



Mike Bauer
Project Manager
Marketing Business Unit

**Chevron Environmental
Management Company**
145 S. State College Blvd
Brea, CA 92821
Tel (714) 671-3200
Fax (714) 671-3440
mbauer@chevron.com

July 10, 2012

Mr. Jerry Wickham
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

RECEIVED

10:13 am, Jul 11, 2012

**Alameda County
Environmental Health**

Re: Former Signal Oil Marine Storage and Distribution Facility
(Former Chevron Bulk Plant 20-6127)
2301-2311 Blanding Avenue
Alameda, California
LOP Case RO0002466

Dear Mr. Wickham:

The purpose of this letter is to verify that as a representative for Chevron Environmental Management Company (Chevron), I reviewed, and concur with, the comments in the *Tidal Survey Work Plan* for the referenced facility, prepared on behalf of Chevron by Conestoga-Rovers & Associates.

Please feel free to contact me at (714) 671-3207 if you have any questions.

Sincerely,

A handwritten signature in blue ink that reads "Mike Bauer".

Mike Bauer
Project Manager



**CONESTOGA-ROVERS
& ASSOCIATES**

10969 Trade Center Drive, Suite 107
Rancho Cordova, California 95670
Telephone: (916) 889-8900 Fax: (916) 889-8999
www.CRAworld.com

July 10, 2012

Reference No. 631916

Mr. Jerry Wickham
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Re: Tidal Survey Work Plan and Request for
Monitoring and Sampling Frequency Reduction
Former Signal Oil Marine Storage and Distribution Facility
(Chevron Bulk Plant 206127)
2301-2311 Blanding Avenue
Alameda, California
SLIC Case RO0002466

Dear Mr. Wickham:

Conestoga-Rovers & Associates (CRA) is submitting this work plan on behalf of Chevron Environmental Management Company (Chevron) for the site referenced above. In a letter dated May 3, 2012 (Attachment A), Alameda County Environmental Health (ACEH) requested a tidal survey work plan be prepared to augment a previously proposed tidal study to evaluate the interaction between onsite groundwater flow and potential mass flux to Alameda Canal. As a result, an additional piezometer will be installed at the site as close the canal as possible and pressure transducers capable of measuring water level changes and conductivity will be installed in the proposed piezometer and existing site wells. Site background, including a site description, site geology and hydrogeology, and our proposed scope of work are presented below.

SITE BACKGROUND

Site Description

The approximately 3.5-acre site is located on the northeast side of Blanding Avenue between Oak and Park Streets in Alameda, California (Figures 1 and 2). Land use in the site vicinity is primarily commercial and industrial. The Alameda Canal and a marina are located adjacent to the northeast side of the site. The site is currently occupied by three large commercial buildings, which are used for office, retail, and storage space, and identified as Park Street Landing at 2307-2337 Blanding Avenue. A summary of the site history dating back to 1897 and previous environmental investigation are included as Attachment B.

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July 10, 2012

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Site Geology and Hydrogeology

Based on past investigation, the soils encountered beneath the site generally consist of silty sand and clayey sand from just beneath grade to approximately 5 to 9 feet below grade (fbg). Fill consisting of black sand and debris, including concrete fragments, has been reported in several borings at shallow depths. A 4 to 5 foot-thick layer of clay with some sand underlies the silty sand and clayey sand. Below the clay is silty sand and sandy silt to the maximum depth explored of approximately 20.5 fbg. Groundwater is typically encountered in site borings at approximately 14.5 to 15 fbg within the silty sand and sandy silt, and subsequently rises in the borings/wells to approximately 7 to 10 fbg suggesting the groundwater beneath the site is semi-confined.

PROPOSED SCOPE OF WORK

CRA proposes installing a piezometer in the vicinity of shallow grab-groundwater sample GWS-9 (Figure 2). The location of the piezometer was selected generally downgradient of well MW-1RA and may change dependent on access and/or subsurface conditions. As noted in previous reports and boring logs, the bermed area adjacent to Alameda Canal where wells MW-1RA/1RB and MW-6 are located contains large pieces of buried debris, including concrete rip-rap making hand clearing and drilling difficult. Additionally, access for a drilling rig is limited by several trees and other vegetation present in this area (Figure 3). Every reasonable attempt will be made to install the requested piezometer. Further details regarding the proposed scope of work are presented below.

Site Health and Safety Plan

CRA will prepare a comprehensive site health and safety plan to protect site workers. The plan will be reviewed and signed by each site worker and kept with the field crew during field activities.

Permits

CRA will obtain the necessary well installation permits from Alameda County prior to commencing drilling activities.



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Underground Utility Location

CRA will mark the proposed boring locations and notify Underground Service Alert (USA) of planned drilling activities. USA will be updated at least 48 hours prior to field work. CRA will subcontract a private utility locator to further identify potential subsurface utilities and underground obstructions. As previous attempts to drill in the canal berm area in 2009 and in 2010 encountered numerous underground obstructions at approximately 4 feet, ground penetrating radar (GPR) will be utilized to determine the final location of the proposed piezometer. Prior to advancing the boring, the proposed location will be hand augered or vacuum excavated to 8 fbg to confirm utility clearance.

Piezometer Installation

After the boring for the piezometer has been hand cleared to 8 fbg, hollow-stem augers or direct push equipment will be advanced to approximately 20 fbg. Soil cuttings collected during hand clearing will be logged to 8 fbg. Below 8 fbg, soil will be collected in acetate liners and logged continuously. Soil samples will be screened in the field with a photoionization detector (PID). Soil type will be logged using the Unified Soil Classification System. Since soil data has already been collected from nearby well MW-1RB, no soil samples will be collected for chemical analysis. The piezometer will be constructed using 1-inch diameter, schedule 40 polyvinyl chloride (PVC) casing with a 0.020-inch machine slotted screen from approximately 11 to 20 fbg (targeting the silty sand/sandy silt layer encountered at 11 to 14 fbg across the site). The filter pack will consist of #2/12 Monterey sand placed in the annulus from the bottom of the boring to approximately 1 foot above screen interval. The well annulus will have a 3-foot bentonite seal above the filter pack, and the remaining annulus will be filled with neat Portland cement to 1 foot below the surface. The well will be enclosed in a traffic rated well box set in concrete flush with or just above the surface.

