



AEI Consultants

Environmental & Engineering Services

October 30, 2015

Work Plan, Soil Vapor Investigation

Property Identification:
Lucasey Manufacturing Site
2744 East Eleventh Street
Oakland, California

AEI Project No.345989

Prepared for:
Risa Investments, LLC

Prepared by:
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October 30, 2015

Mr. Jerry Wickham
Alameda County Environmental Health
1131 Harbor Parkway
Alameda, California 94502

Subject: Work Plan, Soil Vapor Sampling
Lucasey Manufacturing Site
2744 East Eleventh Street, Oakland, California

Dear Mr. Wickham:

On behalf of Risa Investments, LLC, AEI Consultants (AEI) appreciates the opportunity to submit this work plan for soil vapor sampling at the Lucasey Manufacturing Site located at 2744 East Eleventh Street in Oakland, California ("the Site"). The Site is currently in the planning stages of redevelopment for residential use of the existing buildings. This work plan is being submitted following your request to perform soil vapor sampling made during a conference call on October 28, 2015. During the conference call, the recently submitted October 20, 2015 Risk Management Plan (RMP) was discussed with Mr. Jerry Wickham of the Alameda County Environmental Health (ACEH), Mr. Riaz Taplin and Mr. Paul Dicarolo of Risa Investments, LLC, and Mr. Trent Weise of AEI. We understand that the ACEH is requesting that soil vapor samples be collected from locations beneath the building at the Site to directly assess whether there is a risk to indoor air from the residual petroleum hydrocarbons present in the subsurface.

AEI understands that the purpose of soil vapor sampling and analysis is to assess potential impacts to indoor air within the proposed remodeled building and not to further assess petroleum hydrocarbon impacts in the subsurface. AEI has prepared this work plan describing our proposed sample locations and sampling methodology for review and approval by the ACEH.

BACKGROUND

The Site comprises approximately 2.32 acres and is located in an urban mixed use area of Oakland, California, consisting of commercial, residential, and industrial uses. The Site is currently developed with a 104,008 square-foot building built between 1920 and 1922 that is currently used for manufacturing, warehousing, and office space and a four-story tower. The Site vicinity is shown on Figure 1.

The Site is underlain by generally discontinuous layers of fine-grained deposits comprised of gravely-silt, silty-sands and clay. Two water-yielding horizons have been identified at the Site. First encountered water is observed in an upper unconfined to semi-confined zone present to a depth of approximately 21 feet below ground surface (bgs). A deeper confined zone is present from 24 feet bgs to an unknown depth, which is comprised of clayey-sands.

Petroleum hydrocarbons were released to the subsurface at the Site presumably from a fuel oil tank formerly located in what is now a parking lot located in the southern corner of the Site. Figure 2 presents a Site Plan. Residual petroleum hydrocarbons in Site media include:

- The presence of petroleum hydrocarbons in soil vapor were assessed across the Site and documented in an August 18, 2008 *Results of Gore-Sorber™ Soil Vapor Survey and Recovery Well Installation* report. However, Gore-Sorber™ sampling does not provide sufficient information to assess the potential for vapor intrusion at the Site.
- Soil vapor samples collected on-site in June 2009 yielded benzene at a maximum concentration of 22 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) in the soil vapor sample collected from ASV-7. Elevated concentrations of benzene and ethylbenzene were detected in soil vapor samples collected from off-site locations ASV-3 and ASV-4 at maximum concentrations of 740 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) and 2,600 $\mu\text{g}/\text{m}^3$, respectively. Naphthalene was not detected in soil vapor samples collected and analyzed at or above laboratory method detection limits.

The fuel release case (RO0002902) was granted closure by ACEH in a letter dated July 31, 2014. The case was granted closure under Scenario 4 of the Low-Threat Underground Storage Tank Closure Policy (LTCP). The Site Management Requirements of the Case Closure Summary includes that “[b]ased on the depth and type of petroleum hydrocarbons, the potential for exposure is low and the contamination does not appear to present a risk unless exposed by excavation. Therefore, case closure is granted for the current commercial land use.” The conclusion section of the Case Closure Summary notes that “...re-evaluation of this case is required if any excavation takes place below a depth of 8 feet bgs.”

SCOPE OF WORK

To assess potential impacts to soil vapor beneath the building at the Site adjacent to the residual petroleum hydrocarbons present in soil and groundwater at the Site, AEI proposes the following scope of work to collect and analyze soil vapor samples from beneath the building. AEI proposes to collect nine soil vapor samples from the locations shown on Figure 2 and using the methodology presented below.

