DATA GAP INVESTIGATION WORKPLAN AND SITE CONCEPTUAL MODEL

SHORE ACRES GAS
403 EAST 12TH STREET
OAKLAND, CALIFORNIA

Prepared for: Rashid Ghafoor

ECG Project Number: GHA.19009
Alameda County Fuel Leak Case No. RO0002931

April 4, 2018

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INTRODUCTION

Environmental Compliance Group (ECG) has been authorized by Mr. Rashid Ghafoor, the responsible party (RP) to provide this report for the site. ECG has prepared the Data Gap Investigation Work Plan (Workplan) and Site Conceptual Model (SCM) requested by Alameda County Department of Environmental Health (ACDEH) in their correspondence dated August 11, 2017 (Appendix A).

This report is a Workplan to address data gaps at the site regarding the low threat closure policy (LTCP) and contains a site conceptual model for the site. Site information is as follows:

Site Location:	403 East 12th Street Oakland, California
Geotracker Global ID:	T0600174667

LIMITATIONS

This report has been prepared for use by Mr. Ghafoor and the relevant regulatory agencies. The conclusions in this report are professional opinions based on the data presented in this report. This report was prepared in general accordance with hydrogeologic and engineering methods and standards. No other warranties are made as to the findings or conclusions presented in this report. The work described in this report was performed under the direct supervision of the professional geologist whose signature and State of California registration are shown above.

SITE DESCRIPTION AND HYDROGEOLOGIC CONDITIONS

SITE DESCRIPTION

The site occupies a parcel on the southeast corner of 4th Avenue and East 12th Street in Oakland, Alameda County, California (Figure 1). The site is situated in a commercial and residential area in central Oakland and is currently used as a hand car wash. The site was historically used as a gasoline station. The area of interest at the site is the former location of three underground storage tanks (USTs) and three fuel dispenser islands where impacted soil and groundwater was first identified in 2006 and 2009. A detailed site plan is shown on Figure 2.

HYDROGEOLOGIC CONDITIONS

The site is underlain by Quaternary-age dune sand deposits referred to as the Merritt Sand. The Merritt Sand is typically described as loose, well-sorted fine- to medium-grained sand with a large silt component. The sand is reported to reach a maximum depth of 50-feet bgs in the area.

Based on boring logs from the advancement of 11 soil borings and the installation of six monitoring wells and four extraction wells, the stratigraphy of the site and vicinity consists of silt to

approximately 30-feet bgs with discontinuous thin intervals of sandy silt and clayey silty sand present in the area.

Depth to groundwater is shallow and semi confined, ranging between 8- to 14-feet bgs. The groundwater flow direction appears to be generally toward the southeast. The site is located on a topographic high elevation. The most recent groundwater gradient map is shown on Figure 3 and a Rose Diagram is shown on Figure 4.

PROJECT BACKGROUND

INVESTIGATIONS

In July 2006, Geofon Incorporated (Geofon) advanced soil borings GP-1 and GP-2 and collected and analyzed soil samples. Results are detailed in Geofon's report entitled *Summary of Phase II Assessment Activities,* dated July 25, 2006.

In August 2009, Wright Environmental Services, Inc. (Wright) removed three USTs, associated fuel dispensers, and all associated piping. Results are detailed in Wright's *Closure Report for Three Underground Storage Tanks*, dated September 2009.

In April 2010, Apex Envirotech, Inc. (Apex) advanced nine soil borings to evaluate the lateral and vertical extent of impacted soil and groundwater. Results are documented in Apex's *Subsurface Investigation Results Report* dated June 23, 2010.

In June 2011, ECG supervised the installation of six groundwater monitoring wells (MW-1 through MW-6) and two extraction wells (EW-1 and EW-2). Results are documented in ECG's *Off-Site Investigation and Dual Phase Pilot Test Results with Fourth Quarter 2011 Monitoring Report*, dated January 26, 2012.

In December 2011, ECG supervised the advancement of 11 soil borings to evaluate the lateral extent of impacted groundwater to the north, west, and south of the site. Results are documented in ECG's report entitled *Off Site Investigation and Dual Phase Pilot Test Results with Fourth Quarter 2011 Groundwater Monitoring Report* dated January 17, 2012.

RISK ASSESSMENTS

In January 2011, ECG conducted a preferential pathway study for the site. Results are detailed in ECG's *Site Assessment and Soil Vapor Extraction Pilot Test Workplan*, dated February 9, 2011.

In January 2011, ECG conducted a sensitive receptor survey for the site. Results are detailed in ECG's *Site Assessment and Soil Vapor Extraction Pilot Test Workplan*, dated February 9, 2011. Additional receptor survey data has been requested by the County from Alameda County Public Works Agency (ACPWA) files and is pending.

A soil vapor survey has not been completed for the site but is proposed in this workplan.

CORRECTIVE ACTIONS

In June 2011, ECG supervised the installation of six groundwater monitoring wells (MW-1 through MW-6) and two extraction wells (EW-1 and EW-2). ECG also performed a 5-day dual phase

extraction (DPE) test in June 2011. Results are documented in ECG's *Off-Site Investigation and Dual Phase Pilot Test Results with Fourth Quarter 2011 Monitoring Report*, dated January 26, 2012.

In May 2013, ECG supervised the installation of two extraction wells (EW-3 and EW-4). In September 2013, ECG installed the subsurface piping network from the remediation wells to the remediation compound and the subsurface conduit required by PG&E to install the electrical service required to operate the remediation compound.

In April 2014, the dual phase extraction system began operation. The DPE system includes a 25-horsepower liquid-ring blower capable of up to 400 standardized cubic feet per minute (scfm) flowrate, thermal/catalytic oxidizer, a conveyance piping network, and four individual extraction wells. The blower extracts vapors and groundwater from each extraction wells and through the conveyance piping where the impacted vapor is destroyed in the thermal/catalytic oxidizer prior to discharge to the atmosphere and the groundwater is treated with an air stripper and granular activated carbon prior to discharge to the municipal sewer system.

The remediation system was started on April 30, 2014 and shut down on June 27, 2014 due to carbon change out requirements. The system was restarted on August 15, 2014. The remediation system was shut down on February 18, 2015 due to complaints from neighbors regarding the propane tank onsite providing supplemental fuel to the remediation equipment. ECG supervised the installation of natural gas provided by PG&E to the site and the system was restarted on August 11, 2015. The system was shut down on December 16, 2015 due to contaminant breakthrough of the first carbon vessel and scheduled carbon change out. The system was restarted January 21, 2016 and shut down on April 11, 2016 due to decreasing contaminant extraction rates and pending regulatory review of ECG's *Fourth Quarter 2015 Monitoring and Remediation System Evaluation Report*, dated August 1, 2016.

The DPE system is operated under Bay Area Air Quality Management District (BAAQMD) permit number 25354 and East Bay Municipal Utility District (EBMUD) Discharge Permit No. 68508758. The DPE system has removed approximately 8,434 pounds of TPHg, 39 pounds of benzene, and 2. pounds of MTBE from the subsurface.

DATA GAP WORKPLAN

The following is a summary of work proposed for next phase of investigation and corrective actions at the site. This work will be performed to satisfy data gaps outlined in the directive letter from ACDEH letter dated August 11, 2017 to meet the State's Water Resources Control Board's LTCP guidelines. All proposed work will be completed in accordance with ECG's SOPs included in Appendix B.

LTCP GENERAL CRITERIA D (FREE PRODUCT)

The LTCP requires the removal of free product to the extent possible at release sites. Historically, free product has been observed at well MW-5. Furthermore, dissolved concentrations in groundwater are near the solubility limits for TPHg and benzene at well MW-1 and MW-6. To address the free product or the potential for free product at these locations, ECG proposes installing passive skimmers in wells MW-1, MW-5, and MW-6.

The PRC Passive Skimmer, manufactured by Geotech, is a passive skimmer used to recover light floating hydrocarbons down to a sheen. The skimmer uses a hydrophobic element to collect free product from the well with little or no water being collected. The hydrophobic element has a 10-inch recovery zone that tracks the water free product interface up to 24-inches and can hold up to one liter of free product. A copy of the skimmer specification sheet is contained in Appendix C.

GENERAL CRITERIA F – SECONDARY SOURCE REMOVAL

A secondary source is defined as petroleum impacted soil and/or groundwater located at or immediately beneath the point of release from the primary source. Seven potential primary sources have been identified at the site. The three former USTs are each a primary source; the three former dispenser islands, and the product conveyance piping are all potential primary sources. To investigate these primary sources to determine if secondary sources are present at which location and to what extent, ECG proposes excavating test pits at the site.

ECG proposes excavating three test pits at the site as shown on Figure 5. The three test pits will be excavated using a track hoe excavator with a 16-foot reach. Soil removed from the test pits will be field screed with a photo ionization device (PID) in the field and any soil reading over 200 ppm will be immediately loaded into an end dump truck for proper disposal at a nearby landfill. Soil under 200 ppm will be stockpiled at the site and used as backfill for the test pits after sampling has occurred. Soil samples will be collected at hot spots along the trenches and at a minimum of no greater than every 10 feet laterally along the test pits. No wells will be disturbed during trenching activities. Since groundwater is relatively shallow (7-feet bgs), but under semi-confined conditions, the test pits are anticipated to be no more than 14-feet deep with water anticipated at around 11-feet bgs. Hot spots will be "chased" vertically to attempt to define the secondary sources during this phase of the project. Lateral definition will not be attempted in the individual trenches because the "side by side" or almost parallel location of the three test pits will provide the lateral definition information. Free product, if encountered in soil or water will be laterally investigated to an extent practical during this phase of the investigation. Once the laboratory data and field PID readings are analyzed, future excavation may be proposed if warranted.

It should be noted that in 2009, during the UST excavation activities, the fire department suspended excavation activities at the site due to the presence of strong odors in outdoor air. For that reason, the end dumps will be onsite to immediately remove the most impacted soil and the exposed surface area of the trenches will be minimized by keeping the trenches as narrow as possible and backfilling open trenches as quickly as practical. In addition, PIDs will be used to monitor outdoor air concentrations during trenching activities.

Due to the tight soil conditions previously encountered and logged at the site, it is anticipated that the test pits will not cave in during trenching activities. Installing lateral slotted piping will not be considered because of tight soil conditions and the documented substandard performance of the DPE system. As stated in the ACDEH's letter, the secondary sources, if present, should be removed at a maximum of one year's time frame. Based on the results of the DPE system operating at the site, the only practical way to evaluate and remove the secondary sources is through limited narrow trenching to minimize outdoor air degradation and maximize secondary source removal.

ECG will coordinate subcontractors with the ACEHD for permitting, the managers of the hand car wash business on site to minimize disruptions, and the RP to complete this work in a timely and efficient manner. It is anticipated that approximately one week of 10-hour days will be needed to

complete the project. An estimated 200 cubic yards of material will be disturbed if the three trenches are 2 feet by 11-feet by 75-feet long. As previously stated, only soil above the action level of 200 ppm in the field will be removed from the site.

Upon completion of the proposed test pits, ECG proposes an asphalt contractor repave and seal the disrupted asphalt areas to minimalize rainwater and hand car wash water from percolating beneath the subsurface and potentially exacerbating the migration of free product and dissolved phase concentrations in groundwater. In addition, any utilities encountered during trenching will be included on future maps to assess the possibility of preferential pathways for petroleum migration. This information along with existing utilities locations, along with previous groundwater and soil data, will be used to update the site conceptual model (SCM) presented later in this report.

ECG will also have submersible pumps and poly tanks on site to remove and secondary sources encountered in groundwater. The water can be economically treated and discharged on site using the existing remediation equipment and BAAQMD and EBMUD discharge permits. The pumps will remain positioned in the top of the water column to capture the most impacted groundwater encountered in the test pits. Groundwater samples will be collected before and after pumping activities to quantify removal of any secondary sources in groundwater. If large amounts of free product are encountered, an alternate disposal method incorporating offsite disposal with vacuum trucks will be required. Two 10,000 gallon poly tanks will be onsite to segregate free product with dissolved phase impacted groundwater.

LTCP MEDIA SPECIFIC CRITERIA FOR GROUNDWATER

ACDEH's review of case files for the site indicates insufficient data for groundwater potential impacts by petroleum hydrocarbons in the down gradient (southeast) direction from the site. To satisfy the LTCP criteria for groundwater, ECG proposes installing two additional shallow groundwater monitoring wells downgradient from the site at locations shown on Figure 6.

Prior to drilling, permits will be obtained from Alameda County and Underground Services Alert will be notified a minimum of 48-hours prior to drilling. As a further precaution to avoid underground utilities, the first 5-feet of every boring will be hand cleared.

ECG will supervise a driller licensed to operate in California, during the installation of two 2-inch diameter monitoring wells (Wells MW-7 and MW-8) at the locations shown on Figure 6. The monitoring wells will then be installed to 20-feet bgs with 15-feet of 0.020 screen and #3 sand. A two-foot bentonite seal will separate the filter pack from the neat cement grout installed to the surface. Typical monitoring well construction details are shown on Figure 7.

Soil samples will be collected at five-foot interval from 5- to 20-feet bgs for classification and field screening with a PID. A minimum of two samples from each boring will be submitted to the laboratory for analysis of the site constituents shown on Table 8-1. At least 24 hours after the groundwater wells have been installed they will be developed and sampled. All work will be done in accordance to ECG SOPs included as Appendix B.

LTCP MEDIA SPECIFIC CRITERIA FOR VAPOR INTRUSION TO INDOOR AIR

ACDEH's review of the site's data indicates that insufficient data exists to assess compliance for vapor intrusion to indoor air. ECG proposes sampling indoor air at the former convenience store building still present at the site.

Two Summa Canisters will be placed on the ground surface inside the store. One at the southwest corner of the store and one in the northeast corner of the store and the 24-hour flow controllers will be started immediately. The sampling will terminate approximately 24 hours later and the samples will be delivered under chain of custody to Eurofins Air Toxics Ltd. (Eurofins) in Folsom, California for analysis. Eurofins will analyze the samples for total volatile organic suite by USEPA Method TO-15 Modified.

SHALLOW SOIL GAS CONCENTRATIONS

ECG will supervise Cascade during the advancement of three soil vapor probes (SG-1 through SG-3) to a depth of 5-feet bgs at the locations shown on Figure 5. The soil vapor probes will be installed with a hand auger. The soil vapor probe will consist of a stainless steel vapor implant made of 316 stainless steel. They will be fitted a stainless steel collection tip (Figure 8). One end of the soil vapor probe will be fitted with a PVC barb connected to 1/8 or ¼-inch diameter nylon or Teflon tubing. The tubing will be capped at the surface with a gas tight valve or fitting secured in a traffic rated vault box.

The soil vapor probes will not be purged or sampled until at least 48 hours after their installation. The soil vapor probes will be purged of stagnant air prior to sampling. At least three purge volumes of vapor will be removed at a rate less than 200 milliliters per minute (ml/min.) prior sample collection.

Vapor samples will be collected into Summa canisters fitted with flow regulators to ensure that the canisters are filled at a rate less than 200 ml/min. Summa canisters will have a minimum capacity of 400 ml. The vapor samples will be submitted under chain of custody documentation to Eurofins for analyses of volatile organics by EPA Method TO-15, which includes benzene, ethylbenzene, and naphthalene.

Upon completion of the work, a results report will be submitted. The results will be compared to commercial indoor air environmental screening levels (ESL) established by the California Regional Water Quality Control Board, Region 2.

LTCP MEDIA SPECIFIC CRITERIA FOR DIRECT CONTACT AND OUTDOOR AIR CRITERIA

The LTCP guidance requires evaluation of shallow soil for determining risks associated with outdoor air and dermal exposures based on petroleum constituent concentrations listed in Table 1 of the LTCP document (Appendix D). Benzene and ethylbenzene levels in shallow soil at the site meet the LTCP requirements listed on Table 1. However, shallow soil has never been analyzed for naphthalene.

ECG proposes sampling for naphthalene at 5-0 and 10-feet depth intervals along with the other constituents listed in Table 8-1 in this report during excavation of test pits described above to satisfy this data gap.

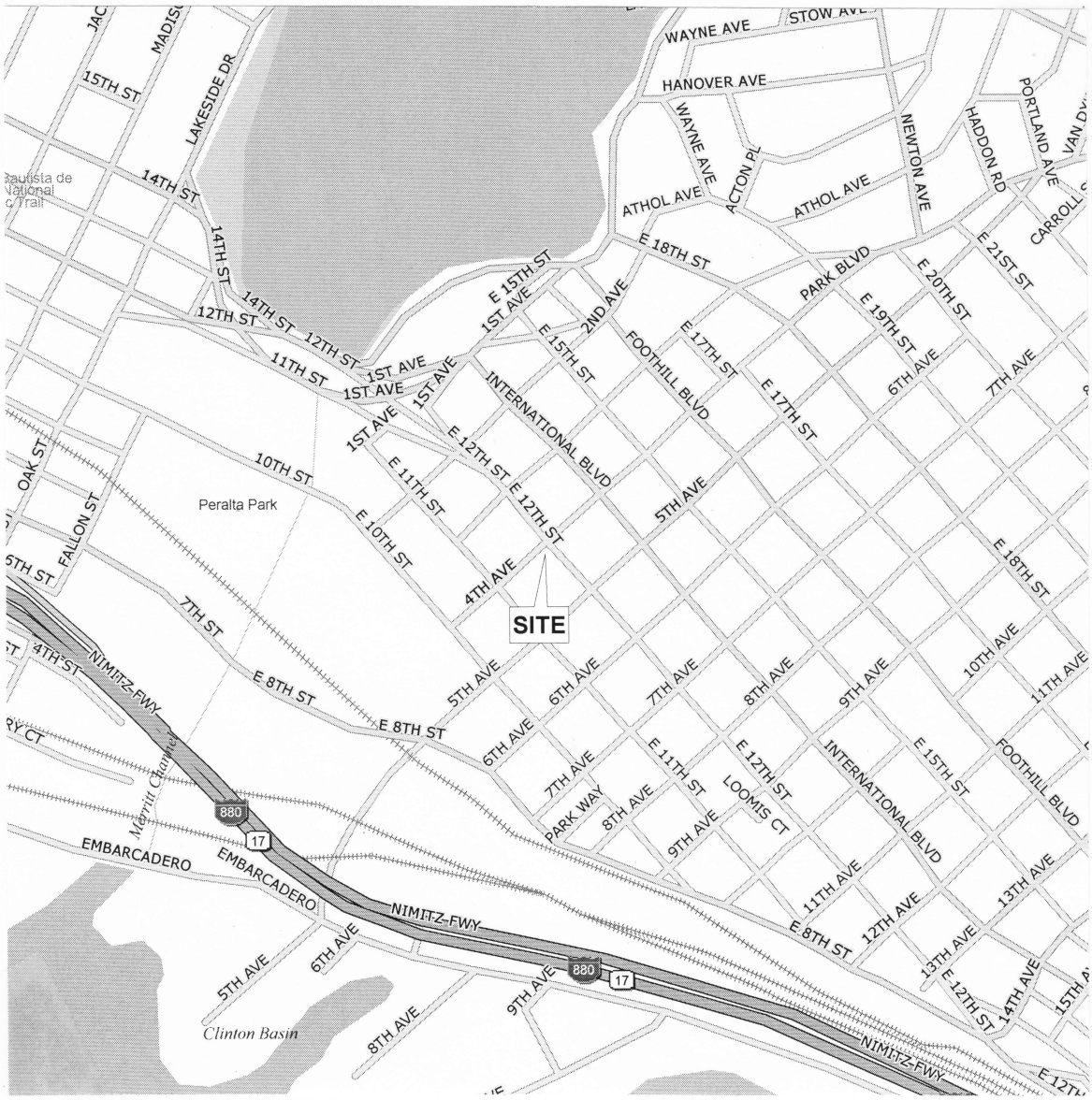
SCHEDULE

Upon approval of this Workplan report by ACDEH, ECG will begin permitting and scheduling the test pit and indoor air sample activities and offsite monitoring well and soil vapor probe installation activities. Once the analytical data is received, ECG will prepare and submit a results report with an updated Site Conceptual Model (SCM) within 60-days.

SITE CONCEPTUAL MODEL

ECG has prepared a SCM as requested by ACDEH and will make updates to the SCM as new data is received. The SCM is discussed in Table E-1 and shown on Figures E-1 through E-15.

FIGURES



NORTH

0 1,000 2,000

Approximate Scale In Feet
1 inch = 1,000 Feet

FIGURE 1	**SITE LOCATION MAP**	**Environmental Compliance Group, LLC**
Project Number: GHA.19009	Shore Acre Gas 403 East 12th Street Oakland, California	270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664-1035
Date: February 9, 2011		

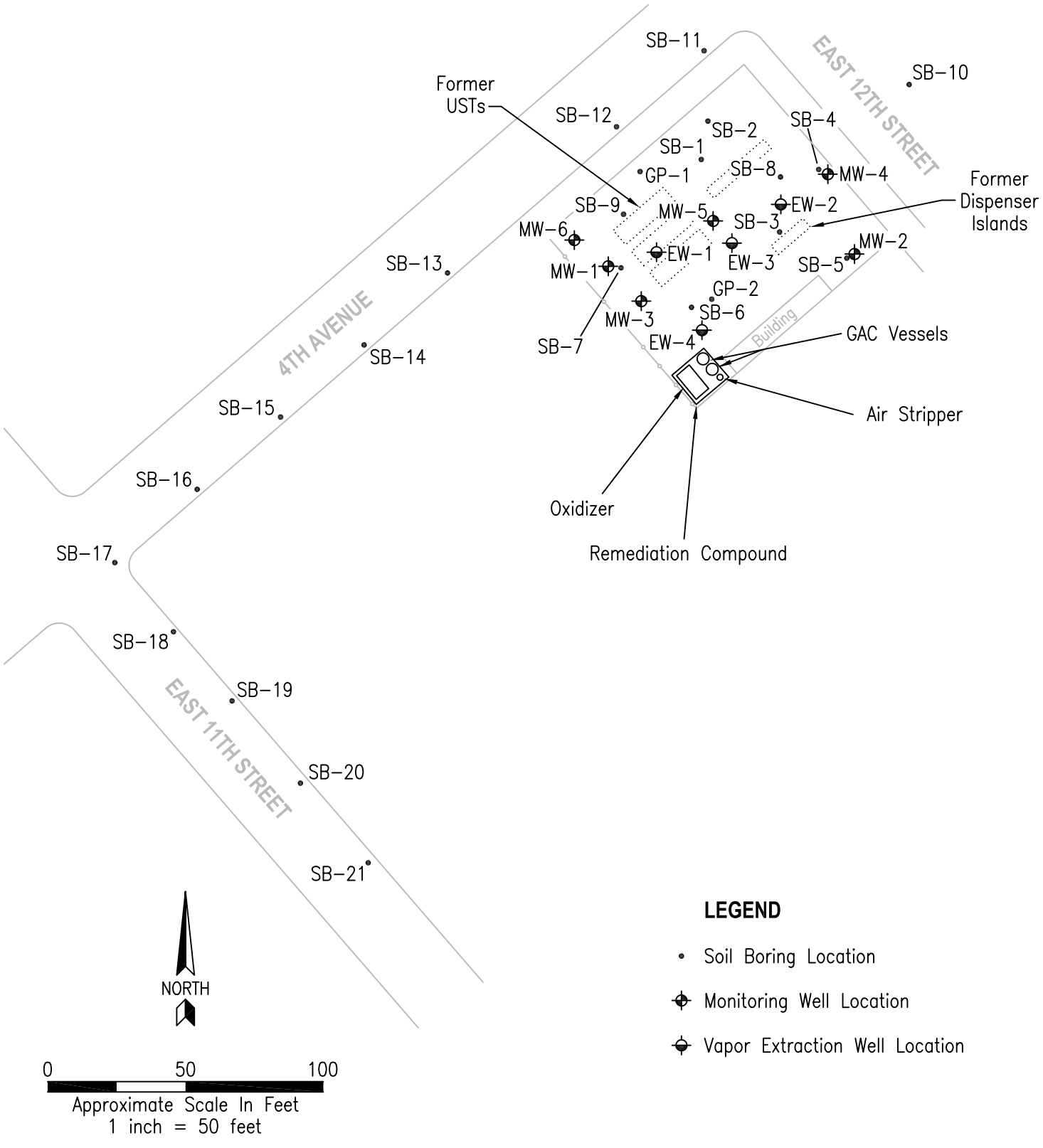
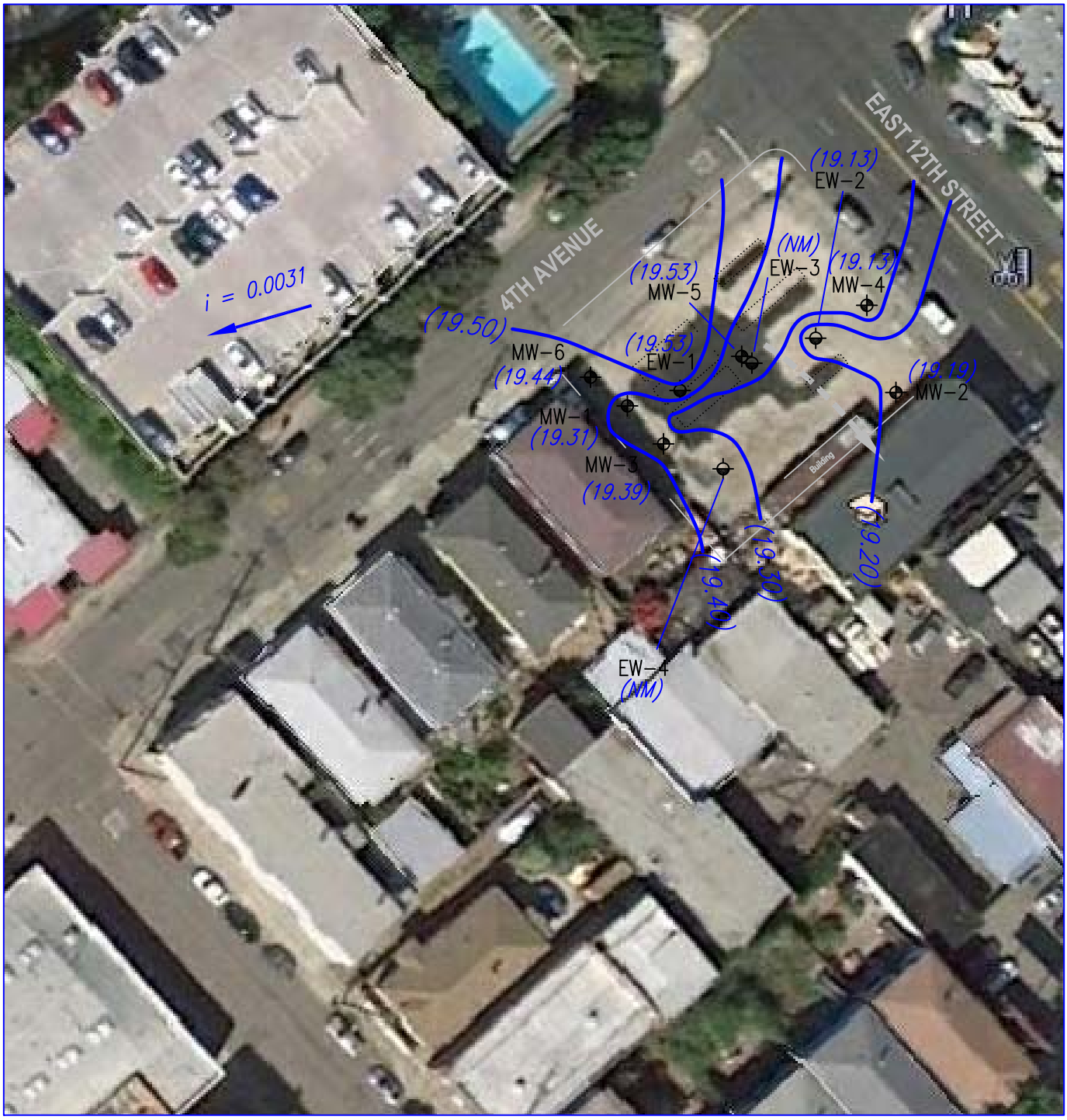


FIGURE 2	**SITE MAP**	**Environmental Compliance Group, LLC**
Project Number: GHA.19009	Shore Acre Gas 403 East 12th Street Oakland, California	270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664-1035
Date: October 23, 2017		



LEGEND

NORTH

Monitoring Well Location

Vapor Extraction Well Location

(19.13) Elevation Of Groundwater Measured In Feet Above Mean Sea Level

(19.30) Lines Of Equipotential Measured In Feet Above Mean Sea Level (Dashed Where Inferred)

Flow Lines

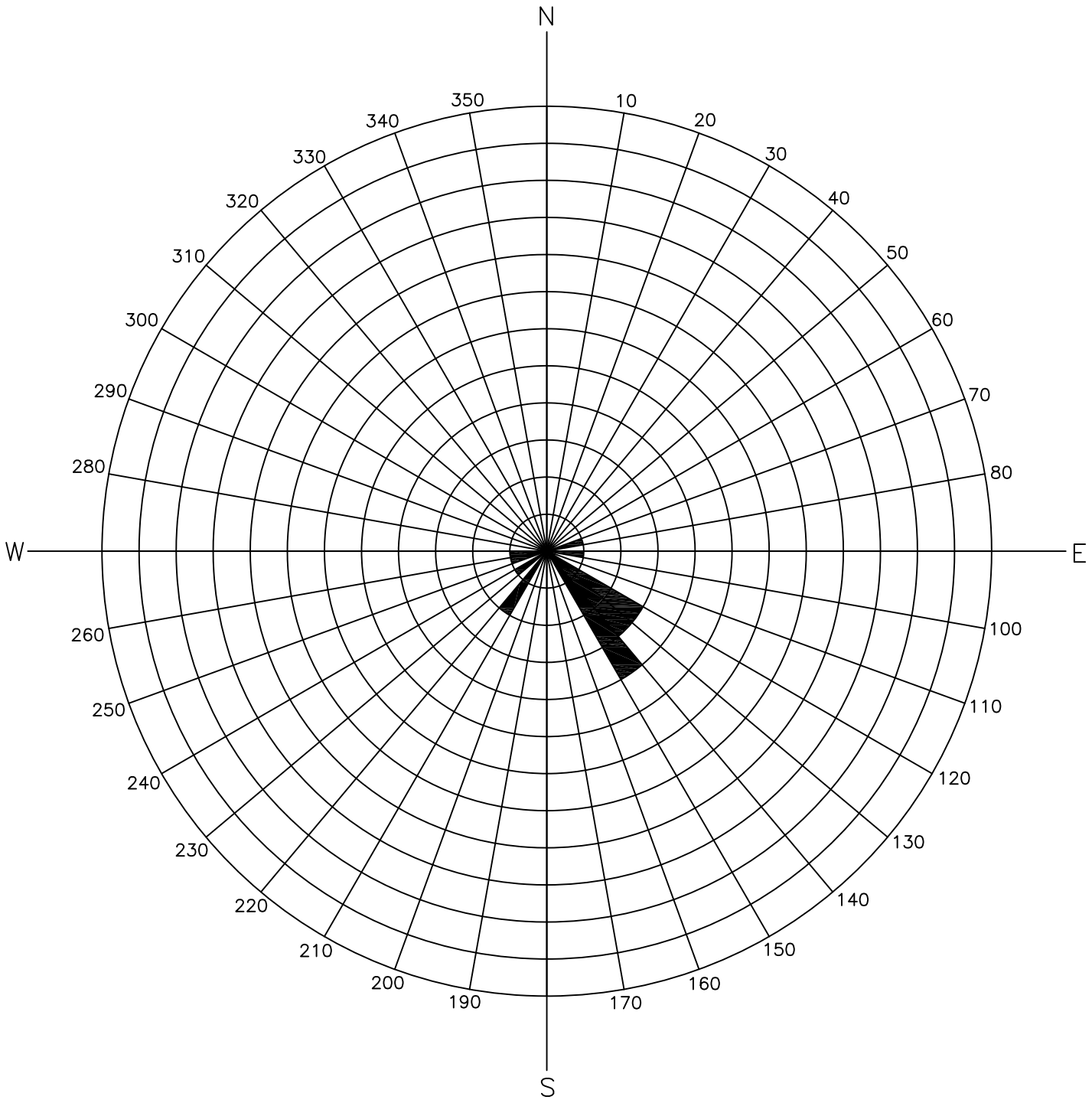
i = 0.0080 General Gradient

(NM) Not Measured

0 50 100

Approximate Scale In Feet
1 inch = 50 feet

FIGURE 3 **Project Number:** GHA.19009 **Date:** November 16, 2017	**POTENTIOMETRIC SURFACE MAP** **SEPTEMBER 28, 2017** Shore Acre Gas 403 East 12th Street Oakland, California	**Environmental Compliance Group, LLC** 270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664-1035



Thru 3rd Quarter 2017

FIGURE 4	**ROSE DIAGRAM**	Environmental Compliance Group, LLC
Project Number: GHA.19009	Shore Acre Gas 403 East 12th Street Oakland, California	270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664-1035
Date: February 28, 2018		

