Atlantic Richfield Company

Shannon Couch
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May 31, 2011

Mr. Paresh Khatri
Alameda County Environmental Health Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577
(submitted via ACEH ftp site)

Re: Atlantic Richfield Company Station #2112
1260 Park Street, Alameda, California
ACEH Case #RO0000044

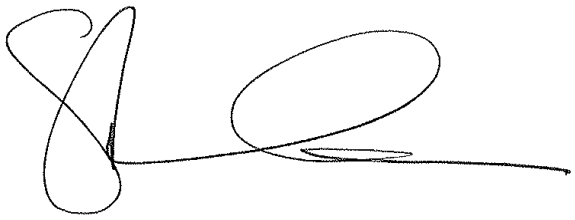
Dear Mr. Khatri,

Atlantic Richfield Company is pleased to submit this Request for No Further Action Status for ARCO Station #2112, located at 1260 Park Street in Alameda, California. I declare that to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached document are true and correct.

Atlantic Richfield Company is interested in bringing forward those cases that appear to meet low-risk closure criteria. Based on our review, the environmental case at the aforementioned location does not appear to pose a significant threat to human health, environmental receptors, or reasonably anticipated beneficial uses of water. Furthermore, we believe that if this case were to be considered in relation to the decisional framework and criteria developed by the California State Water Resources Control Board and the SWRCB Task Forces, a finding of No Further Action would be appropriate. As such, we request that the environmental case for this facility be granted No Further Action status at this time.

If you have any questions or would like to discuss this matter in greater detail, please feel free to contact me via email or at the number listed above.

Regards,



Shannon Couch
Operations Project Manager

Enclosure: Case Evaluation and Justification for No Further Action (BAI, 5/31/2011)

Cc: Mr. John Skance, ARC (electronic copy uploaded to ENFOS)
Electronic copy uploaded to GeoTracker

Broadbent & Associates, Inc.
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BROADBENT & ASSOCIATES, INC
ENVIRONMENTAL, WATER RESOURCES & ENGINEERING

May 31, 2011

Project No. 06-88-616

Atlantic Richfield Company
P.O. Box 1257
San Ramon, CA 94583
Submitted via ENFOS

Attn.: Ms. Shannon Couch

Re: Case Evaluation and Justification for No Further Action, Atlantic Richfield Company Station #2112, 1260 Park Street, Alameda, California; ACEH Case #RO0000044

Dear Ms. Couch:

Attached is the *Case Evaluation and Justification for No Further Action* for the Atlantic Richfield Company Station #2112 located at 1260 Park Street, Alameda, California (Site). A summary of existing Site conditions and the technical justification for a finding of No Further Action Status is presented in this document.

The subject Site environmental case has been open for over 21 years. A leak was discovered and stopped in December 1989. Petroleum hydrocarbons were detected at the Site during a preliminary boring investigation of the underground storage tanks complex. Over-excavation activities performed to date have reportedly removed approximately 2,000 cubic yards of impacted soil. Operation of the Soil-Vapor and Groundwater Extraction and Treatment Systems removed over 336 pounds of hydrocarbons from the subsurface.

Gasoline, BTEX, and MTBE are not present in groundwater samples from the Site, although very low concentrations of 1,2-DCA are present within the interior of the Site. The Site conditions are very unlikely to create a vapor intrusion pathway for exposure. There are no down-gradient wells used for potable purposes, while the closest down-gradient irrigation supply well is approximately 0.25 miles to the northwest. No surface water bodies are likely to be affected by the Site. These observations, plus additional lines of evidence are the basis for this closure request.

Should you have questions regarding this submittal, please do not hesitate to contact us at 530-566-1400.

Sincerely,
BROADBENT & ASSOCIATES, INC.

Thomas A. Venus, PE
Senior Engineer

Enclosures

cc: Mr. Paresh Khatri, Alameda County Environmental Health (submitted via ACEH ftp site)
Electronic copy uploaded to GeoTracker

CASE EVALUATION AND JUSTIFICATION FOR NO FURTHER ACTION ARCO STATION #2112, ALAMEDA, CALIFORNIA

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ARCO STATION #2112, ALAMEDA, CALIFORNIA

1. SITE SUMMARY

1.1 Location and Setting

The Site is located at 1260 Park Street, on the southern corner of Park Street and Encinal Avenue in Alameda California. The latitude and longitude of the center of the Site is approximately 37°45'43.55" North, 122°14'39.17" West (37.762117°, -122.244183°). This location is within Township 2 South, Range 3 West, Section 18 relative to the Mount Diablo Baseline and Meridian of Northern California. It is covered by the United States Geological Survey 'Oakland – East' 7.5 minute topographic map. The Site property is recognized by the Alameda County Assessor's Office as Assessor's Parcel Number 70-184-1-3. The approximate ground surface elevation at the Site is 32 feet. A Site Location Map is provided as Drawing 1.

The land use in the immediate area is mixed commercial and residential. The property adjacent to the southeast is a Kentucky Fried Chicken restaurant. The property adjoining at the south corner is in use as a Montessori Child Care Center. The property adjacent to the southwest is in use as a hair and nail salon with residential apartments on the second floor. Across Encinal Avenue to the northeast the property is in use as a Fire Station for the Alameda Fire Department. Across Park Street to the northwest the properties are in use as a Jack In The Box restaurant and Dmitra's Sandwich Shop.

1.2 Current Use

The Site is currently in use as an active ARCO brand retail gasoline station with AM/PM convenience store. There are four gasoline underground storage tanks (USTs) with associated piping to four dispensers on two pump islands under one overhead canopy. The Site is covered with asphalt or concrete surfacing except for planters along the northwest, northeast, and southeast property boundaries containing bushes and mature trees.

1.3 Regional Geology and Hydrogeology

According to the *East Bay Plain Groundwater Basin Beneficial Use Evaluation Report* (California Regional Water Quality Control Board – San Francisco Bay Region/SFRWQCB, June 1999), the Site is located along the northeastern edge of the Central Sub-Area of the East Bay Plain of the San Francisco Basin. The Central Sub-Area extends beneath San Francisco Bay. The boundaries of the sub-area are based on the Young Bay Mud. The Young Bay Mud has a sharp "edge" in some areas, and in other areas the boundary is less well-defined. Alameda Island and Bay Farm Island (presently known as Harbor Bay Island) are located along the northeastern edge of the sub-area. Historically, there were artesian wells in the sub-area that produced from gravels below the Yerba Buena Mud, but saltwater intrusion shut down these wells. Single-family residences historically relied on the Merritt Sand for water supply. However, septic systems and some saltwater intrusion resulted in localized contamination. More recently, deep wells (700 to 1,000 feet deep) were drilled at the Alameda City Golf Course. Production rates were lower than expected but this is believed due to drilling problems. Water quality was satisfactory for irrigation.

Throughout most of the Alameda County portion of the East Bay Plain, from Hayward north to Albany, water level contours show that the general direction of groundwater flow is from east to west or from the Hayward Fault to the San Francisco Bay. Groundwater flow direction generally correlates to topography. Flow direction and velocity are also influenced by buried stream channels that typically are oriented in an east to west direction. In the southern end of the study area however, near the San Lorenzo Sub-Area, the direction of flow may not be this simple. According to information presented in the *East Bay Plain Groundwater Basin Beneficial Use Evaluation Report*, the small set of water level measurements available

seemed to show that the groundwater in the upper aquifers may be flowing south, with the deeper aquifers, the Alameda Formation, moving north (SFRWQCB, 1999).

According to the *East Bay Plain Groundwater Basin Beneficial Use Evaluation Report*, the single-most important groundwater quality parameter directly influencing a beneficial use determination is the Total Dissolved Solids (TDS) concentration. Resolution 89-39 – *Sources of Drinking Water*, exempts the Municipal and Domestic (MUN) Supply Beneficial Use designations for groundwater with TDS concentrations greater than 3,000 milligrams per liter (mg/L, parts per million - ppm) and are not reasonably expected by the SFRWQCB to supply a public water system (note that the United States EPA uses the 10,000 mg/L TDS value in determining potential drinking water sources). In 1996, SFRWQCB staff reviewed the General Plans for the East Bay Plain cities of Alameda, Albany, El Cerrito, Berkeley, Emeryville, Hayward, Oakland, Piedmont, Richmond, and San Leandro, along with the Alameda County Resource Conservation District, the Alameda County Flood Control & Water Conservation District, the North Richmond Shoreline, and Alameda County. Reportedly, none of these cities had "any plans to develop local groundwater resources for drinking water purposes, because of existing or potential saltwater intrusion, contamination, or poor or limited quantity." However, the SFRWQCB's Basin Plan denotes existing beneficial uses of MUN, Industrial Process Supply (PROC), Industrial Service Supply (IND), and Agricultural Supply (AGR) for the East Bay Plain groundwater basin (SFRWQCB, 1999).

1.4 Local Hydrogeology

Depth to groundwater at the Site fluctuates at least seasonally and is typically encountered between nine to 11 ft, although it has ranged from as little as 6.76 ft (well A-3 on 4/28/1993) to more than 18.43 ft (well A-1 on 2/24/1993). Based on groundwater monitoring conducted by BAI since 2006, groundwater flows predominantly towards the west or northwest. During the First Quarter 2011 groundwater monitoring event the flow direction was towards the Northwest at a gradient magnitude of 0.014 ft/ft. A groundwater elevation contours map from the First Quarter 2011 groundwater monitoring event is presented as Drawing 2. Groundwater elevation data since 1991 are presented within Appendix A.

1.5 Lithology

Based on the description of soil samples collected during soil boring investigations, the lithology beneath the Site consists primarily of sand with silt or clay, silty sand, or clayey sand from the surface to 25.5 ft below ground surface (bgs), the maximum depth explored and logged in boring B-1. Copies of available soil boring logs are provided in Appendix B. No soil boring or well construction logs have been able to be located in the project files for the monitoring wells associated with the Site.

1.6 Sensitive Receptors

In May 2011, BAI conducted a well survey by reviewing confidential well record information provided by the California Department of Water Resources (DWR). The purpose of the survey was to identify wells that may be located within a 0.5 mile radius of the Site. The DWR furnished information for a total of 325 wells in the vicinity of the Site. These wells were located in Township 2 South, Range 3 West, Sections 7 and 18, and Township 2 South, Range 4 West, Section 12.

Results of this sensitive receptor survey/well search indicated a total of 88 well logs were located within a 0.5 mile radius of the Site. Of the 88 wells, there are 76 environmental monitoring/remediation wells (including those at the Site), 11 irrigation water supply wells, and one cathodic protection well. Of the irrigation water supply wells, six are in the northwest quadrant (downgradient direction), one in the northeast quadrant, and four in the southeast quadrant. Ten of the irrigation water supply wells are relatively shallow for residential properties. The closest irrigation water supply well from the Site is 0.25 miles to the northwest. This well for the Alameda School District provides irrigation water at the Alameda High School. It includes a protective double casing from the surface down to 135 ft of its 525 ft total depth.

The closest surface water body to the Site in the downgradient direction appears to be an unnamed impounded lagoon surrounded by residences approximately 2,600 ft to the west-southwest. The strait between Alameda and Harbor Bay Island into the San Leandro Bay is approximately 3,500 ft to the south-southwest. The Oakland Inner Harbor's Tidal Canal is approximately 4,000 ft to the north-northeast.

1.7 Summary of Previous Investigations

On May 15, 1987 a 550-gallon capacity waste oil tank was removed from the Site by Crosby & Overton Environmental. Laboratory analytical tests performed on soil samples (9310-1, 9310-2, and 9347-1) collected beneath the waste oil tank indicated the presence of Total Petroleum Hydrocarbons in the Diesel range (TPH-D) at up to 430 milligrams per kilogram (mg/kg, or parts per million) and Total Petroleum Hydrocarbons in the Motor Oil (TPH-MO) range at up to 2,400 mg/kg. Reportedly approximately 14 cubic yards of contaminated soil from the UST excavation was removed and transported offsite for disposal. Following excavation the level of TPH-MO contamination had been reduced to <10 mg/kg (the detection limit). The UST pit was reportedly backfilled with clean sand. Unfortunately, no copy of this report was able to be located. A summary of the analytical results and site map depicting the previous location of the waste oil tank is provided in Appendix C.

On January 22 and 29, 1990 a soil investigation was conducted by Applied GeoSystems, Inc. to assess soil conditions prior to removal and replacement of the existing five gasoline USTs in the southeastern portion of the Site: one 10,000 gal (T1); two 4,000 gal (T2 and T3); and two 6,000 gal (T4 and T5). The investigation included the advancement of five soil borings (B1-B5) in the vicinity of the then-existing gasoline USTs, and one boring (B6) in the location of the proposed new UST complex in the northwestern portion of the Site. Total boring depths ranged from 11.5 to 13 feet below ground surface (ft bgs) with the exception of boring B1, which was advanced to a total depth of 25 ft bgs. Groundwater was encountered at approximately 12 ft bgs. Petroleum hydrocarbon contaminants were detected above laboratory reporting limits in samples collected from borings B1 through B5: Total Petroleum Hydrocarbons in the Gasoline Range (TPH-G) up to 21,000 milligrams per kilogram (mg/kg, or ppm), Benzene, Toluene, Ethylbenzene, Total Xylenes (BTEX) at up to 210 mg/kg, 1,100 mg/kg, 320 mg/kg, and 2,600 mg/kg, respectively. Hydrocarbon constituents were not detected in the samples collected from boring B6 (Applied GeoSystems, Inc., 1990). A summary of analytical results and a map depicting boring locations are provided in Appendix C. Soil boring logs are presented in Appendix B.

The removal and replacement of the gasoline USTs and product piping took place at the Site between July 27 and September 30 1990. During excavation activities, soil samples were collected by GeoStrategies, Inc. from the sidewalls and bottom of each tank complex excavation, the new UST complex location, and within the product line trenches. The existing UST complex was excavated to approximately 13 ft bgs in an area approximately 23 ft by 77 ft. Soil samples were collected between six and 12 ft bgs. Based on the soil sample analytical results, the excavation was expanded slightly to an area of approximately 27 ft by 81 ft. Concentrations of TPH-G and BTEX were detected up to 23,000 mg/kg, 150 mg/kg, 490 mg/kg, 940 mg/kg and 2,700 mg/kg respectively in the sample from the southwest sidewall of the excavation at a depth of 12 ft bgs (sample AX1-3-12) in an area that the excavation could not be readily expanded. Product line trenches were generally excavated to a depth of three ft bgs except in locations of observed contamination. Sample AT-36 northeast of the Station Building contained TPH-G and BTEX concentrations of 15,000 mg/kg, 71 mg/kg, 710 mg/kg, 200 mg/kg, and 1,300 mg/kg, respectively. Where product line contamination was observed some of the trenches were extended to a depth of 9.5 ft bgs. A total of approximately 1,950 cubic yards of soil was removed from the Site during this time and transported to an offsite facility for treatment/ disposal (GeoStrategies, Inc., 1990). Historic soil sampling locations and a summary of laboratory analytical results are presented in Appendix C.

In September 1991 four on-site wells (A-1 through A-4), one recovery well (AR-1), and three vapor extraction wells (AV-1 through AV-3) were installed at the Site by GeoStrategies, Inc. In January 1992, four vapor extraction wells (AV-4 through AV-7) were installed on-site. In June 1992, one down-gradient off-Site

monitoring well (A-5) and one on-Site recovery well (AR-2) were installed by GeoStrategies, Inc. These wells were installed to evaluate the vertical and horizontal extent of petroleum hydrocarbon contamination associated with the Site and provide extraction wells for use with interim soil vapor and groundwater remediation systems. Well locations are presented in Drawing 2. Results of these investigations were supposedly provided within the *Aquifer Test/Vapor Well Installation Report* prepared by GeoStrategies, Inc. and dated August 27, 1992, and the *Quarterly Monitoring/Well Installation Report* prepared by GeoStrategies, Inc. and dated September 25, 1992. No copies of these reports have been found. No soil boring logs or well construction drawings have been able to be located from the project files.

A vapor extraction pilot test was conducted in October 1991. Results of this test were supposedly provided within the *Continuing Site Assessment/Quarterly Monitoring Report* prepared by GeoStrategies, Inc. and dated January 27, 1992. No copies of this report have been found. In December 1991, a 4-hr Step/24-hr constant-rate drawdown aquifer pumping tests were performed. These results were supposedly published within the *Aquifer Test/Vapor Well Installation Report* prepared by GeoStrategies, Inc. and dated August 27, 1992. No copies of this report have been found.

During the Fourth Quarter of 1992, Soil Vapor Extraction (SVE) and Groundwater Extraction and Treatment (GWET) systems were installed at the Site. The GWET system consisted of two existing recovery wells (AR-1 and AR-2) and an on-site Treatment facility. Each well contained a pneumatic total fluids pump which transferred extracted groundwater to the onsite treatment facility consisting of a surge tank, particulate filter, and two 180-pound activated carbon vessels connected in series. The GWET system reportedly became operational on January 5, 1993. The SVE system consisted of eight vapor extraction wells (AV-1 through AV-7 and A-1). Extracted vapors were routed through a particulate filter and three 2,000-pound carbon vessels connected in series. The SVE system reportedly began operation on January 7, 1993. In August 1995, both the GWET and SVE systems were shutdown reportedly due to low influent concentrations. By that time an estimated total of 334.6 pounds (~54.9 gallons) of Total Purgeable Petroleum Hydrocarbons as Gasoline (TPPH-G) had been removed by the SVE system, and 0.81 pounds of TPPH-G had been removed by the GWET system. The systems were decommissioned and removed from the Site in 1997. GWET and SVE systems performance data are included in Appendix D.

A *Case Closure Summary* report was prepared and submitted by Pacific Environmental Group, Inc. on November 20 1996. The report stated that "remediation and site assessment are complete." The ACEH did not close the Site case file at this time.

On July 31 2001, Delta Environmental Consultants, Inc. conducted soil sampling during product line and dispenser removal and upgrade activities. Soil samples were collected beneath the dispensers following their removal (PL-1 through PL-4) and along the product line trenches at depths ranging from 3.6 to 4.8 ft bgs (DP-1 through DP-4). Petroleum hydrocarbon concentrations were reported in sample PL-3 (southwest dispenser) at 1,400 mg/kg TPH-G, and BTEX at 0.32 mg/kg, 15 mg/kg, 15 mg/kg, and 94 mg/kg, respectively. At the request of ACEH, UST soil samples were collected on the east side of the current UST pit at approximately three ft bgs (UST-1 and UST-2). Petroleum hydrocarbon concentrations were reported in sample UST-1 (close to sample PL-3) at 1,400 mg/kg TPH-G, and BTEX at 2.4 mg/kg, 31 mg/kg, 17 mg/kg, and 110 mg/kg, respectively. Approximately seven cubic yards of soil was excavated in the area of sample PL-3. A confirmation soil sample was collected from the base of the over-excavation at approximately 9 ft bgs. No soil was excavated immediately adjacent to the locations of the UST samples due to the proximity of the USTs. Approximately 9.8 cubic yards of soil was removed from the Site during product line and dispenser upgrades and transported to an offsite facility for disposal/treatment (Delta Environmental Consultants, Inc., 2001). Soil sampling locations and a summary of previous analytical results are provided in Appendix C.

Periodic groundwater monitoring and sampling of the Site wells began in October 1991. Groundwater monitoring and sampling was discontinued following the Second Quarter of 1997. During five consecutive monitoring and sampling events between First Quarter 1996 and Second Quarter 1997, no petroleum

hydrocarbon contaminants were detected above the laboratory reporting limits (Pacific Environmental Group, Inc., 1997). As requested by ACEH in their letter dated June 20, 2006 the wells associated with the Site were redeveloped and sampled during the Third Quarter of 2006. Detected concentrations during this sampling event were consistent with results previously reported prior to and following the case closure request, with the exception that monitoring since 2006 has included analysis and reporting on concentrations for the oxygenates MTBE, Ethyl Tertiary Butyl Ether (ETBE), Tertiary Amyl Methyl Ether (TAME), Di-Isopropyl Ether (DIPE), Tertiary Butyl Alcohol (TBA), Ethanol, and the minor lead-scavenging additives 1,2-Dichloroethane (1,2-DCA), and 1,2-Dibromomethane (also known as Ethylene Dibromide, EDB). During monitoring and sampling in the Third Quarter of 2010 and First Quarter of 2011, no Gasoline Range Organics (GRO) and petroleum hydrocarbon constituents, oxygenates, or additives were detected in the wells associated with the Site, with the exception of low concentrations (to 1.2 µg/L) of 1,2-DCA detected in onsite wells AR-1 and A-2 (BAI, 2011). Historic groundwater elevation and laboratory analytical data through First Quarter 2011 are summarized in Appendix A.

On June 10, 2009 Stratus field personnel observed RSI Drilling advance three soil borings (B-7, B-8 and B-9) on the eastern side of the Station Building around the former UST pits. A total of twelve soil samples were collected from the three borings at depths of 5, 8, 11, and 14 ft bgs. The sample at 11 ft bgs from boring B-8 closest to the back side of the Station Building contained GRO at 2,000 mg/kg, and BTEX at 0.23 mg/kg, 14 mg/kg, 18 mg/kg, and 210 mg/kg, respectively (BAI, 2009). It is important to note that the samples from 11 and 14 ft in soil boring B-8 were described as "wet." The soil samples in boring B-8 from five ft ("dry") and eight ft ("moist") contained no GRO or BTEX, with the exception of a trace amount of Total Xylenes (1.5 µg/kg) in the sample from eight ft bgs. A summary of the soil analytical data is provided in Appendix C. Copies of the soil boring logs are provided in Appendix B.

1.8 Groundwater Constituents of Concern

No GRO, BTEX or MTBE have been detected in wells on the Site during the last three groundwater monitoring and sampling events (Second Quarter 2006, Third Quarter 2010, and First Quarter 2011). Up to 1.2 micrograms per liter (µg/L, parts per billion, ppb) of 1,2-DCA was detected in well A-2 during these last three sampling events, and in well AR-1 during the last two sampling events. TPH-G/GRO has not been detected at the Site since 1994. BTEX has not been detected at the Site since 1995. MTBE has been detected at the Site just once with 22 µg/L in a sample from well A-1 on July 17, 2006. Similarly, TAME has been detected at the Site just once with 3.3 µg/L in the same sample from well A-1 on July 17, 2006. MTBE was not detected before (TAME was not analyzed for prior to 2006), nor have MTBE or TAME been detected during the follow-up last two sampling events. Therefore it is believed that the reported MTBE and TAME concentrations for July 2006 were aberrations. Therefore the previous CoCs at the Site were TPH-G/GRO, BTEX, and 1,2-DCA. The sole current CoC is 1,2-DCA.

The following table presents the previous and current constituents of concern (CoCs) as well as their respective Water Quality Objectives. Water Quality Objectives for CoCs are considered to be the Secondary Maximum Contaminant Level (MCL), or the Primary MCL if the Secondary MCL has not been established. If neither has been established, the SFRWQCB's Environmental Screening Level (ESL) is used.

Contaminant	Current Maximum Concentration	Water Quality Objective	Water Quality Objective Basis
TPH-G/GRO	<50 µg/L	100 µg/L	SFRWQCB ESL
Benzene	<0.50 µg/L	1 µg/L	California Primary MCL
Toluene	<0.50 µg/L	150 µg/L	California Primary MCL
Ethylbenzene	<0.50 µg/L	300 µg/L	California Primary MCL
Total Xylenes	<0.50 µg/L	1,750 µg/L	California Primary MCL
1,2-DCA	1.2 µg/L	0.5 µg/L	California Primary MCL

1.9 Current Regulatory Status

In their letter dated September 3, 2009 the ACEH stated that soil sample analytical results indicated that the Site might still pose a risk to human health, specifically potential contaminant volatilization to indoor air. This position was based on interpretation of results within the *On-Site Soil Investigation Report* (BAI, 8/10/2009) in which GRO and Benzene were detected at concentrations of 2,000 mg/kg and 0.23 mg/kg, respectively from a depth of 11 ft in boring B-8, on the southwest side of the station building. Like the majority of soil samples collected from borings on the southeast side of the station building that did not detect or detected low concentrations of hydrocarbons, soil samples collected in boring B-8 at 5 ft and 8 ft detected no GRO or Benzene above the laboratory reporting limits. Based on the September 3, 2009 ACEH request, it was originally proposed to install and sample new soil gas monitoring implants at the Site for the purposes of conducting a vapor intrusion assessment. However, guidance available now suggests that there is no need to assess the vapor intrusion pathway with low concentrations of dissolved petroleum hydrocarbons in groundwater (i.e. Benzene less than 1 mg/L and GRO less than 10 mg/L) and greater than five feet separation between a contaminant source and building. According to California State Water Resources Control Board (SWRCB) draft guidance, there have been no published examples of petroleum vapor intrusion for this condition and that modeling studies indicate bioattenuation will limit the potential for vapor intrusion. During the last round of monitoring at Station #2112, groundwater samples from wells across the Site have tested negative for CoCs with the exception of 1,2-DCA in well A-2 (0.96 µg/L) and AR-1 (1.2 µg/L).

According to information provided on the State's GeoTracker website, impediments to closure include the following:

- *Site Assessment Incomplete – Pollutant sources have not been adequately identified or evaluated.* Elevated concentrations of petroleum hydrocarbons were detected in borings and UST compliance soil samples. Groundwater recovery and vapor extraction systems were operated at the site. Verification sampling conducted in 2009 detected elevated residual soil contamination at the site. Additional assessment is feasible and warranted.

- *Inadequate Source Control – Feasible Source Control Not Performed.* Elevated concentrations of petroleum hydrocarbons were detected in borings and UST compliance soil samples. Groundwater recovery and vapor extraction systems were operated at the site. Verification sampling conducted in 2009 detected elevated residual soil contamination at the site. Additional remediation (source removal) appears necessary and is feasible.

Based on the work done to date, it is believed that the assessment of the Site should be considered adequate with sufficient characterization already performed to recognize the low risk nature of this case. Additional remediation (source removal) of a limited area of elevated residual soil contamination under the influence of groundwater is unnecessary for the minimal to absent benefit that would affect this low risk case.

