CONESTOGA-ROVERS & ASSOCIATES

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

TRANSMITTAL

DATE: 11-30-12

REFERENCE NO.: 631916

PROJECT NAME: Park Street Landing (former Chevron 20-6127)

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

RECEIVED
10:09 am, Dec 03, 2012
Alameda County
Environmental Health

Please find enclosed:
- ☐ Draft
- ☐ Originals
- ☐ Prints
- ☒ Final
- ☐ Other

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- ☐ Mail
- ☐ Overnight Courier
- ☐ Same Day Courier
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QUANTITY	DESCRIPTION
1	PIEZOMETER INSTALLATION AND TIDAL STUDY REPORT

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

COMMENTS:
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.

Copy to: Mr. Mike Bauer *(electronic)*
Ms. Julie Beck Ball
Mr. Peter Reinhold Beck
Mr. Monroe Wingate
Mr. Tom Foley

Completed by: B. Silva [Please Print]

Signed: 

Filing: **Correspondence File**

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

November 30, 2010

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

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 *Well Installation Report* for the referenced facility, prepared on behalf of Chevron by Conestoga-Rovers & Associates. I declare under penalty of perjury that the foregoing is true and correct.

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

Sincerely,

Mike Bauer
Project Manager

PIEZOMETER INSTALLATION AND TIDAL STUDY REPORT

FORMER SIGNAL OIL MARINE STORAGE AND DISTRIBUTION FACILITY (CHEVRON FACILITY 20-6127) 2301-2311 BLANDING AVENUE ALAMEDA, CALIFORNIA

Prepared For:
Mr. Jerry Wickham
Alameda County Health Care Services Agency
Environmental Health Services

Prepared by:
Conestoga-Rovers & Associates

10969 Trade Center Drive
Rancho Cordova, California
U.S.A. 95670

Office: (916) 889-8900
Fax: (916) 889-8999

web: http:\\www.CRAworld.com

NOVEMBER 30, 2012
REF. NO. 631916 (29)

PIEZOMETER INSTALLATION AND TIDAL STUDY REPORT

FORMER SIGNAL OIL MARINE STORAGE AND DISTRIBUTION FACILITY
(CHEVRON FACILITY 20-6127)
2301-2311 BLANDING AVENUE
ALAMEDA, CALIFORNIA

Brian Silva

David Herzog, PG

Prepared by:
Conestoga-Rovers & Associates

10969 Trade Center Drive
Rancho Cordova, California
U.S.A. 95670

Office: (916) 889-8900
Fax: (916) 889-8999

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NOVEMBER 30, 2012
REF. NO. 631916 (29)

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1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) is submitting this *Piezometer Installation and Tidal Study Report* for the former Signal Oil Marine Storage and Distribution facility (Chevron facility 20-6127) located at 2301-2311 Blanding Avenue, in Alameda, California on behalf of Chevron Environmental Management Company (Chevron). The purpose of the work was to further evaluate the interaction between on site groundwater flow and potential mass flux to Alameda Canal. The work was performed in accordance with CRA's *Tidal Survey Work Plan and Request for Monitoring and Sampling Frequency Reduction*, dated July 10, 2012, and Alameda County Health Care Services Agency, Environmental Health Services (ACEH) letter dated May 3, 2012 (Appendix A).

This report includes site background, previous environmental work, a summary of the work completed, tidal study data evaluation, mass flux calculation, and conclusions and recommendations.

2.0 SITE BACKGROUND

The following sections provide a description of the site and a summary of the geologic and hydrogeologic setting at the site.

2.1 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 in Appendix B.

2.2 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.

2.3 PREVIOUS ENVIRONMENTAL WORK

Five groundwater monitoring wells, six soil vapor wells, and seven sub-slab soil vapor wells have been installed at the site. Additionally, twenty-eight soil borings have been advanced and three surface soil samples have been collected at the site. Quarterly monitoring and sampling of site wells initiated in 2001 is ongoing. A summary of previous environmental work performed is presented in Appendix B.

3.0 PIEZOMETER INSTALLATION ACTIVITIES

To further evaluate the interaction between onsite groundwater flow and potential mass flux to Alameda Canal, CRA oversaw the installation of piezometers P-1 and P-2. Monitoring well and piezometer locations are shown on Figure 2.

3.1 SITE HEALTH AND SAFETY PLAN

CRA created a comprehensive site health and safety plan to protect site workers. The plan was reviewed and signed by all site workers and visitors and kept onsite at all times.

3.2 PERMITS AND UNDERGROUND UTILITY LOCATION

CRA conducted work under Alameda County Public Works Agency well permits W2012-0654 and W2012-0655 for piezometers P-1 and P-2. Copies of the permits are included in Appendix C.

Prior to drilling, CRA contacted Underground Service Alert to notify utility providers of the proposed work and to identify the locations of subsurface utilities. On September 19, 2012, ULS Services Corporation, a private utility locator, cleared the work area to

confirm that the boring locations were free of unknown underground utilities. Additionally, each boring location was cleared to approximately 8 fbg using water-knifing equipment and a hand auger.

3.3 PIEZOMETER INSTALLATION

On September 27 through 28, 2012, CRA oversaw the drilling of piezometer borings P-1 and P-2 to a total depth of 20 fbg and 12 fbg respectively (Figure 2). Vapor Tech Services of Berkeley, California (C57 License 916085) performed the drilling and piezometer installation activities. Soil cuttings from the top 8 feet of hand cleared soils were logged. Below 8 fbg, the borings were advanced using a direct-push Geoprobe 7822DT Track combination rig and continuously logged in accordance with the Unified Soil Classification System (USCS). Soil samples were screened in the field for the presence of volatile organic vapors using a photo-ionization detector (PID).

A 1-inch schedule 40 polyvinyl chloride (PVC) casing with 0.020-inch machine-slotted screen was installed in piezometers P-1 (16.5 to 20 fbg) and P-2 (7 to 12 fbg). A filter pack consisting of 2/12 sand extends from the bottom of the boring to 1 foot above the well screen interval. A 2-foot thick bentonite seal was placed above the filter pack. Neat cement was placed above the bentonite seal to the surface. Each piezometer head was sealed with a locking cap and contained in a traffic-rated, water-tight well box. Boring logs and well construction details for P-1 and P-2 are included in Appendix D. Well construction details are summarized in Table 1.

3.6 SOILS ENCOUNTERED

Soils encountered beneath the site during this investigation are generally consistent with soils encountered during previous investigations at the site. Beneath 5 to 6 feet of fill, approximately 8 feet of sandy silt and clay is encountered in piezometer P-1. Underlying the sandy silt and clay is silty sand encountered at depths of approximately 13 fbg in the boring for piezometer P-1 and 6 fbg in the boring for piezometer P-2. After piezometer installation, groundwater rose to depths of approximately 7.5 fbg (P-1) and 8.5 fbg (P-2).

3.7 INVESTIGATION-DERIVED WASTE

Soil cuttings and decontamination/purge water were temporarily stored onsite in 55-gallon steel drums pending transport and disposal at a Chevron-approved facility.

3.8 SURVEYING

On October 15, 2012, Morrow Surveying of West Sacramento, California (a California state-licensed surveyor) surveyed piezometers P-1 and P-2 as well as a stilling well temporarily installed in Alameda Canal. The top of casing elevation of each well was surveyed to mean sea level datum and tied into the previous well survey for the site. Horizontal well coordinates were measured in compliance with AB2886 (GeoTracker), and uploaded into the GeoTracker internet database.

4.0 TIDAL STUDY

The following sections summarize data collection activities, evaluation, and mass flux calculation.

4.1 DATA LOGGER INSTALLATION

On October 2, 2012, CRA installed submersible dataloggers capable of measuring conductivity, temperature, and depth to water in site wells (MW-1RA through MW-6) and piezometers (P-1 and P-2) to evaluate the effects of tide and saline/freshwater interactions on groundwater. A barologger was also utilized to monitor barometric changes. Data were collected over a 2-week period until the dataloggers and barologger were removed on October 15, 2012. A datalogger was also installed in a temporary stilling well placed on the adjacent pier to collect water level fluctuations in Alameda Canal. Periodic depth-to-water measurements were also manually collected during the two-week period and are summarized in Table 2.

