Catalina Espino Devine
Project Manager
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Chevron Environmental Management Company
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RECEIVED
By Alameda County Environmental Health at 9:53 am, Apr 25, 2013

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

Re: Chevron Service Station No. 91153
3135 Gibbons Drive (3126 Fernside Blvd)
Alameda, CA

I have reviewed the attached report dated April 24, 2013.

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,

Catalina Espino Devine
Project Manager

Attachment: Report

CONESTOGA-ROVERS
& ASSOCIATES

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

April 24, 2013 Reference No. 311642

Mr. Mark Detterman
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502 6577

Re: Work Plan for Sub-Slab Soil Gas Investigation
Former Chevron Service Station 91153
3135 Gibbons Drive (3126 Fernside Boulevard)
Alameda, California
Fuel Leak Case No. RO0000341

Dear Mr. Mark Detterman:

Conestoga-Rovers & Associates (CRA) prepared this *Work Plan for Sub-Slab Soil Gas Investigation* on behalf of Chevron Environmental Management Company (Chevron) for the site referenced above (Figure 1). This work plan was prepared in response to a request by Alameda County Environmental Health (ACEH) during a November 1, 2012 meeting that Chevron, CRA and ACEH attended. The proposed sub-slab soil gas investigation will evaluate the potential for hydrocarbon soil gas under the concrete slab in the garage. The site description and proposed scope of work are presented below.

SITE DESCRIPTION

Site Background

The site is located on a triangular-shaped lot at the intersections of Gibbons Drive, Fernside Boulevard, and High Street in Alameda, California (Figure 1). The former service station operated until June 1986. A residence was built on the property in 1989 (Figure 2). Surrounding area use is residential and commercial.

Previous Environmental Work

Environmental investigations began in 1986 with the underground storage tank (UST) removal. Since 1986, a total of 12 confirmation samples, 33 soil borings, 10 groundwater monitoring wells (well C-2 has been destroyed), one extraction well, one temporary well, and 51 temporary soil vapor probes have been installed. Groundwater has been monitored since 1986. In 2011 indoor, crawl space and outdoor ambient air samples were collected.

Remediation conducted has included an excavation during UST removal and during the foundation construction for the house, a groundwater pump and treat system, oxygen releasing compound (ORC) and hydrogen peroxide injections, groundwater extraction events, and since 1995 weekly to quarterly light non-aqueous phase liquid (LNAPL) removal by bailing or a sorbent sock. Two well surveys and preferential pathway analyses have also been conducted. A summary of previous environmental investigation and remediation is included as Attachment A.

Site Geology

Soil beneath the site consists primarily of sand with some silt and clay to the total depth explored of approximately 23 feet below grade (fbg).

Site Hydrology

The site is approximately 8 feet above mean sea level. Depth to water in wells ranges from approximately 0 to 6.5 fbg. The groundwater basin beneath the site is designated as an existing or potential drinking water resource.[1] Groundwater flow direction is typically east-southeast toward the Oakland Alameda Estuary. The estuary is the closest surface water and is approximately 550 feet downgradient. LNAPL is currently present in well C-1.

PROPOSED SUBSURFACE AND AMBIENT AIR INVESTIGATION

CRA proposes installing two sub-slab probes in the garage, the final locations will be determined with the property owner (Figure 2). Soil gas samples will be collected after the probes are installed. During this sampling event, a second round of indoor, crawl space and outdoor ambient air samples will be collected in approximately the same locations and using the methods as outlined in CRA's *Subsurface and Crawl Space, Indoor and Ambient Air Investigation Report* dated April 18, 2012. An ambient air sample will also be collected from the garage, this location will also be determined with the property owner.

Site-Specific Health and Safety Plan

CRA will prepare a site-specific health and safety plan to protect site workers. The plan will be reviewed and signed by all site workers and visitors. The plan will be kept onsite during all field work.

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1 East Bay Plain Groundwater Basin Beneficial Use Evaluation Report, Alameda and Contra Costa Counties, California; California Regional Water Quality Control Board – San Francisco Bay Region Groundwater Committee; June 1999.

Permits
Alameda County Public Works Agency does not require a permit for the installation of sub-slab probes.

Underground Utility Location and Utility Clearance
CRA will contact Underground Service Alert to identify locations of underground utilities. A private utility locating company will be hired to confirm subsurface utility locations and locate unmarked utilities.

Sub-Slab Probe Installation and Construction
The sub-slab probes will be installed based on the Department of Toxic Substances Control California Environmental Protection Agency's, October 2011 *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance).* A rotary hammer drill will be used to create a 2-inch diameter and 1-inch deep "outer" hole that partially penetrates the concrete slab. A small portable vacuum cleaner will be used to remove cuttings from the hole. Removal of cuttings in this manner from the non-penetrated slab does not compromise soil vapor samples because there is a lack of pneumatic communication between sub-slab material and the vacuum cleaner.

A smaller diameter "inner" hole will then be created utilizing a rotary hammer drill to penetrate the remaining concrete slab and into the sub-slab material to a depth of approximately six inches below the concrete slab.

Sub-slab probes are constructed using stainless-steel tubing and stainless-steel compression fittings. Stainless-steel will be used to ensure that construction materials are not a source of volatile organic compounds. Quick drying Portland cement slurry will be placed into the annular space between the probe and "outer" hole. The probes will be completed flush with the slab surface and capped with a stainless steel plug to prevent interference with daily garage use.

