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August 24, 2018

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

**RE: Former Mobil RAS #99105/6301 San Pablo Avenue, Oakland, California.**

Dear Ms. Detterman:

Attached for your review and comment is a letter report entitled *Groundwater and Soil Vapor Assessment, Updated Site Conceptual Model, and Work Plan for Additional Assessment*, dated August 24, 2018, for the above-referenced site. The letter was prepared by Cardno, of Petaluma, California, and details activities at the subject site.

I have read and acknowledge the content, recommendations, and/or conclusions contained in the attached document or report submitted on my behalf to the State Water Board's GeoTracker website.

If you have any questions or comments, please contact me at 510.547.8196.

Sincerely,

A handwritten signature in blue ink that reads "J Sedlachek".

Jennifer C. Sedlachek  
Project Manager

Attachments: GeoTracker Upload Certification  
Cardno's *Groundwater and Soil Vapor Assessment, Updated Site Conceptual Model, and Work Plan for Additional Assessment*, dated August 24, 2018

cc: w/ attachment  
Mr. Leroy Griffin, Oakland Fire Department  
Messrs. On Dan and Nathan Lam

w/o attachment  
Mr. Scott Perkins, Cardno

# GeoTracker Upload Certification

Former Mobil Service Station 99105  
6301 San Pablo Avenue, Oakland, California  
Alameda County No. RO0000445

## GeoReport Upload

Report Title	Sample Period	GeoReport
<i>Groundwater and Soil Vapor Assessment, Updated Site Conceptual Model, and Work Plan for Additional Assessment</i>	second quarter 2018	✓

## EDF Uploads

Sample ID	Matrix	EDF	GeoWell
VW2	Air	✓	
VW3	Air	✓	
VW4	Air	✓	
MW2	Water	✓	✓
MW3	Water	✓	✓
MW5	Water	✓	✓
MW6	Water	✓	✓
MW7	Water	✓	✓
MW8	Water	✓	✓

**Note:** GeoMap, GeoZ, GeoXY, and GeoBore not applicable for this report.

# Groundwater and Soil Vapor Assessment, Updated Site Conceptual Model, and Work Plan for Additional Assessment

Former Mobil Service Station 99105  
Alameda County No. RO0000445

Cardno 2783C.R04

August 24, 2018

# Groundwater and Soil Vapor Assessment, Updated Site Conceptual Model, and Work Plan for Additional Assessment

Former Mobil Service Station 99105  
6301 San Pablo Avenue  
Oakland, California

Alameda County No. RO0000445

Cardno 2783C.R04

August 24, 2018

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# 1 Introduction

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At the request of ExxonMobil Environmental Services (EMES), on behalf of Exxon Mobil Corporation, Cardno prepared this groundwater and soil vapor assessment, updated site conceptual model, and work plan for additional soil vapor assessment for the site. The work included sampling groundwater and soil vapor wells and updating the site conceptual model for the site in accordance with the Alameda County Department of Environmental Health (ACDEH) letter dated June 20, 2018 (Appendix A). Based on the results of the work, Cardno proposes conducting additional soil, groundwater, and soil vapor assessment at the site.

## 2 Site Description and Location

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The site (Assessor's Parcel Number 16-1455-10) is located at 6301 San Pablo Avenue, on the northwest corner of San Pablo Avenue and 63rd Street, in Oakland, California (Plate 1). The site is located at an elevation of approximately 42 feet above msl.

The site was operated as a Mobil service station from 1951 to 1980, then used as a rental car lot, and is currently an automobile oil change and smog facility. Four 2,000-gallon gasoline USTs and one 350-gallon used-oil UST were present on the property. The tanks were not used after 1980 and were removed in 1994 (Alisto, 1996). The locations of the former USTs, former dispenser islands, groundwater monitoring wells, and select site features are shown on Plate 2.

Properties in the site vicinity are occupied by mixed-use residential and commercial developments. An elementary school is located across San Pablo Avenue to the east, residential properties are located to the west and south, and Saint Paul Primitive Baptist Church is located adjacent to the site to the southwest (Plate 2). Utilities are present at and near the site as illustrated on Plate 3. To date, no basements or sumps have been identified within 100 meters of the site. Surveys have been left at the neighboring properties with no response; however, there are no visual indications of basements.

A tabular site conceptual model for the site detailing additional site information is included as Appendix B.

## 3 Geology and Hydrogeology

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### 3.1 Regional Geology and Hydrogeology

The site is located in the East Bay Plain Subbasin of the Santa Clara Valley Groundwater Basin. A northwest trending alluvial plain, the East Bay Plain Subbasin is bounded on the north by San Pablo Bay, on the east by the Franciscan Basement rock contact, and by the Niles Cone Groundwater Basin to the south. The East Bay Plain Subbasin aquifer system consists of unconsolidated deposits, Quaternary in age, with a cumulative thickness of approximately 1,000 feet. These deposits included early Pleistocene Santa Clara Formation, the late Pleistocene Alameda Formation, the early Holocene Temescal Formation, and artificial fill (DWR, 2014).

The East Bay Plain is regionally divided into two major groundwater basins: the San Pablo and the San Francisco Basin. These basins are tectonic depressions that are filled primarily with a sequence of coalescing alluvial fans. The San Francisco Basin is further divided into seven sub-areas. The site is located in the Oakland Sub-Area, which is filled primarily by alluvial deposits that range from 300 to 700 feet thick without well-defined aquitards (CRWQCB, 1999). Under natural conditions, the direction of groundwater flow in the East Bay Plain is east to west towards San Francisco Bay and correlates with topography.

## 3.2 Site Geology and Hydrogeology

Based on soil boring logs from wells and borings installed at the site and vicinity, the uppermost sediments consist predominately of fine-grained silts, clays, and sandy clays, with minor fine gravel and sand lenses from surface to depths of 13 to 15 feet bgs. The fine-grained unit is underlain by clayey sands, silty sands, gravelly sand, and sand to depths of 18 to 21.5 feet bgs. On the northwest side of the site at borings MP1 and well MW2, silty clay and sandy clay underlie the sand from 18 to 23 feet bgs. At the center of the site at well MW4, the sands are underlain by clayey silt from 20 to 23 feet bgs, which are underlain by clayey sand to 26.5 feet bgs, the total depth explored. West of the site, in borings B1 through B5, sediments consist primarily of clay and silt to 25 feet bgs with a few lenses of sand and gravel up to 2 feet thick (Cardno ERI, 2012b).

DTW at the site has ranged from approximately 3.75 to 13.81 feet bgs during the monitoring program. The direction of groundwater flow is typically towards the west and the San Francisco Bay as shown on the rose diagram included on Plate 4.

## 4 Previous Work

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Cumulative groundwater monitoring and sampling data is included in Tables 1A and 1B. Well construction details are included in Table 2. Cumulative soil analytical results are included in Table 3. Soil vapor analytical results are included in Tables 4A and 4B. Cumulative PID readings of the vapor wells are included in Table 5.

### 4.1 Site Assessment Activities

Multiple phases of assessment have been conducted from 1988 to the present, including the installation of groundwater monitoring wells MW1 through MW8, temporary monitoring points MP-1 through MP-6, soil vapor sampling wells VW1 through VW5 and SVS1 through SVS3 and the drilling of soil borings AB-1 through AB-13, B1 through B5, and HA-1 (ETIC, 2011a; Cardno ERI, 2012a; Cardno ERI, 2014). Wells MW1, MW4, and MP-1 through MP-6 have been destroyed (ETIC, 2011a).

### 4.2 Remediation Activities

#### 4.2.1 Excavation Activities

In 1994, one 350-gallon used oil UST and four 2,000-gallon gasoline USTs were removed from the site. Holes were observed in two of the 2,000-gallon gasoline tanks. Analytical results from soil samples collected from the bottom of the gasoline tank excavation area (11 feet bgs), indicated maximum concentrations of 520 mg/kg of TPHg and 0.18 mg/kg of benzene. During UST excavation, liquid-phase hydrocarbons were observed in groundwater (Alisto, 1996).

In February 1996, standing water in the UST excavation was pumped out of the excavation area. Soil samples were collected from the bottom of the gasoline tank excavation area. Additionally, two 2-inch diameter steel and three 2-inch diameter fiberglass fuel pipelines were removed from the site. Signs of rust were observed in the steel piping at the stub-ups near the northwest end of the former dispenser island. Holes were not observed in the pipes. The pipeline excavation was approximately 3 feet deep by 3 feet wide and 50 feet long, extending from the southeastern corner of the gasoline tank excavation to the dispenser islands. Hydrocarbons were observed in soil near the northwestern end of the former dispenser island. An area approximately 16 feet long by 11 feet wide and 5 feet deep was over-excavated to remove the soil. Compliance soil samples were collected every 20 feet from beneath the former product lines (Alisto, 1996).

An estimated total of 367 cubic yards of soil was excavated from the site during the UST and product line removals (ETIC, 2011a).



During redevelopment activities conducted by the property owner in early 1999, more than 200 cubic yards of soil were removed from the northeastern side of the site (TRC, 2002). The property owner built a basement for the building to approximately 8 feet bgs in the excavated area.

#### **4.2.2 Dual-Phase Extraction**

A DPE event was conducted in November 1998. Wells MW3 and MW4 were used as groundwater and SVE wells. Six temporary monitoring points (MP-1 through MP-6) were installed to monitor vacuum readings and groundwater depths during the DPE event. Approximately 75 gallons of groundwater were processed and 21 pounds of vapor-phase hydrocarbons were removed from well MW4. Monitoring points MP-1 through MP-6 were destroyed following the DPE event (Alton, 1999).

A second DPE test was performed in August 2014. Approximately 37 pounds of vapor-phase TPHg were removed during 86 hours of operation with a maximum vapor flow rate of 37.5 scfm (Cardno ERI, 2014).

### **4.3 Groundwater Monitoring Activities**

Routine groundwater monitoring and sampling has been ongoing since 1996. Measurable NAPL was measured in well MW4 during the monitoring and sampling events between August 1996 and January 1999, when well MW4 was destroyed during site redevelopment activities. Sheen was observed periodically in well MW5 from 2012 to 2016. Sheen was also observed once in 2016 in well MW8. Sheen has not been observed at the site since July 2016.

### **4.4 Soil Vapor Monitoring Activities**

Soil vapor monitoring began at the site in 2010 with the installation of wells VW1 through VW5 (ETIC, 2011b). Off-site soil vapor sampling wells SVS1 through SVS3 were installed in 2012 (Cardno ERI, 2012a). In addition, PID readings have been collected from select wells during groundwater monitoring events since 2014.

Concentrations and/or reporting limits of select analytes exceed applicable screening levels. Maximum concentrations and PID readings have been reported in well VW4 located near the southeastern corner of the on-site commercial building.

## **5 Groundwater Monitoring and Sampling**

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On July 26, 2018, Cardno monitored and sampled site monitoring and observation wells in accordance with the groundwater sampling protocol included in Appendix C. Groundwater sampling field logs and well gauging data are provided in Appendix D.

The groundwater samples were submitted to Eurofins Calscience, Inc. (Eurofins), of Garden Grove, California, a California state-certified laboratory, under COC protocol. Laboratory analytical results and sampling methods are summarized in Tables 1A and 1B. Laboratory analytical reports are included in Appendix E.

Approximately 11 gallons of purge and decon water were generated during the groundwater monitoring and sampling event. Waste disposal documentation will be included under separate cover.

### **5.1 Results**

The groundwater flow direction was towards the northwest, as illustrated on Plate 4.

Dissolved-phase concentrations show overall stable or decreasing trends. Maximum dissolved-phase concentrations are limited to the area near wells MW5 and MW8. The maximum TPHd, TPHg, benzene, and naphthalene concentrations were reported in well MW8 at concentrations exceeding select ESLs. Select groundwater analytical results are illustrated on Plate 5.

## 6 Soil Vapor Sampling

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On July 24, 2018, soil vapor samples were collected from soil vapor wells VW2 through VW4. Due to the presence of moisture, soil vapor samples were not collected from wells VW1 and VW5. The work was conducted in accordance with the field protocol included in Appendix C.

The samples were collected using a custom-made purging manifold consisting of airtight valves, a flow regulator, pressure and vacuum gauges, and a vacuum pump capable of producing a vacuum of approximately 30 inches of mercury (in Hg). The manifold also includes a port that connects sample collection vessels and/or sorbent tubes (Summa™ canisters).

Prior to purging and sampling, the manifold was connected to each well, and the tubing and fittings downstream from the wellhead valves were vacuum tested at approximately 19 to 20 in Hg. The sampling manifold and tubing held the applied vacuum for five minutes at each well.

Purge volumes were calculated for each well. One volume of vapor was purged from each well. Prior to sampling, a helium leak test was performed at each well, including a Summa™ canister and its fittings, to check for leaks in the annulus. To assess the potential for leaks in the well annulus, a shroud was placed over the well and Summa™ canister, and helium was introduced into the shroud and maintained at a constant concentration. Helium screening was performed in the field by drawing soil gas into a Tedlar bag via a lung-box and screening the contents of the Tedlar bag with a helium meter. The concentration of helium in the sample divided by the concentration of helium in the shroud provides a measure of the proportion of the sample attributable to leakage. A leak that comprises less than 5% of the sample is insignificant. Helium screening was also performed using laboratory analysis of the contents of the Summa™ canister collected under the shroud. Sampling was conducted at approximately the same rate of purging, at 100 to 200 milliliters per minute. Field data sheets are included in Appendix D.

Cardno submitted soil vapor samples for analysis to Eurofins Calscience, Inc., under COC protocol. Laboratory analytical results and sampling methods are summarized in Tables 4A and 4B. Select soil vapor analytical results are illustrated on Plate 6. Laboratory analytical reports are included in Appendix E.

### 6.1 Results

The leak detection compound (helium) was not reported in the wells. The California EPA states that ambient air leaks of up to 5% are acceptable (DTSC, 2015).

#### 6.1.1 Former UST Areas

Oxygen concentrations were reported at 17.0% in well VW2 and 9.73% in well VW3, indicating favorable conditions for bio-attenuation in the vicinity of the former USTs. Petroleum hydrocarbon concentrations reported in the wells were below applicable screening levels. The concentrations were up to three orders of magnitude lower than concentrations reported in the wells during the previous sampling event in 2015.

#### 6.1.2 Former Dispenser Island Area

Oxygen concentrations were reported at 2.29% in well VW4, indicating that conditions in the former dispenser island area are not favorable for bio-attenuation. Concentrations of TPHg, benzene, ethylbenzene, and naphthalene were reported above applicable screening levels in well VW4. The concentrations were similar to concentrations reported in the well during the previous sampling event in 2015.

## 7 Conclusions

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Maximum petroleum hydrocarbons in groundwater and soil vapor are present in the vicinity of the former dispenser islands. Concentrations are decreasing in the northern portion of the site in the vicinity of the former USTs where conditions are favorable for bio-attenuation.

## 8 Remaining Source

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Cardno estimated the remaining source present underneath the on-site building. Methods for estimating remaining hydrocarbon mass are subjective; estimates may vary by orders of magnitude based on the assumptions used. The estimates prepared for this report are intended to be an estimate of the site conditions and may not be an accurate representation of subsurface conditions.

Cardno estimates that there are approximately 37 pounds of remaining mass beneath the building, including approximately 3 pounds of TPHd, 34 pounds of TPHg, 0.02 pound of benzene, and 0.03 pound of MTBE. Calculations of estimated mass are included in Appendix F. The mass has been greatly reduced by the excavations performed to date, including the excavation for the current basement, which underlies the majority of the building.

### 8.1 Grids and Depths

Cardno divided the building into grids and depths. The building was broken down into 24 grids: 21 grids measuring 11 x 11 feet and three grids measuring 11 x 10 feet. The grids were broken down into three depths: 0 to 8 feet (the depth of the excavated subterranean basement), 8 to 12 feet bgs, and 12 to 16 feet bgs (the maximum depth of samples collected underneath the building). The layout of the grids is illustrated on Plate 7.

### 8.2 Calculations

Cardno used the following calculation to evaluate remaining hydrocarbon mass in each of the three grid depths:

$$\frac{[\textit{remaining native soil}] * [\textit{density}] * [\textit{average concentration}]}{[453,592 \textit{ milligrams}]}$$

**Remaining Native Soil:** Cardno calculated the volume of original native soil based on dimensions and then subtracted the amount of excavated native soil to obtain the amount of remaining native soil in cubic feet.

**Density:** The average density of soil at the site is 1.5 grams per cubic centimeter (ETIC, 2011b). Cardno used the converted 42.48 kilograms per cubic foot as the density of soil at the site.

**Average Concentration:** Cardno used average concentrations in mg/kg. Mass removed was individually calculated for TPHd, TPHg, benzene, and MTBE.

**453,592 Milligrams:** This value is equivalent to 1 pound and is used to convert the final calculation into pounds.

### 8.3 Limitations

The following limitations were encountered:

- The samples underneath the building were obtained between 18 and 22 years ago. DPE activities and natural attenuation have likely reduced concentrations since that time.
- There are estimated to be approximately 21 pounds of mass remaining in Grid 19. In 1998, a DPE event conducted at the site removed approximately 21 pounds of vapor-phase hydrocarbons from well MW4 (Alton, 1999), which is located in neighboring Grid 20. Grid 20 is only estimated to have approximately 1 pound of mass based on samples collected before the DPE event. It is possible that a significant

percentage of the mass removed during the DPE event came from Grid 19 and that this estimate may overstate the amount of mass remaining in Grid 19.

- Only select samples were analyzed for TPHd. This estimate may understate the amount of remaining TPHd hydrocarbon mass.
- Only select samples were analyzed for MTBE. As MTBE has not been reported above 0.92 mg/kg at any location at the site, it is not likely that additional MTBE data would significantly change the results.
- Samples were not collected from every grid and depth, which may cause this estimate to understate the amount of remaining mass; however, samples were collected from the locations most likely to have significant remaining mass.

## 9 Site Conceptual Model

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A tabular site conceptual model for the site is included in Appendix B. The cross sections requested in the ACDEH letter will be generated after the completion of the proposed work detailed in Section 9 so that the cross sections will incorporate the latest site data.

Three data gaps were identified in the site model:

1. Potential off-site soil vapor intrusion has not been fully assessed.
2. Soil in the vicinity of the former used-oil tank has not been sampled for the analyses detailed in the *Low-Threat Underground Storage Tank Case Closure Policy* (SWRCB, 2012).
3. The potential extent of dissolved-phase concentrations south of wells MW5 and MW8 has not been defined.

## 10 Proposed Work

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Cardno proposes to install two soil vapor wells and drill two soil borings at the site to address the three data gaps identified by the site conceptual model. The proposed assessment locations are illustrated on Plate 8.

### 10.1 Potential Off-Site Vapor Intrusion

Petroleum hydrocarbon concentrations have been reported above applicable screening levels in every soil vapor sample collected from wells VW4 and VW5 since 2010. Wells VW4 and VW5 are located near the southern half of the on-site building, which is currently used for vehicle service. There are large roll-up doors (frequently open) as well as automobiles inside the building. The employees are routinely exposed to vehicle fluids and exhaust from vehicles. In addition, a basement was excavated beneath the building to permit workers to work beneath vehicles to perform fluid changes. During a site visit in February 2018, Cardno investigated the use of the office in the on-site building. The office was being used for storage, including the storage of automotive chemicals.

The *Low-Threat Underground Storage Tank Case Closure Policy* exempts active fueling facilities from having to satisfy the media-specific criteria for petroleum vapor intrusion to indoor air as “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” (SWRCB, 2012). While the on-site building is not an active fueling facility, the vehicle service operations conducted in the building result in similar small surface spills and fugitive vapor releases. As the ongoing activities inside the on-site building likely poses a greater risk than the historical release, further evaluation of soil vapor in the vicinity of the on-site building is not warranted given the current land use. Further sampling should be conducted along the perimeter of the site, however, to assess potential off-site vapor intrusion.

### **10.1.1 Soil Vapor Well Installation**

Cardno proposes to install one soil vapor well along the western border of the site and one soil vapor well along the southern border of the site in the locations illustrated on Plate 8 to assess potential off-site vapor intrusion. The proposed locations are approximate and may be moved based on subsurface obstructions.

Cardno will perform the soil vapor assessment survey in accordance with the protocol presented in the following guidance documentation:

- *Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air* (DTSC, 2011).
- *Advisory – Active Soil Gas Investigations* (DTSC, 2015).
- *Collecting and Interpreting Soil Gas-Samples from the Vadose Zone, A Practical Strategy for Assessing the Subsurface Vapor-to-Indoor Air Migration Pathway of Petroleum Hydrocarbon* (API, 2005).
- *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater* (CRWQCB-SFB, 2016).

The procedures for drilling, decontamination, and well construction are described in the field protocol contained in Appendix C. The fieldwork will be conducted under the advisement of a professional geologist and in accordance with applicable regulatory guidelines.

#### **10.1.1.1 Pre-Field Activities**

Prior to the onset of drilling, a well installation permit will be obtained from the Alameda County Public Works Agency (Public Works) if required. Cardno personnel will visit the site to check for obstructions and to mark the proposed locations. Underground Service Alert, Alameda County Department of Environmental Health (ACDEH), and Public Works will be notified at least 48 hours prior to the onset of field activities; in addition, a private utility location company will be employed to identify potential underground utilities or other obstructions in the proposed well locations.

#### **10.1.1.2 Soil Vapor Well Installation**

The two soil borings will be installed using 2-inch diameter hand augers to a depth of 5 feet bgs. Soil samples will be collected at total depth (screened interval) from each boring.

The wells will be constructed with a sand pack from approximately 4.5 to 5 feet bgs. Previously-installed wells completed to a depth of 6 feet bgs are frequently wet. The intent is to install the wells approximately 1 foot shallower to reduce the chances of encountering groundwater. Soil vapor samples will be collected a minimum of 48 hours after installation in accordance with the field protocol included in Appendix C. Samples will be collected from the newly-installed wells in addition to the existing wells, including wells SVS1 through SVS3, installed west of the site on the church property.

#### **10.1.1.3 Soil Vapor Sample Collection**

The newly-installed soil vapor wells will be purged and sampled following a waiting period of at least 48 hours after installation. The purge volume will be calculated based on the volume of each well and the associated sample collection tubing. Three purge volumes will be removed from each well prior to sample collection.

Prior to purging each well, Cardno will conduct a vacuum leak test on the sampling equipment. For the leak test, Cardno will attach the sample vessel, purging manifold, and vacuum pump to an air-tight valve on the sub-slab well. With the air-tight valve closed, Cardno will apply a vacuum of approximately 20 inches of mercury (in Hg) to the sample collection system and turn off the vacuum pump. Cardno will then monitor the vacuum for 5 minutes. If the vacuum is not maintained, Cardno will isolate the leak and remount the fittings and tubing until the vacuum is held for 5 minutes.

Purging will be performed with a sample manifold equipped with a vacuum gauge and flow regulator and vacuum pump. The flow regulator will be set to a rate of no more than 200 milliliters per minute (ml/min).

After purging, Cardno will close the vapor-tight valve and remove the purge device. Summa™ canisters with a volume of less than or equal to 400 ml will be used or a mobile laboratory will be mobilized to the site to perform the analysis. The mobile lab and/or smaller (less than 1 liter) sample containers will be utilized to minimize the

required sample volume which reduces the chance for surface air to enter the sample container. The samples will be collected using a maximum 200 ml/min flow regulator. The Summa™ canister will be opened and allowed to fill. The canister vacuum readings at the beginning and end of sampling will be recorded. Leak detection will be performed during vapor sampling by covering the surface completion of the well and the Summa™ canister with a shroud, and introducing helium into the shroud. The concentration of helium will be maintained at approximately 10%; the helium concentration in the shroud will be monitored with a helium meter. Cardno will end sample collection when the vacuum within the sample canister is approximately 5 in Hg. Cardno will label the sample containers, store the samples at ambient temperature in laboratory-supplied containers, and initiate COC records.

A minimum of one duplicate sample will be collected during each sampling event. Samples will be collected a minimum of two times, approximately six months apart to evaluate seasonal fluctuations.

#### **10.1.1.4 Laboratory Analyses**

The soil vapor samples will be submitted for analysis to a California state-certified laboratory, under COC protocol for analysis of:

- TPHg using EPA Method TO-3M.
- Full-scan VOCs (including but not limited to BTEX, fuel oxygenates, lead scavengers, and naphthalene) using EPA Method TO-15M.
- Naphthalene using EPA method TO-17
- Methane, oxygen plus argon, carbon monoxide, carbon dioxide, and helium using American Society of Testing and Materials (ASTM) Method D-1946.

#### **10.1.1.5 Risk Evaluation**

Cardno will assess potential risk from vapor intrusion by comparing the reported concentrations to ESLs established by the San Francisco Bay Regional Water Quality Control Board (CRWQCB-SFB, 2016). If the published screening levels indicate a potential risk, the risk will be evaluated using the Johnson and Ettinger Model, as modified by the DTSC in December 2014 (DTSC, 2014).

## **10.2 Former Used-Oil Tank Investigation**

Soil in the vicinity of the former used-oil tank has not been analyzed for PAHs in accordance with the *Low-Threat Underground Storage Tank Case Closure Policy* (SWRCB, 2012).

### **10.2.1 Soil Boring Advancement**

Cardno proposes to drill a soil boring along the southern border of the former used-oil UST excavation in the location illustrated on Plate 8. The procedures for drilling, decontamination, and well construction are described in the field protocol contained in Appendix C. The fieldwork will be conducted under the advisement of a professional geologist and in accordance with applicable regulatory guidelines.

#### **10.2.1.1 Pre-Field Activities**

Prior to the onset of drilling, a well installation permit will be obtained from Public Works. Cardno personnel will visit the site to check for obstructions and to mark the proposed locations. Underground Service Alert, ACDEH, and Public Works will be notified at least 48 hours prior to the onset of field activities; in addition, a private utility location company will be employed to identify potential underground utilities or other obstructions in the proposed well locations.

#### **10.2.1.2 Drilling**

The soil boring will be drilled to approximately 10 feet bgs. Soil samples will be collected at a minimum frequency of 5-foot intervals or where field observations indicate the presence of petroleum hydrocarbons. A minimum of three soil samples above 10 feet bgs will be submitted for laboratory analysis. If groundwater is encountered, a grab groundwater sample will be collected.

### **10.2.1.3 Laboratory Analyses**

The soil and groundwater samples will be submitted for analysis to a California state-certified laboratory, under COC protocol for analysis of:

- TPHd and TPHg using EPA Method 8015B.
- MTBE, BTEX, TBA, DIPE, ETBE, TAME, 1,2-DCA, and EDB using EPA Method 8260B.

In addition, the soil samples will be analyzed for PAHs, including naphthalene, using EPA Method 8270C.

## **10.3 Extent of Dissolved-Phase Concentrations**

NAPL with a thickness between 0.02 and 0.92 foot was observed in well MW4, which was destroyed in 1999 during site redevelopment activities. NAPL has not been observed at the site since January 1999.

Boring HA1 was advanced approximately 12 feet east of former well MW4 to delineate the extent of NAPL beneath the footprint of the new building. NAPL was not observed in the grab groundwater sample collected from soil boring HA1 (TRC, 2000).

Well MW5 was installed as a replacement well for well MW4. NAPL has not been observed in well MW5, located approximately 25 feet southwest of former well MW4, since installation. Sheen was observed periodically in well MW5 from 2012 to 2016. Sheen was also observed once in 2016 in well MW8. Sheen has not been observed at the site since July 2016.

Maximum dissolved-phase concentrations have been reported in wells MW5 and MW8, the wells with the periodic sheen. Maximum vapor-phase concentrations have been reported in nearby wells VW4 and VW5. The extent of dissolved-phase concentrations downgradient of these wells towards the residential properties across 63<sup>rd</sup> Street has not been fully assessed.

### **10.3.1 Soil Boring Advancement**

Cardno proposes to drill a soil boring downgradient of the maximum on-site concentrations in the location illustrated on Plate 8.

The procedures for drilling, decontamination, and well construction are described in the field protocol contained in Appendix C. The fieldwork will be conducted under the advisement of a professional geologist and in accordance with applicable regulatory guidelines.

#### **10.3.1.1 Pre-Field Activities**

Prior to the onset of drilling, a well installation permit will be obtained from Public Works. Cardno personnel will visit the site to check for obstructions and to mark the proposed locations. Underground Service Alert, ACDEH, and Public Works will be notified at least 48 hours prior to the onset of field activities; in addition, a private utility location company will be employed to identify potential underground utilities or other obstructions in the proposed well locations.

#### **10.3.1.2 Drilling**

The soil boring will be drilled to the minimum depth required to collect a sample of first-encountered groundwater. Soil samples will be collected at approximate 5-foot intervals or where field observations indicate the presence of petroleum hydrocarbons.

