CONESTOGA-ROVERS & ASSOCIATES

5900 Hollis Street, Suite A
Emeryville, California 94608
Telephone: (510) 420-0700 Fax: (510) 420-9170
www.CRAworld.com

TRANSMITTAL

DATE: 5/16/2011

REFERENCE NO.: 311973

PROJECT NAME: Former Chevron #90121

TO: Mr. Mark Detterman
Alameda County Environmental Health
1131 Harbor Bay Pkwy
Alameda, CA 94501

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3:09 pm, May 18, 2011
Alameda County
Environmental Health

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QUANTITY	DESCRIPTION
1	SENSITIVE RECEPTOR AND PREFERENTIAL PATHWAY SURVEY, RESPONSE TO REGULATORY COMMENTS, AND WORK PLAN FOR ADDITIONAL ASSESSMENT

- ☐ As Requested
- ☒ For Your Use
- ☐ For Review and Comment
- ☐
- ☐

COMMENTS:
Please contact Mr. Nathan Lee at 510-420-3333 with any questions or if you require additional information.

Copy to: Diocese of Oakland
Mr. David Patten, Chevron

Completed by: Nathan Lee [Please Print] Signed: Nathan Lee

Filing: **Correspondence File**

Dave Patten
Project Manager
Marketing Business Unit

Chevron Environmental Management Company
6111 Bollinger Canyon Road
San Ramon, CA 94583
Tel (925) 543-1740
Fax (925) 543-2324
drpatten@chevron.com

Alameda County Health Care Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Chevron Service Station No. 9-0121
3026 Lakeshore Avenue
Oakland, CA

I have reviewed the attached report dated May 15, 2011.

I agree with the conclusions and recommendations presented in the referenced report. The information in this report is accurate to the best of my knowledge and all local Agency/Regional Board guidelines have been followed. This report was prepared by Conestoga-Rovers & Associates, upon whose assistance and advice I have relied.

This letter is submitted pursuant to the requirements of California Water Code Section 13267(b)(1) and the regulating implementation entitled Appendix A pertaining thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Sincerely,

Dave Patten
Project Manager

Attachment: Report

SENSITIVE RECEPTOR AND PREFERENTIAL PATHWAY SURVEY, RESPONSE TO REGULATORY COMMENTS, AND WORK PLAN FOR ADDITIONAL ASSESSMENT

Former Chevron Service Station 9-0121
3026 Lakeshore Avenue
Oakland, California

Prepared for:

Mr. Mark Detterman
Senior Hazardous Materials Specialist
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Prepared by:
Conestoga-Rovers & Associates

5900 Hollis Street, Suite A
Emeryville, California
U.S.A. 94608

Office: (510) 420-0700
Fax: (510) 420-9170

web: http:\\www.CRAworld.com

MAY 15, 2011
REF. NO. 311973 (13)
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SENSITIVE RECEPTOR AND PREFERENTIAL PATHWAY SURVEY, RESPONSE TO REGULATORY COMMENTS, AND WORK PLAN FOR ADDITIONAL ASSESSMENT

Former Chevron Service Station 9-0121
3026 Lakeshore Avenue
Oakland, California

Nathan Lee

Nathan Lee, PG 8486

Prepared by:
Conestoga-Rovers & Associates

5900 Hollis Street, Suite A
Emeryville, California
U.S.A. 94608

Office: (510) 420-0700
Fax: (510) 420-9170

web: http:\\www.CRAworld.com

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1.0 INTRODUCTION

1.1 GENERAL

Conestoga-Rovers & Associates (CRA) is submitting this Sensitive Receptor and Preferential Pathway Survey, Response to Regulatory Comments, and Work Plan for Additional Assessment on behalf of Chevron Environmental Management Company (Chevron) for the former Chevron Service Station 9-0121 located at 3026 Lakeshore Avenue in Oakland, California (Figure 1). This report was prepared in response to the January 28, 2011 Alameda County Environmental Health (ACEH) letter (Appendix A). This report includes the sensitive receptor and preferential pathway survey results, a response to regulatory comments, and a work plan proposing offsite sub-slab vapor and ambient air investigation and advancement of seven onsite and offsite soil borings. CRA will submit an updated site conceptual model (SCM) after completing the proposed scope of work.

1.2 SITE BACKGROUND

A retail service station was operated onsite by Chevron from 1933 to 2009. The site is currently a vacant lot and located on the southern corner of the intersection of Lakeshore Avenue and MacArthur Boulevard in Oakland, California (Figure 1). Surrounding property use includes residential, commercial, and recreational.

A review of Sanborn Maps and city records produced by EDR indicates that a service station and automobile repair shop was formerly located at 3000 Lakeshore Avenue, which is at the corner on Lakeshore Avenue and Beacon Street (Figure 2). The service station operated from approximately 1933 to 1957 when the gas station was replaced by an office building.

1.3 SITE GEOLOGY

The site is situated at the western edge of the Piedmont Hills and is approximately 7 feet above mean sea level (ft-amsl) with relatively flat topography. Sediments in the vicinity consist of Holocene-age estuarine deposits comprised of organic clay and silty clay (Bay Mud); overlying Holocene-age alluvial sand and silt; and Pleistocene-age interbedded clay, silt, sand, and gravel.[1] Sediments encountered at the site consist of

1 *California's Groundwater Bulletin 118*; The State of California Department of Water Resources Agency February 27, 2004.

clays interbedded with silt, silty sand, fine sand and gravel layers to the total depth explored of 35 feet below grade (fbg).

1.4 SITE HYDROGEOLOGY

The site is located in the Santa Clara Valley Groundwater Basin, East Bay Plain Sub Basin. Groundwater in this region has been designated for potential beneficial agricultural, municipal, and industrial uses.[2] The average historical groundwater elevation has ranged from approximately 2 to 14 fbg and flows predominantly to the southwest. The average depth to groundwater is approximately 6 fbg. The nearest surface water body is Lake Merritt, approximately 900 feet to the southwest.

1.5 ENVIRONMENTAL SUMMARY

The site has been an open environmental case since 1990 under ACEH jurisdiction (Fuel Leak Case Number RO0000284 and GeoTracker Global ID T0600100328). To date, 22 monitoring wells have been installed (13 of which have been destroyed) and 9 soil borings have been advanced. Remedial activities have consisted of at least five fueling facility upgrades, some of which included remedial excavations, and light non-aqueous phase liquid (LNAPL) recovery. A summary of previous environmental investigation and remediation is included in Appendix B.

2.0 SENSITIVE RECEPTOR SURVEY AND PREFERENTIAL PATHWAY STUDY

Potential sensitive receptors include humans, fauna, and flora that could come into contact with site-related hydrocarbons. Human receptors are generally the top priority, especially children, elderly, and the ill. When assessing sensitive receptors, schools, hospitals, parks, and residential communities within the vicinity are identified. Impacts to public resources such as groundwater and exposure routes to receptors are considered. This includes identifying water production wells, including municipal, domestic, agricultural, and industrial wells, and surface water bodies, including streams, ponds and lakes.

2 Table 2-2 *Existing and Potential Beneficial Uses in Groundwater in Identified Basins; Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin*; California Regional Water Quality Control Board - San Francisco Bay Region, January 18, 2007.

Details of the sensitive receptor survey and preferential pathway study are presented below.

2.1 SENSITIVE RECEPTOR SURVEY METHODOLOGY

CRA requested well records from the California Department of Water Resources (DWR) and the Alameda County Public Works Agency (ACPWA) to identify any water supply wells within a half-mile radius. Directories and the internet were used to assist in locating nearby facilities, such as schools, daycare businesses, nursing homes, hospitals, etc.

A survey of properties located within a 500-foot radius was used to determine if the property owners were aware of any wells, sumps, or basements on their property. A two-page questionnaire was mailed to each property owner with a self-addressed stamped envelope for return to CRA. The questionnaire asked for details of the construction and use of any wells and sumps. Additional questions concerning foundation construction and basements were included in the survey.

2.2 SURVEY FINDINGS

Results of the sensitive receptor survey are presented below, on Figure 3, and in Tables 1 and 2. The completed survey forms are included in Appendix C.

Municipal and Water Supply Wells

Groundwater in the region is designated as an existing or potential drinking water resource.[3] No municipal wells were identified within a half-mile radius and East Bay Municipal Utility District (EBMUD) relies solely on imported water to supply the region with drinking water.[3]

Private Wells

ACPWA and DWR identified only cathodic protection, destroyed, and monitoring wells within the survey radius (Figure 3). No domestic wells were identified.

3 http://www.ebmud.com/our-water/water-supply.

A total of 56 properties within a 500-foot radius were identified and sent questionnaires. Below is a summary of responses received as of May 4, 2011:

- 17 responses were received by CRA
- 2 surveys were returned by the United States Postal Service as "Not Deliverable" (APN 023-0418-023-01 and APN 023-0418-025)
- 37 properties did not respond

No private wells were identified through the mail survey. However, two property owners (APN 023-0418-015 at 579 Beacon Street and APN 023-0419-027-04 at 2930 Lakeshore Avenue) were unsure if wells were present on their properties. One sump was identified through responses to the mail survey. This sump is located 350 feet to the west/southwest. The Diocese of Oakland did not respond to the survey; however, its property is adjacent to the site and has an operating sump. One property owner was unsure if a sump was present on his/her property at 579 Beacon Street. Twelve properties with basements were identified in the mail survey. One property owner was unsure if a basement was present on his/her property at 549 Merritt Avenue. The locations of the above potential sensitive receptors are shown on Figure 3. Some locations are not shown on Figure 3 because they are located on the hill to the south and are not sensitive receptors based on the higher elevation. Based on the extent of hydrocarbons, and the distance and orientation of the sensitive receptor, the only sensitive receptors potentially at risk are A, B, and C on Table 1 and Figure 3.

Other Potential Sensitive Receptors

Four schools and one church are located within 1,000 feet of the site; their locations are shown on Figure 3. No daycare, nursing, or hospital facilities were identified within 1,000 feet of the site.

Lake Merritt, a tidal lake, is located 900 feet to the southwest and is the only surface water body located near the site. Lake Merritt is shown on Figures 1 and 3.

3.0 PREFERENTIAL PATHWAY SURVEY

CRA conducted a preferential pathway survey to evaluate potential conduits for the migration of dissolved hydrocarbons. CRA contracted NORCAL Geophysical Consultants, Inc. (NORCAL) of Cotati, California and contacted individual utility companies to assess the location, size and depth of all subsurface utilities in the vicinity. NORCAL's May 3, 2011 *Geophysical Investigation* report is included in Appendix D.

Underground utility data from utility companies identified by Underground Service Alert (USA) was collected to identify any impact to nearby sensitive receptors through migration of hydrocarbons along preferential utility pathways. Utility location data is presented on Figure 2. Major utilities include storm drain sewer, sanitary sewer, water, and communication lines. Natural gas and electric utilities were identified by NORCAL during the utility survey. Some major electrical utilities are above ground within the vicinity.

3.1 SEWER UTILITIES

Information regarding the sewer utilities was gathered from the City of Oakland. The City had limited information about the depth of installation, date of installation, and backfill material. According to Lee White, Manager of the Construction Division of the City of Oakland, older sewer lines were surrounded by native material, not backfill (Personal communication 2011).

Storm Drain Sewer

Two main storm drain sewers run roughly parallel to Lakeshore Avenue north and south of the site. Both are constructed of concrete and drain into Lake Merritt near the intersection of El Embarcadero and Lakeshore Avenue. The southern main varies in diameter from 7 to 8 feet. The northern main diameter is not indicated on the City of Oakland maps. Depth data for these utilities is not available from the City of Oakland.

Sanitary Sewer

Sanitary sewers are located beneath all streets within the vicinity. These sewers are constructed of vitrified and concrete material and vary in diameter from 27 to 33 inches.

3.2 WATER UTILITIES

CRA contacted EBMUD for water utility information. Water mains are located beneath all streets surrounding the site. The mains are made of various materials including cast iron, steel, and asbestos cement. Utility diameter varies from 6 to 36 inches and burial depth range from 1.5 to 4 fbg (top of utility) according to maps and drawings provided by EBMUD.

3.3 GAS AND ELECTRIC UTILITIES

Natural gas and electric utilities were identified by NORCAL and information was provided by Pacific Gas & Electric (PG&E). Typical burial depth of these utilities in the region is between 1.5 and 4 fbg according to PG&E locators.

3.4 COMMUNICATION UTILITIES

CRA contacted AT&T (formerly Pacific Bell) and Comcast for communication utility information. The majority of communication lines are installed above ground. Only one underground communication line was identified in the sidewalk to the north. These utilities are typically installed around 3 fbg according to Comcast representative Nicole Lawson (Personal communication April 15, 2011).

3.5 RESULTS OF THE PREFERENTIAL PATHWAY STUDY

The average depth to groundwater at the site is approximately 6 fbg. Water, natural gas, electric, and communication utilities are likely installed shallower than 6 fbg and are not likely preferential pathways for dissolved hydrocarbon migration. Storm drain and sanitary sewer lines are likely located between the surface and 7 fbg. Though the sewer lines may come in contact with groundwater, it is uncertain whether the sewer lines act as preferential pathways for hydrocarbon migration.

