Dave Patten
Project Manager
Marketing Business Unit

Chevron Environmental Management Company
6001 Bollinger Canyon Road
San Ramon, CA 94583
Tel (925) 842-7877
drpatten@chevron.com

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

Re: Former Chevron Service Station No. 90260
21995 Foothill Boulevard
Hayward, California
Fuel Leak Case No. RO0000383

I have read and acknowledged the content, recommendations and/or conclusions contained in the attached *Feasibility Study/Corrective Action Plan Addendum* submitted on my behalf to Alameda County Department of Public Health's (ACEDH) FTP server and the State Water Resource Control Board's GeoTracker website.

This report was prepared by GHD Services Inc., upon whose assistance and advice I have relied. The information in this report is accurate to the best of my knowledge and all local Agency/Regional Board guidelines have been followed.

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

Sincerely,

Dave Patten
Project Manager

Attachment: *Feasibility Study/Corrective Action Plan Addendum*

July 27, 2017 Reference No. 311915

Mr. Mark Detterman
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Re: Feasibility Study and Corrective Action Plan Addendum
Former Chevron Service Station 90260
21995 Foothill Boulevard
Hayward, California
Fuel Leak Case No. RO0000383

Dear Mr. Detterman:

GHD is submitting this *Feasibility Study and Corrective Action Plan Addendum* (FS/CAP Addendum) for the site referenced above (Figures 1 and 2) on behalf of Chevron Environmental Management Company (CEMC). In the March 31, 2017 *Feasibility Study/Corrective Action Plan and Work Plan* (FS/CAP), GHD recommended installation of enhanced in-situ biodegradation (EISB) sulfate canisters in three wells and quarterly canister replacement for at least one year to sufficiently enhance biodegradation and reduce the estimated time for the constituents of concern (COCs) to reach the cleanup goals by increasing the rate of aerobic biodegradation in onsite wells MW-5, DVE-12, and DVE-20. However, in a letter dated May 25, 2017, Alameda County Department of Environmental Health (ACDEH) requested a re-evaluation of remedial options (Attachment A). ACDEH is concerned current hydrocarbon concentrations in groundwater indicate residual light non-aqueous phase liquids (LNAPL) in soil and that this approach will not address residual hydrocarbons in soil, does not address dissolved hydrocarbons in offsite downgradient wells MW-13 and MW-18, or ensure the dissolved plume does not impact the irrigation wells or San Lorenzo Creek. The locations of site monitoring wells, irrigation wells, and San Lorenzo Creek are illustrated on Figure 2. GHD's response to the ACDEH's concerns are discussed hererin.

1. Hydrocarbons in Soil

Between October 1997 and June 2002, a two-phase extraction (TPE) remediation system removed an estimated 30,800 pounds of hydrocarbons from 19 shallow vapor extraction wells (DVE-1 through DVE-19). Prior to 2002, hydrocarbons were detected in onsite soil between approximately 4 and 15 fbg at concentrations up to 9,900 milligrams per kilogram (mg/kg) TPHg, 110 mg/kg benzene, and 170 mg/kg ethylbenzene. Following system operation, the highest concentrations detected in soil between 4 and 15 fbg was 720 mg/kg TPHg, 0.004 mg/kg benzene, and 1.3 mg/kg at 15 fbg, indicating the system sufficiently removed a majority of hydrocarbons in shallow soil. Furthermore, all soil samples collected

GHD
5900 Hollis Street Suite A Emeryville California 94608 USA
T 510 420 0700 **F** 510 420 9170 **W** www.ghd.com

within the upper 10 feet contained concentrations below the direct exposure risks outlined in the State Water Resources Control Board (SWRCB) Low-Threat Closure Policy (LTCP). Therefore, remaining hydrocarbons in soil do not pose a direct expose risk.

Between July 17, 2007 and December 22, 2009, a dual phase extraction (DPE) system extracted soil vapor and groundwater from wells DVE-9, DVE-12, DVE-20, MW-5, MW-11, and MW-12 removing an estimated 6,765.2 pounds of TPHg, 15.4 pounds of benzene, and 1.5 pounds of MTBE. As discussed in GHD's March 31, 2017 FS/CAP, residual hydrocarbon concentrations are primarily located beneath the water table at approximately 15 to 30 fbg and benzene concentrations are either low (below LTCP direct exposure limits) or not detected. The TPE and DPE systems that operated onsite removed a significant amount of hydrocarbon mass from the subsurface and no additional active remediation is warranted.

Furthermore, in their April 2017 Review, the SWRCB disagreed with the ACDEH assessment that LNAPL remains in soil since free product has not been observed in any of the 23 groundwater monitoring wells since 2007. The SWRCB April 2017 Review in included as Attachment B.

2. Hydrocarbons in Groundwater

Groundwater monitoring and sampling has been ongoing for 29 years since 1988. Tables 2.1 and 2.2 below, originally presented in GHD's March 2017 FS/CAP, summarize the most recent groundwater analytical data for the shallow groundwater zone and degradation rate calculations.

Table 2.1: Shallow Zone – Groundwater Analytical Data (February 1, 2017)

Well ID	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)
WQOs	*100*	*1*	*150*	*30*	*1,800*	*5*
MW-4	**1,100**	<5	<5	23	7	<5
MW-5	**63,000**	**160**	**1,500**	**2,700**	**14,000**	<50
MW-6	<100	<1	<1	<1	<1	<1
MW-7	**130**	<1	<1	1	3	**13**
MW-8	**14,000**	**8**	**530**	**530**	**2,700**	<5
MW-9	**1,200**	<1	<1	5	0.6J	<1
MW-10	Destroyed					
MW-11	**700**	0.6J	0.6J	<1	3	<1
MW-12	**420**	<1	<1	1	6	**11**

Table 2.1: Shallow Zone – Groundwater Analytical Data (February 1, 2017)