Sub-Slab Soil Gas Sampling
Soil gas samples will be collected no earlier than 24 hours after the sub-slab probes are installed. Soil gas samples will be collected in an one-liter Summa™ canister connected directly to the sub-slab probe. A closed circuit sampling train will be created by attaching the sample Summa™ canister in series with the purge Summa™ canister via a steam-cleaned stainless-steal manifold. A flow rate of 167 milliliters pre minute will be used to collect the sample.

A "shut-in" test will be performed prior to connecting the sampling equipment to the sub-slab vapor probe tubing. This test will be performed by sealing all openings to ambient air, opening the purge Summa™ canister to establish a vacuum inside the sampling train and waiting to ensure the vacuum remained stable over time. The "shut-in" test reduces the potential for ambient air to infiltrate into the sample.

After the "shut in" test is completed, tubing will be connected to the sub-slab probe from the sampling train and approximately three probe tubing volumes of stagnant air will be purged for a representative soil gas sample. After purging, the sample Summa™ canister valve will be opened. The Summa™ canister's vacuum will be used to draw soil vapor through the flow controller and into the sample canister until a negative pressure of approximately five-inches of mercury is observed on the vacuum gauge.

Leak testing will be performed during sampling by using laboratory grade helium to determine if ambient air was entering the Summa™ canisters during sampling. A shroud will be used to surround the sub-slab vapor sampling equipment and the connections between the sampling equipment and the sub-slab vapor probe tubing. A helium detector will be placed inside the shroud to quantify helium concentrations inside the shroud. An atmosphere of approximately 10 percent helium will be created and maintained for the sampling duration. All samples will be labeled, logged on a chain-of-custody, stored at ambient temperature, and shipped to a State of California certified laboratory.

Soil Gas Chemical Analysis

All soil gas samples will be analyzed for the following:

- Total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethyl benzene, xylenes (BTEX), methyl tertiary butyl ether (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
- Oxygen (O_2), carbon dioxide (CO_2), methane (CH_4), nitrogen (N_2), and helium by ASTM D-1946 (GC/TCD)

AMBIENT AIR 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 volatile organic compounds (VOCs) that may be detected by indoor air testing. Table A presents the a summary of BTEX background indoor air concentrations based on the post-1990 studies evaluated in the U.S. Environmental Protection Agency (USEPA)'s *Background Indoor Air Concentrations of Volatile Organic Compounds in North American Residences (1990-2005): A Compilation of Statistics for Assessing Vapor Intrusion*, June 2011.

TABLE A: RANGES OF BACKGROUND INDOOR AIR CONCENTRATIONS[1]

Chemical of Concern	*Number of Studies*	*Number of Samples*	*Range % Detect*	*Total % Detects*	*RL Range (µg/m³)*	*Range of 50th % (µg/m³)*	*Range of 75th % (µg/m³)*	*Range of 90th % (µg/m³)*
Benzene	14	2,615	31-100	91.1	0.05 – 1.6	<RL – 4.7	1.9 – 7.0	5.2 - 15
Toluene	12	2,065	86-100	96.4	0.03 – 1.9	4.8 – 24	12 – 41	25 – 77
Ethylbenzene	10	1,484	26-100	85.7	0.01 – 2.2	1 – 3.7	2 – 5.6	4.8 – 13
Xylene, m/p-	10	1,920	52-100	92.9	0.4 – 2.2	1.5 – 14	4.6 – 21	12 – 56
Xylene, o-	12	2,004	31-100	89.0	0.11 – 2.2	1.1 – 3.6	2.4 – 6.2	5.5 – 16

RL = Reporting limit

µg/m³ =L = 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 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}.

[1] USEPA, *Table ES-1 Ranges of Summary Statistics for Background Indoor Air Concentrations of Common VOCs Measured in North American Residences between 1990 and 2005, Background Indoor Air Concentrations of Volatile Organic Compounds in North American Residences (1990-2005): A Compilation of Statistics Assessing Vapor Intrusion*, June 2011.

TABLE B: CALIFORNIA HUMAN HEALTH SCREENING LEVELS FOR INDOOR AIR AND SOIL GAS		
	[1]*Indoor Air Human Health Screening Levels (µg/m3)*	
Chemical	*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 tertiary-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., day-care 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 Ethylbenzene* 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 concentration 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 crawl space 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 crawl space air.

Indoor air, outdoor air, and crawlspace 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. Crawl space benzene concentrations significantly higher than indoor air.

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 October 2011 *Vapor Intrusion Guidance*.

REPORTING

CRA will prepare a comprehensive report presenting the subsurface and ambient air investigation results within the site conceptual model that ACEH requested in a letter dated August 31, 2012 (Attachment B). The report, at a minimum, will contain:

- Sub-Slab probe installation and sampling methodology
- Tabulated soil, groundwater, and vapor data
- Summary of results
- Analytical reports and chain-of-custody forms
- A site conceptual model
- Conclusions and recommendations

SCHEDULE

Following approval, CRA will obtain access from the property owner to conduct the assessment. CRA is currently working with the property owner to establish a date and time to enter the residence. CRA will notify ACEH of when the assessment will take place.

CONESTOGA-ROVERS
& ASSOCIATES

Please contact Nathan Lee at (925) 849-1003 if you have any questions or require additional information.

Regards,

CONESTOGA-ROVERS & ASSOCIATES

Nathan Lee, PG 8486

NL/aa/26
Encl.