#### **10.3.1.3 Laboratory Analyses**

The soil and groundwater samples will be submitted for analysis to a California state-certified laboratory, under COC protocol for analysis of:

- TPHd and TPHg using EPA Method 8015B.
- MTBE, BTEX, TBA, DIPE, ETBE, TAME, 1,2-DCA, and EDB using EPA Method 8260B.

## 11 Contact Information

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The responsible party contact is Ms. Jennifer C. Sedlachek, ExxonMobil Environmental Services Company, 4096 Piedmont Avenue #194, Oakland, California, 94611. The consultant contact is Mr. Scott Perkins, Cardno, 601 North McDowell Boulevard, Petaluma, California, 94954. The agency contact is Ms. Karel Detterman, Alameda County Health Care Services Agency, Environmental Health Services, 1131 Harbor Bay Parkway, Suite 250, Alameda, California, 94502-6577.

## 12 Limitations

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For documents cited that were not generated by Cardno, the data taken from those documents is used “as is” and is assumed to be accurate. Cardno does not guarantee the accuracy of this data and makes no warranties for the referenced work performed nor the inferences or conclusions stated in these documents.

This document and the work performed have been undertaken in good faith, with due diligence and with the expertise, experience, capability, and specialized knowledge necessary to perform the work in a good and workmanlike manner and within all accepted standards pertaining to providers of environmental services in California at the time of investigation. No soil engineering or geotechnical references are implied or should be inferred. The evaluation of the geologic conditions at the site for this investigation is made from a limited number of data points. Subsurface conditions may vary away from these data points.

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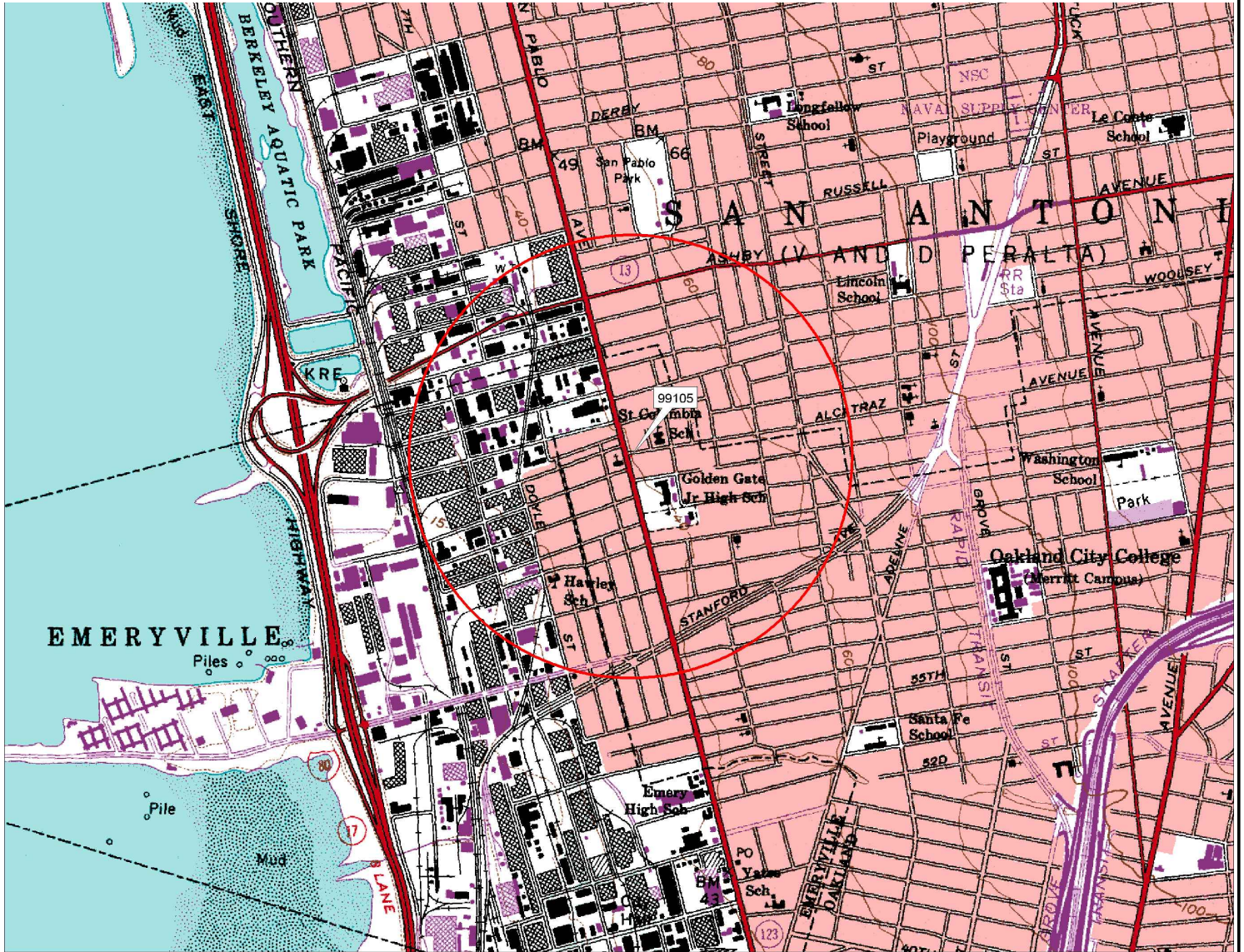
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## 14 Acronym List

µg/L	Micrograms per liter	NAPL	Non-aqueous phase liquid
µg/m <sup>3</sup>	Micrograms per cubic meter	NEPA	National Environmental Policy Act
µs	Microsiemens	NGVD	National Geodetic Vertical Datum
1,2-DCA	1,2-dichloroethane	NPDES	National Pollutant Discharge Elimination System
acfm	Actual cubic feet per minute	O&M	Operations and Maintenance
AS	Air sparge	ORP	Oxidation-reduction potential
AST	Aboveground storage tank	OSHA	Occupational Safety and Health Administration
bgs	Below ground surface	OVA	Organic vapor analyzer
BTEX	Benzene, toluene, ethylbenzene, and total xylenes	P&ID	Process and Instrumentation Diagram
cfm	Cubic feet per minute	PAH	Polycyclic aromatic (or polyaromatic) hydrocarbon
COC	Chain-of-Custody	PCB	Polychlorinated biphenyl
CPT	Cone Penetration (Penetrometer) Test	PCE	Tetrachloroethene or perchloroethylene
DIPE	Di-isopropyl ether	PID	Photo-ionization detector
DO	Dissolved oxygen	PLC	Programmable logic control
DOT	Department of Transportation	POTW	Publicly-owned treatment works
DPE	Dual-phase extraction	ppmv	Parts per million by volume
DTW	Depth to water	PQL	Practical quantitation limit
EDB	1,2-dibromoethane	psi	Pounds per square inch
EPA	Environmental Protection Agency	PVC	Polyvinyl chloride
ESL	Environmental screening level	QA/QC	Quality assurance/quality control
ETBE	Ethyl tertiary butyl ether	RBSL	Risk-based screening levels
FID	Flame-ionization detector	RCRA	Resource Conservation and Recovery Act
fpm	Feet per minute	RL	Reporting limit
GAC	Granular activated carbon	scfm	Standard cubic feet per minute
gpd	Gallons per day	SSTL	Site-specific target level
gpm	Gallons per minute	STLC	Soluble threshold limit concentration
GWPTS	Groundwater pump and treat system	SVE	Soil vapor extraction
HIT	High-intensity targeted	SVOC	Semi-volatile organic compound
HVOC	Halogenated volatile organic compound	TAME	Tertiary amyl methyl ether
J	Estimated value between MDL and PQL (RL)	TBA	Tertiary butyl alcohol
LEL	Lower explosive limit	TCE	Trichloroethene
LPC	Liquid-phase carbon	TOC	Top of well casing elevation; datum is msl
LRP	Liquid-ring pump	TOG	Total oil and grease
LUFT	Leaking underground fuel tank	TPH	Total petroleum hydrocarbons
LUST	Leaking underground storage tank	TPHd	Total petroleum hydrocarbons as diesel
MCL	Maximum contaminant level	TPHg	Total petroleum hydrocarbons as gasoline
MDL	Method detection limit	TPHmo	Total petroleum hydrocarbons as motor oil
mg/kg	Milligrams per kilogram	TPHs	Total petroleum hydrocarbons as stoddard solvent
mg/L	Milligrams per liter	TRPH	Total recoverable petroleum hydrocarbons
mg/m <sup>3</sup>	Milligrams per cubic meter	UCL	Upper confidence level
MPE	Multi-phase extraction	USCS	Unified Soil Classification System
MRL	Method reporting limit	USGS	United States Geologic Survey
msl	Mean sea level	UST	Underground storage tank
MTBE	Methyl tertiary butyl ether	VCP	Voluntary Cleanup Program
MTCA	Model Toxics Control Act	VOC	Volatile organic compound
NAI	Natural attenuation indicators	VPC	Vapor-phase carbon

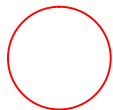


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FN 2783TOPO NL 2

**EXPLANATION**



1/2-mile radius circle



**APPROXIMATE SCALE**



SOURCE:  
Modified from a map  
provided by  
DeLorme 3-D TopoQuads



**SITE VICINITY MAP**

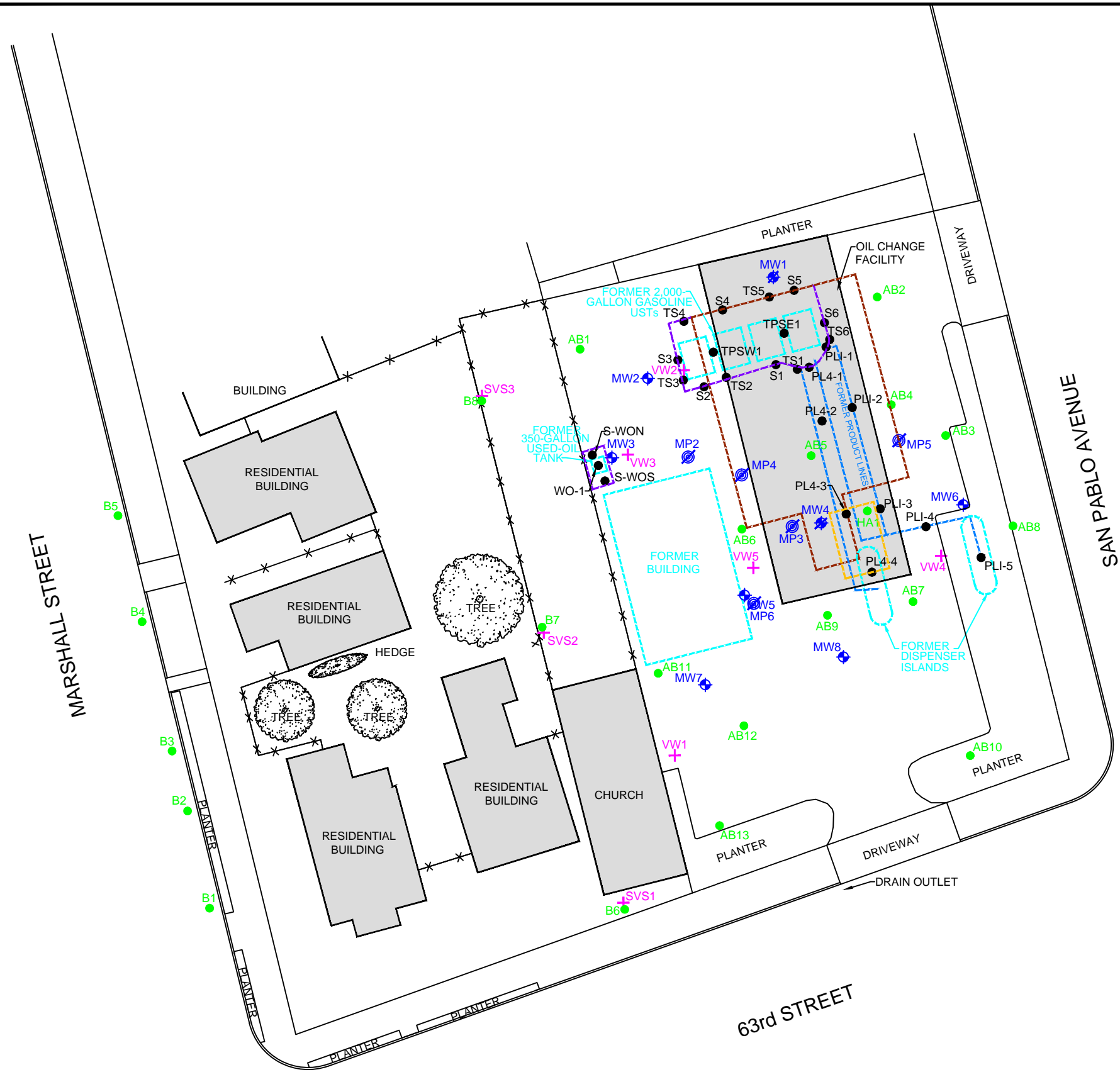
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6301 San Pablo Avenue  
Oakland, California

**PROJECT NO.**

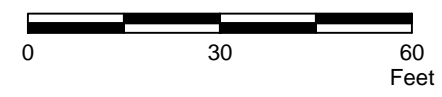
2783

**PLATE**

1



APPROXIMATE SCALE



FN 27830001 R04

**GENERALIZED SITE PLAN**  
 FORMER MOBIL SERVICE STATION 99105  
 6301 San Pablo Avenue  
 Oakland, California

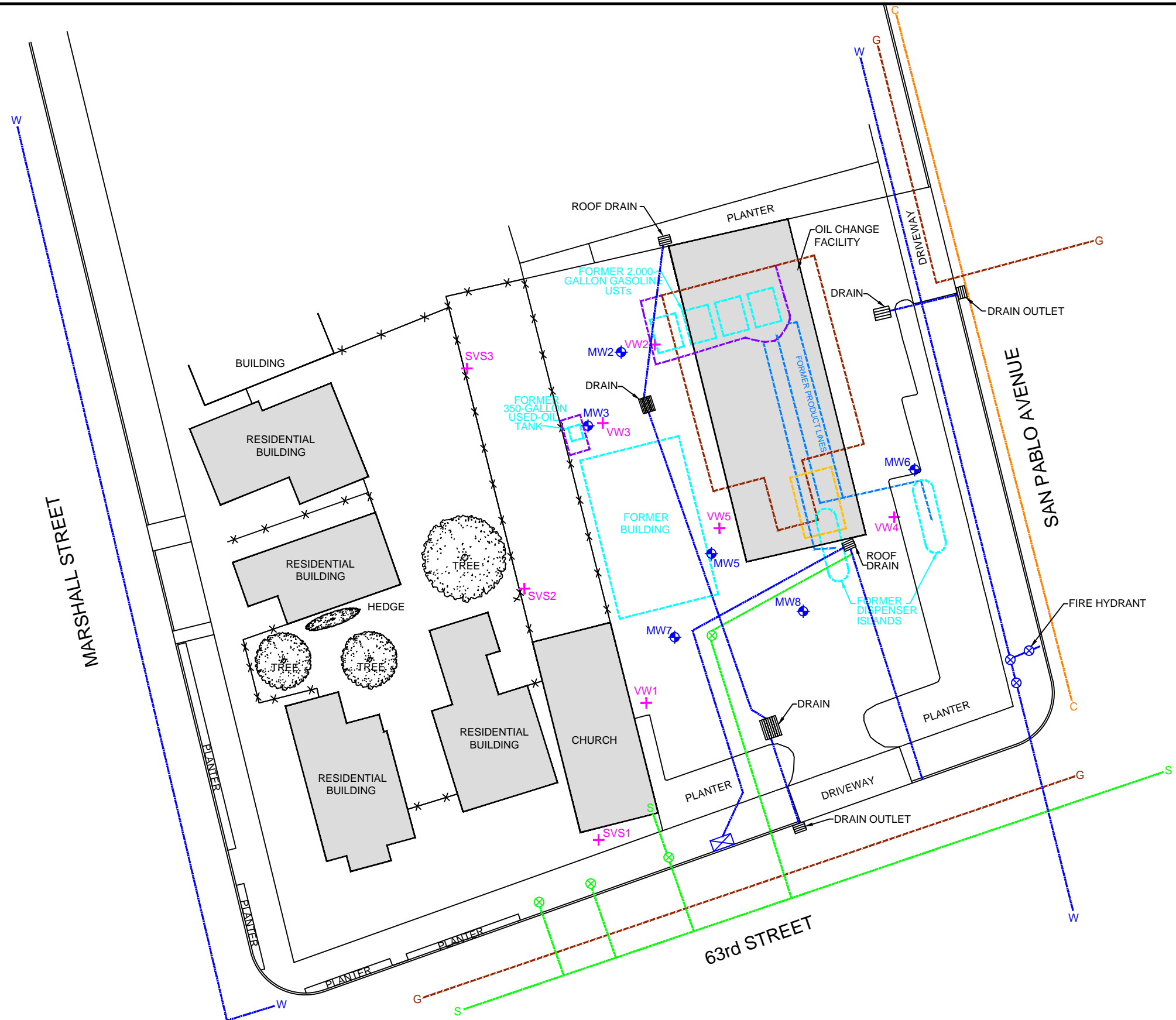
**EXPLANATION**

- MW8 Groundwater Monitoring Well
- AB13 Soil Boring
- VW5 Soil Vapor Sampling Well
- MW4 Destroyed Groundwater Monitoring Well
- MP6 Destroyed Observation Well
- PLI-5 Excavation Samples
- 1994 Areas of Excavation (11 feet bgs)
- 1996 Area of Excavation (5 feet bgs)
- 1996 Product Line Excavation (3 feet bgs)
- 1999 Area of Excavation (8 feet bgs)

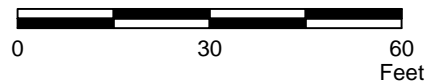
**PROJECT NO.**  
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**PLATE**  
2





APPROXIMATE SCALE



FN 27830001 R04

### UTILITY LOCATION MAP

FORMER MOBIL SERVICE STATION 99105  
6301 San Pablo Avenue  
Oakland, California

#### EXPLANATION

- MW8 Groundwater Monitoring Well
- VW5 Soil Vapor Sampling Well

- 1994 Areas of Excavation (11 feet bgs)
- 1996 Area of Excavation (5 feet bgs)
- 1996 Product Line Excavation (3 feet bgs)
- 1999 Area of Excavation (8 feet bgs)

#### Utilities Legend

- Water Vaults
- Sewer Vault
- Cable
- Gas
- Sewer
- Water

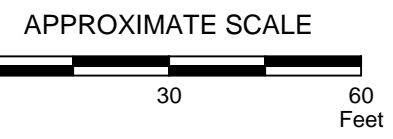
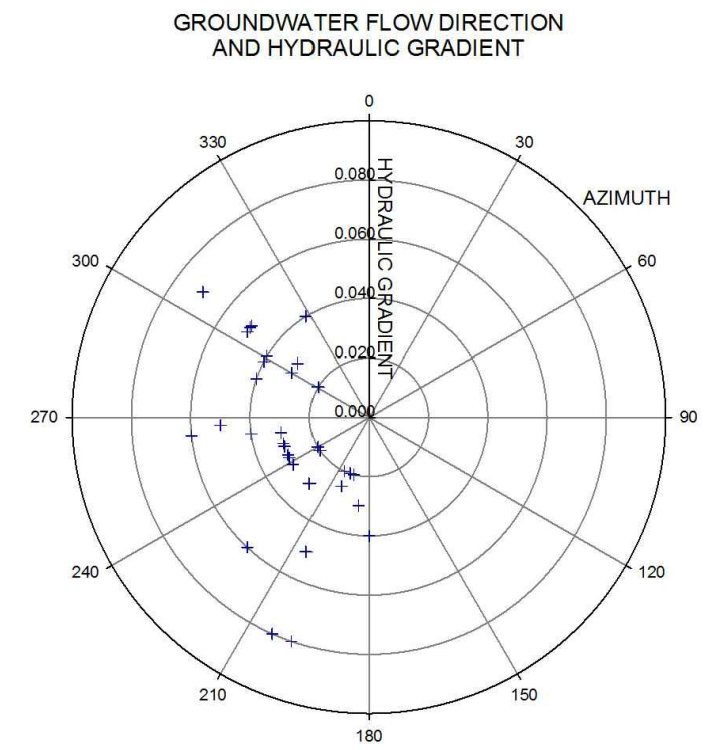
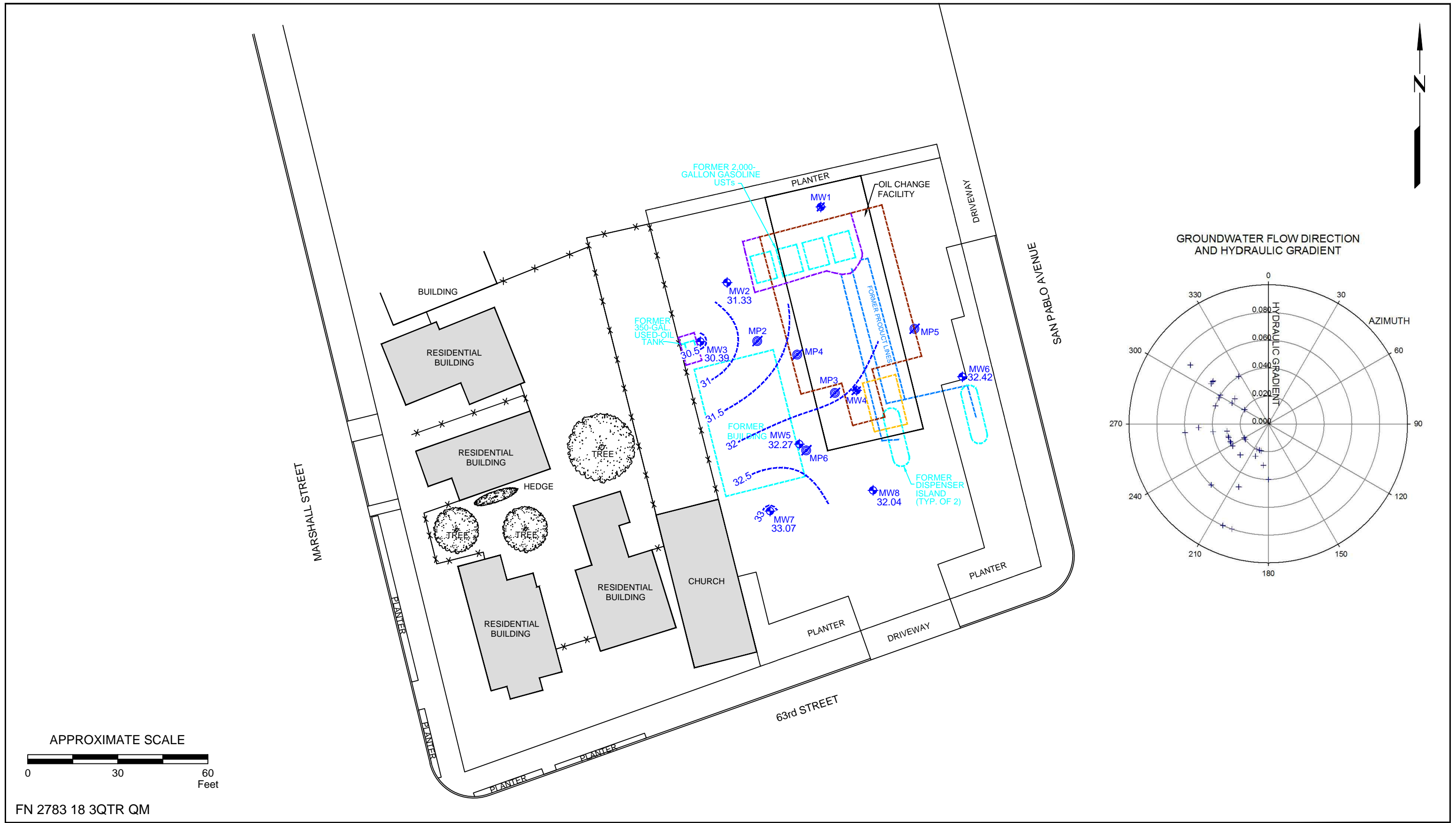
PROJECT NO.

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PLATE

3





FN 2783 18 3QTR QM

**GROUNDWATER ELEVATION MAP**  
**July 26, 2018**  
 FORMER MOBIL SERVICE STATION 99105  
 6301 San Pablo Avenue  
 Oakland, California

**EXPLANATION**

- MW8 Groundwater Monitoring Well
- 32.04 Groundwater elevation in feet; datum is mean sea level
- MW4 Destroyed Groundwater Monitoring well
- MP6 Destroyed Observation Well
- Line of Equal Groundwater Elevation; datum is mean sea level
- 1994 Areas of Excavation (11 feet bgs)
- 1996 Area of Excavation (5 feet bgs)
- 1996 Product Line Excavation (3 feet bgs)
- 1999 Area of Excavation (8 feet bgs)

**PROJECT NO.**  
2783

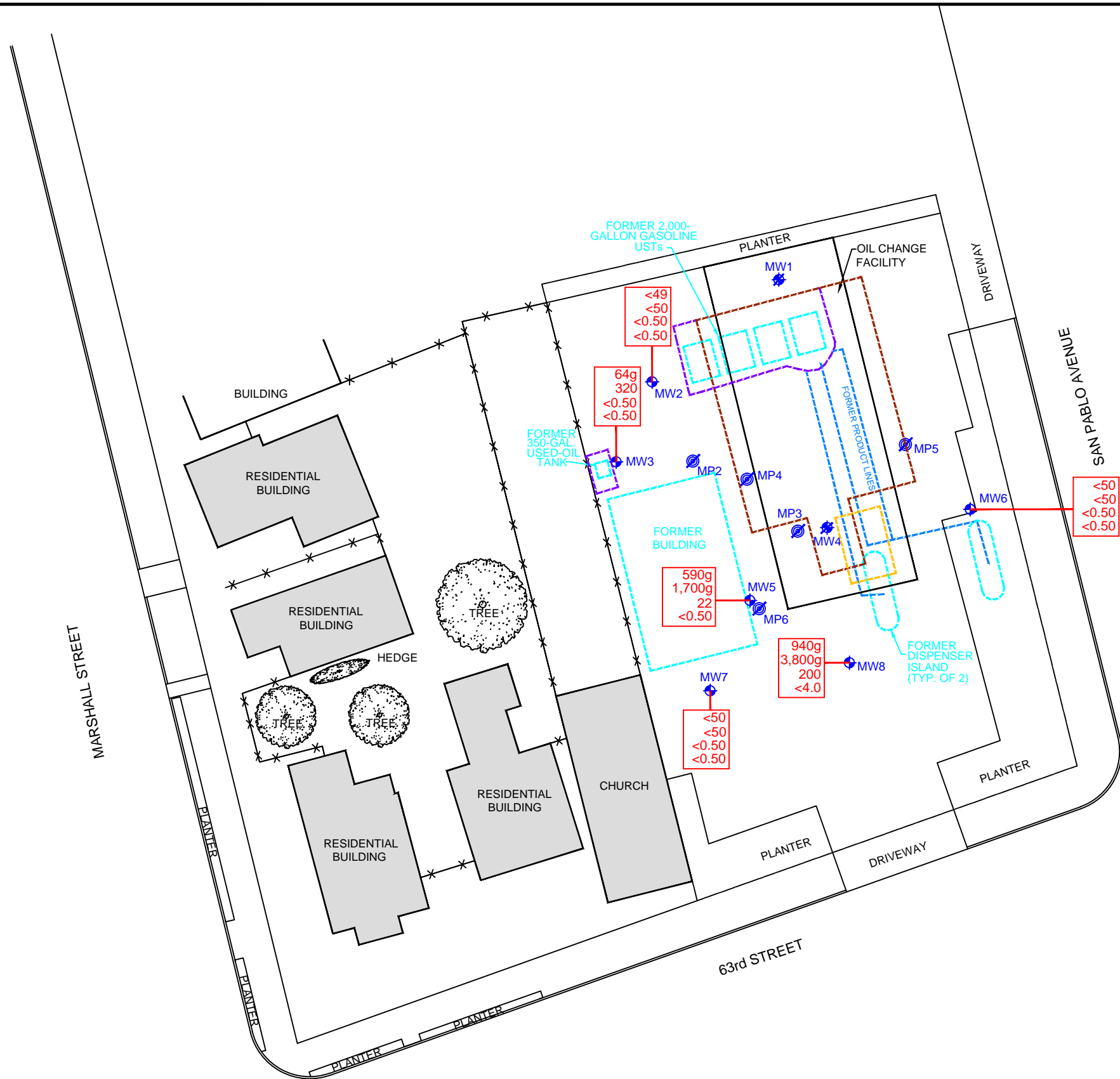
**PLATE**  
4



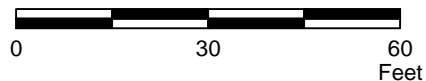
Analyte Concentrations in µg/L  
 Sampled July 26, 2018

- Total Petroleum Hydrocarbons as diesel
- Total Petroleum Hydrocarbons as gasoline
- Benzene
- Methyl Tertiary Butyl Ether

< Less than the Stated Laboratory Reporting Limit  
 µg/L Micrograms per Liter



APPROXIMATE SCALE



FN 2783 18 3QTR QM

**SELECT ANALYTICAL RESULTS, GROUNDWATER**  
**July 26, 2018**  
 FORMER MOBIL SERVICE STATION 99105  
 6301 San Pablo Avenue  
 Oakland, California

**EXPLANATION**

- MW8 Groundwater Monitoring Well
- MW4 Destroyed Groundwater Monitoring well
- MP6 Destroyed Observation Well

- 1994 Areas of Excavation (11 feet bgs)
- 1996 Area of Excavation (5 feet bgs)
- 1996 Product Line Excavation (3 feet bgs)
- 1999 Area of Excavation (8 feet bgs)

**PROJECT NO.**  
2783

**PLATE**  
5



Analyte Concentrations in  $\mu\text{g}/\text{m}^3$   
 Sampled July 24, 2018

Total Petroleum Hydrocarbons  
 as gasoline  
 Benzene  
 Naphthalene

< Less than the Stated Laboratory  
 Reporting Limit

DUP. Duplicate

NS Not Sampled

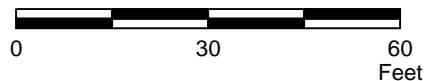
$\mu\text{g}/\text{m}^3$  Micrograms per cubic meter

q Unable to sample well due to  
 wet conditions.