Well ID	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)
WQOs	*100*	*1*	*150*	*30*	*1,800*	*5*
MW-13	**1,400**	<5	16	**40**	94	<5
MW-14[a]	85J	<1	<1	<1	<1	<1
MW-15[a]	<100	<1	<1	<1	<1	<1
MW-16[a]	**3,500**	**26**	3J	12	7	<5
MW-17[b]	<100	<1	<1	<1	<1	<1
MW-18[a]	**17,000**	**23**	24	**640**	330	<10
P-1[a]	<100	<1	<1	<1	<1	5
DVE-9	**3,300**	**8**	23	**140**	73	**22**
DVE-12	**15,000**	**27**	31	**480**	1,200	**11**
DVE-20	**8,600**	<5	9	**110**	260	<5

a December 7, 2016
b Last sampled March 29, 2016
µg/L Micrograms per liter
< Indicates constituent was not detected at or above laboratory reporting limit
J Estimated value between method detection limit and laboratory reporting limit
WQOs Water Quality Objectives are equivalent to the drinking water Environmental Screening Levels (ESLs, Table F-3) from *User's Guide: Derivation and Application of Environmental Screening Levels* prepared by the California Regional Water Quality Control Board – San Francisco Bay Region interim final 2016.
Bold indicates results above WQO

Table 2.2: Summary of Degradation Rate Calculations

Well	Analyte	Maximum Conc.	Maximum Conc. Post Remed-iation	Most Recent Conc.	WQO	Date to Reach WQOs	Years to Reach WQO
		Concentrations in µg/L					
MW-4	TPHg Benzene MTBE	1,300,000 45,000 290,000	19,000 35 5	1,100 <5 <5	100 1 5	2021 At WQO At WQO	4 At WQO At WQO
MW-5	TPHg Benzene MTBE	1,100,000 64,000 8,500	110,000 940 50	63,000 160 13	100 1 5	2073 2029 Stable (fluctuating)	56 12 Stable (fluctuating)
MW-7	TPHg Benzene MTBE	330,000 41,000 21,000	140 <0.5 140	130 <1 13	100 1 5	Fluctuating Near WQOs At WQO Fluctuating Near WQO	Fluctuating Near WQOs At WQO Fluctuating Near WQO
MW-8	TPHg Benzene MTBE	290,000 27,000 3,600	52,000 14 <10	14,000 8 <5	100 1 5	2034 Fluctuating Near WQO Fluctuating Near WQO	17 Fluctuating Near WQO Fluctuating Near WQO
MW-9	TPHg Benzene MTBE	220,000 3,300 510	5,100 5 <5.0	1,200 <1 <1	100 1 5	2024 At WQO At WQO	7 At WQO At WQO
MW-11	TPHg Benzene MTBE	340,000 36,000 6,900	2,400 12 5	700 0.6 <1	100 1 5	2019 At WQO At WQO	2 At WQO At WQO
MW-12	TPHg Benzene MTBE	2,400,000 53,000 66,000	8,500 410 72	420 <1 11	100 1 5	2021 2016 2017	4 At WQO 1
MW-13	TPHg Benzene MTBE	120,000 12,000 2,500	13,000 12 <3	1,400 <5 <5	100 1 5	Fluctuating Fluctuating Near WQOs Fluctuating Near WQOs	Fluctuating Fluctuating Near WQOs Fluctuating Near WQOs
MW-14	TPHg Benzene MTBE	9,900 1,400 250	2,500 77 <0.5	85 <1 <1	100 1 5	2017 At WQO At WQO	Fluctuating Near WQOs At WQO At WQO
MW-16	TPHg Benzene MTBE	71,000 9,700 1,000	30,000 1,500 8	3,500 26 <5	100 1 5	2040 2031 At WQO	23 15 At WQO

Table 2.2: Summary of Degradation Rate Calculations

Well	Analyte	Maximum Conc.	Maximum Conc. Post Remed-iation	Most Recent Conc.	WQO	Date to Reach WQOs	Years to Reach WQO
MW-18	TPHg Benzene MTBE	93,000 8,600 2,500	26,000 78 <5	17,000 23 <10	100 1 5	2057 2025 At WQO	40 8 At WQO
MW-19	TPHg Benzene MTBE	32,000 11,000 180	32,000 11,000 180	<100 4 2	100 1 5	2016 2017 At WQO	At WQO Fluctuating Near WQO At WQO
DVE-9	TPHg Benzene MTBE	80,000 3,400 370	12,000 920 180	3,300 8 22	100 1 5	2024 2017 2027	7 1 10
DVE-12	TPHg Benzene MTBE	120,000 38,000 210	46,000 910 60	15,000 27 11	100 1 5	2028 2022 Fluctuating Near WQO	11 5 Fluctuating Near WQO
DVE-20	TPHg Benzene MTBE	64,000 1,500 19	20,000 110 <10	8,600 <5 <5	100 1 5	2026 Fluctuating Near WQO At WQO	9 Fluctuating Near WQO At WQO

The residual dissolved-phase TPHg plume is centered on wells MW-5, MW-8, DVE-12, and DVE-20 onsite. The dissolved phase benzene plume is centered on well MW-5, is defined in all directions, and concentrations have decreased at least two orders of magnitude as a result of biodegradation and operation of the DPE system onsite. The highest benzene concentration now detected is 160 micrograms per liter (µg/L). Dissolved MTBE concentrations above the water quality objective (WQO)[1] are limited to onsite wells MW-7, MW-12, DVE-9, and DVE-12 with a maximum concentration of 22 µg/L. All hydrocarbon concentrations are one to four orders of magnitude below historical maximum concentrations.

TPHg concentrations in offsite well MW-13 have been fluctuating since DPE system shutdown in 2009; however, even the highest concentration detected since 2009 is one order of magnitude lower than the historical maximum concentration. Benzene and MTBE concentrations in MW-13 have degraded to below laboratory reporting limits, indicating the hydrocarbon plume is shrinking. Furthermore, the SWRCB states in their April 2017 review "the majority of monitoring wells display a decreasing trend in groundwater concentrations and delineation wells do not indicate an increase in areal extent. Monitoring

[1] Water Quality Objectives are equivalent to the drinking water Environmental Screening Levels (ESLs, Table F-3) from User's Guide: Derivation and Application of Environmental Screening Levels prepared by the California Regional Water Quality Control Board – San Francisco Bay Region interim final 2016.

well MW-13 has fluctuated in concentrations in past years." Hydrocarbon concentrations over time in MW-13 are illustrated on Figure A below.

