HOUSE RELOCATION, PHASE II, EMERYVILLE, CALIFORNIA SOIL AND SOIL GAS SAMPLE REPORT

Prepared for:

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1333 Park Avenue
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In Compliance with:

U.S. Environmental Protection Agency
Region IX
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1.0 INTRODUCTION

This report was prepared on behalf of the City of Emeryville and presents the results of the soil and soil gas sampling and analysis activities conducted in support of the relocation of a residential house to the Parcel No. 049-1025-26-3 (Parcel), under work authorization (WA) entitled, *House Relocation, Phase II, Adeline and 40th Street*. This Parcel occupies the northwest corner of 40th Street and Adeline Street in Emeryville, California, as shown on Figure 1, Site Location Map, and Figure 2, Soil and Soil Gas Sampling Locations. The Parcel currently has no street address and occupies an area of approximately 1,400 square feet. This landscaped area is shown on Figure 2. The Parcel will be expanded to include an additional asphalt paved area so that the increased parcel size will have approximately 4,000 square feet and can accommodate the house to be relocated on it. The soil and soil gas investigation was conducted by URS Corporation (URS) and its subcontractor, OTG EnviroEngineering Solutions, Inc. (OTG), under contract to the City of Emeryville and subject to the requirements of the Brownfields Grant administered by the United States Environmental Protection Agency (EPA) in Region IX. The local oversight agency for this project is the Alameda County Health Agency Department of Environmental Health (ACDEH).

No known soil and groundwater samples had been collected historically within the landscaped area (the original parcel lot). However, environmental investigations have been conducted for several years in areas surrounding the Parcel, including the additional area that will be merged into the Parcel. Petroleum hydrocarbons (gas, diesel, mineral spirits, and their constituents) have been identified in subsurface soil and groundwater in the general area. The City desires to assess potential human health risks before relocating a residential house to the expanded parcel.

1.1 Site Name or Sampling Area

The site has a Parcel No. 049-1025-26-3, but has no street address. It is bounded by 40th Street on the south, Adeline Street on the east, a vacant lot on the west, and residential properties on the north. Soil sampling occurred within the current Parcel area (the landscaped area) and soil gas sampling occurred within the expanded parcel area (both the landscaped area and the asphalt paved area).

1.2 Site or Sampling Area Location

The Site is located in Emeryville, California, in the greater San Francisco Bay Area (Figure 1). The surrounding neighborhood is mixed commercial and residential use.

1.3 Responsible Agency

The soil and soil gas sampling was performed by staff of URS, and its subcontractor OTG, on behalf of the City of Emeryville and was subject to local oversight by the ACDEH. As this project is under an USEPA brownfields program grant, the USEPA has provided project oversight. The Sampling and Analysis Plan (SAP) that governed the field data collection and sample analysis was prepared and subject to review and approval by the USEPA QA Officer.

1.4 Project Organization

Title/Responsibility	Name
EPA Project Manager	Susanne Perkins
ACDEH Project Manager	Barney Chan
City of Emeryville Proj Mgr.	Ignacio Dayrit
EPA QA Officer	Eugenia McNaughton, PhD
Quality Assurance Manager	Vance S. Fong, PE
Contractor (Company Name)	URS Corporation, Oakland, CA
URS Project Manager	Susan Flakus
URS/OTG Task Manager	Xinggang Tong
Quality Assurance Reviewer for URS Corporation	Michelle Wood
URS/OTG Field Coordinator	Xinggang Tong

1.5 Statement of the Specific Problem

The City of Emeryville has been redeveloping closed/abandoned old industrial and residential sites for many years. Three significant redevelopment projects are progressing actively in areas surrounding the parcel: SNK Andente Redevelopment Area across 40th Street, Green City Lofts Redevelopment Area across Adeline Street, and Oak Walk Redevelopment Area that includes almost the entire city block bounded by 40th Street on the south, 41st Street on the

north, Adeline Street on the east, and San Pablo Avenue on the west. The asphalt paved area that will be merged into the expanded parcel belongs to the Oak Walk Redevelopment Area and it has been investigated for environmental concerns by the developer, Bay Rock Residential. Within a 500-foot radius of the Parcel, there used to be a gas station, a bakery company vehicle service yard, and two paint manufacturing facilities. Petroleum hydrocarbons, including gasoline, diesel, mineral spirits and their constituents have been identified in subsurface soil and groundwater by the three developers. The City determined that it was necessary to investigate the impact of petroleum hydrocarbons and other potential contaminants on the residential house that will be relocated on the expanded parcel.

The chemicals of concern for this sampling program included the following: heavy metals and polynuclear aromatic hydrocarbons (PAHs) in surface soils; total petroleum hydrocarbons (TPH), including TPH-gasoline carbon chain range, TPH-diesel carbon chain range; mineral spirits; and the volatile organic compounds (VOCs) benzene, toluene, ethylbenzene, xylenes (BTEX), and methyl tert butyl ether (MTBE), in subsurface soils; and, TPH-gasoline range compounds and individual VOCs in soil vapor that could diffuse into the residential house.

The City of Emeryville has received funds under the EPA brownfields program to support the investigation. Under this grant program, the EPA requested that a SAP, including associated QA elements, be prepared in accordance with EPA requirements. The local oversight agency for this project is the ACDEH. The investigation was implemented at the Site in accordance with the objectives and requirements stated in the EPA-approved SAP.

2.0 BACKGROUND

2.1 Site Description

The Parcel occupies the northwest corner of 40th Street and Adeline Street. The Parcel has an area of approximately 1,400 square feet (sf). Except a small restroom (for AC Transit bus driver use only), there were no other structures on the property at the time of the investigation. The Parcel has been landscaped with bushes.

The redevelopment plans have been for the parcel size to be increased by incorporating additional vacant land west of the current lot. The expanded parcel will measure approximately 40 feet wide by 95 feet long (along 40th Street) and will have an area of approximately 4,000 sf. An historically-significant single family house, that is currently located in the Oak Walk Redevelopment Area, will be relocated to this expanded parcel. The area surrounding the parcel has historically been of residential, commercial and industrial mixed land use, and is being redeveloped into a neighborhood of residential and commercial mixed land use.

2.2 Operational History

As documented in a Phase I Environmental Site Assessment Report (Levine-Fricke, June 29, 1993), the area that the expanded parcel currently occupies used to be the parking area of the San Francisco French Bread Company site. Parcel 049-1025-26-3 (1,400 sf) was created when the City took over part of this bread company site for the extension of 40th Street westward from Adeline Street in 1996. The rest of the San Francisco French Bread Company site was purchased by a private party in partnership with Bay Rock Residential to redevelop the area as Oak Walk Redevelopment Area. The San Joaquin Company, Inc. (SJC), an environmental consulting firm retained by the developer, has been conducting environmental

investigations since 2003 for the proposed Oak Walk Redevelopment Area. Detailed site background information and environmental investigation results can be found in the report titled *Environmental Site Characterization, Oak Walk Redevelopment Site* (SJC, April 2005). Tables 1 through 3 provide site investigation information from the SJC report.