2. ENVIRONMENTAL CONDITIONS

2.1 Extent of Groundwater Impact

During the February 8, 2011 groundwater monitoring/sampling event at the Site, no CoCs were detected in wells associated with the Site, with the exception of 1,2-DCA in wells A-2 (0.96 µg/L) and AR-1 (1.2 µg/L). TPH-G/GRO has not been detected at the Site since 1994. BTEX have not been detected at the Site since 1995. MTBE has been detected at the Site just once with 22 µg/L in a sample from well A-1 on July 17, 2006. Similarly, TAME has been detected at the Site just once with 3.3 µg/L in the same sample from well A-1 on July 17, 2006. MTBE was not detected before (TAME was not analyzed for prior to 2006), nor have MTBE or TAME been detected during the follow-up last two sampling events. Therefore it is believed that the reported MTBE and TAME concentrations for July 2006 were aberrations. A groundwater

analytical summary map from the First Quarter 2011 monitoring/sampling event is provided as Drawing 2. A summary of historic groundwater concentration results are provided in Appendix A.

2.2 Extent of Soil Impact

Soil investigations and excavations have been performed around the former waste oil tank and former UST complex on the southeast side of the Station Building, under the former product pipelines on the northeast and northwest sides of the Station Building, and under the dispensers and present product pipelines runs back to the current UST complex on the western side of the Station Building. In 1987, the former 550-gallon waste oil UST was removed on the southeast side of the Station Building. After finding petroleum hydrocarbon contamination in the motor oil range, approximately 14 cubic yards of soil was removed and transported offsite for disposal/treatment. Subsequent sampling found no TPH-MO above the laboratory reporting limit.

In mid to late 1990, the former USTs on the southeast side of the Station Building, and the product piping runs along the north side of the Station Building were removed when the current UST complex was installed directly southwest of the dispenser islands. The former UST complex was initially excavated out to an area approximately 23 ft by 77 ft by 12 ft deep, but subsequently expanded out to an area approximately 27 ft by 81 ft. Soil samples were collected on the sidewalls of the excavation at 6 ft and 10 or 12 ft bgs. On the southwest sidewall in an area of the excavation that could not readily be expanded, confirmation sidewall sample AX1-3-12 reported concentrations of TPH-G and BTEX of 23,000 mg/kg, 150 mg/kg, 490 mg/kg, 940 mg/kg and 2,700 mg/kg, respectively. Sample AX1-7*-10, collected on the northwest sidewall of the excavation at 10 ft bgs, contained TPH-G and BTEX of 9,400 mg/kg, 96 mg/kg, 570 mg/kg, 200 mg/kg, and 1,200 mg/kg, respectively. Sample AT-36, collected at 3 ft bgs under the former pipeline run across the northern portion of the Site contained TPH-G and BTEX at 15,000 mg/kg, 71 mg/kg, 710 mg/kg, 200 mg/kg, and 1,300 mg/kg, respectively. A total of approximately 1,950 cubic yards of soil was excavated from the Site during the 1990 UST and pipeline removal/replacement project.

In 2001, additional soil sampling and excavation was performed during product line and dispenser removal and upgrade activities. Soil samples were collected beneath the dispensers during the upgrades, and along the product line trenches at depths ranging from 3.6 to 4.8 ft bgs. After excavating approximately seven cubic yards in the area of sample PL-3, a confirmation soil sample was collected at approximately nine ft bgs containing just 0.075 mg/kg Toluene, 0.072 mg/kg Ethylbenzene, 0.45 mg/kg Total Xylenes and 11 mg/kg MTBE (No TPH-G or Benzene was detected above the reporting limits). In sample UST-1 near sample PL-3, TPH-G, BTEX, and MTBE concentrations were 1,400 mg/kg, 2.4 mg/kg, 31 mg/kg, 17 mg/kg, 110 mg/kg, and 11 mg/kg, respectively, however no over-excavation could occur in close proximity to the active USTs. A total of approximately 9.8 cubic yards of soil was excavated and removed from the Site during the 2001 product line and dispenser upgrades.

During the period of January 1993 to August 1995, the SVE system operating onsite removed an estimated total of 334.6 pounds (~54.9 gallons) of TPPH-G from the soil. Until 2009, no confirmation soil samples had been collected to check the degree of residual soil contamination remediation. In 2009, BAI had three soil borings advanced around the outside of the former UST excavation on the southeast side of the Station Building. The objective was to check the degree of residual soil contamination following SVE system remediation. Boring B-8 was advanced between the southeast side of the Station Building and the northwest excavation sidewall, near the locations of former sidewall samples AX1-2*-10 and AX1-7*-10 that contained up to 9,400 mg/kg TPH-G and 96 mg/kg, 570 mg/kg, 200 mg/kg, and 1,200 mg/kg BTEX, respectively. Soil samples from boring B-8 collected at five ft bgs and eight ft bgs contained no detectable petroleum hydrocarbon constituents with the exception of trace Total Xylenes at eight ft (0.0015 mg/kg). Wet soil samples collected at 11 ft bgs, contained 2,000 mg/kg TPH-G, and 0.23 mg/kg, 14 mg/kg, 18 mg/kg, and 210 mg/kg BTEX, respectively. These wet soil samples were presumed to be under the influence of a fluctuating groundwater table and thought less representative of the true vadose zone condition.

3. TECHNICAL JUSTIFICATION FOR NO FURTHER ACTION

Over-excavation activities performed to date have reportedly removed approximately 1,974 cubic yards of impacted soil from the Site. In addition, operation of the SVE system between 1993 and 1995 removed an estimated 335.3 pounds of total hydrocarbons from the subsurface (TPPH-G and Benzene). Furthermore, operation of the GWET system between 1993 and 1995 removed an additional 0.94 pounds of total hydrocarbons (TPPH-G and Benzene). The SVE and GWET systems were both shutdown in August 1995 reportedly due to low influent concentrations after removing an estimated combined total hydrocarbons sum of 336 pounds (TPPH-G and Benzene).

Because groundwater is relatively shallow and the soil impacts limited in extent and magnitude, we can infer that the contaminant mass in soil above the groundwater table is not appreciable, and the potential for further leaching is limited. The lack of meaningful rebound in post-remediation groundwater contaminant concentrations attests to the success of the SVE operations.

Vapor intrusion into the Station Building is not thought to be a viable exposure pathway of concern for the conditions present at this Site. As evidenced by boring B-8 at this Site, there is approximately 8-10 feet of essentially clean/non-impacted soil in the vadose zone under the Station Building. Numerous studies have indicated that significant bio-attenuation of vapors occurs and the vapor intrusion to the indoor air pathway is not likely to be complete for petroleum vapors if there are at least five feet of clean coarse-grained soil or two feet of fine-grained soil overlying the contaminant source (R. Davis 2005 & 2006, G.B. Davis et al 2009, McHugh et al 2010). Current draft guidance indicates there is no need to assess the vapor intrusion pathway with low concentrations of dissolved petroleum hydrocarbons in groundwater (i.e. Benzene less than 1 mg/L and GRO less than 10 mg/L) and greater than five feet separation between a contaminant source and building. According to SWRCB draft guidance, there have been no published examples of petroleum vapor intrusion for this condition and that modeling studies indicate bio-attenuation will limit the potential for vapor intrusion (SWRCB, 2010).

Constituents of Concern have been adequately delineated to concentrations below laboratory reporting limits in wells down-gradient of the Site. It is believed that the adverse effect of Site contaminants on shallow groundwater will be minimal and localized, and there will be no adverse effect on the groundwater contained in deeper aquifers, given the physical and chemical characteristics of petroleum constituents, the hydrogeological characteristics of the groundwater and direction of groundwater flow.

Numerous studies of the fate and transport of petroleum hydrocarbons and fuel oxygenates have been performed, including the Lawrence Livermore Reports (Lawrence Livermore National Laboratories, 1995 & 1998) and the 2004 Los Angeles Area Petroleum Hydrocarbon and Fuel Oxygenate Study (Shih et al, 2004). These studies indicate that unabated, petroleum hydrocarbon and MTBE groundwater plumes reach a maximum length before the processes of natural attenuation, diffusion, advection, and dispersion reduce the concentration to Water Quality Objectives or levels adequately protective of human health. The 1995 and 1998 Lawrence Livermore Reports indicate that the lateral dimensions of most (non-MTBE) LUFT sites do not exceed more than a few hundred feet, and that in 90% of cases, the Benzene concentration had decreased to below 1 mg/L within 400 feet of the source area. The 2004 Los Angeles Study indicated that the longest MTBE plume length observed (5 µg/L) was approximately 1,040 feet, and that 90% of MTBE cases resulted in a plume length of 540 feet or less.

Additionally, according to a study by the California Leaking Underground Fuel Tank Task Force conducted in 2009 (Chinn, 2009), it is recognized that domestic drinking water wells are not commonly being installed in urban areas already served by municipal drinking water sources. Typically municipal wells are installed at a greater depth and with a more robust sanitary seal. This implies that in areas already serviced by municipal sources, groundwater in shallow water bearing zones is not likely to be used for drinking water purposes except in the immediate vicinity of any already existing wells. Releases from petroleum USTs typically only impact the shallowest water bearing zones and therefore should not be prevented from case

closure unless it can be reasonably expected that Water Quality Objectives will not be met prior to impacting existing or potential future wells.

Because the Site is located in an area already serviced by public water supply system, it is not reasonably expected that new drinking water wells will be installed in the vicinity of the Site. If a municipal well were to be installed, it is unlikely to draw from shallow groundwater, and the well's sanitary seal would protect against the incursion of contaminants into the well.

If further investigation and remediation are not warranted at the Site, then long-term groundwater monitoring serves no beneficial purpose.

4. QUALIFICATION AS LOW RISK CASE

SWRCB Resolution 68-16 (*Statement of Policy with Respect to Maintaining High Quality of Waters in California*), Resolution 88-63 (*Sources of Drinking Water*), and Resolution 92-49 (*Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304*) require the cleanup of unauthorized releases to background concentrations or the highest water quality protective of the designated beneficial uses. Nevertheless, it is believed that the environmental case at the subject Site should be granted No Further Action status at this time for numerous technical and regulatory reasons. These reasons are outlined in the following sections.

4.1 Qualification as a Low-Risk Environmental Case

On December 8, 1995, Mr. Walt Pettit, SWRCB Executive Director, issued an advisory to the Regional Water Quality Control Boards indicating that oversight agencies should proceed aggressively to close low risk cases. *Supplemental Instructions to State Water Board December 8, 1995, Interim Guidance on Required Cleanup at Low Risk Fuel Sites*, prepared by SFRWQCB on January 5, 1996 defined and explained low-risk criteria for environmental UST cases. These low-risk criteria are presented below, with justification why each criteria element is satisfied:

1) The leak has been stopped and ongoing sources, including free product, removed or remediated to the extent practicable

The cause of the original release has been repaired, and the USTs, fuel dispensers, and piping have been subsequently replaced and/or upgraded. Free phase product has not been reported at the Site. There is no evidence of an ongoing release. As such, this criterion is satisfied.

2) The Site has been adequately characterized

For this environmental case, the lateral extent of CoCs in groundwater is delineated cross-gradient and down-gradient by the existing monitoring well network. Constituents of concern have been delineated to concentrations at or below Water Quality Objectives in downgradient wells A-1, A-5, and AR-2. Based on Site reports it appears that the bulk of petroleum hydrocarbon impacts to soil reported in the vicinity of the USTs, dispenser islands, and product piping were removed by over-excavation and SVE. Boring B-8 exhibited the presence of 8-10 feet of essentially clean/non-impacted vadose zone soil above the groundwater table in the area of the former UST excavation on the backside of the Station Building. Under these circumstances, it is not necessary to perform a Vapor Intrusion Assessment as there is no functional vapor intrusion pathway to exposure via inhalation of indoor air based on numerous referenced studies and guidance concerning bioattenuation of petroleum hydrocarbon concentrations through the vadose zone.

3) The dissolved hydrocarbon plume is not migrating

Since late 1995, petroleum hydrocarbons have not been detected in groundwater samples collected from wells associated with the Site. No TPH-G/GRO or BTEX have been detected in groundwater samples from the Site. No MTBE has been detected either, with the curious exception of a sample collected from well A-1 on July 17, 2006 which reportedly contained 22 µg/L. Similarly, another oxygenate TAME has been detected at the Site just once with 3.3 µg/L in the same sample from well A-1 on July 17, 2006. MTBE was not detected before (TAME was not analyzed for prior to 2006), nor have MTBE or TAME been detected during the follow-up last two sampling events. Therefore it is believed that the reported MTBE and TAME concentrations for July 2006 were aberrations. The lead scavenger 1,2-DCA has been reliably detected at low concentrations since 2006 in well A-2 (1.2 µg/L on 7/17/2006, 0.72 µg/L on 9/10/2010, 0.96 µg/L on 2/8/2011) and in well AR-1 (1.2 µg/L on 9/10/2010 and 1.2 µg/L on 2/8/2011). The fact that 1,2-DCA (phased out with leaded gasoline in the 1980's) has not been detected in the downgradient wells A-1, AR-2 and A-5 attests to the fact that the 'hydrocarbon plume' is not migrating.

4) No water wells, deeper drinking water aquifers, surface water, or other sensitive receptors are likely to be impacted

There are no potable water supply wells known to exist within 0.5 miles of the Site. According to well logs provided by the DWR, eleven irrigation supply wells and one cathodic protection well are located within 0.5 miles of the Site. Of the eleven irrigation water supply wells, just six are located in the downgradient direction (i.e. northeast quadrant). The closest irrigation water supply well, located approximately 0.25 miles to the northwest, has a protective double casing from the surface down to 135 ft of its total 525 ft depth. Deeper drinking water aquifers, surface waters, or other sensitive receptors are unlikely to be impacted by the past release at the Site.

5) The Site presents no significant risk to human health

The absence of GRO, Benzene, Toluene, Ethylbenzene, and trace concentration of Total Xylenes in shallow vadose zone soils collected from boring B-8 indicates the potential for vapor intrusion into the Station Building is extremely unlikely. No water supply wells are likely to be impacted now or in the foreseeable future. Therefore, it is believed that the Site presents no significant risk to human health and that no further investigation is warranted.

6) The Site presents no significant risk to the environment

The closest down-gradient surface water body appears to the unnamed lagoon impoundment located approximately 2,600 ft to the west-southwest. Due to the distance of this water body from the Site, it is not reasonably anticipated that groundwater from beneath the Site would affect this receptor.

4.2 Qualification as Low-Risk Case Based on Groundwater Concentration

On May 19, 2009 the SWRCB formed the UST Cleanup Program Task Force under Resolution 2009-0042. The task force was directed to make recommendations to improve the UST cleanup regulatory program, including additional approaches to risk-based cleanup. The Task Force Final Report (January 13, 2010) included a recommendation that cases be considered for low-risk closure if the concentration of petroleum hydrocarbons and fuel oxygenates in groundwater are below the following levels:

- 10 mg/L for TPH-G and TPH-Diesel;
- 1 mg/L for each of the individual petroleum constituents;
- 0.5 mg/L for each of the individual oxygenates.

It is understood that while these criteria cannot be uniformly applied to all sites, in "the vast majority of cases," unless an existing water well or surface water body is located within 1,000 feet of the source area in the down-gradient direction, cases that exhibit concentrations similar to those established above should be considered strong candidates for low-risk closure. It is also noted that "[i]n cases where the TPH concentration is high, but MTBE and Benzene concentrations are low or not present above laboratory detection limits, the case should be considered to be low-risk irrespective of the TPH concentration."

In the subject case, GRO, BTEX, MTBE and the other oxygenates are not detected above the laboratory reporting limits. The exception is the individual petroleum constituent 1,2-DCA (formerly used as a lead scavenger in leaded gasoline), which has been detected in recent samples from well A-2 (1.2 µg/L on 7/17/2006, 0.72 µg/L on 9/10/2010, and 0.96 µg/L on 2/8/2011) and well AR-1 (1.2 µg/L on 9/10/2010 and 1.2 µg/L on 2/8/2011). However, these concentrations are several orders of magnitude below the criteria threshold listed above of 1.0 mg/L (1,000 µg/L) for the individual petroleum constituents. Therefore, the Site case is considered to be a strong candidate for low-risk closure.

4.3 Achievement of Water Quality Objectives Being Met Before Resource Is Used

The SWRCB Resolution 68-16 resolves that any activity that produces a waste discharge will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that the highest water quality consistent with the maximum benefit to the people of the State will be maintained. SWRCB Resolution 88-63 resolves that virtually all water in California is designated as a drinking water source. Water Code Section 13304 authorizes Regional Boards to require the complete cleanup of all waste discharged and the restoration of affected water to background conditions or the best water quality reasonable if background levels of water quality cannot be restored. SWRCB Resolution 92-49 sets forth the policies and procedures for the investigation and cleanup of discharges from leaking UST cases. Resolution 92-49 does not require, however, that the Water Quality Objectives be met at the time of site closure. Even if the requisite level of water quality has not yet been attained, a site may be closed if the level will be attained within a reasonable time frame. SWRCB Water Quality Order 98-04 (Matthew Walker) explicitly interprets a "reasonable time frame" as "anywhere from a couple of decades to hundreds of years." The Matthew Walker petition further states "…[I]f complete removal of detectable traces of petroleum hydrocarbon constituents become the standard for UST corrective actions, the statewide technical and economic implications will be enormous."

The SWRCB Resolution 2009-042 states that "[i]t is the responsibility of Regional Water Boards, LOP agencies, and other local agencies to close UST cases that are ready for closure." This resolution further states "[i]n previous decisions, the State Water Board, when determining a reasonable period, has considered all relevant factors including, but not limited to, existing and anticipated beneficial uses of water." Resolution 2009-081 further clarifies this issue by stating that "[i]n the orders issued by the State Water Board regarding UST case closure, several factors relevant to the particular UST case were considered, such as: (1) whether remaining petroleum constituents would migrate beyond the limited spatial extent, (2) the presence and location of drinking water wells in the area, (3) the likelihood that the impacted groundwater will be used as a source of drinking water in the reasonably foreseeable future, and (4) the protective nature of standard well-construction practices."

The SWRCB Resolution 2009-042 makes it clear that the decisional framework used in previous UST closure orders interpreted a "reasonable time frame" to be the amount of time before the resource is actually used, based on *existing* or *anticipated* beneficial use. SWRCB Resolution 2009-081 clarifies that the decisional framework in UST closure orders contemplate whether the impacted groundwater will be used as a source of *drinking water* in the *foreseeable future*. These Resolutions indicate that closure policy based on "potential beneficial use" or "possible future beneficial use" is inappropriate. These Resolutions indicate that the decisional framework previously used by SWRCB when considering UST closure is based on "existing" beneficial use, or "anticipated beneficial use within the foreseeable future." SWRCB Resolution 2009-081

resolves that "[w]hen considering whether a UST cleanup case should be closed, Agencies shall apply the decisional framework established in previous State Water Board UST closure orders."

The individual petroleum constituent 1,2-DCA was formerly used as a lead scavenger in leaded gasoline until being phased out in the late 1980's. The chemical has been recognized by the US EPA as particularly persistent in certain groundwater environments (EPA, 2008). Simple physical weathering of 1,2-DCA from residual gasoline is a slow process that may require decades or more to reduce high concentrations of 1,2-DCA to its MCL. Although 1,2-DCA can be rapidly degraded if oxygen is available, natural anaerobic biodegradation can provide substantial reductions in the concentration of 1,2-DCA over time. Generally, retardation due to sorption on native organic carbon is not an important process contributing to natural attenuation of 1,2-DCA in groundwater. The rate of neutral hydrolysis for 1,2-DCA is slow, with a half life of 300 years at 15°C. However, abiotic transformation caused by reaction with Iron (II) Sulfide can provide substantial reductions in the concentration of 1,2-DCA. Although the rates of biodegradation and natural attenuation of are slow, 1,2-DCA does degrade occur over time.

Although 1,2-DCA has been detected in groundwater from on-site wells A-2 and AR-1 at concentrations slightly above the 0.5 µg/L Water Quality Objective (Primary MCL), its occurrence has been at consistently low concentrations (maximum of 1.2 µg/L) and highly localized within the center of the Site. Furthermore, it has not been detected in the downgradient wells AR-2 and A-5. The one time it was detected in downgradient well A-1 on 7/17/2006 was along with the previously described anomalous detections of TAME and MTBE: It has not been recorded in well A-1 in two follow-up rounds of groundwater monitoring.

The onsite occurrence of these low concentrations of 1,2-DCA lie within the case closure decision factors described in SWRCB Resolution 2009-0081, specifically the plume is of limited spatial extent, there are no drinking water wells in the area, it is unlikely that the impacted groundwater under the Site will be used as drinking water in the reasonably foreseeable future, and well construction standards will protect by design existing and/or future water supply wells. As such, it is believed that Water Quality Objectives will be reached within a 'reasonable time frame' without the need for active remediation, and the case closure should be considered a strong candidate for low-risk closure.

5. BENEFIT OF ADDITIONAL WORK

While the concentration of the single current CoC (1,2-DCA) is currently above the Water Quality Objective, the concentration is significantly low and the impact is limited in extent. The lateral extent of this CoC in groundwater has been adequately delineated for the purposes of low-risk closure. The plume appears to be stable and is not expected to migrate. No potable water supply wells are known to exist within 0.5 miles of the Site. The nearest irrigation water supply well, located approximately 0.25 miles to the northwest, is protected by a double casing from the surface down to 135 ft of its total 525 ft, and consequently not likely to be at risk from shallow groundwater contamination. Based on the available Site data, the contaminant plume does not appear to represent a significant threat to existing or reasonably anticipated beneficial uses in the foreseeable future. The potential for vapor intrusion and exposure to Station Building occupants is considered highly unlikely and current guidance recommends against the necessity of vapor intrusion assessment for the situational conditions present at the Site. The Site appears to be adequately characterized and no further investigation appears to be warranted to evaluate potential impacts to human health or environmental receptors.

Since the SVE and GWET remediation systems reached the point of diminishing returns, if Atlantic Richfield Company were to pursue active remediation of the 1,2-DCA contaminant plume at the Site, the most likely remedial approach would be the implementation of enhanced anaerobic biodegradation or abiotic biodegradation using a reaction with Iron(II) Sulfide minerals. This type of system would require the installation of remediation system infrastructure, equipment, and ongoing operations and maintenance for perhaps an extended period of time before concentrations would be below laboratory reporting limits. While pursuing the installation and operation of such a system would be a significant cost, it is not expected that

installation and operation of such a system would confer appreciable benefit to human health or the environmental receptors. As noted in Water Quality Order 98-04, "[i]f the complete removal of detectable traces of petroleum hydrocarbon constituents becomes the standard for UST corrective actions, the statewide technical and economic implications will be enormous." As such, it appears that the Site-specific benefit of additional work, if any, is dwarfed by the cost and statewide implications for corrective action.

6. CLOSURE RECOMMENDATION

This Request for No Further Action presents a summary of the current environmental status of the Site, as well as rationale justifying case closure both from technical and regulatory perspectives. In addition to the technical and regulatory justification, there are strong economic reasons for closing the case. Maintaining a backlog of open low-risk environmental cases diverts available funding from cases with significantly greater threat to human health and the environment. By closing low-risk environmental cases, the available funding for the investigation and remediation of environmental cases with significantly greater threat to human health and the environment can be increased, which will, in turn accelerate the cleanup of UST cases within Alameda County and statewide.

Further investigation of the Site is not necessary to ensure that human health and the environment are protected since the plume already appears to be stable and that Water Quality Objectives will be met within a reasonable time frame. Active remediation of the existing contaminants cannot be justified from a technical or economic perspective since the constituent of concern 1,2-DCA has been documented to degrade naturally to the Water Quality Objective within a reasonable time frame. If further investigation and remediation are not warranted at the Site, then long term groundwater monitoring serves no beneficial purpose. It is recommended that Atlantic Richfield Company formally request that No Further Action status be granted at this time for ACEH Environmental Case #RO0000044 at 1260 Park Street, Alameda.

7. LIMITATIONS

The findings presented in this report are based upon observations of field personnel, points investigated, results of laboratory tests performed by various laboratories, and our understanding of SWRCB, RWQCB and ACEH requirements. Our services were performed in accordance with the generally accepted standard of practice at the time this report was written. No other warranty, expressed or implied was made. This report has been prepared for the exclusive use of the Atlantic Richfield Company. It is possible that variations in soil or groundwater conditions could exist beyond points explored in this investigation. Also, changes in site conditions could occur in the future due to variations in rainfall, temperature, regional water usage, or other factors.

