March 2, 2017

Ms. Karel Detterman
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

I, Bob Winet, hereby authorize ERAS Environmental, Inc. to submit the Workplan for Limited Phase II Subsurface Investigation for 1091 Calcot Place, Oakland, California, dated March 1, 2017 to the Alameda County Health Care Services Agency.

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.

Signature: Bob Winet 3/3/2017

Printed Name: Bob Winet

Bob Winet
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WORK PLAN FOR LIMITED PHASE II SUBSURFACE INVESTIGATION

AT

1091 Calcot Place
Oakland, California

ERAS PROJECT NUMBER: 16-005

Prepared for

Mr. Bob Winet
East Bay Lofts LLC
36966 Pinto Palm Street
Rancho Mirage, CA 92270

March 1, 2017

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CERTIFICATION

This **Work Plan for Limited Phase II Subsurface Investigation** at 1019 Calcot Place in Oakland, California, has been prepared by ERAS Environmental, Inc. (ERAS) under the professional supervision of the Registered Professional Geologist whose signature appears hereon.

This work plan was prepared in general accordance with the accepted standard of practice that exists in Northern California at the time the investigation was performed. Judgments leading to conclusions and recommendations are generally made with an incomplete knowledge of the conditions present. More extensive studies, including additional environmental investigations, can tend to reduce the inherent uncertainties associated with such studies.

Our firm has prepared this work plan for the Client's exclusive use for this particular project and in accordance with generally accepted professional practices within the area at the time of our investigation. No other representations, expressed or implied, and no warranty or guarantee is included or intended.

This work plan may be used only by the client and only for the purposes stated within a reasonable time from its issuance. Land use, site conditions (both on-site and off-site) or other factors may change over time, and additional work may be required with the passage of time. Any party other than the client who wishes to use this report shall notify ERAS of such intended use. Based on the intended use of report, ERAS may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release ERAS from any liability resulting from the use of this report by any unauthorized party.

Sincerely,
ERAS Environmental, Inc.

Curtis Payton
California Registered Professional Geologist 5608

Andrew Savage
Project Geologist

March 1, 2017

1.0 INTRODUCTION

The following is a work plan for the collection of soil and groundwater samples to further characterize the lateral and vertical extent of petroleum hydrocarbons at a commercial site located at 1091 Calcot Place in Oakland, California (the "Property"). The workplan was requested by Ms. Karel Detterman of the Alameda County Environmental Health Care Services Agency (ACHCSA) in a letter dated January 20, 2017.

A previous subsurface investigation conducted by ERAS on the Property identified concentrations of petroleum hydrocarbons quantified as diesel and oil range organics (TPH-dro[1], and TPH-oro) that warranted further investigation.

This work plan was prepared to further investigate nature and extent of hydrocarbons near the former fuel oil underground storage tanks (USTs) and former furnaces so that an environmental site case closure can be obtained from the ACHCSA.

The Property is located on the northwestern side of Calcot Place near the intersection of Calcot Place and 23rd Avenue, in the southern portion of the City of Oakland. The Property consists of a single parcel with the Alameda County Assessor's parcel number 19-55-11 and consists of an approximate area of 1.36 acres. The Property contains a single small commercial building and parking/storage area.

The location of the Property is shown on **Figure 1**. The layout of the Property is shown on **Figure 2**.

1.1 BACKGROUND

The history and the description of the Property is based on information obtained during a Phase 1 Environmental Site Assessment conducted by ERAS in 2014.

The Property is in an area of mixed commercial and residential land uses. The Property was occupied by a parking lot for live/work lofts at 1091 Calcot Place and storage and repair of personal automobiles and vehicles formerly used in movie production.

To the northeast of the Property was Southern Pacific Railroad. To the southeast was Calcot Place and across the street was a commercial building at 1092 Calcot Place. To the west of the Property was Nimitz Freeway (I-880). The Property also wrapped around the 1091 Calcot Building which according to signs was formerly occupied by California Cotton Mills. The building was indicated to have been built in 1883. The former California Cotton Mill building is now occupied by live/work lofts.

[1] TPH-gro, TPH-dro, and TPH-oro are methods that compare analytical results to standards for gasoline, diesel and motor oil, respectively. Therefore, analytical results are estimates of quantities based on what would be expected for the range of hydrocarbon results for the standard. Gasoline range organics (gro) are those hydrocarbon compounds that are in the range of C6 to C10, diesel range organics (dro) are those hydrocarbon compounds that are in the range of C10 to C23, and oil range organics (oro) are those hydrocarbon compounds that are in the range of C18 to C36. There can be overlap in reporting methods as well as identification of compounds that fall within the standard that may not necessarily be derived from gasoline, diesel, or oil.

A 1911 Sanborn Fire Insurance map showed two oil USTs and four burners (furnaces) located along the northeast edge of the Property parallel to the rail lines that border the Property. These were not present in 1951 according to the Sanborn map of that date.

The current Property contained parking and storage space along with one small building of brick construction on a concrete slab foundation. The building was located on the far northwestern corner of the Property. The building was full of vehicles, parts, and various other items for the restoration of vehicles.

The yard area was divided into two areas. The southeastern-most portion was an asphalt paved parking area for the live/work lofts at 1091 Calcot Place. No leaks or spills were observed in this area other than de minims oil spotting from parked vehicles. None of the oil spotting was in the area of cracks or drains. The northeastern portion of the Property was an asphalt paved yard area used for the storage of vehicles, storage containers, storage trailers, and various other automotive items.

Septic systems, drywells, monitoring wells or evidence of subsurface investigations were not observed on the Property by ERAS. No evidence of aboveground storage tanks (ASTs) or underground storage tanks (USTs) were observed on the Property by ERAS. No evidence of leakage, spillage, and dumping of regulated material was observed on the Property by ERAS.

1.2 PREVIOUS SUBSURFACE INVESTIGATIONS

ERAS Environmental conducted a subsurface investigation of the Property on December 23, 2014 that included the drilling of three soil borings and the collection of groundwater samples. The soil borings were drilled directly in the area of the former USTs. The results of the analysis are summarized on **Table 1** through **Table 5**.

The area of the former USTs was screened using a magnetometer and ground penetrating radar (GPR) to determine if the USTs had been removed. The USTs were determined to have been removed.

The results of the investigation indicated the former presence of the USTs on the Property have impacted the subsurface environmental conditions beneath the Property at concentrations above the ESLs. ERAS concluded that additional investigations would likely be needed to characterize the nature and extent of the petroleum hydrocarbon contaminants detected as well as typical semi-volatile organic compounds found in fuel and oil blends.

ERAS recommended the report be provided to the Alameda County Department of Environmental Health (ACDEH) and the California Regional Water Quality Control Board (RWQCB) for further oversight.

The ACDEH requested a work plan for further investigation in correspondence dated April 14, 2015. ERAS prepared a work plan dated August 31, 2015 which was approved by the ACDEH in correspondence dated November 20, 2015. The ACDEH requested that soil samples be collected from depth intervals of 0-5 feet bgs and 5-10 feet bgs. The ACDEH also requested that all groundwater and soil samples be analyzed for total petroleum hydrocarbons quantified

as gasoline range organics (TPH-gro), TPH-dro, and TPH-oro by EPA Method 8015, full scan volatile organic compounds (VOCs) including naphthalene by EPA Method 8260. It was also requested that all soil samples be analyzed for semi volatile organic compounds (SVOC's) by EPA Method 8270 and that polycyclic aromatic hydrocarbons (PAHs) be analyzed by Select Ion Monitoring (SIM) Mode.

ERAS Environmental conducted a subsurface investigation of the Property on January 20, 2016 that included the drilling of four soil borings and the collection of soil and groundwater samples. The soil borings were drilled in an attempt to vertically and horizontally delineate the extent of the contamination. The results of the analysis are summarized on **Table 1** through **Table 5**.

The soil samples from 0-5 and 5-10 feet bgs were analyzed for TPH-gro, TPH-dro, and TPH-oro by EPA Method 8015, VOCs including naphthalene by EPA Method 8260B, SVOCs by EPA Method 8270, along with PAHs by SIM Mode.

The groundwater samples from the borings were analyzed for TPH-gro, TPH-dro, and TPH-oro by EPA Method 8015, and VOCs including naphthalene by EPA Method 8260B.

Shallow soil, 3.5-4 feet bgs, on the Property appears to have been impacted by phenol at concentrations which exceed the ESL and range from 0.30-0.59 mg/Kg. The shallow soil sample collected from boring B-4 was also found to contain a concentration of benzo (a) pyrene (0.77 mg/Kg) which exceeded the ESL. The remaining detected compounds which exceed the ESL were detected in the deeper sample, 7.5-8 feet bgs, collected from boring B-7 which was in a close vicinity to the former USTs. This sample contained concentrations of TPH-dro, naphthalene, and 2-methylnapthalene which exceeded their respective ESLs.

Based on the results of this investigation the bulk of the groundwater contamination which exceeds the ESL's appears to be limited to the area of borings B-1, B-2, B-3, and B-5. The extent of the contamination has been characterized in the down-gradient direction by boring B-4 which did not contain any concentrations of TPH-gro, TPH-dro, TPH-oro, or VOC's above their respective MDLs.

The most up-gradient boring B-7 was located along the Property line and the Western/Southern Pacific Railroad. This boring was found to contain concentrations of TPH-dro and naphthalene just above their respective ESL.

Cross-gradient borings B-5 and B-6 yielded groundwater samples with elevated concentrations of TPH-dro above the ESL. Boring B-5 also yielded a sample with a concentration of TPH—oro above the ESL. Contamination associated with the former USTs may be migrating along a large high pressure fire suppression line observed to have been located in the yard area which ran along the northeastern Property boundary. Cross gradient boring B-6 was found to only contain a concentration of TPH-dro at 180 µg/L which was just above the ESL of 100 µg/L.