Waste Disposal

Soil cuttings and rinse water generated during drilling activities will be stored temporarily onsite in Department of Transportation approved 55-gallon drums until they can be transported to a Chevron-approved facility for disposal.

Tidal Survey

The primary intent of the tidal study is to better define groundwater and surface water interaction near Alameda Canal and to evaluate mass flux between the site and the canal. Effects of tides, subsurface saline/freshwater interactions and stratigraphy on groundwater



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Reference No. 631916

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flow and potential differences in flow versus depth will be considered. The tidal study will include the following elements:

- Conduct the study a minimum of two weeks following a regularly scheduled groundwater monitoring event to allow equilibrium conditions to be reached in sampled wells
- Install pressure transducers capable of measuring water level changes and conductivity on a real time basis in site monitoring wells and the newly installed piezometer (transducers will be installed near the midpoint of each screened interval, where practical)
- Install a transducer in a temporary “stilling well” installed on the pier to collect actual sea-level data
- Install a barometric transducer in a protected area onsite (avoiding temperature extremes, fluids, vibration/motion and damage) to monitor ambient barometric pressure
- Collect transducer measurements over an approximate two-week period spanning high and low tide events
- Collect periodic, manual depth-to-water measurements in each of the monitoring wells containing transducers during the two-week monitoring period for calibration and backup data

Reporting

Upon completion of the above piezometer installation activities and performance of the tidal survey, CRA will prepare a summary report.

The report will include:

- A summary of piezometer installation activities
- Boring/well log
- Summary and evaluation of tidal survey data
- CRA’s conclusions and recommendations

Schedule

CRA will begin scheduling the proposed work upon approval of this work plan by the ACEH. CRA will submit the summary report approximately 12 weeks following the conclusion of the tidal survey.



**CONESTOGA-ROVERS
& ASSOCIATES**

July 10, 2012

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Request for Monitoring and Sampling Frequency Reduction

Pursuant to Resolution 2009-0042, CRA would like to request that the monitoring and sampling frequency for the site wells be reduced from quarterly to semi-annual (first and third quarter). All site wells have been monitored and sampled for more than one year and hydrocarbons concentrations are stable to declining.

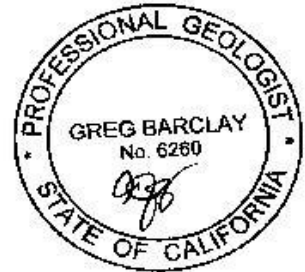
We appreciate the opportunity to work with you on this project. Please contact Mr. Brian Silva at (916) 889-8908 if you have any questions or require additional information.

Sincerely,

CONESTOGA-ROVERS & ASSOCIATES

Brian Silva

Greg Barclay, PG 6260



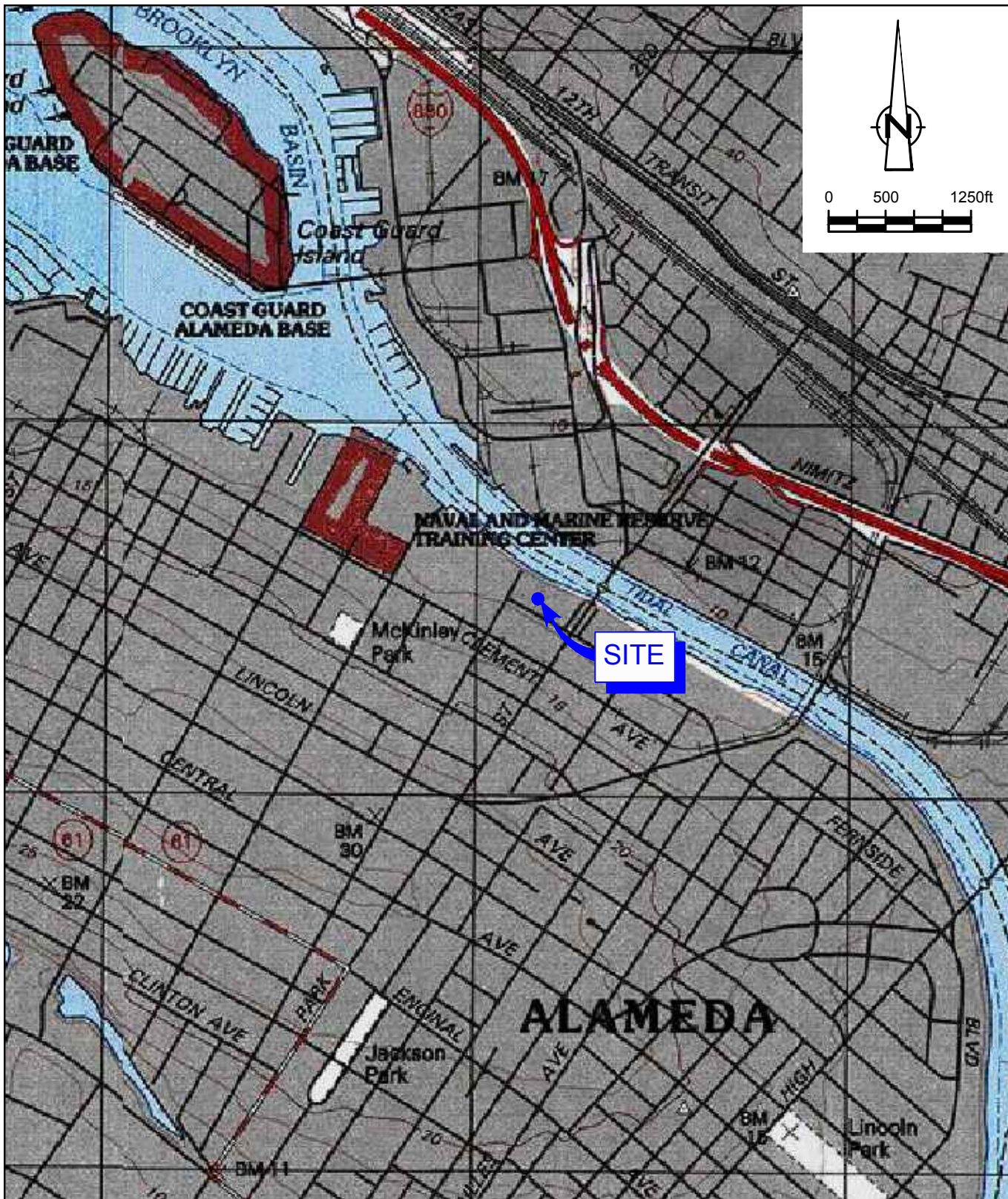
BS/de/26
Encl.