Figure 1	Vicinity Map
Figure 2	Site Plan with Proposed Air Sample Locations
Attachment A	Previous Environmental Investigation and Remediation
Attachment B	Agency Letter

cc: Ms. Catalina Espino Devine, Chevron
Mr. Mark Hom, Property Owner

FIGURES

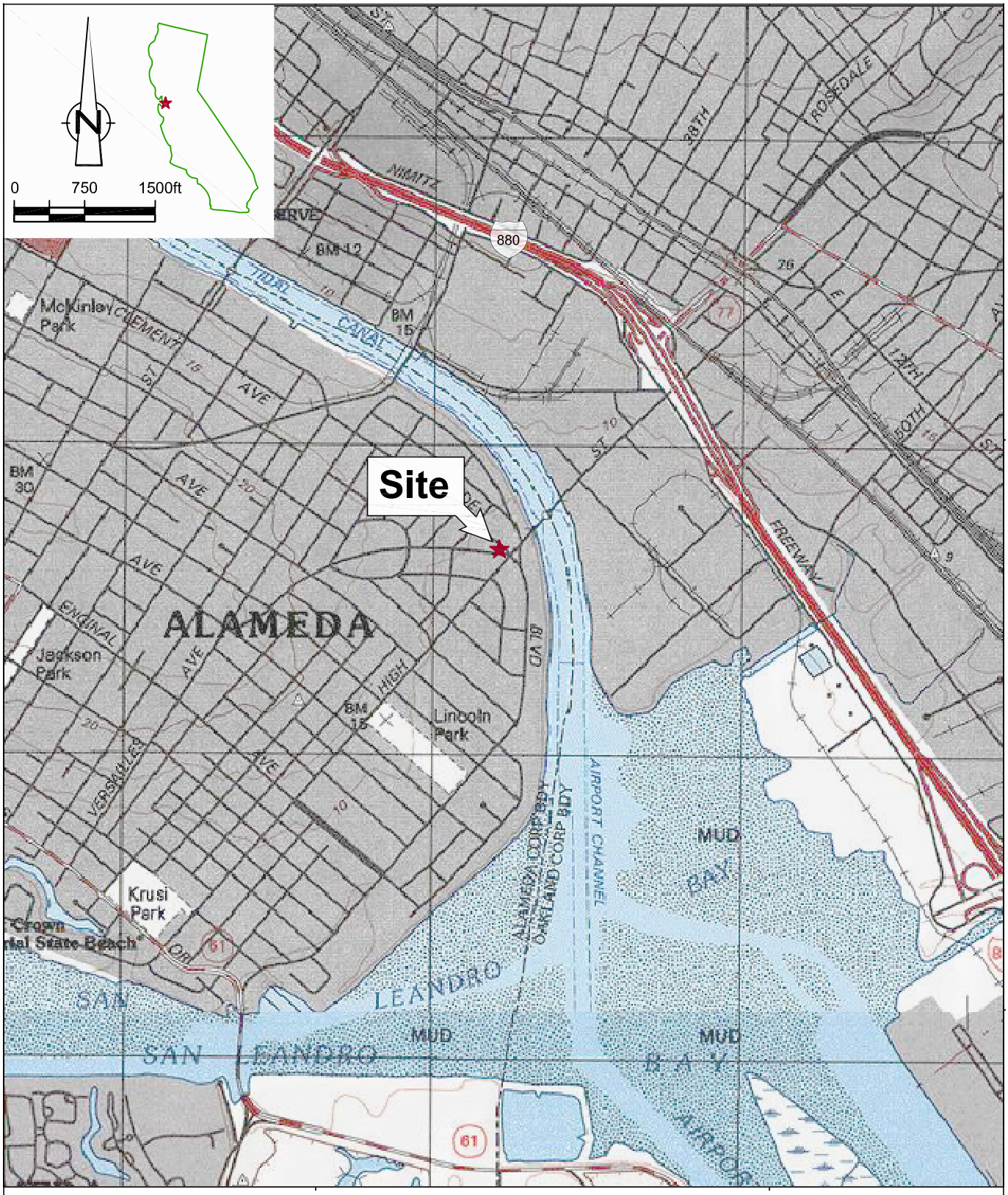

Figure 1

VICINITY MAP
FORMER CHEVRON STTION 9-1153
3135 GIBBONS DRIVE (3126 FERNSIDE BLVD)
Alameda, California

