AEI CONSULTANTS
Environmental & Civil Engineering Services

3210 Old Tunnel Road, Suite B, Lafayette, CA 94549-4157
Phone: (925) 283-6000 Fax: (925) 283-6121

October 9, 2002

Mr. Barney Chan
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

Subject: 1450 Fruitvale Avenue
Oakland, California
AEI Project No. 5624

Dear Mr. Chan:

Enclosed is copy of our Site Summary and Risk Evaluation Report prepared for the above referenced property.

Thank you again for your time and please call me at (925) 283-6000 if you have any questions.

Sincerely,

Peter McIntyre
Project Manager, Geologist

October 9, 2002

SITE SUMMARY AND RISK EVALUATION REPORT

20307

1450 Fruitvale Avenue
Oakland, California

AEI Project No. 5624

Prepared For

Fruitvale-Farnam Associates, LLP
141 Woodland Way
Piedmont, CA 94611

Prepared By

AEI Consultants
3210 Old Tunnel Road, Suite B
Lafayette, CA 94549
(925) 283-6000

AEI

TABLE OF CONTENTS

Figures

Tables

Appendices

1.0 INTRODUCTION

AEI Consultants (AEI) has prepared this Site Summary and Risk Assessment Report on behalf of the Fruitvale-Farnam Associates, LLP (FFA), owners of the property located at 1450 Fruitvale Avenue in the City of Oakland, California (refer to Figures 1 and 2). AEI has been retained by FFA to provide environmental engineering and consulting services related to the release of fuel hydrocarbons from the former underground storage tank (UST) system at the site. The Alameda County Health Care Services Agency (ACHCSA) is the lead local oversight agency for this site, working under the authority of the San Francisco Bay Regional Water Quality Control Board (RWQCB), providing regulatory guidance during the mitigation of the release.

As requested by ACHCSA, this report presents and evaluation of the risk to human health and the environment posed by the release of petroleum hydrocarbons from the site. The evaluation was performed in accordance with the guidance provided by the City of Oakland Public Works Agency, *Oakland Urban Land Redevelopment Program: Guidance Document* (January 2000) and the RWQCB's *Application of Risk Based Screening Levels and Decision Making to Sites with Impacted Soil and Groundwater* (December 2001). A summary of historical research and investigative efforts is presented along with a discussion of the extent and magnitude of the release. Proposed site use, area land use, and groundwater and surface water resources have been considered.

The evaluations discussed herein conclude that although the release has impacted groundwater directly beneath the release area, the plume is very localized and has not mifrated. No threat to drinking water or surface water was identified. In addition, the comparative evaluation of risk posed by the release has not revealed a significant risk to human health or the environment with unrestricted land use assumptions. Based on these conclusions, it is recommended that the site be considered for case closure.

2.0 SITE DESCRIPTION

The subject property (hereinafter referred to as the "site" or "property") is located on the eastern corner of Fruitvale Avenue and Farnam Street in a residential and commercial area of the City of Oakland. The property is approximately 16,600 square feet in size. Until December 2001, the site was developed with a three-story building, the footprint of which occupied approximately one-third of the parcel. The property is currently vacant and unimproved.

The proposed development of the property is to include a 2 or 3 story building with first floor commercial with office space above. The proposed building will have a footprint covering approximately 40% of the property, with the remainder of the property improved with cement or asphalt surfacing. Landscaped areas will comprise less than 5% of the properties surface area. Refer to the site plans for the former and proposed property layout.

3.0 SITE BACKGROUND

3.1 Research and Exploratory Excavation

The site was reportedly developed as a gas station in 1950 by Atlantic Richfield Oil Company (currently known as ARCO) and operated until approximately 1983. There were four underground storage tanks located along the southern property boundary. The fuel dispenser island was located on the northeast corner of the former parking lot. The gas station was demolished and the subsequent warehouse building was then constructed.

Research was performed at the City of Oakland Fire and Building Departments for records regarding the location of the tanks and underground piping. Although no formal tank removal records were available, it was determined that the former tank hold was along Farnam Street, as shown in Figure 3.

Following on an inconclusive geophysical survey, AEI was retained to excavate the suspected tank hold, and confirm the presence or absence of any tanks. Three excavations were performed in May 1999, one along Farnam Street and two smaller excavations within the rollup door of the building, likely locations of an unknown waste oil tank. The locations of the excavations are shown on Figure 3. No tanks were found and soils removed from the larger excavation appeared to be consistent with imported fill material commonly used to backfill former tank holds. A total of six soil samples and one groundwater sample (labeled AEI GW 8', from the larger excavation at 8 feet bgs) were collected. The samples contained very low or non-detect hydrocarbon concentrations. Sample analytical data from the samples collected from the excavations are included on Table 1. The results of AEI GW 8 are in Table 3.

Although a previous subsurface investigation had revealed a release (Sec. 3.2), it was apparent that the tanks had been removed and that the release that had occurred did not occur in the former tank hold but rather from the product piping or dispensing location.

3.2 Investigative Activities

Between July 1998 and June 2002, a total of twenty-two soil borings (labeled GP-1 through GP-9 and AEI-9 through AEI-22) have been performed and three monitoring wells (MW-1 through MW-3) installed. Soil sample analytical data collected during these projects is summarized in Table 2. Groundwater sample analytical data from temporary borings is presented in Table 3 and data collected during the eight episodes of monitoring is presented in Tables 4 and 5. Hydrocarbon distributions in the soil and groundwater are presented on Figures 5 through 7.

On September 26, 2002, an additional three shallow soil borings (AEI-23 through AEI-25) were advanced with a hand auger in the dispenser (AEI-23) and piping (AEI-24) locations

and beneath the proposed building (AEI-25) to confirm the absence of hydrocarbons in the shallow soil and to collect a soil sample for grain size analysis.

Based on the 60 total soil samples collected from the site, 15 groundwater samples collected from temporary borings, and eight monitoring episodes, several conclusions have been drawn.

Although the concentrations of hydrocarbons in the three monitoring wells remain elevated, samples collected from the recent borings have shown that the plume has not extended significantly in any direction from the localized area of the monitoring wells. All contaminants of concern (COCs) decrease by nearly 2 orders of magnitude or to below detection limits within no more than 120 feet in all directions. Benzene and toluene were not detected at greater than 1 µg/l and 2.7 µg/l, respectively, in the most outlying borings of the investigation. Limited lateral migration of the hydrocarbon plume is evidence of very low lateral transmissivity through the saturated zone. This is supported by the high annual variations in water table elevations, which would not occur if groundwater moved freely beneath the site in a highly permeable aquifer. Although these low transmissivity soils limit the input of oxygen to the system and limit hydrocarbon attenuation by dispersion, the result has been to "contain" the hydrocarbons to directly beneath the release area. Because the release is at least 19 years old, and likely much older, it is apparent that this plume will not significantly spread in the future.

Soil sample analytical data has not revealed any significant presence of source material remaining in the vadose zone. The highest concentrations of hydrocarbon detected in the soil have been in soils within the range of high and low average water table depths. The lack of hydrocarbons in soils adjacent the former tank hold and low to non-detect concentrations in samples collected from less than 10 feet bgs indicate that the release occurred along the piping lines or dispenser rather than from the tanks and is very localized in nature.

4.0 CONTAMINANTS OF CONCERN

The investigation efforts performed to date have identified that the material released from the site is consistent with gasoline range fuel hydrocarbons. For the purpose of identifying and assessing the risk to human health and the environment, a summary of each specific COCs identified at the site is presented here. As a conservative assumption, the highest concentrations of each COC present in each depth range and medium is used, although localized averaging may be useful to provide a more site-specific estimate of mass of hydrocarbons remaining.

Exhibit 1: Identified Contaminants

Contaminant	Maximum Concentration (sample ID)		
	Surface Soil (< 3 ft bgs) in mg/kg	Subsurface Soil (<water table and >3 ft bgs) in mg/kg	Groundwater in µg/l
Benzene	<0.005 (all in depth range)	0.59 (GP-3 10')	3,800 (AEI-22)
Toluene	<0.005 (all in depth range)	0.58 (AEI-22 10')	290 (AEI-22)
Ethyl benzene	<0.005 (all in depth range)	1.1 (GP-3 10')	2,200 (MW-3)
Xylenes (total)	<0.005 (all in depth range)	1.5 (GP-3 10')	1,900 (AEI-22)
MTBE	<0.05 (all in depth range)	< LDL (all in depth range)	92 (MW-2)
TPH-g (C6-C12)	<1.0 (all in depth range)	95 (GP-3 10')	25,000 (AEI-22 & MW-3)

LDL – Laboratory Detection Limit

The Oakland guidance document defines surface soils as soils from ground surface to 1 meter (3 feet) bgs and subsurface soils as those from 3 feet bgs to the water table. The RWQCB RBSL document defines surface soils as soils from ground surface to 3 meters (10 feet) bgs and subsurface soils as those between 10 feet bgs and the water table. For most COCs present at this site, screening levels presented by the RWQCB for volatile organics are the same for both surface and subsurface soils, therefore the data presented above is according to the Oakland definitions. The water table beneath this site has varied between 8.7 feet bgs and 16.9 feet bgs, with an average of 11.9 feet bgs for the eight monitoring episodes. For the purpose of identifying soil samples as "subsurface" soils, the average water table depth will be used, and subsurface soils will be those collected from above that depth. For the groundwater medium, only data from the recent soil boring project (AEI-13 through AEI-22) and from the last episode of monitoring is used.

cannot use

historic low gw depth.

In addition to the COCs identified above, the presence of the following have been analyzed for and found to not be significant at the site: lead, diesel range hydrocarbons, and the fuel additives diisopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), tert amyl methyl ether (TAME), t-butyl alcohol (TBA) 1,2-dibromoethane (EDB), and 1,2-dichloroethane (1,2-DCA).

5.0 ENVIRONMENTAL SETTING

5.1 Geology and Hydrology

The site is located at 40 feet above mean seal level. The site is flat; however, the topography of the area slopes gently to the southwest. The soils beneath the site are generally categorized as alluvial deposits derived from Franciscan Formation bedrock of the Berkeley-Oakland hills.

According to logs of the borings completed by AEI, the near surface sediments generally consist of mixed silty, sandy, and gravely clays, which were encountered to boring termination, up to 35 feet below ground surface (bgs). A grain size distribution analysis was performed on sample AEI-24 [redacted] than US Standard Sieve # [redacted] Generally soils encountered to between 10 and 12 feet bgs were predominantly clay while sand and gravel content increased with depth. Clean sand stringers ranging from several inches to several feet thick were encountered locally in several borings in the 10 to 15 feet bgs range. Refer to Figure 9 for a cross-section of the property.

silt & clay

Groundwater was not initially encountered in the recent borings; however, evidence of saturation was observed in the 12 to 15 feet bgs range. Greenish sandy clays and clays, present generally below this depth range were observed in a majority of the borings. These color changes from brown / dark brown clays in this depth range is indicative of clays that are saturated. The greenish color is caused by reduced iron (Fe II), which is stable in a saturated, low oxygen environment. Along with the water level measurements in the permanent wells, the color change further supports the argument that the clays are saturated. Groundwater was present in each boring, ranging from 13 to 35 feet bgs, within several hours of drilling, reflecting the low hydraulic conductivity of the clays.

Average groundwater elevations for the three wells ranged from 25.36 feet above msl in October 2000 to 33.54 feet above msl in March 2002. Based on these measurements, groundwater beneath the site generally flows in a southeasterly direction; however during March and June 2002, northwesterly and southwesterly flow directions were measured, respectively. Generally the hydraulic gradient has been on the order of 10^{-2} ft/ft. Historical groundwater level measurements are presented in Table 3. A rose diagram of groundwater flow directions is presented on the site plans.

5.2 Exposure Pathways

An exposure pathway analysis has been performed to identify which specific exposure pathways are complete for exposure of human or environmental receptors.

5.2.1 Groundwater Exposure Pathways

[redacted] Table 2.4 of the Basin Plan (p. 2-17) indicates that the only beneficial uses of water within the sub-basin are surface water recreation and waters (assumed to be surface waters) for spawning and general wildlife. No beneficial use of groundwater is noted in the plan for this sub-basin.

The Department of Water Resources (DWR) was contacted to review well reports on behalf of AEI. The search was performed for all wells, excluding shallow monitoring wells, within approximately ½ mile of the site. A total of five (5) wells were identified during the search. Due to confidentiality law governing well driller's reports, copies are not included in this report; however, they can be forwarded to the ACHCSA if requested from their office. The following table summarizes the result of the survey.

Exhibit 2: Well Survey Results

Location	Direction / Distance from site (feet)	Depth (feet)	Use
3101 Chapman St.	South SW / 2,400	20 (max)	5 temporary borings
2928 Chapman St.	South SW / 2,500	108	Unknown
1601 39th Avenue	East SE / 2,300	30	Irrigation
29th Avenue @ E. 14th	West NW / 1,300	381	Unknown
Unknown	Unknown	345	Unknown

Of the five sites identified, four are known to be over 1,200 feet from the site. The well of unknown location was reportedly drilled to 345 feet bgs. No screen interval details are available; however, a well drilled to that depth is unlikely to be screened within the shallowest aquifer.

Based on the distance and direction of the wells from the site and the results of recent plume definition, it is concluded that these wells are not potential receptors of the release. With the exception of the monitoring wells present on the site for the purpose of the release investigation, no other wells or access to groundwater is present on the site. Groundwater beneath the site is not considered a drinking water resource for the purpose of the following risk evaluations. In addition, migration of groundwater to surface water and aquatic receptors is also not considered complete due to 1) the distance to nearest surface water bodies, 2) lack of dissolved phase

hydrocarbon in groundwater over 19 years after release could have occurred, and 3) strong evidence of very low lateral groundwater movement beneath the site.

5.2.2 Soil & Soil Vapor Exposure Pathways

Three forms of exposure pathways warrant consideration: 1) direct contact with impacted soil, including dermal contact and ingestion, 2) volatilization of organic compounds to both indoor breathing space and outdoor ambient air, and 3) leaching of contaminants from soils to groundwater. At this site, each on of these potential exposure pathways could be considered complete. A variety of factors effect the risk posed by exposure along each of these pathways, including bulk soil properties, type and extent of surfacing and building coverage, and the depth and characteristics of the water table aquifer.