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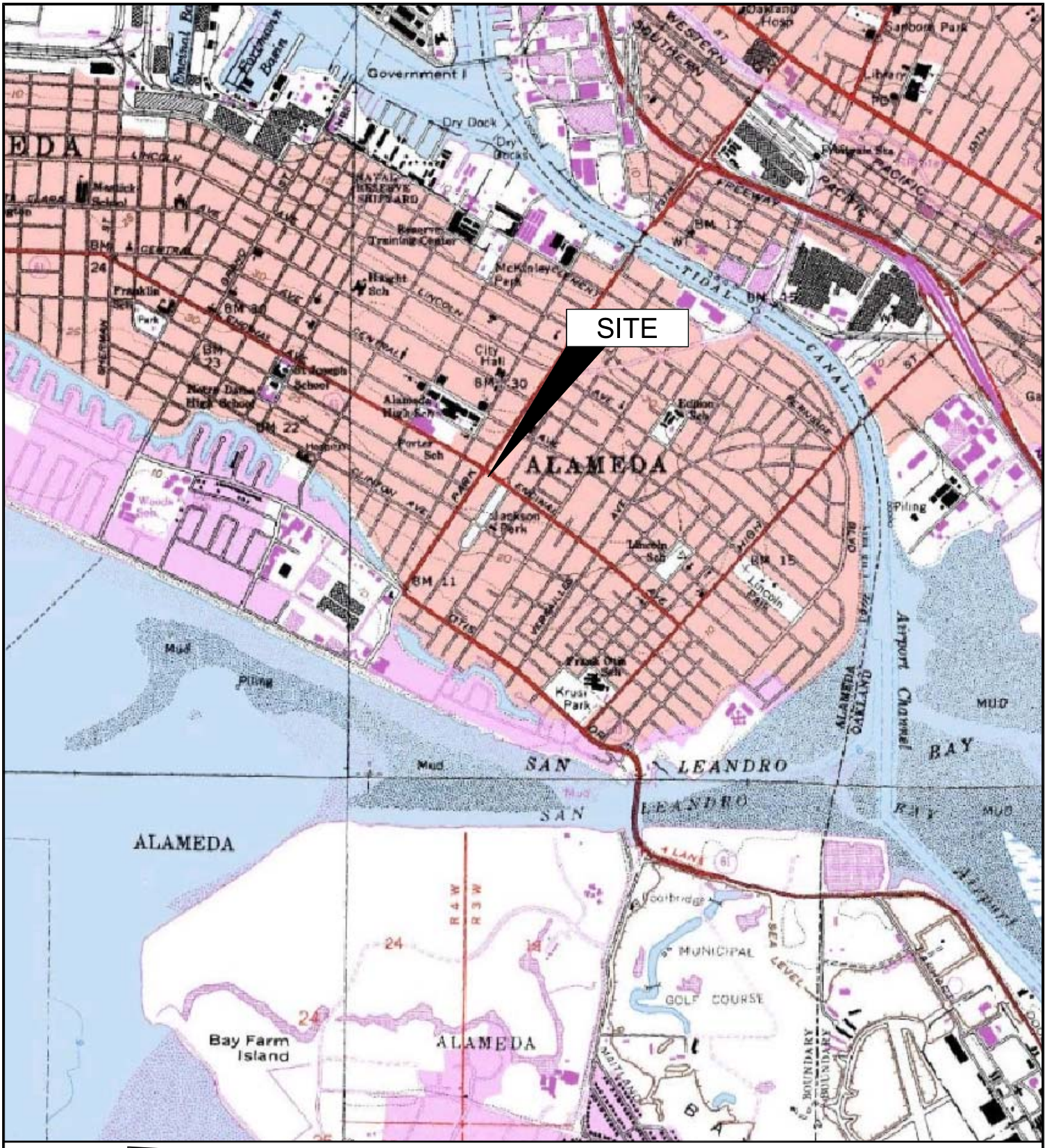


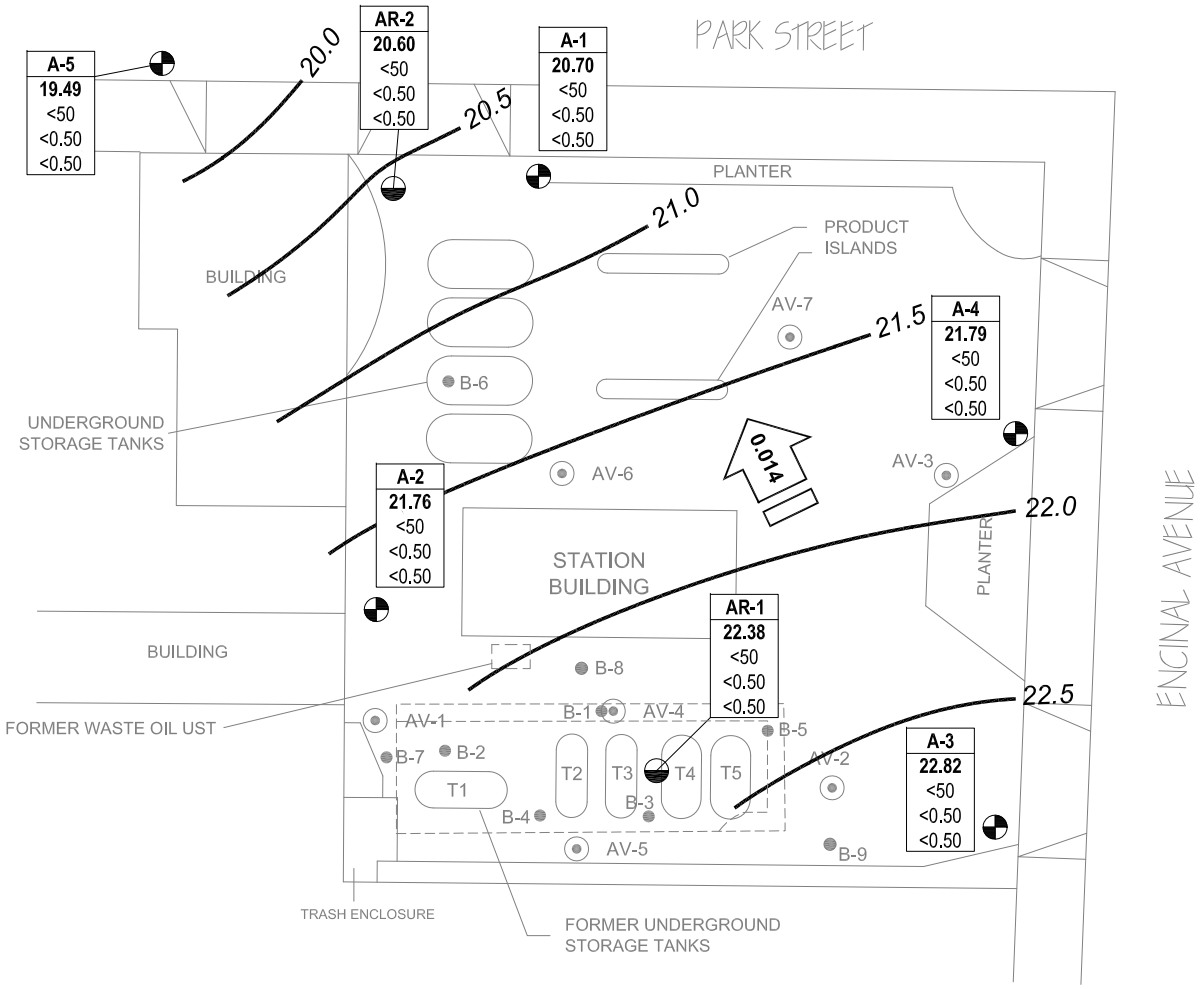
IMAGE SOURCE: USGS

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
1324 Mangrove Ave. Suite 212, Chico, CA 95926
Project No.: 06-88-616 Date: 07/27/09

Station #2112
1260 Park Street
Alameda, California

Site Location Map

Drawing
1



LEGEND:

- A-1 — MONITORING WELL LOCATION
- AR-1 — GROUNDWATER EXTRACTION WELL LOCATION
- AV-1 — VAPOR EXTRACTION WELL LOCATION
- B-9 — SOIL BORING LOCATION
- 20.50 — GROUNDWATER ELEVATION CONTOURS (FT)
- 0.014 — GROUNDWATER FLOW DIRECTION AND GRADIENT (FT/FT)
- Well — WELL DESIGNATION
- ELEV — GROUNDWATER ELEVATION (FT)
- GRO / Benzene / MTBE — GRO, BENZENE AND MTBE CONCENTRATIONS IN GROUNDWATER (µg/L)
- NM/MS — NOT MEASURED/NOT SAMPLED
- < — NOT DETECTED AT OR ABOVE LABORATORY REPORTING LIMITS

NOTE: SITE MAP ADAPTED FROM URS FIGURES. SITE DIMENSIONS AND FACILITY LOCATIONS NOT VERIFIED.

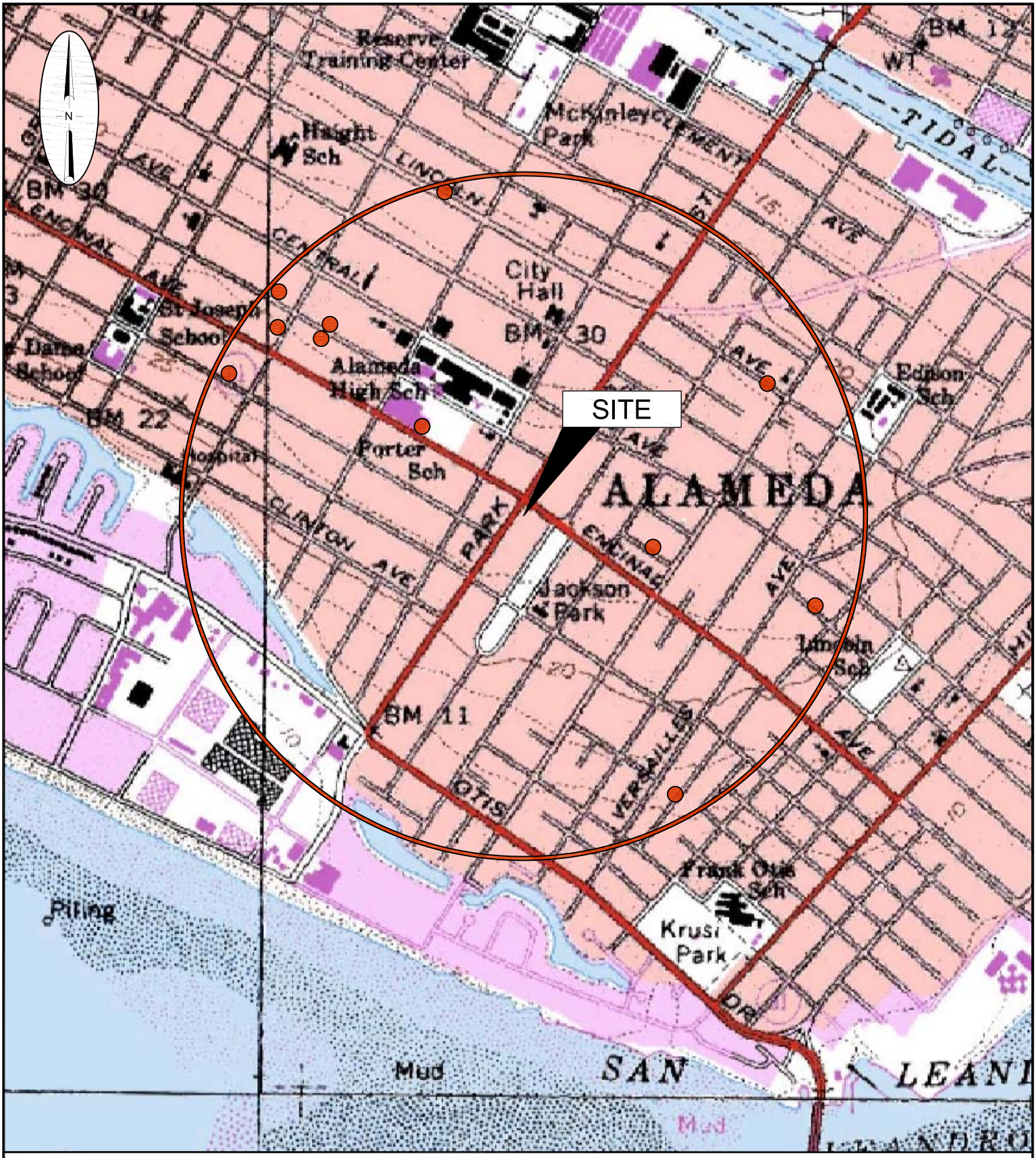
0 40 80
SCALE (ft)

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
1324 Mangrove Ave. Suite 212, Chico, California 95926
Project No.: 06-88-616 Date: 4/12/2011

Station #2112
1260 Park Street
Alameda, California

Groundwater Elevation Contours and Analytical Summary Map
8 February 2011

Drawing
2



LEGEND

- Approximate Irrigation Supply Well Location
- Half-Mile Radius

0 1,000 2,000

SCALE (ft)

BROADBENT & ASSOCIATES, INC.
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Project No.: 06-88-616 Date: 5/18/2011

Station #2112
1260 Park Street
Alameda, California

Water Supply Wells Within Half-Mile Radius

Drawing 3

APPENDIX A

HISTORIC GROUNDWATER ELEVATION AND ANALYTICAL DATA

Table A-1
Historical Groundwater Elevation Data

ARCO Service Station 2112
1260 Park Street at Encinal Avenue
Alameda, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Water (feet, TOB)	Groundwater Elevation (feet, MSL)
A-1	10/07/91	28.39	16.47	11.92
	02/18/92		17.16	11.23
	05/22/92		17.14	11.25
	08/14/92		16.63	11.76
	10/23/92		16.28	12.11
	01/28/93		17.34	11.05
	02/24/93		18.43	9.96
	04/28/93		17.71	10.68
	05/28/93		17.18	11.21
	06/16/93		16.63	11.76
	07/27/93		16.60	11.79
	08/24/93		16.44	11.95
	09/28/93		16.66	11.73
	10/22/93		16.67	11.72
	11/16/93		16.56	11.83
	12/16/93		16.96	11.43
	02/07/94		17.62	10.77
	05/02/94		17.17	11.22
	08/05/94		11.40	16.99
	11/30/94		9.43	18.96
	02/22/95		10.76	17.63
	05/23/95		9.25	19.14
	08/09/95		11.33	17.06
	11/16/95		12.11	16.28
A-2	10/07/91	29.28	12.74	16.54
	02/18/92		11.55	17.73
	05/22/92		11.71	17.57
	08/14/92		12.54	16.74
	10/23/92		12.64	16.64
	01/28/93		10.29	18.99
	02/24/93		11.05	18.23
	04/28/93		10.91	18.37
	05/28/93		11.27	18.01
	06/16/93		12.20	17.08
	07/27/93		11.27	18.01
	08/24/93		12.25	17.03
	09/28/93		12.36	16.92
	10/22/93		12.18	17.10
	11/16/93		12.34	16.94
	12/16/93		11.74	17.54
	02/07/94		10.56	18.72
	05/02/94		11.48	17.80
	08/05/94		12.26	17.02
	11/30/94		10.93	18.35
	02/22/95		10.55	18.73
	05/23/95		11.05	18.23
	08/09/95		11.70	17.58
	11/16/95		12.64	16.64
A-3	10/07/91	27.87	10.55	17.32
	02/18/92		9.12	18.75
	05/22/92		9.41	18.46
	08/14/92		10.31	17.56
	10/23/92		10.57	17.30
	01/28/93		7.66	20.21
	02/24/93		8.28	19.59
	04/28/93		6.76	21.11

Table A-1 (continued)
Historical Groundwater Elevation Data

ARCO Service Station 2112
1260 Park Street at Encinal Avenue
Alameda, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Water (feet, TOB)	Groundwater Elevation (feet, MSL)
A-3	05/28/93		8.98	18.89
(cont.)	06/16/93		9.69	18.18
	07/27/93		9.66	18.21
	08/24/93		9.85	18.02
	09/28/93		10.21	17.66
	10/22/93		10.05	17.82
	11/16/93		11.20	16.67
	11/16/93		9.42	18.45
	02/07/94		8.29	19.58
	05/02/94		9.08	18.79
	08/05/94		10.02	17.85
	11/30/94		8.53	19.34
	02/22/95		7.90	19.97
	05/23/95		8.60	19.27
	08/09/95		9.30	18.57
	11/16/95		NM	--
A-4	10/07/91	28.54	11.40	17.14
	02/18/92		10.52	18.02
	05/22/92		10.45	18.09
	08/14/92		11.22	17.32
	10/23/92		11.44	17.10
	01/28/93		9.12	19.42
	02/24/93		9.91	18.63
	04/28/93		8.29	20.25
	05/28/93		9.92	18.62
	06/16/93		10.64	17.90
	07/27/93		10.81	17.73
	08/24/93		10.98	17.56
	09/28/93		11.08	17.46
	10/22/93		11.06	17.48
	11/16/93		10.27	18.27
	12/16/93		10.64	17.90
	02/07/94		9.42	19.12
	05/02/94		10.33	18.21
	08/05/94		10.94	17.60
	11/30/94		9.89	18.65
	02/22/95		9.44	19.10
	05/23/95		9.80	18.74
	08/09/95		10.39	18.15
	11/16/95		NM	--
A-5	06/26/92	27.29	10.77	16.52
	08/14/92		11.04	16.25
	10/23/92		11.12	16.17
	01/28/93		9.94	17.35
	02/24/93		10.63	16.66
	04/28/93		10.70	16.59
	05/28/93		10.35	16.94
	06/16/93		10.76	16.53
	07/27/93		10.78	16.51
	08/24/93		10.97	16.32
	09/28/93		10.90	16.39
	10/22/93		10.82	16.47
	11/16/93		10.98	16.31
	12/16/93		10.70	16.59
	02/07/94		9.96	17.33
	05/02/94		10.59	16.70

Table A-1 (continued)
Historical Groundwater Elevation Data

ARCO Service Station 2112
1260 Park Street at Encinal Avenue
Alameda, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Water (feet, TOB)	Groundwater Elevation (feet, MSL)
A-5 (cont.)	08/05/94		10.91	16.38
	11/30/94		10.69	16.60
	02/22/95		10.71	16.58
	05/23/95		10.75	18.33
	08/09/95		10.78	18.30
	11/16/95		11.33	15.96
AR-1	10/07/91	29.08	12.09	16.99
	02/18/92		11.11	17.97
	05/22/92		10.10	18.98
	08/14/92		11.86	17.22
	10/23/92		12.12	16.96
	01/28/93		9.85	19.23
	02/24/93		14.80	14.28
	04/28/93		9.74	19.34
	05/28/93		13.52	15.56
	06/16/93		15.12	13.96
	06/27/93		13.48	15.60
	08/24/93		13.52	15.56
	09/28/93		13.90	15.18
	10/22/93		13.19	15.89
	11/16/93		12.72	16.36
	12/16/93		12.13	16.95
	02/07/94		10.03	19.05
	05/02/94		10.82	18.26
	08/05/94		12.63	16.45
	11/30/94		10.23	18.85
	02/22/95		9.90	19.18
	05/23/95		10.40	18.68
	08/09/95		11.00	18.08
	11/16/95		11.94	17.14
AR-2	06/26/92	28.20	11.54	16.66
	08/14/92		11.76	16.44
	10/23/92		11.85	16.35
	01/28/93		19.70	8.50
	02/24/93		19.58	8.62
	04/28/93		12.27	15.93
	05/28/93		14.93	13.27
	06/16/93		16.45	11.75
	07/27/93		11.65	16.55
	08/24/93		17.02	11.18
	09/28/93		11.65	16.55
	10/22/93		10.61	17.59
	11/16/93		11.63	16.57
	12/16/93		14.33	13.87
	02/07/94		10.51	17.69
	05/02/94		11.16	17.04
	05/03/94		12.03	16.17
	08/05/94		11.59	16.61
	11/30/94		9.56	18.64
	02/22/95		10.60	17.60
	05/23/95		10.95	17.25
	08/09/95		11.84	16.36
	11/16/95		11.30	16.90

MSL = Mean sea level
TOB = Top of box
NM = Not measured

Table A-2
Historical Groundwater Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline and BTEX Compounds)

ARCO Service Station 2112
1260 Park Street at Encinal Avenue
Alameda, California

Well Number	Date Sampled	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
A-1	10/07/91	470	48	34	7.5	82
	02/18/92	<30	5.4	0.82	<0.3	<0.3
	05/22/92	38	15	0.92	1.3	0.51
	08/14/92	<50	14	<0.5	1.5	<0.5
	10/23/92	66	22	4.6	2	4.3
	01/28/93	750	120	120	16	96
	04/28/93	6,700	1,900	1,700	240	1,300
	08/24/93	1,600	230	88	34	160
	10/22/93	2,500	79	<10	<10	160
	02/07/94	61	24	<0.5	2.1	0.8
	05/02/94	58	17	0.7	2.2	4.2
	08/05/94	<50	5.1	1.4	0.6	2.5
	11/30/94	130	16	8.4	0.6	27
	02/22/95	<50	1.2	<0.50	<0.50	<0.50
	05/23/95	<50	4.9	0.95	0.61	3.9
	08/09/95	<50	2.3	<0.50	<0.50	0.53
	11/16/95	<50	3.3	1.5	<0.50	1.9
A-2	10/07/91	31	7.4	0.39	<0.3	0.93
	02/18/92	490	120	< 1.5	< 1.5	17
	05/22/92	100	2.4	<0.3	<0.3	0.89
	08/14/92	110	5	<0.5	<0.5	<0.5
	10/23/92	<50	<0.5	<0.5	<0.5	<0.5
	01/28/93	280	130	<2.5	<2.5	<2.5
	04/28/93	210	32	0.89	5.2	2.3
	08/24/93	<50	<0.5	<0.5	<0.5	<0.5
	10/22/93	<50	<0.5	<0.5	<0.5	<0.5
	02/07/94	<50	<0.5	<0.5	<0.5	<0.5
	05/02/94	<50	<0.5	<0.5	<0.5	<0.5
	08/05/94	<50	<0.5	<0.5	<0.5	<0.5
	11/30/94	<50	<0.5	<0.5	<0.5	<0.5
	02/22/95	<50	0.68	1.3	<0.50	0.52
	05/23/95	<50	<0.50	<0.50	<0.50	<0.50
	08/09/95	<50	<0.50	<0.50	<0.50	<0.50
	11/16/95	<50	<0.50	<0.50	<0.50	<0.50
A-3	10/07/91	<30	<0.3	<0.3	<0.3	<0.3
	02/18/92	<30	<0.3	<0.3	<0.3	<0.3
	05/22/92	<30	<0.3	<0.3	<0.3	<0.3
	08/14/92	<50	<0.5	<0.5	<0.5	<0.5
	10/23/92	<50	<0.5	<0.5	<0.5	<0.5
	01/28/93	<50	<0.5	<0.5	<0.5	<0.5
	04/28/93	<50	<0.5	<0.5	<0.5	<0.5
	08/24/93	<50	<0.5	<0.5	<0.5	<0.5
	10/22/93	<50	<0.5	<0.5	<0.5	<0.5
	02/07/94	<50	<0.5	<0.5	<0.5	<0.5
	05/02/94	<50	<0.5	<0.5	<0.5	<0.5
	08/05/94	<50	<0.5	<0.5	<0.5	<0.5
	11/30/94	<50	<0.5	<0.5	<0.5	<0.5
	02/22/95	<50	<0.50	<0.50	<0.50	<0.50
	05/23/95	<50	<0.50	<0.50	<0.50	<0.50
	08/09/95	<50	<0.50	<0.50	<0.50	<0.50
	11/16/95	----------Well Sampled Annually----------				

Table A-2 (continued)
Historical Groundwater Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline and BTEX Compounds)

ARCO Service Station 2112
1260 Park Street at Encinal Avenue
Alameda, California

Well Number	Date Sampled	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
A-4	10/07/91	<30	0.32	0.69	<0.3	1.1
	02/18/92	<30	<0.3	<0.3	<0.3	<0.3
	05/22/92	<30	<0.3	<0.3	<0.3	<0.3
	08/14/92	<50	<0.5	<0.5	<0.5	<0.5
	10/23/92	<50	<0.5	<0.5	<0.5	<0.5
	01/28/93	<50	<0.5	<0.5	<0.5	<0.5
	04/28/93	<50	<0.5	<0.5	<0.5	<0.5
	08/24/93	<50	<0.5	<0.5	<0.5	<0.5
	10/22/93	<50	<0.5	<0.5	<0.5	<0.5
	02/07/94	<50	<0.5	<0.5	<0.5	<0.5
	05/02/94	<50	<0.5	<0.5	<0.5	<0.5
	08/05/94	<50	<0.5	<0.5	<0.5	<0.5
	11/30/94	<50	<0.5	<0.5	<0.5	<0.5
	02/22/95	<50	<0.50	<0.50	<0.50	<0.50
	05/23/95	<50	<0.50	0.59	<0.50	<0.50
	08/09/95	<50	<0.50	<0.50	<0.50	<0.50
	11/16/95		----------Well Sampled Annually----------			
A-5	06/26/92	<50	<0.5	<0.5	<0.5	<0.5
	08/14/92	<50	<0.5	<0.5	<0.5	<0.5
	10/23/92	<50	<0.5	<0.5	<0.5	<0.5
	01/28/93	<50	<0.5	<0.5	<0.5	<0.5
	04/28/93	<50	<0.5	<0.5	<0.5	<0.5
	08/24/93	<50	<0.5	<0.5	<0.5	<0.5
	10/22/93	<50	<0.5	<0.5	<0.5	<0.5
	02/07/94	<50	<0.5	0.9	<0.5	0.7
	05/02/94	<50	<0.5	<0.5	<0.5	<0.5
	08/05/94	<50	<0.5	<0.5	<0.5	<0.5
	11/30/94	<50	<0.5	<0.5	<0.5	<0.5
	02/22/95	<50	<0.50	<0.50	<0.50	<0.50
	05/23/95	<50	<0.50	<0.50	<0.50	<0.50
	08/09/95	<50	<0.50	<0.50	<0.50	<0.50
	11/16/95	<50	<0.50	<0.50	<0.50	<0.50
AR-1	10/07/91	<30	<0.3	<0.3	<0.3	<0.3
	02/18/92	<30	<0.3	<0.3	<0.3	<0.3
	05/22/92	<30	<0.3	<0.3	<0.3	<0.3
	08/14/92	<50	<0.5	<0.5	<0.5	<0.5
	10/23/92	<50	<0.5	<0.5	<0.5	<0.5
	10/22/93	150	29	2.3	7.9	7.4
	02/07/94	<50	1.3	<0.5	1	<0.5
	05/02/94	120	24	<0.5	1.9	2.7
	08/05/94	980	200	<2.5 a	55	21
	11/30/94	60	7.7	<0.5	1.2	<0.5
	02/22/95	<50	<0.50	<0.50	<0.50	<0.50
	05/23/95	310	47	1.3	11	4.4
	08/09/95	<50	8.3	<0.50	0.97	<0.50
	11/16/95	<50	<0.50	<0.50	<0.50	<0.50
AR-2	06/26/92	<50	<0.5	<0.5	<0.5	<0.5
	08/14/92	<50	<0.5	<0.5	<0.5	<0.5
	10/23/92	110	0.15	0.27	<0.5	0.56
	02/07/94	<50	<0.5	<0.5	<0.5	<0.5
	05/02/94	<50	<0.5	<0.5	<0.5	<0.5
	08/05/94	<50	<0.5	<0.5	<0.5	<0.5
	11/30/94	<50	<0.5	<0.5	<0.5	<0.5

Table A-2 (continued)
Historical Groundwater Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline and BTEX Compounds)

ARCO Service Station 2112
1260 Park Street at Encinal Avenue
Alameda, California

Well Number	Date Sampled	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
AR-2 (cont.)	02/22/95	<50	<0.50	<0.50	<0.50	<0.50
	05/23/95	<50	4.2	<0.50	<0.50	<0.50
	08/09/95	<50	<0.50	<0.50	<0.50	<0.50
	11/16/95	<50	<0.50	<0.50	<0.50	<0.50

ppb = Parts per billion
a. Laboratory raised MRL due to high analyte concentration requiring sample dilution.
Prior to June 1995, TPPH as gasoline was reported as TPH as gasoline.