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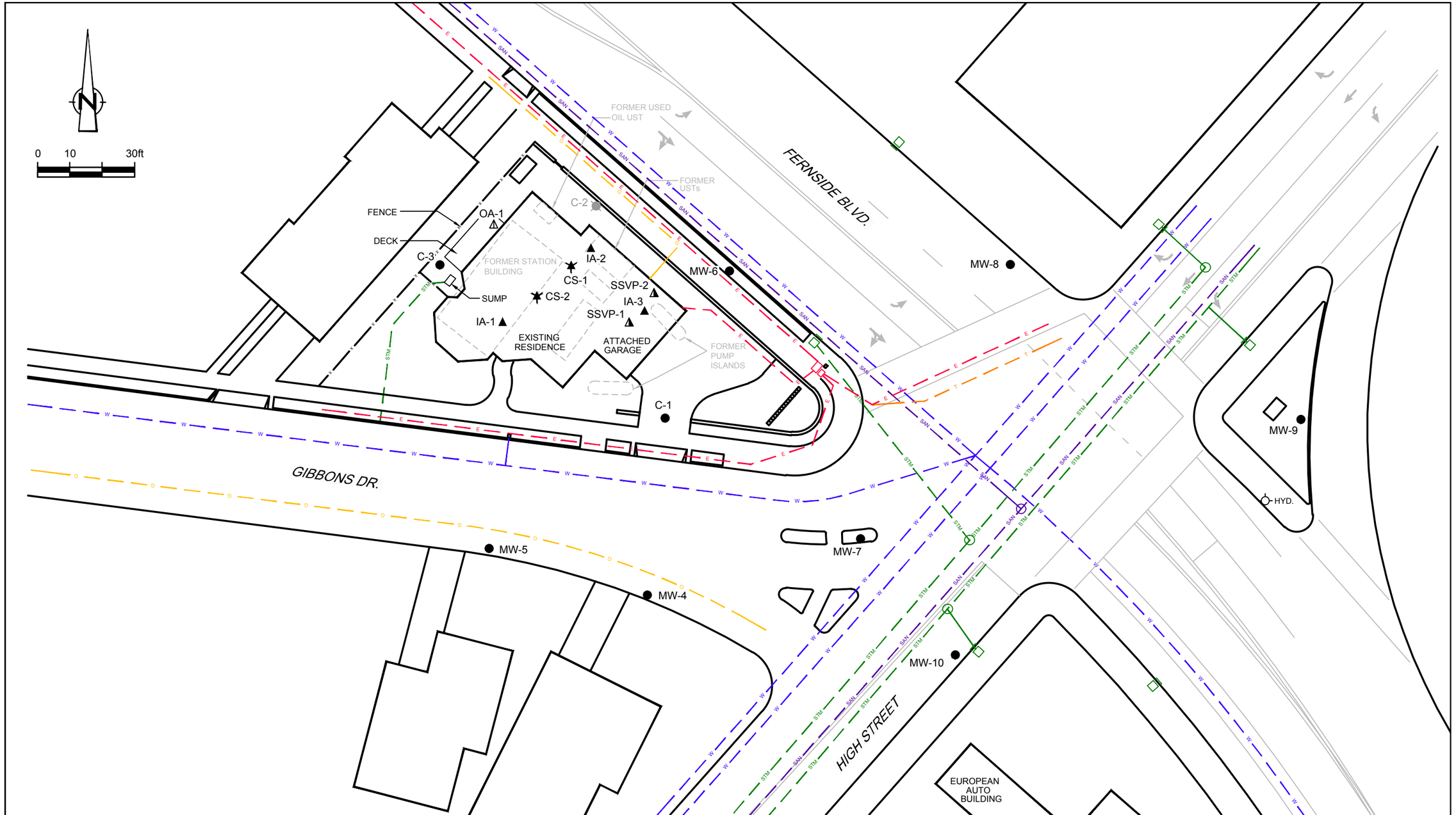


Figure 2

SITE PLAN
FORMER CHEVRON SERVICE STATION 91153
3135 GIBBONS DRIVE (3126 FERNSIDE BLVD)
Alameda, California

311642-2013(026)GN-BR002 APR 19/2013

ATTACHMENT A

PREVIOUS ENVIRONMENTAL INVESTIGATION AND REMEDIATION

PREVIOUS ENVIRONMENTAL INVESTIGATION AND REMEDIATION

1986 UST Removal and Excavation

The underground storage tanks (USTs) were removed and an unreported volume of soil was excavated from the former UST pit and product line trenches. Excavated soil was aerated onsite and used as backfill. Additional information is available in Blaine Tech Services, Inc.'s June 19, 1986 *Field Sampling* report and Weiss Associates' (Weiss) December 20, 1994 *Comprehensive Site Evaluation and Proposed Future Action Plan*.

1986 Well Installation

Wells C-1 through C-3 were installed onsite. Additional information is available in Emcon Associates' September 18, 1986 *Well Installation Memorandum*.

1987 Area Well Survey

In August 1987, Pacific Environmental Group, Inc. (PEG) conducted a well survey and indentified wells within approximately 0.5 mile of the site. The majority of these wells were used for groundwater monitoring or cathodic protection and some were used for irrigation. None of the wells were listed as municipal drinking water supply wells. Additional information is available in PEG's August 12, 1987 *Well Survey Report*.

1989 House Construction and Destruction of Monitoring Well C-2

According to Weiss' December 20, 1994 *Comprehensive Site Evaluation and Proposed Future Action Plan*, a majority of the soil beneath the planned residence footprint was removed for construction in early 1989. Groundwater monitoring well C-2 was apparently destroyed during construction prior to May 1989. Additional information is available in Weiss' December 20, 1994 *Comprehensive Site Evaluation and Proposed Future Action Plan*.

1987 and 1989 Soil Vapor Survey

Soil vapor surveys were conducted to quantify vapor intrusion to indoor air risks for onsite residents. Based on vapor concentrations from samples collected from the southeastern portion of the site, a vapor barrier was recommended for any structures. Additional information is available in EA Engineering's August 19, 1987 *Risk Assessment* and June 9, 1989 *Soil Vapor Contaminant Assessment Report of Investigation*.

1989 Subsurface Investigation

In July 1989, EA collected soil samples from between 0.5 and 9.5 feet below grade (fbg) in five shallow onsite borings and three shallow offsite borings (SB1 through SB8). The highest concentrations of total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene and xylenes (BTEX) were found in the areas east of the UST complex and pump

islands. Additional information is available in Weiss' December 20, 1994 *Comprehensive Site Evaluation and Proposed Future Action Plan*.

1991 Groundwater Treatment

A groundwater pump and treat system was installed and operated by EA from 1991 to 1994. The system extracted groundwater from a recovery trench and extraction well RW-1. Additional information is available in Weiss' December 20, 1994 *Comprehensive Site Evaluation and Proposed Future Action Plan*.

1992 Well Installations

Offsite wells MW-4 through MW-6 were installed to further delineate the lateral extent of dissolved hydrocarbons. Additional information is available in Groundwater Technology Inc.'s (GTI) July 16, 1992 *Environmental Assessment Report*.