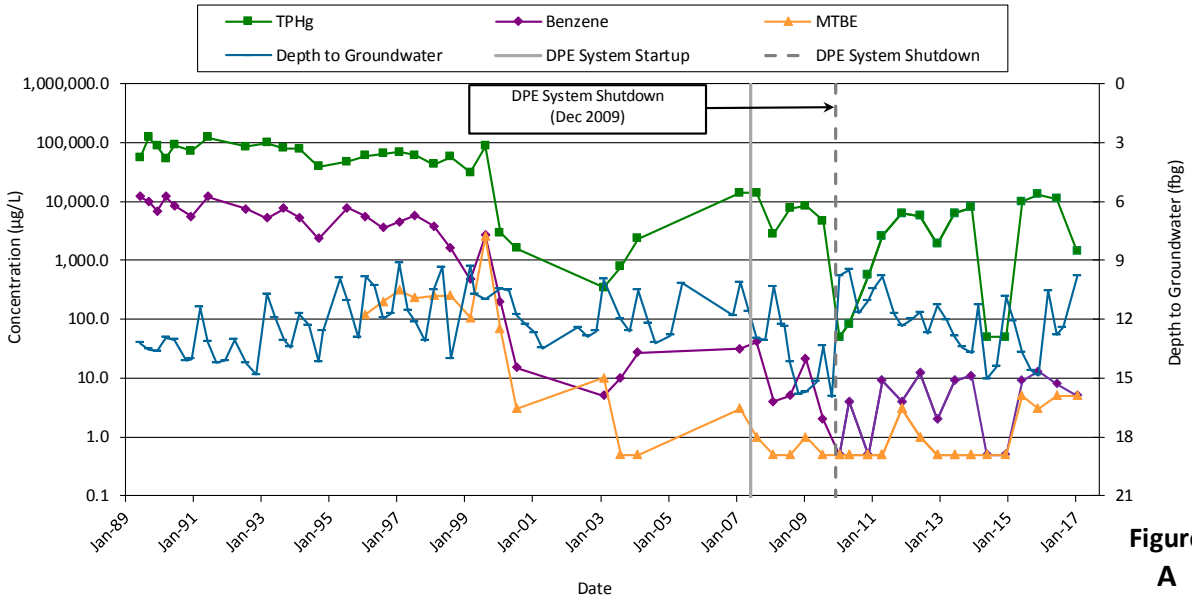


Figure A

FORMER CHEVRON STATION 90260
21995 FOOTHILL BOULEVARD
HAYWARD, CALIFORNIA

MW-13: TPHg,BENZENE, AND MTBE CONCENTRATIONS AND DEPTH TO GROUNDWATER

Hydrocarbon concentrations in offsite downgradient well MW-18 are decreasing, indicating the dissolved hydrocarbon plume is decreasing in areal extent. TPHg concentrations, although in the same order of magnitude, are lower than the historical maximum concentration as illustrated on Figure B below. Furthermore, benzene concentrations have decreased two orders of magnitude to the current concentration of 23 µg/L and MTBE has decreased to below laboratory reporting limits.

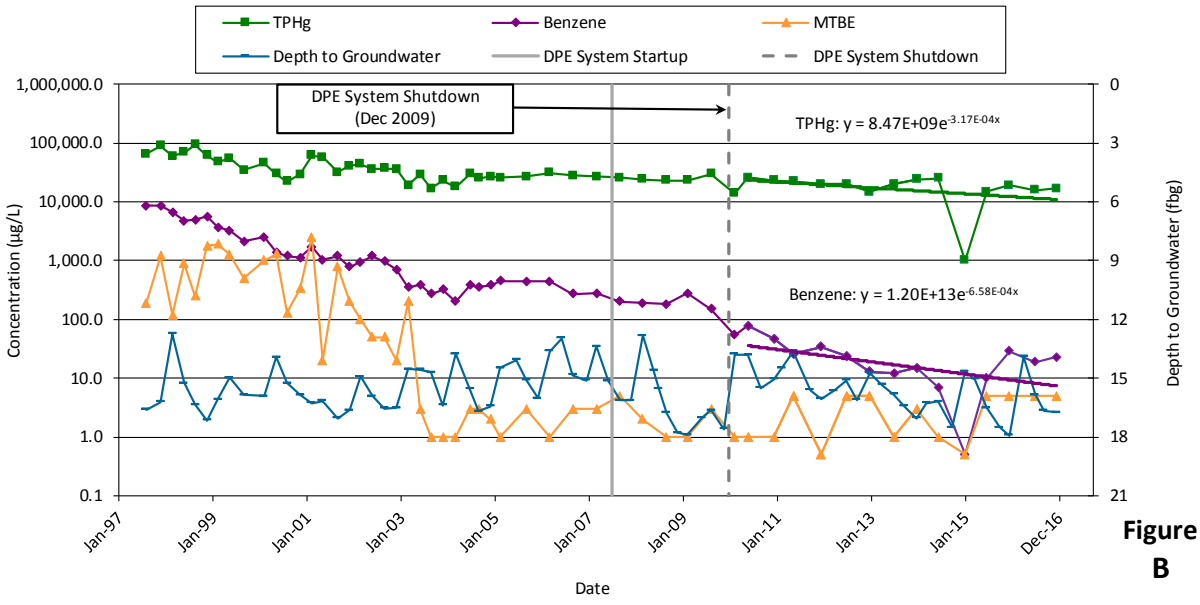


Figure B

FORMER CHEVRON STATION 90260
21995 FOOTHILL BOULEVARD
HAYWARD, CALIFORNIA

MW-18: TPHg,BENZENE, AND MTBE CONCENTRATIONS AND DEPTH TO GROUNDWATER

In all wells, TPHg concentrations are expected to reach the WQO in 56 years or less; benzene concentrations are expected to reach the WQO in 15 years or less and MTBE concentrations are expected to reach the WQO in 10 years or less. These are considered reasonable timeframes based on the recent State Water Resources Board (SWRCB) Resolution 2009-0042.