4.0 RESPONSE TO REGULATORY COMMENTS

In its January 28, 2011 letter, ACEH requested clarification and additional information on this case. In correspondence dated March 10, 2011 to ACEH, CRA provided information for technical comments 1, 3, 4, 5, and 6. Below are the comments from ACEH's letter (italicized) and CRA's additional responses.

1. *Elevator Sump Groundwater Samples*

   To clarify, the sump in the basement of the Diocese of Oakland building at 3014 Lakeshore Avenue is not an elevator sump. Based on visual inspection, the sump appears to gather groundwater from weep holes in the concrete-lining of the basement.

2.a *Similarly the additional storm drain under Lakeshore Avenue appears to be a conduit for impacted groundwater moving offsite to the northwest based on depth to groundwater and depth of the utility. Older nondetectable data from well MW-7 appears to support this interpretation.*

As shown on the groundwater flow direction rose diagram presented on Figure 2, the predominant groundwater flow direction is toward the southwest. Less than nine groundwater monitoring events have shown a groundwater flow direction other than toward the south, southwest, and west. Well MW-7 is located approximately 100 feet crossgradient of the site on the northwest side of Lakeshore Avenue. Also considering the historical distribution of dissolved hydrocarbon in all the monitoring wells, we disagree that MW-7 demonstrates utilities beneath Lakeshore Avenue are acting as preferential pathways.

7. *Status of Proposed Work – A December 4, 2001 work plan proposed, and a December 6, 2001 ACEH directive letter approved, the installation of two wells and a series of soil bores along the southeastern boundary storm drain. The work was proposed to evaluate the extent of the plume towards the southeast across the storm drain line, to determine if the storm drain was acting as a preferential pathway, and to determine the effectiveness of the plastic barrier between the two sites. ACEH has not found either a report or an explanation as to why this investigation may not be necessary; please clarify the status of this investigation.*

CRA agrees an assessment of the storm drain sewers is needed to determine if hydrocarbon migration is occurring along them. CRA proposes advancing two soil borings along the 7 foot diameter storm sewer at the site's southern edge and two soil borings in the sidewalk of Beacon Street to the southwest. These locations are similar to the locations proposed in the 2001 work plan. Well MW-5 is located on the opposite side of this utility in Excelsior Court and occasionally contains low dissolved hydrocarbon concentrations. There is no correlation between depth to groundwater and when hydrocarbons are and not detected in well MW-5. This data suggests that this storm sewer is not significantly affecting the flow of groundwater. Therefore, CRA does not propose additional wells along Excelsior Court. The additional assessment details are proposed below.

5.0 PROPOSED ADDITIONAL SITE ASSESSMENT

To determine the extent of hydrocarbon migration along potential preferential pathways, provide additional downgradient delineation, and assess any vapor intrusion to properties adjacent to the site, CRA proposes the following scope of work.

Health and Safety Plan

CRA will prepare a health and safety plan to protect site workers. The plan will be reviewed and signed by all site workers and visitors. The plan will remain onsite during all field activities.

Underground Utility Location

CRA will contact USA and use a private utility locator to confirm that no utilities are present at or near the boring locations. Previous utility surveys could not cover private properties without finalized access agreements. Per Chevron safety standards, each boring will be cleared to 8 fbg using an air-knife assisted vacuum rig or hand auger.

Chemical Analysis

Select soil and grab-groundwater samples will be analyzed for the following:

- Total petroleum hydrocarbons as motor oil (TPHmo) with silica gel cleanup, total petroleum hydrocarbons as diesel (TPHd) with silica gel cleanup, and total petroleum hydrocarbons as gasoline (TPHg) by EPA Method 8015 modified; and
- Benzene, toluene, ethylbenzene and xylenes (BTEX), methyl tertiary butyl ether (MTBE), di isopropyl ether (DIPE), ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME) and tertiary butyl alcohol (TBA) by EPA Method 8260B.

Waste Disposal

Soil cuttings generated will be placed in drums and labeled appropriately. These wastes will be profiled and transported to the appropriate Chevron-approved disposal facility following receipt of analytical profile results.

5.1 PROPOSED SUBSURFACE INVESTIGATION

CRA proposes advancing seven soil borings. Proposed locations are shown on Figure 2 and details are presented below.

Permits and Access Agreements

CRA will obtain the necessary permits from ACPWA and the City of Oakland prior to field operations. CRA will secure access agreements prior to completing any work on private property.

Soil Borings

Soil borings will be advanced with hand augers adjacent to the 7-foot diameter storm drain sewer. If possible, the borings will be advanced to approximately 10 fbg or until the backfill material of the utility trench is encountered. Soil samples will be collected directly from the hand auger buckets and will be considered disturbed samples. Upon completion, the borings will be backfilled to grade with Portland Type I/II grout using a tremie pipe and patched to match the existing surface.

Grab-Groundwater Sampling Protocol

Grab-groundwater samples will be collected from first encountered groundwater in each boring using disposable bailers. The samples will be decanted into the appropriate laboratory provided sampling containers, labeled, capped, logged on a chain-of-custody form (COC), placed on ice and transported to a Chevron and State approved laboratory for analysis.

Soil Sampling Protocol

Soil samples will be collected from each boring for laboratory analysis at approximately 3-foot intervals, at obvious changes in soils, and where hydrocarbon staining or odors are observed, to the bottom of the boring. CRA geologists will log collected soils using the ASTM D2488-06 Unified Soil Classification System. Soil will be field-screened using a photo ionization detector (PID) and visual observations. All samples will be sealed, capped, labeled, logged on a COC, placed on ice and transported to a Chevron and State approved laboratory for analysis. CRA's Standard Field Procedures for Soil Borings are presented in Appendix C.

5.2 PROPOSED VAPOR INTRUSION INVESTIGATION

To assess any vapor intrusion in the adjacent properties, CRA proposes installing sub-slab vapor probes and collecting indoor and outdoor air samples. Chevron is currently working on obtaining an access agreement with the adjacent property owners. Once access is established, CRA will perform site visits to determine the proposed locations for sub-slab vapor probes.

Sub-Slab Vapor Probe Locations

CRA proposes to install at least one sub-slab vapor probe per parcel and will submit a site plan with proposed locations after CRA is given legal permission to perform site visits. All work will be conducted according to the Department of Toxic Substance Control's (DTSC's) December 15, 2004 *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air* (Revised February 2005) (DTSC 2005 guidance document). Prior to drilling, utilities entering the properties will be identified and marked, and any internal locations where utilities penetrate the building slabs (e.g. furnace, water heater, circuit breaker box, and water or sewer lines) will be determined. Locations where utilities penetrate the slab will be avoided.

Sub-Slab Vapor Probe Installation

Sub-slab vapor probes installation procedures are based on the United States EPA's *Standard Operating Procedure (SOP) for Installation of Sub Slab Vapor Probes and Sampling Using EPA Method TO 15 to Support Vapor Intrusion Investigations (Draft)*. A rotary hammer drill will be used to create a 2-inch diameter and 1-inch deep "outer" hole that partially penetrates the slab. A small portable vacuum cleaner will be used to remove cuttings from the hole. Removal of cuttings in this manner in a non penetrated slab will not compromise soil vapor samples because of lack of pneumatic communication between sub-slab material and the vacuum cleaner.

The rotary hammer drill will then be used to create a smaller diameter "inner" hole through the remainder of the slab into sub-slab material. Drilling into sub-slab material will create an open cavity for the probes, which will prevent obstructions by small pieces of gravel.

Once the thickness of the slab is known, stainless steel or brass tubing will be cut to ensure that the probe tubing does not reach the bottom of the hole to avoid obstructing the probe with sub-slab material. Sub-slab vapor probes will be constructed using stainless steel or brass tubing and stainless steel or brass compression fittings to ensure that construction materials are not a source of volatile organic compounds (VOCs).

The sub-slab vapor probe will be set in the hole. The top of the probe will be completed, flush with the slab and have recessed stainless steel or brass plugs to prevent interference with day-to-day use of the building. Quick drying Portland cement slurry will be pushed into the annular space between the probe and outside of the "outer" hole. The cement will be allowed to cure for at least 72 hours prior to sampling.

Sub-Slab Vapor Probe Sampling

Vapor samples will be collected at least 72 hours after the placement of the probes using 100 percent lab-certified 1-liter Summa™ canisters in a manifold system, connected to each sub-slab probe. While sampling, 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 mercury is observed on the vacuum gauge. Additional samples will be taken in the breathing zone above the sub-slab probes (indoor air samples) and outside ambient air samples. In accordance with the DTSC *Advisory Active Soil Gas Investigations* guidance document, dated January 28, 2003, leak testing using laboratory grade helium will be performed during sampling. After sampling, the Summa™ canisters will be packaged and sent to the Air Toxics, Ltd. laboratory under COC for analysis.

Indoor and Outdoor Air Sampling

One indoor air sample will be collected above each sub-slab vapor probe. One outdoor ambient air sample will be collected. The samples will be collected from the breathing zone over approximately 8 hours. Chemical inventories and building assessments will be conducted prior to sampling for each property per the above DTSC guidance.

Vapor Chemical Analysis (Sub-Slab Probes)

Sub-slab vapor samples will be analyzed for the following:

- TPHd, TPHg, BTEX, MTBE and naphthalene by EPA Method TO-15
- O_2, N_2, CO_2, CH_4, and helium as a leak check compound by ASTM D-1946 (GC/TCD)
- Air Phase Hydrocarbon (APH) Fractions (Sp) Aromatics C8-C12 Modified TO-15 GC/MS Full Scan
- APH Fractions (Sp) Aliphatics C5-C12 Modified TO-15 GC/MS Full Scan

To evaluate the TPHg vapor concentrations detected, the samples will be analyzed by APH fractions for aromatics and aliphatics compounds. This data will further evaluate the potential risk to human health from vapor intrusion to indoor air.

Vapor Chemical Analysis (Indoor and Outdoor Air Samples)
Indoor and outdoor air samples will be analyzed for the following:

- TPHg, BTEX, MTBE and naphthalene by EPA Method TO-15 SIM (GC/MS)
- Air Phase Hydrocarbon (APH) Fractions (Sp) Aromatics C8-C12 Modified TO-15 GC/MS Full Scan
- APH Fractions (Sp) Aliphatics C5-C12 Modified TO-15 GC/MS Full Scan

6.0 SUB-SLAB DATA INTERPRETATION

Indoor air samples may measure BTEX and other petroleum hydrocarbon compounds within the concentration ranges commonly seen as background values measured at sites where no subsurface petroleum hydrocarbon contamination is present. There are many sources of background contamination inside buildings. Materials and substances commonly found in commercial and residential settings, such as paints, paint thinners, gasoline-powered machinery, building materials, cleaning products, dry cleaned clothing, and cigarette smoke, contain VOCs that may be detected by indoor air testing. Table A presents a summary of BTEX background concentrations reported in several indoor air studies.

TABLE A: SUMMARY OF INDOOR AIR BACKGROUND STUDIES[4]

	USEPA (2002)							
Chemical of concern	***Brown et al. (1994) ppbv***	***Sheldon (1992) ppbv***	***EPA IAQ (1991) ppbv***	***Shah and Singh (1988) ppbv***	***Stolwijk (1990) ppbv***	***Foster et al. (2002) ppbv***	***Range of values ppbv***	***Range of values ($\mu g/m^3$)***
Benzene	2.51	0.69	4.39	5.16	3.16	1.28	0.69 -5.16	2.14 -16.8
Ethyl-benzene	1.15	—	3.23	2.89	2.32	—	1.15 -3.23	5.08 -14.3
Toluene	9.83	—	16.21	7.39	22.0	—	7.39 -22.0	26.9 -80.0
Xylenes, m-p	5.54	—	—	—	4.57	—	4.57 -5.54	20.0 -24.2

Notes: USEPA = United States Environmental Protection Agency, ppbv = parts per billion by volume, $\mu g/m^3$ = micrograms per cubic meter.

For example, the range of normal background concentrations for benzene spans the 1.41 to 14.1 µg/m3 range representing 10-5 to 10-4 incremental risk values published as part of the California Human Health Screening Levels (CHHSLs) by the California EPA. Table B lists the Office of Environmental Health Hazard Assessment (OEHHA) hazard quotient concentration values of 1 and excess cancer risk concentrations of 10^{-6}.

4 T.E. McHugh et. al., *An Empirical Analysis of the Groundwater-to-Indoor-Air Exposure Pathway: The Role of Background Concentrations in Indoor Air*, 2004.

TABLE B: CALIFORNIA HUMAN HEALTH SCREENING LEVELS FOR INDOOR AIR AND SOIL GAS

Chemical	*[1]Indoor Air Human Health Screening Levels (µg/m3)*	
	Residential Land Use	*Commercial/ Industrial Land Use Only*
Benzene	8.40 E-02	1.41 E-01
Carbon Tetrachloride	5.79 E-02	9.73 E-02
1,2-Dichloroethane	1.16 E-01	1.95 E-01
cis-1,2-Dichloroethylene	3.65 E+01	5.11 E+01
trans-1,2-Dichloroethylene	7.30 E+01	1.02 E+02
Ethylbenzene	0.97 E+00[2]	1.60 E+00[2]
Mercury, elemental	9.40 E-02	1.31 E-01
Methyl tert-Butyl Ether	9.35 E+00	1.57 E+01
Naphthalene	7.20 E-02	1.20 E-01
Tetrachloroethylene	4.12 E-01	6.93 E-01
Tetraethyl Lead	3.65 E-04	5.11 E-04
Toluene	3.13 E+02	4.38 E+02
1,1,1-Trichloroethane	2.29 E+03	3.21 E+03
Trichloroethylene	1.22 E+00	2.04 E+00
Vinyl Chloride	3.11 E-02	5.24 E-02
m-Xylene	7.30 E+02[3]	1.02 E+03[3]
o-Xylene	7.30 E+02[3]	1.02 E+03[3]
p-Xylene	7.30 E+02[3]	1.02 E+03[3]

Reference: Appendix 1, OEHHA Target Indoor Air Concentrations and Soil-Gas Screening Numbers for Existing Buildings under Residential and Industrial/Commercial land uses.

