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CONSULTANTS

May 5, 2006

Ms. Teresa Clarke
Affordable Housing Associates
1250 Addison Street, Suite G
Berkeley, California 94702

RE: Subsurface Characterization Report
160 14th Street, Oakland, California
*ACC Project Number 6179-014-02*

Dear Ms. Clarke:

ACC Environmental Consultants (ACC) has prepared this letter report summarizing the findings of soil and grab groundwater sampling for 160 14th Street, Oakland, California, recommended in ACC's April 5, 2006 *Soil and Groundwater Management Plan*. The primary goal of this investigation was to profile soil and groundwater to be removed during proposed future site development. Specifically, excess soils were characterized for suspect petroleum hydrocarbons and metals to obtain the data to profile the soil for offsite disposal and to evaluate potential worker safety mitigation measures during soil handling activities. Groundwater was also characterized to better determine if groundwater treatment is warranted prior to discharge during dewatering activities.

Soil analytical results indicate that the soil outside the vicinity of the former underground storage tanks (USTs) is suitable for use as clean backfill, but due to the volume and site history, may be more cost effective to dispose at a Class III accepting facility. Soil in the immediate vicinity of the former USTs will likely require Class II disposal at a slightly higher cost. Groundwater contains concentrations of gasoline constituents in the vicinity of the former USTs and tetrachloroethene (PCE) and may require polishing with GAC prior to discharge under permit from EBMUD.

This work was performed in accordance with which will be revised to reflect this newly obtained data. If you have any questions regarding the report, please contact me at (510) 638-8400, ext. 109.

Sincerely,

David DeMent, PG, REA II
Environmental Division Manager

**Northern California: 7977 Capwell Drive, Suite 100 • Oakland, CA 94621 • (510) 638-8400 • Fax (510) 638-8404**
Southern California: 1541 Wilshire Blvd., Suite 516, Los Angeles, CA 90017 • (213) 353-1240 • Fax (213) 353-1244

Enclosures

# SUBSURFACE CHARACTERIZATION REPORT

**160 14th Street**
**Oakland, California**

*ACC Project Number 6179-014-02*

Prepared for:

Ms. Teresa Clarke
Affordable Housing Associates
1250 Addison Street, Suite G
Berkeley, California 94702

May 5, 2006

Prepared By: _____

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**160 14th Street**
**Oakland, California**

## 1.0 INTRODUCTION

At the request of the Affordable Housing Associates (Client), ACC Environmental Consultants Inc., (ACC), has prepared this Subsurface Characterization Report summarizing subsurface soil and groundwater conditions at 160 14th Street, Oakland, California (Site). The primary goal of this investigation was to profile soil and groundwater to be removed during proposed future site development. Specifically, excess soils were characterized for suspect petroleum hydrocarbons and metals to obtain the data to profile the soil for offsite disposal and to evaluate potential worker safety mitigation measures during soil handling activities. Groundwater was also characterized to better determine if treatment with granulated activated carbon (GAC) is warranted prior to discharge during possible dewatering activities.

## 2.0 BACKGROUND

### 2.1 Initial Subsurface Investigation

The subject property was occupied by an asphalt-paved parking lot located at the north corner of Madison and 14th Streets, Oakland, California (Figure 1). ACC conducted a Phase I Environmental Site Assessment (ESA) on the subject property in April 2001. The Phase I ESA identified former USTs at the Site and a dry cleaning business located adjacent to the Site to the northwest at 190 14$^{th}$ Street, Oakland, California.

In order to evaluate potential subsurface impacts from the former USTs and offsite dry cleaning operation, ACC advanced three exploratory soil borings in July 2001 designated SB1 through SB3. Using a limited-access Geoprobe® drill tool, ACC collected discrete soil samples at various depths from each soil boring and grab groundwater samples from borings SB1 and SB3. Samples were analyzed for constituents of concern, including: total extractable petroleum hydrocarbons (TEPH) as diesel and motor oil; total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, and total xylenes (BTEX), and methyl tertiary butyl ether (MTBE); and halogenated volatile organic compounds (HVOCs). Soil and grab groundwater sample analytical results are summarized in Tables 1 and 2.