2.3 Previous Investigations/Regulatory Involvement

There are four active petroleum hydrocarbon contamination cases within one city block of the Parcel. All four cases are under the oversight of ACDEH. The San Francisco French Bread Company site once had a 10,000-gallon gasoline underground storage tank (UST) and a 10,000-gallon diesel UST, both of which were removed in 1989. Soil and groundwater samples collected near the USTs indicated that both USTs leaked before they were removed. Celis Alliance Fuel Station, formerly located at 4000 San Pablo Avenue, also has a documented leak of gasoline and diesel. Both Dunne Quality Paints located at 1007 41st Street and One Color (formerly Boysen Paint Factory) located at 1001 41st Street had an unauthorized release of paint solvent (mineral spirits). In addition, trichloroethene (TCE) and tetrachloroethene (PCE) were detected at ppb levels in groundwater collected from three of the 15 monitoring wells installed for the investigation of the former Dunne Quality Paints Site, now the Green City Lofts Redevelopment Area.

As part of the Oak Walk Redevelopment area investigation conducted in 2004, SJC installed a shallow groundwater monitoring well (MWT-3) and a soil boring (BE-3) in the area that will be merged into the Parcel, a well (MW-4) on the 40th Street pedestrian lane next to the Parcel, and two trenches (SJC Trench 3 and SJC Trench 4) located directly adjacent to or near the current Parcel. These locations are identified on Figure 2. OB-6 is a monitoring well installed by Clayton for the investigation of mineral spirits that

may have migrated from the former Dunne Quality Paints site. This site is being developed into the Green City Lofts. The investigation results are summarized in Tables 1 through 3.

2.4 Hydrogeological Information

Shallow groundwater elevations in the area typically vary between 5 feet to 12 feet below grade. There was no groundwater sampling conducted on the site, and further discussion of hydrogeology is therefore not included in this soil and soil gas sample report.

2.5 Environmental and/or Human Impact

Human Health Risks

No actual health impacts are known for this site based on any medical case history or complaints. Based on the occurrence and concentration of certain contaminants in the vicinity of the site in the near surface and subsurface soils and groundwater, the sampling and analytical regime was designed to test for the potential impacts to human health risks.

Ecological Risks

The small size of the site and its location, i.e., high level of human activity, likely precludes the presence of diverse and abundant wildlife populations. No special status species are currently known to occur at the site and none are likely to occur in the future. Therefore, the potential for ecological exposure to contaminants by wildlife is likely to be minimal.

3.0 SAMPLING RATIONALE

In general, the sampling rationale as stated in the approved SAP addressed the potential health risks to future residential occupants of the site. There was a concern of potential heavy metal presence in surface soil within the landscaped area. As such, surface soils were sampled for the analysis of California Title 22 metals. Also, the presence of carcinogenic and other PAHs were checked by use of low-detection limit analysis by EPA method 8310.

Because of documented petroleum hydrocarbon contamination in subsurface soil and groundwater in the general area, subsurface soil was sampled for the analysis of TPH carbon chain ranges for gasoline, diesel, mineral spirits, and for VOCs, including BTEX and MTBE as well as all EPA priority list VOCs by method 8260. Since there are three existing groundwater monitoring wells (MWT-3, MW-4, and OB-6) located within and immediately outside of the approximately 4,000 sf lot (the expanded parcel) that are being monitored regularly by their owners for their respective redevelopment projects, no additional groundwater sampling was conducted within the scope of this Phase II House Relocation Project.

A soil gas survey was conducted within the 4,000 sf lot in accordance with guidance of the USEPA and the CalEPA Department of Toxic Substances Control (DTSC) and the CalEPA San Francisco Bay Regional Water Quality Control Board (SF-RWQCB) for potential vapor intrusion of volatile organic compounds (VOCs) into residential houses.

A summary of the sampling rationale is included in Table 4, including sample matrix (soil or soil gas), sample locations and intervals below grade, and correlated analytical parameters and EPA approved methods for each sample.

3.1 Project Data Quality Objectives

Data quality objectives (DQOs) are qualitative and quantitative statements for establishing criteria for data quality and for developing data collection designs. Data quality indicators (DQIs) are determined for the field and laboratory measurements used on the project. DQIs define criteria for calibration and quality control (QC) for field and laboratory methods.

Data Quality Indicators

DQOs for precision, accuracy, representativeness, comparability, and completeness provide minimum acceptable specifications for comparison during the review and validation process to ensure that the analytical data produced are of sufficient quality to meet DQOs. The definitions and basis for assessing precision, accuracy, representativeness, comparability, and completeness (PARCC parameters) are described below. Numeric data quality indicator acceptance criteria for soil samples and associated field equipment rinsate blank aqueous samples were provided in Table 3-1, Item 6 and in Table 5-2, Data Quality Indicators for Soil Samples and Blanks, found after Section 5.2, in the SAP.

3.2 Data Quality Review

The sampling conducted at the site was expected to produce data that supports decisions related to the potential for health risks to future occupants. Data reports received from the laboratory and the analytical results were reviewed for adherence to the DQOs as specified in the SAP and checked by a qualified scientist who was independent of the project team. The summary of this data quality review is included in Appendix B. The data were determined to be complete and of acceptable quality that met the project DQOs/DQIs.

4.0 SOIL AND SOIL GAS SAMPLING ACTIVITIES

Soil and soil gas sampling operations were conducted in October 2005, in accordance with the project-specific SAP prepared by URS (URS, 2005) and approved by the USEPA. Soil gas samples were collected at six locations on October 17, 2005, with the assistance of a direct-push rig operated by ResonantSonic International. Soil samples were collected on October 19, 2005, with stainless steel trowels (surface soils) and a manual auger method (subsurface soils). Soil samples were collected at three locations within the landscape area. All sampling locations are shown on Figure 2. The location rationale is discussed in Section 3.0. Field sampling logs are included in Appendix A and laboratory analytical reports are included in Appendices C and D.

4.1 Soil Sampling

Soil samples were collected within the existing parcel from three locations, labeled as OTG-SB-2, OTG-SB-2 and OTG-SB-3.

Soil Matrix Samples

Soil matrix samples were analyzed by the following methods:

- California Title 22 CAM 17 Metals by EPA Method 6010B/7000 series (mercury by EPA Method 7471)
  (3 surface samples + 1 field duplicate)
- PAHs by EPA Method 8310 with low detection limits
  (3 surface samples + 1 field duplicate)
- TPH - Gasoline by EPA Method 8015B(M)
  (3 subsurface samples + 1 field duplicate)
- TPH - Mineral Spirits by EPA Method 8015(M)
  (3 subsurface + 1 field duplicate
- TPH - Diesel, Mineral Oil by EPA Method 8015(M)
  (3 subsurface soils + 1 field duplicate)
- EPA Priority Pollutant VOCs and MTBE by EPA Method 8260B
  (3 subsurface samples + 1 field duplicate)

Soil samples and the associated equipment rinsate blanks were analyzed by the California-certified laboratory, Torrent Laboratory located at 483 Sinclair Frontage Road in Milpitas, California.

4.1.1 Surface Soil Sampling

The three surface soil samples, collected at 0-6 inches below the ground surface (bgs), were analyzed for California Title 22 metals and PAHs. Surface soil samples were collected using a stainless steel hand trowel. Sample containers were filled to the top, taking care to prevent soil from remaining in the lid threads prior to being closed to prevent potential contaminant migration to or from the sample.

In accordance with the SAP, a duplicate soil sample was collected at the location OTG-SB-1 (labeled as a "blind" duplicate to the laboratory as OTG-SB-4-1 on the Chain-of-Custody record). Soils to be analyzed for these non-VOC field duplicate samples were placed in a sample-dedicated stainless steel bowl and homogenized with a trowel. The homogenized soil was transferred with a trowel to the appropriate sample containers. Sample containers were closed as soon as they were filled, chilled to 4°C, and processed for shipment to the laboratory.