2.0 REGIONAL GEOLOGY/HYDROLOGY

The Property is in the southern part of the City of Oakland in the San Francisco Bay area. The San Francisco Bay area occupies a broad alluvial valley that slopes gently northward toward Oakland Bay and is flanked by alluvial fans deposited at the foot of the Diablo Range to the east and the Santa Cruz Mountains to the west. The northern part of the valley is called the Santa Clara Valley. Surface topography in the immediate vicinity of the Property is gently sloping down to the south west towards tidally influenced Brooklyn Basin Tidal Canal.

The Property is at an elevation of approximately 15 feet above Mean Sea Level according to the United States Geological Survey (USGS) Oakland East Quadrangle California 7.5 Minute Series topographic map.

Materials underlying the site are unconsolidated deposits of near shore and beach sediments, deposited in Oakland Bay at higher sea level stands. At shallow depths beneath these sediments are chert, greywacke, serpentine and shale bedrock that are a part of the Cretaceous to Jurassic-aged Franciscan Formation. Bedrock is exposed to the west and north on the upland surfaces.

The subject site is located on the San Francisco Bay Plain in the northernmost part of the Santa Clara Valley Groundwater Basin, (DWR, 1967).

The regional groundwater flow follows the topography, moving from areas of higher elevation to areas of lower elevation. The regional groundwater flow direction in the area of the Property is estimated to be toward the southwest toward the Brooklyn Basin Tidal Canal.

Based on the subsurface investigation conducted by ERAS, the subsurface vadose zone lithology encountered consisted of silty clay underlain by the water bearing zone which consisted of silt and silty sand. Groundwater was encountered at depths ranging from 3 to 16 feet bgs. The shallow groundwater was encountered in the former UST area. It appears this area may be acting as a “pool” that collected groundwater. Shallow groundwater was observed at approximately 16 feet outside this area.

Based on active and recent groundwater monitoring conducted at three nearby sites which include 2200 East 12th Street, 2345 International Boulevard, and 955 Kennedy Street the groundwater flow direction in the vicinity of the Property has been determined to be westerly at gradients of approximately 0.001 to 0.050 feet per foot.

3.0 SITE CONCEPTUAL MODEL

A summary of the current site conceptual model is included on **Table 6** and the current data gaps and proposed investigation are summarized on **Table 7**.

3.1 HYDROGEOLOGIC SETTING

A small shallow (approximately 3 feet bgs) perched water zone appears to be located in the vicinity of the former USTs however water volumes of this zone were not sufficient for sampling during the latest sampling event. The main shallow groundwater zone appears to be present in the 11-15 foot bgs zone. The main shallow water-bearing zone appears to be located in thin clayey sand, sand, clayey silt, and silty sand units interbedded within clay. Groundwater is generally under water-table conditions, but may be locally confined by clay in the upper portion of the water-bearing zone. The base of the shallow water bearing zone appears to be approximately 16 feet bgs and is underlain by a stiff clay which extends to at least 24 feet bgs.

At the time of drilling ERAS noted a large high pressure water line which serviced a fire hydrant in the yard area which ran along the northeastern Property boundary near the former USTs and may act as a conduit along which contamination could migrate.

3.2 EXTENT OF CONTAMINATION

Previous sampling in the source area (former oil USTs) and step out borings were analyzed for VOCs and SVOCs. The following is a summary of the findings of previous sampling and analyses.

Soil

Soil at 3.5-4 feet bgs from borings B-5, B-6 and B-7 was found to have been impacted by phenol at concentrations which exceed the ESL and range from 0.30-0.59 mg/Kg. A concentration of benzo (a) pyrene of 0.77 mg/Kg which exceeded the ESL was found in the sample from boring B-4 at 3.5-4 feet bgs.

The sample collected at 7.5-8 feet bgs in boring B-7 contained concentrations of TPH-dro, naphthalene, and 2-methylnapthalene which exceeded their respective ESLs.

Groundwater

The bulk of the contamination in groundwater which exceeds the ESLs appears to be limited to the area of borings B-1, B-2, B-3 in the former UST location, and B-5, located approximately 15 feet to the southeast. The extent of the contamination has been characterized in the likely down-gradient direction (west) by the results of analysis of samples from boring B-4 which did not contain any concentrations of TPH-gro, TPH-dro, TPH-oro, or VOCs above their respective MDLs.

The most up-gradient boring B-7 was located along the northeastern Property line and the Western/Southern Pacific Railroad. The groundwater from this boring was found to contain concentrations of TPH-dro and naphthalene just above their respective ESL.

Cross-gradient borings B-5 and B-6 yielded groundwater samples with elevated concentrations

of TPH-dro above the ESL. Boring B-5 also yielded a sample with a concentration of TPH—oro above the ESL. Contamination associated with the former USTs may be migrating along a large high pressure fire suppression line observed to have been located in the yard area and ran along the northeastern Property boundary. Cross gradient boring B-6 was found to only contain a concentration of TPH-dro at 180 µg/L which was just above the ESL of 100 µg/L.

4.0 WORK PLAN

ACHCSA issued a directive letter dated January 20, 2017 that requested the submittal of a work plan to address the following data gaps.

1) Determine accurate location of potential source areas and historic sampling locations on a scaled figure (not an aerial photograph).
   Response: A scaled map displaying the potential source areas is included as **Figure 2**.

2) Determine a plan for the removal of free product and potential secondary source removal unless site attributes prevent removal.
   Response: A groundwater well that can be used to conduct free product and secondary source removal will be installed near the former boring B-3, the area of highest concentrations of petroleum hydrocarbons in groundwater.

3) Determine site specific groundwater flow direction.
   Response: Based on active and recent groundwater monitoring conducted at three nearby sites which include 2200 East 12th Street, 2345 International Boulevard, and 955 Kennedy Street the groundwater flow direction in the vicinity of the Property has been determined to be to the west at approximately 0.001 to 0.050 feet per foot.

4) Determine the extent of the contaminant plume.
   Response: The work proposed in this work plan is designed to characterize the extent of the contaminant plume based on current understanding of the site conditions.

5) Evaluate the potential for vapor intrusion to indoor air.
   Response: There are no structures in the location of the release for which an indoor air problem could be suspected. Based on previous sampling, there does not appear to be significant contamination by volatile contaminants. This issue will be addressed again based on the results of this proposed investigation.

6) Evaluate the potential for direct contact and outdoor air exposure.
   Response: The work proposed in this work plan will be used to evaluate the potential for direct contact by collection of additional shallow soil samples. There is not a threat to outdoor air exposure based on the known concentration of VOCs in the shallow soil and groundwater.

7) Soil samples from 0-5 and 5-10 feet bgs should be analyzed for TPH-gro, TPH-dro, and TPH-oro by EPA Method 8015, VOCs including naphthalene by EPA Method 8260B, SVOCs by EPA Method 8270, along with PAHs by SIM Mode.
   Response: The samples collected as part of this proposed work will be analyzed as requested.

8) Groundwater samples should be analyzed for TPH-gro, TPH-dro, and TPH-oro by EPA Method 8015, and VOCs including naphthalene by EPA Method 8260B.
Response: The samples collected as part of this proposed work will be analyzed as requested.

4.1 SCOPE OF PROPOSED INVESTIGATION

ERAS proposes a scope of work for this investigation as follows.

- Obtain a permit for drilling from the Alameda County Public Works Department (ACPWD).

- Clear the boring locations for the presence of utilities by notifying Underground Service Alert and employing a private underground locating/clearance service.

- Advance eight borings using a direct push sample rig. The borings in the location of the former burners will be advanced to a depth of 4 feet bgs. The remainder borings will be advanced to approximately 24 feet. These borings will be continuously logged by a field geologist.

- Collect a soil sample from the base of the 4 foot borings unless signs of contamination are observed.

- Collect a selected soil sample from the depth ranges of 0-5 and 5-10 feet bgs from the 24 foot borings.

- Collect a groundwater sample from each boring.

- Analyze the soil samples for TPH-gro, TPH-dro, and TPH-oro by EPA Method 8015, VOCs including naphthalene by EPA Method 8260B, SVOCs by EPA Method 8270, along with PAHs by SIM Mode.

- Analyze the groundwater samples for TPH-gro, TPH-dro, and TPH-oro by EPA Method 8015, and VOCs including naphthalene by EPA Method 8260B.

- Install a groundwater well in the location of the former USTs near the boring which contained the highest concentration of the contaminants of concern (B-3). The well will be set to a depth of 24 feet bgs. The screen interval will be based on the lithology observed during drilling.

- Collect soil samples from the tank pit at depths of 0-5 feet and 5-10 feet bgs for analysis in the location of the proposed well.

- Develop the groundwater well and collect a groundwater sample for laboratory analysis.

- Analyze the groundwater samples for TPH-gro, TPH-dro, and TPH-oro by EPA Method 8015, and VOCs including naphthalene by EPA Method 8260B.

- Analyze the soil samples for TPH-gro, TPH-dro, and TPH-oro by EPA Method 8015, VOCs including naphthalene by EPA Method 8260B, SVOCs by EPA Method 8270, along with PAHs by SIM Mode.

- Prepare a report detailing the field procedures and results of the investigation.

4.2 FIELD WORK COORDINATION

ERAS will procure a drilling permit from the ACPWD prior to drilling activities.

The boring locations and monitoring well location will be marked with paint and Underground Service Alert notified at least 48 hours in advance to give owners of underground utilities an opportunity to mark their lines. Prior to drilling, each boring location will be cleared using a private underground utility locator.

4.3 BORING LOCATIONS AND SAMPLING

The locations of the proposed borings are shown on **Figure 2**. The Standard Operating Procedures for direct-push sampling is included in **Appendix B**.