Offsite downgradient well MW-14, located approximately 250 feet upgradient of the water supply wells, contains 85 µg/L TPHg and no BTEX or MTBE. No BTEX or MTBE have been detected for at least four years and TPHg concentrations are two orders of magnitude lower than historical maximum concentrations, indicating the plume is decreasing in areal extent. None-the-less, a sentinel well will be installed between MW-14 and the irrigation wells to monitor groundwater conditions immediately upgradient of the active irrigation well. The proposed sentinel well is illustrated on Figure 2.

Offsite well P-1 monitors groundwater conditions adjacent to the San Lorenzo Creek. No hydrocarbons are detected in P-1 with the exception of 5 µg/L MTBE. Furthermore, no concentration historically detected in P-1 has exceeded the San Francisco Regional Water Quality Control Board environmental screening levels (ESLs) for freshwater aquatic habitat goal levels. The historical maximum concentrations, current concentrations, and aquatic ESLs are summarized in Table 2.3 below.

Table 2.3: Well P-1 Historical Maximum Concentrations and Aquatic Habitat Goal Levels

Constituent	Historical Maximum Concentration (µg/L)	Current Concentration (µg/L)	Aquatic ESL (µg/L)
TPHg	310	<100	440
Benzene	31	<1	46
Toluene	0.9	<1	1,300
Ethylbenzene	1	<1	2,900
Xylenes	1	<1	Not Established
MTBE	20	5	66,000

3. Conclusions and Recommendations

Based on the following, no additional remediation or assessment is warranted.

- A significant mass of hydrocarbons has been removed from soil and groundwater as a result of years of operation of TPE and DPE extraction systems.
- Soil and groundwater conditions on- and offsite have been thoroughly assessed by a total of 24 monitoring wells, 20 soil vapor extraction wells, 3 soil vapor probes, 2 temporary wells, and 49 soil borings.
- All onsite soil samples collected within the upper 10 feet contain concentrations below the direct exposure risks outlined in the SWRCB LTCP.
- No LNAPL has been detected in monitoring wells in over 10 years.
- Dissolved hydrocarbon concentrations are one to four orders of magnitude below historical maximum concentrations.
- The dissolved hydrocarbon plume is shrinking in areal extent.
- In their April 2017 Review, the SWRCB notes no LNAPL remains in soil since free product has not been observed in any of the 23 groundwater monitoring wells since 2007; and site wells, although fluctuating, display a decreasing trend in groundwater concentrations and delineation wells do not indicate an increase in areal extent.

GHD will install the sentinel well as proposed in the March 31, 2017 FS/CAP and Work Plan and as approved by the ACDEH May 25, 2017 letter. An offsite investigation report will be submitted following the well installation.

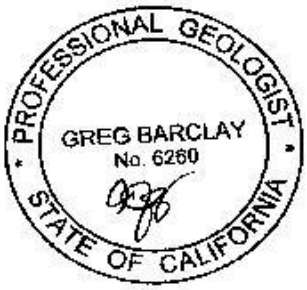
GHD will also install the EISB sulfate canisters in offsite wells MW-13 and MW-18 in addition to previously proposed onsite wells, and quarterly canister replacement for at least one year. This is expected to sufficiently enhance biodegradation and reduce the estimated time for residual COCs to reach the cleanup goals by increasing the rate of aerobic biodegradation in onsite wells MW-5, DVE-12, and DVE-20, as well as offsite wells MW-13 and MW-18.