4.1.2 Subsurface Soil Sampling

The three subsurface soil samples, at 5-5.5 feet bgs, were analyzed for TPH as gasoline, diesel, mineral spirits by Modified EPA Method 8015, and for priority list VOCs by EPA Method 8260B (the list includes BTEX and MTBE). The 5-foot bgs interval soil sample were collected by first hand augering to 5 feet below grade, then advancing a 6-inch stainless steel sleeve into the soil.

Volatiles, TPH-Gasoline and TPH-Mineral Spirits

Each subsurface soil sample designated for volatile organic analysis was brought to the surface in the stainless steel sleeve. Immediately upon retraction of the sleeve, Encore samplers were used to collect soil from the end of the sleeve in accordance with EPA Method 5035 for preparation of samples for VOC analysis for low detection limits by 8260B. The Encore samplers were also used to collect soil samples for TPH gasoline and mineral spirits carbon chain range analyses.

For field duplicates, no homogenization was permitted for the VOC samples. A duplicate soil sample was collected at the location of OTG-SB-2) by advancing a second sleeve to the interval of 5.5 to 6.0 feet bgs. One of the sets of Encore sample aliquots were labeled with the correct sample identification number and the second was labeled with a false sample identification number unknown to the laboratory, OTG-SB-4-5. A different sample time was entered on the duplicate label and noted in the field log.

TPH - Diesel, Mineral Oil

After the Encore sampling was completed, the stainless steel sleeve was then sealed with Teflon sheeting, plastic caps, and aluminized tape to submit for semi-volatiles analyses (TPH-diesel and TPH-mineral oil). Soil samples for field duplicates were collected from co-located interval and labeled as described above under the volatile organics analyses section. Sample containers were chilled to 4°C and processed for shipment to the laboratory.

Soil quality control samples are further described in Section 4.3.

4.2 Soil Gas Sampling

Soil gas sampling was conducted at the site at six locations shown on Figure 2 to the planned sample interval of 5 feet bgs as the water table is approximately as high as 5.5 feet bgs.

Soil Gas Samples

Soil gas samples were analyzed by the following methods:

- Low Detection Volatile Organic Compounds by EPA Method TO-15 (6 SUMMA canister air samples + 1 field duplicate)
- TPH – gasoline range carbon chain by modified EPA Method TO-3 (6 SUMMA canister air samples + 1 field duplicate)

Soil gas samples, including one duplicate, and one trip blank sample were analyzed by California-certified Air Toxics, Ltd., located at 180 Blue Ravine Road, Suite B, Folsom, California.

4.2.1 Soil Gas Sampling Protocol

Subsurface soil gas samples were collected using a Geoprobe-type DPT drill rig modified specifically for *insitu* soil gas surveys. The system consists of a one-inch diameter, three-foot long threaded hollow steel probe that can be connected to make lengths of up to 30 feet, a vacuum pump, tubing and fittings for gas collection. The lowermost part of the first section of the probe has a conical and retractable gas sampling tip that can be opened to allow gas to be drawn from its opening. The probe was pushed directly into the ground to 5 feet bgs. Samples were collected into 6-liter (L) SUMMA canisters. The following quality control steps were adhered to when collecting the soil gas samples:

- A 5 micron particulate filter was used for soil gas grab sampling. The sampling rate was between 100 ml to 200 ml per

minute. Each canister will be fitted with a controller set by the laboratory to fill the 6L canister in 30 minutes (167 ml/min).

- Sampling depths were chosen to minimize the possibility of breakthrough of ambient air from the surface. Sampling depth for this project was 5 feet bgs.

- New, inert Teflon tubing with an outer diameter of 0.25 inch was used and discarded after each sample was collected.

- The gas collection tubing was first flushed with three tubing volumes of soil gas before a gas sample was collected into a pre-vacuumed and pre-cleaned SUMMA canister.

- The hollow steel probe was field steam cleaned after each use.

- The canister, with the tag completely filled out with the sample ID, sampler's name, date, time and initial and residual pressure was placed in the box in which it came and shipped back to Air Toxics.

In accordance with the SAP, a field duplicate soil gas sample was collected at the location of OTG-SG-4 and labeled OTG-SG-7. A trip blank that was unopened during sampling and shipping was included. Quality control samples are further described in Section 4.3.

The eight soil gas samples were shipped under chain-of-custody protocols via UPS next-day delivery service to the laboratory for the required analyses.

Soil gas sampling and analysis procedures and associated quality control requirements are further described in the SAP, Section 5.3 highlighted on Table 5-2 and included in Appendix B of the SAP.

4.3 Sample Quality Control

4.3.1 Field Procedures

Field personnel wore clean, disposable gloves that were changed between sample locations. Equipment used for sampling potentially contaminated soil was decontaminated according to EPA Region 9 recommended procedures described in Section 6.7 of the SAP.

Soil and water sample containers were properly labeled and placed in a cooler with enough ice to keep the temperature at 4°C±2C°

4.3.2 Field Quality Control Samples

Field quality control samples are intended to help evaluate conditions resulting from field activities and are intended to accomplish two primary goals, assessment of field contamination and assessment of sampling variability. The former looks for substances introduced in the field due to environmental or sampling equipment and is assessed using blanks of different types. The latter includes variability due to sampling technique and instrument performance as well as variability possibly caused by the heterogeneity of the matrix being sampled and is assessed using replicate sample collection. The following sections cover field QC samples applicable for this site.

4.3.2.1 Equipment Rinsate Blanks

Equipment rinsate blanks were collected to evaluate field sampling and decontamination procedures by pouring deionized water over the decontaminated sampling equipment. One equipment rinsate blank was

collected per matrix and were analyzed by EPA methods that correlated to the soil sample parameters. The equipment rinsate blank containers were preserved, packaged, and sealed in the manner described for the environmental samples.

4.3.2.2 Trip Blanks

Trip blanks were not required to be collected in association with the samples collected for VOC analyses for soils. For the soil gas samples, one trip blank accompanied the other SUMMA canisters on the day of sampling and during shipment. The trip blank SUMMA canister was sent along with the other canisters but remained unopened in the field. The canister was labeled as a trip blank.

4.3.2.3 Temperature Blanks

For each cooler that was shipped or transported to an analytical laboratory, a temperature blank was included and used by the sample custodian to check the temperature of samples upon receipt.

4.3.2.4 Field Duplicates

Duplicate soil samples were collected at a rate of one per 10 samples. Non-VOC duplicate surface soil samples for metals and PAH analyses were homogenized with a stainless steel trowel in a decontaminated, sample-dedicated stainless steel bowl. Homogenized material from the bowl were then transferred to the appropriate wide-mouth glass jars for both the original and duplicate samples. VOC (including TPH-gasoline range) duplicate samples were collected from co-located sample points as homogenization would aerate and volatilize the soil constituents. Subsurface TPH - diesel and motor oil range samples were also co-located samples.

Duplicate samples were preserved, packaged, and sealed in the same manner as other samples of the same matrix. A separate sample number and station number were assigned to each duplicate, and it was submitted blind (unknown) to the laboratory.

4.3.3 Laboratory Quality Control Samples

Laboratory quality control (QC) samples were analyzed as part of standard laboratory practice and in accordance with the SAP.