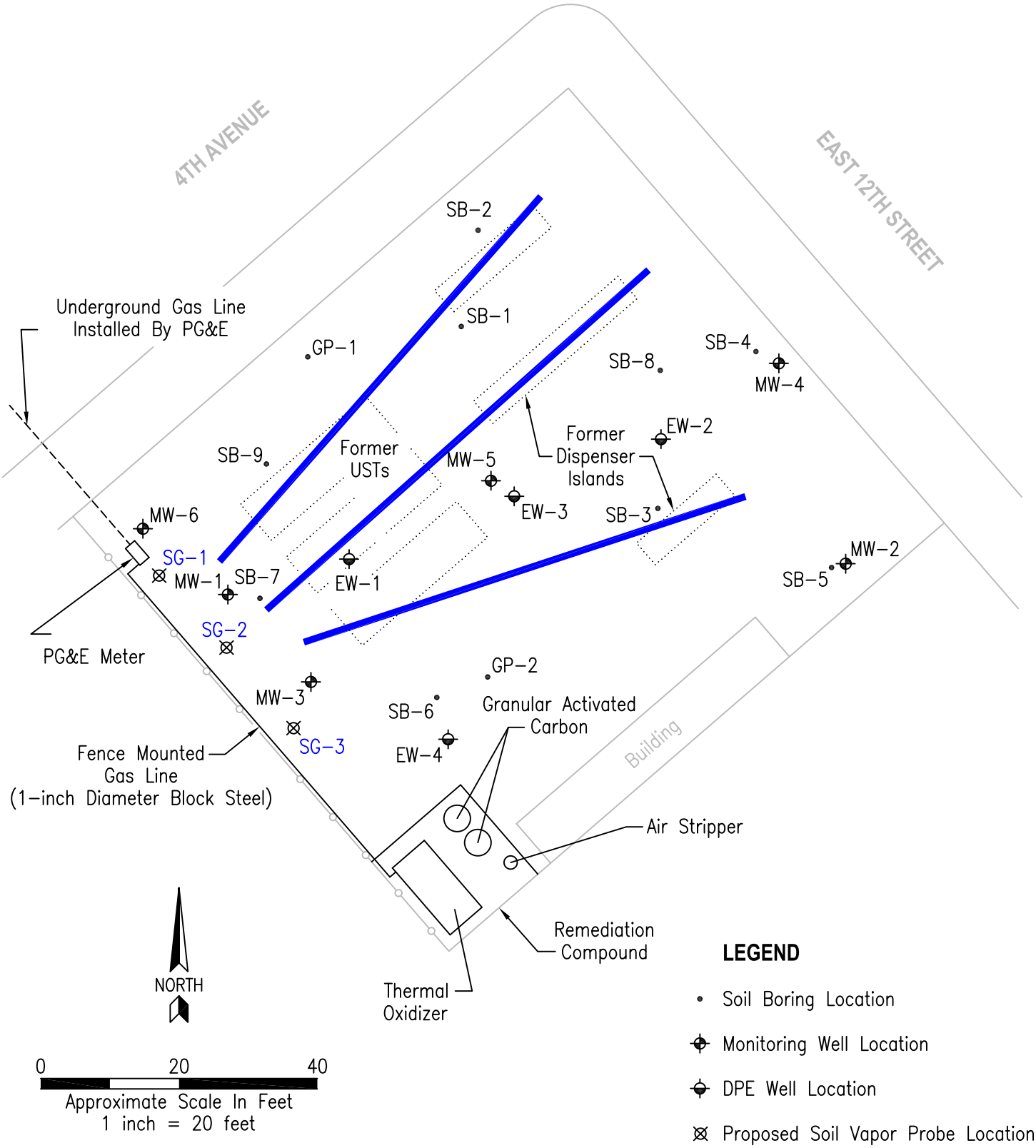


FIGURE 5	**PROPOSED TEST PITS AND SOIL VAPOR PROBE LOCATION MAP** Shore Acre Gas 403 East 12th Street Oakland, California	**Environmental Compliance Group, LLC** 270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664-1035
Project Number: GHA.19009		
Date: February 28, 2018		

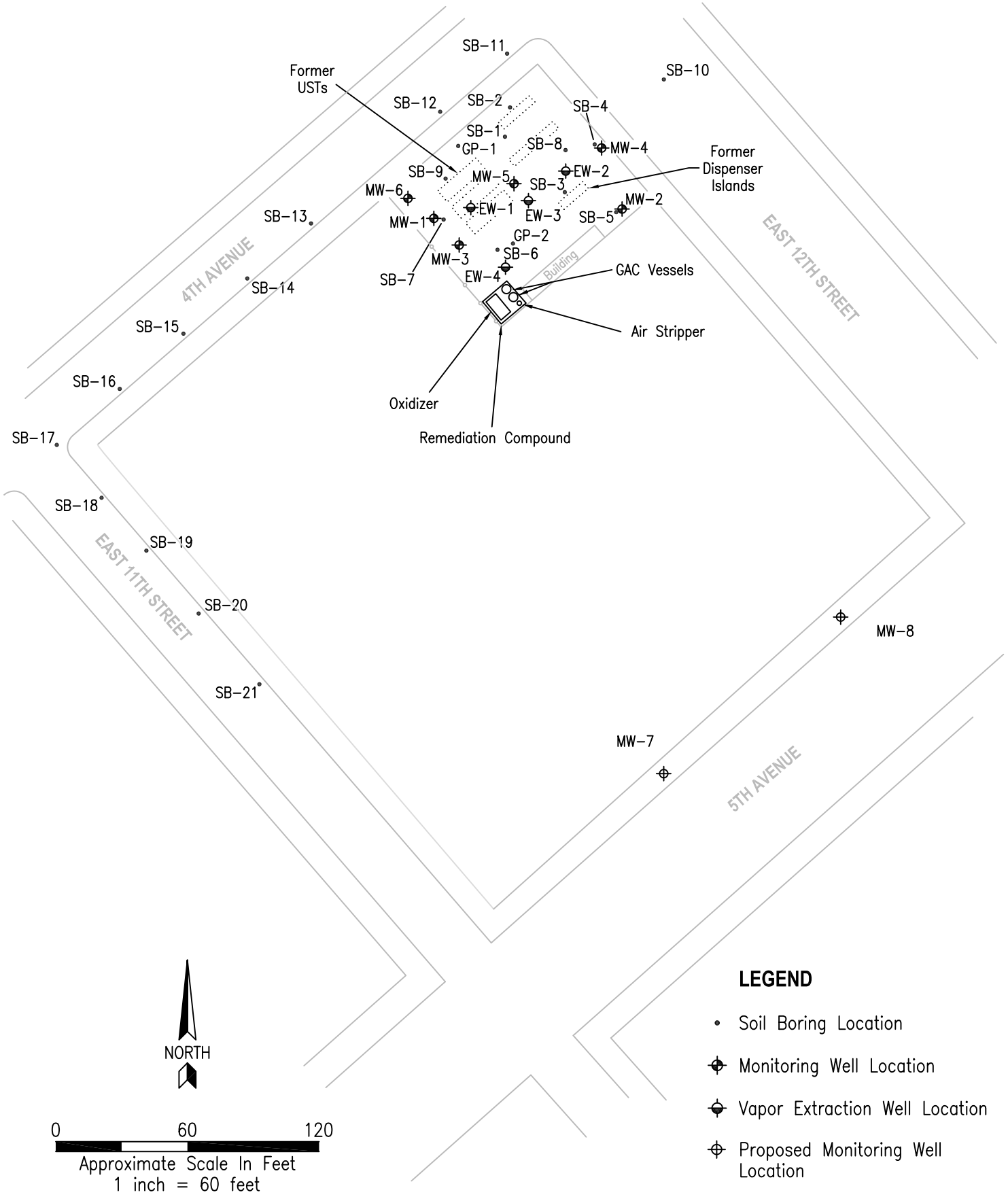
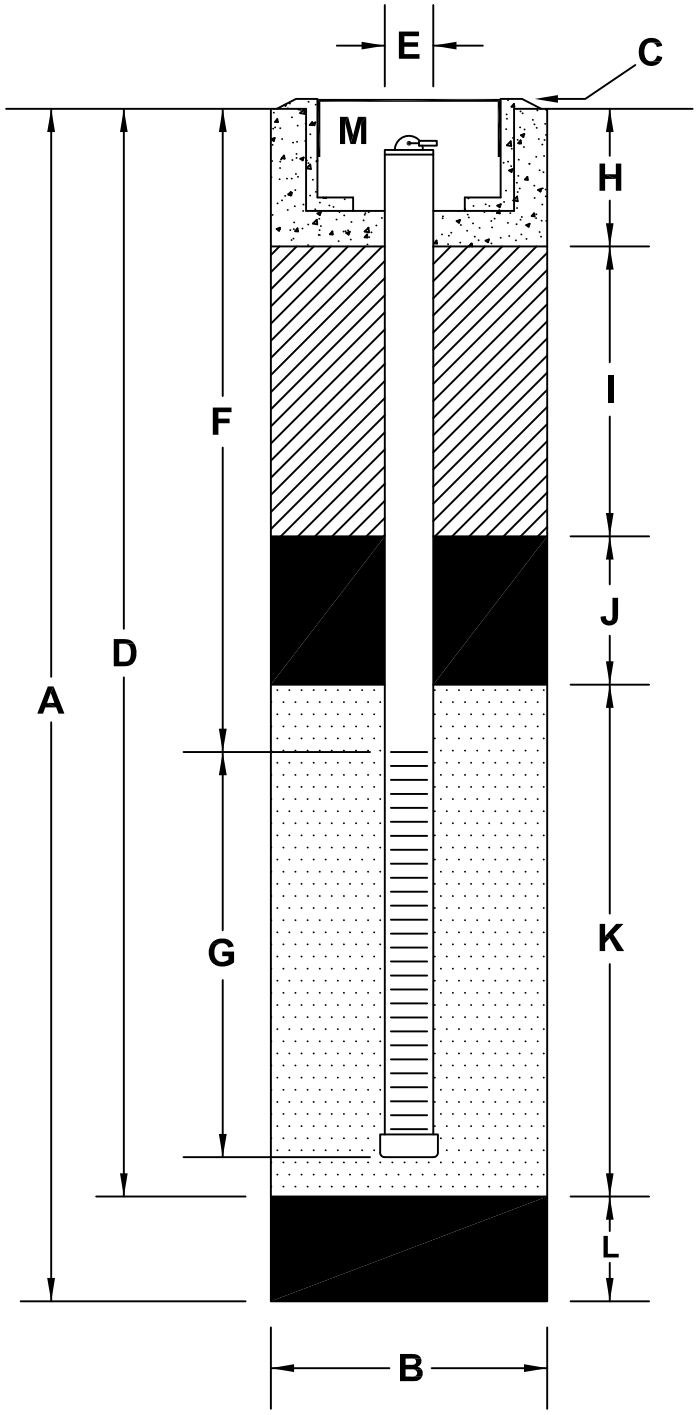


FIGURE 6	**PROPOSED MONITORING WELL LOCATION MAP**	Environmental Compliance Group, LLC
Project Number: GHA.19009	Shore Acre Gas 403 East 12th Street Oakland, California	270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664-1035
Date: March 1, 2018		

PROPOSED WELL CONSTRUCTION DETAIL



A Total Depth Of Boring 20 ft.

B Diameter Of Boring 8 in.
Drilling Method Hollow Stem Auger

C Top Of Box Elevation _____ ft.
☒ Referenced To Mean Sea Level
☐ Referenced To Project Datum

D Casing Length 20 ft.
Material Sch 40 PVC

E Casing Diameter 2 in.

F Depth To Top Perforations 5 ft.

G Perforated Length 15 ft.
Perforated Interval From 5 to 20 ft.
Perforation Type Machine Slotted
Perforation Size 0.010 in.

H Surface Seal From 0 to 2 ft.
Seal Material Neat Cement

I Sanitary Seal From 2 to 3 ft.
Seal Material Grout

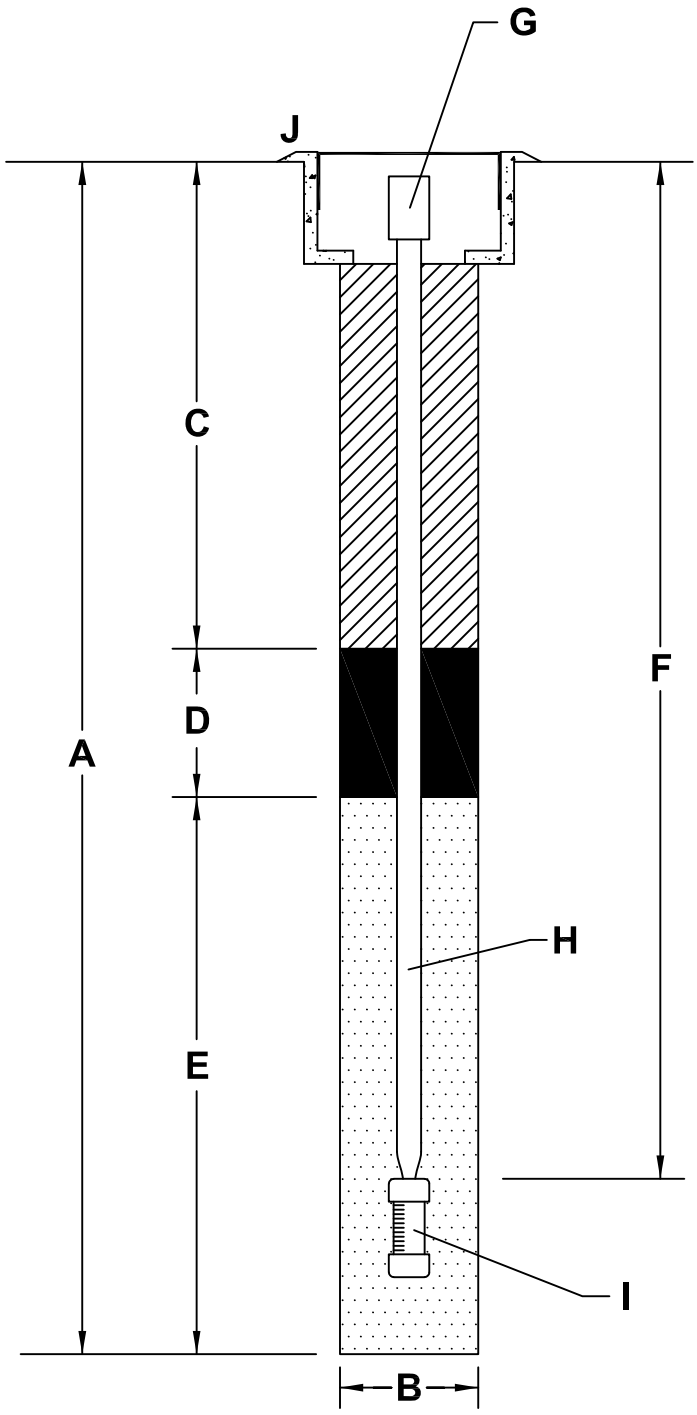
J Seal From 3 to 4 ft.
Seal Material Bentonite

K Filter Pack From 4 to 20 ft.
Pack Material #2/16 Lonestar Sand

L Bottom Seal N/A ft.
Seal Material N/A

M 8-inch Diameter Traffic Rated Christy Box

FIGURE 7	**PROPOSED MONITORING WELL CONSTRUCTION DETAIL** Shore Acres Gas 403 East 12th Street Oakland, California	Environmental Compliance Group, LLC 270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664-1035
Project Number: GHA.19009		
Date: February 28, 2018		



A Total Depth Of Boring 5 ft.

B Diameter Of Boring 2 in.
Drilling Method Hand Auger

C Sanitary Seal From 0 to * ft.
Seal Material Hydrated Granular Bentonite

D Seal From * to * ft.
Seal Material Dry Granular Bentonite

E Filter Pack From * to * ft.
Pack Material No. 3 Lonestar Sand

F Depth To Probe 6–10* ft.

G Gas Tight Valve

H 1/8" To 1/4" Tubing

I Probe Tip (1/2" Sch 40 Well Screen)

J 8–inch Diameter Traffic Rated Christy Box

* Depths To Be Determined From Site Lithology

FIGURE 8	**PROPOSED SOIL VAPOR PROBE CONSTRUCTION DETAIL** Shore Acres Gas 403 East 12th Street Oakland, California	**Environmental Compliance Group, LLC** 270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664–1035
Project Number: GHA.19009		
Date: February 28, 2018		

TABLES

Table 1
Well Construction Details
Shore Acres Gas
403 East 12th Street
Oakland, California

Well ID	Date Installed	TOC Elevation (ft amsl)	Well Depth (ft bgs)	Casing Diameter (inches)	Casing Material	Screen/ Filter	Screen Interval (ft bgs)
Monitoring Wells							
MW-1	June 2011	30.81	20	2	PVC	0.020/#3	10-20
MW-2		31.29	20	2	PVC	0.020/#3	10-20
MW-3		31.30	18	2	PVC	0.020/#3	8-18
MW-4		31.21	19	2	PVC	0.020/#3	9-19
MW-5		31.35	20	2	PVC	0.020/#3	10-20
MW-6		30.79	20	2	PVC	0.020/#3	10-20
Dual Phase Extraction Wells							
EW-1	June 2011	31.46	20	4	PVC	0.020/#3	5-20
EW-2		31.43	20	4	PVC	0.020/#3	5-20
EW-3	May 2013	---	20	6	PVC	0.020/#3	5-20
EW-4		---	20	6	PVC	0.020/#3	5-20

Notes:

TOC - denotes top of casing
ft - denotes feet
amsl - denotes above mean sea level
bgs - denotes below ground surface
PVC - denotes polyvinyl chloride

Table 2a
Historical Soil Analytical Data
TPH and BTEX
Shore Acres Gas
403 East 12th Street
Oakland, California

Boring ID	Sample Depth (feet)	Collection Date	TPHd (mg/kg)	TPHg (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total xylenes (mg/kg)
UST Removal Samples								
SS-D1	2	August 2009	**1,800***	**3,000**	<0.25	**0.34**	**39**	**180**
SS-D2	2		**900***	**2,400**	<0.25	<0.25	**36**	**120**
SS-D3	2		**460***	**1,000**	<0.15	<0.15	**12**	**14**
SS-D4	2		**540***	**640**	<0.090	**1.0**	**6.1**	**51**
SS-D5	2		**320**	**140**	<0.025	<0.025	**1.3**	**3.2**
SS-D6	2.0		**320***	**260**	<0.025	**0.054**	**1.0**	**8.0**
SS-J1	2.0		**39***	**160**	<0.025	<0.025	**0.71**	**0.94**
SS-Isle	4.0		**560***	**100**	<0.025	<0.025	**0.30**	**0.084**
SS-7	18.0		**310***	**1,600**	**6.9**	**76**	**39**	**200**
Tank 1-SS-1	14.0		**830***	**2,500**	**4.2**	**100**	**69**	**360**
Tank 1-SS-2	14.0		**62***	**480**	**1.8**	**5.3**	**14**	**62**
Tank 2-SS-1	14.0		**120***	**290**	**0.37**	**2.4**	**6.3**	**31**
Tank 2-SS-2	14.0		**330***	**80**	**0.074**	**0.051**	**1.2**	**5.8**
Tank 3-SS-1	14.0		**480***	**2,100**	**2.4**	**41**	**62**	**320**
Tank 3-SS-2	14.0		**75***	**130**	**0.23**	**0.26**	**3.1**	**15**
Soil Borings								
GP-1-15.5	15.5	July 2006	**13.0**	**18.0**	**0.63**	**0.052**	**0.69**	**0.13**
GP-1-18.0	18.0		<1.0	<1.0	**0.0056**	**0.0082**	<0.005	**0.019**
GP-2-12.0	12.0		**600**	**3,600**	**17**	**180**	**98**	**440**
GP-2-20.0	20.0		**79**	**1,100**	**3.2**	**41**	**25**	**130**
SB-1-9.5	9.5	April 2010	---	**1,600**	**5.1**	**43**	**30**	**180**
SB-1-24.5	24.5		---	<1.0	<0.005	<0.005	<0.005	<0.010
SB-1-29.5	29.5		---	<1.0	<0.005	<0.005	<0.005	<0.010
SB-2-9.5	9.5		---	**2.2**	**0.26**	**<0.010**	**0.066**	<0.020
SB-2-24.5	24.5		---	<1.0	<0.005	<0.005	<0.005	<0.010
SB-2-29.5	29.5		---	<1.0	<0.005	<0.005	<0.005	<0.010
SB-3-14.5	14.5		---	**17**	**17**	**100**	**42**	**240**
SB-3-24.5	24.5		---	<1.0	<0.005	**0.005**	<0.005	**0.013**
SB-3-29.5	29.5		---	<1.0	<0.005	<0.005	<0.005	<0.010
SB-4-14.5	14.5		---	**1,700**	**13**	**79**	**28**	**170**
SB-4-19.5	19.5		---	<1.0	<0.005	0.009	<0.005	**0.026**
SB-4-29.5	29.5		---	<1.0	<0.005	<0.005	<0.005	<0.010
SB-5-14.5	14.5		---	**470**	<0.20	**0.45**	**6.2**	**37**
SB-5-24.5	24.5		---	<1.0	<0.005	<0.005	<0.005	<0.010
SB-5-29.5	29.5		---	<1.0	<0.005	<0.005	<0.005	<0.010
SB-6-9.5	9.5		---	**6,100**	**21**	**170**	**95**	**580**
SB-6-29.5	29.5		---	<1.0	<0.005	<0.005	<0.005	<0.010
SB-6-32	32.0		---	<1.0	<0.005	<0.005	<0.005	<0.010
SB-7-9.5	9.5		---	**4,000**	**12**	**46**	**55**	**360**
SB-7-29.5	29.5		---	<1.0	<0.005	<0.005	<0.005	<0.010
SB-7-32	32.0		---	<1.0	<0.005	<0.005	<0.005	<0.010

Table 2a
Historical Soil Analytical Data
TPH and BTEX
Shore Acres Gas
403 East 12th Street
Oakland, California

Boring ID	Sample Depth (feet)	Collection Date	TPHd (mg/kg)	TPHg (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Total xylenes (mg/kg)
SB-8-9.5	9.5	April 2010	---	**2,500**	**16**	**110**	**63**	**370**
SB-8-24.5	24.5		---	<1.0	<0.005	<0.005	<0.005	<0.010
SB-8-29.5	29.5		---	<1.0	<0.005	<0.005	<0.005	<0.010
SB-9-14.5	14.5		---	**390**	**3.0**	**3.0**	**9.1**	**41**
SB-9-29.5	29.5		---	<1.0	<0.005	<0.005	<0.005	<0.010
SB-9-32	32.0		---	<1.0	<0.005	<0.005	<0.005	<0.010
Groundwater Wells								
MW-1-5	5	June 2011	<5.0	<1.0	<0.005	<0.005	<0.005	<0.010
MW-1-15	15		<5.0	**18**	**0.55**	<0.050	**0.87**	**1.2**
MW-1-20	20		<5.0	<1.0	<0.005	<0.005	<0.005	<0.010
MW-2-5	5		<5.0	<1.0	<0.005	<0.005	<0.005	<0.010
MW-2-10	10		<5.0	**69**	<0.005	<0.005	<0.005	<0.010
MW-2-15	15		<5.0	**50**	<0.050	**0.48**	**3.1**	**19**
MW-2-20	20		<5.0	<1.0	<0.005	<0.005	<0.005	<0.010
MW-3-5	5		<5.0	<1.0	<0.010	<0.010	<0.010	<0.020
MW-3-10	10		<15	**840**	**3.4**	**33**	**20**	**140**
MW-3-15	15		<5.0	**380**	**3.0**	**4.5**	**7.3**	**41**
MW-3-20	20		<5.0	<1.0	**0.019**	<0.005	**0.006**	<0.010
MW-4-5	5		<5.0	<1.0	<0.005	<0.005	<0.005	<0.010
MW-4-10	10		<15	**420**	**1.7**	**2.6**	**9.2**	**51**
MW-4-15	15		<5.0	**3.1**	**0.036**	**0.20**	**0.15**	**0.95**
MW-4-20	20		<5.0	<1.0	**0.007**	**0.017**	**0.010**	**0.039**
MW-5-5	5		<5.0	**76**	<0.10	<0.10	**1.3**	**0.76**
MW-5-10	10		<15	**3,200**	**4.6**	**6.5**	**72**	**410**
MW-5-15	15		<5.0	**600**	**1.3**	**13**	**15**	**110**
MW-6-5	5		<5.0	<1.0	<0.005	<0.005	<0.005	<0.010
MW-6-10	10		<5.0	**5.1**	**0.015**	<0.010	**3.4**	**1.0**
MW-6-15	15		<5.0	<1.0	<0.005	<0.005	<0.005	<0.010
MW-6-20	20		<5.0	<1.0	<0.005	<0.005	<0.005	<0.010
EW-1-5	5		<5.0	**34**	<0.005	<0.005	**0.16**	**0.31**
EW-1-10	10		<15	**85**	<0.10	<0.10	**2.2**	**0.89**
EW-1-15	15		<15	**420**	**2.1**	**4.1**	**9.4**	**55**
EW-1-20	20		<5.0	<1.0	<0.005	<0.005	<0.005	<0.010
EW-2-5	5		<5.0	<1.0	<0.005	<0.005	<0.005	<0.010
EW-2-10	10		<5.0	**130**	<0.10	<0.10	**2.9**	**15**
EW-2-15	15		<15	**5,500**	**29**	**430**	**120**	**910**
EW-2-20	20		<5.0	<1.0	**0.14**	**0.054**	**0.025**	**0.14**

Notes:

TPHd - denotes total petroleum hydrocarbons as diesel
TPHg - denotes total petroleum hydrocarbons as gasoline
mg/kg - denotes milligrams per kilogram
< - denotes less than the detection limit
--- denotes no data

Table 2b
Historical Soil Analytical Data
Oxygenates and Lead Scavengers
Shore Acres Gas
403 East 12th Street
Oakland, California

Boring ID	Sample Depth (feet)	Collection Date	DIPE (mg/kg)	ETBE (mg/kg)	MTBE (mg/kg)	TAME (mg/kg)	TBA (mg/kg)	1,2-DCA (mg/kg)	EDB (mg/kg)
UST Removal Samples									
SS-D1	2	August 2009	<0.25	<0.25	<0.25	<0.25	<1.5	---	---
SS-D2	2		<0.25	<0.25	<0.25	<0.25	<1.5	---	---
SS-D3	2		<0.15	<0.15	<0.15	<0.15	<0.70	---	---
SS-D4	2		<0.090	<0.090	<0.090	<0.090	<0.50	---	---
SS-D5	2		<0.025	<0.025	<0.025	<0.025	<0.15	---	---
SS-D6	2		<0.025	<0.025	<0.025	<0.025	<0.15	---	---
SS-J1	2		<0.025	<0.025	<0.025	<0.025	<0.15	---	---
SS-Isle	4		<0.025	<0.025	<0.025	<0.025	<0.15	---	---
SS-7	18		<0.25	<0.25	<0.25	<0.25	<1.5	<0.25	<0.25
Tank 1-SS-1	14		<0.50	<0.50	<0.50	<0.50	<2.5	<0.50	<0.50
Tank 1-SS-2	14		<0.040	<0.040	**0.37**	<0.040	**0.51**	<0.040	<0.040
Tank 2-SS-1	14		<0.050	<0.050	**0.18**	<0.050	**0.35**	<0.050	<0.050
Tank 2-SS-2	14		<0.025	<0.025	**0.090**	<0.025	**0.16**	<0.025	<0.025
Tank 3-SS-1	14		<0.50	<0.50	<0.50	<0.50	<2.5	<0.50	<0.50
Tank 3-SS-2	14		<0.025	<0.025	**0.19**	<0.025	**0.15**	<0.025	<0.025
Soil Borings									
GP-1-15.5	15.5	July 2006	<0.005	<0.005	**0.029**	<0.005	**0.27**	---	---
GP-1-18.0	18.0		<0.005	<0.005	**0.54**	<0.005	**0.33**	---	---
GP-2-12.0	12.0		<0.50	<0.50	<0.50	<0.50	<2.5	---	---
GP-2-20.0	20.0		<0.025	<0.025	**0.041**	<0.025	<0.15	---	---
SB-1-9.5	9.5	April 2010	<0.80	<0.80	<0.80	<0.80	<8.0	<0.80	<0.80
SB-1-24.5	24.5		<0.005	<0.005	**0.11**	<0.005	<0.050	<0.005	<0.005
SB-1-29.5	29.5		<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005
SB-2-9.5	9.5		<0.010	<0.010	<0.010	<0.010	<0.10	<0.010	<0.010
SB-2-24.5	24.5		<0.005	<0.005	**0.053**	<0.005	<0.050	<0.005	<0.005
SB-2-29.5	29.5		<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005
SB-3-14.5	14.5		<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0
SB-3-24.5	24.5		<0.005	<0.005	**0.10**	<0.005	<0.050	<0.005	<0.005
SB-3-29.5	29.5		<0.005	<0.005	**0.010**	<0.005	<0.050	<0.005	<0.005
SB-4-14.5	14.5		<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0
SB-4-19.5	19.5		<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005
SB-4-29.5	29.5		<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005
SB-5-14.5	14.5		<0.20	<0.20	<0.20	<0.20	<2.0	<0.20	<0.20
SB-5-24.5	24.5		<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005
SB-5-29.5	29.5		<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005
SB-6-9.5	9.5		<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0
SB-6-29.5	29.5		<0.005	<0.005	**0.20**	<0.005	<0.050	<0.005	<0.005
SB-6-32	32.0		<0.005	<0.005	**0.18**	<0.005	<0.050	<0.005	<0.005
SB-7-9.5	9.5		<1.0	<1.0	**4.0**	<1.0	<10	<1.0	<1.0
SB-7-29.5	29.5		<0.005	<0.005	**0.18**	<0.005	<0.050	<0.005	<0.005
SB-7-32	32.0		<0.005	<0.005	**0.11**	<0.005	<0.050	<0.005	<0.005

Table 2b
Historical Soil Analytical Data
Oxygenates and Lead Scavengers
Shore Acres Gas
403 East 12th Street
Oakland, California

Boring ID	Sample Depth (feet)	Collection Date	DIPE (mg/kg)	ETBE (mg/kg)	MTBE (mg/kg)	TAME (mg/kg)	TBA (mg/kg)	1,2-DCA (mg/kg)	EDB (mg/kg)
SB-8-9.5	9.5	April 2010	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0
SB-8-24.5	24.5		<0.005	<0.005	**0.033**	<0.005	<0.050	<0.005	<0.005
SB-8-29.5	29.5		<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005
SB-9-14.5	14.5		<0.20	<0.20	**5.5**	<0.20	<2.0	<0.20	<0.20
SB-9-29.5	29.5		<0.005	<0.005	**0.090**	<0.005	**0.15**	<0.005	<0.005
SB-9-32	32.0		<0.005	<0.005	**0.11**	<0.005	<0.050	<0.005	<0.005
Groundwater Wells									
MW-1-5	5	June 2011	<0.005	<0.005	**0.35**	<0.005	**0.093**	<0.005	<0.005
MW-1-15	15		<0.050	<0.050	**1.1**	<0.050	<0.50	<0.050	<0.050
MW-1-20	20		<0.005	<0.005	**0.31**	<0.005	**0.58**	<0.005	<0.005
MW-2-5	5		<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005
MW-2-10	10		<0.050	<0.050	<0.050	<0.050	<0.50	<0.050	<0.050
MW-2-15	15		<0.050	<0.050	<0.050	<0.050	<0.50	<0.050	<0.050
MW-2-20	20		<0.005	<0.005	**0.006**	<0.005	<0.050	<0.005	<0.005
MW-3-5	5		<0.010	<0.010	**1.5**	<0.010	**0.37**	<0.010	<0.010
MW-3-10	10		<0.80	<0.80	**1.3**	<0.80	<8.0	<0.80	<0.80
MW-3-15	15		<0.20	<0.20	**3.0**	<0.20	<2.0	<0.20	<0.20
MW-3-20	20		<0.005	<0.005	**0.036**	<0.005	**0.16**	<0.005	<0.005
MW-4-5	5		<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005
MW-4-10	10		<0.40	<0.40	<0.40	<0.40	<4.0	<0.40	<0.40
MW-4-15	15		<0.010	<0.010	<0.010	<0.010	<0.10	<0.010	<0.010
MW-4-20	20		<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005
MW-5-5	5		<0.10	<0.10	<0.10	<0.10	<1.0	<0.10	<0.10
MW-5-10	10		<4.0	<4.0	<4.0	<4.0	<40	<4.0	<4.0
MW-5-15	15		<0.40	<0.40	<0.40	<0.40	<4.0	<0.40	<0.40
MW-6-5	5		<0.005	<0.005	<0.005	<0.005	<0.050	<0.005	<0.005
MW-6-10	10		<0.010	<0.010	<0.010	<0.010	<0.10	<0.010	<0.010
MW-6-15	15		<0.005	<0.005	**0.026**	<0.005	**0.088**	<0.005	<0.005
MW-6-20	20		<0.005	<0.005	**0.010**	<0.005	**0.37**	<0.005	<0.005
EW-1-5	5		<0.050	<0.050	<0.050	<0.050	<0.50	<0.050	<0.050
EW-1-10	10		<0.10	<0.10	<0.10	<0.10	<1.0	<0.10	<0.10
EW-1-15	15		<0.40	<0.40	**0.59**	<0.40	<4.0	<0.40	<0.40
EW-1-20	20		<0.005	<0.005	**0.009**	<0.005	**0.16**	<0.005	<0.005
EW-2-5	5		<0.005	<0.005	**0.25**	<0.005	**0.14**	<0.005	<0.005
EW-2-10	10		<0.10	<0.10	**0.33**	<0.10	<1.0	<0.10	<0.10
EW-2-15	15		<4.0	<4.0	<4.0	<4.0	<40	<4.0	<4.0
EW-2-20	20		<0.005	<0.005	**0.008**	<0.005	**0.26**	<0.005	<0.005