Eight borings will be advanced using a direct push sample rig. The four borings in the locations of the former burners will be advanced to a maximum of approximately 4 feet. Three remaining borings will be advanced to a depth of 24 feet bgs in an attempt to vertically and horizontally characterize the extent of the contamination in groundwater. These borings will be continuously logged. The final boring will be drilled within the former UST area to install a well that can be used to remove free product and for collection of future groundwater samples.

Soil samples will be collected from the base of the borings in the location of the former burners unless signs of contamination are observed. In the 24 foot borings soil samples will be collected for laboratory analysis from depths of 0-5 and 5-10 feet.

Groundwater samples will be collected from each boring. The soil and groundwater samples will be kept chilled pending transport under chain-of-custody procedures to a California certified environmental analytical laboratory.

The soil samples will be analyzed for TPH-gro, TPH-dro, and TPH-oro by EPA Method 8015, VOCs including naphthalene by EPA Method 8260B, SVOCs by EPA Method 8270, along with PAHs by SIM Mode.

The groundwater samples will be analyzed for TPH-gro, TPH-dro, and TPH-oro by EPA Method 8015, and VOCs including naphthalene by EPA Method 8260B.

4.4 GROUNDWATER MONITORING WELL INSTALLATION AND SAMPLING

The proposed location of the proposed groundwater well is shown on **Figure 2**. The Standard Operating Procedures for the well installation, development, and sampling are included in **Appendix B**.

The boring for the proposed well will be advanced to about 24 feet bgs using a direct-push sample rig or 12-inch outer diameter hollow stem auger (HAS) continuously cored for a descriptive log. A soil sample from the 0-5 foot and 5-10 foot in the unsaturated zone will be selected for chemical analysis. The soil cores will be screened with an organic vapor monitor to aid sample selection. The boring will be reamed to total depth for the well using 12-inch HSA. The boring will be converted to a 4-inch diameter schedule 40 PVC well with 0.010-inch slotted screen from about 10 to 24 feet bgs. The screened interval will be adjusted based on observations of lithology during soil sampling. The annulus will be filled with #2/12 sand filter pack to 9 feet, with one foot of bentonite. The bentonite will be allowed to hydrate at least 30 minutes and the remaining annulus will be grouted with neat cement. The well heads will be protected with a flush-mount traffic-rated vault.

The new wells will be developed using surge blocks and a submersible pump or new disposable bailers.

The top-of-casing of the new well will be surveyed for vertical elevation relative to mean sea level to the nearest 0.01 foot and for horizontal position in latitude and longitude as required for upload to the state GeoTracker internet database.

Groundwater samples will be collected from the new well. The well will be purged using a new disposable bailer or peristaltic pump. The purged groundwater will be monitored for monitoring parameters including pH, temperature and conductivity. Groundwater samples will be decanted from the peristaltic pump tubing or the base of the bailers using a VOC tip into appropriate containers and stored in a cooler with ice.

Groundwater samples will be kept refrigerated pending transport under chain-of-custody procedures to a California certified environmental analytical laboratory where they will be analyzed for TPH-gro, TPH-dro, and TPH-oro by EPA Method 8015, and VOCs including naphthalene by EPA Method 8260B.

4.5 FIELD AND REPORT SCHEDULE

The field work will be scheduled as soon as possible following approval of this work plan by the ACEHD. A report will be submitted within 30 working days of the completion of field activities.

5.0 REFERENCES

Alameda County Health Care Services Agency, Department of Environmental Health, Fuel Leak Case, RO 0000390 and GeoTracker Global ID T0600101343, Exxon #7-0238, Oakland, California, October 1, 2012.

California Department of Water Resources, Evaluation of Ground Water Resources South Bay, Appendix A: Geology, Bulletin 118-1, August 1967.

California Regional Water Quality Control Board, Water Quality Control Plan, San Francisco Bay Basin Region (2), December 1986.

Conestoga-Rovers & Associates, Credit World Auto Sales, 2345 International Boulevard (Formerly East 14th Street), Oakland, California, July 2015.

ERAS Environmental, Inc., Limited Soil and Groundwater Investigation Report, APN 19-15-11, 1091 Calcot Place, Oakland, California, January 9, 2015.

ERAS Environmental, Inc., Work Plan for Limited Phase II Subsurface Investigation, 1091 Calcot Place, Oakland, August 31, 2015.

ERAS Environmental, Inc., Limited Phase II Subsurface Investigation, 1091 Calcot Place, Oakland, California, February 12, 2016.

Goldman, Harold B., Geology of Burlingame Bay prepared for Burlingame Bay Conservation and Development Commission, February 1967.

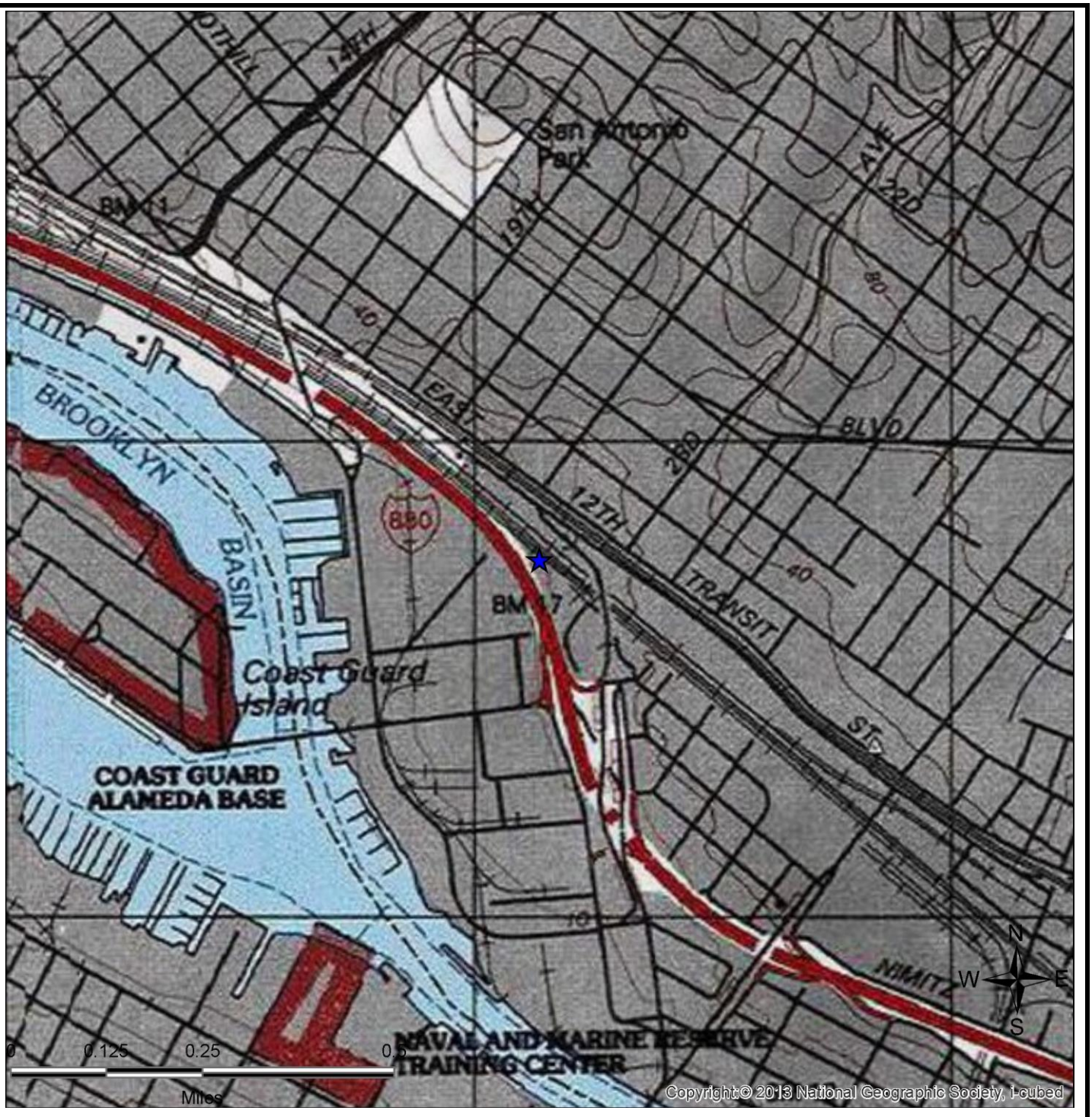
Helley, E.J., La Joie, K.R., Spangle, W.E., and Blair, M.L., Flatland Deposits of the Burlingame Bay Region, California - their geology and engineering properties and their importance to comprehensive planning, U.S. Geological Survey Professional Paper 943, 1974.

P&D Environmental Inc., Groundwater Monitoring and Sampling Report, (October 18, 2011 Sampling Event), Mel Senna Brake Service, 2301 East 12th Street, Oakland, California, December 18, 2013.

PSC, Low Threat Underground Storage Tank Case Closure Request, Earthgrains Baking Companies, Inc., 955 Kennedy Street, Oakland, California, April 19, 2013.

Sanborn fire insurance maps were reviewed at the San Francisco Public Library. Sanborn maps dated 1911, 1950, and 1951 were reviewed.