Laboratory QC samples are an aliquot (subset) of the field sample. They are not a separate sample, but a special designation of an existing sample. Extra volume for laboratory QC samples or reanalysis were provided as required.

One sample designation was required per 20 samples (including duplicates) for matrix spike laboratory QC samples.

5.0 SUMMARY OF SAMPLE RESULTS

Results of chemical analyses of soil and soil gas samples are summarized in Table 5 (soil gas data), Table 6 (surface soil data), and Table 7 (subsurface soil data).

Soil Gas Samples

Detected VOCs in the soil gas samples are summarized in Table 5. For comparison purposes, three different regulatory criteria are also listed at the bottom of the table: RWQCB soil gas ESLs for residential land use, OEHHA soil gas screening levels (SB 32), and Federal EPA Region 9 ambient air PRGs divided by α, which is a dilution factor (from soil gas to ambient air) and is given as 0.0009 in Table 2 of Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air, Interim Final by CalEPA/DTSC (December 2004). Every detected VOC by EPA Method TO-15 had its reported maximum concentration significantly lower than its regulatory criteria. For comparison to the modified EPA Method TO-3 results for TPH - gasoline, the SF-RWQCB has developed a residential Environmental Screening Level (ESL) of 26,000 ug/m^3 for volatile petroleum hydrocarbons in shallow (less than 3 meters below grade) subsurface soil gas. It should be noted that the laboratory reported results for TO-3 in ug/L which has a 1 to 1000 conversion factor to ug/m3. On Table 5, this SF-RWQCB ESL is converted to 26 ug/L. All results for TO-3 are lower that this criteria for residential properties. Therefore, soil gas does not appear to be of a health concern.

Soil Samples - Organics Analyses

No PAHs (by EPA method 8310 with lower reporting limits) were detected at or above their respective reporting limits in any of the surface soil samples (Table 6).

None of the VOCs by EPA method 8260, TPH-gasoline range compounds, mineral spirits, TPH-diesel range compounds and mineral oil had detected concentrations at or above their respective reporting limits in any of the subsurface soil samples (Table 7).

Soil Samples - Metals Analyses

Metals were reported in all of the surface soil samples (Table 7). In particular, arsenic and lead were reported above their respective SF-RWQCB ESLs in two of the three sample locations. The arsenic ESL (5.5 mg/kg) is well below typical San Francisco Bay Area background levels, which is generally accepted to be 20 mg/kg on average. Using the benchmark of 20 mg/kg for comparison, only one soil sample (OTG-SB-3-1) had a higher arsenic concentration (26 mg/kg). Lead concentrations reported in sample OTG-SB-1-1 of 220 mg/kg, and its duplicate OTG-SB-4-1 at 320 mg/kg, and in OTG-SB-3-1 (340 mg/kg) exceeded the lead ESL of 150 mg/kg for residential land use. Also, one result for cadmium of 2.5 mg/kg slightly exceeded its ESL of 1.7 mg/kg. This result is from sample OTG-SB-3-1.

6.0 FIELD VARIANCES

No modifications to the approved plan occurred except that the subsurface soil TPH - diesel and motor oil range duplicate samples were collected as co-located samples using stainless steel sample sleeves. Therefore, soils were not brought to the surface and homogenized in a stainless steel bowl, then split into sample jars. No problems with data quality were identified by the selection of this co-located sampling method and the DQOs/DQIs for the usability and completeness of the subsurface TPH data were met.

TABLE 1

Relevant Soil Investigation Data from Oak Walk Redevelopment Project (by SJC) and Green City Lofts Redevelopment Project (by Clayton)

			Petroleum Hydrocarbons			BTEX Compounds				Volatile Organic Compounds by EPA Method 8260B													PAHs by EPA Method 8270C		
Sample ID	Date sampled	Depth BGS	Mineral Spirits	TPHd- (diesel)	TPHg (gaso-line)	Benzene	Toluene	Ethyl-benzene	Total xylenes	MTBE	Ace-tone	2-But-anone	n-Bu-tylben-zene	sec-Bu-tylben-zene	tert-Bu-tylben-zene	Isopro-pylben-zene	p-isopro-pylben-zene	p-isopro-pyltol-uene	n-pro-pylben-zene	1,2,4-Tri-methyl-benzene	1,3,5-Tri-methyl-benzene	Other VOCs by 8260B	Naptha-lene	2-Methyl-naptha-lene	15 Other PNAs by 8270C
		ft.	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Exploratory Trenches Dug by the San Joaquin Company (SJC)																									
T3-8.0	12/03/2003	8	n/a	4.3	6.4	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	ND	n/a	n/a
T3-9.5	12/03/2003	9.5	n/a	ND	ND	ND	ND	ND	ND	ND	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
T4-10.5	12/03/2003	10.5	n/a	ND	ND	ND	ND	ND	ND	ND	n/a	n/a	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	n/a	ND
Borings and Wells by SJC																									
BE-3-5	04/02/2004	5.0	ND	1.1	ND	ND	ND	ND	ND	ND	0.11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BE-3-10	04/02/2004	10.0	ND	ND	ND	ND	ND	ND	ND	ND	0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BE-3-15	04/02/2004	15.0	ND	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
BE-3-20	04/02/4002	20.0	190	ND	1600	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MWT-3-5	04/02/2004	5.0	ND	1.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MWT-3-10	04/02/2004	10.0	ND	7.5	7.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.026	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MWT-3-15	04/02/2004	15.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MWT-3-20	04/02/2004	20.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4-5.5	4/30/2004	5.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4-10.5	4/30/2004	10.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4-15.5	4/30/2004	15.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4-19.5	4/30/2004	19.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table 2

Relevant Groundwater Investigation Data from Oak Walk Redevelopment Project (by SJC)

and Green City Lofts Redevelopment Project (by Clayton)

		Petroleum Hydrocarbons			BTEX Compounds				Volatile organic compounds by EPA method 8260B												PANs by EPA method 8270C		
Sample ID	Date sampled	Mineral Spirits	TPHd (diesel)	TPHg (gas)	Benzene	Toluene	Ethyl-benzene	Total xylenes	MTBE	Acetone	2-Bu-tanone	n-Butyl-benzene	sec-Butyl-benzene	tert-Butyl-benzene	Isopro-pylben-zene	p-isopro-pylben-zene	p-isopro-pylto-luene	n-pro-pylben-zene	1,2,4-Tri-methylben zene	1,3,5-Tri-methylben zene	Naptha-lene	2-Methyl-naptha-lene	15 Other PNAs by 8270C
		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Water Samples Collected from Exploratory Trenches by SJC																							
T3-W	12/03/2003	2300	n/a	6300	ND	ND	31	30	ND	ND	ND	100	47	ND	ND	23	ND	230	320	110	12	n/a	n/a
Groundwater Samples from Wells Installed by SJC																							
MW-4	5/19/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MWT-3	5/19/2004	ND	450	1000	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND
Groundwater Samples from Wells Installed by Clayton																							
OB-6	6/27/2003	ND							PCE = 11 ug/L		TCE = 15 ug/L												

Table 3

Relevant Metals in soil data from Oak Walk Redevelopment Project (by SJC) and Green City Lofts Redevelopment Project (by Clayton)

Results of analyses for Title 22 CAM17 metals in soil samples recovered from selected soil borings at Oak Walk redevelopment site

