CONESTOGA-ROVERS
& ASSOCIATES

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November 6, 2007

Mrs. Donna Drogos
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

RECEIVED

2:46 pm, Nov 07, 2007

Alameda County
Environmental Health

Re: **Additional Site Characterization Work Plan**
1137-1167 65th Street, Oakland, California 94608
Fuel Leak Case No. RO0000082
CRA Project No. 521000

Dear Ms. Drogos,

On behalf of Mr. John Nady, Conestoga-Rovers & Associates, Inc. (CRA) is pleased to present this *Additional Site Characterization Work Plan* for the above referenced site. This is in response to agency directive.

Pending your approval, we proposed to provide additional characterization of soil, attempt to define the plume by offsite grab groundwater samples, and perform onsite soil gas vapor sampling. This will allow us to collect a more current representation of soil conditions to evaluate onsite risk, remediation, and closure.

After we receive agency approval, we will proceed with the scope of work presented in this Work Plan. This will be followed by a *Site Characterization Report*. After that we would like to meet with the agency to discuss the project.

Please call me at (510) 420-3307 if you have any questions regarding this report or the project.

Sincerely,

Conestoga-Rovers & Associates,

Mark Jonas, P.G.
Senior Project Manager

Attachment: *Additional Site Characterization Report*

cc: Mr. Frederic Schrag, 6701 Shellmound Street, Emeryville, California 94608 (1 copy + PDF via e-mail)

Work Plan 2007 - Nady 521000

ADDITIONAL SITE CHARACTERIZATION WORK PLAN

1137-1167 65th Street
Oakland, California
Fuel Leak Case No. RO0000082
CRA Project No. 521000

November 6, 2007

Submittal to:

Mrs. Donna Drogos
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Prepared By:

Conestoga-Rovers & Associates, Inc.
5900 Hollis Street, Suite A
Emeryville, California 94608

Conestoga-Rovers & Associates, Inc. (CRA) prepared this document for use by our client and appropriate regulatory agencies. It is based partially on information available to CRA from outside sources and/or in the public domain, and partially on information supplied by CRA and its subcontractors. CRA makes no warranty or guarantee, expressed or implied, included or intended in this document, with respect to the accuracy of information obtained from these outside sources or the public domain, or any conclusions or recommendations based on information that was not independently verified by CRA. This document represents the best professional judgment of CRA. None of the work performed hereunder constitutes or shall be represented as a legal opinion of any kind or nature.

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge.

Mark Jonas, P.G.
Senior Project Manager

PROFESSIONAL GEOLOGIST
MARK L. JONAS
No. 6392
STATE OF CALIFORNIA

ADDITIONAL SITE CHARACTERIZATION WORK PLAN
1137-1167 65th Street
Oakland, California 94608

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1137-1167 65th Street
Oakland, California
Fuel Leak Case No. RO0000082

CRA Project No. 521000

November 6, 2007

1.0 INTRODUCTION

On behalf of Mr. John Nady, Conestoga-Rovers & Associates (CRA) is pleased to submit this *Additional Site Characterization Work Plan (Work Plan)* for the above referenced site. This report is in response to the Alameda County Health Care Services Agency, Environmental Health Services (ACEH) e-mail from Mr. Barney Chan (Appendix A). ACEH is the lead agency for this site. Presented in this *Work Plan* are site background, site characterization, remediation, proposed scope of work, and a quality assurance project plan.

2.0 SITE BACKGROUND

2.1 Site Description

The site is currently comprised of a group of buildings separated by narrow walkways and occupying the addresses of 1137, 1145, 1147, and 1167 65th Street, Oakland, California (Figure 1). The site topography is at an elevation of approximately 35 feet above mean sea level (ft msl). The site vicinity is of mixed residential, commercial, and light industrial use.

2.2 Previous Investigations and Activities

Previous reports are identified in the reference section. The following provides a synopsis of environmental investigations and activities:

1982 Tank Removal: One gasoline underground storage tank (UST) and associated gas pump was reportedly removed in 1982. Based on depressions in the site asphalt, the gasoline UST was most likely located beneath the former gasoline pump (Figure 2).

1998 Tank Removal: In 1998, a 750-gallon heating oil UST was removed from beneath the sidewalk in front of 1167 65th Street (Figure 2). Approximately 18 cubic yards of impacted soil was removed from the UST cavity and transported under manifest for disposal. The former UST cavity was subsequently backfilled with clean fill and resurfaced. One confirmation soil sample was collected at a depth of 12 ft bgs and analyzed for total petroleum hydrocarbons as diesel (TPHd) and benzene, toluene, ethylbenzene, and total xylenes (BTEX). The sample contained 14 micrograms per kilogram (μg/kg) TPHd and no detectable concentrations of BTEX constituents. Additional information is present in the December 24, 1998 *UST Removal Report* prepared by Artesian.

2001 Product Removal: In November 2001, product containing total petroleum hydrocarbon (TPH) compounds with BTEX and volatile organic compounds (VOCs) including 1,2-dichloroethane (1,2-DCA) were removed from six USTs located at the site. The removed product was transported under chain of custody for disposal as hazardous waste.

2002 Tank Removal and Abandonment: In February 2002, five of the six USTs emptied in November 2001 were excavated and removed, and one UST was filled with cement slurry and abandoned in place. NorCal Geophysical Consultants (NorCal) conducted a limited geophysical survey to identify the location of the buried USTs. Analysis of soil and groundwater samples collected from the tank areas indicated elevated concentrations of TPH compounds including gasoline (TPHg), naphtha (TPHnap), Stoddard solvent (TPHss), and TPHd; BTEX; and VOCs. Soil removed from the former UST areas was transported under manifest for disposal. Additional information is present in the May 17, 2002 *UST Removal Report* prepared by SCI consultants.

2002 Soil Boring and Geophysical Survey: In November 2002, Cambria advanced eleven soil borings (SB-1 through SB-11) to further define the extent of petroleum hydrocarbons and VOCs in soil and groundwater beneath the site (Figure 2). During the boring activities, Cambria installed temporary wells in each boring to assess groundwater elevation and to facilitate collection of groundwater samples. The eleven borings were located near the former USTs and associated piping, and up gradient, cross gradient and down gradient of the former UST/piping areas. ForeSite of Pleasant Hill, California conducted a brief geophysical survey to screen proposed boring locations prior to drilling. ForeSite was unable to locate piping emanating from the locations of USTs 1, 2, 3, & 4. Analysis of soil and groundwater samples detected TPH (apparently from Stoddard solvent or mineral spirits) and VOCs. Separate phase hydrocarbon (i.e., free product) globules were observed in groundwater at the location of SB-4 (the former gasoline UST/pump location). The groundwater flow direction at the site could not be fully assessed from the collected data. Additional information is provided in Cambria's February 13, 2004 *Soil and Groundwater Investigation Report.*

July 2003 Geophysical Survey: On July 7, 2003, NorCal conducted a limited site geophysical survey to locate the former product piping. NorCal detected product piping connecting the former exterior and interior USTs, and additional piping north of the exterior UST location, presumably for supply of the former dry cleaning machines (Figure 2). NorCal traced the extents of the pipe previously discovered by ForeSite back to a water box located in the sidewalk and to the bathroom. This pipe is likely a water supply line. NorCal conducted additional searches around the former product piping and have located the full extent of the former product piping.

January 2004 Soil Boring Investigation: In January 2004, Cambria advanced nineteen soil borings to further define the extent of petroleum hydrocarbons and VOCs in soil and groundwater beneath the site. Soil samples were collected at the intervals specified in the August 26, 2003 work plan. Cambria collected nine A-zone, one B-zone, and four C-zone groundwater samples. To prevent cross contamination of deeper groundwater samples, a dual-walled direct-push rig was used to obtain multiple discrete-depth groundwater samples. Soil and groundwater samples were analyzed for hydrocarbons and VOCs in accordance with the August 26, 2003 work plan. Analytical laboratory results detected VOCs in C-zone groundwater in the southeastern portion of the site, and petroleum hydrocarbons in shallow soil and groundwater in significant portions of the site. Additional information is provided in Cambria's February 24, 2004 *Interim Investigation Data Report.*

January 2004 Conduit Survey Study: In January 2004, Cambria conducted a sensitive receptor survey for beneficial use wells (e.g., municipal supply, domestic, irrigation, etc.) and surface water bodies within ½-mile of the site as described in the August 26, 2003 work plan. While several environmental monitoring wells were located during the survey, Cambria did not locate any surface water bodies or beneficial use wells within ½-mile of the site. Cambria understands that site groundwater is in the East Bay plain beneath and adjacent to Emeryville, where groundwater is not considered a current or potential drinking water resource.

January 2004 Conduit Study: In January 2004, Cambria conducted a conduit study to evaluate if preferential migration pathways exist near the site and merit additional investigation. Underground utilities are shown on Figure 2. No preferential migration pathways were located adjacent to the site in Peabody Lane. Based on site concentrations in grab groundwater samples near 65th Street, it is unlikely that preferential migration is occurring via the underground utilities located in 65th Street.

Groundwater Monitoring: Quarterly groundwater monitoring and sampling have been performed at the site since 2004. Historical and recent groundwater analytical data are presented in Tables 4 and 5.

3.0 SITE CHARACTERIZATION

3.1. Geology and Hydrogeology

3.1.1. Regional and Local Geology

The site is located in the Coast Ranges Geomorphic province of California (Norris and Webb, 1990). The site is situated on alluvial fan deposits of the Temescal Formation, comprised of interfingering lenses of clayey gravel, sandy silt, clay and sand-clay mixtures (Radburch, 1957). The sediments of the San Francisco Bay Estuary, which have been described as unconsolidated silt and clay mixed with abundant organic material and discontinuous beds or lenses of sand and/or gravel (Helley et al., 1979), most likely influence site geology and hydrogeology.

Based on previous investigations, the subsurface soils generally consist of interbedded layers of low permeability silts and clays and moderate permeability sandy silt and clay mixtures to a total explored depth of 36 ft bgs. A discontinuous layer of silty sand varying in thickness from 0.5 to 3.5-feet is present from 15 to 20 ft bgs in the southeastern portion of the site.

3.1.2 Local Hydrogeology

Several water-bearing zones have been identified beneath the site. A perched zone ranging in thickness from 1.5 to 2.0-feet is typically present at varying depths from approximately 3.5 to 6 feet bgs. A shallow water-bearing zone ranging in thickness from 1 to 8-feet is present at varying depths from approximately 6 to 12 ft bgs. In certain areas of the site, the perched and shallow water-bearing zones appear to be hydraulically connected. This perched and / or shallow water-bearing zone (present at approximately 3.5 to 12 ft bgs) has been designated water-bearing Zone A. A semi-confined or confined water-bearing zone is present in the southeastern portion of the site at approximately 15 to 18 ft bgs, and has been designated water-bearing Zone B. A deeper, confined or semi-confined water-bearing zone is present in the northeastern portion of the site (boring SB-2) at approximately 30 to 36 ft bgs, and has been designated water-bearing Zone C.

The inferred direction of groundwater flow for all water-bearing zones beneath the site is southwest, in the general direction of the San Francisco Bay.

3.2 Hydrocarbon Distribution

3.2.1 Chemicals of Concern in Soil

Soil samples were collected down to a maximum depth of 24 ft bgs; however, groundwater was detected at a minimum depth of 2.5 ft bgs, therefore, the majority of the soil samples were collected under saturated conditions.

Hydrocarbon concentrations in soil were detected in five areas of the site (see Table 1): 1.) shallow soil in the immediate area surrounding the former interior USTs, 2.) shallow soil in the immediate area of the former exterior USTs, 3) shallow soil in the area of the former product piping and floor drain (borings SB-8, SB-21, SB-22, and SB-24), 4.) soil from approximately 3.5 to 17.5 ft bgs in the southwestern most portion of the site (borings SB-7 and SB-18), and 5.) shallow soil in the area of Peabody Lane defined by borings SB-5 and SB-15.

Chemicals of Concern (COC) concentrations exceeding, Non Drinking Water Commercial ESLs, were reported in soil at 7.5 ft bgs (at the top of the groundwater table) from borings SB-14 (Xylenes) and SB-15 (Benzene and Xylenes). Xylene concentrations exceeding ESLs were also reported in SB-18A and SB-18B (7.5 through 17.5 ft bgs). Tetrachloroethene (PCE), above Non Drinking Water Commercial ESLs, was reported in a soil sample collected from below Tank 3. PCE was also reported in soil samples taken from SB-23 (3 ft bgs), SB-1 (3.5 ft bgs), and SB-10 (3 ft bgs). Soil samples taken from SB-17 (7.5 ft bgs, 11.5 ft bgs, and 17 ft bgs) reported concentrations of cis-1,2-Dichloroethene (cis-1,2-DCE). Vinyl Chloride was reported in the soil sample taken from SB-17 (11.5 ft bgs) (see Table 2).

3.2.2 Chemicals of Concern in Soil in Groundwater

Hydrocarbon concentrations were detected in the B-zone and C-zone groundwater samples (see Figure 4 and 5). Hydrocarbon concentrations in groundwater detected in the A-zone primarily surround the five hydrocarbon soil areas discussed above (see Figure 3).

Groundwater A-zone

VOC concentrations in A-zone groundwater exceeding the ESLs were limited to benzene and xylenes near the former interior, exterior, and gasoline USTs. Vinyl Chloride PCE, Trichloroethene (TCE) and cis-1,2-DCE were reported in MW-1A groundwater sample during the last quarterly groundwater monitoring event. Vinyl Chloride and cis-1,2-DCE were reported in groundwater grab water samples from SB-6 and SB-10 (see Figure 3). VOC concentrations in groundwater are shown on Tables (5 & 7).

Groundwater B-zone

VOC concentrations in B-zone were reported in SB-17B for cis-1,2-DCE, and SB-7 for Vinyl Chloride. Hydrocarbon concentrations were detected in MW-6B, SB-7 and SB-17B (see Figure 4).

Groundwater C-zone

Hydrocarbon concentrations and VOC groundwater concentrations were detected near the southwestern most portion of the site in MW-6C and SB-18C (see Figures 5). VOC concentrations in groundwater are shown on Tables (5 & 7).

4.0 PROPOSED SCOPE OF WORK: ONSITE CHARACTERIZATION

This section presents the scope of work for additional site characterization and soil vapor sampling. In summary, soil, groundwater, and soil vapor samples will be obtained and analyzed to characterize the site.

4.1. Sampling Rationale

During previous investigations soil or groundwater samples were collected onsite and from adjacent properties where past contamination was suspected. The rationale for site characterization is to establish site soil, groundwater, and soil vapor traits, necessary in identifying a proper course of action, and ultimately site closure.

4.2. Proposed Sampling Locations

Proposed boring locations for site soil characterization are presented in Figures 6 *Proposed Boring and Sampling Location Map.* The locations are only approximate and may be modified based on access, subsurface and overhead utilities, unforeseen subsurface conditions, and limitations on selected properties.

4.3. Sampling Procedures

The section presents proposed boring and sampling procedures.

4.3.1. Soil Boring Procedures

After pre-sampling preparations are complete, a field program using a C-57 drilling contractor will be implemented. A hand auger then a geoprobe or a direct-push rig will be used to collect lithologic, PID, and soil analytical samples, if necessary, and then a groundwater grab sample. After pre-sampling preparations are complete, the field program will be initiated. It is currently anticipated that nine (9) boreholes will be used to collect soil at depths of (3, 6, 9, 12, 15, 18, and 21) feet below ground surface (bgs) (see Figure 6). Five (5) of the boring will include a grab groundwater sample. A geoprobe (or similar device) will be used to collect each soil and grab ground water sample. After sampling activities are complete the boring will be properly closed with grout and capped with like material as the existing surface. Standard field procedures for hand auger soil borings and geoprobes are presented in Appendix B *Standard Field Procedures.* These procedures provide general field guidance.

4.3.2. Groundwater Sampling Procedures

After pre-sampling preparations are complete, a field program using a C-57 drilling contractor will be implemented. A hand auger then a geoprobe or a direct-push rig will be used to collect lithologic, PID, and soil analytical samples, if necessary, and then a groundwater sample. After pre-sampling preparations are complete, the field program will be initiated. Groundwater grab sample locations are proposed to comprise of three borings, in close proximity, to obtain insight in the three distinct zones of groundwater with low risk of cross contamination. It is currently anticipated that a total of thirty nine (39) borings will be necessary to collect representative grab groundwater samples for the three separate groundwater zones (see Figure 6). Thirteen (13) boreholes will be used to collect grab groundwater samples from approximately 5 and 10 feet bgs, Thirteen (13) boreholes will be used to collect grab groundwater samples from approximately 15 and 20 feet bgs, and Thirteen (13) boreholes will be used to collect grab groundwater samples from approximately 25 and 35 feet bgs. Five (5) of the 25 to 35 feet bgs groundwater boreholes will be in conjunction with soil boring and soil sampling as previously stated above. A geoprobe (or similar device) will be used to collect each grab ground water sample.

After sampling activities are complete the boring will be properly closed with grout and capped with like material as the existing surface. The protocols presented in Appendix B *Standard Field Procedures* provide general guidance for collecting grab groundwater samples.

4.3.3 Soil Sampling Procedures

At each boring, soils will be examined for staining and odor and screened using a photoionization detector (PID). Soil samples will be collected from any interval where staining, odor, or elevated PID readings are observed. Soil samples will be collected using the general protocol presented in Appendix B *Standard Field Procedures*. Soil samples will be collected in polyethene or brass tubes, or glass sampling containers with no head-space remaining. Samples will be labeled, placed in a cold iced insulated container for transport to the laboratory under a chain-of-custody record.

4.4. Sampling Analysis

Groundwater and selected soil samples will be analyzed by a California-certified laboratory for the analyses presented below.

4.4.1. Groundwater Analysis

Groundwater samples will be analyzed for Total Petroleum Hydrocarbons (TPH) as stoddard solvents, diesel, gasoline, and motor oil, BTEX, and HVOCs. Following Table 5-1 presents groundwater analysis, sampling containers, preservation, detection limit, and holding time:

Table 5-1
Groundwater Analysis, Sampling Containers, Preservatives, Detection Limits, and Holding Times

Analysis and Method	Sampling Containers	Preservatives	Detection Limit	Holding Times
BTEX (EPA Method 8260B)	3 VOAs	HCl	0.5 ug/L	14 days

Analysis and Method	Sampling Containers	Preservatives	Detection Limit	Holding Times
TPHg/ TPHss (EPA Method SW8015C)	1-liter Amber	none	50 ug/L	14 days
TPHd/ TPHmo (EPA Method SW8015C) with silica gel cleanup	1-liter Amber	none	50 ug/L	14 days
HVOCs (EPA Method SW8260B)	2 VOAs	HCl	0.5 ug/L	14 days

4.4.2. Soil Analysis

Soil samples will be analyzed for TPHd/ TPHmo, TPHg/ TPHss, BTEX, MTBE, and VOCs. The following Table 5-2 presents soil analysis, sampling containers, preservation, detection limit, and holding time:

Table 5-2
Soil Analysis, Sampling Containers, Preservatives, Detection Limits, and Holding Times

Analysis and Method	Sampling Containers	Preservatives	Detection Limit	Holding Times
TPHd/ TPHmo (EPA Method 8015M)	Glass or Tube	Cold	1.0 mg/kg	14 days
TPHg/ TPHss (EPA Method 8015M)	Glass or Tube	Cold	1.0 mg/kg	14 days
BTEX (EPA Method 8260)	Glass or Tube	Cold	0.005 mg/kg	14 days
VOCs (EPA Method 8260)	Glass or Tube	Cold	0.005 mg/kg	14 days

5.0 SOIL GAS SAMPLING AND ANALYSIS

This section presents the scope of work for the soil gas investigation. The proposed soil gas sampling approach is to collect samples from seven (7) locations onsite and on adjacent properties. Soil gas samples will be collected from shallow soil depths of 5 to 10 feet bgs, unless high groundwater levels are present. Figure 6 presents the proposed soil gas sampling locations.

5.1. Sampling Rationale

The rationale for soil gas sampling and analysis is to evaluate the potential risk from vapor intrusion.

5.2. Proposed Sampling Locations

Proposed sampling locations for soil gas samples are presented in Figure 6. The proposed locations are only approximate and may be modified based on subsurface utilities or unforeseen subsurface conditions.

5.3. Soil Gas Sampling Procedures

Vapor Probes Construction: After pre-sampling preparations are complete, the field program will be initiated. CRA will collect soil gas samples from the seven (7) locations based on the SMCHD's Vapor Sampling Guidelines. A soil gas sample will be collected near source areas using direct push technology; specifically the post-run tubing (PRT) system utilized by Vironex. Temporary soil gas sampling points will be sampled by hydraulically pushing a direct-push rod equipped with an expendable drive point and a PRT expendable point holder to the desired depth. The direct-push rod will be retracted slightly to expose the PRT holder, and the PRT adapter and tubing will be fed down the rods and connected to the PRT holder. Vapor probes will be constructed of 6-inch screen attached to ¼-inch Teflon tubing. Each probe will be placed at the desired depth and surrounded by a sand pack. Each probe will be isolated from the others by a bentonite grout mixture. Vapor points will be finished at the surface using a traditional well vault. Two Summa™ canisters (a purge and sample canister) will be connected to the Teflon™ tubing from the boring using a tee valve per SMCHD's Vapor Sampling Guidelines. The bentonite seal will be allowed to set for approximately 30 minutes prior to performing the vacuum test (leak test). To check for leaks of the purging and sampling apparatus, the vapor tight valve is vacuum tested for 10 minutes by adjusting the purge canister valve. After the vacuum test, the purge canister is used to purge three volumes of the sample tubing line prior to sample collection to remove air trapped inside the line. Isopropyl alcohol will be utilized as a tracer gas for the investigation. After purging, the purge canister will be closed and isopropyl alcohol (2-proponal) moistened paper towels will be placed around all fitting connections and joints, and at the borehole. The presence of tracer gas in the sample results will indicate if the sampling system was compromised. The vacuum of the Summa™ canister will be used to draw soil gas through the flow controller until a negative pressure of approximately 5 inches of Hg is observed on the vacuum gauge. Soil gas will be purged and sampled at a low flow

5.4. Soil Gas Sampling Analysis

Samples from soil vapor points will be collected using flow meters and 1-liter Summa™ canisters connected to the sampling tubing at each vapor point. A battery powered air pump with attached vacuum-chamber and Tedlar™ bag will be used to purge an appropriate volume from the sampling point tubing. After purging, the valve between the purge pump and Summa™ canister will be closed and the Summa™ canister valve will be opened. The vacuum of the Summa™ canister will be used to draw the soil vapor through the flow controller until a negative pressure of approximately 5-inches of Hg is observed on the vacuum gauge. In accordance with the Department of Toxic Substances Control (DTSC) *Advisory-Active*

Soil Gas Investigations guidance document, dated January 28, 2003, leak testing will be performed during sampling. After sampling, the Summa™ canisters will be packaged and sent to the Air Toxics laboratory under chain-of-custody for analysis. Standard Field Procedures for Soil Vapor Probe Installation and Sampling are presented as Attachment B. Soil Vapor Probe Construction and Sampling Diagrams are presented as Attachment C.

Chemical Analysis: The soil gas samples will be kept at ambient temperature and submitted under chain-of-custody to a state certified laboratory for analysis. The samples will be analyzed by Modified EPA Methods TO-15 for TPH, HVOCs, BTEX, and isopropyl alcohol. Each sample will be labeled and logged on a chain-of-custody form. The following Table 6-1 presents soil vapor analysis, sampling containers, preservation, detection limit, and holding time.

Sample Quality Assurance / Quality Control: A duplicate sample will be collected from one location suspected to be the most impacted. The duplicate sample will be collected immediately after the original sample from the same sample depth.

Table 6-1
Alternative Method Soil Vapor Analysis, Sampling Containers, Preservatives, Detection Limits, and Holding Times

Analysis and Method	Sampling Containers	Preservatives	Detection Limit	Holding Times
TPH Method (TO-15)	Summa Canister	None	uG/m^3	14 days
BTEX (Method TO-15)		None	1.6 uG/m^3	14 days
HVOCs (Method TO-15) Chloroethane Tetrachlorethene (PCE), Trichlorethene (TCE), cis-1,2-Dichloroethene, trans-1,2-Dichloroethene, 1,1-Dichloroethane, 1,2-Dichloroethane, Vinyl Chloride (VC)	Summa Canister	None	uG/m^3 (varies per constituent)	14 days

6.0 SAMPLING PREPARATIONS AND GENERAL PROCEDURES

6.1. Pre-Sampling Preparations

Prior to performing on-site sampling activities, regulatory approval will be received for the proposed sampling approach; a site-specific Health and Safety Plan will be prepared; utility clearance will be performed; we will attempt to acquire access agreements from selected property owners; boring permit(s) will be acquired; and encroachment permits will be submitted (if necessary) and approved.

6.1.1. Regulatory Approval of Sampling Approach

This scope of work presents the proposed scope of work for the sampling approach. The scope of work shall be approved by the ACEH prior to initiating field activities.

6.1.2. Health and Safety Plan

A site-specific Health and Safety Plan (HSP) will be prepared for the proposed field activities. The HSP will be maintained on-site during field work.

6.1.3. Utility Clearance

Prior to boring, the proposed boring locations will be marked with white paint and Underground Service Alert (USA) will be notified to perform a utility survey of USA members. Because of the limits of the USA survey, a utility locating service will be subcontracted to also perform additional utility survey of those areas proposed for borehole sampling. This will help to identify subsurface utilities at boring locations. In addition, during borings for grab groundwater samples, a hand auger may be used to clear to a reasonable depth and to collect shallow soil samples.