A summary of each generalized exposure pathway is presented below, along with whether they are considered compete or not for this specific release. Where appropriate, the reader is directed to the rational as to why a specific pathway is considered incomplete. A discussion of residential versus commercial land use screening levels is presented in Section 6.0.

Exhibit 3: Exposure Pathway Summary

Medium	Exposure Pathway	Complete at this site (yes / no)	Rationale
Surface Soil	Ingestion, dermal contact, & vapor inhalation	Yes	
Subsurface Soil	Vapor inhalation – indoor	Yes	
	Vapor inhalation – outdoor	Yes	
	Drinking water impacted by leachate	No	No drinking water wells, resources in area (Sec. 5.2.1)
Groundwater	Vapor inhalation – indoor	Yes	
	Vapor inhalation – outdoor	Yes	
	Ingestion of groundwater	No	No drinking water wells, resources in area (Sec. 5.2.1)
Surface Water	Ingestion and dermal contact, ecological concerns	No	No surface waters within 3,200 feet of site (Sec. 5.2.1)

Refer to Section 6.0 for a discussion of the components of RBSLs for each exposure pathway.

5.3 Conduit Survey

Subsurface, manmade conduits have the potential to provide preferential contaminant migration pathways for contaminants away from the source area to receptors. Sewer and utility lines may be set in gravel filled trenches, which can act as a high permeability material for impacted groundwater and free phase product movement. Utility corridors may accumulate high contaminant vapors concentrations.

no depths?

No existing underground utilities could be identified at the site. The former building was demolished in December 2001, at which time, natural gas, water, and sanitary sewer lines were cut and capped. Electrical and phone service for the site were connected via overhead lines. Locations of the water and natural gas feed lines are on Figure 3. The location of the sewer connection could not be located. No storm drains were observed by AEI on the property prior to demolition of the building.

The sidewalk and streets were inspected for the presence of utility lines. Underground Service Alert (USA) north was contact during recent drilling activities. Results of the inspection are presented on Figure 3. Along Fruitvale Avenue, a Pacific Bell fiber optics line was marked. Along Farnam Street, a natural gas line and a water line were marked. Wastewater (sanitary sewer and/or storm drain) manholes were observed along both Fruitvale and Farnam.

Generally, water lines, natural gas lines, and telecommunications lines are set at depths ranging from 2 to 5 feet below ground surface. A storm drain was also observed at the corner of Fruitvale and Farnam, with a pipe leading away from the site, at a depth of approximately 2 ½ feet. In this depth range, these utilities should not present a conduit for preferential groundwater migration, even at high water table. In addition, these utilities did not appear to be in large conduit tunnels. Therefore the accumulation of excessive vapor is not expected along these shallow utilities.

The depth of the wastewater lines could not be determined, however the locations of these lines relative to recently advance groundwater sampling points indicates that minimal hydrocarbon have migrated from the site toward these lines.

6.0 RISK ASSESSMENT

Although the City of Oakland Guidance Document and the RWQCB RBSLs each have differing assumptions and exposure parameters, each are based on similar theories of human and environmental exposure to impacted soils and groundwater.

In general, the human health risk posed by an individual chemical is expressed in terms of a non-cancer hazard quotient and a cancer risk (for carcinogenic chemicals). Generally, an acceptable incremental additional cancer risk of 1 x 10^{-4} to 1 x 10^{-6} (1 in 10,000 to 1 in 1,000,000) and an overall hazard quotient (sum of all chemicals) of less than 1 are acceptable. The development of screening levels is performed by assuming exposure scenarios along each pathway based on land use, either residential or commercial / industrial, and groundwater use. A reference dose (non-cancer hazard evaluation) and slope factor (cancer evaluation), along with the exposure assumptions, is used in the calculations to determine the screening level for each chemical. With the exception of site-specific conditions discussed in the following section, the calculations used to derive the screening levels are assumed valid and the reader is referred to the referenced guidance documents for details.

6.1 City of Oakland Tiered Analysis

The *Oakland Urban Land Redevelopment Program: Guidance Document* (Guidance Document) outlines a tiered analysis for assisting in the investigation and cleanup of impacted sites. Tier 1 risk based screening levels (RBSLs) are established for sites were minimal historical research and site-specific data are available with respect to a release. Tier 1 RBSL are most conservative to account for unknowns remaining after minimal investigation, and are based on an acceptable cancer risk of 10^{-6}. The Tier 2 RBSLs are intended for sites that have concentrations above Tier 1 RBSL and where additional site-specific data is available. Of primary importance for eligibility for Tier 2 analyses is the availability of site-specific grain size analyses and detailed logs of borings from the site. In addition the Tier 2 analyses are based on an incremental additional cancer risk of 10^{-5}.

Prior to performing the RBSL comparison, the Eligibility Checklist was completed for the site (Guidance Document p. 5). See Appendix C for a copy of the Checklist.

In this case, sufficient data is available for use of the Tier 2 analysis. Residential RBSLs were utilized to provide the most conservative comparison and were lower for each chemical than commercial/industrial levels. For each COC present at the site, the Tier 2 residential RBSLs are lower that the Tier 2 commercial/industrial RBSLs. Refer to Tables 6 through 8 for comparison of Tier 2 residential RBSLS with site maximum concentrations for each complete exposure pathway (Exhibit 3, Section 5.2).

Based on the comparison presented in these tables, it is apparent no concentrations of BTEX or MTBE present in the soil or groundwater are over the Tier 2 levels.

6.2 RWQCB RBSL Comparative Analysis

The RWQCB screening levels are similar to the Oakland Guidance document, however several additional components have been added. These additional considerations include evaluation of exposure to construction / trench workers exposed to subsurface soils, a more thorough consideration of impact to aquatic life by discharge of groundwater to surface water bodies, and a consideration of degradation of surface water quality. In addition, screening levels for total petroleum hydrocarbons are presented.

Because exposure scenarios are different for the derivation of residential versus the commercial / industrial land use screening levels, site specific concentrations are compared against levels for both land use scenarios.

6.2.1 Groundwater Screening Levels

For evaluation of risk posed by impacted groundwater to human health and the environment, a total of four individual components are identified for site specific consideration: indoor air impact, based soil type; ceiling levels, based on either nuisance odor at discharge to surface water or an upper limit; aquatic life protection; and general surface water quality considerations. A summary of these screening levels is presented in Table 10, along with maximum site groundwater concentrations.

As stated in Section 5.2.1, no existing beneficial use of groundwater was noted in the Basin Plan or identified during a review of well logs for the area. Therefore the screening levels presented in Table reflect non-drinking water levels. In addition, no surface water exists within 3,200 feet of the site. Therefore, screening level components for aquatic life protection (which assume no dilution at groundwater discharge to surface water body) and general surface water quality are not considered relevant to this evaluation. This argument is supported by the fact that hydrocarbon concentrations outside of the source area were found to be below detection limits or well below concentrations located within the source area.

Maximum concentrations of benzene, toluene, ethyl-benzene, xylenes, and MTBE concentrations in groundwater beneath the site are below the two remaining screening level components appropriate for the site, indoor air impacts for fine-grained soils and the upper limit. Although indoor air impact screening levels for TPH-g are not presented, the maximum concentration at the site (25,000 µg/l) is below the upper limit stated as 50,000 µg/l.

6.2.2 Soil Screening Levels

The RWQCB Guidance identifies surface soils as less than 3 meters (10 feet) deep, in comparison to 3 feet in the Oakland Guidance. The remaining soils in the vadose zone (unsaturated soils) are identified as subsurface soils. Based on the presence of the water table at an average depth of approximately 12 feet bgs at this site,

maximum concentrations for all vadose zone soils (0 to 12 feet bgs) are compared with both RWQCB surface and subsurface RBSLs.

Subsurface soils screening levels are comprised of four exposure component levels: direct exposure (based on construction / trench worker exposure scenario), indoor air quality (both residential and commercial), protection of groundwater quality, and soil quality ceiling levels. The surface screening levels include direct exposure scenarios for both residential and commercial/industrial land use and an ecotoxicity level. Tables 10 and 11 present the component screening levels for surface and subsurface soils, respectively. It should be noted that both indoor air quality screening levels and groundwater protection screening levels are identical for each land use scenario.

With the exception of benzene and toluene, remaining COCs are lower than the screening levels for both the residential and commercial land use scenario.

For xylenes, the only component RBSL level lower than the site maximum is that for protection of groundwater quality. This level is based on a target groundwater concentration protective of aquatic life, which is overly conservative for this site, as stated in Section 6.2.1. Ignoring this component, the groundwater protection level would be raised to well above the maximum detection of xylenes in vadose zone soil of 1.5 mg/kg, as calculated using the dilution-attenuation factor (DAF) equation referred to in Table 9.

The maximum concentration of benzene detected at the site is 0.59 mg/kg, over the lowest component soil screening level for direct exposure and indoor air quality, both of which are 0.18 mg/kg. When considering comparison of site data presented in Tables 10 and 11, it should be noted that these are site maximum concentrations. Refer to Figures 7 and 8 for sample analytical data presented on the site plan, which reveals that the majority of the soils beneath the site are impacted with much lower concentrations, many of which are below laboratory detection limits. For example, average benzene concentrations of soil samples collected from approximately 10 feet bgs within the source area (borings GP-1 through GP-8, AEI-9 through AEI-12, and MW-1 through MW-3) is 0.045 mg/kg, with non-detect treated as ½ of the detection limit. It should also be noted that the maximum benzene concentration of 0.59 mg/kg was only detected in one sample, at 10 feet bgs. The depth is well below a depth were prolonged exposure could reasonably be expected to compare with the very conservative 30 year direct exposure duration used to calculate the screening level.

In addition, the lack of hydrocarbons present in soils collected from the 2 to 5 feet bgs range indicates that none or only very minimal diffusion of benzene and other volatiles toward the surface from deeper impacted soils and groundwater water could be occurring.

7.0 CONCLUSIONS

7.1 Release Characterization

Although no formal tank removal records were available, initial research and excavation work revealed that the former USTs were removed from the property around 1983. A total of twenty-five soil borings and three monitoring wells have been installed at the site to assess subsurface conditions and the distribution of hydrocarbons.

Soil sample analytical data revealed that the release likely occurred at the former dispenser island or along the product piping rather than from the former USTs. Soil sample analyses did not reveal a "hotspot" of significantly impacted soils, indicating that the release was localized in nature.

Although groundwater sample analytical data obtained from the monitoring wells has revealed that dissolved phase concentrations remain elevated adjacent to the dispenser area, recent sample data from locations away from this area in every direction indicated that the plume has not spread in over 19 years, the minimum amount of time since the release stopped. The lack of floating free phase product and lack of any significant soil source indicates that no significant additional hydrocarbons will be added to groundwater system.

7.2 Risk Assessment

A comparative risk analysis was performed to evaluate risk to human health and the environment using both the City of Oakland Guidance Document and the RWQCB Risk Based Screening Levels (RBSLs). Both residential and commercial/industrial land use scenarios were evaluated.

Based on existing data, it was determined that the site qualified for comparison the Oakland Tier 2 screening levels. Due to the lack of documented groundwater resources in the vicinity of the site (Sec. 5.2.1), groundwater exposure was not considered a complete pathway. Based on the Tier 2 comparison, no elevated risk to human health was revealed.

The comparison of the highest dissolved hydrocarbon concentrations at the site with RWQCB RBSLs, did not reveal an elevated risk to human health or the environment, assuming no discharge of impacted groundwater to surface water or groundwater use in the area (Sec. 5.2.1).

With the exception of benzene, maximum hydrocarbon concentration in the soil also did not reveal an elevated risk to human health or the environment, again assuming no discharge of impacted groundwater to surface water. Although the maximum concentration of benzene detected at the site exceeds the very conservative direct exposure exposure pathway by less than 1 order of magnitude, it is apparent that site wide conditions, even in the source area, are not realistically represented by the highest benzene concentration.

7.3 Closing Statement

Based on the limited extent of the release and the results of the risk evaluation, AEI is recommending that this case be granted formal case closure.

Because the case will be closed with low levels of volatile organic compounds remaining in the subsurface, as a conservative safety factor, AEI recommends that the proposed commercial building be constructed with an impermeable vapor barrier beneath the slab foundation. This type of engineering control is common for slab-on-grade foundation types and will greatly reduce any possible diffusive hydrocarbon migration into the building. As an additional precaution, any contractor performing excavation work at the site should be aware of potential for previously unidentified impacted soils to be encountered and have health and safety and soils management plans in place.

Once final case closure is granted, the existing monitoring wells should be decommissioned according to applicable state and local regulation.

8.0 REFERENCES

Phase I Environmental Site Assessment, prepared by Glenfos, Inc., July 1998

Phase II Subsurface Investigation Report, prepared by AEI, June 11, 1999.

Subsurface Investigation Report, prepared by AEI, August 1999.

Workplan, prepared by AEI, July 17, 2000

Monitoring Well Installation and Sampling Report, prepared by AEI, November 22, 2000.

Quarterly Groundwater Monitoring Report, prepared by AEI, January 29, 2001.

Quarterly Groundwater Monitoring Report, prepared by AEI, May 4, 2001.

Quarterly Groundwater Monitoring Report, prepared by AEI, September 10, 2001.

Quarterly Groundwater Monitoring Report, prepared by AEI, December 12, 2001.

Quarterly Groundwater Monitoring Report, prepared by AEI, April 15, 2002

Groundwater Investigation Report, prepared by AEI, July 5, 2002

Application of Risk Based Screening Levels and Decision Making to Sites With Impacted Soil and Groundwater, California Regional Water Quality Control Board – San Francisco Bay Region, December 2001.

Oakland Urban Land Redevelopment Program: Guidance Document, City of Oakland Public Works Agency, January 1, 2000.

Standard Guide for Risk-Based Corrective Action Applied at Petroleum Release Sites, American Society for Testing and Materials, Designation E 1739-95

9.0 LIMITATIONS AND SIGNATURES

This report presents a summary of work completed by AEI, including observations and descriptions of site conditions. Where appropriate, it includes analytical results for samples taken during the course of the work. The number and location of samples are chosen to provide required information, but it cannot be assumed that they are entirely representative of all areas not sampled. In addition, where appropriate, mathematical analyses of health risks and/or chemical migration may have been made using equations referenced in this report. Assumptions for the values of applicable physical and physiological constants have been made, where appropriate; the values of which may not be representative of all possible site conditions. Therefore, the results of these estimates cannot be considered to be valid for all possible site conditions. All conclusions and recommendations are based on these analyses, observations, calculations and the governing regulations. Conclusions beyond those stated and reported herein should not be inferred from this document.