Notes:

mg/kg - denotes milligrams per kilogram
< - denotes less than the detection limi
--- - denotes not analyzed/applicable
DCA - denotes dichloroethane
EDB - denotes ethylene dibromide
MTBE - denotes methyl tertiary butyl ether
DIPE - denotes di-isopropyl ether
ETBE - denotes ethyl tertiary butyl ether
TAME - denotes tertiary amyl ether
TBA - denotes tertiary butyl alcohol

Table 3a
Grab Groundwater Sample Results
TPH and BTEX
Shore Acres Gas
403 East 12th Street
Oakland, California

Sample ID	Collection Date	TPHd (ug/L)	TPHg (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl-benzene (ug/L)	Total Xylenes (ug/L)
Excavation							
Pit Sample 1	August 2009	**21,000**	**21,000**	**3,800**	**1,000**	**1,200**	**3,700**
Direct Push Grab Groundwater Samples							
SB-1	April 2010	---	**60**	**2.9**	**6.7**	**2.1**	**9.7**
SB-2		---	<50	<0.5	<0.5	<0.5	<1.0
SB-3		---	**170**	**1.5**	**11**	**4.8**	**27**
SB-4		---	**6,500**	**78**	**440**	**190**	**960**
SB-5		---	<50	<0.5	<0.5	<0.5	<1.0
SB-6		---	**440**	<20	<20	<20	<40
SB-7		---	**270**	<12	<12	<12	<25
SB-8		---	<50	**0.6**	**1.3**	**0.6**	**3.3**
SB-9		---	<50	<10	<10	<10	<20
SB-10	December 2011	---	<50	<0.5	<0.5	<0.5	<1.0
SB-11		---	**2,300**	**83**	**1.9**	**140**	**43**
SB-12		---	**4,700**	**620**	**290**	**84**	**400**
SB-13		---	**400**	**51**	**2.4**	**4.2**	**9.7**
SB-14		---	<50	**1.7**	z	**2.1**	<1.0
SB-15		---	**320**	**32**	**p**	**33**	**25**
SB-16		---	**4,800**	**1,600**	**10**	**49**	<20
SB-17		---	**990**	**290**	**7.2**	**27**	**4.3**
SB-18		---	**560**	**8.7**	**4.9**	**23**	**83**
SB-19		---	**260**	**7.1**	<0.5	**16**	**7.0**
SB-21		---	<50	<0.5	<0.5	<0.5	<1.0

Notes:

TPHd - denotes total petroleum hydrocarbons as diesel

TPHg - denotes total petroleum hydrocarbons as gasoline

ug/L - denotes micrograms per liter

< - denotes less than the detection limit

--- - denotes not analyzed/applicable

Table 3b
Grab Groundwater Sample Results
Oxygenates and Lead Scavengers
Shore Acres Gas
403 East 12th Street
Oakland, California

Sample ID	Collection Date	DIPE (ug/L)	ETBE (ug/L)	MTBE (ug/L)	TAME (ug/L)	TBA (ug/L)	1,2-DCA (ug/L)	EDB (ug/L)
Excavation								
Water	February 2000	<10	<10	**15,000**	**39**	**17,000**	<10	<10
Direct Push Grab Groundwater Samples								
SB-1	April 2010	<0.5	<0.5	**14**	<0.5	<5.0	<0.5	<0.5
SB-2		<0.5	<0.5	**45**	<0.5	<5.0	<0.5	<0.5
SB-3		<0.5	<0.5	**110**	<0.5	**32**	<0.5	<0.5
SB-4		<5.0	<5.0	<5.0	<5.0	<50	<5.0	<5.0
SB-5		<0.5	<0.5	**0.6**	<0.5	<5.0	<0.5	<0.5
SB-6		<20	<20	**4,000**	<20	<200	<20	<20
SB-7		<12	<12	**2,500**	<12	<120	<12	<12
SB-8		<0.5	<0.5	**26**	<0.5	**98**	<0.5	<0.5
SB-9		<10	<10	**1,800**	<10	**5,300**	<10	<10
SB-10	December 2011	<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	<0.5
SB-11		<1.0	<1.0	**22**	<1.0	**140**	<1.0	<1.0
SB-12		<5.0	<5.0	**100**	<5.0	**550**	<5.0	<5.0
SB-13		<2.0	<2.0	**39**	<2.0	**3,900**	<2.0	<2.0
SB-14		<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	<0.5
SB-15		<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	<0.5
SB-16		<10	<10	<10	<10	<100	<10	<10
SB-17		<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0
SB-18		<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	<0.5
SB-19		<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	<0.5
SB-21		<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	<0.5

Notes:

ug/L - denotes micrograms per liter
< - denotes less than the detection limit
DCA - denotes dichloroethane
EDB - denotes ethylene dibromide
MTBE - denotes methyl tertiary butyl ether
DIPE - denotes di-isopropyl ether
ETBE - denotes ethyl tertiary butyl ether
TAME - denotes tertiary amyl ether
TBA - denotes tertiary butyl alcohol

Table 4a
Monitoring Well Data
Water Level, TPH, and BTEX
Shore Acres Gas
403 East 12th Street
Oakland, California

Well ID TOC	Date Measured	Depth to Groundwater (ft bgs)	Groundwater Elevation (ft amsl)	TPHd (ug/L)	TPHg (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl-benzene (ug/L)	Total Xylenes (ug/L)
Monitoring Wells									
MW-1	6/23/2011	10.46	20.35	<250	23,000	4,500	820	1,700	3,800
	9/22/2011	12.13	18.68	<50	21,000	4,000	1,500	980	3,000
	12/11/2011	11.69	19.12	---	23,000	2,900	1,000	720	3,000
	3/30/2012	Inaccessible							
	6/1/2012	11.04	19.77	---	40,000	4,100	800	2,700	6,100
	9/14/2012	12.96	17.85	<100	20,000	2,700	160	830	2,600
	3/27/2013	8.57	22.24	<50	15,000	1,700	150	400	830
	5/20/2013	8.57	22.24	<100	22,000	2,800	870	560	2,000
	9/4/2013	9.29	21.52	<250	12,000	2,900	130	190	370
	12/6/2013	9.11	21.70	<120	15,000	3,000	780	580	2,400
	6/27/2014	8.92	21.89	<120	15,000	2,500	280	2,400	2,400
	9/19/2014	10.98	19.83	---	11,000	530	190	460	950
	12/15/2014	7.66	23.15	---	11,000	1,100	140	310	420
	3/31/2015	8.81	22.00	---	38,000	1,200	230	810	2,600
	9/18/2015	12.23	18.58	---	7,600	890	38	240	360
	12/16/2015	12.02	18.79	---	8,900	580	16	110	110
	3/22/2016	10.48	20.33	---	18,000	690	66	540	1,900
	9/23/2016	9.01	21.80	---	20,000	1,400	90	1,100	4,500
	3/28/2017	8.73	22.08	---	47,000	1,600	270	3,600	9,000
	9/28/2017	11.50	19.31	---	**22,000**	**660**	**27**	**700**	**1,600**
MW-2	6/23/2011	10.70	20.59	<250	13,000	1,000	160	370	1,600
	9/22/2011	12.42	18.87	<50	12,000	300	130	470	1,400
	12/11/2011	11.98	19.31	---	8,300	170	120	450	1,500
	3/30/2012	8.55	22.74	<250	17,000	850	700	710	2,900
	6/1/2012	11.26	20.03	---	5,300	830	260	630	1,700
	9/14/2012	13.11	18.18	<50	10,000	260	190	600	1,900
	3/27/2013	9.43	21.86	<50	12,000	440	98	320	810
	5/20/2013	9.41	21.88	<100	6,600	300	74	190	500
	9/4/2013	10.11	21.18	<100	5,300	300	50	180	280
	12/6/2013	9.93	21.36	<50	4,300	280	39	140	160
	6/27/2014	9.93	21.36	<50	1,300	200	22	85	160
	9/19/2014	12.49	18.80	---	990	42	12	97	110
	12/15/2014	8.65	22.64	---	85	14	3.3	5.2	13
	3/31/2015	9.83	21.46	---	---	---	---	---	---
	9/18/2015	12.45	18.84	---	1,300	29	8.9	44	120
	12/16/2015	12.57	18.72	---	880	8.2	2.9	16	30
	3/22/2016	11.11	20.18	---	900	7.3	2.4	3.7	16
	9/23/2016	9.90	21.39	---	570	10	2.9	13	37
	3/28/2017	9.42	21.87	---	3,000	120	6.2	39	64
	9/28/2017	12.10	19.19	---	**2,100**	**11**	**2.5**	**16**	**43**

Table 4a
Monitoring Well Data
Water Level, TPH, and BTEX
Shore Acres Gas
403 East 12th Street
Oakland, California

Well ID TOC	Date Measured	Depth to Groundwater (ft bgs)	Groundwater Elevation (ft amsl)	TPHd (ug/L)	TPHg (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl-benzene (ug/L)	Total Xylenes (ug/L)
MW-3	6/23/2011	10.79	20.51	<250	55,000	15,000	3,600	2,000	4,300
	9/22/2011	12.60	18.70	<250	77,000	15,000	3,900	1,700	4,900
	12/11/2011	12.13	19.17	---	64,000	12,000	3,100	1,600	4,500
	3/30/2012	7.90	23.40	<120	100,000	17,000	10,000	2,000	8,400
	6/1/2012	11.47	19.83	---	83,000	15,000	6,000	2,900	10,000
	9/14/2012	13.42	17.88	<200	69,000	10,000	1,500	1,800	5,900
	3/27/2013	9.15	22.15	<200	63,000	7,100	2,100	1,900	7,700
	5/20/2013	9.16	22.14	<250	80,000	9,700	2,900	2,400	8,600
	9/4/2013	9.87	21.43	<250	47,000	7,200	470	1,200	5,000
	12/6/2013	9.69	21.61	<50	19,000	5,600	240	520	1,600
	6/27/2014	9.49	21.81	<50	12,000	5,800	240	860	760
	9/19/2014	11.62	19.68	---	9,500	610	160	220	400
	12/15/2014	8.10	23.20	---	1,300	260	69	39	120
	3/31/2015	9.37	21.93	---	13,000	1,300	270	230	700
	9/18/2015	13.13	18.17	---	8,300	1,000	150	150	440
	12/16/2015	13.09	18.21	---	11,000	1,100	130	290	350
	3/22/2016	11.39	19.91	---	1,500	230	23	14	53
	9/23/2016	9.57	21.73	---	4,200	640	51	58	140
	3/28/2017	9.20	22.10	---	1,200	47	20	11	67
	9/28/2017	11.91	19.39	---	**3,400**	**97**	**56**	**84**	**190**
MW-4	6/23/2011	10.62	20.59	<250	47,000	3,500	7,100	2,300	11,000
	9/22/2011	12.25	18.96	<250	46,000	2,000	2,400	1,100	5,300
	12/11/2011	11.89	19.32	---	46,000	2,100	3,400	1,800	7,000
	3/30/2012	8.51	22.70	<250	60,000	6,800	8,200	1,200	5,700
	6/1/2012	11.14	20.07	---	72,000	9,700	8,500	2,300	9,000
	9/14/2012	12.97	18.24	<50	15,000	940	880	450	1,700
	3/27/2013	9.05	22.16	<50	25,000	1,800	2,200	660	2,500
	5/20/2013	9.03	22.18	<250	18,000	1,600	1,700	470	1,900
	9/4/2013	9.68	21.53	<50	15,000	510	410	260	820
	12/6/2013	9.54	21.67	<50	9,600	630	650	240	970
	6/27/2014	9.58	21.63	<50	3,300	550	2,900	200	420
	9/19/2014	11.61	19.60	---	2,100	110	54	92	210
	12/15/2014	8.45	22.76	---	720	58	32	29	33
	3/31/2015	9.46	21.75	---	---	---	---	---	---
	9/18/2015	12.03	19.18	---	17,000	130	33	70	200
	12/16/2015	12.41	18.80	---	8,200	160	44	88	130
	3/22/2016	11.22	19.99	---	1,900	88	71	43	91
	9/23/2016	9.45	21.76	---	2,700	520	85	54	120
	3/28/2017	9.22	21.99	---	4,500	700	56	140	300
	9/28/2017	11.88	19.33	---	**7,100**	**250**	**29**	**220**	**310**

Table 4a
Monitoring Well Data
Water Level, TPH, and BTEX
Shore Acres Gas
403 East 12th Street
Oakland, California

Well ID TOC	Date Measured	Depth to Groundwater (ft bgs)	Groundwater Elevation (ft amsl)	TPHd (ug/L)	TPHg (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl-benzene (ug/L)	Total Xylenes (ug/L)
MW-5	6/23/2011	10.12	21.23	<250	130,000	7,100	25,000	13,000	94,000
	9/22/2011	12.53	18.82	<250	120,000	6,900	7,600	3,800	17,000
	12/11/2011	12.09	19.26	---	110,000	7,800	14,000	4,200	20,000
	3/30/2012	8.06	23.29	Sheen - not sampled					
	6/1/2012	11.38	19.97	Sheen - not sampled					
	9/14/2012	13.61	17.74	Free product - not sampled					
	3/27/2013	9.21	22.14	Free product - not sampled					
	5/20/2013	9.17	22.18	Free product - not sampled					
	9/4/2013	9.70	21.65	Free product - not sampled					
	12/6/2013	9.67	21.68	<250	81,000	10,000	13,000	5,500	21,000
	6/27/2014	9.51	21.84	Free product - not sampled					
	9/19/2014	12.91	18.44	---	56,000	1,000	270	1,000	4,100
	12/15/2014	---	---	---	13,000	840	530	450	1,700
	3/31/2015	9.36	21.99	---	34,000	1,100	570	500	2,000
	9/18/2015	---	---	---	9,800	290	23	140	270
	12/16/2015	---	---	---	6,100	220	5.8	92	35
	3/22/2016	12.26	19.09	---	6,300	320	58	190	480
	9/23/2016	---	---	---	10,000	350	48	230	930
	3/28/2017	---	---	---	9,700	310	68	580	1,200
	9/28/2017	11.97	19.38	---	**7,500**	**140**	**16**	**140**	**370**
MW-6	6/23/2011	10.43	20.36	<250	11,000	2,400	120	480	840
	9/22/2011	12.10	18.69	<50	15,000	1,500	270	880	2,500
	12/11/2011	11.69	19.10	---	13,000	660	190	610	1,500
	3/30/2012	7.50	23.29	<250	9,500	1,200	160	250	520
	6/1/2012	11.04	19.75	---	23,000	2,200	220	1,300	3,000
	9/14/2012	12.96	17.83	<50	14,000	1,000	86	420	1,200
	3/27/2013	---	---	Inaccessible					
	5/20/2013	---	---	Inaccessible					
	9/4/2013	9.19	21.60	<100	9,500	1,400	120	1,400	1,600
	12/6/2013	9.03	21.76	<100	14,000	1,200	24	1,400	810
	6/27/2014	8.80	21.99	<100	9,800	1,200	75	2,800	530
	9/19/2014	10.68	20.11	---	6,500	240	21	490	110
	12/15/2014	7.62	23.17	---	4,700	520	25	110	43
	3/31/2015	8.75	22.04	---	10,000	330	12	80	73
	9/18/2015	11.61	19.18	---	7,000	430	24	120	110
	12/16/2015	11.58	19.21	---	8,200	460	12	17	26
	3/22/2016	10.10	20.69	---	5,900	380	15	87	83
	9/23/2016	8.90	21.89	---	7,700	170	<5.0	8.0	<10
	3/28/2017	8.70	22.09	---	8,100	190	11	100	130
	9/28/2017	11.35	19.44	---	**6,100**	**210**	**17**	**27**	**48**

Table 4a
Monitoring Well Data
Water Level, TPH, and BTEX
Shore Acres Gas
403 East 12th Street
Oakland, California

Well ID TOC	Date Measured	Depth to Groundwater (ft bgs)	Groundwater Elevation (ft amsl)	TPHd (ug/L)	TPHg (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl-benzene (ug/L)	Total Xylenes (ug/L)
DPE Wells									
EW-1	6/28/2011	---	---	---	20,000	2,000	490	1,000	2,400
	9/22/2011	12.55	18.71	<120	39,000	3,900	610	1,400	4,600
	12/11/2011	12.09	19.17	---	27,000	2,600	270	1,400	4,400
	3/30/2012	8.06	23.20	<120	21,000	3,100	160	910	2,300
	6/1/2012	11.42	19.84	---	21,000	2,800	100	1,200	3,100
	9/14/2012	13.37	17.89	<50	22,000	1,900	50	1,000	2,600
	3/27/2013	9.06	22.20	<50	15,000	630	36	360	590
	5/20/2013	9.06	22.20	<100	11,000	600	28	210	350
	9/4/2013	9.77	21.49	<50	9,300	610	19	170	250
	12/6/2013	9.63	21.83	<100	11,000	740	17	260	340
	6/27/2014	9.55	21.91	<100	12,000	1,400	210	1,900	2,400
	9/19/2014	12.41	19.05	---	28,000	1,000	450	1,400	3,900
	12/15/2014	8.20	23.26	---	4,000	560	29	150	150
	3/31/2015	9.30	22.16	---	---	---	---	---	---
	9/18/2015	13.25	18.21	---	6,900	370	5.5	190	210
	12/16/2015	13.22	18.24	---	6,000	250	3.3	31	31
	3/22/2016	11.54	19.92	---	3,900	200	<5.0	46	33
	9/23/2016	9.51	21.95	---	6,200	130	<5.0	35	24
	3/28/2017	9.24	22.22	---	9,000	210	3.2	55	95
	9/28/2017	11.93	19.53	---	**8,200**	**66**	**2.3**	**49**	**28**
EW-2	6/28/2011	---	---	---	33,000	3,100	2,000	790	3,500
	9/22/2011	12.50	18.90	<250	66,000	2,400	4,500	2,000	11,000
	12/11/2011	12.12	19.28	---	70,000	2,800	6,900	2,700	13,000
	3/30/2012	8.48	22.92	<250	57,000	5,800	5,500	1,200	5,400
	6/1/2012	11.40	20.00	---	82,000	8,800	8,600	3,300	13,000
	9/14/2012	13.27	18.13	<100	32,000	2,600	2,400	1,000	4,500
	3/27/2013	9.24	22.16	<100	18,000	940	790	390	1,700
	5/20/2013	9.21	22.19	<50	10,000	540	430	220	790
	9/4/2013	9.88	21.52	<250	10,000	680	580	480	1,700
	12/6/2013	9.96	21.47	<50	13,000	620	380	350	1,600
	6/27/2014	9.85	21.58	<50	27,000	3,200	5,600	1,200	8,000
	9/19/2014	16.80	14.63	---	18,000	690	1,300	360	2,400
	12/15/2014	8.73	22.70	---	11,000	510	500	160	1,100
	3/31/2015	9.90	21.53	---	---	---	---	---	---
	9/18/2015	15.10	16.33	---	16,000	1,400	2,400	520	3,400
	12/16/2015	16.57	14.86	---	29,000	1,400	3,300	400	2,500
	3/22/2016	16.56	14.87	---	22,000	820	2,100	420	2,800
	9/23/2016	9.82	21.61	---	6,500	37	38	29	170
	3/28/2017	9.54	21.89	---	7,100	64	33	51	260
	9/28/2017	12.30	19.13	---	**1,900**	**8.8**	**15**	**23**	**79**

Table 4a
Monitoring Well Data
Water Level, TPH, and BTEX
Shore Acres Gas
403 East 12th Street
Oakland, California

Well ID TOC	Date Measured	Depth to Groundwater (ft bgs)	Groundwater Elevation (ft amsl)	TPHd (ug/L)	TPHg (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl-benzene (ug/L)	Total Xylenes (ug/L)
EW-3	5/20/2013	8.82	---	<50	1,300	430	540	280	1,000
	9/4/2013	9.49	---	<100	9,800	480	220	560	1,800
	12/6/2013	10.05	---	<50	10,000	810	580	260	1,100
	6/27/2014	9.90	---	<50	27,000	4,300	4,300	1,200	7,900
	9/19/2014	13.00	---	---	15,000	670	650	530	2,400
	12/15/2014	8.20	---	---	26,000	1,200	1,100	350	2,000
	3/31/2015	9.31	---	---	8,000	170	18	130	560
	9/18/2015	13.98	---	---	12,000	340	110	180	1,900
	12/16/2015	14.31	---	---	11,000	360	75	110	920
	3/22/2016	12.63	---	---	5,700	120	6.7	90	170
	9/23/2016	9.46	---	---	2,800	26	2.2	60	61
	3/28/2017	9.21	---	---	4,100	150	3.9	41	32
	9/28/2017	11.87	---	---	**3,600**	**18**	**5.4**	**25**	**46**
EW-4	5/20/2013	9.12	---	<50	8,100	720	160	94	430
	9/4/2013	9.85	---	z	11,000	990	580	310	1,200
	12/6/2013	9.62	---	w	4,400	150	170	140	670
	6/27/2014	9.47	---	<50	8,400	1,500	940	540	2,100
	9/19/2014	12.48	---	---	9,000	680	1,600	450	3,000
	12/15/2014	8.50	---	---	7,700	570	170	320	1,000
	3/31/2015	9.78	---	---	23,000	1,000	1,200	420	1,700
	9/18/2015	15.45	---	---	7,200	860	62	55	130
	12/16/2015	16.08	---	---	5,200	1,200	35	40	81
	3/22/2016	16.74	---	---	7,400	920	83	120	350
	9/23/2016	9.95	---	---	8,200	350	27	70	670
	3/28/2017	9.50	---	---	10,000	460	12	190	690
	9/28/2017	12.22	---	---	**8,000**	**89**	**6.3**	**100**	**410**

Notes:
TOC - denotes top of casing elevation
TPHg - denotes total petroleum hydrocarbons as gasoline
TPHd - denotes total petroleum hydrocarbons as diesel
ft bgs - denotes feet below top of casing
ft amsl - denotes feet above mean sea level
ug/L - denotes micrograms per liter
< - denotes less than the detection limit
--- - denotes not available/applicable
FLH - denotes floating liquid hydrocarbons
* - denotes less than six inches of water and considered dry

Table 4b
Monitoring Well Data
Oxygenates and Lead Scavengers
Shore Acres Gas
403 East 12th Street
Oakland, California

Well ID TOC	Date Measured	DIPE (ug/L)	ETBE (ug/L)	MTBE (ug/L)	TAME (ug/L)	TBA (ug/L)	1,2-DCA (ug/L)	EDB (ug/L)
Monitoring Wells								
MW-1	6/23/2011	<25	<25	3,000	<25	3,900	<25	<25
	9/22/2011	<50	<50	2,600	<50	2,500	<50	<50
	12/11/2011	<20	<20	1,800	<20	1,600	<20	<20
	3/30/2012	Inaccessible						
	6/1/2012	<20	<20	2,800	<20	1,300	<20	<20
	9/14/2012	<10	<10	2,200	<10	1,600	<10	<10
	3/27/2013	<0.5	<0.5	590	<0.5	350	<0.5	<0.5
	5/20/2013	<10	<10	1,100	<10	620	<10	<10
	9/4/2013	<10	<10	240	<10	<100	<10	<10
	12/6/2013	<5.0	<5.0	350	<50	<100	<5.0	<5.0
	6/27/2014	<10	<10	97	<10	<100	<10	<10
	9/19/2014	<10	<10	150	<10	<100	<10	<10
	12/15/2014	<0.5	<0.5	310	<0.5	98	<0.5	<0.5
	3/31/2015	<5.0	<5.0	330	<5.0	<50	<5.0	<5.0
	9/18/2015	<5.0	<5.0	150	<5.0	<50	<5.0	<5.0
	12/16/2015	<5.0	<5.0	57	<5.0	<50	<5.0	<5.0
	3/22/2016	<50	<50	<50	<50	<500	<50	<50
	9/23/2016	<0.5	<0.5	250	<0.5	250	<0.5	<0.5
	3/28/2017	<20	<20	340	<20	470	<20	<20
	9/28/2017	<10	<10	**130**	<10	**290**	<10	<10
MW-2	6/23/2011	<10	<10	240	<10	640	<10	<10
	9/22/2011	<5.0	<5.0	110	<5.0	260	<5.0	<5.0
	12/11/2011	<2.5	<2.5	45	<2.5	110	<2.5	<2.5
	3/30/2012	<5.0	<5.0	140	<5.0	490	<5.0	<5.0
	6/1/2012	<5.0	<5.0	180	<5.0	490	<5.0	<5.0
	9/14/2012	<5.0	<5.0	65	<5.0	190	<5.0	<5.0
	3/27/2013	<0.5	<0.5	120	<0.5	930	<0.5	<0.5
	5/20/2013	<2.5	<2.5	120	<2.5	1,800	<2.5	<2.5
	9/4/2013	<5.0	<5.0	100	<5.0	780	<5.0	<5.0
	12/6/2013	<5.0	<5.0	63	<5.0	230	<5.0	<5.0
	6/27/2014	<5.0	<5.0	21	<5.0	<50	<5.0	<5.0
	9/19/2014	<5.0	<5.0	16	<5.0	<50	<5.0	<5.0
	12/15/2014	<0.5	<0.5	7.3	<0.5	23	<0.5	<0.5
	3/31/2015	---	---	---	---	---	---	---
	9/18/2015	<0.5	<0.5	4.1	<0.5	<5.0	<0.5	<0.5
	12/16/2015	<0.5	<0.5	1.0	<0.5	<5.0	<0.5	<0.5
	3/22/2016	<0.5	<0.5	<0.5	<0.5	3.7	<0.5	<0.5
	9/23/2016	<0.5	<0.5	5.3	<0.5	<5.0	<0.5	<0.5
	3/28/2017	<0.5	<0.5	10	<0.5	<5.0	<0.5	<0.5
	9/28/2017	<1.0	<1.0	**3.0**	<1.0	<10	<1.0	<1.0

Table 4b
Monitoring Well Data
Oxygenates and Lead Scavengers
Shore Acres Gas
403 East 12th Street
Oakland, California

Well ID TOC	Date Measured	DIPE (ug/L)	ETBE (ug/L)	MTBE (ug/L)	TAME (ug/L)	TBA (ug/L)	1,2-DCA (ug/L)	EDB (ug/L)
MW-3	6/23/2011	<100	<100	8,200	<100	6,400	<100	<100
	9/22/2011	<100	<100	11,000	<100	2,800	<100	<100
	12/11/2011	<100	<100	7,400	<100	1,800	<100	<100
	3/30/2012	<100	<100	13,000	<100	<1,000	<100	<100
	6/1/2012	<50	<50	12,000	<50	<500	<50	<50
	9/14/2012	<50	<50	9,400	<50	<500	<50	<50
	3/27/2013	<0.5	<0.5	7,900	<0.5	3,800	<0.5	<0.5
	5/20/2013	<25	<25	10,000	<25	5,000	<25	<25
	9/4/2013	<25	<25	5,300	<25	2,100	<25	<25
	12/6/2013	<25	<25	1,400	<25	640	<25	<25
	6/27/2014	<25	<25	520	<25	260	<25	<25
	9/19/2014	<25	<25	390	<25	370	<25	<25
	12/15/2014	<0.5	<0.5	110	<0.5	140	<0.5	<0.5
	3/31/2015	<5.0	<5.0	980	<5.0	610	<5.0	<5.0
	9/18/2015	<5.0	<5.0	410	<5.0	410	<5.0	<5.0
	12/16/2015	<5.0	<5.0	290	<5.0	<50	<5.0	<5.0
	3/22/2016	<5.0	<5.0	71	<5.0	56	<5.0	<5.0
	9/23/2016	<5.0	<5.0	380	<5.0	<50	<5.0	<5.0
	3/28/2017	<5.0	<5.0	19	<5.0	95	<5.0	<5.0
	9/28/2017	<1.0	<1.0	**110**	<1.0	**79**	<1.0	<1.0
MW-4	6/23/2011	<50	<50	<50	<50	<500	<50	<50
	9/22/2011	<25	<25	<25	<25	<250	<25	<25
	12/11/2011	<25	<25	<25	<25	<250	<25	<25
	3/30/2012	<50	<50	56	<50	<500	<50	<50
	6/1/2012	<50	<50	180	<50	<500	<50	<50
	9/14/2012	<20	<20	<20	<20	<200	<20	<20
	3/27/2013	<0.5	<0.5	77	<0.5	450	<0.5	<0.5
	5/20/2013	<10	<10	61	<10	360	<10	<10
	9/4/2013	<2.5	<2.5	17	<2.5	64	<2.5	<2.5
	12/6/2013	<2.5	<2.5	6.6	<2.5	<25	<2.5	<2.5
	6/27/2014	<2.5	<2.5	<2.5	<2.5	<25	<2.5	<2.5
	9/19/2014	<2.5	<2.5	<2.5	<2.5	<25	<2.5	<2.5
	12/15/2014	<0.5	<0.5	<0.5	<0.5	13	<0.5	<0.5
	3/31/2015	---	---	---	---	---	---	---
	9/18/2015	<1.0	<1.0	<1.0	<1.0	<10	<1.0	<1.0
	12/16/2015	<5.0	<5.0	<5.0	<5.0	<50	<5.0	<5.0
	3/22/2016	<5.0	<5.0	<5.0	<5.0	<20	<5.0	<5.0
	9/23/2016	<5.0	<5.0	8.0	<5.0	<50	<5.0	<5.0
	3/28/2017	<5.0	<5.0	12	<5.0	<50	<5.0	<5.0
	9/28/2017	<2.0	<2.0	**25**	<2.0	<20	<2.0	<2.0

Table 4b
Monitoring Well Data
Oxygenates and Lead Scavengers
Shore Acres Gas
403 East 12th Street
Oakland, California

Well ID TOC	Date Measured	DIPE (ug/L)	ETBE (ug/L)	MTBE (ug/L)	TAME (ug/L)	TBA (ug/L)	1,2-DCA (ug/L)	EDB (ug/L)
MW-5	6/23/2011	<120	<120	440	<120	<1,200	<120	<120
	9/22/2011	<50	<50	670	<50	1,500	<50	<50
	12/11/2011	<120	<120	690	<120	1,600	<120	<120
	3/30/2012	Sheen - not sampled						
	6/1/2012	Sheen - not sampled						
	9/14/2012	Free product - not sampled						
	3/27/2013	Free product - not sampled						
	5/20/2013	Free product - not sampled						
	9/4/2013	Free product - not sampled						
	12/6/2013	<25	<25	270	<25	<250	<25	<25
	6/27/2014	Free product - not sampled						
	9/19/2014	<25	<25	75	<25	<250	<25	<25
	12/15/2014	<0.5	<0.5	370	<0.5	340	<0.5	<0.5
	3/31/2015	<5.0	<5.0	71	<5.0	280	<5.0	<5.0
	9/18/2015	<5.0	<5.0	15	<5.0	<50	<5.0	<5.0
	12/16/2015	<5.0	<5.0	17	<5.0	<50	<5.0	<5.0
	3/22/2016	<5.0	<5.0	26	<5.0	110	<5.0	<5.0
	9/23/2016	<5.0	<5.0	38	<5.0	<50	<5.0	<5.0
	3/28/2017	<0.5	<0.5	27	<0.5	<5.0	<0.5	<0.5
	9/28/2017	<2.0	<2.0	**27**	<2.0	<20	<2.0	<2.0
MW-6	6/23/2011	<25	<25	1,100	<25	4,000	<25	<25
	9/22/2011	<12	<12	600	<12	2,800	<12	<12
	12/11/2011	<10	<10	290	<10	1,300	<10	<10
	3/30/2012	<10	<10	990	<10	3,500	<10	<10
	6/1/2012	<10	<10	1,400	<10	2,200	<10	<10
	9/14/2012	<10	<10	580	<10	2,000	<10	<10
	3/27/2013	Inaccessible						
	5/20/2013	Inaccessible						
	9/4/2013	<5.0	<5.0	29	<5.0	140	<5.0	<5.0
	12/6/2013	<2.5	<2.5	12	<2.5	<25	<2.5	<2.5
	6/27/2014	<2.5	<2.5	4.9	<2.5	<25	<2.5	<2.5
	9/19/2014	<2.5	<2.5	7.1	<2.5	<25	<2.5	<2.5
	12/15/2014	<0.5	<0.5	33	<0.5	88	<0.5	<0.5
	3/31/2015	<5.0	<5.0	12	<5.0	<50	<5.0	<5.0
	9/18/2015	<2.5	<2.5	9.6	<2.5	<25	<2.5	<2.5
	12/16/2015	<5.0	<5.0	10	<5.0	<50	<5.0	<5.0
	3/22/2016	<5.0	<5.0	8.7	<5.0	28	<5.0	<5.0
	9/23/2016	<5.0	<5.0	<5.0	<5.0	<50	<5.0	<5.0
	3/28/2017	<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	<0.5
	9/28/2017	<2.0	<2.0	<2.0	<2.0	<20	<2.0	<2.0