6.1.4. Access Agreement

For locations proposed for off-site boring on private property, CRA uses an in-house access agreement. We will present the agreement to selected property owners. We cannot guarantee that property owner will agree to access their property, in a timely and reasonable fashion. As identified on Figure 6, we propose to collect offsite borings in a generally locations defined by hatch patterns on the graphic. This provides some flexibility in acquiring access agreements.

6.1.5. Permits

Based on regulatory requirements of the local agency, a soil boring permit will be obtained from Alameda County Public Works Agency. An encroachment permit will also probably be required for the offsite borings on public property.

6.2. Decontamination, Documentation, and Waste Management Procedures

The section presents equipment decontamination, documentation, and management of investigation derived waste.

6.2.1. Equipment Decontamination

Prior to use and between sampling events, all downhole and sampling equipment will be cleaned with Alconox, or an appropriate alternative, and deionized or distilled water.

6.2.2. Sample Documentation

Sampling containers will be labeled in the field with the job number, sampling location, date and time of sample, and requested analysis. A chain-of-custody record will be initiated and updated throughout handling of the samples and will accompany the samples to the laboratory.

6.2.3. Investigation Derived Waste

All investigation derived waste (IDW) will be temporarily stored on-site in sealed DOT-approved drums or other appropriate container(s). The drums will be labeled with the appropriate boring(s) identification number(s), date of collection, and nature of contents. All drummed IDW will be properly disposed of by the client.

6.2.4 Borehole Locations

Following borehole sampling, sampling locations will be defined based on field measurements from existing structures. Borehole sampling locations will be identified on a scaled figure.

7.0 REPORT

After receiving analytical results from the laboratory, a *Characterization Report* or other appropriate report will be provided with sampling methods, results, and conclusions.

8.0 QUALITY ASSURANCE PROJECT PLAN

This Quality Assurance Project Plan (QAPP) is intended to define procedures to facilitate the acquisition of accurate and reliable data.

8.1. Project Organization

Mr. John Nady is currently responsible for the site. CRA works for this client to provide consulting and sampling services. Subcontractors would be used for drilling, soil and groundwater analysis, soil gas sampling and analysis, and independent utility clearance. It is currently anticipated that California-certified McCampbell Analytical Inc. (DHS License #1644) will provide analytical services for groundwater and soil samples. The laboratory for soil gas analysis will be selected prior to initiating field work. Alameda County Health Agency is the lead agency and will provide oversight for sampling activities. Documents will be sent to the client and the lead agency for their consideration. Underground Service Alert (USA) will be contacted prior to performing any subsurface activities.

Following are principal contacts for organization currently associated with the project:

Client
Mr. John Nady Trustee of the Nady Trust.
c/o Frederic Schrag
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Alameda County Health Care Services Agency
Department of Environmental Health
Mrs. Donna Drogos
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donna.drogos@acgov.org
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Alameda County Public Works Agency
James Yoo (for Drilling Permit)
510/670-6633; 510/782-1939 fax
Jamesy@acpwa.org
399 Elmhurst Street, Hayward, CA 94544

8.2. Quality Assurance Objectives

The overall quality assurance objective is to develop and implement procedures for field sampling, chain-of-custody, laboratory analysis, and reporting that will provide results that are defensible and reliable. Quality assurance objectives for accuracy, precision, and method detection limits are discuss as follows:

Accuracy

The criterion for accuracy is a measurement of bias that exists in a measurement system. It refers to the degree of agreement of a measurement, X, with an accepted reference or true value, T, usually expressed as the difference between the two values, X-T. Accuracy can also be assessed by using percent bias and percent recovery information. Accuracy is difficult to measure for the entire data collection activity and specifically the sampling component. The criteria for accuracy is best addressed using laboratory matrix spikes.

Precision

The criterion for precision is a measure of the reproducibility of replicate analyses made under a given set of conditions. Specifically, it is a quantitative measure of the variability of a group of measurements as compared to their average value. The overall precision of each data collection activity should take into account both field sampling precision and analytical precision. The specific criterion for precision for each parameter is detailed within the individual analytical test method. If groundwater is sampled, a blind duplicate ground water sample will be collected and assessed as a means of assessing both sampling and analytical reproducibility and as a measure of the data collection activity's precision. The duplicate sample will be analyzed for the same suite of analyses as the original sample. All results will be included in a report.

Method Detection Limits

Anticipated method detection limits are based on a relatively standard sample with a manageable amount of interference. The specific character of a sample with respect to high concentrations of multiple contaminants can increase the actual detection limit above the anticipated method detection limit.

8.3. Sampling Procedures

Sampling procedures are presented in Sections 4, 5, and 6.

8.4. Sample Custody Procedures and Documentation

Chain-of-custody procedures and documentation are covered in Section 6.

8.5. Field and Laboratory Calibration Procedures

Field Calibration Procedures

If a photoionization detector (PID) is used, it will be calibrated in the office or at an equipment supplier, prior to use in the field.

Laboratory Calibration Procedures

The analytical laboratory has calibration procedures as required by the current EPA Standard Methods and their own laboratory Quality Assurance/Quality Control (QA/QC) plan. The details associated with all the specific laboratory calibration procedures are available from the laboratory upon request.

8.6. Analytical Procedures

Analytical methods to be used are presented in Section 4 and 5. Specific laboratory procedures associated with each method are available upon request.

8.7. Certified Analytical Laboratory

Pursuant to Health and Safety Code Section 25198, a state-certified laboratory will perform analytical services. For this project it is anticipated that McCampbell Analytical Inc., a California-certified laboratory with DHS License #1644, will perform analytical services for groundwater and soil analysis. Selection of the laboratory for soil gas samples will be made prior to performing field work.

8.8. Data Assessment and Corrective Actions

Data Assessment

Data assessment within the analytical laboratory is defined by the specific requirements of the standard analytical method and the laboratory's QA/QC program. Procedures for analytical accuracy, precision, and completeness are in laboratory documents, available upon request. Accuracy and precision are also discussed in Section 9.2 "Quality Assurance Objectives." Completeness of analytical data is a measure of the amount of valid data obtained from the measurement system compared with the amount that was expected under normal conditions.

The analytical laboratory McCampbell Analytical will submit QC documentation with the analytical results. QC documentation includes a case narrative describing conformance; surrogate recoveries; spike amount(s), control limits, accuracy, and precision; calibration summaries; and a GC/MS internal standard summary. The soil gas analytical laboratory will also provide QC documentation with their analytical results.

Field data and analytical results will be evaluated by a Professional Geologist.

Corrective Actions

Unacceptable conditions or data, nonconformance with the QA procedures, or other deficiency may require corrective actions. A corrective action may be necessary if the nonconformance is of program significance. If required, the action to correct the nonconformance will be developed, initiated, and implemented.

Corrective action(s) may include:

- Reanalyzing the samples, if holding time permits.
- Resampling and reanalyzing.
- Evaluating and amending the sampling and analytical procedures.
- Accepting the data and acknowledging its level of uncertainty.

Necessary corrective actions will be documented.

8.9. Reporting Procedures

Reporting procedures for measurement of system performance and data quality are part of the laboratory's operating procedures and documentation is available upon request. Quality control documentation will be presented with analytical results from the laboratory.

8.10. Data Management

Laboratory data management, data reduction, and reporting requirements are in the laboratory's QA/QC program and operating procedures. Documentation from the laboratory is available upon request. Independent third-party (outside of McCampbell Analytical) validation will not be performed.

McCampbell Analytical and the selected soil gas laboratory will perform an internal review of analytical and QC results prior to release of a data package signed by a laboratory representative.

Laboratory results and associated quality control documentation will be presented in a report following field activities and sample analysis.

8.11. Internal Quality Control

Quality control is defined as the routine application of procedures for obtaining prescribed standards of performance. The procedures used for field work are discussed throughout this report, under Sections 4, 5, and 6. Standards of performance are discussed in this section of the *Work Plan.* Laboratory documentation on standard analytical methods and the laboratory's QA/QC program is available upon request.

9.0 REFERENCES

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Regional Water Quality Control Board, San Francisco Bay Region – Groundwater Committee, 1999. *East Bay Plain Groundwater Basin Beneficial Use Evaluation Report.* June.