These services were performed in accordance with generally accepted practices in the environmental engineering and construction field that existed at the time and location of the work.

Sincerely,
AEI Consultants

Peter McIntyre
Project Manager, Geologist

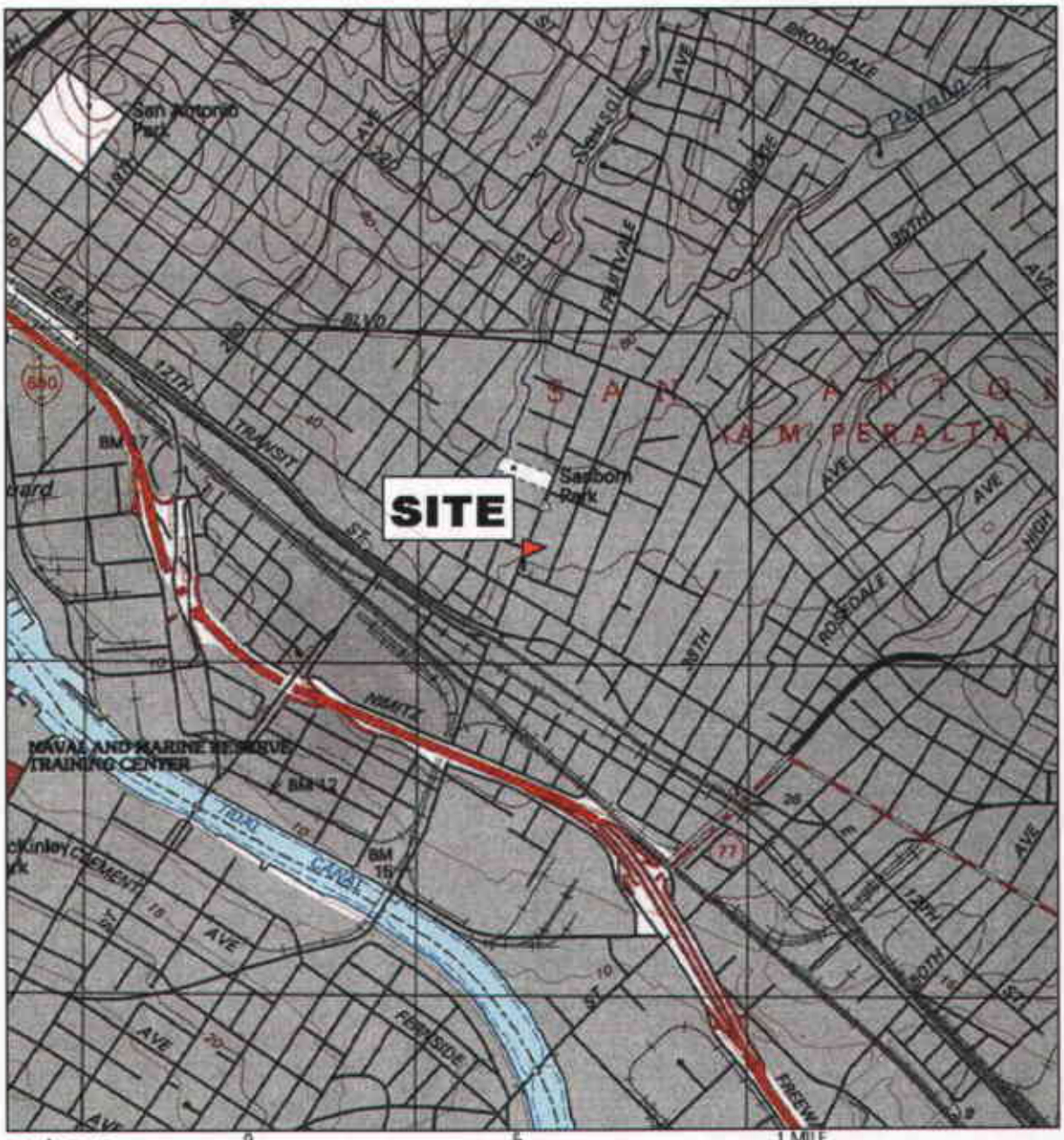
Joseph P. Derhake, PE
Principal

AEI CONSULTANTS
3210 OLD TUNNEL RD, STE B, LAFAYETTE, CA

SITE AREA MAP

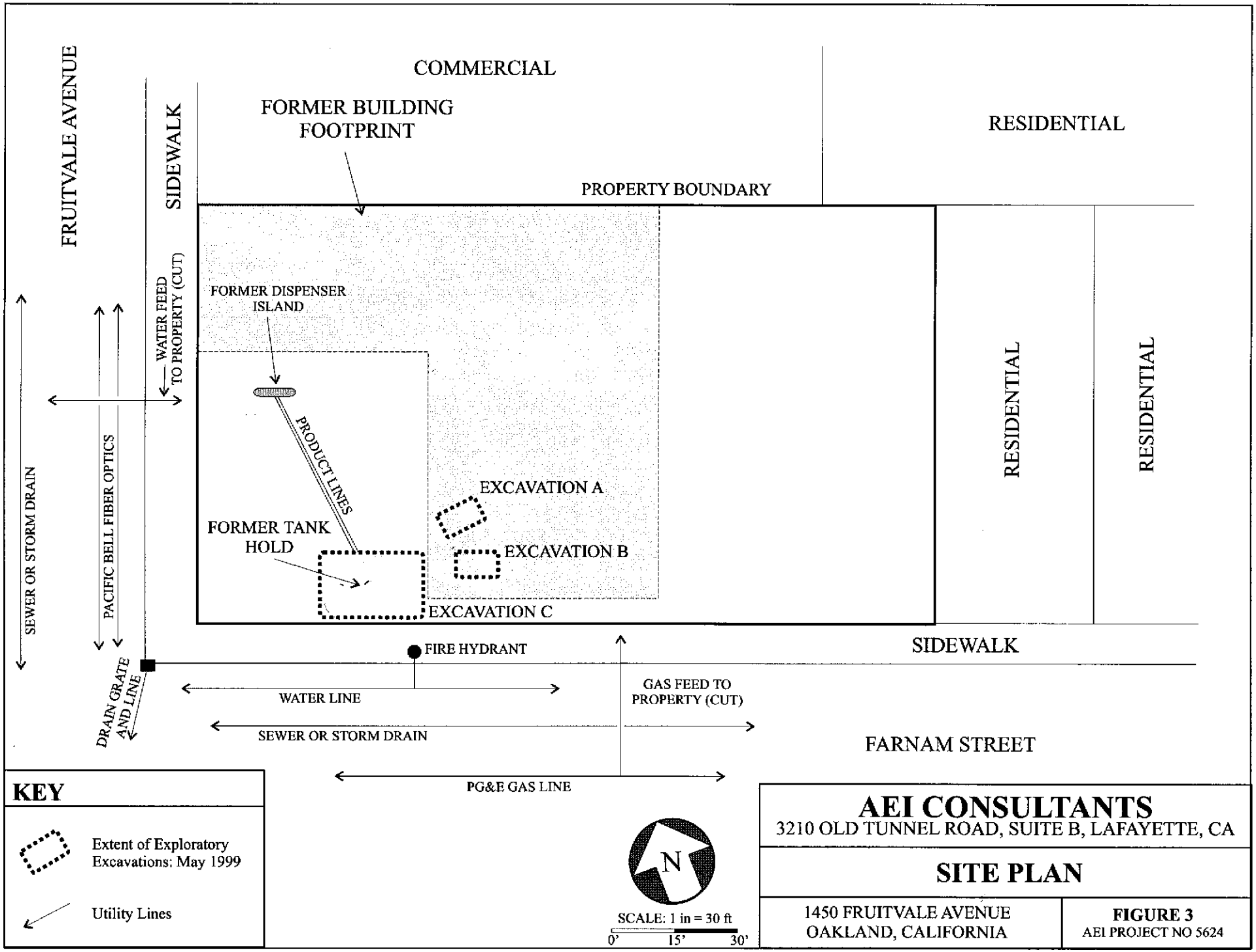
1450 FRUITVALE AVENUE
OAKLAND, CALIFORNIA

FIGURE 1
PROJECT NO. 5624



Printed from TOPO! ©2001 National Geographic Holdings (www.topo.com)

AEI CONSULTANTS 3210 OLD TUNNEL RD, STE B, LAFAYETTE, CA	
SITE LOCATION MAP	
1450 FRUITVALE AVENUE OAKLAND, CALIFORNIA	**FIGURE 2** PROJECT NO. 5624



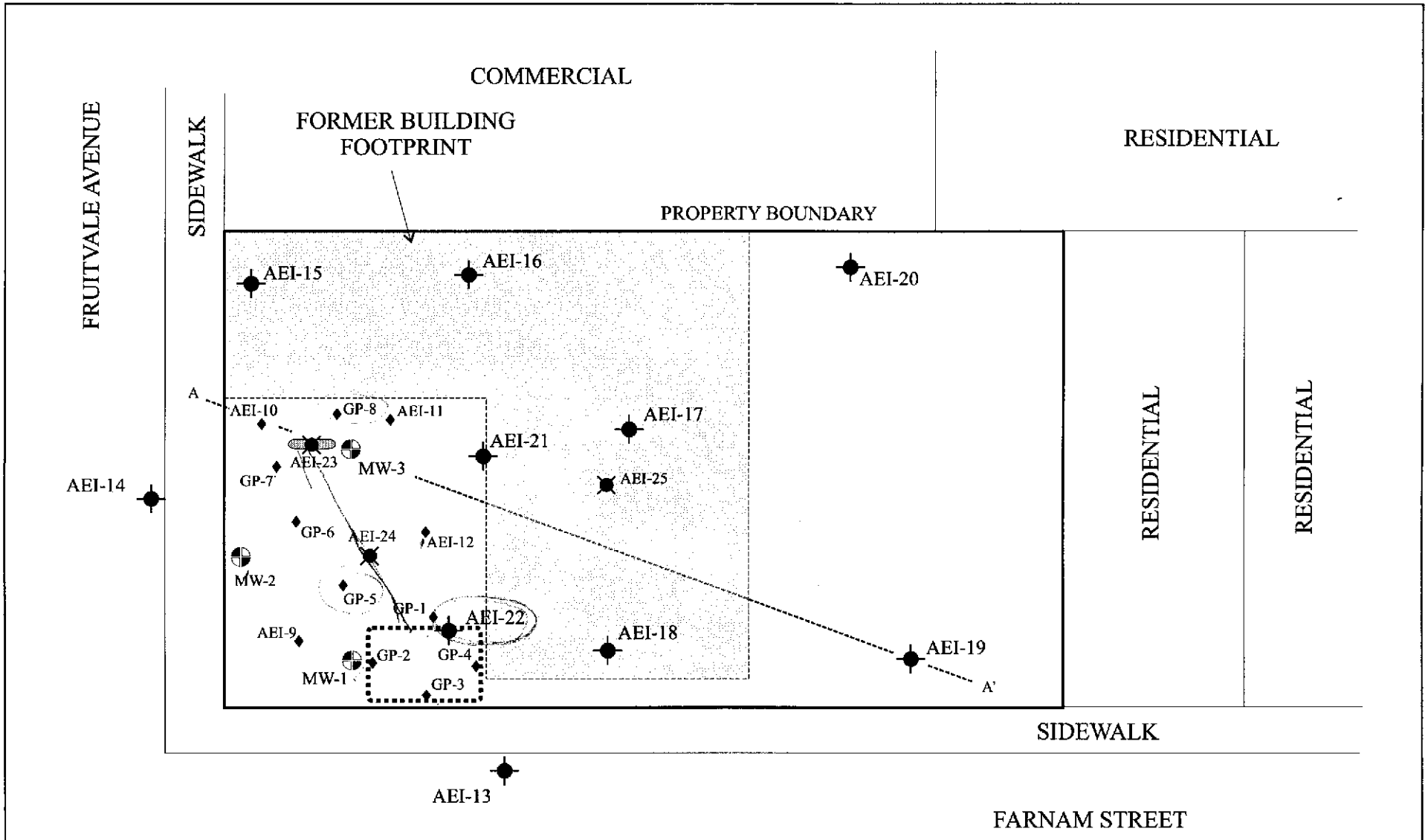
AEI CONSULTANTS

3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA

SITE PLAN

1450 FRUITVALE AVENUE
OAKLAND, CALIFORNIA

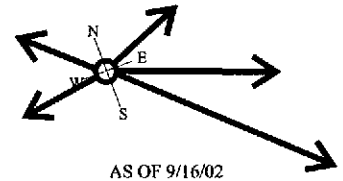
FIGURE 3
AEI PROJECT NO 5624



KEY

- Existing 2" Monitoring Wells
- Temporary Borings: 1998-1999
- Temporary Borings: June 2002
- Hand Auger Borings: Sept. 2002

GROUNDWATER FLOW DIRECTION ROSE DIAGRAM (½ in = 1 episode)



AS OF 9/16/02

N

SCALE: 1 in = 30 ft

0' 15' 30'