4.2 DATA EVALAUATION

The data were processed to remove the effects of barometric pressure changes, and were adjusted to initial depth-to-water measurements collected during datalogger installations. The corrected data for deeper screened wells are presented on Graph A

(Appendix E). The data show that groundwater in these wells is influenced by changes in tide without significant delay in response. During low tide, water in Alameda Canal was below groundwater onsite, but during high tide, water in the canal was often higher than groundwater in adjacent site wells. This indicates that during high tide there was minor groundwater flow from the canal toward the site, but overall groundwater flow was toward the canal. During the test, the average groundwater gradient adjacent to the canal was 0.028, as calculated between well MW-1RB and data from the stilling well. Figures 3 and 4 present groundwater elevation and flow directions between maximum and minimum tides.

Groundwater in shallower screened wells MW-1RA and P-2 do not show the same hydraulic connectivity with the canal. Graph B (Appendix E) presents data for these wells along with data from the stilling well. Manual depth-to-water measurements are also included on the graph for comparison because the datalogger results from well MW-1RA did not fluctuate, indicating a likely datalogger sensor malfunction.

Graph C (Appendix E) presents conductivity data from site wells. Data from the stilling well are not included because the conductivity in the canal exceeded the range of the datalogger, and all readings were at the maximum 30 millisiemens per centimeter (mS/cm). The greatest fluctuation in conductivity is shown in well MW-1RB, located adjacent to the canal, and suggests interaction between water in the canal and groundwater, with conductivity increasing as the tide rises. Wells MW-1RB, MW-3, P-1, and P-2 also show minor fluctuations, which may represent some interaction with the canal or possible dilution from changes in water table. Other wells show little response, generally lessoning with distance from the canal. The data from MW-6, which is located adjacent to the river, show no fluctuation likely due to malfunction of the datalogger sensor.

The raw datalogger and barologger data is available upon request.

4.3 MASS FLUX CALCULATION

Figure 5 presents a geologic cross-section along wells and borings located adjacent to Alameda Canal. The approximate extent of dissolved hydrocarbons in groundwater monitored by deeper screened wells is depicted on the cross-section. CRA used this conceptual model to evaluate mass flux of hydrocarbons into the canal. The area of the plume on the section is approximately 424 square feet. Within this area the average concentrations of TPHd, TPHg, and benzene detected in wells MW-1RA and MW-6 in July 2012 is assumed equal throughout the area for the calculations, and are summarized

below in Table A. Soil encountered in the area consists of clayey and silty fine to medium grained sand. For the calculations CRA used an average hydraulic conductivity of 10^{-4} centimeters per second, or 0.283 feet per day.[1] The specific discharge velocity based on this hydraulic conductivity and average gradient is 0.0079 feet per day. Petroleum hydrocarbons do not migrate at the same rate as the flow of groundwater, so a retardation factor (R) is applied to the specific discharge velocity to determine approximate hydrocarbon migrations rates. CRA used the following formula to calculate retardation factors:[1]

$$R = 1 + \rho K_{oc} f_{oc} / \varphi$$

Where:

ρ is bulk density of aquifer material (1.5 g/cm^3)
K_{oc} is organic carbon partitioning coefficient[2]
f_{oc} is fraction of organic carbon of aquifer materials (0.007)
φ is aquifer porosity (0.25)

This calculation results in a retardation factor for TPHd and TPHg of 211, and for benzene of 3.478. These factors applied to the specific discharge velocity results in a TPHd and TPHg velocity of 3.7E-05 feet per day, and a benzene velocity of 2.3E-03 feet per day.

To calculate the mass flux (M) across this section, CRA used the following equation:[3]

$$M = CAqc$$

Where:

C is the average concentration within the area
A is the cross sectional area of the hydrocarbon plume
q is the specific discharge velocity
c is a units conversion factor of 2.83E-05 g-L/µg-ft^3

1 Kuo, J., 1999, Practical Design Calculations for Groundwater and Soil Remediation: Lewis Publishers, Boca Raton, FL.

2 Table J - San Francisco Bay Regional Water Quality Control Board, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater: Interim Final – November 2007 (Revised May 2008).

3 Einarson, M.D. and D.M. Mackay, 2001, Predicting Impacts of Groundwater Contamination: Environmental Science & Technology, 35(3): 66A-73A.

This calculation results in approximately 9.6E-04 grams TPHd, 3.2E-04 grams TPHg, and 1.4E-03 grams benzene mass migrating through the section daily (Table A). In order to estimate the concentrations in Alameda Canal resulting from the calculated mass flux, CRA calculated the volume of water passing the site daily. The average rate of flow of water past the site due to tidal motion is 0.16 knots[4], or 23,621 feet per day. Although the volume of water passing the site across the width of the canal can be determined, CRA simplified the model by assuming that the mass flux enters a canal one foot wide. The maximum height of the plume shown on Figure 5 is 6 feet, which results in approximately 141,726 cubic feet (4.0E+06 liters) of water passing by the area of the plume daily. The resulting concentrations in this volume of water in the canal are 2.3E-04 µg/L TPHd, 8.0E-05 µg/L TPHg, and 3.4E-04 µg/L benzene. As shown in Table A below, these concentrations are well below the environmental screening levels (ESLs)[5] for marine and estuary habitats. These results indicate that the mass flux of hydrocarbons into the canal do not pose a risk.

TABLE A – MASS FLUX CALCULATION RESULTS

Constituent of Concern	*Average Concentration July 2012 (µg/L)*	*Constituent Mass Flux/Day (grams)*	*Unit Volume Concentration in Canal (µg/L)*	*Marine Habitat ESL Table F-2b[2] (µg/L)*	*Estuary Habitat ESL Table F-2c[2] (µg/L)*
TPHd	2,150	9.6E-04	2.3E-04	210	210
TPHd (SiGel)	49	2.2E-05	5.5E-06	210	210
TPHg	720	3.2E-04	8.0E-05	210	210
Benzene	49	1.4E-03	3.4E-04	71	46
SiGel – TPHd with silica gel column cleanup					

5.0 CONCLUSIONS AND RECOMMENDATIONS

From the information presented above the following can be concluded:

- Wells screened within the deeper silty sand zone (MW-1RB through MW-6 and P-1) are tidally influenced based on water level and conductivity data.
- Shallow wells MW-1RA and P-2 show little, if any tidal influence.
- During high tide there was minor groundwater flow from the canal toward the site, but overall groundwater flow was toward the canal.
-

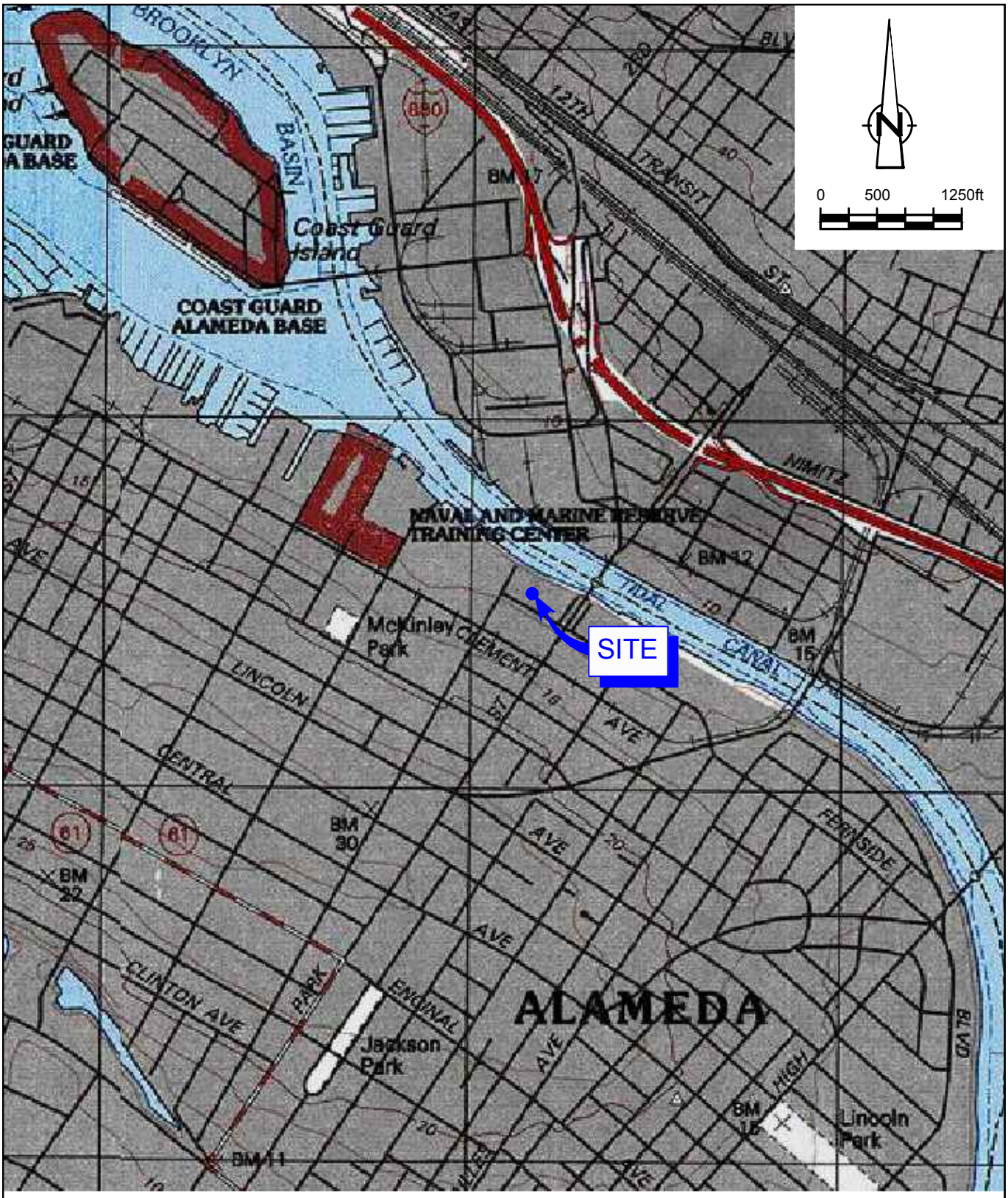
[4] Oakland Inner Harbor Tide & Current Predictor (http:/tbore.boil.sc.edu/tide): University of South Carolina, Biological Sciences, Columbia, SC.