Table A-3
Historical Groundwater Analytical Data
Total Methyl t-Butyl Ether

ARCO Service Station 2112
1260 Park Street at Encinal Avenue
Alameda, California

Well Number	Date Sampled	Methyl t-Butyl Ether (ppb)
A-1	08/09/95	<2.5
A-2	08/09/95	<2.5
A-3	08/09/95	<2.5
A-4	08/09/95	<2.5
A-5	08/09/95	<2.5
A-6	08/09/95	<2.5
AR-1	08/09/95	<2.5
AR-2	08/09/95	<2.5

ppb = Parts per billion

Table 2
Groundwater Elevation and Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline, BTEX Compounds, and MtBE)

ARCO Service Station 2112
1260 Park Street at Encinal Avenue
Alameda, California

Well Number	Date Gauged/ Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOB)	Groundwater Elevation (feet, MSL)	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	MtBE (ppb)
A-1	01/15/96	28.39	11.18	17.21	<50	<0.50	<0.50	<0.50	<0.50	NA
	04/08/96		10.61	17.78	<50	<0.50	<0.50	<0.50	<0.50	NA
	07/02/96		11.28	17.11	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	10/01/96		11.70	16.69	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	04/08/97		10.98	17.41	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	06/14/97		11.35	17.04	<50	<0.50	<0.50	<0.50	<0.50	<2.5
A-2	01/15/96	29.28	11.17	18.11	<50	<0.50	<0.50	<0.50	<0.50	NA
	04/08/96		10.45	18.83	<50	<0.50	<0.50	<0.50	<0.50	NA
	07/02/96		11.40	17.88	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	10/01/96		12.10	17.18	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	04/08/97		11.05	18.23	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	06/14/97		11.65	17.63	<50	<0.50	<0.50	<0.50	<0.50	<2.5
A-3	01/15/96	27.87	8.66	19.21	---------- Well Sampled Annually ----------					
	04/08/96		7.86	20.01	---------- Well Sampled Annually ----------					
	07/02/96		9.03	18.84	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	10/01/96		9.88	17.99	---------- Well Sampled Annually ----------					
	04/08/97		8.55	19.32	---------- Well Sampled Annually ----------					
	06/14/97		9.43	18.44	---------- Well Sampled Annually ----------					
A-4	01/15/96	28.54	10.00	18.54	---------- Well Sampled Annually ----------					
	04/08/96		9.34	19.20	---------- Well Sampled Annually ----------					
	07/02/96		10.22	18.32	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	10/01/96		10.85	17.69	---------- Well Sampled Annually ----------					
	04/08/97		9.88	18.66	---------- Well Sampled Annually ----------					
	06/14/97		10.43	18.11	---------- Well Sampled Annually ----------					
A-5	01/15/96	27.29	10.61	16.68	<50	<0.50	<0.50	<0.50	<0.50	NA
	04/08/96		10.59	16.70	<50	<0.50	<0.50	<0.50	<0.50	NA
	07/02/96		10.73	16.56	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	10/01/96		10.84	16.45	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	04/08/97		10.68	16.61	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	06/14/97		10.70	16.59	<50	<0.50	<0.50	<0.50	<0.50	<2.5
AR-1	01/15/96	29.08	10.44	18.64	<50	<0.50	<0.50	<0.50	<0.50	NA
	04/08/96		9.56	19.52	<50	<0.50	<0.50	<0.50	<0.50	NA
	07/02/96		10.67	18.41	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	10/01/96		11.60	17.48	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	04/08/97		10.95	18.13	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	06/14/97		11.04	18.04	<50	<0.50	<0.50	<0.50	<0.50	<2.5
AR-2	01/15/96	28.20	11.00	17.20	<50	<0.50	<0.50	<0.50	<0.50	NA
	04/08/96		9.71	18.49	<50	<0.50	<0.50	<0.50	<0.50	NA
	07/02/96		11.15	17.05	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	10/01/96		11.62	16.58	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	04/08/97		10.38	17.82	<50	<0.50	<0.50	<0.50	<0.50	<2.5
	06/14/97		11.30	16.90	<50	<0.50	<0.50	<0.50	<0.50	<2.5

MtBE = Methyl tert-butyl ether
MSL = Mean sea level
TOB = Top of box
ppb = Parts per billion
NA = Not analyzed

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #2112, 1260 Park Street, Alameda, CA

Well and Sample Date	P/NP	TOC Elevation (feet)	Depth to Water (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	Comments
					GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
A-1												
10/7/1991	--	28.39	16.47	11.92	470	48	34	7.5	82	--	--	
2/18/1992	--	28.39	17.16	11.23	<30	5.4	0.82	<0.3	<0.3	--	--	
5/22/1992	--	28.39	17.14	11.25	38	15	0.92	1.3	0.51	--	--	
8/14/1992	--	28.39	16.63	11.76	<50	14	<0.5	1.5	<0.5	--	--	
10/23/1992	--	28.39	16.28	12.11	66	22	4.6	2	4.3	--	--	
1/28/1993	--	28.39	17.34	11.05	750	120	120	16	96	--	--	
2/24/1993	--	28.39	18.43	9.96	--	--	--	--	--	--	--	
4/28/1993	--	28.39	17.71	10.68	6,700	1,900	1,700	240	1,300	--	--	
5/28/1993	--	28.39	17.18	11.21	--	--	--	--	--	--	--	
6/16/1993	--	28.39	16.63	11.76	--	--	--	--	--	--	--	
7/27/1993	--	28.39	16.60	11.79	--	--	--	--	--	--	--	
8/24/1993	--	28.39	16.44	11.95	1,800	230	88	34	160	--	--	
9/28/1993	--	28.39	16.66	11.73	--	--	--	--	--	--	--	
10/22/1993	--	28.39	16.67	11.72	2,500	79	<10	<10	160	--	--	
11/16/1993	--	28.39	16.56	11.83	--	--	--	--	--	--	--	
12/16/1993	--	28.39	16.96	11.43	--	--	--	--	--	--	--	
2/7/1994	--	28.39	17.62	10.77	61	24	<0.5	2.1	0.8	--	--	
5/2/1994	--	28.39	17.17	11.22	58	17	0.7	2.2	4.2	--	--	
8/5/1994	--	28.39	11.40	16.99	<50	5.1	1.4	0.6	2.5	--	--	
11/30/1994	--	28.39	9.43	18.96	130	16	8.4	0.6	27	--	--	
2/22/1995	--	28.39	10.76	17.63	<50	1.2	<0.50	<0.50	<0.50	--	--	
5/23/1995	--	28.39	9.25	19.14	<50	4.9	0.95	0.61	3.9	--	--	
8/9/1995	--	28.39	11.33	17.06	<50	2.3	<0.50	<0.50	0.53	<2.5	--	
11/16/1995	--	28.39	12.11	16.28	<50	3.3	1.5	<0.50	1.9	--	--	
1/15/1996	--	28.39	11.18	17.21	<50	<0.50	<0.50	<0.50	<0.50	--	--	
4/8/1996	--	28.39	10.61	17.78	<50	<0.50	<0.50	<0.50	<0.50	--	--	
7/2/1996	--	28.39	11.28	17.11	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
10/1/1996	--	28.39	11.70	16.69	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
4/8/1997	--	28.39	10.98	17.41	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
6/14/1997	--	28.39	11.35	17.04	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #2112, 1260 Park Street, Alameda, CA

Well and Sample Date	P/NP	TOC Elevation (feet)	Depth to Water (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	Comments
					GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
A-1 Cont.												
7/17/2006	--	30.81	10.92	19.89	<50	<0.50	<0.50	<0.50	<0.50	22	--	a
9/10/2010	P	30.81	10.90	19.91	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	
2/8/2011	**P**	**30.81**	**10.11**	**20.70**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**0.39**	
A-2												
10/7/1991	--	29.28	12.74	16.54	31	7.4	0.39	<0.3	0.93	--	--	
2/18/1992	--	29.28	11.55	17.73	490	120	<1.5	<1.5	17	--	--	
5/22/1992	--	29.28	11.71	17.57	100	2.4	<0.3	<0.3	0.89	--	--	
8/14/1992	--	29.28	12.54	16.74	110	5	<0.5	<0.5	<0.5	--	--	
10/23/1992	--	29.28	12.64	16.64	<50	<0.5	<0.5	<0.5	<0.5	--	--	
1/28/1993	--	29.28	10.29	18.99	280	130	<2.5	<2.5	<2.5	--	--	
2/24/1993	--	29.28	11.05	18.23	--	--	--	--	--	--	--	
4/28/1993	--	29.28	10.91	18.37	210	32	0.89	5.2	2.3	--	--	
5/28/1993	--	29.28	11.27	18.01	--	--	--	--	--	--	--	
6/16/1993	--	29.28	12.20	17.08	--	--	--	--	--	--	--	
7/27/1993	--	29.28	11.27	18.01	--	--	--	--	--	--	--	
8/24/1993	--	29.28	12.25	17.03	<50	<0.5	<0.5	<0.5	<0.5	--	--	
9/28/1993	--	29.28	12.36	16.92	--	--	--	--	--	--	--	
10/22/1993	--	29.28	12.18	17.10	<50	<0.5	<0.5	<0.5	<0.5	--	--	
11/16/1993	--	29.28	12.34	16.94	--	--	--	--	--	--	--	
12/16/1993	--	29.28	11.74	17.54	--	--	--	--	--	--	--	
2/7/1994	--	29.28	10.56	18.72	<50	<0.5	<0.5	<0.5	<0.5	--	--	
5/2/1994	--	29.28	11.48	17.80	<50	<0.5	<0.5	<0.5	<0.5	--	--	
8/5/1994	--	29.28	12.26	17.02	<50	<0.5	<0.5	<0.5	<0.5	--	--	
11/30/1994	--	29.28	10.93	18.35	<50	<0.5	<0.5	<0.5	<0.5	--	--	
2/22/1995	--	29.28	10.55	18.73	<50	0.68	1.3	<0.5	0.52	--	--	
5/23/1995	--	29.28	11.05	18.23	<50	<0.50	<0.50	<0.50	<0.50	--	--	
8/9/1995	--	29.28	11.70	17.58	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
11/16/1995	--	29.28	12.64	16.64	<50	<0.50	<0.50	<0.50	<0.50	--	--	
1/15/1996	--	29.28	11.17	18.11	<50	<0.50	<0.50	<0.50	<0.50	--	--	
4/8/1996	--	29.28	10.45	18.83	<50	<0.50	<0.50	<0.50	<0.50	--	--	

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ARCO Service Station #2112, 1260 Park Street, Alameda, CA

Well and Sample Date	P/NP	TOC Elevation (feet)	Depth to Water (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	Comments
					GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
A-2 Cont.												
7/2/1996	--	29.28	11.40	17.88	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
10/1/1996	--	29.28	12.10	17.18	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
4/8/1997	--	29.28	11.05	18.23	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
6/14/1997	--	29.28	11.65	17.63	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
7/17/2006	--	31.26	11.00	20.26	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	
9/10/2010	P	31.26	10.84	20.42	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	
2/8/2011	**P**	**31.26**	**9.50**	**21.76**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**1.15**	
A-3												
10/7/1991	--	27.87	10.55	17.32	<30	<0.3	<0.3	<0.3	<0.3	--	--	
2/18/1992	--	27.87	9.12	18.75	<30	<0.3	<0.3	<0.3	<0.3	--	--	
5/22/1992	--	27.87	9.41	18.46	<30	<0.3	<0.3	<0.3	<0.3	--	--	
8/14/1992	--	27.87	10.31	17.56	<50	<0.5	<0.5	<0.5	<0.5	--	--	
10/23/1992	--	27.87	10.57	17.30	<50	<0.5	<0.5	<0.5	<0.5	--	--	
1/28/1993	--	27.87	7.66	20.21	<50	<0.5	<0.5	<0.5	<0.5	--	--	
2/24/1993	--	27.87	8.28	19.59	--	--	--	--	--	--	--	
4/28/1993	--	27.87	6.76	21.11	<50	<0.5	<0.5	<0.5	<0.5	--	--	
5/28/1993	--	27.87	8.98	18.89	--	--	--	--	--	--	--	
6/16/1993	--	27.87	9.69	18.18	--	--	--	--	--	--	--	
7/27/1993	--	27.87	9.66	18.21	--	--	--	--	--	--	--	
8/24/1993	--	27.87	9.85	18.02	<50	<0.5	<0.5	<0.5	<0.5	--	--	
9/28/1993	--	27.87	10.21	17.66	--	--	--	--	--	--	--	
10/22/1993	--	27.87	10.05	17.82	<50	<0.5	<0.5	<0.5	<0.5	--	--	
11/16/1993	--	27.87	11.20	16.67	--	--	--	--	--	--	--	
11/16/1993	--	27.87	9.42	18.45	--	--	--	--	--	--	--	d
2/7/1994	--	27.87	8.29	19.58	<50	<0.5	<0.5	<0.5	<0.5	--	--	
5/2/1994	--	27.87	9.08	18.79	<50	<0.5	<0.5	<0.5	<0.5	--	--	
8/5/1994	--	27.87	10.02	17.85	<50	<0.5	<0.5	<0.5	<0.5	--	--	
11/30/1994	--	27.87	8.53	19.34	<50	<0.5	<0.5	<0.5	<0.5	--	--	
2/22/1995	--	27.87	7.90	19.97	<50	<0.50	<0.50	<0.50	<0.50	--	--	
5/23/1995	--	27.87	8.60	19.27	<50	<0.50	<0.50	<0.50	<0.50	--	--	

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Well and Sample Date	P/NP	TOC Elevation (feet)	Depth to Water (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	Comments
					GRO/ TPHg	Benzene	Toluene	Ethyl- Benzene	Total Xylenes	MTBE		
A-3 Cont.												
8/9/1995	--	27.87	9.30	18.57	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
11/16/1995	--	27.87	--	--	--	--	--	--	--	--	--	e
1/15/1996	--	27.87	8.66	19.21	--	--	--	--	--	--	--	e
4/8/1996	--	27.87	7.86	20.01	--	--	--	--	--	--	--	e
7/2/1996	--	27.87	9.03	18.84	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
10/1/1996	--	27.87	9.88	17.99	--	--	--	--	--	--	--	e
4/8/1997	--	27.87	8.55	19.32	--	--	--	--	--	--	--	e
6/14/1997	--	27.87	9.43	18.44	--	--	--	--	--	--	--	e
7/17/2006	--	30.20	--	--	--	--	--	--	--	--	--	c
9/10/2010	--	30.20	--	--	--	--	--	--	--	--	--	c
2/8/2011	**NP**	**30.20**	**7.38**	**22.82**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**1.05**	**f**
A-4												
10/7/1991	--	28.54	11.40	17.14	<30	0.32	0.69	<0.3	1.1	--	--	
2/18/1992	--	28.54	10.52	18.02	<30	<0.3	<0.3	<0.3	<0.3	--	--	
5/22/1992	--	28.54	10.45	18.09	<30	<0.3	<0.3	<0.3	<0.3	--	--	
8/14/1992	--	28.54	11.22	17.32	<50	<0.5	<0.5	<0.5	<0.5	--	--	
10/23/1992	--	28.54	11.44	17.10	<50	<0.5	<0.5	<0.5	<0.5	--	--	
1/28/1993	--	28.54	9.12	19.42	<50	<0.5	<0.5	<0.5	<0.5	--	--	
2/24/1993	--	28.54	9.91	18.63	--	--	--	--	--	--	--	
4/28/1993	--	28.54	8.29	20.25	<50	<0.5	<0.5	<0.5	<0.5	--	--	
5/28/1993	--	28.54	9.92	18.62	--	--	--	--	--	--	--	
6/16/1993	--	28.54	10.64	17.90	--	--	--	--	--	--	--	
7/27/1993	--	28.54	10.81	17.73	--	--	--	--	--	--	--	
8/24/1993	--	28.54	10.98	17.56	<50	<0.5	<0.5	<0.5	<0.5	--	--	
9/28/1993	--	28.54	11.08	17.46	--	--	--	--	--	--	--	
10/22/1993	--	28.54	11.06	17.48	<50	<0.5	<0.5	<0.5	<0.5	--	--	
11/16/1993	--	28.54	10.27	18.27	--	--	--	--	--	--	--	
12/16/1993	--	28.54	10.64	17.90	--	--	--	--	--	--	--	
2/7/1994	--	28.54	9.42	19.12	<50	<0.5	<0.5	<0.5	<0.5	--	--	
5/2/1994	--	28.54	10.33	18.21	<50	<0.5	<0.5	<0.5	<0.5	--	--	

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					GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
A-4 Cont.												
8/5/1994	--	28.54	10.94	17.60	<50	<0.5	<0.5	<0.5	<0.5	--	--	
11/30/1994	--	28.54	9.89	18.65	<50	<0.5	<0.5	<0.5	<0.5	--	--	
2/22/1995	--	28.54	9.44	19.10	<50	<0.50	<0.50	<0.50	<0.50	--	--	
5/23/1995	--	28.54	9.80	18.74	<50	<0.50	0.59	<0.50	<0.50	--	--	
8/9/1995	--	28.54	10.39	18.15	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
11/16/1995	--	28.54	--	--	--	--	--	--	--	--	--	e
1/15/1996	--	28.54	10.00	18.54	--	--	--	--	--	--	--	e
4/8/1996	--	28.54	9.34	19.20	--	--	--	--	--	--	--	e
7/2/1996	--	28.54	10.22	18.32	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
10/1/1996	--	28.54	10.85	17.69	--	--	--	--	--	--	--	e
4/8/1997	--	28.54	9.88	18.66	--	--	--	--	--	--	--	e
6/14/1997	--	28.54	10.43	18.11	--	--	--	--	--	--	--	e
7/17/2006	--	30.73	9.02	21.71	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	a,b
9/10/2010	P	30.73	9.96	20.77	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	
2/8/2011	**P**	**30.73**	**8.94**	**21.79**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**0.59**	
A-5												
6/26/1992	--	27.29	10.77	16.52	<50	<0.5	<0.5	<0.5	<0.5	--	--	
8/14/1992	--	27.29	11.04	16.25	<50	<0.5	<0.5	<0.5	<0.5	--	--	
10/23/1992	--	27.29	11.12	16.17	<50	<0.5	<0.5	<0.5	<0.5	--	--	
1/28/1993	--	27.29	9.94	17.35	<50	<0.5	<0.5	<0.5	<0.5	--	--	
2/24/1993	--	27.29	10.63	16.66	--	--	--	--	--	--	--	
4/28/1993	--	27.29	10.70	16.59	<50	<0.5	<0.5	<0.5	<0.5	--	--	
5/28/1993	--	27.29	10.35	16.94	--	--	--	--	--	--	--	
6/16/1993	--	27.29	10.76	16.53	--	--	--	--	--	--	--	
7/27/1993	--	27.29	10.78	16.51	--	--	--	--	--	--	--	
8/24/1993	--	27.29	10.97	16.32	<50	<0.5	<0.5	<0.5	<0.5	--	--	
9/28/1993	--	27.29	10.90	16.39	--	--	--	--	--	--	--	
10/22/1993	--	27.29	10.82	16.47	<50	<0.5	<0.5	<0.5	<0.5	--	--	
11/16/1993	--	27.29	10.98	16.31	--	--	--	--	--	--	--	
12/16/1993	--	27.29	10.70	16.59	--	--	--	--	--	--	--	

Table 1. Summary of Groundwater Monitoring Data: Relative Water Elevations and Laboratory Analyses

ARCO Service Station #2112, 1260 Park Street, Alameda, CA

Well and Sample Date	P/NP	TOC Elevation (feet)	Depth to Water (feet)	Water Level Elevation (feet)	Concentrations in (µg/L)						DO (mg/L)	Comments
					GRO/ TPHg	Benzene	Toluene	Ethyl-Benzene	Total Xylenes	MTBE		
A-5 Cont.												
2/7/1994	--	27.29	9.96	17.33	<50	<0.5	0.9	<0.5	0.7	--	--	
5/2/1994	--	27.29	10.59	16.70	<50	<0.5	<0.5	<0.5	<0.5	--	--	
8/5/1994	--	27.29	10.91	16.38	<50	<0.5	<0.5	<0.5	<0.5	--	--	
11/30/1994	--	27.29	10.69	16.60	<50	<0.5	<0.5	<0.5	<0.5	--	--	
2/22/1995	--	27.29	10.71	16.58	<50	<0.50	<0.50	<0.50	<0.50	--	--	
5/23/1995	--	27.29	10.75	18.33	<50	<0.50	<0.50	<0.50	<0.50	--	--	
8/9/1995	--	27.29	10.78	18.30	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
11/16/1995	--	27.29	11.33	15.96	<50	<0.50	<0.50	<0.50	<0.50	--	--	
1/15/1996	--	27.29	10.61	16.68	<50	<0.50	<0.50	<0.50	<0.50	--	--	
4/8/1996	--	27.29	10.59	16.70	<50	<0.50	<0.50	<0.50	<0.50	--	--	
7/2/1996	--	27.29	10.73	16.56	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
10/1/1996	--	27.29	10.84	16.45	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
4/8/1997	--	27.29	10.68	16.61	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
6/14/1997	--	27.29	10.70	16.59	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	
7/17/2006	--	29.53	10.67	18.86	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	a
9/10/2010	P	29.53	10.21	19.32	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	
2/8/2011	**P**	**29.53**	**10.04**	**19.49**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**0.55**	
AR-1												
9/10/2010	P	31.17	10.24	20.93	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	
2/8/2011	**P**	**31.17**	**8.79**	**22.38**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**0.82**	
AR-2												
9/10/2010	P	30.19	10.37	19.82	<50	<0.50	<0.50	<0.50	<0.50	<0.50	--	
2/8/2011	**P**	**30.19**	**9.59**	**20.60**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**0.93**	

ABBREVIATIONS & SYMBOLS:
-- = Not analyzed/applicable/measured/available
< = Not detected at or above laboratory reporting limit
ft bgs = Feet below ground surface
BTEX = Benzene, toluene, ethylbenzene and xylenes
DO = Dissolved oxygen
DTW = Depth to water in ft bgs
GRO = Gasoline range organics, range C4-C12
GWE = Groundwater elevation measured in ft
mg/L = Milligrams per liter
MTBE = Methyl tert butyl ether
NP = Not purged before sampling
P = Purged before sampling
TOC = Top of casing measured in ft
TPH-g = Total petroleum hydrocarbons as gasoline, analyzed using EPA Method 8015, Modified
µg/L = Micrograms per liter
SEQ/SEQM = Sequoia Analytical/Sequoia Morgan Hill Laboratories

FOOTNOTES:
a = Hydrocarb. in req. fuel range, but doesn't resemble req. fuel
b = Surrogate recovery above the acceptance limits. Matrix interference suspected
c = Well obstructed
d = Date believed to be erroneous; date likely to be 12/16/1993
e = Well sampled annually
f = NP due to blockage

GRO analysis was completed by EPA method 8260B (C4-C12) for samples collected from the time period April 2006 through February 4, 2008. The analysis for GRO was changed to EPA method 8015B (C6-C12) for samples collected from the time period February 5, 2008 through the present.

Note: The data within this table collected prior to April 2006 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants. Broadbent & Associates, Inc. has not verified the accuracy of this information.

Table 2. Summary of Fuel Additives Analytical Data

ARCO Service Station #2112, 1260 Park Street, Alameda, CA

Well and Sample Date	Concentrations in (µg/L)								Comments
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
A-1									
8/9/1995	--	--	<2.5	--	--	--	--	--	
7/2/1996	--	--	<2.5	--	--	--	--	--	
10/1/1996	--	--	<2.5	--	--	--	--	--	
4/8/1997	--	--	<2.5	--	--	--	--	--	
6/14/1997	--	--	<2.5	--	--	--	--	--	
7/17/2006	<300	<20	22	<0.50	<0.50	3.3	0.76	<0.50	
9/10/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
2/8/2011	**<300**	**<10**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
A-2									
8/9/1995	--	--	<2.5	--	--	--	--	--	
7/2/1996	--	--	<2.5	--	--	--	--	--	
10/1/1996	--	--	<2.5	--	--	--	--	--	
4/8/1997	--	--	<2.5	--	--	--	--	--	
6/14/1997	--	--	<2.5	--	--	--	--	--	
7/17/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	
9/10/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	0.72	<0.50	
2/8/2011	**<300**	**<10**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**0.96**	**<0.50**	
A-3									
8/9/1995	--	--	<2.5	--	--	--	--	--	
7/2/1996	--	--	<2.5	--	--	--	--	--	
2/8/2011	**<300**	**<10**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
A-4									
8/9/1995	--	--	<2.5	--	--	--	--	--	
7/2/1996	--	--	<2.5	--	--	--	--	--	
7/17/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
9/10/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
2/8/2011	**<300**	**<10**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
A-5									
8/9/1995	--	--	<2.5	--	--	--	--	--	

Table 2. Summary of Fuel Additives Analytical Data

ARCO Service Station #2112, 1260 Park Street, Alameda, CA

Well and Sample Date	Concentrations in (µg/L)								Comments
	Ethanol	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB	
A-5 Cont.									
7/2/1996	--	--	<2.5	--	--	--	--	--	
10/1/1996	--	--	<2.5	--	--	--	--	--	
4/8/1997	--	--	<2.5	--	--	--	--	--	
6/14/1997	--	--	<2.5	--	--	--	--	--	
7/17/2006	<300	<20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
9/10/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
2/8/2011	**<300**	**<10**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	
AR-1									
9/10/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	1.2	<0.50	
2/8/2011	**<300**	**<10**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**1.2**	**<0.50**	
AR-2									
9/10/2010	<300	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	
2/8/2011	**<300**	**<10**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	

ABBREVIATIONS & SYMBOLS:
< = Not detected at or above specified laboratory reporting limit
1,2-DCA = 1,2-Dichloroethane
DIPE = Di-isopropyl ether
EDB = 1,2-Dibromoethane
ETBE = Ethyl tert-butyl ether
MTBE = Methyl tert-butyl ether
TAME = tert-Amyl methyl ether
TBA = tert-Butyl alcohol
µg/L = micrograms per liter

Note: The data within this table collected prior to April 2006 was provided to Broadbent & Associates, Inc. by Atlantic Richfield Company and their previous consultants. Broadbent & Associates, Inc. has not verified the accuracy of this information.