12/19/02

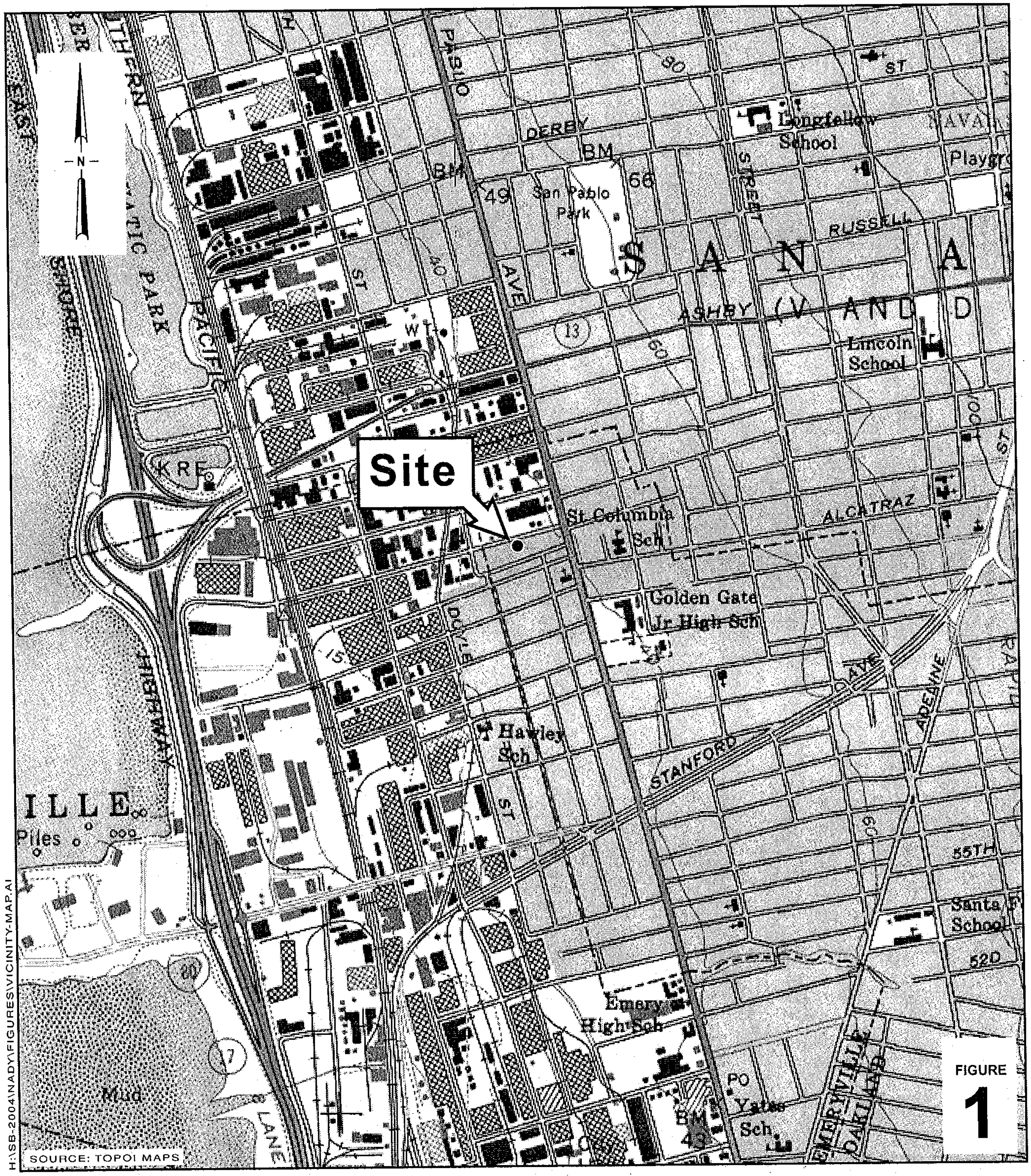


FIGURE 1

0 1/8 1/4 1/2 1

SCALE : 1" = 1/4 MILE

Vicinity Map

1137 - 1167 65th Street

Oakland, California

CONESTOGA-ROVERS & ASSOCIATES

10/17/07

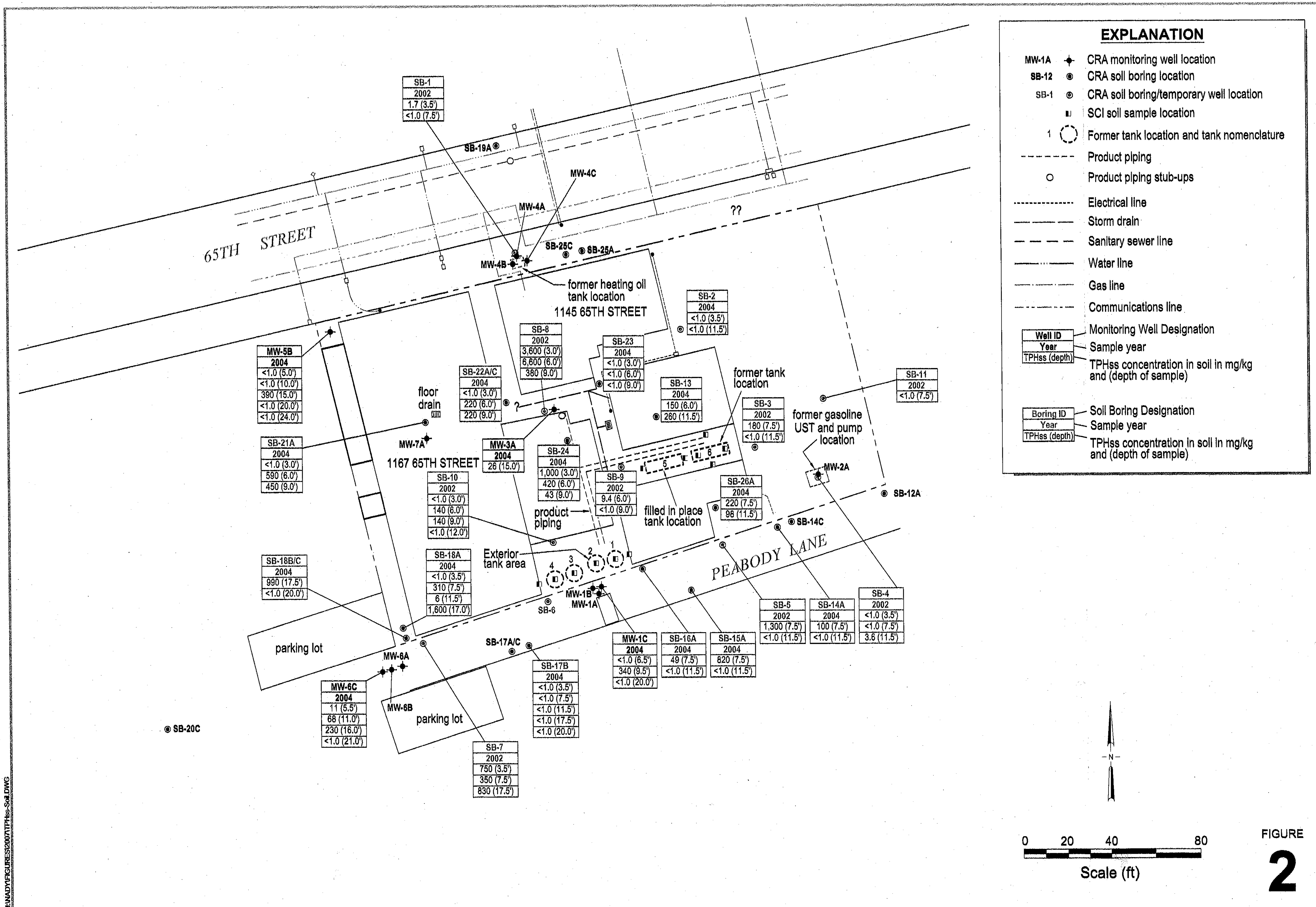


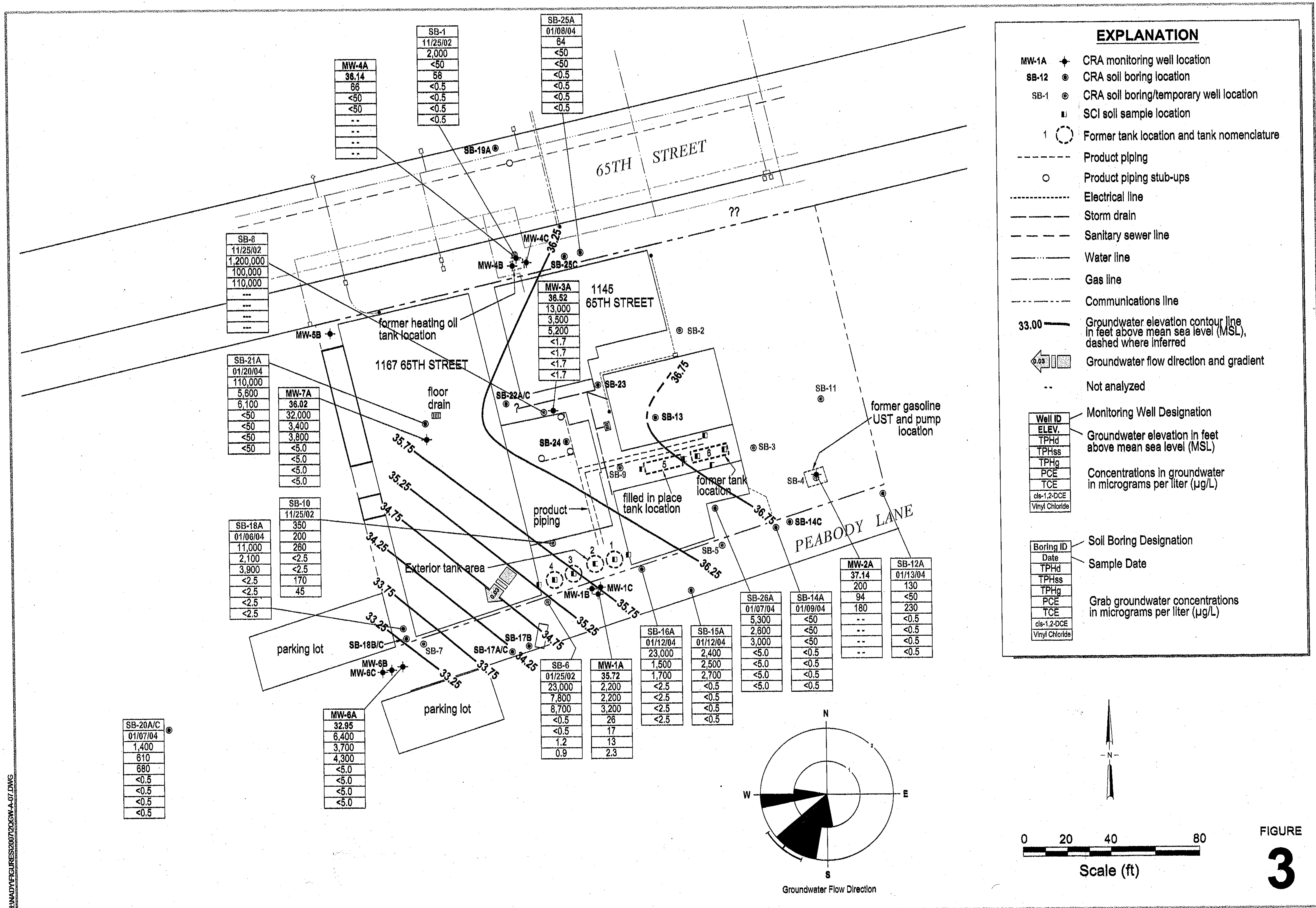
FIGURE 2

TPHss Concentrations in Soil

CONESTOGA-ROVERS & ASSOCIATES

1137 - 1167 65th Street
Oakland, California

10/16/07



CONESTOGA-ROVERS & ASSOCIATES

Groundwater Flow and Chemical Concentrations - A Zone

June 11, 2007

1137 - 1167 65th Street
Oakland, California

FIGURE 3

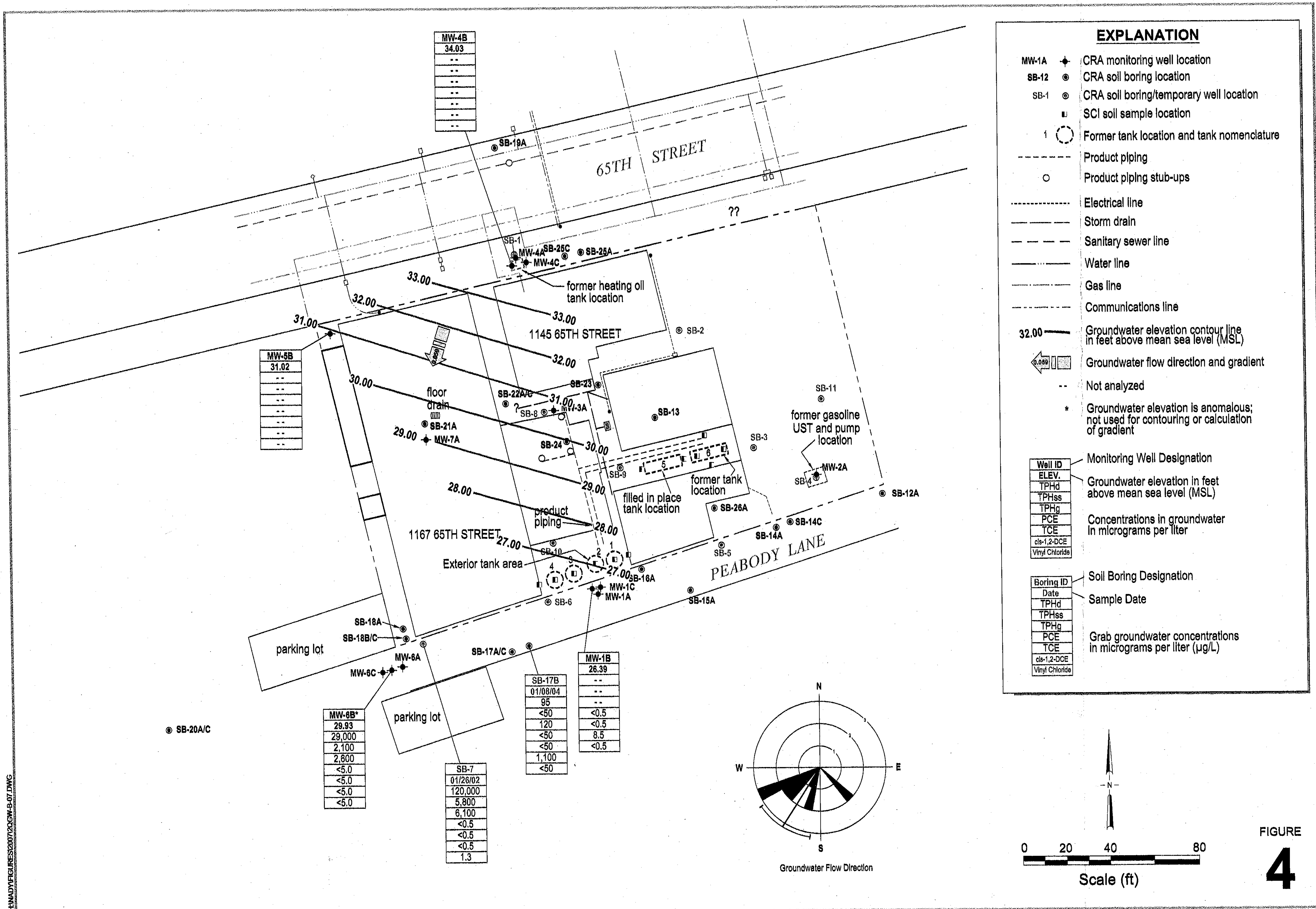


FIGURE 4

Groundwater Flow and Chemical Concentrations - B Zone

June 11, 2007

CONESTOGA-ROVERS & ASSOCIATES

1137 - 1167 65th Street
Oakland, California

10/17/07

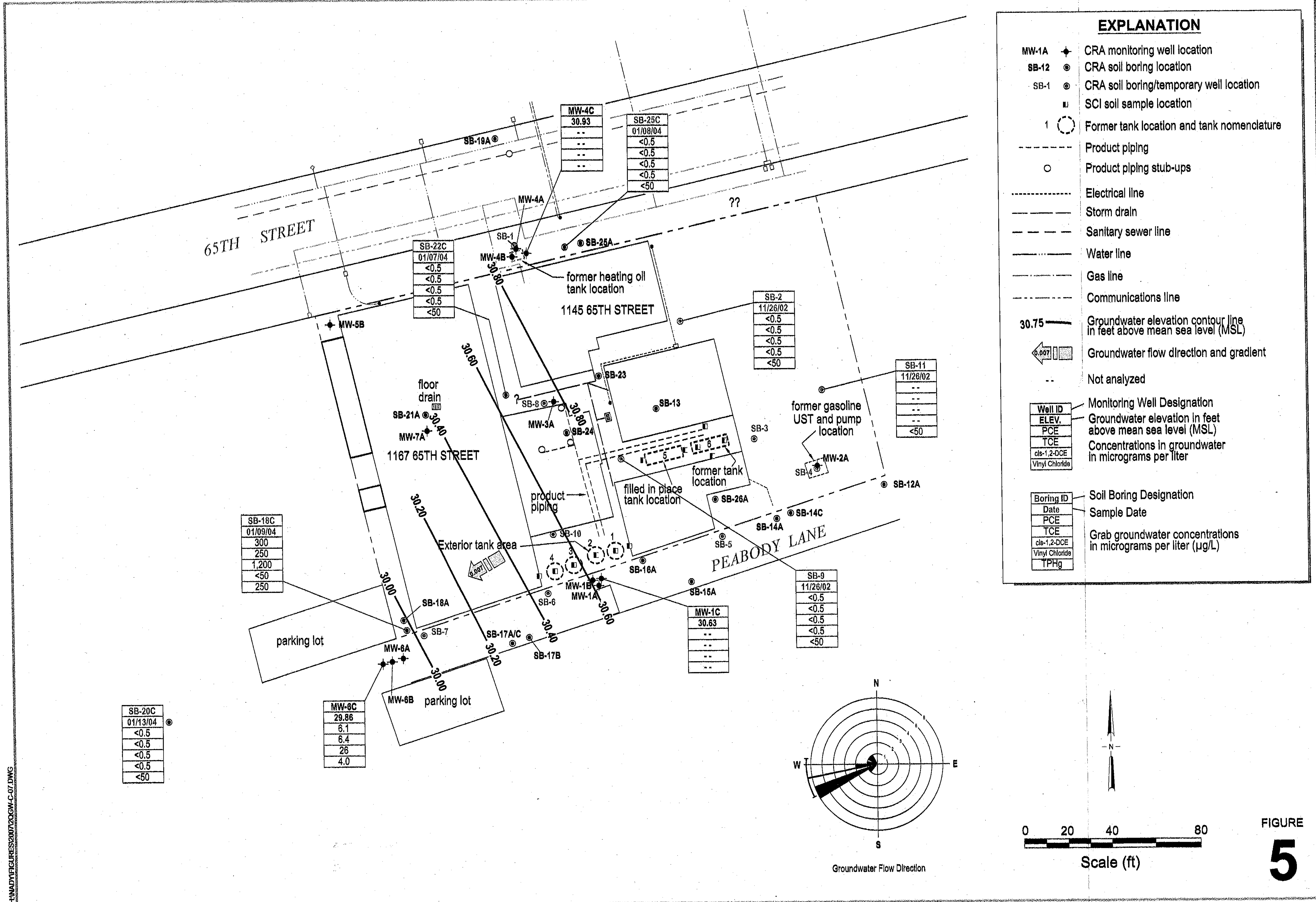


FIGURE 5

Groundwater Flow and Chemical Concentrations - C Zone

June 11, 2007

1137 - 1167 65th Street
Oakland, California

CONESTOGA-ROVERS & ASSOCIATES

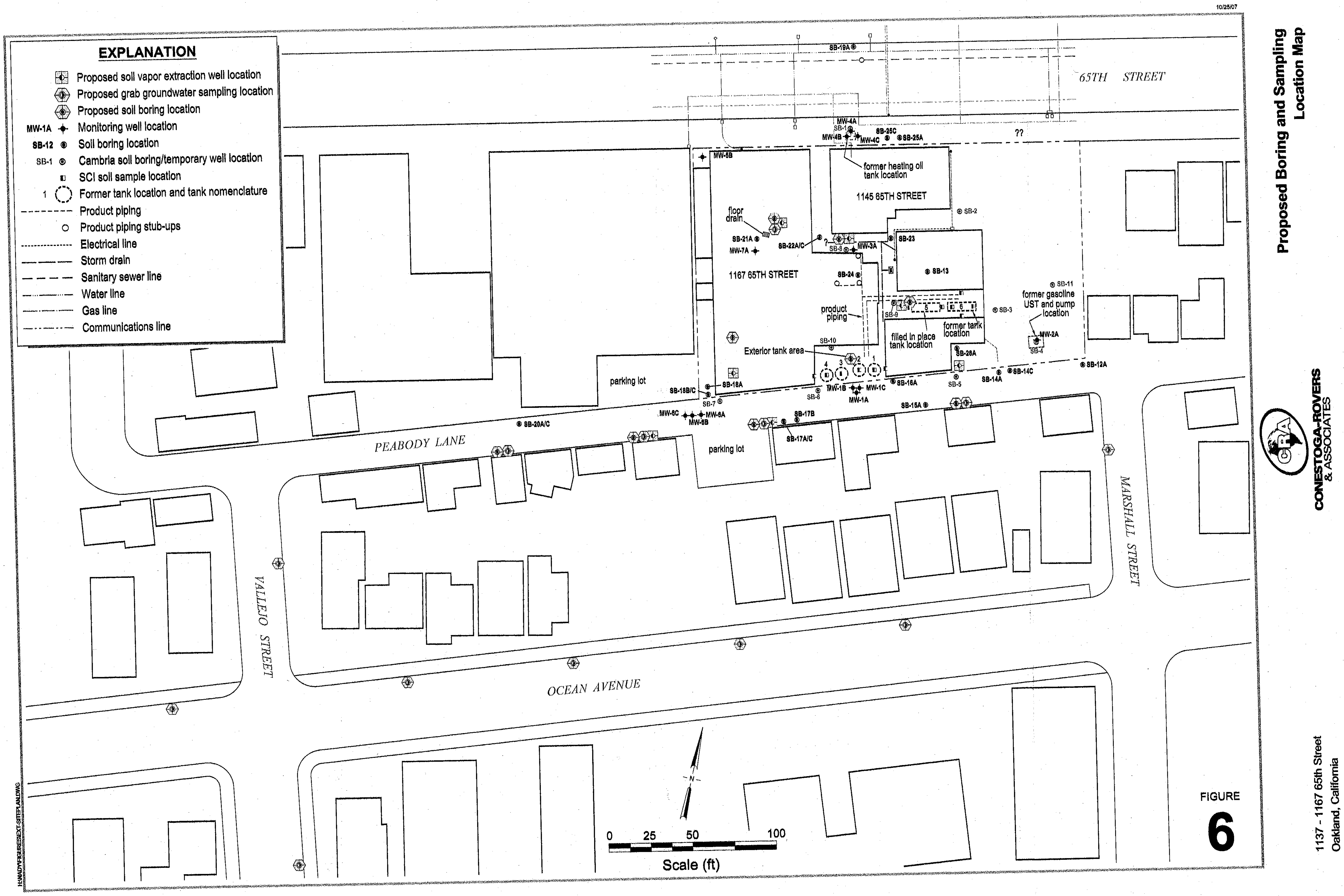

10/25/07
EXPLANATION
Proposed soil vapor extraction well location
Proposed grab groundwater sampling location
Proposed soil boring location
MW-1A Monitoring well location
SB-12 Soil boring location
SB-1 Cambria soil boring/temporary well location
SCI soil sample location
1 Former tank location and tank nomenclature
Product piping
Product piping stub-ups
Electrical line
Storm drain
Sanitary sewer line
Water line
Gas line
Communications line
65TH STREET
PEABODY LANE
VALLEJO STREET
OCEAN AVENUE
MARSHALL STREET
1145 65TH STREET
1167 65TH STREET
former heating oil tank location
floor drain
product piping
Exterior tank area
filled in place tank location
former tank location
former gasoline UST and pump location
parking lot
parking lot
SB-19A
MW-4A
SB-1
MW-4B
MW-4C
SB-25C
SB-25A
MW-5B
SB-2
SB-21A
MW-7A
SB-22A/C
SB-8
MW-3A
SB-23
SB-13
SB-24
SB-11
SB-9
SB-3
MW-2A
SB-4
SB-10
SB-26A
SB-12A
SB-18B/C
SB-18A
SB-7
SB-6
MW-1B
MW-1C
MW-1A
SB-16A
SB-5
SB-14A
SB-14C
SB-15A
SB-17B
SB-17A/C
MW-6C
MW-6A
MW-6B
SB-20A/C
Scale (ft)
0 25 50 100
N
H:\MADY\FIGURES\EXT-SITEPLAN.DWG
Proposed Boring and Sampling Location Map
CONESTOGA-ROVERS & ASSOCIATES
1137 - 1167 65th Street
Oakland, California
FIGURE
6

Table 1. Soil Analytical Data: Petroleum Hydrocarbons and Lead - 1137-1167 65th Street, Oakland, California

Sample ID	Date Sampled	Sample Depth (ft)	TPHmo	TPHd	TPHss	TPHg	TPHnap	Lead	Notes
			←		mg/kg			→	
Shallow Soil Commercial Non-Drinking Water ESL (risk driver)			1000 (soil leaching)	500 (soil leaching)	400 (soil leaching)	400 (soil leaching)	400 (soil leaching)	750	
Deep Soil Commercial Non-Drinking Water ESL (risk driver)			1000 (soil leaching)	500 (soil leaching)	400 (soil leaching)	400 (soil leaching)	400 (soil leaching)	750	
Cambria Samples									
MW-1C @6.5	5/10/2004	6.5	<5.0	<1.0	<1.0	<1.0	--	--	
MW-1C @9.5	5/10/2004	9.5	<5.0	**60**	**340**	**160**	--	--	
MW-1C @14.5	5/10/2004	14.5	<5.0	**10**	--	**6**	--	--	
MW-1C @20	5/10/2004	20	<5.0	<1.0	<1.0	<1.0	--	--	
MW-3A @15	5/7/2004	15	**9.2**	**180**	**26**	**11**	--	--	
MW-5B @5	5/18/2004	5	<5.0	<1.0	<1.0	<1.0	--	--	
MW-5B @10	5/18/2004	10	<5.0	<1.0	<1.0	<1.0	--	--	
MW-5B @15	5/18/2004	15	<5.0	**42**	**390**	**410**	--	--	
MW-5B @20	5/18/2004	20	<5.0	<1.0	<1.0	<1.0	--	--	
MW-5B @24	5/18/2004	24	<5.0	<1.0	<1.0	<1.0	--	--	
MW-6C @5.5	5/11/2004	5.5	**1800**	**810**	**11**	**6**	--	--	
MW-6C @11	5/11/2004	11	<5.0	**18**	**68**	**29**	--	--	
MW-6C @16	5/11/2004	16	<5.0	**16**	**230**	**100**	--	--	
MW-6C @21	5/11/2004	21	<5.0	<1.0	<1.0	<1.0	--	--	
SB-13 @6.0	1/5/2004	6	<5.0	21	**150**	**140**	--	--	
SB-13 @11.5	1/5/2004	11.5	<5.0	41	**260**	**260**	--	--	
							--	--	
SB-14A @7.5	1/9/2004	7.5	<5.0	64	100	210	--	--	
SB-14A @11.5	1/9/2004	11.5	<5.0	<1.0	<1.0	<1.0	--	--	
SB-15A @7.5	1/12/2004	7.5	9.3	190	820	1,500	--	--	
SB-15A @11.5	1/12/2004	11.5	<5.0	<1.0	<1.0	<1.0	--	--	

Conestoga-Rovers & Associates

Table 1. Soil Analytical Data: Petroleum Hydrocarbons and Lead - 1137-1167 65th Street, Oakland, California

Sample ID	Date Sampled	Sample Depth (ft)	TPHmo	TPHd	TPHss	TPHg	TPHnap	Lead	Notes
			←		mg/kg			→	
Shallow Soil Commercial Non-Drinking Water ESL (risk driver)			1000 (soil leaching)	500 (soil leaching)	400 (soil leaching)	400 (soil leaching)	400 (soil leaching)	750	
Deep Soil Commercial Non-Drinking Water ESL (risk driver)			1000 (soil leaching)	500 (soil leaching)	400 (soil leaching)	400 (soil leaching)	400 (soil leaching)	750	
SB-16A @7.5	1/12/2004	7.5	<5.0	59	49	90	--	--	
SB-16A @11.5	1/12/2004	11.5	<5.0	<1.0	<1.0	<1.0	--	--	
SB-17B @3.5	1/8/2004	3.5	210	**110**	**<1.0**	**<1.0**	--	--	
SB-17B @7.5	1/8/2004	7.5	<5.0	**<1.0**	**<1.0**	**<1.0**	--	--	
SB-17B @11.5	1/8/2004	11.5	<5.0	**<1.0**	**<1.0**	**<1.0**	--	--	
SB-17B @17.0	1/8/2004	17.5	<5.0	**<1.0**	**<1.0**	**<1.0**	--	--	
SB-17B @20	1/8/2004	20	5.5	**1**	**<1.0**	**<1.0**	--	--	
SB-18A @3.5	1/6/2004	3.5	<5.0	**<1.0**	**<1.0**	**<1.0**	--	--	
SB-18A @7.5	1/6/2004	7.5	<50	**230**	**310**	**340**	--	--	
SB-18A @11.5	1/6/2004	11.5	<5.0	**9**	**6**	**6**	--	--	
SB-18A @17	1/6/2004	17	<100	**850**	**1,600**	**2,600**	--	--	
SB-18B @17.5	1/6/2004	17.5	<50	**660**	**990**	**1,000**	--	--	
SB-18B @20	1/9/2004	20	<5.0	**<1.0**	**<1.0**	**<1.0**	--	--	
SB-21A @3	1/20/2004	3.0	<5.0	**<1.0**	**<1.0**	**<1.0**	--	--	
SB-21A @6	1/20/2004	6.0	<25	**220.0**	**590.0**	**590.0**	--	--	
SB-21A @9	1/20/2004	9.0	<25	**270.0**	**450.0**	**470.0**	--	--	
SB-22A/C @3	1/7/2004	3.0	<5.0	1.1	**<1.0**	<1.0	--	--	
SB-22A/C @6	1/7/2004	6.0	11.0	230.0	220.0	410.0	--	--	
SB-22A/C @9	1/7/2004	9.0	6.7	150.0	220.0	400.0	--	--	
SB-23 @3	1/6/2004	3.0	<5.0	<1.0	**<1.0**	**<1.0**	--	--	
SB-23 @6	1/6/2004	6.0	<5.0	<1.0	**<1.0**	**<1.0**	--	--	
SB-23 @9	1/6/2004	9.0	<5.0	<1.0	**<1.0**	**<1.0**	--	--	

Conestoga-Rovers & Associates

Table 1. Soil Analytical Data: Petroleum Hydrocarbons and Lead - 1137-1167 65th Street, Oakland, California

Sample ID	Date Sampled	Sample Depth (ft)	TPHmo	TPHd	TPHss	TPHg	TPHnap	Lead	Notes
			←		mg/kg			→	
Shallow Soil Commercial Non-Drinking Water ESL (risk driver)			1000 (soil leaching)	500 (soil leaching)	400 (soil leaching)	400 (soil leaching)	400 (soil leaching)	750	
Deep Soil Commercial Non-Drinking Water ESL (risk driver)			1000 (soil leaching)	500 (soil leaching)	400 (soil leaching)	400 (soil leaching)	400 (soil leaching)	750	
SB-24 @3	1/5/2004	3.0	<250	1300	1000	980	--	--	
SB-24 @6	1/5/2004	6.0	8.9	220	420	430	--	--	
SB-24 @9	1/5/2004	9.0	<5.0	54	43	43	--	--	
							--	--	
SB-26A @7.5	1/7/2004	7.5	6.8	150	220	240	--	--	
SB-26A @11.5	1/7/2004	11.5	<5.0	67	98	180	--	--	
SB-1-3.5	11/25/2002	3.5	860	170	1.7	2.6a,b	--	37	
SB-1-7.5	11/25/2002	7.5	140	32	<1.0	<1.0	--	5.8	
SB-2-3.5	11/25/2002	3.5	<5.0	<1.0	<1.0	<1.0	--	3.9	
SB-2-11.5	11/25/2002	11.5	<5.0	<1.0	<1.0	<1.0	--	6.8	
SB-3-7.5	11/25/2002	7.5	<5.0	20	180	190a	--	<3.0	
SB-3-11.5	11/25/2002	11.5	<5.0	<1.0	<1.0	<1.0	--	9.7	
SB-4-3.5	11/25/2002	3.5	<5.0	<1.0	<1.0	<1.0	--	3.1	
SB-4-7.5	11/25/2002	7.5	15	2.1	<1.0	<1.0	--	21	
SB-4-11.5	11/25/2002	11.5	5.9	4.8	3.6	4.0	--	3.9	
SB-5-7.5	11/25/2002	7.5	5	190	**1,300**	**1,200a**	--	4.2	
SB-5-11.5	11/25/2002	11.5	<5.0	<1.0	<1.0	<1.0	--	<3.0	
SB-7-3.5	11/25/2002	3.5	16	250	**750**	**810a**	--	8.5	
SB-7-7.5	11/25/2002	7.5	13	79	350	380a	--	6.1	
SB-7-17.5	11/25/2002	17.5	18	470	**830**	**890a**	--	6.6	
SB-8-3	11/25/2002	3.0	<500	**2,500**	**3,600**	**3,500a**	--	6.1	
SB-8-6	11/25/2002	6.0	<500	**2,900**	**6,600**	**6,400a**	--	7.5	
SB-8-9	11/25/2002	9.0	6.3	58	380	380a	--	7.5	
SB-9-6	11/25/2002	6.0	<5.0	2.8	9.4	9.5a	--	6.4	
SB-9-9	11/25/2002	9.0	<5.0	<1.0	<1.0	<1.0	--	6.0	
SB-10-3	11/25/2002	3.0	<5.0	<1.0	<1.0	<1.0	--	5.0	
SB-10-6	11/25/2002	6.0	<5.0	70	140	140a	--	6.4	

Table 1. Soil Analytical Data: Petroleum Hydrocarbons and Lead - 1137-1167 65th Street, Oakland, California

Sample ID	Date Sampled	Sample Depth (ft)	TPHmo	TPHd	TPHss	TPHg	TPHnap	Lead	Notes
			←			mg/kg		→	
Shallow Soil Commercial Non-Drinking Water ESL (risk driver)			1000 (soil leaching)	500 (soil leaching)	400 (soil leaching)	400 (soil leaching)	400 (soil leaching)	750	
Deep Soil Commercial Non-Drinking Water ESL (risk driver)			1000 (soil leaching)	500 (soil leaching)	400 (soil leaching)	400 (soil leaching)	400 (soil leaching)	750	
SB-10-9	11/25/2002	9.0	<5.0	96	140	180a	--	<3.0	
SB-10-12	11/25/2002	12.0	<5.0	<1.0	<1.0	<1.0	--	<3.0	
SB-11-7.5	11/25/2002	7.5	<5.0	<1.0	<1.0	<1.0	--	9.1	
Previous SCI Samples									
Tank 1 Bottom	2/25/2002	--	--	69	74	110	58	--	
Tank 2 Bottom	2/25/2002	--	--	34	280	**440**	230	--	
Tank 3 Bottom	2/25/2002	--	--	220	**940**	**1,500**	**750**	--	
Tank 4 Bottom	2/25/2002	--	--	12	**1,000**	**1,600**	**830**	--	
E End @ 6'	2/26/2002	6.0	--	220	**1,400**	**2,200**	**1,100**	--	
W End @ 6'	2/26/2002	6.0	--	390	**1,800**	**2,900**	**1,500**	--	
Pipe #1	2/26/2002	--	--	68	<0.99	<0.99	<0.99	--	
Pipe #2	2/26/2002	--	--	6.8	<0.95	<0.95	<0.95	--	
Tank 5 E End	2/13/2002	--	--	**1,000**	**11,000**	**17,000**	**8,400**	--	
Tank 5 W End	2/13/2002	--	--	**1,800**	**8,400**	**13,000**	**6,200**	--	
Tank 6 N Wall	3/7/2002	2.0	--	53	<0.98	<0.98	<0.98	--	
Tank 6 S Wall	3/7/2002	5.0	--	260	270	310	140	--	
Tank 6 E End	2/13/2002	--	--	**670**	300	**470**	240	--	
Tank 6 W End	2/13/2002	--	--	**1,500**	**17,000**	**26,000**	**12,000**	--	

Abbreviations and Methods:

Concentrations exceeding ESLs shown in bold.

mg/kg = Milligrams per kilogram, equivalent to parts per million (ppm)

-- = Not available, not analyzed, or does not apply

<x = Not detected above laboratory reporting limit. Laboratory reporting limit = numerical value

TPHmo = Total petroleum hydrocarbons as motor oil by EPA Method 8015C with silica gel cleanup

TPHd = Total petroleum hydrocarbons as diesel by EPA Method 8015C with silica gel cleanup

TPHss = Total petroleum hydrocarbons as Stoddard solvent by EPA Method 8021B/8015Cm

Table 1. Soil Analytical Data: Petroleum Hydrocarbons and Lead - 1137-1167 65th Street, Oakland, California

Sample ID	Date Sampled	Sample Depth (ft)	TPHmo	TPHd	TPHss	TPHg	TPHnap	Lead	Notes
			←		mg/kg			→	
Shallow Soil Commercial Non-Drinking Water ESL (risk driver)			1000 (soil leaching)	500 (soil leaching)	400 (soil leaching)	400 (soil leaching)	400 (soil leaching)	750	
Deep Soil Commercial Non-Drinking Water ESL (risk driver)			1000 (soil leaching)	500 (soil leaching)	400 (soil leaching)	400 (soil leaching)	400 (soil leaching)	750	

TPHg = Total petroleum hydrocarbons as gasoline by EPA Method 8021B/8015Cm

TPHnap = Total petroleum hydrocarbons as naphtha by EPA Method 8015m/8020

Lead by EPA Method 6010C

a = Laboratory note: TPH pattern that does not appear to be derived from gasoline (Stoddard solvent/mineral spirit?)

b = Laboratory note: heavier gasoline range compounds are significant (aged gasoline?)

Residential RBSL = Table B-1 - Risk Based Screening Level Components for Surface Soil (Potentially Impacted Groundwater is not a Current or Potential Source of Drinking Water) for residential reuse for established by the SFBRWQCB, Interim Final December 2001. (The risk driver is shown in parentheses.)

Commercial Non-Drinking Water ESL = Table B (Shallow Soil = 0 - 10 ft bgs) and Table D (Deep Soil = >10 ft bgs) - Environmental Screening Levels for Surface Soil (Groundwater is not a Current or Potential Source of Drinking Water) for commercial/industrial reuse for established by the SFBRWQCB, Interim Final July 2003.

(soil leaching) = ESL risk driver is shown in parentheses.