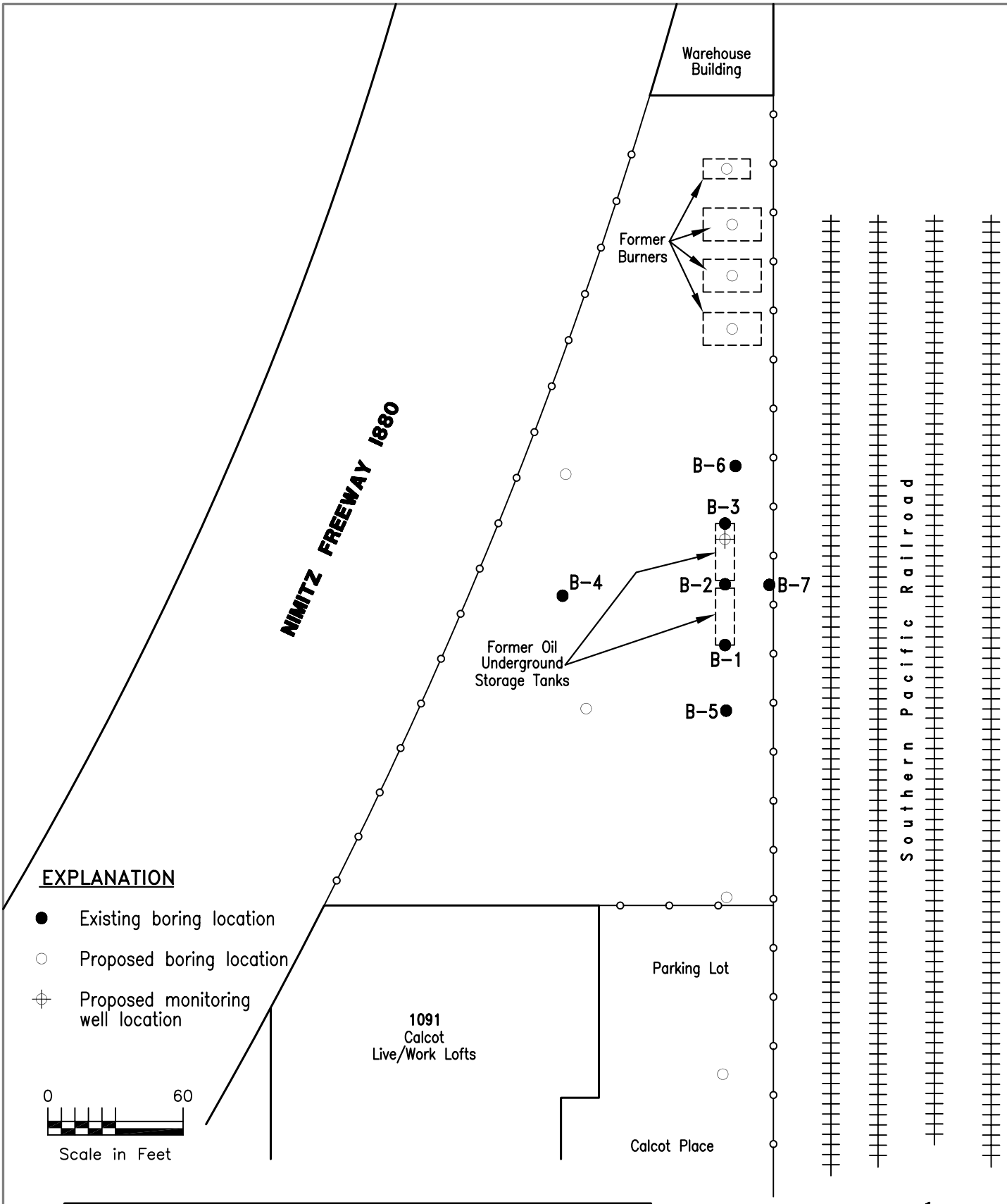
FIGURES AND TABLES



SITE LOCATION TOPOGRAPHIC MAP

U.S. Geological Survey. Oakland East Quadrangle, 7.5 Minute Series

ERAS Environmental, Inc.	19-55-11 Calcot Pl. Oakland, CA	FIGURE: 1 JOB: DATE: 10/20/2014



PROPOSED BORING LOCATION MAP

Project No. 16-005
1091 Calcot Place
Oakland, CA

FIGURE 2
February, 2017

ERAS Environmental Inc.

TABLE 1. ANALYTICAL RESULTS - SOIL - HYDROCARBONS

1091 Calcot Place, Oakland

Sample ID	Date	TPH-gro	TPH-dro	TPH-dro*	TPH-oro	TPH-oro*
		(mg/Kg)				
B-4, 3-3.5	20-Jan-16	<1.0	8.9	NA	78	NA
B-4 9.5-10	20-Jan-16	<1.0	<0.74	NA	3.0 J	NA
B-5, 3.5-4	20-Jan-16	<1.0	<0.74	NA	5.4	NA
B-5, 7.5-8	20-Jan-16	3.1	79	NA	180	NA
B-6, 3.5-4	20-Jan-16	<1.0	<0.74	NA	3.6 J	NA
B-6, 7.5-8	20-Jan-16	3.9	51	NA	63	NA
B-7, 3.5-4	20-Jan-16	<1.0	<0.74	NA	2.8 J	NA
B-7, 7.5-8	20-Jan-16	430	**470**	NA	190	NA
ESL <3m		500	110		500	
ESL >3m		770	110		1,000	

Notes
NA = Not Analyzed
(mg/Kg) = Miligrams per Kilogram
TPH-gro = Total petroleum hydrocarbons quantified as gasoline range organics
TPH-dro = Total petroleum hydrocarbons quantified as diesel range organics
TPH-oro = Total petroleum hydrocarbons quantified as oil range organics
TPH-dro* = Total petroleum hydrocarbons quantified as diesel range organics run without silica gel cleanup
TPH-oro* = Total petroleum hydrocarbons quantified as oil range organics run without silica gel cleanup
ESL <3m = environmental screening limits set forth by the RWQCQ for soil shallower than 3 meters on a commercial Property where groundwater is considered a potential source of drinking water
ESL >3m = environmental screening limits set forth by the RWQCQ for soil deeper than 3 meters on a commercial Property where groundwater is considered a potential source of drinking water
Bold Type Indicates Reported Value Above the ESL.
J indicates an estimated value between the reporting limit and the method detection limit

TABLE 2. ANALYTICAL RESULTS - SOIL - VOC

1091 Calcot Place, Oakland

Sample ID	Date	Naphthalene	MTBE	sec-Butyl-benz	IPB	4-IPT
		(mg/Kg)				
B-4, 3-3.5	20-Jan-16	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
B-4, 9.5-10	20-Jan-16	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
B-5, 3.5-4	20-Jan-16	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
B-5, 7.5-8	20-Jan-16	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
B-6, 3.5-4	20-Jan-16	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
B-6, 7.5-8	20-Jan-16	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
B-7, 3.5-4	20-Jan-16	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
B-7, 7.5-8	20-Jan-16	**2.0**	<0.10	0.35	0.76	0.12
ESL <3m		1.2	0.023	-	-	-
ESL >3m		1.2	0.023	-	-	-

Notes
NA = Not Analyzed
(mg/Kg) = Miligrams per Kilogram
MTBE = Methyl tert butyl ether
sec-Butyl-benz = sec-Butyl-benzene
IPB = Isopropylbenenzene
4-IPT = 4-Isopropyl toluene
ESL <3m = environmental screening limits set forth by the RWQCQ for soil shallower than 3 meters on a commercial Property where groundwater is considered a potential source of drinking water
ESL >3m = environmental screening limits set forth by the RWQCQ for soil deeper than 3 meters on a commercial Property where groundwater is considered a potential source of drinking water
Bold Type Indicates Reported Value Above the ESL.

TABLE 3. ANALYTICAL RESULTS - SOIL - SVOC

1091 Calcot Place, Oakland

Sample ID	Date	2-Methnap	Phenol	Fluorene
		(mg/Kg)		
B-4, 3-3.5	20-Jan-16	<10	<10	<10
B-4, 9.5-10	20-Jan-16	<0.25	<0.25	<0.25
B-5, 3.5-4	20-Jan-16	<0.25	**0.59**	<0.25
B-5, 7.5-8	20-Jan-16	<2.0	<2.0	<2.0
B-6, 3.5-4	20-Jan-16	<0.25	**0.30**	<0.25
B-6, 7.5-8	20-Jan-16	<0.25	<0.25	<0.25
B-7, 3.5-4	20-Jan-16	<0.25	**0.53**	<0.25
B-7, 7.5-8	20-Jan-16	**8.3**	<1.2	1.3
ESL <3m		0.25	0.076	8.9
ESL >3m		0.25	0.076	8.9

Notes
NA = Not Analyzed
(mg/Kg) = Miligrams per Kilogram
2-Methnap = 2-Methylnaphthalene
ESL <3m = environmental screening limits set forth by the RWQCQ for soil shallower than 3 meters on a commercial Property where groundwater is considered a potential source of drinking water
ESL >3m = environmental screening limits set forth by the RWQCQ for soil deeper than 3 meters on a commercial Property where groundwater is considered a potential source of drinking water
Bold Type Indicates Reported Value Above the ESL.

TABLE 4. ANALYTICAL RESULTS - SOIL - PAH

1091 Calcot Place, Oakland

Sample ID	Date	Fluorene	Benzo (a)	1-Methnap	2-Methnap	Naphth	Phenan	Pyrene
		(mg/Kg)						
B-4, 3-3.5	20-Jan-16	<0.020	**0.77**	<0.020	<0.020	<0.020	0.36	0.84
B-4, 9.5-10	20-Jan-16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
B-5, 3.5-4	20-Jan-16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
B-5, 7.5-8	20-Jan-16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.029
B-6, 3.5-4	20-Jan-16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
B-6, 7.5-8	20-Jan-16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.037
B-7, 3.5-4	20-Jan-16	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
B-7, 7.5-8	20-Jan-16	1.2	<0.50	3.0	**7.5**	1.0	0.58	<0.50
ESL <3m		8.9	0.13	-	0.25	1.2	11	85
ESL >3m		8.9	0.13	-	0.25	1.2	11	85

Notes
NA = Not Analyzed
(mg/Kg) = Miligrams per Kilogram
Benzo (a) = Benzo (a) pyrene
1-Methnap = 1-Methylnaphthalene
2-Methnap = 2-Methylnaphthalene
Naphth = Naphthlene
Phenan = Phenanthrene
ESL <3m = environmental screening limits set forth by the RWQCQ for soil shallower than 3 meters on a commercial Property where groundwater is considered a potential source of drinking water
ESL >3m = environmental screening limits set forth by the RWQCQ for soil deeper than 3 meters on a commercial Property where groundwater is considered a potential source of drinking water
Bold Type Indicates Reported Value Above the ESL.