APPENDIX B

SOIL BORING LOGS

Total depth of boring: 25-1/2 feet **Diameter of boring:** 6 inches **Date drilled:** 1-22-90

Casing diameter: N/A **Length:** N/A **Slot size:** N/A

Screen diameter: N/A **Length:** N/A **Material type:** N/A

Drilling Company: H.E.W. Drilling Inc. **Driller:** Tomas & Defecto

Method Used: Continuos-Flight Auger **Field Geologist:** Steve Bittman

Signature of Registered Professional:

Registration No.: CEG 1264 **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (6 inches) over baserock (6 inches).	
2	S-1.5	8		SP	Sand with some clay, fine-grained, gray-green, damp to moist, medium dense, noticeable odor.	
	S-2	6 10	80			
4	S-3.5	5				
	S-4	8 9	425			
6	S-5.5	8			Gray-brown.	
	S-6	10 17	450			
8	S-7.5	21		SC	Clayey sand, fine-grained, brown-gray, moist, very dense, obvious odor.	
	S-8	39 52	660			
10	S-9.5	10				
	S-10	35 50	600			
12	S-12.5	15		▽	Wet, noticeable odor.	
	S-13	35 57	50			
14						
16	S-15.5	14			Brown.	
	S-16	32 59	35			
18						
20	S-20	35				
	S-20.5	60	2		(Section continues downward)	

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LOG OF BORING B - 1

ARCO Station 2112
1260 Park Street
Alameda, California

PLATE 4

Depth	Sample No.	BLOWS	P.I.D.	USCS Code	Description	Well Const.
22				SC	Clayey sand, fine-grained, brown, moist, very dense.	
24	S-25	0				
26					Total Depth = 25-1/2 feet.	
28						
30						
32						
34						
36						
38						
40						
42						
44						
46						
48						
50						

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PROJECT 69048-1

LOG OF BORING B - 1

ARCO Station 2112
1260 Park Street
Alameda, California

PLATE 5

Total depth of boring: 11-1/2 feet **Diameter of boring:** 6 inches **Date drilled:** 1-22-90

Casing diameter: N/A **Length:** N/A **Slot size:** N/A

Screen diameter: N/A **Length:** N/A **Material type:** N/A

Drilling Company: H.E.W. Drilling Inc. **Driller:** Tomas & Pefecto

Method Used: Continuos-Flight Auger **Field Geologist:** Steven Bittman

Signature of Registered Professional:

Registration No.: CEG 1264 **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0						
					Asphalt (6 inches) over baserock (6 inches).	
2		11		SP	Sand with some clay, fine-grained, dark brown, damp, medium dense, noticeable odor.	
		12				
	S-3	13	110			
4						
		10		SC	Clayey sand, fine-grained, dark brown, damp to moist, dense, noticeable odor.	
6		15				
	S-6	26	115			
8						
10		15				
		26				
	S-11	39	650			
12					Total Depth = 11-1/2 feet.	
14						
16						
18						
20						

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PROJECT 69048-1

LOG OF BORING B - 2

ARCO Station 2112
1260 Park Street
Alameda, California

PLATE 6

Total depth of boring: 11-1/2 feet **Diameter of boring:** 6 inches **Date drilled:** 1-22-90

Casing diameter: N/A **Length:** N/A **Slot size:** N/A

Screen diameter: N/A **Length:** N/A **Material type:** N/A

Drilling Company: H.E.W. Drilling Inc. **Driller:** Tomas & Pefecto

Method Used: Continuos-Flight Auger **Field Geologist:** Steve Bittman

Signature of Registered Professional:

Registration No.: CEG 1264 **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (6 inches) over baserock (6 inches).	
2	S-3	11, 12, 13	110	SP	Sand with some clay, fine-grained, brown, moist, dense.	
4						
6	S-6	10, 15, 26	115	SC	Clayey sand, fine-grained, gray, moist, noticeable odor.	
8						
10	S-11	15, 26, 39	650			
12					Total Depth = 11-1/2 feet.	
14						
16						
18						
20						

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PROJECT 69048-1

LOG OF BORING B - 3

ARCO Station 2112
1260 Park Street
Alameda, California

PLATE 7

Total depth of boring: 11-1/2 feet **Diameter of boring:** 6 inches **Date drilled:** 1-22-90

Casing diameter: N/A **Length:** N/A **Slot size:** N/A

Screen diameter: N/A **Length:** N/A **Material type:** N/A

Drilling Company: H.E.W. Drilling Inc. **Driller:** Tomas & Pefecto

Method Used: Continuos-Flight Auger **Field Geologist:** Steve Bittman

Signature of Registered Professional:

Registration No.: CEG 1264 **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (6 inches) over baserock (6 inches).	
2	S-3	20, 22, 35	60	SP	Sand with some clay, fine-grained, dark brown, damp, very dense, noticeable odor.	
4						
6	S-6	3, 6, 10	25	SC	Clayey sand, fine-grained, blue-gray, medium dense, noticeable odor.	
8						
10	S-11	16, 21, 32	800			
12					Total Depth = 11-1/2 feet.	
14						
16						
18						
20						

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PROJECT 69048-1

LOG OF BORING B - 4

ARCO Station 2112
1260 Park Street
Alameda, California

PLATE 8

Total depth of boring: 11-1/2 feet **Diameter of boring:** 6 inches **Date drilled:** 1-22-90

Casing diameter: N/A **Length:** N/A **Slot size:** N/A

Screen diameter: N/A **Length:** N/A **Material type:** N/A

Drilling Company: H.E.W. Drilling Inc. **Driller:** Tomas & Pefecto

Method Used: Continuos-Flight Auger **Field Geologist:** Steve Bittman

Signature of Registered Professional:

Registration No.: CEG 1264 **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0						
					Asphalt (6 inches) over baserock (6 inches).	
2		5		SP	Sand with some clay, fine-grained, brown, damp, medium dense.	
	S-3	8 9	0			
4						
		7		SC	Clayey sand, fine-grained, brown, mottled gray, medium dense, noticeable odor.	
6		7				
	S-6	7	2			
8						
10		12				
		22				
	S-11	35	800			
12					Total Depth = 11-1/2 feet.	
14						
16						
18						
20						

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PROJECT 69048-1

LOG OF BORING B - 5

ARCO Station 2112
1260 Park Street
Alameda, California

PLATE 9

Total depth of boring: 13 feet **Diameter of boring:** 6 inches **Date drilled:** 1-29-90

Casing diameter: N/A **Length:** N/A **Slot size:** N/A

Screen diameter: N/A **Length:** N/A **Material type:** N/A

Drilling Company: Garret Enterprises **Driller:** Red & Dave

Method Used: Continuos-Flight Auger **Field Geologist:** Steve Strausz

Signature of Registered Professional:

Registration No.: CEG 1264 **State:** CA

Depth	Sample No.	Blows	P.I.D.	USCS Code	Description	Well Const.
0					Asphalt (6 inches) over baserock (6 inches).	
2				SM	Silty sand, fine-to medium-grained, gray to light brown, damp, medium dense.	
4						
6	S-5.5	5				
	S-6	6	1.7			
		8				
8				SC	Clayey sand, gray-brown, moist, dense.	
10		12				
		18				
	S-10	18				
12		14		▽		
		21				
	S-12	30	3.1			
14					Total Depth = 13 feet.	
16						
18						
20						

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PROJECT 69048-1

LOG OF BORING B - 6

ARCO Station 2112
1260 Park Street
Alameda, California

PLATE 10

SOIL BORING LOG **Boring No. B-7** **Sheet: 1 of 1**

Client	ARCO 2112	Date	June 10, 2009
Address	1260 Park Street	Drilling Co.	RSI Drilling rig type: Powerprobe 9630 Pro-D
	Alameda, CA	Driller	Norman
Project No.	E2112	Method	Direct Push Hole Diameter: 2"
Logged By:	Collin Fischer	Sampler:	Continuous core

Sample Type	Sample No.	Date	Sample Time	Sample Recov.	Well Details	Depth Scale	Lithologic Column	Descriptions of Materials and Conditions	PID (PPM)
						1	SM	Cleared to 6.5' bgs with air knife.	
						2			
						3			
						4		Silty sand, SM, (0'-7.5'), dark yellowish brown, dry 85% fine to medium grained sand, 15% silt	
S	B-7 5'	6/10/09	1050	100		5			0
						6			
						7			
S	B-7 8'	6/10/09	1053	100		8	SC		0
						9		Clayey sand, SC, (7.5'-10.5'), dark yellowish brown, moist 70% medium grained sand, 30% clay	
						10			
S	B-7 11'	6/10/09	1055	100		11	SM		0
						12			
						13		Silty sand, SM, (10.5'-14'), dark grayish brown, wet 85% medium grained sand, 15% silt	
S	B-7 14'	6/10/09	1058	100		14			0
						15			
						16			
						17			
						18			
						19			
						20			

Recovery

Sample

Comments:

STRATUS ENVIRONMENTAL, INC.

SOIL BORING LOG **Boring No. B-8** **Sheet: 1 of 1**

Client	ARCO 2112	Date	June 10, 2009
Address	1260 Park Street	Drilling Co.	RSI Drilling rig type: Powerprobe 9630 Pro-D
	Alameda, CA	Driller	Norman
Project No.	E2112	Method	Direct Push Hole Diameter: 2"
Logged By:	Collin Fischer	Sampler:	Continuous core

Sample Type	Sample No.	Date	Sample Time	Sample Recov.	Well Details	Depth Scale	Lithologic Column	Descriptions of Materials and Conditions	PID (PPM)
						1		Cleared to 6.5' bgs with air knife.	
						2			
						3			
						4	SM	Silty sand with gravel, SM, (0'-7'), dark yellowish brown, dry 70% fine to medium grained sand, 20% silt, 10 % medium gravel	
S	B-8 5'	6/10/09	1103	100		5			0
						6			
						7			
S	B-8 8'	6/10/09	1105	100		8	SC		0
						9		Clayey sand, SC, (7'-9.5'), dark yellowish brown, moist 70% medium grained sand, 30% clay	
						10			
S	B-8 11'	6/10/09	1108	100		11	SM		5000+
						12		Silty sand, SM, (9.5'-14'), dark grayish brown, wet 85% medium grained sand, 15% silt	
						13			
S	B-8 14'	6/10/09	1110	100		14			0
						15			
						16			
						17			
						18			
						19			
						20			

Recovery

Sample

Comments:

STRATUS ENVIRONMENTAL, INC.

SOIL BORING LOG **Boring No. B-9** **Sheet: 1 of 1**

Client	ARCO 2112	Date	June 10, 2009
Address	1260 Park Street	Drilling Co.	RSI Drilling rig type: 6620 DT
	Alameda, CA	Driller	Norman
Project No.	E2112	Method	Direct Push Hole Diameter: 2"
Logged By:	Collin Fischer	Sampler:	Continuous core

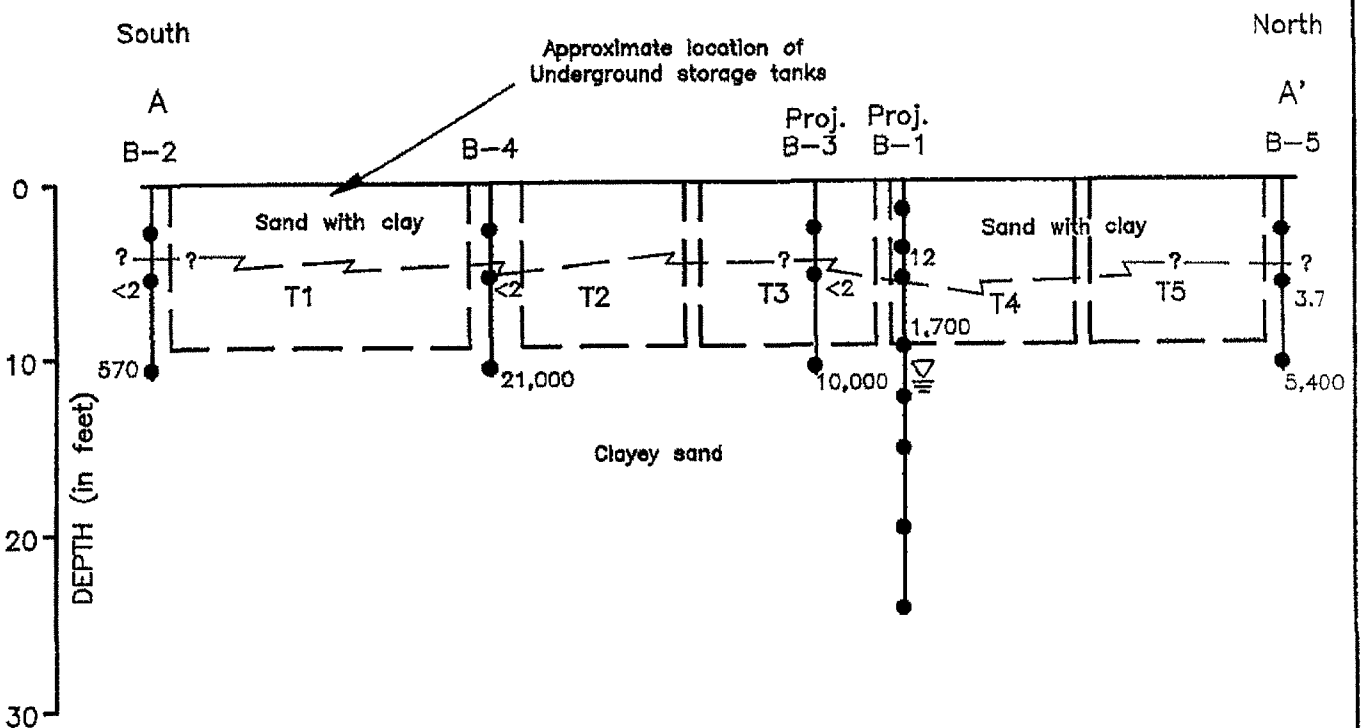
Sample Type	Sample No.	Date	Sample Time	Sample Recov.	Well Details	Depth Scale	Lithologic Column	Descriptions of Materials and Conditions	PID (PPM)
						1		Cleared to 6.5' bgs with air knife.	
						2			
						3			
						4			
S	B-9 5'	6/10/09	1135	100		5			0
						6			
						7		Silty sand, SM, (0'-12'), dark yellowish brown, dry 85% fine to medium grained sand, 15% silt	
S	B-9 8'	6/10/09	1138	100		8	SM		0
						9			
						10			
S	B-9 11'	6/10/09	1140	100		11			0
						12			
						13		Silty sand, SM, (12'-14'), dark yellowish brown, wet 80% fine to medium grained sand, 20% silt	
S	B-9 14'	6/10/09	1143	100		14			0
						15			
						16			
						17			
						18			
						19			
						20			

Recovery

Sample

Comments:

STRATUS ENVIRONMENTAL, INC.



EXPLANATION

= Laboratory analyzed soil sample showing concentration of TPH in part per million

= Boring

= Initial water level in boring

Approximate Horizontal and Vertical Scale

10 5 0 10 20

feet

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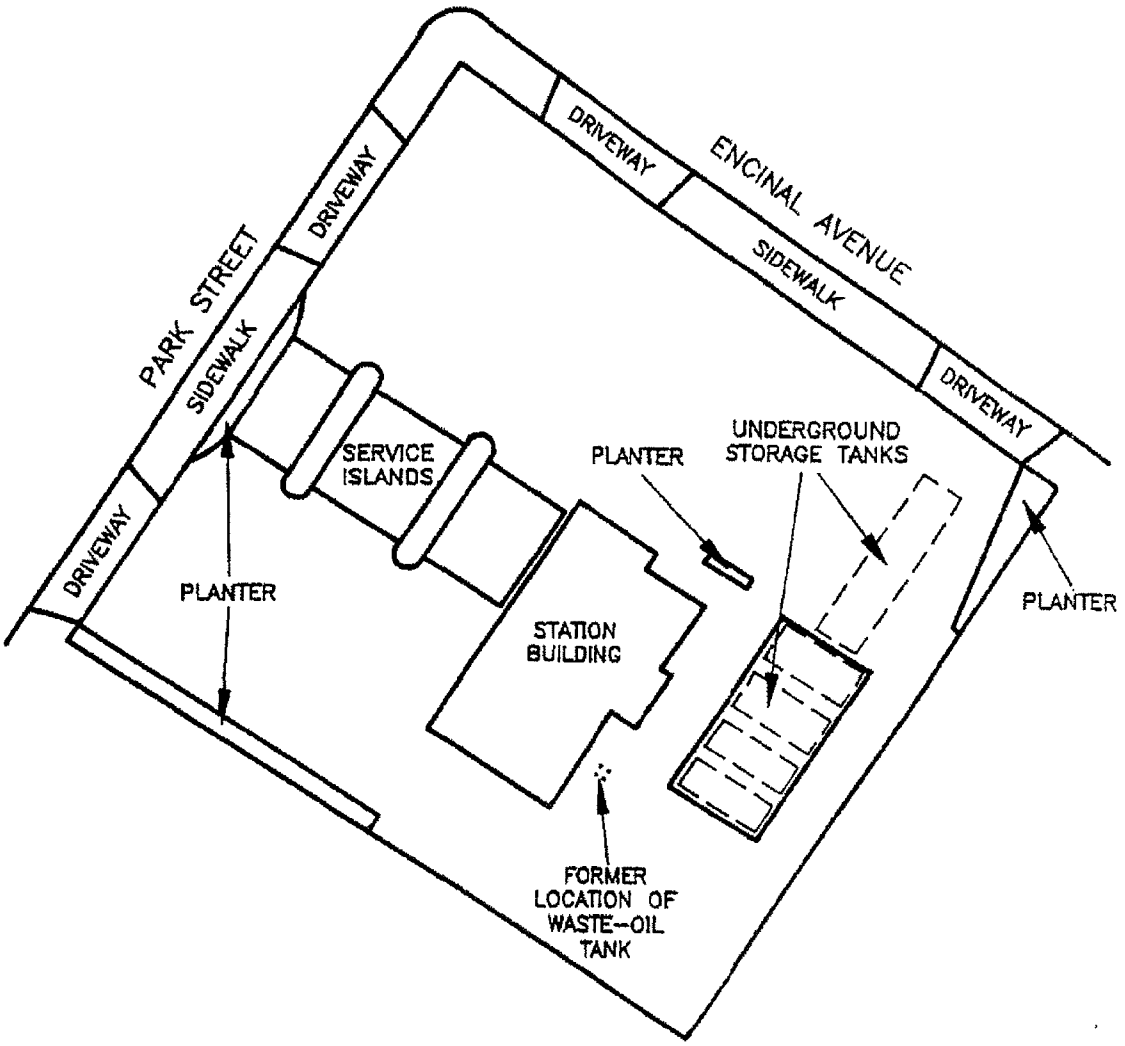
PROJECT 69048-1

GEOLOGIC CROSS SECTION A - A'
ARCO Station 2112
1260 Park Street
Alameda, California

PLATE 11

APPENDIX C

HISTORIC SOIL ANALYTICAL DATA



Approximate Scale

40 20 0 40 80

feet

Source: Based on ARCO site plan dated 1983

Applied GeoSystems

PROJECT NO. 19011-1

GENERALIZED SITE PLAN
ARCO Station No. 2112
1260 Park Street
Alameda, California

PLATE
P - 1

TABLE 1
RESULTS OF CHEMICAL ANALYSES
ON SOIL SAMPLES
Arco Service Station No. 2112
1260 Park Street/Encinal Avenue
Alameda, California

Sample Number	Date Sampled	TEH (as diesel fuel)	TEH (as motor oil)
9310-1 (bottom of tank)	5/14/87	430	2,400
9310-2 (west side of tank)	5/15/87	<10	<10
9347-1 (6-foot depth)	5/21/87	NA	<10

Results in milligrams/kilogram (mg/kg) = parts per million (ppm)
TEH: Total extractable hydrocarbons
NA: Not analyzed
Sampled by Crosby and Overton.

TABLE 1
RESULTS OF LABORATORY ANALYSIS OF SOIL SAMPLES
ARCO Station 2112
1260 Park Street
Alameda, California

Sample Number	TPHg	B	T	E	X
S-6-B1	12	0.16	0.34	0.14	1.3
S-10-B1	1,700	15	72	22	180
S-6-B2	<2.0	<0.050	<0.050	<0.050	<0.050
S-11-B2	570	3.9	13	11	82
S-6-B3	<2.0	0.097	<0.050	<0.050	0.20
S-11-B3	10,000	47	350	120	940
S-6-B4	<2.0	0.063	0.096	<0.050	0.20
S-11-B4	21,000	210	1,100	320	2,600
S-6-B5	3.7	<0.050	0.081	<0.050	0.18
S-11-B5	5,400	8.8	27	66	160
S-5.5-B6	<2.0	<0.050	<0.050	<0.050	<0.050
S-10-B6	<2.0	<0.050	<0.050	<0.050	<0.050

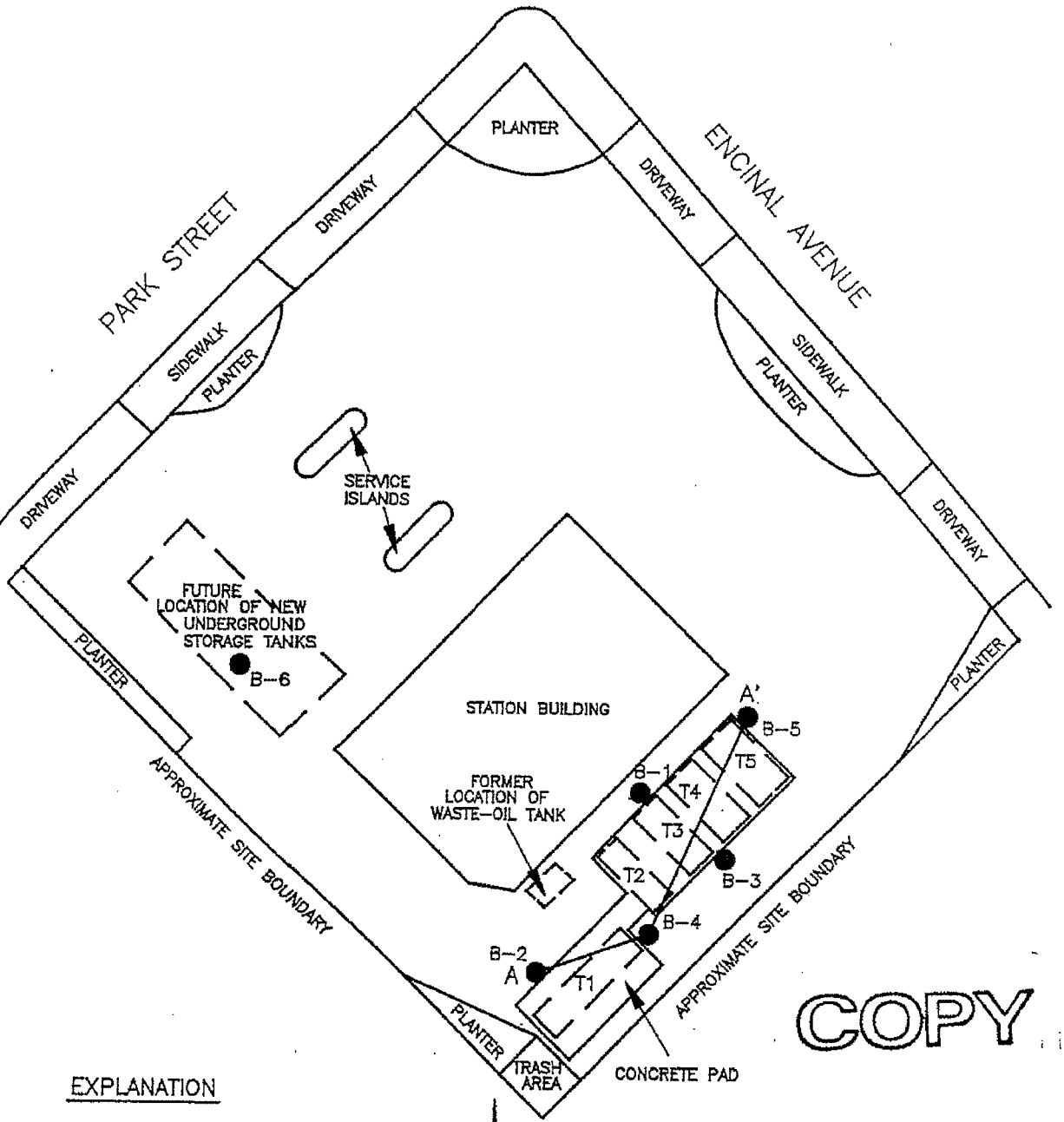
Results in milligrams per kilogram or parts per million

TPHg = Total petroleum hydrocarbons as gasoline
B = benzene E = ethylbenzene T = toluene X = total xylene isomers
< = indicates less than the reported limit

Sample identification:

S-10-B6
- S: Soil sample
- 10: Approximate sample depth in feet
- B6: Boring number

COPY



COPY

EXPLANATION

B-6 ● = Soil boring (Applied GeoSystems, January 23, 1990)

T5 = Existing underground storage tanks

A' = Cross Section

A

N

Approximate Scale

30 15 0 30 60

feet

Source: Modified from plan supplied by ARCO.