Sample No.	BE-3-19.5	
Date sampled	04/02/2004	
Depth BGS (ft.)	19.5	
Antimony	ND	mg/Kg
Arsenic	2.1	mg/Kg
Barium	150	mg/Kg
Beryllium	ND	mg/Kg
Cadmium	ND	mg/Kg
Chromium III	30	mg/Kg
Chromium VI	n/a	mg/Kg
Cobalt	6.9	mg/Kg
Copper	19	mg/Kg
Lead	5.4	mg/Kg
Molybdenum	ND	mg/Kg
Nickel	26	mg/Kg
Selenium	ND	mg/Kg
Silver	ND	mg/Kg
Thallium	ND	mg/Kg
Vanadium	25	mg/Kg
Zinc	32	mg/Kg
Mercury	ND	mg/Kg

TABLE 4
Summary of Soil and Soil Gas Sampling and Analysis
Phase II House Relocation Project
Emeryville CA

Sample ID	Sample Type	Depth below grade	Date of Sampling	Time of Sampling	Analysis			
					Title 22 metals & EPA 8310 for PAHs	TPH gas, diesel, mineral spirits & EPA 8260 for VOCs	TO-15 for VOCs	mTO-3 for TVPH
OTG-SB-1-1	soil	0" - 6"	10/19/2005	13:29	X			
OTG-SB-1-5	soil	5' - 5.5'	10/19/2005	15:20		X		
OTG-SB-2-1	soil	0" - 6"	10/19/2005	13:00	X			
OTG-SB-2-5	soil	5' - 5.5'	10/19/2005	16:09		X		
OTG-SB-3-1	soil	0" - 6"	10/19/2005	13:08	X			
OTG-SB-3-5	soil	5' - 5.5'	10/19/2005	14:10		X		
OTG-SB-4-1	soil	0" - 6"	10/19/2005	13:19	X			
OTG-SB-4-5	soil	5.5' - 6'	10/19/2005	16:21		X		
Eq Rinsate	water		10/19/2005	14:55		X		
OTG-SG-1	soil gas	5'	10/17/2005	16:32 to 17:10			X	X
OTG-SG-2	soil gas	5'	10/17/2005	16:17 to 16:59			X	X
OTG-SG-3	soil gas	5'	10/17/2005	13:30 to 14:25			X	X
OTG-SG-4	soil gas	5'	10/17/2005	13:53 to 14:30			X	X
OTG-SG-5	soil gas	5'	10/17/2005	15:00 to 15:35			X	X
OTG-SG-6	soil gas	5'	10/17/2005	15:12 to 15:47			X	X
OTG-SG-7	soil gas	5'	10/17/2005	14:32 to 15:09			X	X
TB011705	trip blank						X	

TVPH - Total Volatile Petroleum Hydrocarbons

OTG-SG-7 is a field duplicate of OTG-SG-4

OTG-SB-4-1 is a field duplicate of OTG-SB-1-1

OTG-SB-4-5 is a field duplicate of OTG-SB-2-5

TABLE 5
Summary of Soil Gas Data
Phase II House Relocation Project
Emeryville, CA

			EPA TO 15	Volatile Organic Compounds by EPA Method TO 15																					
Sample ID	**Date sampled**	**Depth BGS**	**TPHg (gasoline) 1**	**1,3-Butadiene**	**Ethanol**	**Acetone**	**Carbon disulfide**	**Hexane**	**2-Butanone**	**Tetrahydrofuran**	**Chloroform**	**1,1,1-Trichloroethane**	**Cyclohexane**	**2,2,4-Trimethylpentane**	**Benzene**	**Heptane**	**Toluene**	**Ethyl Benzene**	**m,p-Xylene**	**o-Xylene**	**stylene**	**Cumene**	**4-Ethyltoluene**	**1,2,4-Trimethylbenzene**	**1,3-Dichlorobenzene**	**1,2-Dichlorobenzene**
		ft.	ug/L	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3		ug/m3	ug/m3	ug/m3	ug/m3
OTG-SG-1	10/17/2005	5.0	4.3	ND(1.7)	27	150	7.1	6.4	32	7.5	ND(3.8)	ND(4.3)	3.3	3.8	7.4	8.5	18	7.6	30	11	3.9	ND(3.9)	11	10	ND(4.8)	ND(4.7)
OTG-SG-1 Lab Duplic	10/17/2005	5.0	n/a	ND(1.7)	26	150	6.6	6.6	31	6	ND(3.8)	ND(4.3)	2.9	4.2	7.2	6.6	17	8.0	30	11	ND(3.4)	ND(3.9)	10	10	ND(4.8)	ND(4.7)
OTG-SG-2	10/17/2005	5.0	7.7	5.1	16	240	6.5	9.2	41	5.3	ND(3.8)	ND(4.3)	3.6	ND(3.7)	8.1	8.5	38	80	310	94	ND(3.4)	4.2	10	8.1	ND(4.8)	ND(4.7)
OTG-SG-3	10/17/2005	5.0	12	ND(1.8)	6.7	64	2.6	650	7.4	5	6.4	ND(4.6)	6.1	ND(3.9)	ND(2.7)	5.4	28	12	50	14	ND(3.6)	ND(4.1)	8.8	9.2	ND(5.0)	ND(5.0)
OTG-SG-4	10/17/2005	5.0	11	ND(1.8)	58	170	7.1	24	37	6.4	ND(3.9)	ND(4.4)	ND(2.8)	7	13	17	44	79	320	96	8.6	ND	12	12	7.2	7.8
OTG-SG-5	10/17/2005	5.0	2.8	ND(1.8)	14	46	ND(2.5)	6.5	4.2	3.8	ND(3.9)	ND(4.4)	ND(2.8)	ND(3.8)	ND(2.6)	ND(3.3)	11	6.0	23	6.6	ND(3.4)	ND(4.0)	5.4	5.9	ND(4.8)	ND(4.8)
OTG-SG-6	10/17/2005	5.0	4.5	ND(1.8)	26	62	ND(2.6)	4.1	6.7	4.4	20	6.1	ND(2.9)	ND(3.9)	ND(2.7)	ND(3.4)	8.4	5	24	8.4	ND(3.6)	6	7.6	8.2	ND(5.0)	ND(5.0)
OTG-SG-7	10/17/2005	5.0	2.9	ND(1.6)	33	70	ND(2.2)	2.5	8.7	3.5	ND(3.4)	ND(3.8)	ND(2.4)	ND(3.3)	ND(2.2)	ND(2.9)	10	16	79	24	ND(3.0)	ND(3.5)	6.4	6.0	5.0	ND(4.2)
OTG-SG-7 Lab Duplic	10/17/2005	5.0	2.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
RWQCB soil gas ESL (residential land)			26 ug/L 2.6E+01	NA	1.9E+07	6.6E+05	NA	NA	NA	NA	450	4.6E+05	NA	NA	85	NA	6.3E+04	4.2E+05	1.5E+05		2.1E+05	NA	NA	NA	2.2E+04	4.2E+04
OEHHA soil gas screening level (SB 32)			NA	NA	NA	NA	NA	NA	NA	NA	NA	2.8E+06	NA	NA	93.4	NA	3.5E+05	2.7E+06	914,000	819,000	NA	NA	NA	NA	NA	NA	NA
Fed EPA Region 9 ambient air PRGs			NA	0.061	NA	3300	730	210	5100	0.99	0.083	2300	6200	NA	0.25	NA	400	1100	110		1100	400	NA	6.2	110	210
Derived Soil Gas Screening Level (PRGs/α)				68		3.7E+06	811,111	2.3E+05	5.7E+06	1,100	92	2.6E+06	6.9E+06		278		4.4E+05	1.2E+06	1.2E+05		1.2E+06	4.4E+05		6,889	1.2E+05	2.3E+05