[5] Tables F-2b and F-2c - San Francisco Bay Regional Water Quality Control Board, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater: Interim Final – November 2007 (Revised May 2008).

- Mass flux into Alameda Canal from the site is significantly less than the marine and estuary habitat ESLs for site constituents of concern and do not pose a threat to Alameda Canal.

Based on the above and results of previously conducted site investigation, it is CRA's belief that the site meets the general and media-specific criteria of a low-threat UST release case as defined in the recently adopted *Low-Threat Underground Storage Tank Case Closure Policy* via State Water Resources Control Board (SWRCB) Resolution 2012-0016 adopted on August 17, 2012. The dissolved hydrocarbon plume is stable to decreasing in aerial extent and meets Class 5 media-specific groundwater criteria. Vapor intrusion to indoor air has previously been shown to be an incomplete pathway via a site-specific risk assessment per Criteria C, and direct contact and outdoor air exposure meet media-specific Criteria A. CRA will begin preparing a low-threat closure report for submittal to AECH that addresses these media-specific criteria as well as the eight general criteria for case closure. We recommend that further semi-annual monitoring and sampling of site wells be suspended.

FIGURES

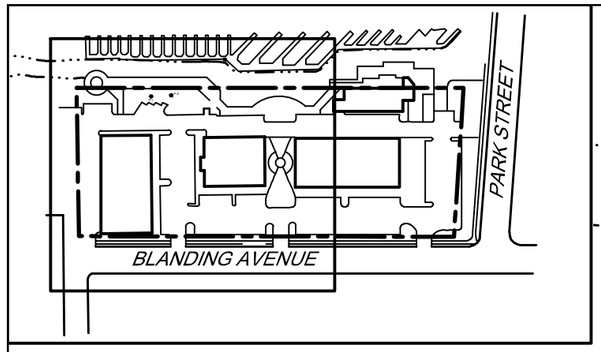


SOURCE: TOPO! MAPS.

figure 1

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

631916-2012(029)GN-WA001 OCT 18/2012



KEY PLAN
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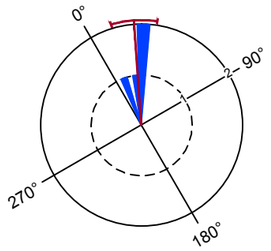


HISTORICAL GROUNDWATER FLOW DIRECTION
FROM 2Q 2009 TO 3Q 2010

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 ✪ PIEZOMETER LOCATION
- ⬓ STILLING WELL LOCATION
- A —— A' LOCATION OF CROSS-SECTION

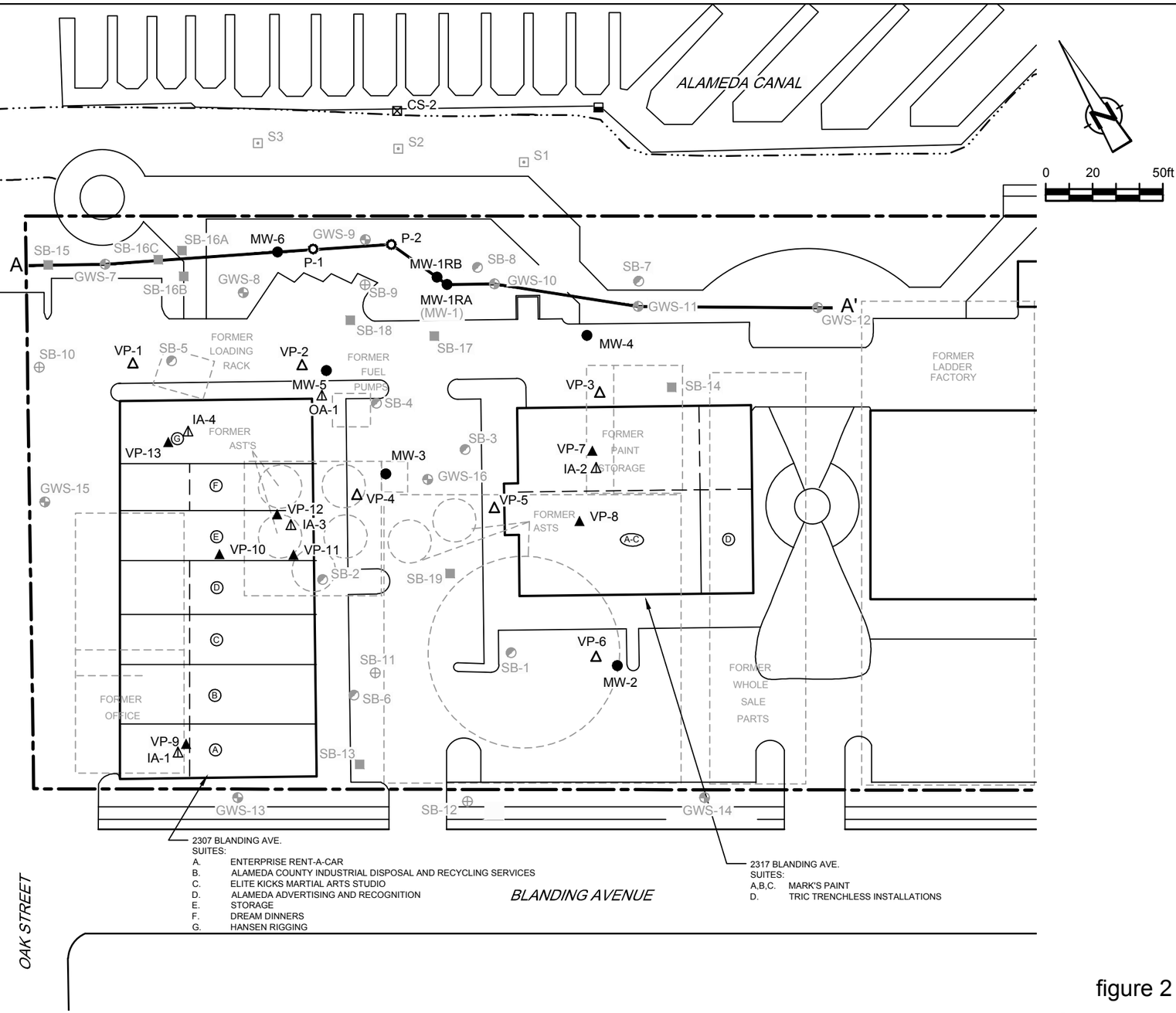
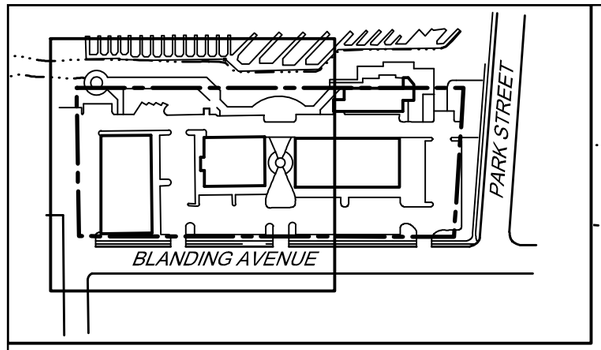


figure 2

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.