	DUP.
100,000,000	99,000,000
14,000	14,000
4,500	4,100

APPROXIMATE SCALE



FN 2783 18 3QTR QM

## SELECT ANALYTICAL RESULTS, SOIL VAPOR July 24, 2018

FORMER MOBIL SERVICE STATION 99105  
 6301 San Pablo Avenue  
 Oakland, California

### EXPLANATION

- MW8 Groundwater Monitoring Well
- MW4 Destroyed Groundwater Monitoring well
- MP6 Destroyed Observation Well
- AB13 Soil Boring
- VW5 Soil Vapor Sampling Well

- 1994 Areas of Excavation (11 feet bgs)
- 1996 Area of Excavation (5 feet bgs)
- 1996 Product Line Excavation (3 feet bgs)
- 1999 Area of Excavation (8 feet bgs)



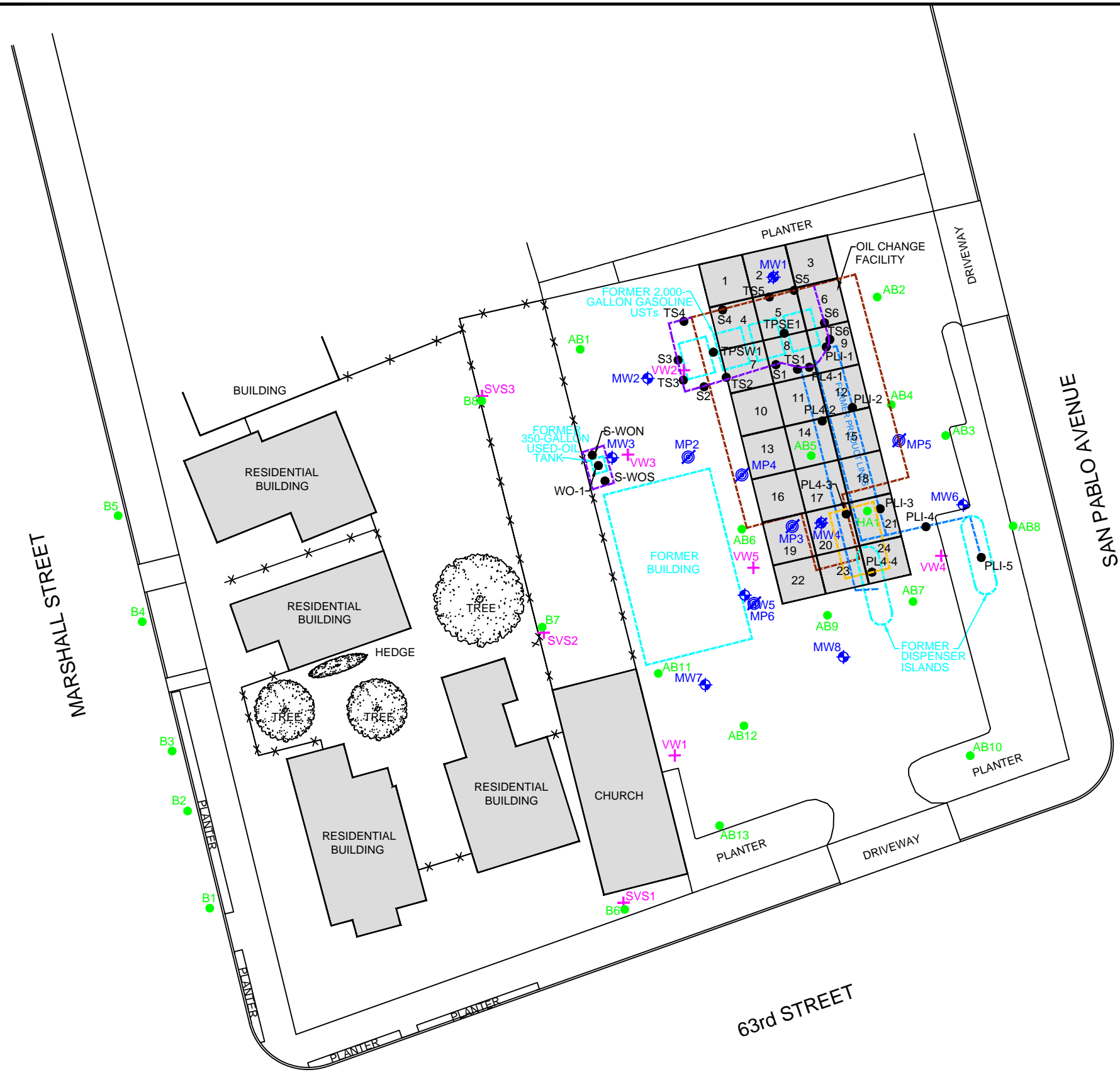
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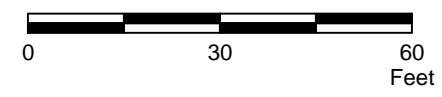
PLATE

6





APPROXIMATE SCALE



FN 27830001 R04

### ESTIMATED MASS IN SOIL

FORMER MOBIL SERVICE STATION 99105  
6301 San Pablo Avenue  
Oakland, California

#### EXPLANATION

- MW8 Groundwater Monitoring Well
- AB13 Soil Boring
- VW5 Soil Vapor Sampling Well
- MW4 Destroyed Groundwater Monitoring Well
- MP6 Destroyed Observation Well
- PLI-5 Excavation Samples
- 1994 Areas of Excavation (11 feet bgs)
- 1996 Area of Excavation (5 feet bgs)
- 1996 Product Line Excavation (3 feet bgs)
- 1999 Area of Excavation (8 feet bgs)

PROJECT NO.

2783

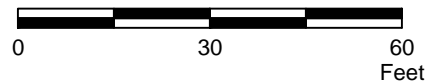
PLATE

7





APPROXIMATE SCALE



FN 27830001 R04

### PROPOSED ASSESSMENT LOCATIONS

FORMER MOBIL SERVICE STATION 99105  
 6301 San Pablo Avenue  
 Oakland, California

#### EXPLANATION

- MW8 Groundwater Monitoring Well
- VW5 Soil Vapor Sampling Well
- SVS5 Proposed Soil Vapor Sampling Well
- AB13 Soil Boring
- B10 Proposed Soil Boring Location

- 1994 Areas of Excavation (11 feet bgs)
- 1996 Area of Excavation (5 feet bgs)
- 1996 Product Line Excavation (3 feet bgs)
- 1999 Area of Excavation (8 feet bgs)

#### Utilities Legend

- Water Vaults
- Sewer Vault
- Cable
- Gas
- Sewer
- Water

PROJECT NO.

2783

PLATE

8



**TABLE 1A**  
**CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA**  
Former Mobil Service Station 99105  
6301 San Pablo Avenue  
Oakland, California

Well ID	Sampling Date	TOC Elev (feet)	DTW (feet)	GW Elev (feet)	NAPL (feet)	TPHd (µg/L)	TPHg (µg/L)	MTBE 8021B (µg/L)	MTBE 8260B (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	TBA (µg/L)	EDB (µg/L)	1,2-DCA (µg/L)	ETBE (µg/L)	TAME (µg/L)	DIPE (µg/L)	Ethanol (µg/L)	
EPA Method						8015B	8015B	8021B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B
Tier 1 ESLs (February 2016)						100	100	5	5	1	40	13	20	12	0.05	0.50	---	---	---	---	---
<b>Groundwater Monitoring Wells</b>																					
MW1	03/14/96	32.79	4.50	28.29	No	<b>450</b>	<b>610</b>	---	---	0.75	0.54	1.5	<b>59</b>	---	---	---	---	---	---	---	---
MW1	05/21/96	32.79	5.64	27.15	No	ND	ND	---	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---
MW1	08/13/96	32.79	9.76	23.03	No	ND	ND	---	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---
MW1	11/08/96	32.79	10.24	22.55	No	ND	ND	ND	---	ND	0.92	ND	2.1	---	---	---	---	---	---	---	---
MW1	01/31/97	32.79	3.83	28.96	No	ND	ND	2.6	ND	ND	0.85	ND	ND	---	---	---	---	---	---	---	---
MW1	04/22/97	32.79	9.14	23.65	No	ND	ND	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---
MW1	07/29/97 a	32.79	10.18	22.61	No	60e	ND	<b>36</b>	---	0.84	0.95	ND	1.6	---	---	---	---	---	---	---	---
MW1	10/09/97 a	32.79	10.46	22.33	No	56e	ND	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---
MW1	01/23/98 a	32.79	3.95	28.84	No	33	ND	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---
MW1	04/22/98	32.79	5.33	27.46	No	ND	ND	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---
MW1	07/21/98	32.79	9.17	23.62	No	---	ND	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---
MW1	10/20/98	32.79	10.41	22.38	No	---	ND	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---
MW1	01/27/99	32.79	5.51	27.28	No	---	ND	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---
MW1	Apr-99	32.79	Destroyed during construction activities.																		
MW2	03/14/96	32.80	4.51	28.29	No	<b>250</b>	<b>560</b>	---	---	<b>2.0</b>	0.96	4.3	11	---	---	---	---	---	---	---	---
MW2	05/21/96	32.80	5.65	27.15	No	<b>560</b>	<b>730</b>	---	---	<b>5.1</b>	1.4	6.7	5.9	---	---	---	---	---	---	---	---
MW2	08/13/96	32.80	10.14	22.66	No	<b>380b</b>	<b>490</b>	---	---	<b>25</b>	3.5	7.2	13	---	---	---	---	---	---	---	---
MW2	11/08/96	32.80	10.70	22.10	No	<b>160d</b>	<b>520</b>	<b>6.1</b>	---	<b>80</b>	2.7	<b>14</b>	<b>66</b>	---	---	---	---	---	---	---	---
MW2	01/31/97	32.80	3.84	28.96	No	<b>130b</b>	74	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---
MW2	04/22/97	32.80	9.61	23.19	No	<b>430</b>	<b>260</b>	ND	---	<b>2.7</b>	ND	2.5	ND	---	---	---	---	---	---	---	---
MW2	07/29/97 a	32.80	10.53	22.27	No	<b>150d</b>	<b>320</b>	ND	---	<b>28</b>	1.2	10	ND	---	---	---	---	---	---	---	---
MW2	10/09/97 a	32.80	10.87	21.93	No	<b>160b</b>	<b>460</b>	2.6	---	<b>43</b>	2.8	2.0	2.6	---	---	---	---	---	---	---	---
MW2	01/23/98 a	32.80	3.75	29.05	No	54	ND	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---
MW2	04/22/98	32.80	5.36	27.44	No	<b>540</b>	<b>180</b>	ND	---	<b>1.2</b>	0.3	0.4	ND	---	---	---	---	---	---	---	---
MW2	07/21/98	32.80	9.55	23.25	No	---	80	ND	---	<b>8.9</b>	2.1	0.6	2.5	---	---	---	---	---	---	---	---
MW2	10/20/98	32.80	10.75	22.05	No	---	50	ND	---	0.8	0.7	ND	0.8	---	---	---	---	---	---	---	---
MW2	01/27/99	32.80	5.53	27.27	No	---	ND	ND	---	0.6	ND	ND	ND	---	---	---	---	---	---	---	---
MW2	07/27/99	32.80	6.20	26.60	No	---	ND	ND	---	ND	0.6	ND	ND	---	---	---	---	---	---	---	---
MW2	12/08/99	32.80	9.98	22.82	No	---	ND	ND	---	<b>1.2</b>	0.43	ND	ND	---	---	---	---	---	---	---	---
MW2	10/25/00	39.34	11.30	28.04	No	---	<20	<0.30	---	<b>2.0</b>	0.59	0.46	1.3	---	---	---	---	---	---	---	---
MW2	01/15/01	39.34	9.41	29.93	No	---	<20	<0.30	---	<0.20	0.46	<0.20	<0.60	---	---	---	---	---	---	---	---
MW2	04/10/01	39.34	6.16	33.18	No	---	23	<1.0	---	0.28	<0.20	<0.20	<0.60	---	---	---	---	---	---	---	---
MW2	07/24/01	39.34	10.70	28.64	No	---	<50	<0.30	---	<0.20	0.93	<0.20	0.82	---	---	---	---	---	---	---	---
MW2	11/27/01	39.34	10.15	29.19	No	---	<50	<0.30	---	<b>1.2</b>	0.22	<0.20	<0.60	---	---	---	---	---	---	---	---
MW2	01/18/02	41.99	5.46	36.53	No	---	<50.0	1.40	---	<0.50	<0.50	<0.50	<0.50	---	---	---	---	---	---	---	---
MW2	04/10/02	41.99	6.48	35.51	No	---	<50.0	1.80	---	<0.50	<0.50	<0.50	<0.50	---	---	---	---	---	---	---	---
MW2	07/12/02	41.99	10.45	31.54	No	---	<50.0	<0.50	---	<0.50	<0.50	<0.50	<0.50	---	---	---	---	---	---	---	---
MW2	10/14/02	41.99	11.46	30.53	No	---	<50.0	<0.5	---	<0.5	4.1	0.6	4.0	---	---	---	---	---	---	---	---
MW2	01/20/03	41.99	5.39	36.60	No	---	<50.0	0.6	---	<0.50	<0.50	<0.50	<0.50	---	---	---	---	---	---	---	---

**TABLE 1A**  
**CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA**  
Former Mobil Service Station 99105  
6301 San Pablo Avenue  
Oakland, California

Well ID	Sampling Date	TOC Elev (feet)	DTW (feet)	GW Elev (feet)	NAPL (feet)	TPHd (µg/L)	TPHg (µg/L)	MTBE 8021B (µg/L)	MTBE 8260B (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	TBA (µg/L)	EDB (µg/L)	1,2-DCA (µg/L)	ETBE (µg/L)	TAME (µg/L)	DIPE (µg/L)	Ethanol (µg/L)	
EPA Method						8015B	8015B	8021B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B
Tier 1 ESLs (February 2016)						100	100	5	5	1	40	13	20	12	0.05	0.50	---	---	---	---	---
MW2	04/28/03	41.99	5.87	36.12	No	---	<50.0	<0.50	---	<0.50	<0.50	<0.50	<0.50	---	---	---	---	---	---	---	---
MW2	07/15/03	41.99	10.31	31.68	No	---	<50	<0.5	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	---
MW2	10/08/03	41.99	11.20	30.79	No	---	<50	<0.5	---	<0.5	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	---
MW2	01/15/04	41.99	5.36	36.63	No	---	63.3	1.0	---	0.70	<0.5	<0.5	<0.5	---	---	---	---	---	---	---	---
MW2	Well not sampled from 2004 to 2010.																				
MW2	09/17/10	41.99	10.72	31.27	No	<50	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<10	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---
MW2	12/15/10	42.24	Well resurveyed.																		
MW2	09/14/11	42.24	10.02	32.22	No	<b>110g</b>	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<50
MW2	01/18/12	42.24	11.24	31.00	No	---	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<50
MW2	01/27/12	42.24	9.65	32.59	No	<50	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW2	07/09/12	42.24	10.07	32.17	No	<50	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---
MW2	01/25/13	42.24	5.62	36.62	No	<50	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---
MW2	08/23/13	42.24	10.76	31.48	No	<50	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---
MW2	01/10/14	42.24	11.42	30.82	No	<50	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---
MW2	07/14/14	42.24	10.52	31.72	No	<49	<50	---	<0.50	<0.50	<0.50	<0.50	0.52	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---
MW2	08/18/14	42.24	11.06	31.18	No	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW2	11/06/14	42.24	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW2	01/23/15	42.24	6.10	36.14	No	<50	62g	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---
MW2	06/26/15	42.24	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW2	08/14/15	42.24	11.45	30.79	No	<50	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---
MW2	03/25/16	42.24	4.62	37.62	No	<45	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---
MW2	07/12/16	42.24	10.37	31.87	No	<50	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---
MW2	03/02/17	42.24	4.32	37.92	No	<45	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---
MW2	08/11/17	42.24	10.73	31.51	No	<45	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---
MW2	02/02/18	42.24	5.69	36.55	No	<45	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---
MW2	07/26/18	42.24	10.91	31.33	No	<49	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	---
MW3	03/14/96	32.80	9.55	23.25	No	<b>1,200</b>	<b>4,200</b>	---	---	<b>220</b>	<b>30</b>	<b>140</b>	<b>520</b>	---	---	---	---	---	---	---	---
MW3	05/21/96	32.80	10.16	22.64	No	<b>2,800</b>	<b>8,500</b>	---	---	<b>710</b>	<b>110</b>	<b>440</b>	<b>1,700</b>	---	---	---	---	---	---	---	---
MW3	08/13/96	32.80	11.18	21.62	No	<b>2,300c</b>	<b>5,000</b>	---	---	<b>430</b>	<b>ND</b>	<b>200</b>	<b>360</b>	---	---	---	---	---	---	---	---
MW3	11/08/96	32.80	11.51	21.29	No	<b>2,900b</b>	<b>8,400</b>	<b>73</b>	<b>ND</b>	<b>890</b>	<b>82</b>	<b>790</b>	<b>1,700</b>	---	---	---	---	---	---	---	---
MW3	01/31/97	32.80	7.90	24.90	No	<b>7,500b</b>	<b>16,000</b>	<b>ND</b>	---	<b>660</b>	<b>85</b>	<b>960</b>	<b>1,800</b>	---	---	---	---	---	---	---	---
MW3	04/22/97	32.80	10.64	22.16	No	<b>2,700</b>	<b>8,000</b>	<b>200</b>	<b>ND</b>	<b>340</b>	<b>33</b>	<b>400</b>	<b>490</b>	---	---	---	---	---	---	---	---
MW3	07/29/97 a	32.80	11.36	21.44	No	<b>2,300b</b>	<b>9,800</b>	<b>ND</b>	---	<b>330</b>	<b>ND</b>	<b>530</b>	<b>530</b>	---	---	---	---	---	---	---	---
MW3	10/09/97 a	32.80	11.52	21.28	No	<b>2,600b</b>	<b>7,300</b>	<b>270</b>	<b>ND</b>	<b>300</b>	<b>ND</b>	<b>430</b>	<b>460</b>	---	---	---	---	---	---	---	---
MW3	01/23/98 a	32.80	7.50	25.30	No	<b>2,300</b>	<b>6,100</b>	<b>ND</b>	---	<b>190</b>	<b>23</b>	<b>330</b>	<b>320</b>	---	---	---	---	---	---	---	---
MW3	04/22/98	32.80	6.81	25.99	No	<b>2,600</b>	<b>4,900</b>	<b>ND</b>	<b>ND</b>	<b>140</b>	<b>12</b>	<b>250</b>	<b>230</b>	---	---	---	---	---	---	---	---
MW3	07/21/98	32.80	10.65	22.15	No	---	<b>7,400</b>	<b>74</b>	<b>ND</b>	<b>250</b>	<b>16</b>	<b>400</b>	<b>370</b>	---	---	---	---	---	---	---	---
MW3	10/20/98	32.80	11.57	21.23	No	---	<b>6,700</b>	<b>ND</b>	<b>ND</b>	<b>200</b>	<b>18</b>	<b>350</b>	<b>350</b>	---	---	---	---	---	---	---	---
MW3	01/27/99	32.80	9.11	23.69	No	---	<b>3,100</b>	<b>13</b>	---	<b>74</b>	<b>4</b>	<b>94</b>	<b>39</b>	---	---	---	---	---	---	---	---
MW3	07/27/99	32.80	7.27	25.53	No	---	<b>8,900</b>	<b>ND</b>	---	<b>170</b>	<b>21</b>	<b>360</b>	<b>440</b>	---	---	---	---	---	---	---	---
MW3	12/08/99	32.80	10.63	22.17	No	---	<b>4,800</b>	<b>ND</b>	---	<b>94</b>	<b>13</b>	<b>170</b>	<b>210</b>	---	---	---	---	---	---	---	---

**TABLE 1A  
CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA**

Former Mobil Service Station 99105  
6301 San Pablo Avenue  
Oakland, California

Well ID	Sampling Date	TOC Elev (feet)	DTW (feet)	GW Elev (feet)	NAPL (feet)	TPHd (µg/L)	TPHg (µg/L)	MTBE 8021B (µg/L)	MTBE 8260B (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	TBA (µg/L)	EDB (µg/L)	1,2-DCA (µg/L)	ETBE (µg/L)	TAME (µg/L)	DIPE (µg/L)	Ethanol (µg/L)		
EPA Method						8015B	8015B	8021B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	
Tier 1 ESLs (February 2016)						100	100	5	5	1	40	13	20	12	0.05	0.50	---	---	---	---	---	---
MW3	10/25/00	39.27	12.08	27.19	No	---	3,800	<50	<5	63	2.9	100	65	---	---	---	---	---	---	---		
MW3	01/15/01	39.27	10.29	28.98	No	---	4,300	<5.0	---	76	9.5	47	76	---	---	---	---	---	---	---		
MW3	04/10/01	39.27	10.11	29.16	No	---	2,700	<20	---	55	4.4	100	37	---	---	---	---	---	---	---		
MW3	07/24/01	39.27	11.57	27.70	No	---	3,100	<1.0	---	110	6.9	110	81	---	---	---	---	---	---	---		
MW3	11/27/01	39.27	10.93	28.34	No	---	2,400	<0.30	---	47	8.9	25	35	---	---	---	---	---	---	---		
MW3	01/18/02	41.71	9.47	32.24	No	---	1,130	13.6	---	15.3	2.30	42.0	24.6	---	---	---	---	---	---	---		
MW3	04/10/02	41.71	10.14	31.57	No	---	916	11.2	---	35.1	3.00	22.5	13.8	---	---	---	---	---	---	---		
MW3	07/12/02	41.71	11.34	30.37	No	---	2,330	15.4	---	60.5	2.90	39.8	50.9	---	---	---	---	---	---	---		
MW3	10/14/02	41.71	12.10	29.61	No	---	2,550	<0.5	---	36.9	3.8	20.3	48.0	---	---	---	---	---	---	---		
MW3	01/20/03	41.71	9.20	32.51	No	---	1,750	10.7	---	20.4	304.0	60.7	22.0	---	---	---	---	---	---	---		
MW3	04/28/03	41.71	9.37	32.34	No	---	2,730	11.2	---	10.0	2.7	42.7	20.1	---	---	---	---	---	---	---		
MW3	07/15/03	41.71	11.15	30.56	No	---	1,790	5.6	---	68.8	3.6	39.0	44.7	---	---	---	---	---	---	---		
MW3	10/08/03	41.71	11.89	29.82	No	---	1,320	7.1	---	35.1	4.0	23.6	31.8	---	---	---	---	---	---	---		
MW3	01/15/04	41.71	9.16	32.55	No	---	791	3.4	---	24.4	1.3	40.1	14.7	---	---	---	---	---	---	---		
MW3	Well not sampled from 2004 to 2010.																					
MW3	09/17/10	41.71	11.46	30.25	No	99	2,500	---	<0.50	2.6	0.31f	1.8	1.8	9.8f	<0.50	1.9	<0.50	<0.50	0.17f	---		
MW3	12/15/10	42.18	Well resurveyed.			---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
MW3	09/14/11	42.18	11.37	30.81	No	270g	1,200	---	<0.50	18	0.95	1.7	1.3	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	<50		
MW3	01/18/12	42.18	12.11	30.07	No	---	910g	---	<0.50	0.89	<0.50	<0.50	0.88	23	<0.50	<0.50	<0.50	<0.50	<0.50	<50		
MW3	01/27/12	42.18	10.18	32.00	No	1,000g	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
MW3	07/09/12	42.18	11.15	31.03	No	420g	350g	---	<0.50	7.9	<0.50	<0.50	<0.50	9.1	<0.50	1.1	<0.50	<0.50	<0.50	---		
MW3	01/25/13	42.18	9.41	32.77	No	120g	390g	---	<0.50	2.8	<0.50	<0.50	<0.50	9.6	<0.50	1.1	<0.50	<0.50	<0.50	---		
MW3	08/23/13	42.18	11.67	30.51	No	310g	640	---	<0.50	1.1	<0.50	<0.50	<0.50	7.2	<0.50	0.90	<0.50	<0.50	<0.50	---		
MW3	01/10/14	42.18	12.13	30.05	No	160g	720g	---	<0.50	<0.50	<0.50	<0.50	<0.50	12	<0.50	1.1	<0.50	<0.50	<0.50	---		
MW3	07/14/14	42.18	11.55	30.63	No	320g	1,100g	---	<0.50	1.8	<0.50	<0.50	0.53	11	<0.50	1.1	<0.50	<0.50	<0.50	---		
MW3	08/18/14	42.18	11.83	30.35	No	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
MW3	11/06/14	42.18	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
MW3	01/23/15	42.18	10.19	31.99	No	440g	750g	---	<0.50	5.6	1.7	0.79	1.0	8.1	<0.50	0.70	<0.50	<0.50	<0.50	---		
MW3	06/26/15	42.18	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
MW3	08/14/15	42.18	12.25	29.93	No	120g	710g	---	<0.50	2.0	0.50	<0.50	1.3	<5.0	<0.50	1.3	<0.50	<0.50	<0.50	---		
MW3	03/25/16	42.18	8.05	34.13	No	190g	320g	---	<0.50	1.6	<0.50	0.91	<0.50	<5.0	<0.50	1.0	<0.50	<0.50	<0.50	---		
MW3	07/12/16	42.18	11.47	30.71	No	230g	340g	---	<0.50	2.0	<0.50	<0.50	<0.50	5.5	<0.50	1.1	<0.50	<0.50	<0.50	---		
MW3	03/02/17	42.18	7.56	34.62	No	130g	350g	---	<0.50	2.5	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	---		
MW3	08/11/17	42.18	11.12	31.06	No	170g	450g	---	<0.50	1.0	<0.50	<0.50	0.53	7.9	<0.50	0.75	<0.50	<0.50	<0.50	---		
MW3	02/02/18	42.18	9.41	32.77	No	93	240	---	<0.50	1.9	<0.50	<0.50	<0.50	<5.0	<0.50	0.88	<0.50	<0.50	<0.50	---		
MW3	07/26/18	42.18	11.79	30.39	No	64g	320	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<0.50	<0.50	<0.50	<0.50	<0.50	---		
MW4	03/14/96	31.50	4.92	26.58	No	3,500	12,000	---	---	2,200	140	880	2,000	---	---	---	---	---	---	---		
MW4	05/21/96	31.50	8.60	22.90	No	4,200	11,000	---	---	1,700	ND	930	470	---	---	---	---	---	---	---		
MW4	08/13/96	31.50	10.02	21.50	0.02	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
MW4	11/08/96	31.50	10.28	21.33	0.15	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
MW4	01/31/97	31.50	7.88	23.62	No	8,200b	23,000	ND	---	980	68	1,100	1,400	---	---	---	---	---	---	---		

**TABLE 1A**  
**CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA**  
Former Mobil Service Station 99105  
6301 San Pablo Avenue  
Oakland, California