Preliminary Field Activities

Prior to performing field activities, AEI will perform the following preliminary field activities:

- Apply for and obtain soil boring permits from the Alameda County Water District.
- Prepare a site-specific Health and Safety Plan (HASP) for this scope of work.
- Notify the ACEH of the proposed field schedule.
- Notify Underground Service Alert of the proposed subsurface drilling activities.

Field Activities

Following completion of the preliminary field activities, an AEI field team will perform the following field activities:

- Using a private utility locator, confirm the location of public and private utilities at the Site and confirm the absence of public or private utilities or other obstructions at all drilling locations.
- Advance nine (9) soil borings to a depth of 5.5-feet at the locations shown on Figure 2. Soil boring locations are subject to change at the discretion of AEI's field team based on field conditions and the results of the utility survey. Install temporary soil vapor probes in each of the soil borings.
- Advance and install nine (9) sub-slab soil vapor points, co-located with each soil boring.
- Collect a total of 18 soil vapor samples.

AEI will contract a State of California-licensed drilling company to construct temporary soil vapor probes set at a depth of approximately 5-feet bgs. Soil vapor sampling will be performed in general accordance with the *Advisory – Active Soil Gas Investigation, July 2015*, issued by the California Department of Toxic Substances Control (DTSC), and Los Angeles and San Francisco Regional Water Quality Control Boards.

Each temporary sub-slab soil vapor probe will be collected by drilling a 5/8-inch diameter hole through the concrete floor slab. A temporary soil vapor probe consisting of 0.25-inch diameter Teflon tubing tipped with a screen-lined point will be inserted into the hole drilled to approximately one-inch beneath the slab. The annular space surrounding the tubing and the surface will be sealed with hydrated granular bentonite.

Each temporary soil vapor probe will be constructed with a polyethylene or steel vapor probe tip attached to 1/4-inch tubing. The vapor probe tip will be placed at a depth of five-feet bgs and encapsulated in an annular filter pack consisting of a roughly one-foot layer of #2 to #4 sand. The temporary soil vapor probe will then be sealed by backfilling the remaining section of the borehole with one-foot of dry bentonite with the remainder consisting of bentonite to surface, hydrated in six-inch lifts. A gas-tight valve will be installed at the end of the sample tubing and closed to seal the tubing.

After waiting the Advisory-recommended equilibration time of a minimum of two-hours, soil vapor samples will be collected. Prior to collecting the samples, a shut-in test will be performed by placing a vacuum on the above-grade sampling train and vacuum canisters. The vacuum will be observed for approximately six minutes and verified to not change. Isopropyl alcohol will be used as a leak-check compound. Prior to sampling, and following purging of the sampling lines and approximately three pore volumes of the sand pack and dried bentonite, the purge valve will be closed and the initial vacuum of the laboratory-supplied, certified clean, one-liter vacuum canister will be recorded. Soil vapor samples will be collected through laboratory-supplied, certified clean, regulators at approximately 150-milliliters per minute. After approximately five minutes (depending on the down-hole vacuum), or -5 in Hg vacuum in the canister, each canister will be closed and removed from the sampling line and the final canister vacuum recorded. The vacuum canister sample will be sealed with a gas tight cap, appropriately labeled, and entered onto a chain of custody manifest for delivery to the laboratory.

The collected soil vapor samples will be transported under chain-of-custody protocol to State of California-certified laboratory analysis. Each soil gas sample will be analyzed for volatile organic compounds (VOCs) using US EPA Testing Method TO-15.

Following the collection of soil vapor samples, each soil vapor probe will be destroyed by removing the sample tubing, hydrating the existing bentonite, and completing the borehole with cement to match the existing ground surface.

Data Review and Reporting

Upon receipt of the analytical results, AEI will compare the observed chemical concentrations, if present, to Environmental Screening Levels (ESLs) developed by the California Regional Water Quality Control Board, San Francisco Bay Region and using the procedures outlined in the *Final, Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance)*, October 2011, issued by the DTSC. AEI will prepare a report presenting the results of the investigation and our assessment of the data related to the protection of indoor air that will be submitted to the ACEH. The report will include a description of the sampling methodology, tables summarizing the sample results, and a figure presenting the sample locations.

CLOSING

AEI appreciates working with the ACEH to move this project forward and trust that this document meets with your approval. If you have any questions or comments, do not hesitate to contact Mr. Trent A. Weise, P.E. at (408) 559-7600 or tweise@aeiconsultants.com.