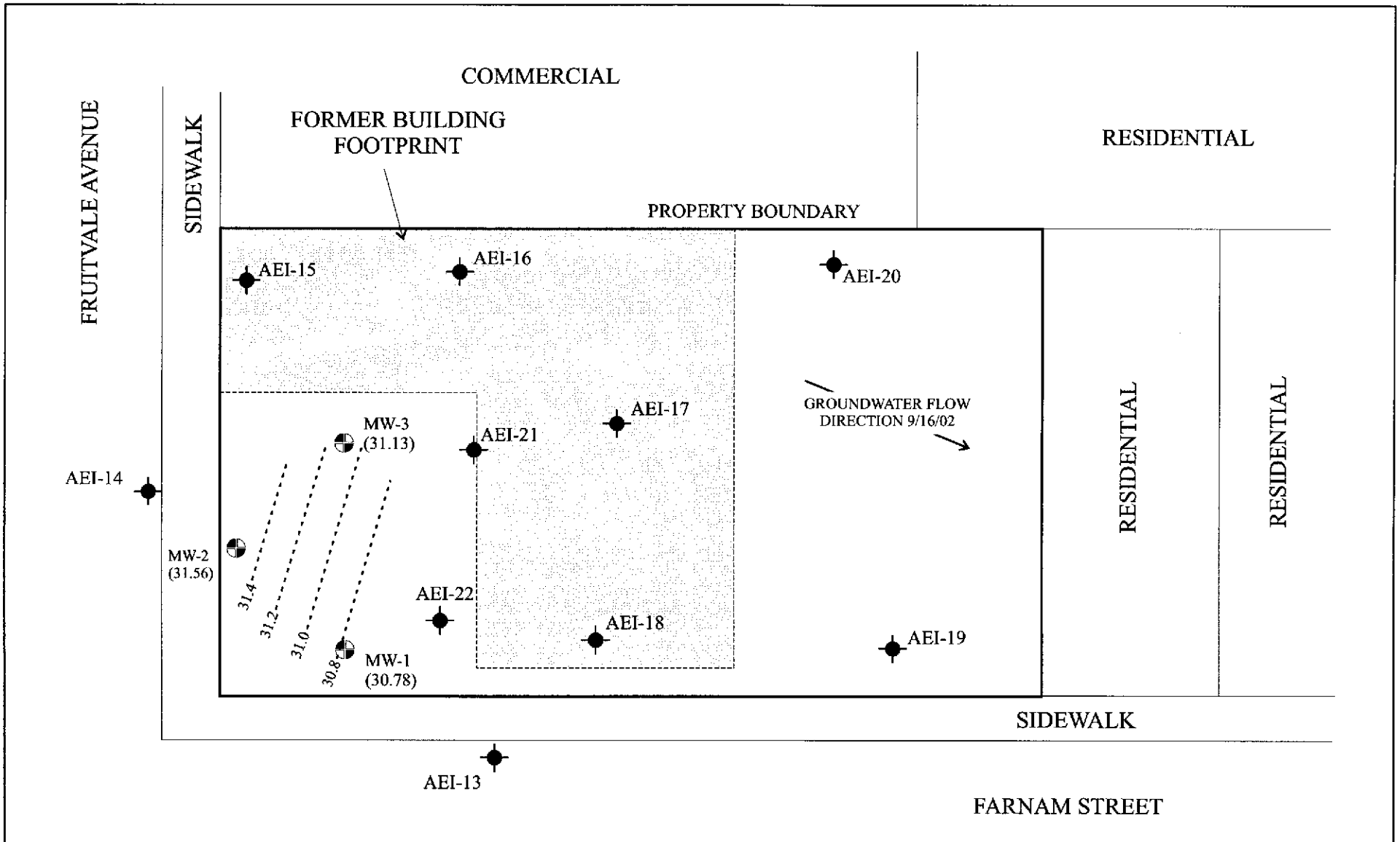
AEI CONSULTANTS

3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA

BORING AND WELL LOCATIONS

1450 FRUITVALE AVENUE
OAKLAND, CALIFORNIA

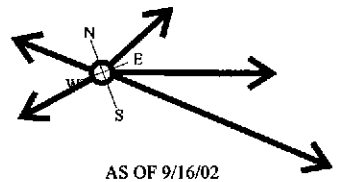
FIGURE 4
AEI PROJECT NO 5624



KEY

- Existing 2" Monitoring Wells
- Temporary Borings: June 2002
- Contour Interval = 0.2 ft amsl
- SCALE: 1" = 30'

GROUNDWATER FLOW DIRECTION ROSE DIAGRAM (½ in = 1 episode)



AS OF 9/16/02

N

SCALE: 1 in = 30 ft

0' 15' 30'

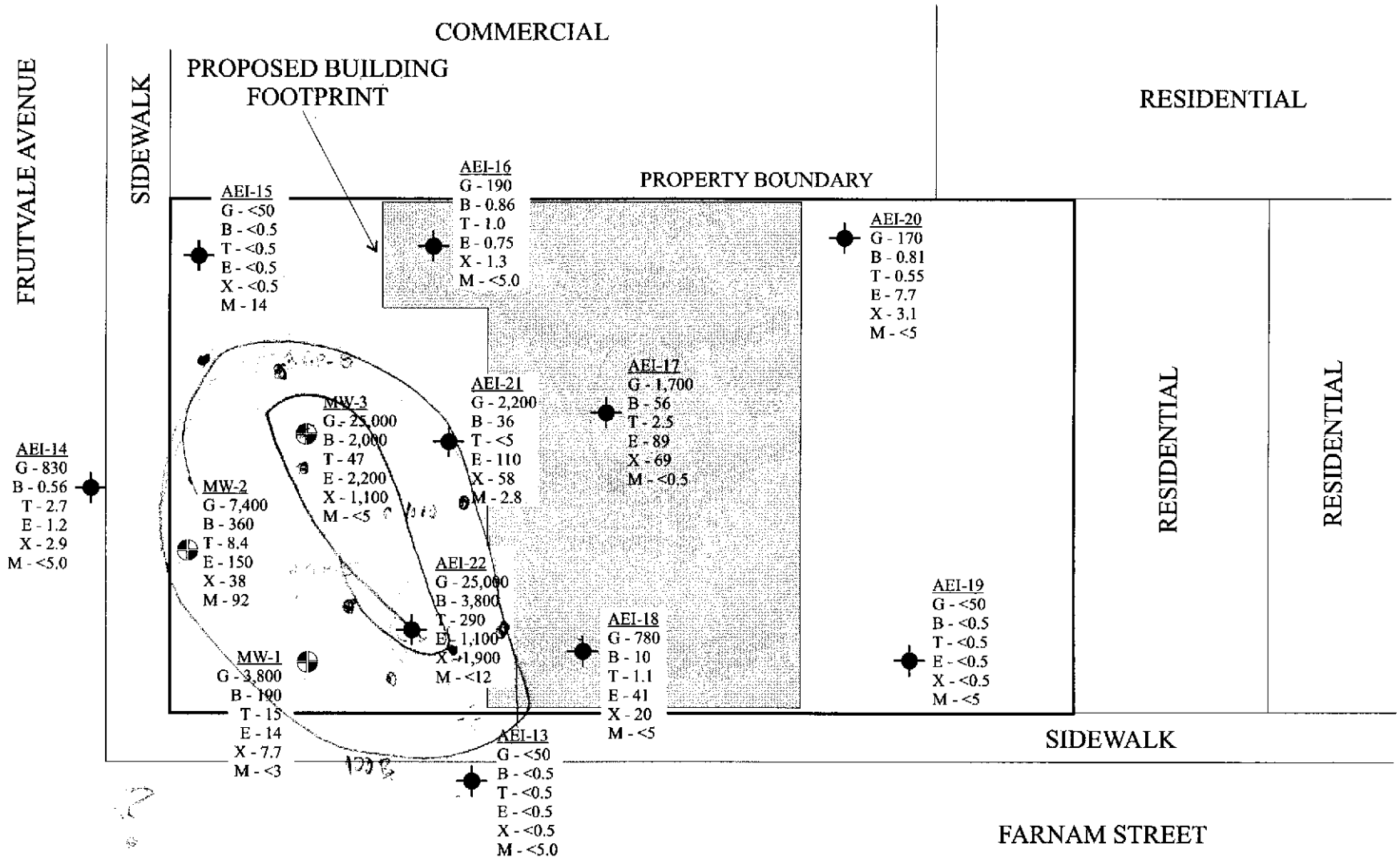
AEI CONSULTANTS

3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA

WATER TABLE CONTOURS

1450 FRUITVALE AVENUE
OAKLAND, CALIFORNIA

FIGURE 5
AEI PROJECT NO 5624

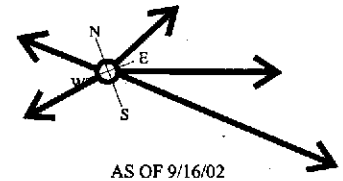


KEY

- Existing 2" Monitoring Wells
- Temporary Borings: June 2002

Sample Results in µg/l. Data for wells from 9/16/02 event.

GROUNDWATER FLOW DIRECTION ROSE DIAGRAM (½ in = 1 episode)



AS OF 9/16/02

N

SCALE: 1 in = 30 ft

0' 15' 30'

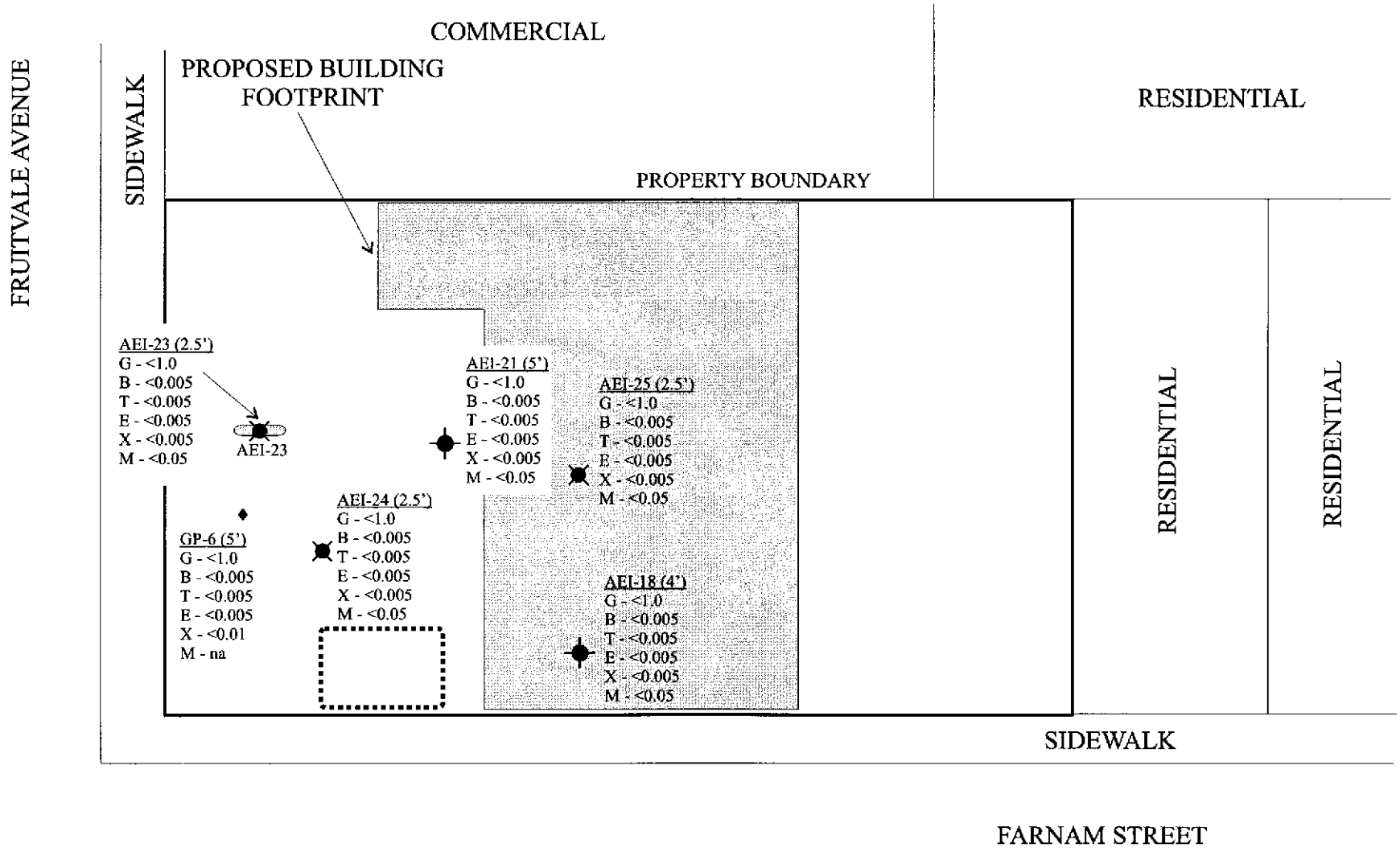
AEI CONSULTANTS

3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA

GROUNDWATER SAMPLE ANALYTICAL DATA

1450 FRUITVALE AVENUE
OAKLAND, CALIFORNIA

FIGURE 6
AEI PROJECT NO 5624

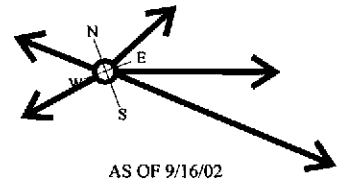


KEY

Boring and well locations with sample depth in parenthesis. All soil sample data in mg/kg

G-TPH gasoline
B-Benzene
T-Toluene
E-Ethylbenzene
X-Xylenes
M-MTBE

GROUNDWATER FLOW DIRECTION ROSE DIAGRAM (½ in = 1 episode)



AS OF 9/16/02

N

SCALE: 1 in = 30 ft

0' 15' 30'