Notes: 1. "Residential Land Use" screening levels generally considered adequate for other sensitive uses (e.g., daycare centers, hospitals, etc.).

Commercial/industrial properties should be evaluated using both residential and commercial/industrial CHHSLs. A deed restriction that prohibits use of the property for sensitive purposes may be required at sites that are evaluated and/or remediated under a commercial/industrial land use scenario only.

Calculation of cumulative risk may be required at sites where multiple contaminants with similar health effects are present.

Carcinogens: CHHSLS based on target cancer risk of 10-6. Cal/EPA cancer slope factors used when available.

Noncarcinogens: CHHSLS based on target hazard quotient of 1.0.

Soil Gas: Screening levels based on soil gas data collected <1.5 meters (five feet) below a building foundation or the ground surface. Intended for evaluation of potential vapor intrusion into buildings and subsequent impacts to indoor-air. Soil gas data should be collected and evaluated at all sites with significant areas of VOC-impacted soil. Screening levels also apply to sites that overlie plumes of VOC-impacted groundwater.

2. Calculation of a screening number for the chemical outlined in OEHHA draft report, *California Human Health Screening Levels for Ethlybenzene* dated November 2009.

3. Representative Screening Numbers for mixed xylenes. The representative value for mixed xylenes is based on the calculated lowest one amongst the three isomers.

As a result, it is not possible to interpret whether vapor intrusion is occurring by simply comparing indoor air concentrations against the most conservative screening values, since these values do not account for background concentrations. Instead, indoor concentrations must be compared to both outdoor air and sub-slab soil vapor concentrations to determine whether external or indoor sources are contributing to

indoor air concentrations. A clear indication of active vapor intrusion would be a combination of indoor and outdoor air samples where indoor air contained significantly greater concentrations of petroleum hydrocarbon VOC's (e.g., BTEX) than outdoor air, and also contained significantly lower concentrations of petroleum hydrocarbon VOC's than sub-slab soil vapor.

The DTSC's 2005 guidance document (pg. 19) specifies a 100-fold attenuation value (sub-slab concentration x 0.01) for comparison across building foundations. Indoor air, outdoor air, and sub-slab vapor concentrations will be evaluated per the above protocols. Criteria indicative of vapor intrusion should be:

1. Indoor air benzene concentrations significantly higher than outdoor air.
2. Indoor air benzene concentrations significantly higher than the range of normal background (rather than the indoor air 10^{-6} standard values presented in OEHHA Table 2 above, which are within the lower range of normal background).
3. Sub-slab benzene concentrations significantly higher than indoor air (indoor air is grater then one tenth of the sub-slab concentration).

Any other combination of concentrations, and concentration ratios, will likely indicate either an indoor or outdoor background source rather than vapor intrusion to the building.

This information is gathered from the DTSC's 2005 guidance document and the OEHHA November 2002 *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils* (Subsurface Vapor Intrusion Guidance).

7.0 REPORTING

CRA will prepare a comprehensive report presenting the results of the subsurface investigation and vapor intrusion assessment. Data from these investigations will advance the understanding of this case and as such, CRA will provide an updated SCM in the report. The report, at a minimum, will contain:

- Descriptions of the installation and sampling methods
- Tabulated soil, groundwater, and vapor data
- Analytical reports and chain-of-custody forms
- Waste Disposal information
- Summary of results
- Conclusions and recommendations

8.0 SCHEDULE

CRA will conduct this work following approval from ACEH. After approval, CRA will ensure the necessary access agreements are in place, obtain the necessary permits, meet with utility service providers, and schedule the investigations as soon as possible. The soil vapor sampling schedule is dependent on the rain. CRA will follow DTSC guidelines regarding sampling after rain. If there are any delays, CRA will notify ACEH.

FIGURES

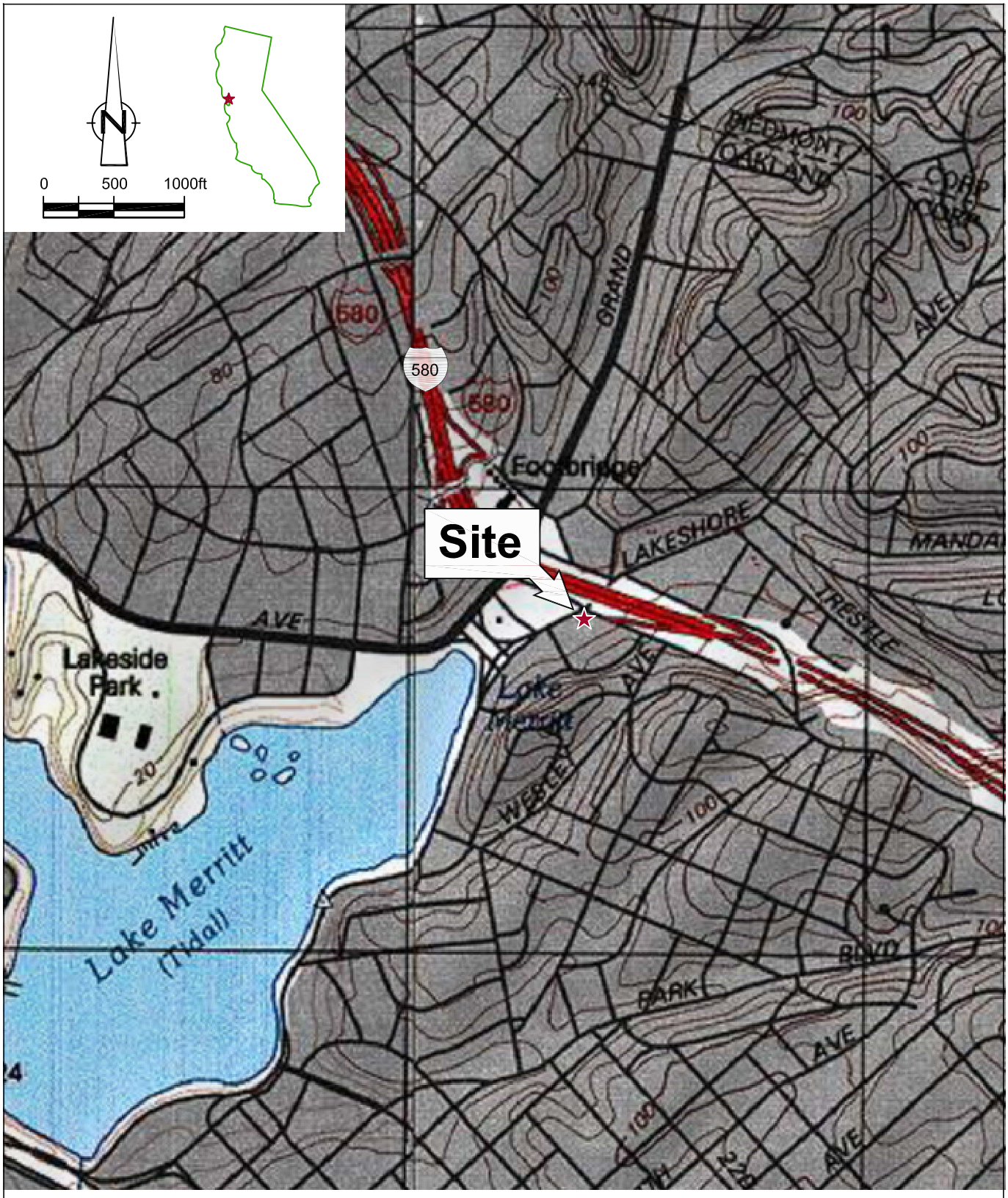


Figure 1

VICINITY MAP
FORMER CHEVRON SERVICE STATION 9-0121
3026 LAKESHORE AVENUE
Oakland, California

311973-VMAP

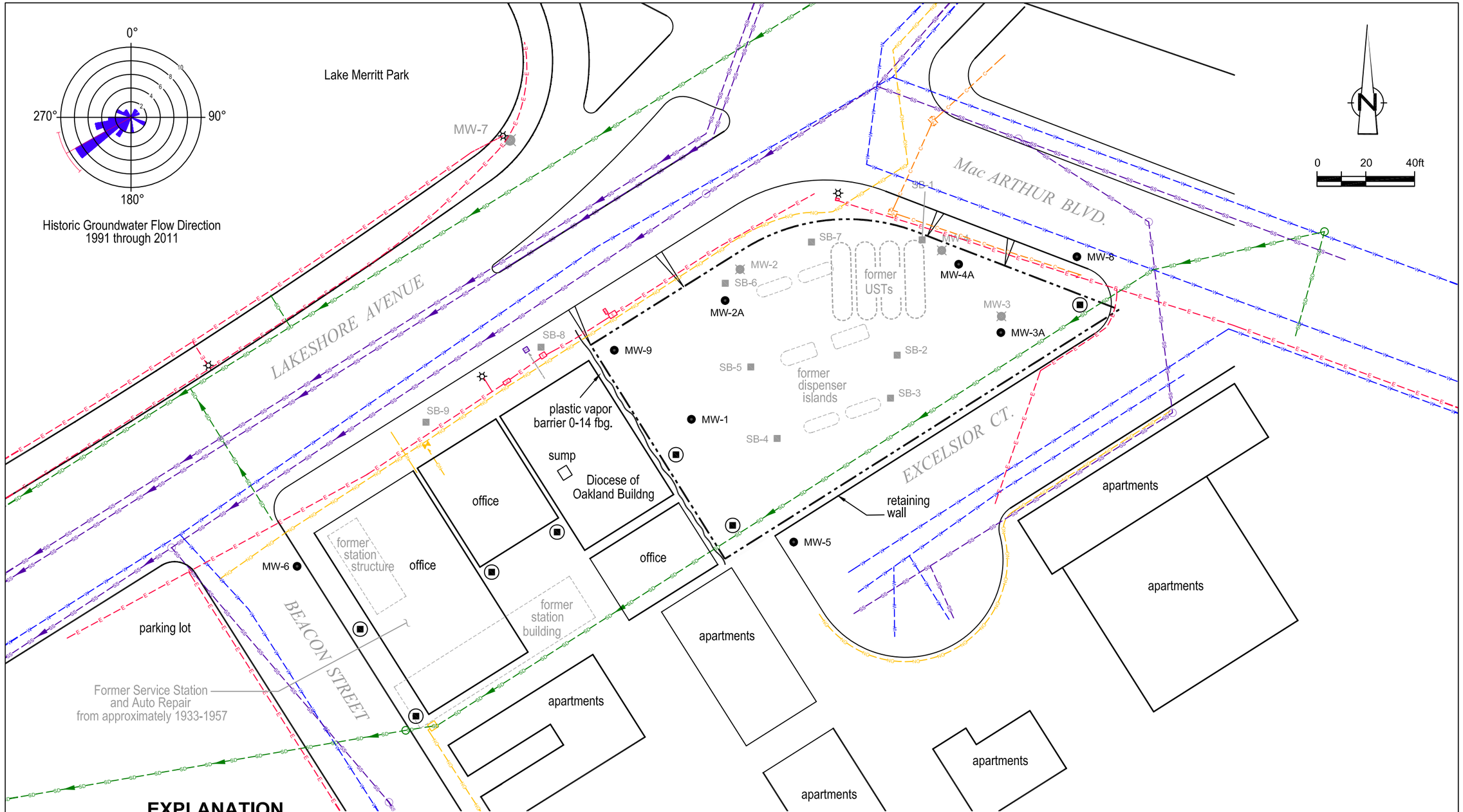
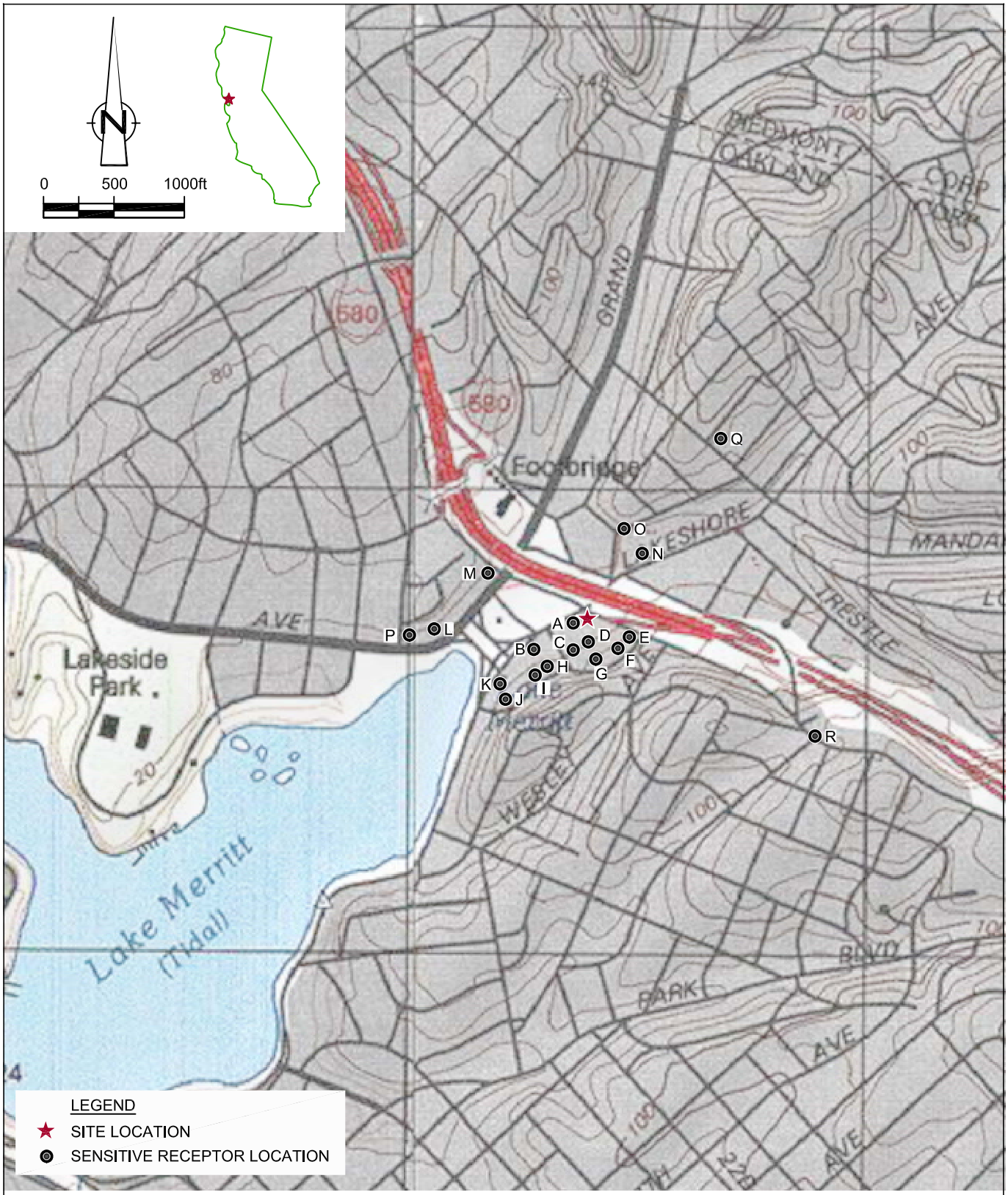