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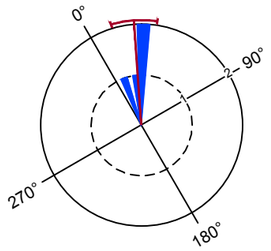

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- ⚠ INDOOR AND OUTDOOR AIR SAMPLING LOCATION
- P-1 PIEZOMETER LOCATION
- ⬓ STILLING WELL LOCATION
- 7.50 GROUNDWATER ELEVATION CONTOUR, IN FEET ABOVE MEAN SEA LEVEL (MSL), DASHED WHERE INFERRED
- (7.32) GROUNDWATER ELEVATION
- 0.017 GROUNDWATER FLOW DIRECTION AND GRADIENT (ft/ft)
- * NOT USED IN CONTOURING

NOTE:
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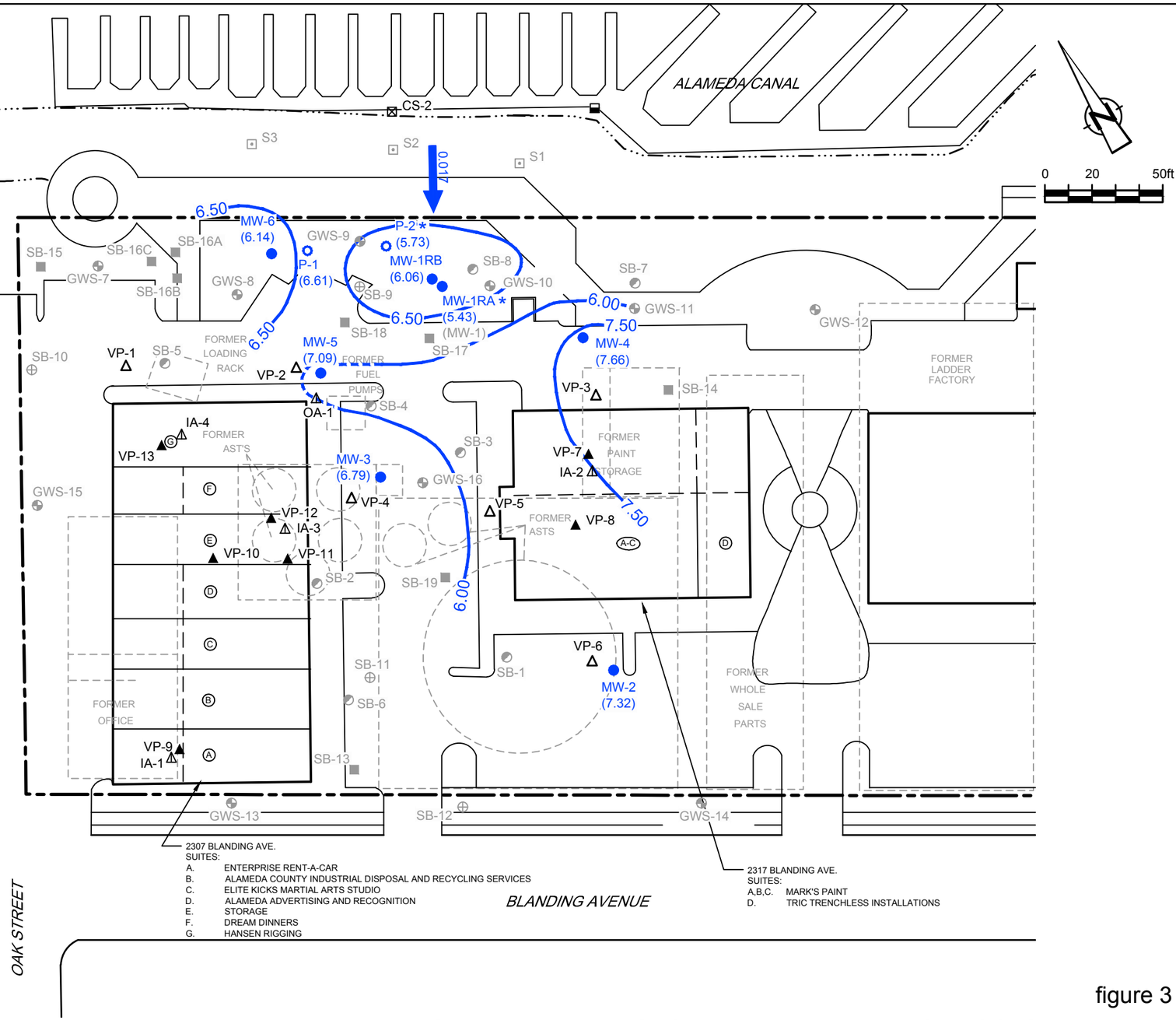
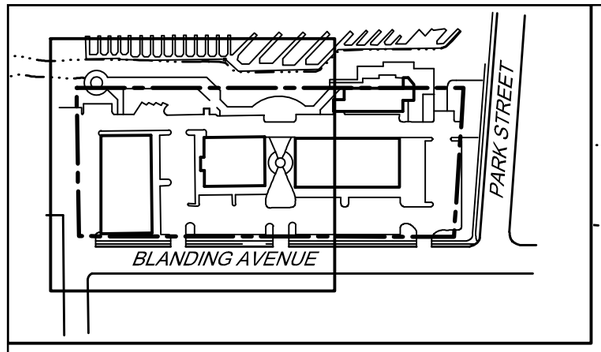
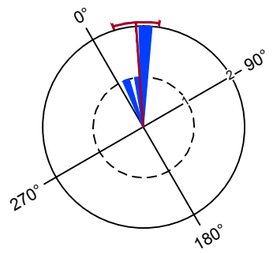


figure 3

TIDAL STUDY MAXIMUM GROUNDWATER ELEVATION - OCTOBER 2, 2012
FORMER SIGNAL OIL MARINE STORAGE AND DISTRIBUTION FACILITY
(CHEVRON FACILITY 20-6127)
2301-2311 BLANDING AVENUE
Alameda, California



KEY PLAN
SCALE: 1"=250'