Well ID	Sampling Date	TOC Elev (feet)	DTW (feet)	GW Elev (feet)	NAPL (feet)	TPHd (µg/L)	TPHg (µg/L)	MTBE 8021B (µg/L)	MTBE 8260B (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	TBA (µg/L)	EDB (µg/L)	1,2-DCA (µg/L)	ETBE (µg/L)	TAME (µg/L)	DIPE (µg/L)	Ethanol (µg/L)	
EPA Method						8015B	8015B	8021B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B
Tier 1 ESLs (February 2016)						100	100	5	5	1	40	13	20	12	0.05	0.50	---	---	---	---	---
MW4	04/22/97	31.50	7.40	24.10	No	<b>4,500</b>	<b>8,800</b>	ND	---	<b>950</b>	ND	<b>610</b>	<b>130</b>	---	---	---	---	---	---	---	---
MW4	07/29/97	31.50	9.85	21.74	0.12	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW4	10/09/97	31.50	10.35	21.38	0.30	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW4	01/23/98	31.50	4.68	27.51	0.92	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW4	04/22/98	31.50	6.39	25.22	0.14	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW4	07/21/98	31.50	7.10	24.55	0.20	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW4	10/20/98	31.50	9.03	22.60	0.17	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW4	01/27/99	31.50	5.37	26.18	0.07	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW4	Apr-99	31.50	Destroyed during construction activities.																		
MW5	10/25/00	39.18	10.92	28.26	No	---	<b>2,500</b>	<b>&lt;20</b>	---	<b>79</b>	3.8	<b>66</b>	<b>&lt;20</b>	---	---	---	---	---	---	---	---
MW5	01/15/01	39.18	8.32	30.86	No	---	<b>3,900</b>	<b>&lt;5.0</b>	---	<b>120</b>	7.9	<b>280</b>	<b>52</b>	---	---	---	---	---	---	---	---
MW5	04/10/01	39.18	7.21	31.97	No	---	<b>8,000</b>	<b>&lt;5.0</b>	---	<b>280</b>	4.4	<b>410</b>	<b>100</b>	---	---	---	---	---	---	---	---
MW5	07/24/01	39.18	9.54	29.64	No	---	<b>7,000</b>	<b>&lt;1.0</b>	---	<b>360</b>	7.4	<b>380</b>	<b>67</b>	---	---	---	---	---	---	---	---
MW5	11/27/01	39.18	8.84	30.34	No	---	<b>5,000</b>	<b>8.9</b>	<b>&lt;2</b>	<b>64</b>	11	<b>340</b>	<b>52</b>	---	---	---	---	---	---	---	---
MW5	01/18/02	41.59	6.52	35.07	No	---	<b>6,330</b>	<b>21.8</b>	---	<b>99.1</b>	2.30	<b>103</b>	19.6	---	---	---	---	---	---	---	---
MW5	04/10/02	41.59	7.20	34.39	No	---	<b>2,140</b>	<b>&lt;2.50</b>	---	<b>275</b>	8.00	<b>183</b>	<b>24.5</b>	---	---	---	---	---	---	---	---
MW5	07/12/02	41.59	8.83	32.76	No	---	<b>3,940</b>	<b>20</b>	<b>&lt;0.50</b>	<b>350</b>	<b>&lt;0.50</b>	<b>268</b>	14	---	---	---	---	---	---	---	---
MW5	10/14/02	41.59	10.74	30.85	No	---	<b>4,040</b>	<b>&lt;2.5</b>	---	<b>98.5</b>	9.0	<b>169</b>	<b>29.0</b>	---	---	---	---	---	---	---	---
MW5	01/20/03	41.59	6.45	35.14	No	---	<b>7,660</b>	<b>59</b>	<b>&lt;0.50</b>	<b>421</b>	10.0	<b>743</b>	<b>96.0</b>	---	---	---	---	---	---	---	---
MW5	04/28/03	41.59	6.68	34.91	No	---	<b>7,510</b>	<b>47</b>	<b>&lt;0.50</b>	<b>403</b>	5.5	<b>524</b>	<b>50.5</b>	---	---	---	---	---	---	---	---
MW5	07/15/03	41.59	6.68	32.91	No	---	<b>6,080</b>	<b>52.9</b>	<b>&lt;2.5</b>	<b>406</b>	19.8	<b>412</b>	<b>34.7</b>	---	---	---	---	---	---	---	---
MW5	10/08/03	41.59	10.56	31.03	No	---	<b>2,460</b>	<b>54.3</b>	<b>&lt;0.5</b>	<b>160</b>	12.8	<b>173</b>	<b>31.7</b>	---	---	---	---	---	---	---	---
MW5	01/15/04	41.59	6.56	35.03	No	---	<b>4,630</b>	<b>37.4</b>	<b>&lt;0.5</b>	<b>181</b>	6.0	<b>312</b>	<b>38.5</b>	---	---	---	---	---	---	---	---
MW5	Well not sampled from 2004 to 2010.																				
MW5	09/17/10	41.59	9.99	31.60	No	<b>5,700</b>	<b>6,600</b>	---	<b>&lt;5.0</b>	<b>19</b>	<b>&lt;5.0</b>	<b>16</b>	1.4f	<b>&lt;100</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	---
MW5	12/15/10	41.86	Well resurveyed.																		
MW5	09/14/11	41.86	7.33	34.53	No	<b>1,600g</b>	<b>7,200</b>	---	<b>&lt;2.0</b>	<b>23</b>	<b>&lt;2.0</b>	8.6	<b>&lt;2.0</b>	<b>25</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;200</b>
MW5	01/18/12	41.86	9.46	32.40	No	---	<b>3,600g</b>	---	<b>&lt;1.0</b>	<b>14</b>	<b>&lt;1.0</b>	7.6	<b>&lt;1.0</b>	<b>37</b>	<b>&lt;1.0</b>	<b>&lt;1.0</b>	<b>&lt;1.0</b>	<b>&lt;1.0</b>	<b>&lt;1.0</b>	<b>&lt;1.0</b>	<b>&lt;100</b>
MW5	01/27/12	41.86	8.81	33.05	No	<b>3,100g</b>	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW5	07/09/12	41.86	8.91	32.95	Sheen	<b>29,000g</b>	<b>9,300g</b>	---	<b>&lt;2.5</b>	<b>21</b>	<b>&lt;2.5</b>	6.9	<b>&lt;2.5</b>	<b>36</b>	<b>&lt;2.5</b>	<b>&lt;2.5</b>	<b>&lt;2.5</b>	<b>&lt;2.5</b>	<b>&lt;2.5</b>	<b>&lt;2.5</b>	---
MW5	01/25/13	41.86	6.01	35.85	Sheen	<b>22,000g</b>	<b>4,900g</b>	---	<b>&lt;2.0</b>	<b>46</b>	<b>&lt;2.0</b>	4.5	<b>&lt;2.0</b>	<b>45</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	---
MW5	08/23/13	41.86	9.12	32.74	No	<b>34,000g</b>	<b>17,000</b>	---	<b>&lt;2.0</b>	<b>17</b>	<b>&lt;2.0</b>	6.3	<b>&lt;2.0</b>	<b>42</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	---
MW5	01/10/14	41.86	10.30	31.56	No	<b>36,000g</b>	<b>62,000</b>	---	<b>&lt;2.0</b>	<b>4.7</b>	<b>&lt;2.0</b>	3.5	<b>&lt;2.0</b>	<b>36</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	---
MW5	07/14/14	41.86	8.70	33.16	No	<b>88,000g</b>	<b>90,000g</b>	---	<b>&lt;5.0</b>	<b>100</b>	<b>&lt;5.0</b>	12	<b>&lt;5.0</b>	<b>&lt;50</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	---
MW5	08/18/14	41.86	9.40	32.46	No	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW5	08/22/14	41.86	9.60	32.26	No	<b>5,800g</b>	<b>5,100</b>	---	<b>&lt;5.0</b>	<b>520</b>	<b>&lt;5.0</b>	<b>320</b>	<b>81</b>	<b>&lt;50</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	---
MW5	11/06/14	41.86	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW5	01/23/15	41.86	7.30	34.56	No	<b>19,000g</b>	<b>3,300g</b>	---	<b>&lt;5.0</b>	<b>130</b>	<b>&lt;5.0</b>	<b>65</b>	<b>26</b>	<b>&lt;50</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	<b>&lt;5.0</b>	---
MW5	06/26/15	41.86	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW5	08/14/15	41.86	9.87	31.99	Sheen	<b>4,900g</b>	<b>10,000g</b>	---	<b>&lt;2.0</b>	<b>27</b>	<b>&lt;2.0</b>	<b>24</b>	17	<b>23</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	---
MW5	03/25/16	41.86	5.67	36.19	No	<b>2,300g</b>	<b>4,500g</b>	---	<b>&lt;2.0</b>	<b>91</b>	<b>&lt;2.0</b>	<b>23</b>	8.3	<b>&lt;20</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	---

**TABLE 1A**  
**CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA**  
Former Mobil Service Station 99105  
6301 San Pablo Avenue  
Oakland, California

Well ID	Sampling Date	TOC Elev (feet)	DTW (feet)	GW Elev (feet)	NAPL (feet)	TPHd (µg/L)	TPHg (µg/L)	MTBE 8021B (µg/L)	MTBE 8260B (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	TBA (µg/L)	EDB (µg/L)	1,2-DCA (µg/L)	ETBE (µg/L)	TAME (µg/L)	DIPE (µg/L)	Ethanol (µg/L)		
EPA Method						8015B	8015B	8021B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	
Tier 1 ESLs (February 2016)						100	100	5	5	1	40	13	20	12	0.05	0.50	---	---	---	---	---	
MW5	07/12/16	41.86	8.90	32.96	Sheen	<b>2,800g</b>	<b>1,500g</b>	---	<2.0	<b>54</b>	<2.0	12	6.0	<b>&lt;20</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<2.0	<2.0	<2.0	<2.0	---	
MW5	03/02/17	41.86	5.14	36.72	No	<b>3,400g</b>	<b>650g</b>	---	<2.0	<b>71</b>	<2.0	8.5	5.2	<b>&lt;20</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<2.0	<2.0	<2.0	<2.0	---	
MW5	08/11/17	41.86	9.31	32.55	No	<b>3,700g</b>	<b>1,300g</b>	---	<1.0	<b>2.9</b>	1.2	1.5	3.4	<b>12</b>	<b>&lt;1.0</b>	<b>&lt;1.0</b>	<1.0	<1.0	<1.0	<1.0	---	
MW5	02/02/18	41.86	7.11	34.75	No	<b>1,500</b>	<b>2,600</b>	---	<1.0	<b>24</b>	<1.0	1.4	2.8	<10	<b>&lt;1.0</b>	<b>&lt;1.0</b>	<1.0	<1.0	<1.0	<1.0	---	
MW5	07/26/18	41.86	9.59	32.27	No	<b>590g</b>	<b>1,700g</b>	---	<0.50	<b>22</b>	0.74	1.9	1.4	<b>28</b>	<b>&lt;0.50</b>	<0.50	<0.50	<0.50	<0.50	<0.50	---	
MW6	08/18/14	42.00	Well surveyed.																			
MW6	08/18/14	42.00	13.12	28.88	No	<b>350g</b>	<b>410g</b>	---	0.60	<0.50	<0.50	<0.50	<0.50	<b>14</b>	<b>&lt;0.50</b>	<b>1.1</b>	<0.50	<0.50	<0.50	<0.50	---	
MW6	08/22/14	42.00	11.20	30.80	No	<b>1,000g</b>	<b>1,500g</b>	---	<0.50	<0.50	<0.50	<0.50	<0.50	<b>12</b>	<b>&lt;0.50</b>	<0.50	<0.50	<0.50	<0.50	<0.50	---	
MW6	11/06/14	42.00	10.77	31.23	No	<b>640g</b>	<b>840g</b>	---	0.80	<0.50	<0.50	<0.50	<0.50	<b>14</b>	<b>&lt;0.50</b>	<b>1.3</b>	<0.50	<0.50	<0.50	<0.50	---	
MW6	01/23/15	42.00	7.38	34.62	No	<b>170g</b>	<b>120g</b>	---	<0.50	<0.50	<0.50	<0.50	<0.50	6.7	<b>&lt;0.50</b>	<0.50	<0.50	<0.50	<0.50	<0.50	---	
MW6	06/26/15	42.00	9.11	32.89	No	<b>160g</b>	<b>170g</b>	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<b>&lt;0.50</b>	<0.50	<0.50	<0.50	<0.50	<0.50	---	
MW6	08/14/15	42.00	9.89	32.11	No	91g	<b>120g</b>	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<b>&lt;0.50</b>	<b>0.59</b>	<0.50	<0.50	<0.50	<0.50	---	
MW6	03/25/16	42.00	6.06	35.94	No	82g	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<b>&lt;0.50</b>	<0.50	<0.50	<0.50	<0.50	<0.50	---	
MW6	07/12/16	42.00	9.09	32.91	No	<b>130g</b>	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<b>&lt;0.50</b>	<0.50	<0.50	<0.50	<0.50	<0.50	---	
MW6	03/02/17	42.00	5.66	36.34	No	84	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<b>&lt;0.50</b>	<0.50	<0.50	<0.50	<0.50	<0.50	---	
MW6	08/11/17	42.00	9.27	32.73	No	57	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<b>&lt;0.50</b>	<0.50	<0.50	<0.50	<0.50	<0.50	---	
MW6	02/02/18	42.00	7.20	34.80	No	<45	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<b>&lt;0.50</b>	<0.50	<0.50	<0.50	<0.50	<0.50	---	
MW6	07/26/18	42.00	9.58	32.42	No	<50	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<b>&lt;0.50</b>	<0.50	<0.50	<0.50	<0.50	<0.50	---	
MW7	08/18/14	41.34	Well surveyed.																			
MW7	08/18/14	41.34	13.81	27.53	No	<51	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<b>21</b>	<b>&lt;0.50</b>	<b>3.1</b>	<0.50	<0.50	<0.50	<0.50	---	
MW7	08/22/14	41.34	Dry	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
MW7	11/06/14	41.34	11.73	29.61	No	<50	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<b>15</b>	<b>&lt;0.50</b>	<b>3.9</b>	<0.50	<0.50	<0.50	<0.50	---	
MW7	01/23/15	41.34	10.81	30.53	No	57g	<b>140</b>	---	<0.50	<b>4.2</b>	2.8	6.4	6.1	<b>23</b>	<b>&lt;0.50</b>	<b>5.1</b>	<0.50	<0.50	<0.50	<0.50	---	
MW7	06/26/15	41.34	10.28	31.06	No	49g	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	11	<b>&lt;0.50</b>	<b>3.4</b>	<0.50	<0.50	<0.50	<0.50	---	
MW7	08/14/15	41.34	11.41	29.93	No	<47	58g	---	<0.50	<0.50	<0.50	<0.50	<0.50	6.6	<b>&lt;0.50</b>	<b>2.5</b>	<0.50	<0.50	<0.50	<0.50	---	
MW7	03/25/16	41.34	9.72	31.62	No	55g	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	9.5	<b>&lt;0.50</b>	<b>1.9</b>	<0.50	<0.50	<0.50	<0.50	---	
MW7	07/12/16	41.34	10.66	30.68	No	88g	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	10	<b>&lt;0.50</b>	<b>2.0</b>	<0.50	<0.50	<0.50	<0.50	---	
MW7	03/02/17	41.34	5.83	35.51	No	<45	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<b>&lt;0.50</b>	<b>0.62</b>	<0.50	<0.50	<0.50	<0.50	---	
MW7	08/11/17	41.34	11.14	30.20	No	<45	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<b>&lt;0.50</b>	<b>1.2</b>	<0.50	<0.50	<0.50	<0.50	---	
MW7	02/02/18	41.34	9.83	31.51	No	<47	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<b>&lt;0.50</b>	<b>0.88</b>	<0.50	<0.50	<0.50	<0.50	---	
MW7	07/26/18	41.34	8.27	33.07	No	<50	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	<b>&lt;0.50</b>	<0.50	<0.50	<0.50	<0.50	<0.50	---	
MW8	08/18/14	41.30	Well surveyed.																			
MW8	08/18/14	41.30	12.18	29.12	No	<b>440g</b>	<b>1,600</b>	---	<0.50	<b>39</b>	<0.50	<b>19</b>	<b>44</b>	<b>20</b>	<b>&lt;0.50</b>	<b>0.78</b>	<0.50	<0.50	<0.50	<0.50	---	
MW8	08/22/14	41.30	13.10	28.20	No	<b>350g</b>	<b>950g</b>	---	<0.50	<b>5.7</b>	<0.50	4.2	6.4	<b>31</b>	<b>&lt;0.50</b>	<0.50	<0.50	<0.50	<0.50	<0.50	---	
MW8	11/06/14	41.30	10.96	30.34	No	<b>260g</b>	<b>910g</b>	---	<0.50	<b>54</b>	<0.50	<b>25</b>	11	<b>34</b>	<b>&lt;0.50</b>	<b>2.8</b>	<0.50	<0.50	<0.50	<0.50	---	
MW8	01/23/15	41.30	6.83	34.47	No	<b>440g</b>	<b>1,000g</b>	---	<0.50	<b>110</b>	1.8	<b>19</b>	10	<b>20</b>	<b>&lt;0.50</b>	<0.50	<0.50	<0.50	<0.50	<0.50	---	
MW8	06/26/15	41.30	8.46	32.84	No	<b>650g</b>	<b>1,100</b>	---	<2.0	<b>100</b>	<2.0	<b>24</b>	6.2	<b>20</b>	<b>&lt;2.0</b>	<b>&lt;2.0</b>	<2.0	<2.0	<2.0	<2.0	---	
MW8	08/14/15	41.30	9.85	31.45	No	<b>770g</b>	<b>2,000g</b>	---	<0.50	<b>92</b>	1.2	<b>14</b>	13	<b>15</b>	<b>&lt;0.50</b>	<0.50	<0.50	<0.50	<0.50	<0.50	---	
MW8	03/25/16	41.30	8.18	33.12	No	<b>1,200g</b>	<b>4,000g</b>	---	<0.50	<b>160</b>	1.6	<b>130</b>	<b>37</b>	<b>17</b>	<b>&lt;0.50</b>	<0.50	<0.50	<0.50	<0.50	<0.50	---	

**TABLE 1A**  
**CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA**  
Former Mobil Service Station 99105  
6301 San Pablo Avenue  
Oakland, California

Well ID	Sampling Date	TOC Elev (feet)	DTW (feet)	GW Elev (feet)	NAPL (feet)	TPHd (µg/L)	TPHg (µg/L)	MTBE 8021B (µg/L)	MTBE 8260B (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	TBA (µg/L)	EDB (µg/L)	1,2-DCA (µg/L)	ETBE (µg/L)	TAME (µg/L)	DIPE (µg/L)	Ethanol (µg/L)	
EPA Method						8015B	8015B	8021B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B
Tier 1 ESLs (February 2016)						100	100	5	5	1	40	13	20	12	0.05	0.50	---	---	---	---	---
MW8	07/12/16	41.30	7.96	33.34	Sheen	<b>1,500g</b>	<b>2,000</b>	---	<2.5	<b>160</b>	<2.5	<b>84</b>	11	<b>29</b>	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	---
MW8	03/02/17	41.30	7.67	33.63	No	<b>1,800g</b>	<b>1,500g</b>	---	<2.5	<b>270</b>	<2.5	<b>190</b>	16	<25	<2.5	<2.5	<2.5	<2.5	<2.5	<2.5	---
MW8	08/11/17	41.30	9.27	32.03	No	<b>1,400g</b>	<b>2,900g</b>	---	<1.0	<b>95</b>	<1.0	<b>48</b>	4.2	<b>36</b>	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---
MW8	02/02/18	41.30	7.38	33.92	No	<b>1,200</b>	<b>2,700</b>	---	<2.0	<b>170</b>	<2.0	<b>100</b>	11	<20	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	---
MW8	07/26/18	41.30	9.26	32.04	No	<b>940g</b>	<b>3,800g</b>	---	<4.0	<b>200</b>	<4.0	<b>220</b>	<b>23</b>	<b>42</b>	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	---
<b>Grab Groundwater Samples</b>																					
AB10	03/05/98	---	2.0	---	No	---	<b>200</b>	ND	---	<b>3.0</b>	1.2	3.2	2.8	---	---	---	---	---	---	---	---
AB1	03/05/98	---	4.5	---	No	---	<b>1,600</b>	ND	---	<b>31</b>	5.3	<b>79</b>	<b>130</b>	---	---	---	---	---	---	---	---
AB2	03/05/98	---	8.0	---	No	---	ND	ND	---	ND	2.9	0.9	5.7	---	---	---	---	---	---	---	---
AB3	03/05/98	---	5.5	---	No	---	<b>6,800</b>	<b>230</b>	---	<b>680</b>	<b>100</b>	<b>1,500</b>	<b>2,300</b>	---	---	---	---	---	---	---	---
AB4	03/05/98	---	4.0	---	No	---	<b>8,500</b>	ND	---	<b>240</b>	ND	<b>260</b>	<b>720</b>	---	---	---	---	---	---	---	---
AB6	03/05/98	---	4.5	---	No	---	<b>12,000</b>	ND	---	<b>350</b>	ND	<b>310</b>	<b>100</b>	---	---	---	---	---	---	---	---
AB9	03/05/98	---	6.0	---	No	---	<b>1,000</b>	ND	---	<b>57</b>	12	<b>44</b>	<b>93</b>	---	---	---	---	---	---	---	---
AB11	03/05/98	---	8.5	---	No	---	ND	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---
AB12	03/05/98	---	6.0	---	No	---	<b>8,800</b>	<b>37</b>	---	<b>660</b>	<b>50</b>	<b>630</b>	<b>940</b>	---	---	---	---	---	---	---	---
AB13	03/05/98	---	8.0	---	No	---	<b>210</b>	ND	---	<b>11</b>	0.8	10	15	---	---	---	---	---	---	---	---
HA1	01/25/00	---	---	---	---	---	<500	<5.0	---	<0.3	<0.3	<0.3	<0.6	---	---	---	---	---	---	---	---
B1	11/18/10	---	Dry	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B2	11/19/10	---	Dry	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B3	11/19/10	---	8.45	---	---	<50	<50	---	<0.50	<0.50	<0.50	0.053f	0.21f	---	---	<b>8.7</b>	---	---	---	---	---
B4	11/19/10	---	Dry	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
B5	11/18/10	---	8.95	---	---	<50	<50	---	<0.50	<0.50	<0.50	0.047f	0.21f	---	---	0.099f	---	---	---	---	---
W-15-B6	06/19/12	---	15	---	---	<50	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	---	---	<0.50	<0.50	<0.50	<0.50	---
W-15-B7	06/19/12	---	15	---	---	<50	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	---	---	<0.50	<0.50	<0.50	<0.50	---
W-9.5-B8	06/19/12	---	9.5	---	---	<b>230g</b>	<50	---	<0.50	<0.50	<0.50	<0.50	<0.50	<5.0	---	---	<0.50	<0.50	<0.50	<0.50	---
<b>Former Used-Oil Tank Cavity Sample</b>																					
WW1	01/04/96	---	3.00	---	No	---	ND	---	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---
<b>Former Gasoline Tank Cavity Sample</b>																					
TW1	01/04/96	---	6.00	---	No	<b>700</b>	ND	---	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---



**TABLE 1A**  
**CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA**

Former Mobil Service Station 99105  
6301 San Pablo Avenue  
Oakland, California

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Notes:

- TOC Elev. = Top of casing elevation.
- DTW = Depth to water.
- GW Elev. = Groundwater elevation.
- NAPL = Non-aqueous phase liquid.
- TPHd = Total petroleum hydrocarbons as diesel.
- TPHg = Total petroleum hydrocarbons as gasoline.
- MTBE = Methyl tertiary butyl ether.
- BTEX = Benzene, toluene, ethylbenzene, and total xylenes.
- DIPE = Di-isopropyl ether.
- ETBE = Ethyl tertiary butyl ether.
- TAME = Tertiary amyl methyl ether.
- TBA = Tertiary butyl alcohol.
- 1,2-DCA = 1,2-dichloroethane.
- EDB = 1,2-dibromoethane.
- VOCs = Volatile organic compounds.
- ESL = Environmental Screening Level.
- ND = Not detected at or above the laboratory reporting limit.
- µg/L = Micrograms per liter.
- < = Less than the stated laboratory reporting limit.
- = Not analyzed/Not applicable.
- a = Well sampled using no-purge method.
- b = Diesel and unidentified hydrocarbons <C15.
- c = Diesel and unidentified hydrocarbons <C15>C25.
- d = Diesel and unidentified hydrocarbons >C20.
- e = Unidentified hydrocarbons >C18.
- f = Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit.
- g = Chromatographic pattern does not match that of the specified standard.

Adapted from ETIC's Report of Groundwater Monitoring, Third Quarter 2010.  
MTBE by EPA Method 8021B includes EPA Method 8020 results.  
MTBE by EPA Method 8260 includes EPA Method 8240 results.  
Additional VOCs not included in analytical suite prior to 2018.

**TABLE 1B**  
**CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA - ADDITIONAL VOCs**

Former Mobil Service Station 99105  
6301 San Pablo Avenue  
Oakland, California

Well ID	Sampling Date	1,2,4-Trimethylbenzene (µg/L)	1,3,5-Trimethylbenzene (µg/L)	1,2-Dichlorobenzene (µg/L)	1,4-Dichlorobenzene (µg/L)	Chlorobenzene (µg/L)	Isopropylbenzene (µg/L)	n-Butylbenzene (µg/L)	n-Propylbenzene (µg/L)	p-Isopropyltoluene (µg/L)	sec-Butylbenzene (µg/L)	tert-Butylbenzene (µg/L)	Naphthalene (µg/L)	Additional VOCs (µg/L)
EPA Method		8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B	8260B
Tier 1 ESLs (February 2016)		---	---	14	5	25	---	---	---	---	---	---	0.17	---

**Groundwater Monitoring Wells**

MW2	02/02/18	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	ND
MW2	07/26/18	---	---	---	---	---	---	---	---	---	---	---	<1.0	---
MW3	02/02/18	<0.50	<0.50	4.5	0.76	2.0	1.1	<0.50	0.67	<0.50	0.66	<0.50	<1.0	ND
MW3	07/26/18	---	---	---	---	---	---	---	---	---	---	---	<1.0	---
MW5	02/02/18	<1.0	1.2	6.2	1.3	6.2	18	14	35	3.9	9.0	1.1	<2.0	ND
MW5	07/26/18	---	---	---	---	---	---	---	---	---	---	---	<1.0	---
MW6	02/02/18	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	ND
MW6	07/26/18	---	---	---	---	---	---	---	---	---	---	---	<1.0	---
MW7	02/02/18	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<1.0	ND
MW7	07/26/18	---	---	---	---	---	---	---	---	---	---	---	<1.0	---
MW8	02/02/18	6.1	3.9	<2.0	<2.0	<2.0	42	15	90	3.4	8.2	<2.0	21	ND
MW8	07/26/18	---	---	---	---	---	---	---	---	---	---	---	92	---

**TABLE 1B**  
**CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA - ADDITIONAL VOCs**

Former Mobil Service Station 99105  
6301 San Pablo Avenue  
Oakland, California

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Notes:

TOC Elev.	=	Top of casing elevation.
DTW	=	Depth to water.
GW Elev.	=	Groundwater elevation.
NAPL	=	Non-aqueous phase liquid.
TPHd	=	Total petroleum hydrocarbons as diesel.
TPHg	=	Total petroleum hydrocarbons as gasoline.
MTBE	=	Methyl tertiary butyl ether.
BTEX	=	Benzene, toluene, ethylbenzene, and total xylenes.
DIPE	=	Di-isopropyl ether.
ETBE	=	Ethyl tertiary butyl ether.
TAME	=	Tertiary amyl methyl ether.
TBA	=	Tertiary butyl alcohol.
1,2-DCA	=	1,2-dichloroethane.
EDB	=	1,2-dibromoethane.
VOCs	=	Volatile organic compounds.
ESL	=	Environmental Screening Level.
ND	=	Not detected at or above the laboratory reporting limit.
µg/L	=	Micrograms per liter.
<	=	Less than the stated laboratory reporting limit.
---	=	Not analyzed/Not applicable.
a	=	Well sampled using no-purge method.
b	=	Diesel and unidentified hydrocarbons <C15.
c	=	Diesel and unidentified hydrocarbons <C15>C25.
d	=	Diesel and unidentified hydrocarbons >C20.
e	=	Unidentified hydrocarbons >C18.
f	=	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit.
g	=	Chromatographic pattern does not match that of the specified standard.

Adapted from ETIC's Report of Groundwater Monitoring, Third Quarter 2010.

MTBE by EPA Method 8021B includes EPA Method 8020 results.

MTBE by EPA Method 8260 includes EPA Method 8240 results.

Additional VOCs not included in analytical suite prior to 2018.