Figure 2

SITE PLAN WITH PROPOSED SOIL BORING LOCATIONS
FORMER CHEVRON SERVICE STATION 9-0121
3026 LAKESHORE AVENUE
Oakland, California

I:\CHEVRON\311973_9-0121 OAKLAND\311973-FIGURES\311973_SITEPLAN.DWG



NOTE: SEE TABLE 1 FOR ADDITIONAL INFORMATION

Figure 3

SENSITIVE RECEPTOR SURVEY DATA
FORMER CHEVRON SERVICE STATION 9-0121
3026 LAKESHORE AVENUE
Oakland, California

311973-RECEPTOR

TABLES

TABLE 1

SENSITIVE RECEPTORS
CHEVRON SERVICE STATION 9-0121
3026 LAKESHORE AVENUE, OAKLAND, CALIFORNIA

*Receptor ID **	*Type (number at location)*	*Name*	*Address*	*City*	*Approximate Distance From Site (feet)*	*Direction from Site*
A	Sump	Diocese of Oakland	3014 Lakeshore Ave	Oakland	0	W/SW
B	Sump	APN 023-0419-027-04	2930 Lakeshore Ave	Oakland	350	W/SW
C	Possible Well	APN 023-0418-015	579 Beacon St	Oakland	95	SW
B	Possible Well	APN 023-0419-027-04	2930 Lakeshore Ave	Oakland	350	W/SW
D	Basement	APN 023-0418-002	47 Excelsior Ct	Oakland	20	SW
E	Basement	APN 023-0418-008-01	585 MacArthur Blvd	Oakland	180	SE
F	Basement	APN 023-0418-009	655 Beacon St	Oakland	170	SE
G	Basement	APN 023-0418-010	627 Beacon St	Oakland	190	S/SE
C	Basement	APN 023-0418-015	579 Beacon St	Oakland	95	SW
H	Basement	APN 023-0419-020	581 Boden Way	Oakland	315	SW
I	Basement	APN 023-0419-021	561 Boden Way	Oakland	350	SW
B	Basement	APN 023-0419-027-04	2930 Lakeshore Ave	Oakland	350	W/SW
J	School	Bayhill High School	521 Boden Way	Oakland	650	SW
K	Church	Our Lady of Lourdes Church	2808 Lakeshore Ave	Oakland	650	SW
L	School	School of Choice	554 Grand Ave	Oakland	900	W/SW
M	School	Lakeview Elementary School	746 Grand Ave	Oakland	640	W
N	School	Springback Learning Center	3225 Lakeshore Ave	Oakland	470	NE
O	Monitoring Wells (3)	Gettler-Ryan (Shell)	3201 Rand Ave **	Oakland	600	NE
P	Monitoring Wells (4)	Texaco Station	500 Grand Ave	Oakland	1,200	W
Q	Destroyed Well	BLT - Baymark	800 York St	Oakland	1,450	NE
R	Cathodic Well	EBMUD	Athol and MacArthur	Oakland	1,700	SW

TABLE 1

SENSITIVE RECEPTORS
CHEVRON SERVICE STATION 9-0121
3026 LAKESHORE AVENUE, OAKLAND, CALIFORNIA

Notes/Abbreviations:

N = North

S = South

E = East

W = West

* = Locations shown on Figure 3

** = The address of record does not correlate to any known current address on Rand Avenue, the closest address on Rand is used.

TABLE 2

WELL SEARCH RESULTS
CHEVRON SERVICE STATION 9-0121
3026 LAKESHORE AVENUE, OAKLAND, CALIFORNIA

Receptor ID	*Address*	*City*	*Owner*	*Use*	*Total Depth (feet)*	*Diameter (inches)*	*Approximate Distance From Site (feet)*
--	3026 Lakeshore Ave	Oakland	Chevron	Destroyed	27	30	0
O	3201 Rand Ave	Oakland	Gettler Ryan	Monitoring	15	2	600
O	3201 Rand Ave	Oakland	Gettler Ryan	Monitoring	15	6	600
O	3201 Rand Ave	Oakland	Gettler Ryan (Shell)	Monitoring	15	6	600
P	500 Grand Ave	Oakland	Texaco	Monitoring	15	2	1,200
P	500 Grand Ave	Oakland	Texaco	Monitoring	20	2	1,200
P	500 Grand Ave	Oakland	Texaco	Monitoring	24	2	1,200
P	500 Grand Ave	Oakland	Texaco	Monitoring	5	2	1,200
Q	800 York St	Oakland	BLT - Baymark	Destroyed	37	2	1,450
R	Athol Ave. & Macathur Blvd.	Oakland	EBMUD	Cathodic	130	5	1,700

Notes/Abbreviations:

Data from California Department of Water Resource Well Completion Reports compiled by Alameda County Public Works Agency on April 5, 2011.

APPENDIX A

REGULATORY LETTER

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
ALEX BRISCOE, Director

ENVIRONMENTAL HEALTH DEPARTMENT
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

January 28, 2011

Mr. Dave Patton
Chevron Products Company
6011 Bollinger Canyon Road
San Ramon, CA 94583
(sent via electronic mail to drpatten@chevron.com)

Subject: Request for Work Plan; Fuel Leak Case No. RO0000284 and Geotracker Global ID T0600100328, Chevron #9-0121; 3026 Lakeshore Avenue, Oakland, CA 94610

Dear Mr. Patton:

Alameda County Environmental Health (ACEH) staff has reviewed the case file including the *Offsite Sampling Report,* dated July 24, 2007, the *Response to Comments,* dated August 31, 2007, and the *Second Semi Annual 2010 Groundwater Monitoring and Sampling Report,* dated November 15, 2010; each submitted on your behalf by Conestoga-Rovers & Associates (CRA). The reports advance the site understanding; however, a number of data gaps appear to require further evaluation. Most critically from a potential human health perspective this includes a vapor intrusion study for the adjacent building; however, remaining data gaps are not limited to vapor intrusion. Based on ACEH staff review of the case file, we request that you address the following technical comments and send us the reports described below.

TECHNICAL COMMENTS

1. **Elevator Sump Groundwater Samples** – Table 1 in the *First Quarter 2010 Groundwater Monitoring and Sampling Report*, dated May 10, 2010 contains the analytical results for four irregularly spaced grab groundwater samples from the elevator sump in the Chancery Office of the Diocese of Oakland Annex for the period between May 2007 and March 2010. While the most recent event indicates a statistically significant increase in the concentration of TPHd, TPHg, BTEX, and MTBE in the sump water (5,200 µg/l TPHd, 3,200 µg/l TPHg, 7 µg/L benzene, 3 µg/l toluene, 3 µg/l ethylbenzene, 5 µg/l total xylenes, and 35 µg/L MTBE), analytical concentrations collected prior to that event are of concern in an interior space and in turn, an interior air space. It is understood that complete volatilization from groundwater is not expected; however, the exposure level for indoor air is very low. Several buildings are associated with the Oakland Annex, or in the immediate vicinity, and may have similar vapor intrusion concerns but not necessarily an elevator sump, but do not appear to have been investigated. As a consequence, ACEH requests submittal of a work plan to conduct the following related work, by the date identified below:

    a. **Sensitive Receptor Survey** – A complete Sensitive Receptor Survey is requested for the vicinity. It is understood that a well survey and a utility conduit survey have been undertaken at the site; however, it is not clear that all sensitive receptors have been previously identified or investigated. Please note that the current Site Conceptual Model (SCM), dated October 15, 2001, on the ACEH ftp site appears incomplete in the concluding section entitled "Discussion and Recommendations", specifically a discussion on an evaluation of potential threats to human health and the environment. Submittal of a completed copy is requested to understand that discussion and recommendation and will help complete the case record.

b. **Vapor Intrusion Survey -** A Vapor Intrusion Survey of all potentially impacted structures in the vicinity is requested by the date identified below. Please account for vapor intrusion pathways potentially allowed by utility conduits or laterals to interior air spaces by vapor point placement.

2. **Updated Site Conceptual Model** – Due to the age of the existing SCM, ACEH requests incorporation of more recent work into an updated SCM. This should include but not be limited to an analysis of the following observations:

   a. **Contaminant Exploitation of Utilities** – While the location of utility mains are reasonably well understood in the immediate vicinity of the site, the understanding of the potential for these utilities, or utility laterals (such as the sanitary sewer to the former restrooms), to be used as preferential conduits has not been evaluated. Previous documents submitted for the site (including the October 15, 2001 SCM) state utilities may be a preferential pathway for plume migration. An analysis of groundwater flow patterns overtime indicate well MW-3A is seasonally both upgradient and downgradient of the site depending on the time of year, a somewhat anomalous situation due to the rising land (e.g. hill) surface at that vicinity. The data appears to imply that the storm drain that runs along the southeastern edge of the property both contributes and receives groundwater to or from the site, depending on the time of year. Because Lake Merritt is nearby, it would not be unexpected for the storm drain to discharge to the lake. This needs further evaluation.

      Similarly the additional storm drain under Lakeshore Avenue appears to be a conduit for impacted groundwater moving offsite to the northwest based on depth to groundwater and depth of the utility. Older nondetectable data from well MW-7 appears to support this interpretation. Again, because Lake Merritt is nearby, it would not be unexpected for the storm drain to discharge to the lake. This needs further evaluation.

   b. **Source of Sump Groundwater Contamination** – A minimum of two potential sources for the impacted groundwater in the elevator sump can be quickly identified (storm drain or other utility, or an aged plastic barrier between the site and the Diocese Annex buildings). Contaminants in the sump grab groundwater sample were similar, but higher, than those in well MW-9 in the most recent sampling in March 2010. Groundwater from well MW-9 is among the most impacted at the site. An evaluation of these, or other, sources may help mitigate vapor intrusion concerns.

3. **Sump Sampling Interval –** ACEH requests that the sampling of the sump groundwater be conducted on a semi-annual basis, at least until further information is generated that documents the level of potential health risks to building occupants is negligible. Please co-ordinate and submit the data with the regularly scheduled semi-annual groundwater monitoring events.

4. **Detection of Elevated TPHmo -** The October 20, 2006 report entitled *Additional Subsurface Investigation Report* found elevated TPHmo concentrations in groundwater at soil bores SB-8 and SB-9 (up to 3,700 µg/l, in SB-9). A motor oil UST has not been reported to have been associated with the site, although that may be unusual for an older service station facility. As a consequence, ACEH requests a minimum of one groundwater monitoring event include analysis for TPHmo to help gauge the extent of concern with this contaminant.

