ARCADIS
Infrastructure, environment, buildings

ARCADIS U.S., Inc.
100 Montgomery Street, Suite 300
San Francisco, CA 94104
Tel 415.374.2744
Fax 415.374.2745
www.arcadis-us.com

Work Plan Addendum for Additional Soil Characterization
Former BP Service Station #11266
1541 Park Street
Alameda, California
ACEH Case #RO0000318

ENVIRONMENT

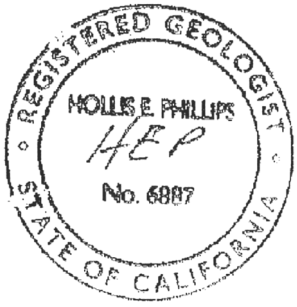
"I declare that to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached document are true and correct."

Date:
August 2, 2010

Submitted by:

ARCADIS U.S., Inc

Hollis E. Phillips, PG
Project Manager



Contact:
Hollis E. Phillips

Phone:
415.374.2744 ext 13

Email:
Hollis.phillips@arcadis-us.com

Our ref:
GP09BPNA.C001

ARCADIS
2033 North Main Street
Suite 340
Walnut Creek
California 94596
Tel 925.274.1100
Fax 925.274.1103
www.arcadis-us.com

ENVIRONMENT

Paresh Khatri
Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject:
Work Plan Addendum for Additional Soil Characterization
Former BP Service Station #11266
1541 Park Street
Alameda, California
ACEH Case #RO0000318

Date:
July 27, 2010

Contact:
Ben McKenna

Phone:
925.296.7857

Email:
Ben.McKenna@arcadis-us.com

Our ref:
GP09BPNA.C001

Dear Mr. Khatri:

ARCADIS U.S., Inc. (ARCADIS) has prepared this Work Plan Addendum to describe soil sampling activities associated with the former BP Service Station #11266 located at 1541 Park Street, Alameda, California ("Site") (Figure 1).

The objective of this investigation is to assess the extent of petroleum hydrocarbon impacts in the vicinity of historical boring C-1. The investigation activities described in this Work Plan include:

- Advancement of up to two soil borings (SB-01 through SB-02) and associated soil sampling;.
- Potentially installing two sub-slab soil vapor probes in lieu of the soil borings if sufficient safety concerns arise from the soil boring advancements and associated sampling;
- Prepare a report detailing the findings of the investigation activities.

Site Description

The Site is located on the Southwest corner of the intersection of Lincoln Avenue and Park Street in Alameda, California. The station is currently an operating 76-brand gasoline service station. Structures on the site include a service station building with three service bays and four pump islands and dispensers. Structures below ground surface on site consist of one 12,000 gallon and two 10,000 gallon double walled fiberglass gasoline underground storage tanks (USTs). A 1,000 gallon double-walled

fiberglass UST is used to store used oil. The first documented installation of USTs was 1987, during which previous USTs, whose installation date was not noted, were removed (BAI, 2009). The site surface is covered in asphalt and concrete with planters containing shrubs and trees along the property boundaries. The area around the Site is primarily commercial and retail.

Subsurface investigations and remedial activities have occurred on site since 1987. A summary of these activities was generated by a previous consultant; Broadbent & Associates, Inc. (BAI) (BAI, 2008). There are currently five on site monitoring wells (MW-1 through MW-5) and one offsite monitoring well (MW-6) located in the Southern lane of Lincoln Avenue. One recovery well (RW-1) is located on the Northern portion of the site.

Investigation History

Between 1992 and 1995, soil was excavated during the replacement of USTs, which were installed in 1987, and fuel dispensers and associated piping. Confirmation samples collected during excavation activities were reported with fuel related contaminants (total petroleum hydrocarbons as gasoline (TPH-g), benzene, toluene, ethybenzene and total xylenes (BTEX). A recovery well was installed and operated with pump and treat remediation from August 26, 1992 to October 1, 1994, but due to a lack of documentation, the volume of groundwater treated nor the amount of petroleum hydrocarbons removed is known (BAI, 2008). Alameda County Environmental Health Department (ACEH) requested that soil sampling be done in the vicinity of historical sample C-1, which had a detection of TPH-g and benzene at 3,200 milligrams per kilogram (mg/kg) and 81 mg/kg, respectively at 11.5 feet (ft) below ground surface (bgs).