Sincerely,

GHD

Kiersten Hoey

Greg Barclay PG 6260



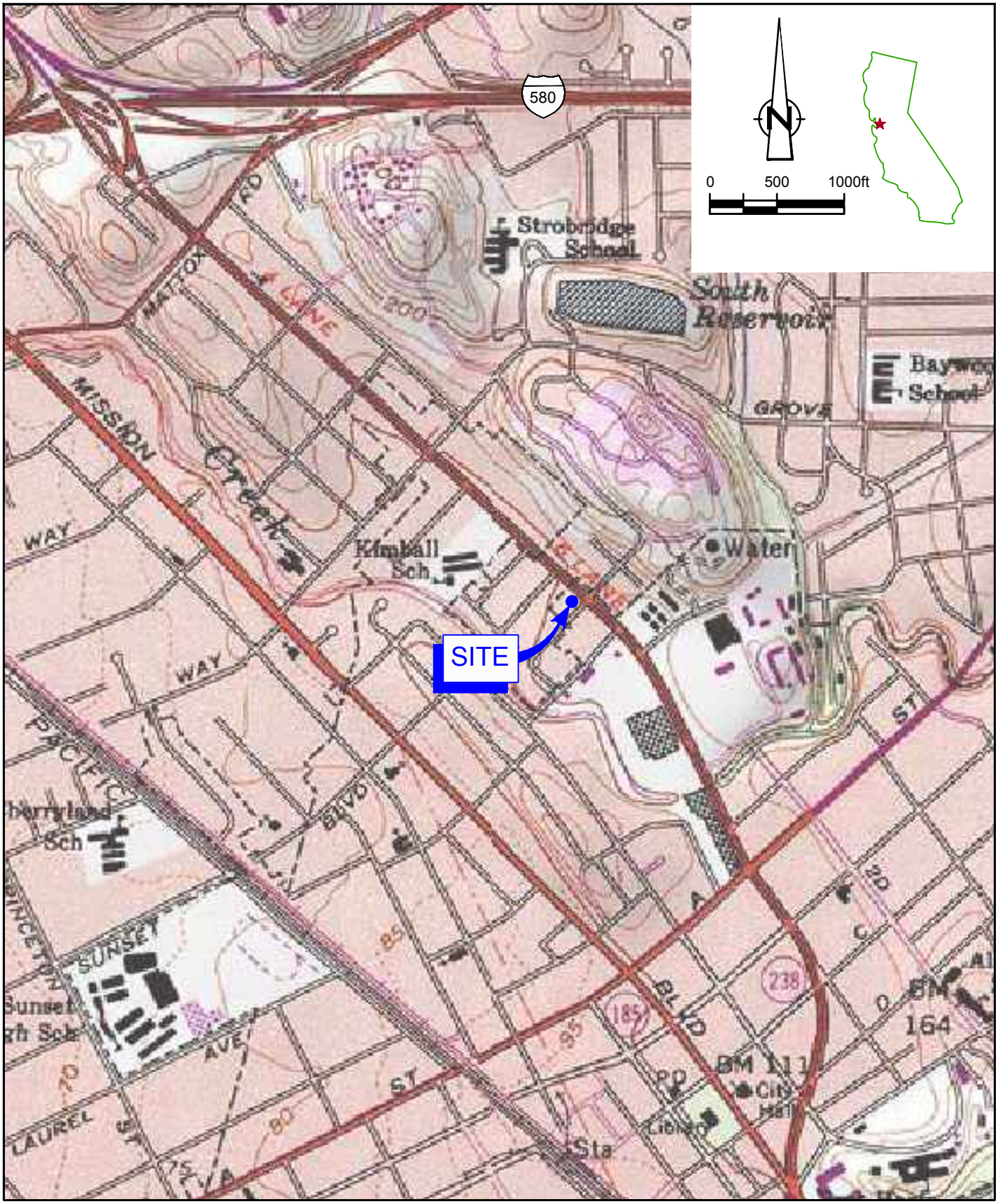
KH/cw/64 Addendum

Encl.

Figure 1	Vicinity Map
Figure 2	Site Plan
Attachment A	Regulatory Letter
Attachment B	SWRCB April 2017 Review

cc: Mr. Dave Patten, Chevron (*electronic copy*)
Mr. Hugh Murphy, City of Hayward Fire Department (*electronic copy*)

Figures



FORMER CHEVRON SERVICE STATION 90260
21995 FOOTHILL BOULEVARD
HAYWARD, CALIFORNIA

311915-2017.1

Mar 20, 2017

VICINITY MAP

FIGURE 1

CAD File: 311915-2017.1(064)GN-SO001.DWG

FOOTHILL BOULEVARD

MW-10

TREATMENT SYSTEM ENCLOSURE

COMMERCIAL

FORMER DISPENSER ISLANDS

FORMER USTS

FORMER CHEVRON SERVICE STATION 9-0260

FORMER STANDARD SERVICE STATION NO.1230

OAKVIEW AVENUE

REX ROAD

RIO VISTA STREET

RIO VISTA STREET

ACCESS ROAD

SAN LORENZO CREEK

MW-1 MW-2 MW-3 MW-4 MW-5 MW-6 MW-7 MW-8 MW-9 MW-11 MW-12 MW-13 MW-14 MW-15 MW-16 MW-17 MW-18 MW-19 MW-20 MW-21 MW-22 MW-23

DVE-1 DVE-2 DVE-3 DVE-4 DVE-5 DVE-6 DVE-7 DVE-8 DVE-9 DVE-10 DVE-11 DVE-12 DVE-13 DVE-14 DVE-15 DVE-16 DVE-17 DVE-18 DVE-19 DVE-20

P-1

SB-11 SB-12 SB-13 SB-14 SB-15 SB-16 SB-17 SB-18 SB-19 SB-20 SB-21 SB-22 SB-23 SB-24

B-6 B-8 B-9 B-10

CPT-1 CPT-2 CPT-3 CPT-4 CPT-5 CPT-6 CPT-7 CPT-8 CPT-9 CPT-10 CPT-11 CPT-12 CPT-13 CPT-14 CPT-15 CPT-16 CPT-17

VP-1 VP-3

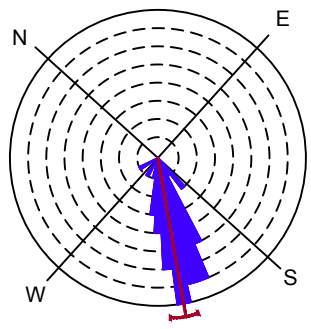
Private Well (Not in Use)
Located at 1108 Rex Road

Private Well (Used for Irrigation)
Located at 22047 Rio Vista Street

180' SOUTHWEST

LEGEND

- PROPOSED MONITORING WELL LOCATION
- PRIVATE WELL LOCATION
- MW-1 MONITORING WELL LOCATION
- MW-5 MONITORING WELL USED FOR DPE
- DVE-12 DVE WELL CONVERTED TO DPE WELL
- P-1 PIEZOMETER LOCATION
- SB-11 SOIL BORING LOCATION
- CPT-1 CPT SOIL BORING LOCATION
- VP-1 VAPOR PROBE LOCATION
- MW-1 MONITORING WELL LOCATION (DESTROYED)
- DVE-1 DVE WELL LOCATION (DESTROYED)



HISTORIC GROUNDWATER FLOW DIRECTION
1999 THROUGH 1Q 2017

Source: Microsoft Product Screen Shot(s) Reprinted with permission from Microsoft Corporation, Acquisition Date Oct/2013 - Nov/2013 Accessed: 2016

0 30 60ft

Coordinate System:
CA State Plane
Zone 3

FORMER CHEVRON SERVICE STATION 90260
21995 FOOTHILL BOULEVARD
HAYWARD, CALIFORNIA

311915-2017.1

Jul 20, 2017

SITE PLAN

Figure 2

CAD File: 311915-2017.1(064)GN-SO002.DWG

Attachment A
Regulatory Letter

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
REBECCA GEBHART, Interim Director

DEPARTMENT OF ENVIRONMENTAL HEALTH
LOCAL OVERSIGHT PROGRAM (LOP)
For Hazardous Materials Releases
1131 HARBOR BAY PARKWAY, SUITE 250
ALAMEDA, CA 94502
(510) 567-6700
FAX (510) 337-9335

May 25, 2017

Mr. David Patten
Chevron Environmental Management Co.
6101 Bollinger Canyon Road
San Ramon, CA 94583
(Sent via electronic mail to: drpatten@chevron.com)

Subject: Conditional Work Plan Approval and Plume Delineation and FS/CAP Comments; Fuel Leak Case No. RO0000383 (Global ID # T0600100315), Chevron #9-0260, 21995 Foothill Boulevard, Hayward, CA 94541

Dear Mr. Patten:

Alameda County Department of Environmental Health (ACDEH) staff has reviewed the case file for the above referenced site including the *Feasibility Study / Corrective Action Plan and Work Plan*, dated March 31, 2017, and the *Fourth Quarter 2016, Groundwater Monitoring and Sampling Report,* dated March 1, 2017. The reports were prepared and submitted on your behalf by GHD. Thank you for submitting the reports.