Table 4b
Monitoring Well Data
Oxygenates and Lead Scavengers
Shore Acres Gas
403 East 12th Street
Oakland, California

Well ID TOC	Date Measured	DIPE (ug/L)	ETBE (ug/L)	MTBE (ug/L)	TAME (ug/L)	TBA (ug/L)	1,2-DCA (ug/L)	EDB (ug/L)
DPE Wells								
EW-1	6/28/2011	<25	<25	1,500	<25	5,300	<25	<25
	9/22/2011	<50	<50	640	<50	1,800	<50	<50
	12/11/2011	<25	<25	490	<25	1,000	<25	<25
	3/30/2012	<20	<20	370	<20	1,100	<20	<20
	6/1/2012	<25	<25	500	<25	1,700	<25	<25
	9/14/2012	<10	<10	370	<10	1,400	<10	<10
	3/27/2013	<0.5	<0.5	270	<0.5	560	<0.5	<0.5
	5/20/2013	<5.0	<5.0	250	<5.0	560	<5.0	<5.0
	9/4/2013	<2.5	<2.5	220	<2.5	590	<2.5	<2.5
	12/6/2013	<2.5	<2.5	130	<2.5	270	<2.5	<2.5
	6/27/2014	<10	<10	40	<10	<100	<10	<10
	9/19/2014	<20	<20	300	<20	<200	<20	<20
	12/15/2014	<0.5	<0.5	170	<0.5	110	<0.5	<0.5
	3/31/2015	---	---	---	---	---	---	---
	9/18/2015	<2.5	<2.5	100	<2.5	<25	<2.5	<2.5
	12/16/2015	<5.0	<5.0	24	<5.0	<50	<5.0	<5.0
	3/22/2016	<5.0	<5.0	40	<5.0	46	<5.0	<5.0
	9/23/2016	<5.0	<5.0	78	<5.0	<50	<5.0	<5.0
	3/28/2017	<0.5	<0.5	90	<0.5	<5.0	<0.5	<0.5
	9/28/2017	<2.0	<2.0	**42**	<2.0	<20	<2.0	<2.0
EW-2	6/28/2011	<25	<25	670	<25	4,100	<25	<25
	9/22/2011	<50	<50	740	<50	1,600	<50	<50
	12/11/2011	<50	<50	540	<50	880	<50	<50
	3/30/2012	<50	<50	1,800	<50	2,800	<50	<50
	6/1/2012	<50	<50	2,600	<50	3,300	<50	<50
	9/14/2012	<20	<20	1,100	<20	2,400	<20	<20
	3/27/2013	<0.5	<0.5	360	<0.5	1,800	<0.5	<0.5
	5/20/2013	<2.5	<2.5	390	<2.5	2,600	<2.5	<2.5
	9/4/2013	<5.0	<5.0	460	<5.0	1,400	<5.0	<5.0
	12/6/2013	<10	<10	210	<10	560	<10	<10
	6/27/2014	<10	<10	110	<10	<100	<10	<10
	9/19/2014	<25	<25	96	<25	<250	<25	<25
	12/15/2014	<0.5	<0.5	94	<0.5	66	<0.5	<0.5
	3/31/2015	---	---	---	---	---	---	---
	9/18/2015	<10	<10	50	<10	<100	<10	<10
	12/16/2015	<50	<50	58	<50	<500	<50	<50
	3/22/2016	<250	<250	<250	<250	<1,000	<250	<250
	9/23/2016	<5.0	<5.0	26	<5.0	<50	<5.0	<5.0
	3/28/2017	<0.5	<0.5	59	<0.5	<5.0	<0.5	<0.5
	9/28/2017	<2.0	<2.0	**18**	<2.0	**65**	<2.0	<2.0

Table 4b
Monitoring Well Data
Oxygenates and Lead Scavengers
Shore Acres Gas
403 East 12th Street
Oakland, California

Well ID TOC	Date Measured	DIPE (ug/L)	ETBE (ug/L)	MTBE (ug/L)	TAME (ug/L)	TBA (ug/L)	1,2-DCA (ug/L)	EDB (ug/L)
EW-3	5/20/2013	<2.5	<2.5	140	<2.5	1,100	<2.5	<2.5
	9/4/2013	<2.5	<2.5	120	<2.5	650	<2.5	<2.5
	12/6/2013	<2.5	<2.5	96	<2.5	690	<2.5	<2.5
	6/27/2014	<5.0	<5.0	150	<5.0	360	<5.0	<5.0
	9/19/2014	<25	<25	75	<25	<250	<25	<25
	12/15/2014	<0.5	<0.5	160	<0.5	700	<0.5	<0.5
	3/31/2015	<5.0	<5.0	38	<5.0	68	<5.0	<5.0
	9/18/2015	<5.0	<5.0	120	<5.0	<50	<5.0	<5.0
	12/16/2015	<5.0	<5.0	81	<5.0	<50	<5.0	<5.0
	3/22/2016	<2.5	<2.5	33	<2.5	84	<2.5	<2.5
	9/23/2016	<0.5	<0.5	32	<0.5	34	<0.5	<0.5
	3/28/2017	<0.5	<0.5	51	<0.5	130	<0.5	<0.5
	9/28/2017	<2.0	<2.0	**35**	<2.0	**100**	<2.0	<2.0
EW-4	5/20/2013	<5.0	<5.0	480	<5.0	1,900	<5.0	<5.0
	9/4/2013	<5.0	<5.0	220	<5.0	1,300	<5.0	<5.0
	12/6/2013	<5.0	<5.0	58	<5.0	430	<5.0	<5.0
	6/27/2014	<2.5	<2.5	82	<2.5	65	<2.5	<2.5
	9/19/2014	<20	<20	120	<20	520	<20	<20
	12/15/2014	<0.5	<0.5	100	<0.5	110	<0.5	<0.5
	3/31/2015	<5.0	<5.0	140	<5.0	310	<5.0	<5.0
	9/18/2015	<5.0	<5.0	140	<5.0	420	<5.0	<5.0
	12/16/2015	<5.0	<5.0	87	<5.0	390	<5.0	<5.0
	3/22/2016	<25	<25	81	<25	250	<25	<25
	9/23/2016	<5.0	<5.0	150	<5.0	180	<5.0	<5.0
	3/28/2017	<0.5	<0.5	61	<0.5	270	<0.5	<0.5
	9/28/2017	<2.0	<2.0	**46**	<2.0	**170**	<2.0	<2.0

Notes:

ug/L - denotes micrograms per liter
< - denotes less than the detection limit
DCA - denotes dichloroethane
EDB - denotes ethylene dibromide
MT8E - denotes methyl tertiary butyl ether
DIPE - denotes di-isopropyl ether
ETBE - denotes ethyl tertiary butyl ether
TAME - denotes tertiary amyl ether
TBA - denotes tertiary butyl alcohol
--- - denotes no data available

Table 5a
Soil Vapor Extraction System Performance Calculations
Shore Acres Gas
403 East 12th Street
Oakland, California

Date	Meter* (hours)	Influent Flow Rate (scfm)	Influent Sample Results			Extraction Rates (lb/day)			Cumulative Extraction (lb)		
			TPHg (ppmv)	Benzene (ppmv)	MTBE (ppmv)	TPHg (lb/day)	Benzene (lb/day)	MTBE (lb/day)	TPHg (lb)	Benzene (lb)	MTBE (lb)
05/27/14	590.3	106.0	2,500	14	0.73	112	0.5	0.0	2,745	11.4	0.7
06/17/14	961.5	125.0	40	1.4	0.18	2.1	0.05	0.0	2,778	12.3	0.8
06/27/14	988.2	Unit shut down for Carbon Change Out									
08/15/14	988.2	Restart Unit									
08/19/14	992.6	125.0	33	0.79	0.13	1.7	0.03	0.0	2,780	12.3	0.8
09/25/14	1,535.7	163.0	2,100	15	< 0.1	144	0.77	0.0	6,042	29.7	0.9
10/28/14	1,750.4	146.0	130	2.4	0.44	8.0	0.11	0.0	6,114	30.6	1.1
12/09/14	2,142.4	154.0	610	2.6	0.23	40	0.13	0.0	6,760	32.7	1.3
02/18/15	2,708.3	System shut down, propane tank removed from site									
08/11/15	2,708.9	System restarted									
08/25/15	2,864.4	125.0	344	2.7	< 0.1	18	0.11	0.0	7,305	32.6	1.3
09/29/15	3,428.0	128.0	91	1.4	< 0.1	5	0.06	0.0	7,420	33.9	1.4
10/26/15	3,742.1	122.0	225	0.97	< 0.1	12	0.04	0.0	7,571	34.4	1.5
11/23/15	4,175.9	150.0	407	1.2	< 0.1	26	0.06	0.0	8,036	35.4	1.6
12/16/15	4,613.3	148.0	102	0.84	< 0.1	6	0.04	0.0	8,152	36.1	1.6
12/16/15	4,613.3	Unit shut down for Carbon Change Out									
01/27/16	4,761.0	146.0	23	0.73	< 0.1	1.4	0.03	0.0	8,161	36.1	1.6
03/21/16	5,797.5	138.0	20	0.86	< 0.1	1.2	0.04	0.0	8,211	37.7	1.8
04/11/16	6,279.7	135.0	43	0.86	< 0.1	2.4	0.04	0.0	8,260	38.4	1.9

MW_{TPHg} = Molecular Weight of TPHg = 105 MW_{MTBE} = Molecular Weight of Methyl tert-butyl ether = 88.15
$MW_{Benzene}$ = Molecular Weight of Benzene = 78.11

days of operation during quarter 69.4

ft^3 = cubic feet min = minutes lb/day = pounds per day
ppmv = parts per million by volume = ft^3 / $1x10^6$ ft^3 scfm = standard cubic feet per minute

NS = not sampled NA = not analyzed NC = not calculated

Extraction rate = (flow rate(ft^3/min) x concentration (ft^3 / $1x10^6$ ft^3) x MW_{TPHg}(lb/lb-mol) x 1440 min/day)/(359 ft^3/lb-mol*)

* - Hour meter readings does not match field data sheets because hour meter was 5472.6 when unit was started.

Table 5b

Soil Vapor Extraction System Destruction Efficiency and Emission Calculations

Shore Acres Gas

403 East 12th Street

Oakland, California

Date	Stack Flow Rate (scfm)	Stack Sample Results (ppmv)			Emission Rates (lb/day)			Destruction Efficiency (%)		
		TPHg	Benzene	MTBE	TPHg	Benzene	MTBE	TPHg	Benzene	MTBE
05/27/14	106.0	< 5.0	< 0.050	< 0.10	< 0.2	< 0.002	< 0.004	100.0	100.0	100.0
06/17/14	125.0	< 5.0	< 0.050	< 0.10	< 0.2	< 0.002	< 0.004	100.0	100.0	100.0
08/19/14	125.0	< 5.0	< 0.050	< 0.10	< 0.2	< 0.002	< 0.004	100.0	100.0	100.0
09/25/14	163.0	< 5.0	< 0.050	< 0.10	< 0.3	< 0.003	< 0.006	100.0	100.0	100.0
10/28/14	146.0	< 5.0	< 0.050	< 0.10	< 0.3	< 0.002	< 0.005	100.0	100.0	100.0
12/09/14	154.0	< 5.0	< 0.050	< 0.10	< 0.3	< 0.002	< 0.005	100.0	100.0	100.0
02/18/15	154.0	System shutdown and propane tank removed from site								
08/11/15	121.0	System restart								
08/25/15	125.0	< 5.0	< 0.050	< 0.10	< 0.2	< 0.002	< 0.004	100.0	100.0	100.0
10/26/15	122.0	< 5.0	< 0.050	< 0.10	< 0.2	< 0.002	< 0.004	100.0	100.0	100.0
11/23/15	150.0	< 5.0	< 0.050	< 0.10	< 0.3	< 0.002	< 0.005	100.0	100.0	100.0
12/16/15	148.0	< 5.0	< 0.050	< 0.10	< 0.3	< 0.002	< 0.005	100.0	100.0	100.0
12/16/15		System shutdown and propane tank removed from site								
01/27/16	146.0	< 5.0	< 0.050	< 0.10	< 0.3	< 0.002	< 0.005	100.0	100.0	100.0
03/21/16	138.0	< 5.0	< 0.050	< 0.10	< 0.2	< 0.002	< 0.005	100.0	100.0	100.0
04/11/16	135.0	< 5.0	< 0.050	< 0.10	< 0.2	< 0.002	< 0.005	100.0	100.0	100.0

Note: "<" indicates analytical method detection limit; method detection limits are used as stack concentrations to estimate emission rates. Destruction efficiency is assumed to be 100%.

Sample Calculations

Emission rate = flow rate(ft^3/min) x concentration (ft^3 / $1x10^6$ ft^3) x MW (lb/lb-mole)/359 (ft^3/lb-mole*) x 1440 min/day

Destruction Efficiency = [(Extraction rate - Emission rate)/Extraction rate] x 100%

Stack flow = Catox Influent + Natural Gas flow rate

lb/day = pounds per day

ft^3 = cubic feet

ppmv = parts per million by volume = ft^3 / $1x10^6$ ft^3

NS = not sampled

min = minutes

scfm = standard cubic feet per minute

NA = Not applicable

Table 5c
Groundwater Treatment System Performance Data
Shore Acres Gas
403 East 12th Street
Oakland, California

DATE	TOTAL FLOW (gallons)	AVG. PERIOD FLOW RATE (gallons/min)	Influent Water Analytical Results			Estimated Removal Rates			Estimated Removal (Period)			Estimated Removal (Cumulative)		
			TPHg (ug/L)	Benzene (ug/L)	MTBE (ug/L)	TPHg (lb/day)	Benzene (lb/day)	MTBE (lb/day)	TPHg (pounds)	Benzene (pounds)	MTBE (pounds)	TPHg (pounds)	Benzene (pounds)	MTBE (pounds)
04/30/14	189,810	Unit Start Up												
06/27/14	358,850	2.02	18,600	2,600	96	0.45	0.063	0.002	26.21	3.66	0.13	26.21	3.66	0.13
08/19/14	360,060	Unit Stut Down for Carbon Change Out												
09/25/14	463,050	1.93	17,500	760	148	0.41	0.018	0.003	15.03	0.65	0.13	41.24	4.32	0.26
12/15/14	613,230	1.29	12,175	710	131	0.19	0.011	0.002	15.24	0.89	0.16	56.48	5.21	0.43
02/18/15	766,392	1.64	15,500	585	89	0.30	0.011	0.002	19.79	0.75	0.11	76.27	5.95	0.54
02/18/15	766,392	Unit Stut Down for Change from Propane to Natural Gas												
08/11/15	766,392	Unit Restarted												
09/18/15	849,579	1.52	10,525	743	103	0.19	0.014	0.002	40.72	2.87	0.40	117.00	8.83	0.94
12/16/15	1,082,639	1.82	12,800	803	63	0.28	0.018	0.001	35.49	2.23	0.17	152.49	11.05	1.11
12/16/15	1,082,639	Unit Stut Down for Carbon Change Out												
01/21/16	1,082,639	Unit Restarted												
03/22/16	1,239,526	1.79	9,750	515	52	0.21	0.011	0.001	20.28	1.07	0.11	172.77	12.13	1.22
04/11/16	1,340,425	Unit Stut Down for Rebound Monitoring												

156,887 **total gallons pumped during current reporting period** 20.28 1.07 0.11
2615 **average gallons per day during current reporting period**
1.8 **average gallons per minute during current reporting period**

Notes:
Influent concentrations are an average of extraction wells EW-1 through EW-4
Groundwater flow meter was 189,910 when unit was started up
Sample Calculations:
Extraction/ disposal rate = flow rate(gallons/min) * concentration (ug/L) * 3.785 L/gallon *lb/454,000,000 ug * 1440 min/day

NC - Not calculated
NS - Not Sampled
--- - Not Analyzed

MTBE - Methyl tertiary butyl ether
TPHg - Total Petroleum Hydrocarbons as gasoline
TBA -Tertiary butyl ether

lb/day - pounds per day
ug/L - micrograms per liter

Table 6
Sensitive Receptor Survey Data
Shore Acres Gas
403 East 12th Street
Oakland, California

Figure ID	Well Owner	Well Location Description on DWR Log	Well Type	Total Depth (feet bgs.)	Screen Interval (feet bgs.)	Seal Inteval (feet bgs.)	Installation Date	Distance/ Direction (feet)	Notes:
1	Port of Oakland	251 5th Avenue, Oakland	Monitoring	13.0	8-13	0-8	6/14/05	1000/SW	
2-3	Kaiser Paving Company	5th Avenue and S.P. Tracks, Oakland	Test Hole	15.0	None	Unknown	4/20/05	1,200/SW	

Notes:

DWR - denotes Department of Water Resources
--- - denotes no data available
bgs - denotes below ground surface

Table 7
Data Gaps Summary and Proposed Investigation
Shore Acres Gas
403 East 12th Street
Oakland, California

Item #	Data Gap Item	Proposed Investigation	Rationale	Analyses
1	Presence of LNAPL in MW-5 and possible LNAPL in MW-1 and MW-6	Install passive free product recovery skimmers in these wells. Geotech PRC Passive Skimmers proposed (spec sheet contained in Appendix C).	Biweekly monitoring of skimmers until concentrations reduced to acceptable levels and/or presence of free product elimianted.	Linear thickness and volumes removed measurments. Physical properties like color, odor, and viscosity
2	Additional soil data relating to source area. Additional removal of secondary source material.	Dig test pits through former tank pits and dispenser islands at locations shown on Figure 5. Test pits will be approximately 2-feet wide, 11-feet deep, and 75-feet long. Transport soil with PID readings above 200 ppm offsite for disposal and place soil with PID less than 200 ppm back into test pits. If significantly impacted groundwater is encountered in the test pits, it will be pumped out and stored onsite in poly tanks until it can be pumped and treated by the onsite DPE system.	Identify secondary source hot spots and remove secondary source materials. Test pits will not damage the existing monitoring well network. Soil samples will be collected from the test pits. Groundwater samples will be collected from any treated groundwater.	TPHg, TPHd, BTEX, DIPE, ETBE, MTBE, TAME, TBA, 1,2-DCA, EDB, Naphthalene.
3	Lateral impacted groundwater is not defined.	Install two downgradient groundwater monitoring wells at the locations shown on Figure 6. Wells will be constructed of 2-inch diameter PVC with screen from approximately 5-feet to 20-feet bgs. Proposed groundwater well construction specifications are shown on Figure 6.	Define the downgradient extent of impacted groundwater. Quarterly sampling of downgradient wells for a minimum of one year.	TPHg, TPHd, BTEX, DIPE, ETBE, MTBE, TAME, TBA, 1,2-DCA, EDB, Naphthalene.

Table 7
Data Gaps Summary and Proposed Investigation
Shore Acres Gas
403 East 12th Street
Oakland, California

Item #	Data Gap Item	Proposed Investigation	Rationale	Analyses
4 & 5	Vapor intrusion to indoor air and direct contact to outdoor air.	Install three soil vapor probes to 5-feet bgs and collect vapor samples. Proposed vapor probe locations are shown on Figure 5 and construction specifications are shown Figure 5. Collect two indoor air samples from the onsite building at the locations shown on Figure 5. Samples will be collected over a 24-hour period with flow controllers.	For volatilization from soil to indoor air and outdoor air, vapor inhalation is the potential exposure pathway. Evaluate potential impacts from impacted soil to indoor and outdoor air.	TPHg, TPHd, BTEX, DIPE, ETBE, MTBE, TAME, TBA, 1,2-DCA, EDB, Naphthalene.
6	Potential missing data on nearby wells in the vicinity	Review ACPWA records to confirm DWR logs already reviewed.	Identify potential receptors	NA

APPENDICES

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

August 11, 2017

Rashid Ghafoor (Sent via e-mail to: rashidz1@aol.com)
226 Havenwood Circle
Pittsburg, CA 94567

Subject: Fuel Leak Case No. RO0002931 and GeoTracker Global ID T0600174667, Shore Acres Gas, 403 E. 12th St., Oakland, CA 94606

Dear Mr. Ghafoor:

Alameda County Department of Environmental Health (ACDEH) staff has reviewed the case file including the August 1, 2016 *Fourth Quarter 2015 Groundwater Monitoring and Remediation System Evaluation Report* (Evaluation Report) and the *Third Quarter 2016 Groundwater Monitoring and Rebound Report* (Rebound Report) dated December 29, 2016, prepared and submitted on your behalf by Environmental Compliance Group, LLC (ECG). Both reports and the case file have been evaluated in conjunction with the State Water Resources Control Board's (SWRCBs) Low Threat Underground Storage Tank Case Closure Policy (LTCP) adopted by the SWRCB on May 1, 2012 for the closure of leaking petroleum underground storage tank (UST) sites. The Policy applies to petroleum UST sites subject to Chapter 6.7 of the Health and Safety Code. The Policy establishes both general and media-specific criteria. If the general and applicable media-specific criteria are satisfied, then the leaking UST case is generally considered to present a low threat to human health, safety, and the environment.

ACDEH understands that the site is currently leased to a Hand Car Wash business, which started operation in January 2015. The Hand Car Wash facility is comprised of an existing site trailer and numerous portable canopies arranged on the paved site. ACDEH understands that redevelopment is not currently under consideration and commercial property usage will continue.

Site Background

Three USTs were removed in August 2009. The UST removal was documented in the September 2009 *Underground Storage Tank Removal at 403 East 12th Street Oakland California* (UST Report) prepared by Wright Environmental Services, Inc., on your behalf.

The UST Report described the removal of three pump islands and associated piping, two 12,000 gallon USTs used for gasoline storage and one 12,000 gallon UST previously used for diesel storage in August 2009. The USTs had been installed in 1982, were placed out of service in July 2008 when the USTs were emptied, of product, cleaned, sealed, and placed under temporary closure with a permit from the Oakland Fire Department. As described in the UST Report, fuel system piping was removed from Pump Islands designated 1 and 2. Pump Island 3 was excavated, but not found to contain fuel system piping; however did contain two large diameter pipes thought to be associated with abandoned utilities from prior uses. The former pump islands trenches were backfilled with clean imported fill.

After the three USTs were removed, the UST Report notes that evidence of gross contamination was found from the top of each UST, approximately 4 feet below ground surface (bgs) to two feet below the bottom of each UST (approximately 14 feet bgs). Soil contamination was also observed around each turbine and fill riser directly below the concrete pavement. Following the UST removal, the UST excavation was first backfilled with TPH-impacted soil previously removed and stockpiled from the excavation, then covered with plastic. The balance of excavation, above the plastic, was backfilled with imported fill, then paved with asphalt concrete.

ACDEH approved a Feasibility Study/Corrective Action Plan (FS/CAP) on February 7, 2013 and upon completion of the 30-day public notification period, ACDEH approved implementation of the CAP on March 22, 2013. A portable Dual Phase Extraction System (DPE) was operated at the site periodically from April 30, 2014 through April 2016, followed by one year of groundwater rebound monitoring. The data presented in the Rebound Report and the Remediation Report indicates that the chosen CAP was not effective in advancing the case to closure and it is likely the DPE's ineffectiveness was due in part to the presence of the secondary source. At the present time it is not appropriate to resume DPE operation due to the failure to remove secondary source to the extent practicable as required by the LTCP. Alternative corrective actions will likely be requested to be evaluated in the future, including, but not limited to, removal of the secondary source.

ACDEH has determined that the site does not meet the LTCP General Criteria d (Free Product Removal), e (Site Conceptual Model), 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. Site-specific details are provided in the following Technical Comments.

To continue progress on the path to closure, ACDEH requests preparation of a Data Gap Investigation Work Plan that is supported by a Site Conceptual Model (SCM) to address the data gaps listed in the following technical comments.

TECHNICAL COMMENTS

1. **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 *Technical Justification for Vapor Intrusion (VI) Media Specific Criteria* (Technical Justification Paper) included with the LTCP provides criteria for direct and indirect evidence of the presence of light non-aqueous phase liquid (LNAPL) or free product in soil and groundwater. The Rebound Report provided direct evidence of free product observed in MW-5. Indirect evidence, as described in the LTCP Technical Justification Paper includes groundwater concentrations of benzene, toluene, ethylbenzene, or xylenes (BTEX) and/or Total Petroleum Hydrocarbon as gasoline (TPHg) greater than 20,000 micrograms per liter (ug/L). Well MW-1 detected 20,000 ug/L TPHg, MW-5 detected 10,000 ug/L TPHg, and MW-6 detected 7,700 ug/L TPHg. Please present a strategy in the Data Gap Work Plan described in Technical Comment 7 below to collect sufficient data to satisfy the LTCP General Criteria d (Free Product Removal) criteria.

2. **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.

The UST Report provides documentation of the existence of three pump islands at the site and that the UST excavation was backfilled with TPH-impacted soil, precluding compliance with General Criteria f. Please add the location of the third pump island to all figures in all future reports. Please present a strategy in the Data Gap Work Plan described in Technical Comment 7 below to collect sufficient data to determine if secondary source has been removed to the extent practicable to satisfy the LTCP General Criteria f.

3. **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.

ACDEH's review of the case files indicates that insufficient data and analysis has been presented to assess compliance with Media Specific Criteria for Groundwater. The rose diagram included in the Rebound Report indicates that the prevalent groundwater gradient direction on site is to the southeast and several residences and commercial business are located downgradient of the site. Free product is present in MW-5, and benzene was detected at 1,400 ug/L in MW-1 and has fluctuated between 4,500 ug/L to 530 ug/L since June 2011. Wells EW-4 and MW-2 detected TPHg and benzene and are located in the down gradient portion of the property proximal to the southeastern property boundary, and indicate that the plume length is unknown. Currently it is unknown if free product has migrated southeast and downgradient off site.

As requested in ACDEH's February 18, 2016 Directive Letter, the Evaluation Report provided a brief description of the surface drains connected to the sanitary sewer to dispose of water generated by the hand car wash. Please locate all site drains on all site figures commencing with submittal of the Data Gap Work Plan and SCM described in Technical Comment 7.

Please present a strategy in the Data Gap Work Plan described in Technical Comment 7 below to collect sufficient data to satisfy the LTCP Media Specific Criteria for Groundwater criteria.

4. **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.

ACDEH's review of the case files indicates that insufficient data and analysis has been presented to assess compliance with Media Specific Criteria for Vapor Intrusion to Indoor Air. As previously mentioned, the rose diagram indicates the prevalent groundwater gradient direction is to the

southeast and benzene was detected at 1,400 ug/L in MW-1. Additionally, naphthalene concentrations in shallow soil, 0 to 5 feet and 5 to 10 feet below ground surface (bgs) intervals across the site and groundwater are unknown as naphthalene has not been included in the list of analytes. ACDEH notes that benzene and naphthalene are both contaminants that the LTCP uses to assess risk from vapor intrusion to indoor air. In accordance with the LTCP, since benzene is detected between 100 ug/L and 1,000 ug/L in groundwater, the bioattenuation zone must greater than 10 feet thick. Review of the site's boring logs indicate a bioattenuation zone greater than 5 feet bgs but less than 10 feet bgs, and indicates the potential for vapor intrusion to indoor air to the neighboring residences and business. As previously requested in Technical Comment 5 of ACDEH's February 18, 2016 Directive Letter, ACDEH requests preparation of a Data Gap Work Plan to assess potential vapor intrusion to indoor air of the on-site trailer and adjacent downgradient businesses and residences. Please present a strategy in the described in Technical Comment 7 below to collect sufficient data to satisfy the Media Specific Criteria for Vapor Intrusion to Indoor Air. Please ensure that your strategy is consistent with the field sampling protocols described in the Department of Toxic Substances Control's (DTSC's) *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air (Vapor Intrusion Guidance) (October 20011)* and DTSC's *Advisory Active Soil Gas Investigations* (July 2015). Consistent with the guidance, ACDEH requires installation of permanent vapor wells to assess temporal and seasonal variations in soil gas concentrations.

5. **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.

   ACDEH's review of the case files indicates that insufficient data and analysis has been presented to assess compliance with Media Specific Direct Contact and Outdoor Air Criteria. Naphthalene concentrations in shallow soil, 0 to 5 feet and 5 to 10 feet below ground surface (bgs) intervals across the site are unknown as analysis for naphthalene has not been included in historic site investigations.

   Please present a strategy in the Data Gap Work Plan described in Technical Comment 7 below to collect sufficient data to satisfy the LTCP Media Specific Criteria for Direct Contact and Outdoor Air Criteria.

6. **LTCP General Criteria e (Site Conceptual Model)** – According to the LTCP, the SCM is a fundamental element of a comprehensive site investigation. The SCM establishes the source and attributes of the unauthorized release, describes all affected media (including soil, groundwater, and soil vapor as appropriate), describes local geology, hydrogeology and other physical site characteristics that affect contaminant environmental transport and fate, and identifies all confirmed and potential contaminant receptors (including water supply wells, surface water bodies, structures

and their inhabitants). The SCM is relied upon by practitioners as a guide for investigative design and data collection. All relevant site characteristics identified by the SCM shall be assessed and supported by data so that the nature, extent and mobility of the release have been established to determine conformance with applicable criteria in this policy.

To facilitate review, ACDEH requests the SCM be presented in a tabular format that highlights the major SCM elements and associated data gaps, which need to be addressed to progress the site to case closure under the LTCP. Please see Attachment A, *Site Conceptual Model Requisite Elements in Tabular Format.*

As a part of the SCM, please perform a Sensitive Receptor Study to determine if sensitive receptors are present within a radius of 1,500 feet of the site. ACDEH acknowledges that the well survey performed in 2011 using the Department of Water Resources (DWR) well data base, but requests review of Alameda County Public Works Agency (ACPWA) well data base for a complete inventory of vicinity water supply wells. The ACPWA and DWR data bases provide considerably different results that warrant review of both data bases. ACDEH requests the identification and location on a site vicinity figure all active, inactive, decommissioned, and abandoned (improperly decommissioned or lost) wells including irrigation, water supply, industrial, dewatering, and cathodic protection wells within a 1,500-foot radius of the site. Please be aware that well locations are not confidential, however well construction details are and must not be included with the requested report. Additionally, please identify on the same figure beneficial resources and other sensitive receptors including, but not limited to, surface water bodies, schools, hospitals, day care centers, elder care facilities, etc. Please plot the numbered well locations on an aerial photography-based figure and provide a table listing the same numbered well locations and information similar to the example provided in Attachment B, *Sample Well Survey Figure and Table.* Please include the SCM with the Data Gap Work Plan described in Technical Comment 7 below to satisfy the LTCP General Criteria e Site Conceptual Model.

7. **Data Gap Investigation Work Plan and Site Conceptual Model** – Please prepare a Data Gap Work Plan and Site Conceptual Model to address the technical comments listed above. Please support the scope of work in the Data Gap Work Plan with a focused SCM and Data Quality Objectives (DQOs) that relate the data collection to each LTCP criteria. Please specify which scenario within each General and Media-Specific Criteria the sampling strategy is intended to apply to so that ACDEH can verify the appropriateness of the proposed sample locations.

8. **Groundwater Monitoring Analyses** - ACDEH's July 26, 2017 Directive Letter provided a submittal schedule for semiannual groundwater monitoring and sampling reports and the schedule is consolidated below in the Technical Report Request Section. Because one of the USTs was used to store diesel, ACDEH requests the following analyses for all groundwater samples collected from the six site monitoring wells (MW-1 through MW-6) and four extraction wells (EW-1, EW-2, EW-3, EW-4) for the 2nd Half 2017, 1st Half of 2018, and 2nd Half of 2018 semiannual groundwater monitoring and sampling events.

Please note going forward, any and all proposed changes to the groundwater monitoring and sampling program, including sampling periodicity and changes to groundwater sample analyses, must be approved in writing by ACDEH prior to implementation. Non-compliance with ACDEH Directive Letters jeopardizes Underground Storage Tank Cleanup Fund (USTCF) reimbursement.

Please submit the semiannual groundwater and sampling reports by the dates provided in the Technical Request Section below:

- Total Petroleum Hydrocarbons (TPH)-Gasoline and TPH-Diesel (TPH-D) by EPA Method 8015B;

- Benzene, toluene, ethylbenzene, and xylenes (BTEX), naphthalene, ethylene dibromide (EDB), ethylene dichloride (EDC), methyl tertiary-butyl ether (MTBE), tert-amyl-methyl ether (TAME), ethyl tert-butyl ether (ETBE), di-isopropyl ether (DIPE), and t-Butyl alcohol (TBA) and fuel oxygenates by EPA Method 8260B.

9. **Request for information** - The ACDEH case file for the subject site contains only the electronic files listed on our web site at *http://www.acgov.org/aceh/lop/ust.htm*. Please review it to ensure that all reports and other documents and communications have been provided to ACDEH. You are requested to submit electronic copies of missing boring logs for EW-3 and EW-4, and off-site soil borings SB-10 through SB-21 and their respective ACPWA permits for this property by the date specified in the Technical Report Request Section below. ACDEH requests e-mail notification of the documents uploaded to Geotracker by the date listed below.

10. **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.

Please be aware that failure to comply with Geotracker requirements jeopardizes reimbursement from the USTCF.