**TABLE 2**  
**WELL CONSTRUCTION DETAILS**  
Former Mobil Service Station 99105  
6301 San Pablo Avenue  
Oakland, California

Well ID	Well Installation Date	TOC Elevation (feet)	Borehole Diameter (inches)	Total Depth of Boring (feet bgs)	Well Depth (feet bgs)	Casing Diameter (inches)	Well Casing Material	Screened Interval (feet bgs)	Slot Size (inches)	Filter Pack Interval (feet bgs)	Filter Pack Material
MW1	03/01/96	32.79	10	21.5	21.5	4	PVC	5-20	0.010	4.5-21.5	#12 Sand
MW2	03/01/96	42.24	10	21.5	21.5	4	PVC	5-20	0.010	4.5-21.5	#12 Sand
MW3	03/01/96	42.18	10	21.5	21.5	4	PVC	5-20	0.010	4.5-21.5	#12 Sand
MW4	03/01/96	31.50	10	26.5	25	4	PVC	5-25	0.010	4.5-21.5	#12 Sand
MW5	09/06/00	41.86	10	21.5	21.5	4	PVC	5-20	0.010	4-21.5	#2/12 Sand
MW6	08/11/14	42.00	12	18	15	4	PVC	5-15	0.020	4-15	#2/12 Sand
MW7	08/11/14	41.34	10	16	15	2	PVC	5-15	0.020	4-15	#2/12 Sand
MW8	08/15/14	41.30	12	16	15	4	PVC	5-15	0.020	4-15	#2/12 Sand
VW1	11/01/10	---	4	6	6	0.25	Stainless Steel	5.25-5.75	0.0057	5-6	#2/12 Sand
VW2	11/02/10	---	4	6	6	0.25	Stainless Steel	5.25-5.75	0.0057	5-6	#2/12 Sand
VW3	11/01/10	---	4	6	6	0.25	Stainless Steel	5.25-5.75	0.0057	5-6	#2/12 Sand
VW4	11/02/10	---	4	6	6	0.25	Stainless Steel	5.25-5.75	0.0057	5-6	#2/12 Sand
VW5	11/02/10	---	4	6	6	0.25	Stainless Steel	5.25-5.75	0.0057	5-6	#2/12 Sand
MP1	11/16/98	---	1.5	23	23	1	PVC	4-23	0.020	2.5-23	#3 Sand
MP2	11/16/98	---	1.5	20	20	1	PVC	5-20	0.020	4-20	#3 Sand
MP3	11/16/98	---	1.5	18	18	1	PVC	3-18	0.020	2-18	#3 Sand
MP4	11/16/98	---	1.5	18	18	1	PVC	3-18	0.020	2-18	#3 Sand
MP5	11/16/98	---	1.5	18	18	1	PVC	3-18	0.020	2-18	#3 Sand
MP6	11/16/98	---	1.5	17.5	17.5	1	PVC	3.5-17.5	0.020	2.5-17.5	#3 Sand
SVS1	06/18/12	38.78	3.25	5.5	5	0.25	PVC/Stainless Steel	4.75-5	0.010	4.5-5	#3 Sand
SVS2	06/18/12	41.05	3.25	5.5	5	0.25	PVC/Stainless Steel	4.75-5	0.010	4.5-5	#3 Sand
SVS3	06/18/12	42.64	3.25	5.5	5	0.25	PVC/Stainless Steel	4.75-5	0.010	4.5-5	#3 Sand

Notes:  
TOC = Top of casing.  
PVC = Polyvinyl chloride.  
bgs = Below ground surface.  
--- = No applicable.

**TABLE 3**  
**CUMULATIVE SOIL ANALYTICAL DATA**  
Former Mobil Service Station 99105  
6301 San Pablo Avenue  
Oakland, California  
(Page 1 of 4)

Sample ID	Sample Date	Depth (feet bgs)	TPHd (mg/kg)	TPHg (mg/kg)	MTBE 8021 (mg/kg)	MTBE 8260B (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	1,2-DCA (mg/kg)	EDB (mg/kg)	Naphthalene (mg/kg)	Lead (mg/kg)	TOG (mg/kg)
<b>Environmental Screening Levels, Tier 1 (February 2016)</b>																			
Tier 1			240	100	0.023	0.023	0.044	2.9	1.4	2.3	0.075	---	---	---	0.0045	0.00033	0.023	80	---
<b>Monitoring, Remediation, and Soil Vapor Well Samples</b>																			
MW1	03/01/96	5 - 5.5	3.4	<1.0	---	---	<0.0050	<0.0050	<0.0050	<0.0050	---	---	---	---	---	---	---	<2.5	---
MW1	03/01/96	10 - 10.5	<1.0	<1.0	---	---	<0.0050	<0.0050	<0.0050	<0.0050	---	---	---	---	---	---	---	<2.5	---
MW1	03/01/96	15 - 15.5	4.2	<1.0	---	---	<0.0050	<0.0050	<0.0050	<0.0050	---	---	---	---	---	---	---	<2.5	---
MW2	03/01/96	5 - 5.5	2.4	<1.0	---	---	<0.0050	<0.0050	<0.0050	<0.0050	---	---	---	---	---	---	---	<2.5	---
MW2	03/01/96	10 - 10.5	57	<b>220</b>	---	---	<b>1.2</b>	1.4	<b>2.7</b>	<b>14</b>	---	---	---	---	---	---	---	<2.5	---
MW2	03/01/96	15 - 15.5	<1.0	<1.0	---	---	<0.0050	<0.0050	0.0063	0.035	---	---	---	---	---	---	---	<2.5	---
MW3	03/01/96	5.5 - 6	1.1	<1.0	---	---	<0.0050	<0.0050	<0.0050	<0.0050	---	---	---	---	---	---	---	<2.5	9
MW3	03/01/96	10.5 - 11	72	53	---	---	0.032	0.43	0.65	0.93	---	---	---	---	---	---	---	<2.5	290
MW3	03/01/96	15.5 - 16	<1.0	<1.0	---	---	<0.0050	<0.0050	<0.0050	<0.0050	---	---	---	---	---	---	---	<2.5	10
MW4	03/01/96	5.5 - 6	34	280	---	---	1.2	1	4.1	19	---	---	---	---	---	---	---	<2.5	---
MW4	03/01/96	10.5 - 11	7.7	6	---	---	<b>0.11</b>	<0.0050	0.11	0.093	---	---	---	---	---	---	---	<2.5	---
MW4	03/01/96	15.5 - 16	2.1	6	---	---	<b>0.076</b>	0.023	0.083	0.07	---	---	---	---	---	---	---	<2.5	---
S-5-MW6	08/11/14	5	83b,c	<0.53	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.049	<0.0099	<0.0099	<0.0099	<b>&lt;0.0049</b>	<b>&lt;0.0049</b>	<b>&lt;0.049</b>	---	---
S-10-MW6	08/11/14	10	47b,c	4.4c	---	<0.0052	<0.0052	<0.0052	<0.0052	<0.0052	<0.052	<0.010	<0.010	<0.010	<b>&lt;0.0052</b>	<b>&lt;0.0052</b>	<b>&lt;0.052</b>	---	---
S-15-MW6	08/11/14	15	<4.9b	2.2c	---	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	<0.048	<0.0095	<0.0095	<0.0095	<b>&lt;0.0048</b>	<b>&lt;0.0048</b>	---	---	---
S-5-MW7	08/11/14	5	<5.0b	<0.48	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<b>&lt;0.0050</b>	<b>&lt;0.0050</b>	<b>&lt;0.050</b>	---	---
S-10-MW7	08/11/14	10	<5.0b	<0.49	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.049	<0.0098	<0.0098	<0.0098	<b>&lt;0.0049</b>	<b>&lt;0.0049</b>	<b>&lt;0.049</b>	---	---
S-15-MW7	08/11/14	15	<5.0b	<0.49	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<b>&lt;0.0050</b>	<b>&lt;0.0050</b>	---	---	---
S-5-MW8	08/15/14	5	<5.0b	<0.50	---	<0.0048	0.0051	<0.0048	<0.0048	<0.0048	<0.048	<0.0096	<0.0096	<0.0096	<b>&lt;0.0048</b>	<b>&lt;0.0048</b>	<b>&lt;0.048</b>	---	---
S-8-MW8	08/15/14	8	41b,c	22	---	<0.50	<0.50	<0.50	<b>3.4</b>	2.1	<5.0	<0.99	<0.99	<0.99	<b>&lt;0.50</b>	<b>&lt;0.50</b>	<b>&lt;5.0</b>	---	---
S-10-MW8	08/15/14	10	<5.0b	3.3	---	<0.0051	0.044	<0.0051	0.17	0.15	<0.051	<0.010	<0.010	<0.010	<b>&lt;0.0051</b>	<b>&lt;0.0051</b>	<b>0.15</b>	---	---
S-15-MW8	08/15/14	15	<5.0b	<0.48	---	<0.0052	0.032	<0.0052	<0.0052	<0.0052	<0.052	<0.010	<0.010	<0.010	<b>&lt;0.0052</b>	<b>&lt;0.0052</b>	<b>&lt;0.052</b>	---	---
VW1	11/01/10	5.5-6	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.050	<0.010	<0.010	<0.010	<b>&lt;0.0050</b>	<b>&lt;0.0050</b>	---	---	---
VW2	11/02/10	5.5-6	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.050	<0.010	<0.010	<0.010	<b>&lt;0.0050</b>	<b>&lt;0.0050</b>	---	---	---
VW3	11/01/10	5.5-6	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.050	<0.010	<0.010	<0.010	<b>&lt;0.0050</b>	<b>&lt;0.0050</b>	---	---	---
VW4	11/02/10	5.5-6	<5.0b	3.7c	---	<0.0050	<0.0050	<0.0050	0.0050	0.0050a	<0.050	<0.010	<0.010	<0.010	<b>&lt;0.0050</b>	<b>&lt;0.0050</b>	---	---	---
VW5	11/02/10	5.5-6	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.010	<0.050	<0.010	<0.010	<0.010	<b>&lt;0.0050</b>	<b>&lt;0.0050</b>	---	---	---
S-5-SVS1	06/18/12	5	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	---	---	---	---	---
S-5-SVS2	06/18/12	5	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	---	---	---	---	---
S-5-SVS3	06/18/12	5	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	---	---	---	---	---

**TABLE 3**  
**CUMULATIVE SOIL ANALYTICAL DATA**  
Former Mobil Service Station 99105  
6301 San Pablo Avenue  
Oakland, California  
(Page 2 of 4)

Sample ID	Sample Date	Depth (feet bgs)	TPHd (mg/kg)	TPHg (mg/kg)	MTBE 8021 (mg/kg)	MTBE 8260B (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	1,2-DCA (mg/kg)	EDB (mg/kg)	Naphthalene (mg/kg)	Lead (mg/kg)	TOG (mg/kg)
<b>Environmental Screening Levels, Tier 1 (February 2016)</b>																			
Tier 1			240	100	0.023	0.023	0.044	2.9	1.4	2.3	0.075	---	---	---	0.0045	0.00033	0.023	80	---
<b>Borings</b>																			
AB-1	03/05/98	5 - 6	---	ND	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---	---
AB-2	03/05/98	4 - 5	---	ND	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---	---
AB-3	03/05/98	5.5	---	ND	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---	---
AB-4	03/05/98	5 - 6	---	18	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---	---
AB-5	03/05/98	3 - 4	---	170	ND	---	ND	ND	0.65	ND	---	---	---	---	---	---	---	---	---
AB-6	03/05/98	5	---	230	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---	---
AB-7	03/05/98	4-5	---	19	ND	---	ND	ND	0.032	ND	---	---	---	---	---	---	---	---	---
AB-8	03/05/98	5	---	ND	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---	---
AB-9	03/05/98	4	---	16	ND	---	0.006	ND	0.028	ND	---	---	---	---	---	---	---	---	---
AB-10	03/05/98	4	---	ND	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---	---
AB-11	03/05/98	5 - 6	---	3.9	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---	---
AB-12	03/16/98	5 - 6	---	ND	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---	---
AB-13	03/16/98	5 - 6	---	ND	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---	---
MP-1	11/16/98	7.5	---	10	ND	---	ND	0.007	0.013	ND	---	---	---	---	---	---	---	---	---
MP-2	11/16/98	7	---	270	ND	---	ND	0.03	0.29	2.1	---	---	---	---	---	---	---	---	---
MP-2	11/16/98	10.5	---	140	0.15	---	0.08	ND	0.31	ND	---	---	---	---	---	---	---	---	---
MP-3	11/16/98	7.5	---	230	0.28	---	ND	0.1	1.6	ND	---	---	---	---	---	---	---	---	---
MP-4	11/16/98	5	---	120	0.19	---	ND	ND	0.35	ND	---	---	---	---	---	---	---	---	---
MP-4	11/16/98	10	---	18	ND	---	ND	0.013	0.07	0.086	---	---	---	---	---	---	---	---	---
MP-5	11/16/98	6.5	---	6.4	ND	---	ND	ND	0.015	0.022	---	---	---	---	---	---	---	---	---
MP-5	11/16/98	10.5	---	220	0.52	---	ND	ND	1.4	3	---	---	---	---	---	---	---	---	---
MP-6	11/16/98	7	---	ND	ND	---	ND	ND	ND	ND	---	---	---	---	---	---	---	---	---
MP-6	11/16/98	10	---	240	0.92	ND	ND	ND	1.6	4.2	---	---	---	---	---	---	---	---	---
HA-1	01/25/00	5	---	<0.50	<0.025	---	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---	---	---
B1	11/17/10	5-5.5	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---

**TABLE 3**  
**CUMULATIVE SOIL ANALYTICAL DATA**  
Former Mobil Service Station 99105  
6301 San Pablo Avenue  
Oakland, California  
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Sample ID	Sample Date	Depth (feet bgs)	TPHd (mg/kg)	TPHg (mg/kg)	MTBE 8021 (mg/kg)	MTBE 8260B (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	1,2-DCA (mg/kg)	EDB (mg/kg)	Naphthalene (mg/kg)	Lead (mg/kg)	TOG (mg/kg)
<b>Environmental Screening Levels, Tier 1 (February 2016)</b>																			
Tier 1			240	100	0.023	0.023	0.044	2.9	1.4	2.3	0.075	---	---	---	0.0045	0.00033	0.023	80	---
B1	11/18/10	9.5-10	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B1	11/18/10	14.5-15	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B1	11/18/10	19.5-20	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B1	11/18/10	24.5-25	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B2	11/17/10	5-5.5	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B2	11/18/10	8.5-9	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B2	11/19/10	14.5-15	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B2	11/19/10	19.5-20	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B3	11/17/10	5-5.5	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B3	11/18/10	9.5-10	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B3	11/19/10	12-12.5	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B3	11/19/10	14.5-15	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B3	11/19/10	17-17.5	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B3	11/19/10	19.5-20	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B4	11/17/10	5-5.5	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B4	11/18/10	9.5-10	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B4	11/19/10	14.5-15	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B4	11/19/10	19.5-20	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B5	11/17/10	5-5.5	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B5	11/18/10	9.5-10	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B5	11/19/10	14.5-15	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
B5	11/19/10	19.5-20	<5.0b	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	---	---
<b>Tank Excavation Samples</b>																			
S-1	08/05/94	11	---	6.5	---	---	<b>0.18</b>	0.082	0.37	1.2	---	---	---	---	---	---	---	---	---
S-2	08/05/94	11	---	3.2	---	---	<b>0.11</b>	<0.050	0.16	0.21	---	---	---	---	---	---	---	---	---
S-3	08/05/94	11	---	<b>540</b>	---	---	<b>&lt;1.5</b>	<b>4.1</b>	<b>24</b>	<b>72</b>	---	---	---	---	---	---	---	---	---
S-4	08/05/94	11	---	73	---	---	<b>&lt;0.067</b>	0.21	<b>1.5</b>	<b>6.8</b>	---	---	---	---	---	---	---	---	---
S-5	08/05/94	11	---	0.84	---	---	<b>&lt;0.050</b>	<0.050	<0.050	0.031	---	---	---	---	---	---	---	---	---
S-6	08/05/94	11	---	40	---	---	<0.014	0.059	0.25	0.6	---	---	---	---	---	---	---	---	---
TS-1	01/04/96	4	21	3.8	---	---	<0.005	0.0085	<0.005	<0.005	---	---	---	---	---	---	---	<2.5	---
TS-2	01/04/96	4	20	<1.0	---	---	<0.005	<0.005	<0.005	0.0053	---	---	---	---	---	---	---	<2.5	---
TS-3	01/04/96	4	44	9.5	---	---	<b>0.11</b>	0.28	0.019	0.021	---	---	---	---	---	---	---	<b>160</b>	---
TS-4	01/04/96	5	1.8	1.7	---	---	<0.005	0.014	0.0081	0.0086	---	---	---	---	---	---	---	<2.5	---
TS-5	01/04/96	5	2.0	<1.0	---	---	<0.005	<0.005	<0.005	<0.005	---	---	---	---	---	---	---	<2.5	---
TS-6	01/04/96	4	2.0	<1.0	---	---	<0.005	0.0095	<0.005	0.015	---	---	---	---	---	---	---	86	---
TPSW-1	02/14/96	---	160	<b>640</b>	---	---	<0.0050	0.32	<b>6.5</b>	<b>36</b>	---	---	---	---	---	---	---	5.3	---
TPSE-1	02/14/96	---	160	93	---	---	<0.0050	<0.0050	0.43	<b>2.7</b>	---	---	---	---	---	---	---	5.8	---
<b>Used-Oil UST Excavation Samples</b>																			
WO-1	08/05/94	6	1.2	21	---	---	<0.015	0.11	0.34	1.5	---	---	---	---	---	---	---	4.3	94
S-WON	01/04/96	3	2.9	<1.0	---	---	<0.005	<0.005	<0.005	<0.005	---	---	---	---	---	---	---	30	8.5

**TABLE 3**  
**CUMULATIVE SOIL ANALYTICAL DATA**  
Former Mobil Service Station 99105  
6301 San Pablo Avenue  
Oakland, California  
(Page 4 of 4)

Sample ID	Sample Date	Depth (feet bgs)	TPHd (mg/kg)	TPHg (mg/kg)	MTBE 8021 (mg/kg)	MTBE 8260B (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	TBA (mg/kg)	DIPE (mg/kg)	ETBE (mg/kg)	TAME (mg/kg)	1,2-DCA (mg/kg)	EDB (mg/kg)	Naphthalene (mg/kg)	Lead (mg/kg)	TOG (mg/kg)
<b>Environmental Screening Levels, Tier 1 (February 2016)</b>																			
Tier 1			240	100	0.023	0.023	0.044	2.9	1.4	2.3	0.075	---	---	---	0.0045	0.00033	0.023	80	---
S-WOS	01/04/96	3	1.6	<1.0	---	---	<0.005	<0.005	<0.005	0.095	---	---	---	---	---	---	---	28	10
<b>Product Line Samples</b>																			
PL1-1	02/14/96	3.0	14	<1.0	---	---	<0.0050	<0.0050	<0.005	<0.0050	---	---	---	---	---	---	---	11	---
PL1-2	02/14/96	2.5	<1.0	<1.0	---	---	<0.0050	<0.0050	<0.0050	<0.0050	---	---	---	---	---	---	---	5.0	---
PL1-3	02/15/96	2.5	37	<b>240</b>	---	---	<b>0.24</b>	0.59	1.1	1.3	---	---	---	---	---	---	---	6.5	---
PL1-5	02/15/96	2	4.9	63	---	---	<b>0.30</b>	0.42	0.31	0.41	---	---	---	---	---	---	---	8.2	---
PL4-1	02/14/96	3.0	7.7	1.4	---	---	0.056	0.078	0.0073	0.0420	---	---	---	---	---	---	---	9.9	---
PL4-2	02/15/96	2.5	<1.0	<1.0	---	---	<0.0050	<0.0050	<0.0050	<0.0050	---	---	---	---	---	---	---	5.5	---
PL4-3	02/15/96	5	3.0	4.3	---	---	0.0086	0.0075	0.040	0.058	---	---	---	---	---	---	---	6.3	---
PL4-4	02/15/96	5.0	3.2	<1.0	---	---	<0.0050	<0.0050	<0.0050	<0.0050	---	---	---	---	---	---	---	4.6	---
<b>Soil Stockpile Samples</b>																			
WO-(1-2)	d 01/04/96	---	38	<1.0	---	---	<0.005	<0.005	<0.005	<0.005	---	---	---	---	---	---	---	20	240
SPPL4-(1-4)	03/01/96	---	11	9	---	---	0.013	0.03	0.13	0.054	---	---	---	---	---	---	---	<2.5	---
Comp-1	01/25/00	---	---	<0.50	<0.025	---	<0.0050	<0.0050	<0.0050	<0.010	---	---	---	---	---	---	---	8.04	---
S-SP1-1	06/19/12	---	<5.0	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	16.1	---
S-SP1-2	06/19/12	---	<5.0	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	24.4	---
S-SP1-3	06/19/12	---	5.7	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	12.7	---
S-SP1-4	06/19/12	---	<5.0	<0.50	---	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.010	<0.010	<0.010	<0.0050	<0.0050	---	21.5	---
SP1	08/11/14	---	<4.9b	0.91c	---	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	<0.049	<0.0098	<0.0098	<0.0098	<0.0049	<0.0049	<0.049	9.74	---

Notes:

- TPHd = Total petroleum hydrocarbons as diesel analyzed using EPA Method 8015B.
- TPHg = Total petroleum hydrocarbons as gasoline analyzed using EPA Method 8015B.
- MTBE 8021 = Methyl tertiary butyl ether analyzed using EPA Method 8020 or 8021B.
- MTBE 8260B = Methyl tertiary butyl ether analyzed using EPA Method 8260B.
- BTEX = Benzene, toluene, ethylbenzene, and total xylenes analyzed using EPA Method 8260B.
- TBA = Tertiary butyl alcohol analyzed using EPA Method 8260B.
- DIPE = Di-isopropyl ether analyzed using EPA Method 8260B.
- ETBE = Ethyl tertiary butyl ether analyzed using EPA Method 8260B.
- TAME = Tertiary amyl methyl ether analyzed using EPA Method 8260B.
- 1,2-DCA = 1,2-dichloroethane analyzed using EPA Method 8260B.
- EDB = 1,2-dibromoethane analyzed using EPA Method 8260B.
- TOG = Total oil and grease.
- Green** = Soil has been excavated.
- ND = Not detected at or above the laboratory reporting limit.
- feet bgs = Feet below ground surface.
- mg/kg = Milligrams per kilogram.
- < = Less than the stated laboratory reporting limit.
- = Not analyzed/Not sampled/Not applicable.
- a = Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
- b = The sample extract was subjected to Silica Gel treatment prior to analysis.
- c = The chromatographic pattern does not match that of the specified standard.
- d = Additional analysis: cadmium (<0.0250 mg/kg), chromium (12 mg/kg), lead (4.3 mg/kg), nickel (38 mg/kg), and zinc (71 mg/kg).





**TABLE 4A**  
**CUMULATIVE SOIL VAPOR ANALYTICAL DATA**  
Former Mobil Service Station 99105  
6301 San Pablo Avenue  
Oakland, California  
(Page 2 of 2)

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Notes:

CO <sub>2</sub>	=	Carbon dioxide.
CO	=	Carbon monoxide.
TPHg	=	Total petroleum hydrocarbons as gasoline.
MTBE	=	Methyl tertiary butyl ether.
BTEX	=	Benzene, toluene, ethylbenzene, and total xylenes.
1,2-DCA	=	1,2-dichloroethane.
EDB	=	1,2-dibromoethene.
TBA	=	Tertiary butyl alcohol.
Add'l	=	Additional volatile organic compounds.
feet bgs	=	Feet below ground surface.
%V	=	Percent by volume.
in Hg	=	Inches of mercury.
µg/m <sup>3</sup>	=	Micrograms per cubic meter.
---	=	Not analyzed.
a	=	1,2-dichlorobenzene.
b	=	1,4-dichlorobenzene.
c	=	1,3,5-trimethylbenzene.
d	=	1,2,4-trimethylbenzene.
e	=	Bromodichloromethane.
f	=	Leak detection compound reported, biased low.
g	=	Acetone.
h	=	2-Butanone.
i	=	Carbon disulfide.
j	=	Chlorobenzene.
k	=	Chloroform.
l	=	Chloromethane.
m	=	4-ethyltoluene.
n	=	Ambient helium concentration.
o	=	1,1,1-Trichloroethane.
p	=	Samples collected in a tedlar bag.
q	=	Unable to sample well due to wet conditions.
r	=	Trichlorofluoromethane.



**TABLE 4B**  
**ADDITIONAL CUMULATIVE SOIL VAPOR ANALYTICAL DATA**  
Former Mobil Service Station 99105  
6301 San Pablo Avenue  
Oakland, California  
(Page 2 of 2)

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Notes:

CO <sub>2</sub>	=	Carbon dioxide.
CO	=	Carbon monoxide.
TPHg	=	Total petroleum hydrocarbons as gasoline.
MTBE	=	Methyl tertiary butyl ether.
BTEX	=	Benzene, toluene, ethylbenzene, and total xylenes.
1,2-DCA	=	1,2-dichloroethane.
EDB	=	1,2-dibromoethene.
TBA	=	Tertiary butyl alcohol.
Add'l	=	Additional volatile organic compounds.
feet bgs	=	Feet below ground surface.
%V	=	Percent by volume.
in Hg	=	Inches of mercury.
µg/m <sup>3</sup>	=	Micrograms per cubic meter.
---	=	Not analyzed.
a	=	1,2-dichlorobenzene.
b	=	1,4-dichlorobenzene.
c	=	1,3,5-trimethylbenzene.
d	=	1,2,4-trimethylbenzene.
e	=	Bromodichloromethane.
f	=	Leak detection compound reported, biased low.
g	=	Acetone.
h	=	2-Butanone.
i	=	Carbon disulfide.
j	=	Chlorobenzene.
k	=	Chloroform.
l	=	Chloromethane.
m	=	4-ethyltoluene.
n	=	Ambient helium concentration.
o	=	1,1,1-Trichloroethane.
p	=	Samples collected in a tedlar bag.
q	=	Unable to sample well due to wet conditions.
r	=	Trichlorofluoromethane.

**TABLE 5  
CUMULATIVE PID READINGS, VAPOR WELLS**

Former Mobil Service Station 99105  
6301 San Pablo Avenue  
Oakland, California

Sampling Date	VW1 (ppm)	VW2 (ppm)	VW3 (ppm)	VW4 (ppm)	VW5 (ppm)
08/01/14	559	118	146	>7,000	500
08/18/14	317	1.9	85.8	1,780	395
08/22/14	62	0.4	122	>9,000	473
12/31/14	75.2	Wet	178.1	1,499	165.4
01/23/15	1.2	2.2	64	3,680	18
06/26/15	Wet	0.7	79.5	2,319	Wet
08/14/15	Wet	6.2	16.6	2,740	Wet
03/25/16	18.3	Wet	69.3	1,447	Wet
07/12/16	7.5	1.1	46.2	2,244	Wet
03/02/17	Wet	Wet	0.5	1,345	Wet
08/11/17	Wet	0.8	1.6	1,075	Wet
02/02/18	0.0	76.3	0.0	346.7	Wet

Notes:  
ppm = Parts per million.

**APPENDIX A**  
**CORRESPONDENCE**



June 20, 2018

Jennifer Sedlachek  
ExxonMobil  
4096 Piedmont, Ave., #194  
Oakland, CA 94611

Dan On and Nathan and Binh Lam, etal  
200 El Dorado Terrace  
San Francisco, CA 94112-1757

(Sent via e-mail to: [jennifer.c.sedlachek@exxonmobil.com](mailto:jennifer.c.sedlachek@exxonmobil.com))

Subject: Fuel Leak Case No. RO0000445 and Geotracker Global ID T0600101855, Mobil#99-105/Cars  
Rent A Car, 6301 San Pablo Avenue, Oakland, CA 94608

Ladies and Gentlemen:

Thank you for participating in the meeting held at Alameda County Department of Environmental Health's (ACDEH) offices on February 2, 2018 attended by Jennifer Sedlachek of ExxonMobil, Scott Perkins, Jim Chappell, and David Daniels of CARDNO and for submitting the draft figure as requested during the meeting. The purpose of the meeting was to discuss ACDEH's November 28, 2017 Directive Letter requesting a Work Plan Addendum and identify the next steps to progress the case to closure.

In 1994, four 2,000 gallon gasoline underground storage tanks (USTs) and a 350 gallon waste oil UST were removed from the site. In early 1999, prior to site redevelopment as an oil change facility, the former UST pit was over excavated. In 2014, the results of a dual-phase extraction (DPE) feasibility study concluded that DPE did not produce a significant reduction in soil vapor concentration.

ACDEH is concerned that the potential risk of vapor intrusion to both on- and off-site receptors persists due to a bioattenuation zone that is less than 5 feet in thickness, the presence of elevated Total Petroleum Hydrocarbons (TPH) in soil vapor in VW-4 and VW-5, and in groundwater at MW-5 and MW-8, and the potential of TPH contamination adjacent to the former waste oil UST.