TABLE 5. ANALYTICAL RESULTS - GROUNDWATER

1091 Calcot Place, Oakland

Sample ID	Date	TPH-gro	TPH-dro	TPH-dro*	TPH-oro	TPH-oro*	VOC
		(µg/L)					
B-1	23-Dec-14	NA	79	NA	**440**	NA	NA
B-2	23-Dec-14	NA	**6,100**	NA	**5,100**	NA	NA
B-3	23-Dec-14	NA	**15,000**	**20,000**	**23,000**	**86,000**	NA
B-4	20-Jan-16	<50	<50	NA	<65	NA	ND
B-5	20-Jan-16	<50	**6,000**	NA	**6,600**	NA	ND
B-6	20-Jan-16	<50	**180**	NA	85 J	NA	BESL
B-7	20-Jan-16	<50	**140**	NA	86 J	NA	**1.4[1]**
ESL		100	100	100	100	100	-

Notes

NA = Not Analyzed

ND = Below laboratory detection limits

BESL = All concentrations detected were below the ESL

(µg/L) = Micrograms per liter

TPH-gro = Total petroleum hydrocarbons quantified as gasoline range organics

TPH-dro = Total petroleum hydrocarbons quantified as diesel range organics

TPH-oro = Total petroleum hydrocarbons quantified as oil range organics

TPH-dro* = Total petroleum hydrocarbons quantified as diesel range organics run without silica gel cleanu

TPH-oro* = Total petroleum hydrocarbons quantified as oil range organics run without silica gel cleanup

VOC = Volitile organioc compounds

*[1] Naphthalene concentration was detected at 1.4 µg/L with an ESL of 1.2 µg/L.

ESL = environmental screening limits set forth by the RWQCQ for drinking water

Bold Type Indicates Reported Value Above the ESL.

J indicates an estimated value between the reporting limit and the method detection limit

TABLE 6 - SITE CONCEPTUAL MODEL
1091 Calcot Place, Oakland

CSM Element	CSM Sub-Element	Description	Potential Data Gap(s)
Geology and Hydrogeology	Regional	The Property is in the southern part of the City of Oakland in the San Francisco Bay area. The San Francisco Bay area occupies a broad alluvial valley that slopes gently northward and is flanked by alluvial fans deposited at the foot of the Diablo Range to the east and the Santa Cruz Mountains to the west. Surface topography in the immediate vicinity of the Property is gently sloping down to the northwest towards Airport Channel. The Property is at an elevation of approximately 15 feet above Mean Sea Level according to the United States Geological Survey (USGS) Oakland East Quadrangle California 7.5 Minute Series topographic map. Materials underlying the site are unconsolidated deposits of near shore and beach sediments, deposited in Oakland Bay at higher sea level stands. At shallow depths beneath these sediments are chert, greywacke, serpentine and shale bedrock that are a part of the Cretaceous to Jurassic-aged Franciscan Formation. Bedrock is exposed to the east-northeast on the upland surfaces. The subject site is located on the San Francisco Bay Plain in the northernmost part of the Santa Clara Valley Groundwater Basin, (DWR, 1967), the surface of which slopes gently down toward west. The regional groundwater flow follows the topography, moving from areas of higher elevation to areas of lower elevation. The regional groundwater flow direction in the area of the Property is estimated to be toward the west toward the Brooklyn Basin. Based on active and recent groundwater monitoring conducted at three nearby sites which include 2200 East 12th Street, 2345 International Boulevard, and 955 Kennedy Street the groundwater flow direction in the vicinity of the Property has been determined to be to the west at approximately 0.001 to 0.050 feet per foot.	None
	Site	***Geology:*** Based on lithologic logs prepared from borings on the Property the subsurface lithology consists of silty clay underlain by the water bearing zone which consisted of silt, clayey silt, and silty sand. The groundwater bearing zone is underlain by a stiff silty clay.	None
		Hydrogeology: A small shallow (approximately 3 feet bgs) perched water zone appears to be located in the vicinity of the former USTs however water volumes of this zone were not sufficient for sampling during the latest sampling event. The main shallow groundwater zone appears to be present in the 11-15 foot bgs zone. The main shallow water-bearing zone appears to be located in thin clayey sand, sand, clayey silt, and silty sand units interbedded within clay. Groundwater is generally under water-table conditions, but may be locally confined by clay in the upper portion of the water-bearing zone. The base of the shallow water bearing zone appears to be approximately 16 feet bgs and is underlain by a stiff clay which extends to at least 24 feet bgs.	None
Surface Water Bodies	--	The closest surface water bodies are the Brooklyn Basin, a portion of San Francisco Bay which was located approximately 1/4 of a mile to the west of the Property.	None
Nearby Wells	--	A well survey has been conducted and the only identified commercial or residential production well identified was located approximately 3,200 feet to the southeast in a cross gradient direction. Based on the distance and location this well is unlikely to be impacted.	None
CSM Element	**CSM Sub-Element**	**Description**	**Potential Data Gap(s)**
Constituents of Concern	--	Constituents of concern have been identified by comparing analytical results for soil to ESLs for commercial land use and for groundwater that is considered a current or potential drinking water source. Constituents of concern that have been identified to include petroleum hydrocarbons quantified as diesel and oil range organics (TPH-dro, and TPH-oro), naphthalene, 2-methylnapthalene, phenol, and benzo (a) pyrene.	None
Potential Sources	On-site	The Property formerly contained two USTs used to store fuel oil along with four former burners.	The area of the burners has not been evaluated
		There is no record of the removal of the USTs but a geophysical survey in the area of the former USTs indicated their absence.	None
CSM Element	**CSM Sub-Element**	**Description**	**Potential Data Gap(s)**
Nature and Extent of Environmental Impacts	Extent in Soil, TPH-dro	A concentration of TPH-dro in soil above the commercial ESL for areas where groundwater is considered a potential source of drinking water have been detected in one soil sample collected from boring B-7 from a depth of 7.5-8 feet bgs at a concentration of 470 milligrams per kilogram (mg/Kg) which exceeded the ESL of 110 mg/Kg. No other concentrations of TPH-dro were detected at concentrations which exceed the ESL. This concentration of TPH-dro appears to be limited in extent and confined to a small area in the vicinity of the former USTs.	None
	Extent in Soil, TPH-oro	Concentrations of TPH-oro in soil above the commercial ESL for areas where groundwater is considered a potential source of drinking water have not been detected.	None
	Extent in Soil, VOCs	A concentration of naphthalene in soil above the commercial ESL for areas where groundwater is considered a potential source of drinking water have been detected in one soil sample collected from boring B-7 from a depth of 7.5-8 feet bgs at a concentration of 2.0 mg/Kg which exceeded the ESL of 1.2 mg/Kg. No other concentrations VOC's were detected above their respective ESL's. This concentration of naphthalene appears to be limited in extent and confined to a small area in the vicinity of the former UST's.	None
	Extent in Soil, SVOCs and PAH	Shallow soil, 3.5-4 feet bgs, on the Property appears to have been impacted by phenol at concentrations which exceed the ESL and range from 0.30-0.59 mg/Kg. Phenol was not detected at deeper depths. The shallow soil sample collected from boring B-4 was also found to contain a concentration of benzo (a) pyrene (0.77 mg/Kg) which exceeded the ESL and again was not detected at deeper depths. The remaining detected compound which exceed the ESL was detected in the deeper sample, 7.5-8 feet bgs, collected from boring B-7 which was in a close vicinity to the former USTs. This sample contained concentrations of 2-methylnapthalene which exceeded the ESL of 8.3 mg/Kg which was limited in extent.	None

TABLE 6 - SITE CONCEPTUAL MODEL
1091 Calcot Place, Oakland

Nature and Extent of Environmental Impacts	Extent in Groundwater, TPH-dro	Elevated concentrations of TPH-dro in groundwater which exceed the ESL were detected in groundwater samples collected from borings B-2, B-3, B-5, B-6, and B-7 ranging from 140 to 15,000 µg/L. The bulk of the TPH-dro contamination exceeding the ESL appear to be limited to the area of the former UST's extending cross gradient to the location of boring B-5. The down-gradient extent has been defined by boring B-4. The cross gradient extent in the vicinity of boring B-5 has not been delineated.	The cross gradient extent in the vicinity of boring B-5 has not been delineated. Free product in the source area requires additional evaluation to determine the most practicle method for removal.
	Extent in Groundwater, TPH-oro	Elevated concentrations of TPH-oro in groundwater which exceed the ESL were detected in groundwater samples collected from borings B-1, B-2, B-3, and B-5 ranging from 440 to 23,000 µg/L. The bulk of the TPH-oro contamination exceeding the ESL appear to be limited to the area of the former UST's extending cross gradient to the location of boring B-5. The down-gradient extent has been defined by boring B-4. The cross gradient extent in the vicinity of boring B-5 has not been delineated.	The cross gradient extent in the vicinity of boring B-5 has not been delineated. Free product in the source area requires additional evaluation to determine the most practicle method for removal.
	Extent in Groundwater, VOCs	The only detected VOC in groundwater was naphthalene at a concentration of 1.4 µg/L which exceeded the ELS of 1.2 µg/L. This contaminant appears to be limited in extent and was not detected in the other borings above the ESL.	None
	Extent in Groundwater, SVOCs	No analyses for SVOCs has been conducted.	None
Migration Pathways	Potential Conduits	At the time of drilling ERAS noted a large high pressure water line which serviced a fire hydrant in the yard area which ran along the northeastern Property boundary near the former USTs and may act as a conduit for which contamination to migrate along. This would explain the elevated concentrations of petroleum hydrocarbons detected in boring B-5.	None
Potential Receptors/Risk	On-site	Potable water at the site currently is provided via municipal supply and will continue to be in the foreseeable future. As such, direct contact to groundwater is not contemplated. Receptors at the site could include the following: • Future construction worker via soil and groundwater	Based on evaluation of the data relative to ESLs, it is likely that some risk for longer- term site occupants exists.
Potential Receptors/Risk	Off-site	A well survey has been conducted and the only identified commercial or residential production well identified was located approximately 3,200 feet to the southeast in a cross gradient direction. Based on the distance and location this well is unlikely to be impacted.	None

Notes
1. ERAS Environmental, Inc. Phase 1 Environmental Site Assessment, APN 19-55-11, Oakland, California, November 6, 2014.
2. ERAS Environmental, Inc. Limited Soil and Groundwater Investigation, APN 19-55-11 on Calcot Place, Oakland, California, January 9, 2015.
2. ERAS Environmental, Inc. Limited Soil and Groundwater Investigation, 1091 Calcot Place, Oakland, California, February 12, 2016.