Applied GeoSystems

PROJECT 69048-1

GENERALIZED SITE PLAN
ARCO Station 2112
1260 Park Street
Alameda, California

PLATE
2

TABLE 1

SOIL ANALYTICAL DATA
(EXCAVATIONS)

SAMPLE I.D.	SAMPLE DATE	ANALYZED DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
AX1-1-6	26-Jul-90	26-Jul-90	14	<0.005	<0.005	<0.005	1
AX1-1-10	10-Aug-90	21-Aug-90	27.	0.12	1.1	0.7	4.4
AX1-2-6	26-Jul-90	26-Jul-90	1700	<0.005	16	4.8	76
AX1-2*-10	10-Aug-90	19-Aug-90	7700.	60.	360.	150.	930.
AX1-3-6	26-Jul-90	26-Jul-90	<1	<0.005	<0.005	<0.005	<0.005
AX1-3-10	09-Aug-90	21-Aug-90	15000.	130.	850.	330.	1900.
AX1-3-12	26-Jul-90	26-Jul-90	23000	150	490	940	2700
AX1-4-6	26-Jul-90	31-Jul-90	<1	<0.005	<0.005	<0.005	<0.005
AX1-4-12	26-Jul-90	26-Jul-90	1.2	<0.005	0.011	0.018	0.062
AX1-5-6	26-Jul-90	26-Jul-90	<1	0.019	<0.005	<0.005	0.032
AX1-6-6	26-Jul-90	26-Jul-90	<1	0.067	0.011	0.042	0.055
AX1-6-10	10-Aug-90	18-Aug-90	1000.	2.0	24.	18.	110.
AX1-7-6	26-Jul-90	27-Jul-90	50	<0.005	<0.005	<0.005	<0.005
AX1-7*-10	10-Aug-90	21-Aug-90	9400.	96.	570.	200.	1200.

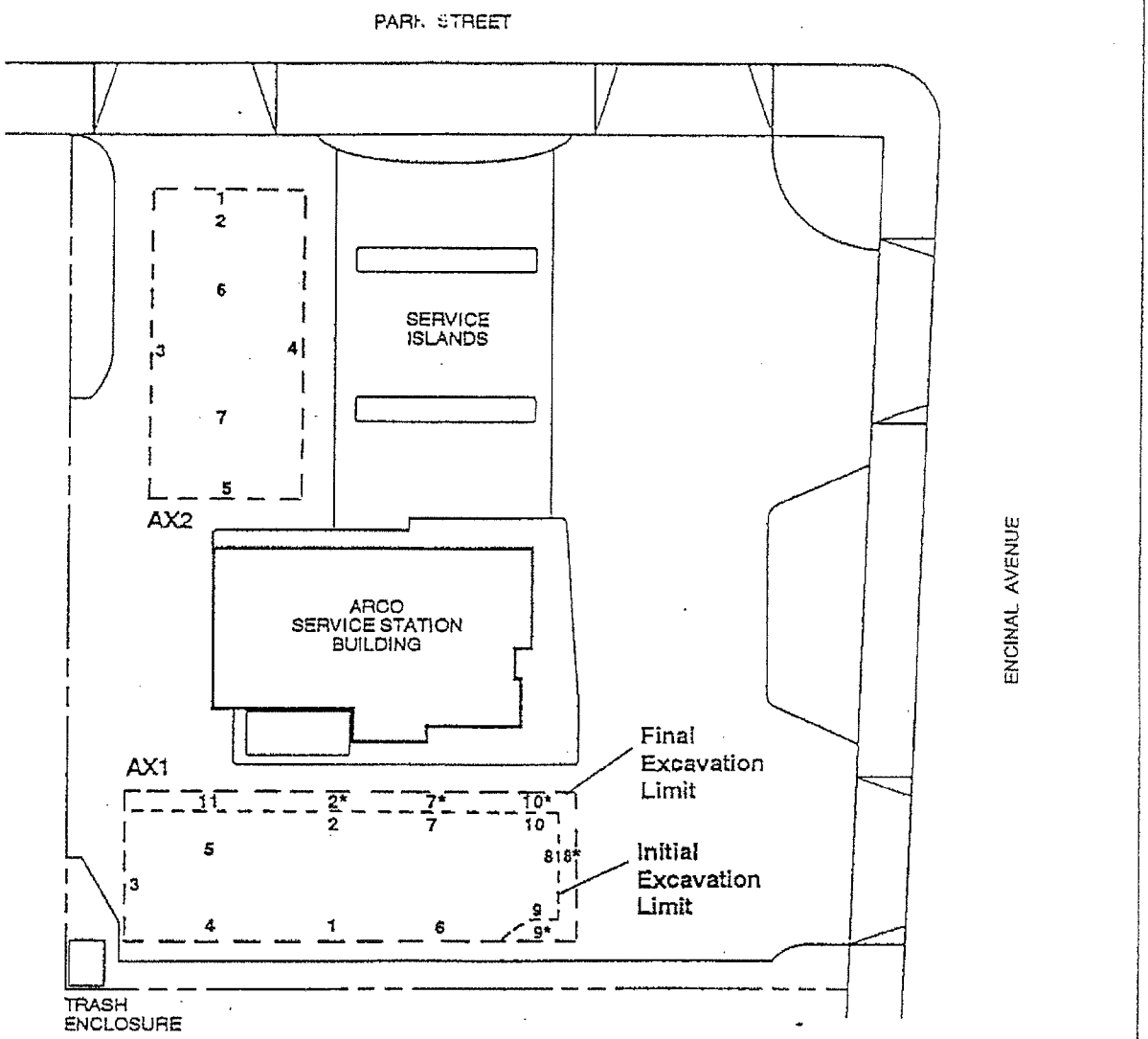
TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPM = Parts Per Million

Notes: 1. All data shown as <x are reported as ND (NONE DETECTED).
2. BTEX data analyzed on July 26, 27 and 31, 1990 by NET are reported in micrograms per kilogram.
3. The last number of the Sample I.D. corresponds to the approximate depth below existing grade that the sample was collected.
4. For sample locations, see Plate 3.
5. TPH-G concentration for AX1-8-10' appear to be the more volatile constituents of diesel.

TABLE 1

SOIL ANALYTICAL DATA
(EXCAVATIONS)

SAMPLE I.D.	SAMPLE DATE	ANALYZED DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
AX1-8-10	27-Jul-90	27-Jul-90	7,300	20	130	98	650
AX1-8*-10	10-Aug-90	18-Aug-90	320.	<0.4	<0.4	3.8	12.
AX1-9-10	27-Jul-90	27-Jul-90	<1	0.014	<0.005	0.020	0.017
AX1-9*-10	10-Aug-90	18-Aug-90	1.6	0.037	0.057	0.01	0.051
AX1-10-10	27-Jul-90	27-Jul-90	2,700	36	51	180	320
AX1-10*-10	10-Aug-90	18-Aug-90	120.	0.56	4.3	2.5	15.
AX1-11-10	27-Jul-90	27-Jul-90	<1	12	6	14	35
AX2-1-6	31-Jul-90	31-Jul-90	<1	<0.005	<0.005	0.007	0.007
AX2-1-12	31-Jul-90	31-Jul-90	2.0	0.024	0.073	0.048	0.110
AX2-2-11	31-Jul-90	31-Jul-90	2.0	0.470	0.180	0.005	0.013
AX2-3-6	31-Jul-90	31-Jul-90	<1	<0.005	<0.005	<0.005	<0.005
AX2-3-11.5	31-Jul-90	31-Jul-90	<1	<0.005	<0.005	<0.005	<0.005
AX2-4-6	31-Jul-90	31-Jul-90	<1	<0.005	<0.005	<0.005	<0.005
AX2-4-11	31-Jul-90	31-Jul-90	<1	<0.005	<0.005	<0.005	<0.005
AX2-5-6	31-Jul-90	31-Jul-90	<1	<0.005	<0.005	<0.005	<0.005
AX2-5-11	31-Jul-90	31-Jul-90	<1	<0.005	<0.005	<0.005	<0.005
AX2-6-11	31-Jul-90	31-Jul-90	<1	0.013	0.011	<0.005	<0.005
AX2-7-11	31-Jul-90	31-Jul-90	<1	<0.005	<0.005	<0.005	<0.005



GeoStrategies Inc.

Excavation Soil Sample Map
ARCO Service Station #2112
1260 Park Street
Alameda, California

PLATE 3

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7920	RG/CEG 12/6/2	10/90		

TABLE 2

SOIL ANALYTICAL DATA
(TRENCHING)

SAMPLE I.D.	SAMPLE DATE	ANALYZED DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
AT-1	17-Aug-90	20-Aug-90	2000.	<0.8	23.	28.	210.
AT-2	17-Aug-90	20-Aug-90	6.7	0.023	0.088	0.11	0.84
AT-3	17-Aug-90	20-Aug-90	<1.	<0.005	<0.005	<0.005	<0.005
AT-4	17-Aug-90	20-Aug-90	5.8	0.034	0.12	0.057	0.52
AT-7-2	08-Aug-90	16-Aug-90	2.0	0.008	0.017	0.008	0.061
AT-8-2.5	08-Aug-90	16-Aug-90	14.	0.11	0.15	0.28	1.6
AT-9-9.5	20-Aug-90	29-Aug-90	<1.	<0.01	<0.01	<0.01	<0.01
AT-10-2.5	15-Aug-90	17-Aug-90	<1	<0.003	<0.003	<0.003	<0.003
AT-10-9.5	20-Aug-90	28-Aug-90	<1.	<0.005	<0.005	0.008	0.014
AT-11-2.5	15-Aug-90	17-Aug-90	<1	<0.003	<0.003	<0.003	<0.003
AT-12-2.5	15-Aug-90	17-Aug-90	<1	<0.003	<0.003	<0.003	<0.003

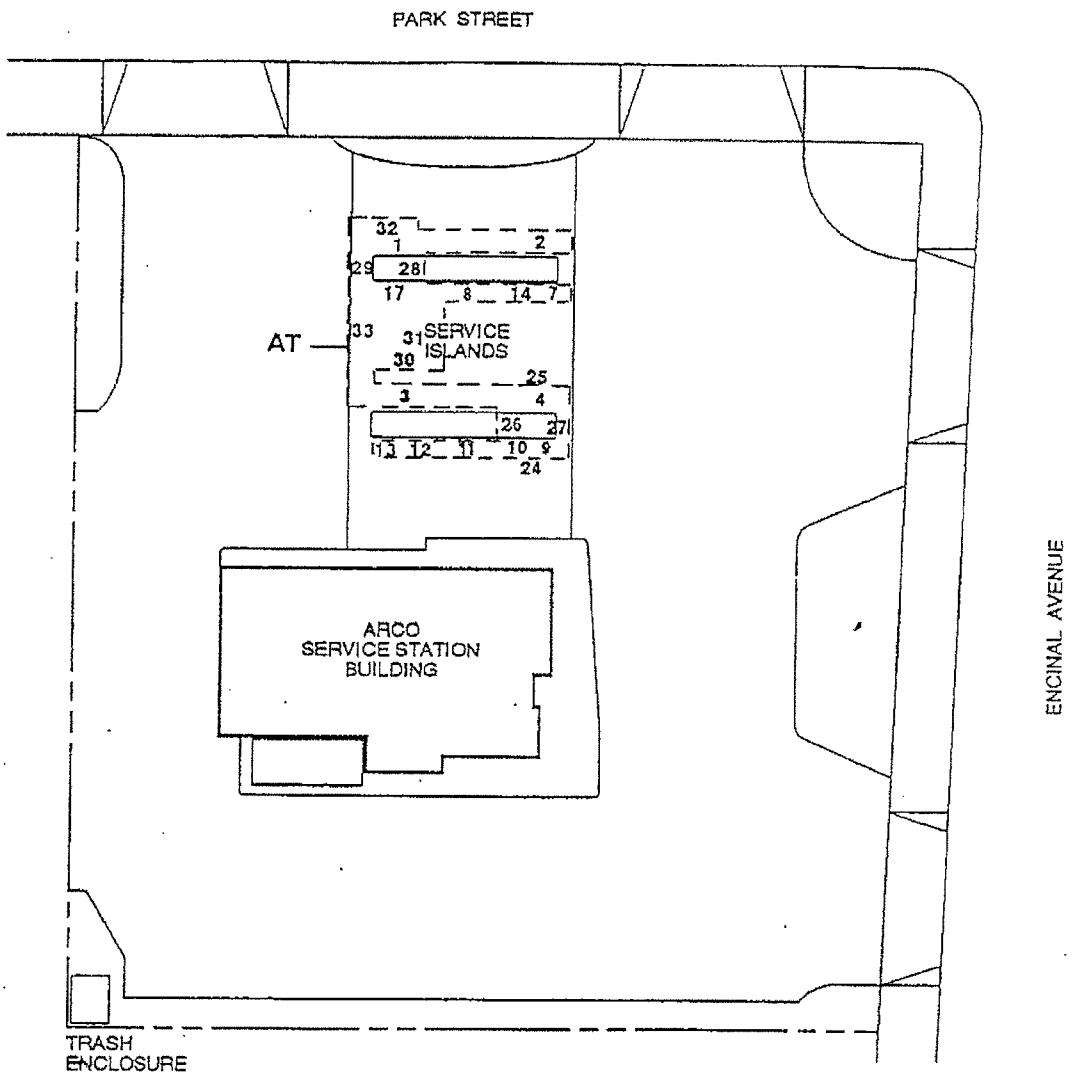
TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPM = Parts Per Million

Notes: 1. All data shown as <x are reported as ND (none detected).
2. BTEX data analyzed on August 17, 1990 by Superior are reported in micrograms per kilograms.
3. The last number of the Sample I.D. corresponds to the approximate depth below existing grade that the sample was collected. AT-1 and AT-3 were collected at 3.5 feet below existing grade. AT-2 and AT-4 were collected at 2.5 feet below existing grade.
4. For sample locations, see Plate 4.

TABLE 2

SOIL ANALYTICAL DATA
(TRENCHING)

SAMPLE I.D.	SAMPLE DATE	ANALYZED DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
AT-13-2.5	15-Aug-90	17-Aug-90	<1	<0.003	<0.003	<0.003	<0.003
AT-14-2.5	15-Aug-90	17-Aug-90	250	0.019	0.032	0.110	3.0
AT-14-7	23-Aug-90	24-Aug-90	1.9	0.025	0.034	0.026	0.25
AT-17-8.5	20-Aug-90	28-Aug-90	5800.	51.	330.	100.	560.
AT-24-5	22-Aug-90	29-Aug-90	<1.	<0.005	<0.005	<0.005	<0.005
AT-25-5	22-Aug-90	28-Aug-90	<1.	<0.008	<0.008	<0.008	<0.008
AT-26-5	22-Aug-90	28-Aug-90	890.	<1.	1.6	2.5	38.
AT-27-5	22-Aug-90	28-Aug-90	<1.	<0.005	<0.005	<0.005	0.006
AT-28-5	23-Aug-90	28-Aug-90	4600.	<2.	46.	56.	460.
AT-29-5	23-Aug-90	27-Aug-90	<1.	<0.005	<0.005	<0.005	<0.005
AT-30-5	23-Aug-90	24-Aug-90	<1.0	<0.005	<0.005	<0.005	<0.005
AT-31-5	23-Aug-90	29-Aug-90	<1.	<0.005	<0.005	<0.005	0.007
AT-32-5	24-Aug-90	28-Aug-90	<1.	<0.005	<0.005	<0.005	<0.005
AT-33-5	24-Aug-90	28-Aug-90	<1.	<0.005	0.008	<0.005	0.009



EXPLANATION

AT — Trench excavation and designation

1 — Sample location and designation

N

COPY

0 30 60

Scale in Feet

GeoStrategies Inc.

Trench Soil Sample Map
ARCO Service Station #2112
1260 Park Street
Alameda, California

PLATE 4

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7920	CWP CEG 1202	10/90		

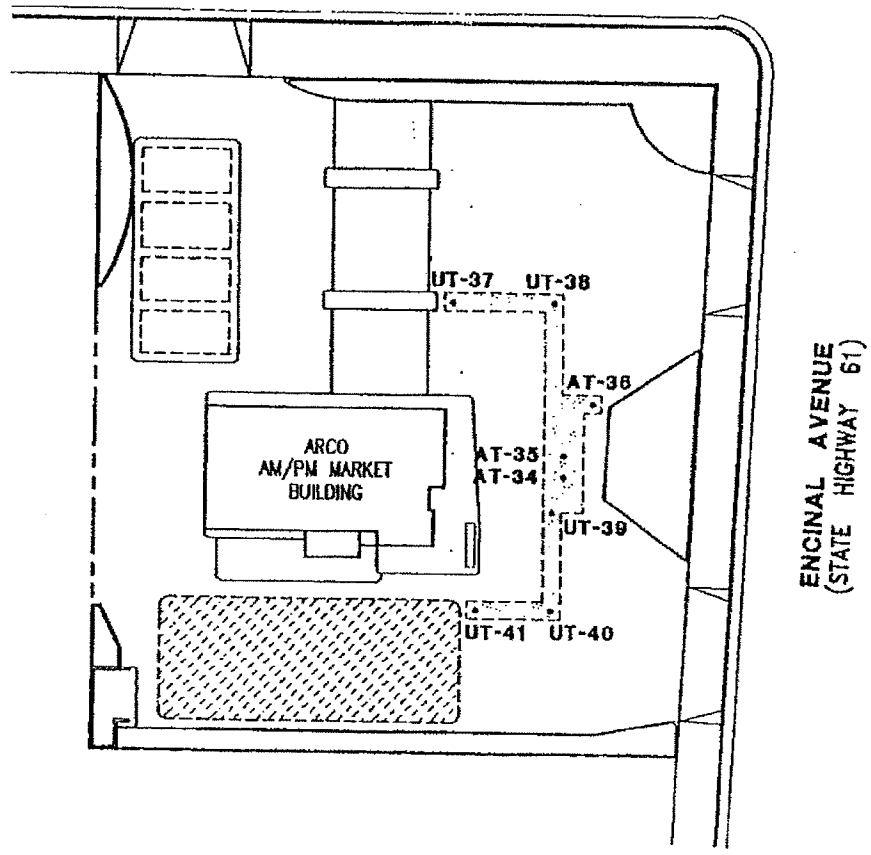
TABLE 1

SOIL ANALYTICAL DATA
(Trench Samples)

SAMPLE NO	DEPTH (FT)	SAMPLE DATE	ANALYSIS DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
AT-34	3.0	25-Oct-90	25-Oct-90	<1.0	<0.003	<0.003	<0.003	<0.003
AT-35	3.0	25-Oct-90	25-Oct-90	<1.0	<0.003	<0.003	<0.003	<0.003
AT-36	3.0	25-Oct-90	25-Oct-90	15000	71	710	200	1300
UT-37	4.0	05-Mar-91	08-Mar-91	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
UT-38	4.0	05-Mar-91	08-Mar-91	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
UT-39	4.0	05-Mar-91	08-Mar-91	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
UT-40	3.5	05-Mar-91	08-Mar-91	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
UT-41	3.5	05-Mar-91	08-Mar-91	<1.0	<0.0050	<0.0050	<0.0050	<0.0050

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPM = Parts Per Million

Notes: 1. BTEX for samples AT-34 through AT-36 were reported in parts per billion (ppb).
2. All data shown as <x are reported as ND (none detected).



EXPLANATION

- Trench Samples
- Approximate location of trench
- Soil Stockpile

COPY

Base Map: ARCO Site Plans dated 3-19-86 and 2-21-90

0 40

Scale in Feet

GeoStrategies Inc.

SOIL SAMPLING MAP
ARCO Service Station #2112
1260 Park Street
Alameda, California

PLATE 3

JOB NUMBER 792001-3

REVIEWED BY DHP

DATE 3/91

REVISED DATE

TABLE 1

SOIL ANALYSES DATA

SAMPLE NO	SAMPLE DATE	ANALYZED DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
AV-1-5.5	23-Sep-91	04-Oct-91	<1.0	<0.005	<0.005	<0.005	<0.005
AV-1-11	23-Sep-91	05-Oct-91	2,900	<5.0	12	6.0	34
AV-2-6	24-Sep-91	04-Oct-91	<1.0	<0.005	<0.005	<0.005	<0.005
AV-2-11	24-Sep-91	04-Oct-91	<1.0	<0.005	<0.005	<0.005	<0.005
AV-3-6.5	25-Sep-91	05-Oct-91	<1.0	<0.005	<0.005	<0.005	<0.005
AV-3-11.5	25-Sep-91	05-Oct-91	540	5.3	12	7.6	35
A-1-5	25-Sep-91	04-Oct-91	<1.0	<0.005	<0.005	<0.005	<0.005
A-1-11	25-Sep-91	05-Oct-91	730	6.4	24	11	56
A-2-12	24-Sep-91	04-Oct-91	<1.0	0.038	0.038	0.038	0.038
A-3-11.5	24-Sep-91	04-Oct-91	<1.0	<0.005	<0.005	<0.005	<0.005
A-4-11	25-Sep-91	04-Oct-91	<1.0	<0.005	<0.005	<0.005	<0.005

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPM = Parts Per Million

Note: 1. All data shown as <x are reported as ND (none detected).

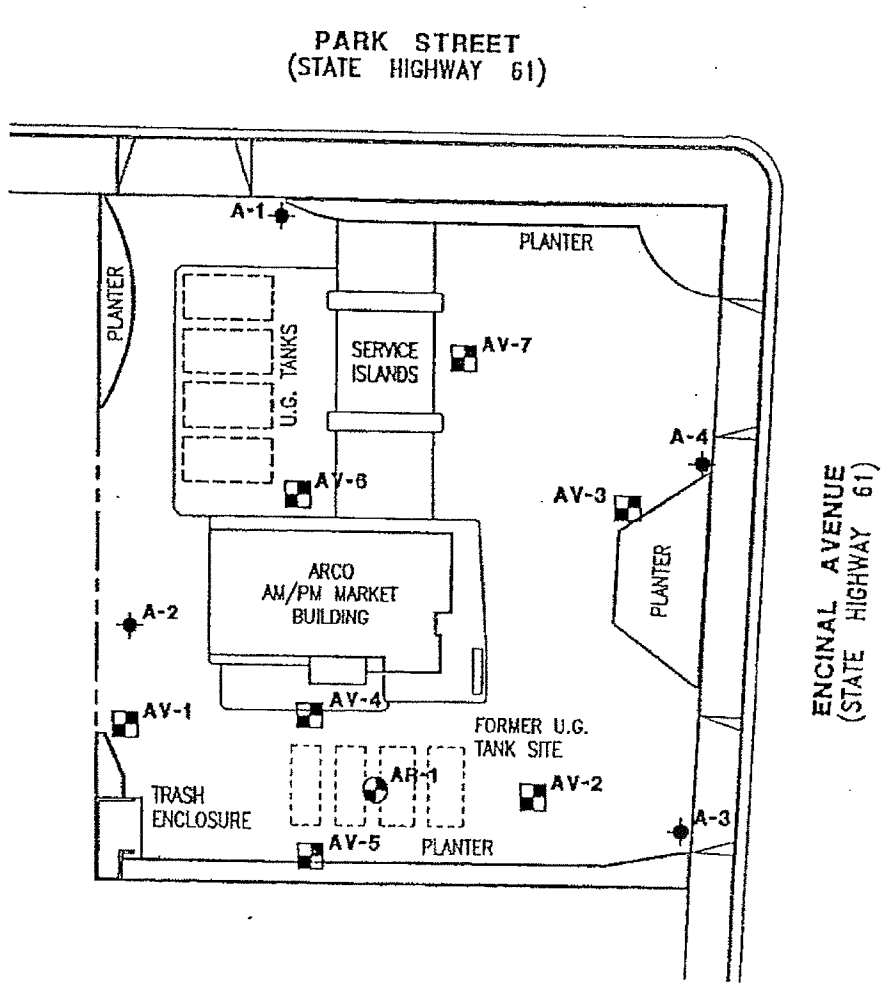
TABLE 2

SOIL ANALYSES DATA

SAMPLE NO	SAMPLE DATE	ANALYZED DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
AV-4-10.5	02-Jan-92	06-Jan-92	21,000	190	860	290	1,700
AV-5-10.5	02-Jan-92	06-Jan-92	<1	0.0070	0.018	0.0060	0.031
AV-6-10.5	02-Jan-92	06-Jan-92	<1	<0.0050	<0.0050	<0.0050	<0.0050
AV-7-10.5	02-Jan-92	06-Jan-92	<1	<0.0050	<0.0050	<0.0050	<0.0050

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPM = Parts Per Million

Note: 1. All data shown as <x are reported as ND (not detected).



EXPLANATION

- Ground-water monitoring well
- Ground-water recovery well
- Vapor extraction well

COPY

Base Map: ARCO Site Plans dated 3-19-86 and 2-21-90

0 40

Scale in Feet

GeoStrategies Inc.