1993 Offsite Groundwater Sampling

Weiss collected groundwater samples from temporary offsite borings BH-A, BH-B, and BH-C, located crossgradient and downgradient of the groundwater extraction trench. Additional information is available in Weiss' December 20, 1994 *Comprehensive Site Evaluation and Proposed Future Action Plan*.

1993 Monitoring Well Installation

On November 11, 1993 GTI installed groundwater monitoring well MW-7 and temporary monitoring well TMW-1 to further characterize the distribution of hydrocarbons in soil and groundwater upgradient and downgradient of the site. Additional information is available in GTI's January 31, 1994 *Additional Environmental Assessment Report*.

1994 Site Evaluation and Proposed Further Action

At Chevron's request, Weiss prepared a site evaluation to summarize all investigative and remedial actions performed to date and to outline a recommended future action plan. Additional information is available in WA's December 20, 1994 *Site Evaluation and Proposed Further Action Plan*.

1995 Well Installations

Wells MW-8 through MW-10 were installed to further delineate the downgradient extent of hydrocarbons in groundwater. Additional information is available in GTI's October 31, 1995 *Additional Site Assessment Report*.

1996 Evaluation for Potential Migration Pathway via Buried Utility Pipelines

Fluor Daniel GTI (FD-GTI) compiled utility location and depth information to analyze the potential for offsite migration of dissolved hydrocarbons in utility trenches. The report

concluded that several utilities penetrated groundwater, but that these utilities were not acting as preferential pathways. The report states that the buried utilities were installed in materials similar to native soil and were unlikely to result in preferential flow. In addition, monitoring well data near the utilities was not consistent with preferential flow. Additional information is available in FD-GTI's May 15, 1996 *Evaluation for Potential Migration Pathway via Buried Utility Pipelines*.

1996 Geophysical Investigation for Buried Underground Storage Tanks

FD-GTI performed a geophysical survey of approximately 70 feet of sidewalk along Gibbons Boulevard and near monitoring well C-1. Both ground penetrating radar and vertical magnetic gradiometer were used. No buried underground storage tanks were identified within the survey areas. Additional information is available in FD-GTI's July 8, 1996 *Geophysical Investigation for Buried Underground Storage Tanks*.

1997 Shallow Soil Investigation

Shallow soil samples S-1 through S-15 were collected along the north, west, and east property boundaries to assess lead concentrations in onsite soil. Additional information is available in Gettler-Ryan's (G-R) October 22, 1997 *Soil Sampling Report*.

1997 ORC and Peroxide Injection

Oxygen releasing compound (ORC) was placed in well MW-6 and MW-7 and hydrogen peroxide was injected in well MW-1 to remediate light non-aqueous phase liquids. Additional information is available in ChevronTexaco Energy Research and Technology Company's (Chevron ETC) May 2003 *Risk-Based Corrective Action Evaluation of Vapor Intrusion to Indoor Air from Soil Vapor*,

1998 Bio-Parameter Evaluation

Three samples collected during the third quarter 1998 groundwater monitoring event were analyzed for bio-parameter data to evaluate biodegradation processes. The report concluded that not enough parameters indicated biodegradation was occurring. However, the report states that the recently added ORC and hydrogen peroxide would potentially increase bioremediation. Additional information is available in Chevron's September 29, 1998 *Bio-Remediation Evaluation Letter*.

1999 Hydrogen Peroxide Injection

In July 1999, Cambria Environmental Technology, Inc. (Cambria) injected a hydrogen peroxide solution into well C-1 to oxidize residual hydrocarbons. Additional information is available in Cambria's July 12, 1999 *Hydrogen Peroxide Injection* report.

2001 to 2002 Groundwater Batch Extraction Events

Five groundwater batch extraction events were conducted. These events were discontinued because of inconvenience to the resident. Additional Information available in Chevron ETC's May 2003 *Risk-Based Corrective Action Evaluation of Vapor Intrusion to Indoor Air from Soil Vapor*.

2002-2003 Vapor Intrusion Study and Risk-Based Correction Action Evaluation of Vapor Intrusion to Indoor Air from Soil Vapor

Borings SV-1 through SV-7 were hand-augered along the edges of the current building and soil-vapor samples were collected from temporary probes. These data were used to evaluate potential indoor air risks to onsite residents. Data was compared to the United States Environmental Protection Agency's established target risk levels for adults and children. The report concludes that vapor intrusion risks from soil vapor intrusion to indoor air were below the established guidelines. Additional information is available in Chevron ETC's May 2003 *Risk-Based Corrective Action Evaluation of Vapor Intrusion to Indoor Air from Soil Vapor*.

2010 Preferential Pathway and Well Survey

In 2010, Conestoga-Rovers & Associates (CRA) completed another preferential pathway analysis and well survey. CRA located electric, natural gas, water, communication, storm drain sewer, and sanitary sewer lines near the site. Although some of these utilities periodically intersect the groundwater table, hydrocarbon concentrations in monitoring wells indicate that utilities are not acting as significant pathways for hydrocarbon migration. This is consistent with previous assessments. The closest water supply wells are over 1,000 feet from the site. These wells are either upgradient or located in Oakland across the Oakland Alameda Estuary. The wells identified in the survey are not at risk from hydrocarbons originating from the site. Additional information is available in CRA's September 30, 2010 *Preferential Pathway Study and Well Survey Report*.