1. Modified EPA Method TO-3 results reported in ug/L. RWQCB ESL screening for TPH-gasoline is 2.6E+4 ug/m3. Conversion of ESL criteria equals 2.6E+1 ug/L due to factor of 1000 (1 ug/L = 1000 ug/m3) so table shows 26 ug/L for the criteria

α=0.0009 (from Table 2 of Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air, Interim Final, by CalEPA/DTSC, December 2004)

OEHHA Soil Gas Screening Level (SB 32) published by CalEPA/OEHHA, External Review Draft, March 2004

RWQCB Soil Gas Screening Level for residential land use published by California Regional Water Quality Control Board, February 2005

TABLE 6
Summary of Analytical Data for Surface Soil Samples
Phase II House Relocation Project
Emeryville, CA

	Unit	RWQCB's ESL residential shallow soil	Surface soil samples (0"-6" bgs) collected on 10/19/05			
			OTG-SB-1-1	OTG-SB-2-1	OTG-SB-3-1	OTG-SB-4-1
Antimony	mg/kg	6.1	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Arsenic	mg/kg	5.5	**8.4**	4.6	**26**	**12**
Barium	mg/kg	750	140 J	140 J	120 J	270 J
Beryllium	mg/kg	4	ND (2.0)	ND(2.0)	ND(2.0)	ND(2.0)
Cadmium	mg/kg	1.7	1.2	ND(1.0)	**2.5**	1.5
Chromium	mg/kg	58	58 J	38 J	37 J	35 J
Cobalt	mg/kg	10	8.3	9.4	11	9.4
Copper	mg/kg	230	30 J	15 J	56 J	40 J
Lead	mg/kg	150	**220**	15	**340**	**320**
Mercury	mg/kg	3.7	0.37	0.12	0.27	0.45
Molybdenum	mg/kg	40	ND (5.0)	ND(5.0)	ND(5.0)	ND(5.0)
Nickel	mg/kg	150	33	40	36	31
Selenium	mg/kg	10	ND (1.0)	ND(1.0)	1.2	ND(1.0)
Silver	mg/kg	20	ND (1.0)	ND(1.0)	ND(1.0)	ND(1.0)
Thallium	mg/kg	1.0	ND (5.0)	ND(5.0)	ND(5.0)	ND(5.0)
Vanadium	mg/kg	110	30 J	38 J	37 J	39 J
Zinc	mg/kg	600	240	43	280	300
PANs/PNAs by EPA8310	mg/Kg		ND (0.010)	ND (0.005)	ND (0.010)	ND (0.010)

Notes:

OTG-SB-4-1 is a field duplicate of OTG-SB-1-1.

ND - Not detected above reporting limit (RL); RL indicated in parentheses.

J - Estimated value based on QA Review - See Appendix B.

TABLE 7
Summary of Analytical Data for Soil Samples Collected from 5 ft bgs
Phase II House Relocation Project
Emeryville, CA

Sample ID	Date sampled	Depth bgs	Stripptable TPH gasoline	Stripptable TPH mineral spirits	Extractable TPH diesel	Extractable TPH mineral oil	EPA 8260 VOCs
Units		ft	mg/kg	mg/kg	mg/kg	mg/kg	ug/kg
OTG-SB-1-5	10/19/2005	5 - 5.5	ND (0.12)	ND (0.12)	ND (2.0)	ND (2.0)	ND
OTG-SB-2-5	10/19/2005	5 - 5.5	ND (0.1)	ND (0.1)	ND (20)	ND (20)	ND UJ
OTG-SB-3-5	10/19/2005	5 - 5.5	ND (0.1) UJ	ND (0.1)	ND (2.0) UJ	ND (2.0)	ND
OTG-SB-4-5	10/19/2005	5.5 - 6.0	ND (0.1) UJ	ND (0.1) UJ	ND (20)	ND (20)	ND
Units			mg/L	mg/L	mg/L	mg/L	ug/L
Eq Rinsate	10/19/2005		ND (0.05)	ND (0.05)	ND (0.1)	ND (0.1)	ND

Notes:

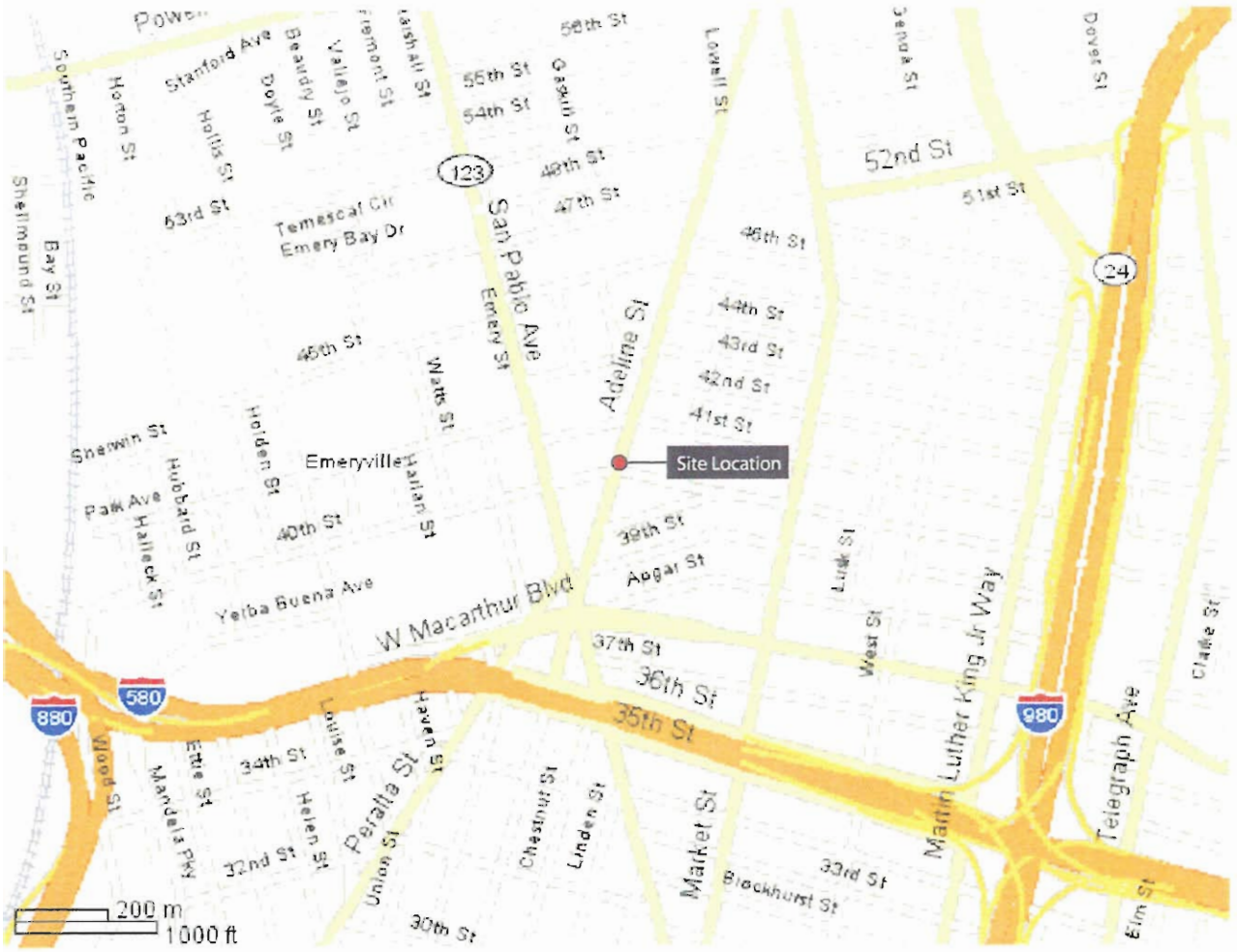
OTG-SB-4-5 is a field duplicate of OTG-SB-2-5.