The Feasibility Study / Corrective Action Plan (FS/CAP) portion of the referenced *Feasibility Study / Corrective Action Plan and Work Plan* evaluated four alternative corrective actions (Monitored Natural Attenuation, excavation, groundwater extraction, and Enhanced In-Situ Biodegradation [EISB]), and found based on analytical testing that petroleum hydrocarbon degradation is currently proceeding under extremely anaerobic conditions. The FS/CAP proposed the installation, and quarterly replacement, of five-fool long containers packed with sulfate and sand in five wells (MW--5, DVE-20, SVE-9, DVE-12, and MW-8) to enhance anaerobic biodegradation of hydrocarbons in the five wells, such that biodegradation in the wells would be increased into the highly (sulfate) anaerobic zone from the current extremely (methanogenic) anaerobic biodegradation zone.

The Work Plan portion of the referenced *Feasibility Study / Corrective Action Plan and Work Plan* proposed the installation of a groundwater well on Rio Vista Street to act as a sentinel well upgradient of an actively used private residential irrigation water supply well on that street, and potentially of San Lorenzo Creek. It appears the sentinel well would be located approximately 70 feet upgradient of the private well, which was recently analyzed for site contaminants of concern and yielded non-detectable concentrations at standard limits of reporting. A second, inactive residential water supply well, would not be monitored by a sentinel well, based on the inactive use profile.

Based on ACDEH staff review of the case file, we request that you address the following technical comments and send us the reports described below.

TECHNICAL COMMENTS

1. **Work Plan Modifications** – The work plan portion of the referenced FS/CAP proposes a series of actions with which ACDEH is in general agreement of undertaking; however, ACDEH requests one modification to the approach. Please submit a report by the date identified below.

    a. **Well Screen Interval** – The work plan in the FS/CAP stated that the screen interval for the sentinel well proposed to be installed upgradient of the actively used private residential irrigation water supply well would utilize an approximately 15 foot long screen interval between 15 and 40 feet below grade surface (bgs). In general ACDEH prefers shorter screen intervals, on the order of approximately 10 feet, in an effort to limit vertical intra-well fluid flow between granular zones of differing transmissivity; however, recognizes some latitude is necessary for in-field well installation

decisions if two granular zones will not be connected by the screen interval. Please incorporate this thinking into the well screen interval selection.

2. **Feasibility Study / Corrective Action Plan Recommendations** – The FS/CAP portion of the report proposed the installation of passive sulfate-amended canisters at five wells to increase extremely anaerobic degradation to highly anaerobic biodegradation of hydrocarbons in groundwater beneath the site. In ACDEH's view this approach will likely very slowly treat near-well hydrocarbon concentrations in groundwater, but is likely not to address the apparently substantial residual soil contamination source, does not address substantially impacted groundwater further from the proposed wells themselves, or further from the site, such as at offsite downgradient wells MW-13 and MW-18. Groundwater concentrations in these wells are of sufficient concern to ACDEH to note in the previous directive letter that since system shut-down in December 2009 contaminant concentrations have increased substantially in these wells, and that the groundwater concentrations are suggestive of residual, non-migrating Light Non Aqueous Phased Liquids (LNAPL) in soil which will continue to contaminate groundwater in the vicinity for an extended period. The adequacy of biodegradation of apparently substantial petroleum hydrocarbon concentrations in soil, and in groundwater, including at downgradient locations from the site, with a passive, highly anaerobic bio-enhancement is, in part, sufficiently uncertain that a downgradient sentinel well has been proposed. Additionally, the extent of anaerobic biodegradation outside of each well has not been proposed to be accessed.

   While ACDEH is in agreement with the sentinel well installation in order to ensure that the migrating slug of groundwater contamination does not, in the interim, impact the actively used irrigation well, San Lorenzo Creek, or the second inactive irrigation well, it appears appropriate to request an evaluation of remedial alternatives that are capable of remediating the groundwater contaminant plume on and offsite in order to reach Water Quality Objectives in a more reasonable time due to the current groundwater use in the vicinity. This may include an active system, or perhaps a combination active / passive system, at both on and offsite locations, to prevent impacts to the identified sensitive receptors.

   Therefore, utilizing the time period the proposed sentinel well will be installed in, ACDEH requests the re-evaluation of FS/CAP options, including such potential options as Air Sparging / Soil Vapor Extraction (AS/SVE), horizontal well installation, or other methods to actively increase the oxygen concentration in soil and groundwater in the residual LNAPL source zone, and in downgradient locations. Other options are also likely to be identified. Please submit a FS/CAP Addendum by the date identified below.