TECHNICAL REPORT REQUEST

ACDEH's July 26, 2017 Directive Letter provided a submittal schedule for semiannual groundwater monitoring and sampling reports and the schedule is consolidated below with the data gap work plan and SCM requested in this Directive Letter. Please upload technical reports to the ACDEH ftp site (Attention: Karel Detterman), and to the State Water Resources Control Board's Geotracker website, in accordance with the following specified file naming convention and schedule:

- **August 11, 2017**: Semiannual Groundwater Monitoring and Sampling Report, 1st Half 2017
  File to be named: RO2931_GWM_R_yyyy-mm-dd

- **September 9, 2017**: Boring logs and ACPWA permits for EW-3, EW-4, off-site borings SB-10 through SB-21
  File to be named: RO2931_MISC_R_yyyy-mm-dd

- **October 9, 2107**: Data Gap Investigation Work Plan and Site Conceptual Model
  File to be named: RO2931_WP_SCM_R_yyyy-mm-dd

- **November 30, 2017**: Semiannual Groundwater Monitoring and Sampling Report, 2nd Half 2017
  File to be named: RO2931_GWM_R_yyyy-mm-dd

- **May 31, 2018**: Semiannual Groundwater Monitoring and Sampling Report, 1st Half 2018
  File to be named: RO2931_GWM_R_yyyy-mm-dd

- **November 30, 2018**: Semiannual Groundwater Monitoring and Sampling Report, 2nd Half 2018
  File to be named: RO2931_GWM_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.

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

Digitally signed by Karel Detterman
DN: cn=Karel Detterman, o, ou, email=karel.detterman@acgov.org, c=US
Date: 2017.08.11 11:04:43 -07'00'

Karel Detterman, PG
Hazardous Materials Specialist

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

Attachment A, Site Conceptual Model Requisite Elements in Tabular Format

Attachment B, Sample Well Survey Figure and Table

cc: Drew Van Allen, Environmental Compliance Group, LLC, 270 Vintage Drive, Turlock, CA 95382 (Sent via E-mail to: ecg.ust@gmail.com)

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

APPENDIX B

ENVIRONMENTAL COMPLIANCE GROUP, LLC
STANDARD OPERATING AND SAFETY AND LOSS CONTROL PROCEDURES

1.0 SOIL BORING/DRILLING SAMPLE COLLECTION AND CLASSIFICATION PROCEDURES

ECG will prepare a site-specific Health and Safety Plan as required by the Occupational Health and Safety Administration (OSHA) Standard "Hazardous Waste Operations and Emergency Response" guidelines (29 CFR.1910.120). The document will be reviewed and signed by all ECG personnel and subcontractors prior to performing work at the site.

Prior to conducting and subsurface work at the site, Underground Services Alert (USA) will be contacted to delineate subsurface utilities near the site with surface markings. In addition, the first five feet of every location will be hand cleared to a diameter larger than the diameter of the auger or probe as a further precaution against damaging underground utilities. Sites that are currently operated as gas stations will be cleared with a private utility locator prior to drilling activities.

Soil samples to be submitted for chemical analyses are collected into brass or stainless steel tubes. The tubes are placed in an 18-inch long split-barrel sampler. The split-barrel sampler is driven its entire length hydraulically or by 140-pound drop hammer. The split-barrel sampler is removed from the borehole and the tubes are removed. When the tubes are removed from the split-barrel sampler, the tubes are trimmed and capped with Teflon sheets and plastic caps or the soil is removed from the tubes and placed in other appropriate sample containers. The samples are sealed, labeled, and placed in ice under chain-of-custody to be delivered to the analytical laboratory. All samples will be kept refrigerated until their delivery to the analytical laboratory.

One soil sample collected from each split-barrel sampler is field screened with a photoionization detector (PID), flame ionization detector (FID), or other equivalent field screening meter. The soil sample is sealed in a plastic bag or other appropriate container to allow volatilization of volatile organic compounds (VOCs). The field meter is used to measure the VOC concentration in the container's headspace and is recorded on the boring logs at the appropriate depth interval.

Other soil samples collected from each split-barrel sampler are inspected and documented to identify the soil stratigraphy beneath the site and classify the soil types according to the United Soil Classification System. The soil types are recorded on boring logs with the appropriate depth interval and any pertinent field observations. Drilling and sampling equipment are steam cleaned or washed in solution and rinsed in deionized water prior to use, between sample collections and boreholes and after use.

2.0 SOIL EXCAVATION SAMPLE COLLECTION AND CLASSIFICATION PROCEDURES

Soil samples to be submitted for chemical analyses are collected into brass or stainless steel tubes or other appropriate containers. The samples are sealed, labeled, and placed in ice under chain-of-custody (COC) to be delivered to the analytical laboratory. All samples will be kept refrigerated until their delivery to the analytical laboratory.

Select soil samples are placed into a sealed plastic bag or other appropriate container and field screened using a PID, FID, or equivalent meter. Other soil samples collected are inspected and documented to identify the soil stratigraphy beneath the site and classify the soil types according to the United Soil Classification System. The soil types are recorded field notes with the appropriate depth interval and any pertinent field observations. Sampling equipment are steam cleaned or washed in solution and rinsed in deionized water prior to use, between sample collections, and after use. Soil cuttings and rinseate water are temporarily stored onsite pending laboratory analytical results and proper transport and disposal.

3.0 SAMPLE IDENTIFICATION AND COC PROCEDURES

Sample containers are labeled with job number, job name, sample collection time and date, sample collection point, and analyses requested. Sampling method, sampler's name, and any pertinent field observations are recorded on boring logs or excavation field notes. COC forms track the possession of the sample from the time of its collection until the time of its delivery to the analytical laboratory. During sample transfers, the person with custody of the samples will relinquish them to the next person by signing the COC and documenting the time and date. The analytical laboratory Quality Control/Quality Assurance (QA/QC) staff will document the receipt of the samples and confirm the analyses requested on the COC matches the sample containers and preservative used, if any. The analytical laboratory will assign unique log numbers for identification during the analyses and reporting. The log numbers will be added to the COC form and maintained in a log book maintained by the analytical laboratory.

4.0 ANALYTICAL LABORATORY QA/QC PROCEDURES

The analytical laboratory analyzes spikes, replicates, blanks, spiked blanks, and certified reference materials to verify analytical methods and results. The analytical laboratory QA/QC also includes:

Routine instrument calibration,
Complying with state and federal laboratory accreditation and certification programs,
Participation in U.S. EPA performance evaluation studies,
Standard operating procedures, and
Multiple review of raw data and client reports

5.0 HOLLOW STEM AUGER WELL INSTALLATION

Boreholes for wells are often drilled with a truck-mounted hollow stem auger drill rig. The borehole diameter is at least 4 inches wider than the outside diameter of the well casing. Soil samples are collected and screened as described in **Section 1.0** and decontamination procedures are also the same as described in **Section 1.0**.

Wells are cased with both blank and factory-perforated Schedule 40 PVC. The factory perforations are typically 0.020 inches wide by 1.5 inch long slots, with 42 slots per foot. A PVC cap is typically installed at the bottom of the casing with stainless steel screws. No solvents or cements are used in the construction of the wells. Well stabilizers or centering devices may be installed around the casing to ensure the filter material and grout in the annulus are evenly distributed. The casing is purchased pre-cleaned or steam cleaned and washed prior to installation in the borehole.

The casing is set inside the augers and sand, gravel, or other filter material is poured into the annulus to fill the borehole from the bottom to approximately 1-2 feet above the perforations. A two foot thick bentonite plug is placed above the filter material to prevent the grout from filling the filter pack. Neat cement or sand-cement grout is poured into the annulus from the top of the bentonite plug to the surface. For wells located in parking lots or driveways, or roads, a traffic rated well box is installed around the well. For wells located in landscaped areas or fields, a stovepipe well protection device is installed around the well. Soil cuttings and rinseate water are temporarily stored onsite pending laboratory analytical results and proper transport and disposal.

6.0 MUD AND AIR ROTARY WELL INSTALLATION

Boreholes for wells can also be drilled with a truck-mounted air rotary or mud rotary drill rig. Air or mud can be used as a drill fluid to fill the borehole and prevent the borehole from caving in and remove drill cuttings. Mud or air can be chosen depending on the subsurface conditions. Soil samples are collected and screened as described in **Section 1.0** and decontamination procedures are also the same as described in **Section 1.0**.

Wells are cased with both blank and factory-perforated Schedule 40 PVC. The factory perforations are typically 0.020 inches wide by 1.5 inch long slots, with 42 slots per foot. A PVC cap is typically installed at the bottom of the casing with stainless steel screws. No solvents or cements are used in the construction of the wells. Well stabilizers or centering devices may be installed around the casing to ensure the filter material and grout in the annulus are evenly distributed. The casing is purchased pre-cleaned or steam cleaned and washed prior to installation in the borehole. Soil cuttings and drilling fluids are temporarily stored onsite pending laboratory analytical results and proper transport and disposal.

The casing is set inside the augers and sand, gravel, or other filter material is poured into the annulus to fill the borehole from the bottom to approximately 1-2 feet above the perforations. A two foot thick bentonite plug is placed above the filter material to prevent the grout from filling the filter pack. Neat cement or sand-cement grout is poured into the annulus from the top of the bentonite plug to the surface. For wells located in parking lots or driveways, or roads, a traffic rated well box is installed around the well. For wells located in landscaped areas or fields, a stovepipe well protection device is installed around the well. Soil cuttings and rinseate water are temporarily stored onsite pending laboratory analytical results and proper transport and disposal.

7.0 WELL DEVELOPMENT

After well installation, the wells are developed to remove residual drilling materials from the annulus and to improve well production by fine materials from the filter pack. Possible well development methods include pumping, surging, bailing, jetting, flushing, and air lifting. Development water is temporarily stored onsite pending laboratory analytical results and proper transport and disposal. Development equipment are steam cleaned or washed in solution and rinsed in deionized water prior to use, between sample collections and after use. After well development the wells are typically allowed to stabilize for at least 24 hours prior to purging and sampling.

8.0 LIQUID LEVEL MEASUREMENTS

Liquid level measurements are made with a water level meter and/or interface probe and disposable bailers. The probe tip attached to a measuring tape is lowered into the well and into the groundwater when a beeping tone indicates the probe is in the groundwater. The probe and measuring tape (graduated to hundredths of a foot) are slowly raised until the beeping stops and the depth to water measurement is recorded. If the meter makes a steady tone, this indicates the presence of floating liquid hydrocarbons (FLH) and the probe and measuring tape are raised until the steady tone stops and the depth to the FLH is measured. Once depth to water and depth to FLH (if present) has been recorded, the probe and measuring tape are lowered to the bottom of the well where the total depth of the well is measured. The depth to water, depth to FLH, and depth to bottom are measured again to confirm the results.

If FLH is encountered in the well, a disposable bailer is lowered into the well and brought back to the surface to confirm the thickness/presence of FLH. To minimize potential for cross contamination between wells, all measurements are done from cleanest to dirtiest well. Prior to beginning liquid level measurements, in between measurements in all wells, and at the completion of liquid level measurements, the water level probe and measuring tape is cleaned with solution (Alconox, Simple Green, or equivalent) and rinsed with deionized water.

9.0 WELL PURGING AND SAMPLING

Each well is typically purged of at least three well casing volumes of groundwater prior to collecting a groundwater sample. Purging can continue beyond three well casing volumes if field parameters including pH, temperature, electrical conductivity are not stabilizing during the purging process. If the well is purged dry before the three well casing volumes has been purged, the well is typically allowed to recharge to 80 percent of its initial water level before a groundwater sample is collected.

Purging equipment can include submersible pumps, PVC purging bailers, disposable bailers, air lift pumps, or pneumatic pumps. Prior to beginning well purging, in between each well purging, and at the completion of purging activities, all non-dedicated purging equipment is cleaned with solution (Alconox, Simple Green, or equivalent) and rinsed with deionized water.

Once the well has been purged, it will be sampled with a disposable bailer, PVC bailer, stainless steel bailer, or through a low flow groundwater pump. The groundwater sample is transferred from the bottom of the bailer to reduce volatilization to the appropriate sample container. The sample containers are specified by the analytical laboratory depending on the analyses requested. Sample containers typically include volatile organic compound (VOA) vials with septa of Teflon like materials. The groundwater sample is collected into the VOAs to minimize air bubbles and once the cap has been placed on the VOA, the VOA is tipped upside down to see if air bubbles are present in the VOA. Typically a duplicate VOA is collected from each well to be analyzed by the analytical laboratory, if warranted, to verify results.

Sample containers are labeled as described in **Section 3.0** and placed immediately in an ice chest and kept refrigerated until its delivery to the analytical laboratory. A trip blank may also be prepared by the analytical laboratory to travel with the ice chest during transport to the laboratory. Field blanks from equipment that has been decontaminated may be collected in between use in different wells to verify the decontamination procedure is effective. To minimize potential for cross contamination between wells, all wells are purged and sampled from cleanest to dirtiest well.

10.0 TEDLAR BAG SOIL VAPOR SAMPLING

Sampling equipment to collect Tedlar bag soil vapor samples includes an air pump, a Tedlar bag which can range in size from 1 to 10 liters, and 3/16-inch diameter polyethylene tubing. The air pump should be equipped with 3/16-inch hose barbs for the polyethylene tubing to attach to. The Tedlar bag must be equipped with a valve for filling and sealing the bag.

When soil vapor samples are collected from remediation equipment, the sample collection port on the remediation equipment is typically fitted with a 3/16-inch hose barb. Prior to collecting soil vapor samples from remediation equipment, air flow, temperature, and pressure or vacuum of the sampling point/remediation equipment are recorded. One end of the polyethylene tubing is connected to the sample collection port and one end is connected to the influent of the air pump, creating an air tight seal. The air pump is turned on and soil vapor from the sample collection port is pumped through the air pump for at least one minute. The air pump is turned off and one end of another piece of polyethylene tubing is connected to the effluent of the air pump and one end is connected to the valve on the Tedlar bag. The valve is opened and the air pump is turned on filling the Tedlar bag with the soil vapor sample until the bag has reached 75% capacity, when the valve on the Tedlar bag is closed and the air pump is turned off.

Tedlar bags are labeled as described in **Section 3.0** and placed immediately in an empty ice chest and kept dry and unrefrigerated until its delivery to the analytical laboratory. After each soil vapor sample collection, the air pump is turned on for five minutes to allow ambient air to clear the air pump and polyethylene tubing.

11.0 SUMMA CANISTER SOIL VAPOR SAMPLING

Sampling equipment to collect Summa canister soil vapor samples includes a sterilized Summa stainless steel canister under vacuum, ¼-inch diameter polyethylene tubing, and a laboratory calibrated flow meter, if required.

When soil vapor samples are collected from remediation equipment, the sample collection port on the remediation equipment is typically fitted with brass connection with silicone septa that has been threaded into a tapped hole on the piping network. Prior to collecting soil vapor samples from remediation equipment, air flow, temperature, and pressure or vacuum of the sampling point/remediation equipment are recorded. One end of the polyethylene tubing is connected to the brass sample collection port and one end is connected to the canister valve or flow meter, creating an air tight seal. Prior to collecting the soil vapor sample, the valve on the Summa canister is opened to verify the Summa canister has the required vacuum which is recorded. Three well volumes of vapor will be purged at a rate less than 200 milliliters per minute (ml/min.), including sand pack pore volume from each soil vapor probe prior to sample collection. The sample valve or flow meter is opened and the soil vapor sample is collected into the Summa canister and the sample valve is closed and the final vacuum reading (typically greater than 5 inches per square inch) on the Summa canister is recorded.

Per the DTSC *Advisory Active Soil Gas Investigations*, April 2012, high quality soil gas data collection is driven by project-specific data quality objectives (DQOs) and can be enhanced by using a shroud and a gaseous tracer compound. This method of leak detection ensures that soil gas wells are properly constructed and the sample train components do not leak. Most gaseous tracer compounds do not affect target analyte measurements nor does their detection require sample dilution. Also, gaseous leak tracer compounds allow a quantitative determination of a leak either in the sampling train or from ambient air intrusion down the borehole.

The shroud will be designed to contain the entire sampling train and the soil gas well annulus. The sampling train will be constructed of material that does not react with the sample analytes and will not off gas or adsorb volatile compounds. The sampling equipment will be clean and shut-in tested prior to use. The gaseous leak tracer compound (isobutylene 100 ppm) concentration inside the shroud will be monitored frequently to verify initial concentrations. A photoionization detector will be used to monitor tracer gas concentrations.

Summa canisters are labeled as described in **Section 3.0** and placed immediately in an empty ice chest and kept dry and unrefrigerated until its delivery to the analytical laboratory.

12.0 SYRINGE SOIL VAPOR SAMPLING

Sampling equipment to collect syringe soil vapor samples includes a sterilized, 100 cubic centimeter, gas tight syringe and silicone septa.

When soil vapor samples are collected from remediation equipment, the sample collection port on the remediation equipment is typically fitted with brass connection with silicone septa that has been threaded into a tapped hole on the piping network. Prior to collecting soil vapor samples from remediation equipment, air flow, temperature, and pressure or vacuum of the sampling point/remediation equipment are recorded. The syringe is inserted into the silicone septa and the plunger is purged or pumped at least three times. The sample is collected the fourth time the syringe plunger is extracted and the syringe is removed from the sample collection port and the needle on the syringe is capped with a rubber stopper.

Syringes are labeled as described in **Section 3.0** and placed immediately in an empty ice chest and kept dry and unrefrigerated until its delivery to the analytical laboratory.

13.0 TEMPORARY SAMPLING POINTS

A temporary borehole is advanced using either a slam bar or a direct push drill rig. In the case of the slam bar, once the borehole has been created, a temporary soil vapor probe is inserted into the borehole and advanced with a slide hammer or other physical force two additional feet. A bentonite seal is then placed in the borehole above the soil vapor probe to create an air tight seal and prevent ambient air from entering the sample collection space. In the case of the direct push drill rig, the sampling rod is advanced to the desired depth with a 6-inch retractable vapor screen at the tip. The sample screen on the 6-inch vapor screen is removed and a bentonite seal is then placed in the borehole above the soil vapor probe to create an air tight seal and prevent ambient air from entering the sample collection space.

Once the bentonite seal has set, at least one hour, the soil vapor survey samples are collected into Tedlar bags as described in **Section 10.0** or Suma canisters as described in **Section 11.0.** Samples are labeled as described in **Section 3.0** and placed immediately in an empty ice chest and kept dry and unrefrigerated until its delivery to the analytical laboratory. After each soil vapor sample collection, the air pump is turned on for five minutes to allow ambient air to clear the air pump and polyethylene tubing.

14.0 REPEATABLE SAMPLING POINTS

A borehole is advanced using either a hand auger or a drill rig. A 6-inch slotted probe with caps on both ends is placed in the borehole. A Swagelok fitting is attached to one end cap and 3/16-inch diameter Nylon tubing is attached to the Swagelok fitting. A one foot sand pack is placed around the probe and the remainder of the borehole is sealed with a layer of dry bentonite powder, followed by a layer of bentonite chips, and an additional layer of dry bentonite powder. A well box is placed on the surface of the repeatable sampling point and the excess Nylon tubing is placed inside the well box.

Soil vapor survey samples will be collected at least one week after probe installation. In addition, soil vapor survey samples will only be collected after five consecutive precipitation free days and after any onsite irrigation has been suspended.

The soil vapor survey samples are collected into Tedlar bags as described in **Section 10.0** or Summa canisters as described in **Section 11.0.** Tedlar bags or Summa canisters are labeled as described in **Section 3.0** and placed immediately in an empty ice chest and kept dry and unrefrigerated until its delivery to the analytical laboratory. After each soil vapor sample collection, the air pump is turned on for five minutes to allow ambient air to clear the air pump and polyethylene tubing.

APPENDIX C

Go To Geotech

Oil Skimmers

geotech

Geotech PRC Passive Skimmer

The Geotech PRC (Product Recovery Canister) is a passive skimmer with a floating intake that separates and recovers light hydrocarbons from groundwater. The Geotech PRC collects floating product down to a sheen then is emptied through a discharge valve at the bottom of the canister after being raised to the surface.

FEATURES

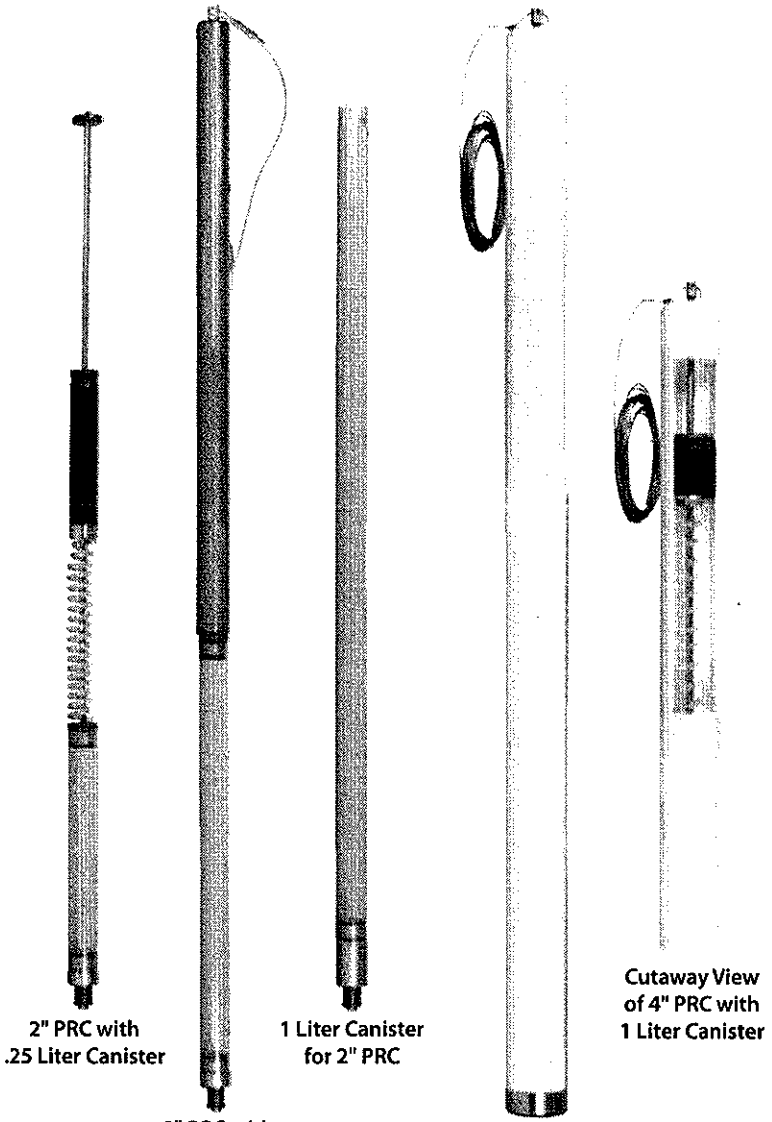
- Oleophilic/Hydrophobic filter buoy recovers product without taking in water
- Quick fill time – about 15 minutes with ample product
- Protected easy release drain valve
- Able to convert to active recovery systems

2" PRC

- 12" (30.5 cm) effective buoy travel
- 3 recovery capacities: .25, .5 and 1 liter
- Transparent recovery canister
- 2" (5 cm) or larger monitoring well applications
- Optional protective screen

4" PRC

- 16" (40.6 cm) effective buoy travel
- 3 recovery capacities: 1, 3 and 4 liter
- 4" (10 cm) or larger monitoring well applications
- Buoy protected in 0.020 (.5mm) slot PVC screen



2" PRC with .25 Liter Canister

2" PRC with .5 Liter Canister and Screen

1 Liter Canister for 2" PRC

4" PRC with 4 Liter Canister

Cutaway View of 4" PRC with 1 Liter Canister

CALL GEOTECH TODAY (800) 833-7958

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email: sales@geotechenv.com website: www.geotechenv.com

Oil Skimmers

geotech

Geotech PRC Passive Skimmer

4" PRC SPECIFICATIONS

	1 Liter	3 Liter	4 Liter
Dimensions:	37.0" L x 3.5" OD (94cm x 9cm)	53.0" L x 3.5" OD (135cm x 9cm)	60.0" L x 3.5" OD (152cm x 9cm)
Empty Weight:	8 lbs. (3.7kg)	15 lbs. (6.8kg)	16 lbs. (8.2kg)
Full Weight:	9.5 lbs. (4.3kg)	19 lbs. (8.6kg)	25.5 lbs. (11.6kg)
Capacity:	.26 gal.	.8 gal.	1.06 gal.
Min. Water Required:	18.5" (47cm)	35.0" (89cm)	43.0" (109cm)
Materials (All):	Stainless steel, brass, and engineered plastics		

2" PRC SPECIFICATIONS

	.25 Liter	.5 Liter	1 Liter
Dimensions:	49.0" L x 1.75" OD (149cm x 4.4cm)	59.5" L x 1.75" OD (151cm x 4.4cm)	82.5" L x 1.75" OD (210cm x 4.4cm)
Empty Weight: With Screen:	3.1 lbs. (1.4kg) 4.5 lbs. (2.0kg)	3.5 lbs. (1.6kg) 4.9 lbs. (2.2kg)	5.2 lbs. (2.4kg) 6.6 lbs. (3.0kg)
Full Weight: With Screen:	3.5 lbs. (1.6kg) 4.9 lbs. (2.2kg)	4.3 lbs. (2.0kg) 5.7 lbs. (2.6kg)	6.7 lbs. (3.0kg) 8.1 lbs. (3.7kg)
Capacity:	.07 gal.	0.13 gal.	0.26 gal.
Min. Water Required:	29.0" (74cm)	39.5" (100cm)	62.0" (157cm)
Materials (All):	Stainless steel, brass, and engineered plastics		

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APPENDIX D

Low-Threat Underground Storage Tank Case Closure Policy

Preamble

The State Water Resources Control Board (State Water Board) administers the petroleum UST (Underground Storage Tank) Cleanup Program, which was enacted by the Legislature in 1984 to protect health, safety and the environment. The State Water Board also administers the petroleum UST Cleanup Fund (Fund), which was enacted by the Legislature in 1989 to assist UST owners and operators in meeting federal financial responsibility requirements and to provide reimbursement to those owners and operators for the high cost of cleaning up unauthorized releases caused by leaking USTs.

The State Water Board believes it is in the best interest of the people of the State that unauthorized releases be prevented and cleaned up to the extent practicable in a manner that protects human health, safety and the environment. The State Water Board also recognizes that the technical and economic resources available for environmental restoration are limited, and that the highest priority for these resources must be the protection of human health and environmental receptors. Program experience has demonstrated the ability of remedial technologies to mitigate a substantial fraction of a petroleum contaminant mass with the investment of a reasonable level of effort. Experience has also shown that residual contaminant mass usually remains after the investment of reasonable effort, and that this mass is difficult to completely remove regardless of the level of additional effort and resources invested.

It has been well-documented in the literature and through experience at individual UST release sites that petroleum fuels naturally attenuate in the environment through adsorption, dispersion, dilution, volatilization, and biological degradation. This natural attenuation slows and limits the migration of dissolved petroleum plumes in groundwater. The biodegradation of petroleum, in particular, distinguishes petroleum products from other hazardous substances commonly found at commercial and industrial sites.

The characteristics of UST releases and the California UST Program have been studied extensively, with individual works including:

a. Lawrence Livermore National Laboratory report (1995)
b. SB1764 Committee report (1996)
c. UST Cleanup Program Task Force report (2010)
d. Cleanup Fund Task Force report (2010)
e. Cleanup Fund audit (2010)
f. State Water Resources Control Board site closure orders
g. State Water Resources Control Board Resolution 2009-0081

In general, these efforts have recognized that many petroleum release cases pose a low threat to human health and the environment. Some of these studies also recommended establishing “low-threat” closure criteria in order to maximize the benefits to the people of the State of California through judicious application of available resources.

The purpose of this policy is to establish consistent statewide case closure criteria for low-threat petroleum UST sites. The policy is consistent with existing statutes, regulations, State Water Board precedential decisions, policies and resolutions, and is intended to provide clear direction to responsible parties, their service providers, and regulatory agencies. The policy seeks to increase UST cleanup process efficiency. A benefit of improved efficiency is the preservation of limited resources for mitigation of releases posing a greater threat to human and environmental health.

This policy is based in part upon the knowledge and experience gained from the last 25 years of investigating and remediating unauthorized releases of petroleum from USTs. While this policy does not specifically address other petroleum release scenarios such as pipelines or above ground storage tanks, if a particular site with a different petroleum release scenario exhibits attributes similar to those which this policy addresses, the criteria for closure evaluation of these non-UST sites should be similar to those in this policy.

This policy is a state policy for water quality control and applies to all petroleum UST sites subject to Chapter 6.7 of Division 20 of the Health and Safety Code and Chapter 16 of Division 3 of Title 23 of the California Code of Regulations. The term "regulatory agencies" in this policy means the State Water Board, Regional Water Quality Control Boards (Regional Water Boards) and local agencies authorized to implement Health and Safety Code section 25296.10. Unless expressly provided in this policy, the terms in this policy shall have the same definitions provided in Chapter 6.7 of Division 20 of the Health and Safety Code and Chapter 16 of Division 3 of Title 23 of the California Code of Regulations.

Criteria for Low-Threat Case Closure

In the absence of unique attributes of a case or site-specific conditions that demonstrably increase the risk associated with residual petroleum constituents, cases that meet the general and media-specific criteria described in this policy pose a low threat to human health, safety or the environment and are appropriate for closure pursuant to Health and Safety Code section 25296.10. Cases that meet the criteria in this policy do not require further corrective action and shall be issued a uniform closure letter consistent with Health and Safety Code section 25296.10. Annually, or at the request of the responsible party or party conducting the corrective action, the regulatory agency shall conduct a review to determine whether the site meets the criteria contained in this policy.

It is important to emphasize that the criteria described in this policy do not attempt to describe the conditions at all low-threat petroleum UST sites in the State. The regulatory agency shall issue a closure letter for a case that does not meet these criteria if the regulatory agency determines the site to be low-threat based upon a site specific analysis.

This policy recognizes that some petroleum-release sites may possess unique attributes and that some site specific conditions may make case closure under this policy inappropriate, despite the satisfaction of the stated criteria in this policy. It is impossible to completely capture those sets of attributes that may render a site ineligible for closure based on this low-threat policy. This policy relies on the regulatory agency's use of the conceptual site model to identify the special attributes that would require specific attention prior to the application of low-threat criteria. In these cases, it is the regulatory agency's responsibility to identify the conditions that make closure under the policy inappropriate.

General Criteria
General criteria that must be satisfied by all candidate sites are listed as follows:

a. The unauthorized release is located within the service area of a public water system;
b. The unauthorized release consists only of petroleum;
c. The unauthorized ("primary") release from the UST system has been stopped;
d. Free product has been removed to the maximum extent practicable;
e. A conceptual site model that assesses the nature, extent, and mobility of the release has been developed;
f. Secondary source has been removed to the extent practicable;
g. Soil or groundwater has been tested for methyl tert-butyl ether (MTBE) and results reported in accordance with Health and Safety Code section 25296.15; and
h. Nuisance as defined by Water Code section 13050 does not exist at the site.

a. The unauthorized release is located within the service area of a public water system
This policy is protective of existing water supply wells. New water supply wells are unlikely to be installed in the shallow groundwater near former UST release sites. However, it is difficult to predict, on a statewide basis, where new wells will be installed, particularly in rural areas that are undergoing new development. This policy is limited to areas with available public water systems to reduce the likelihood that new wells in developing areas will be inadvertently impacted by residual petroleum in groundwater. Case closure outside of areas with a public water system should be evaluated based upon the fundamental principles in this policy and a site specific evaluation of developing water supplies in the area. For purposes of this policy, a public water system is a system for the provision of water for human consumption through pipes or other constructed conveyances that has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days out of the year.

b. The unauthorized release consists only of petroleum
For the purposes of this policy, petroleum is defined as crude oil, or any fraction thereof, which is liquid at standard conditions of 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.

c. The unauthorized release has been stopped
The tank, pipe, or other appurtenant structure that released petroleum into the environment (i.e. the primary source) has been removed, repaired or replaced. It is not the intent of this policy to allow sites with ongoing leaks from the UST system to qualify for low-threat closure.

d. Free product has been removed to the maximum extent practicable
At petroleum unauthorized release sites where investigations indicate the presence of free product, free product shall be removed to the maximum extent practicable. In meeting the requirements of this section:

(a) Free product shall be removed 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;

(b) Abatement of free product migration shall be used as a minimum objective for the design of any free product removal system; and
(c) Flammable products shall be stored for disposal in a safe and competent manner to prevent fires or explosions.

e. A conceptual site model that assesses the nature, extent, and mobility of the release has been developed

The Conceptual Site Model (CSM) is a fundamental element of a comprehensive site investigation. The CSM establishes the source and attributes of the unauthorized release, describes all affected media (including soil, groundwater, and soil vapor as appropriate), describes local geology, hydrogeology and other physical site characteristics that affect contaminant environmental transport and fate, and identifies all confirmed and potential contaminant receptors (including water supply wells, surface water bodies, structures and their inhabitants). The CSM is relied upon by practitioners as a guide for investigative design and data collection. Petroleum release sites in California occur in a wide variety of hydrogeologic settings. As a result, contaminant fate and transport and mechanisms by which receptors may be impacted by contaminants vary greatly from location to location. Therefore, the CSM is unique to each individual release site. All relevant site characteristics identified by the CSM shall be assessed and supported by data so that the nature, extent and mobility of the release have been established to determine conformance with applicable criteria in this policy. The supporting data and analysis used to develop the CSM are not required to be contained in a single report and may be contained in multiple reports submitted to the regulatory agency over a period of time.