NE = not established

Conestoga-Rovers & Associates

Table 2. Soil Analytical Data: Volatile Organic Compounds - 1137-1167 65th Street, Oakland, California

Sample ID	Date Sampled	Depth (ft)	Benzene	Toulene	Ethylbenzene	Xylenes	Tetrachloroethene	cis-1,2-Dichloroethene	Trichloroethene	Isopropylbenzene (Cumene)	n-Propylbenzene	1,3,5-Trimethylbenzene	1,2,4-Trimethylbenzene	sec-Butylbenzene	4-Isopropyl Toluene	n-Butylbenzene	Naphthalene	Styrene	Methylene Chloride	Acetone	2-Butanone (MEK)	4-methyl-2-pentanone(MIBK)	Vinyl Chloride (Other VOCs)	1,2-Dichloropropane (Other VOCs)
			ug/kg																					
Shallow Non Drinking Water Commercial ESL (risk driver)			380 (de)	9,300 (sl)	13,000 (iai)	1,500 (sl)	250 (iai)	3,600 (iai)	730 (iai)	(520,000)	(550,000)	(70,000)	(170,000)	(410,000)	–	(550,000)	4,800 (sl)	15,000 (sl)	15,000 (iai)	500 (sl)	13,000 (sl)	3,900 (sl)	19	150
Deep Non Drinking Water Commercial ESL (risk driver)			500 (iai)	9,300 (sl)	13,000 (iai)	1,500 (sl)	250 (iai)	3,600 (iai)	730 (iai)	(520,000)	(550,000)	(70,000)	(170,000)	(410,000)	–	(550,000)	4,800 (sl)	15,000 (sl)	1,500 (iai)	500 (sl)	13,000 (sl)	3,900 (sl)		
Cambria Samples																								
MW-1C @6.5	5/10/2004	6.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
MW-1C @9.5	5/10/2004	9.5	<0.2	<0.2	<0.2	<0.2	<20	<20	<20	–	–	–	–	–	–	–	–	–	<20	–	–	–	<20	<20
MW-1C @14.5	5/10/2004	14.5	<5.0	<5.0	<5.0	5.3	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
MW-1C @20	5/10/2004	20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
MW-3A @15	5/7/2004	15	<5.0	<5.0	<5.0	<5.0	<100	<100	<100	–	–	–	–	–	–	–	–	–	<100	–	–	–	<100	<100
MW-5B @5	5/18/2004	5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
MW-5B @10	5/18/2004	10	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
MW-5B @15	5/18/2004	15	<100	<100	<100	1400	<20	<20	<20	–	–	–	–	–	–	–	–	–	<20	–	–	–	<20	<20
MW-5B @20	5/18/2004	20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
MW-5B @24	5/18/2004	24	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
MW-6C @5.5	5/11/2004	5.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
MW-6C @11	5/11/2004	11	<25	<25	<25	<25	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
MW-6C @16	5/11/2004	16	<50	<50	<50	<50	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
MW-6C @21	5/11/2004	21	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
SB-13 @6.0	1/5/2004	6	<50	<50	<50	<50	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
SB-13 @11.5	1/5/2004	11.5	<100	<100	<100	<100	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
SB-14A @7.5	1/9/2004	7.5	640	390	1800	5000	<400	<400	<400	–	–	–	–	–	–	–	–	–	<400	–	–	–	<400	<400
SB-14A @11.5	1/9/2004	11.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
SB-15A @7.5	1/12/2004	7.5	<1000	<1000	<1000	2400	<400	<400	<400	–	–	–	–	–	–	–	–	–	<400	–	–	–	<400	<400
SB-15A @11.5	1/12/2004	11.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
SB-16A @7.5	1/12/2004	7.5	<50	<50	69	110	<100	<100	<100	–	–	–	–	–	–	–	–	–	<100	–	–	–	<100	<100
SB-16A @11.5	1/12/2004	11.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
SB-17B @3.5	1/8/2004	3.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
SB-17B @7.5	1/8/2004	7.5	<5.0	<5.0	<5.0	<5.0	<5.0	8.3	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
SB-17B @11.5	1/8/2004	11.5	<5.0	<5.0	<5.0	<5.0	<5.0	180	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	8.3	7.4
SB-17B @17.0	1/8/2004	17.5	<5.0	<5.0	<5.0	<5.0	<5.0	170	<10	–	–	–	–	–	–	–	–	–	<10	–	–	–	<10	<10
SB-17B @20	1/8/2004	20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
SB-18A @3.5	1/6/2004	3.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0
SB-18A @7.5	1/6/2004	7.5	<200	<200	310	1600	<400	<400	<400	–	–	–	–	–	–	–	–	–	<400	–	–	–	<400	<400
SB-18A @11.5	1/6/2004	11.5	<5.0	<5.0	<5.0	15	<50	<50	<50	–	–	–	–	–	–	–	–	–	<50	–	–	–	<50	<50
SB-18A @17	1/6/2004	17	<200	<200	1100	6500	<400	<400	<400	–	–	–	–	–	–	–	–	–	<400	–	–	–	<400	<400
SB-18B @17.5	1/6/2004	17.5	<250	<250	570	2900	<400	<400	<400	–	–	–	–	–	–	–	–	–	<400	–	–	–	<400	<400

Table 2. Soil Analytical Data: Volatile Organic Compounds - 1137-1167 65th Street, Oakland, California

Sample ID	Date Sampled	Depth (ft)	Benzene	Toulene	Ethylbenzene	Xylenes	Tetrachloroethene	cis-1,2-Dichloroethene	Trichloroethene	Isopropylbenzene (Cumene)	n-Propylbenzene	1,3,5-Trimethylbenzene	1,2,4-Trimethylbenzene	sec-Butylbenzene	4-Isopropyl Toluene	n-Butylbenzene	Naphthalene	Styrene	Methylene Chloride	Acetone	2-Butanone (MEK)	4-methyl-2-pentanone(MIBK)	Vinyl Chloride	1, 2- Dichloropropane	Other VOCs
			ug/kg																						
Shallow Non Drinking Water Commercial ESL (risk driver)			380 (de)	9,300 (sl)	13,000 (iai)	1,500 (sl)	250 (iai)	3,600 (iai)	730 (iai)	(520,000)	(550,000)	(70,000)	(170,000)	(410,000)	–	(550,000)	4,800 (sl)	15,000 (sl)	15,000 (iai)	500 (sl)	13,000 (sl)	3,900 (sl)	19	150	
Deep Non Drinking Water Commercial ESL (risk driver)			500 (iai)	9,300 (sl)	13,000 (iai)	1,500 (sl)	250 (iai)	3,600 (iai)	730 (iai)	(520,000)	(550,000)	(70,000)	(170,000)	(410,000)	–	(550,000)	4,800 (sl)	15,000 (sl)	1,500 (iai)	500 (sl)	13,000 (sl)	3,900 (sl)			
SB-18B @20	1/9/2004	20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0	
SB-21A @3	1/20/2004	3.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0	
SB-21A @6	1/20/2004	6.0	<100	<100	<100	<100	<100	<100	<100	–	–	–	–	–	–	–	–	–	<100	–	–	–	<100	<100	
SB-21A @9	1/20/2004	9.0	<200	<200	230	<200	<200	<200	<200	–	–	–	–	–	–	–	–	–	<200	–	–	–	<200	<200	
SB-22A/C @3	1/7/2004	3.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0	
SB-22A/C @6	1/7/2004	6.0	<200	<200	<200	670	<400	<400	<400	–	–	–	–	–	–	–	–	–	<400	–	–	–	<400	<400	
SB-22A/C @9	1/7/2004	9.0	<200	<200	<200	770	<100	<100	<100	–	–	–	–	–	–	–	–	–	<100	–	–	–	<100	<100	
SB-23 @3	1/6/2004	3.0	<5.0	<5.0	<5.0	<5.0	13	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0	
SB-23 @6	1/6/2004	6.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0	
SB-23 @9	1/6/2004	9.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	–	–	–	–	–	–	–	–	–	<5.0	–	–	–	<5.0	<5.0	
SB-24 @3	1/5/2004	3.0	<500	<500	<500	<500	<400	<400	<400	–	–	–	–	–	–	–	–	–	<400	–	–	–	<400	<400	
SB-24 @6	1/5/2004	6.0	<200	<200	240	<200	<400	<400	<400	–	–	–	–	–	–	–	–	–	<400	–	–	–	<400	<400	
SB-24 @9	1/5/2004	9.0	<50	<50	<50	<50	<50	<50	<50	–	–	–	–	–	–	–	–	–	<50	–	–	–	<50	<50	
SB-26A @7.5	1/7/2004	7.5	<200	<200	<200	<200	<100	<100	<100	–	–	–	–	–	–	–	–	–	<100	–	–	–	<100	<100	
SB-26A @11.5	1/7/2004	11.5	<200	<200	<200	330	<50	<50	<50	–	–	–	–	–	–	–	–	–	<50	–	–	–	<50	<50	
SB-1-3.5	11/25/2002	3.5	<5.0	37	16	120	44	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	9.6	36	<5.0	<5.0	<50	<10	<5.0	ND		
SB-1-7.5	11/25/2002	7.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	150	<5.0	<5.0	<50	<10	<5.0	ND		
SB-2-3.5	11/25/2002	3.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	<10	<5.0	ND		
SB-2-11.5	11/25/2002	11.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	<10	<5.0	ND		
SB-3-7.5	11/25/2002	7.5	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<1,000	<200	<100	ND		
SB-3-11.5	11/25/2002	11.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	<10	<5.0	ND		
SB-4-3.5	11/25/2002	3.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	<10	<5.0	ND		
SB-4-7.5	11/25/2002	7.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	59	<5.0	<5.0	<50	<10	<5.0	ND		
SB-4-11.5	11/25/2002	11.5	<5.0	<5.0	7.4	11	<5.0	<5.0	<5.0	7.8	33	79	160	9.5	<5.0	<5.0	<5.0	<5.0	<5.0	<50	<10	<5.0	ND		
SB-5-7.5	11/25/2002	7.5	<200	<200	<200	<200	<200	<200	<200	360	970	300	<200	1,700	260	1,600	<200	<200	<200	<2,000	<400	<200	ND		
SB-5-11.5	11/25/2002	11.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	<10	<5.0	ND		
SB-7-3.5	11/25/2002	3.5	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	200	<100	<100	<1,000	<200	<100	ND		
SB-7-7.5	11/25/2002	7.5	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	130	<100	<100	<100	<100	<1,000	<200	<100	ND		
SB-7-17.5	11/25/2002	17.5	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	470	<100	<100	<100	<100	<1,000	<200	<100	ND		
SB-8-3	11/25/2002	3.0	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<5,000	<1,000	<500	ND		
SB-8-6	11/25/2002	6.0	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<1,000	<10,000	<2,000	<1,000	ND		
SB-8-9	11/25/2002	9.0	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	470	<100	<100	<100	<100	<1,000	<200	<100	ND		
SB-9-6	11/25/2002	6.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<100	<20	<10	ND		
SB-9-9	11/25/2002	9.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	<10	<5.0	ND		
SB-10-3	11/25/2002	3.0	<5.0	<5.0	<5.0	<5.0	56	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	<10	<5.0	ND		
SB-10-6	11/25/2002	6.0	<50	<50	<50	<50	<50	<50	<50	<50	100	<50	<50	260	71	260	<50	<50	<50	<500	<100	<50	ND		

Conestoga-Rovers & Associates

Table 2. Soil Analytical Data: Volatile Organic Compounds - 1137-1167 65th Street, Oakland, California

Sample ID	Date Sampled	Depth (ft)	Benzene	Toulene	Ethylbenzene	Xylenes	Tetrachloroethene	cis-1,2-Dichloroethene	Trichloroethene	Isopropylbenzene (Cumene)	n-Propylbenzene	1,3,5-Trimethylbenzene	1,2,4-Trimethylbenzene	sec-Butylbenzene	4-Isopropyl Toluene	n-Butylbenzene	Naphthalene	Styrene	Methylene Chloride	Acetone	2-Butanone (MEK)	4-methyl-2-pentanone(MIBK)	Vinyl Chloride	1, 2- Dichloropropane
			←									ug/kg										→	Other VOCs	
Shallow Non Drinking Water Commercial ESL (risk driver)			380 (de)	9,300 (sl)	13,000 (iai)	1,500 (sl)	250 (iai)	3,600 (iai)	730 (iai)	(520,000)	(550,000)	(70,000)	(170,000)	(410,000)	–	(550,000)	4,800 (sl)	15,000 (sl)	15,000 (iai)	500 (sl)	13,000 (sl)	3,900 (sl)	19	150
Deep Non Drinking Water Commercial ESL (risk driver)			500 (iai)	9,300 (sl)	13,000 (iai)	1,500 (sl)	250 (iai)	3,600 (iai)	730 (iai)	(520,000)	(550,000)	(70,000)	(170,000)	(410,000)	–	(550,000)	4,800 (sl)	15,000 (sl)	1,500 (iai)	500 (sl)	13,000 (sl)	3,900 (sl)		
SB-10-9	11/25/2002	9.0	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<500	<5,000	<1,000	<500	ND	
SB-10-12	11/25/2002	12.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	<10	<5.0	a	
SB-11-7.5	11/25/2002	7.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<50	<10	<5.0	ND	
Previous SCI Samples																								
Tank 1 Bottom	2/25/2002	–	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	230	<130	<130	<130	<130	<130	<130	<130	<130	<130		
Tank 2 Bottom	2/25/2002	–	<250	<250	<250	<250	<250	<250	<250	<250	<250	300	680	290	370	550	<250	<250	<250	<250	<250	<250		
Tank 3 Bottom	2/25/2002	–	<250	<250	<250	<250	310	<250	<250	<250	570	680	1,600	960	930	1,500	<250	<250	<250	<250	<250	<250		
Tank 4 Bottom	2/25/2002	–	<250	<250	<250	<250	<250	<250	<250	740	1,700	<250	840	2,100	940	1,900	660	<250	<250	<250	<250	<250		
E End @ 6'	2/25/2002	6.0	<250	<250	<250	950	<250	<250	<250	1,300	3,200	<250	<250	1,700	920	2,400	<250	<250	<250	<250	<250	<250		
W End @ 6'	2/25/2002	6.0	<250	<250	<250	<250	<250	<250	<250	520	1,300	1,100	<250	1,700	890	1,700	<250	<250	<250	<250	<250	<250		
Pipe #1	2/25/2002	–	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0		
Pipe #2	2/25/2002	–	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9	<4.9		
Tank 5 E End	3/7/2002	–	<2,000	<2,000	8,600	<2,000	<2,000	<2,000	<2,000	5,600	16,000	25,000	63,000	13,000	9,900	14,000	<2,000	<2,000	<2,000	<2,000	<2,000	<2,000		
Tank 5 W End	3/7/2002	–	<1,700	<1,700	5,900	<1,700	<1,700	<1,700	<1,700	4,100	11,000	17,000	47,000	9,600	8,500	1,000	<1,700	<1,700	<1,700	<1,700	<1,700	<1,700		
Tank 6 N Wall	3/7/2002	2.0	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7	<4.7		
Tank 6 S Wall	3/7/2002	5.0	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8	<4.8		
Tank 6 E End	3/7/2002	--	<420	<420	<420	<420	<420	<420	<420	<420	<420	1,600	2,100	<420	510	<420	<420	<420	<420	<420	<420	<420		
Tank 6 W End	3/7/2002	--	<3,100	<3,100	<3,100	<3,100	<3,100	<3,100	<3,100	8,500	24,000	46,000	100,000	30,000	27,000	<3,100	<3,100	<3,100	<3,100	<3,100	<3,100	<3,100		

Abbreviations and Methods:

ug/kg = Micrograms per kilogram, equivalent to parts per billion (ppb)

Volatile organic compounds by EPA Method 8260B (8010)

< n = Chemical not present at a concentration in excess of detection limit shown

ND = None detected above laboratory reporting limit, see laboratory report for individual reporting limits.

Commercial Non-Drinking Water ESL = Table B (Shallow Soil = 0 - 10 ft bgs) and Table D (Deep Soil = >10 ft bgs) - Environmental Screening Levels for Surface Soil (Groundwater is not a Current or Potential Source of Drinking Water) for commercial/industrial reuse for established by the SFBRWQCB, Interim Final July 2003.

(soil leaching) = ESL risk driver is shown in parentheses.

NE = not established

(160,000) = No ESL published for component. The value presented is from EPA's Preliminary Remediation Goals (PRG), 2000.

–' = ESL or PRG not established

iai = indoor air impacts

sl = soil leaching

de = direct exposure

NE = not established

Notes:

a = Vinyl Chloride: 18 ug/kg

Table 3. Well Construction Details - John Nady, 1137-1167 65th Street, Oakland, California

Well ID	Date Installed	Borehole Depth (ft)	Borehole Diameter (inches)	Casing Diameter (in)	Screen Interval (ft bgs)	Screen Size (in)	Filter Pack (ft bgs)	Bentonite Seal (ft bgs)	Cement Seal (ft bgs)	TOC Elevation (ft msl)	First Water (ft bgs)
A-Zone Monitoring Wells											
MW-1A	5/10/2004	14.5	8	2	4.5 - 14.5	0.010	3.5 - 14.5	2.5 - 3.5	0 - 2.5	39.64	7.0
MW-2A	5/11/2004	12.0	10	4	3.0 - 12.0	0.020	2.5 - 3.0	1.0 - 2.5	0 - 1.0	40.72	4.5
MW-3A	5/7/2004	16.0	8	2	3.5 - 14.0	0.010	3.0 - 3.5	2.0 - 3.0	0 - 2.0	40.88	4.0
MW-4A	5/18/2004	16.0	8	2	3.0 - 13.0	0.010	2.5 - 13.0	1.5 - 2.5	0 - 1.5	38.71	NA
MW-6A	5/11/2004	14.5	8	2	4.5 - 14.5	0.010	3.5 - 14.5	1.5 - 3.5	0 - 1.5	37.98	12.0
MW-7A	5/7/2004	10.0	6.5	1	5.0 - 10.0	0.010	4.0 - 10.0	3.0 - 4.0	0 - 3.0	40.58	6.0
B-Zone Monitoring Wells											
MW-1B	5/12/2004	20.0	8	2	16.5 - 20.0	0.010	15.5 - 20.0	13.0 - 15.5	0 - 13.0	39.50	7.0
MW-4B	5/18/2004	24.0	8	2	17.0 - 21.0	0.010	16.0 - 21.0	12.0 - 14.0 21.0 - 24.0	0 - 12.0	38.54	3.5
MW-5B	5/18/2004	24.0	8	2	15.0 - 24.0	0.010	14.0 - 24.0	12.0 - 14.0	0 - 12.0	38.98	NA
MW-6B	5/12/2004	24.5	8	2	17.0 - 22.0	0.010	16.0 - 22.0	14.0 - 16.0 22.0 - 24.5	0 - 14.0	37.66	15.5
C-Zone Monitoring Wells											
MW-1C	5/10/2004	40.0	8	2	25.0 - 34.0	0.010	24.0 - 34.0	22.0 - 24.0 34.0 - 40.0	0 - 22.0	39.49	7.0
MW-4C	5/17/2004	40.0	8	2	27.0 - 32.0	0.010	26.0 - 27.0	24.0 - 26.0 32.0 - 40.0	0 - 24.0	38.50	12.0
MW-6C	5/11/2004	39.5	8	2	26.5 - 34.0	0.010	25.5 - 34.0	23.0 - 25.0 34.0 - 39.5	0 - 23.0	37.59	15.0

Abbreviations / Notes

ft = feet
in = inches
ft bgs = feet below grade surface
ft msl = feet above mean sea level
TOC = top of casing

Table 3. Well Construction Details - John Nady, 1137-1167 65th Street, Oakland, California

Well ID	Date Installed	Borehole Depth (ft bgs)	Borehole Diameter (inches)	Casing Diameter (in)	Screening Interval (ft bgs)	Screen Size (in)	First Water (ft bgs)
A-Zone Temporary Monitoring Wells/ Grab Groundwater Samples							
SB-12A	1/13/2004	13.0	2.5	---	8 to 13	---	4.5
SB-14A	1/9/2004	5.0	2.375	---	2 to 7	---	4.0
SB-15A	1/12/2004	13.0	2.5	---	8 to 13	---	4.0
SB-16A	1/12/2004	13.0	2.5	---	8 to 13	---	4.0
SB-18A	1/6/2004	20.0	2.375	---	7 to 12	---	1.5
SB-20A	1/13/2004	13.0	2.5	---	8 to 13	---	8.0
SB-21A	1/20/2004	9.5	3	---	4.5 to 9.5	---	8.5
SB-25A	1/8/2004	10.0	2.375	---	5 to 10	---	5.0
SB-26A	1/7/2004	13.0	2.375	---	8 to 13	---	4.0
SB-1	11/26/2002	12.0	2	1	7 to 12	0.01	3.45
SB-4	11/26/2002	12.0	2	1	7 to 12	0.01	6.10
SB-6	11/26/2002	12.0	2	1	7 to 12	0.01	11.25
SB-8	11/26/2002	9.0	2	1	4 to 9	0.01	4.70
SB-10	11/26/2002	12.0	2	1	7 to 12	0.01	11.60
B-Zone Temporary Monitoring Wells/ Grab Groundwater Samples							
SB-17B	1/8/2004	22.0	2.375	---	17 to 22	---	16.5
SB-7	11/26/2002	18.0	2	1	13 to 18	0.01	10.30

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Table 3. Well Construction Details - John Nady, 1137-1167 65th Street, Oakland, California

Well ID	Date Installed	Borehole Depth (ft bgs)	Borehole Diameter (inches)	Casing Diameter (in)	Screening Interval (ft bgs)	Screen Size (in)	First Water (ft bgs)
C-Zone Temporary Monitoring Wells/ Grab Groundwater Samples							
SB-18B	1/9/2004	31.0	2.375	---	26 to 31	---	25.0
SB-18C	1/9/2004	40.0	2.375	---	35 to 40	---	34.0
SB-20C	1/13/2004	40.0	2.5	---	29 to 34	---	31.0
SB-22C*	1/7/2004	46.0	2.375	---	41 to 46	---	---
SB-25C	1/8/2004	34.0	2.375	---	29 to 34	---	29.0
SB-2	11/26/2002	36.0	2	1	31 to 36	0.01	29.50
SB-9	11/26/2002	29.0	2	1	24 to 29	0.01	25.00
SB-11	11/26/2002	30.0	2	1	25 to 30	0.01	29.30

Abbreviations / Notes

ft = feet

in = inches

ft bgs = feet below grade surface

ft msl = feet above mean sea level

*= Grab groundwater sample was collected without protection against cross contamination between groundwater zones; may not be discrete.

Table 4. Monitoring Well Groundwater Results: Petroleum Hydrocarbons - John Nady, 1137-1167 65th Street, Oakland, California

Well ID *TOC* *(ft)*	Date Sampled	Groundwater Zone	Groundwater Elevation (ft msl)	Depth to Water (ft)	TPHd	TPHg	TPHmo	TPHss	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Notes
					←				μg/L				→	
MW-1A	6/3/2004	Zone A	35.14	4.50	1,300	1,400	260	2,500	ND<0.5	ND<0.5	2.0	11	ND<5.0	
39.64	11/23/2004		36.54	3.10	1,400	2,300	ND<250	2,800	0.64	ND<0.5	2.5	9.7	6.8	a,b,c
	3/14/2005		37.02	2.62	3,200	4,800	ND<250	6,000	0.68	ND<0.5	2.0	6.8	ND<5.0	d,e
	6/15/2005		35.14	4.50	2,500	2,800	ND<250	3,400	ND<2.5	ND<2.5	ND<2.5	5.9	ND<25	a,b,h,i,c
	9/19/2005		33.14	6.50	2,800	4,100	ND<250	6,000	ND<1.0	ND<1.0	3.3	6.2	ND<10	a,b,i,c
	12/12/2005		35.14	4.50	2,500	2,600	ND<250	3,100	ND<1.7	ND<1.7	2.7	6.5	ND<17	a,b,c,h,i
	3/13/2006		37.74	1.90	2,300	2,000	ND<250	2,400	0.51	ND<0.5	1.9	3.5	--	a,b,c,i
	6/19/2006		35.94	3.70	2,600	2,200	ND<250	3,500	0.52	ND<0.5	2.9	6.7	--	m,b,c
	9/20/2006		34.19	5.45	2,400	2,200	ND<250	2,400	ND<2.5	ND<2.5	3.0	9.7	--	a,b,c,i
	12/20/2006		37.02	2.62	1,900	1,300	ND<250	1,400	0.52	ND<0.5	2.9	7.6	--	a,e,h
	3/29/2007		37.04	2.60	1,200	1,800	ND<250	2,100	ND<0.5	ND<0.5	2.2	6.4	ND<5.0	a,b,c
	6/11/2007		35.72	3.92	2,200	3,200	ND<250	2,200	ND<5.0	ND<5.0	ND<5.0	ND<5.0	--	a,b,c
	9/7/2007		**33.90**	**5.74**	**1,800**	**2,300**	**ND<250**	**1,700**	**ND<0.5**	**ND<0.5**	**2.2**	**4.6**	**ND<5.0**	a,b,c
MW-2A	6/3/2004	Zone A	36.48	4.24	2,900	1,700	ND<250	3,500	ND<0.5	3.5	4.9	5.1	ND<5.0	
40.72	11/23/2004		37.83	2.89	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
	3/14/2005		39.02	1.70	--	--	--	--	--	--	--	--	--	
	3/15/2005		--	--	560	360	450	260	ND<0.5	2.5	ND<0.5	ND<0.5	ND<5.0	e,d,g,i
	6/15/2005		37.91	2.81	--	--	--	--	--	--	--	--	--	
	6/16/2005		--	--	470	480	330	430	ND<0.5	2.9	ND<0.5	ND<0.5	ND<5.0	a,b,i,g,e
	9/19/2005		35.46	5.26	--	--	--	--	--	--	--	--	--	
	9/20/2005		--	--	2,100	960	870	960	ND<0.5	4.7	2.9	ND<0.5	ND<5.0	e,g,b,i,l
	12/12/2005		37.66	3.06	--	--	--	--	--	--	--	--	--	
	12/13/2005		--	--	700	670	470	510	ND<0.5	5.9	ND<0.5	ND<0.5	ND<5.0	a,b,e,g,i
	3/13/2006		40.33	0.39	--	--	--	--	--	--	--	--	--	
	3/14/2006		--	--	81	100	ND<250	81	ND<0.5	1.5	ND<0.5	ND<0.5	--	a,b,c,i
	6/19/2006		37.31	3.41	--	--	--	--	--	--	--	--	--	
	6/20/2006		--	--	530	270	420	180	ND<0.5	1.7	ND<0.5	ND<0.5	--	e,g,i,l
	9/20/2006		34.65	6.07	800	1,700	730	1,700	ND<2.5	5.5	ND<2.5	ND<2.5	--	a,b,d,e,g,i
	12/20/2006		38.57	2.15	190	94	300	61	ND<0.5	1.5	ND<0.5	ND<0.5	--	e,g,m,n
	3/29/2007		38.22	2.50	200	260	ND<250	240	ND<0.5	2.7	ND<0.5	ND<0.5	ND<5.0	a,b,c
	6/11/2007		37.14	3.58	200	180	ND<250	94	ND<0.5	1.7	ND<0.5	ND<0.5	--	a,b,c,i
	9/7/2007		**35.04**	**5.68**	**190**	**240**	**ND<250**	**180**	**ND<0.5**	**0.98**	**ND<0.5**	**ND<0.5**	**ND<5.0**	a,b,c,i
MW-3A	6/3/2004	Zone A	36.56	4.32	90,000	4,800	6,000	12,000	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<50	
40.88	11/23/2004		37.89	2.99	22,000	3,800	ND<2,500	5,700	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<50	a,c,d
	3/14/2005		37.28	3.60	--	--	--	--	--	--	--	--	--	
	3/15/2005		--	--	37,000	2,400	ND<2,500	3,500	ND<1.7	ND<1.7	ND<1.7	ND<1.7	ND<17	e,d,i
	6/15/2005		36.78	4.10	--	--	--	--	--	--	--	--	--	
	6/16/2005		--	--	15,000	2,100	ND<1,200	3,300	ND<1.7	ND<1.7	ND<1.7	2.4	ND<17	a,c,d,h,i
	9/19/2005		35.93	4.95	--	--	--	--	--	--	--	--	--	
	9/20/2005		--	--	55,000	4,700	ND<5,000	8,000	ND<1.0	ND<1.0	2.6	6.8	ND<10	a,b,c,d,i

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Table 4. Monitoring Well Groundwater Results: Petroleum Hydrocarbons - John Nady, 1137-1167 65th Street, Oakland, California