Figure 1 Vicinity Map
Figure 2 Site Plan
Figure 3 Aerial Site Plan

Attachment A Regulatory Correspondence
Attachment B Summary of Site History and Previous Environmental Work

cc: Mike Bauer, Chevron (*electronic only*)
 Julie Beck Ball
 Peter Reinhold Beck
 Monroe Wingate
 Tom Foley, Gallagher & Miersch

FIGURES

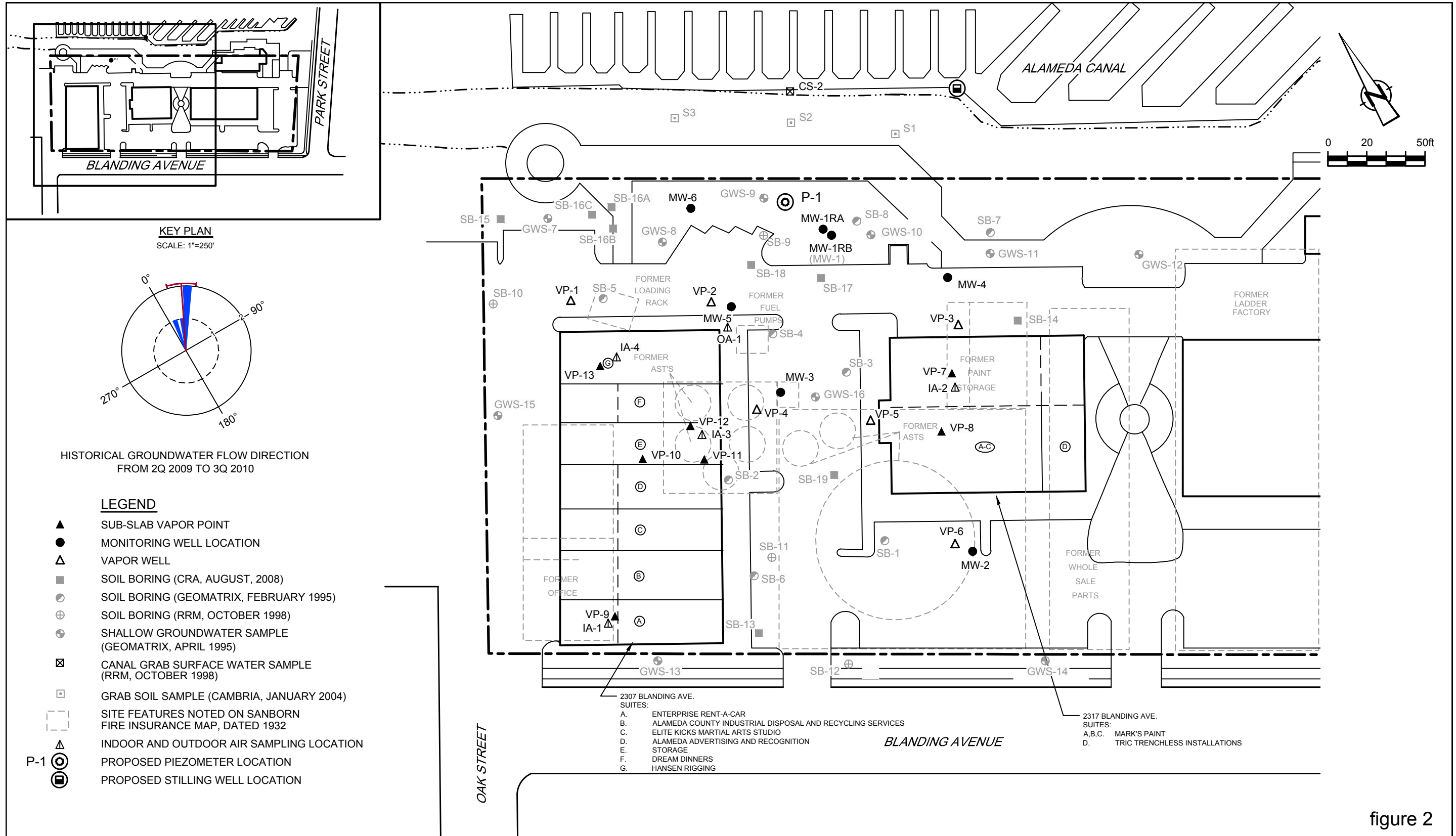


SOURCE: TOPOI MAPS.