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 herein. "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.

g. Soil and groundwater have been tested for MTBE and results reported in accordance with Health and Safety Code section 25296.15

Health and Safety Code section 25296.15 prohibits closing a UST case unless the soil, groundwater, or both, as applicable have been tested for MTBE and the results of that testing are known to the Regional Water Board. The exception to this requirement is where a regulatory agency determines that the UST that leaked has only contained diesel or jet fuel. Before closing a UST case pursuant to this policy, the requirements of section 25296.15, if applicable, shall be satisfied.

h. Nuisance as defined by Water Code section 13050 does not exist at the site
Water Code section 13050 defines "nuisance" as anything which meets all of the following requirements:

(1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property.

(2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.

(3) Occurs during, or as a result of, the treatment or disposal of wastes.

For the purpose of this policy, waste means a petroleum release.

Media-Specific Criteria
Releases from USTs can impact human health and the environment through contact with any or all of the following contaminated media: groundwater, surface water, soil, and soil vapor. Although this contact can occur through ingestion, dermal contact, or inhalation of the various media, the most common drivers of health risk are ingestion of groundwater from drinking water wells, inhalation of vapors accumulated in buildings, contact with near surface contaminated soil, and inhalation of vapors in the outdoor environment. To simplify implementation, these media and pathways have been evaluated and the most common exposure scenarios have been combined into three media-specific criteria:

1. Groundwater
2. Vapor Intrusion to Indoor Air
3. Direct Contact and Outdoor Air Exposure

Candidate sites must satisfy all three of these media-specific criteria as described below.

1. Groundwater
This policy describes criteria on which to base a determination that threats to existing and anticipated beneficial uses of groundwater have been mitigated or are de minimis, including cases that have not affected groundwater.

State Water Board Resolution 92-49, *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304* is a state policy for water quality control and applies to petroleum UST cases. Resolution 92-49 directs that water affected by an unauthorized release attain either background water quality or the best water quality that is reasonable if background water quality cannot be restored. Any alternative level of water quality less stringent than background must be consistent with the maximum benefit to the people of the state, not unreasonably affect current and anticipated beneficial use of affected water, and not result in water quality less than that prescribed in the water quality control plan for the basin within which the site is located. Resolution No. 92-49 does not require that the requisite level of water quality be met at the time of case closure; it specifies compliance with cleanup goals and objectives within a reasonable time frame.

Water quality control plans (Basin Plans) generally establish “background” water quality as a restorative endpoint. This policy recognizes the regulatory authority of the Basin Plans but underscores the flexibility contained in Resolution 92-49.

It is a fundamental tenet of this low-threat closure policy that if the closure criteria described in this policy are satisfied at a petroleum unauthorized release site, attaining background water quality is not feasible, establishing an alternate level of water quality not to exceed that prescribed in the applicable Basin Plan is appropriate, and that water quality objectives will be attained through natural attenuation within a reasonable time, prior to the expected need for use of any affected groundwater.

If groundwater with a designated beneficial use is affected by an unauthorized release, 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 below. A plume that is "stable or decreasing" is a contaminant mass that has expanded to its maximum extent: the distance from the release where attenuation exceeds migration.

Groundwater-Specific Criteria

(1) a. The contaminant plume that exceeds water quality objectives is less than 100 feet in length.
   b. There is no free product.
   c. The nearest existing water supply well or surface water body is greater than 250 feet from the defined plume boundary.

(2) a. The contaminant plume that exceeds water quality objectives is less than 250 feet in length.
   b. There is no free product.
   c. The nearest existing water supply well or surface water body is greater than 1,000 feet from the defined plume boundary.
   d. The dissolved concentration of benzene is less than 3,000 micrograms per liter (µg/l), and the dissolved concentration of MTBE is less than 1,000 µg/l.

(3) a. The contaminant plume that exceeds water quality objectives is less than 250 feet in length.
   b. Free product has been removed to the maximum extent practicable, may still be present below the site where the release originated, but does not extend off-site.
   c. The plume has been stable or decreasing for a minimum of five years.
   d. The nearest existing water supply well or surface water body is greater than 1,000 feet from the defined plume boundary.
   e. The property owner is willing to accept a land use restriction if the regulatory agency requires a land use restriction as a condition of closure.

(4) a. The contaminant plume that exceeds water quality objectives is less than 1,000 feet in length.
   b. There is no free product.
   c. The nearest existing water supply well or surface water body is greater than 1,000 feet from the defined plume boundary.
   d. The dissolved concentration of benzene is less than 1,000 µg/l, and the dissolved concentration of MTBE is less than 1,000 µg/l.

(5) a. The regulatory agency determines, based on an analysis of site specific conditions that under current and reasonably anticipated near-term future scenarios, the contaminant plume poses a low threat to human health and safety and to the environment and water quality objectives will be achieved within a reasonable time frame.

Sites with Releases That Have Not Affected Groundwater
Sites with soil that does not contain sufficient mobile constituents [leachate, vapors, or light non-aqueous-phase liquids (LNAPL)] to cause groundwater to exceed the groundwater criteria in this policy shall be considered low-threat sites for the groundwater medium. Provided the general criteria and criteria for other media are also met, those sites are eligible for case closure.

For older releases, the absence of current groundwater impact is often a good indication that residual concentrations present in the soil are not a source for groundwater pollution.

2. Petroleum Vapor Intrusion to Indoor Air
Exposure to petroleum vapors migrating from soil or groundwater to indoor air may pose unacceptable human health risks. This policy describes conditions, including bioattenuation zones, which if met will assure that exposure to petroleum vapors in indoor air will not pose unacceptable health risks. In many petroleum release cases, potential human exposures to vapors are mitigated by bioattenuation processes as vapors migrate toward the ground surface. For the purposes of this section, the term "bioattenuation zone" means an area of soil with conditions that support biodegradation of petroleum hydrocarbon vapors.

The low-threat vapor-intrusion criteria described below apply to sites where the release originated and impacted or potentially impacted adjacent parcels when: (1) existing buildings are occupied or may be reasonably expected to be occupied in the future, or
(2) buildings for human occupancy are reasonably expected to be constructed in the future. Appendices 1 through 4 (attached) illustrate four potential exposure scenarios and describe characteristics and criteria associated with each scenario. Petroleum release sites shall satisfy the media-specific criteria for petroleum vapor intrusion to indoor air and be considered low-threat for the vapor-intrusion-to-indoor-air pathway if:

a. Site-specific conditions at the release site satisfy all of the characteristics and criteria of scenarios 1 through 3 as applicable, or all of the characteristics and criteria of scenario 4 as applicable; or

b. A site-specific risk assessment for the vapor intrusion pathway is conducted and demonstrates that human health is protected to the satisfaction of the regulatory agency; or

c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, the regulatory agency determines that petroleum vapors migrating from soil or groundwater will have no significant risk of adversely affecting human health.

Exception: Exposures to petroleum vapors associated with historical fuel system releases are comparatively insignificant relative to exposures from small surface spills and fugitive vapor releases that typically occur at active fueling facilities. Therefore, satisfaction of the media-specific criteria for petroleum vapor intrusion to indoor air is not required at active commercial petroleum fueling facilities, except in cases where release characteristics can be reasonably believed to pose an unacceptable health risk.

3. Direct Contact and Outdoor Air Exposure

This policy describes conditions where direct contact with contaminated soil or inhalation of contaminants volatized to outdoor air poses a low threat to human health. 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 they meet any of the following:

a. Maximum concentrations of petroleum constituents in soil are less than or equal to those listed in Table 1 for the specified depth below ground surface (bgs). The concentration limits for 0 to 5 feet bgs protect from ingestion of soil, dermal contact with soil, and inhalation of volatile soil emissions and inhalation of particulate emissions. The 5 to 10 feet bgs concentration limits protect from inhalation of volatile soil emissions. Both the 0 to 5 feet bgs concentration limits and the 5 to 10 feet bgs concentration limits for the appropriate site classification (Residential or Commercial/Industrial) shall be satisfied. In addition, if exposure to construction workers or utility trench workers are reasonably anticipated, the concentration limits for Utility Worker shall also be satisfied; or

b. Maximum concentrations of petroleum constituents in soil are less than levels that a site specific risk assessment demonstrates will have no significant risk of adversely affecting human health; or

c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, the regulatory agency determines that the concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health.

Table 1

Concentrations of Petroleum Constituents in Soil That Will Have No Significant Risk of Adversely Affecting Human Health

Chemical	Residential		Commercial/ Industrial		Utility Worker
	0 to 5 feet bgs	Volatilization to outdoor air (5 to 10 feet bgs)	0 to 5 feet bgs	Volatilization to outdoor air (5 to 10 feet bgs)	0 to 10 feet bgs
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Benzene	1.9	2.8	8.2	12	14
Ethylbenzene	21	32	89	134	314
Naphthalene	9.7	9.7	45	45	219
PAH[1]	0.063	NA	0.68	NA	4.5

Notes:

1. Based on the seven carcinogenic poly-aromatic hydrocarbons (PAHs) as benzo(a)pyrene toxicity equivalent [BaPe]. Sampling and analysis for PAH is only necessary where soil as affected by either waste oil or Bunker C fuel.
2. The area of impacted soil where a particular exposure occurs is 25 by 25 meters (approximately 82 by 82 feet) or less.
3. NA = not applicable
4. mg/kg = milligrams per kilogram

Low-Threat Case Closure

Cases that meet the general and media-specific criteria established in this policy pose a low threat to human health, safety and the environment and satisfy the case-closure requirements of Health and Safety Code section 25296.10, and case closure is consistent with State Water Board Resolution 92-49 that requires that cleanup goals and objectives be met within a reasonable time frame. If the case has been determined by the regulatory agency to meet the criteria in this policy, the regulatory agency shall notify responsible parties that they are eligible for case closure and that the following items, if applicable, shall be completed prior to the issuance of a uniform closure letter specified in Health and Safety Code section 25296.10. After completion of these items, and unless the regulatory agency revises its determination based on comments received on the proposed case closure, the regulatory agency shall issue a uniform closure letter within 30 days from the end of the comment period.

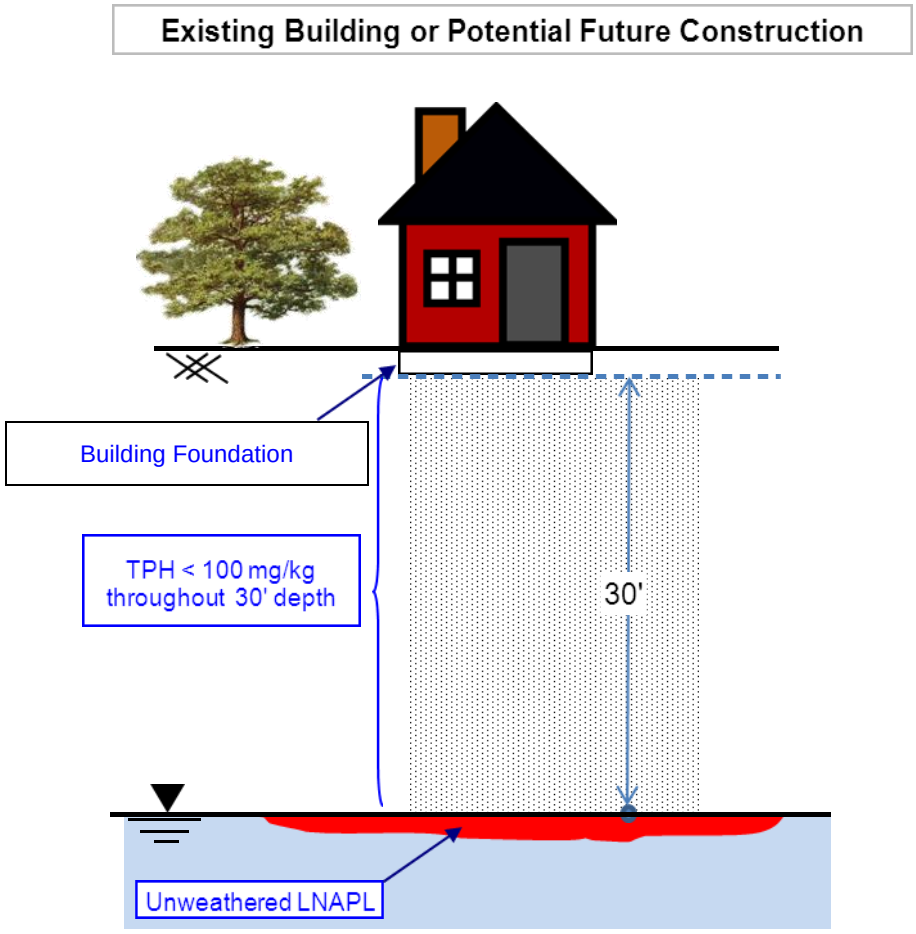
a. Notification Requirements – Municipal and county water districts, water replenishment districts, special act districts with groundwater management authority, agencies with authority to issue building permits for land affected by the petroleum release, owners and occupants of the property impacted by the petroleum release, and the owners and occupants of all parcels adjacent to the impacted property shall be notified of the proposed case closure and provided a 60 day period to comment. The regulatory agency shall consider any comments received when determining if the case should be closed or if site specific conditions warrant otherwise.

b. Monitoring Well Destruction – All wells and borings installed for the purpose of investigating, remediating, or monitoring the unauthorized release shall be properly destroyed prior to case closure unless a property owner certifies that they will keep and maintain the wells or borings in accordance with applicable local or state requirements.

c. Waste Removal – All waste piles, drums, debris and other investigation or remediation derived materials shall be removed from the site and properly managed in accordance with regulatory agency requirements.

Appendix 1
Scenario 1: Unweathered* LNAPL in Groundwater

Required Characteristics of the Bioattenuation Zone



Required Characteristics of the Bioattenuation Zone:

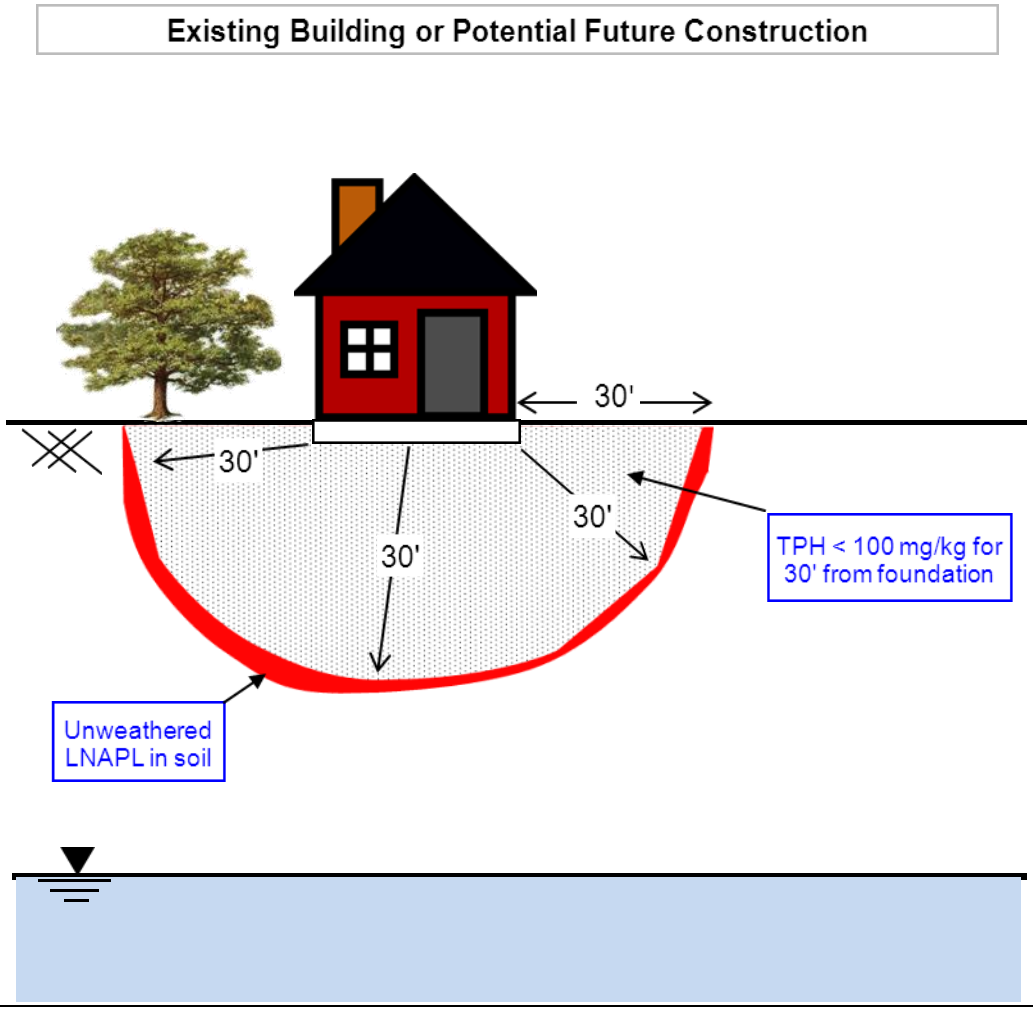
1. The bioattenuation zone shall be a continuous zone that provides a separation of at least 30 feet vertically between the LNAPL in groundwater and the foundation of existing or potential buildings; and
2. Total TPH (TPH-g and TPH-d combined) are less than 100 mg/kg throughout the entire depth of the bioattenuation zone.

TPH = total petroleum hydrocarbons
TPH-g = total petroleum hydrocarbons as gasoline
TPH-d = total petroleum hydrocarbons as diesel

*As used in this context, unweathered LNAPL is generally understood to mean petroleum product that has not been subjected to significant volatilization or solubilization, and therefore has not lost a significant portion of its volatile or soluble constituents (e.g., comparable to recently dispensed fuel).

Appendix 2
Scenario 2: Unweathered* LNAPL in Soil

Required Characteristics of the Bioattenuation Zone



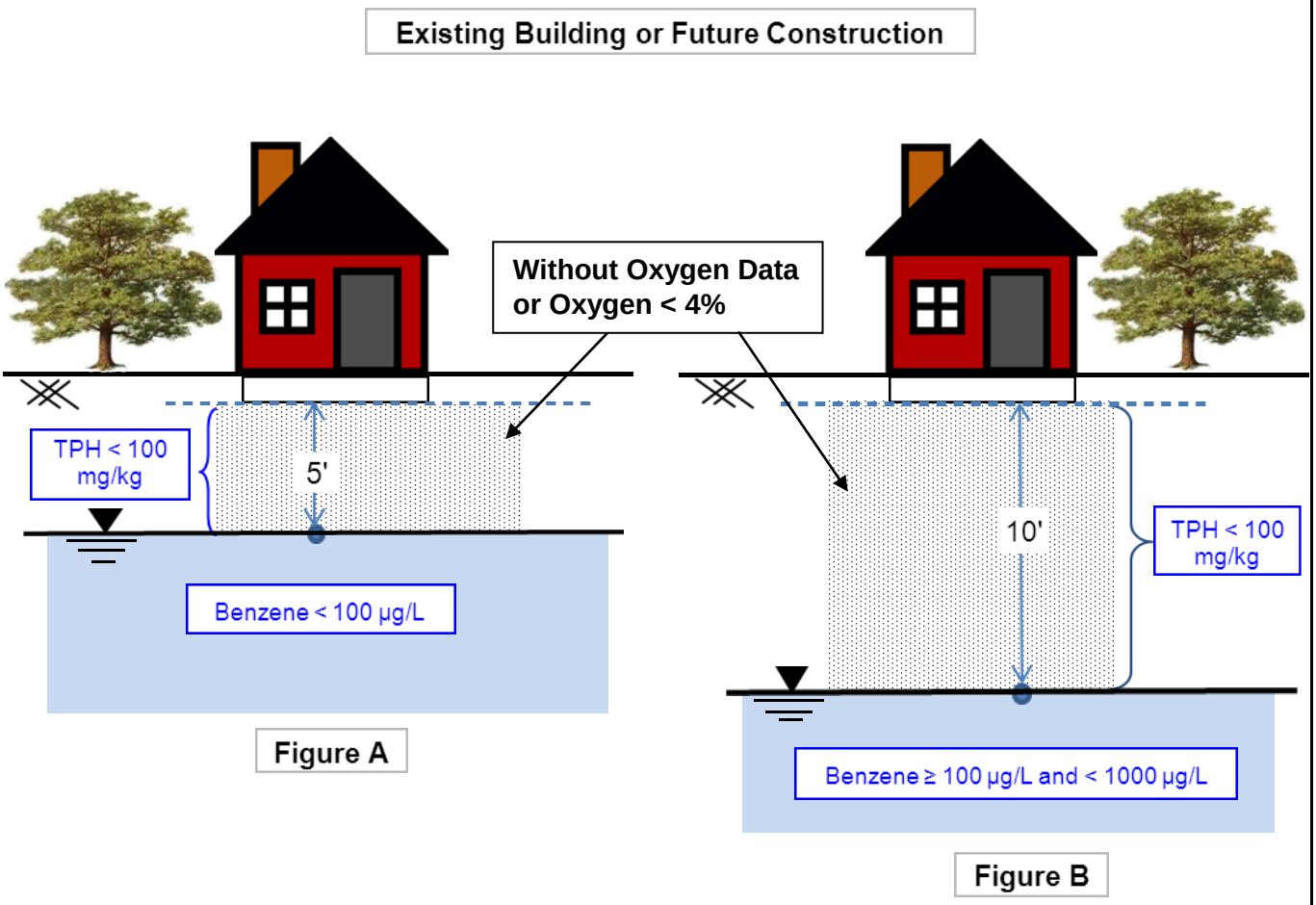
Required Characteristics of the Bioattenuation Zone:

1. The bioattenuation zone shall be a continuous zone that provides a separation of at least 30 feet both laterally and vertically between the LNAPL in soil and the foundation of existing or potential buildings, and
2. Total TPH (TPH-g and TPH-d combined) are less than 100 mg/kg throughout the entire lateral and vertical extent of the bioattenuation zone.

*As used in this context, unweathered LNAPL is generally understood to mean petroleum product that has not been subjected to significant volatilization or solubilization, and therefore has not lost a significant portion of its volatile or soluble constituents (e.g., comparable to recently dispensed fuel).

Appendix 3
Scenario 3 - Dissolved Phase Benzene Concentrations in Groundwater
(Low concentration groundwater scenarios with or without oxygen data)
(1 of 2)

Defining the Bioattenuation Zone Without Oxygen Data or Oxygen < 4%



Required Characteristics of Bioattenuation Zone for Sites Without Oxygen Data or Where Oxygen is < 4%

Figure A: 1) Where benzene concentrations are less than 100 µg/L, the bioattenuation zone:

a) Shall be a continuous zone that provides a separation of at least 5 feet vertically between the dissolved phase Benzene and the foundation of existing or potential buildings; and
b) Contain Total TPH (TPH-g and TPH-d combined) less than 100 mg/kg throughout the entire depth of the bioattenuation zone.

Figure B: 1) Where benzene concentrations are equal to or greater than 100 µg/L but less than 1000 µg/L, the bioattenuation zone:

a) Shall be a continuous zone that provides a separation of at least 10 feet vertically between the dissolved phase Benzene and the foundation of existing or potential buildings; and b) Contain Total TPH (TPH-g and TPH-d combined) less than 100 mg/kg throughout the entire depth of the bioattenuation zone.

Appendix 3
Scenario 3 - Dissolved Phase Benzene Concentrations in Groundwater
(Low concentration groundwater scenarios with or without oxygen data)
(2 of 2)

Defining the Bioattenuation Zone With Oxygen ≥ 4%

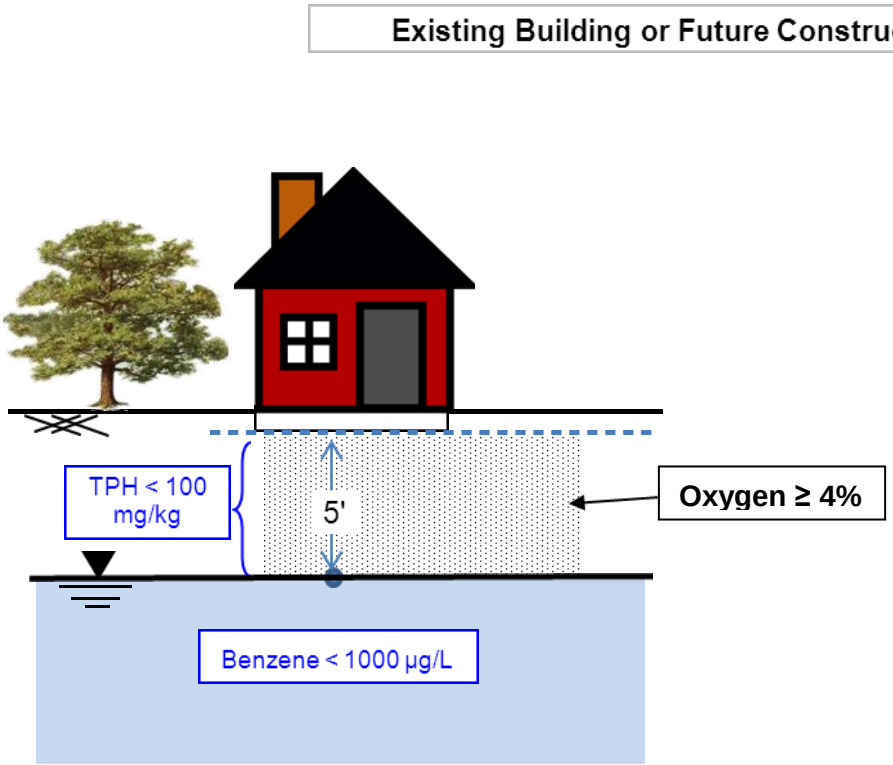


Figure C

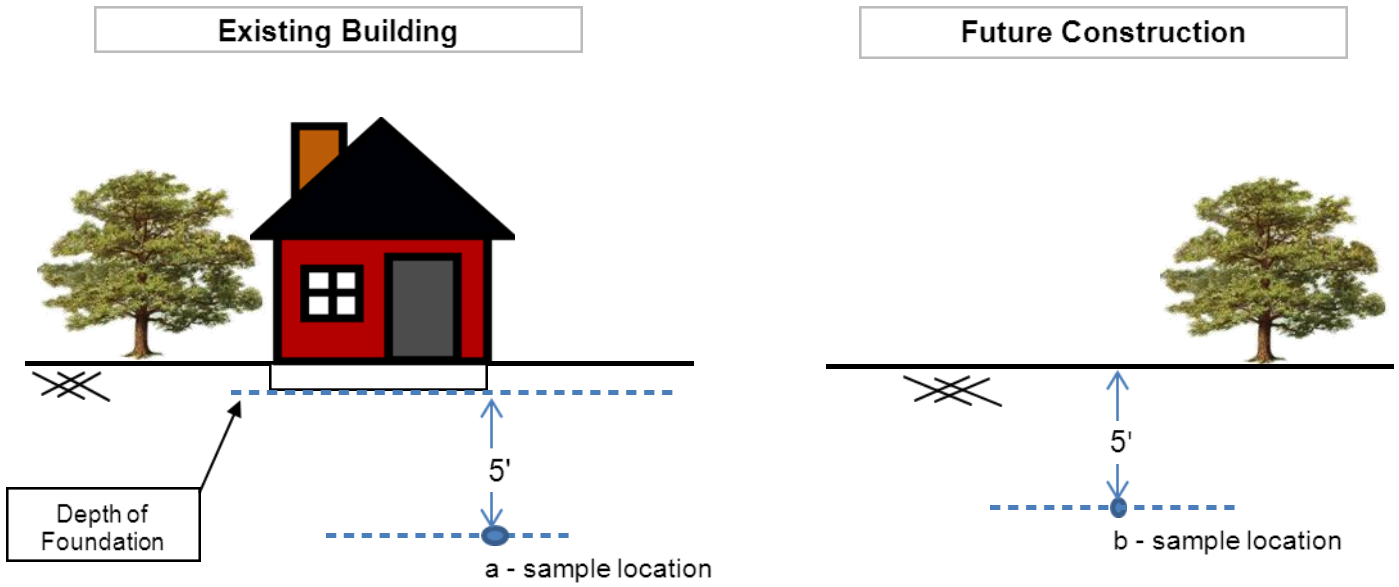
Required Characteristics of Bioattenuation Zone for Sites With Oxygen ≥ 4%

Where benzene concentrations are less than 1000 µg/L, the bioattenuation zone:

1. Shall be a continuous zone that provides a separation of least 5 feet vertically between the dissolved phase Benzene and the foundation of existing or potential buildings; and
2. Contain Total TPH (TPH-g and TPH-d combined) less than 100 mg/kg throughout the entire depth of the bioattenuation zone.

Appendix 4
Scenario 4 - Direct Measurement of Soil Gas Concentrations
(1 of 2)

Soil Gas Sampling – No Bioattenuation Zone



The criteria in the table below apply unless the requirements for a bioattenuation zone, established below, are satisfied.

When applying the criteria below, the soil gas sample must be obtained from the following locations:

a. Beneath or adjacent to an existing building: The soil gas sample shall be collected at least five feet below the bottom of the building foundation.
b. Future construction: The soil gas sample shall be collected from at least five feet below ground surface.

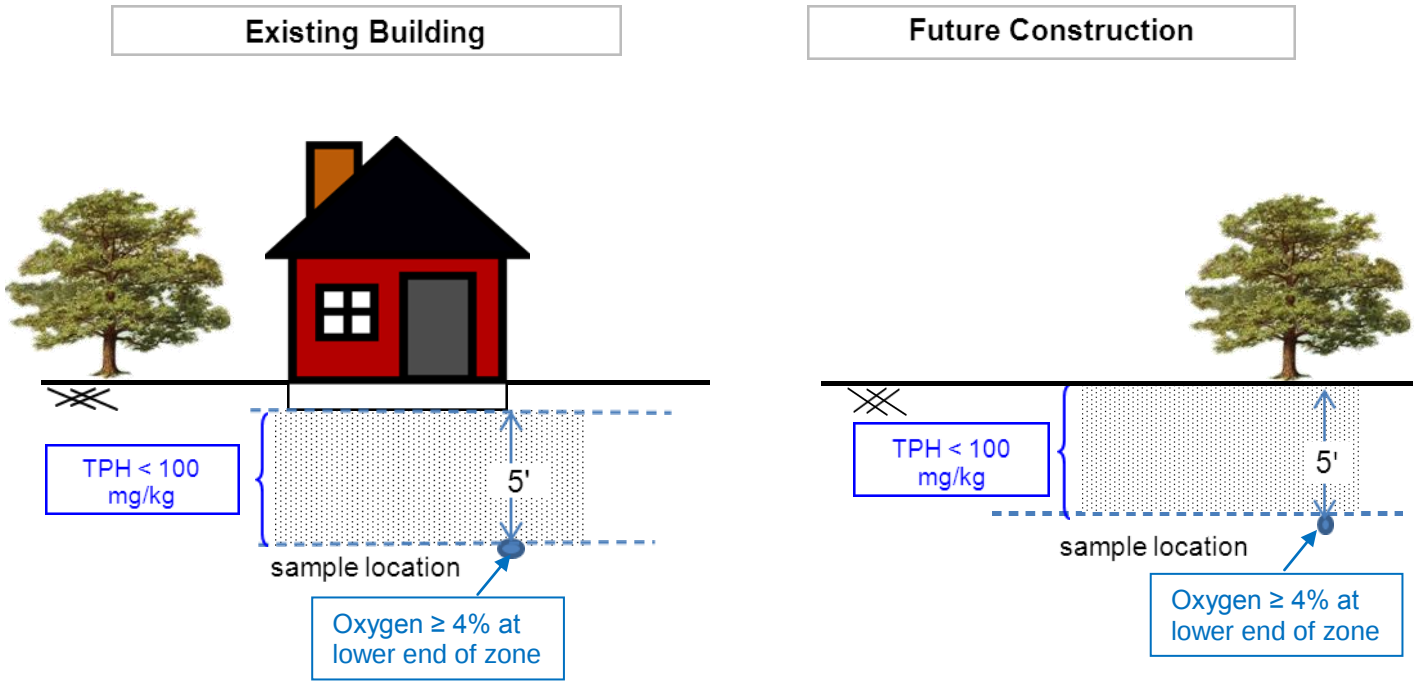
Soil Gas Criteria (µg/m^3)

	No Bioattenuation Zone*	
	Residential	**Commercial**
Constituent	Soil Gas Concentration (µg/m^3)	
Benzene	< 85	< 280
Ethylbenzene	<1,100	<3,600
Naphthalene	< 93	< 310

*For the no bioattenuation zone, the screening criteria are same as the California Human Health Screening Levels (CHHSLs) with engineered fill below sub-slab.