5. **Missing Data** – The October 20, 2006 report entitled *Additional Subsurface Investigation Report* prepared by Cambria does not include either Table 2 *Groundwater Analytical Data*, or the attendant laboratory report for the groundwater analytical data. The copy in GeoTracker is similarly incomplete. Please submit a complete copy of the report to the ACEH ftp site and to GeoTracker in order to help complete the data record and to validate the data.

6. **Clarification of UST Removal Report Excavation Sampling** – Recent confirmation soil samples for the four 10,000-gallon gasoline USTs was reported to be at a depth of 9.5 feet below grade surface (bgs); however, general depth-to-water measurements shortly after UST removal (August 10, 2010 and September 15, 2010, respectively) was reported to be between 6 and 7 feet bgs. Please clarify the extent of groundwater extraction / removal at the time of UST removal.

7. **Status of Proposed Work** – A December 4, 2001 work plan proposed, and a December 6, 2001 ACEH directive letter approved, the installation of two wells and a series of soil bores along the southeastern boundary storm drain. The work was proposed to evaluate the extent of the plume towards the southeast across the storm drain line, to determine if the storm drain was acting as a preferential pathway, and to determine the effectiveness of the plastic barrier between the two sites. ACEH has not found either a report or an explanation as to why this investigation may not be necessary; please clarify the status of this investigation.

TECHNICAL REPORT REQUEST

Please submit the following deliverables and technical reports to ACEH (Attention: Mark Detterman), according to the following schedule:

- **April 1, 2011** – Sensitive Receptor Survey, and Vapor Intrusion Survey Work Plan
- **May 2, 2011 -** Updated SCM, clarifications, missing data, etc.
- **May 16, 2011** – First Semi-Annual 2011 Groundwater Monitoring Report
- **60 Days After Work Plan Approval** –Vapor Intrusion Survey

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

Should you have any questions, please contact me at (510) 567--6876 or send me an electronic mail message at mark.detterman@acgov.org.

Sincerely,

Digitally signed by Mark E. Detterman
DN: cn=Mark E. Detterman, o, ou, email, c=US
Date: 2011.01.31 15:59:34 -08'00'

Mark E. Detterman, P.G., C.E.G.
Senior Hazardous Materials Specialist

Enclosures: Attachment 1 – Responsible Party (ies) Legal Requirements / Obligations
Electronic Report Upload (ftp) Instructions

cc: Nathan Lee, Connestoga-Rovers & Associates, Inc., 5900 Hollis Street, Suite A, Emeryville, CA 94608 (sent via electronic mail to nlee@craworld.com)
Donna Drogos (sent via electronic mail to donna.drogos@acgov.org)
Mark Detterman (sent via electronic mail to mark.detterman@acgov.org)
ftp eFile, GeoTracker

Attachment 1

Responsible Party(ies) Legal Requirements / Obligations

REPORT REQUESTS

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (LOP and SLIC) require submission of reports in electronic form. The electronic copy replaces paper copies and is expected to be used for all public information requests, regulatory review, and compliance/enforcement activities. Instructions for submission of electronic documents to the Alameda County Environmental Cleanup Oversight Program FTP site are provided on the attached "Electronic Report Upload Instructions." Submission of reports to the Alameda County FTP site is an addition to existing requirements for electronic submittal of information to the State Water Resources Control Board (SWRCB) GeoTracker website. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for all groundwater cleanup programs. For several years, responsible parties for cleanup of leaks from underground storage tanks (USTs) have been required to submit groundwater analytical data, surveyed locations of monitoring wells, and other data to the GeoTracker database over the Internet. Beginning July 1, 2005, these same reporting requirements were added to Spills, Leaks, Investigations, and Cleanup (SLIC) sites. Beginning July 1, 2005, electronic submittal of a complete copy of all reports for all sites is required in GeoTracker (in PDF format). Please visit the SWRCB website for more information on these requirements (http://www.swrcb.ca.gov/ust/electronic_submittal/report_rqmts.shtml.

PERJURY STATEMENT

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "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." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 6835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

Please note that delays in investigation, later reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to $10,000 per day for each day of violation.

APPENDIX B

PREVIOUS ENVIRONMENTAL INVESTIGATION AND REMEDIATION

SUMMARY OF ENVIRONMENTAL INVESTIGATION AND REMEDIATION

FORMER CHEVRON SERVICE STATION 9-0121 OAKLAND

1967 Source Leak: In July 1967, a 2,000-gallon inventory loss was discovered. The steel underground storage tanks (USTs) were removed and replaced with new USTs double wrapped in asphalt. A 32-inch long gash was observed in one of the removed tanks. This information was reported in Pacific Environmental Group, Inc.'s (PEG) October 4, 1993 *Remedial Feasibility Study*.

Prior to 1981 Monitoring Well Installation: Six monitoring wells were installed between late the late 1970's and 1981 and used as recovery wells to recover light non aqueous-phase liquids (LNAPL). Installation dates and well construction logs were unavailable. This information was reported in PEG's October 4, 1993 *Remedial Feasibility Study*.

1980 Tank Replacement: A tank tightness test indicated that one of the USTs may have had a leak and was subsequently replaced with a fiberglass UST. An undocumented quantity of soil was removed from the site during UST replacement. A plastic impermeable barrier extending to approximately 14 to 16 feet below grade (fbg) was installed along the southwestern property line. This information was reported in PEG's October 4, 1993 *Remedial Feasibility Study*.

1981 Monitoring Well Installation: Four additional 8-inch diameter monitoring wells were installed in July 1981. In August 1981, a pump test was performed to determine groundwater draw down and production rates. Additional information is available in Groundwater Technology, Inc.'s (GTI) *Considerations on Retrieval of Product from Groundwater.* The report is not dated.

1984 Station Rebuild and UST Abandonment: In 1984, the station was torn down and completely rebuilt. During renovation two USTs, approximately 500 to 1,000 gallons, were discovered beneath the sidewalk. The USTs were abandoned in place by filling them with grout. Approximately 740 cubic yards of soil related to the site redevelopment were over-excavated and disposed of offsite. This information was reported in PEG's October 4, 1993 *Remedial Feasibility Study*.

1984 Basement Inspections: The building tenants at 3014 Lakeshore Avenue complained of petroleum odors in the building. No odor or sheen was noted in the basement. A letter was sent to the property owner by Chevron stating that Chevron had been monitoring the basement

during the two previous years (1982 and 1983) and did not find any evidence of hydrocarbons. This information was reported in PEG's October 4, 1993 *Remedial Feasibility Study*.

1990 UST Repair: A hole created by repetitive tank volume gauging with a stick was discovered in the unleaded gasoline UST. The hole was repaired and the UST was put back in service. This information was reported in PEG's October 4, 1993 *Remedial Feasibility Study*.

1991 Monitoring Well Destruction: In March 1991 six monitoring wells were destroyed and in April 1991 two monitoring wells were destroyed. Additional information available in GTI's April 25, 1991 *Destruction of Five Groundwater Monitoring Wells and Three Groundwater Extraction Wells*.

1991 Monitoring Well Installation: On August 7 and 13, 1991 monitoring wells MW-1 through MW-4 were installed. Additional information is available in GTI's October 18, 1991 *Well Installation Report*.

1992 Monitoring Well Installation and Destruction: In June 1992, offsite monitoring wells MW-5 through MW-8 were installed and onsite well MW-1 was destroyed. Additional information is available in GTI's July 31, 1992 *Environmental Assessment Report*.

1993 Feasibility Study: In October 1993, PEG completed a remedial feasibility study and recommended natural attenuation as the cleanup method. Additional information is available in PEG's October 4, 1993 *Remedial Feasibility Study*.

1996 Product Piping and Dispenser Replacement: In September 1996, the product piping and dispensers were replaced. Soil samples were collected from beneath the dispensers and product piping at depths ranging from 2 to 3 fbg. Approximately 100 cubic yards of soil was removed and disposed of offsite. Additional information is available in Touchstone Development's November 1, 1996 *Product Piping Removal and Soil Sampling Report*.

1996 Well Destruction: In October 1996 one well was destroyed. Additional information is available in RRM Engineering Contracting Firm's October 2, 1996 *Well 1S/3W25R80 Abandonment Document Letter*.

1999 Well Installation: In April 1999, onsite monitoring well MW-9 was installed, and ¾-inch diameter wells MW-2 through MW-4 were destroyed and replaced with 2-inch diameter wells MW-2A through MW-4A. Additional information is available in Gettler-Ryan's May 26, 1999 *Monitoring Well Destruction and Installation Report*.

2001 Site Conceptual Model: In October 2001, Delta Environmental Consultants, Inc. (Delta) completed a site conceptual model and recommended further offsite, downgradient delineation of dissolved hydrocarbons by installing additional monitoring wells to the southwest. Additional information is available in Delta's October 15, 2001 *Site Conceptual Model*.

2006 Offsite Borings: In August 2006, Cambria Environmental Technology, Inc. (Cambria) supervised the advancement of offsite borings SB-8 and SB-9 as part of the ongoing site assessment. Boring SB-10 was not advanced due to refusal and boring SB-11 was not advanced due to its location on the opposite side of a newly installed culvert. Additional information is available in Cambria's October 20, 2006 *Additional Subsurface Investigation Report*.

2007 Offsite Sump Sampling: In May 2007, CRA collected a single grab-groundwater sample from the sump located downgradient in the Diocese of Oakland office building basement. CRA agreed with ACEH to add sump monitoring to the semi-annual groundwater monitoring and sampling schedule once an access agreement was in place to allow regularly scheduled sump sampling. Additional information is available in CRA's July 12, 2007 *Offsite Sampling Report*.

2010 Station Demolition and Fueling Facilities Removal: On August 10, 2010, CRA observed Musco Excavators, Inc. remove the USTs and associated fuel piping. CRA collected soil samples EX-1 through EX-6 beneath the former USTs at 9.5 fbg, P-1 through P-14 beneath the former product piping at 4 and 6 fbg, and soil stockpile samples SS-1 through SS-3. Groundwater sample GW-1 was collected from the UST excavation. Additional information is available in CRA's September 9, 2010 *Underground Storage Tank Removal and Soil Sampling Report*.

APPENDIX C

NEIGHBORHOOD SURVEY QUESTIONNAIRES

Please complete the following sections (it is permissible to write "unknown" if you simply don't know). Please complete Section A of the survey even if you do not have a well or groundwater pumping sump so we can demonstrate to the ACEH that you have been contacted.

SECTION A

Property Owner Name: David F. Arizu
Owner Address: 332 Warwick Ave. Oakland, Ca 94610
Owner Telephone Number (if well or sump is present): _____
Name of tenant at subject site (if not owner occupied): _____
Tenant telephone number (if well or sump is present): _____
Does the subject site contain multiple tenants? yes
Is the subject site used for commercial or residential purposes? Residential
What type of foundation exists? Slab on grade Perimeter Pier & post (I don't know)
Is there a basement at the subject site? Yes on ground level
Is there a well at the subject site (complete Section B)? No
Is there a sump at the subject site that pumps groundwater (complete Section C)? No

SECTION B (complete if a WELL exists at the subject site)

Well Location: _____
Well Diameter: _____
Well Depth: _____
Pump Depth: _____
Material used for the well casing: _____
Date the well was installed: _____
How frequently is the well used? _____
Approximate gallons of water pumped during each well cycle: _____
What is the water well used for? (example garden, drinking, etc) _____

SECTION C (complete if you have a SUMP which pumps groundwater)

Location and depth of sump: _____

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

Additional Comments: _____

_____

_____

_____

_____

_____

Please complete the following sections (it is permissible to write "unknown" if you simply don't know). Please complete Section A of the survey even if you do not have a well or groundwater pumping sump so we can demonstrate to the ACEH that you have been contacted.

SECTION A

Property Owner Name: SILK ARBOR PROPERTIES
Owner Address: 2116 ONEIDA CIRCLE, DANVILLE CA 94526
Owner Telephone Number (if well or sump is present)
Name of tenant at subject site (if not owner occupied): _____
Tenant telephone number (if well or sump is present): _____
Does the subject site contain multiple tenants? YES
Is the subject site used for commercial or residential purposes? RESIDENTIAL
What type of foundation exists? (Slab on grade) Perimeter Pier & post I don't know
Is there a basement at the subject site? NO
Is there a well at the subject site (complete Section B)? NO
Is there a sump at the subject site that pumps groundwater (complete Section C)? NO

SECTION B (complete if a WELL exists at the subject site)

Well Location: _____
Well Diameter: _____
Well Depth: _____
Pump Depth: _____
Material used for the well casing: _____
Date the well was installed: _____
How frequently is the well used? _____
Approximate gallons of water pumped during each well cycle: _____
What is the water well used for? (example garden, drinking, etc) _____

SECTION C (complete if you have a SUMP which pumps groundwater)

Location and depth of sump: _____

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

Additional Comments: _____

_____

_____

_____

_____

_____

Please complete the following sections (it is permissible to write "unknown" if you simply don't know). Please complete Section A of the survey even if you do not have a well or groundwater pumping sump so we can demonstrate to the ACEH that you have been contacted.