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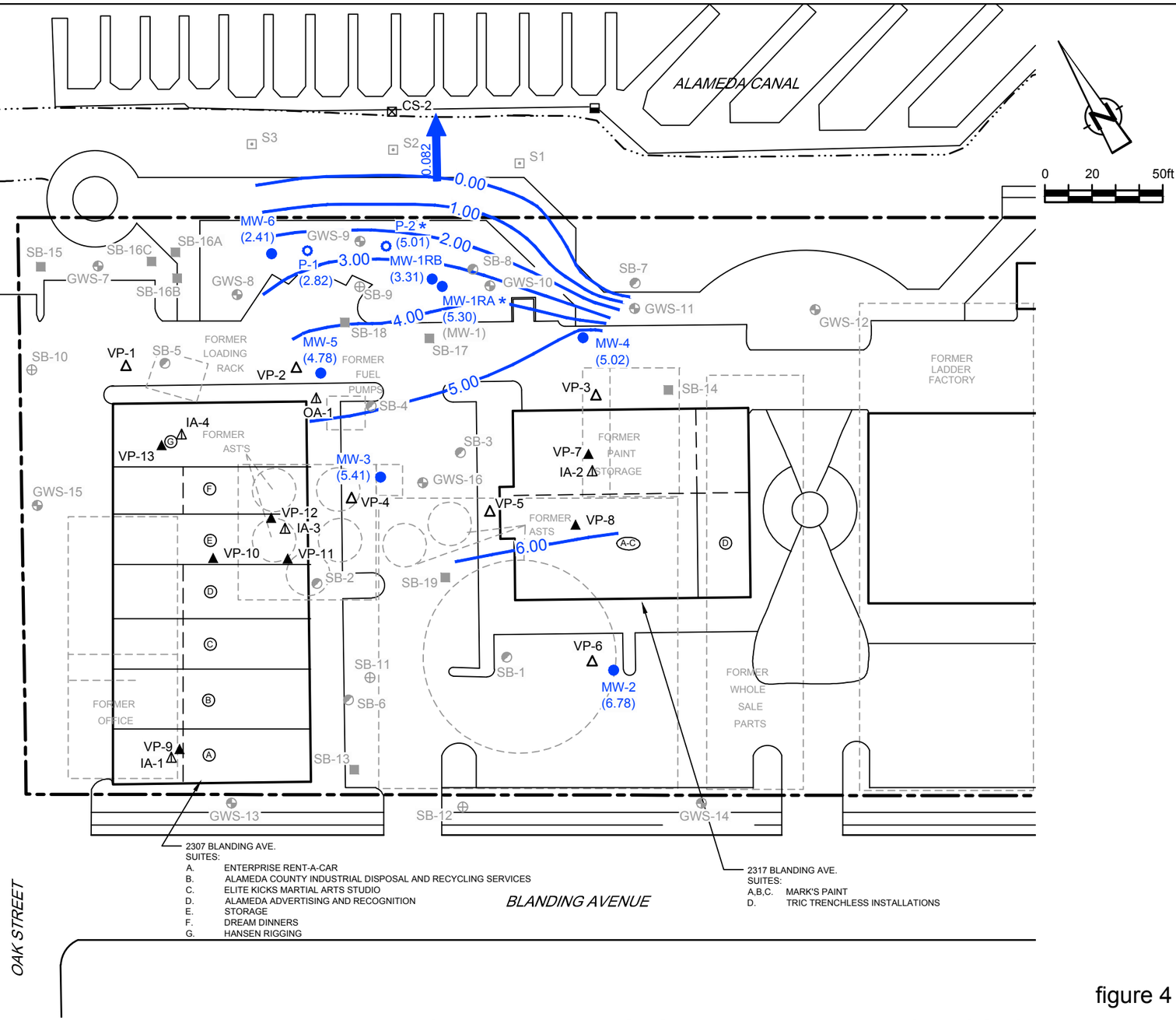
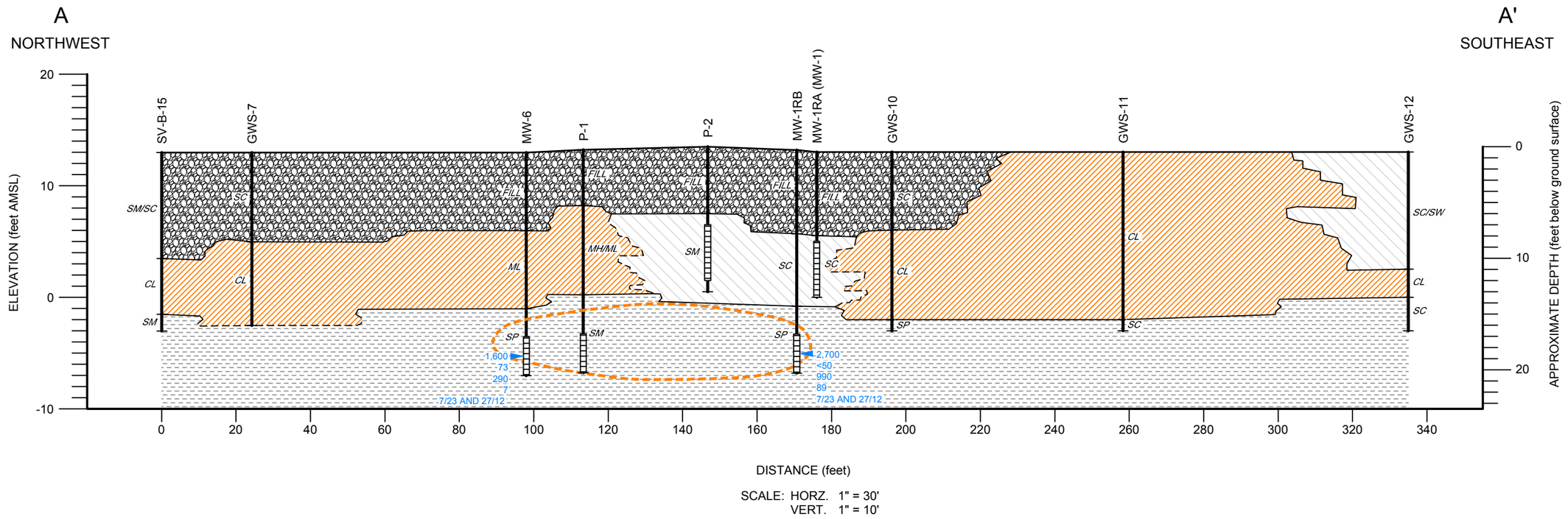


2307 BLANDING AVE.
SUITES:
A. ENTERPRISE RENT-A-CAR
B. ALAMEDA COUNTY INDUSTRIAL DISPOSAL AND RECYCLING SERVICES
C. ELITE KICKS MARTIAL ARTS STUDIO
D. ALAMEDA ADVERTISING AND RECOGNITION
E. STORAGE
F. DREAM DINNERS
G. HANSEN RIGGING

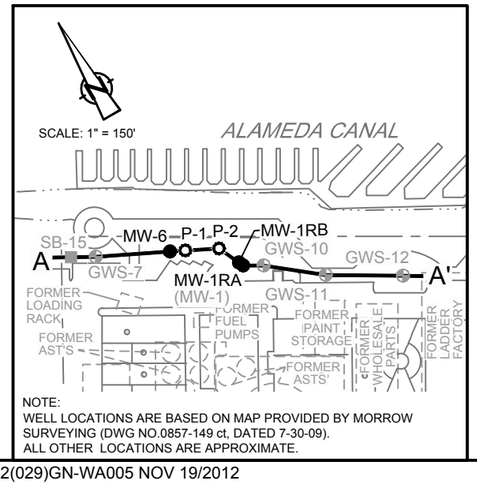
2317 BLANDING AVE.
SUITES:
A,B,C. MARK'S PAINT
D. TRIC TRENCHLESS INSTALLATIONS

figure 4

TIDAL STUDY MINIMUM GROUNDWATER ELEVATION - OCTOBER 14, 2012
FORMER SIGNAL OIL MARINE STORAGE AND DISTRIBUTION FACILITY
(CHEVRON FACILITY 20-6127)
2301-2311 BLANDING AVENUE
Alameda, California



SCALE: HORZ. 1" = 30'
VERT. 1" = 10'



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.

LEGEND

MW-6 — WELL DESIGNATION
GROUND SURFACE
OBSERVATION WELL INSTALLATION
STRATIGRAPHIC BOUNDARY
ML — TYPICAL SOIL CLASSIFICATION
SCREENED INTERVAL
BOTTOM OF BORING
APPROXIMATE GROUNDWATER SAMPLE LOCATION
TPHd
TPHd(SiGel)
TPHg
BENZENE
DATE
HYDROCARBON CONCENTRATIONS IN GROUNDWATER (µg/L)
CONTOUR

- FILL
- LOW PERMEABILITY SOILS
- MODERATE PERMEABILITY SOILS
- HIGH PERMEABILITY SOILS

figure 5

GEOLOGIC CROSS SECTION A-A'
FORMER SIGNAL OIL MARINE STORAGE AND DISTRIBUTION FACILITY
(CHEVRON FACILITY 20-6127)
2301-2311 BLANDING AVENUE
Alameda, California

TABLES

WELL CONSTRUCTION SPECIFICATIONS
FORMER SIGNAL OIL MARINE STORAGE AND DISTRIBUTION FACILITY
(CHEVRON BULK PLANT 20-6127)
2301-2311 BLANDING AVENUE
ALAMEDA, CALIFORNIA