ACDEH has evaluated the case against the State Water Resources Control Board's (SWRCBs) Low Threat Underground Storage Tank Case Closure Policy (LTCP). Based on ACDEH staff review, we have determined that the site does not meet the LTCP Media-Specific Criteria for Groundwater, Vapor Intrusion to Indoor Air, or Direct Contact and Outdoor Air Exposure.

As discussed during the meeting, ACDEH requests that collection and analysis of soil vapor samples from the five existing soil vapor wells and submittal of a Work Plan Addendum that will address the following Technical Comments.

**TECHNICAL COMMENTS:**

**Soil Vapor Sample Collection:**

- 1. Collection of soil vapor samples from all probes:** Within the next 60 days, please collect soil gas samples from all five soil vapor wells VW-1 through VW-5, analyze the vapor samples for naphthalene including confirmation analysis for naphthalene by EPA Method TO-17, Total Petroleum Hydrocarbons as gasoline (TPHg), and benzene, toluene, ethylbenzene, and xylenes (BTEX), and provide a soil vapor sampling report by the date provided below. Please include the soil vapor sampling Standard Operating Procedures (SOPs) with the Soil Vapor Sampling Report. Please ensure that a tracer helium concentration of 20% is maintained throughout the vapor sampling event and is tabulated as a percentage. Please include analysis for oxygen, carbon dioxide, and methane, as included in previous sampling events.

**Preparation of a Work Plan Addendum:**

2. **Assessment of On- and Off-Site Vapor Intrusion:** Based on the new soil vapor results, in the Work Plan Addendum, propose actions to determine whether or not on- and off-site soil vapor intrusion is an issue. Please propose the installation of additional soil vapor wells and sub-slab wells and sample collection along the western property boundary and in the bathroom, storage closet, and stair well all located in southern end of the oil change facility.
3. **Evaluation of Soil and Groundwater Adjacent to Former Waste Oil UST:** A waste oil UST was removed in 1994; however analysis for polyromantic hydrocarbons (PAHs) including naphthalene in soil have not been evaluated; consequently, the Media-Specific Criteria for Direct Contact to Outdoor Air (DC/OA) cannot be assessed. In the Work Plan Addendum requested below, please propose the installation of a soil boring immediately adjacent to the former waste oil UST for the collection and analysis of soil and grab groundwater samples. Propose collection and analysis of soil samples to satisfy the LTCP DC/OA criteria.
4. **Update Site Conceptual Model:** Please submit an updated SCM with the Work Plan Addendum requested below to understand the relationship between site utilities and preferential pathways and potential on- and off-site contaminant migration:
  - a. **On-site Utility Survey (Completed):** Please include the recently completed on-site utility survey in the updated SCM.
  - b. **Request for Foundation and Basement Survey (In Progress):** ACDEH understands that questionnaires regarding the presence of basements or sumps were sent to the neighboring Church and four residences located to the west of the site, but, to date, responses have not been received. In the absence of questionnaire responses, please consider a Google Maps review and/or a neighborhood reconnaissance.
  - c. **Cross Sections:** As discussed in our meeting, please prepare two cross sections oriented parallel to the western property line of the site and located on either side of the Church. Please include on the cross sections the depths of utilities in the vicinity and foundation depths:
    - i. West side of the Church, utilize the borings for SVS-1, SVS-2, SVS-3, B6, B7, and B8;
    - ii. East side of the Church, a traverse along the western boundary of the site.
  - d. **Rose Diagram:** Please include an updated Rose diagram with the SCM.
5. **Groundwater Delineation Downgradient of VW-4, VW-5, MW-5, and MW-8:** Soil vapor sampling events in 2010 and 2012 detected benzene and ethylbenzene in VW4 and VW5 in exceedance of the LTCP's Soil Gas Criteria for *No Bioattenuation Zone for Commercial Use*. Benzene concentrations up to 30,000 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) and ethylbenzene concentrations of 95,000  $\mu\text{g}/\text{m}^3$  were detected in VW4 located outside and adjacent to the oil change facility's bathroom. Additionally, sheen/non-aqueous phase liquid (NAPL) periodically appears in MW-5 and MW-8. Please propose a strategy to define the extent of sheen/NAPL on-site in the vicinity of VW-4, VW-5, MW-5, and MW-8 in the Work Plan Addendum requested below. Please include an estimate for remaining source underneath the former station building.



**TECHNICAL REPORT REQUEST**

Please upload the technical reports to the State Water Resources Control Board's Geotracker website, in accordance with the following specified file naming convention and schedule and send copies of the reports to [karel.detterman@acgov.org](mailto:karel.detterman@acgov.org) to facilitate timely review.

- **August 24, 2018** – Soil Vapor Sampling Report  
File to be named: RO445\_SWI\_R\_yyyy-mm-dd
- **September 30, 2018** – Work Plan Addendum and Updated SCM  
File to be named: RO445\_WP\_ADEND\_SCM\_R\_yyyy-mm-dd

This report is being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request. Online case files are available for review at the following website: <http://www.acgov.org/aceh/lop/ust.htm>

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

Sincerely,

Karel Detterman, PG 5628  
Senior Hazardous Materials Specialist

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

cc: Scott Perkins, Cardno, 601 N. McDowell Blvd., Petaluma, CA 94954, (Sent via e-mail to: [Scott.Perkins@cardno.com](mailto:Scott.Perkins@cardno.com))

Paresh Khatri, ACDEH, (Sent via e-mail to: [paresh.khatri@acgov.org](mailto:paresh.khatri@acgov.org))

Dilan Roe, ACDEH (Sent via E-mail to: [dilan.roe@acgov.org](mailto:dilan.roe@acgov.org))

Karel Detterman, ACDEH (Sent via E-mail to: [karel.detterman@acgov.org](mailto:karel.detterman@acgov.org))

GeoTracker, Electronic Case File

<b>Alameda County Environmental Cleanup Oversight Programs (LOP and SCP)</b>	<b>REVISION DATE:</b> December 14, 2017
	<b>ISSUE DATE:</b> July 25, 2012
	<b>PREVIOUS REVISIONS:</b> September 17, 2013, May 15, 2014, December 12, 2016
<b>SECTION:</b> ACDEH Procedures	<b>SUBJECT:</b> Responsible Party(ies) Legal Requirements / Obligations

REPORT & DELIVERABLE REQUESTS

Alameda County Department of Environmental Health (ACDEH) Cleanup Oversight Programs, Local Oversight Program (LOP) and Site Cleanup Program (SCP) require submission of all reports in electronic form to the State Water Board's (SWB) GeoTracker website in accordance with California Code of Regulations, Chapter 30, Division 3, Title 23 and Division 3, Title 27.

Leaking Underground Fuel Tank (LUFT) Cases

Reports and deliverable requests are 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 (RP) in conjunction with an unauthorized release from a petroleum underground storage tank (UST) system.

Site Cleanup Program (SCP) Cases

For non-petroleum UST cases, reports and deliverables requests are pursuant to California Health and Safety Code Section 101480.

ELECTRONIC SUBMITTAL OF REPORTS

A complete report submittal includes the PDF report and all associated electronic data files, including but not limited to GEO\_MAP, GEO\_XY, GEO\_Z, GEO\_BORE, GEO\_WELL, and laboratory analytical data in Electronic Deliverable Format™ (EDF). Additional information on these requirements is available on the State Water Board's website ([http://www.waterboards.ca.gov/water\\_issues/programs/ust/electronic\\_submittal/](http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal/))

- Do not upload draft reports to GeoTracker
- Rotate each page in the PDF document in the direction that will make it easiest to read on a computer monitor.

GEOTRACKER UPLOAD CERTIFICATION

Each report submittal is to include a GeoTracker Upload Summary Table with GeoTracker valid values<sup>1</sup> as illustrated in the example below to facilitate ACDEH review and verify compliance with GeoTracker requirements.

**GeoTracker Upload Table Example**

Report Title	Sample Period	PDF Report	GEO_MAPS	Sample ID	Matrix	GEO_Z	GEO_XY	GEO_BORE	GEO_WELL	EDF
<b>2016 Subsurface Investigation Report</b>	2016 S1	✓	✓	Effluent	SO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
<b>2012 Site Assessment Work Plan</b>	2012	✓	✓			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>2010 GW Investigation Report</b>	2008 Q4	✓	✓	SB-10	W	✓	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
				SB-10-6	SO	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	✓
				MW-1	WG	✓	✓	✓	✓	✓
				SW-1	W	✓	✓	✓	✓	✓

<sup>1</sup> GeoTracker Survey XYZ, Well Data, and Site Map Guidelines & Restrictions, CA State Water Resources Control Board, April 2005

<b>Alameda County Environmental Cleanup Oversight Programs (LOP and SCP)</b>	<b>REVISION DATE:</b> NA
	<b>ISSUE DATE:</b> December 14, 2017
	<b>PREVIOUS REVISIONS:</b> September 17, 2013, May 15, 2014, December 12, 2016
<b>SECTION:</b> ACDEH Procedures	<b>SUBJECT:</b> Responsible Party(ies) Legal Requirements / Obligations

ACKNOWLEDGEMENT STATEMENT

All work plans, technical reports, or technical documents submitted to ACDEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on my behalf to the State Water Board's GeoTracker website." This letter must be signed by the Responsible Party, or legally authorized representative of the Responsible Party.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6731, 6735, and 7835) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately licensed or certified professional and include the professional registration stamp, signature, and statement of professional certification. Additional information is available on the Board of Professional Engineers, Land Surveyors, and Geologists website at: <http://www.bpelsg.ca.gov/laws/index.shtml>.

UNDERGROUND STORAGE TANK CLEANUP FUND

For LUFT cases, RP's non-compliance with these regulations may result in ineligibility to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse the cost of cleanup. Additional information is available on the internet at: [https://www.waterboards.ca.gov/water\\_issues/programs/ustcf/](https://www.waterboards.ca.gov/water_issues/programs/ustcf/)

AGENCY OVERSIGHT

Significant delays in conducting site assessment/cleanup or report submittals may result in referral of the case to the Regional Water Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to \$10,000 per day for each day of violation.

**APPENDIX B**  
**SITE CONCEPTUAL MODEL**

Element	Description	Data Gaps
<b>Geology and Hydrogeology</b>		
Regional Geology and Hydrogeology	<p>The site is located in the East Bay Plain Subbasin of the Santa Clara Valley Groundwater Basin. A northwest trending alluvial plain, the East Bay Plain Subbasin is bounded on the north by San Pablo Bay, on the east by the Franciscan Basement rock contact, and by the Niles Cone Groundwater Basin to the south. The East Bay Plain Subbasin aquifer system consists of unconsolidated deposits, Quaternary in age, with a cumulative thickness of approximately 1,000 feet. These deposits included early Pleistocene Santa Clara Formation, the late Pleistocene Alameda Formation, the early Holocene Temescal Formation, and artificial fill (DWR, 2014).</p> <p>The East Bay Plain is regionally divided into two major groundwater basins: the San Pablo and the San Francisco Basin. These basins are tectonic depressions that are filled primarily with a sequence of coalescing alluvial fans. The San Francisco Basin is further divided into seven sub-areas. The site is located in the Oakland Sub-Area, which is filled primarily by alluvial deposits that range from 300 to 700 feet thick without well-defined aquitards (CRWQCB, 1999). Under natural conditions, the direction of groundwater flow in the East Bay Plain is east to west towards San Francisco Bay and correlates with topography.</p>	None
Site Geology and Hydrogeology, Hydraulic Flow, and Groundwater Gradient	<p>Based on soil boring logs from wells and borings installed at the site and vicinity, the uppermost sediments consist predominately of fine-grained silts, clays, and sandy clays, with minor fine gravel and sand lenses from surface to depths of 13 to 15 feet bgs. The fine-grained unit is underlain by clayey sands, silty sands, gravelly sand, and sand to depths of 18 to 21.5 feet bgs. On the northwest side of the site at borings MP1 and well MW2, silty clay and sandy clay underlie the sand from 18 to 23 feet bgs. At the center of the site at well MW4, the sands are underlain by clayey silt from 20 to 23 feet bgs, which are underlain by clayey sand to 26.5 feet bgs, the total depth explored. West of the site, in borings B1 through B5, sediments consist primarily of clay and silt to 25 feet bgs with a few lenses of sand and gravel up to 2 feet thick (Cardno ERI, 2012b).</p> <p>DTW at the site has ranged from approximately 3.75 to 13.81 feet bgs during the monitoring program. The direction of groundwater flow is typically towards the west and the San Francisco Bay.</p>	None
<b>Facility History</b>		
Facility Structures and Site Operations	<p>The site was operated as a Mobil service station from 1951 to 1980, then used as a rental car lot, and is currently an automobile oil change facility. The four 2,000-gallon gasoline USTs and one 350-gallon used-oil UST associated with the service station were not used after 1980 and were removed in 1994 (Alisto, 1996).</p>	None
<b>Sensitive Receptors, Land Use, and Nearby Sites</b>		
Surface Water Bodies	<p>There are no surface water bodies within 1,000 feet of the site. McLaughlin Eastshore State Park (Bay) lies approximately 4,000 feet to the west.</p>	None
Nearby Wells	<p>There are not public water supply, municipal, or domestic wells located within a ¼-mile radius of the site.</p>	None
Public Use Areas	<p>Public use areas include an elementary school located across San Pablo Avenue to the east, residential properties located to the west and south, and Saint Paul Primitive Baptist Church located adjacent to the site to the southwest</p>	None
Residences	<p>The site is located in a mixed-use commercial and residential area with residences located within 100 feet of the site.</p>	None
Sub-Grade	<p>There is a basement underneath the on-site building. Based on visual confirmation and an online property data search, two residences downgradient of the site have garages. No basements have been identified during reconnaissance visits to neighboring properties, including a July 2018 reconnaissance visit dedicated to locating basements. Cardno hand delivered surveys to neighboring property owners requesting information on sub-grade structures, but the neighboring property owners did not complete the surveys.</p>	None
Utilities	<p>Cable, gas, sewer, and water lines are present at the site and along the streets bordering the site.</p>	None

Element	Description	Data Gaps
Storm and Sanitary Sewers	Two storm drains are located on or adjacent to the site. Storm water is not treated and discharges into the San Francisco Bay. Sewer lines discharge at the East Bay Municipal Utilities District plant located at approximately 9 miles northwest of the site.	None
Other	Other site receptors have not been identified.	None
Nearby Sites	Properties in the site vicinity are occupied by mixed-use residential and commercial developments. The nearest open environmental case is at the ALASKA Gasoline service station at 6211 San Pablo Avenue, located approximately 215 feet south of the site.	None
<b>Release Information</b>		
Release History	The primary sources of petroleum hydrocarbons at the site are the former used-oil UST and the four former gasoline USTs. The USTs were removed in 1994 (Alisto, 1996).	None
Extent and Distribution of Petroleum Hydrocarbon Concentrations	<p><b>Non-Aqueous Phase Liquid</b></p> <p>NAPL with a thickness between 0.02 and 0.92 foot was observed in well MW4, which was destroyed in 1999 during site redevelopment activities. NAPL has not been observed at the site since January 1999.</p> <p>Boring HA1 was advanced approximately 12 feet east of former well MW4 to delineate the extent of NAPL beneath the footprint of the new building. NAPL was not observed in the grab groundwater sample collected from soil boring HA1 (TRC, 2000).</p> <p>Well MW5 was installed as a replacement well for well MW4. NAPL has not been observed in well MW5, located approximately 25 feet southwest of former well MW4, since installation. Sheen was observed periodically in well MW5 from 2012 to 2016. Sheen was also observed once in 2016 in well MW8. Sheen has not been observed at the site since July 2016.</p> <p><b>Data Gap:</b> See Hydrocarbons in Groundwater section.</p> <p><b>How to Address:</b> See Hydrocarbons in Groundwater section.</p>	Yes
	<p><b>Hydrocarbons in Groundwater</b></p> <p>Dissolved-phase concentrations show overall stable or decreasing trends. Maximum dissolved-phase concentrations are limited to the area near wells MW5 and MW8.</p> <p><b>Data Gap:</b> The potential extent of dissolved-phase concentrations downgradient of wells MW5 and MW8 towards the residential properties across 63<sup>rd</sup> Street has not been fully assessed.</p> <p><b>How to Address:</b> Cardno proposes to drill a soil boring downgradient of the wells MW5 and MW8.</p>	Yes
	<p><b>Hydrocarbons in Soil</b></p> <p>The lateral distribution of petroleum hydrocarbons in soil were delineated by soil borings advanced between March 1996 and June 2012 (Alisto, 1996; Alton, 1998; Alton, 1999; ETIC, 2011; Cardno ERI 2012a).</p> <p>The vertical extent of TPHg and benzene in soil is defined at wells MW2 and MW3 with concentrations at or below the laboratory reporting limits below 15 feet bgs and 15.5 feet bgs, respectively. In the deepest sample from well MW4 (15.5 to 16 feet bgs), concentrations of TPHg (6 mg/kg) and BTEX (maximum 0.083 mg/kg) are approximately two orders of magnitude less than the sample collected between 5.5 and 6 feet bgs.</p> <p><b>Data Gap:</b> Soil in the vicinity of the former used-oil tank has not been sampled for the analyses detailed in the <i>Low-Threat Underground Storage Tank Case Closure Policy</i> (SWRCB, 2012).</p> <p><b>How to Address:</b> Cardno proposes to drill a soil boring along the southern edge of the former used-oil UST to sample for the analyses requested in the <i>Low-Threat Underground Storage Tank Case Closure Policy</i> (SWRCB, 2012).</p>	Yes

Element	Description	Data Gaps
	<p><b>Hydrocarbons in Soil Vapor</b></p> <p>Maximum vapor-phase concentrations are present in wells VW4 and VW5 at concentrations above applicable screening levels. Concentrations are below applicable screening levels in the remaining site vapor wells.</p> <p><b>Data Gap:</b> Potential off-site vapor intrusion has not been assessed.</p> <p><b>How to Address:</b> Cardno proposes to install one soil vapor well along the western border of the site and one soil vapor well along the southern border of the site.</p>	Yes
<b>Exposure Routes and Potential Receptors</b>		
Exposure Routes and Potential Receptors	<p><b>Soil:</b> The site is an active oil changing facility with a paved ground surface that covers the entire site. Since the site is paved, direct exposure (via ingestion or dermal contact) to historic releases is not likely; however, if the pavement is removed in the future during construction activities, potential exposure via dermal contact or ingestion with soil may occur.</p> <p><b>Groundwater:</b> Groundwater is encountered beneath the site at an average depth of approximately 5 to 10 feet bgs. There are no active water supply wells within a 1,000-foot radius of the site. Shallow and deep groundwater are potential receptors. Petroleum hydrocarbons are present in groundwater at the site at concentrations exceeding applicable screening levels. The presence of NAPL and sheen to the south of and west of the maximum on-site concentrations has not been assessed. Groundwater exposure pathways may potentially be complete.</p> <p><b>Soil Vapor:</b> The oil changing building is the only site structure occupied by workers. The potential exposure route of vapor inhalation may exist in the commercial/industrial setting for workers in the on-site building; however, this exposure risk is insignificant compared to the risk posed by the vehicle service operations conducted in the on-site building, which can result in small surface spills and fugitive vapor releases. Potential off-site vapor intrusion has not been assessed.</p> <p><b>Preferential Pathways:</b> There are utility lines located throughout the site. As concentrations at the site are not migrating, it is unlikely that these utility lines are acting as preferential pathways.</p> <p><b>Data Gap:</b> See Hydrocarbons in Groundwater and Hydrocarbons in Soil Vapor sections.</p> <p><b>How to Address:</b> See Hydrocarbons in Groundwater and Hydrocarbons in Soil Vapor sections.</p>	Yes

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**APPENDIX C**  
**FIELD PROTOCOLS**

## Low-Stress (Low-Flow) Groundwater Sampling Protocol

Cardno conducts low-stress (low-flow) groundwater monitoring and sample collection in general accordance with the United States Environmental Protection Agency (EPA) guidelines described in the EPA document entitled “Standard Operating Procedure for Low-Stress (Low Flow)/Minimal Drawdown Ground-Water Sample Collection” ([www.epa.gov/Region9/qa/pdfs/finalsopls1217.pdf](http://www.epa.gov/Region9/qa/pdfs/finalsopls1217.pdf)).

At the beginning of each monitoring and sampling event, the monitoring well boxes are opened and the locking well caps removed from the wells. The liquid level within the wells is allowed to equilibrate with ambient barometric conditions prior to collection of depth-to-liquid measurements.

In wells in which NAPL or sheen are not present, the depth to water (DTW) in each well that contains water is measured to the nearest 0.01 foot with an electronic water level meter. Groundwater elevations are calculated by subtracting the DTW from the elevation of the top of casing (TOC) measured by a licensed land surveyor. The volume of groundwater occupying the well casing (i.e. a “casing volume”) is calculated based on the thickness of the water column and casing dimensions, as follows:

One casing volume =  $\pi r^2 h (7.48)$  where:

r	=	radius of the well casing in feet.
h	=	column of water in the well in feet (depth to casing bottom - depth to water)
7.48	=	conversion constant (cubic feet to gallons)

If NAPL is present in the well, an electronic interface probe is used to measure the depth-to-NAPL and DTW. The apparent thickness of the NAPL layer in the well is calculated by subtracting the depth-to-NAPL from the DTW. Wells containing NAPL are generally not purged or sampled.

The monitoring wells are purged with an electric submersible pump. The pump is lowered slowly into the well and placed approximately two to three feet below the air-water interface, within the screen interval of the well. An electronic water level probe is also placed in the well and used to monitor drawdown during purging. Initially, the well is pumped at a rate of approximately 0.5 liter per minute. The pump rate is measured using a graduated vessel and a stopwatch. The physical properties of the purged groundwater are measured using a multi-purpose meter. The monitored physical properties generally include temperature, electrical conductivity, and pH. Measurements are taken at approximately three to five minute intervals. Purging and monitoring continue until the physical properties of the discharge are stable for three successive readings. The following stabilization criteria are used: temperature, 1 degree C; electrical conductivity, 3 percent; and pH, 0.1 pH unit. If the physical properties do not stabilize, a maximum of three casing volumes are purged. DTW measurements are collected at three to five minute intervals, and the pump rate adjusted to minimize drawdown.

After purging, groundwater samples are collected with a new, disposable Teflon® or polypropylene bailer. The groundwater is carefully poured into appropriate sample containers (40-milliliter glass vials, 1,000 ml glass amber bottles, etc.). Depending on the required analysis, each sample container is preserved with hydrochloric acid, nitric acid, etc., or it is preservative free. The type of preservative used for each sample is specified on the chain of custody form.

Each vial and glass amber bottle is sealed with a cap containing a Teflon® septum, and subsequently examined for air bubbles to avoid headspace, which would allow volatilization to occur. The samples are promptly transported in iced storage in a thermally-insulated ice chest, accompanied by a Chain-of-Custody record, to a California state-certified laboratory.

## Soil Boring and Well Installation Field Protocol

### Preliminary Activities

Prior to the onset of field activities at the site, Cardno obtains the appropriate permit(s) from the governing agency(s). Advance notification is made as required by the agency(s) prior to the start of work. Cardno marks the borehole locations and contacts the local one call utility locating service at least 48 hours prior to the start of work to mark buried utilities. Borehole locations may also be checked for buried utilities by a private geophysical surveyor. Prior to drilling, the borehole location is cleared in accordance with the client's procedures. Fieldwork is conducted under the advisement of a registered professional geologist and in accordance with an updated site-specific safety plan prepared for the project, which is available at the job site during field activities.

### Drilling and Soil Sampling Procedures

Cardno contracts a licensed driller to advance the boring and collect soil samples. The specific drilling method (e.g., hollow-stem auger, direct push method, or sonic drilling), sampling method [e.g., core barrel or California-modified split spoon sampler (CMSSS)] and sampling depths are documented on the boring log and may be specified in a work plan. Soil samples are typically collected at the capillary fringe and at 5-foot intervals to the total depth of the boring. To determine the depth of the capillary fringe prior to drilling, the static groundwater level is measured with a water level indicator in the closest monitoring well to the boring location, if available.

The borehole is advanced to just above the desired sampling depth. For CMSSSs, the sampler is placed inside the auger and driven to a depth of 18 inches past the bit of the auger. The sampler is driven into the soil with a standard 140-pound hammer repeatedly dropped from a height of 30 inches onto the sampler. The number of blows required to drive the sampler each 6-inch increment is recorded on the boring log. For core samplers (e.g., direct push), the core is driven 18 inches using the rig apparatus.

Soil samples are preserved in the metal or plastic sleeve used with the CMSSS or core sampler, in glass jars or other manner required by the local regulatory agency (e.g., Environmental Protection Agency Method 5035). Sleeves are removed from the sample barrel, and the lowermost sample sleeve is immediately sealed with Teflon™ tape, capped, labeled, placed in a cooler chilled to 4° Celsius and transported to a state-certified laboratory. The samples are transferred under chain-of-custody (COC) protocol.

### Field Screening Procedures

Cardno places the soil from the middle of the sampling interval into a plastic re-sealable bag. The bag is placed away from direct sunlight for a period of time which allows volatilization of chemical constituents, after which the tip of a photo-ionization detector (PID) or similar device is inserted through the plastic bag to measure organic vapor concentrations in the headspace. The PID measurement is recorded on the boring log. At a minimum, the PID or other device is calibrated on a daily basis in accordance with manufacturer's specifications using a hexane or isobutylene standard. The calibration gas and concentration are recorded on a calibration log. Instruments such as the PID are useful for evaluating relative concentrations of volatilized hydrocarbons, but they do not measure the concentration of petroleum hydrocarbons in the soil matrix with the same precision as laboratory analysis. Cardno trained personnel describe the soil in the bag according to the Unified Soil Classification System and record the description on the boring log, which is included in the final report.

### Air Monitoring Procedures

Cardno performs a field evaluation for volatile hydrocarbon concentrations in the breathing zone using a calibrated photo-ionization detector or lower explosive level meter.

## **Groundwater Sampling**

A groundwater sample, if desired, is collected from the boring by using Hydropunch™ sampling technology or installing a well in the borehole. In the case of using Hydropunch™ technology, after collecting the capillary fringe soil sample, the boring is advanced to the top of the soil/groundwater interface and a sampling probe is pushed to approximately 2 feet below the top of the static water level. The probe is opened by partially withdrawing it and thereby exposing the screen. A new or decontaminated bailer is used to collect a water sample from the probe. The water sample is then emptied into laboratory-supplied containers constructed of the correct material and with the correct volume and preservative to comply with the proposed laboratory test. The container is slowly filled with the retrieved water sample until no headspace remains and then promptly sealed with a Teflon-lined cap, checked for the presence of bubbles, labeled, entered onto a COC record and placed in chilled storage at 4° Celsius. Laboratory-supplied trip blanks accompany the water samples as a quality assurance/quality control procedure. Equipment blanks may be collected as required. The samples are kept in chilled storage and transported under COC protocol to a client-approved, state-certified laboratory for analysis.

## **Backfilling of Soil Boring**

If a well is not installed, the boring is backfilled from total depth to approximately 5 feet below ground surface (bgs) with either neat cement or bentonite grout using a tremie pipe and either the boring is backfilled from 5 feet bgs to approximately 1 foot bgs with hydrated bentonite chips or backfill is continued to just below grade with neat cement grout. The borehole is completed to surface grade with material that best matches existing surface conditions and meets local agency requirements. Site-specific backfilling details are shown on the respective boring log.

## **Well Construction**

A well (if constructed) is completed using materials documented on the boring log or specified in a work plan. The well is constructed with slotted casing across the desired groundwater sampling depth(s) and completed with blank casing to within 6 inches of surface grade. No further construction is conducted on temporary wells. For permanent wells, the annular space of the well is backfilled with Monterey sand from the total depth to approximately 2 feet above the top of the screened casing. A hydrated granular bentonite seal is placed on top of the sand filter pack. Grout may be placed on top of the bentonite seal to the desired depth using a tremie pipe. The well may be completed to surface grade with a 1-foot thick concrete pad. A traffic-rated well vault and locking cap for the well casing may be installed to protect against surface-water infiltration and unauthorized entry. Site-specific well construction details including type of well, well depth, casing diameter, slot size, length of screen interval and sand size are documented on the boring log or specified in the work plan.

## **Well Development and Sampling**

If a permanent groundwater monitoring well is installed, the grout is allowed to cure a minimum of 48 hours before development. Cardno personnel or a contracted driller use a submersible pump or surge block to develop the newly installed well. Prior to development, the pump is decontaminated by allowing it to run and re-circulate while immersed in a non-phosphate solution followed by successive immersions in potable water and de-ionized water baths. The well is developed until sufficient well casing volumes are removed so that turbidity is within allowable limits and pH, conductivity and temperature levels stabilize in the purge water. The volume of groundwater extracted is recorded on a log.