ND - Not detected above reporting limit (RL); RL indicated in parentheses.

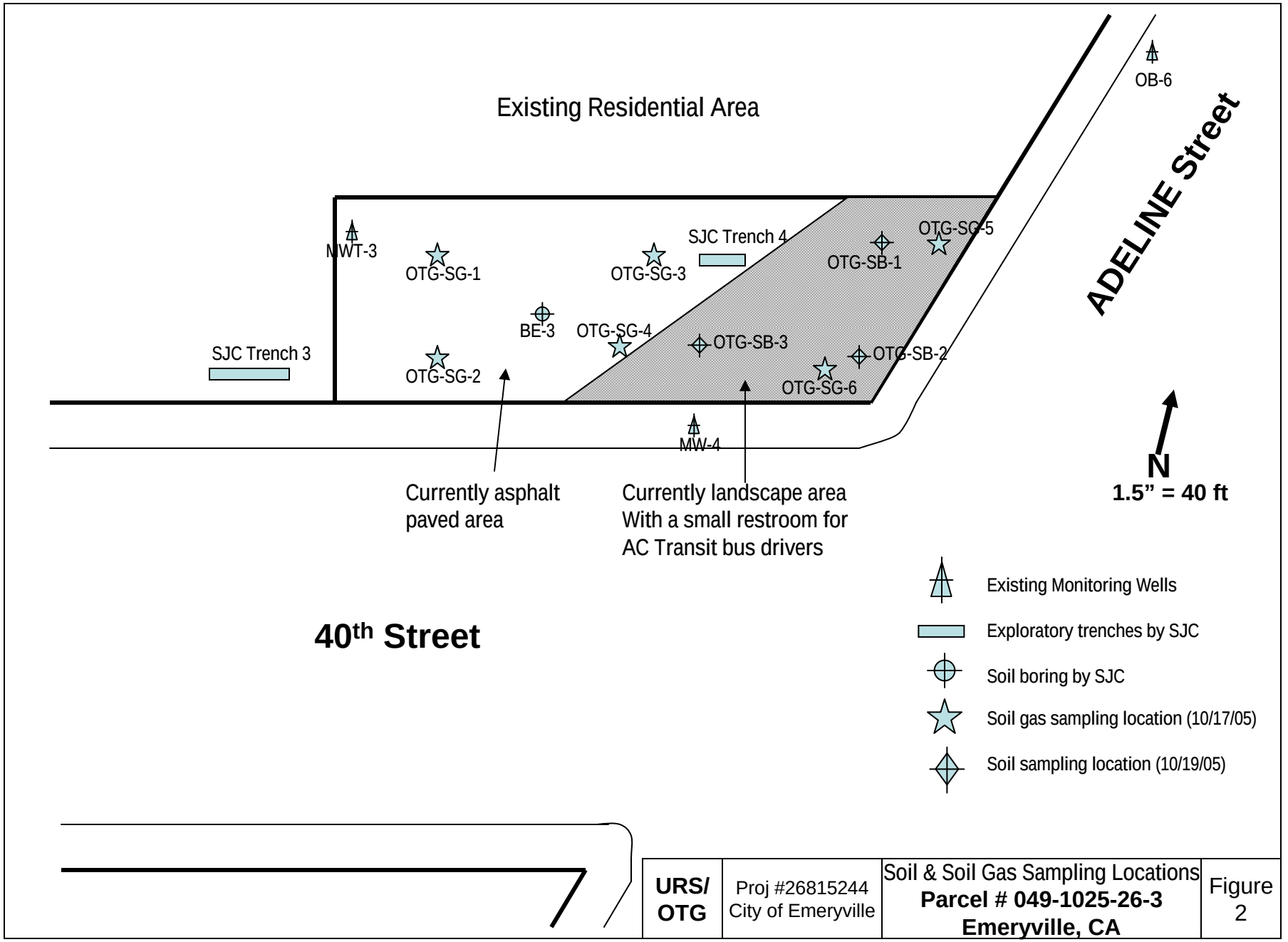
The RL for EPA 8260 VOCs 10 ug/kg for soils except certain compounds - see laboratory report tables.

J - Estimated value based on QA Review - See Appendix B.

UJ - Not detected above RL but flagged as estimated result based on QA Review - See Appendix B.



URS	26815244.10000 City of Emeryville	Site Location Adeline Street and 40th Street Emeryville, CA	Figure 1



URS/ OTG	Proj #26815244 City of Emeryville	Soil & Soil Gas Sampling Locations **Parcel # 049-1025-26-3 Emeryville, CA**	Figure 2

APPENDIX A

FIELD SAMPLING LOGS

DAILY FIELD LOG

OTG EnviroEngineering Solutions, Inc.

Project # 05URS03	Date: 10/17/05
Task # 00000	Weather: Clear, Calm & Warm
Proj Name City Parcel @ 40th st & Adeline st	OTG employees on site: Xinggang Tong
Location: 40th st at Adeline st.	Yurong Han

Purpose of Field Work: Soil gas Sampling

Subcontractors C. Cruz Sub-surface Locators, Inc.
Resonant Sonic International

Field Log Left office @ 10:30 & went to URS Oakland office to pickup summa canisters & SAP & H&S plan, Arrived on site at 12 noon C. Cruz sub-surface Locators arrived at 12:10 pm & checked all drilling locations, all ok, left site @ 12:35 pm

Tuan (one man crew) with a Geoprobe rig arrived on 13:15

started at OTG-SG-3 at 13:20, drove one-inch steel Rod down to 5 ft, pulled up ~2" to expose the tip. new tubing (Proline $\frac{1}{4}$" OD x 0.04" Wall) 10 ft connecting to a tee, use 50-ml glass Syringe to purge the tube three times (150ml) which is equivelent to 3 tubing volumes. Locked the Syringe side Tee & opened the Tee side connected to the Summa Canister. The Vacuum of each summa canister is first measured before use & recorded, & then a flow Controller set at 30 min & with 2 M filter is connected to it, the sample collection tubing is connected to the Controller intake.

steel rods & tips were steam cleaned on site prior to use & between each locations

Logged by (print) Xinggang Tong Signature:

DAILY FIELD LOG

OTG EnviroEngineering Solutions, Inc.

Project # 05URS03	Date: 10/17/05
Task # 00000	Weather:
Proj Name City parcel @ 40th st & Adeline st	OTG employees on site:
Location:	

Purpose of Field Work:

Subcontractors

Field Log

Sample ID	Summa Canister ID	start Vac mm Hg	start time	end time	end Vac mm Hg
OTG-SG-3	919	28.5	13:30	14:25	5.0
OTG-SG-4	33991	28.5	13:53	14:30	4.5
OTG-SG-7	14004	28.5	14:32	15:09	0
OTG-SG-7 is a dup of OTG-SG-4					
OTG-SG-5	35255	28.5	15:00	15:35	4.5
OTG-SG-6	9950	29	15:12	15:47	5"
OTG-SG-2	428	28.5	16:17	16:59	3.5
OTG-SG-1	4319	29.5	16:32	17:10	3

Left site on 18:00 to Kinko Fedex at Oakland City Center. Fedex shipping next day delivery to Air Toxics Lab.