Well ID *TOC* *(ft)*	Date Sampled	Groundwater Zone	Groundwater Elevation (ft msl)	Depth to Water (ft)	TPHd	TPHg	TPHmo	TPHss	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Notes
					←				μg/L				→	
MW-3A	12/12/2005		36.72	4.16	--	--	--	--	--	--	--	--	--	
(cont.)	12/13/2005		--	--	34,000	1,100	ND<12,000	1,600	ND<1.7	ND<1.7	ND<1.7	2.3	ND<17	a,b,c,d,h,i
	3/13/2006		37.42	3.46	--	--	--	--	--	--	--	--	--	
	3/14/2006		--	--	21,000	2,200	1,600	3,300	ND<0.5	ND<0.5	1.1	ND<0.5	--	a,c,d,g,h
	6/19/2006		36.48	4.40	--	--	--	--	--	--	--	--	--	
	6/20/2006		--	--	19,000	8,000	1,000	16,000	ND<5.0	ND<5.0	ND<5.0	ND<5.0	--	c,d,g,h,m
	9/20/2006		35.78	5.10	13,000	2,500	1,300	3,300	ND<5.0	ND<5.0	ND<5.0	ND<5.0	--	a,c,d,g,h,i
	12/20/2006		36.78	4.10	15,000	2,600	670	3,500	ND<2.5	ND<2.5	ND<2.5	7.6	--	e,g,h,n
	3/29/2007		36.82	4.06	21,000	2,600	940	3,400	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<50	a,c,d,h
	6/11/2007		36.52	4.36	13,000	5,200	730	3,500	ND<10	ND<10	ND<10	ND<10	--	a,d,h
	9/7/2007		**35.98**	**4.90**	**36,000**	**11,000**	**1,600**	**15,000**	**ND<10**	**ND<10**	**ND<10**	**ND<10**	**ND<100**	**a,c,d,h**
MW-4A	6/3/2004	Zone A	36.26	2.45	270	ND<50	440	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
38.71	11/23/2004		37.13	1.58	73	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	d
	3/14/2005		36.66	2.05	--	--	--	--	--	--	--	--	--	
	3/15/2005		--	--	210	ND<50	300	ND<50	0.91	1.7	ND<0.5	1.9	ND<5.0	g,d,f,i
	6/15/2005		36.38	2.33	--	--	--	--	--	--	--	--	--	
	6/16/2005		--	--	99	59	ND<250	75	1.0	1.9	ND<0.5	2.1	ND<5.0	j,d,f
	9/19/2005		35.01	3.70	--	--	--	--	--	--	--	--	--	
	9/20/2005		--	--	87	ND<50	ND<250	ND<50	1.2	2.1	0.51	2.4	ND<5.0	d,f
	12/12/2005		36.39	2.32	--	--	--	--	--	--	--	--	--	
	12/13/2005		--	--	71	ND<50	ND<250	ND<50	0.67	1.4	ND<0.5	1.9	ND<5.0	d,f,i
	3/13/2006		36.75	1.96	--	--	--	--	--	--	--	--	--	
	3/14/2006		--	--	68	ND<50	ND<250	ND<50	0.60	1.3	ND<0.5	1.8	--	d,f
	6/19/2006		36.15	2.56	--	--	--	--	--	--	--	--	--	
	6/20/2006		--	--	72	ND<50	ND<250	ND<50	0.53	1.1	ND<0.5	1.6	--	f
	9/20/2006		35.10	3.61	160	110	ND<250	88	1.2	2.5	0.61	3.9	--	a,d,f,i
	12/20/2006		36.39	2.32	97	ND<50	ND<250	ND<50	0.99	2.1	0.52	2.9	--	f
	3/29/2007		36.46	2.25	ND<50	ND<50	ND<250	ND<50	ND<0.5	0.93	ND<0.5	1.3	ND<5.0	
	6/11/2007		36.14	2.57	66	ND<50	ND<250	ND<50	ND<0.5	0.92	ND<0.5	1.6	--	d,f
	9/7/2007		**35.34**	**3.37**	**78**	**ND<50**	**ND<250**	**ND<50**	**0.74**	**1.3**	**ND<0.5**	**1.9**	**ND<5.0**	f
MW-6A	6/3/2004	Zone A	31.98	6.00	3,500	970	340	2,400	ND<0.5	ND<0.5	ND<0.5	2.1	ND<5.0	
37.98	11/23/2004		33.13	4.85	1,400	1,900	ND<250	3,000	ND<0.5	ND<0.5	ND<0.5	3.0	ND<5.0	a,c
	3/14/2005		35.03	2.95	5,900	2,900	ND<250	2,600	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<50	e,d,i
	6/15/2005		33.28	4.70	6,100	2,200	ND<250	3,400	ND<0.5	ND<0.5	0.60	4.4	ND<10	a,i,c,d
	9/19/2005		32.07	5.91	2,600	2,200	ND<250	3,900	ND<1.0	ND<1.0	1.4	7.6	ND<10	a,b,c
	12/12/2005		33.12	4.86	4,600	2,900	ND<250	4,500	ND<0.5	ND<0.5	1.6	8.9	ND<5.0	a,c,h,i
	3/13/2006		36.05	1.93	4,300	1,900	ND<250	3,000	ND<0.5	ND<0.5	ND<0.5	4.3	--	a,c,d,h
	6/19/2006		32.59	5.39	7,800	2,300	260	4,600	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	c,g,h,m
	9/20/2006		31.96	6.02	2,600	960	ND<250	1,200	ND<2.5	ND<2.5	ND<2.5	ND<2.5	--	a,c,i
	12/20/2006		33.57	4.41	4,100	2,400	ND<250	3,200	ND<5.0	ND<5.0	ND<5.0	8.1	--	e,h,n

Table 4. Monitoring Well Groundwater Results: Petroleum Hydrocarbons - John Nady, 1137-1167 65th Street, Oakland, California

Well ID *TOC* *(ft)*	Date Sampled	Groundwater Zone	Groundwater Elevation (ft msl)	Depth to Water (ft)	TPHd	TPHg	TPHmo	TPHss	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Notes
					←				μg/L				→	
MW-6A	3/29/2007		33.67	4.31	2,900	2,200	ND<250	2,700	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<50	a,c
(cont.)	6/11/2007		32.95	5.03	6,400	4,300	ND<250	3,700	ND<0.5	ND<0.5	2.1	9.5	--	a,c
	9/7/2007		**32.32**	**5.66**	**5,800**	**1,600**	**ND<250**	**1,400**	**ND<1.0**	**ND<1.0**	**ND<1.0**	**3.1**	**ND<10**	**a,b,c,d,h**
MW-7A	6/3/2004	Zone A	36.08	4.50	--	3,900	--	9,900	ND<5.0	ND<5.0	ND<5.0	6.6	ND<50	
40.58	11/23/2004		--	--	--	--	--	--	--	--	--	--	--	
	3/14/2005		37.03	3.55	14,000	3,900	620	3,700	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<50	c,d,h
	6/15/2005		36.41	4.17	24,000	2,500	ND<1,200	3,900	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<50	a,c,d,h,i
	9/19/2005		35.25	5.33	43,000	7,000	ND<5,000	13,000	ND<10	ND<10	ND<10	ND<10	ND<100	a,c,i
	12/12/2005		36.15	4.43	10,000	1,700	ND<1,200	2,500	ND<1.0	ND<1.0	1.4	2.4	ND<10	a,c,d,h,i
	3/13/2006		36.76	3.82	31,000	1,600	1,100	2,300	ND<0.5	ND<0.5	0.93	9.1	--	a,c,d,g,h,i
	6/19/2006		35.78	4.80	36,000	26,000	1,300	44,000	ND<5.0	ND<5.0	10	ND<5.0	--	c,d,g,h,i,m
	9/20/2006		35.03	5.55	36,000	49,000	ND<5,000	69,000	ND<50	ND<50	ND<50	ND<50	--	a,c,h,i
	12/20/2006		36.35	4.23	14,000	38,000	ND<1,200	53,000	ND<50	ND<50	ND<50	150	--	e,h,n
	3/29/2007		36.06	4.52	34,000	4,100	890	5,600	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<50	a,h,c,d
	6/11/2007		36.02	4.56	32,000	3,800	ND<1,200	3,400	ND<5.0	ND<5.0	ND<5.0	ND<5.0	--	a,c,d,h,i
	9/7/2007		**35.18**	**5.40**	**57,000**	**21,000**	**ND<2,500**	**19,000**	**ND<10**	**ND<10**	**ND<10**	**54**	**ND<100**	**a,b,c,d,h**
MW-1B	6/3/2004	Zone B	25.10	14.40	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
39.50	11/23/2004		26.24	13.26	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
	3/14/2005		33.97	5.53	52	ND<50	ND<250	ND<50	0.60	ND<0.5	ND<0.5	ND<0.5	ND<5.0	d,i
	6/15/2005		31.87	7.63	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	i
	9/19/2005		30.35	9.15	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	i
	12/12/2005		30.39	9.11	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	i
	3/13/2006		32.15	7.35	--	--	--	--	--	--	--	--	--	
	6/19/2006		22.99	16.51	--	--	--	--	--	--	--	--	--	
	9/20/2006		30.32	9.18	--	--	--	--	--	--	--	--	--	
	12/20/2006		31.60	7.90	--	--	--	--	--	--	--	--	--	
	3/29/2007		24.63	14.87	--	--	--	--	--	--	--	--	--	
	6/11/2007		26.39	13.11	--	--	--	--	--	--	--	--	--	
	9/7/2007		**28.42**	**11.08**	--	--	--	--	--	--	--	--	--	
MW-4B	6/3/2004	Zone B	33.52	5.02	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
38.54	11/23/2004		34.65	3.89	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
	3/14/2005		34.78	3.76	--	--	--	--	--	--	--	--	--	
	3/15/2005		--	--	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	i
	6/15/2005		33.98	4.56	--	--	--	--	--	--	--	--	--	
	6/16/2005		--	--	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	i
	9/19/2005		32.57	5.97	--	--	--	--	--	--	--	--	--	
	9/20/2005		--	--	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	i
	12/12/2005		33.65	4.89	--	--	--	--	--	--	--	--	--	
	12/13/2005		--	--	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	i

Table 4. Monitoring Well Groundwater Results: Petroleum Hydrocarbons - John Nady, 1137-1167 65th Street, Oakland, California

Well ID *TOC* *(ft)*	Date Sampled	Groundwater Zone	Groundwater Elevation (ft msl)	Depth to Water (ft)	TPHd	TPHg	TPHmo	TPHss	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Notes
					←				μg/L				→	
MW-4B *(cont.)*	3/13/2006		34.61	3.93	--	--	--	--	--	--	--	--	--	
	6/19/2006		33.86	4.68	--	--	--	--	--	--	--	--	--	
	9/20/2006		32.58	5.96	--	--	--	--	--	--	--	--	--	
	12/20/2006		33.92	4.62	--	--	--	--	--	--	--	--	--	
	3/29/2007		33.96	4.58	--	--	--	--	--	--	--	--	--	
	6/11/2007		34.03	4.51	--	--	--	--	--	--	--	--	--	
	9/7/2007		**33.22**	**5.32**	--	--	--	--	--	--	--	--	--	
MW-5B *38.98*	6/3/2004	Zone B	30.16	8.82	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
	11/23/2004		31.32	7.66	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
	3/14/2005		32.71	6.27	--	--	--	--	--	--	--	--	--	
	3/15/2005		--	--	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	i
	6/15/2005		31.20	7.78	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	i
	9/19/2005		28.68	10.30	--	--	--	--	--	--	--	--	--	
	9/20/2005		--	--	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
	12/12/2005		30.65	8.33	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	i
	3/13/2006		32.87	6.11	--	--	--	--	--	--	--	--	--	
	6/19/2006		30.97	8.01	--	--	--	--	--	--	--	--	--	
	9/20/2006		29.68	9.30	--	--	--	--	--	--	--	--	--	
	12/20/2006		31.21	7.77	--	--	--	--	--	--	--	--	--	
	3/29/2007		31.40	7.58	--	--	--	--	--	--	--	--	--	
	6/11/2007		31.02	7.96	--	--	--	--	--	--	--	--	--	
	9/7/2007		**30.02**	**8.96**	--	--	--	--	--	--	--	--	--	
MW-6B *37.66*	6/3/2004	Zone B	29.36	8.30	2,300	1,100	ND<250	2,900	ND<0.5	ND<0.5	ND<0.5	1.4	ND<5.0	
	11/23/2004		30.53	7.13	280	500	ND<250	700	ND<0.5	ND<0.5	ND<0.5	1.6	ND<5.0	a,c
	3/14/2005		31.86	5.80	5,200	1,300	340	1,200	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	e,d,i
	6/15/2005		30.17	7.49	1,700	900	ND<250	1,300	ND<0.5	ND<0.5	ND<0.5	1.9	ND<5.0	a,c
	9/19/2005		28.83	8.83	2,700	1,200	ND<250	2,000	1.0	1.4	ND<1.0	5.0	ND<20	a,b,c
	12/12/2005		29.85	7.81	4,100	840	ND<250	1,200	ND<0.5	ND<0.5	ND<0.5	3.3	ND<5.0	a,c,h,i
	3/13/2006		32.31	5.35	6,900	1,400	270	2,000	ND<0.5	ND<0.5	ND<0.5	4.7	--	a,c,d,h,i
	6/19/2006		29.88	7.78	7,700	1,700	310	3,300	ND<1.0	ND<1.0	ND<1.0	ND<1.0	--	c,g,h,m
	9/20/2006		28.78	8.88	16,000	3,200	740	4,200	ND<5.0	ND<5.0	ND<5.0	ND<5.0	--	a,c,d,g,h,i
	12/20/2006		30.34	7.32	16,000	55,000	ND<1,200	77,000	ND<50	ND<50	ND<50	130	--	e,g,h,n
	3/29/2007		30.44	7.22	24,000	3,400	650	4,300	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<50	a,h,c,d
	6/11/2007		29.93	7.73	29,000	2,600	ND<1,200	2,100	ND<5.0	ND<5.0	ND<5.0	ND<5.0	--	a,c,d,h
	9/7/2007		**28.95**	**8.71**	**32,000**	**4,500**	**ND<1,200**	**3,800**	**ND<5.0**	**ND<5.0**	**ND<5.0**	**11**	**ND<50**	**a,b,c,d,h**
MW-1C *39.49*	6/3/2004	Zone C	30.07	9.42	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
	11/23/2004		31.30	8.19	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
	3/14/2005		32.58	6.91	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	f
	6/15/2005		30.89	8.60	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	

Table 4. Monitoring Well Groundwater Results: Petroleum Hydrocarbons - John Nady, 1137-1167 65th Street, Oakland, California

Well ID *TOC* *(ft)*	Date Sampled	Groundwater Zone	Groundwater Elevation (ft msl)	Depth to Water (ft)	TPHd	TPHg	TPHmo	TPHss	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Notes
					←				μg/L				→	
MW-1C *(cont.)*	9/19/2005		29.19	10.30	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	i
	12/12/2005		30.54	8.95	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	i
	3/13/2006		32.99	6.50	--	--	--	--	--	--	--	--	--	
	6/19/2006		30.66	8.83	--	--	--	--	--	--	--	--	--	
	9/20/2006		29.53	9.96	--	--	--	--	--	--	--	--	--	
	12/20/2006		31.13	8.36	--	--	--	--	--	--	--	--	--	
	3/29/2007		31.19	8.30	--	--	--	--	--	--	--	--	--	
	6/11/2007		30.63	8.86	--	--	--	--	--	--	--	--	--	
	9/7/2007		**29.60**	**9.89**	--	--	--	--	--	--	--	--	--	
MW-4C *38.50*	6/3/2004	Zone C	30.10	8.40	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
	11/23/2004		31.31	7.19	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
	3/14/2005		33.15	5.35	--	--	--	--	--	--	--	--	--	
	3/15/2005		--	--	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	i
	6/15/2005		30.85	7.65	--	--	--	--	--	--	--	--	--	
	6/16/2005		--	--	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
	9/19/2005		25.97	12.53	--	--	--	--	--	--	--	--	--	
	9/20/2005		--	--	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
	12/12/2005		30.00	8.50	--	--	--	--	--	--	--	--	--	
	12/13/2005		--	--	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	i
	3/13/2006		31.18	7.32	--	--	--	--	--	--	--	--	--	
	6/19/2006		30.90	7.60	--	--	--	--	--	--	--	--	--	
	9/20/2006		29.91	8.59	--	--	--	--	--	--	--	--	--	
	12/20/2006		31.21	7.29	--	--	--	--	--	--	--	--	--	
	3/29/2007		31.29	7.21	--	--	--	--	--	--	--	--	--	
	6/11/2007		30.93	7.57	--	--	--	--	--	--	--	--	--	
	9/7/2007		**30.20**	**8.30**	--	--	--	--	--	--	--	--	--	
MW-6C *37.59*	6/3/2004	Zone C	27.89	9.70	240	160	ND<250	340	ND<0.5	ND<0.5	ND<0.5	1.1	ND<5.0	
	11/23/2004		29.21	8.38	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
	3/14/2005		31.79	5.80	60	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	d
	6/15/2005		30.14	7.45	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
	9/19/2005		28.79	8.80	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
	12/12/2005		29.81	7.78	ND<50	ND<50	ND<250	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	
	3/13/2006		32.09	5.50	--	--	--	--	--	--	--	--	--	
	6/19/2006		29.84	7.75	--	--	--	--	--	--	--	--	--	
	9/20/2006		28.74	8.85	--	--	--	--	--	--	--	--	--	
	12/20/2006		30.29	7.30	--	--	--	--	--	--	--	--	--	
	3/29/2007		30.39	7.20	--	--	--	--	--	--	--	--	--	
	6/11/2007		29.86	7.73	--	--	--	--	--	--	--	--	--	
	9/7/2007		**28.92**	**8.67**	--	--	--	--	--	--	--	--	--	

Table 4. Monitoring Well Groundwater Results: Petroleum Hydrocarbons - John Nady, 1137-1167 65th Street, Oakland, California

Well ID *TOC* *(ft)*	Date Sampled	Groundwater Zone	Groundwater Elevation (ft msl)	Depth to Water (ft)	TPHd	TPHg	TPHmo	TPHss	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Notes
					←				μg/L				→	

Abbreviations:

TOC (ft) = Top of casing elevation in feet above mean sea level (msl)

mg/L = micrograms per liter - approximately equal to parts per billion = ppb

ft = measured in feet

TPHd = Total petroleum hydrocarbons as diesel by EPA Method SW8015C with silica gel cleanup.

TPHg = Total petroleum hydrocarbons as gasoline by EPA Method SW8015C.

TPHmo = Total petroleum hydrocarbons as motor oil by EPA Method SW8015C with silica gel cleanup.

TPHss = Total petroleum hydrocarbons as stoddard solvent by EPA Method SW8015C.

Benzene, toluene, ethylbenzene, and xylenes by EPA Method SW8021B.

MTBE = Methyl tertiary-butyl ether by EPA Method SW8021B (EPA Method SW8260B).

-- = Not available, not applicable, not analyzed, not measured

Notes:

a = TPH pattern that does not appear to be derived from gasoline (stoddard solvent/mineral spirit?).

b = No recognizable pattern.

c = Stoddard solvent/mineral spirit.

d = Diesel range compounds are significant; no recognizable pattern.

e = Gasoline range compounds are significant.

f = One to a few isolated peaks present

g = Oil range compounds are significant.

h = Lighter than water immiscible sheen/product is present.

i = Liquid sample contains greater than ~1 vol. % sediment.

j = Unmodified or weakly modified gasoline is significant

k = TPHg range non-target isolated peaks subtracted out of the TPHg concentration

l = Heavier gasoline compounds are significant (aged gasoline?)

m = Strongly aged gasoline or diesel range compounds are significant

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Table 5. Monitoring Well Groundwater Results: Halogenated Volatile Organic Compounds - John Nady, 1137-1167 65th Street, Oakland, California

Well ID *TOC* *(ft)*	Date Sampled	Groundwater Zone	Groundwater Elevation (ft amsl)	Depth to Water (ft)	Chloroethane	Chloroform	1,1,2,2-Tetrachloroethane	(PCE) Tetrachloroethene	(TCE) Trichloroethene	1,2-Dichlorobenzene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethane	1,2-Dichloroethane	Vinyl Chloride	Notes/Other VOCs
					←					μg/L					→	
MW-1A	6/3/2004	**Zone A**	35.14	4.50	ND<2.5	ND<2.5	ND<2.5	55	16	ND<2.5	36	ND<2.5	ND<2.5	ND<2.5	6.3	
39.64	11/23/2004		36.54	3.10	ND<1.0	ND<1.0	ND<1.0	38	11	ND<1.0	51	2.4	2.8	ND<1.0	9.5	
	3/14/2005		37.02	2.62	ND<1.0	ND<1.0	ND<1.0	42	12	2.0	32	2.2	2.4	ND<1.0	8.0	
	6/15/2005		35.14	4.50	ND<1.0	ND<1.0	ND<1.0	62	19	2.6	24	2.4	3.0	ND<1.0	10	h,i
	9/19/2005		33.14	6.50	ND<1.2	ND<1.2	ND<1.2	55	18	2.3	28	2.0	2.6	ND<1.2	9.4	i
	12/12/2005		35.14	4.50	ND<1.0	ND<1.0	16	60	17	2.0	22	2.3	2.5	ND<1.0	12	h,i
	3/13/2006		37.74	1.90	ND<1.2	ND<1.2	14	30	17	ND<1.2	16	1.4	2.0	ND<1.2	4.0	i
	6/19/2006		35.94	3.70	ND<0.5	ND<0.5	ND<0.5	33	9.0	ND<0.5	15	1.1	1.8	ND<0.5	3.2	
	9/20/2006		34.19	5.45	ND<0.5	ND<0.5	ND<0.5	34	15	ND<0.5	21	1.6	2.3	ND<0.5	5.4	i
	12/20/2006		37.02	2.62	ND<0.5	ND<0.5	ND<0.5	27	15	ND<0.5	16	1.3	1.7	ND<0.5	5.2	
	3/29/2007		37.04	2.60	ND<0.5	ND<0.5	ND<0.5	29	16	ND<0.5	13	1.2	1.4	ND<0.5	ND<0.5	
	6/11/2007		35.72	3.92	ND<0.5	ND<0.5	ND<0.5	26	17	ND<0.5	13	1.6	1.9	ND<0.5	2.3	
	9/7/2007		**33.90**	**5.74**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**25**	**15**	**ND<0.5**	**17**	**1.4**	**2.0**	**ND<0.5**	**2.3**	
MW-2A	6/3/2004	**Zone A**	36.48	4.24	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
40.72	11/23/2004		37.83	2.89	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
	3/14/2005		39.02	1.70	–	–	–	–	–	–	–	–	–	–	–	
	3/15/2005		–	–	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	6/15/2005		37.91	2.81	–	–	–	–	–	–	–	–	–	–	–	
	6/16/2005		–	–	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	9/19/2005		35.46	5.26	–	–	–	–	–	–	–	–	–	–	–	
	9/20/2005		–	–	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	12/12/2005		37.66	3.06	–	–	–	–	–	–	–	–	–	–	–	
	12/13/2005		–	–	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	3/13/2006		40.33	0.39	–	–	–	–	–	–	–	–	–	–	–	
	6/19/2006		37.31	3.41	–	–	–	–	–	–	–	–	–	–	–	
	9/20/2006		34.65	6.07	–	–	–	–	–	–	–	–	–	–	–	
	12/20/2006		38.57	2.15	–	–	–	–	–	–	–	–	–	–	–	
	3/29/2007		38.22	2.50	–	–	–	–	–	–	–	–	–	–	–	
	6/11/2007		37.14	3.58	–	–	–	–	–	–	–	–	–	–	–	
	9/7/2007		**35.04**	**5.68**	–	–	–	–	–	–	–	–	–	–	–	
MW-3A	6/3/2004	**Zone A**	36.56	4.32	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	a
40.88	11/23/2004		37.89	2.99	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	
	3/14/2005		37.28	3.60	–	–	–	–	–	–	–	–	–	–	–	
	3/15/2005		–	–	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	43	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	j, i, 1,3-dichlorobenzene (1.2) 1,4-dichlorobenzene (5.7)
	6/15/2005		36.78	4.10	–	–	–	–	–	–	–	–	–	–	–	
	6/16/2005		–	–	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	52	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	h,i, 1,3-dichlorobenzene (1.5) 1,4-dichlorobenzene (8.3)
	9/19/2005		35.93	4.95	–	–	–	–	–	–	–	–	–	–	–	
	9/20/2005		–	–	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	51	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	i, 1,4-dichlorobenzene (7.6) 1,3- dichlorobenzene (1.4)
	12/12/2005		36.72	4.16	–	–	–	–	–	–	–	–	–	–	–	
	12/13/2005		–	–	ND<1.0	ND<1.0	26	ND<1.0	ND<1.0	43	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	h,i, 1,4-dichlorobenzene (7.2)
	3/13/2006		37.42	3.46	–	–	–	–	–	–	–	–	–	–	–	
	3/14/2006		–	–	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	i, chlorobenzene (3.7) 1,4-dichlorobenzene (7.2)
	6/19/2006		36.48	4.40	–	–	–	–	–	–	–	–	–	–	–	
	6/20/2006		–	–	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	h, chlorobenzene (9.8) 1,4-dichlorobenzene (7.3)
	9/20/2006		35.78	5.10	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	h,i, chlorobenzene (31)
	12/20/2006		36.78	4.10	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	h, chlorobenzene (31) 1,4-dichlorobenzene (5.6)
	3/29/2007		36.82	4.06	ND<1.7	ND<1.7	ND<1.7	ND<1.7	ND<1.7	ND<1.7	ND<1.7	ND<1.7	ND<1.7	ND<1.7	ND<1.7	chlorobenzene (55) 1,4- dichlorobenzene (6.0)