Sincerely,

AEI Consultants



Trent A. Weise, P.E. (C64480)
Vice President



Copies:

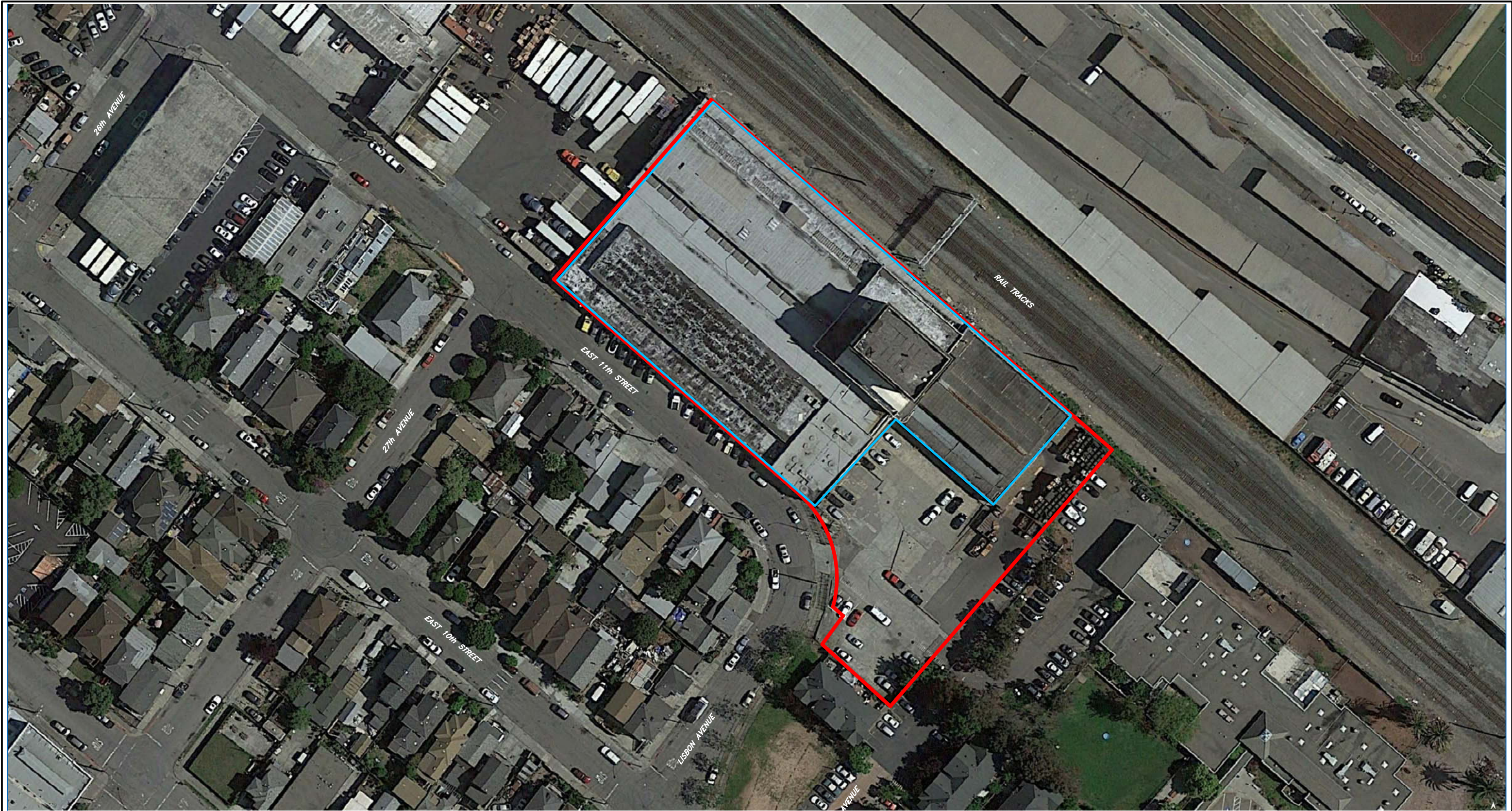
Mr. Paul Dicarlo – Risa Investments, LLC

Enclosures



REFERENCES

The regulatory record for this Site can be found on the State of California GeoTracker Website at http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0600133151.