2011 Subsurface and Crawl Space and Indoor Ambient Air Investigation

In 2011, Conestoga-Rovers & Associates (CRA) collected two indoor ambient air samples from inside the residence, two ambient air samples from within the crawl space, and one outdoor ambient air sample. Also eight soil borings B-1 through B-8 were advanced onsite. Additional information is available in CRA's April 18, 2012 *Subsurface and Crawl Space, Indoor and Ambient Air Investigation Report*.

ATTACHMENT B

AGENCY LETTER

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
ALEX BRISCOE, Agency Director

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

August 31, 2012

Ms. Catalina Espino Devine
Chevron Environmental Management Co.
6101 Bollinger Canyon Road
San Ramon, CA
(sent via electronic mail to espino@chevron.com)

Mr. Mark Hom and Anna Cheng
3135 Gibbons Drive
Alameda, CA, 94501-1749
(sent via electronic mail to mark@galvinhom.com)

JL and Jane Bolton
Address Unknown

John Thompson
Address Unknown

Shirley & Ruben Cohen
Address Unknown

Gary & Jerri Fenstermaker
Address Unknown

Claire Cepollina & Fred Martini
Address Unknown

Subject: Request for Site Conceptual Model and Data Gap Work Plan; Fuel Leak Case No. RO0000341; (Global ID # T0600100330); Chevron #9-1153, (3126 Fernside Blvd), 3135 Gibbons Drive, Alameda, CA 94501

Dear Mses. Devine and Cheng, and Mr. Hom:

Alameda County Environmental Health Department (ACEH) staff has reviewed the case file, including the *Subsurface and Crawl Space, Indoor and Ambient Air Investigation Report,* dated April 18, 2012 and the *Second Quarter 2012 Groundwater Monitoring and Sampling Report*, dated July 26, 2012. Both reports were prepared and submitted by Conestoga-Rovers & Associates (CRA) on your behalf. Thank you for submitting the reports. The subsurface report documented the results of the installation of eight soil bores (B-1 to B-8) and the collection of soil samples, and the collection of vapor samples (ambient background, indoor air, and crawl space; for TPHg, BTEX, MTBE, naphthalene, and aliphatic hydrocarbons) in an attempt to understand the potential vapor contribution from subsurface sources beneath the subject site. Background and crawl space vapor concentrations were very similar, reporting benzene concentrations over ESLs for ambient and residential indoor air; however, both crawl space samples reported slightly higher concentrations (except MTBE). Both indoor air samples contained substantially higher concentrations of one or more compounds above outdoor or crawl space air samples. While a building chemical survey was conducted, it does not appear chemical products were removed from the house prior to collection of the indoor air vapor samples in an attempt to determine the contribution from onsite subsurface contamination.

Based on the review of the case file ACEH requests that you address the following technical comments and send us the documents requested below.

TECHNICAL COMMENTS

1. **Proposed Surfactant Enhanced Recovery Corrective Actions** - The referenced investigation report also contained a modified work plan largely based on a previous work plan (January 14, 2010 *Work Plan for Remediation and Vapor Survey),* that recommended surfactant enhanced recovery (SER) with a surfactant injection pilot test at free-phase well C-1. The recent work plan proposed the installation of two wells approximately 15 to 20 feet down and cross gradient (respectively) to monitor for the presence of surfactant in groundwater radially from the proposed

injection point at well C-1. Review of groundwater gradient maps and associated rose diagrams indicate that both proposed well locations are not appropriately positioned (are not downgradient of well C-1) to properly monitor or capture liberated soil free-phase hydrocarbons at the site unless the wells become extraction wells to manage (and confine) groundwater flow to the site. Critically, one of the principal rationales for the proposed SER is vicinity and property owner complaints related to remediation system noise. Otherwise, because free-phase well C-1 is essentially at the property line limits of the parcel, downgradient migration of free-phase cannot be precluded or controlled between individual short duration extraction events without an active system. Further the reported limited ability to locate bores or wells due to property owner preferences and exclusions, also indicates that the location of additional groundwater control wells (or bores) is also likely to be difficult to identify and limited. Thus while only well C-1 contains free-phase, existing data (confirmed and augmented by data collected in the recent site investigation), continues to indicate significant hydrocarbon contamination remains, at a minimum, in the majority of the southeastern half of the site; including significant concentrations at a depth of three feet, three to four feet from the foundation of a residential home (and is therefore presumed to also under lie the home due to likely source areas). ACEH also remains sufficiently concerned that the C-1 well pilot test might thus become essentially a spot treatment of a free-phase well without an apparent ability to also remediate elevated residual soil contamination across the site including in close proximity to the residential living spaces. As such SER appears to be an inappropriate remedial technology without the installation of a method to capture, manage, and collect liberated free-phase, and to monitor and remediate soil beneath the site, and ACEH does not concur with this approach.

2. **Request for SCM and Data Gap Work Plan** – ACEH requests the generation of an site conceptual model (SCM) to identify data gaps at the subject site, accompanied with a data gap work plan. One of several data gaps noted by ACEH includes an onsite well downgradient (east) of well C-1. It is understood that wells MW-8, MW-9, and MW-10 are downgradient and are non-detectable for hydrocarbon compounds found at the subject site; however, well placement limitations imposed by the five-star intersection (of three roads) and the presence of a major utility corridor along High Street, with multiple utilities located in the groundwater bearing zone, suggests a strong potential for direct migration to the Oakland – Alameda Estuary. While it is understood that the utilities may have used native soils as backfill, and that this is typically suggested not to create preferential pathways, ACEH also has direct experience with similar Alameda backfills acting as preferential pathways. A well positioned closer would serve multiple purposes onsite.