SITE PLAN
ARCO Service Station #2112
1260 Park Street
Alameda, California

PLATE 2

JOB NUMBER 792005-5

REVIEWED BY

DATE 2/92

REVISED DATE

TABLE 1

SOIL SAMPLE ANALYTICAL RESULTS

ARCO Service Station No. 2112
1260 Park Street
Alameda, California

Sample ID	Date Sampled	Depth (ft)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total Xylenes (mg/kg)	TPHg (mg/kg)	MTBE (mg/kg)	Lead (mg/kg)
Product Line Samples									
PL-1	07/31/01	3.7	<0.025	<0.025	<0.025	<0.025	<5.0	<0.25	<10
PL-2	07/31/01	4.6	<0.025	<0.025	<0.025	<0.025	<5.0	<0.25	<10
PL-3	07/31/01	4.8	0.32	15	15	94.0	1400	2.6	<10
PL-4	07/31/01	3.6	<0.025	<0.025	<0.025	<0.025	<5.0	<0.25	<10
									<10
Dispenser Samples									
DP-1	07/31/01	3.3	<0.025	<0.025	<0.025	<0.025	<5.0	<0.25	<10
DP-2	07/31/01	4.3	<0.025	<0.025	<0.025	<0.025	<5.0	<0.25	<10
DP-3	07/31/01	4.6	<0.025	<0.025	<0.025	0.120	<5.0	0.58	<10
DP-4	07/31/01	3.5	<0.025	<0.025	<0.025	<0.025	<5.0	<0.25	<10
UST Samples									
UST-1	07/31/01	3	2.4	31	17	110	1400	11	<10
UST-2	07/31/01	3	<0.025	0.060	0.036	0.32	6.3	<0.25	<10
Over-excavation									
PL-3	08/07/01	9	<0.050	0.075	0.072	0.45	<10	11	<10
Soil Stockpile Results									
SP-1,2,3,4	07/31/01		<0.025	0.050	0.05	0.47	11	NA	11
SP-5,6,7,8	08/07/01		0.070	0.16	0.14	5.2	35	NA	<10

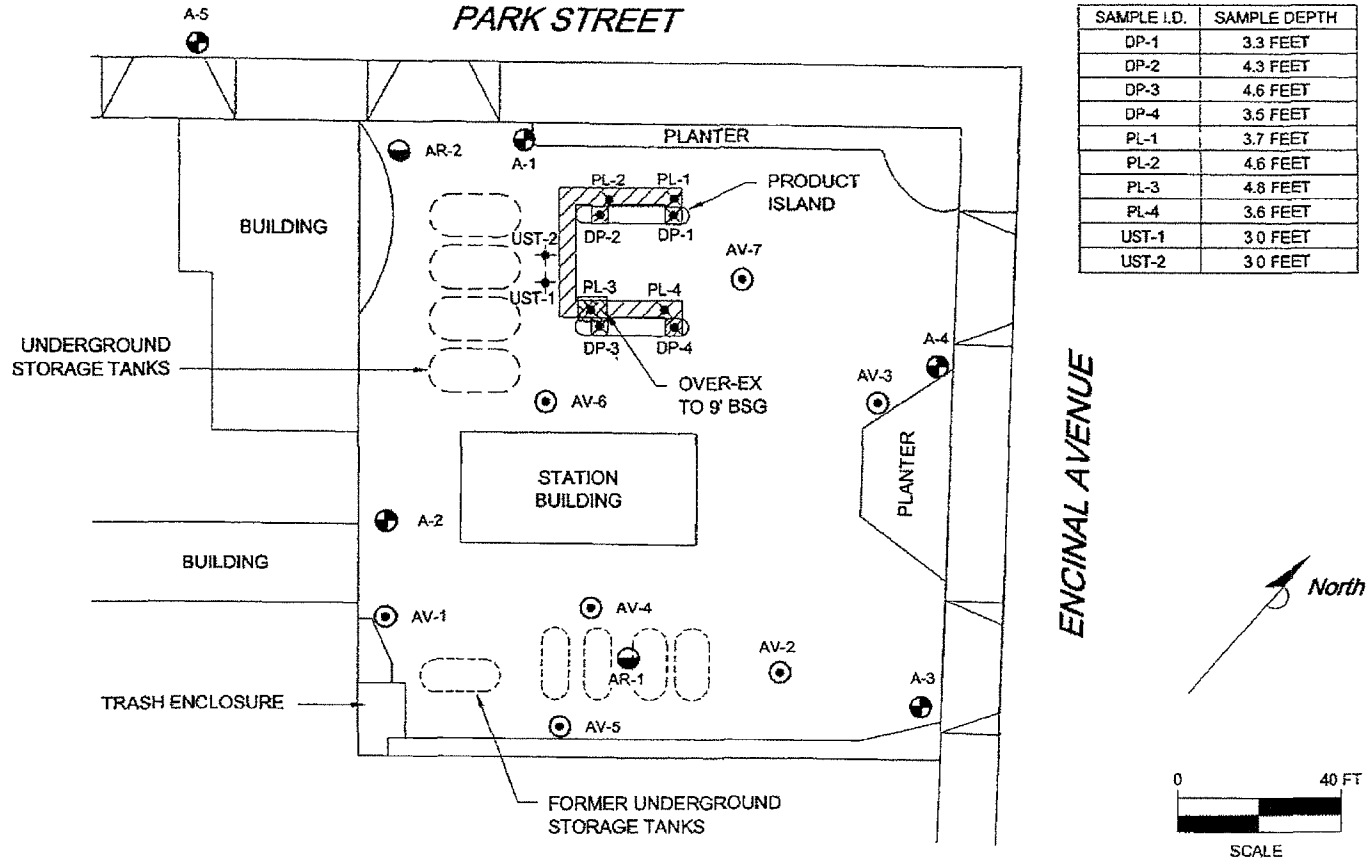
TPHg = Total Petroleum Hydrocarbons as gasoline (C6-C12)

MTBE = Methyl tertiary butyl ether analyzed by EPA Method 8021B unless otherwise noted

µg/L = Micrograms per liter

NA = Not Analyzed

N/A = Not Applicable



DISPENSER PUMP & PRODUCT LINES

SAMPLE I.D.	SAMPLE DEPTH
DP-1	3.3 FEET
DP-2	4.3 FEET
DP-3	4.6 FEET
DP-4	3.5 FEET
PL-1	3.7 FEET
PL-2	4.6 FEET
PL-3	4.8 FEET
PL-4	3.6 FEET
UST-1	3.0 FEET
UST-2	3.0 FEET

LEGEND:

- A-1 — MONITORING WELL LOCATION
- AR-1 — GROUND WATER EXTRACTION WELL LOCATION
- AV-1 — VAPOR EXTRACTION WELL LOCATION
- UST-1 — TANK BASIN SOIL SAMPLE LOCATIONS
- PL-1 — FORMER PRODUCT LINE/ DISPENSER PUMP SOIL SAMPLE LOCATIONS
- PRODUCT LINE EXCAVATION TRENCH

FIGURE 2
SOIL SAMPLE LOCATION MAP

ARCO SERVICE STATION NO. 2112
1260 PARK STREET
ALAMEDA, CALIFORNIA

PROJECT NO D000-307	DRAWN BY TLA 9/24/01
FILE NO. 2112-1	PREPARED BY TLA
REVISION NO 2	REVIEWED BY

Delta Environmental Consultants, Inc.

\\Sacramento\CAD Files\Sacramento\ARCO\2112\2112-1.dwg

analytical results (EDF) were uploaded to the GeoTracker AB2886 database. Upload confirmation pages are provided in Appendix C.

Soil Samples - Laboratory Analytical Results (mg/kg)

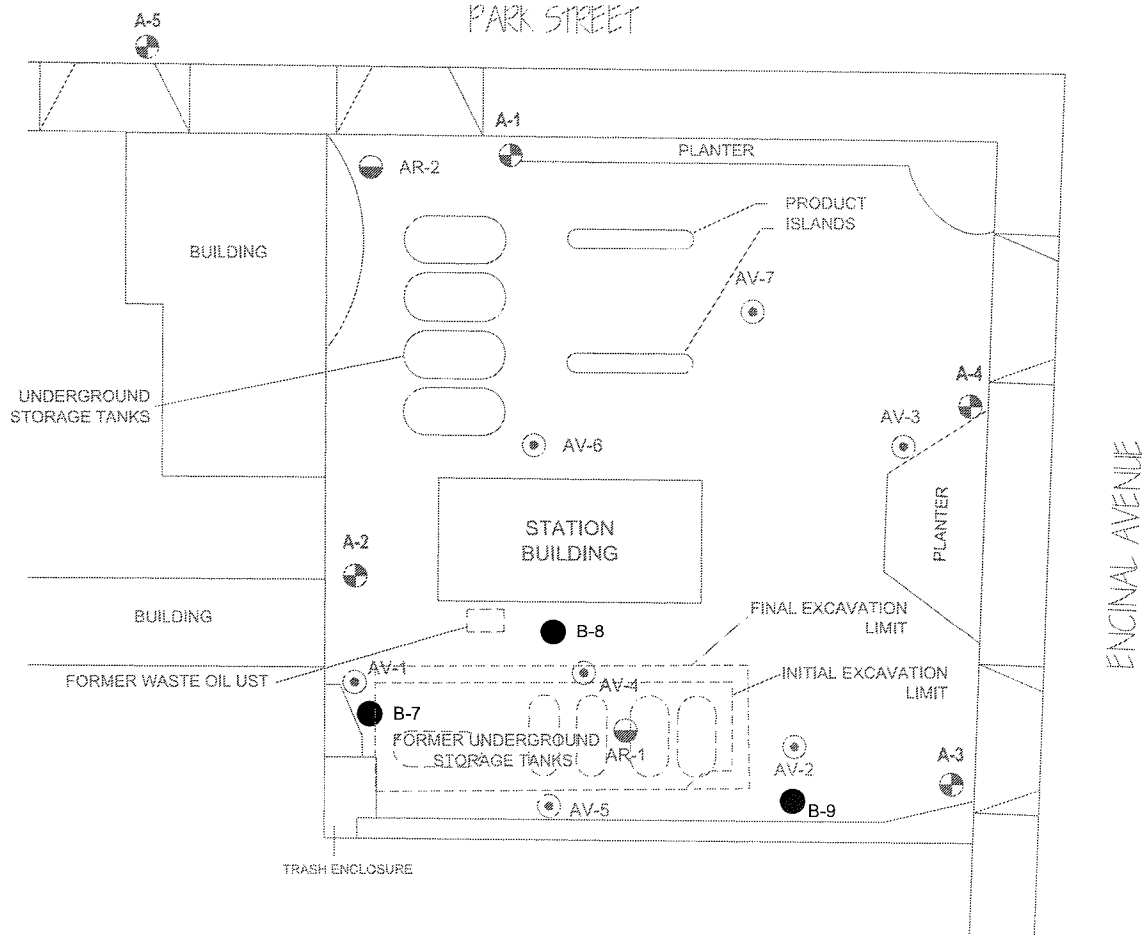
Sample ID	GRO	Benzene	Toluene	Ethylbenzene	Xylenes
B-7 5'	<0.50	<0.001	<0.001	<0.001	<0.001
B-7 8'	<0.50	<0.001	<0.001	<0.001	<0.001
B-7 11'	**2.8**	<0.10	<0.10	**0.14**	<0.10
B-7 14'	**8.6**	<0.001	**0.0016**	**0.0063**	**0.04**
B-8 5'	<0.50	<0.001	<0.001	<0.001	<0.001
B-8 8'	<0.50	<0.001	<0.001	<0.001	**0.0015**
B-8 11'	**2,000**	**0.23**	**14**	**18**	**210**
B-8 14'	**3.2**	<0.001	**0.005**	**0.0044**	**0.031**
B-9 5'	**26**	<0.10	<0.10	**0.31**	**2.8**
B-9 8'	<0.50	<0.001	<0.001	<0.001	**0.0015**
B-9 11'	<0.50	<0.001	<0.001	<0.001	**0.0022**
B-9 14'	<0.50	<0.001	<0.001	<0.001	**0.0023**
ESLs	**100**	**0.12**	**9.3**	**2.3**	**11**

mg/kg – milligrams per kilogram
ESLs – Environmental Screening Levels for Residential Shallow Soil (less than 3 meters)

6.0 DISCUSSION OF FINDINGS

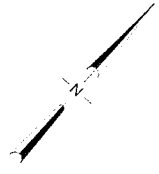
Observed results are summarized in the following bullet points:

- GRO was detected above the laboratory reporting limit in five of the 12 soil samples collected at concentrations up to 2,000 milligrams per kilogram (mg/kg) in sample B-8 11'.
- Benzene was detected above the laboratory reporting limit in one of the 12 samples at a concentration of 0.23 mg/kg in sample B-8 11'.
- Toluene was detected above the laboratory reporting limit in three of the 12 soil samples collected at concentrations up to 14 mg/kg in sample B-8 11'.
- Ethylbenzene was detected above the laboratory reporting limit in five of the 12 soil samples collected at concentrations up to 18 mg/kg in sample B-8 11'.
- Total xylenes were detected above the laboratory reporting limit in eight of the 12 soil samples collected at concentrations up to 210 mg/kg in sample B-8 11'.
- The remaining constituents analyzed for were not detected above their respective laboratory reporting limits in the 12 soil samples collected.
- GRO and BTEX concentrations exceeded the ESLs in sample B-8 11'. GRO and BTEX concentrations detected above laboratory reporting limits in the remaining 11 soil samples collected were below the established ESLs.



LEGEND:

- A-1 MONITORING WELL LOCATION
- AR-1 GROUND-WATER EXTRACTION WELL LOCATION
- AV-1 VAPOR EXTRACTION WELL LOCATION
- B-9 BORING LOCATION
- EXCAVATED AREA



0 40 80

SCALE (ft)

BROADBENT & ASSOCIATES, INC.

ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
1324 Mangrove Ave. Suite 212, Chico, California 95926

Project No.: 06-88-616 Date: 4/30/09

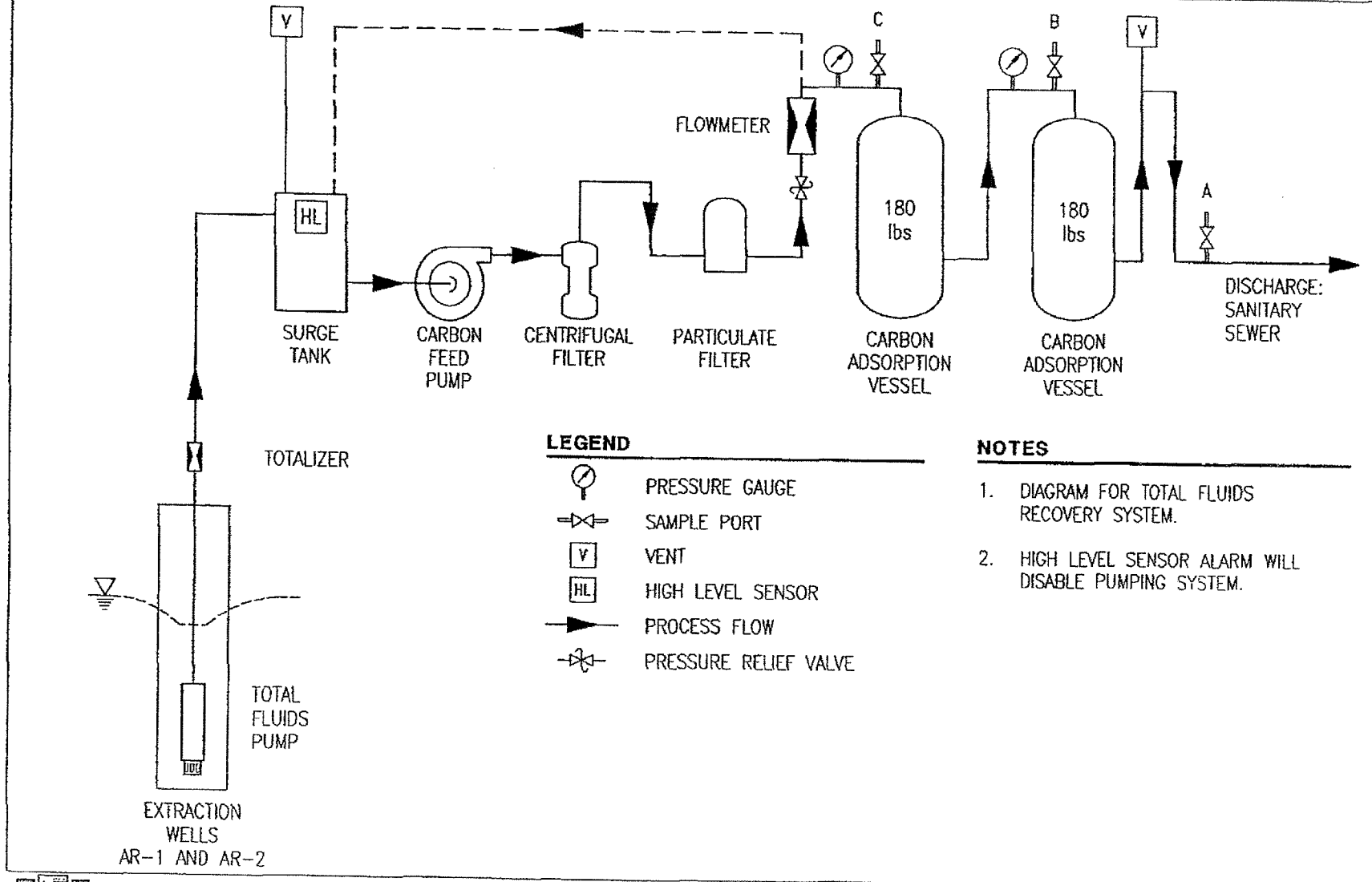
Station #2112
1260 Park Street
Alameda, California

Site Map with Soil Boring Locations and Excavation Limits

Drawing 2

APPENDIX D

GROUNDWATER AND SOIL VAPOR EXTRACTION PERFORMANCE DATA

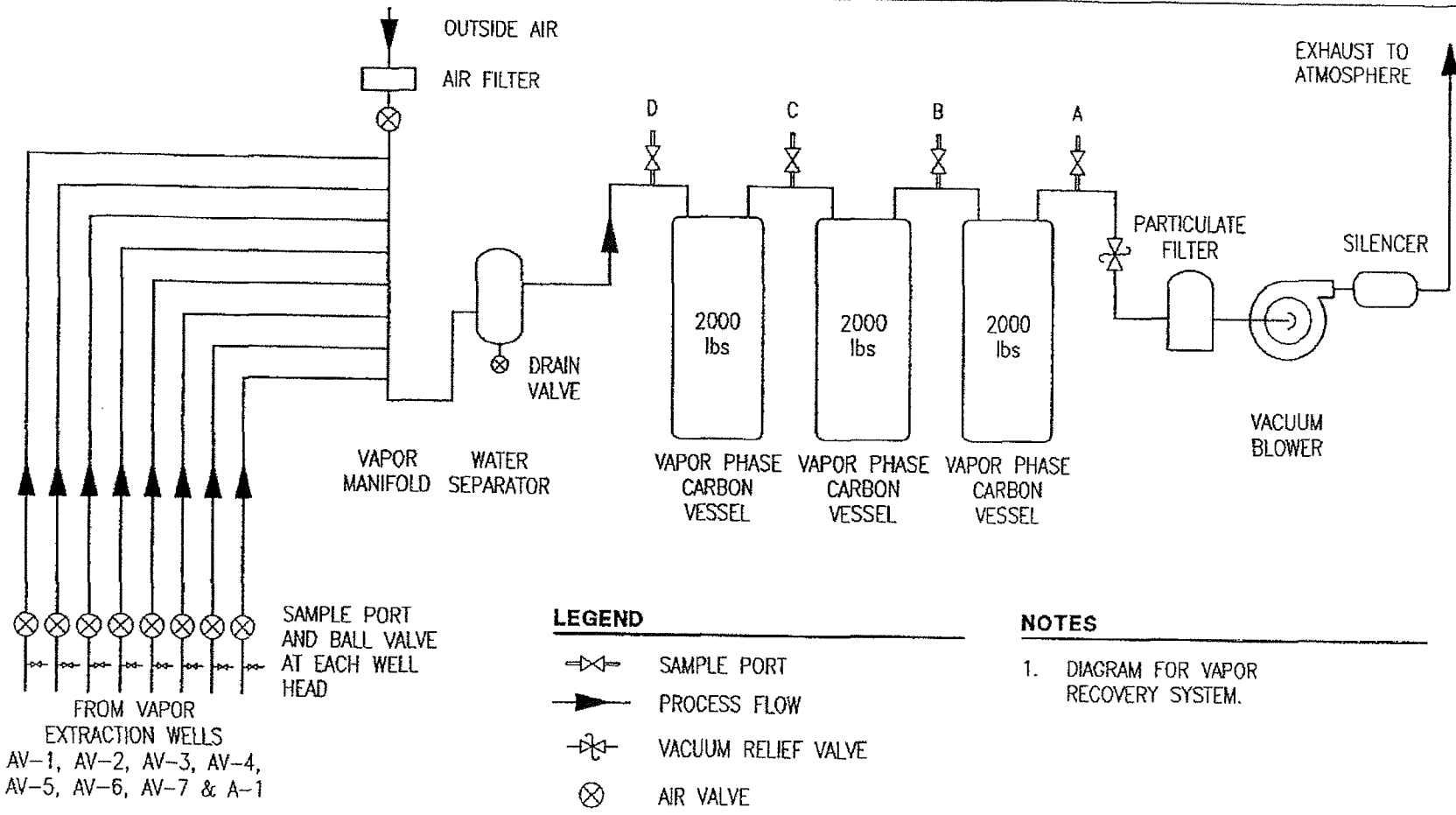


GeoStrategies Inc.

GROUNDWATER SYSTEM PROCESS FLOW DIAGRAM
ARCO Service Station #2112
1260 Park Street
Alameda, California

PLATE 3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7920	BS	6/93	



GeoStrategies Inc.

VAPOR SYSTEM PROCESS FLOW DIAGRAM
ARCO Service Station #2112
1260 Park Street
Alameda, California

PLATE 4

JOB NUMBER 7920

REVIEWED BY BS

DATE 6/93

REVISED DATE

TABLE 4
GROUNDWATER TREATMENT SYSTEM SAMPLING DATA
ARCO Station 2112
Alameda, California

SAMPLE POINT	SAMPLE DATE	SAMPLE TIME	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)	pH	CONDUCTIVITY (umhos)	TEMP. (C)
A	15-Jul-93	14:02	<50	<0.50	<0.50	<0.50	<0.50	---	---	---
A	23-Aug-93	12:15	<50	<0.50	<0.50	<0.50	<0.50	6.80	832	28.6
A	15-Sep-93	14:20	<50	<0.50	<0.50	<0.50	<0.50	7.20	1000	22.6
B	15-Jul-93	14:05	<50	<0.50	<0.50	<0.50	<0.50	---	---	---
B	23-Aug-93	12:20	<50	<0.50	<0.50	<0.50	<0.50	6.69	835	31.8
B	15-Sep-93	14:25	<50	<0.50	<0.50	<0.50	<0.50	7.25	1070	23.5
C	15-Jul-93	14:08	58	7.5	0.57	3.0	5.1	---	---	---
C	23-Aug-93	12:25	<50	<0.50	<0.50	<0.50	<0.50	6.98	840	26.0
C	15-Sep-93	14:30	<50	3.5	<0.50	1.7	2.3	7.28	1060	23.0
TB	15-Jul-93	---	<50	<0.50	<0.50	<0.50	<0.50	---	---	---
TB	23-Aug-93	---	<50	<0.50	<0.50	<0.50	<0.50	---	---	---
TB	15-Sep093	---	<50	<0.50	<0.50	<050	<0.50	---	---	---

TPH-G = Total Petroleum Hydrocarbons Calculated as Gasoline
PPB = Parts Per Billion.
A = Effluent sample
B = Sample collected between carbon vessels
C = Influent sample
TB = Trip Blank

TABLE 5
GROUNDWATER TREATMENT SYSTEM FLOW/RECOVERY DATA
ARCO Station 2112
Alameda California

Reading Date	Flow Meter Reading (gallons)	Average Flowrates		Laboratory Results			Periodic Dissolved Hydrocarbon Recovery (lb)
		(gal/day)	(gal/min)	Port A TPH-G (ug/l)	Port B TPH-G (ug/l)	Port C TPH-G (ug/l)	
13-Jun-93	412,174	1204	0.84				
15-Jul-93	482,409	2195	1.52	<50	<50	58	0 03
23-Aug-93	525,121	1095	0.76	<50	<50	<50	0 01
15-Sep-93	551,379	1142	0.79	<50	<50	<50	0 00
Averages		1409	0.98				
Totals	139,205						0.04

Notes:
1. Flowrates based on flow meter readings and the number of days between readings.
2. TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline.
3. ug/l = micrograms per liter per billion (ppb).

TABLE 6
VAPOR TREATMENT SYSTEM SAMPLING DATA
ARCO Station 2112
Alameda, California

SAMPLE POINT	SAMPLE DATE	TPH-G (PPMV)	BENZENE (PPMV)	TOLUENE (PPMV)	ETHYLBENZENE (PPMV)	XYLENES (PPMV)
S-1 (Influent, Port D)	07-Sep-93	110	1.7	2.7	0.37	3.0
A1/A2 (Port C)	07-Sep-93	<2.3	<0.019	<0.016	<0.014	<0.014
A2/A3 (Port B)	07-Sep-93	<2.3	<0.019	<0.016	<0.014	<0.014
A-3 (Effluent, Port A)	07-Sep-93	<2.3	<0.019	<0.016	<0.014	<0.014

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline.
PPMV = Parts Per Million by Volume.

Carbon Adsorption
ARCO Station 2112
1260 Park St./Encinal
Alameda, CA

Table 7
Vapor Extraction System Performance

Date	Cumulative hours	Vapor Flow			Hydrocarbon Concentrations				Periodic Hydrocarbon Recovery			Total Periodic Flow
		Temp. (F)	Delta P (in H2O)	Flow (SCFM)	Port A3 (PPMV)	Port A2?A3 (PPMV)	Port A1/A2 (PPMV)	Port S-1 (PPMV)	Vessels A1 (pounds)	Vessels A2 (pounds)	Vessels A3 (pounds)	(SCF)
7-Jan-93	0	50	0.9	199	0	0	0	150	0.00	0.00	0.00	0
8-Jan-93	5	50	1.0	210	0	0	0	180	1.91	0.00	0.00	62,957
11-Jan-93	77	50	1.2	230	0	0	0	120	20.07	0.00	0.00	993,107
12-Jan-93	101	50	1.0	210	0	0	0	130	6.62	0.00	0.00	302,193
13-Jan-93	125	53	1.0	209	0	0	0	120	6.09	0.00	0.00	301,308
14-Jan-93	149	54	1.1	219	0	0	0	100	5.32	0.00	0.00	315,707
15-Jan-93	173	54	1.1	219	0	0	0	120	6.38	0.00	0.00	315,707
18-Jan-93	245	50	1.0	210	0	0	0	70	10.69	0.00	0.00	906,579
19-Jan-93	269	52	1.0	209	0	0	0	50	2.54	0.00	0.00	301,602
20-Jan-93	293	54	1.0	209	0	0	0	50	2.53	0.00	0.00	301,015
21-Jan-93	317	55	1.1	219	0	0	0	85	4.51	0.00	0.00	315,400
22-Jan-93	341	55	1.0	209	0	0	0	40	2.03	0.00	0.00	300,722
5-Feb-93	605	58	0.95	203	0	0	0	55	29.77	0.00	0.00	3,214,837
18-Feb-93	917	58	1.0	208	0	0	0	37	24.29	0.00	0.00	3,898,054
12-Mar-93	1445	62	1.1	218	0	14	30	50	23.21	18.57	16.25	6,892,124
25-Mar-93	1446	63	1.05	212	0	0	0	79	0.17	0.00	0.00	12,741
20-May-93	1998	64	0.85	179	0	0	0	26	25.99	0.00	0.00	5,937,228
3-Sep-93	1998	70	0.82	174	0	0	0	300	0.00	0.00	0.00	0
7-Sep-93	2094	72	0.82	177	0	0	0	110	18.84	0.00	0.00	1,017,296
3rd Quarter 1993	96								18.84	0.00	0.00	1,017,296
Total	2094								190.96	18.57	16.25	25,388,576
Averages				206				99				

PPMV = parts per million by volume.
SCFM = standard cubic feet per minute.