FIGURES



LEGEND

-  Building - 2744 East 11th Street
-  Approximate Site Boundary

0 80 160
 APPROXIMATE SCALE
 IN FEET

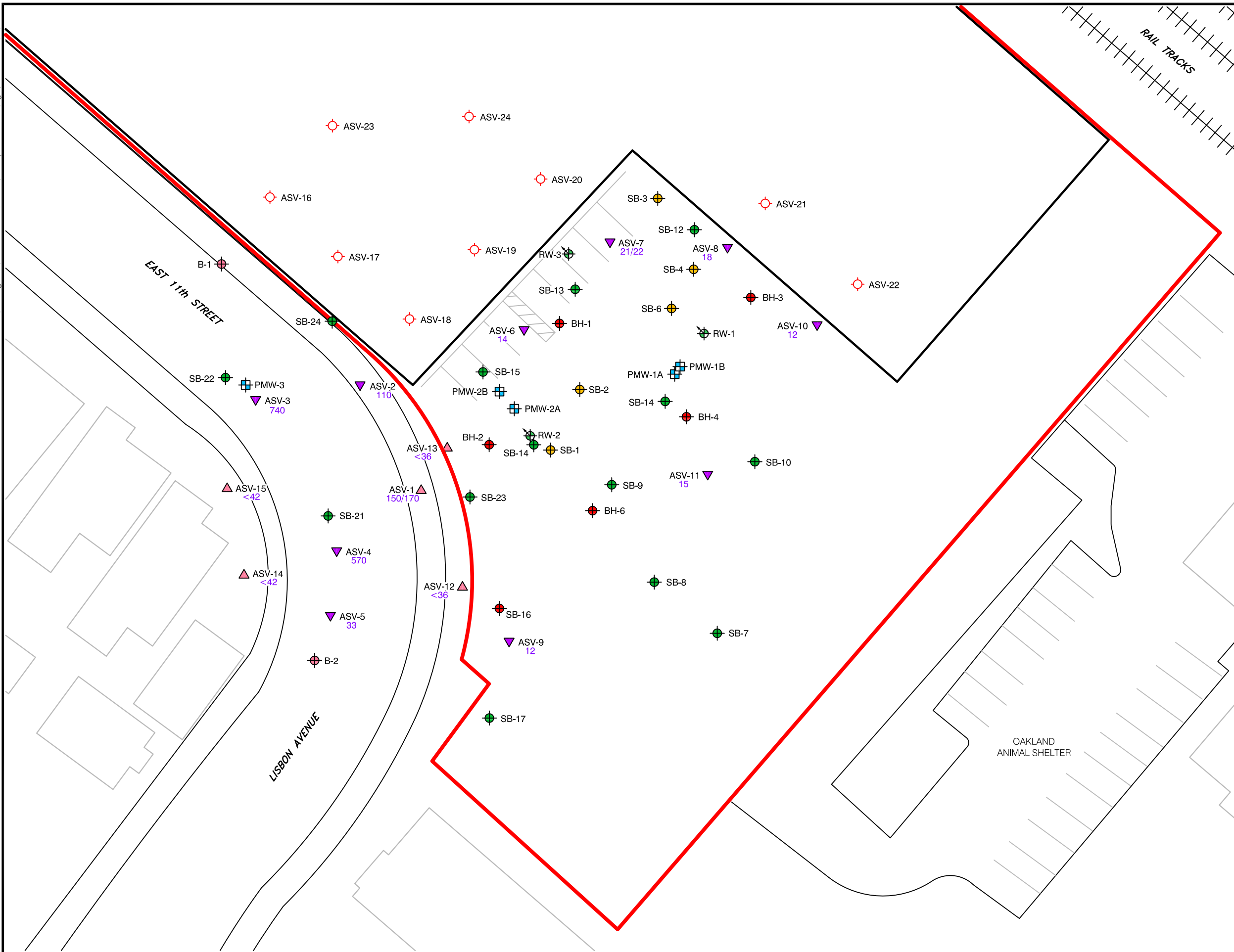


AEI Consultants
 San Jose, California

SITE VICINITY MAP

2744 East 11th Street
 Oakland, California

FIGURE 1
 Project No. 345989

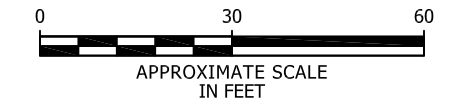


LEGEND

- ASV-24 Proposed Soil Vapor Sample Location
- RW-3 Product Recovery Well (Clearwater)
- PMW-3 Product Monitoring Well (ERM)
- SB-24 Soil Boring (Clearwater)
- SB-6 Soil Boring (Terra Firma)
- SB-14 Soil Boring (AEI)
- B-2 Soil Boring (ERM 2010)
- ASV-11 Soil Vapor Sample Location (ERM, 2009)
- ASV-15 Soil Vapor Sample Location (ERM, 2010)
- 15 Benzene Concentration in Soil Vapor in Micrograms per Cubic Meter ($\mu\text{g}/\text{m}^3$)

NOTE:

Base Map Sources:
 ERM, Exhibit 1, 03/2011
 Google Earth, Image Date 5/11/2015



AEI Consultants
 San Jose, California

SITE PLAN

2744 East 11th Street
 Oakland, California

FIGURE 2
 Project No. 345989