Table 5. Monitoring Well Groundwater Results: Halogenated Volatile Organic Compounds - John Nady, 1137-1167 65th Street, Oakland, California

Well ID TOC (ft)	Date Sampled	Groundwater Zone	Groundwater Elevation (ft amsl)	Depth to Water (ft)	Chloroethane	Chloroform	1,1,2,2-Tetrachloroethane	(PCE) Tetrachloroethene	(TCE) Trichloroethene	1,2-Dichlorobenzene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethane	1,2-Dichloroethane	Vinyl Chloride	Notes/Other VOCs
					← µg/L →											
MW-3A	6/11/2007		36.52	4.36	ND<1.7	ND<1.7	ND<1.7	ND<1.7	ND<1.7	ND<1.7	ND<1.7	ND<1.7	ND<1.7	ND<1.7	ND<1.7	h, chlorobenzene (68)
(cont.)	**9/7/2007**		**35.98**	**4.90**	**ND<2.5**	**ND<2.5**	**ND<2.5**	**ND<2.5**	**ND<2.5**	**ND<2.5**	**ND<2.5**	**ND<2.5**	**ND<2.5**	**ND<2.5**	**ND<2.5**	h, chlorobenzene (82)
MW-4A	6/3/2004	Zone A	36.26	2.45	ND<0.5	ND<0.5	ND<0.5	1.7	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
38.71	11/23/2004		37.13	1.58	ND<0.5	ND<0.5	ND<0.5	1.9	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
	3/14/2005		36.66	2.05	–	–	–	–	–	–	–	–	–	–	–	
	3/15/2005		–	–	ND<0.5	ND<0.5	ND<0.5	1.1	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	6/15/2005		36.38	2.33	–	–	–	–	–	–	–	–	–	–	–	
	6/16/2005		–	–	ND<0.5	ND<0.5	ND<0.5	1.4	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
	9/19/2005		35.01	3.70	–	–	–	–	–	–	–	–	–	–	–	
	9/20/2005		–	–	ND<0.5	ND<0.5	ND<0.5	1.3	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
	12/12/2005		36.39	2.32	–	–	–	–	–	–	–	–	–	–	–	
	12/13/2005		–	–	ND<0.5	ND<0.5	ND<0.5	2.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	3/13/2006		36.75	1.96	–	–	–	–	–	–	–	–	–	–	–	
	6/19/2006		36.15	2.56	–	–	–	–	–	–	–	–	–	–	–	
	9/20/2006		35.10	3.61	–	–	–	–	–	–	–	–	–	–	–	
	12/20/2006		36.39	2.32	–	–	–	–	–	–	–	–	–	–	–	
	3/29/2007		36.46	2.25	–	–	–	–	–	–	–	–	–	–	–	
	6/11/2007		36.14	2.57	–	–	–	–	–	–	–	–	–	–	–	
	9/7/2007		**35.34**	**3.37**	–	–	–	–	–	–	–	–	–	–	–	
MW-6A	6/3/2004	Zone A	31.98	6.00	4.7	0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.8	2.1	ND<0.5	6.7	
37.98	11/23/2004		33.13	4.85	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
	3/14/2005		35.03	2.95	0.61	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	6/15/2005		33.28	4.70	6.9	ND<0.5	ND<0.5	ND<0.5	ND<0.5	3.3	ND<0.5	2.5	1.5	ND<0.5	3.2	i, 1,4-dichlorobenzene (0.60)
	9/19/2005		32.07	5.91	21	ND<0.5	ND<0.5	ND<0.5	ND<0.5	2.6	ND<0.5	6.7	4.7	0.59	5.0	
	12/12/2005		33.12	4.86	13	ND<0.5	8.7	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.1	0.82	ND<0.5	ND<0.5	h,i
	3/13/2006		36.05	1.93	1.7	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	h
	6/19/2006		32.59	5.39	9.4	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.0	1.1	ND<0.5	1.3	h
	9/20/2006		31.96	6.02	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.6	1.9	0.57	ND<0.5	i
	12/20/2006		33.57	4.41	12	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	h
	3/29/2007		33.67	4.31	8.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.69	0.71	ND<0.5	ND<0.5	
	6/11/2007		32.95	5.03	9.8	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	
	9/7/2007		**32.32**	**5.66**	**24**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	h
MW-7A	6/3/2004	Zone A	36.08	4.50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	2.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
40.58	11/23/2004		–	–	–	–	–	–	–	–	–	–	–	–	–	
	3/14/2005		37.03	3.55	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	2.6	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	h
	6/15/2005		36.41	4.17	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.8	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	h,i
	9/19/2005		35.25	5.33	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.6	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	12/12/2005		36.15	4.43	ND<0.5	ND<0.5	21	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	h,i
	3/13/2006		36.76	3.82	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	h,i
	6/19/2006		35.78	4.80	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	h,i
	9/20/2006		35.03	5.55	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	h,i
	12/20/2006		36.35	4.23	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	h
	3/29/2007		36.06	4.52	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	
	6/11/2007		36.02	4.56	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	j,h,i
	9/7/2007		**35.18**	**5.40**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	h
MW-1B	6/3/2004	Zone B	25.10	14.40	ND<0.5	8.3	ND<0.5	ND<0.5	ND<0.5	ND<0.5	3.9	ND<0.5	8.1	7.9	ND<0.5	
39.50	11/23/2004		26.24	13.26	ND<0.5	6.2	ND<0.5	ND<0.5	ND<0.5	ND<0.5	2.5	ND<0.5	8.4	8.8	ND<0.5	
	3/14/2005		33.97	5.53	1.1	1.9	ND<0.5	ND<0.5	ND<0.5	ND<0.5	3.8	ND<0.5	5.2	12	ND<0.5	i
	6/15/2005		31.87	7.63	ND<0.5	1.3	ND<0.5	ND<0.5	ND<0.5	ND<0.5	3.3	ND<0.5	8.8	9.9	ND<0.5	i
	9/19/2005		30.35	9.15	0.98	0.87	ND<0.5	ND<0.5	ND<0.5	ND<0.5	3.0	ND<0.5	7.1	11	ND<0.5	i
	12/12/2005		30.39	9.11	1.5	0.75	ND<0.5	ND<0.5	ND<0.5	ND<0.5	3.7	ND<0.5	7.0	12	ND<0.5	i
	3/13/2006		32.15	7.35	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	6.1	ND<0.5	6.8	5.2	ND<0.5	i

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Table 5. Monitoring Well Groundwater Results: Halogenated Volatile Organic Compounds - John Nady, 1137-1167 65th Street, Oakland, California

Well ID TOC (ft)	Date Sampled	Groundwater Zone	Groundwater Elevation (ft amsl)	Depth to Water (ft)	Chloroethane	Chloroform	1,1,2,2-Tetrachloroethane	(PCE) Tetrachloroethene	(TCE) Trichloroethene	1,2-Dichlorobenzene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethane	1,2-Dichloroethane	Vinyl Chloride	Notes/Other VOCs
					←					μg/L					→	
MW-1B	6/19/2006		22.99	16.51	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	7.0	ND<0.5	7.8	6.2	ND<0.5	
(cont.)	9/20/2006		30.32	9.18	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	9.9	ND<0.5	11	10	ND<0.5	i
	12/20/2006		31.60	7.90	2.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	9.9	ND<0.5	7.7	7.8	ND<0.5	
	3/29/2007		24.63	14.87	1.6	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	9.0	ND<0.5	9.7	8.7	ND<0.5	
	6/11/2007		26.39	13.11	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	8.5	ND<0.5	8.0	6.5	ND<0.5	i
	9/7/2007		**28.42**	**11.08**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**9.8**	**ND<0.5**	**8.6**	**7.0**	**ND<0.5**	
MW-4B	6/3/2004	Zone B	33.52	5.02	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
38.54	11/23/2004		34.65	3.89	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
	3/14/2005		34.78	3.76	–	–	–	–	–	–	–	–	–	–	–	
	3/15/2005		–	–	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	6/15/2005		33.98	4.56	–	–	–	–	–	–	–	–	–	–	–	
	6/16/2005		–	–	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	9/19/2005		32.57	5.97	–	–	–	–	–	–	–	–	–	–	–	
	9/20/2005		–	–	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	12/12/2005		33.65	4.89	–	–	–	–	–	–	–	–	–	–	–	
	12/13/2005		–	–	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	3/13/2006		34.61	3.93	–	–	–	–	–	–	–	–	–	–	–	
	6/19/2006		33.86	4.68	–	–	–	–	–	–	–	–	–	–	–	
	9/20/2006		32.58	5.96	–	–	–	–	–	–	–	–	–	–	–	
	12/20/2006		33.92	4.62	–	–	–	–	–	–	–	–	–	–	–	
	3/29/2007		33.96	4.58	–	–	–	–	–	–	–	–	–	–	–	
	6/11/2007		34.03	4.51	–	–	–	–	–	–	–	–	–	–	–	
	9/7/2007		**33.22**	**5.32**	–	–	–	–	–	–	–	–	–	–	–	i
MW-5B	6/3/2004	Zone B	30.16	8.82	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
38.98	11/23/2004		31.32	7.66	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
	3/14/2005		32.71	6.27	–	–	–	–	–	–	–	–	–	–	–	
	3/15/2005		–	–	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	6/15/2005		31.20	7.78	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	9/19/2005		28.68	10.30	–	–	–	–	–	–	–	–	–	–	–	
	9/20/2005		–	–	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
	12/12/2005		30.65	8.33	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	3/13/2006		32.87	6.11	–	–	–	–	–	–	–	–	–	–	–	
	6/19/2006		30.97	8.01	–	–	–	–	–	–	–	–	–	–	–	
	9/20/2006		29.68	9.30	–	–	–	–	–	–	–	–	–	–	–	
	12/20/2006		31.21	7.77	–	–	–	–	–	–	–	–	–	–	–	
	3/29/2007		31.40	7.58	–	–	–	–	–	–	–	–	–	–	–	
	6/11/2007		31.02	7.96	–	–	–	–	–	–	–	–	–	–	–	
	9/7/2007		**30.02**	**8.96**	–	–	–	–	–	–	–	–	–	–	–	
MW-6B	6/3/2004	Zone B	29.36	8.30	0.65	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
37.66	11/23/2004		30.53	7.13	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.89	ND<0.5	ND<0.5	
	3/14/2005		31.86	5.80	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.1	ND<0.5	ND<0.5	ND<0.5	ND<0.5	3.5	i
	6/15/2005		30.17	7.49	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.4	ND<0.5	ND<0.5	0.66	ND<0.5	0.55	
	9/19/2005		28.83	8.83	1.4	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.0	1.2	ND<0.5	1.1	ND<0.5	1.1	
	12/12/2005		29.85	7.81	2.3	ND<0.5	11	ND<0.5	ND<0.5	ND<0.5	1.3	ND<0.5	1.3	ND<0.5	ND<0.5	h,i
	3/13/2006		32.31	5.35	0.73	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	h
	6/19/2006		29.88	7.78	0.91	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.52	ND<0.5	ND<0.5	h
	9/20/2006		28.78	8.88	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	j,h,i
	12/20/2006		30.34	7.32	2.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	1.2	ND<0.5	0.69	ND<0.5	ND<0.5	h
	3/29/2007		30.44	7.22	1.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.76	ND<0.5	ND<0.5	
	6/11/2007		29.93	7.73	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	j,h
	9/7/2007		**28.95**	**8.71**	**1.3**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**1.9**	**ND<0.5**	**0.66**	**ND<0.5**	**ND<0.5**	h
MW-1C	6/3/2004	Zone C	30.07	9.42	ND<0.5	0.57	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
39.49	11/23/2004		31.30	8.19	ND<0.5	0.56	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
	3/14/2005		32.58	6.91	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i

Table 5. Monitoring Well Groundwater Results: Halogenated Volatile Organic Compounds - John Nady, 1137-1167 65th Street, Oakland, California

Well ID TOC (ft)	Date Sampled	Groundwater Zone	Groundwater Elevation (ft amsl)	Depth to Water (ft)	Chloroethane	Chloroform	1,1,2,2-Tetrachloroethane	(PCE) Tetrachloroethene	(TCE) Trichloroethene	1,2-Dichlorobenzene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,1-Dichloroethane	1,2-Dichloroethane	Vinyl Chloride	Notes/Other VOCs
					← μg/L →											
MW-1C *(cont.)*	6/15/2005		30.89	8.60	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
	9/19/2005		29.19	10.30	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	12/12/2005		30.54	8.95	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	3/13/2006		32.99	6.50	–	–	–	–	–	–	–	–	–	–	–	
	6/19/2006		30.66	8.83	–	–	–	–	–	–	–	–	–	–	–	
	9/20/2006		29.53	9.96	–	–	–	–	–	–	–	–	–	–	–	
	12/20/2006		31.13	8.36	–	–	–	–	–	–	–	–	–	–	–	
	3/29/2007		31.19	8.30	–	–	–	–	–	–	–	–	–	–	–	
	6/11/2007		30.63	8.86	–	–	–	–	–	–	–	–	–	–	–	
	9/7/2007		**29.60**	**9.89**	–	–	–	–	–	–	–	–	–	–	–	
MW-4C *38.50*	6/3/2004	**Zone C**	30.10	8.40	ND<0.5	0.84	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
	11/23/2004		31.31	7.19	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
	3/14/2005		33.15	5.35	–	–	–	–	–	–	–	–	–	–	–	
	3/15/2005		–	–	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	6/15/2005		30.85	7.65	–	–	–	–	–	–	–	–	–	–	–	
	6/16/2005		–	–	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
	9/19/2005		25.97	12.53	–	–	–	–	–	–	–	–	–	–	–	
	9/20/2005		–	–	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
	12/12/2005		30.00	8.50	–	–	–	–	–	–	–	–	–	–	–	
	12/13/2005		–	–	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	i
	3/13/2006		31.18	7.32	–	–	–	–	–	–	–	–	–	–	–	
	6/19/2006		30.90	7.60	–	–	–	–	–	–	–	–	–	–	–	
	9/20/2006		29.91	8.59	–	–	–	–	–	–	–	–	–	–	–	
	12/20/2006		31.21	7.29	–	–	–	–	–	–	–	–	–	–	–	
	3/29/2007		31.29	7.21	–	–	–	–	–	–	–	–	–	–	–	
	6/11/2007		30.93	7.57	–	–	–	–	–	–	–	–	–	–	–	
	9/7/2007		**30.20**	**8.30**	–	–	–	–	–	–	–	–	–	–	–	
MW-6C *37.59*	6/3/2004	**Zone C**	27.89	9.70	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	2.8	ND<0.5	0.61	ND<0.5	ND<0.5	
	11/23/2004		29.21	8.38	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	
	3/14/2005		31.79	5.80	ND<0.5	ND<0.5	ND<0.5	1.8	1.9	ND<0.5	12	ND<0.5	1.1	ND<0.5	2.3	
	6/15/2005		30.14	7.45	ND<0.5	ND<0.5	ND<0.5	3.1	3.1	ND<0.5	20	0.64	1.4	ND<0.5	5.7	
	9/19/2005		28.79	8.80	ND<0.5	ND<0.5	ND<0.5	2.9	3.0	ND<0.5	18	0.57	1.3	ND<0.5	6.8	
	12/12/2005		29.81	7.78	0.66	ND<0.5	ND<0.5	3.2	3.0	ND<0.5	19	0.61	1.4	ND<0.5	10	
	3/13/2006		32.09	5.50	ND<0.5	ND<0.5	ND<0.5	3.2	3.9	ND<0.5	26	0.61	0.95	ND<0.5	5.1	
	6/19/2006		29.84	7.75	ND<0.5	ND<0.5	ND<0.5	4.0	3.4	ND<0.5	32	0.78	0.96	ND<0.5	11	
	9/20/2006		28.74	8.85	ND<0.5	ND<0.5	ND<0.5	3.7	4.6	ND<0.5	23	0.76	1.0	ND<0.5	9.4	i
	12/20/2006		30.29	7.30	ND<0.5	ND<0.5	ND<0.5	4.1	4.6	ND<0.5	36	0.88	0.92	ND<0.5	13	
	3/29/2007		30.39	7.20	ND<0.5	ND<0.5	ND<0.5	6.0	6.4	ND<0.5	35	1.2	1.1	ND<0.5	5.3	
	6/11/2007		29.86	7.73	ND<0.5	ND<0.5	ND<0.5	6.1	6.4	ND<0.5	26	0.99	0.85	ND<0.5	4.0	
	9/7/2007		**28.92**	**8.67**	**ND<0.5**	**ND<0.5**	**ND<0.5**	**7.0**	**6.9**	**ND<0.5**	**32**	**0.99**	**0.90**	**ND<0.5**	**4.2**	

Abbreviations:

TOC (ft) = Top of casing elevation in feet above mean sea level (msl)
μg/L = micrograms per liter; approximately equal to parts per billion = ppb
ft = measured in feet
Halogenated Volatile Organic Compounds analyzed by EPA Method SW8260B, reported EPA Method 8010 basic target list.
ND<0.5 = Not Detected above detection limit cited.
– = Not available, not applicable, not analyzed, not measured

Notes:

a = Total Trihalomethanes
b = Sample diluted due to high organic content
h = lighter than water immiscible sheen/product is present
i = liquid sample that contains greater than ~1 vol. % sediment
j = sample diluted due to high organic content/matrix interference

Table 6. Soil Boring Grab Groundwater Results: Petroleum Hydrocarbons - John Nady, 1137-1167 65th Street, Oakland, California

Boring ID *TOC* *(ft*)*	Date Sampled	Groundwater Zone	Groundwater Elevation (ft)	Depth to Water (ft)	TPHmo	TPHd	TPHss	TPHg	Notes
					←	µg/L		→	
Previous Cambria Samples									
SB-1	11/25/2002	Zone A	35.39	3.45	---	---	---	---	
(38.84)	11/26/2002		35.44	3.40	**7,500**	**2,000**	<50	58	
SB-2	11/25/2002	Zone C	11.61	29.50	---	---	---	---	
(41.11)	11/26/2002		29.46	11.65	<250	<50	<50	<50	
SB-4	11/25/2002	Zone A	34.02	6.90	---	---	---	---	
(40.92)	11/26/2002		34.82	6.10	---	---	---	---	SPH
SB-6	11/25/2002	Zone A	28.24	11.25	---	---	---	---	
(39.49)	11/26/2002		32.19	7.30	620	**23,000**	**7,800**	**8,700**	a,b,c
SB-7	11/25/2002	Zone B	28.20	10.30	---	---	---	---	
(38.50)	11/26/2002		30.10	8.40	<25,000	**120,000**	**5,800**	**6,100**	a,b,c
SB-8	11/25/2002	Zone A	36.30	4.70	---	---	---	---	
(41.00)	11/26/2002		36.55	4.65	<250,000	**1,200,000**	**100,000**	**110,000**	a,b,c
SB-9	11/25/2002	Zone C	16.02	25.00	---	---	---	---	
(41.02)	11/26/2002		17.07	23.95	300	50	<50	<50c	
SB-10	11/25/2002	Zone A	29.27	11.60	---	---	---	---	
(40.87)	11/26/2002		31.12	9.75	<250	350	200	260a,c	
SB-11	11/25/2002	Zone C	12.15	29.30	---	---	---	---	
(41.45)	11/26/2002		19.55	21.90	<250	<50	<50	<50	
Soil Boring Grab Groundwater Samples									
SB-12A	1/13/2004	Zone A	---	4.5	300	130	<50	230	h,c,e,d,f
SB-14A	1/9/2004	Zone A	---	4.0	<250	<50	<50	<50	c
SB-14C	1/9/2004	Zone C	---	NW	---	---	---	---	
SB-15A	1/12/2004	Zone A	---	4.0	290	**2,400**	**2,500**	**2,700**	a,c,d

Table 6. Soil Boring Grab Groundwater Results: Petroleum Hydrocarbons - John Nady, 1137-1167 65th Street, Oakland, California

Boring ID *TOC* *(ft*)*	Date Sampled	Groundwater Zone	Groundwater Elevation (ft)	Depth to Water (ft)	TPHmo (µg/L)	TPHd (µg/L)	TPHss (µg/L)	TPHg (µg/L)	Notes
SB-16A	1/12/2004	Zone A	---	4.0	**9,800**	**23,000**	**1,500**	**1,700**	a,b,c,d,e,i
SB-17A	1/13/2004	Zone A	---	NW	---	---	---	---	
SB-17B	1/8/2004	Zone B	---	16.5	<250	95	<50	120	c,d,f,g
SB-17C	1/13/2004	Zone C	---	NW	---	---	---	---	
SB-18A	1/6/2004	Zone A	---	1.5	<2,500	**11,000**	**2,100**	**3,900**	d,b
SB-18B**	1/9/2004	Zone C	---	25.0	<250	92	<50	250	g,h
SB-18C	1/9/2004	Zone C	---	34.0	---	---	170	300	c,g,h
SB-19A	1/13/2004	Zone A	---	NW	---	---	---	---	
SB-20A	1/13/2004	Zone A	---	8.0	<250	**1,400**	**610**	**680**	b,d,j
SB-20C	1/13/2004	Zone C	---	31.0	<250	<50	<50	<50	c
SB-21A	1/20/2004	Zone A	---	8.5	<25,000	**110,000**	**5,600**	**6,100**	a,b,i,k
SB-22A	1/7/2004	Zone A	---	NW	---	---	---	---	
SB-22C	1/7/2004	Zone C	---	--	<250	110	<50	<50	c,f
SB-25A	1/8/2004	Zone A	---	5.0	<250	64	<50	<50	c,f,g
SB-25C	1/8/2004	Zone C	---	29.0	<250	<50	<50	<50	c
SB-26A	1/7/2004	Zone A	---	4.0	**1,000**	**5,300**	**2,600**	**3,000**	c,d,e
Previous SCI Samples									
Interior	2/20/2002		---	---	---	**94,000**	**13,000**	**21,000**	
Exterior	2/25/2002		---	---	---	**82,000**	**42,000**	**66,000**	

Table 6. Soil Boring Grab Groundwater Results: Petroleum Hydrocarbons - John Nady, 1137-1167 65th Street, Oakland, California

Boring ID *TOC (ft*)*	Date Sampled	Groundwater Zone	Groundwater Elevation (ft)	Depth to Water (ft)	TPHmo	TPHd	TPHss	TPHg	Notes
					←	μg/L		→	

Abbreviations:

Bold values represent concentrations above the non-drinking water ESL.

TOC Elev. (ft) = Top of casing elevation in feet above mean sea level

μg/L = micrograms per liter = parts per billion = ppb

TPHmo = Total petroleum hydrocarbons as motor oil by EPA Method 8015C with silica gel cleanup

TPHd = Total petroleum hydrocarbons as diesel by EPA Method 8015C with silica gel cleanup

TPHss = Total petroleum hydrocarbons as Stoddard solvent by EPA Method 8021B/8015Cm

TPHg = Total petroleum hydrocarbons as gasoline by EPA Method 8021B/8015Cm

--- = Not available, not analyzed, or does not apply.

< n = Chemical not present at a concentration in excess of detection limit shown.

SPH = Separate phase hydrocarbons detected in well; no groundwater collected.

Notes:

* = Grab groundwater sample was collected without protection against cross contamination between groundwater zones; sample may not be discrete.

** = Sample SB-18B collected in the C-zone

a = Laboratory note: TPH pattern that does not appear to be derived from gasoline (Stoddard solvent/mineral spirit?)

b = Laboratory note: lighter than water immiscible sheen/product is present

c = Laboratory note: liquid sample that contains greater than ~2 vol. % sediment

d = Laboratory note: gasoline range compounds are significant

e = Laboratory note: oil range compounds are significant

f = Laboratory note: diesel range compounds are significant; no recognizable pattern

g = Laboratory note: one to a few isolated non-target peaks present

h = Laboratory note: unmodified or weakly modified gasoline is significant

i = Laboratory note: sample diluted due to high organic content

j = Laboratory note: strongly aged gasoline or diesel range compounds are significant

k = Laboratory note: stoddard solvent/mineral spirit

ESL - Potential Drinking Water Source = Table A - Environmental Screening Levels (Groundwater is a Current or Potential Source of Drinking Water) established by the RWQCB-SFBR, Interim Final July 2003.

ESL - Not A Potential Drinking Water Source = Table B - Environmental Screening Levels (Groundwater is not a Current or Potential Source of Drinking established by the RWQCB-SFBR, Interim Final July 2003.