Abbreviations
bgs = below ground surface
VOCs = volatile organic compounds
SVOCs = semi volatile organic compounds
TPH-dro = total petroleum hydrocarbons quantified as diesel range organics
TPH-oro = total petroleum hydrocarbons as oil range organics
PAH = polynuclear aromatic hydrocarbons
µg/L = micrograms per liter
mg/Kg = milligrams per kilogram

TABLE 7 - DATA GAPS AND PROPOSED INVESTIGATION

1091 Calcot Place, Oakland CA

Item	Data Gap	Proposed Investigation	Rational	Analysis
1	The full extent of the contamination associated with the former USTs has not been determined in the southeast cross-gradient direction	Advance three additional borings southeast and southwest of boring B-5 using a direct push sample rig to about 24 feet bgs in an attempt to laterally delineate the extent of the contamination. An additional boring to the west of former USTs will also be advanced to 24 feet bgs to eliminate the portential that the contaminant plume is present between B-4 and B-6. These borings will be continuously logged. Soil samples will be collected from 0-5 feet and 5-10 feet bgs and groundwater samples will be collected from each boring. The soil and groundwater samples will be kept chilled pending transport under chain-of-custody procedures to a California certified environmental analytical laboratory.	Horizontally delineate the extent of the contamination associated with the former USTs.	The soil samples will be analyzed for TPH gro, TPH-dro, and TPH oro by EPA Method 8015, VOCs including naphthalene by EPA Method 8260B, SVOCs by EPA Method 8270, along with PAHs by SIM Mode. The groundwater samples will be analyzed for TPH gro, TPH-dro, and TPH-oro by EPA Method 8015, and VOCs including naphthalene by EPA Method 8260B.
2	The former burners which were associated with the fuel oil USTs have not been evaluated	Advance four additional borings in the locations of the former burners using a direct push sample rig to 4 feet bgs to evaluate the area of the former burners. These borings will be continuously logged. Soil samples will be collected from the base of the borings unless contamination is observed in a shallower. The soil samples will be kept chilled pending transport under chain-of-custody procedures to a California certified environmental analytical laboratory.	Determine if theres is subsurface impact in the location of the formers burners	The soil samples will be analyzed for TPH gro, TPH-dro, and TPH oro by EPA Method 8015, VOCs including naphthalene by EPA Method 8260B, SVOCs by EPA Method 8270, along with PAHs by SIM Mode.
3	Free product in the source area requires additional evaluation to determine the most practicle method for removal.	Install one groundwater monitoring well in the source area to a depth of 24 feet bgs. A soil sample from the 0-5 foot and 5-10 foot in the unsaturated zone will be selected for chemical analysis. Develop the grounwater monitoring well. Sample the groundwater monitoring well to evaluate the presence of free product in the source area. The groundwater samples will be kept chilled pending transport under chain-of-custody procedures to a California certified environmental analytical laboratory.	Evaluate the presence of free product in the source area and provide analytical results for shallow soil to evaluate the potential for direct contact.	The soil samples will be analyzed for TPH gro, TPH-dro, and TPH oro by EPA Method 8015, VOCs including naphthalene by EPA Method 8260B, SVOCs by EPA Method 8270, along with PAHs by SIM Mode. The groundwater samples will be analyzed for TPH gro, TPH-dro, and TPH-oro by EPA Method 8015, and VOCs including naphthalene by EPA Method 8260B.

TABLE 7 - DATA GAPS AND PROPOSED INVESTIGATION

1091 Calcot Place, Oakland CA

Abbreviations
bgs = below ground surface
TPH-gro = total petroleum hydrocarbons quantified as gasolie range organics
TPH-dro = total petroleum hydrocarbons quantified as diesel range organics
TPH-oro = total petroleum hydrocarbons quantified as oil range organics
VOCs = volitile organic compounds
SVOCs = semi volitile organic compounds
PAHs = poly aromatic hydrocarbons

APPENDIX A

ACHCSA Letter – January 20, 2017

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
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January 20, 2017

Mr. Bob Winet (Sent via e-mail to: bwinet3@verizon.net)
California Cotton Mill Lofts
East Bay Lofts LLC
36966 Pinto Palm St.
Rancho Mirage, CA 92270

Mr. Dana Dominguez (Sent via e-mail to: dana@dldlumber.com)
DLD Lumber Company
1755 Egbert Avenue
San Francisco, CA 94124

Subject: Technical Report Request for Fuel Leak Case No. RO0003162 and Geotracker Global ID T1000006533, California Cotton Mill, 1091 Calcot Place, Oakland, CA 94606

Gentlemen:

Thank you for attending the meeting at Alameda County Department of Environmental Health's (ACDEH) office on Thursday November 17, 2016. The purpose of the meeting was to discuss our evaluation of the site data including the February 12, 2016 *Limited Phase II Subsurface Investigation* prepared on your behalf by ERAS Environmental (ERAS) in reference to the State Water Resources Control Board's (SWRCBs) Low Threat Underground Storage Tank Case Closure Policy (LTCP), identify data gaps, and develop a path to case closure. ACDEH understands that the property has been sold, commercial property usage will continue, and redevelopment is not currently under consideration.

According to the November 6, 2014 Phase 1 Environmental Site Assessment prepared by ERAS, the site is currently in use as a specialized vehicle restoration and storage yard but the subject site has been occupied since at least 1883 with the California Cotton Mills Company. Subsequent to the cotton mill's closure in 1954, the site has been occupied by a welding supply, plastics manufacturer, truck rental, personal item storage. The 1911 Sanborn Fire Insurance map indicates that two underground oil storage tanks (USTs) and three furnaces were located along the eastern side of the property but the 1950 Sanborn Fire Insurance map does not show the USTs, so the status of the USTs is unknown. In December 2014, results of a geophysical survey did not indicate the presence of the USTs; however, large amounts of buried metal (likely foundations from former manufacturing equipment) were detected in the vicinity of the area known to have formerly contained the USTs.

ACDEH has evaluated the data in conjunction with the case files, and LTCP. Based on ACDEH staff review, we have determined that the site does not meet the LTCP General Criteria b (not petroleum only release), d (Free Product), f (Secondary Source Removal), Media-Specific Criteria for Groundwater, Media-Specific Criteria for Vapor Intrusion to Indoor Air, and the Media-Specific Criteria for Direct Contact.

ACDEH requests that you prepare a Data Gap Investigation Work Plan that is supported by an updated Site Conceptual Model (SCM) to address the identified data gaps discussed during our meeting.

TECHNICAL COMMENTS

1. **LTCP General Criteria b (Unauthorized Release Consists Only of Petroleum) –** For purposes of this policy, petroleum is defined as crude oil, or any fraction thereof, which is liquid at standard conditions and temperature and pressure, which means 60 degrees Fahrenheit and 14.7 pounds

per square inch absolute including the following substances: motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents and used oils, including any additives and blending agents such as oxygenates contained in the formulation of the substances.

Due to a long and uncertain historical usage and removal history of the two USTs, please present a strategy in the Data Gap Work Plan (described in Item 7 below) to address the data gaps identified above, including accurate location of potential source areas (two USTs and three furnaces) and historic sampling locations on a scaled figure. Please identify any additional data gaps, such as the need for analysis of wear metals and poly aromatic hydrocarbons (PAHs) that are typically associated with unknown UST usage. Alternatively, please provide justification of why the site satisfies this general criterion in the SCM described in Item 7 below.

2. **LTCP General Criteria d (Free Product) –** The LTCP requires free product to be removed to the extent practicable at release sites where investigations indicate the presence of free product by removing in a manner that minimizes the spread of the unauthorized release into previously uncontaminated zones by using recovery and disposal techniques appropriate to the hydrogeologic conditions at the site, and that properly treats, discharges, or disposes of recovery byproducts in compliance with applicable laws. Additionally, the LTCP requires that abatement of free product migration be used as a minimum objective for the design of any free product removal system.

   The LTCP's *Technical Justification for Vapor Intrusion (VI) Media Specific Criteria* provides both direct and indirect evidence in soil and groundwater for the presence of light non-aqueous phase liquid (LNAPL) (aka "free product"). Groundwater samples detected up to 20,000 Total Petroleum Hydrocarbons diesel range organics (TPH-dro), and 23,000 TPH oil range organics (TPH-oro) in a sample collected from B-3 at the north end of the former UST. Additionally, TPH gasoline range organics (TPH-gro) were detected at 430 milligrams per kilogram and TPHdro was detected at 470 mg/kg in B-7 located east of the former UST at a depth of 8 feet below ground surface (bgs). Analysis for TPH-gro was not performed on soil samples collected from the former UST location. These concentrations exceed those discussed in the Technical Justification paper. Please present a strategy to assess the presence of free product and characterize the UST location in the Data Gap Work Plan requested below.