**TABLE 1 - SOIL ANALYTICAL RESULTS - 2001**

| Sample ID | TPHg | TEPH as Diesel | TEPH as Motor Oil | Benzene | Toluene | Ethyl-Benzene | Total Xylenes | MTBE |
|---|---|---|---|---|---|---|---|---|
| SB1-13.0 | <1.0 | N/A | N/A | 0.014 | <0.005 | <0.005 | <0.005 | <0.005 |
| SB1-15.5 | <1/0 | N/A | N/A | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| SB2-8.0 | 87 | 100 | 600 | 1 | 8 | 2.0 | <0.62 | <0.62 |

| Sample ID | TPHg | TEPH as Diesel | TEPH as Motor Oil | Benzene | Toluene | Ethyl-Benzene | Total Xylenes | MTBE |
|---|---|---|---|---|---|---|---|---|
| SB2-13.0 | <1.0 | N/A | N/A | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |

*Notes: All soil results reported in micrograms per kilogram (mg/kg), approximately equal to parts per million*
*N/A : not analyzed*
*< : Sample tested below the laboratory minimum detection limit indicated*

**TABLE 2 - GROUNDWATER ANALYTICAL RESULTS - 2001**

| Sample ID | TPHg | HVOCs (PCE) | TEPH as Diesel | TEPH as Motor Oil | Benzene | Toluene | Ethyl-Benzene | Total Xylenes |
|---|---|---|---|---|---|---|---|---|
| SB1-W | 78 | 6.1† | 340 | <690 | 5.7 | <0.5 | 1.9 | <0.5 |
| SB3-W | N/A | 2.6† | N/A | N/A | N/A | N/A | N/A | N/A |

*Notes: All groundwater results reported in micrograms per Liter (µg/L), approximately equal to parts per billion*
*< : Sample tested below the laboratory minimum detection limit indicated*

2.2 Current Subsurface Investigation

During proposed site development activities, excess soil will be excavated in order to install stacked parking spaces along the northeast border of the Site and an elevator (Figure 2). To facilitate offsite disposal of excess soil and determine if any potential worker safety concerns are present, ACC proposed to characterize soil insitu to the total depth of proposed excavation of 12 feet bgs. In addition, since soil in the vicinity of the former USTs is to be removed and may contain residual petroleum hydrocarbons, ACC proposed advancing exploratory soil borings adjacent to the former USTs (soil borings B-2 and B-3), collecting soil samples for analysis of petroleum hydrocarbons, and sampling of the excavated soil located in the vicinity of the former USTs.

Due to unusually high seasonal precipitation, the estimated static groundwater level for the Site may be at or above the total depth of the excavation for the stacked parking structure and dewatering may be necessary during site development. In order to characterize groundwater for suspect constituents of concern (petroleum hydrocarbons and tetrachloroethylene (PCE) were identified in groundwater in 2001), additional groundwater sampling was performed to determine if extracted groundwater must be treated prior to discharge during potential dewatering activities.

## 3.0 FIELD PROCEDURES

Prior to soil boring advancement, ACC obtained a soil boring permit from the Alameda County Public Works Agency, Water Resources Section (Appendix 1). As required by law, Underground Service Alert was notified 48-hour prior to advancement of soil borings and a Site-Specific Health and Safety Plan was prepared and available onsite during field activities.

Six exploratory soil borings, designated B-1 through B-6, were advanced at the Site on April 4, 2006. Approximate soil boring locations are illustrated on Figure 2. Soil borings were advanced at

representative locations utilizing a truck-mounted, hydraulically-driven Geoprobe® sampling rig utilizing stainless steel soil probes equipped with 2-inch inside-diameter clear acetate liners. The six continuously-cored soil borings were advanced to total depths ranging between 12 to 20 feet bgs. The sampling probe and rods were pre-cleaned prior to use and between sample drives by washing them with a trisodium phosphate and potable water solution, a potable water rinse, and distilled water rinse.

Upon removal from the sampler, each recovered soil core was visually inspected and logged. Select discrete soil sample intervals were obtained for laboratory analysis and were identified by soil boring location and approximate depth away from the surface. Each select sample interval was cut from the 4-foot liner, capped with Teflon® sheeting and tight-fitting polyethylene caps, labeled, and stored in a pre-chilled, insulated container to be transported following chain of custody protocol to Curtis & Tompkins, Inc. (C&T) a state-certified analytical laboratory.

Grab groundwater samples were collected from soil borings B-1, B-3, and B-5 by manually purging a representative groundwater sample in the open soil boring with the use of a disposable polyethylene bailer according to ACC protocols. Laboratory-supplied sample containers were filled to overflowing and then sealed. Once filled, samples were inverted and tapped to test for air bubbles. Samples were then labeled, logged on standard chain of custody forms, and stored in a pre-chilled, insulated container for preservation in the field and during transport to C&T. Following drilling and sample collection, each soil boring location was abandoned with appropriate cement grout to the surface.