SECTION A

Property Owner Name: Palisades Properties, LLC
Owner Address: 585 MacArthur Blvd
Owner Telephone Number (if well or sump is present): _____
Name of tenant at subject site (if not owner occupied): Apt bldg
Tenant telephone number (if well or sump is present): _____
Does the subject site contain multiple tenants? Yes
Is the subject site used for commercial or residential purposes? _____
What type of foundation exists? Slab on grade Perimeter Pier & post I don't know
Is there a basement at the subject site? Partial underground parking
Is there a well at the subject site (complete Section B)? No
Is there a sump at the subject site that pumps groundwater (complete Section C)? No

SECTION B (complete if a WELL exists at the subject site)

Well Location: _____
Well Diameter: _____
Well Depth: _____
Pump Depth: _____
Material used for the well casing: _____
Date the well was installed: _____
How frequently is the well used? _____
Approximate gallons of water pumped during each well cycle: _____
What is the water well used for? (example garden, drinking, etc) _____

APN No. 023 -0418-008-01

SECTION C (complete if you have a SUMP which pumps groundwater)

Location and depth of sump: _____

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

Additional Comments: _____

_____

_____

_____

_____

_____

Please complete the following sections (it is permissible to write "unknown" if you simply don't know). Please complete Section A of the survey even if you do not have a well or groundwater pumping sump so we can demonstrate to the ACEH that you have been contacted.

SECTION A

Property Owner Name: Katherine Czesak
Owner Address: 655 Beacon St, Oakland, CA 94610
Owner Telephone Number (if well or sump is present): _____
Name of tenant at subject site (if not owner occupied): _____
Tenant telephone number (if well or sump is present): _____
Does the subject site contain multiple tenants? yes
Is the subject site used for commercial or residential purposes? yes
What type of foundation exists? Slab on grade Perimeter Pier & post I don't know
Is there a basement at the subject site? Yes
Is there a well at the subject site (complete Section B)? No
Is there a sump at the subject site that pumps groundwater (complete Section C)? No

SECTION B (complete if a WELL exists at the subject site)

Well Location: _____
Well Diameter: _____
Well Depth: _____
Pump Depth: _____
Material used for the well casing: _____
Date the well was installed: _____
How frequently is the well used? _____
Approximate gallons of water pumped during each well cycle: _____
What is the water well used for? (example garden, drinking, etc) _____

SECTION C (complete if you have a SUMP which pumps groundwater)

Location and depth of sump: _____

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

Additional Comments: _____

_____

_____

_____

_____

_____

Please complete the following sections (it is permissible to write "unknown" if you simply don't know). Please complete Section A of the survey even if you do not have a well or groundwater pumping sump so we can demonstrate to the ACEH that you have been contacted.

SECTION A

Property Owner Name: A+C. TRIMBACH
Owner Address: 33 MEADOW HILL, TIBURON CA
Owner Telephone Number (if well or sump is present): —
Name of tenant at subject site (if not owner occupied): —
Tenant telephone number (if well or sump is present): —
Does the subject site contain multiple tenants? YES
Is the subject site used for commercial or residential purposes? NO
What type of foundation exists? Slab on grade Perimeter Pier & post I don't know
Is there a basement at the subject site? YES
Is there a well at the subject site (complete Section B)? NO
Is there a sump at the subject site that pumps groundwater (complete Section C)? NO

SECTION B (complete if a WELL exists at the subject site)

Well Location: _____
Well Diameter: _____
Well Depth: _____
Pump Depth: _____
Material used for the well casing: _____
Date the well was installed: _____
How frequently is the well used? _____
Approximate gallons of water pumped during each well cycle: _____
What is the water well used for? (example garden, drinking, etc) _____

SECTION C (complete if you have a SUMP which pumps groundwater)

Location and depth of sump: _____

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

Additional Comments: _____

_____

_____

_____

_____

_____

Please complete the following sections (it is permissible to write "unknown" if you simply don't know). Please complete Section A of the survey even if you do not have a well or groundwater pumping sump so we can demonstrate to the ACEH that you have been contacted.

SECTION A

Property Owner Name: Tamra G. Hamilton
Owner Address: 2627 California St Berkeley
Owner Telephone Number (if well or sump is present): _____
Name of tenant at subject site (if not owner occupied): _____
Tenant telephone number (if well or sump is present): _____
Does the subject site contain multiple tenants? yes
Is the subject site used for commercial or residential purposes? residential
What type of foundation exists? Slab on grade Perimeter Pier & post I don't know
Is there a basement at the subject site? yes
Is there a well at the subject site (complete Section B)? no
Is there a sump at the subject site that pumps groundwater (complete Section C)? no

SECTION B (complete if a WELL exists at the subject site)

Well Location: _____
Well Diameter: _____
Well Depth: _____
Pump Depth: _____
Material used for the well casing: _____
Date the well was installed: _____
How frequently is the well used? _____
Approximate gallons of water pumped during each well cycle: _____
What is the water well used for? (example garden, drinking, etc) _____

APN No. 023 -0418-013-02

SECTION C (complete if you have a SUMP which pumps groundwater)

Location and depth of sump: _____

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

Additional Comments: _____

_____

_____

_____

_____

_____

Please complete the following sections (it is permissible to write "unknown" if you simply don't know). Please complete Section A of the survey even if you do not have a well or groundwater pumping sump so we can demonstrate to the ACEH that you have been contacted.

SECTION A

Property Owner Name: Joe and Maureen Woelffer
Owner Address: 5891 Buena Vista Avenue, Oakland, CA
Owner Telephone Number (if well or sump is present): Property Managed by Wellington Prop Mgmt
Name of tenant at subject site (if not owner occupied): Multiple tenants
Tenant telephone number (if well or sump is present): _____
Does the subject site contain multiple tenants? yes. 4 units
Is the subject site used for commercial or residential purposes? residential
What type of foundation exists? Slab on grade Perimeter Pier & post I don't know
Is there a basement at the subject site? yes
Is there a well at the subject site (complete Section B)? Unknown / I don't think so
Is there a sump at the subject site that pumps groundwater (complete Section C)? I don't think so / Unknown

SECTION B (complete if a WELL exists at the subject site)

Well Location: _____
Well Diameter: _____
Well Depth: _____
Pump Depth: _____
Material used for the well casing: _____
Date the well was installed: _____
How frequently is the well used? _____
Approximate gallons of water pumped during each well cycle: _____
What is the water well used for? (example garden, drinking, etc) _____

APN No. 023 -0418-015

SECTION C (complete if you have a SUMP which pumps groundwater)

Location and depth of sump: _____

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

Additional Comments: _____

_____

_____

_____

_____

_____

Please complete the following sections (it is permissible to write "unknown" if you simply don't know). Please complete Section A of the survey even if you do not have a well or groundwater pumping sump so we can demonstrate to the ACEH that you have been contacted.

SECTION A

Property Owner Name: Michael W. Foster
Owner Address: 3000 Lakeshore Ave
Owner Telephone Number (if well or sump is present): _____
Name of tenant at subject site (if not owner occupied): _____
Tenant telephone number (if well or sump is present): _____
Does the subject site contain multiple tenants? _____
Is the subject site used for commercial or residential purposes? Commercial
What type of foundation exists? Slab on grade Perimeter Pier & post I don't know
Is there a basement at the subject site? NO
Is there a well at the subject site (complete Section B)? NO
Is there a sump at the subject site that pumps groundwater (complete Section C)? NO

SECTION B (complete if a WELL exists at the subject site)

Well Location: N/A or unknown
Well Diameter: _____
Well Depth: _____
Pump Depth: _____
Material used for the well casing: _____
Date the well was installed: _____
How frequently is the well used? _____
Approximate gallons of water pumped during each well cycle: _____
What is the water well used for? (example garden, drinking, etc) _____

APN No. 023 -0418-018

SECTION C (complete if you have a SUMP which pumps groundwater)

Location and depth of sump: _____

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

Additional Comments: _____

_____

_____

_____

_____

_____

Please complete the following sections (it is permissible to write "unknown" if you simply don't know). Please complete Section A of the survey even if you do not have a well or groundwater pumping sump so we can demonstrate to the ACEH that you have been contacted.

SECTION A

Property Owner Name: Jack McPhail
Owner Address: 848 Euclid Ave., Berkeley 94708
Owner Telephone Number (if well or sump is present): —
Name of tenant at subject site (if not owner occupied): Multiple Tenants
Tenant telephone number (if well or sump is present): —
Does the subject site contain multiple tenants? yes
Is the subject site used for commercial or residential purposes? Residential
What type of foundation exists? Slab on grade ~~Perimeter~~ Pier & post I don't know
Is there a basement at the subject site? yes
Is there a well at the subject site (complete Section B)? NO
Is there a sump at the subject site that pumps groundwater (complete Section C)? NO

SECTION B (complete if a WELL exists at the subject site)

Well Location: _____
Well Diameter: _____
Well Depth: _____
Pump Depth: _____
Material used for the well casing: _____
Date the well was installed: _____
How frequently is the well used? _____
Approximate gallons of water pumped during each well cycle: _____
What is the water well used for? (example garden, drinking, etc) _____

SECTION C (complete if you have a SUMP which pumps groundwater)

Location and depth of sump: _____

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

Additional Comments: _____

_____

_____

_____

_____

_____

Please complete the following sections (it is permissible to write "unknown" if you simply don't know). Please complete Section A of the survey even if you do not have a well or groundwater pumping sump so we can demonstrate to the ACEH that you have been contacted.

SECTION A

Property Owner Name: ALBERT TAM
Owner Address: 1871 10th AVE. SAN FRANCISCO, CA 94122
Owner Telephone Number (if well or sump is present): _____
Name of tenant at subject site (if not owner occupied): _____
Tenant telephone number (if well or sump is present): _____
Does the subject site contain multiple tenants? YES.
Is the subject site used for commercial or residential purposes? RENTAL
What type of foundation exists? Slab on grade Perimeter Pier & post I don't know
Is there a basement at the subject site? _____
Is there a well at the subject site (complete Section B)? NO
Is there a sump at the subject site that pumps groundwater (complete Section C)? NO

SECTION B (complete if a WELL exists at the subject site)

Well Location: _____
Well Diameter: _____
Well Depth: _____
Pump Depth: _____
Material used for the well casing: _____
Date the well was installed: _____
How frequently is the well used? _____
Approximate gallons of water pumped during each well cycle: _____
What is the water well used for? (example garden, drinking, etc) _____

APN No. 023 -0418-029

SECTION C (complete if you have a SUMP which pumps groundwater)

Location and depth of sump: _____

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

Additional Comments: _____

_____

_____

_____

_____

_____

Please complete the following sections (it is permissible to write "unknown" if you simply don't know). Please complete Section A of the survey even if you do not have a well or groundwater pumping sump so we can demonstrate to the ACEH that you have been contacted.

SECTION A

Property Owner Name: Charles Kennedy
Owner Address: 648 Beacon St. Oakland, Ca 94610
Owner Telephone Number (if well or sump is present):
Name of tenant at subject site (if not owner occupied): [illegible]
Tenant telephone number (if well or sump is present):
Does the subject site contain multiple tenants? yes
Is the subject site used for commercial or residential purposes?
What type of foundation exists? Slab on grade / Perimeter / Pier & post / I don't know
Is there a basement at the subject site? yes
Is there a well at the subject site (complete Section B)? no
Is there a sump at the subject site that pumps groundwater (complete Section C)? no

SECTION B (complete if a WELL exists at the subject site)

Well Location: n/a
Well Diameter: n/a
Well Depth:
Pump Depth: n/a
Material used for the well casing: n/a
Date the well was installed:
How frequently is the well used? n/a
Approximate gallons of water pumped during each well cycle:
What is the water well used for? (example garden, drinking, etc)

APN No. 023 -0418-033

SECTION C (complete if you have a SUMP which pumps groundwater)

Location and depth of sump: _____

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

Additional Comments: _____

_____

_____

_____

_____

_____

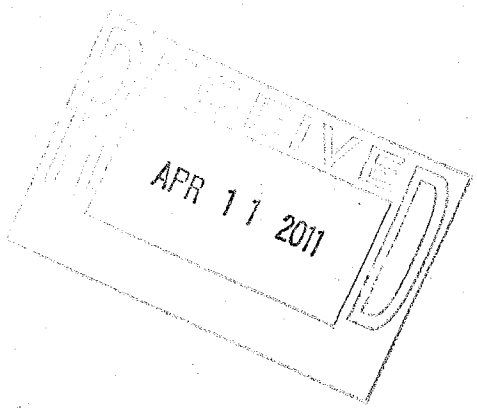
Please complete the following sections (it is permissible to write "unknown" if you simply don't know). Please complete Section A of the survey even if you do not have a well or groundwater pumping sump so we can demonstrate to the ACEH that you have been contacted.

SECTION A

Property Owner Name: Jake & Lee Sinclair
Owner Address: 555 Merritt Ave
Owner Telephone Number (if well or sump is present):____
Name of tenant at subject site (if not owner occupied):____
Tenant telephone number (if well or sump is present): _____
Does the subject site contain multiple tenants? yes
Is the subject site used for commercial or residential purposes? _____
What type of foundation exists? Slab on grade (Perimeter) Pier & post I don't know
Is there a basement at the subject site? NO
Is there a well at the subject site (complete Section B)? NO
Is there a sump at the subject site that pumps groundwater (complete Section C)? NO

SECTION B (complete if a WELL exists at the subject site)

Well Location: _____
Well Diameter: _____
Well Depth: _____
Pump Depth: _____
Material used for the well casing: _____
Date the well was installed: _____
How frequently is the well used? _____
Approximate gallons of water pumped during each well cycle: _____
What is the water well used for? (example garden, drinking, etc) _____



APN No. 023 -0419-005

SECTION C (complete if you have a SUMP which pumps groundwater)

Location and depth of sump: _____

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

Additional Comments: _____

_____

_____

_____

_____

_____

Please complete the following sections (it is permissible to write "unknown" if you simply don't know). Please complete Section A of the survey even if you do not have a well or groundwater pumping sump so we can demonstrate to the ACEH that you have been contacted.