Stratus Environmental, Inc. (Stratus) planned to advance soil boring B-01 in the area of historical boring C-1, southeast of the existing USTs, on March 26, 2009. RSI Drilling encountered pea gravel and an unidentified metal object during the advancement of boring B-01. Due to the proximity to underground objects and the risk of destabilizing the concrete by undermining, the boring was abandoned. Boring B-02 was advanced to a maximum depth of 9.5 ft bgs near the former waste oil tank excavation pit in the area of the historical W.O.-1 sample (BAI, 2009). Because of the inability to advance a sample boring to the same depth of the historical detection of constituents of concern at C-1 due to the presence of pea gravel, ACEH found that the results of the soil investigation did not sufficiently assess the conditions in the area of C-1(ACEH letter, September 3, 2009).

All site-related wells were gauged and sampled in a one-time sampling event during the second quarter 2009 investigation. Groundwater samples were analyzed for gasoline range organics (GRO) by Environmental Protection Agency (EPA) method 8015B; benzene, toluene, ethylbenzene, and total xylenes (BTEX); five oxygenates, 1,2 Dichloroethane (1,2-DCA), 1,2 Dibromoethane (EDB), and halogenated volatile organic compounds by EPA method 8260B; ethanol; and total lead by EPA method 200.7. Lead was detected above the laboratory reporting limit at a maximum concentration of 54.2 micrograms per liter (µg/L) in MW-1. Gasoline was detected above the laboratory reporting limit at a maximum concentration of 11,000 µg/L in MW-1. BTEX were detected on site at maximum concentrations of 5.1, 29, 310, and 1200 µg/L, respectively, in MW-1. Chlorobenzene and TBA were detected at a maximum concentration from the MW-1 groundwater sample at 1.9 µg/L and 10 µg/L, respectively. MTBE was detected at a concentration of 17 µg/L in the sample from MW-2. 1,2 Dichlorobenzene were detected in MW-3 at 1.5 µg/L.

Soil samples were analyzed for TPH-g by EPA method 8015B, five oxygenates, EDB and 1,2 DCA by EPA method 8260, total lead by EPA method 200.7, and halogenated volatile organic compounds (VOCs) by EPA method 8260. Lead was detected above the laboratory reporting limit at a maximum concentration of 96.6 milligrams per kilogram (mg/kg), which is below the California Department of Public Health and California EPA reporting limits.

Proposed Scope of Work

This Work Plan includes the following investigation activities:

- Advancement of up to two soil borings to a depth of approximately 12.0 feet (ft) below ground surface (bgs) at the locations shown on Figure 2. During the most recent groundwater sampling event depth to water was measured between 6.84 to 8.82 ft bgs, respectively. The target depth of 12.0 feet bgs was selected to assure sufficient subsurface soil characterization based on historical sampling results.

- Collect soil samples from 11.5 feet bgs from soil borings.

- If soil borings cannot be advanced because of subsurface impediments ARCADIS will install two sub-slab soil vapor probes in the locations shown on Figure 2.

- Conduct soil vapor sampling from the newly installed sub-slab soil vapor probes.

- Prepare a report detailing the findings of the investigation activities.

The specific scope of work for project is discussed below.

Site-Specific Health, Safety & Environmental Protection Plan

As required by the Occupational Health and Safety Administration (OSHA) "Hazardous Waste Operations and Emergency Response" guidelines (29 CFR 1910.120), ARCADIS will prepare a site-specific environmental health and safety plan (E-HASP). The field staff and contractors will review the E-HASP prior to beginning field operations at the Site.