Select soil samples were analyzed for: total lead by EPA Method 6010B; the 17 California Assessment Manual metals (CAM 17) by EPA Method 6010B; HVOCs by EPA Method 8260B; and TPHg, BTEX, and MTBE by EPA Method 8260B. Grab groundwater samples were analyzed for TPHg, BTEX, and MTBE by EPA Method 8260B and HVOCs by EPA Method 8260B.

## 4.0 FINDINGS

### 4.1 Field Conditions

The surface of the area investigated was covered by asphalt pavement to an approximate depth of 6 to 9 inches bgs. Native soil consisted primarily of silt and sandy silt to an average depth of 12 feet bgs. Sand with varying amounts of disseminated fine-grained silts and clays was generally observed from 12 feet bgs to 20 feet bgs. Soils were generally uniform across the area of the investigation. During sampling activities, ACC noted field indications of petroleum hydrocarbon impact in soil boring B-3 as characteristic gasoline odor and possible olive green soil discoloration. No field indications of petroleum hydrocarbon impact were noted in the other five soil borings.

Groundwater was encountered during this investigation at depths ranging from 10 to 16 feet bgs.

### 4.2 Analytical Results

Soil sample analytical results are summarized in Tables 3 through 5 and grab groundwater sample analytical results are summarized in Tables 6 and 7.

## TABLE 3 – TPHg/BTEX/MTBE SOIL RESULTS

| Sample ID | Sample Depth | TPHg | Benzene | Toluene | Ethyl-benzene | Total Xylenes | MTBE |
|---|---|---|---|---|---|---|---|
| B-1@10.5' | 10.5' | <0.94 | <0.0047 | <0.0047 | <0.0047 | <0.0047 | <0.0047 |
| B-4@6' | 6.0' | <0.98 | <0.0049 | <0.0049 | <0.0049 | <0.0049 | <0.0049 |
| B-6@8' | 8.0' | <0.0049 | <0.0049 | <0.0049 | 0.0064 | 0.022 | <0.0049 |

*Notes: All soil results reported in micrograms per kilogram (mg/kg), approximately equal to parts per million*
*< Sample tested below the laboratory minimum detection limit indicated*

## TABLE 4 – TOTAL LEAD SOIL RESULTS

| Sample ID | Sample Depth | Total Lead |
|---|---|---|
| B-4@3' | 3.0' | 2.7 |
| B-5@2' | 2.0' | 5.0 |
| B-6@4' | 4.0' | 3.2 |

*Notes: All soil results reported in micrograms per kilogram (mg/kg)*

## TABLE 5 – CAM 17 METAL SOIL RESULTS

| Constituent | B2-COMP | North Bay Average* | Residential PRG** |
|---|---|---|---|
| Antimony | <2.9 | 1.3-10 | 31 |
| Arsenic | 2.9 | 6-16 | 22 |
| Barium | 68 | 500 | 5,400 |
| Beryllium | 0.22 | <1 | 1,100 |
| Cadmium | <0.24 | --- | 1,400 |
| Chromium | 36 | 100-700 | 210 |
| Cobalt | 5.7 | 15-70 | 900 |
| Copper | 8.9 | 50-300 | 3,100 |
| Lead | 18 | 30-300 | 255 |
| Mercury | 0.066 | 0.082-0.13 | 23 |
| Molybdenum | <0.97 | <3 | 390 |
| Nickel | 23 | 30-200 | 1,600 |
| Selenium | <0.24 | 0.5 | 390 |
| Silver | <0.24 | --- | 390 |
| Thallium | <0.24 | --- | 5.2 |
| Vanadium | 32 | 150-500 | 78 |
| Zinc | 42 | 150-500 | 23,000 |

*Notes: All soil results reported in micrograms per kilogram (mg/kg), approximately equal to parts per million*
*< Sample tested below the laboratory minimum detection limit indicated*
** According to United States Geologic Survey Professional Paper 1270*
*** Residential Preliminary Remediation Goal set by USEPA Region 9 as of October 2004*

**TABLE 6 – TPHg/BTEX/MTBE GROUNDWATER RESULTS**

| Sample ID | TPHg | Benzene | Toluene | Ethyl-benzene | Total Xylenes | MTBE |
|---|---|---|---|---|---|---|
| B-1 Water | 960 | <2.0 | 18 | <2.0 | 2.8 | <2.0 |
| B-3 Water | 18,000 | 690 | 82 | 990 | 2,070 | <3.6 |
| B-5 Water | 1,100 | <5.0 | <5.0 | <5.0 | 6.6 | <5.0 |

*Notes: All results reported in micrograms per Liter (µg/L)*
*< Sample tested below the laboratory minimum detection limit indicated*