SECTION A

Property Owner Name: HELEN HOM
Owner Address: 581 BODEN WAY #3
Owner Telephone Number (if well or sump is present): _____
Name of tenant at subject site (if not owner occupied): _____
Tenant telephone number (if well or sump is present): _____
Does the subject site contain multiple tenants? YES
Is the subject site used for commercial or residential purposes? RESIDENTIAL
What type of foundation exists? Slab on grade Perimeter Pier & post (I don't know)
Is there a basement at the subject site? YES
Is there a well at the subject site (complete Section B)? NO
Is there a sump at the subject site that pumps groundwater (complete Section C)? NO

SECTION B (complete if a WELL exists at the subject site)

Well Location: _____
Well Diameter: _____
Well Depth: _____
Pump Depth: _____
Material used for the well casing: _____
Date the well was installed: _____
How frequently is the well used? _____
Approximate gallons of water pumped during each well cycle: _____
What is the water well used for? (example garden, drinking, etc) _____

SECTION C (complete if you have a SUMP which pumps groundwater)

Location and depth of sump: _____

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

Additional Comments: _____

_____

_____

_____

_____

_____

Please complete the following sections (it is permissible to write "unknown" if you simply don't know). Please complete Section A of the survey even if you do not have a well or groundwater pumping sump so we can demonstrate to the ACEH that you have been contacted.

SECTION A

Property Owner Name: Murray Gordon
Owner Address: _____
Owner Telephone Number (if well or sump is present): _____
Name of tenant at subject site (if not owner occupied): _____
Tenant telephone number (if well or sump is present): _____
Does the subject site contain multiple tenants? yes
Is the subject site used for commercial or residential purposes? Residential
What type of foundation exists? Slab on grade Perimeter Pier & post I don't know
Is there a basement at the subject site? garage
Is there a well at the subject site (complete Section B)? no
Is there a sump at the subject site that pumps groundwater (complete Section C)? no

SECTION B (complete if a WELL exists at the subject site)

Well Location: _____
Well Diameter: _____
Well Depth: _____
Pump Depth: _____
Material used for the well casing: _____
Date the well was installed: _____
How frequently is the well used? _____
Approximate gallons of water pumped during each well cycle: _____
What is the water well used for? (example garden, drinking, etc) _____

APN No. 023 -0419-021

SECTION C (complete if you have a SUMP which pumps groundwater)

Location and depth of sump: _____

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

Additional Comments: _____

_____

_____

_____

_____

_____

Please complete the following sections (it is permissible to write "unknown" if you simply don't know). Please complete Section A of the survey even if you do not have a well or groundwater pumping sump so we can demonstrate to the ACEH that you have been contacted.

SECTION A

Property Owner Name: Philip Berry
Owner Address: 2930 Lakeshore Oakland
Owner Telephone Number (if well or sump is present):
Name of tenant at subject site (if not owner occupied):
Tenant telephone number (if well or sump is present): Rande
Does the subject site contain multiple tenants? no
Is the subject site used for commercial or residential purposes? Dave Jones
What type of foundation exists? Slab on grade Perimeter Pier & post (I don't know)
Is there a basement at the subject site? yes
Is there a well at the subject site (complete Section B)?
Is there a sump at the subject site that pumps groundwater (complete Section C)? sump yes — don't know details

SECTION B (complete if a WELL exists at the subject site)

Well Location:
Well Diameter:
Well Depth:
Pump Depth:
Material used for the well casing:
Date the well was installed:
How frequently is the well used?
Approximate gallons of water pumped during each well cycle:
What is the water well used for? (example garden, drinking, etc)

APN No. 023 -0419-027-04

SECTION C (complete if you have a SUMP which pumps groundwater)

Location and depth of sump: ?

Frequency of Use: ?

Approximate gallons of water pumped from the sump each day: ?

Where is the sump water discharged? I assume the sewer

Additional Comments: What is this all about? Is there a plume coming from the old gas station?

APN No. 023 -0419-027-04

Please complete the following sections (it is permissible to write "unknown" if you simply don't know). Please complete Section A of the survey even if you do not have a well or groundwater pumping sump so we can demonstrate to the ACEH that you have been contacted.

SECTION A

Property Owner Name: Paul Wood
Owner Address: 573 Merritt Ave. / 123 2nd Ave #306 SLC, ut. 84103
Owner Telephone Number (if well or sump is present): _____
Name of tenant at subject site (if not owner occupied): _____
Tenant telephone number (if well or sump is present): _____
Does the subject site contain multiple tenants? yes
Is the subject site used for commercial or residential purposes? yes
What type of foundation exists? Slab on grade Perimeter Pier & post . I don't know
Is there a basement at the subject site? Yes
Is there a well at the subject site (complete Section B)? no
Is there a sump at the subject site that pumps groundwater (complete Section C)? no

SECTION B (complete if a WELL exists at the subject site)

Well Location: _____
Well Diameter: _____
Well Depth: _____
Pump Depth: _____
Material used for the well casing: _____
Date the well was installed: _____
How frequently is the well used? _____
Approximate gallons of water pumped during each well cycle: _____
What is the water well used for? (example garden, drinking, etc) _____

APN No. 023 -0419-040

SECTION C (complete if you have a SUMP which pumps groundwater)

Location and depth of sump: _____

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

Additional Comments: _____

_____

_____

_____

_____

_____

Please complete the following sections (it is permissible to write "unknown" if you simply don't know). Please complete Section A of the survey even if you do not have a well or groundwater pumping sump so we can demonstrate to the ACEH that you have been contacted.

SECTION A

Property Owner Name: Robert E. and Beverly A Sereda
Owner Address: 2 fourplexes 560-566 Merritt & 568-574 Merritt Av
Owner Telephone Number (if well or sump is present): Oakland, CA 94610
Name of tenant at subject site (if not owner occupied): We do not give out tenant info.
Tenant telephone number (if well or sump is present): _____
Does the subject site contain multiple tenants? yes
Is the subject site used for commercial or residential purposes? residential
What type of foundation exists? Slab on grade Perimeter Pier & post I don't know
Is there a basement at the subject site? no
Is there a well at the subject site (complete Section B)? no
Is there a sump at the subject site that pumps groundwater (complete Section C)? no

SECTION B (complete if a WELL exists at the subject site)

Well Location: _____
Well Diameter: _____
Well Depth: _____
Pump Depth: _____
Material used for the well casing: _____
Date the well was installed: _____
How frequently is the well used? _____
Approximate gallons of water pumped during each well cycle: _____
What is the water well used for? (example garden, drinking, etc) _____

SECTION C (complete if you have a SUMP which pumps groundwater)

Location and depth of sump: _____

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

Additional Comments: We appreciate the fact that Mr Lee returned our call. Would have been nice to have further info in original letter regarding site. We believe we are well beyond 500 feet of 3026 Lakeshore Ave

Barr

APN No. 023 -0420-020

APPENDIX D

NORCAL's MAY 3, 2011 GEOPHYSICAL INVESTIGATION

NORCAL GEOPHYSICAL CONSULTANTS, INC.

May 3, 2011

Mr. Ian Hull
Conestoga-Rovers & Associates
5900 Hollis Street, Suite A
Emeryville, California 94608

Subject: Geophysical Investigation
Former Chevron Service Station 9-0212
3026 Lakeshore Avenue
Oakland, California

NORCAL Project No. 11-462.93

Dear Mr. Hull:

This report presents the findings of a geophysical investigation performed on March 20, 2011 on portions of the subject property and adjacent cul-de-sac and nearby sidewalks. NORCAL Professional Geophysicist David Hagin PGp 1033 and senior geophysical technician Travis Black conducted the field investigation. Mr. Belew Yifru of Conestoga-Rovers & Associates (CRA) provided background and safety information and on-site logistical support.

I SITE DESCRIPTION and PURPOSE

The survey consisted of investigating the former Chevron station site, Excelsior Court and nearby sidewalks as shown on Plate 1. The roadways were excluded from the survey area. The purpose of this investigation was to locate and document detectable subsurface utilities that may provide a preferential pathway for migration of subsurface contaminants.

II GEOPHYSICAL METHODOLOGY

We performed the geophysical investigation using a combination of geophysical instrumentation including:

1.) Hand-held metal detection (MD) to delineate the locations and general outline of subsurface metallic objects;
2.) Electromagnetic line-locating (EMLL) methods to investigate for evidence of conductive underground utility lines;
3.) Ground penetrating radar (GPR) to image the shallow subsurface for evidence of utility lines or other buried objects.

A more detailed discussion of these methods, data analysis, geophysical instrumentation, and limitations is presented in Appendix A.

III DATA ACQUISITION

The MD survey was accomplished by conducting a series of bidirectional traverses over the subject area. Following the MD survey, GPR was used to further define the nature of the MD defined features. Additionally, the EMLL was used to scan the area for the ambient radio-frequency signals that are often received and re-emitted by utilities such as electric, telephone, water, and natural gas lines. The EMLL was also used to energize and trace out the subsurface location of identified utilities, where possible. The resulting interpreted outline or orientation of any detected sub-surface object was marked on the ground surface and plotted in plan view on a site map.

IV RESULTS and CONCLUSIONS

Subsurface features were located using a combination of the three methods listed and visual observations. Plate 1 shows the locations of all detected sub-surface utilities in the areas of investigation. The detected utilities include water, sanitary sewer, electric, natural gas, cable, storm drain, telecommunications, and others. These are located within Excelsior Court, and along the sidewalks of Lakeshore Avenue, MacArthur Boulevard and Beacon Street. It should be noted that the survey area did not extend into the roadways except for Excelsior Court. Several short segments of utilities were also located within the former service station parcel. These were mapped as undifferentiated as the type of utility could not be determined. Additionally several metal detector anomalies were located along the Lakeshore Avenue sidewalk and within the service station area. The source of these anomalies were not further investigated as this was not within the scope of this survey, but may include vaults, utility boxes, and other debris related to the former service station. A high conductivity area within the service station site may be related to a subsurface reinforced concrete slab.

V LIMITATIONS

There are general limitations unique to the geophysical methods used for this investigation. For example, USTs and/or metallic debris may be buried deeper than the detection capabilities of the geophysical method. There may be a lack of contrast in physical properties between native soils and buried objects. Above or below ground cultural features, such as utilities, chain link fences, and debris, may cause interference that limits or masks the detection of nearby buried objects. Since the accuracy of our findings is subject to these limitations, it should be noted that it is possible that not all utilities and other buried objects or features may be detected or accurately characterized.

VI STANDARD CARE AND WARRANTY

The scope of NORCAL's services for this project consisted of using geophysical methods to characterize the shallow subsurface. The accuracy of our findings is subject to specific site conditions and limitations inherent to the techniques used. We performed our services in a manner consistent with the level of skill ordinarily exercised by members of the profession currently employing similar methods. No warranty, with respect to the performance of services or products delivered under this agreement, expressed or implied, is made by NORCAL.

We appreciate having the opportunity to provide you with this information.

Sincerely,

NORCAL Geophysical Consultants, Inc.

David T. Hagin
Professional Geophysicist, PGp 1033

DTH/KGB/tt

Enclosures:

Appendix A - Geophysical Methodology, Instrumentation, Data Analysis, and Limitations

Appendix A

GEOPHYSICAL METHODOLOGY, INSTRUMENTATION, DATA ANALYSIS AND LIMITATIONS

Appendix B

GROUND PENETRATING RADAR (GPR)

Methodology

Ground penetrating radar is a method that provides a continuous, high resolution cross-section depicting variations in the electrical properties of the shallow subsurface. The method is particularly sensitive to variations in electrical conductivity and electrical permittivity (the ability of a material to hold a charge when an electrical field is applied).

The GPR system operates by radiating electromagnetic pulses into the ground from a transducer (antenna) as it is moved along a traverse. Since most earth materials are transparent to electromagnetic energy, the signal spreads downward into the subsurface. However, when the signal encounters a variation in electrical permittivity, a portion of the electromagnetic energy is reflected back to the surface. When the signal encounters a metal object, all of the incident energy is reflected. The reflected signals are received by the same transducer and are printed in cross-section form on a graphical recorder. Changes in subsurface reflection character on the GPR records can provide information regarding the location of USTs, sumps, buried debris, underground utilities, and variations in the shallow stratigraphy.

The GPR system typically used is a Geophysical Survey Systems, Inc. SIR-2000 Subsurface Interface Radar Systems equipped with a 500 megahertz (MHz) transducer. This transducer is near the center of the available frequency range and is used to provide high resolution at shallow depths.