Table 7. Soil Boring Grab Groundwater Results: Volatile Organic Compounds - John Nady, 1137-1167 65th Street, Oakland, California

Boring ID *(TOC)* *(ft*)*	Date Sampled	Groundwater Zone	Groundwater Elevation (ft)	Depth to Water (ft)	Benzene	Toulene	Ethylbenzene	Xylenes	Chloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	Trichloroethene	1,2-Dichlorobenzene	cis-1,2-Dichloroethene	1,1-Dichloroethane	1,2-Dichloroethane	Vinyl Chloride	Notes
					←						µg/L						→	
Soil Boring Grab Groundwater Samples																		
SB-1	11/25/2002	Zone A	35.39	3.45	---	---	---	---	---	---	---	---	---	---	---	---	---	
(38.84)	11/26/2002		35.44	3.40	1.7	3.2	0.55	3.6	<0.5	<0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	j,o
SB-2	11/25/2002	Zone C	11.61	29.50	---	---	---	---			---	---		---			---	
(41.11)	11/26/2002		29.46	11.65	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	o
SB-4	11/25/2002	Zone A	34.02	6.90	---	---	---	---	---	---	---	---	---	---	---	---	---	
(40.92)	11/26/2002		34.82	6.10	---	---	---	---	---	---	---	---	---	---	---	---	---	SPH
SB-6	11/25/2002	Zone A	28.24	11.25	---	---	---	---	---	---	---	---	---	---	---	---	---	
(39.49)	11/26/2002		32.19	7.30	2.1	1.2	<0.5	0.55	3.8	<0.5	<0.5	<0.5	<0.5	1.2	1.4	<0.5	0.90	a,n,o
SB-7	11/25/2002	Zone B	28.20	10.30	---	---	---	---			---	---		---			---	
(38.50)	11/26/2002		30.10	8.40	<0.5	0.74	<0.5	3	**16**	16	<0.5	<0.5	<0.5	<0.5	1.7	<0.5	1.3	a,n,o
SB-8	11/25/2002	Zone A	36.30	4.70	---	---	---	---	---	---	---	---	---	---	---	---	---	
(41.00)	11/26/2002		36.55	4.65	<10	<10	<10	<10	<10	<10	<10	<10	**20**	<10	<10	<10	<10	a,n,o
SB-9	11/25/2002	Zone C	16.02	25.00	---	---	---	---	---	---	---	---	---	---	---	---	---	
(41.02)	11/26/2002		17.07	23.95	<0.5	0.88	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	o
SB-10	11/25/2002	Zone A	29.27	11.60	---	---	---	---	---	---	---	---	---	---	---	---	---	
(40.87)	11/26/2002		31.12	9.75	<2.5	3.4	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	170	19	<2.5	**45**	a,o
SB-11	11/25/2002	Zone C	12.15	29.30	---	---	---	---	---	---	---	---	---	---	---	---	---	
(41.45)	11/26/2002		---	21.90	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
SB-12A	1/13/2004	Zone A	---	4.5	<0.5	2.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	a,i,o

Table 7. Soil Boring Grab Groundwater Results: Volatile Organic Compounds - John Nady, 1137-1167 65th Street, Oakland, California

Boring ID (TOC) (ft*)	Date Sampled	Groundwater Zone	Groundwater Elevation (ft)	Depth to Water (ft)	Benzene	Toulene	Ethylbenzene	Xylenes	Chloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	Trichloroethene	1,2-Dichlorobenzene	cis-1,2-Dichloroethene	1,1-Dichloroethane	1,2-Dichloroethane	Vinyl Chloride	Notes
					← μg/L →													
SB-14A	1/9/2004	Zone A	---	4.0	0.58	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	i,o
SB-14C	1/9/2004	Zone C	---	NW	---	---	---	---	---	---	---	---	---	---	---	---	---	
SB-15A	1/12/2004	Zone A	---	4.0	<0.5	<0.5	<0.5	**17**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	e,i,o
SB-16A	1/12/2004	Zone A	---	4.0	0.65	0.51	1.3	7.7	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	e, h,i,p,n,o
SB-17A	1/13/2004	Zone A	---	NW	---	---	---	---	---	---	---	---	---	---	---	---	---	
SB-17B	1/8/2004	Zone B	---	16.5	<0.5	<0.5	<0.5	<0.5	<50	<50	<50	<50	<50	**1,100**	<50	<50	<50	f,i,o
SB-17C	1/13/2004	Zone C	---	NW	---	---	---	---	---	---	---	---	---	---	---	---	---	
SB-18A	1/6/2004	Zone A	---	1.5	<5.0	<5.0	<5.0	11	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	e,h,p,n
SB-18B**	1/9/2004	Zone C	---	25.0	0.54	<0.5	<0.5	0.64	<100	<100	**630**	**430**	<100	**1,800**	<100	<100	<100	a,f
SB-18C	1/9/2004	Zone C	---	34.0	0.82	<0.5	<0.5	1.3	<50	<50	**300**	250	<50	**1,200**	<50	<50	<50	a,f,i,o
SB-19A	1/13/2004	Zone B	---	NW	---	---	---	---	---	---	---	---	---	---	---	---	---	
SB-20A	1/13/2004	Zone A	---	8.0	<0.5	<0.5	<0.5	3.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	g,h,n
SB-20C	1/13/2004	Zone C	---	31.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	i,o
SB-21A	1/20/2004	Zone A	---	8.5	<5.0	<5.0	<5.0	<5.0	<50	<50	<50	<50	<50	<50	<50	<50	<50	e,h,p.n
SB-22A	1/7/2004	Zone A	---	NW	---	---	---	---	---	---	---	---	---	---	---	---	---	
SB-22C	1/7/2004	Zone C	---	--	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	i, o
SB-25A	1/8/2004	Zone A	---	5.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	i, o
SB-25C	1/8/2004	Zone C	---	29.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	i, o
SB-26A	1/7/2004	Zone A	---	4.0	6.2	<5.0	<5.0	**13**	<0.5	<0.5	<5.0	<5.0	<0.5	<0.5	<0.5	<0.5	<5.0	i,e,o,p

Table 7. Soil Boring Grab Groundwater Results: Volatile Organic Compounds - John Nady, 1137-1167 65th Street, Oakland, California

Boring ID (TOC) (ft*)	Date Sampled	Groundwater Zone	Groundwater Elevation (ft)	Depth to Water (ft)	Benzene	Toulene	Ethylbenzene	Xylenes	Chloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	Trichloroethene	1,2-Dichlorobenzene	cis-1,2-Dichloroethene	1,1-Dichloroethane	1,2-Dichloroethane	Vinyl Chloride	Notes
					←						μg/L						→	
Trip Blank	11/26/2002		---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Previous SCI Samples																		
Interior	2/20/2002		---	---	**47**	<5.0	9.4	**114**			<5.0	<5.0		<5.0			<5.0	
Exterior	2/20/2002		---	---	<7.1	<7.1	<7.1	**24**			83	<7.1		9.6			<7.1	

Abbreviations:

TOC Elev. (ft) = Top of casing elevation in feet above mean sea level

μg/L = micrograms per liter = parts per billion = ppb

Volatile organic compounds by EPA Method 8260B

--- = Not available, not analyzed, or does not apply

< n = Chemical not present at a concentration in excess of detection limit shown

* = Grab groundwater sample was collected without protection against cross contamination between groundwater zones; may not be discrete.

** = Sample 18B collected in the C-zone

SPH = Separate phase hydrocarbons detected in well; no groundwater collected.

Notes:

a = TPH pattern that does not appear to be derived from gasoline (stoddard solvent/mineral spirit?).

b = No recognizable pattern.

c = Stoddard solvent/mineral spirit.

d= Diesel range compounds are significant; no recognizable pattern.

e = Gasoline range compounds are significant.

f = One to a few isolated peaks present

g = Oil range compounds are significant.

h = Lighter than water immiscible sheen/product is present.

i = Liquid sample contains greater than ~1 vol. % sediment.

j = Unmodified or weakly modified gasoline is significant

k = TPHg range non-target isolated peaks subtracted out of the TPHg concentration

l = Heavier gasoline compounds are significant (aged gasoline?)

m = Strongly aged gasoline or diesel range compounds are significant

n = Laboratory note: lighter than water immiscible sheen/product is present

o = Laboratory note: liquid sample that contains greater than `2vol.. % sediment

p= Laboratory note: sample diluted due to high organic content

q= Laboratory note: reporting limit rasied due to insufficient sample amount

APPENDIX A

Agency Correspondence

Jonas, Mark

From: Jonas, Mark
Sent: Monday, August 06, 2007 1:51 PM
To: 'Chan, Barney, Env. Health'
Cc: Frederic Schrag (Schrag@nady.com)
Subject: Authorization Characterization Work Plan & Ownership - Nady FLC#RO0000082

Dear Barney:
Thank you for approving our submittal an upcoming Additional Site Characterization Work Plan for the Nady site (FLC #RO0000082). We'll get you the Work Plan in 4 to 6 weeks. The plan will focus on groundwater and soil gas characterization. We would like to understand the groundwater plume before we provide you with a Feasibility Study or an Interim CAP.

With respect to ownership, the property is owned by the Nady Trust, with John Nady as Trustee. Mr. Wofsy sold the property to Nady in 1986.

Sincerely,
Mark Jonas
Mark Jonas, P.G.
Conestoga-Rovers & Associates, Inc.
510/420-3307 direct

www.CRAworld.com

From: Chan, Barney, Env. Health [mailto:barney.chan@acgov.org]
Sent: Monday, August 06, 2007 10:34 AM
To: Jonas, Mark
Subject: RE: Authorization Request GW Characterization Work Plan - Nady FLC#RO0000082

Mark: I have no problem with requesting a wp for additional site characterization, plus SV sampling and F/S & interim cap. Please clarify the property ownership and RP. I have Mr. Nady, Mr F. Schrag and the Assessor's records state Mr. Alan Wofsy.

Thank you

Barney M. Chan
Hazardous Materials Specialist
Alameda County Environmental Health
510-567-6765

From: Jonas, Mark [mailto:mjonas@craworld.com]
Sent: Monday, August 06, 2007 9:07 AM
To: Chan, Barney, Env. Health
Cc: Schrag@nady.com
Subject: Authorization Request GW Characterization Work Plan - Nady FLC#RO0000082

Dear Barney:
We request your approval for us to submit a Groundwater Characterization Work Plan for the Nady site (Fuel Leak Case #RO0000082), located at 1137-1167 65th Street, in Oakland. This will primarily address off-site groundwater characterization.

Sincerely,

Mark Jonas
Mark Jonas, P.G.
Conestoga-Rovers & Associates, Inc.
5900 Hollis Street, Suite A
Emeryville, California 94608
510/420-3307 direct
510/420-9170 fax

www.CRAworld.com

APPENDIX B

Standard Field Procedures

Conestoga-Rovers & Associates

STANDARD FIELD PROCEDURES FOR SOIL BORINGS

This document describes Conestoga-Rovers & Associates' standard field methods for drilling and sampling soil borings. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor odor or staining, estimate ground water depth and quality and to submit samples for chemical analysis.

Soil Classification/Logging

All soil samples are classified according to the Unified Soil Classification System by a trained geologist or engineer working under the supervision of a California Registered Geologist (RG) or a Certified Engineering Geologist (CEG). The following soil properties are noted for each soil sample:

- Principal and secondary grain size category (i.e. sand, silt, clay or gravel)
- Approximate percentage of each grain size category,
- Color,
- Approximate water or product saturation percentage,
- Observed odor and/or discoloration,
- Other significant observations (i.e. cementation, presence of marker horizons, mineralogy), and
- Estimated permeability.

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or hydraulic push technologies. At least one and one half ft of the soil column is collected for every five ft of drilled depth. Additional soil samples are collected near the water table and at lithologic changes. Samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments beyond the bottom of the borehole. The vertical location of each soil sample is determined by measuring the distance from the middle of the soil sample tube to the end of the drive rod used to advance the split barrel sampler. All sample depths use the ground surface immediately adjacent to the boring as a datum. The horizontal location of each boring is measured in the field from an onsite permanent reference using a measuring wheel or tape measure.

Drilling and sampling equipment is steam-cleaned prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

Sample Storage, Handling and Transport

Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon tape and plastic end caps. Soil samples are labeled and stored at or below 4°C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

Field Screening

One of the remaining tubes is partially emptied leaving about one-third of the soil in the tube. The tube is capped with plastic end caps and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable photoionization detector (PID) measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. PID measurements are used along with the field observations, odors, stratigraphy and ground water depth to select soil samples for analysis.

Water Sampling

Water samples, if they are collected from the boring, are either collected using a driven Hydropunch type sampler or are collected from the open borehole using bailers. The ground water samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory.

Duplicates and Blanks

Blind duplicate water samples are collected usually collected only for monitoring well sampling programs, at a rate of one blind sample for every 10 wells sampled. Laboratory-supplied trip blanks accompany samples collected for all sampling programs to check for cross-contamination caused by sample handling and transport. These trip blanks are analyzed if the internal laboratory QA/QC blanks contain the suspected field contaminants. An equipment blank may also be analyzed if non-dedicated sampling equipment is used.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe.

Waste Handling and Disposal

Soil cuttings from drilling activities are usually stockpiled onsite on top of and covered by plastic sheeting. At least four individual soil samples are collected from the stockpiles for later compositing at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples. Soil cuttings are transported by licensed waste haulers and disposed in secure, licensed facilities based on the composite analytic results.

Ground water removed during sampling and/or rinsate generated during decontamination procedures are stored onsite in sealed 55 gallon drums. Each drum is labeled with the drum number, date of generation, suspected contents, generator identification and consultant contact. Disposal of the water is based on the analytic results for the well samples. The water is either pumped out using a vacuum truck for transport to a licensed waste treatment/disposal facility or the individual drums are picked up and transported to the waste facility where the drum contents are removed and appropriately disposed.

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STANDARD FIELD PROCEDURES FOR SOIL VAPOR PROBE INSTALLATION AND SAMPLING

DIRECT PUSH AND VAPOR POINT METHODS

This document describes Conestoga-Rovers & Associates' standard field methods for soil vapor sampling. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Objectives

Soil vapor samples are collected and analyzed to assess whether vapor-phase subsurface contaminants pose a threat to human health or the environment.

Direct Push Method for Soil Vapor Sampling

The direct push method for soil vapor sampling uses a hollow vapor probe, which is pushed into the ground, rather than augured, and the stratigraphy forms a vapor seal between the surface and subsurface environments ensuring that the surface and subsurface gases do not mix. Once the desired soil vapor sampling depth has been reached, the field technician installs disposable polyethylene tubing with a threaded adapter that screw into the bottom of the rods. The screw adapter ensures that the vapor sample comes directly from the bottom of the drill rods and does not mix with other vapor from inside the rod or from the ground surface. In addition, hydrated bentonite is placed around the sampling rod and the annulus of the boring to prevent ambient air from entering the boring. The operator then pulls up on the rods and exposes the desired stratigraphy by leaving an expendable drive point at the maximum depth. The required volume of soil vapor is then purged through the polyethylene tubing using a standard vacuum pump. The soil vapor can be sampled for direct injection into a field gas chromatograph, pumped into inert tedlar bags using a "bell jar" sampling device, or allowed to enter a Summa vacuum canister. Once collected, the vapor sample is transported under chain-of-custody to a state-certified laboratory. The ground surface immediately adjacent to the boring is used as a datum to measure sample depth. The horizontal location of each boring is measured in the field relative to a permanent on-site reference using a measuring wheel or tape measure. Drilling and sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent. Once the sampling is completed, the borings are filled to the ground surface with neat cement.

Shallow Soil Vapor Point Method for Soil Vapor Sampling

The shallow soil vapor point method for soil vapor sampling utilizes a hand auger or drill rig to advance a boring for the installation of a soil vapor sampling point. Once the boring is hand augered to the final depth, a 6-inch slotted probe, capped on either end with brass or Swagelok fittings, is placed within 12-inches of number 2/16 filter sand (Figure A). Nylon tubing of ¼-inch outer-diameter of known length is attached to the probe. A 2-inch to 12-inch layer of unhydrated bentonite chips is placed on top of the filter pack. Next pre-hydrated granular bentonite is then poured into the hole to approximately and topped with another 2-inch layer of unhydrated bentonite chips or concrete, depending if the boring will hold one probe or multiple probes. The tube is coiled and placed within a wellbox finished flush to the surface. Soil vapor samples will be collected no sooner than one week after installation of the soil-vapor points to allow adequate time for representative soil vapors to accumulate. Soil vapor sample collection will not be scheduled until after a minimum of three consecutive precipitation-free days and irrigation onsite has ceased. Figure B shows the soil vapor sampling apparatus. A measured volume of air will be purged from the tubing using a vacuum pump and a tedlar bag. Immediately after purging, soil-vapor samples will be collected using the appropriate size Summa canister with attached flow regulator and sediment filter. The soil-vapor points will be preserved until they are no longer needed for risk evaluation purposes. At that time, they will be destroyed by extracting the tubing, hand augering to remove the sand and bentonite, and backfilling the boring with neat cement. The boring will be patched with asphalt or concrete, as appropriate.

Vapor Sample Storage, Handling, and Transport

Samples are stored and transported under chain-of-custody to a state-certified analytic laboratory. Samples should never be cooled due to the possibility of condensation within the canister.

STANDARD FIELD PROCEDURES FOR SOIL VAPOR PROBE INSTALLATION AND SAMPLING

DIRECT PUSH AND VAPOR POINT METHODS

This document describes Conestoga-Rovers & Associates' standard field methods for soil vapor sampling. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Objectives

Soil vapor samples are collected and analyzed to assess whether vapor-phase subsurface contaminants pose a threat to human health or the environment.

Direct Push Method for Soil Vapor Sampling

The direct push method for soil vapor sampling uses a hollow vapor probe, which is pushed into the ground, rather than augured, and the stratigraphy forms a vapor seal between the surface and subsurface environments ensuring that the surface and subsurface gases do not mix. Once the desired soil vapor sampling depth has been reached, the field technician installs disposable polyethylene tubing with a threaded adapter that screw into the bottom of the rods. The screw adapter ensures that the vapor sample comes directly from the bottom of the drill rods and does not mix with other vapor from inside the rod or from the ground surface. In addition, hydrated bentonite is placed around the sampling rod and the annulus of the boring to prevent ambient air from entering the boring. The operator then pulls up on the rods and exposes the desired stratigraphy by leaving an expendable drive point at the maximum depth. The required volume of soil vapor is then purged through the polyethylene tubing using a standard vacuum pump. The soil vapor can be sampled for direct injection into a field gas chromatograph, pumped into inert tedlar bags using a "bell jar" sampling device, or allowed to enter a Summa vacuum canister. Once collected, the vapor sample is transported under chain-of-custody to a state-certified laboratory. The ground surface immediately adjacent to the boring is used as a datum to measure sample depth. The horizontal location of each boring is measured in the field relative to a permanent on-site reference using a measuring wheel or tape measure. Drilling and sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent. Once the sampling is completed, the borings are filled to the ground surface with neat cement.

Shallow Soil Vapor Point Method for Soil Vapor Sampling

The shallow soil vapor point method for soil vapor sampling utilizes a hand auger or drill rig to advance a boring for the installation of a soil vapor sampling point. Once the boring is hand augered to the final depth, a 6-inch slotted probe, capped on either end with brass or Swagelok fittings, is placed within 12-inches of number 2/16 filter sand (Figure A). Nylon tubing of ¼-inch outer-diameter of known length is attached to the probe. A 2-inch to 12-inch layer of unhydrated bentonite chips is placed on top of the filter pack. Next pre-hydrated granular bentonite is then poured into the hole to approximately and topped with another 2-inch layer of unhydrated bentonite chips or concrete, depending if the boring will hold one probe or multiple probes. The tube is coiled and placed within a wellbox finished flush to the surface. Soil vapor samples will be collected no sooner than one week after installation of the soil-vapor points to allow adequate time for representative soil vapors to accumulate. Soil vapor sample collection will not be scheduled until after a minimum of three consecutive precipitation-free days and irrigation onsite has ceased. Figure B shows the soil vapor sampling apparatus. A measured volume of air will be purged from the tubing using a vacuum pump and a tedlar bag. Immediately after purging, soil-vapor samples will be collected using the appropriate size Summa canister with attached flow regulator and sediment filter. The soil-vapor points will be preserved until they are no longer needed for risk evaluation purposes. At that time, they will be destroyed by extracting the tubing, hand augering to remove the sand and bentonite, and backfilling the boring with neat cement. The boring will be patched with asphalt or concrete, as appropriate.

Vapor Sample Storage, Handling, and Transport

Samples are stored and transported under chain-of-custody to a state-certified analytic laboratory. Samples should never be cooled due to the possibility of condensation within the canister.

Conestoga-Rovers & Associates

ANDARD FIELD PROCEDURES FOR GROUNDWATER MONITORING AND SAMPLING

This document presents standard field methods for groundwater monitoring, purging and sampling, and well development. These procedures are designed to comply with Federal, State and local regulatory guidelines. CRA's specific field procedures are summarized below.

Groundwater Elevation Monitoring

Prior to performing monitoring activities, the historical monitoring and analytical data of each monitoring well shall be reviewed to determine if any of the wells are likely to contain non-aqueous phase liquid (NAPL) and to determine the order in which the wells will be monitored (i.e. cleanest to dirtiest). Groundwater monitoring should not be performed when the potential exists for surface water to enter the well (i.e. flooding during a rainstorm).

Prior to monitoring, each well shall be opened and the well cap removed to allow water levels to stabilize and equilibrate. The condition of the well box and well cap shall be observed and recommended repairs noted. Any surface water that may have entered and flooded the well box should be evacuated prior to removing the well cap. In wells with no history of NAPL, the static water level and total well depth shall be measured to the nearest 0.01 foot with an electronic water level meter. Wells with the highest contaminant concentrations shall be measured last. In wells with a history of NAPL, the NAPL level/thickness and static water level shall be measured to the nearest 0.01 foot using an electronic interface probe. The water level meter and/or interface probe shall be thoroughly cleaned and decontaminated at the beginning of the monitoring event and between each well. Monitoring equipment shall be washed using soapy water consisting of Liqui-nox™ or Alconox™ followed by one rinse of clean tap water and then two rinses of distilled water.

Groundwater Purging and Sampling

Prior to groundwater purging and sampling, the historical analytical data of each monitoring well shall be reviewed to determine the order in which the wells should be purged and sampled (i.e. cleanest to dirtiest). No purging or groundwater sampling shall be performed on wells with a measurable thickness of NAPL or floating NAPL globules. If a sheen is observed, the well should be purged and a groundwater sample collected only if no NAPL is present. Wells shall be purged either by hand using a disposal or PVC bailer or by using an aboveground pump (e.g. peristaltic or Wattera™) or down-hole pump (e.g. Grundfos™ or DC Purger pump).

Groundwater wells shall be purged approximately three to ten well-casing volumes (depending on the regulatory agency requirements) or until groundwater parameters of temperature, pH, and conductivity have stabilized to within 10% for three consecutive readings. Temperature, pH, and conductivity shall be measured and recorded at least once per well casing volume removed. The total volume of groundwater removed shall be recorded along with any other notable physical characteristic such as color and odor. If required, field parameters such as turbidity, dissolved oxygen (DO), and oxidation-reduction potential (ORP) shall also be measured prior to collection of each groundwater sample.

Groundwater samples shall be collected after the well has been purged. If the well is slow to recharge, a sample shall be collected after the water column is allowed to recharge to 80% of the pre-purging static water level. If the well does not recover to 80% in 2 hours, a sample shall be collected once there is enough groundwater in the well. Groundwater samples shall be collected using clean disposable bailers or pumps (if an operating remediation system exists on site and the project manager approves of its use for sampling) and shall be decanted into clean containers supplied by the analytical laboratory. New latex gloves and disposable tubing or bailers shall be used for sampling each well. If a PVC bailer or down-hole pump is used for groundwater purging, it shall be decontaminated before purging each well by using soapy water consisting of Liqui-nox™ or Alconox™ followed by one rinse of clean tap water and then two rinses of distilled water. If a submersible pump with non-dedicated discharge tubing is used for groundwater purging, both the inside and outside of pump and discharge tubing shall be decontaminated as described above.

Sample Handling

Except for samples that will be tested in the field, or that require special handling or preservation, samples shall be stored in coolers chilled to 4° C for shipment to the analytical laboratory. Samples shall be labeled, placed in protective foam sleeves or bubble wrap as needed, stored on crushed ice at or below 4° C, and submitted under chain-of-custody (COC) to the laboratory. The laboratory shall be notified of the sample shipment schedule and arrival time. Samples shall be shipped to the laboratory within a time frame to allow for extraction and analysis to be performed within the standard sample holding times.

Sample labels shall be filled out using indelible ink and must contain the site name; field identification number; the date, time, and location of sample collection; notation of the type of sample; identification of preservatives used; remarks; and the signature of the sampler. Field identification must be sufficient to allow easy cross-reference with the field datasheet.

All samples submitted to the laboratory shall be accompanied by a COC record to ensure adequate documentation. A copy of the COC shall be retained in the project file. Information on the COC shall consist of the project name and number; project location; sample numbers; sampler/recorder's signature; date and time of collection of each sample; sample type; analyses requested; name of person receiving the sample; and date of receipt of sample.

Laboratory-supplied trip blanks shall accompany the samples and be analyzed to check for cross-contamination, if requested by the project manager.

Well Development

Wells shall be developed using a combination of groundwater surging and extraction. A surge block shall be used to swab the well and agitate the groundwater in order to dislodge any fine sediment from the sand pack. After approximately ten minutes of swabbing the well, groundwater shall be extracted from the well using a bailer, pump and/or reverse air-lifting through a pipe to remove the sediments from the well. Alternating surging and extraction shall continue until the sediment volume in the groundwater (i.e. turbidity) is negligible, which typically requires extraction of approximately ten well-casing volumes of groundwater. Preliminary well development usually is performed during well installation prior to placing the sanitary surface seal to ensure sand pack stabilization. Well development that is performed after surface seal installation, should occur no less than 72 hours after seal installation to ensure that the cement has had adequate time to set.

Waste Handling and Disposal

Groundwater extracted during development and sampling shall be stored onsite in sealed U.S. DOT H17 55-gallon drums. Each drum shall be labeled with the contents, date of generation, generator identification and consultant contact.