Permitting

All applicable permits will be obtained from ACEH and the City of Alameda, as necessary, prior to drilling.

Underground Utility Locating

Underground Service Alert (USA) will be notified a minimum of 48 hours prior to commencing field activities to identify any public utility alignments that may be in conflict with the proposed borings. In conjunction with USA, a private utility locating company will be utilized to further evaluate the potential presence of underground utilities in the vicinity of the proposed soil borings and soil vapor point locations. Soil borings and soil vapor point locations may require field modifications due to onsite utility locations and/or field conditions.

Soil Borings

Depth-to-water readings will be collected from the existing monitoring well network prior to soil boring activities and properly documented by field staff.

Two soil borings will be advanced at the locations shown in Figure 2. Soil boring locations were selected in accordance with the comments made in the ACEH letter dated September 3, 2009. Each soil boring will be advanced with a drilling rig using direct-push Geoprobe® technology.

Due to the presence of subsurface pea gravel as indicated above, ARCADIS is proposing to use alternative methods to clear the borings to the maximum depth of the pea gravel. Prior to drilling, the locations will be cleared using either an air knife/vacuum truck or hand auger to a minimum depth of 5 feet bgs (utility clearance depth) or to the maximum depth of the pea gravel. Air knifing/vacuuming will be done through a conductor casing set in the pea gravel at the location of SB-02. The subsidence of the conductor casing as the pea gravel is vacuumed out will serve to prevent the collapse of the boring and any potential undermining of the concrete pad. Once the boring has been cleared to the depth of the pea gravel the Geoprobe will be used within the conductor to collect the sample at depth. Any site conditions that prevent the completion of the soil borings (utilities, sub-surface conditions, etc.) will be properly documented by field staff.

It is anticipated that the soil borings will be advanced to a maximum total depth of 12.0 feet bgs, to approximately the same depth range as the C-1 boring, and grouted to ground surface upon completion. Soil samples for logging purposes will be collected continuously for visual classification from 5 feet bgs to the total borehole depth using a Geoprobe® sampler.

Soil samples will be field screened for VOCs with a photoionization detector (PID). The soil screening procedures will involve measuring approximately 30 grams from a relatively undisturbed soil sample, placing this sample in a sealed container (Ziplock® bag). The bag will be allowed to equilibrate for at least 20 minutes, then the head space within the bag will be tested for total organic vapor, measured in parts per million (ppm: volume/volume). The PID results will be noted on the field boring logs. PID readings are useful for indicating relative levels of impacts, but cannot be used to evaluate hydrocarbon levels with the confidence of laboratory results. Soil samples will be selected for laboratory analysis based on soil vapor readings using a PID and/or visual characteristics (i.e., staining, odors and sheen).

Soil samples for chemical analysis will be retained in glass jars with Teflon® coated caps or brass, stainless steel, or plastic liners, capped with Teflon® squares and plastic end caps. Soil samples will then be sealed in Ziplock® bags. The samples will be placed on ice for transport to the laboratory accompanied by chain-of-custody documentation.

Soil samples collected from the soil boring will be submitted to a State of California certified laboratory under chain-of-custody documentation and analyzed for the following constituents:

- TPH-G by United States Environmental Protection Agency (USEPA) Method 8015 modified
- Benzene, toluene, ethylbenzene and xylenes (BTEX) and MTBE by USEPA Method 8260B
- Oxygenates di-isopropyl ether (DIPE), ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME), tertiary butyl alcohol (TBA), 1,2-Dibromomethane (EDB),
- 1,2-Dichloroethane (1,2-DCA), methyl ter-butyl ether (MTBE), Halogenated VOCs, and ethanol by USEPA Method 8260B.
- Total Lead by EPA method 200.7.

Sub-Slab Soil Vapor Probe Installation

Two sub-slab soil vapor probes will be installed at the locations show on Figure 2 should the initially proposed soil borings not be able to be advanced or present a significant health and safety risk.