Following development, groundwater within the well is allowed to recharge until at least 80% of the drawdown is recovered. A new or decontaminated bailer is slowly lowered past the air/water interface in the well, and a water sample is collected and checked for the presence of non-aqueous phase liquid, sheen or emulsions. The water sample is then emptied into laboratory-supplied containers as discussed above.

### **Surveying**

If required, wells are surveyed by a licensed land surveyor relative to an established benchmark of known elevation above mean sea level to an accuracy of +/- 0.01 foot. The casing is notched or marked on one side to identify a consistent surveying and measuring point.

### **Decontamination Procedures**

Cardno or the contracted driller decontaminates soil and water sampling equipment between each sampling event with a non-phosphate solution, followed by a minimum of two tap water rinses. De-ionized water may be used for the final rinse. Downhole drilling equipment is steam-cleaned prior to drilling the borehole and at completion of the borehole.

### **Waste Treatment and Soil Disposal**

Soil cuttings generated from the drilling or sampling are stored on site in labeled, Department of Transportation-approved, 55-gallon drums or other appropriate storage container. The soil is removed from the site and transported under manifest to a client- and regulatory-approved facility for recycling or disposal. Decontamination fluids and purge water from well development and sampling activities, if conducted, are stored on site in labeled, regulatory-approved storage containers. Fluids are subsequently transported under manifest to a client- and regulatory-approved facility for disposal or treated with a permitted mobile or fixed-base carbon treatment system.

# Soil Vapor Sampling Well Installation and Sampling Field Protocol

## Preliminary Activities

Prior to the onset of field activities at the site, Cardno obtains the appropriate permit(s) from the governing agency(s). Advance notification is made as required by the agency(s) prior to the start of work. Cardno marks the borehole locations and contacts the local one call utility locating service at least 48 hours prior to the start of work to mark buried utilities. Borehole locations may also be checked for buried utilities by a private geophysical surveyor. Prior to drilling, the borehole location is cleared in accordance with the client's procedures. Fieldwork is conducted under the advisement of a registered professional geologist and in accordance with an updated site-specific safety plan prepared for the project, which is available at the job site during field activities.

## Well Construction

The borehole is advanced to the desired depth using either a direct-push rig, hand auger, or air vacuum rig. Lithologic conditions are recorded on a boring log during borehole advancement, and select soil matrix sampling may be conducted based on soil characteristics.

Each soil vapor sampling (SVS) well is constructed using inert screen material attached to  $\frac{1}{8}$ - to  $\frac{1}{4}$ -inch outer diameter inert tubing. A gas-tight vacuum fitting or valve is attached to the top of each length of tubing using a female compression fitting. Each screen is set within a minimum of a 12-inch thick appropriately sized sand pack, with a minimum of 3 inches of sand pack above the top of the screen. A minimum of 4 inches of dry granular bentonite is set above each screen and associated sand pack. In SVS wells with multiple and separate casings and screens, the annular space between the top of the dry granular bentonite above the deep screen and the bottom of the sand pack associated with the shallow screen is sealed with a minimum of 18 inches of hydrated bentonite. The remainder of the annular space of the well is sealed with hydrated bentonite to 1 foot below ground surface. Wellheads are finished with traffic-rated well boxes set in concrete flush with the surrounding grade. No glues, chemical cements, or solvents are used in well construction.

A boring log is completed with the construction details for each well, including the materials of construction, depth of the borehole, screen length, and annular seal thickness.

## Soil Vapor Sampling

Samples are collected using a soil vapor purging and sampling manifold consisting of a flow regulator, vacuum gauges, vacuum pump, shroud, and laboratory-prepared, gas-tight, opaque containers such as Summa™ canisters. Samples may also be collected using a syringe and analyzed by a mobile laboratory. Prior to use, Summa™ canisters are checked to ensure they are under the laboratory induced vacuum between 31 and 25 inches of mercury (in. Hg). New inert tubing is used to purge and sample each well. Prior to purging and sampling each SVS well, the sampling manifold is connected to the gas-tight vacuum fitting or valve at the wellhead and the downstream tubing and fittings are vacuum tested at approximately 24 to 28 in. Hg. Purging and sampling are conducted only on SVS wells when the tubing and fittings hold the applied vacuum for 5 minutes per vacuum gauge reading.

When required, Cardno conducts a purge volume versus constituent concentration test on at least one SVS well prior to purging and sampling activities. The purge volume test well is selected based on the location of the anticipated source of chemical constituents at the site and on the location of anticipated maximum soil vapor concentrations based on lithologic conditions. If the SVS well has been in place for more than one week, it is assumed that soil vapor in the sand pack has equilibrated with the surrounding soil, and only the screen and tubing volumes are included in the purge volume calculation. If the SVS well has been in place for less than one week, the volume of the sand pack around the screen is included in the purge volume calculation. A photo-ionization detector (PID) or on-site mobile laboratory is used to evaluate concentrations of chemical constituents in the vapor stream after 1, 3, and 10 volumes of vapor have been purged from the SVS well. Purging is conducted at a rate of 100 to 200 milliliters per minute (ml/min). The purge volume exhibiting the highest concentration is the volume of vapor purged from each SVS well prior to sampling. If the three separate purge volumes produce equal concentrations a default of 3 purge volumes is extracted prior to sampling.

Prior to sampling, a helium leak test is performed at each SVS well, including a summa canister and its fittings, to check for leaks in the SVS annulus. To assess the potential for leaks in the SVS well annulus, a shroud is placed over the SVS well and summa canister and the shroud is filled with a measured amount of helium. Helium screening is performed in the field by drawing soil gas into a Tedlar bag via a lung-box and screening the contents of the Tedlar bag with a helium meter. The concentration of helium in the sample divided by the concentration of helium in the shroud provides a measure of the proportion of the sample attributable to leakage. A leak that comprises less than 5% of the sample is insignificant. Helium screening is also performed using laboratory analysis of the contents of the summa canister collected under the shroud. Sampling is conducted at approximately the same rate of purging, at 100 to 200 ml/min. Soil vapor samples are submitted under chain-of-custody protocol for the specified laboratory analyses.

At a minimum, weather conditions (temperature, barometric pressure and precipitation), the sampling flow rate, the purge volume, the helium leak detection percentage results, the sample canister identification number, the method of sample collection, and the vacuum of the sampling canister at the start and end of sample collection (if applicable) are recorded on a log for each SVS well purged and sampled.

### **Decontamination Procedures**

If soil samples are collected, Cardno or the contracted driller decontaminates the soil sampling equipment between each sampling interval using a non-phosphate solution, followed by a minimum of two tap water rinses. De-ionized water may be used for the final rinse. Downhole drilling equipment is steam-cleaned or triple-rinsed prior to advancing each borehole.

### **Waste Treatment and Disposal**

Soil cuttings generated from the well installation are stored on site in labeled, Department of Transportation-approved, 55-gallon drums or other appropriate storage container. The soil is removed from the site and transported under manifest to a client- and regulatory-approved facility for recycling or disposal. Decontamination water is stored on site in labeled, regulatory-approved storage containers, and is subsequently transported under manifest to a client- and regulatory-approved facility for disposal or treated with a permitted mobile or fixed-base carbon treatment system.

**APPENDIX D**  
**FIELD DATA SHEETS**



### Daily Field Report

Project ID #: 99105 Cardno Job: 2783  
Subject: M+S Date: 7/26/18  
Equipment Used: Impact gun, hand tools, majra Sheet: 1 of 1  
Name(s): N. Hagerl, K. Plank  
Time Arrived On Site: 0630 Time Departed Site: 1245 Total Travel:

0630- held safety meeting, discussed JLTs.

0700- Opened wells, waited 30 mins; took DTW

~~0700~~ → Set up for sampling on MW3, installed

0745 Low flow tubing. Tubing set to 14'.

0800- Began purging on MW3. DTW dropped  
0.23', pump rate set to 100 ml/min  
Sampled at 0820.

0900

~~0845~~ Prepared for sampling on MW5. Set up  
well for low flow, tubing set to 15'

0940- Began purging MW5. Noticeable odor of the <sup>\* odor</sup>  
water. Minimal DTW dropdown at  
100 ml/min. Sampled at 1000

~~1030~~ Set up low flow on MW7. Well full of water, scooped out.

1100- began purging MW7. Noticed high drawdown  
and possibly slow recharge. ~~0.23~~ Tubing set  
to 10'. Readings stabilized quickly. Had <sup>\* Drawdown</sup>  
to slow pump to 75 ml/min. Sampled  
at 1130

Decon = 4 gals  
purge = 1 gal.

# Daily Field Report



Project ID #: 2783

Subject: MFS

Date: 7/26/18

Equipment Used: DTW tube

Sheet: 1 of 1

Name(s): Nick Hayer Kat Plunk

Time Arrived On Site:

Time Departed Site:

- 0615 - Arrived onsite
- 0620 - Safety meeting
- 0645 - Set up the CON and opened all wells for <sup>shrs</sup>to equalize
- 0715 - began gauging wells
- 0730 - Finished gauging
- 0735 - Set up on MW1
- 0750 - began pumping at 200 ~~at 15ft~~
- 0804 - Finished pumping
- 0810 - Sampled MW2
- 0835 - began cleanup
- 0845 - Caught up on paper work
- 0900 - Help Kat clean up
- 0915 - set up on MW8
- 0937 - began pumping at 200 mL/minute ~~at 10ft~~
- 0954 - Finished purging
- 1000 - Sampled MW8
- 1020 - cleaned up space and moved onto MW6
- 1030 - set up on MW6
- 1050 - ~~go~~
- 1100 - Began pumping at P.R 200 at a depth 11ft
- 1115 - Finished purging and ready to sample
- 1120 - Sampled MW6
- 1145 - cleaned up work space
- 1200 - helped kat finish MW7 & clean up
- 1245 - OEPSite

\*TOOK TWO AT \_\_\_\_\_



Cardno Job# <b>2187</b>	Quarter <b>3</b>	Year <b>18</b>	Comments <b>Sampl 0810</b>
Client/Site: <b>BMES 99105</b>			
Location: <b>San Pablo Ave Oakland ca</b>			
Sample Tech.: <b>NH</b>			
DATE: <b>7/26/18</b>			
Weather: <b>Cloudy/65°F</b>			

WELL ID <b>MW2</b>									
TIME	DTW	PURGE VOLUME	Pump Rate (Q)	Temp	COND	pH	DO	ORP	Turbidity
hr:min	feet	mL	mL/min	deg C F		unit	mg/L	mV	
<b>0750</b>	<b>10:91</b>		<b>1</b>	<b>1 deg</b>	<b>3%</b>	<b>0.1</b>	<b>0.3</b>	<b>10% or 5</b>	<b>10% or 5</b>
<b>0752</b>	<b>11:09</b>	<b>400</b>	<b>200</b>	<b>18.5</b>	<b>335.5</b>	<b>6.75</b>	<b>1.83</b>	<b>103.5</b>	
<b>0755</b>	<b>11:05</b>	<b>800</b>	<b>200</b>	<b>18.4</b>	<b>335.5</b>	<b>6.75</b>	<b>1.74</b>	<b>102.8</b>	
<b>0758</b>	<b>11:05</b>	<b>1200</b>	<b>200</b>	<b>18.4</b>	<b>335.6</b>	<b>6.77</b>	<b>1.71</b>	<b>102.3</b>	
<b>0801</b>	<b>11:05</b>	<b>1600</b>	<b>200</b>	<b>18.4</b>	<b>335.4</b>	<b>6.71</b>	<b>1.70</b>	<b>102.3</b>	
<b>0804</b>	<b>11:05</b>	<b>1800</b>	<b>200</b>	<b>18.4</b>	<b>335.4</b>	<b>6.78</b>	<b>1.64</b>	<b>102.8</b>	

Depth to Pump Intake	Feet <b>15</b>	1000 mL=1 Liter	1 gallon=3.785 Liters
Total Purge Volume	<b>1400</b> mL	<b>1.4</b> Liters	GALLONS <b>1</b>
DTW final: <b>11.05</b>		CASING VOL. FACTOR	WELL INFORMATION
DTW initial: <b>10.91</b>	diameter <b>F</b>	TD:	SAMPLE COLLECTION DTW final: <b>11.05</b>
	2"-dia: 0.163	DTW <sub>i</sub> :	
	4"-dia: 0.652	h:	
Drawdown: <b>0.14</b>	6"-dia: 1.457	csg vol:	TIME: <b>0810</b>

COMMENTS  
**Sampl 0810**

Cardno Job#	2783	Quarter	3	Year	2018	Comments MW3 sampled at 0820			
Client/Site:	EMEJ 99105								
Location:	6301 San Pablo Ave, Oakland								
Sample Tech.:	KP								
DATE:	7/26/18								
Weather:	cool, 60's								
WELL ID		MW3							
TIME	DTW	PURGE VOLUME	Pump Rate (Q)	Temp	COND	pH	DO	ORP	Turbidity
hr:min	feet	mL	mL/min	deg ° F	mS/cm	unit	mg/L	mV	
801	11.81	—	100	1 deg	3%	0.1	0.3	10% or 5	10% or 5
805	11.86	400	100	18.1	906	6.51	0.96	-98.6	
808	11.90	700	100	18.0	859	6.55	0.63	-102.4	
811	11.94	1000	100	18.1	850	6.55	0.49	-103.2	
0814	12.00	1300	100	18.0	832	6.55	0.36	-105.8	
0817	12.04	1600	100	18.0	832	6.59	0.32	-105.8	
Depth to Pump Intake		14	Feet	1000 mL=1 Liter			1 gallon=3.785 Liters		
Total Purge Volume		1600	mL	1.6	Liters	0.40 GALLONS			
		CASING VOL. FACTOR		WELL INFORMATION		SAMPLE COLLECTION			
DTW final:	12.04	diameter	F	TD:	DTW <sub>final</sub> :				
DTW initial	11.81	2"-dia:	0.163	DTW <sub>i</sub> :	12.04				
		4"-dia:	0.652	h:	TIME:				
Drawdown:	0.23	6"-dia:	1.457	csg vol:	0820				
COMMENTS									
MW3 sampled @ 0820									

Cardno Job# 2787	Quarter 3	Year 14	Comments  1000  odor
Client/Site: EMS/ 99109			
Location: San Pablo Ave Oakland, CA			
Sample Tech.: NH			
DATE: 7/26/18			
Weather: Cloudy/65°F			

WELL ID									
TIME	DTW	PURGE VOLUME	Pump Rate (Q)	Temp	COND	pH	DO	ORP	Turbidity
hr:min	feet	mL	mL/min	deg C F		unit	mg/L	mV	
0937	9.26			1 deg	3%	0.1	0.3	10% or 5	10% or 5
0939	9.30	400	200	20.5	966	6.30	0.266	90.5	— odor
0942	9.35	1000	200	20.7	968	6.38	0.44	86.8	
0945	9.38	1600	175	20.7	968	6.43	0.34	85.3	
0948	9.41	2200	175	20.7	967	6.49	0.25	82.1	
0951	9.45	2800	175	20.7	966	6.50	0.25	81.9	
0954	9.50	3200	175	20.6	966	6.51	0.24	81.6	

Slowed -  
core

0954

Depth to Pump Intake	Feet 10.5	1000 mL=1 Liter	1 gallon=3.785 Liters
Total Purge Volume	3200 mL	3.2 Liters	GALLONS 1.2
CASING VOL. FACTOR		WELL INFORMATION	
DTW final:	09.54	diameter F	TD:
DTW initial	09.37	2"-dia: 0.163	DTW <sub>i</sub> :
		4"-dia: 0.652	h:
Drawdown:	0.17	6"-dia: 1.457	csg vol:

SAMPLE COLLECTION	
DTW final: 09.54	
TIME: 1000	

COMMENTS  
  
1000

Cardno Job#	2783	Quarter	3	Year	2018	Comments MWS sampled @ 1000				
Client/Site:	EMES 99105									
Location:	6201 San Pablo Ave, Oakland									
Sample Tech.:	KP									
DATE:	7/26/18									
Weather:	cool, 60's									
WELL ID	MWS									
TIME	DTW	PURGE VOLUME	Pump Rate (Q)	Temp	COND	pH	DO	ORP	Turbidity	
hr:min	feet	mL	mL/min	deg C F	mS/cm	unit	mg/L	mV		
940	9.49	—	150	1 deg	3%	0.1	0.3	10% or 5	10% or 5	
942	9.55	300	100	19.5	904	6.56	0.44	43.8		slowed
0945	9.61	600	100	19.2	900	6.56	0.41	47.9		
0948	9.63	900	100	19.3	900	6.56	0.38	49.6		
0951	9.68	1200	100	19.4	903	6.56	0.27	54.2		
0954	9.72	1500	100	19.4	905	6.56	0.27	57.7		
Depth to Pump Intake		15	Feet	1000 mL=1 Liter		1 gallon=3.785 Liters				
Total Purge Volume		1500	mL	1.5	Liters	0.40	GALLONS			
		CASING VOL. FACTOR		WELL INFORMATION		SAMPLE COLLECTION				
DTW final:	9.72	diameter	F	TD:		DTW <sub>final</sub> :				
DTW initial	9.49	2"-dia:	0.163	DTW <sub>i</sub> :		9.72				
		4"-dia:	0.652	h:		TIME:				
Drawdown:	0.23	6"-dia:	1.457	csg vol:		0				
COMMENTS										
MWS Sampled @ 1000										

Cardno Job# <b>2783</b>	Quarter <b>3</b>	Year <b>18</b>
Client/Site: <b>EMES 99105</b>		
Location: <b>San Pablo Ave Oakland, CA</b>		
Sample Tech.: <b>MH</b>		
DATE: <b>7/26/18</b>		
Weather: <b>78 sunny</b>		

Comments

1120

WELL ID: **MWB**

TIME	DTW	PURGE VOLUME	Pump Rate (Q)	Temp	COND	pH	DO	ORP	Turbidity
hr:min	feet	mL	mL/min	deg C F		unit	mg/L	mV	
1100	9.61	200	200	1 deg	3%	0.1	30.3	10% or 5	10% or 5
1102	9.69	400	200	18.8	895	6.73	0.24	108.8	
1105	9.69	1000	200	18.6	888	6.70	0.33	100.6	
1108	9.71	1800	200	18.6	887	6.69	0.30	99.2	
1111	9.75	2200	200	18.6	885	6.67	0.24	99.6	
1114	9.79	2800	200	18.8	887	6.66	0.23	96.3	

Depth to Pump Intake: Feet **11**      1000 mL=1 Liter      1 gallon=3.785 Liters

Total Purge Volume: **2800** L      **2.8** Liters      GALLONS **1**

		CASING VOL. FACTOR	WELL INFORMATION	SAMPLE COLLECTION
DTW final:	<b>9.79</b>	diameter	F	DTW <sub>final</sub> : <b>9.79</b>
DTW initial:	<b>9.61</b>	2"-dia:	0.163	
		4"-dia:	0.652	
Drawdown:	<b>0.18</b>	6"-dia:	1.457	TIME: <b>1120</b>

COMMENTS

1120



Cardno Job#	2783	Quarter	3	Year	2018
Client/Site:	EMES 99105				
Location:	6301 San Pablo Ave, Oakland				
Sample Tech.:	KP				
DATE:	7/26/17				
Weather:	Sunny 70's				

Comments  
 Sampled MW7  
 @ 1130

WELL ID MW7									
TIME	DTW	PURGE VOLUME	Pump Rate (Q)	Temp	COND	pH	DO	ORP	Turbidity
hr:min	feet	mL	mL/min	deg C F	µS/cm	unit	mg/L	mV	
1106	8.28	—	125	1 deg	3%	0.1	0.3	10% or 5	10% or 5
1110	8.40	500	195	21.7	961	6.49	2.18	60.2	
1113	8.48	800	100	21.2	965	6.48	1.34	69.5	Slowed
1116	8.57	1025	75	21.5	966	6.42	1.29	72.2	Slowed
1119	8.66	1250	75	21.3	960	6.42	1.43	74.9	
1122	8.75	1475	75	21.8	960	6.42	1.60	74.0	

Depth to Pump Intake	10 Feet	1000 mL=1 Liter	1 gallon=3.785 Liters
Total Purge Volume	1475 mL	1.48 Liters	0.39 GALLONS
CASING VOL. FACTOR		WELL INFORMATION	
DTW final:	8.75	diameter	F
DTW initial	8.28	2"-dia:	0.163
		4"-dia:	0.652
Drawdown:	0.47	6"-dia:	1.457
		csg vol:	
		DTW <sub>final</sub> : 8.75	
		TIME: 1130	

COMMENTS  
 MW7 sampled @ 1130

# WATER SAMPLING SITE STATUS

 Date: 7/26/18

 Inspected by: NT/KP

 Cardno Job No.: 2783

 Station No.: 99105

 Site Address: San Pablo Ave Oakland, CA

Well ID	Well Head Screws	Rubber Gasket	Well Cap Locking	Lock on Well Cap	Concrete Well Seal	Well Head PVC	Water in Well Vault	Well Cover	Fence/Gate Condition	# Drums	Drum Contents	Building Condition	Site Appearance	Comments / Well Covers
	N/R/ok	N/R/ok	N/R/ok	N/R/ok	N/R/ok	N/R/ok	Y/N	N/R/ok	N/R/ok	N/R/ok	s/w/e	g/v/o	N/R/ok	
MW 2	ok	ok	ok	ok	ok	ok	N	ok	ok					
MW 3	NA	N	ok	ok	ok	ok	N	ok	ok					
MW 5	ok	N	ok	ok	ok	ok	N	ok	ok					
MW 6	ok	ok	ok	ok	ok	ok	N	ok	ok					
MW 7	ok	NA	ok	ok	N	ok	Y	ok	ok					Water above well casing
MW 8	ok	N	ok	ok	ok	ok	N	ok	ok					

N = Not repairable in time available-see comments.  
 R = Repaired-see comments  
 ok = No action needed.

Y = Yes.  
 N = No.

s = Soil.  
 w = Water.  
 e = Empty.

g = Graffiti on walls.  
 v = Vagrants (or evidence of).  
 o = Open (not secured).

## Soil Vapor Sampling Datasheet

Site ID: Former Mobil Service Station 99105

Cardno Project #: 2783

Site Address: 6301 San Pablo Avenue, Oakland, CA

Sampled:

Well ID	Yes	No	Wet:	Vac > 7.5 In/Hg	Other:	Notes:	3 Purge Vol (ml)
VW1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		6752
VW2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		6752
VW3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		6752
VW4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Duplicate	6752
VW5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		6752

QCTB (Trip Blank):

Canister ID: LC1237

Vacuum (in Hg): -10

Time: —

Sorbent Tube (TO-17):

Tube ID: VW4 Rep

Time: 1205

### Soil Vapor Sampling Datasheet

Site ID: Former Mobil Service Station 99105	Cardno Project #: 2783
Site Address: 6301 San Pablo Avenue, Oakland, CA	Weather / Air Temp (F°): 60°F
Location ID: VW1 Well Depth: 6'	Atmospheric Pressure (in Hg): 30.06"
Date: 7-24-18	Helium Detector #: MGD 2002
Field Personnel: Nadya Vicente	Purge Volume (mL - 3PV): 6752

<b>Pre-Sampling Information</b>			
Flow Test: Moisture in Well (WET):	<input checked="" type="checkbox"/>	Vacuum in Well:	<input type="checkbox"/>
<b>Shut In Test :</b>	Start Time: _____	End Time: _____	Initial Vacuum _____ (in Hg) Final Vacuum _____ (in Hg)

**Well Purge** Start Time: \_\_\_\_\_ End Time: \_\_\_\_\_

% Helium in Shroud During Purge :				
Time	% He	Down-hole Vacuum (in/Hg)	Flow Rate (cc/min)	Vol. Purged (ml)

Helium Leak (ppm): \_\_\_\_\_

**Sample Information:**

Sample ID	Start Time	End Time	Maintained % Helium in Shroud	Canister ID	Flow Controller #	Initial Vacuum (in Hg)	Final Vacuum (in Hg)
Duplicate							

**% Helium in Shroud During Sample Collection :**

Time	% He

in Hg = Inches of Mercury  
He = Helium  
PV = Purge Volume

### Soil Vapor Sampling Datasheet

Site ID: Former Mobil Service Station 99105	Cardno Project #: 2783
Site Address: 6301 San Pablo Avenue, Oakland, CA	Weather / Air Temp (F°): 60° F
Location ID: VWZ                                      Well Depth: 6'	Atmospheric Pressure (in Hg): 30.07"
Date: 7-24-18	Helium Detector #: MGD 2002
Field Personnel: Nadya Vicente	Purge Volume (mL - 3PV): 6752

Pre-Sampling Information	
Flow Test: Moisture in Well (WET): <input type="checkbox"/>	Vacuum in Well: <input type="checkbox"/>
Shut In Test: Start Time: 0805    End Time: 0810    Initial Vacuum 20 (in Hg)    Final Vacuum 20 (in Hg)	

**Well Purge**                                      Start Time: 0815                                      End Time: 0849

% Helium in Shroud During Purge :				
Time	% He	Down-hole Vacuum (in/Hg)	Flow Rate (cc/min)	Vol. Purged (ml)
0815	25	0	200	0
0820	23	0	200	1000
0825	20	0	200	2000
0830	26	0	200	3000
0835	22	0	200	4000
0840	24	0	200	5000
0845	20	0	200	6000
0849	23	0	200	6800

Helium Leak (ppm): 0

**Sample Information:**

Sample ID	Start Time	End Time	Maintained % Helium in Shroud	Canister ID	Flow Controller #	Initial Vacuum (in Hg)	Final Vacuum (in Hg)
VWZ	0850	0855	+20	LC607	SGM181	-30	-5
Duplicate							

**% Helium in Shroud During Sample Collection :**

Time	% He
0850	23
0852	28
0854	25
0855	23

Sorbant tube # G-0150657 @ 0857

in Hg = Inches of Mercury  
 He = Helium  
 PV = Purge Volume

## Soil Vapor Sampling Datasheet

Site ID: Former Mobil Service Station 99105	Cardno Project #: 2783
Site Address: 6301 San Pablo Avenue, Oakland, CA	Weather / Air Temp (F°): 59° F
Location ID: VW3                                      Well Depth: 6'	Atmospheric Pressure (in Hg): 30.08"
Date: 7-24-18	Helium Detector #: MGD 2002
Field Personnel: Nadya Vicente	Purge Volume (mL - 3PV): 6752

**Pre-Sampling Information**

Flow Test: Moisture in Well (WET):                                       Vacuum in Well:

Shut In Test:    Start Time: 0940    End Time: 0945    Initial Vacuum 19 (in Hg)    Final Vacuum 19 (in Hg)

**Well Purge**                                      Start Time: 0945                                      End Time: 1019

% Helium in Shroud During Purge :				
Time	% He	Down-hole Vacuum (in/Hg)	Flow Rate (cc/min)	Vol. Purged (ml)
0945	21	0	200	0
0950	24	0	200	1000
0955	21	0	200	2000
1000	21	0	200	3000
1005	23	0	200	4000
1010	20	0	200	5000
1015	22	0	200	6000
1019	20	0	200	6800

Helium Leak (ppm): 0

**Sample Information:**

Sample ID	Start Time	End Time	Maintained % Helium in Shroud	Canister ID	Flow Controller #	Initial Vacuum (in Hg)	Final Vacuum (in Hg)
VW3	1020	1025	+20%	LC564	SGM262	-30	-5
Duplicate							

**% Helium in Shroud During Sample Collection :**

Sorbant tube # 60189328 @ 1028

Time	% He
1020	24
1022	21
1024	26
1025	23

in Hg = Inches of Mercury  
 He = Helium  
 PV = Purge Volume

### Soil Vapor Sampling Datasheet

Site ID: Former Mobil Service Station 99105	Cardno Project #: 2783
Site Address: 6301 San Pablo Avenue, Oakland, CA	Weather / Air Temp (F°): 67° F
Location ID: VW4                      Well Depth: 6'	Atmospheric Pressure (in Hg): 30.06"
Date: 7-24-18	Helium Detector #: MGD 2002
Field Personnel: Nadya Vicente	Purge Volume (mL - 3PV): 6752

Pre-Sampling Information			
Flow Test: Moisture in Well (WET):	<input type="checkbox"/>	Vacuum in Well:	<input type="checkbox"/>
Shut In Test : Start Time: <u>1100</u> End Time: <u>1105</u> Initial Vacuum <u>20</u> (in Hg) Final Vacuum <u>20</u> (in Hg)			

Well Purge                      Start Time: 1105                      End Time: \_\_\_\_\_

% Helium in Shroud During Purge :				
Time	% He	Down-hole Vacuum (in/Hg)	Flow Rate (cc/min)	Vol. Purged (ml)
1105	29	0	200	0
1110	26	0	200	1000
1115	23	0	200	2000
1120	20	0	200	3000
1125	25	0	200	4000
1130	21	0	200	5000
1135	23	0	200	6000
1139	20	0	200	6800

Helium Leak (ppm): 9%

\* changed tubing and checked fittings on summas-vac test ok.