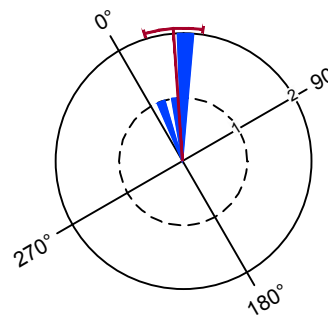
figure 1

VICINITY MAP
 FORMER SIGNAL OIL BULK PLANT (CHEVRON FACILITY 20-6127)
 2301-2311 BLANDING AVENUE
 Alameda, California





KEY PLAN
SCALE: 1"=250'



HISTORICAL GROUNDWATER FLOW DIRECTION
FROM 2Q 2009 TO 3Q 2010

LEGEND

- ▲ SUB-SLAB VAPOR POINT
- MONITORING WELL LOCATION
- △ VAPOR WELL
- SOIL BORING (CRA, AUGUST, 2008)
- ⊙ SOIL BORING (GEOMATRIX, FEBRUARY 1995)
- ⊕ SOIL BORING (RRM, OCTOBER 1998)
- ⊕ SHALLOW GROUNDWATER SAMPLE (GEOMATRIX, APRIL 1995)
- ⊗ CANAL GRAB SURFACE WATER SAMPLE (RRM, OCTOBER 1998)
- GRAB SOIL SAMPLE (CAMBRIA, JANUARY 2004)
- SITE FEATURES NOTED ON SANBORN FIRE INSURANCE MAP, DATED 1932
- △ INDOOR AND OUTDOOR AIR SAMPLING LOCATION
- ⊙ P-1 PROPOSED PIEZOMETER LOCATION
- ⊕ PROPOSED STILLING WELL LOCATION

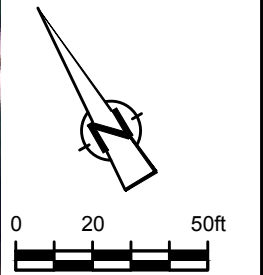
- 2307 BLANDING AVE. SUITES:
- A. ENTERPRISE RENT-A-CAR
 - B. ALAMEDA COUNTY INDUSTRIAL DISPOSAL AND RECYCLING SERVICES
 - C. ELITE KICKS MARTIAL ARTS STUDIO
 - D. ALAMEDA ADVERTISING AND RECOGNITION
 - E. STORAGE
 - F. DREAM DINNERS
 - G. HANSEN RIGGING

- 2317 BLANDING AVE. SUITES:
- A,B,C. MARK'S PAINT
 - D. TRIC TRENCHLESS INSTALLATIONS

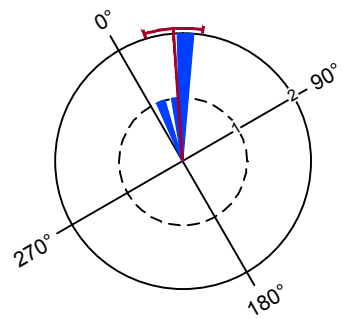
figure 2
SITE PLAN
FORMER SIGNAL OIL MARINE STORAGE AND DISTRIBUTION FACILITY
(CHEVRON FACILITY 20-6127)
2301-2311 BLANDING AVENUE
Alameda, California

NOTE:
WELL LOCATIONS ARE BASED ON MAP PROVIDED BY MORROW SURVEYING (DWG NO.0857-149 ct, DATED 7-30-09).
ALL OTHER LOCATIONS ARE APPROXIMATE.





KEY PLAN
SCALE: 1"=250'



HISTORICAL GROUNDWATER FLOW DIRECTION
FROM 2Q 2009 TO 3Q 2010

- LEGEND**
- MONITORING WELL LOCATION
 - P-1 ○ PROPOSED PIEZOMETER LOCATION
 - PROPOSED STILLING WELL LOCATION

figure 3

AERIAL SITE PLAN
FORMER SIGNAL OIL MARINE STORAGE AND DISTRIBUTION FACILITY
(CHEVRON FACILITY 20-6127)
2301-2311 BLANDING AVENUE
Alameda, California

ATTACHMENT A
REGULATORY CORRESPONDENCE



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

May 3, 2012

Mr. Mike Bauer
Chevron Environmental Management Company
145 S. State College Blvd.
Brea, CA 92821

Ms. Julie Beck Ball
Mr. Peter Reinhold Beck
2720 Broderick Street
San Francisco, CA 94123

Subject: Case File Review for SLIC Case No. RO0002466 and GeoTracker Global ID T06019744728, Park Street Landing 2301-2337 Blanding Avenue, Alameda, CA 94501

Dear Mr. Bauer and Ms. Ball:

Alameda County Environmental Health (ACEH) staff has reviewed the Spills, Leaks, Investigations, and Cleanups (SLIC) case file for the above referenced site including the documents entitled, "*Draft Corrective Action Plan*," dated August 18, 2011 and "*First Quarter 2012 Groundwater Monitoring and Sampling Report*," dated February 28, 2012. Both documents were prepared on Chevron's behalf by Conestoga-Rovers & Associates. The "*Draft Corrective Action Plan*," dated August 18, 2011 (CAP) reviews possible remedial technologies and presents recommendations regarding feasible remedial alternatives. Based on this review, the CAP recommends an updated tidal survey in order to evaluate a monitored natural attenuation (MNA) alternative. A tidal survey would consist of installing transducers in site wells and the Alameda Tidal Canal for a period of 3 days.

We do not concur with the tidal survey as currently recommended and request that you submit a Tidal Survey Work Plan that addresses the technical comments below. The viability of an MNA alternative could only be considered based upon the results of a more definitive tidal survey and mass flux estimation.