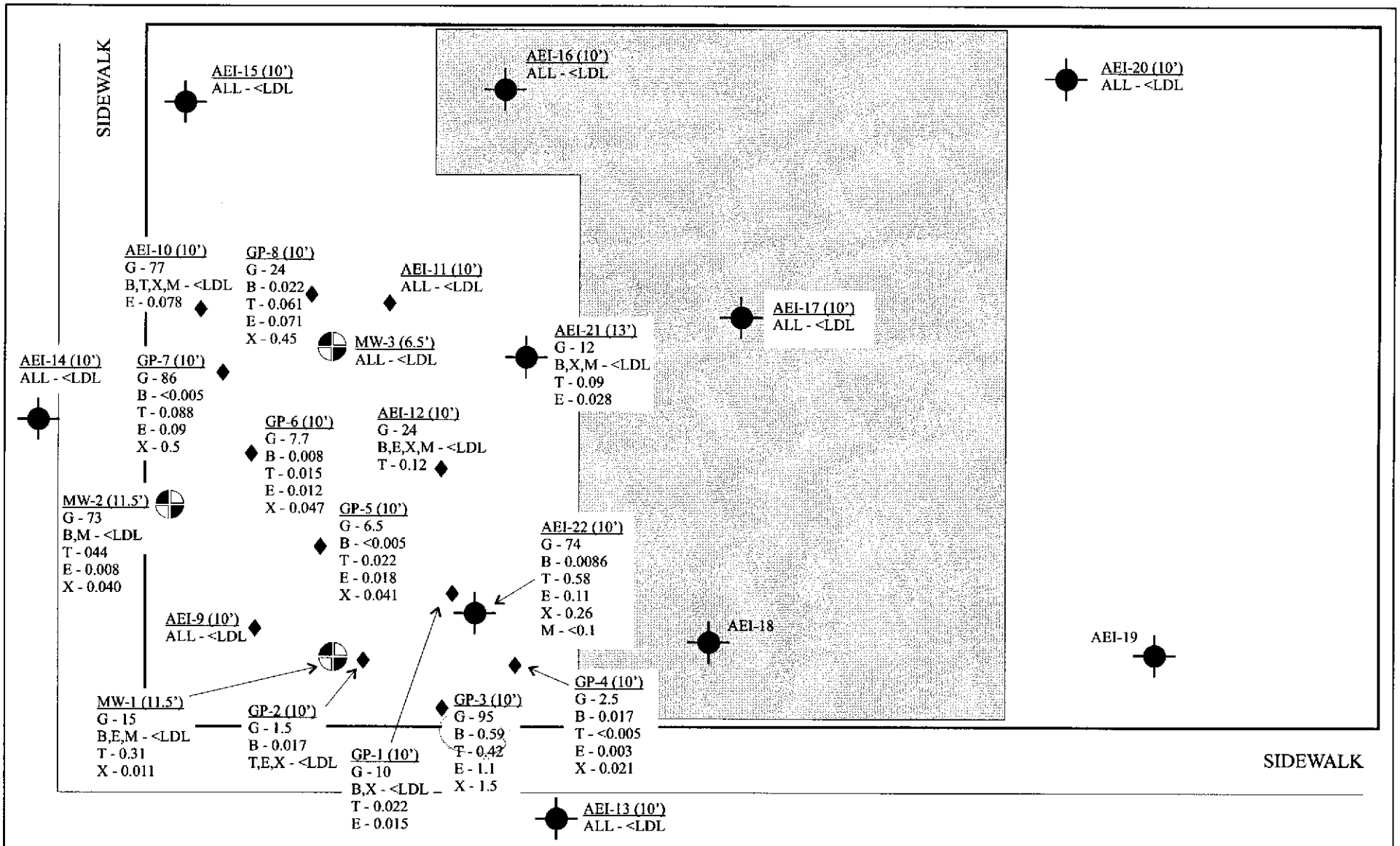
AEI CONSULTANTS

3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA

SOIL SAMPLE ANALYTICAL DATA (0 TO 5 FEET BGS)

1450 FRUITVALE AVENUE
OAKLAND, CALIFORNIA

FIGURE 7
AEI PROJECT NO 5624

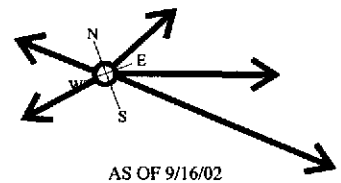


KEY

Boring and well locations with sample depth in parenthesis. All soil sample data in mg/kg. <LDL= less than detection limit.

G-TPH gasoline
B-Benzene
T-Toluene
E-Ethylbenzene
X-Xylenes
M-MTBE

GROUNDWATER FLOW DIRECTION ROSE DIAGRAM (½ in = 1 episode)



AS OF 9/16/02

N

SCALE: 1 in = 20 ft

0' 10H' 20'

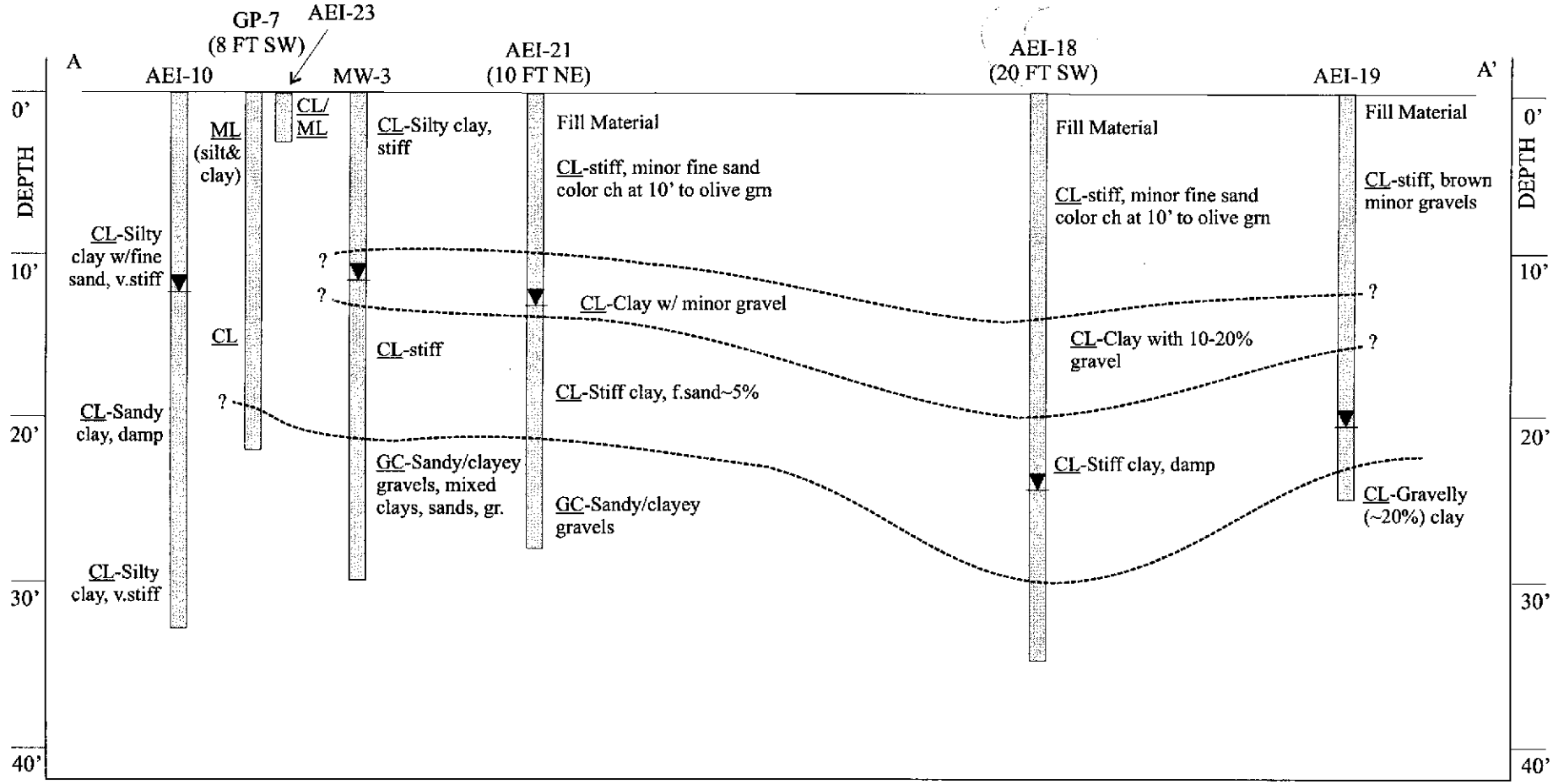
AEI CONSULTANTS

3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA

SOIL SAMPLE ANALYTICAL DATA
(5 FEET BGS TO WATER TABLE)

1450 FRUITVALE AVENUE
OAKLAND, CALIFORNIA

FIGURE 8
AEI PROJECT NO 5624



APPROXIMATE SOIL TYPE BOUNDARY

▼ WATER LEVEL MEASURED IN WELLS OR TEMPORARY BORINGS

VERTICAL SCALE: 1in = ~ 10 ft
HORIZONTAL SCALE: 1 in = ~20 ft

Abbreviations
ML = Silts
GC = Clayey Gravel
CL = Clay, silty, sandy, or gravelly clay

AEI CONSULTANTS
3210 OLD TUNNEL ROAD, SUITE B, LAFAYETTE, CA

CROSS SECTION A-A'

1450 FRUITVALE AVENUE
OAKLAND, CALIFORNIA

FIGURE 9
AEI PROJECT NO 5624

Table 1

Sample Analtyical Data: Exploratory Excavation Project

Sample ID	Location	TPH-g mg/kg	TPH-d mg/kg	TOG mg/kg	MTBE mg/kg	Benzene mg/kg	Toluene mg/kg	Ethyl Benzene mg/kg	Xylenes mg/kg	Total Lead mg/kg
AEI EBA 6'	Exc. A - Bottom	<1.0	<1.0	<50.0	<0.05	<0.005	<0.005	<0.005	<0.005	**6.9**
AEI EBB 6'	Exc. B - Bottom	<1.0	<1.0	<50.0	<0.05	<0.005	<0.005	<0.005	<0.005	**9.1**
AEI EBW 8'	Exc. C - West	<1.0	<1.0	-	<0.05	<0.005	<0.005	<0.005	<0.005	**9.4**
AEI EBE 8'	Exc. C - East	**11**	<1.0	-	<0.05	<0.005	**0.059**	**0.028**	**0.042**	**32**
AEI EBN 8'	Exc. C - North	<1.0	<1.0	-	<0.05	<0.005	<0.005	<0.005	<0.005	**8.7**
AEI EBS 8'	Exc. C - South	<1.0	<1.0	-	<0.05	<0.005	<0.005	<0.005	<0.005	**80**

Table 2
Soil Sample Analytical Data

Sample ID	Consul-tant	Sample Date	TPH-g mg/kg	MTBE mg/kg	Benzene mg/kg	Toluene mg/kg	Ethyl Benzene mg/kg	Xylenes mg/kg	Total Lead mg/kg
GP-1 10'	Glenfos	7/9/1998	10	-	<0.005	0.022	0.015	<0.01	-
GP-2 10'	Glenfos	7/9/1998	1.5	-	0.017	<0.005	<0.005	<0.01	-
GP-2 15'	Glenfos	7/9/1998	27	-	0.017	0.056	0.052	0.51	-
GP-2 30'	Glenfos	7/9/1998	2.5	-	<0.005	<0.005	<0.005	<0.01	-
GP-3 10'	Glenfos	7/9/1998	95	-	0.59	0.42	1.1	1.5	7.3
GP-3 15'	Glenfos	7/9/1998	2.5	-	0.055	0.018	0.055	0.26	-
GP-3 20'	Glenfos	7/9/1998	1.6	-	0.02	<0.005	0.02	0.032	-
GP-3 25'	Glenfos	7/9/1998	<1	-	<0.005	<0.005	<0.005	<0.01	-
GP-4 10'	Glenfos	7/9/1998	2.5	-	0.017	<0.005	0.003	0.021	4.1
GP-5 10'	Glenfos	7/9/1998	6.5	-	<0.005	0.022	0.018	0.041	-
GP-5 15'	Glenfos	7/9/1998	19	-	0.077	0.016	0.43	0.49	-
GP-5 20'	Glenfos	7/9/1998	<1	-	<0.005	<0.005	<0.005	<0.01	-
GP-6 5'	Glenfos	7/9/1998	<1	-	<0.005	<0.005	<0.005	<0.01	-
GP-6 10'	Glenfos	7/9/1998	7.7	-	0.008	0.015	0.012	0.047	6.2
GP-6 15'	Glenfos	7/9/1998	190	-	0.34	0.53	2.3	4.7	-
GP-6 20'	Glenfos	7/9/1998	28	-	0.083	0.081	0.052	0.19	-
GP-7 10'	Glenfos	7/9/1998	86	-	<0.005	0.088	0.09	0.5	-
GP-7 15'	Glenfos	7/9/1998	2.7	-	0.008	0.012	<0.005	0.031	-
GP-8 10'	Glenfos	7/9/1998	24	-	0.022	0.061	0.071	0.45	-
GP-8 15'	Glenfos	7/9/1998	5.8	-	0.021	0.014	0.022	0.06	-
GP-8 20'	Glenfos	8/23/1999	<1	-	<0.005	<0.005	<0.005	<0.01	-
AEI-9 10'	AEI	8/23/1999	<1	<0.05	<0.005	<0.005	<0.005	<0.005	-
AEI-9 20'	AEI	8/23/1999	<1	<0.05	<0.005	<0.005	<0.005	<0.005	-
AEI-10 10'	AEI	8/23/1999	77	<0.05	<0.005	<0.005	0.078	<0.005	-
AEI-10 15'	AEI	8/23/1999	69	0.071	0.1	0.21	0.23	<0.005	-
AEI-11 10'	AEI	8/23/1999	<1	<0.05	<0.005	<0.005	<0.005	<0.005	-
AEI-11 15'	AEI	8/23/1999	210	<0.40	<0.020	1.1	1.2	2.4	-
AEI-12 10'	AEI	8/23/1999	24	<0.05	<0.005	0.12	<0.005	<0.005	-
AEI-12 15'	AEI	8/23/1999	120	<0.40	<0.020	<0.020	1.6	1.6	-
MW-1 6.5'	AEI	9/25-26/00	<1.0	<.05	<.005	<.005	<.005	<.005	-
MW-1 11.5'	AEI	9/25-26/00	15.0	<.05	<.005	0.31	<.005	0.011	-
MW-2 6.5'	AEI	9/25-26/00	<1.0	<.05	<.005	<.005	<.005	<.005	-
MW-2 11'	AEI	9/25-26/00	73.0	<.05	<.005	0.044	0.0080	0.040	-
MW-3 6.5'	AEI	9/25-26/00	<1.0	<.05	<.005	<.005	<.005	<.005	-
MW-3 16'	AEI	9/25-26/00	360.0	<1.0	0.42	2.1	6.5	11.0	-
MDL			1.0	0.05	0.005	0.005	0.005	0.005	

MDL = Method Detection Limit

mg/kg = milligrams per kilogram (ppm)

