.5E-03*	*2.4E+01*	*2.7E-02*	*2.7E+00*	*4.0E+01*
			Hazard	*6.5E-03*	*2.4E+01*	*2.7E-02*	*2.7E+00*	*4.0E+01*
		Commercial/ Industrial	Carcinogenic	*6.5E-03*	*2.4E+01*	*2.7E-02*	*2.7E+00*	*4.0E+01*
			Hazard	*6.5E-03*	*2.4E+01*	*2.7E-02*	*2.7E+00*	*4.0E+01*
Groundwater (mg/l)	Inhalation of Indoor Air Vapors	Residential	Carcinogenic	3.4E+00				
			Hazard	1.1E+01	>SOL	3.0E+04	>SOL	>SOL
		Commercial/ Industrial	Carcinogenic	5.3E+01				
			Hazard	3.2E+02	>SOL	>SOL	>SOL	>SOL
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic	1.0E+03				
			Hazard	>SOL	>SOL	>SOL	>SOL	>SOL
		Commercial/ Industrial	Carcinogenic	>SOL				
			Hazard	>SOL	>SOL	>SOL	>SOL	>SOL
	Ingestion of Groundwater	Residential	Carcinogenic	*1.0E-03*	*7.0E-01*	*1.3E-02*	*1.5E-01*	*1.8E+00*
			Hazard	*1.0E-03*	*7.0E-01*	*1.3E-02*	*1.5E-01*	*1.8E+00*
		Commercial/ Industrial	Carcinogenic	*1.0E-03*	*7.0E-01*	*1.3E-02*	*1.5E-01*	*1.8E+00*
			Hazard	*1.0E-03*	*7.0E-01*	*1.3E-02*	*1.5E-01*	*1.8E+00*
Water Used for Recreation (mg/l)	Ingestion/ Dermal	Residential	Carcinogenic	6.3E-02				
			Hazard	1.8E-01	3.6E+00	1.5E+00	1.1E+01	6.6E+01

*Italicized concentrations based on California MCLs

SAT = RBSL exceeds saturated soil concentration of chemical

>SOL = RBSL exceeds solubility of chemical in water

Note: Recreated from Table 7, Oakland Urban Land Development Program: Guidance Document, City of Oakland, Public Works Agency, Jan 1, 2000.

Oakland Tier 2 SSTLs for Clayey Silts

Medium	Exposure Pathway	Land Use	Type of Risk	Benzene	Ethyl-benzene	MTBE	Toluene	Xylenes
Surficial Soil (mg/kg)	Ingestion/ Dermal/ Inhalation	Residential	Carcinogenic	1.9E+00				
			Hazard	6.3E+01	3.9E+03	2.0E+02	7.1E+03	5.3E+04
		Commercial/ Industrial	Carcinogenic	4.9E+01				
			Hazard	3.0E+02	1.8E+04	9.3E+02	3.4E+04	2.6E+05
Subsurface Soil (mg/kg)	Inhalation of Indoor Air Vapors	Residential	Carcinogenic	1.9E+00				
			Hazard	6.2E+00	SAT	1.4E+04	9.3E+02	SAT
		Commercial/ Industrial	Carcinogenic	3.0E+01				
			Hazard	1.8E+02	SAT	SAT	SAT	SAT
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic	1.6E+02				
			Hazard	6.5E+02	SAT	SAT	SAT	SAT
		Commercial/ Industrial	Carcinogenic	6.2E+02				
			Hazard	SAT	SAT	SAT	SAT	SAT
	Ingestion of Groundwater Impacted by Leachate	Residential	Carcinogenic	*4.5E-03*	*1.6E+01*	*2.1E-02*	*1.8E+00*	*2.7E+01*
			Hazard	*4.5E-03*	*1.6E+01*	*2.1E-02*	*1.8E+00*	*2.7E+01*
		Commercial/ Industrial	Carcinogenic	*4.5E-03*	*1.6E+01*	*2.1E-02*	*1.8E+00*	*2.7E+01*
			Hazard	*4.5E-03*	*1.6E+01*	*2.1E-02*	*1.8E+00*	*2.7E+01*
Groundwater (mg/l)	Inhalation of Indoor Air Vapors	Residential	Carcinogenic	5.6E+00				
			Hazard	1.9E+01	>SOL	3.6E+04	>SOL	>SOL
		Commercial/ Industrial	Carcinogenic	8.9E+01				
			Hazard	5.4E+02	>SOL	>SOL	>SOL	>SOL
	Inhalation of Outdoor Air Vapors	Residential	Carcinogenic	>SOL				
			Hazard	>SOL	>SOL	>SOL	>SOL	>SOL
		Commercial/ Industrial	Carcinogenic	>SOL				
			Hazard	>SOL	>SOL	>SOL	>SOL	>SOL
	Ingestion of Groundwater	Residential	Carcinogenic	*1.0E-03*	*7.0E-01*	*1.3E-02*	*1.5E-01*	*1.8E+00*
			Hazard	*1.0E-03*	*7.0E-01*	*1.3E-02*	*1.5E-01*	*1.8E+00*
		Commercial/ Industrial	Carcinogenic	*1.0E-03*	*7.0E-01*	*1.3E-02*	*1.5E-01*	*1.8E+00*
			Hazard	*1.0E-03*	*7.0E-01*	*1.3E-02*	*1.5E-01*	*1.8E+00*
Water Used for Recreation (mg/l)	Ingestion/ Dermal	Residential	Carcinogenic	6.3E-02				
			Hazard	1.8E-01	3.6E+00	1.5E+00	1.1E+01	6.6E+01

Italicized concentrations based on California MCLs

SAT = RBSL exceeds saturated soil concentration of chemical

>SOL = RBSL exceeds solubility of chemical in water

Note: Recreated from Table 8, Oakland Urban Land Development Program: Guidance Document, City of Oakland, Public Works Agency, Jan 1, 2000.