Appendix 4
Scenario 4 - Direct Measurement of Soil Gas Concentrations
(2 of 2)

Soil Gas Sampling – With Bioattenuation Zone



The criteria in the table below apply if the following requirements for a biattenuation zone are satisfied:

1. There is a minimum of five vertical feet of soil between the soil vapor measurement and the foundation of an existing building or ground surface of future construction.
2. TPH (TPHg + TPHd) is less than 100 mg/kg (measured in at least two depths within the five-foot zone.)
3. Oxygen is greater than or equal to four percent measured at the bottom of the five-foot zone.

Soil Gas Criteria (µg/m^3)

	With Bioattenuation Zone**	
	Residential	**Commercial**
Constituent	Soil Gas Concentration (µg/m^3)	
Benzene	< 85,000	< 280,000
Ethylbenzene	<1,100,000	<3,600,000
Naphthalene	< 93,000	< 310,000

**A 1000-fold bioattenuation of petroleum vapors is assumed for the bioattenuation zone.

APPENDIX E

Table E-1
Site Conceptual Model
Shore Acres Gas
403 East 12th Street
Oakland, California

CSM Element	CSM Sub-Element	Description	Data Gap Item # echnical Comment	Resolution
Geology and Hydrogeology	Regional	The site is underlain by Quaternary-age dune sand deposits referred to as the Merritt Sand. The Merritt Sand is typically described as loose, well-sorted fine- to medium-grained sand with a large silt component. The sand is reported to reach a maximum depth of 50-feet bgs in the area.	None	NA
Geology and Hydrogeology	Site	Based on boring logs from the advancement of 11 soil borings and the installation of six monitoring wells and four extraction wells, the stratigraphy of the site and vicinity consists of silt to approximately 30-feet bgs with discontinuous thin intervals of sandy silt and clayey silty sand present in the area. Depth to groundwater is shallow and semi confined, ranging between 8- to 14-feet bgs. The groundwater flow direction appears to be generally toward the southeast. The site is located on a topographic high elevation. The most recent groundwater gradient map is shown on Figure 3 and a Rose Diagram is shown on Figure 4.	None	NA
Surface Water Bodies		The nearest surface water body is Lake Merritt, which is approximately 1,400-feet to the northwest. The Oakland Marine channel is located approximately 2,300-feet to the southwest of the site	None	NA
Nearby Wells		Based on the results of the well search conducted at the Department of Water Resources (DWR), 3 wells were identified within approximately 2,000 feet of the site. All of the located wells were identified as monitoring wells or test holes. Mr. Harvey Hanoi with East Bay Municipal Utilities District stated that there are no drinking water wells located within 2,000 feet of the site. REVIEW OF ACPWA PENDING	6. Additional receptor survey.	See data gaps table. ACPWA review proposed.

Table E-1
Site Conceptual Model
Shore Acres Gas
403 East 12th Street
Oakland, California

CSM Element	CSM Sub-Element	Description	Data Gap Item # echnical Comment	Resolution
Release Source and Volume		The site was historically used as a gasoline station. The area of interest at the site is the former location of three underground storage tanks (USTs), one 12,000-gallon diesel and two 12,000-gallon gasoline, and three fuel dispenser islands where impacted soil and groundwater was identified in 2009 after the tank removals. No holes were observed in any of the USTs, but evidence of soil contamination was present near the fill end of each UST. Evidence of soil contamination was also present under the dispensers. Impacted groundwater was encountered in the UST pit. The volume of the release is not known.	2. Additional soil data is required in the source area	See data gaps table. Slot trenches will be dug in source areas.
LNAPL		Currently LNAPL is present in well MW-5 and concentrations of contaminants of concern in wells MW-1 and MW-6 indicate indirect evidence of LNAPLs.	1. Need LNAPL removal.	Passive free products skimmers to be installed in wells of concern.
Source Removal Activities		Soil that was excavated from the UST pits during tank removal activities and was returned to the excavation after the collection of soil samples for chemical analysis. A dual phase extraction system was in operation intermittently at the site from May 2014 to April 2016 and removed approximately 8,432 pounds of TPHg, 50 pounds of benzene, and 3 pounds of MTBE.	2. Remove additional impacted source material	Test pits will be dug in source areas to investigate and remove impacted source material.
Contaminants of Concern		Based on historical investigations conducted at the Site and correspondence with Alameda County, TPHg, BTEX, MTBE, and TBA are the contaminants of concern (COC) for the Site.	None	NA

Table E-1
Site Conceptual Model
Shore Acres Gas
403 East 12th Street
Oakland, California

CSM Element	CSM Sub-Element	Description	Data Gap Item # echnical Comment	Resolution
Petroleum Hydrocarbons in Soil		Six monitoring wells, two extraction wells, and 22 soil borings have been advanced at the site and the lateral extent of impacted soil is shown on Figures 16 through 20. The boring and well locations are shown on Figure 2 and cross sections are shown on Figures 9 through 15. Soil analytical results are summarized on Tables 2a and 2b and they show reported soil concentrations did exceed ESLs for TPHg at locations GP-1, GP-2, SB-1, SB-4, SB-5, SB-6, SB-7, SB-8, SB-9, MW-3, MW-4, MW-5, VW-1, and VW-2 and did exceed ESLs for benzene at locations GP-1, GP-2, SB-1, SB-2, SB-4, SB-6, SB-7, SB-8, SB-9, MW-1, MW-3, MW-4, MW-5, VW-1, and VW-2 at depths of approximately 10- feet (below ground surface) bgs or greater. In addition, soil concentrations did exceed ESLs for toluene, ethyl benzene, and xylenes at multiple locations. The TPHg and BTEX soil concentrations do appear to be vertically defined and the lithology at the site would discourage vertical migration. All soil results above ESLs are located in or just adjacent to the more transmissive zones located between approximately 10- to 20-feet bgs. No data for naphthalene has been obtained. This has been defined as a significant data gap. The scope of work presented in this workplan includes the collection and analyses of soil samples for naphthalene.	2. 4. & 5. Additional soil data is required in the source area	See data gaps table. Test pits will be dug in source areas. Soil vapor probes will be installed.

Table E-1
Site Conceptual Model
Shore Acres Gas
403 East 12th Street
Oakland, California

CSM Element	CSM Sub-Element	Description	Data Gap Item # echnical Comment	Resolution
Petroleum Hydrocarbons in Groundwater		Reported concentrations in groundwater have exceeded ESLs for TPHg, BTEX, and MTBE. Groundwater samples were collected from 21 direct-push borings, six monitoring wells, and two extraction wells and the analytical results (Tables 3a, 3b, 4a, and 4b) showed ESLs were exceeded for TPHg in SB-4, SB-6, SB-7, SB-11, SB-12, SB-13, SB-15 through SB-19, MW-1 through MW-6, VW-1, and VW-2. ESLs for benzene were exceeded in SB-4, SB-11, SB-12, SB-13, SB-16, and SB-17, MW-1 through MW-6, VW-1, and VW-2. ESLs for MTBE were exceeded in SB-6, SB-7, and SB-19, MW-1, MW-3, MW-5, MW-6, and VW-2. Groundwater isoconcentration maps using the offsite grab sample data are provided as Figures 21 through 23. Groundwater concentrations have not been defined horizontally to the southeast of the site. This has been defined as a significant data gap. The scope of work presented in this workplan includes the installation of two groundwater wells downgradient from the Site.	3. Lateral impacted groundwater is not defined.	See data gaps table. Two downgradient wells will be installed as described in the data gaps table in the workplan.
Risk Evaluation		The primary source; impacted media; release mechanism; secondary sources; exposure route; potential receptors, and an assessment of whether the exposure pathway is potentially complete, incomplete, or insignificant. Potential exposure routes that have been evaluated include incidental ingestion, dermal contact, dust inhalation, and vapor inhalation.	4. & 5. Vapor intrusion to indoor air and direct contact to outdoor air.	See data gaps table. Three soil vapor probes will be installed and indoor air

Table E-1
Site Conceptual Model
Shore Acres Gas
403 East 12th Street
Oakland, California

CSM Element	CSM Sub-Element	Description	Data Gap Item # echnical Comment	Resolution
		Volatilization from soil to indoor air and outdoor air, vapor inhalation are the potential exposure pathways.	Proposed work includes the installation of three soil vapor probes and collection of outdoor and indoor air samples.	samples will be collected as described in the data gaps table in the workplan.

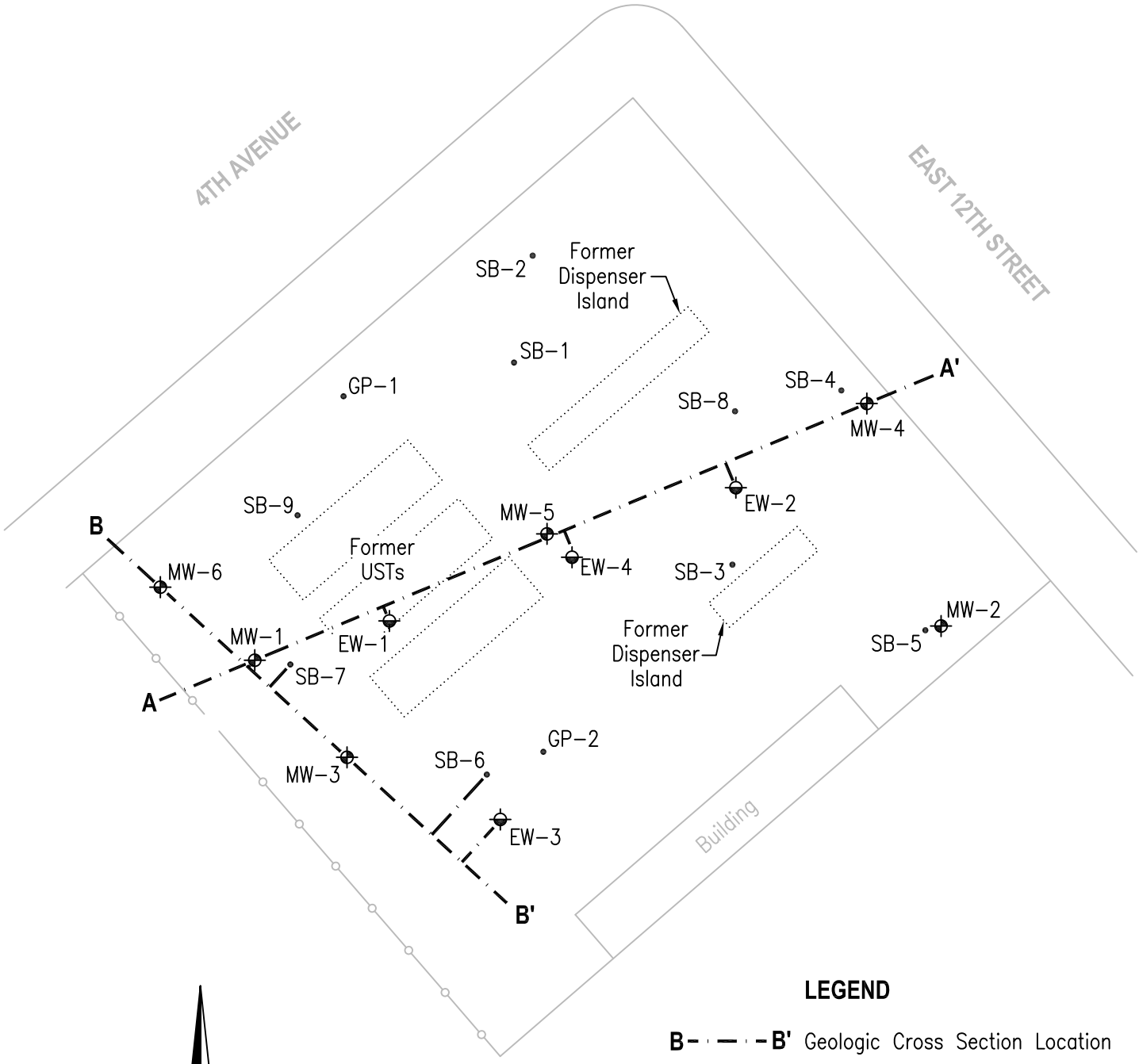


FIGURE 9	**CROSS SECTION LOCATION MAP**	Environmental Compliance Group, LLC
Project Number: GHA.19009	Shore Acre Gas 403 East 12th Street Oakland, California	270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664-1035
Date: February 28, 2018		

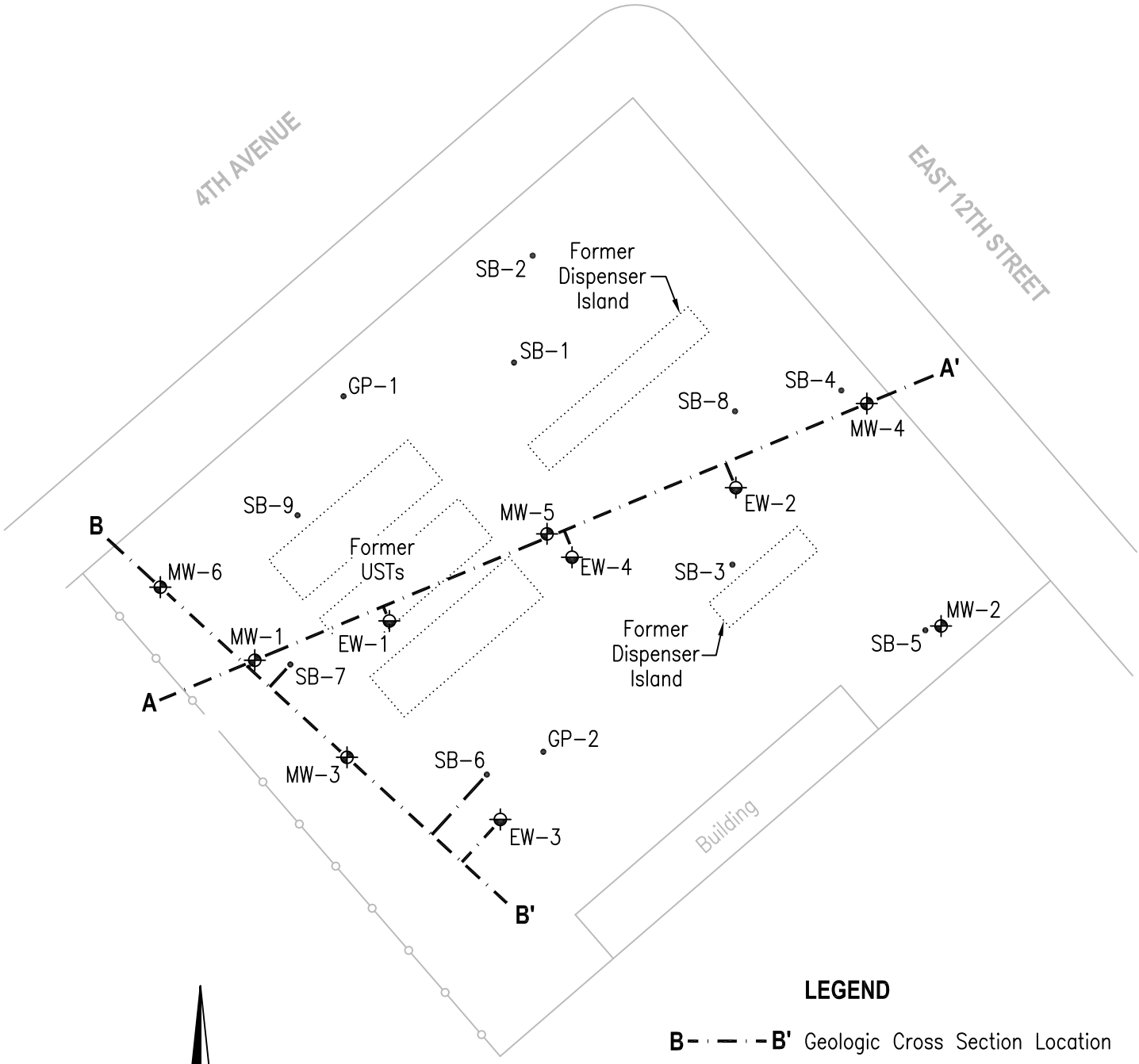
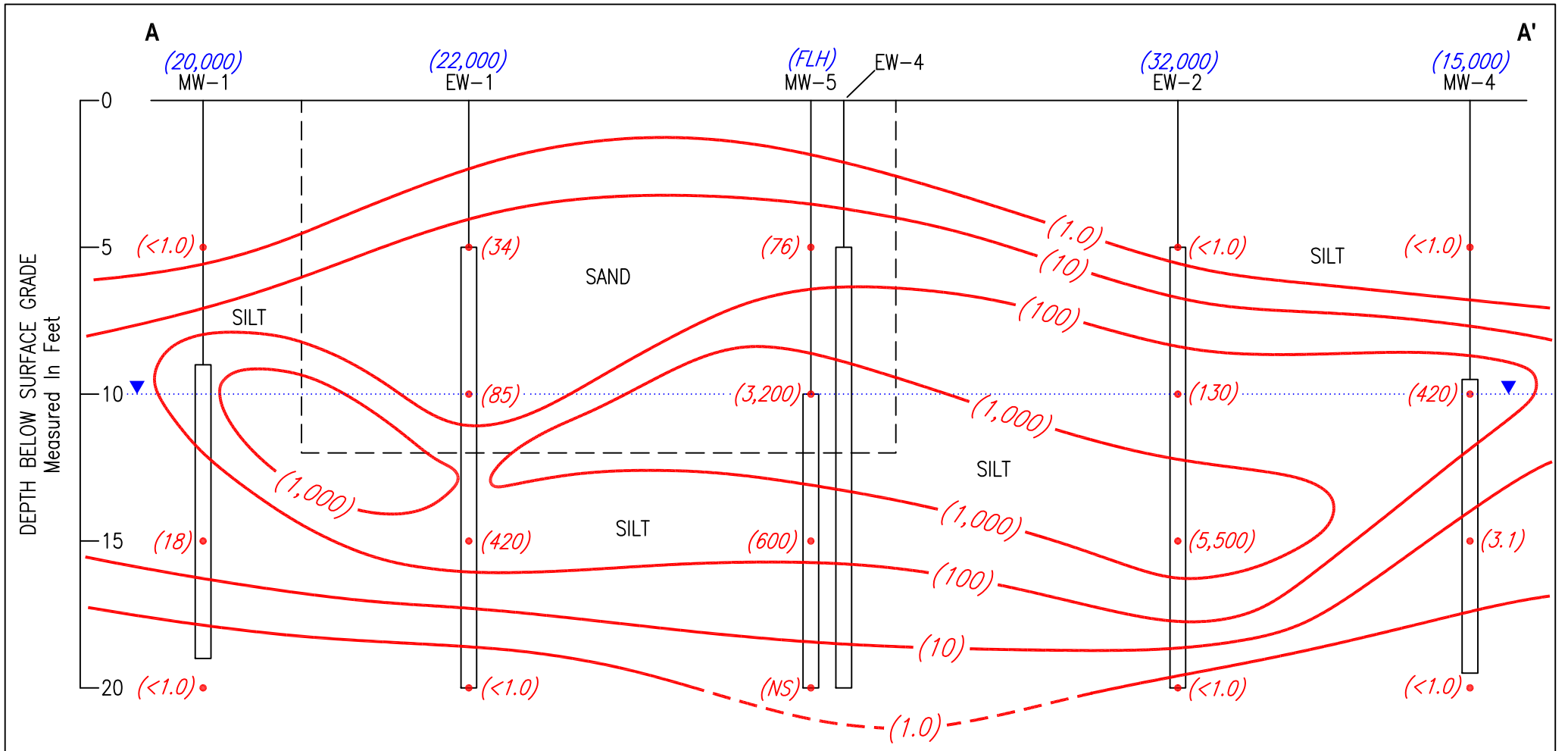


FIGURE E-1	**CROSS SECTION LOCATION MAP**	Environmental Compliance Group, LLC
Project Number: GHA.19009	Shore Acre Gas 403 East 12th Street Oakland, California	270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664-1035
Date: February 28, 2018		



LEGEND

- Soil Sample Location
- Screened Interval
- Approximate Lithologic Contact
- (NS) Not Sampled
- (5,500) Concentration Of TPHg In Soil Measured In mg/Kg
- (1,000) Line Of Equal Concentration Of TPHg In Soil Measured In mg/Kg (Dashed Where Inferred)
- (32,000) Concentration Of Benzene In Groundwater Measured In ug/L Sampled September 14, 2012
- (FLH) Floating Liquid Hydrocarbons
- Groundwater Level

5
0
0
10
Approximate Scale In Feet
(Vertical Exaggeration = 2X)

FIGURE E-2

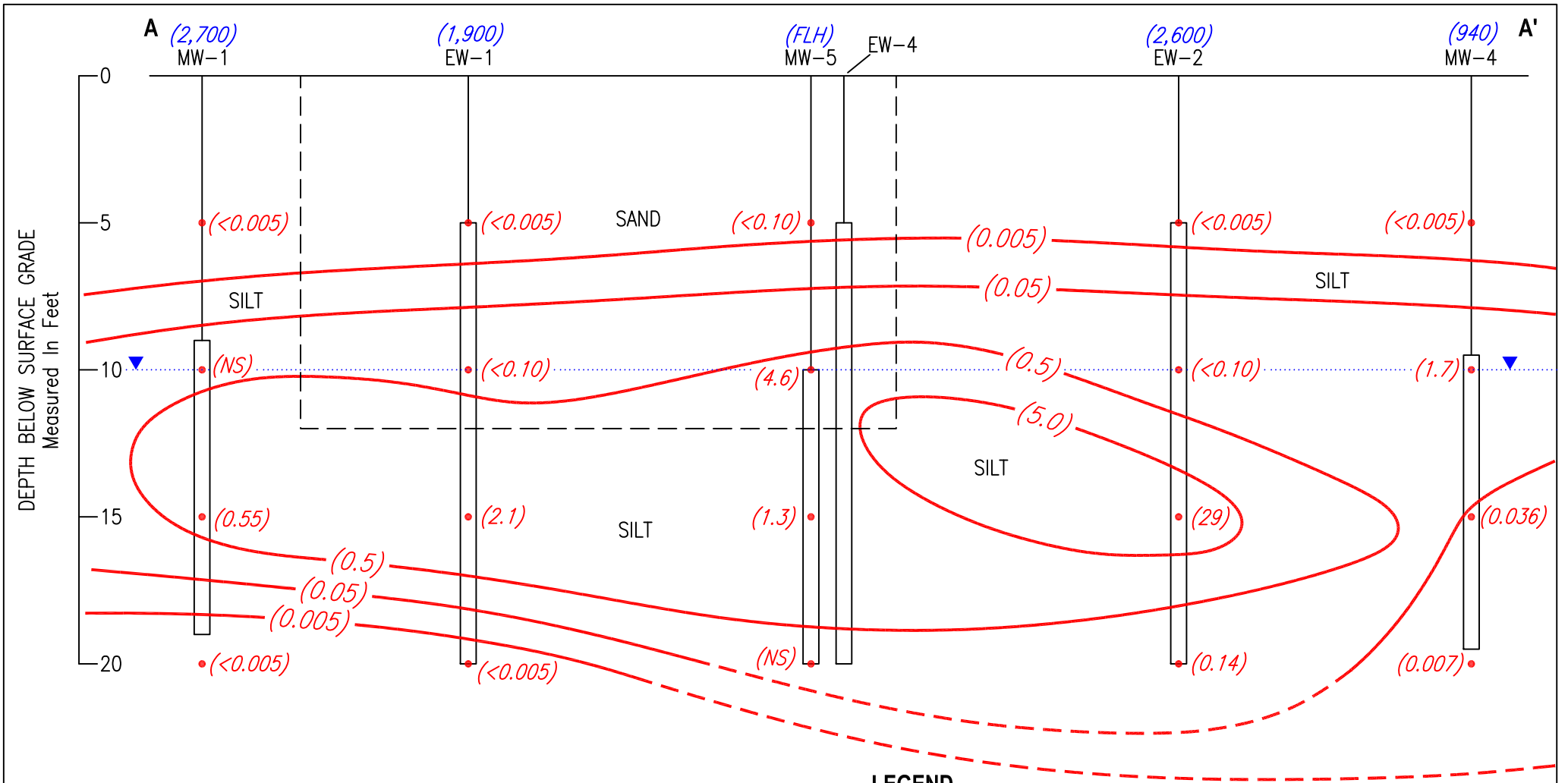
Project Number:
GHA.19009

Date:
February 28, 2018

TPHg IN SOIL ISOCONCENTRATION MAP CROSS SECTION A-A'

Shore Acre Gas
403 East 12th Street
Oakland, California

Environmental Compliance Group, LLC
270 Vintage Drive, Turlock, CA 95382
Phone: (209) 664-1035



LEGEND

- Soil Sample Location
- Screened Interval
- Approximate Lithologic Contact
- (NS) Not Sampled
- (29) Concentration Of Benzene In Soil Measured In mg/Kg
- (5.0) Line Of Equal Concentration Of Benzene In Soil Measured In mg/Kg (Dashed Where Inferred)
- (2,700) Concentration Of Benzene In Groundwater Measured In ug/L Sampled September 14, 2012
- (FLH) Floating Liquid Hydrocarbons
- Groundwater Level

5
0
0
10
Approximate Scale In Feet
(Vertical Exaggeration = 2X)

FIGURE E-3

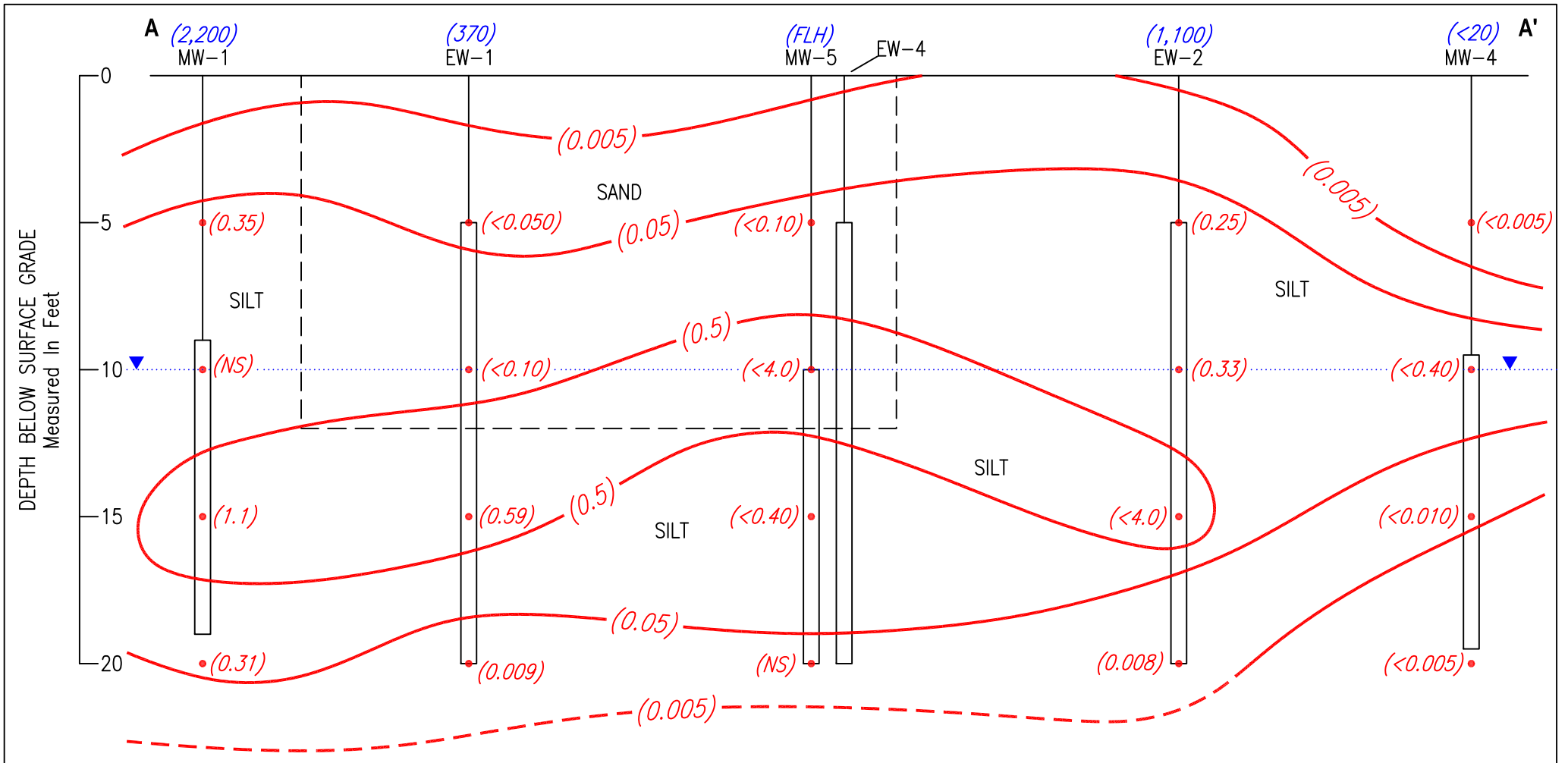
Project Number:
GHA.19009

Date:
February 28, 2018

BENZENE IN SOIL ISOCONCENTRATION MAP CROSS SECTION A-A'

Shore Acre Gas
403 East 12th Street
Oakland, California

Environmental Compliance Group, LLC
270 Vintage Drive, Turlock, CA 95382
Phone: (209) 664-1035



LEGEND

- Soil Sample Location
- Screened Interval
- Approximate Lithologic Contact
- (NS) Not Sampled
- (1.1) Concentration Of MTBE In Soil Measured In mg/Kg
- (0.5) Line Of Equal Concentration Of MTBE In Soil Measured In mg/Kg (Dashed Where Inferred)
- (2,200) Concentration Of Benzene In Groundwater Measured In ug/L Sampled September 14, 2012
- (FLH) Floating Liquid Hydrocarbons
- Groundwater Level

5
0
0
10
Approximate Scale In Feet
(Vertical Exaggeration = 2X)

FIGURE E-4

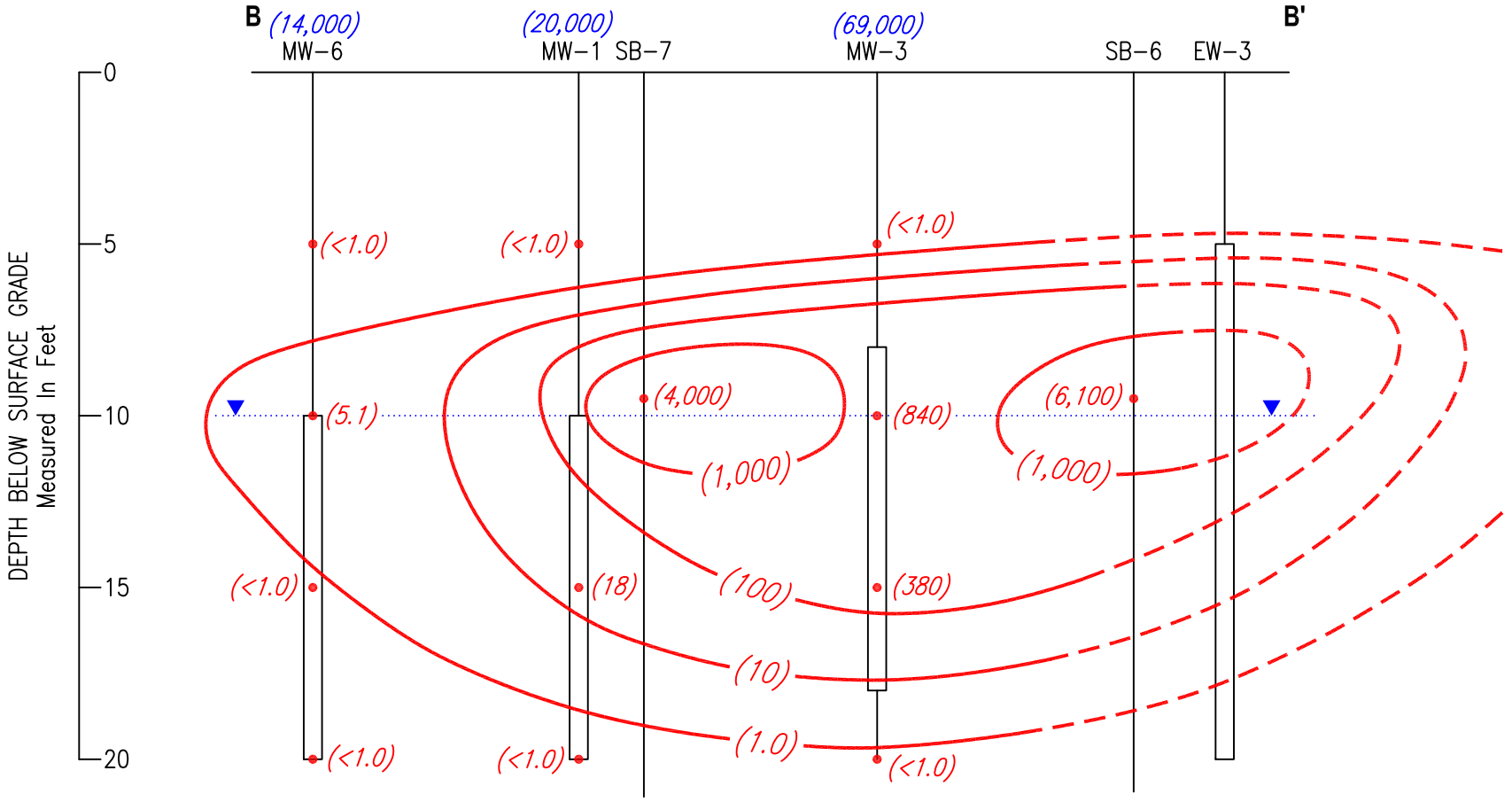
Project Number:
GHA.19009

Date:
February 28, 2018

MTBE IN SOIL ISOCONCENTRATION MAP CROSS SECTION A-A'