   The SCM will help synthesize all the analytical data and evaluate all potential exposure pathways and potential receptors that may exist at the site, including identifying or developing site cleanup objectives and goals. At a minimum, the SCM should include:

   - Local and regional plan view maps that illustrate the location of sources (former facilities, piping, tanks, etc.) extent of contamination, direction and rate of groundwater flow, potential preferential pathways, and locations of receptors;
   - Geologic cross section maps that illustrate subsurface features, man-made conduits, and lateral and vertical extent of contamination;
   - Plots of chemical concentrations versus time;
   - Plots of chemical concentrations versus distance from the source;
   - Summary tables of chemical concentrations in different media (i.e. soil, groundwater, and soil vapor); and
   - Well logs, boring logs, and well survey maps;
   - Discussion of likely contaminant fate and transport.

   For data gaps (i.e. potential contaminant volatilization to indoor air or contaminant migration along preferential pathways, etc.) identified in the SCM please include a data gap work plan, by the

date specified below. A sample SCM and Data Gap Table has been attached to this letter and may be an appropriate format for this site.

3. **Crawl Space, Indoor, and Ambient Air Analytical Results** – As noted above both ambient air and crawl space samples reported very similar concentrations, with slightly higher concentrations of most analytes (TPHg and BTEX) in the crawl space vapor samples; while significantly higher indoor air concentrations for the same analytes were reported. The subsequent analysis suggested that the indoor air samples were within a typical range for indoor air and cited data from six studies as support (Table D of the report, and derived in part from the November 2002 *Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway form Groundwater and Soils [Subsurface Vapor Intrusion Guidance]* and the 2005 DTSC guidance document). ACEH has several technical concerns in regards with the analysis:

    a. **Age of Cited Source Studies** – The majority of the references cited predate the 1996 gasoline reformulation at the Federal level. One of the goals of gasoline reformulation was the reduction of benzene concentrations by approximately 50% by that date. Further reductions in benzene concentrations have followed, especially in California, with the required addition of MTBE in the late 1990's and the associated removal of benzene at that time (with subsequent further modifications in 2003 with the required removal of MTBE). The concentrations of benzene in the cited studies would be expected to reflect higher benzene source concentrations (including gasoline). These higher concentrations would also be expected to affect the background concentration of benzene inside or around (outside) homes at the time of the study. Consequently, it would appear inappropriate to compare older studies, which are likely to generate higher background benzene concentrations, to current generation gasoline formulations or analytical results.

    b. **Indoor Air Vapor Source Accounting** – As reported, the indoor air vapor concentrations were significantly higher than crawl space or ambient outdoor air concentrations and largely attributed higher indoor air concentrations to proximity of the garage and automotive gasoline use, and the laundry room which contained several consumer cleaning products, but which did not have a clear associated chemical content connection. Despite the generation of a chemical product inventory, the report did not otherwise seek to specifically identify other potential sources that would account for the significantly elevated indoor air concentrations.

    As a consequence of these concerns, ACEH requests further analysis of the analytical results of the vapor survey in the SCM, and inclusion of any associated data gaps in the data gap work plan requested above. One such data gap solution identified by ACEH may be the collection of sub-slab vapor samples from beneath the garage slab floor.

4. **Groundwater Monitoring of Recovery Well** – Recovery well RW-1 does not appear to have been monitored in recent history; however, appears to be extant. ACEH requests that it be incorporated into the current monitoring schedule, after it has been redeveloped. Please include redevelopment field sheets for the well in the next groundwater monitoring report, and past analytical data in all future groundwater monitoring reports, by the dates identified below.

5. **Groundwater Monitoring Schedule** – Except for well C-1, wells at the site are sampled on a semi-annual or annual basis; well C-1 is monitored on a quarterly basis. Review of the analytical data collected from downgradient well MW-10 (non-detectable for all compounds for over 11 years) indicates that sufficient and very consistent data indicates that well MW-10 should also be monitored on an annual sampling basis. Free-phase well C-1 should continue to be monitored on a quarterly (or more frequent) basis; however, ACEH requests that the data be reported on a semi-annual basis, as defined below.

6. **Request for an Updated Site Plan** – The current site plan does not appear to reflect site features as visible on aerial photograph map searches. As a consequence ACEH requests that an updated site plan be generated for future reports.

TECHNICAL REPORT REQUEST

Please upload technical reports to the ACEH ftp site (Attention: Mark Detterman), and to the State Water Resources Control Board's Geotracker website, in accordance with the specified file naming convention below, according to the following schedule:

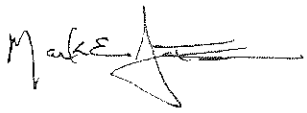
- **October 19, 2012** – SCM and Data Gap Work Plan
  File to be named: SCM_WP_R_yyyy-mm-dd
- **November 30, 2012** – Second Semi-Annual 2012 Groundwater Monitoring Report
  File to be named: GWM_R_yyyy-mm-dd
- **May 24, 2013** – First Semi-Annual 2013 Groundwater Monitoring
  File to be named: GWM_R_yyyy-mm-dd
- **60 Days After SCM & Data Gap Work Plan Approval** – Soil & Groundwater Investigation
  File to be named: SWI_R_yyyy-mm-dd
- **90 Days After SWI Approval** – Feasibility Study
  File to be named: FEASSTUD_R_yyyy-mm-dd

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.

Online case files are available for review at the following website: http://www.acgov.org/aceh/index.htm.