Conestoga-Rovers & Associates

STANDARD FIELD PROCEDURES FOR SOIL BORING AND MONITORING WELL INSTALLATIONS

This document presents standard field methods for drilling and sampling soil borings and installing, developing and sampling groundwater monitoring wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

SOIL BORINGS

Objectives

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor or staining, and to collect samples for analysis at a State-certified laboratory. All borings are logged using the Unified Soil Classification System by a trained geologist working under the supervision of a California Registered Geologist (RG).

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or direct-push technologies such as the Geoprobe®. Soil samples are collected at least every five ft to characterize the subsurface sediments and for possible chemical analysis. Additional soil samples are collected near the water table and at lithologic changes. Samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments at the bottom of the borehole.

Drilling and sampling equipment is steam-cleaned prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

Sample Analysis

Sampling tubes chosen for analysis are trimmed of excess soil and capped with Teflon tape and plastic end caps. Soil samples are labeled and stored at or below 4° C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

Field Screening

One of the remaining tubes is partially emptied leaving about one-third of the soil in the tube. The tube is capped with plastic end caps and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable volatile vapor analyzer measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. Volatile vapor analyzer measurements are used along with the field observations, odors, stratigraphy and groundwater depth to select soil samples for analysis.

Water Sampling

Water samples, if they are collected from the boring, are either collected using a driven Hydropunch® type sampler or are collected from the open borehole using bailers. The groundwater samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

Grouting

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe.

MONITORING WELL INSTALLATION, DEVELOPMENT AND SAMPLING

Well Construction and Surveying

Groundwater monitoring wells are installed to monitor groundwater quality and determine the groundwater elevation, flow direction and gradient. Well depths and screen lengths are based on groundwater depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 10 to 15 ft below and 5 ft above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three ft thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two ft above the well screen. A two ft thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type I,II cement.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security.

The well top-of-casing elevation is surveyed with respect to mean sea level and the well is surveyed for horizontal location with respect to an onsite or nearby offsite landmark.

Well Development

Wells are generally developed using a combination of groundwater surging and extraction. Surging agitates the groundwater and dislodges fine sediments from the sand pack. After about ten minutes of surging, groundwater is extracted from the well using bailing, pumping and/or reverse air-lifting through an eductor pipe to remove the sediments from the well. Surging and extraction continue until at least ten well-casing volumes of groundwater are extracted and the sediment volume in the groundwater is negligible. This process usually occurs prior to installing the sanitary surface seal to ensure sand pack stabilization. If development occurs after surface seal installation, then development occurs 24 to 72 hours after seal installation to ensure that the Portland cement has set up correctly.

All equipment is steam-cleaned prior to use and air used for air-lifting is filtered to prevent oil entrained in the compressed air from entering the well. Wells that are developed using air-lift evacuation are not sampled until at least 24 hours after they are developed.

Groundwater Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of groundwater are purged prior to sampling. Purging continues until groundwater pH, conductivity, and temperature have stabilized. Groundwater samples are collected using bailers or pumps and are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

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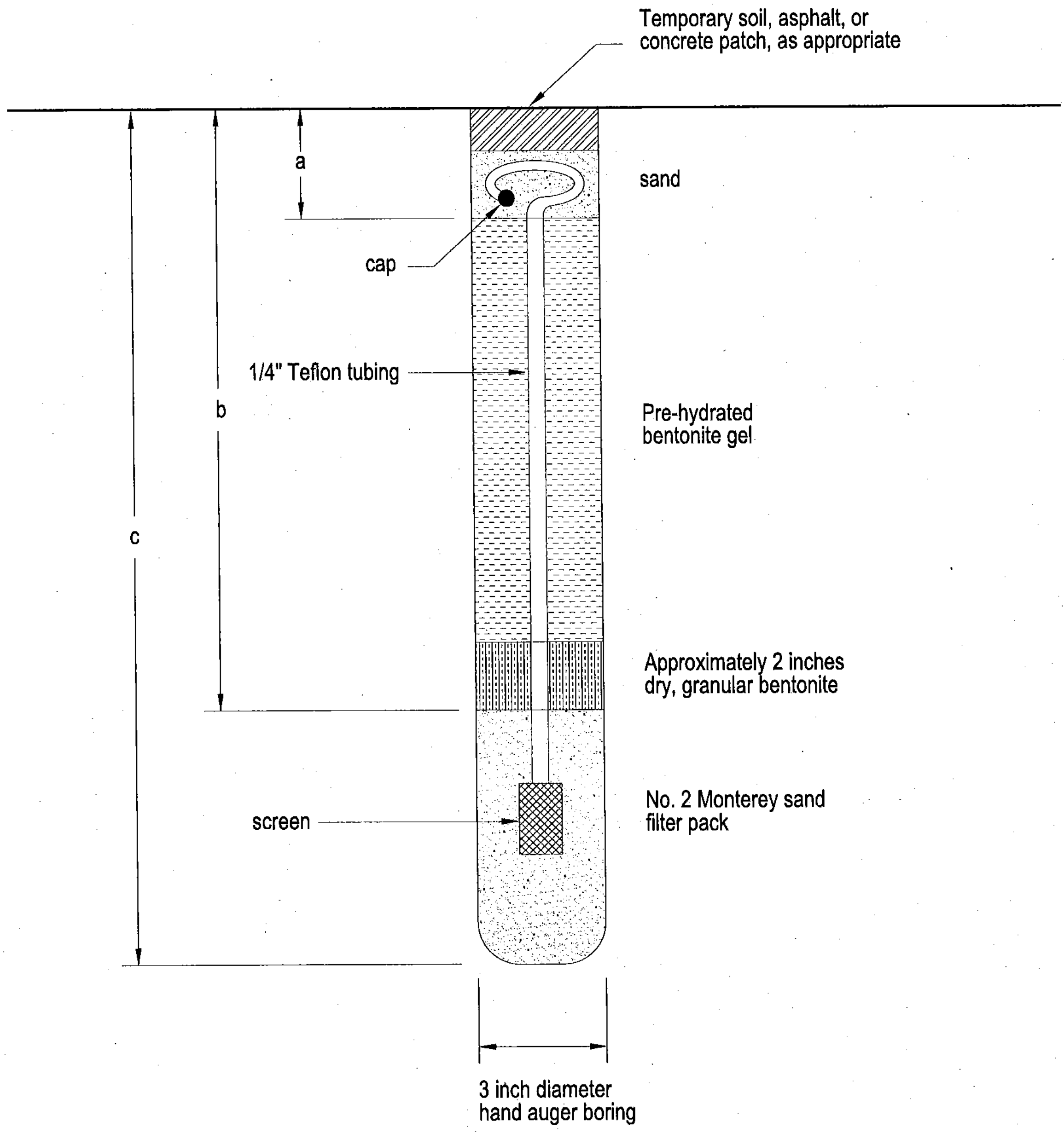
APPENDIX C

Soil Vapor Probe Construction and Sampling



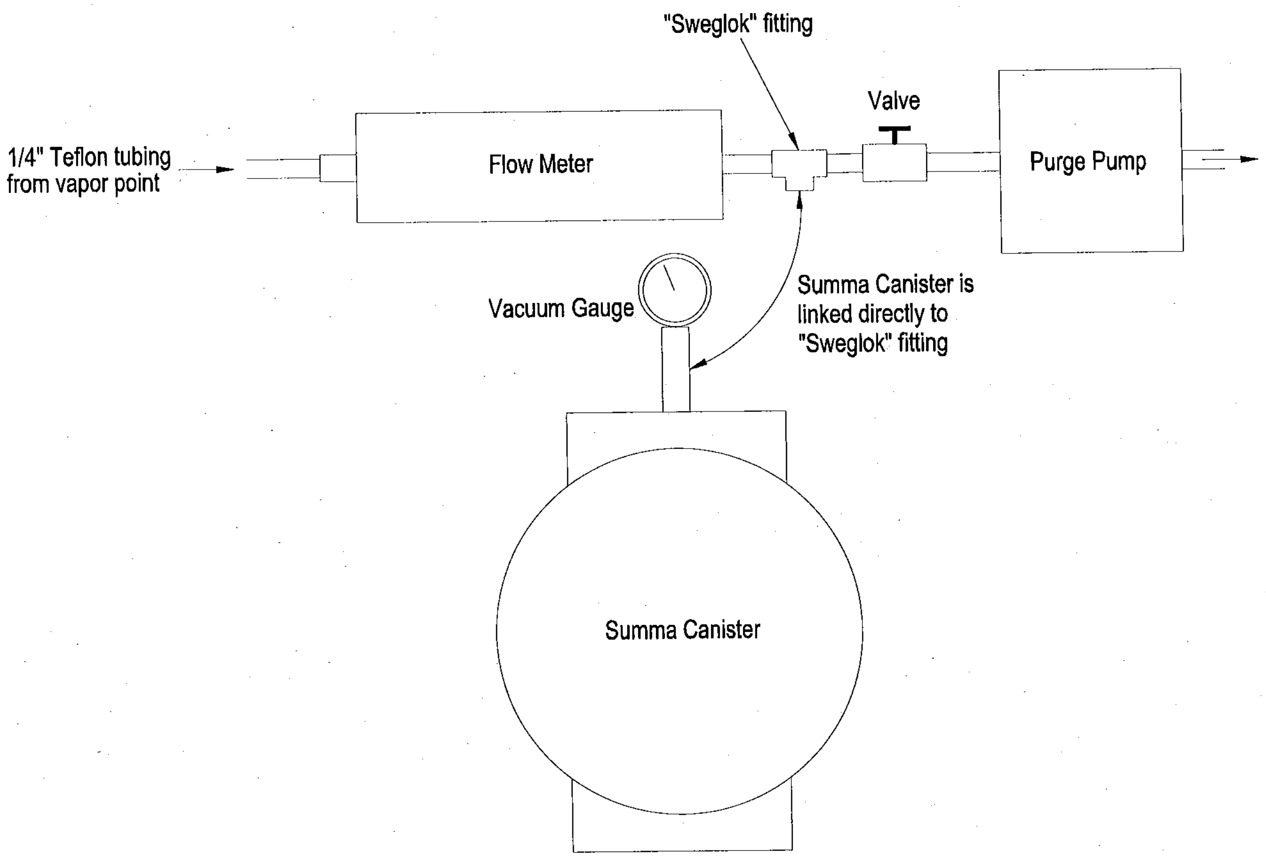
S:\0-TEXACO\TEX-SITES\211273\FIGURES\VAPOR-POINT.DWG

Schematic Not to Scale

FIGURE
A

CONESTOGA-ROVERS & ASSOCIATES

Soil Vapor Point



S:\0-TEXACO\TEX-SITES\211273\FIGURES\VAPOR-DIAG.DWG

Schematic Not to Scale

FIGURE

B

CAMBRIA

Soil Vapor Sampling Apparatus Diagram

APPENDIX D

SMCHD Soil Vapor Sampling Guidelines

USING A GEOPROBE TO COLLECT SUBSURFACE VAPOR SAMPLES FOR HUMAN HEALTH RISK EVALUATION

- Do not mobilize to sample subsurface vapor if measurable precipitation or site irrigation near the sampling location has occurred within the previous 5 days;
- Drill continuous cores as necessary to identify permeable strata (target vapor sampling locations) then backfill the borings with Portland cement (previous assessment may have provided this data);
- Connect a PRT adaptor to approximately 10 to 15 feet of tubing (assuming the total depth of the boring will be approximately 5 feet below grade), install a vapor tight valve on the other end of the tubing, close the vapor tight valve, and seat the PRT adaptor into the bottom of the lead drill rod;
- Hydraulically push the Geoprobe rod to the target vapor sampling depth then raise the drill rod approximately 6 inches[1];
- Place hydrated bentonite around the drill rod to inhibit surface air migration down the outer portion of the drill rod (do not simply add water to a pile of bentonite chips or pellets placed around the drill rod);
- Connect a tee fitting to the top of each purge and sample Summa canister and install a pressure gauge on the top of this fitting;
- Connect 1 to 2 feet of tubing to the tee fitting on each purge and sample canister (the consultant may opt to install an optional valve on the downhole side of the tee connected to the purge canister);
- Connect the free ends of each of the above tubes to a separate (third) tee fitting;
- Connect a 100 to 200 milliliter/minute flow regulator to the downhole side of the third tee fitting and connect the laboratory supplied particulate filter to the downhole side of the regulator (if required);
- Connect the vapor-tight valve in Bullet #3 to the downhole side of the filter (or regulator if the filter was built-in to the regulator);
- Vacuum test the connections between the summa canisters and valve on the downhole side of the regulator for 10 minutes by opening and closing the purge canister valve to place a test vacuum on the assembly (terminate further work if gauge vacuum can not be maintained for 10 minutes);

- If gauge vacuum was maintained for 10 minutes and it has been at least 30 minutes since the drill rod was sealed at the surface with bentonite, then open the purge canister valve and the valve on the downhole side of the regulator to begin purging ambient air from the sampling apparatus and borehole (record the time purging commenced);

- Close the purge canister valve when three volumes of air have been purged from the sample apparatus and borehole (the consultant must know how to calculate the appropriate purge volume prior to mobilization - the adequacy of purging must be based on the inches of pressure drop on the purge canister gauge and not time);

- Open the sample canister valve to begin sample collection (record the time sample collection begins);

- Drop a few pieces of isopropyl alcohol (leak test compound) moistened gauze down the inside of the drill rod and on the downhole side of the valve on the borehole side of the regulator (tinfoil is useful to hold the gauze in place – be careful not to pour isopropyl alcohol directly on the tubing and sample apparatus connections);

- Remoisten the gauze with isopropyl alcohol every 5 minutes[2];

- Close the sample canister valve when the sample canister gauge indicates approximately 5 inches Hg of vacuum remain in the canister (this should take approximately 25 minutes for a 6L Summa canister connected to a 200 milliliters/minute flow regulator);

- Record the time sample collection was stopped and replace the tee fitting on the sample canister with the laboratory supplied brass plug;

- Label the sample and record on the chain of custody the sample name, final vacuum, and the canister and flow controller serial numbers;

- Store the sample in a container that blocks sunlight and do not subject the sample to significant changes in pressure and temperature (avoid airline shipping of sample containers);

- Remove the drilling rod and sampling apparatus and backfill the borehole with Portland cement mixed at 6 gallons of water per 94-pound bag of cement.

FOOTNOTES:

1 - Hard drilling conditions may shear off the PRT fitting during drilling. In these conditions you must install the PRT fitting/valve assembly after reaching the target drilling depth, but before lifting the drilling rod 6 inches.

2 – Isopropyl alcohol moistened gauze must be added to all fitting connections if the reduction in sample canister gauge vacuum indicates sample collection will exceed one hour.

GENERAL NOTES:

Assemble and leak check the sampling apparatus prior to mobilizing to the field. County staff may ask the consultant to reschedule the work if the in-field vacuum leak test fails and cannot be rectified in a timely manner.

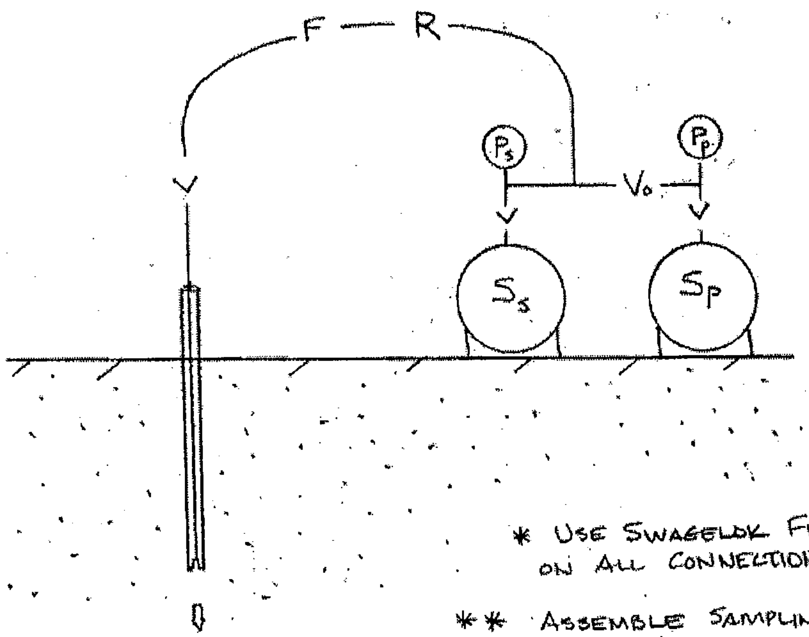
Use Swagelok® type fittings or equivalent for all connections. Wear a new pair of gloves when you assemble the sampling apparatus to limit potential cross-contamination.

Collect at least one duplicate sample from the area of expected impact. Do not chill the samples (discard if condensation observed in the sample tubing). Use EPA Method TO-14A or TO-15 for BTEX/MTBE and EPA TO-3 for TPH-gas (TO-3 can give high reporting limits for BTEX and MTBE due to matrix interference and TO-14A has less QA/QC for TPH-gas).

Additionally, analyze the samples for O_2, CO_2, methane, and isopropyl alcohol. The reporting limit for O_2, CO_2, and methane must be less or equal to the concentrations of these gases in the atmosphere. The reporting limit for isopropyl alcohol must be ≤ 100 ug/m3 (0.1 ug/L). Ensure the laboratory reporting limits for the chemicals of concern are below Regional Water Quality Control Board Environmental Screening Levels or previously approved site specific risk levels. Analyze Summa canister samples within 14 days of collection.

SCHEMATIC OF SUBSURFACE VAPOR SAMPLING SET-UP

V = VALVE
V_o = OPTIONAL VALVE
P = PRESSURE GAUGE
S_s = SAMPLE SUMMA CANISTER
S_p = PURGE SUMMA CANISTER
R = FLOW REGULATOR
F = FILTER



* USE SWAGELOK FITTINGS ON ALL CONNECTIONS

** ASSEMBLE SAMPLING APPARATUS AND LEAK TEST PRIOR TO MOBILIZING TO FIELD

6-3-04

Soil Gas Sampling – PRT System Operation

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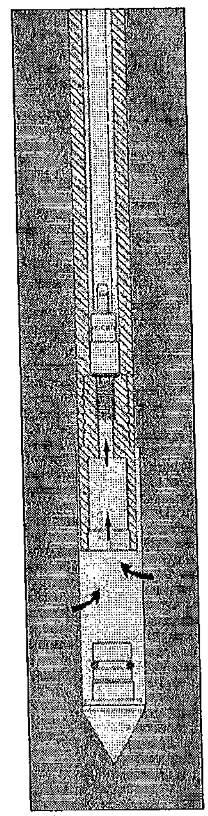


Soil Gas Sampling using the Post-Run Tubing (PRT) System.

Soil Gas Sampling — PRT System Operation

Basics

Using the Post-Run Tubing System, one can drive probe rods to the desired sampling depth, then insert and seal an internal tubing for soil gas sampling. The usual Geoprobe probe rods and driving accessories and the following tools are required:

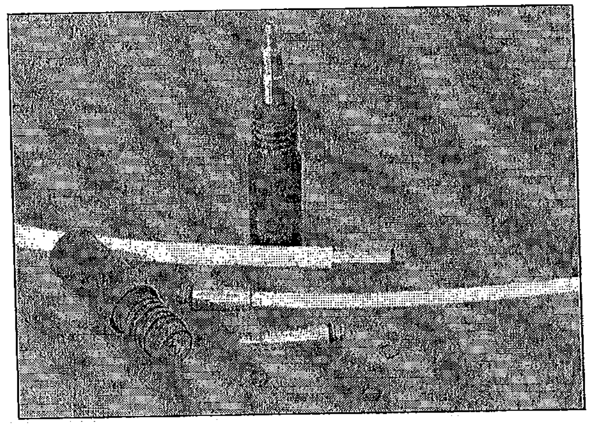
- PRT Expendable Point Holder
- PRT Adapter
- Selected PRT Tubing

Preparation

1. Clean all parts prior to use. Install O-rings on the PRT Expendable Point Holder and the PRT adapter.
2. Inspect the probe rods and clear them of all obstructions.
3. TEST FIT the adapter with the PRT fitting on the expendable point holder to assure that the threads are compatible and fit together smoothly.

   NOTE: PRT fittings are left-hand threaded.
4. Push the adapter into the end of the selected tubing. Tape may be used on the outside of the adapter and tubing to prevent the tubing from spinning freely around the adapter during connection -- especially when using Teflon tubing **(Figure 1)**.

   REMEMBER: The sample will not contact the outside of the tubing or adapter.



PRT SYSTEM PARTS
PRT Expendable Point Holder, PRT Adapters, Tubing, and O-rings.

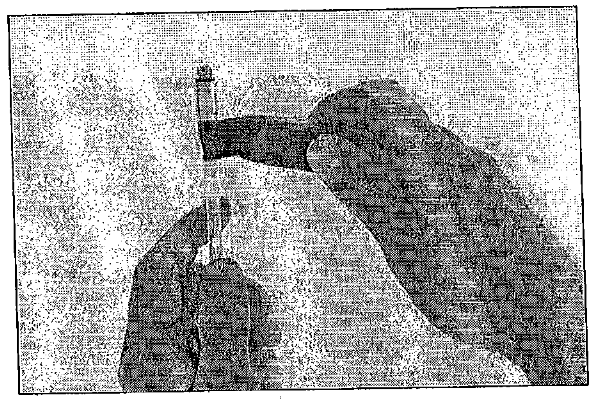


Figure 1. Securing adapter to tubing with tape. NOTE: Tape does not contact soil gas sample.

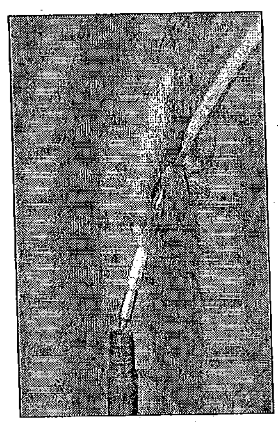


Figure 2. Insertion of tubing and PRT adapter.

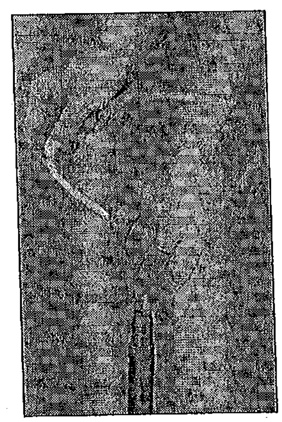
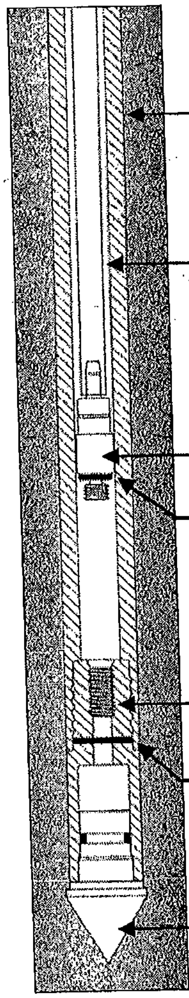


Figure 3. Engaging threads by rotating tubing.



A cross section of probe rods driven to depth and then retracted to allow for soil gas sampling. The PRT adapter and tubing are now fed through the rods and rotated to form a vacuum-tight connection at the point holder. The result is a continuous run of tubing from the sample level to the surface.

Probing

Drive the PRT tip configuration into the ground. Connect probe rods as necessary to reach the desired depth. After depth has been reached, disengage the expendable point by pulling up on the probe rods. Remove the pull cap from the top probe rod, and position the Geoprobe unit to allow room to work.

Connection

1. Insert the adapter end of the tubing down the inside diameter of the probe rods **(Figure 2)**.

2. Feed the tubing down the rod bore until it hits bottom on the expendable point holder. Allow about 2 ft. (610 mm) of tubing to extend out of the hole before cutting it.

3. Grasp the excess tubing and apply some downward pressure while turning it in a counterclockwise motion to engage the adapter threads with the expendable point holder **(Figure 3)**.

4. Pull up lightly on the tubing to test engagement of the threads. (Failure of adapter to thread could mean that intrusion of soil may have occurred during driving of probe rods or disengagement of drive point.)

Sampling

1. Connect the outer end of the tubing to the Silicone Tubing Adapter and vacuum hose (or other sampling apparatus).

2. Follow the appropriate sampling procedure for collecting a soil gas sample **(Figure 1)**.

Removal

1. After collecting a sample, disconnect the tubing from the vacuum hose or sampling system.

2. Pull up firmly on the tubing until it releases from the adapter at the bottom of the hole. (Taped tubing requires a stronger pull.)

3. Remove the tubing from the probe rods. Dispose of polyethylene tubing or decontaminate Teflon tubing as protocol dictates.

4. Retrieve the probe rods from the ground and recover the expendable point holder with the attached PRT adapter.

5. Inspect the O-ring at the base of the PRT adapter to verify that proper sealing was achieved during sampling. The O-ring should be compressed. This seal can be tested by capping the open end of the point holder applying vacuum to the PRT adapter.

6. Prepare for the next sample.

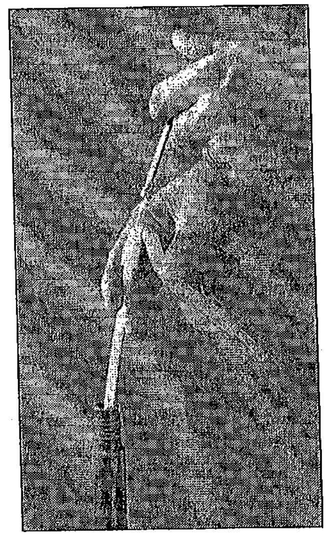


Figure 1. Taking a soil gas sample for direct injection into a GC with the PRT system.