Data Analysis

GPR records are examined to identify reflection patterns characteristic of USTs, utilities, and other buried debris. Typically, USTs are manifested by broad localized hyperbolic (upside-down "U" shape) reflection patterns that vary in intensity. The intensity of a reflection pattern is usually dependent upon the condition of the respective UST, its burial depth, and the type of fill over the UST. Utilities and other buried debris are typically manifested by narrow localized hyperbolic reflections that also vary in intensity.

Limitations

The ability to detect subsurface targets is dependent on site specific conditions. These conditions include depth of burial, the size or diameter of the target, the condition of the specific target in question, the type of backfill material associated with the target, and the surface conditions over the target. Under ideal conditions, the GPR can generally detect objects buried to approximately six feet. However, as the clay content in the subsurface increases, the GPR depth of detection decreases. Therefore, it is possible that on-site soil conditions and target features may limit the depth of detection to the upper one to two feet below ground surface.

ELECTROMAGNETIC LINE LOCATION/METAL DETECTION (EMLL/MD)

Methodology

Electromagnetic line location techniques are used to locate the magnetic field resulting from an electric current flowing on a line. These magnetic fields can arise from currents already on the line (passive) or currents applied to a line with a transmitter (active). The most common passive signals are generated by live electric lines and re-radiated radio signals. Active signals can be introduced by connecting the transmitter to the line at accessible locations or by induction.

The detection of underground utilities is affected by the composition and construction of the line in question. Utilities detectable with standard line location techniques include any continuously connected metal pipes, cables/wires or utilities with tracer wires. Unless the utilities carry a passive current, they must be exposed at the surface or in accessible utility vaults. These generally include water, electric, natural gas, telephone, and other conduits related to facility operations. Utilities that are not detectable using standard electromagnetic line location techniques include those made of non-electrically conductive materials such as PVC, fiberglass, vitrified clay, and pipes with insulated connections.

Buried objects can also be detected, without direct contact, by using the induction mode. This is used to detect buried near surface metal objects such as rebar, manhole covers, USTs, and various metallic debris. The induction mode is used by holding the transmitter-receiver unit above the ground and continuously scanning the surface. The unit utilizes two orthogonal coils that are separated by a specified distance. One of the coils transmits an electromagnetic signal (primary magnetic field) which in turn produces a secondary magnetic field about the subsurface metal object. Since the receiver coil is orthogonal to the transmitter coil, it is unaffected by the primary field. Therefore, the secondary magnetic fields produced by buried metal object will generate an audible response from the unit. The peak of this response indicates when the unit is directly over the metal object.

The instrumentation typically used for the EMLL survey consists of a Radio Detection RD-400 and a Fisher TW-6 inductive pipe and cable locator.

Data Analysis

The EMLL instrumentation indicates the presence of buried metal by emitting an audible tone; there are no recorded data to analyze. Therefore, the locations of buried objects detected with the EMLL method are marked on the ground surface during the survey.

Limitations

The detection of underground utilities is dependent upon the composition and construction of the line of interest, as well as depth. Utilities detectable with standard line location techniques include any continuously connected metal pipes, cables/wires or utilities with tracer wires. Unless carrying a passive current these utilities must be exposed at the surface or accessible in

utility vaults. These generally include water, electric, natural gas, telephone, and other conduits related to facility operations. Utilities that may not be detectable using standard electromagnetic line location techniques include certain abandoned utilities, utilities not exposed at the ground surface, or those made of non-electrically conductive materials such as PVC, fiberglass, vitrified clay, and metal pipes with insulating joints. Pipes generally deeper than about five to seven feet may not be detected.

Appendix A

GROUND PENETRATING RADAR (GPR)

Methodology

Ground penetrating radar is a method that provides a continuous, high resolution cross-section depicting variations in the electrical properties of the shallow subsurface. The method is particularly sensitive to variations in electrical conductivity and electrical permittivity (the ability of a material to hold a charge when an electrical field is applied).

The GPR system operates by radiating electromagnetic pulses into the ground from a transducer (antenna) as it is moved along a traverse. Since most earth materials are transparent to electromagnetic energy, the signal spreads downward into the subsurface. However, when the signal encounters a variation in electrical permittivity, a portion of the electromagnetic energy is reflected back to the surface. When the signal encounters a metal object, all of the incident energy is reflected. The reflected signals are received by the same transducer and are printed in cross-section form on a graphical recorder. Changes in subsurface reflection character on the GPR records can provide information regarding the location of USTs, sumps, buried debris, underground utilities, and variations in the shallow stratigraphy.

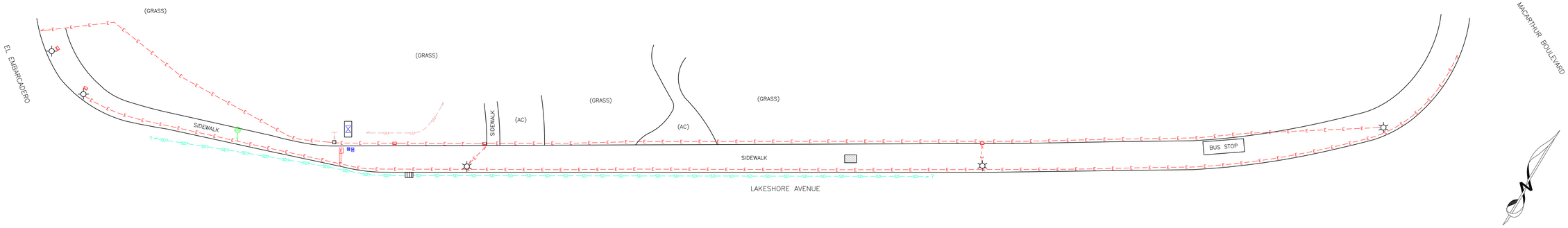
The GPR system typically used is a Geophysical Survey Systems, Inc. SIR-2000 Subsurface Interface Radar Systems equipped with a 500 megahertz (MHz) transducer. This transducer is near the center of the available frequency range and is used to provide high resolution at shallow depths.

Data Analysis

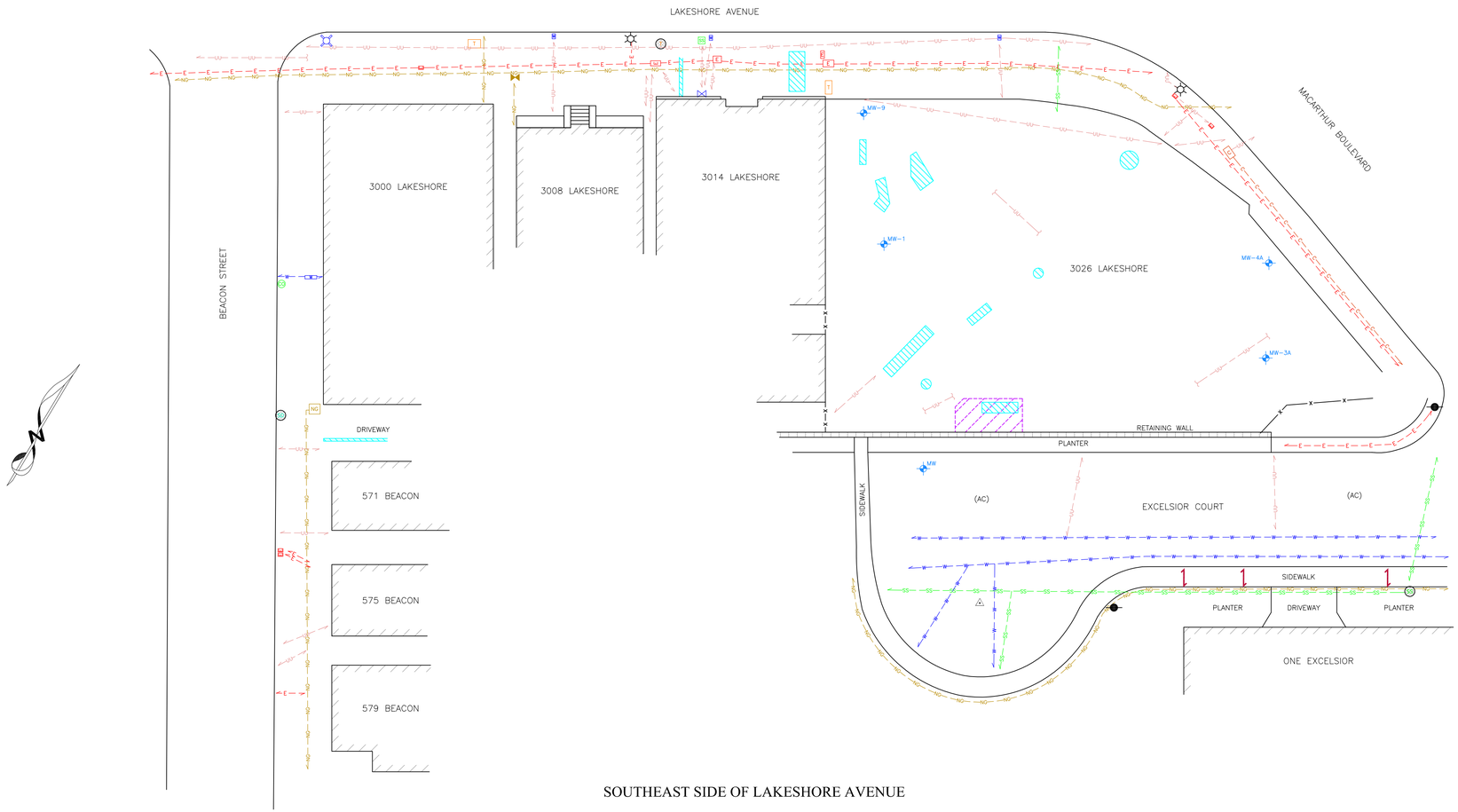
GPR records are examined to identify reflection patterns characteristic of USTs, utilities, and other buried debris. Typically, USTs are manifested by broad localized hyperbolic (upside-down "U" shape) reflection patterns that vary in intensity. The intensity of a reflection pattern is usually dependent upon the condition of the respective UST, its burial depth, and the type of fill over the UST. Utilities and other buried debris are typically manifested by narrow localized hyperbolic reflections that also vary in intensity.

Limitations

The ability to detect subsurface targets is dependent on site specific conditions. These conditions include depth of burial, the size or diameter of the target, the condition of the specific target in question, the type of backfill material associated with the target, and the surface conditions over the target. Under ideal conditions, the GPR can generally detect objects buried to approximately six feet. However, as the clay content in the subsurface increases, the GPR depth of detection decreases. Therefore, it is possible that on-site soil conditions and target features may limit the depth of detection to the upper one to two feet below ground surface.



NORTHWEST SIDE OF LAKESHORE AVENUE



SOUTHEAST SIDE OF LAKESHORE AVENUE

SCALE
0 10 20 40
(1 inch = 20 feet)

LEGEND	
	CABLE LINE
	ELECTRIC LINE
	NATURAL GAS LINE
	SANITARY SEWER LINE
	STORM DRAIN LINE
	SUSPECTED STORM DRAIN LINE
	TELECOMMUNICATIONS LINE
	UNDIFFERENTIATED UTILITY LINE
	WATER LINE
	FENCE
	METAL DETECTOR ANOMALY
	AREA OF HIGH CONDUCTIVITY
	GPR ANOMALY
	CITY MONUMENT
C	CABLE UTILITY BOX/VAULT
E	ELECTRIC UTILITY BOX/VAULT
NG	NATURAL GAS UTILITY BOX/VAULT
SS	SANITARY SEWER UTILITY BOX/VAULT
T	TELECOMMUNICATIONS UTILITY BOX/VAULT
W	WATER UTILITY BOX/VAULT
	UTILITY BOX/VAULT
	FIRE HYDRANT
	MANWAY
	MONITORING WELL
	NATURAL GAS VALVE
SD	SEWER CLEANOUT
	SIGNAL LIGHT
	STORM DRAIN
	STREET LAMP
	UTILITY POLE
	WATER VALVE
(AC)	ASPHALT

NORCAL

GEOPHYSICAL SURVEY MAP
CHEVRON SERVICE STATION 9-0121
3026 LAKESHORE AVENUE

LOCATION: OAKLAND, CALIFORNIA
CLIENT: CRA
JOB #: 11-462.93 | NORCAL GEOPHYSICAL CONSULTANTS INC.
DATE: MAY 2011 | DRAWN BY: G.RANDALL | APPROVED BY: DTH

PLATE 1

5/2/2011 10:29:19 AM

APPENDIX E

STANDARD FIELD PROCEDURES FOR SOIL BORINGS AND MONITORING WELL INSTALLATION

STANDARD FIELD PROCEDURES FOR SOIL BORINGS

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 ASTM D2488-06 Unified Soil Classification System by a trained geologist working under the supervision of a California Professional Geologist (PG).

Soil Boring and Sampling
Prior to drilling, the first 8 feet of the boring are cleared using an air or water knife and vacuum extraction or hand auger. This minimizes the potential for impacting utilities. 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.

Waste Handling and Disposal
Soil cuttings from drilling activities are usually stockpiled onsite and covered by plastic sheeting. At least three individual soil samples are collected from the stockpiles and composited at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples in addition to any analytes required by the receiving disposal facility. Soil cuttings are transported by licensed waste haulers and disposed in secure, licensed facilities based on the composite analytic results.

Groundwater removed during development and sampling is typically 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. Upon receipt of analytic results, 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.