A 0.5-inch-diameter pilot borehole will be advanced through the slab into the material beneath the slab using an electric powered rotary hammer drill. A wider 1.25-inch-diameter borehole will be advanced approximately 1.5 inches into the soil below the slab using the 0.5-inch-diameter borehole as a pilot hole.

A 0.25-inch OD stainless steel tubing with a flush-mount adapter and plug connection will be inserted into the boreholes at each location to a depth of approximately 1 inch above the bottom of the slab to prevent the end of the tubing from becoming obstructed.. The annular space between the 1.25-inch-diameter borehole and the flush-mount adapter will be filled with a post setting concrete mixture. This concrete will be permitted to set and cure for a minimum of 48 hours before sampling is conducted. The port will be finished with a flush mount hex socket plug. Prior to sampling, the concrete will be inspected for cracking or settling.

Sampling Train Assembly

Samples will be collected using 0.25-inch outer diameter (OD) Teflon®-lined polyethylene tubing. Each sampling train assembly (STA) will consist of a laboratory-

provided soil gas sampling manifold (SGSM) with a two-way valve, vacuum gauge for reading the vacuum within the sample or purge canisters flow controller, and vacuum gauge for reading the vacuum within the sampling point. Components of the SGSM will be assembled using ¼-inch OD stainless steel tubing.

Vacuum Leak Testing

Prior to sampling, the STA will be checked for leaks. The leak check will be performed by assembling the STA and applying a vacuum to the STA using a purge SUMMA canister or pump. In the absence of a cap at the sub-slab probe, a laboratory-provided cap will be affixed to the sample end of the SGSM and the vacuum will be applied. The vacuum inside the STA will be monitored with the vacuum gauges. This vacuum will be monitored for 30 minutes for a decrease greater than or equal to 0.5 inch mercury (inHg).

If the vacuum reading does not decrease by 0.5 inHg or more during the 30-minute period, the STA can be used for sampling. If the vacuum readings decrease by 0.5 inHg or more during this monitoring period, the fittings and connection on the STA will be checked and tightened, and the vacuum leak check will be performed again until the STA maintains a vacuum throughout the monitoring period. After the STA is cleared for sampling, the fittings will be left in place as tested. The STA will not be disassembled and fittings will not be removed until purging and sampling with the STA is complete.

Purging

The sub-slab probe will be purged of two liters of soil gas prior to sampling. Purge volume calculations will be based on the dimensions of all tubing, sampling equipment, below-ground tubing and subsurface soil vapor screen used in the construction of the probe.

Soil vapor samples collected from the soil vapor probes will be submitted to a State of California certified laboratory under chain-of-custody documentation and analyzed for the following constituents:

- TPH-G by United States Environmental Protection Agency (USEPA) Method 8015 modified

- Benzene, toluene, ethylbenzene and xylenes (BTEX) and MTBE by USEPA Method 8260B
- Oxygenates di-isopropyl ether (DIPE), ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME), tertiary butyl alcohol (TBA), 1,2-Dibromomethane (EDB),
- 1, 2-Dichloroethane (1,2-DCA), methyl ter-butyl ether (MTBE), Halogenated VOCs, and ethanol by USEPA Method 8260B.
- Total Lead by EPA method 200.7.

Equipment Decontamination

All down-hole sampling equipment will be washed with Alconox® or similar solution between samples. All down-hole and sampling equipment will be steam-cleaned following the completion of drilling activities.

Waste Disposal

Soil cuttings, drilling fluids, purge water, decontamination water, and personal protective equipment generated during drilling operations will be stored in DOT-approved 55-gallon drums and temporarily stored on the subject property pending transport by Belshire Environmental Services Inc. (BESI) disposal contractor to an appropriate disposal or treatment facility.

Notification

ARCADIS will notify ACEH a minimum of 48 hours prior to starting work.