- Sample not analyzed for this chemical

TPH-g = Total petroleum hydrocarbons as gasoline

Table 2
Soil Sample Analytical Data: Continued

Sample ID	Date	TPH-g mg/kg	MTBE mg/kg	Benzene mg/kg	Toluene mg/kg	Ethyl Benzene mg/kg	Xylenes mg/kg
AEI-13 10'	610-12/02	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-14 10'	610-12/02	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-15 10'	610-12/02	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-16 10'	610-12/02	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-16 19'	610-12/02	41	<0.2	<0.02	<0.02	0.038	0.079
AEI-17 10'	610-12/02	<1	<0.5	<0.005	<0.005	<0.005	<0.005
AEI-17 20'	610-12/02	290	<0.05	0.84	1.3	1.8	2.8
AEI-18 4'	610-12/02	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-18 14'	610-12/02	290	<0.02*	<0.2	0.91	2.3	2.9
AEI-19 15'	610-12/02	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-20 10'	610-12/02	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-20 20'	610-12/02	42	<0.5	<0.05	0.20	0.12	0.15
AEI-21 5'	610-12/02	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-21 13'	610-12/02	12	<0.05	<0.005	0.090	0.028	<0.005
AEI-22 10'	610-12/02	74	<0.1	0.0086	0.58	0.11	0.26
AEI-22 20'	610-12/02	5	<0.05	0.30	0.016	0.26	0.42
AEI-23 2.5'	9/27/2002	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-24 2.5'	9/27/2002	<1	<0.05	<0.005	<0.005	<0.005	<0.005
AEI-25 2.5'	9/27/2002	<1	<0.05	<0.005	<0.005	<0.005	<0.005
MDL		1.0	0.05	0.005	0.005	0.005	0.005

MDL = Method Detection Limit

mg/kg = milligrams per kilogram (ppm)

- Sample not analyzed for this chemical

TPH-g = Total petroleum hydrocarbons as gasoline

* MTBE by EPA method 8260, all others by 602/8020

Table 3
Groundwater Sample Analytical Data: Temporary Borings

Sample ID	Consultant	Date	TPH-g µg/L	MTBE µg/L	Benzene µg/L	Toluene µg/L	Ethyl-Benzene µg/L	Xylenes µg/L
GP 1	Glenfos	7/9/1998	170	-	0.53	<0.5	1.2	2.0
GP 4	Glenfos	7/9/1998	210	-	<0.5	<0.5	0.58	<1
GP 5	Glenfos	7/9/1998	17,000	-	42	24	820	110
GP 8	Glenfos	7/9/1998	20,000	<10	1,000	19	420	290
AEI GW 8'	AEI	5/27/1999	<50	<5.0	<0.5	<0.5	<0.5	<0.5
AEI-9W	AEI	8/23/1999	690	3.8	72	0.79	29	24
AEI-13 W	AEI	610-12/02	<50	<5.0	<0.5	<0.5	<0.5	<0.5
AEI-14 W	AEI	610-12/02	830	<5.0	0.56	2.7	1.2	2.9
AEI-15 W	AEI	610-12/02	<50	14*	<0.5	<0.5	<0.5	<0.5
AEI-16 W	AEI	610-12/02	190	<5.0	0.86	1.0	0.75	1.3
AEI-17 W	AEI	610-12/02	1,700	<0.5*	56	2.5	89	69
AEI-18 W	AEI	610-12/02	780	<5.0	10	1.1	41	20
AEI-19 W	AEI	610-12/02	<50	<5.0	<0.5	<0.5	<0.5	<0.5
AEI-20 W	AEI	610-12/02	170	<5.0	0.81	0.55	7.7	3.1
AEI-21 W	AEI	610-12/02	2,200	2.8*	36	<5.0	110	58
AEI-22 W	AEI	610-12/02	25000	<12*	3800	290	1100	1900

MDL = Method Detection Limit

ND = Not detected above the Method Detection Limit (unless otherwise noted)

µg/L = micrograms per liter (ppb)

- Sample not analyzed for this chemical

TPH-g = Total petroleum hydrocarbons as gasoline

* MTBE by EPA method 8260, all others by 602/8020

Table 4
Water Table Data

Well ID (Screen - ft bgs)	Date	Well Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
MW-1	10/16/00	42.13	17.72	24.41
(15-30)	1/19/01	42.13	9.15	32.98
	4/26/01	42.13	9.40	32.73
	8/3/01	42.13	12.38	29.75
	11/5/01	42.13	16.22	25.91
	3/29/02	42.13	7.96	34.17
	6/11/02	42.13	12.18	29.95
	9/16/02	**42.13**	**11.35**	**30.78**
MW-2	10/16/00	42.08	14.98	27.10
(15-30)	1/19/01	42.08	9.00	33.08
	4/26/01	42.08	8.34	33.74
	8/3/01	42.08	11.70	30.38
	11/5/01	42.08	15.08	27.00
	3/29/02	42.08	8.96	33.12
	6/11/02	42.08	12.49	29.59
	9/16/02	**42.08**	**10.52**	**31.56**
MW-3	10/16/00	42.55	17.98	24.57
(15-30)	1/19/01	42.55	10.90	31.65
	4/26/01	42.55	9.21	33.34
	8/3/01	42.55	12.67	29.88
	11/5/01	42.55	15.90	26.65
	3/29/02	42.55	9.20	33.35
	6/11/02	42.55	11.83	30.72
	9/16/02	**42.55**	**11.42**	**31.13**

Episode #	Date	Average Water Table (ft msl)	Change from Previous Episode	Flow direction (gradient)
1	10/16/00	25.36	-	E/SE (0.116)
2	1/19/01	32.57	+7.21	E/NE (0.041)
3	4/26/01	33.27	+0.70	SE (0.034)
4	8/3/01	30.00	-3.27	ESE (0.024)
5	11/5/01	26.52	-3.48	SE (0.033)
6	3/29/02	33.55	+7.03	NW (0.032)
7	6/11/02	30.09	-3.46	SW (0.040)
8	**9/16/02**	**31.16**	**+1.07**	**SE (0.028)**

Notes:
All well elevations are measured from the top of the casings
ft msl = feet above mean sea level

MRL

Table 5
Monitoring Well Sample Analytical Data
Petroleum Hydrocarbons

Well/Sample ID	Date Collected	Consultant/ Lab	TPHg µg/L EPA 8015	MTBE µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Xylenes µg/L
				EPA method 8020				
MW-1	10/16/00	AEI/MAI	4,500	<20	560	14	53	62
	01/19/01	AEI/MAI	13,000	<100	790	46	1,100	210
	04/26/01	AEI/MAI	7,500	<30	470	23	720	120
	08/03/01	AEI/MAI	4,500	<10	440	11	55	6.6
	11/05/01	AEI/MAI	1,700	<10	100	6.0	4.6	2.1
	03/29/02	AEI/MAI	9,500	ND<100	880	32	400	59
	06/11/02	AEI/MAI	3,400	<50	620	9.7	75	11
	09/16/02	**AEI/MAI**	**3,800**	**<10**	**190**	**15.0**	**14**	**7.7**
MW-2	10/16/00	AEI/MAI	4,600	<300	380	3.8	95	33
	01/19/01	AEI/MAI	4,200	<10	450	4.7	120	50
	04/26/01	AEI/MAI	5,600	<20	810	12	210	65
	08/03/01	AEI/MAI	2,900	<20	360	3	97	46
	11/05/01	AEI/MAI	2,400	<85	280	3.2	76	25
	03/29/02	AEI/MAI	7,100	ND<100	930	11	220	39
	06/11/02	AEI/MAI	4,400	<150	680	8.1	160	38
	09/16/02	**AEI/MAI**	**7,400**	**<250**	**360**	**8.4**	**150**	**38**
MW-3	10/16/00	AEI/MAI	12,000	<10	570	32	680	1,200
	01/19/01	AEI/MAI	27,000	<200	3,400	110	2,200	2,700
	04/26/01	AEI/MAI	33,000	<200	3,300	190	2,800	3,400
	08/03/01	AEI/MAI	23,000	<50	2,300	52	1,800	1,400
	11/05/01	AEI/MAI	30,000	<200	1,900	58	2,000	1,600
	03/29/02	AEI/MAI	29,000	ND<100	2,100	57	2,500	1,700
	06/11/02	AEI/MAI	22,000	<50	2,100	44	2,300	1,600
	09/16/02	**AEI/MAI**	**25,000**	**<220**	**2,000**	**47**	**2,200**	**1,100**
MRL			50.0	5.0	0.5	0.5	0.5	0.5

Fuel Oxygenates

Well/Sample ID	Date Collected	DIPE µg/L	ETBE µg/L	MTBE µg/L	TAME µg/L	TBA µg/L	EDB µg/L	1,2-DCA µg/L
					EPA method 8260			
MW-1	**06/11/02**	-	-	2.4	-	-	-	-
	09/16/02	**0.56**	**<0.5**	**<3.0**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
MW-2	**06/11/02**	-	-	23	-	-	-	-
	09/16/02	**7.30**	**<1.2**	**92**	**<1.2**	**<1.2**	**<1.2**	**<1.2**
MW-3	**06/11/02**	-	-	<2.5	-	-	-	-
	09/16/02	**<5.0**	**<5.0**	**<5.0**	**<5.0**	**<50**	**<5.0**	**<5.0**
MRL		0.5	0.5	0.5	0.5	5.0	0.5	0.5

MRL = Method Reporting Limit, unless otherwise shown
µg/L = micrograms per liter
AEI = AEI Consultants
MAI = McCampbell Analytical, Inc.
TPHg = total petroleum hydrocarbons as gasoline
MTBE = methyl tertiary butyl ether

Table 6

Groundwater RBSLs: Residential Land Use: Tier 2 Clayey Silts

Pathway		*Risk Type (Cancer / Hazard)*	*Tier 2 RBSL µg/l*	*Site Maximum µg/l*
Benzene	Inhalation of indoor air vapors	Cancer	5600	3,800
		Hazard	19000	
	Inhalation of outdoor air vapors	Cancer	>SOL	
		Hazard	>SOL	
Toluene	Inhalation of indoor air vapors	Cancer	nc	290
		Hazard	>SOL	
	Inhalation of outdoor air vapors	Cancer	nc	
		Hazard	>SOL	
E-benzene	Inhalation of indoor air vapors	Cancer	nc	2,200
		Hazard	>SOL	
	Inhalation of outdoor air vapors	Cancer	nc	
		Hazard	>SOL	
Xylenes	Inhalation of indoor air vapors	Cancer	nc	1,900
		Hazard	>SOL	
	Inhalation of outdoor air vapors	Cancer	nc	
		Hazard	>SOL	
MTBE	Inhalation of indoor air vapors	Cancer	nc	92
		Hazard	35000	
	Inhalation of outdoor air vapors	Cancer	nc	
		Hazard	>SOL	

nc - chemical not considered carcinogenic
>SOL: RBLS exceeds the solubility of chemical in water
SAT: RBSP exceeds the saturation of chemical in soil
Source: Oakland, 2000.

Table 7

Subsurface Soil RBSLs: Residential Land Use: Tier 2 Clayey Silts

Pathway		*Risk Type (Cancer / Hazard)*	*Tier 2 RBSL mg/kg*	*Site Maximum mg/kg*
Benzene	Inhalation of indoor air vapors	Cancer	1.9	0.59
		Hazard	6.2	
	Inhalation of outdoor air vapors	Cancer	160	
		Hazard	650	
Toluene	Inhalation of indoor air vapors	Cancer	nc	0.58
		Hazard	930	
	Inhalation of outdoor air vapors	Cancer	nc	
		Hazard	SAT	
E-benzene	Inhalation of indoor air vapors	Cancer	nc	1.1
		Hazard	SAT	
	Inhalation of outdoor air vapors	Cancer	nc	
		Hazard	SAT	
Xylenes	Inhalation of indoor air vapors	Cancer	nc	1.5
		Hazard	SAT	
	Inhalation of outdoor air vapors	Cancer	nc	
		Hazard	SAT	
MTBE	Inhalation of indoor air vapors	Cancer	nc	<LDL
		Hazard	14,000	
	Inhalation of outdoor air vapors	Cancer	nc	
		Hazard	SAT	

nc - chemical not considered carcinogenic

>SOL: RBLS exceeds the solubility of chemical in water

SAT: RBSP exceeds the saturation of chemical in soil

Source: Oakland, 2000.

<LDL - less than laboratory detection limits, generally 0.1 to 0.05 for MTBE

Table 8

Surface Soil RBSLs: Residential Land Use: Tier 2 Clayey Silts

Pathway		*Risk Type (Cancer / Hazard)*	*Tier 2 RBSL mg/kg*	*Site Maximum mg/kg*
Benzene	Soil Ingestion, dermal contact, and vapor inhallatoin	Cancer	19	<0.005
		Hazard	63	
Toluene	Soil Ingestion, dermal contact, and vapor inhallatoin	Cancer	nc	<0.005
		Hazard	7,100	
E-benzene	Soil Ingestion, dermal contact, and vapor inhallatoin	Cancer	nc	<0.005
		Hazard	3,900	
Xylenes	Soil Ingestion, dermal contact, and vapor inhallatoin	Cancer	nc	<0.005
		Hazard	53,000	
MTBE	Soil Ingestion, dermal contact, and vapor inhallatoin	Cancer	nc	<0.05
		Hazard	200	

nc - chemical not considered carcinogenic
>SOL: RBLS exceeds the solubility of chemical in water
SAT: RBSP exceeds the saturation of chemical in soil
Source: Oakland, 2000.