TECHNICAL COMMENTS

- 1. Tidal Monitoring Locations.** Limiting the tidal survey to existing wells and one location in the Alameda Tidal Canal does not appear to be sufficient to monitor tidal interaction and accurately estimate flux to the canal. We request that you add one to two piezometers between the Alameda Tidal Canal and monitoring wells MW-1RA and MW-1RB for use in the tidal survey. We also request that you include transducers that are capable of measuring water level changes and conductivity on a real time basis in order to help evaluate surface water and groundwater mixing within the zone of tidal fluctuation.
- 2. Groundwater Monitoring.** The proposal in the "First Quarter 2012 Groundwater Monitoring Report," to continue quarterly groundwater monitoring on the established schedule is generally acceptable. However, ACEH will consider a revised schedule in the Tidal Survey Work Plan requested below.

Responsible Parties
RO0002466
May 3, 2012
Page 2

TECHNICAL REPORT REQUEST

Please submit technical reports to Alameda County Environmental Health (Attention: Jerry Wickham), according to the following schedule:

- **June 30, 2012** – Second Quarter 2012 Groundwater Monitoring Report
- **July 10, 2012** – Tidal Survey Work Plan

If you have any questions, please call me at 510-567-6791 or send me an electronic mail message at jerry.wickham@acgov.org. Online case files are available for review at the following website: <http://www.acgov.org/aceh/index.htm>. If your email address does not appear on the cover page of this notification, ACEH is requesting you provide your email address so that we can correspond with you quickly and efficiently regarding your case.

Sincerely,

Jerry Wickham, California PG 3766, CEG 1177, and CHG 297
Senior Hazardous Materials Specialist

Attachment: Responsible Party(ies) Legal Requirements/Obligations

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: Mr. Brian Silva, Conestoga-Rovers & Associates, 10969 Trade Center Drive, Suite 107, Rancho Cordova, CA 95670 (Sent via E-mail to: bsilva@croworld.com)

Mr. Monroe Wingate, C/o Alan Wingate, 18360 Carriger Road, Sonoma, CA 95476

Donna Drogos, ACEH (Sent via E-mail to: donna.drogos@acgov.org)

Jerry Wickham, ACEH (Sent via E-mail to: jerry.wickham@acgov.org)

GeoTracker, e-File

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.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, 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.

Alameda County Environmental Cleanup Oversight Programs (LOP and SLIC)	REVISION DATE: July 20, 2010
	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 (LOP and SLIC) 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.

ATTACHMENT B

SUMMARY OF SITE HISTORY AND PREVIOUS ENVIRONMENTAL WORK

PREVIOUS ENVIRONMENTAL INVESTIGATION
FORMER SIGNAL OIL MARINE STORAGE AND DISTRIBUTION FACILITY 20-6127
(CHEVRON 20-6127)

Site History

A Sanborn map dated 1897 showed the site as occupied by several residential structures and outbuildings; the southeast portion of the site was shown as occupied by a laundry facility and a blacksmith. From at least 1930 until approximately 1961, the northwestern portion of the site was occupied by a petroleum bulk plant operated by Signal Oil & Gas Company. Former bulk plant facilities consisted of one large and seven smaller gasoline aboveground storage tanks (ASTs) within concrete secondary containment, underground piping, an office building, a loading rack, and a small structure containing gasoline pumps (Figure 2). The northeast portion of the facility was shown as occupied by a structure identified as an auto garage and also used for paint storage on Sanborn maps dated between 1932 and 1950. A rail spur was shown to service the facilities on Blanding Avenue. The central portion of the site was shown as occupied by two structures identified as wholesale tires and a can warehouse. An additional larger structure was shown in the central portion of the site that was identified as vacant on the 1948 Sanborn map and as a ladder factory on the 1950 Sanborn map. Several structures appeared to be present in the southeast portion of the site in the 1939 aerial photograph. However, only one or two small sheds were shown in this area on the 1948 and 1950 Sanborn maps. In the 1958 aerial photograph, the ladder factory structure no longer appeared present and the southeast portion of the site appeared vacant and used for parking. Between 1957 and 1963, the buildings at the site were reportedly removed; it is assumed that the ASTs and piping were also removed at this time. In the 1965 aerial photograph, all the bulk plant facilities appear to have been removed and the majority of the site appears occupied by a construction materials yard with several small structures. Several additional structures also appear present in the southeast portion of the site. From 1973 to 1983, the northwestern portion of the site reportedly was used as a construction yard and for boat repair activities; and the southeastern portion was occupied by a restaurant, paved parking area, and a possible automobile sales lot. In 1987, the site was redeveloped with the current configuration.

1995 Soil and Groundwater Investigation

In February 1995, Geomatrix Consultants, Inc. (Geomatrix) advanced eight soil borings (SB-1 through SB-8) to approximately 10 feet below grade (fbg) in the northwestern portion of the site to evaluate if previous site uses had impacted soil and groundwater quality. Groundwater was not encountered in the borings. Two to three soil samples were collected at various depths from each boring for laboratory analysis. Nineteen samples were analyzed for total petroleum hydrocarbons as gasoline (TPHg) and diesel (TPHd); and benzene, toluene, ethylbenzene, and xylenes (BTEX). TPHg was detected in six of the samples at concentrations ranging from 4.0 to 2,000 milligrams per kilogram (mg/kg). TPHd was detected in the majority of the samples at concentrations ranging from 10 to 250 mg/kg. BTEX were also detected in several of the samples (benzene up to 3.7 mg/kg). The highest concentrations of petroleum hydrocarbons generally were detected in borings SB-2 and SB-4 located in the vicinity of the former ASTs and

gasoline pump, respectively, between 4 and 7 fbg. One sample from each boring (depths ranging from 0.5 to 3 fbg) was also analyzed for CAM 17 metals. The detected metals concentrations generally appeared to be within the range of natural background levels with the exception of slightly elevated arsenic in a few samples. Arsenic was detected in the samples collected at 1 fbg from borings SB-3, SB-4, and SB-6 at 68 mg/kg, 46 mg/kg, and 130 mg/kg, respectively. As a result, deeper samples collected from borings SB-3 (6.5 fbg) and SB-6 (8 fbg) were also analyzed for arsenic; arsenic was not detected in the sample collected from SB-3, but was detected at 2.5 mg/kg in the sample collected from SB-6. Based on these results, the soil impacted with arsenic appeared to be of limited vertical extent. Three soil samples (SB-4-7', SB-5-6', and SB-8-7') were also analyzed for VOCs, which were not detected. Based on the soil analytical results, a shallow groundwater survey was recommended to evaluate if groundwater had been impacted by petroleum hydrocarbons.