Notes:
1) Cumulative hours calculated from dates given on field logs.
2) Total hydrocarbons captured by all three carbon vessels = 225.8 pounds
3) A molecular weight of 65 was used to calculate hydrocarbon recovery.

Table D-1
Groundwater Extraction System Performance Data

ARCO Service Station 2112
1260 Park Street at Encinal Avenue
Alameda, California

Sample I.D.	Date Sampled	Totalizer Reading (gallons)	Net Volume (gallons)	Average Flow Rate (gpm)	TPPH as Gasoline: Influent Concentration (µg/L)	TPPH as Gasoline: Net Removed (lbs)	TPPH as Gasoline: Removed to Date (lbs)	Benzene: Influent Concentration (µg/L)	Benzene: Net Remove (lbs)	Benzene: Removed to Date (lbs)	Primary Carbon Loading (percent)
INFL	06/28/94	741,520	N/A	1.3	ND	0.00	0.80	ND	0.000	0.133	1.0
INFL	11/04/94 a	782,881	41,361	N/A	ND	0.00	0.80	ND	0.000	0.133	1.0
INFL	03/07/95 b	804,954	22,073	N/A	NS	0.00	0.80	NS	0.000	0.133	1.0
INFL	04/20/95	826,131	21,177	0.5	ND	0.00	0.80	ND	0.000	0.133	1.0
INFL	05/03/95	836,000	9,869	0.5	NS	0.00	0.80	NS	0.000	0.133	1.0
INFL	06/06/95	895,000	82,000	1.3	NS	0.00	0.80	NS	0.000	0.133	1.0
INFL	07/06/95 c	945,200	47,200	1.1	74	0.01	0.81	13	0.003	0.135	1.0
INFL	08/03/95 d	945,200	0	0.0	ND	0.00	0.81	3.5	0.000	0.135	1.0
REPORTING PERIOD: 01/01/96 - 03/31/96											
TOTAL POUNDS REMOVED:							0.81			0.135	
TOTAL GALLONS REMOVED:							0.13			0.018	
PERIOD POUNDS REMOVED:						0.00			0.000		
PERIOD GALLONS REMOVED:						0.00			0.000		
TOTAL GALLONS EXTRACTED:					945,200						
PERIOD GALLONS EXTRACTED:					0						
PERIOD AVERAGE FLOW RATE (gpm):					N/A						

TPPH = Total purgeable petroleum hydrocarbons
gpm = Gallons per minute
µg/L = Micrograms per liter
lbs = Pounds
N/A = Not available or not applicable
ND = Not detected above the detection limit
NS = Not sampled (system influent sampled quarterly in January, April, July, and August)
a. System shut down for repair by Pacific Environmental Group, Inc. on November 4, 1994.
b. System restarted March 7, 1995; continuous operation began on this date.
c. GWE system shut down for pulsing.
d. GWE system re-started for sampling, then temporarily shut down August 3, 1995.
Mass removed is an approximation calculated using averaged concentrations.
Pounds of hydrocarbons removed to date provided by prior consultant, GeoStrategies Incorporated.
Prior to June 1995, TPPH as gasoline was reported as TPH as gasoline.
See certified analytical reports for detection limits.

Table D-2
Soil Vapor Extraction System Performance Data

ARCO Service Station 2112
1260 Park Street at Encinal Avenue
Alameda, California

Sample I.D.	Date Sampled	Hourmeter Reading (hours)	Hours of Operation (hours)	Vacuum (" H20)	Flow Rate (scfm)	TPPH as Gasoline: Influent Concentration (ppmv)	TPPH as Gasoline: Removal Rate (lbs/day)	TPPH as Gasoline: Removed to Date (lbs)	Benzene: Influent Concentration (ppmv)	Benzene: Removal Rate (lbs/day)	Benzene: Removed to Date (lbs)
INFL	11/04/94 a	N/A	N/A	N/A	210	N/A	N/A	276.7	N/A	N/A	0.18
INFL	11/14/94 a	N/A	15	65	210	38	8.0	278.5	0.72	0.05	0.22
INFL	11/16/94	N/A	38	42	210	54	4.3	284.4	0.89	0.06	0.30
INFL	11/17/94	N/A	12	42	290	43	4.7	286.7	0.46	0.04	0.32
INFL	11/30/94	N/A	39	40	240	28	2.6	292.6	0.37	0.03	0.38
INFL	12/02/94 b	N/A	36	50	240	28	2.6	296.4	ND	0.00	0.40
INFL	01/11/95 c	N/A	0	27	100	11	0.4	296.4	ND	0.00	0.40
INFL	02/02/95 d	N/A	528	36.5	170	20	0.3	304.2	ND	0.00	0.40
INFL	04/12/95 e	N/A	0	3.5 f	190	26	1.9	304.2	0.22	0.01	0.40
INFL	04/20/95	N/A	192	3.0 f	200	3.9	0.8	312.7	ND	0.00	0.45
INFL	05/03/95	0.0 g	312	4.0 f	200	ND	0.0	314.3	ND	0.00	0.45
INFL	06/06/95	764.0	764	44	210	5.9	0.5	321.6	0.092	0.01	0.55
INFL	07/06/95 h	1,201.7	438	45	210	12	0.9	334.6	0.092	0.01	0.66
INFL	08/03/95 i	1,203.3	2	43	215	11	0.9	334.6	0.18	0.01	0.66
REPORTING PERIOD: 01/01/66 - 03/31/96											
TOTAL POUNDS REMOVED:								334.6			0.66
TOTAL GALLONS REMOVED:								54.9			0.09
PERIOD POUNDS REMOVED:							0.0			0.00	
PERIOD GALLONS REMOVED:							0.0			0.00	
PERIOD AVERAGE FLOW RATE:					N/A						
TOTAL HOURS OF OPERATION:					2,375						

TPPH = Total purgeable petroleum hydrocarbons
" H20 = Inches of water
scfm = Standard cubic feet per minute
ppmv = Parts per million by volume
lbs = Pounds
N/A = Not available or not applicable
ND = Not detected

a. System started, run approx. 7 hours 11/4/94 by PACIFIC; restarted on 11/14/94.
b. System shut down pending the BAAQMDs approval of a monthly monitoring schedule.
c. System restarted with BAAQMD's approval to monitor the system on a monthly basis.
d. System down; performance values estimated by averaging two previous values.
e. System restarted on 4/12/95.
f. Vacuum measured in inches of mercury rather than inches of water.
g. Hourmeter installed 5/3/95 (initial reading = 0.0 hours).
h. SVE system shut down for pulsing.
i. SVE system restarted for sampling, then temporarily shut down 8/3/95.

Mass removed is an approximation calculated using averaged instantaneous mass removal rates.
Pounds of hydrocarbons removed to date provided by prior consultant, GeoStrategies Incorporated.
Timer disconnected on November 15, 1994; continuous operation during week initiated, shutdown weekends.
Prior to June 1995, TPPH as gasoline was reported as TPH calculated as gasoline.
See certified analytical reports for detection limits.

Table D-3
Soil Vapor Extraction Well Data

ARCO Service Station 2112
1260 Park Street at Encinal Avenue
Alameda, California

Date System Monitored	Well Number A-1 Status (O/C)	A-1 Vacuum (" H20) M	A-1 Vacuum (" H20) W	A-1 TPPH as Gasoline (ppmv)	A-1 Benzene (ppmv)	AV-1 Status (O/C)	AV-1 Vacuum (" H20) M	AV-1 Vacuum (" H20) W	AV-1 TPPH as Gasoline (ppmv)	AV-1 Benzene (ppmv)	AV-2 Status (O/C)	AV-2 Vacuum (" H20) M	AV-2 Vacuum (" H20) W	AV-2 TPPH as Gasoline (ppmv)	AV-2 Benzene (ppmv)	AV-3 Status (O/C)	AV-3 Vacuum (" H20) M	AV-3 Vacuum (" H20) W	AV-3 TPPH as Gasoline (ppmv)	AV-3 Benzene (ppmv)
11/15/94	O	68	68	180 *	N/A *	O	68	68	20 *	N/A *	O	68	66	ND *	N/A *	O	64	60	4.0 *	N/A *
11/16/94	O	40	N/A	N/A	N/A	O	40	N/A	N/A	N/A	O	40	N/A	N/A	N/A	O	40	N/A	N/A	N/A
11/17/94	O	40	N/A	N/A	N/A	O	40	N/A	N/A	N/A	O	40	N/A	N/A	N/A	O	40	N/A	N/A	N/A
12/01/95	O	40	N/A	N/A	N/A	O	40	N/A	N/A	N/A	O	40	N/A	N/A	N/A	O	40	N/A	N/A	N/A
12/02/95	O	40	N/A	200 *	N/A *	O	40	N/A	70 *	N/A *	O	40	N/A	15 *	N/A *	O	40	N/A	10 *	N/A *
01/11/95	O	37	N/A	6.1 +	0.06 +	O	37	N/A	ND +	ND +	O	36	N/A	ND +	ND +	O	36	N/A	ND +	ND +
04/20/95	O	48	48	14 +	0.15 +	O	48	48	ND +	ND +	O	48	48	ND +	ND +	O	48	48	ND +	ND +
05/03/95	O	55	46	35 *	N/A *	O	55	50	ND *	N/A *	O	55	50	ND *	N/A *	O	55	50	ND *	N/A *
06/06/95	O	43	40	55 *	N/A *	O	43	42	65 *	N/A *	O	43	42	6 *	N/A *	O	43	42	5.5 *	N/A *
07/06/95	O	45	41	50 +	ND +	O	45	43	6 +	0.03 +	O	45	43	ND +	ND +	O	45	43	16 +	0.2 +
08/03/95 a	O	43	39	11 *	N/A *	O	43	42	12 *	N/A *	O	43	42	10 *	N/A *	O	43	41	6 *	N/A *

Date System Monitored	Well Number AV-4 Status (O/C)	AV-4 Vacuum (" H20) M	AV-4 Vacuum (" H20) W	AV-4 TPPH as Gasoline (ppmv)	AV-4 Benzene (ppmv)	AV-5 Status (O/C)	AV-5 Vacuum (" H20) M	AV-5 Vacuum (" H20) W	AV-5 TPPH as Gasoline (ppmv)	AV-5 Benzene (ppmv)	AV-6 Status (O/C)	AV-6 Vacuum (" H20) M	AV-6 Vacuum (" H20) W	AV-6 TPPH as Gasoline (ppmv)	AV-6 Benzene (ppmv)	AV-7 Status (O/C)	AV-7 Vacuum (" H20) M	AV-7 Vacuum (" H20) W	AV-7 TPPH as Gasoline (ppmv)	AV-7 Benzene (ppmv)
11/15/94	O	64	62	300 *	N/A *	O	68	68	150 *	N/A *	O	64	64	60 *	N/A *	O	64	60	50 *	N/A *
11/16/94	O	40	N/A	N/A	N/A	O	40	N/A	N/A	N/A	O	40	N/A	N/A	N/A	O	40	N/A	N/A	N/A
11/17/94	O	40	N/A	N/A	N/A	O	40	N/A	N/A	N/A	O	40	N/A	N/A	N/A	O	40	N/A	N/A	N/A
12/01/95	O	40	N/A	N/A	N/A	O	40	N/A	N/A	N/A	O	40	N/A	N/A	N/A	O	40	N/A	N/A	N/A
12/02/95	O	40	N/A	175 *	N/A *	O	40	N/A	10 *	N/A *	O	40	N/A	15 *	N/A *	O	40	N/A	30 *	N/A *
01/11/95	O	33	N/A	3.7 +	0.22 +	O	36	N/A	0.03 +	ND +	O	35	N/A	3.0 +	0.31 +	O	35	N/A	165.5 +	ND +
04/20/95	O	48	N/A	26 +	0.04 +	O	48	48	ND +	ND +	O	48	46	ND +	ND +	O	48	46	5.9 +	ND +
05/03/95	O	55	N/A	N/A *	N/A *	O	55	47	ND *	N/A *	O	55	46	ND *	N/A *	O	55	46	10 *	N/A *
06/06/95	O	43	N/A	150 *	N/A *	O	43	40	20 *	N/A *	O	43	39	8 *	N/A *	O	43	40	8 *	N/A *
07/06/95	O	45	N/A	95 +	0.43 +	O	45	41	284 +	2 +	O	45	41	ND +	0.07 +	O	45	41	4 +	0.03 +
08/03/95 a	O	43	N/A	192 *	N/A *	O	43	40	21 *	N/A *	O	43	38	2 *	N/A *	O	43	39	3 *	N/A *

TPPH	= Total purgeable petroleum hydrocarbons	M	= Vacuum measured at manifold
O	= Valve open	W	= Vacuum measured at well head
C	= Valve closed	*	= Concentration readings obtained by flame-ionization detector (FID).
" H20	= Inches of water	+	= Air bag sampled analyzed by EPA Method 8015/8020.
ppmv	= Parts per million by volume; converted from micrograms per liter.	N/A	= Not available or not applicable
Pacific Environmental Group, Inc. startup 11/4/94; prior consultant was GeoStrategies Inc.		ND	= Not detected above the detection limit
Prior to June 1995, TPPH as gasoline was reported as TPH as gasoline.		a.	Remediation systems temporarily shut down 8/3/95.

Figure D-1
Groundwater Extraction System Mass Removal Trend

ARCO Service Station 2112
1260 Park Street at Encinal Avenue
Alameda, California

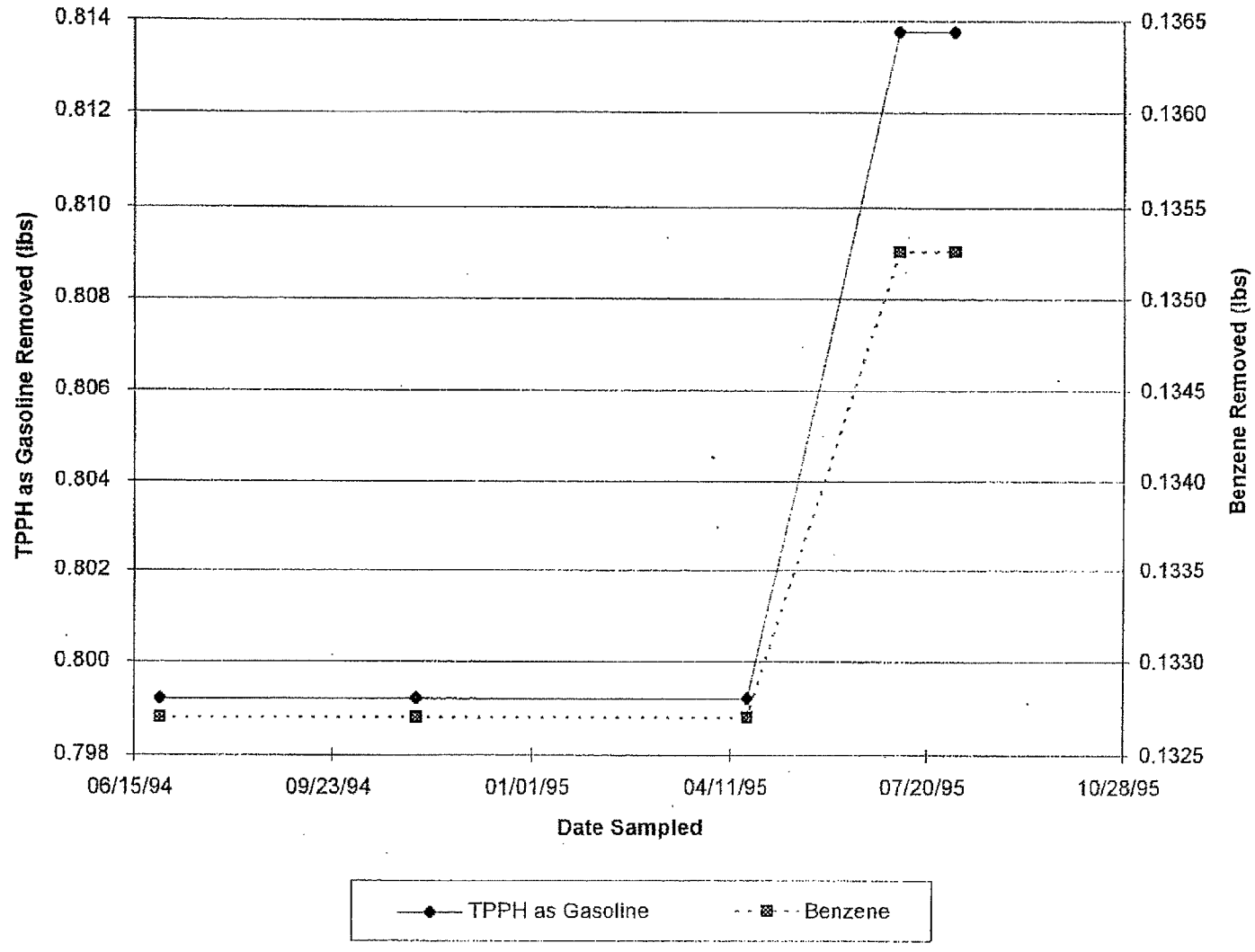


Figure D-2
Groundwater Extraction System Hydrocarbon Concentrations

ARCO Service Station 2112
1260 Park Street at Encinal Avenue
Alameda, California

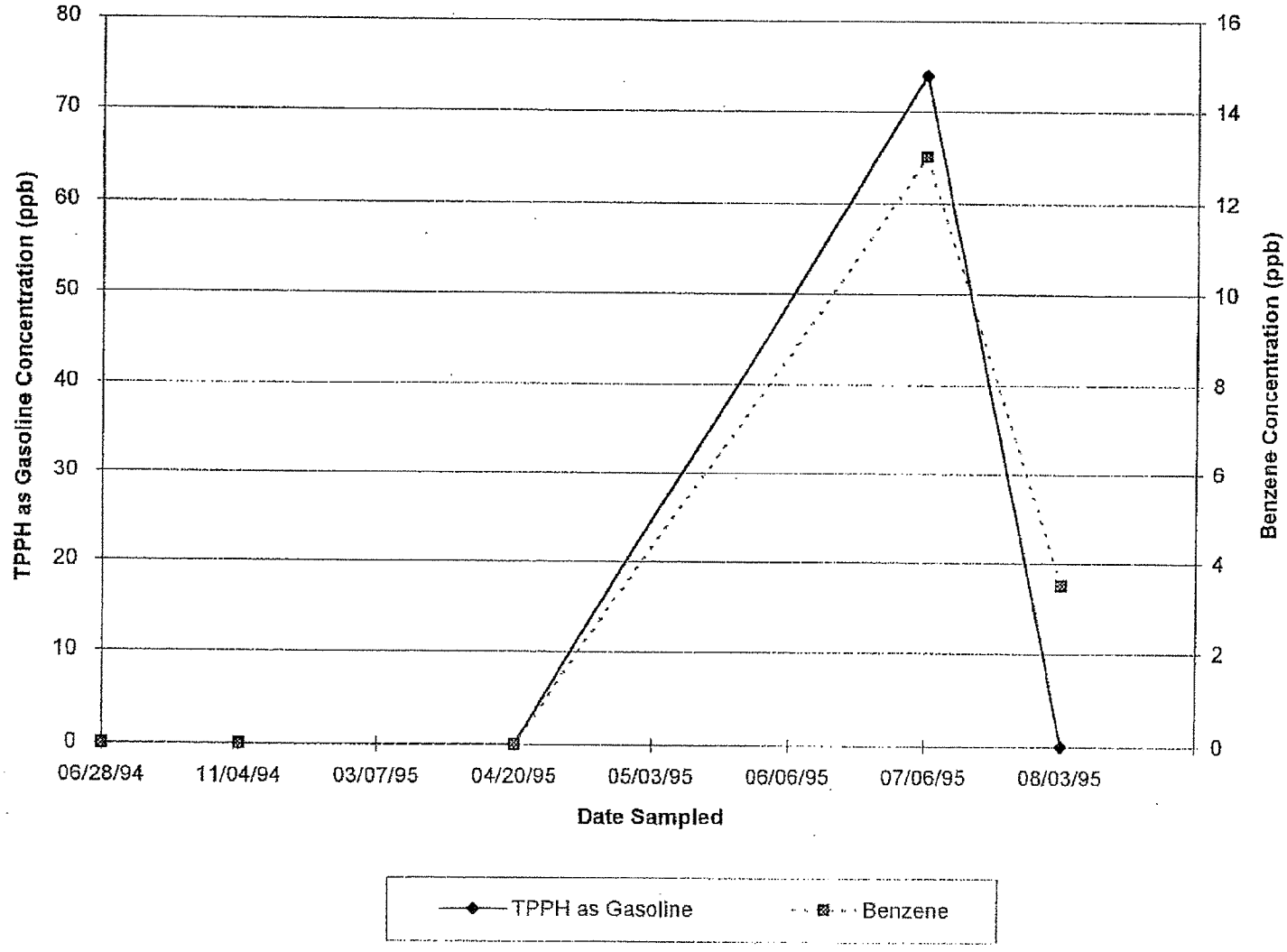


Figure D-3
Soil Vapor Extraction System Mass Removal Trend

ARCO Service Station 2112
1260 Park Street at Encinal Avenue
Alameda, California

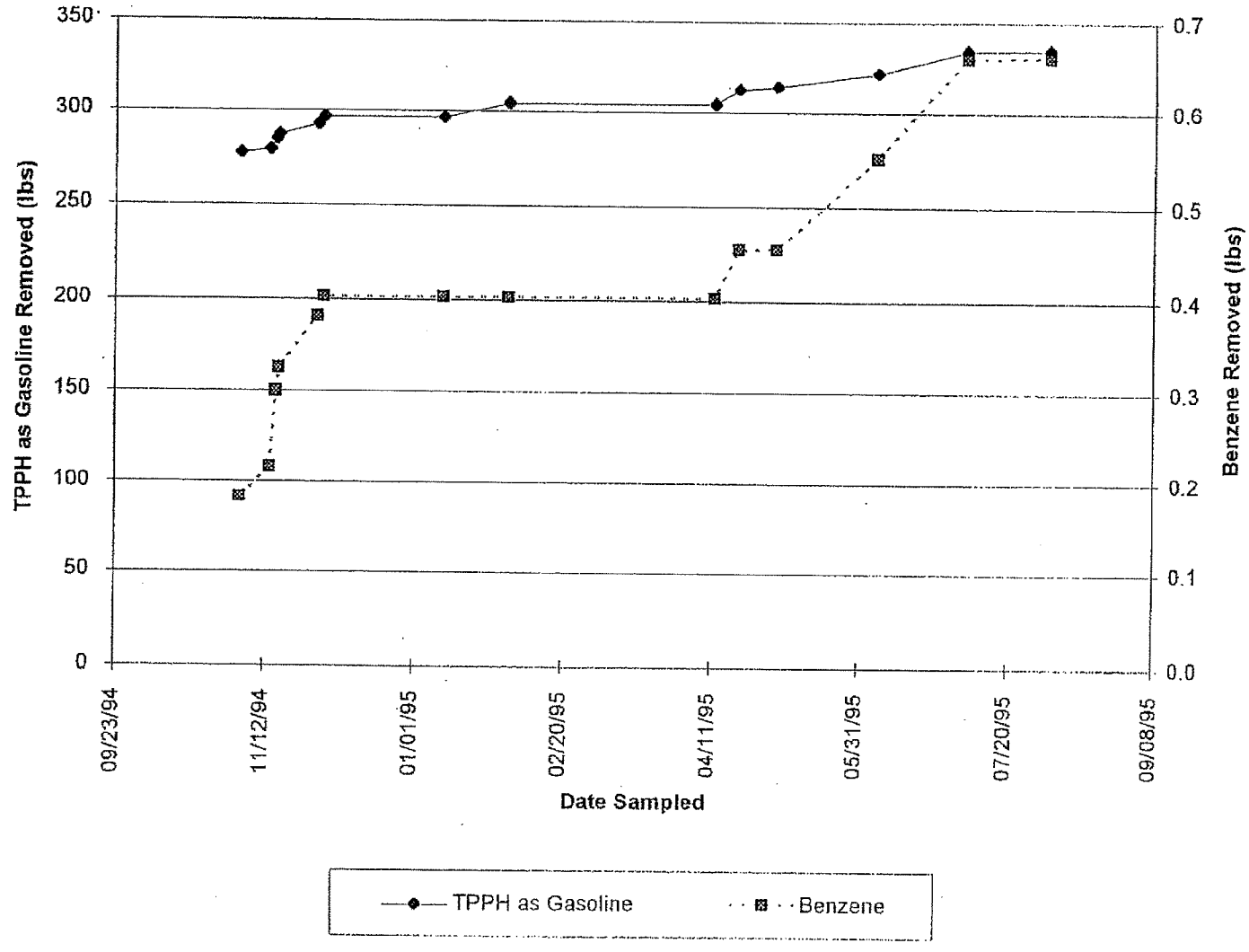


Figure D-4
Soil Vapor Extraction System Hydrocarbon Concentrations

ARCO Service Station 2112
1260 Park Street at Encinal Avenue
Alameda, California