Reporting

A report will be prepared to document the results of site investigation activities. This report will include at a minimum the following:

- Summary of site conditions and background information,
- A scaled site plan illustrating the soil boring locations and other relevant site features,

- Documentation of field activities performed in connection with the site assessment,
- Geologic boring logs and concentration figures,
- Conclusions relevant to the assessment objectives,
- Results of the laboratory analyses performed on selected soil samples, and
- Conclusions and recommendations relevant to the assessment objectives.

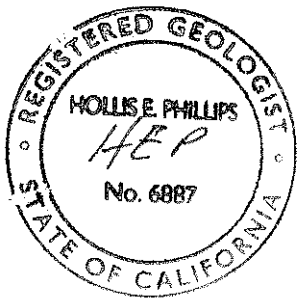
Schedule

ARCADIS is prepared to initiate field work upon approval of this Work Plan by ACEH, the execution of necessary access agreements and the issuance of required permits.

If you have any questions or comments regarding the contents of this Work Plan, please contact either Ben McKenna of ARCADIS at 925.296.7857 or by e-mail at Benino.McKenna@arcadis-us.com or Hollis Phillips of ARCADIS at 415.374.2745 or by e-mail at Hollis.Phillips@arcadis-us.com.

Sincerely,

ARCADIS



Ben McKenna
Project Geologist

Hollis Phillips P.G.
Senior Geologist

Enclosures:

Figure 1 – Site Location Map
Figure 2 – Site Map with Monitoring Well and Soil Boring Locations