TECHNICAL REPORT REQUEST

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

- **July 31, 2017** – Feasibility Study / Corrective Action Plan Addendum
  File to be named: RO383_FEASTUD_ADEND_R_yyyy-mm-dd

- **August 4, 2017** – Offsite Investigation (can be combined with above)
  File to be named: RO383_SWI_R_yyyy-mm-dd

- **June 5, 2017** – First Quarter 2017 Quarterly Groundwater Monitoring Report
  File to be named: RO383_GWM_R_yyyy-mm-dd

- **September 1, 2017** – Second Quarter 2017 Quarterly Groundwater Monitoring Report
  File to be named: RO383_GWM_R_yyyy-mm-dd

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

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

Sincerely,

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

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

cc: Kiersten Hoey, GHD, 5900 Hollis Street, Suite A, Emeryville, CA 94608; (Sent via electronic mail to: Kiersten.Hoey@ghd.com)

Brandon Wilken, GHD, 5900 Hollis Street, Suite A, Emeryville, CA 94608; (Sent via electronic mail to: Brandon.Wilken@ghd.com)

Dilan Roe, ACDEH, (Sent via electronic mail to: dilan.roe@acgov.org)
Paresh Khatri, ACDEH; (Sent via electronic mail to: paresh.khatri@acgov.org)
Mark Detterman, ACDEH, (Sent via electronic mail to: mark.detterman@acgov.org)
Electronic File; GeoTracker

Attachment 1

Responsible Party(ies) Legal Requirements / Obligations

REPORT REQUESTS

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

ELECTRONIC SUBMITTAL OF REPORTS

Alameda County Department of Environmental Health's (ACDEH) Environmental Cleanup Oversight Programs, Local Oversight Program (LOP) and Site Cleanup Program (SCP) 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 File Transfer Protocol (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 SCP 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 (http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal/) for more information on these requirements.

ACKNOWLEDGEMENT STATEMENT

All work plans, technical reports, or technical documents submitted to ACDEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on my behalf to ACDEH's FTP server and the SWRCB's GeoTracker website." 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 6731, 6735, and 7835) 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 licensed 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 case meet this requirement. Additional information is available on the Board of Professional Engineers, Land Surveyors, and Geologists website at: http://www.bpelsg.ca.gov/laws/index.shtml.

UNDERGROUND STORAGE TANK CLEANUP FUND

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

AGENCY OVERSIGHT

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

Alameda County Environmental Cleanup Oversight Programs (LOP and SCP)	**REVISION DATE:** December 1, 2016
	ISSUE DATE: July 5, 2005
	PREVIOUS REVISIONS: October 31, 2005; December 16, 2005; March 27, 2009; July 8, 2010, July 25, 2010; May 15, 2014, November 29, 2016
SECTION: Miscellaneous Administrative Topics & Procedures	**SUBJECT:** Electronic Report Upload (ftp) Instructions

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

REQUIREMENTS

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

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

Submission Instructions

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

2) Upload Files to the ftp Site
   a) Open File Explorer using the Windows  key + E keyboard shortcut.
      i) Note: Netscape, Safari, and Firefox browsers will not open the FTP site as they are NOT being supported at this time.
   b) On the address bar, type in ftp://alcoftp1.acgov.org.
   c) Enter your User Name and Password. (Note: Both are Case Sensitive)
   d) Click Log On.
   e) Open "My Computer" on your computer and navigate to the file(s) you wish to upload to the ftp site.
   f) 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
SWRCB April 2017 Review

State Water Resources Control Board

REVIEW SUMMARY REPORT – CONCUR WITH ADDITIONAL WORK
FIRST REVIEW – APRIL 2017

Case Information

Cleanup Fund (Fund) Claim No.: 5975	GeoTracker Global ID: T0600100315
Site Name: Chevron #9-0260	Address (Site): 21995 Foothill Blvd. Hayward, CA 94541
Responsible Party (RP): Chevron Projects Co. C/O Chevron Environmental Management Co. Attn: Joe Waterson	Address (RP): 6001 Bollinger Canyon Rd. Room C-2196 San Ramon, CA 94583
Fund Expenditures to Date: $1,490,000	Number of Years Case Open: 32
Fund Budget Category: Claim Is Closed	

Agency Information

Agency Name: Alameda County Environmental Health (County)	Address: 1131 Harbor Bay Parkway, 2nd Alameda, CA 94502-6577
Agency Caseworker: Mark Detterman	Case No.: RO0000383

Consultant History

Consultant: GHD Services, Inc. Signatory: Brandon S. Wilken, PG	Years: 2008 – 2016 Office Phone: (510) 420-3347
Consultant: Conestoga-Rovers & Associates Signatory: Nathan S. Lee, PG	Years: 2007 – 2015 Office Phone: (510) 420-0700
Consultant: Gettler-Ryan, Inc. Signatory: Robert A Lauritzen, PG	Years: 1995 – 2008 Office Phone: (925) 551-7555
Consultant: Cambria Environmental Signatory: Robert Foss, PG	Years: 2004-2006 Office Phone: (510) 420-0700
Consultant: Delta Environmental Signatory: Steve W. Meeks, PE	Years: 2002 Office Phone: (916) 638-8385
Consultant: Terra Vac Signatory: James A. Perkins, RG	Years: 1997 Office Phone: Not available
Consultant: Touchstone Developments Signatory: Jeff L. Monroe	Years: 1996 Office Phone: (707) 538-8818
Consultant: Geraghty & Miller Signatory: Not availabe	Years: 1992 Office Phone: Not available
Consultant: Weiss Associates Signatory: Richard B. Weiss, RG	Years: 1988 – 1992 Office Phone: (415) 465-1100

To view all public documents for this case available on GeoTracker use the following URL:
http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0600100315

Summary

The Low-Threat Underground Storage Tank (UST) Case Closure Policy (Policy) contains general and media-specific criteria, and cases that meet those criteria are appropriate for closure pursuant to the Policy. This case does not meet all of the required criteria of the Policy.

Highlights of the case follow: The Site is a former commercial petroleum fueling facility that is currently undeveloped. An unauthorized release was reported in 1985 following a subsurface investigation. Three 10,000-gallon gasoline USTs were removed from the Site in 1996. During the UST closure in 1996, approximately 1,000 gallons of groundwater with free product was removed from the excavation. A dual vacuum extraction (DVE) system operated between October 1997 and June 2002, and removed approximately 30,000 pounds of hydrocarbons from soil vapor. A dual phase extraction (DPE) system operated from July 2007 to December 2009 and removed approximately 6,400 pounds of hydrocarbons from soil vapor and approximately 1,293,003 gallons of impacted groundwater, which equated to approximately 364 pounds of hydrocarbons. A total of 36,765 pounds of hydrocarbons were recovered from active remediation. Active remediation has not been conducted at the Site since December 2009.