Well ID	*Date Installed*	*TOC*	*Total Depth (fbg)*	*Casing Diameter [1] (inches)*	*Slot Size (inches)*	*Screen Interval (fbg)*	*Filter Pack (fbg)*	*Status*
Monitoring Wells								
MW-1	8/15/1990	13.49	19.5	2	0.020	4-19	3-19.5	Replaced w/MW-1RB
MW-1RA	8/4/2010	13.02	13	2	0.020	8-13	7-13	Active
MW-1RB	8/4/2010	13.21	20	2	0.020	16.5-20	15.5-20	Active
MW-2	6/19/2009	10.63	18	2	0.020	10.5-15.5	10-16	Active
MW-3	6/19/2009	10.72	18.5	2	0.020	13.5-18.5	12.5-18.5	Active
MW-4	6/19/2009	11.40	20.5	2	0.020	15.5-20.5	14.5-20.5	Active
MW-5	6/23/2009	10.50	18	2	0.020	13-18	12-18	Active
MW-6	8/4/2010	12.98	20	2	0.020	16.5-20	15.5-20	Active
Piezometers								
P-1	10/27/2012	13.23	12	1	0.020	16.5-20	15.5-20	Active
P-2	10/27/2012	13.51	20	1	0.020	7-12	6-12	Active
Vapor Wells								
VP-1	7/9/2008	NS	4.25	1	0.020	3.75-4.25	3.5-4.5	Vapor only
VP-2	7/9/2008	NS	4.75	1	0.020	4.25-4.75	4-5	Vapor only
VP-3	7/14/2008	NS	5.75	1	0.020	5.25-5.75	5-6	Vapor only
VP-4	7/14/2008	NS	5.75	1	0.020	5.25-5.75	5-6	Vapor only
VP-5	7/14/2008	NS	5.75	1	0.020	5.25-5.75	5-6	Vapor only
VP-6	7/9/2008	NS	5.75	1	0.020	5.25-5.75	5-6	Vapor only
Sub-Slab Vapor Probes								
VP-7	7/17/2009	NS	0.5	0.25	NA	NA	NA	Vapor only
VP-8	7/17/2009	NS	0.5	0.25	NA	NA	NA	Vapor only
VP-9	7/22/2009	NS	0.5	0.25	NA	NA	NA	Vapor only
VP-10	7/22/2009	NS	0.5	0.25	NA	NA	NA	Vapor only
VP-11	7/17/2009	NS	0.5	0.25	NA	NA	NA	Vapor only
VP-12	7/22/2009	NS	0.5	0.25	NA	NA	NA	Vapor only
VP-13	7/22/2009	NS	0.5	0.25	NA	NA	NA	Vapor only

Abbreviations / Notes

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

[1] = Schedule 40 PVC casing material

fbg = Feet below grade

NA = Not applicable

NS = Not surveyed

TABLE 2

MANUAL DEPTH TO WATER MEASUREMENTS
FORMER SIGNAL OIL MARINE STORAGE AND DISTRIBUTION FACILITY
(FORMER CHEVRON 20-6127)
2301-2311 BLANDING AVENUE
ALAMEDA, CALIFORNIA

WELL ID	*DATE*	*TIME*	*Depth to Water*
MW-1RA	10/02/12	13:01	7.60
	10/05/12	13:22	8.15
	10/08/12	12:07	8.07
	10/11/12	10:38	7.40
	10/15/12	9:42	7.80
MW-1RB	10/02/12	11:49	8.00
	10/05/12	13:12	7.61
	10/08/12	11:53	7.66
	10/11/12	10:30	7.41
	10/15/12	9:39	8.95
MW-2	10/02/12	12:48	3.53
	10/05/12	12:45	3.30
	10/08/12	11:30	3.35
	10/11/12	10:04	3.28
	10/15/12	11:12	3.58
MW-3	10/02/12	12:20	4.30
	10/05/12	13:00	4.33
	10/08/12	11:40	4.39
	10/11/12	10:22	4.19
	10/15/12	9:29	4.75
MW-4	10/02/12	12:30	6.15
	10/05/12	inaccessible- blocked by car	
	10/08/12	inaccessible- blocked by car	
	10/11/12	10:12	5.35
	10/15/12	10:17	5.90
MW-5	10/02/12	12:39	5.43
	10/05/12	13:17	4.61
	10/08/12	11:57	4.82
	10/11/12	10:33	4.18
	10/15/12	10:58	4.50
MW-6	10/02/12	11:30	8.00
	10/05/12	13:06	7.57
	10/08/12	11:48	7.98
	10/11/12	10:27	6.86
	10/15/12	9:19	8.10

TABLE 2

MANUAL DEPTH TO WATER MEASUREMENTS
FORMER SIGNAL OIL MARINE STORAGE AND DISTRIBUTION FACILITY
(FORMER CHEVRON 20-6127)
2301-2311 BLANDING AVENUE
ALAMEDA, CALIFORNIA

WELL ID	*DATE*	*TIME*	*Depth to Water*
P-1	10/02/12	11:39	7.61
	10/05/12	13:30	7.69
	10/08/12	12:11	8.38
	10/11/12	10:43	7.14
	10/15/12	9:24	8.28
P-2	10/02/12	11:48	8.50
	10/05/12	13:35	8.25
	10/08/12	12:16	8.05
	10/11/12	10:46	7.95
	10/15/12	9:34	7.91
STILLING	10/02/12	14:42	5.28
	10/15/12	10:45	5.43

APPENDIX A

REGULATORY CORRESPONDENCE

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
ALEX BRISCOE, Director

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

August 16, 2012

Mr. Mike Bauer (*Sent via E-mail to: mbauer@chevron.com*)
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: Conditional Work Plan Approval 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, "*Tidal Survey Work Plan and Request for Monitoring and Sampling Frequency Reduction*," dated July 10, 2012 (Tidal Survey Work Plan) and "*Second Quarter 2012 Groundwater Monitoring and Sampling Report*," dated May 15, 2012. Both documents were prepared on Chevron's behalf by Conestoga-Rovers & Associates. The Tidal Survey Work Plan "*Draft Corrective Action Plan*," dated August 18, 2011 (CAP) presents plans for a tidal study to evaluate the interaction between groundwater at the site and the adjacent Alameda Canal.

The proposed scope of work in the Tidal Survey Work Plan is conditionally approved and may be implemented provided that technical comment 1 below is incorporated during implementation of the proposed tidal study. Submittal of a revised Work Plan or Work Plan Addendum is not required unless an alternate scope of work outside that described in the Work Plan and technical comments below is proposed. We request that you address the following technical comments, perform the proposed work, and send us the reports described below

TECHNICAL COMMENTS

1. **Piezometers.** The proposed piezometer (P-1) would be constructed with a screen interval from 11 to 20 feet bgs which would connect the two zones currently monitored by wells MW-1RA and MW-1RB. A review of water level data from wells MW-1RA and MW-1RB indicates that the two wells monitor zones with significantly different pressure heads. In addition, the concentrations of total petroleum hydrocarbons as gasoline are generally higher in groundwater samples from MW-1RA than MW-1RB. Therefore, we request that two piezometers rather than one be installed near the proposed P-1 location. The screen intervals for the two piezometers should be consistent with the screen intervals for MW-1RA and MW-1RB. Please present the results in the Tidal Study Report requested below.

2. **Reduced Groundwater Monitoring Frequency.** ACEH has no objection to the proposed reduction of groundwater monitoring from quarterly to semi-annual during the first and third quarters. Please present the results in the Groundwater Monitoring Reports requested below.

TECHNICAL REPORT REQUEST

Please upload technical reports to ACEH ftp site (Attention: Jerry Wickham), and to the State Water Resources Control Board's GeoTracker website, in accordance with the following file naming convention and schedule:

- **October 25, 2012** – Semi-annual Groundwater Monitoring Report – Third Quarter 2012
  File to be named: GWM_R_yyyy-mm-dd

- **November 30, 2012** – Tidal Survey Report
  File to be named: SWI_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.

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@craworld.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.

APPENDIX B

SITE HISTORY AND SUMMARY OF 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 (µg/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 µg/L (GWS-9). Benzene was detected in the samples collected from borings GWS-8 through GWS-10 and GWS-16 at concentrations of 36 µg/L, 6,200 µg/L, and 880 µg/L, respectively. Toluene, ethylbenzene, and xylenes (up to 1,200 µg/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 (TTLC) 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/m^3). 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.

APPENDIX C

WELL PERMITS

Alameda County Public Works Agency - Water Resources Well Permit

399 Elmhurst Street
Hayward, CA 94544-1395
Telephone: (510)670-6633 Fax:(510)782-1939

Application Approved on: 09/18/2012 By jamesy

Permit Numbers: W2012-0654 to W2012-0655
Permits Valid from 09/27/2012 to 09/28/2012

Application Id: 1346887918548 **City of Project Site:** Alameda
Site Location: 2301-2311 Blanding Ave Alameda,CA 94501

The approximately 3.5-acre site is located on the northeast side of Blanding Avenue between Oak and Park Streets.