Copies:
Jon Armstrong, Atlantic Richfield Company

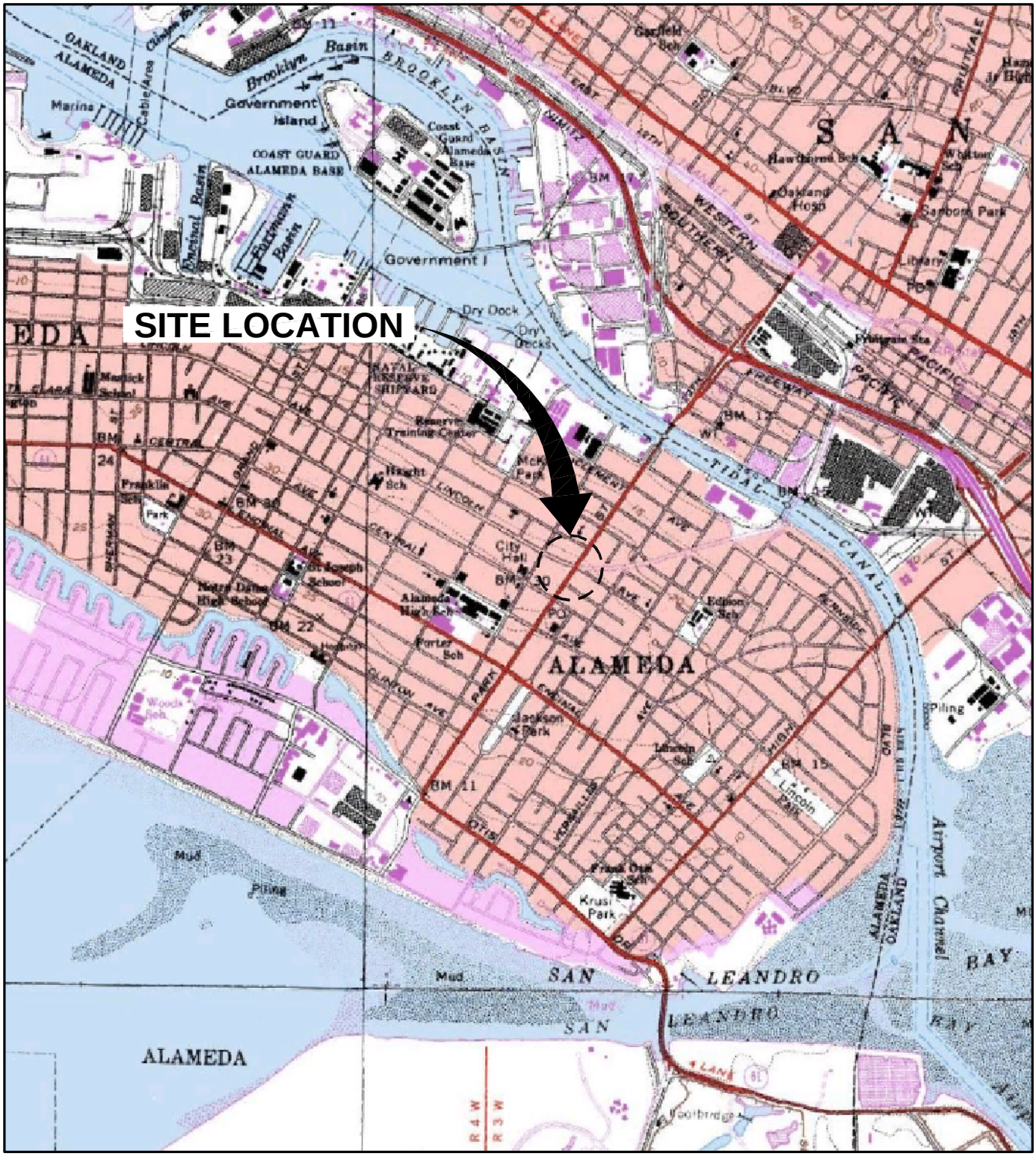
References Cited

- Alameda County Environmental Health; Incomplete Scope of Work for Fuel Leak Case No. RO0000318 and Geo Tracker Global ID T0600100207, BP #11266, 1541 Park Street, Alameda, CA 94501. Letter from Mr. Paresh Khatri (ACEH) to Mr. Paul Supple (Atlantic Richfield Company)

- Broadbent & Associates, Inc.; *Work Plan for Soil & Water Investigation*, *Former BP Service Station #11266, 1541 Park Street, Alameda, California,* December 15, 2008

- Broadbent & Associates, Inc.; *On-Site Soil Investigation and Second Quarter 2009 Ground-Water Monitoring Report, Former BP Service Station #11266, 1541 Park Street, Alameda, California,* August 14, 2009

Figures



REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD.,OAKLAND WEST, CA., 1993, AND SAN LEANDRO, 1993, REVISED 1996.

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.