**TABLE 7 - HVOC GROUNDWATER RESULTS**

| Sample ID | PCE | TCE | Cis-DCE | Vinyl Chloride | Other HVOCs |
|---|---|---|---|---|---|
| B-1 Water | 780 | 33 | <2.0 | <2.0 | <RL |
| B-3 Water | 68 | 5.3 | 16 | 8.7 | <RL |
| B-5 Water | 820 | 42 | <5.0 | <5.0 | <RL |

*Notes All concentrations of other standard HVOCs were below laboratory reporting limits*

## 5.0 DISCUSSION

The primary goal of this investigation was to profile soil and groundwater to be removed during proposed future site development. Specifically, excess soils were characterized for suspect petroleum hydrocarbons and metals to obtain the data to profile the soil for offsite disposal and to evaluate potential worker safety mitigation measures during soil handling activities. Groundwater was also characterized to better determine if treatment with GAC is warranted prior to discharge during dewatering activities.

### 5.1 Soil

Soil borings B-1 through B-6 were located in areas of proposed excavation and representative soil samples were analyzed for suspect concentrations of constituents of concern. Soil sample analyses and sample frequency were specifically chosen to meet soil acceptance criteria at local permitted disposal facilities.

Discrete soil samples were collected from soil borings B-1, B-4, and B-6 at varying depths and analyzed for TPHg, BTEX, and MTBE. These samples are representative of soil to be excavated outside the area of the former USTs and to be disposed offsite. TPHg, BTEX, and MTBE analytical results are summarized in Table 3. TPHg and MTBE values for the three discrete samples were reported below laboratory detection limits. BTEX values for the three samples were reported below laboratory detection limits, except for B-6@ 8', which reported relatively minor concentrations of ethylbenzene and total xylenes just above laboratory reporting limits.

Laboratory composite sample B1-COMP, consisting of discrete soil samples from B-1 at 14.5 feet bgs, B-2 at 15.5 feet bgs, and B-3 at 14.0 feet bgs, was analyzed for HVOCs and reported no constituents above their respective laboratory detection limits. PCE reported in groundwater at the northwest end of the Site does not appear to have impacted soil above the water table and no HVOC impacts are indicated in deeper soil proposed for excavation.

Total lead analytical results are summarized in Table 4. Total lead concentrations ranged from 2.7 mg/kg to 5.0 mg/kg in the three discrete soil samples analyzed and averaged 3.6 mg/kg. CAM 17 metal analytical results are summarized in Table 5. Laboratory composite sample B2-COMP, consisting of discrete soil samples from B-1 at 4.0 feet bgs, B-3 at 8.0 feet bgs, and B-4 at 12.0 feet bgs, was analyzed for CAM 17 metals. Both the discrete lead results and CAM 17 metal results reported relatively minor concentrations well below their respective residential action levels and below what would be considered naturally occurring concentrations in this geographic region. A copy of the soil analytical results and chain of custody record is included as Appendix 2.

Soil sample analytical results indicate that soil proposed for excavation around the parking structure and elevator shaft should be successfully profiled and accepted by local Class II and Class III disposal facilities because the constituents of concern of TPHg, BTEX, MTBE, HVOCs and metals were reported at relatively minor or background concentrations.

Excluded from this characterization was soil in the immediate vicinity of the former USTs. Under the observation and direction of an Environmental Consultant, this soil is scheduled to be excavated and segregated, stockpiled on and under plastic sheeting, sampled for petroleum hydrocarbon constituents, and profiled separately at a future time to determine optimum offsite disposal options.

### 5.2 Groundwater

Grab groundwater samples were collected from soil borings B-1, B-3, and B-5. These locations are representative of the area of the Site that may be dewatered during site development. These grab groundwater samples were analyzed for suspect constituents of concern TPHg, BTEX, MTBE, and HVOCs. TPHg, BTEX, and MTBE analytical results are summarized in Table 6 and HVOC analytical results are summarized in Table 7.

Grab groundwater sample analytical results from soil boring B-1, collected in the northwest corner of the Site, reported 960 micrograms per Liter (µg/L) TPHg. Reported BTEX was insignificant. PCE was reported at 780 µg/L and TCE was reported at 33 µg/L. Grab groundwater sample analytical results from soil boring B-3, collected immediately adjacent to the former UST excavation, reported 18,000 µg/L TPHg, 690 µg/L benzene, 82 µg/L toluene, 990 µg/L ethyl-benzene, and 2,070 µg/L total xylenes. PCE was reported at 68 µg/L as well as significantly lower reported concentrations of PCE-daughter products TCE, DCE, and vinyl chloride. Grab groundwater sample analytical results from soil boring B-5, collected in the west side of the Site, reported 1,100 µg/L TPHg, insignificant BTEX, PCE at 820

µg/L and TCE at 42 µg/L. A copy of the groundwater analytical results and chain of custody record is included as Appendix 2.