In April 1995, Geomatrix collected grab-groundwater samples from 10 shallow borings (GWS-7 through GWS-16) drilled to depths of 15 to 21.5 fbg at the site. Borings GWS-7 through GWS-12 were located in the northeastern portion of the site adjacent to Alameda Canal to evaluate if impacted groundwater was flowing toward the canal; based on an assumed groundwater flow direction toward the canal. Borings GWS-13 through GWS-15 were located on the southwest and northwest property boundaries in the assumed upgradient and perimeter crossgradient directions to evaluate the quality of groundwater coming onto the site. Boring GWS-16 was located to the northeast of the former ASTs and was drilled approximately 6 feet deeper than the remaining borings to evaluate deeper groundwater quality. The groundwater samples were analyzed for TPHg, BTEX, and TPHd; the samples were filtered by the laboratory to remove turbidity and a silica-gel cleanup was performed to remove non-petroleum organic matter prior to the TPHd analysis. TPHg was detected in the samples collected from borings GWS-8 through GWS-11 and GWS-16 at concentrations ranging from 70 (GWS-16) to 22,000 micrograms per liter ($\mu\text{g/L}$) (GWS-9). TPHd was detected in the samples collected from borings GWS-8 through GWS-11 at concentrations ranging from 60 (GWS-8) to 1,200 $\mu\text{g/L}$ (GWS-9). Benzene was detected in the samples collected from borings GWS-8 through GWS-10 and GWS-16 at concentrations of 36 $\mu\text{g/L}$, 6,200 $\mu\text{g/L}$, and 880 $\mu\text{g/L}$, respectively. Toluene, ethylbenzene, and xylenes (up to 1,200 $\mu\text{g/L}$) were also detected in several of the samples. The maximum concentrations were detected in boring GWS-9 located downgradient of the gasoline pump and loading rack. Petroleum hydrocarbons were not detected in the upgradient borings GWS-13 through GWS-15. The deeper sample (GWS-16) contained only low to trace hydrocarbon concentrations.

A black granular material was encountered in boring GWS-7 in the northern corner of the site from approximately 2.5 to 6 fbg. This material appeared similar to a small pile of black granular material observed on the northwestern property boundary that appeared to have originated from the adjacent property (a metal fabrication company). A sample of this material was collected and analyzed for TPHd, VOCs, semi-VOCs, and CAM 17 metals. An elevated concentration of copper (1,700 mg/kg) was detected in the sample. The detected concentration did not exceed the Total Threshold Limit Concentration (TTL) of 2,500 mg/kg, which is the concentration above which a waste may be considered hazardous in California. The sample was also analyzed for soluble copper using the Waste Extraction Test (WET) method; which

was detected at 0.04 milligrams per liter (mg/L). The detected soluble lead concentration did not exceed the Soluble Threshold Limit Concentration (STLC) of 25 mg/L, which is also the concentration above which a waste may be considered hazardous in California. Details of this investigation were presented in the report titled *Soil Investigation and Shallow Groundwater Survey, Northwestern Portion of the Park Street Landing Site*, prepared by Geomatrix and dated September 1995.

1998 RBCA Tier 1 Evaluation

In July 1998, RRM, Inc. (RRM) performed a Tier 1 Risk-Based Corrective Action (RBCA) assessment to evaluate the potential health risks posed by residual petroleum hydrocarbons in soil and groundwater at the site. Based on the results, RRM recommended the collection of site-specific data to complete a Tier 2 RBCA evaluation; the identification of the beneficial uses of groundwater beneath the site; an evaluation of background water quality in Alameda Canal; and to provide evidence that biodegradation was reducing hydrocarbon concentrations. Details of this investigation were presented in the report entitled *Risk-Based Corrective Action (RBCA) Tier 1 Evaluation, Park Street Landing Site*, prepared by RRM and dated July 24, 1998.

1998 Soil and Groundwater Investigation

In October 1998, RRM performed an additional soil and groundwater investigation at the site. The purpose of the investigation was to

1) collect site-specific data to complete a Tier 2 RBCA evaluation; 2) identify the beneficial uses of groundwater beneath the site; 3) evaluate the background water quality in Alameda Canal; and 4) evaluate whether biodegradation of petroleum hydrocarbons was occurring beneath the site. Four additional borings (SB-9 through SB-12) were advanced to depths of 15 to 18 fbg during the investigation. A total of eight soil samples were collected at various depths from the borings and analyzed for TPHg, TPHd, BTEX, and methyl tertiary butyl ether (MTBE). TPHg was detected in the soil samples collected at 5 and 13 fbg from boring SB-9 (130 and 900 mg/kg, respectively); and in the sample collected at 6 fbg from boring SB-11 (140 mg/kg). TPHd was detected in the soil samples collected at 5, 13, and 15 fbg from boring SB-9 (3,300 mg/kg, 1,300 mg/kg, and 1.2 mg/kg, respectively); in the sample collected at 5.5 fbg from boring SB-10 (130 mg/kg); and in the sample collected at 6 fbg from boring SB-11 (60 mg/kg). BTEX (up to 3.3 mg/kg) were detected in the soil samples collected from borings SB-9 and SB-11; MTBE (using EPA Method 8020) was only detected in the sample collected at 13 fbg from boring SB-9 (12 mg/kg). Following the initial TPHd analysis, two rounds of silica gel cleanup followed by TPHd analysis were performed on the soil samples from boring SB-9. The detected TPHd concentrations were reduced after each round, indicating that biodegradation was occurring, and natural organic matter was present in the subsurface.