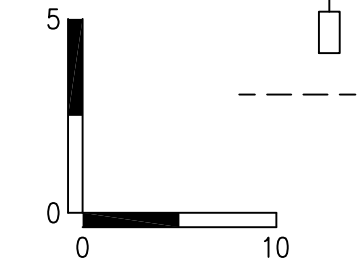
Shore Acre Gas
403 East 12th Street
Oakland, California

Environmental Compliance Group, LLC
270 Vintage Drive, Turlock, CA 95382
Phone: (209) 664-1035



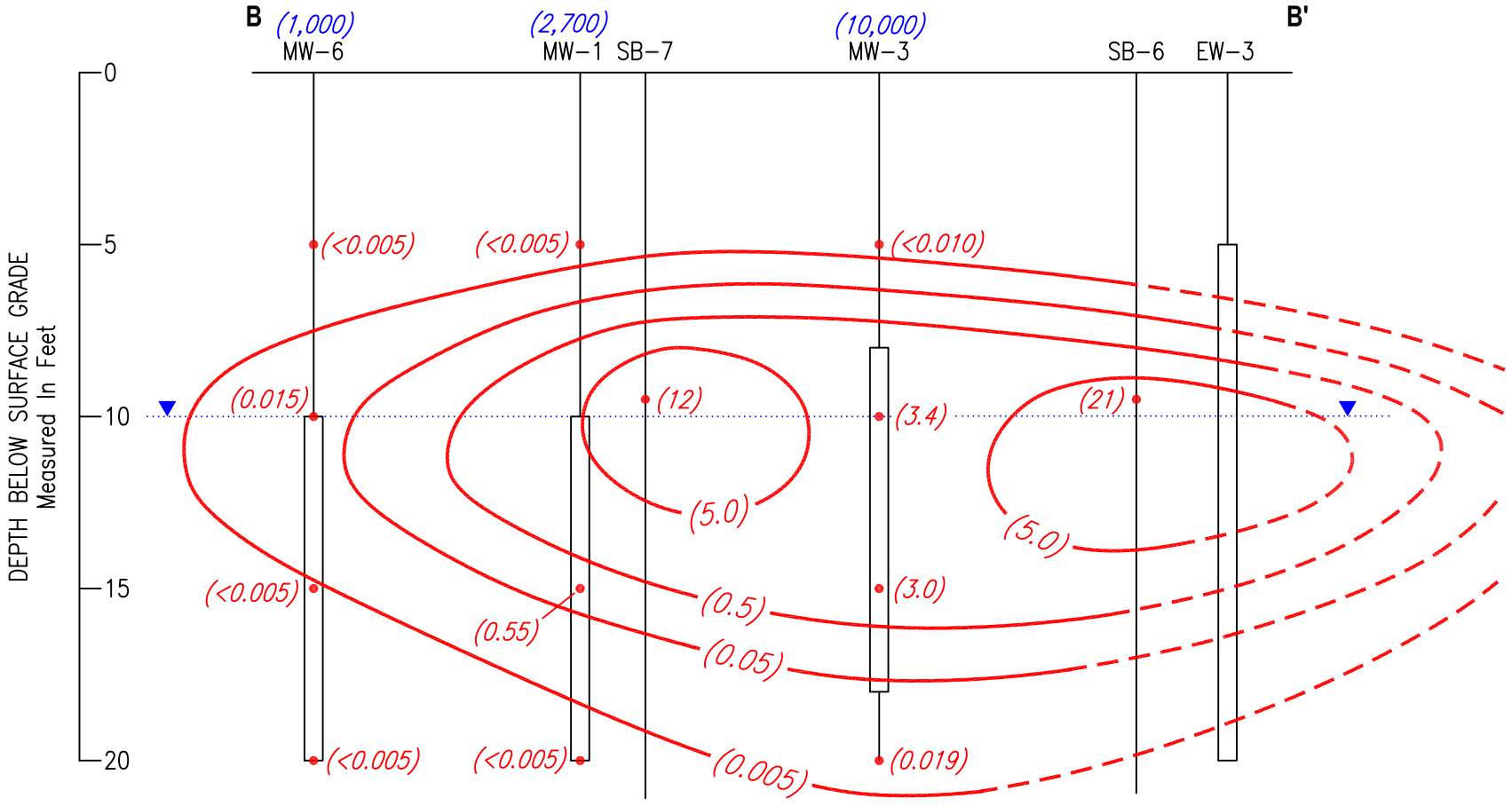
LEGEND

- Soil Sample Location
- Screened Interval
- Approximate Lithologic Contact
- (6,100) Concentration Of TPHg In Soil Measured In mg/Kg
- (1,000) Line Of Equal Concentration Of TPHg In Soil Measured In mg/Kg (Dashed Where Inferred)
- (69,000) Concentration Of TPHg In Groundwater Measured In ug/L Sampled September 14, 2012
- Groundwater Level



Approximate Scale In Feet
(Vertical Exaggeration = 2X)

FIGURE E-5	TPHg IN SOIL ISOCONCENTRATION MAP CROSS SECTION B-B'	Environmental Compliance Group, LLC
Project Number: GHA.19009	Shore Acre Gas 403 East 12th Street Oakland, California	270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664-1035
Date: February 28, 2018		



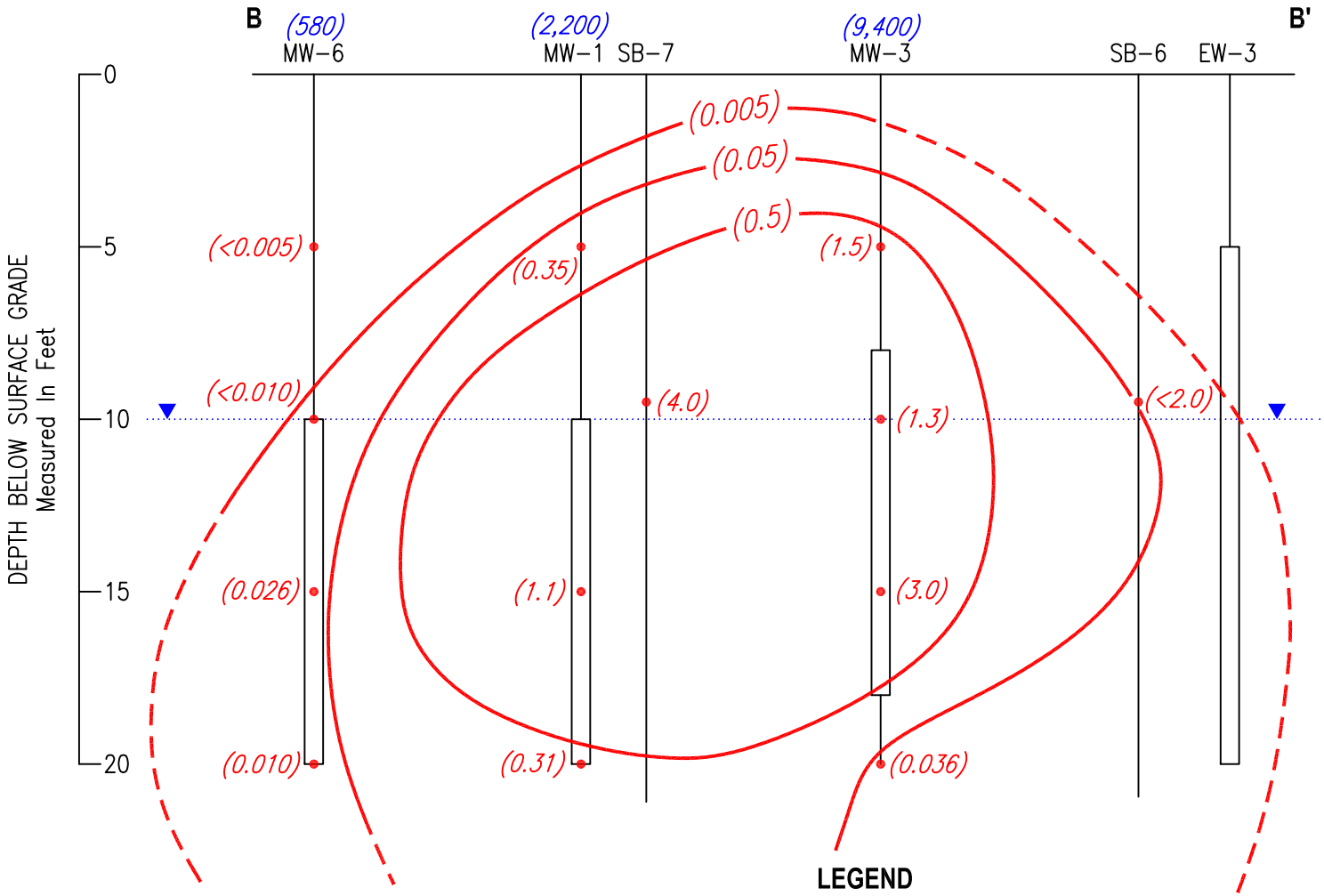
LEGEND

- Soil Sample Location
- Screened Interval
- Approximate Lithologic Contact
- (21) Concentration Of Benzene In Soil Measured In mg/Kg
- (5.0) Line Of Equal Concentration Of Benzene In Soil Measured In mg/Kg (Dashed Where Inferred)
- (10,000) Concentration Of Benzene In Groundwater Measured In ug/L Sampled September 14, 2012
- Groundwater Level

5
0
0
10
Approximate Scale In Feet
(Vertical Exaggeration = 2X)

FIGURE E-6	**BENZENE IN SOIL ISOCONCENTRATION MAP CROSS SECTION B-B'**
Project Number: GHA.19009	Shore Acre Gas 403 East 12th Street Oakland, California
Date: February 28, 2018	

Environmental Compliance Group, LLC
270 Vintage Drive, Turlock, CA 95382
Phone: (209) 664-1035



LEGEND

Soil Sample Location

Screened Interval

Approximate Lithologic Contact

(4.0) Concentration Of MTBE In Soil Measured In mg/Kg

(0.5) Line Of Equal Concentration Of MTBE In Soil Measured In mg/Kg (Dashed Where Inferred)

(9,400) Concentration Of MTBE In Groundwater Measured In ug/L Sampled September 14, 2012

Groundwater Level

5
0
0
10
Approximate Scale In Feet
(Vertical Exaggeration = 2X)

FIGURE E-7

Project Number: GHA.19009

Date: February 28, 2018

MTBE IN SOIL ISOCONCENTRATION MAP CROSS SECTION B-B'

Shore Acre Gas
403 East 12th Street
Oakland, California

Environmental Compliance Group, LLC
270 Vintage Drive, Turlock, CA 95382
Phone: (209) 664-1035

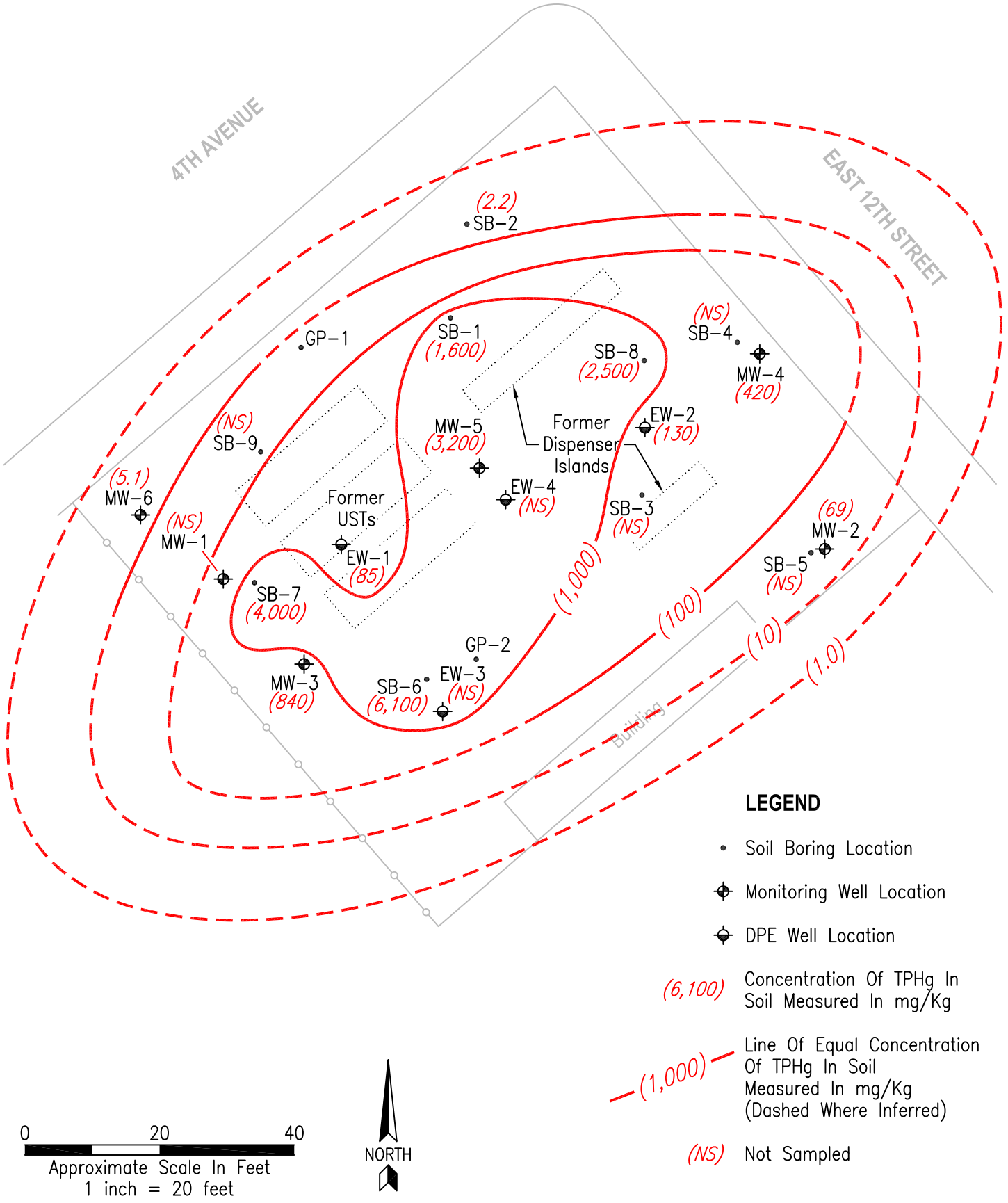


FIGURE E-8 **Project Number:** GHA.19009 **Date:** February 28, 2018	**TPHg IN SOIL AT 10 FEET bgs ISOCONCENTRATION MAP** Shore Acre Gas 403 East 12th Street Oakland, California	**Environmental Compliance Group, LLC** 270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664-1035

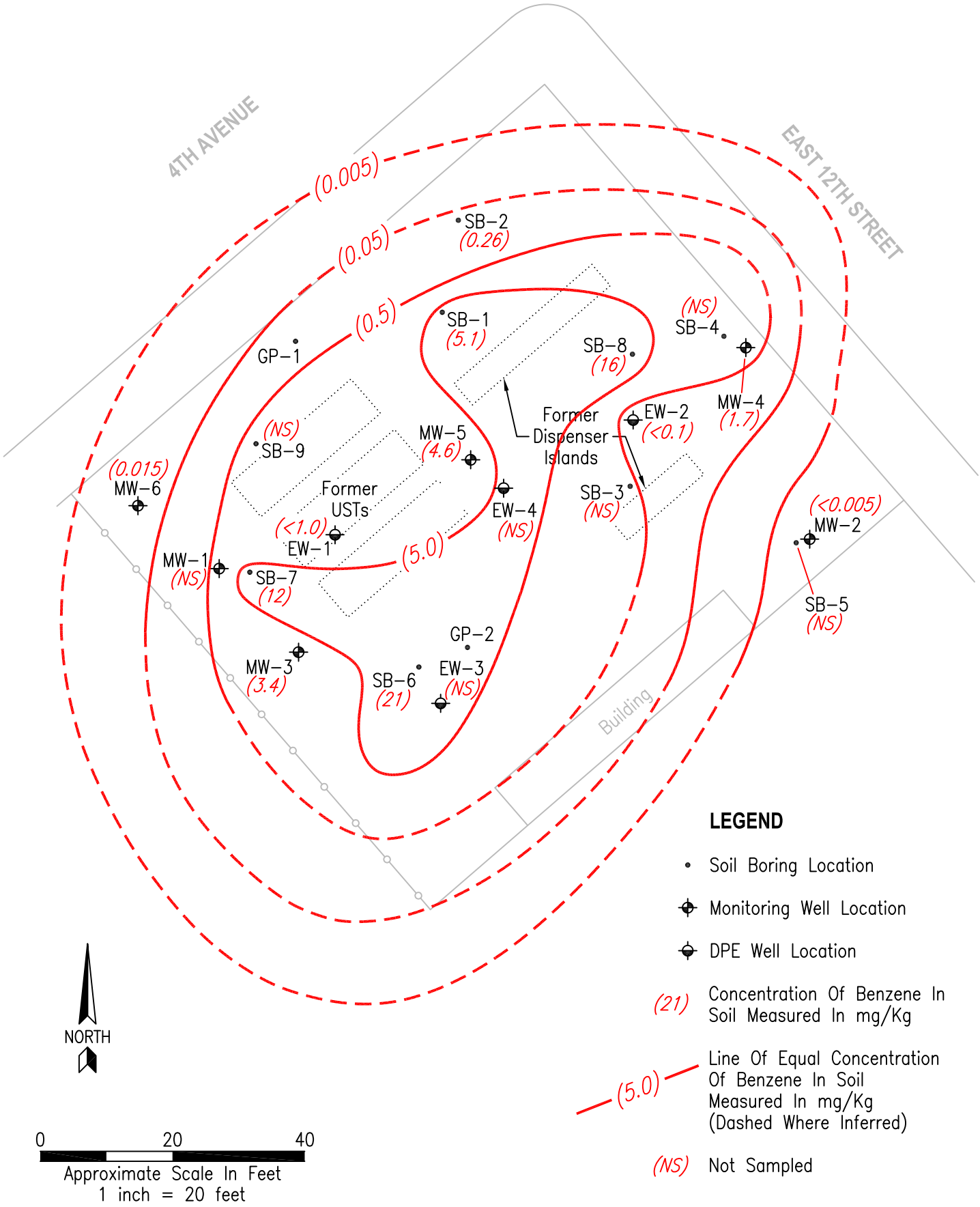


FIGURE E-9	**BENZENE IN SOIL AT 10 FEET bgs ISOCONCENTRATION MAP**	Environmental Compliance Group, LLC
Project Number: GHA.19009	Shore Acre Gas 403 East 12th Street Oakland, California	270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664-1035
Date: February 28, 2018		

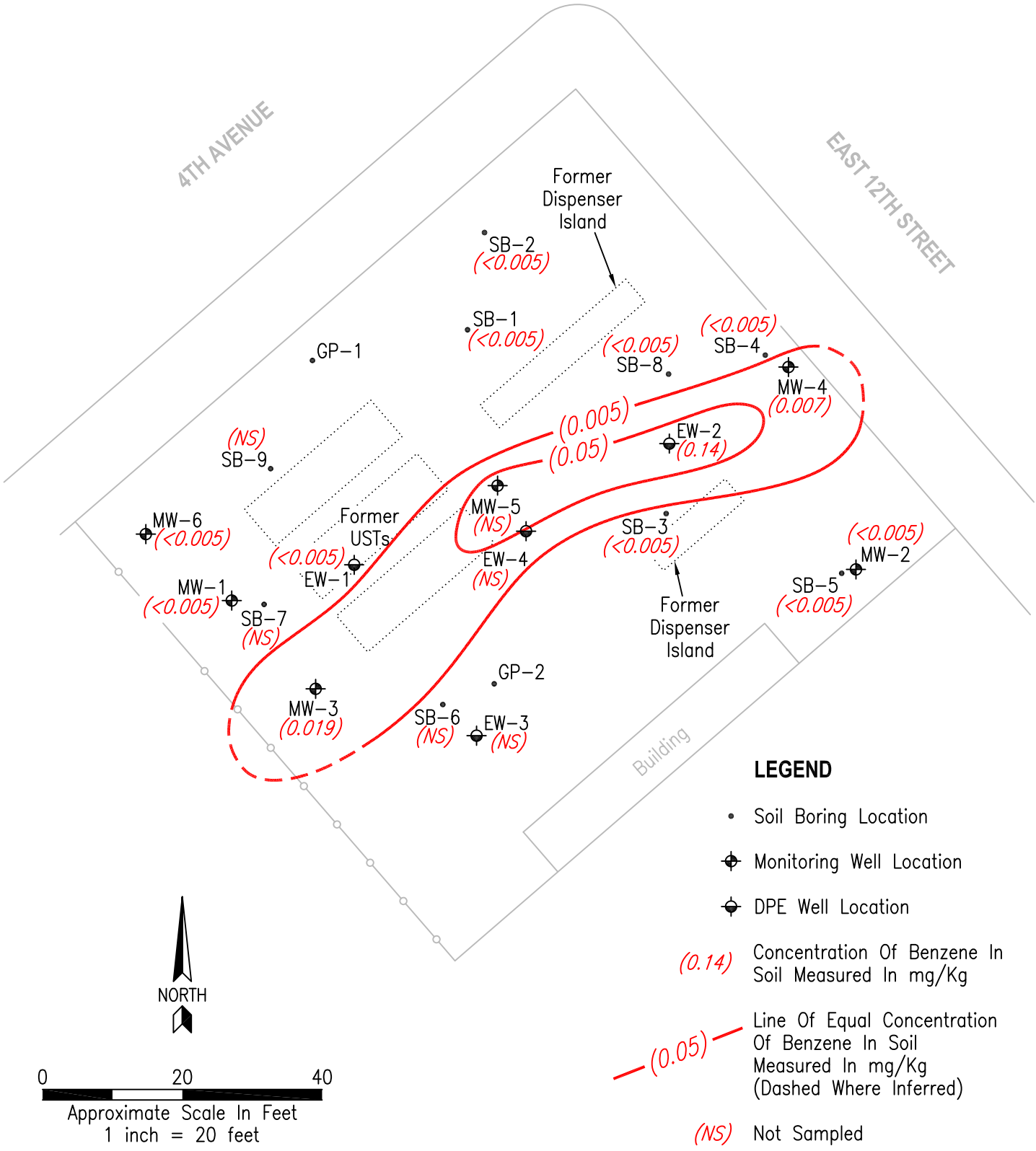


FIGURE E-10	**BENZENE IN SOIL AT 20-25 FEET bgs ISOCONCENTRATION MAP**	Environmental Compliance Group, LLC
Project Number: GHA.19009	Shore Acre Gas 403 East 12th Street Oakland, California	270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664–1035
Date: February 28, 2018		

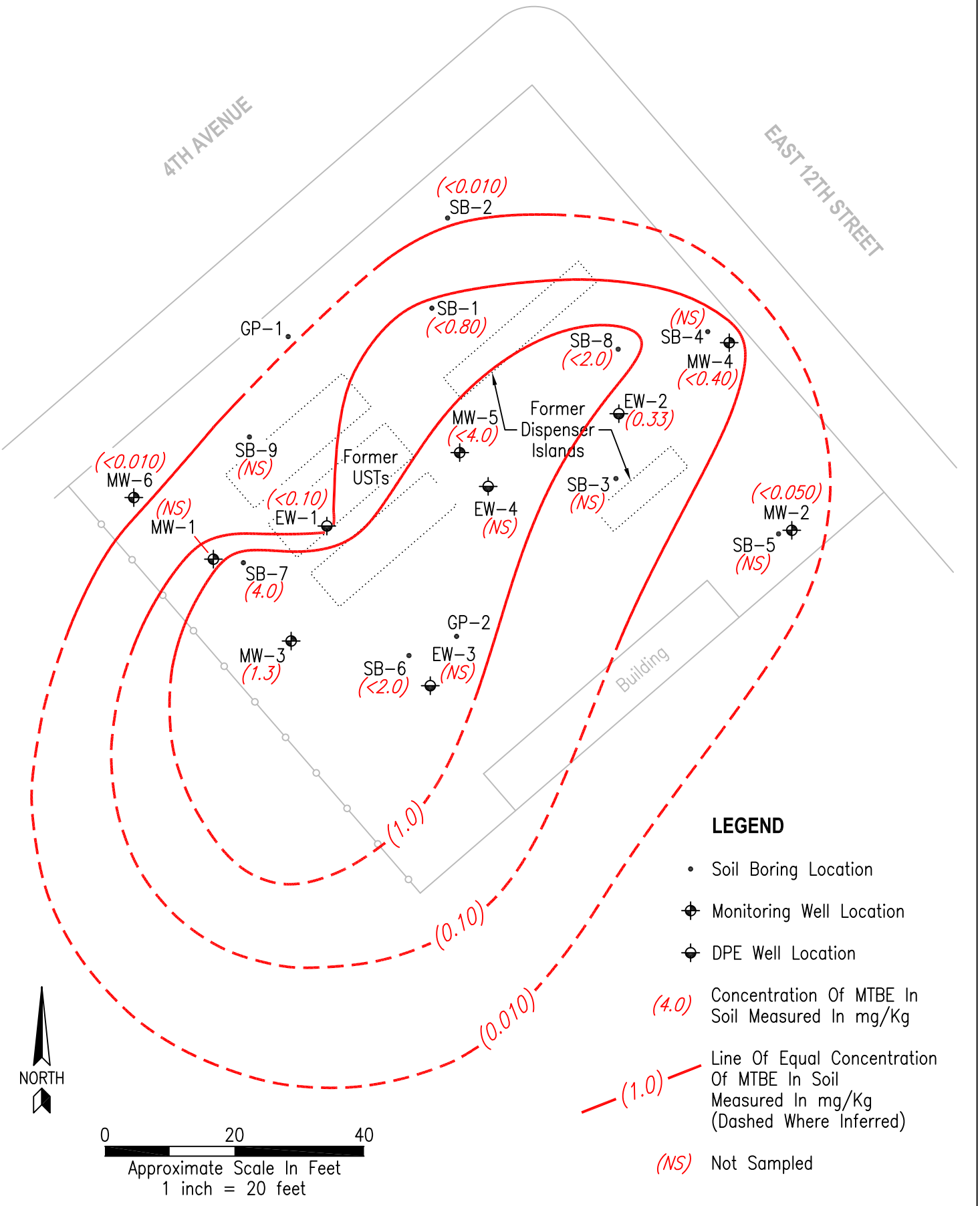


FIGURE E-11	**MTBE IN SOIL AT 10 FEET bgs ISOCONCENTRATION MAP**	Environmental Compliance Group, LLC
Project Number: GHA.19009	Shore Acre Gas 403 East 12th Street Oakland, California	270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664-1035
Date: February 28, 2018		

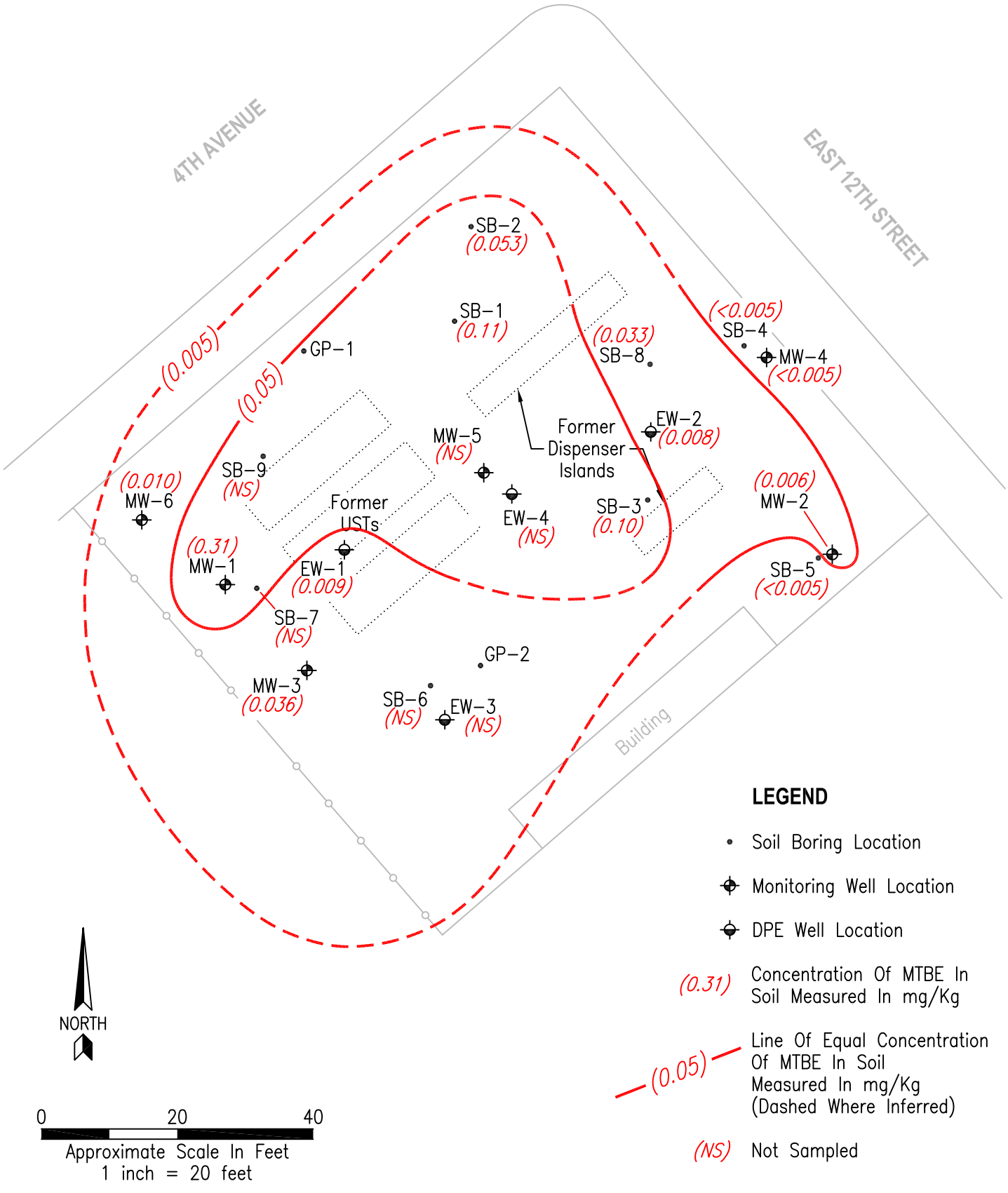


FIGURE E-12	**MTBE IN SOIL AT 20-25 FEET bgs ISOCONCENTRATION MAP**	Environmental Compliance Group, LLC
Project Number: GHA.19009	Shore Acre Gas 403 East 12th Street Oakland, California	270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664–1035
Date: February 28, 2018		

LEGEND

NORTH

Monitoring Well Location

Vapor Extraction Well Location

(3,600) Concentration of TPHg In Groundwater Measured In ug/L

5,000 Lines Of Equal Concentration of TPHg In Groundwater Measured In ug/L (Dashed Where Inferred)

0 50 100

Approximate Scale In Feet
1 inch = 50 feet

FIGURE E-13	**TPHg IN GROUNDWATER ISOCONCENTRATION MAP SEPTEMBER 28, 2017** Shore Acre Gas 403 East 12th Street Oakland, California	**Environmental Compliance Group, LLC** 270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664-1035
Project Number: GHA.19009		
Date: November 16, 2017		

LEGEND

NORTH

Monitoring Well Location

Vapor Extraction Well Location

(140) Concentration of Benzene In Groundwater Measured In ug/L

500 Lines Of Equal Concentration of Benzene In Groundwater Measured In ug/L (Dashed Where Inferred)

0 50 100

Approximate Scale In Feet
1 inch = 50 feet

FIGURE E-14	**BENZENE IN GROUNDWATER ISOCONCENTRATION MAP SEPTEMBER 28, 2017** Shore Acre Gas 403 East 12th Street Oakland, California	Environmental Compliance Group, LLC 270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664-1035
Project Number: GHA.19009		
Date: November 16, 2017		

LEGEND

NORTH

Monitoring Well Location

Vapor Extraction Well Location

(35) Concentration of MTBE In Groundwater Measured In ug/L

5,000 Lines Of Equal Concentration of MTBE In Groundwater Measured In ug/L (Dashed Where Inferred)

0 50 100

Approximate Scale In Feet
1 inch = 50 feet

FIGURE E-15	**MTBE IN GROUNDWATER ISOCONCENTRATION MAP SEPTEMBER 28, 2017** Shore Acre Gas 403 East 12th Street Oakland, California	**Environmental Compliance Group, LLC** 270 Vintage Drive, Turlock, CA 95382 Phone: (209) 664-1035
Project Number: GHA.19009		
Date: November 16, 2017		