Groundwater analytical results generally indicated that concentrations of residual gasoline constituents and PCE previously reported in groundwater samples collected in July 2001 have increased. TPHg and BTEX were reported at elevated concentrations in the grab groundwater sample collected immediately adjacent to the former UST excavation and at much lower concentrations in the two groundwater samples collected approximately 50 feet from the former UST excavation. BTEX concentrations were low to nondetect in the grab groundwater samples collected in soil borings B1 and B-5 indicating that natural attenuation processes at the Site are actively degrading residual BTEX.

PCE, present at insignificant concentrations in 2001, was reported at concentrations approximately two orders of magnitude greater in April 2006. ACC believes that PCE impact in groundwater originates from the dry cleaners located at 190 14th Street, immediately northwest of the Site. The elevated concentrations of PCE present in grab groundwater samples collected from soil borings B-1 and B-5, both located approximately 25 feet from the 190 14th Street property, and the lower concentration of PCE in sample collected from soil boring B-3, located approximately 100 feet from the 190 14th Street property, are consistent with an upgradient / crossgradient offsite source being present at the 190 14th Street property. PCE is <u>not</u> a constituent of concern on the subject property.

## 6.0 CONCLUSIONS

Based on the analytical results of the soil and grab groundwater samples collected on April 4, 2006, and comparison to sample analytical results obtain in July 2001, ACC concludes:

- Relatively minor to nondetect concentrations of TPHg, BTEX, and MTBE are present in soil scheduled to be excavated as part of site development activities;

- The majority of soil containing residual petroleum hydrocarbons associated with the former USTs will be excavated and disposed offsite, thus removing much of the source of petroleum hydrocarbon impact currently reported in grab groundwater sample B-3 Water;

- Excess soil can be successfully profiled and accepted by a local permitted landfill facility;

- Elevated TPHg and BTEX concentrations exist in groundwater in proximity to the former UST excavation but attenuate rapidly with distance from this suspect soil source;

- Elevated PCE concentrations exist in groundwater along the northwest end of the Site and likely originate from the dry cleaners immediately adjacent to the subject property;

- Dewatering, if required during site development, would serve the dual purpose of successfully lowering the groundwater table below the depth of scheduled soil excavation and removing residual petroleum hydrocarbon concentrations in groundwater at the Site;

- Based on anticipated source removal during site development and possible dewatering activities, the proposed foundation vapor barrier, and no future inhabited living space beginning on the ground story, there is no significant human health risk to future occupants following Site development; and

- Additional mitigation measures should not be required to proceed with approved Site development.

## 7.0 RECOMMENDATIONS

Based on the conclusions of this subsurface investigation, ACC recommends the following:

- During construction of the building foundation, install an appropriate soil vapor barrier to mitigate and/or reduce potential volatilization of PCE and minor residual petroleum hydrocarbon constituents in water into indoor air;

- Collect representative soil samples on excavation sidewalls during proposed excavation of the parking basement in the vicinity of the former UST to further document the successful removal of potentially impacted soil and document any remaining residual concentrations in soil;

- Apply for a wastewater discharge permit from the East Bay Municipal Utility District (EBMUD) as soon as feasible and confirm with EBMUD the potential need to polish extracted groundwater with granulated activated carbon (GAC) prior to discharge to the sanitary sewer system;

- If construction dewatering is necessary, periodically sample extracted, untreated groundwater for TPHg, BTEX, and PCE at the start, midpoint, and termination of dewatering to document residual source removal effectiveness;

- Report the finding of elevated PCE in groundwater to the San Francisco Bay Regional Water Quality Control Board and assess the benefits of pursuing cost recovery associated with dealing with PCE in groundwater on the Site originating from an offsite source; and

- Revise ACC's April 5, 2006 project *Soil and Groundwater Management Plan* and incorporate this additional soil and groundwater characterization data.

## 8.0 LIMITATIONS

The service performed by ACC has been conducted in a manner consistent with the levels of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area. No other warranty, expressed or implied, is made.

The conclusions presented in this report are professional opinions based on the indicated data described in this report and applicable regulations and guidelines currently in place. They are intended only for the purpose, site, and project indicated. Opinions and recommendations presented herein apply to site conditions existing at the time of our study.

ACC has included analytical results from a state-certified laboratory, which performs analyses according to procedures suggested by the U.S. Environmental Protection Agency and the State of California. ACC is not responsible for laboratory errors in procedure or result reporting.