3. **General Criteria f – Secondary Source Has Been Removed to the Extent Practicable –** "Secondary source" is defined as petroleum-impacted soil or groundwater located at or immediately beneath the point of release from the primary source. Unless site attributes prevent secondary source removal (e.g. physical or infrastructural constraints exist whose removal or relocation would be technically or economically infeasible), petroleum-release sites are required to undergo secondary source removal to the extent practicable as described in the policy. "To the extent practicable" means implementing a cost-effective corrective action which removes or destroys-in-place the most readily recoverable fraction of source-area mass. It is expected that most secondary mass removal efforts will be completed in one year or less. Following removal or destruction of the secondary source, additional removal or active remedial actions shall not be required by regulatory agencies unless (1) necessary to abate a demonstrated threat to human health or (2) the groundwater plume does not meet the definition of low threat as described in this policy.

ACDEH's review of the case files indicates that insufficient data and analysis has been presented to assess compliance with General Criteria f. Historic data indicates the historic existence of USTs; however no documentation regarding the removal of the USTs could be located. Consequently, the possibility exists that secondary source is still present at the site. Please present a strategy in the Data Gap Work Plan (described in Technical Comment 7 below) to address the Technical Comments discussed above. Alternatively, please provide justification of why the site satisfies this general criterion in the SCM described in Technical Comment 7 below.

4. **LTCP Media Specific Criteria for Groundwater –** To satisfy the media-specific criteria for groundwater, the contaminant plume that exceeds water quality objectives must be stable or decreasing in areal extent, and meet all of the additional characteristics of one of the five classes of sites listed in the policy.

   Our review of the case files indicates that the aerial extent of the groundwater plume, both on-and off-site, is unknown, as is the site groundwater gradient. Therefore, insufficient data and analysis has been presented to support the requisite characteristics of plume length and stability. Please present a strategy in the Data Gap Work Plan discussed in Technical Comment 7 below to determine if groundwater in the vicinity of the site has been impacted by a release. In the absence of site specific groundwater monitoring wells, please prepare a summary table indicating groundwater gradient direction of adjacent environmental cases and their addresses to indicate the local groundwater gradient. Please indicate the location of the adjacent environmental cases and the respective gradient directions on a figure.

   Alternatively, please provide justification of why the site satisfies the media-specific criteria for groundwater in the SCM that assures that threats to existing and anticipated beneficial uses of groundwater have been mitigated or are de minimis.

5. **LTCP Media Specific Criteria for Vapor Intrusion to Indoor Air –** The LTCP describes conditions, including bioattenuation (unsaturated) zones, which if met will assure that exposure to petroleum vapors in indoor air will not pose unacceptable health risks to human occupants of existing or future site buildings, and adjacent parcels. Appendices 1 through 4 of the LTCP criteria illustrate four potential exposure scenarios and describe characteristics and criteria associated with each scenario.

   Our review of the case files indicates that detections of TPH-gro, TPH-dro, and TPH-oro in soil and groundwater indicating the possible presence of free product were found in the suspected former UST location and the extent of the source area remains undefined. Missing information includes thickness and depth of the bioattenuation zone, collection of soil samples within the 0 to 5 feet and 5 to 10 feet bgs intervals across the site, especially in suspected source areas, and analytical results for naphthalene and polycyclic aromatic hydrocarbons (PAHs) in soil. ACDEH notes that naphthalene is one of the contaminants that the LTCP uses to assess risk from vapor intrusion to indoor air and naphthalene was detected in soil samples collected outside the former UST location.

Please present a strategy in the Data Gap Work Plan (described in Technical Comment 7 below) to address the data gaps identified above. Alternatively, please provide justification of why the site satisfies this general criterion in the SCM described in Technical Comment 7 below.

Please note, that if direct measurement of soil gas is proposed, ensure that your strategy is consistent with the field sampling protocols described in the Department of Toxic Substances Control's Final Vapor Intrusion Guidance (July 2015). Consistent with the guidance, ACDEH requires installation of permanent vapor wells to assess temporal and seasonal variations in soil gas concentrations.

6. **LTCP Media Specific Criteria for Direct Contact and Outdoor Air Criteria** – The LTCP describes conditions where direct contact with contaminated soil or inhalation of contaminants volatized to outdoor air poses a low threat to human health. According to the policy, release sites where human exposure may occur satisfy the media-specific criteria for direct contact and outdoor air exposure and shall be considered low-threat if the maximum concentrations of petroleum constituents in soil are less than or equal to those listed in Table 1 for the specified depth bgs. Alternatively, the policy allows for a site specific risk assessment that demonstrates that maximum concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health, or controlling exposure through the use of mitigation measures, or institutional or engineering controls.

   As described in Technical Comments 2 and 3, detections of TPH-gro, TPH-dro, and TPH-oro in soil and groundwater indicating the possible presence of free product were found in the suspected former UST location and the extent of the source area remains undefined. Additionally, PAHs exceeding the beno(a)pyrene toxicity equivalent (BaPe) were detected in a soil sample at 3.5 feet bgs. Please present a strategy in the Data Gap Work Plan described in Technical Comment 7 below to collect sufficient data to satisfy the LTCP direct contact and outdoor air exposure criteria. Soil samples should be collected within the 0 to 5 feet and 5 to 10 feet bgs intervals, elevated photoionization detector (PID) readings, at the groundwater interface, lithologic and/or color changes, and in areas of obvious impact. In addition to TPH as gasoline (TPHg), TPH as Diesel (TPHd), TPH as Motor Oil (TPHmo), benzene, toluene, ethylbenzene, and xylenes (BTEX), Methyl tert-butyl ether (MTBE), naphthalene, and oxygenates by EPA 8260, please include the requisite analysis for PAHs by 8270- Selected Ion Monitoring (SIM).

   Alternatively, please provide justification of why the site satisfies the Media-Specific Criteria for Direct Contact and Outdoor Air Exposure in the SCM described in Technical Comment 7 below that assures that exposure to petroleum constituents in soil will have no significant risk of adversely affecting human health.

7. **Data Gap Investigation Work Plan and Site Conceptual Model –** Please prepare a Data Gap Investigation Work Plan to address the technical comments listed above. Please support the scope of work in the Data Gap Investigation Work Plan with an SCM and Data Quality Objectives (DQOs) that relate the data collection to each LTCP criteria. For example please clarify which scenario within each Media-Specific Criteria the sampling strategy is intended to apply to. If the sampling strategy includes data collection to support the proposed site redevelopment, a description of that redevelopment should be included in the Data Gap Investigation Work Plan to

support your sampling strategy so that ACDEH can verify the appropriateness of the proposed sample locations.

Please indicate the historical and proposed soil borings on a non-aerial photograph site plan which depicts the entire parcel, as the visibility of the boring locations become difficult to discern due to the aerial photograph background. Please include on the site plan the location of the former USTs, all known UST system appurtenances, and the approximate location of the three furnaces. Due to the parcel's linear shape, please indicate the parcel on two figures to enable adequate site detail. Please continue to include in all future reports an extended site map using an aerial photographic base map to depict both the site and immediate vicinity to facilitate understanding the site and surrounding vicinity use (commercial and/or residential).

Please include with the SCM analytical summary tables consolidating all historical soil and groundwater data collected during removal of the USTs, excavations, and all subsequent investigations including sample dates, depths, and the laboratory detection limits for "Non-Detect" (ND) results.

As a part of the SCM, please perform an on-site underground utility survey to determine the presence of underground utilities that could potentially act as preferential pathways. Please plot the locations of all underground utilities and their depths on all figures to facilitate understanding of lateral and vertical contaminant distribution.

8. **Electronic Submittal of Information (ESI) Compliance** - Site data and documents are maintained in two separate electronic databases – ACDEH's ftp site and the SWRCB's GeoTracker database. Both databases act as repositories for regulatory directives and reports; however, only GeoTracker has the functionality to store electronic compliance data including analytical laboratory data for soil, vapor and water samples, monitoring well depth-to-water measurements, and surveyed location and elevation data for permanent sampling locations. Although the SWRCB is responsible for the overall operation and maintenance of the GeoTracker System, ACDEH, as lead regulatory agency, is responsible to ensure the GeoTracker database is complete and accurate for sites regulated under ACDEH's Environmental Cleanup Oversight Programs (SWRCB March 2011 document entitled *Electronic Reporting Roles and Responsibilities*).

A review of the case file and the State's GeoTracker database indicates that the site is not in compliance with California Code of Regulations, Title 23, Division 3, Chapter 16, Article 12, Sections 2729 and 2729.1, stating that beginning September 1, 2001, all analytical data, including monitoring well samples, submitted in a report to a regulatory agency as part of the UST or LUST program, must be transmitted electronically to the SWRCB GeoTracker system via the internet. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for all groundwater cleanup programs, including the Site Cleanup Program (SCP) cases. Beginning July 1, 2005, electronic submittal of a complete copy of all reports for all sites was required in GeoTracker. At present missing data and documents include, but may not be limited to, EDF submittals, depth to groundwater data (GEO_WELL files), well data (GEO_XY, and GEO_Z files), work plans, and older reports (GEO_REPORT files).

Please upload requisite documents to GeoTracker. See Attachment 1 and the State's GeoTracker website for further details. ACDEH requests e-mail notification of, and a list of, the documents uploaded to Geotracker. Please upload all submittals to GeoTracker and to ACDEH's ftp website by the date specified below.