Since 1988, 23 groundwater monitoring wells have been installed and regularly monitored. According to groundwater data, water quality objectives have not been achieved for wells MW-4, MW-5, MW-12, MW-13, MW-16, MW-18, DVE-9, DVE-12, DVE-20, MW-19, and MW-20.

The petroleum release is limited to the soil and shallow groundwater. According to data available in GeoTracker, there are no public water supply wells within 1,000 feet of the projected plume boundary. A surface water body (San Lorenzo Creek) is located less than 250 feet from the projected plume boundary. Three private water supply wells are located less than 250 feet from the projected plume boundary. The well at address 22407 Rio Vista Street is actively used for lawn irrigation, has recently been tested, and is not impacted. The well at 1108 Rex Road is not in use, has recently been tested, and is not impacted. The well at 1180 Rex Road is filled with debris, unusable, and is not able to be tested.

The unauthorized release is located within the service area of a public water system, as defined in the Policy. The affected shallow groundwater is not currently being used as a source of drinking water, and it is highly unlikely that the affected shallow groundwater will be used as a source of drinking water in the foreseeable future. Other designated beneficial uses of impacted groundwater are not threatened, and it is highly unlikely that they will be, considering these factors in the context of the site setting.

Rationale for Closure under the Policy

- General Criteria: The case meets all eight Policy general criteria.
- Groundwater Specific Criteria: The case does not meet Policy Criterion for groundwater. The nearest water supply wells are less than 250 feet from the projected plume boundary. The contaminant plume that exceeds water quality objectives is approximately 680 feet in length. The nearest surface water body, San Lorenzo Creek, is located less than 250 feet from the projected plume boundary. The plume appears to attenuate at P-1, which is located adjacent to the San Lorenzo Creek. P-1 has occasionally had slight exceedances of the water quality objectives.
- Vapor Intrusion to Indoor Air: The Site does not contain existing buildings; however, the case meets Policy Criterion 2a by Scenario 4 with a bioattenuation zone for the Site. The maximum benzene and ethylbenzene concentrations in soil gas are less than 85,000 $\mu g/m^3$ and 1,100,000 $\mu g/m^3$ at a depth of five feet. These levels meet the Residential soil gas criteria where the soil gas sample locations are overlain by soil containing less than 100 milligrams per kilogram (mg/kg) of total petroleum hydrocarbons (TPH) where the oxygen soil vapor

concentration is equal to or greater than 4 percent. For offsite properties within the projected plume boundary, the case meets Policy Criterion 2a by Scenario 3a. The maximum benzene concentration in groundwater is less than 100 micrograms per liter (µg/L). The minimum depth to groundwater is greater than 5 feet, overlain by soil containing less than 100 milligrams per kilogram (mg/kg) of total petroleum hydrocarbons (TPH).

- Direct Contact and Outdoor Air Exposure: The case meets Policy Criterion 3a. Maximum concentrations in soil are less than those in Policy Table 1 for Commercial/Industrial use, and the concentration limits for a Utility Worker are not exceeded. One of 91 soil samples collected above 10 feet below ground surface (bgs) exceeded the concentrations in Table 1. Soil analytical results from MW-9 (offsite in Rex Road) at 10 feet bgs in 1988 contained benzene at 26 mg/kg. The sample result is not representative of the Site and is not considered a threat to human health and the environment.

Objections to Closure and Responses

The Regional Water Board objects to UST case closure in an email dated March 30, 2017 because:

- Comment: ACDEH is in agreement that Light Non Aqueous Phased Liquids (LNAPL) has not been observed on groundwater at the site for some time; however, groundwater concentrations indicate LNAPL concentrations in soil remain and the LNAPL continues to degrade groundwater quality substantially. Using the LNAPL criteria set forth in the LTCP, ACDEH presumes this would be classified as residual or immobile LNAPL. Regardless, groundwater concentrations indicate residual LNAPL is present.
  Response: State Water Board staff disagree with the assessment since free product has not been observed in monitoring wells since 2007.
- Comment: While there are reductions in hydrocarbon contaminants in wells at the site and vicinity, other wells indicate clear increasing concentration trends (well MW-13 which increased from <0.50 micrograms per liter (ug/l) TPHg at system shut down, to 11,000 ug/l most recently). An upward maximum concentration limit at this well has not been defined. Site data has additionally suggested channelized flow may be present beneath the site. Ultimately these concentrations have the potential to impact the downgradient private vicinity wells in the near future.
  Response: State Water Board staff disagree that the plume is not stable or decreasing in areal extent. The majority of monitoring wells display a decreasing trend in groundwater concentrations and delineation wells do not indicate an increase in areal extent. Monitoring well MW-13 has fluctuated in concentrations in past years. Delineation to water quality objectives is not defined southeast of MW-13, but projected to be relatively near MW-13 since groundwater flow direction has historically been observed to be toward the southwest.
- Comment: The SWB recommended that the three private water supply wells be either abandoned or designated non-potable. In reviewing state regulations regarding wells, it is the understanding of ACDEH that a land owner has the right to extract groundwater and put it to beneficial use as long as it is not in a wasteful manner. As a consequence, ACDEH does not believe that our agency can require a landowner to abandoned a water well used to irrigate landscaping, to eliminate a potential receptor for case closure. Conversely, it is the Responsible Party's role to clean up the site so that it is protective of human health on and off-site. Should you have other insight into private water rights, please let us know.
  Response: State Water Board staff default to the County for local ordinances that may be applicable to non-potable well designation, should the water quality become affected in those wells.

Recommendation
State Water Board staff recommend that the County add known private well locations by address or parcel in GeoTracker using the "other" well designation. Additionally, State Water Board staff recommend that the County direct the Responsible Party to comply with the County letter dated November 10, 2016 Plume Delineation and Feasibility Study / Corrective Action Plan Request.

4-5-17

Galvin Kauffman Date
Engineering Geologist
Technical Review Unit
(916) 322-9685

4/6/17

Pat G. Cullen, P.G. #4932 Date
Senior Engineering Geologist
Chief, Technical Review Unit
(916) 341-5684