Grab-groundwater samples were collected from each boring and analyzed for TPHg, TPHd, BTEX, and MTBE. TPHg was only detected in the samples collected from borings SB-9 (14,000 µg/L) and SB-11 (310 µg/L). TPHd was detected in the samples collected from borings SB-9 (83,000 µg/L), SB-10 (97 µg/L), and SB-11 (270 µg/L). Benzene and MTBE (using

EPA Method 8020) were only detected in the sample collected from boring SB-9 (1,400 and 260 µg/L, respectively); the sample was re-analyzed for MTBE using EPA Method 8260, and MTBE was not detected. Toluene, ethylbenzene, and xylenes (up to 630 µg/L) were detected in the samples collected from borings SB-9 and SB-11. As with the soil samples, a silica-gel cleanup reduced the detected TPHd concentrations. Based on the depth to water in the borings, and the elevation of the borings, the groundwater flow direction was calculated to be northerly. Based on natural biodegradation indicator parameters in groundwater (dissolved oxygen, oxidation-reduction potential, nitrate, and sulfate), it appeared that petroleum hydrocarbons were being degraded both aerobically and anaerobically; although it appeared that anaerobic processes dominated.

Three grab-water samples (CS-1 through CS-3) were collected from Alameda Canal (Figure 2) and analyzed for TPHg, TPHd, BTEX, and MTBE; which were not detected. Water level measurements were collected from the Alameda Canal and the four temporary wells placed in borings SB-9 through SB-12 to evaluate potential tidal influence on groundwater beneath the site. The fluctuations in borings SB-10 through SB-12 were minimal indicating that groundwater was tidally influenced to a limited degree in these areas. A more significant fluctuation was observed in SB-9; suggesting that groundwater in this area was tidally influenced, and tidal fluctuations would tend to stabilize the petroleum hydrocarbon plume in this area. Two concrete sea walls separated shallow groundwater beneath the site from canal water; likely causing the limited tidal influence. Based on the site data, relevant beneficial uses, and associated water quality parameters, the most applicable beneficial use of groundwater beneath the site was determined to be freshwater replenishment to surface water.

A well survey was performed for a ½-mile radius around the site. Nine wells were identified within the search radius (one recovery well, one irrigation well, five extraction wells, and two industrial wells). All the wells were either located up-gradient of the site or across the Alameda Canal. Based on the results of the Tier 2 RBCA evaluation, soil and groundwater petroleum hydrocarbon concentrations at the site did not exceed the site-specific target levels (SSTLs). Details of this investigation were presented in the report entitled *Soil and Groundwater Investigation Results, Former Signal Oil Marine Terminal*, prepared by RRM and dated May 7, 1999.

2000 Monitoring Well Installation

In December 2000 Gettler-Ryan Inc., under the supervision of Delta Environmental Consultants, Inc. (Delta), installed one groundwater monitoring well (MW-1) along the northeastern portion of the site adjacent to the Alameda Canal. Soil samples were collected at depths of 5, 10, and 15 fbg from the well boring and analyzed for TPHg, TPHd, BTEX, and MTBE. TPHg was only detected in the sample collected at 10 fbg (320 mg/kg). TPHd was only detected in the samples collected at 5 and 10 fbg (30 and 160 mg/kg, respectively). Low concentrations of BTEX were detected in all the samples; MTBE was not detected in any of the samples. The initial groundwater sample collected from the well contained TPHg, TPHd, and benzene at 5,210 µg/L, 1,100 µg/L, and 868 µg/L, respectively. Details of this investigation were presented

in the report entitled *Monitoring Well Installation Report*, prepared by Delta and dated April 10, 2001.

2004 Soil Investigation

In January 2004, Cambria Environmental Technology, Inc. (Cambria) collected three surface soil samples (S1, S2, and S3) from the bank above the western shore of the Alameda Canal. Sample S2 was collected directly down-slope of well MW-1 near a water seep observed on the slope above the canal. Samples S1 and S3 were collected approximately 70 feet east and 90 feet north of well MW-1, respectively, to evaluate background concentrations. The three samples were analyzed for TPHg, TPHd, BTEX, and MTBE. TPHg, BTEX, and MTBE were not detected in any of the samples. TPHd was detected in samples S1, S2, and S3 at 14 mg/kg, 220 mg/kg, and 220 mg/kg, respectively. The laboratory chromatographs indicated that the hydrocarbon pattern observed in these soil samples was not typical of diesel fuel. Therefore, it was concluded the TPHd detections may have represented either highly-degraded diesel fuel from various historical onsite and nearby operations, or residual organic material of unknown origin present in local fill material. Details of this investigation were presented in the report entitled *Soil Sampling Report*, prepared by Cambria and dated February 18, 2004.

Based on generally decreasing petroleum hydrocarbon concentrations in well MW-1 observed during quarterly monitoring, Cambria submitted a case closure request to ACEH dated January 10, 2006. In response to this request, and in a letter dated October 17, 2007, the ACEH requested the collection of additional data to substantiate the conclusion that petroleum hydrocarbons were not migrating and discharging into Alameda Canal. In addition, the potential for vapor intrusion was to be evaluated. Therefore, CRA prepared and submitted *Soil Boring and Vapor Point Installation Work Plan*, dated January 10, 2008. In a letter dated January 30, 2008, the ACEH approved the work plan, with several provisions.

2008 Site Investigation

In July 2008, CRA advanced six soil borings (SB-13 through SB-15 and SB-17 through SB-19) to a maximum depth of 16 fbg, and installed and sampled six permanent soil vapor wells (VP-1 through VP-6) to depths of 4.5 to 6 fbg. Soil boring SB-16 was cleared to 3 fbg but could not be completed due to refusal encountered at three locations (16A, B, and C).