Project Start Date: 09/27/2012 **Completion Date:** 09/28/2012
Assigned Inspector: Contact Vicky Hamlin at (510) 670-5443 or vickyh@acpwa.org

Applicant: Conestoga Rovers & Associates - Bryan Sandor **Phone:** 916-889-8916
10969 Trade Center Drive Suite 107, Rancho Cordova, CA 95670
Property Owner: Monroe Wingate **Phone:** 480-551-6588
8912 E Pinnacle Peak Rd. Suite F9-622, Scottsdale, AZ 85255
Client: Mike Bauer Chevron EMC **Phone:** 714-671-3207
145 S. State College room 4089, Brea, CA 92821
Contact: Brian Silva **Phone:** 916-889-8908
Cell: 916-919-0403

Total Due: $794.00
Receipt Number: WR2012-0296 **Total Amount Paid:** $794.00
Payer Name : Conestoga-Rovers and Associates, Inc. Paid By: CHECK **PAID IN FULL**

Works Requesting Permits:

Well Construction-Piezometer-Seismic Monitoring-Seismic Monitoring - 2 Wells
Driller: Vapor Tech Services - Lic #: 916085 - Method: hstem **Work Total: $794.00**

Specifications

Permit #	Issued Date	Expire Date	Owner Well Id	Hole Diam.	Casing Diam.	Seal Depth	Max. Depth
W2012-0654	09/18/2012	12/26/2012	P1	8.00 in.	2.00 in.	7.40 ft	20.00 ft
W2012-0655	09/18/2012	12/26/2012	P2	8.00 in.	2.00 in.	16.00 ft	20.00 ft

Specific Work Permit Conditions

1. Compliance with the above well-sealing specifications shall not exempt the well-sealing contractor from complying with appropriate state reporting-requirements related to well destruction (Sections 13750 through 13755 (Division 7, Chapter 10, Article 3) of the California Water Code). Contractor must complete State DWR Form 188 and mail original to the Alameda County Public Works Agency, Water Resources Section, within 60 days, including permit number and site map.

2. Permittee shall assume entire responsibility for all activities and uses under this permit and shall indemnify, defend and save the Alameda County Public Works Agency, its officers, agents, and employees free and harmless from any and all expense, cost, liability in connection with or resulting from the exercise of this Permit including, but not limited to, properly damage, personal injury and wrongful death.

3. Permittee, permittee's contractors, consultants or agents shall be responsible to assure that all material or waters generated during drilling, boring destruction, and/or other activities associated with this Permit will be safely handled, properly managed, and disposed of according to all applicable federal, state, and local statutes regulating such. In no case shall these materials and/or waters be allowed to enter, or potentially enter, on or off-site storm sewers, dry wells, or waterways or be allowed to move off the property where work is being completed.

4. Prior to any drilling activities, it shall be the applicant's responsibility to contact and coordinate an Underground Service Alert (USA), obtain encroachment permit(s), excavation permit(s) or any other permits or agreements required for that Federal, State, County or City, and follow all City or County Ordinances. No work shall begin until all the permits and requirements have been approved or obtained. It shall also be the applicants responsibilities to provide to the Cities or to Alameda County an Traffic Safety Plan for any lane closures or detours planned. No work shall begin until all the permits and requirements have been approved or obtained.

5. Applicant shall contact Vicky Hamlin for an inspection time at 510-670-5443 or email to vickyh@acpwa.org at least five (5) working days prior to starting, once the permit has been approved. Confirm the scheduled date(s) at least 24 hours prior to drilling.

6. Wells shall have a Christy box or similar structure with a locking cap or cover. Well(s) shall be kept locked at all times. Well(s) that become damaged by traffic or construction shall be repaired in a timely manner or destroyed immediately (through permit process). No well(s) shall be left in a manner to act as a conduit at any time.

7. Minimum surface seal thickness is two inches of cement grout placed by tremie.

8. Minimum seal (Neat Cement seal) depth for monitoring wells is 5 feet below ground surface(BGS) or the maximum depth practicable or 20 feet.

9. Copy of approved drilling permit must be on site at all times. Failure to present or show proof of the approved permit application on site shall result in a fine of $500.00.

APPENDIX D

BORING/WELL CONSTRUCTION LOGS

Conestoga-Rovers & Associates
10969 Trade Center Drive, Suite 107
Rancho Cordova, CA
Telephone: 916-889-8900
Fax: 916-889-8999

BORING/WELL LOG

CLIENT NAME	Chevron Environmental Management Co.	**BORING/WELL NAME**	P-1
JOB/SITE NAME	Former Signal Oil Bulk Plant (Chevron 20-6127)	**DRILLING STARTED**	27-Sep-12
LOCATION	2301-2311 Blanding Avenue, Alameda, CA	**DRILLING COMPLETED**	28-Sep-12
PROJECT NUMBER	631916	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Vapor Tech Services	**GROUND SURFACE ELEVATION**	13.43 ft above msl
DRILLING METHOD	Hollow-stem auger	**TOP OF CASING ELEVATION**	13.23 ft above msl
BORING DIAMETER	6"	**SCREENED INTERVAL**	16.5 to 20 fbg
LOGGED BY	W. Martinez	**DEPTH TO WATER (First Encountered)**	17.0 fbg (28-Sep-12)
REVIEWED BY	Greg Barclay, P.G. 6260	**DEPTH TO WATER (Static)**	7.6 fbg (02-Oct-12)
REMARKS	Cleared to 8 fbg with air knife, hollow stem auger to total depth, Perched groundwater encountered at 8fbg		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
							Grass	0.5	
							FILL: concrete debris, trace mica; dusky red; moist.		
				5				5.0	
47.9					MH		**SILT with sand:** soft, fine sand, trace mica; greenish gray; moist; low plasticity.		Portland Type I/II
							@ 8 fbg dark greenish gray; wet (perched water); low plasticity.	9.0	
				10	CH		**Sandy CLAY:** stiff, fine sand, grades to more silt with sand; dark greenish gray; moist; medium plasticity.		
					MH		**SILT with sand:** stiff, fine sand; gray; moist; medium plasticity.	12.0	
							Silty SAND: medium dense, fine sand; pale green; moist; low plasticity.	13.0	Bentonite Seal
				15	SM		@ 17 fbg: loose; greenish gray; wet.		Monterey Sand #2/12
									1"-diam., 0.020" Slotted Schedule 40 PVC
				20				20.0	Bottom of Boring @ 20 fbg

WELL LOG (PID) I:\PROJECT FILES\6-CHAR\63---\6319--\631916\631916-GINT\631916-GINT.GPJ DEFAULT.GDT 11/19/12

Conestoga-Rovers & Associates
10969 Trade Center Drive, Suite 107
Rancho Cordova, CA
Telephone: 916-889-8900
Fax: 916-889-8999

BORING/WELL LOG

CLIENT NAME	Chevron Environmental Management Co.	**BORING/WELL NAME**	P-2
JOB/SITE NAME	Former Signal Oil Bulk Plant (Chevron 20-6127)	**DRILLING STARTED**	27-Sep-12
LOCATION	2301-2311 Blanding Avenue, Alameda, CA	**DRILLING COMPLETED**	28-Sep-12
PROJECT NUMBER	631916	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Vapor Tech Services	**GROUND SURFACE ELEVATION**	13.82 ft above msl
DRILLING METHOD	Hollow-stem auger	**TOP OF CASING ELEVATION**	13.51 ft above msl
BORING DIAMETER	6"	**SCREENED INTERVAL**	7 to 12 fbg
LOGGED BY	W. Martinez	**DEPTH TO WATER (First Encountered)**	8.6 fbg (28-Sep-12)
REVIEWED BY	Greg Barclay, P.G. 6260	**DEPTH TO WATER (Static)**	8.5 fbg (02-Oct-12)
REMARKS	Cleared to 8 fbg with air knife, hollow stem auger to total depth		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (fbg)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (fbg)	WELL DIAGRAM
							Grass	0.5	Portland Type I/II
				5			**FILL:** Concrete debris; reddish brown; moist; low plasticity.		Bentonite Seal
							Silty SAND: soft, fine sand with increasing clay; greenish gray; moist; medium plasticity.	6.0	Monterey Sand #2/12
				10	SM		@ 10 fbg: No Recovery		1"-diam., 0.020" Slotted Schedule 40 PVC
								13.0	Bentonite Seal
									Bottom of Boring @ 13 fbg