Table 9

Groundwater Screening Levels: Drinking Water Resource Not Threatened

(All Concentrations Expressed in mg/l)

Chemical	Site Maximum	Ceiling Level		Indoor Air Impacts		Aquatic Life Protection (upon discharge to surface water)	Surface Water Concentration
		Nuisance Odor (upon discharge to surface)	Upper Limit	Coarse Soils	Fine Soils		
TPH-gasoline	**25000**	5000	**50000**	na	**na**	500	na
Benzene	**3800**	20000	50000	84	**5800**	46	71
Toluene	**290**	400	**50000**	76000	**530000 (sol)**	130	200000
Ethyl-Benzene	**2200**	300	**50000**	170000 (sol)	**170000 (sol)**	290	29000
Xylenes	**1900**	5300	**50000**	150000	**160000 (sol)**	13	na
MTBE	**92**	1800	**50000**	50000	**490000**	8000	na

Components Shown in Red are not considered valid or complete for this site (see text)

Table 10

Surface Soil Screening Levels (<10 feet deep)

(All Concentrations Expressed in mg/kg)

Chemical	Site Maximum	Ceiling	Urban Area Ecotoxicity	Direct Exposure				Indoor Air				Groundwater Protection		
				Residential		Com. / Ind.		Residential		Com. / Ind.				
				Cancer	Non-cancer (HQ = 0.2)	Cancer	Non-cancer (HQ = 0.2)	Coarse Soils	Fine Soils	Coarse Soils	Fine Soils	Target GW Conc** (µg/l)	DAF	Soil Level
TPH-gasoline	95	500	na	na	na	na	na	na	na	na	na	500	834	**400**
Benzene	0.59	500	25	**0.18**	1.4	0.39	4.8	0.18*	**0.18***	0.39*	0.39*	46	44.8	2.1
Toluene	0.58	500	150	na	120	na	400	30	310	89	520 (sat)	130	64.2	**8.4**
Ethyl-Benzene	1.1	230	na	na	300(sat=230)	na	1200(sat=230)	76	230 (sat)	220	230 (sat)	290	82.1	**24**
Xylenes	1.5	210	na	na	270(sat=210)	na	890(sat=210)	210 (sat)	210 (sat)	210 (sat)	210 (sat)	13	78.5	**1**
MTBE	<0.5***	100	na	34	140	79	2100	3.4	68	12	290	1800	5.59	**10**

Components Shown in Red are not considered valid or complete for this site (see text)

* Indoor Air exposure pathway levels for benzene set as direct exposure levels (RWQCB, 2001)

** Target groundwater concentration based on lowest component of Table 9, rather than lowest relevant component

*** No MTBE detected in soil above water table. Highest laboratory detection limit shown.

Groundwater Protection Soil Level = Dilution-attenuation factor (DAF) x Target Groundwater Concentration x 0.001 mg/ml

Table 11

Suburface Soil Screening Levels (>10 feet deep to water table)

(All Concentrations Expressed in mg/kg)

Chemical	Site Maximum	Ceiling		Direct Exposure Construction/Trenchworker		Indoor Air Residential		Indoor Air Com. / Ind.		Groundwater Protection		
		Res.	Com./Ind.	Cancer	Non-cancer (HQ = 0.2)	Coarse Soils	Fine Soils	Coarse Soils	Fine Soils	Target GW Conc** (µg/l)	DAF	Soil Level
TPH-gasoline	95	5000	5000	na	na	na	na	na	na	500	834	**400**
Benzene	0.59	1000	1100	16	58	0.18	**0.18**	0.39	0.39	46	44.8	2.1
Toluene	0.58	520	520	na	4700(sat=520)	30	310	89	520(sat)	130	64.2	**8.4**
Ethyl-Benzene	1.1	230	230	na	12000(sat=230)	76	230(sat)	220	230(sat)	290	82.1	**24**
Xylenes	1.5	210	210	na	11000(sat=210)	210(sat)	210(sat)	210(sat)	210(sat)	13	78.5	**1**
MTBE	<0.5***	500	1000	2900	4900	3.4	68	12	290	1800	5.59	**10**

Components Shown in Red are not considered valid or complete for this site (see text)

* Indoor Air exposure pathway levels for benzene set as direct exposure levels (RWQCB, 2001)

** Target groundwater concentration based on lowest component of Table 9, rather than lowest relevant component

*** No MTBE detected in soil above water table. Highest laboratory detection limit shown.

Groundwater Protection Soil Level = Dilution-attenuation factor (DAF) x Target Groundwater Concentration x 0.001 mg/ml

APPENDIX A

GROUNDWATER MONITORING
FIELD FORMS : 9/16/02

AEI CONSULTANTS - GROUNDWATER MONITORING WELL FIELD SAMPLING FORM	
Monitoring Well Number: MW-1	
Project Name: Fruitvale-Farnam	Date of Sampling: 9/16/02
Job Number: 5624	Name of Sampler: PJM
Project Address: 1450 Fruitvale Avenue, Oakland	
MONITORING WELL DATA	
Well Casing Diameter (2"/4"/6")	2"
Seal at Grade -- Type and Condition	Cement, good
Well Cap & Lock -- OK/Replace	OK
Elevation of Top of Casing	42.13
Depth of Well	28.00
Depth to Water	11.35
Water Elevation	30.78
Three Well Volumes (gallons)*	
2" casing: (TD - DTW)(0.16)(3)	8.5
4" casing: (TD - DTW)(0.65)(3)	
6" casing: (TD - DTW)(1.44)(3)	
Actual Volume Purged (gallons)	9
Appearance of Purge Water	Clears quickly
GROUNDWATER SAMPLES	
Number of Samples/Container Size	4 VOAs

Time	Vol Remvd (gal)	Temp (deg C)	pH	Cond (µs)	Comments
145	1	23.0	6.90	540	
	3	22.2	6.95	665	
	5	21.8	6.83	631	
	7	20.6	6.80	629	

COMMENTS (i.e., sample odor, well recharge time & percent, etc.)
Light HC odor, no sheen

TD - Total Depth of Well
DTW - Depth To Water

AEI CONSULTANTS - GROUNDWATER MONITORING WELL FIELD SAMPLING FORM					
Monitoring Well Number: MW-2					
Project Name: Fruitvale-Farnam				Date of Sampling: 9/16/02	
Job Number: 5624				Name of Sampler: PJM	
Project Address: 1450 Fruitvale Avenue, Oakland					
MONITORING WELL DATA					
Well Casing Diameter (2"/4"/6")				2"	
Seal at Grade -- Type and Condition				Cement, good	
Well Cap & Lock -- OK/Replace				OK	
Elevation of Top of Casing				42.08	
Depth of Well				28.00	
Depth to Water				10.52	
Water Elevation				31.56	
Three Well Volumes (gallons)*					
2" casing: (TD - DTW)(0.16)(3)				8.75	
4" casing: (TD - DTW)(0.65)(3)					
6" casing: (TD - DTW)(1.44)(3)					
Actual Volume Purged (gallons)				9	
Appearance of Purge Water				Clears quickly	
GROUNDWATER SAMPLES					
Number of Samples/Container Size				4 VOAs	
Time	Vol Remvd (gal)	Temp (deg C)	pH	Cond (µs)	Comments
200	2	22.7	6.68	1018	
	4	22.2	6.68	982	
	6	21.9	6.56	1005	
	8	20.9	6.62	1005	
COMMENTS (i.e., sample odor, well recharge time & percent, etc.)					
Moderate HC odor, no sheen					

TD - Total Depth of Well
DTW - Depth To Water

AEI CONSULTANTS - GROUNDWATER MONITORING WELL FIELD SAMPLING FORM					
Monitoring Well Number: MW-3					
Project Name: Fruitvale-Farnam				Date of Sampling: 9/16/02	
Job Number: 5624				Name of Sampler: PJM	
Project Address: 1450 Fruitvale Avenue, Oakland					
MONITORING WELL DATA					
Well Casing Diameter (2"/4"/6")				2"	
Seal at Grade -- Type and Condition				Cement, good	
Well Cap & Lock -- OK/Replace				OK	
Elevation of Top of Casing				42.55	
Depth of Well				28.00	
Depth to Water				11.42	
Water Elevation				31.13	
Three Well Volumes (gallons)*					
2" casing: (TD - DTW)(0.16)(3)				8	
4" casing: (TD - DTW)(0.65)(3)					
6" casing: (TD - DTW)(1.44)(3)					
Actual Volume Purged (gallons)				9	
Appearance of Purge Water				Clears quickly	
GROUNDWATER SAMPLES					
Number of Samples/Container Size				4 VOAs	
Time	Vol Remvd (gal)	Temp (deg C)	pH	Cond (µS)	Comments
220	1	20.4	6.69	1133	
	3	20.4	6.65	1062	
	5	20.1	6.65	1037	
	7	20.1	6.72	1075	
	9	19.8	6.66	1056	
COMMENTS (i.e., sample odor, well recharge time & percent, etc.)					
Moderate HC odor, no sheen					

TD - Total Depth of Well
DTW - Depth To Water

APPENDIX B

SAMPLE ANALYTICAL REPORT: 9/16/02 MONITORING EVENT

McCampbell·Analytical Inc.
110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

All Environmental, Inc. 3210 Old Tunnel Rd., Ste. B Lafayette, CA 94549-4157	Client Project ID: #358; F.F. 2002-3	Date Sampled: 09/16/02
		Date Received: 09/16/02
	Client Contact: Peter McIntyre	Date Reported: 09/20/02
	Client P.O.: Peter McIntyre	Date Completed: 09/20/02

September 20, 2002

Dear Peter:

Enclosed are:

1). the results of 3 analyzed samples from your **#358; F.F. 2002-3 project,**

2). a QC report for the above samples

3). a copy of the chain of custody, and

4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,

Angela Rydelius, Lab Manager

McCampbell Analytical Inc.
110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

All Environmental, Inc.	Client Project ID: #358; F.F. 2002-3	Date Sampled: 09/16/02
3210 Old Tunnel Rd., Ste. B		Date Received: 09/16/02
Lafayette, CA 94549-4157	Client Contact: Peter McIntyre	Date Extracted: 09/19/02
	Client P.O.: Peter McIntyre	Date Analyzed: 09/19/02

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Extraction method: SW5030B Analytical methods: SW8021B/8015Cm Work Order: 0209232

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	MW-1	W	3800,a	ND<10	190	15	14	7.7	1	--#
002A	MW-2	W	7400,a	ND<250	360	8.4	150	38	10	--#
003A	MW-3	W	25,000,a	ND<220	2000	47	2200	1100	10	--#
Reporting Limit for DF =1; ND means not detected at or above the reporting limit		W	50	5.0	0.5	0.5	0.5	0.5	1	µg/L
		S	NA	NA	NA	NA	NA	NA	1	mg/Kg

*water and vapor samples are reported in ug/L, soil and sludge samples in mg/kg, wipe samples in ug/wipe, product/oil/non-aqueous liquid samples in mg/L, and TCLP extracts in ug/L.

cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCampbell Analytical Inc.
110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

All Environmental, Inc.	Client Project ID: #358; F.F. 2002-3	Date Sampled: 09/16/02
3210 Old Tunnel Rd., Ste. B		Date Received: 09/16/02
Lafayette, CA 94549-4157	Client Contact: Peter McIntyre	Date Extracted: 09/18/02
	Client P.O.: Peter McIntyre	Date Analyzed: 09/18/02

Oxygenated Volatile Organics + EDB and 1,2-DCA by P&T and GC/MS*

Extraction Method: SW5030B Analytical Method: SW8260B Work Order: 0209232

Lab ID	0209232-001B	0209232-002B	0209232-003B		Reporting Limit for DF =1	
Client ID	MW-1	MW-2	MW-3			
Matrix	W	W	W			
DF	1	2.5	10		S	W
Compound	**Concentration**				ug/kg	µg/L
Diisopropyl ether (DIPE)	0.56	7.3	ND<5.0		NA	0.5
Ethyl tert-butyl ether (ETBE)	ND	ND<1.2	ND<5.0		NA	0.5
Methyl-t-butyl ether (MTBE)	ND<3.0	92	ND<5.0		NA	0.5
tert-Amyl methyl ether (TAME)	ND	ND<1.2	ND<5.0		NA	0.5
t-Butyl alcohol (TBA)	ND	ND<12	ND<50		NA	5.0
1,2-Dibromoethane (EDB)	ND	ND<1.2	ND<5.0		NA	0.5
1,2-Dichloroethane (1,2-DCA)	ND	ND<1.2	ND<5.0		NA	0.5
Surrogate Recoveries (%)						
%SS:	97.5	99.9	88.4			
Comments			j			

* water and vapor samples and all TCLP & SPLP extracts are reported in ug/L, soil/sludge/solid samples in ug/kg, wipe samples in ug/wipe, product/oil/non-aqueous liquid samples in mg/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) sample diluted due to high organic content.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCampbell Analytical Inc.
110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

QC SUMMARY REPORT FOR SW8021B/8015Cm

Matrix: W WorkOrder: 0209232

EPA Method: SW8021B/8015Cm Extraction: SW5030B BatchID: 3991 Spiked Sample ID: 0209229-003A

Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(gas)	ND	60	104	112	7.85	104	106	2.05	80	120
MTBE	ND	10	92.2	88.8	3.76	105	93.5	11.4	80	120
Benzene	4.222	10	97.8	93.9	2.79	114	98	14.8	80	120
Toluene	ND	10	116	113	2.49	108	95.9	11.6	80	120
Ethylbenzene	ND	10	108	109	0.662	114	102	11.9	80	120
Xylenes	0.53	30	108	108	0	110	100	9.52	80	120
%SS:	116	100	114	110	3.43	116	99.5	15.1	80	120

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.
NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS – MSD) / (MS + MSD) * 2.

* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

McCampbell Analytical Inc.
110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0209232

Client:
All Environmental, Inc.
3210 Old Tunnel Rd., Ste. B
Lafayette, CA 94549-4157

TEL: (925) 283-6000
FAX: (925) 283-6121
ProjectNo: #358; F.F. 2002-
PO: Peter McIntyre

16-Sep-02

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests						
					8021B/8015	SW8260B					
0209232-001	MW-1	Water	9/16/02	☐	A	B					
0209232-002	MW-2	Water	9/16/02	☐	A	B					
0209232-003	MW-3	Water	9/16/02	☐	A	B					

Comments:

	Date/Time		Date/Time
Relinquished by:		**Received by:**	
Relinquished by:		**Received by:**	
Relinquished by:		**Received by:**	

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HOUR ☐ 48 HOUR ☒ 5 DAY

Report To: Peter McIntyre Bill To:
Company: All Environmental
3210 Old Tunnel Road, Suite B
Lafayette, CA 94549-4157
Tele: (925) 283-6000 Fax: (925) 283-6121
Project #: 3581 Project Name: F.F. 2002-3
Project Location: Fruitvale - Fernam
Sampler Signature:

SAMPLE ID	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	Soil	Air	Sludge	Other	METHOD PRESERVED Ice	HCl	HNO_3	Other
MW-1		9/16/02	2-3pm	4	VOAs	X					X	X		
MW-2		"	"	4	"	X					X	X		
MW-3		"	"	4	"	X					X	X		

Analysis Request

BTEX & TPH as Gas (602/8020 + 8015)/MTBE	TPH as Diesel (8015)	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8080	EPA 608 / 8080 PCB's ONLY	EPA 624 / 8240 / 8260 (5 Fuel Oxys, 2 DO scale)	EPA 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI
X								X						
X								X						
X								X						

Other: VOAs | O&G | METALS | OTHER

Comments:

Relinquished By:	Date:	Time:	Received By:
	9/16/02	3:50	
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

Remarks:

ICE/T
GOOD CONDITION
HEAD SPACE ABSENT
DECHLORINATED IN LAB
PRESERVATION APPROFRIATE
CONTAINERS
PRESERVED IN LAB

LOG BY MEL

Melissa Valles

ATTACHMENT C

SAMPLE ANALYTICAL REPORT: AEI-23 THROUGH AEI-25

McCampbell Analytical Inc.
110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

All Environmental, Inc. 3210 Old Tunnel Rd., Ste. B Lafayette, CA 94549-4157	Client Project ID: #5624; Fruitvale	Date Sampled: 09/27/02
		Date Received: 09/27/02
	Client Contact: Peter McIntyre	Date Reported: 10/01/02
	Client P.O.:	Date Completed: 10/01/02

October 01, 2002

Dear Peter:

Enclosed are:

1). the results of 3 analyzed samples from your **#5624; Fruitvale project,**

2). a QC report for the above samples

3). a copy of the chain of custody, and

4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,

Angela Rydelius, Lab Manager

McCampbell Analytical Inc.
110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

All Environmental, Inc.	Client Project ID: #5624; Fruitvale	Date Sampled: 09/27/02
3210 Old Tunnel Rd., Ste. B		Date Received: 09/27/02
Lafayette, CA 94549-4157	Client Contact: Peter McIntyre	Date Extracted: 09/27/02
	Client P.O.:	Date Analyzed: 09/28/02-10/01/02

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE*

Extraction method: SW5030B Analytical methods: SW8021B/8015Cm Work Order: 0209467

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	AEI-23 2 1/2'	S	ND	ND	ND	ND	ND	ND	1	102
002A	AEI-24 2 1/2'	S	ND	ND	ND	ND	ND	ND	1	98.8
003A	AEI-25 2 1/2'	S	ND	ND	ND	ND	ND	ND	1	107
Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	NA	NA	NA	NA	NA	NA	1	ug/L
	S	1.0	0.05	0.005	0.005	0.005	0.005	1	mg/Kg

*water and vapor samples are reported in ug/L, soil and sludge samples in mg/kg, wipe samples in ug/wipe, and TCLP extracts in ug/L.

cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~2 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCampbell Analytical Inc.
110 2nd Avenue South, #D7, Pacheco, CA 94553-5560
Telephone : 925-798-1620 Fax : 925-798-1622
http://www.mccampbell.com E-mail: main@mccampbell.com

QC SUMMARY REPORT FOR SW8021B/8015Cm

Matrix: S WorkOrder: 0209467

EPA Method: SW8021B/8015Cm Extraction: SW5030B BatchID: 4172 Spiked Sample ID: 0209467-001A

Compound	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	mg/Kg	mg/Kg	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(gas)	ND	0.60	104	107	2.16	99.4	95.7	3.81	80	120
MTBE	ND	0.10	85.9	82.6	3.92	91.1	86.6	5.01	80	120
Benzene	ND	0.10	107	97.5	9.59	104	102	1.22	80	120
Toluene	0.02265	0.10	89.3	82.7	6.13	110	107	2.50	80	120
Ethylbenzene	ND	0.10	110	103	6.93	105	103	1.21	80	120
Xylenes	ND	0.30	113	103	9.23	107	103	3.17	80	120
%SS:	114	100	107	102	4.33	108	108	0.501	80	120

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.
NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS – MSD) / (MS + MSD) * 2.

* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

McCampbell Analytical Inc.
110 Second Avenue South, #D7
Pacheco, CA 94553-5560
(925) 798-1620

CHAIN-OF-CUSTODY RECORD

WorkOrder: 0209467

Client:
All Environmental, Inc.
3210 Old Tunnel Rd., Ste. B
Lafayette, CA 94549-4157

TEL: (925) 283-6000
FAX: (925) 283-6121
ProjectNo: #5624; Fruitvale
PO: Peter McIntyre

27-Sep-02

Sample ID	ClientSampID	Matrix	Collection Date	Hold	Requested Tests						
					8021B/8015						
0209467-001	AEI-23 2 1/2'	Soil	9/27/02 2:19:00 PM	☐	A						
0209467-002	AEI-24 2 1/2'	Soil	9/27/02 2:40:00 PM	☐	A						
0209467-003	AEI-25 2 1/2'	Soil	9/27/02 3:00:00 PM	☐	A						

Comments: 48hr TAT

	Date/Time		Date/Time
Relinquished by:		**Received by:**	
Relinquished by:		**Received by:**	
Relinquished by:		**Received by:**	

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

Bottle Type: L-Liter V-Voa S-Soil Jar O-Orbo T-Tedlar B-Brass P-Plastic OT-Other

AEI

McCAMPBELL ANALYTICAL INC.

110 2nd AVENUE SOUTH, #D7
PACHECO, CA 94553
Telephone: (925) 798-1620 Fax: (925) 798-1622

CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HOUR ☒ 48 HOUR ☐ 5 DAY

Report To: Peter McIntyre	Bill To:
Company: All Environmental	
3210 Old Tunnel Road, Suite B	
Lafayette, CA 94549-4157	
Tele: (925) 283-6000	Fax: (925) 283-6121
Project #: 5624	Project Name: Fruitvale
Project Location: Fruitvale / Earnam	
Sampler Signature:	

RUSH

LOG IN ☺

SAMPLE ID	LOCATION	SAMPLING Date	SAMPLING Time	# Containers	Type Containers	MATRIX Water	MATRIX Soil	MATRIX Air	MATRIX Sludge	MATRIX Other	METHOD PRESERVED Ice	METHOD PRESERVED HCl	METHOD PRESERVED HNO_3	METHOD PRESERVED Other
AEI-23 2½'		9/27/02	2:10	1	Brass		X				X			
AEI-24 2½'			2:40	1	"		X				X			
AE-25 2½'			3:00	1	"		X				X			

Analysis Request

BTEX & TPH as Gas (602/8020 + 8015)/ MTBE	TPH as Diesel (8015)	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8080	EPA 608 / 8080 PCB's ONLY	EPA 624 / 8240 / 8260	EPA 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/6010)	RCI
X														
X														
X														

Other: VOAs | O&G | METALS | OTHER

Comments:

Relinquished By:	Date: 9/27/02	Time: 4:00	Received By:
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

Remarks:

ICE/t° ✓
GOOD CONDITION ✓
HEAD SPACE ABSENT ✓
DECHLORINATED IN LAB
PRESERVATION APPROFRIATE ✓
CONTAINERS ✓
PRESERVED IN LAB

APPENDIX D

SAMPLE ANALYTICAL REPORT: GRAIN SIZE ANALYSIS

URS

Wet and Dry Unit Weight
Moisture Content
Total Porosity

Project Name: AEI CONSULTANTS

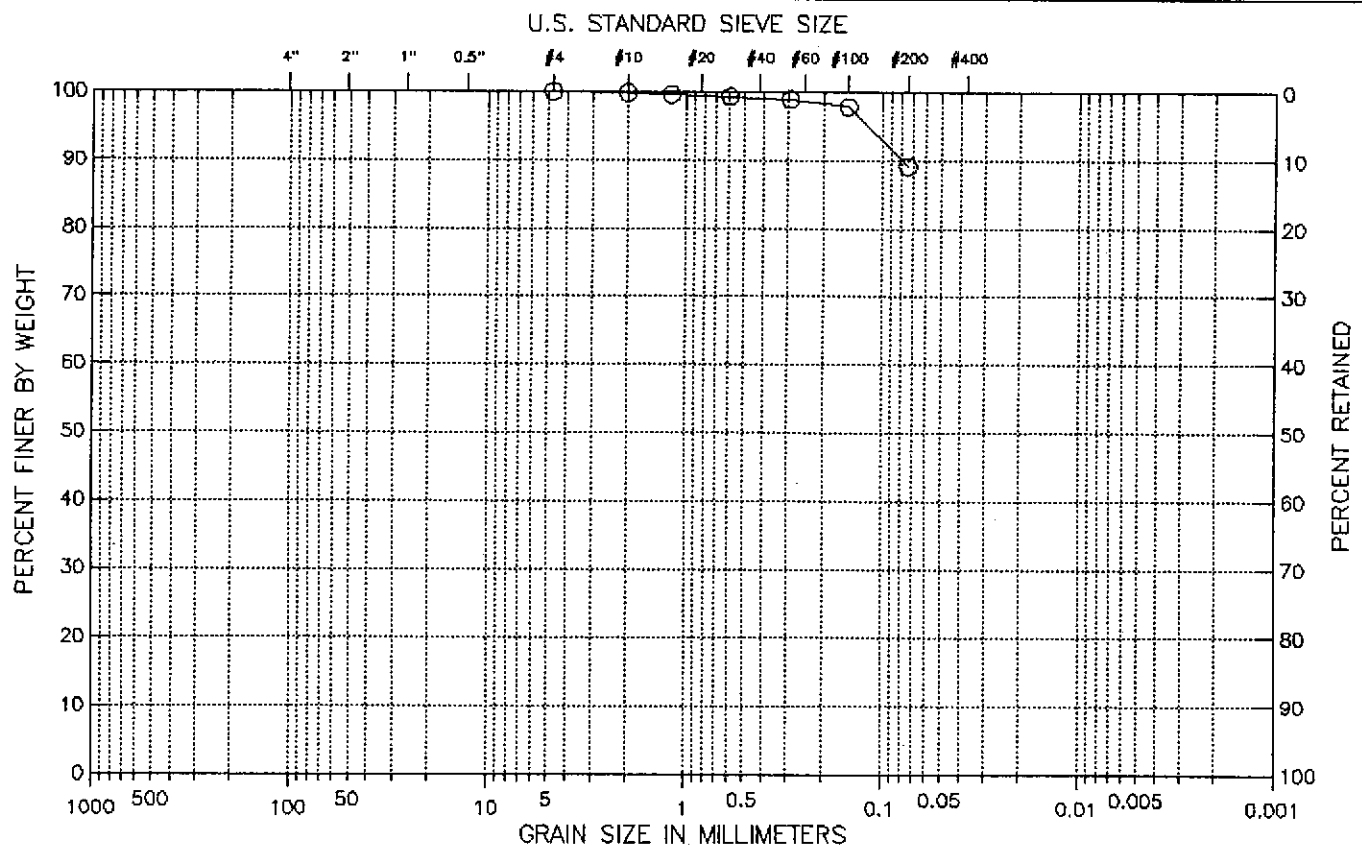
Project Number: 5624

Location: Fruitvale

Sample Number	Wet Density, pcf	Dry Density, pcf	Moisture Content, %	Assumed Specific Gravity	Total Porosity
AEI-2	121.43	101.15	20.06	2.65	38.83%
				2.70	39.96%
				2.75	41.06%

URS

	Boring No. : AEI Sample No: 2 Tested by : S. Capps Filename : AEI-2	Project : AEI CONSULTANTS Project No.: 5624 Location: Fruitvale Date : Thu Oct 03 2002



Classification :

Visual Description :
Grayish brown clay with traces of fine sand

Remarks :
Average Porosity = 39.95%

Figure 1

URS

Thu Oct 03 09:39:10 2002

GEOTECHNICAL LABORATORY TEST DATA

Project : AEI CONSULTANTS
Project No. : 5624
Boring No. : AEI
Sample No. : 2
Location : Fruitvale
Depth :
Test Date : 10/03/02
Test Method : ASTM D422
Filename : AEI-2
Elevation : NA
Tested by : S. Capps
Checked by : C. Wason
Soil Description : Grayish brown clay with traces of fine sand
Remarks : Average Porosity = 39.95%

COARSE SIEVE SET

Sieve Mesh	Sieve Openings Inches	Millimeters	Weight Retained (gm)	Cumulative Weight Retained (gm)	Percent Finer (%)
#4	0.187	4.75	0.00	0.00	100
#10	0.079	2.00	0.49	0.49	100
#16	0.047	1.19	0.61	1.10	100
#30	0.023	0.60	0.95	2.05	99
#50	0.012	0.30	1.14	3.19	99
#100	0.006	0.15	3.28	6.47	98
#200	0.003	0.07	26.22	32.69	89

Total Dry Weight of Sample = 302.94

D85 : N/A
D60 : N/A
D50 : N/A
D30 : N/A
D15 : N/A
D10 : N/A

Soil Classification
ASTM Group Symbol : N/A
ASTM Group Name : N/A
AASHTO Group Symbol : A-4(0)
AASHTO Group Name : Silty Soils

URS

GEOTECHNICAL LABORATORY TEST DATA

Project : AEI CONSULTANTS
Project No. : 5624
Boring No. : AEI
Sample No. : 2
Location : Fruitvale
Depth :
Test Date : 10/03/02
Test Method : ASTM D422
Filename : AEI-2
Elevation : NA
Tested by : S. Capps
Checked by : C. Wason
Soil Description : Grayish brown clay with traces of fine sand
Remarks : Average Porosity = 39.95%

Natural Moisture Content

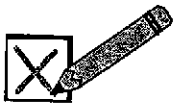
Moisture Content ID	Mass of Container (gm)	Mass of Container and Moist Soil (gm)	Mass of Container and Dried Soil (gm)	Moisture Content (%)
1) AEI-2	0.00	363.70	302.94	20.06

Average Moisture Content = 20.06

APPENDIX E

ELIGIBILITY CHECKLIST

2.2 Qualifying for the Oakland RBCA Levels



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 checklist that comprises Table 1 is designed to assist you in determining your site's eligibility for the Oakland RBCA levels.[6]

Table 1. Oakland RBCA Eligibility Checklist

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. Is there a preferential vapor migration pathway—such as a gravel channel or a utility corridor—that is less than 1 meter from *both* of the following?		
(a) A source area containing a volatile chemical of concern		
(b) A structure where inhalation of indoor air vapors is 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 inhalation of indoor air vapors from either soil or groundwater is of concern *and* one or more of the following four conditions is present?		
(a) Chemicals of concern located less than one meter below the structure		
(b) A slab-on-grade foundation less than 15 cm (6 inches) thick		
(c) An enclosed, below-grade space (e.g., a basement) that has floors or walls less than 15 cm (6 inches) thick		
(d) 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 existing or potential 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 the answer to all questions is "no", your site is eligible for both the Oakland Tier 1 RBSLs and Tier 2 SSTLs. Proceed to Section 2.3 for guidance on meeting the minimum Tier 1 and Tier 2 site characterization requirements.