Soil boring SB-16 was cleared to 3 fbg but could not be completed due to refusal encountered at three locations (16A, B, and C).

Soil analytical data indicated that the majority of TPHd and TPHg concentrations in soil are generally located in the area of and downgradient of the former ASTs. The highest concentrations were detected in boring VP-4 at 5 fbg. Relatively low concentrations of TPHd and TPHg were detected in the perimeter borings. Low concentrations of petroleum-related VOCs were also detected in the majority of the soil samples. The BTEX and VOC concentrations generally did not exceed the ESLs, with the exception of a few samples. Concentrations generally appeared to attenuate or were significantly reduced at 10 fbg. Generally, concentrations of metals were consistent with background levels and only exceeded

the ESLs in a few of the samples. Metals in shallow soil across the northwest portion of the site do not appear to be a result of former bulk plant operations. The metals do not appear to have impacted groundwater as only barium was detected in well MW-1.

The highest concentrations of hydrocarbons in groundwater were generally located downgradient of the former ASTs. TPHd, TPHg, and benzene were detected in downgradient boring SB-18 at 19,000 µg/L, 3,800 µg/L, and 590 µg/L, respectively; but only at 1,600 µg/L, 650 µg/L, and 3 µg/L, respectively, in boring SB-19 adjacent to the former large AST. Only relatively low concentrations of TPHd (up to 750 µg/L) were detected in perimeter borings SB-13, SB-14, and SB-15; and as evidenced by the work performed by RRM, some or most of the detected TPHd may be due to natural organic matter. The extent of the impacted groundwater is well-defined by borings GWS-7, GWS-12 through GWS-15, SB-10 (following silica gel cleanup), and SB-12. Chlorinated solvents were not detected in any of the soil samples collected, and generally were not detected in the groundwater samples with the exception of low concentrations of TCE, cis-1,2-DCE, and vinyl chloride in the sample collected from boring SB-15 in the northeast corner of the site.

The highest hydrocarbon concentrations in soil gas were detected in vapor wells VP-4, VP-5, and VP-6 located in the area of the former ASTs. Significantly lower concentrations were detected in vapor wells VP-1 and VP-2 located downgradient of VP-4. Chlorinated solvents were not detected in the soil vapor samples. Additional details of this investigation are presented in CRA's report entitled *Site Investigation Report*, dated October 2008.

2009 Monitoring Well Installation and Sub-Slab Vapor Sampling

In June 2009, CRA installed monitoring wells MW-2 through MW-5 to total depths of 16 to 20.5 fbg in order to further evaluate groundwater quality beneath the site. The new monitoring wells were installed within the former ASTs (MW-3), and north (MW-5), south (MW-2), and east (MW-4) of the former ASTs. Soil analytical data indicated that the majority of TPHd and TPHg concentrations in soil are located north to south through the former ASTs and generally decreases with depth. The highest TPHd concentration detected was from well boring MW-3 at 4 fbg at a concentration of 610 mg/kg. The highest TPHg concentration detected was from well boring MW-2 at 4.5 fbg at 1,100 mg/kg. No petroleum hydrocarbons were detected in perimeter well boring MW-4. No grab-groundwater samples were collected.

CRA also installed sub-slab vapor points beneath the two western buildings at the site in order to further evaluate potential vapor intrusion beneath the buildings. Two sub-slab vapor points (VP-7 and VP-8) were installed inside 2317 Blanding Avenue and five sub-slab vapor points (VP-9 through VP-13) were installed inside 2307 Blanding Avenue. The highest hydrocarbon concentrations in soil gas were detected in vapor points VP-9 and VP-13, located west-southwest of the former ASTs. Lower concentrations were detected in vapor points VP-8, and VP-10 through VP-12. All detected concentrations were below the shallow soil gas ESL of 29,000 micrograms per cubic meter (µg/m³). Target chlorinated solvents were not detected in the soil vapor samples. Additional details of this investigation are presented in CRA's *Well Installation and Sub-Slab Vapor Sampling Report*, dated September 8, 2009.

2009 Vapor Sampling

In October 2009, CRA re-install and re-sample sub-slab vapor points VP-9 through VP-13 due to ambient air leaks detected during the initial sampling and to further evaluate the elevated soil vapor concentrations detected in vapor wells VP-1 through VP-6. The results of the re-sampling of the vapor wells VP-1 through VP-5 located outside of the buildings were consistent with previous results for vapor wells VP-3 through VP-5. However, results of the re-sampling of vapor wells VP-1 and VP-2 indicated no TPHg or benzene vapor concentrations at each of these locations, which is not consistent with the initial sample results from August 2008. Additional details of this investigation are presented in CRA's *Vapor Sampling Report*, dated December 2, 2009.

2010 Well Installation

In August 2010, CRA replaced well MW-1 with a more discretely screened well, MW-1RB, and installed wells MW-1RA and MW-6 to depths between 13 to 20 fbg to further evaluate shallow groundwater near Alameda Canal. Well MW-1RA and MW-1RB are located in the vicinity of former well MW-1 and MW-6 is located downgradient of well MW-5. Soil analytical data indicated that minor hydrocarbon impact to soil remains in the vicinity of MW-1 and generally decreases with depth. The highest TPHd and TPHg concentrations detected were from well boring MW-1RA at 10 fbg at a concentration of 260 mg/kg and at 13.5 fbg at 490 mg/kg, respectively. Only trace concentrations of hydrocarbons were detected in well boring MW-6. No grab-groundwater were collected from the well boring as the wells will be incorporated into the site's monitoring and sampling program. Additional details of this investigation are presented in CRA's *Well Installation Report*, dated September 29, 2010.