If you have any questions, please call 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: 2012.08.31 10:27:55 -07'00'

Mark E. Detterman, PG, CEG
Senior Hazardous Materials Specialist

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

cc: Nathan Lee, Conestoga-Rovers & Assoc., 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)
Electronic File, GeoTracker

Attachment 1

Responsible Party(ies) Legal Requirements/Obligations

REPORT/DATA REQUESTS

These reports/data are being requested pursuant to Division 7 of the California Water Code (Water Quality), Chapter 6.7 of Division 20 of the California Health and Safety Code (Underground Storage of Hazardous Substances), and Chapter 16 of Division 3 of Title 23 of the California Code of Regulations (Underground Storage Tank Regulations).

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (Local Oversight Program [LOP] for unauthorized releases from petroleum Underground Storage Tanks [USTs], and Site Cleanup Program [SCP] for unauthorized releases of non-petroleum hazardous substances) require submission of reports in electronic format pursuant to Chapter 3 of Division 7, Sections 13195 and 13197.5 of the California Water Code, and Chapter 30, Articles 1 and 2, Sections 3890 to 3895 of Division 3 of Title 23 of the California Code of Regulations (23 CCR). Instructions for submission of electronic documents to the ACEH FTP site are provided on the attached "Electronic Report Upload Instructions."

Submission of reports to the ACEH FTP site is in addition to requirements for electronic submittal of information (ESI) to the State Water Resources Control Board's (SWRCB) Geotracker website. In April 2001, the SWRCB adopted 23 CCR, Division 3, Chapter 16, Article 12, Sections 2729 and 2729.1 (Electronic Submission of Laboratory Data for UST Reports). Article 12 required electronic submittal of analytical laboratory data submitted in a report to a regulatory agency (effective September 1, 2001), and surveyed locations (latitude, longitude and elevation) of groundwater monitoring wells (effective January 1, 2002) in Electronic Deliverable Format (EDF) to Geotracker. Article 12 was subsequently repealed in 2004 and replaced with Article 30 (Electronic Submittal of Information) which expanded the ESI requirements to include electronic submittal of any report or data required by a regulatory agency from a cleanup site. The expanded ESI submittal requirements for petroleum UST sites subject to the requirements of 23 CCR, Division, 3, Chapter 16, Article 11, became effective December 16, 2004. All other electronic submittals required pursuant to Chapter 30 became effective January 1, 2005. Please visit the SWRCB website for more information on these requirements. (http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal/)

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, 7835, 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, late 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.

Alameda County Environmental Cleanup Oversight Programs (LOP and SCP)	**REVISION DATE:** July 25, 2012
	ISSUE DATE: July 5, 2005
	PREVIOUS REVISIONS: October 31, 2005; December 16, 2005; March 27, 2009; July 8, 2010
SECTION: Miscellaneous Administrative Topics & Procedures	**SUBJECT:** Electronic Report Upload (ftp) Instructions

The Alameda County Environmental Cleanup Oversight Programs (petroleum UST and SCP) require submission of all reports in electronic form to the county's FTP site. Paper copies of reports will no longer be accepted. The electronic copy replaces the paper copy and will be used for all public information requests, regulatory review, and compliance/enforcement activities.

REQUIREMENTS

- **Please do not submit reports as attachments to electronic mail.**
- Entire report including cover letter must be submitted to the ftp site as **a single Portable Document Format (PDF) with no password protection**.
- It is **preferable** that reports be converted to PDF format from their original format, (e.g., Microsoft Word) rather than scanned.
- **Signature pages and perjury statements must be included and have either original or electronic signature.**
- **Do not password protect the document**. Once indexed and inserted into the correct electronic case file, the document will be secured in compliance with the County's current security standards and a password. **Documents with password protection will not be accepted**.
- Each page in the PDF document should be rotated in the direction that will make it easiest to read on a computer monitor.
- Reports must be named and saved using the following naming convention:

  RO#_Report Name_Year-Month-Date (e.g., RO#5555_WorkPlan_2005-06-14)

Submission Instructions

1) Obtain User Name and Password
   a) Contact the Alameda County Environmental Health Department to obtain a User Name and Password to upload files to the ftp site.
      i) Send an e-mail to deh.loptoxic@acgov.org
   b) In the subject line of your request, be sure to include **"ftp PASSWORD REQUEST"** and in the body of your request, include the **Contact Information, Site Addresses**, and the **Case Numbers (RO# available in Geotracker) you will be posting for**.

2) Upload Files to the ftp Site
   a) Using Internet Explorer (IE4+), go to ftp://alcoftp1.acgov.org
      (i) Note: Netscape, Safari, and Firefox browsers will not open the FTP site as they are NOT being supported at this time.
   b) Click on Page located on the Command bar on upper right side of window, and then scroll down to Open FTP Site in Windows Explorer.
   c) Enter your User Name and Password. (Note: Both are Case Sensitive.)
   d) Open "My Computer" on your computer and navigate to the file(s) you wish to upload to the ftp site.
   e) With both "My Computer" and the ftp site open in separate windows, drag and drop the file(s) from "My Computer" to the ftp window.

3) Send E-mail Notifications to the Environmental Cleanup Oversight Programs
   a) Send email to deh.loptoxic@acgov.org notify us that you have placed a report on our ftp site.
   b) Copy your Caseworker on the e-mail. Your Caseworker's e-mail address is the entire first name then a period and entire last name @acgov.org. (e.g., firstname.lastname@acgov.org)
   c) The subject line of the e-mail must start with the RO# followed by **Report Upload**. (e.g., Subject: RO1234 Report Upload) If site is a new case without an RO#, use the street address instead.
   d) If your document meets the above requirements and you follow the submission instructions, you will receive a notification by email indicating that your document was successfully uploaded to the ftp site.