Logged by (print) Xinggang Tong Signature:

DAILY FIELD LOG

OTG EnviroEngineering Solutions, Inc.

Project # 05URS03	Date: Oct. 19, 2005, Wednesday
Task # 00000	Weather: clear, Warm
Proj Name City parcel at 40th st & Adeline st.	OTG employees on site: Xinggang Tong, Yurong Han
Location: 40th st. at Adeline st.	
Purpose of Field Work: Soil sampling	

Subcontractors none. Prime Contractor URS Corp – Susan Flakus present
Torrent Lab provided 4-oz glass jars & Encore samplers

Field Log Lab decon'd 3 small shovels & two large stainless steel bowels.
3 3-gallon buckets, all packed in clean plastic bag.

Left office @ 12:20 pm, Arrived on site @ 12:35 pm.

13:00: OTG-SB-2, removed ~2" landscape mulch & grass, filled two 4-oz jars (glass) with surface sod (0"–6" bgs) using a pre-cleaned shovel. Material: gravels & silt.

13:08: OTG-SB-3, removed surface debris ~1", filled two 4-oz glass jars with surface soil 0"–6" bgs using a pre-cleaned shovel soil type: gravels & silt to 8" bgs –

13:15: OTG-SB-1, removed grass & roots ~2", scooped surface soil (0"–6" bgs) with a pre-cleaned shovel into a pre-decon'ed stainless steel container, mixed with the small shovel & transferred into 4 4-oz glass jars, two labeled as OTG-SB-1 & two as OTG-SB-11 for duplicate.
Soil type, gravels & silt to ~8" bgs.

5-ft Soil Sample Collection:
Triple cleaned & Triple rinsed hand auger & Sampler on site.
2" by 6" stainless steel, new, tube for soil sample collection.

13:40. started hand auger at OTG-SB-3, gravels/silt to ~1'
moist silt (brown) to 5', except fine sand btw 3.00'–3.5'.
Collected soil sample with a slide hammer & Sampler set.
pushed encore sampler directly into the end of SS tube without

Logged by (print) Xinggang Tong Signature:

DAILY FIELD LOG

OTG EnviroEngineering Solutions, Inc.

Project # 05URS03	Date: Oct. 19, 2005
Task # 00000	Weather:
Proj Name	OTG employees on site:
Location:	

Purpose of Field Work:

Subcontractors

Field Log

removing the tube from the sampler. 4 Encore samples collected, two for EPA8260, two for TPH gas. re-inserted the sampler int. the hole & pounded again to fill the ss tube, which for diesel & mineral spirits analysis.

14:30 at OTG-SB-1, triple cleaned & triple rinsed hand auger, sample head. Rinsate was collected & labeled as "Eq. Rinsate" for analysis

gravels & Silt, relatively dry, all the way to 5' bgs, less gravels as going down.

First SS tube soil sample was collected from 5'-5.5' bgs, 8 encore samplers were pushed infl the end of the ss tube & filled w/ soil sample, 4 for MS/MSD.

Tried to collect a dup from 5.5'-6.0', unsuccessful, gravels prevented.

15:45 @ OTG-SB-2, triple cleaned & triple rinsed downhole eq. gravels & Silt, relatively dry & uniform all way to 6'

First SS tube pushed into 5'-5.5'

Second SS tube pushed into 5.5-6.0', but very difficult for the 2nd tube, lots of gravels, the 2nd tube for duplicate & labled as OTG-SB-4-5

Left site @ 16:55. Pack all samples in a cooler w/ice.

Lab carrier pick up the cooler from OTG office @ 17:25

Logged by (print) Xinggang Tong Signature: [signature]

APPENDIX B

DATA QUALITY REVIEW

URS

Memorandum

Date: February10, 2006

To: Susan Flakus

From: Michelle Wood

Subject: QA/QC Analysis for October 2005 House Relocation Sampling Event
SDG 0510148

I have completed a quality assurance evaluation of data collected for the House Relocation project during October of 2005. Upon receipt of laboratory reports, the following steps were taken in accordance with the EPA guidance for data validation. Sample custody documents were cross-checked with the laboratory report for sampling dates and required analyses. Holding times were calculated using analysis date, preparation date, and/or test date in relation to sampling date. The results were reviewed for QA/QC elements of precision, accuracy, reporting limits, and contamination. The following QA/QC parameters were reviewed during data evaluation.

- Chains of Custody – Verify that requested analyses were performed and sampling dates are accurately noted in lab reports.
- Holding Times – Check for holding times in excess of EPA guidelines.
- Method Blanks – Review blank analyses for evidence of potential contamination.
- Matrix Spikes – Review spike and spike duplicate recoveries and relative percent differences (RPDs) as a check for analytical precision and accuracy.
- Laboratory Control Samples– Review recoveries and relative percent differences (RPDs) as a check for analytical accuracy and precision.
- Surrogate Recoveries – Review surrogate recoveries to assess accuracy of analytical results.
- Equipment Rinsate Samples – Review equipment rinsate results to assess decontamination procedures.

Chains of Custody

All samples were adequately accounted for throughout the transfer from field to lab.

Holding Times

All samples were analyzed within the prescribed method holding times.

Method Blanks

Method blanks consist of clean laboratory matrix that is carried through each step of the analysis with the environmental samples for each parameter. Method blanks were non-detect in all cases.

Matrix Spikes

MS/MSD samples are analyzed to evaluate matrix interference for an analytical batch and to assess accuracy and precision. MS/MSD recoveries were outside control limits for several metals in batch 1810. Barium, chromium, copper, and vanadium results were qualified as estimated and flagged J if detected and UJ if undetected. The original sample concentrations for lead and zinc were more than four times the spike concentration and therefore the recoveries are meaningless for these analytes. All other MS/MSD recoveries and RPDs were within control limits.

Laboratory Control Samples

LCSs are well-characterized, laboratory-generated samples used to monitor the laboratory's day-to-day performance for analyses and assess the accuracy of the analytical process independent of matrix effects. All LCS recoveries were within control limits.

Surrogates

Surrogates were analyzed and reported as percent recovered with every organic analysis for each sample. Surrogate recoveries were low in a few cases and associated sample results were qualified as estimated and flagged UJ.

Equipment Rinsate

One equipment rinsate sample was collected and analyzed for volatiles and petroleum hydrocarbons. Chloroform was detected in the equipment rinsate at 12.7 µg/L, however, chloroform was not observed in any of the environmental samples and therefore no qualification was necessary.

Summary

The data reviewed are of acceptable precision and accuracy with the following qualifications.

- Barium, chromium, copper, and vanadium results were qualified as estimated and flagged J if detected and UJ if undetected for all soil samples.
- VOCs were qualified as estimated and flagged UJ for sample OTG-SB-2-5
- TPH-d and TPH-g were qualified as estimated and flagged UJ for sample OTG-SB-3-5
- TPH-g and VOCs were qualified as estimated and flagged UJ for sample OTG-SB-4-5