WELL LOG (PID) I:\PROJECT FILES\6-CHAR\63---\6319--\631916\631916-GINT\631916-GINT.GPJ DEFAULT.GDT 11/19/12

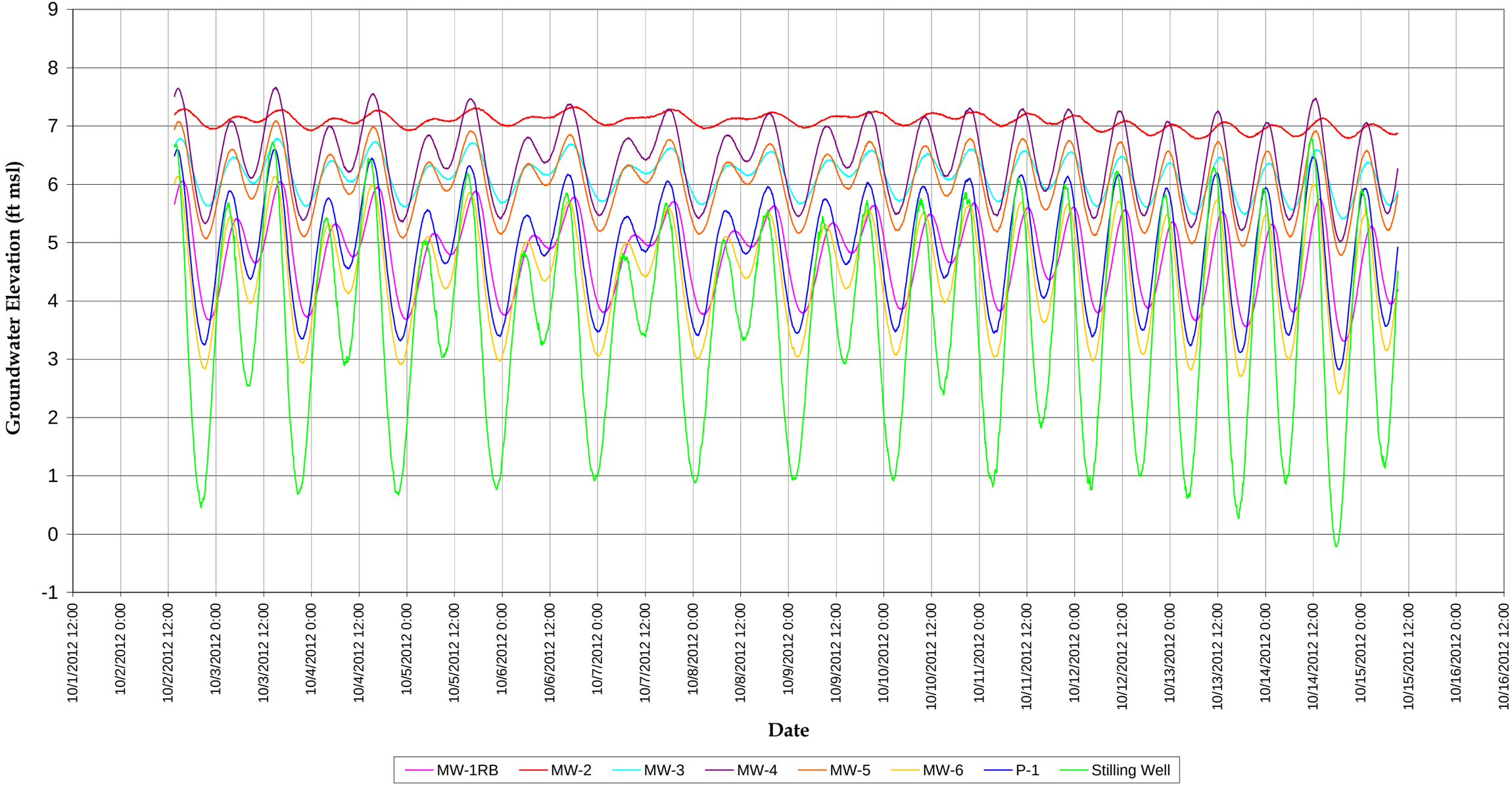
APPENDIX E

DATALOGGER GRAPHS

GRAPH A - TIDAL STUDY DATALOGGER REVIEW

FORMER SIGNAL OIL MARINE STORAGE AND DISTRIBUTION FACILITY

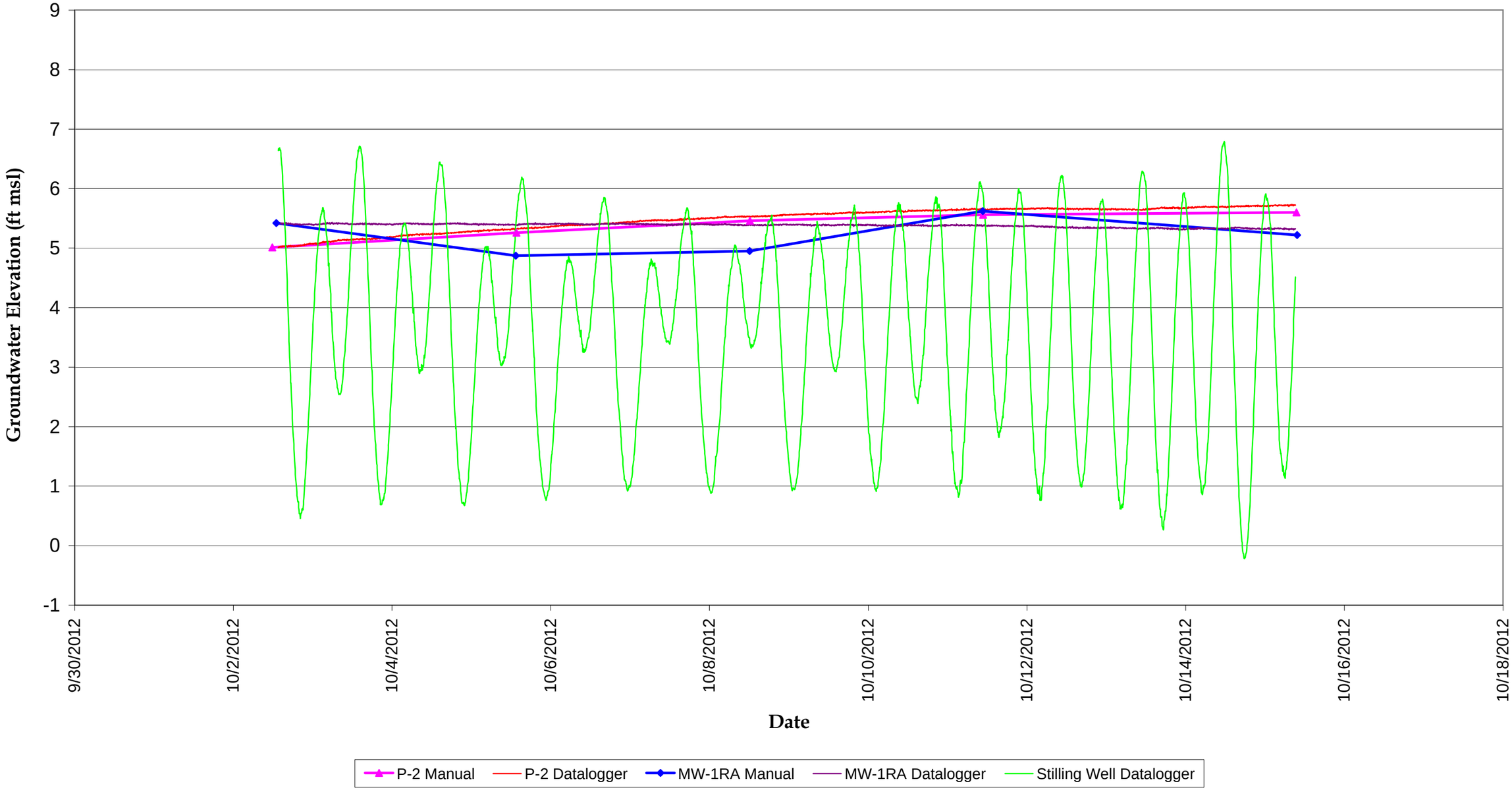
CHEVRON FACILITY 206127, 2301-2311 BLANDING AVENUE, ALAMEDA, CALIFORNIA



GRAPH B - TIDAL STUDY WELLS MW-1RA AND P-2 REVIEW

FORMER SIGNAL OIL MARINE STORAGE AND DISTRIBUTION FACILITY

CHEVRON FACILITY 206127, 2301-2311 BLANDING AVENUE, ALAMEDA, CALIFORNIA



GRAPH C - TIDAL STUDY CONDUCTIVITY REVIEW
FORMER SIGNAL OIL MARINE STORAGE AND DISTRIBUTION FACILITY
CHEVRON FACILITY 206127, 2301-2311 BLANDING AVENUE, ALAMEDA, CALIFORNIA