TECHNICAL REPORT REQUEST

Please upload technical reports to the ACDEH ftp site (Attention: Karel Detterman), and to the Geotracker website, in accordance with the following specified file naming convention and schedule:

- **February 21, 2017 –** Notification of Upload of Electronic Data Submittals to Geotracker
  E-mail notification to: karel.detterman@acgov.org

- **March 24, 2017 –** Updated SCM and Data Gap Work Plan
  File to be named: RO3162_SCM_WP_R_yyyy-mm-dd

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

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

Thank you for your cooperation. Should you have any questions or concerns regarding this correspondence or your case, please send me an e-mail message at karel.detterman@acgov.org or call me at (510) 567-6708.

Sincerely,

Karel Detterman, PG
Hazardous Materials Specialist

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

cc: Francis Rush, 1091 Calcot LLC, 2200 Adeline Street, Ste. 350, Oakland, CA 94607, (Sent via E-mail to: francis@rushproperty.com
Andrew Savage, ERAS Environmental, Inc., 1533 B St., Hayward, CA 94541, (Sent via E-mail to: andrew@eras.biz)
Dilan Roe, ACDEH, (Sent via E-mail to: dilan.roe@acgov.org)
Karel Detterman, ACDEH, (Sent via E-mail to: karel.detterman@acgov.org)
Paresh Khatri, ACDEH, (Sent via E-mail to: paresh.khatri@acgov.org)
GeoTracker, eFile

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.

APPENDIX B

Standard Operating Procedures

STANDARD OPERATING PROCEDURE – DIRECT PUSH BORINGS

SOIL CORING AND SAMPLING PROCEDURES

Prior to drilling, all boreholes will be hand dug to a depth of 4-5 feet below ground surface (bgs) to check for underground utilities.

Soil and groundwater samples are collected for lithologic and chemical analyses using a direct driven soil coring system. A hydraulic hammer drives sampling rods into the ground to collect continuous soil cores. As the rods are advanced, soil is driven into an approximately 2.5-inch-diamter sample barrel that is attached to the end of the rods. Soil samples are collected in sleeves inside the sample barrel as the rods are advanced. After being driven 4 to 5 feet into the ground, the rods are removed from the borehole. The sleeve containing the soil core is removed from the sample barrel, and can then be preserved for chemical analyses, or used for lithologic description. This process is repeated until the desired depth or instrument refusal is reached.

A soil core interval selected for analyses is cut from the sleeve using a pre-cleaned hacksaw. The ends of the tube are covered with aluminum foil or Teflon liner and sealed with plastic caps. The soil-filled liner is labeled with the bore number, sample depth, site location, date, and time. The samples are placed in bags and stored in a cooler containing ice. Soil from the core adjacent to the interval selected for analyses is placed in a plastic zip-top bag. The soil is allowed to volatilize for a period of time, depending on the ambient temperature. The soil is scanned with a flame-ionization detector (FID) or photo-ionization detector (PID).

All sample barrels, rods, and tools (e.g. hacksaw) are cleaned with Alconox or equivalent detergent and de-ionized water. All rinsate from the cleaning is contained in 55-gallon drums at the project site.

GROUNDWATER SAMPLING FROM DIRECT PUSH BORINGS

After the targeted water-bearing zone has been penetrated, the soil-sample barrel is removed from the borehole. Small-diameter well casing with 0.010-inch slotted well screen may be installed in the borehole to facilitate the collection of groundwater samples. Threaded sections of PVC are lowered into the borehole. Groundwater samples may then be collected with a bailer, peristaltic pump, submersible or other appropriate pump until adequate sample volume is obtained. Peristaltic pumps are not used in applications requiring a lift of greater than 1 foot of net head.

Groundwater samples are preserved, stored in an ice-filled cooler, and are delivered, under chain-of-custody, to a laboratory certified by the California Department of Health Services (DHS) for hazardous materials analysis.

BOREHOLE GROUTING FOR DIRECT PUSH BORINGS

Upon completion of soil and water sampling, boreholes will be abandoned with neat cement grout to the surface. If the borehole was advanced into groundwater, the grout is pumped through a grouting tube positioned at the bottom of the borehole.

STANDARD OPERATING PROCEDURE ---

GROUNDWATER MONITORING WELL CONSTRUCTION

The boreholes for monitor wells are usually drilled using a truck-mounted hollow-stem auger drill rig. The hollow-stem auger drilling method allows the well screen, casing and filter pack to be installed through the auger, thereby limiting boring cave-in during well installation. The borehole is logged by a geologist during drilling. Soil samples are collected for logging in a split spoon sampler lined with brass tubes at a maximum interval of five feet. Soil samples selected for chemical analyses are sealed at each end with Teflon sheets and plastic end caps, labeled and stored in a cooler with ice.

Well casing typically consists of flush-threaded schedule 40 PVC; however, schedule 80 PVC, Teflon, or stainless steel may be used depending on site conditions. The screened interval usually consists of machined slots for PVC and Teflon casing and continuous wire-wrap for stainless steel screen. The slot or screen size is selected by the geologist according to filter pack grain size and hydrogeologic formation characteristics. The most commonly used slot sizes are 0.010 inch and 0.020 inch. Either a threaded end cap or a PVC slip cap fastened with stainless steel screws is placed at the bottom of the casing. No solvents or cements are used to join casing sections.

The casing is set inside the hollow-stem auger and sand or gravel filter pack material is slowly poured into the annular space from the bottom of the boring to about 2 ft above the top of the well screen while withdrawing the auger. The filter pack grain size is selected by the geologist to conform to the formation grain size and estimated hydraulic conductivity. A 1-ft to 2-ft thick seal composed of hydrated bentonite pellets is placed above the filter pack to prevent grout from infiltrating into the filter pack. Portland cement grout used to seal the annular space form the top of the bentonite seal to about 6 inches below the surface. The grout is pumped under pressure through a pipe if the bentonite seal is below water. A lockable plastic expansion cap is placed at the top of the casing. Traffic-rated vault boxes are set in concrete around well heads in paved areas. Locking steel monument covers are usually installed over wellheads in unpaved areas.

STANDARD OPERATING PROCEDURE ---

GROUNDWATER MONITORING WELL DEVELOPMENT

Groundwater monitoring wells are developed after installation to improve well yield by removing fine material, including formation material or drilling mud, from the well casing, filter pack and boring annulus/formation interface. Fine material is also removed and soil grains aligned in the formation surrounding the well screen, thereby increasing porosity and hydraulic conductivity.

Prior to well development, the initial static water level is measured using a water level or interface probe. Standard procedure is to develop wells using a WaTerra surge block and an electric submersible pump. Well development may also be performed by hand using surge blocks and bailers, or by a truck-mounted development rig. The well is the surged along the entire screened interval using a surge block. This creates a back-washing effect that draws fine material from the formation and filter pack into the well casing and aligns the formation grains. Following surging, the well is then purged by using and electric submersible pump to remove fine suspended solids. The purging is continued until the purged water is relatively free of suspended solids and measurements of the groundwater pH, and conductivity have stabilized. "Stabilized" is defined as three consecutive readings within 10% of one another. Typically the amount of water purged is a minimum of 10 casing volumes. Data including well yield purge time and rate, clarity, pH, and conductivity are recorded.

After purging is completed, water levels are measured and recorded while recovering to static level. All development equipment is either steam-cleaned or washed in non-phosphate detergent solution and double-rinsed with de-ionized (DI) water between wells.

The purged water is contained on-site in drums or tanks until properly disposed.

STANDARD OPERATING PROCEDURE

GROUNDWATER SAMPLING FROM MONITOR WELLS

Prior to groundwater sampling, a measurement is made of the static water level using a water level probe. At sites where the presence of separate-phase hydrocarbons is suspected, a product bailer or an interface probe is used to measure product thickness. The water level probe is cleaned with non-phosphate detergent and rinsed with de-ionized (DI) water between wells. The static water level and well depth are used to calculate the well casing volume. A minimum of 4 well casing volumes of water are purged from the well prior to sampling in order to obtain a representative sample of the groundwater from the formation surrounding the well. Wells should be purged and sampled in order of least to highest suspected concentrations.

Standard purging equipment is an electric submersible pump. Alternatively, purging and sampling systems may be disposable or dedicated (installed in the well) PVC, teflon, or stainless steel bailers; or bladder pumps. Appropriate personal protective equipment is worn during purging. The well is purged until the clarity, pH, and conductivity of the discharged water has stabilized. "Stabilized" is defined as three consecutive readings within 10% of one another.

These parameters are measured and recorded initially, after every well casing volume is removed, and after the sample is collected. In some localities, turbidity, Eh, and dissolved oxygen measurements may also be required. If the well is purged dry prior to the removal of three or four casing volumes of water, the water level is allowed to recover to 80% of the static level before sampling. Whenever possible, samples will be collected within 24 hours after purging. Ideally, samples will be collected immediately after purging to minimize volatilization of aromatic hydrocarbons.

The standard sampling equipment will be inert polyethylene disposable bailers. New sampling gloves are worn during each sample collection. Sample containers typically consist, depending on the analysis, 40 milliliter volatile organic analysis (VOA) vials with teflon septa, 1 liter amber glass bottles, or plastic bottles. HCl or other preservative are added to the sample containers as appropriate by the laboratory prior to sampling. The groundwater sample is decanted into each VOA vial to form a meniscus at the top to eliminate air bubbles when capped. The sample is labeled with date, time, sample number, project number and analysis. The samples are stored in a cooler with blue ice or ice, and delivered under chain-of-custody to the state-certified analytical laboratory. For quality control purposes, duplicate samples, trip blanks, and equipment blanks may also be collected. The duplicate sample is given a different number than the original sample from the same well. Trip blanks are prepared by the laboratory using DI water and remain in the cooler. Equipment blanks are collected from sampling equipment using DI water after the equipment has been decontaminated and rinsed.

All non-dedicated purging and sampling equipment is washed in non-phosphate detergent solution and double rinsed with DI water after use in every well to avoid cross-contamination.

Purge water will be properly disposed or temporarily contained in labeled steel barrels pending chemical analysis to determine proper disposal procedure.