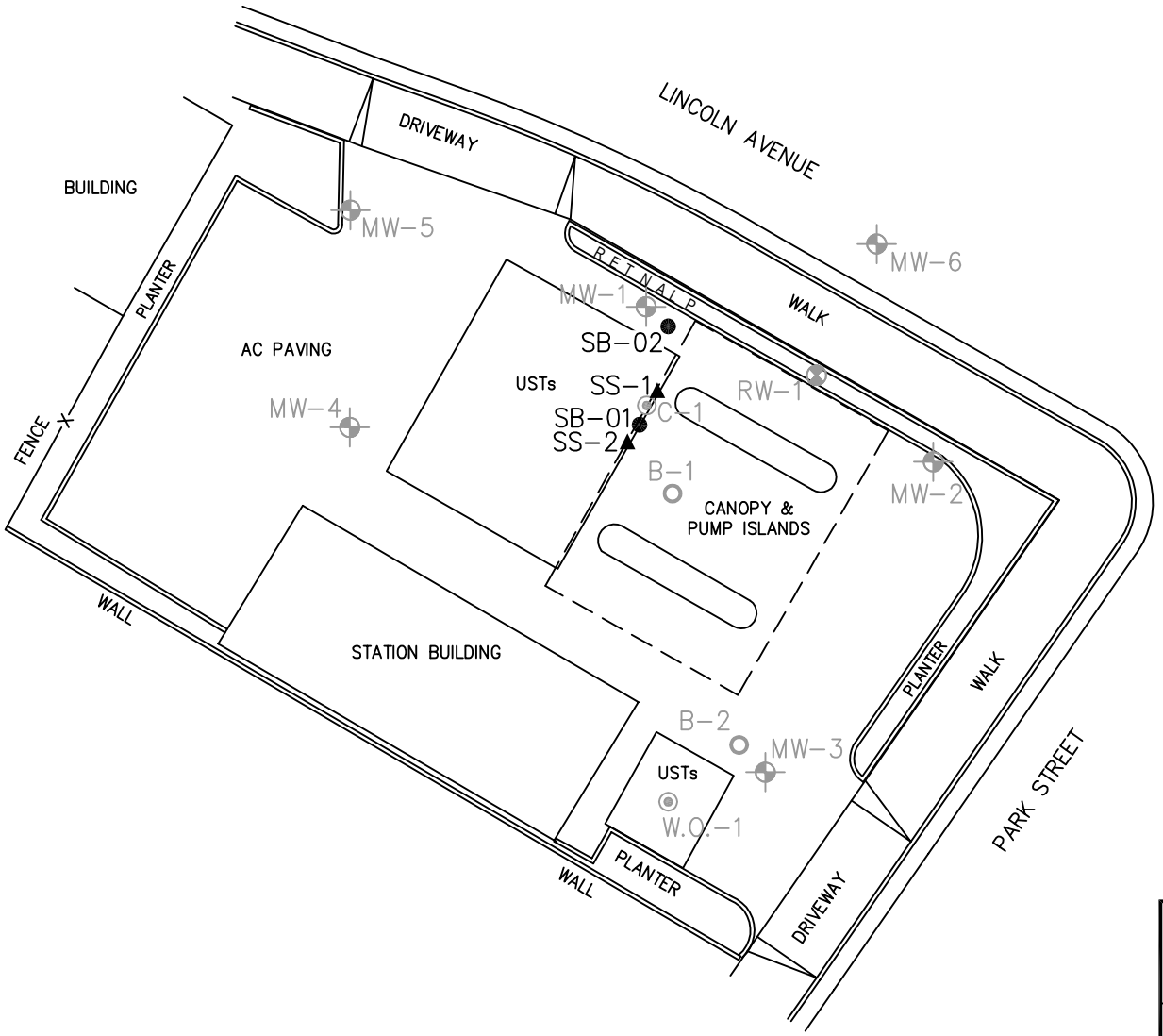
FORMER BP SERVICE STATION #11266
1541 PARK STREET
ALAMEDA, CALIFORNIA

SITE LOCATION MAP

ARCADIS

FIGURE
1

CITY: PETALUMA, CA DIV/GROUP: ENV DB: J. HARRIS LD:--- PIC:--- PM: L.A. SMITH TM: C. MEYER LYR:(Opt)ON=*;OFF=*REF*
G:\ENVCAD\Fullerton\RETURN-TO\PETALUMA\GP09BPNAC101\GP09BPNAC001-P01.dwg LAYOUT: 2 SAVED: 7/15/2010 5:31 AM ACADVER: 18.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 7/27/2010 11:47 AM BY: HUBATCH, RICK
XREFS: IMAGES: PROJECTNAME: ----
GP09BPNAC001-X01



LEGEND

- MONITORING WELL
- RECOVERY WELL
- SOIL BORING BY KAPREALIAN ENGINEERING, INC.
- SOIL BORING BY BROADBENT & ASSOCIATES, INC.
- PROPOSED SOIL BORING LOCATION
- PROPOSED SUB-SLAB VAPOR PROBE LOCATION IF NECESSARY

0 30' 60'

NOTE:
BASEMAP PROVIDED BY BROADBENT & ASSOCIATES, INC., PROJECT REFERENCE NO. 06-88-658, DATED SEPTEMBER 30, 2009, AT A SCALE OF 1"=30'.

FORMER BP SERVICE STATION #11266
1541 PARK STREET
ALAMEDA, CALIFORNIA

SITE MAP WITH MONITORING WELL AND SOIL BORING LOCATIONS

ARCADIS

FIGURE
2