\* Odor from teclar - may be biased high based on Tphg concentrations.

**Sample Information:**

Sample ID	Start Time	End Time	Maintained % Helium in Shroud	Canister ID	Flow Controller #	Initial Vacuum (in Hg)	Final Vacuum (in Hg)
VW4	1145	1153	+20%	LC406	SGM358	-30	-5
Duplicate	1145	1155	+20%	LC846	SGM358	-30	-5

**% Helium in Shroud During Sample Collection :**

Time	% He
1145	25
1147	20
1149	23
1151	21
1153	27
1155	23

Sorbant tube # 60189658 @ 1200  
 Replicate # 60141304 @ 1205

in Hg = Inches of Mercury  
 He = Helium  
 PV = Purge Volume

## Soil Vapor Sampling Datasheet

Site ID: Former Mobil Service Station 99105	Cardno Project #: 2783
Site Address: 6301 San Pablo Avenue, Oakland, CA	Weather / Air Temp (F°):
Location ID: VW5	Well Depth: 6'
Date: 7-24-18	Atmospheric Pressure (in Hg):
Field Personnel: Nadya Vicente	Helium Detector #: MGD 2002
	Purge Volume (mL - 3PV): 6752

Pre-Sampling Information	
Flow Test: Moisture in Well (WET): <input checked="" type="checkbox"/>	Vacuum in Well: <input type="checkbox"/>
Shut In Test: Start Time: _____ End Time: _____ Initial Vacuum _____ (in Hg) Final Vacuum _____ (in Hg)	

**Well Purge** Start Time: \_\_\_\_\_ End Time: \_\_\_\_\_

% Helium in Shroud During Purge :				
Time	% He	Down-hole Vacuum (in/Hg)	Flow Rate (cc/min)	Vol. Purged (ml)

Helium Leak (ppm): \_\_\_\_\_

**Sample Information:**

Sample ID	Start Time	End Time	Maintained % Helium in Shroud	Canister ID	Flow Controller #	Initial Vacuum (in Hg)	Final Vacuum (in Hg)
Duplicate							

**% Helium in Shroud During Sample Collection :**

Time	% He

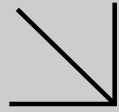
in Hg = Inches of Mercury  
 He = Helium  
 PV = Purge Volume



**APPENDIX E**  
**LABORATORY ANALYTICAL REPORTS**



Calscience



**WORK ORDER NUMBER: 18-07-2179**

*The difference is service*



AIR | SOIL | WATER | MARINE CHEMISTRY

**Analytical Report For**

**Client:** Cardno

**Client Project Name:** ExxonMobil 99105/022783C

**Attention:** Scott Perkins  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

*Cecile deGuia*

Approved for release on 08/13/2018 by:  
Cecile deGuia  
Project Manager

ResultLink ▶

Email your PM ▶

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.



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Work Order Number: 18-07-2179

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**Condition Upon Receipt:**

Samples were received under Chain-of-Custody (COC) on 07/31/18. They were assigned to Work Order 18-07-2179.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

**Holding Times:**

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of  $\leq 15$  minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

**Quality Control:**

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

**Subcontractor Information:**

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

**Additional Comments:**

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

**DoD Projects:**

The test results contained in this report are accredited under the laboratory's ISO/IEC 17025:2005 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation ADE-1864.

## Sample Summary

Client: Cardno	Work Order:	18-07-2179
601 North McDowell Blvd.	Project Name:	ExxonMobil 99105/022783C
Petaluma, CA 94954-2312	PO Number:	022783C
	Date/Time Received:	07/31/18 10:30
	Number of Containers:	62

Attn: Scott Perkins

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
MW2	18-07-2179-1	07/26/18 08:10	10	Aqueous
MW3	18-07-2179-2	07/26/18 08:20	10	Aqueous
MW5	18-07-2179-3	07/26/18 10:00	10	Aqueous
MW6	18-07-2179-4	07/26/18 11:20	10	Aqueous
MW7	18-07-2179-5	07/26/18 11:30	10	Aqueous
MW8	18-07-2179-6	07/26/18 10:00	10	Aqueous
QCBB	18-07-2179-7	07/26/18 12:05	2	Aqueous

## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/31/18  
Work Order: 18-07-2179  
Preparation: EPA 3510C  
Method: EPA 8015B (M)  
Units: ug/L

Project: ExxonMobil 99105/022783C

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>MW2</b>	<b>18-07-2179-1-J</b>	<b>07/26/18 08:10</b>	<b>Aqueous</b>	<b>GC 49</b>	<b>08/02/18</b>	<b>08/09/18 17:43</b>	<b>180802B04S</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
TPH as Diesel		ND		49		1.00	SG
<u>Surrogate</u>		<u>Rec. (%)</u>		<u>Control Limits</u>		<u>Qualifiers</u>	
n-Octacosane		112		68-140			
<b>MW3</b>	<b>18-07-2179-2-J</b>	<b>07/26/18 08:20</b>	<b>Aqueous</b>	<b>GC 49</b>	<b>08/02/18</b>	<b>08/09/18 18:04</b>	<b>180802B04S</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
TPH as Diesel		64		48		1.00	SG,HD
<u>Surrogate</u>		<u>Rec. (%)</u>		<u>Control Limits</u>		<u>Qualifiers</u>	
n-Octacosane		108		68-140			
<b>MW5</b>	<b>18-07-2179-3-J</b>	<b>07/26/18 10:00</b>	<b>Aqueous</b>	<b>GC 49</b>	<b>08/02/18</b>	<b>08/09/18 18:25</b>	<b>180802B04S</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
TPH as Diesel		590		48		1.00	SG,HD
<u>Surrogate</u>		<u>Rec. (%)</u>		<u>Control Limits</u>		<u>Qualifiers</u>	
n-Octacosane		116		68-140			
<b>MW6</b>	<b>18-07-2179-4-J</b>	<b>07/26/18 11:20</b>	<b>Aqueous</b>	<b>GC 49</b>	<b>08/02/18</b>	<b>08/09/18 18:46</b>	<b>180802B04S</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
TPH as Diesel		ND		50		1.00	SG
<u>Surrogate</u>		<u>Rec. (%)</u>		<u>Control Limits</u>		<u>Qualifiers</u>	
n-Octacosane		108		68-140			
<b>MW7</b>	<b>18-07-2179-5-J</b>	<b>07/26/18 11:30</b>	<b>Aqueous</b>	<b>GC 49</b>	<b>08/02/18</b>	<b>08/09/18 19:07</b>	<b>180802B04S</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
TPH as Diesel		ND		50		1.00	SG
<u>Surrogate</u>		<u>Rec. (%)</u>		<u>Control Limits</u>		<u>Qualifiers</u>	
n-Octacosane		118		68-140			

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/31/18  
Work Order: 18-07-2179  
Preparation: EPA 3510C  
Method: EPA 8015B (M)  
Units: ug/L

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>MW8</b>	<b>18-07-2179-6-J</b>	<b>07/26/18 10:00</b>	<b>Aqueous</b>	<b>GC 49</b>	<b>08/02/18</b>	<b>08/09/18 19:29</b>	<b>180802B04S</b>

Parameter	Result	RL	DF	Qualifiers
TPH as Diesel	940	49	1.00	SG,HD

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	113	68-140	

Method Blank	099-15-304-2116	N/A	Aqueous	GC 49	08/02/18	08/09/18 14:14	180802B04S
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Parameter	Result	RL	DF	Qualifiers
TPH as Diesel	ND	50	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
n-Octacosane	104	68-140	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/31/18  
Work Order: 18-07-2179  
Preparation: EPA 5030C  
Method: EPA 8015B (M)  
Units: ug/L

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>MW2</b>	<b>18-07-2179-1-H</b>	<b>07/26/18 08:10</b>	<b>Aqueous</b>	<b>GC 42</b>	<b>08/04/18</b>	<b>08/04/18 20:21</b>	<b>180804L026</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
TPH as Gasoline		ND		50		1.00	
<u>Surrogate</u>		<u>Rec. (%)</u>		<u>Control Limits</u>		<u>Qualifiers</u>	
1,4-Bromofluorobenzene		46		38-134			
<b>MW3</b>	<b>18-07-2179-2-H</b>	<b>07/26/18 08:20</b>	<b>Aqueous</b>	<b>GC 42</b>	<b>08/04/18</b>	<b>08/05/18 00:26</b>	<b>180804L026</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
TPH as Gasoline		320		100		2.00	
<u>Surrogate</u>		<u>Rec. (%)</u>		<u>Control Limits</u>		<u>Qualifiers</u>	
1,4-Bromofluorobenzene		66		38-134			
<b>MW5</b>	<b>18-07-2179-3-H</b>	<b>07/26/18 10:00</b>	<b>Aqueous</b>	<b>GC 42</b>	<b>08/04/18</b>	<b>08/04/18 20:56</b>	<b>180804L026</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
TPH as Gasoline		1700		50		1.00	HD
<u>Surrogate</u>		<u>Rec. (%)</u>		<u>Control Limits</u>		<u>Qualifiers</u>	
1,4-Bromofluorobenzene		110		38-134			
<b>MW6</b>	<b>18-07-2179-4-H</b>	<b>07/26/18 11:20</b>	<b>Aqueous</b>	<b>GC 42</b>	<b>08/04/18</b>	<b>08/04/18 21:31</b>	<b>180804L026</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
TPH as Gasoline		ND		50		1.00	
<u>Surrogate</u>		<u>Rec. (%)</u>		<u>Control Limits</u>		<u>Qualifiers</u>	
1,4-Bromofluorobenzene		55		38-134			
<b>MW7</b>	<b>18-07-2179-5-H</b>	<b>07/26/18 11:30</b>	<b>Aqueous</b>	<b>GC 42</b>	<b>08/04/18</b>	<b>08/04/18 22:06</b>	<b>180804L026</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
TPH as Gasoline		ND		50		1.00	
<u>Surrogate</u>		<u>Rec. (%)</u>		<u>Control Limits</u>		<u>Qualifiers</u>	
1,4-Bromofluorobenzene		49		38-134			

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.





Calscience

## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/31/18  
Work Order: 18-07-2179  
Preparation: EPA 5030C  
Method: EPA 8015B (M)  
Units: ug/L

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>MW8</b>	<b>18-07-2179-6-H</b>	<b>07/26/18 10:00</b>	<b>Aqueous</b>	<b>GC 42</b>	<b>08/04/18</b>	<b>08/04/18 23:51</b>	<b>180804L026</b>

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
TPH as Gasoline	3800	50	1.00	HD

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	172	38-134	AZ

Method Blank	099-12-436-12180	N/A	Aqueous	GC 42	08/04/18	08/04/18 13:33	180804L026
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
TPH as Gasoline	ND	50	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	47	38-134	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/31/18  
Work Order: 18-07-2179  
Preparation: EPA 5030C  
Method: EPA 8260B  
Units: ug/L

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW2	18-07-2179-1-A	07/26/18 08:10	Aqueous	GC/MS L	08/07/18	08/07/18 17:50	180807L036

Parameter	Result	RL	DF	Qualifiers
Benzene	ND	0.50	1.00	
Toluene	ND	0.50	1.00	
Ethylbenzene	ND	0.50	1.00	
o-Xylene	ND	0.50	1.00	
p/m-Xylene	ND	0.50	1.00	
Xylenes (total)	ND	0.50	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1.00	
Tert-Butyl Alcohol (TBA)	ND	5.0	1.00	
Diisopropyl Ether (DIPE)	ND	0.50	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1.00	
1,2-Dibromoethane	ND	0.50	1.00	
1,2-Dichloroethane	ND	0.50	1.00	
Naphthalene	ND	1.0	1.00	
Surrogate	Rec. (%)	Control Limits	Qualifiers	
1,4-Bromofluorobenzene	95	68-120		
Dibromofluoromethane	102	80-127		
1,2-Dichloroethane-d4	102	80-128		
Toluene-d8	101	80-120		

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/31/18  
Work Order: 18-07-2179  
Preparation: EPA 5030C  
Method: EPA 8260B  
Units: ug/L

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW3	18-07-2179-2-A	07/26/18 08:20	Aqueous	GC/MS L	08/07/18	08/07/18 18:20	180807L036

Parameter	Result	RL	DF	Qualifiers
Benzene	ND	0.50	1.00	
Toluene	ND	0.50	1.00	
Ethylbenzene	ND	0.50	1.00	
o-Xylene	ND	0.50	1.00	
p/m-Xylene	ND	0.50	1.00	
Xylenes (total)	ND	0.50	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1.00	
Tert-Butyl Alcohol (TBA)	ND	5.0	1.00	
Diisopropyl Ether (DIPE)	ND	0.50	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1.00	
1,2-Dibromoethane	ND	0.50	1.00	
1,2-Dichloroethane	ND	0.50	1.00	
Naphthalene	ND	1.0	1.00	
Surrogate	Rec. (%)	Control Limits	Qualifiers	
1,4-Bromofluorobenzene	100	68-120		
Dibromofluoromethane	98	80-127		
1,2-Dichloroethane-d4	97	80-128		
Toluene-d8	102	80-120		

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/31/18  
Work Order: 18-07-2179  
Preparation: EPA 5030C  
Method: EPA 8260B  
Units: ug/L

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW5	18-07-2179-3-A	07/26/18 10:00	Aqueous	GC/MS L	08/07/18	08/07/18 18:50	180807L036

Parameter	Result	RL	DF	Qualifiers
Benzene	22	0.50	1.00	
Toluene	0.74	0.50	1.00	
Ethylbenzene	1.9	0.50	1.00	
o-Xylene	ND	0.50	1.00	
p/m-Xylene	1.4	0.50	1.00	
Xylenes (total)	1.4	0.50	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1.00	
Tert-Butyl Alcohol (TBA)	28	5.0	1.00	
Diisopropyl Ether (DIPE)	ND	0.50	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1.00	
1,2-Dibromoethane	ND	0.50	1.00	
1,2-Dichloroethane	ND	0.50	1.00	
Naphthalene	ND	1.0	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	97	68-120	
Dibromofluoromethane	96	80-127	
1,2-Dichloroethane-d4	94	80-128	
Toluene-d8	100	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/31/18  
Work Order: 18-07-2179  
Preparation: EPA 5030C  
Method: EPA 8260B  
Units: ug/L

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW6	18-07-2179-4-A	07/26/18 11:20	Aqueous	GC/MS L	08/07/18	08/07/18 19:20	180807L036

Parameter	Result	RL	DF	Qualifiers
Benzene	ND	0.50	1.00	
Toluene	ND	0.50	1.00	
Ethylbenzene	ND	0.50	1.00	
o-Xylene	ND	0.50	1.00	
p/m-Xylene	ND	0.50	1.00	
Xylenes (total)	ND	0.50	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1.00	
Tert-Butyl Alcohol (TBA)	ND	5.0	1.00	
Diisopropyl Ether (DIPE)	ND	0.50	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1.00	
1,2-Dibromoethane	ND	0.50	1.00	
1,2-Dichloroethane	ND	0.50	1.00	
Naphthalene	ND	1.0	1.00	
Surrogate	Rec. (%)	Control Limits	Qualifiers	
1,4-Bromofluorobenzene	97	68-120		
Dibromofluoromethane	97	80-127		
1,2-Dichloroethane-d4	94	80-128		
Toluene-d8	100	80-120		

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/31/18  
Work Order: 18-07-2179  
Preparation: EPA 5030C  
Method: EPA 8260B  
Units: ug/L

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW7	18-07-2179-5-A	07/26/18 11:30	Aqueous	GC/MS L	08/07/18	08/07/18 19:50	180807L036

Parameter	Result	RL	DF	Qualifiers
Benzene	ND	0.50	1.00	
Toluene	ND	0.50	1.00	
Ethylbenzene	ND	0.50	1.00	
o-Xylene	ND	0.50	1.00	
p/m-Xylene	ND	0.50	1.00	
Xylenes (total)	ND	0.50	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1.00	
Tert-Butyl Alcohol (TBA)	ND	5.0	1.00	
Diisopropyl Ether (DIPE)	ND	0.50	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1.00	
1,2-Dibromoethane	ND	0.50	1.00	
1,2-Dichloroethane	ND	0.50	1.00	
Naphthalene	ND	1.0	1.00	
Surrogate	Rec. (%)	Control Limits	Qualifiers	
1,4-Bromofluorobenzene	97	68-120		
Dibromofluoromethane	100	80-127		
1,2-Dichloroethane-d4	99	80-128		
Toluene-d8	100	80-120		

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/31/18  
Work Order: 18-07-2179  
Preparation: EPA 5030C  
Method: EPA 8260B  
Units: ug/L

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
MW8	18-07-2179-6-A	07/26/18 10:00	Aqueous	GC/MS L	08/07/18	08/07/18 20:20	180807L036

Parameter	Result	RL	DF	Qualifiers
Benzene	200	4.0	8.00	
Toluene	ND	4.0	8.00	
Ethylbenzene	220	4.0	8.00	
o-Xylene	ND	4.0	8.00	
p/m-Xylene	23	4.0	8.00	
Xylenes (total)	23	4.0	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	4.0	8.00	
Tert-Butyl Alcohol (TBA)	42	40	8.00	
Diisopropyl Ether (DIPE)	ND	4.0	8.00	
Ethyl-t-Butyl Ether (ETBE)	ND	4.0	8.00	
Tert-Amyl-Methyl Ether (TAME)	ND	4.0	8.00	
1,2-Dibromoethane	ND	4.0	8.00	
1,2-Dichloroethane	ND	4.0	8.00	
Naphthalene	92	8.0	8.00	
Surrogate	Rec. (%)	Control Limits	Qualifiers	
1,4-Bromofluorobenzene	99	68-120		
Dibromofluoromethane	100	80-127		
1,2-Dichloroethane-d4	98	80-128		
Toluene-d8	100	80-120		


  
Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/31/18  
Work Order: 18-07-2179  
Preparation: EPA 5030C  
Method: EPA 8260B  
Units: ug/L

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	099-12-880-1603	N/A	Aqueous	GC/MS L	08/07/18	08/07/18 11:18	180807L036

Parameter	Result	RL	DF	Qualifiers
Benzene	ND	0.50	1.00	
Toluene	ND	0.50	1.00	
Ethylbenzene	ND	0.50	1.00	
o-Xylene	ND	0.50	1.00	
p/m-Xylene	ND	0.50	1.00	
Xylenes (total)	ND	0.50	1.00	
Methyl-t-Butyl Ether (MTBE)	ND	0.50	1.00	
Tert-Butyl Alcohol (TBA)	ND	5.0	1.00	
Diisopropyl Ether (DIPE)	ND	0.50	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	0.50	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	0.50	1.00	
1,2-Dibromoethane	ND	0.50	1.00	
1,2-Dichloroethane	ND	0.50	1.00	
Naphthalene	ND	1.0	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,4-Bromofluorobenzene	97	68-120	
Dibromofluoromethane	96	80-127	
1,2-Dichloroethane-d4	101	80-128	
Toluene-d8	99	80-120	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.





Calscience

## Quality Control - Spike/Spike Duplicate

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/31/18  
Work Order: 18-07-2179  
Preparation: EPA 5030C  
Method: EPA 8015B (M)

Project: ExxonMobil 99105/022783C

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
18-07-2266-3	Sample	Aqueous	GC 42	08/04/18	08/04/18 16:16	180804S012
18-07-2266-3	Matrix Spike	Aqueous	GC 42	08/04/18	08/04/18 16:51	180804S012
18-07-2266-3	Matrix Spike Duplicate	Aqueous	GC 42	08/04/18	08/04/18 17:26	180804S012

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
TPH as Gasoline	ND	2000	1656	83	1632	82	68-122	1	0-18	

  
Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

## Quality Control - Spike/Spike Duplicate

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/31/18  
Work Order: 18-07-2179  
Preparation: EPA 5030C  
Method: EPA 8260B

Project: ExxonMobil 99105/022783C

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
18-08-0217-2	Sample	Aqueous	GC/MS L	08/07/18	08/07/18 12:22	180807S010
18-08-0217-2	Matrix Spike	Aqueous	GC/MS L	08/07/18	08/07/18 13:21	180807S010
18-08-0217-2	Matrix Spike Duplicate	Aqueous	GC/MS L	08/07/18	08/07/18 13:51	180807S010

Parameter	Sample Conc.	Spike Added	MS Conc.	MS %Rec.	MSD Conc.	MSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Benzene	ND	100.0	95.45	95	93.27	93	75-125	2	0-20	
Toluene	ND	100.0	96.01	96	94.55	95	75-125	2	0-20	
Ethylbenzene	ND	100.0	96.67	97	95.16	95	75-125	2	0-20	
o-Xylene	ND	100.0	97.15	97	93.82	94	75-127	3	0-20	
p/m-Xylene	ND	200.0	197.1	99	193.2	97	75-125	2	0-20	
Methyl-t-Butyl Ether (MTBE)	ND	100.0	74.87	75	71.81	72	71-131	4	0-20	
Tert-Butyl Alcohol (TBA)	ND	500.0	564.7	113	575.0	115	20-180	2	0-40	
Diisopropyl Ether (DIPE)	ND	100.0	89.17	89	85.38	85	64-136	4	0-20	
Ethyl-t-Butyl Ether (ETBE)	ND	100.0	75.63	76	73.11	73	73-133	3	0-20	
Tert-Amyl-Methyl Ether (TAME)	ND	100.0	85.24	85	84.24	84	75-125	1	0-20	
1,2-Dibromoethane	ND	100.0	98.66	99	94.97	95	75-126	4	0-20	
1,2-Dichloroethane	ND	100.0	99.23	99	99.13	99	75-127	0	0-20	

RPD: Relative Percent Difference. CL: Control Limits



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## Quality Control - LCS/LCSD

Cardno	Date Received:	07/31/18
601 North McDowell Blvd.	Work Order:	18-07-2179
Petaluma, CA 94954-2312	Preparation:	EPA 3510C
	Method:	EPA 8015B (M)
Project: ExxonMobil 99105/022783C		Page 1 of 3

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-15-304-2116	LCS	Aqueous	GC 49	08/02/18	08/09/18 14:35	180802B04S			
099-15-304-2116	LCSD	Aqueous	GC 49	08/02/18	08/09/18 14:56	180802B04S			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
TPH as Diesel	2000	1875	94	1871	94	69-123	0	0-30	

  
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RPD: Relative Percent Difference. CL: Control Limits



Calscience

## Quality Control - LCS

Cardno	Date Received:	07/31/18
601 North McDowell Blvd.	Work Order:	18-07-2179
Petaluma, CA 94954-2312	Preparation:	EPA 5030C
	Method:	EPA 8015B (M)
Project: ExxonMobil 99105/022783C		Page 2 of 3

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS Batch Number
<b>099-12-436-12180</b>	<b>LCS</b>	<b>Aqueous</b>	<b>GC 42</b>	<b>08/04/18</b>	<b>08/04/18 12:58</b>	<b>180804L026</b>
<u>Parameter</u>		<u>Spike Added</u>	<u>Conc. Recovered</u>	<u>LCS %Rec.</u>	<u>%Rec. CL</u>	<u>Qualifiers</u>
TPH as Gasoline		2000	1823	91	78-120	


  
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RPD: Relative Percent Difference. CL: Control Limits



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## Quality Control - LCS/LCSD

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/31/18  
Work Order: 18-07-2179  
Preparation: EPA 5030C  
Method: EPA 8260B

Project: ExxonMobil 99105/022783C

Page 3 of 3

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number				
099-12-880-1603	LCS	Aqueous	GC/MS L	08/07/18	08/07/18 09:39	180807L036				
099-12-880-1603	LCSD	Aqueous	GC/MS L	08/07/18	08/07/18 10:09	180807L036				
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Benzene	10.00	10.51	105	10.05	101	80-120	73-127	4	0-22	
Toluene	10.00	10.54	105	10.18	102	80-120	73-127	4	0-28	
Ethylbenzene	10.00	10.47	105	10.10	101	80-120	73-127	4	0-25	
o-Xylene	10.00	10.34	103	10.14	101	80-120	73-127	2	0-30	
p/m-Xylene	20.00	21.35	107	20.80	104	80-120	73-127	3	0-30	
Methyl-t-Butyl Ether (MTBE)	10.00	7.997	80	7.994	80	75-123	67-131	0	0-27	
Tert-Butyl Alcohol (TBA)	50.00	55.13	110	53.14	106	80-120	73-127	4	0-30	
Diisopropyl Ether (DIPE)	10.00	9.635	96	9.320	93	73-121	65-129	3	0-26	
Ethyl-t-Butyl Ether (ETBE)	10.00	8.245	82	8.132	81	76-124	68-132	1	0-30	
Tert-Amyl-Methyl Ether (TAME)	10.00	9.288	93	9.285	93	80-120	73-127	0	0-24	
1,2-Dibromoethane	10.00	10.26	103	10.30	103	80-120	73-127	0	0-32	
1,2-Dichloroethane	10.00	10.67	107	10.43	104	80-122	73-129	2	0-23	

Total number of LCS compounds: 12

Total number of ME compounds: 0

Total number of ME compounds allowed: 1

LCS ME CL validation result: Pass

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RPD: Relative Percent Difference. CL: Control Limits

## Sample Analysis Summary Report

Work Order: 18-07-2179

Page 1 of 1

<u>Method</u>	<u>Extraction</u>	<u>Chemist ID</u>	<u>Instrument</u>	<u>Analytical Location</u>
EPA 8015B (M)	EPA 3510C	972	GC 49	1
EPA 8015B (M)	EPA 5030C	1161	GC 42	2
EPA 8260B	EPA 5030C	316	GC/MS L	2

<u>Qualifiers</u>	<u>Definition</u>
AZ	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
B	Analyte was present in the associated method blank.
BA	The MS/MSD RPD was out of control due to suspected matrix interference.
BB	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
DF	Reporting limits elevated due to matrix interferences.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
GE	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
HD	Chromat. profile inconsistent with pattern(s) of ref. fuel stnds.
HO	High concentration matrix spike recovery out of limits
HT	Analytical value calculated using results from associated tests.
HX	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS was in control.
IL	Relative percent difference out of control.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
LD	Analyte presence was not confirmed by second column or GC/MS analysis.
LP	The LCS and/or LCSD recoveries for this analyte were above the upper control limit. The associated sample was non-detected. Therefore, the sample data was reported without further clarification.
LQ	LCS recovery above method control limits.
LR	LCS recovery below method control limits.
ND	Parameter not detected at the indicated reporting limit.
QO	Compound did not meet method-described identification guidelines. Identification was based on additional GC/MS characteristics.
RU	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
SG	A silica gel cleanup procedure was performed.
SN	See applicable analysis comment.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of  $\leq 15$  minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.







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2179

**Ship From**  
CAL SCIENCE- CONCORD  
ALAN KEMP  
5063 COMMERCIAL CIRCLE  
#H  
CONCORD, CA 94520

**Tracking #: 541496752**

**NPS**



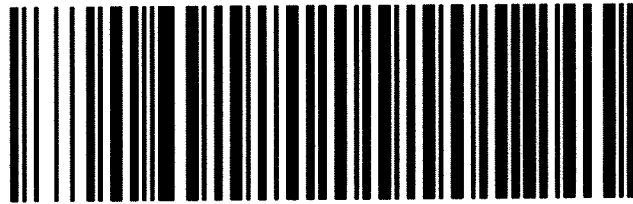
**Ship To**  
CEL  
SAMPLE RECEIVING  
7440 LINCOLN WAY  
GARDEN GROVE, CA 92841

**ORC**  
**GARDEN GROVE**

**A**

**COD:** \$0.00  
**Weight:** 0 lb(s)  
**Reference:**  
CARDNO ERI  
**Delivery Instructions:**

**D92845A**



88126697

**Signature Type:** STANDARD

Print Date: 7/30/2018 2:34 PM

Package 1 of 2

**LABEL INSTRUCTIONS:**

- Do not copy or reprint this label for additional shipments - each package must have a unique barcode.**
- Step 1: Use the "Print Label" button on this page to print the shipping label on a laser or inkjet printer.
- Step 2: Fold this page in half.
- Step 3: Securely attach this label to your package and do not cover the barcode.

**TERMS AND CONDITIONS:**

By giving us your shipment to deliver, you agree to all of the GSO service terms & conditions including, but not limited to; limits of liability, declared value conditions, and claim procedures which are available on our website at www.gso.com.

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### SAMPLE RECEIPT CHECKLIST

COOLER 1 OF 1

CLIENT: Cardno

DATE: 07/31/2018

**TEMPERATURE:** (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)  
 Thermometer ID: SC6 (CF: -0.5°C); Temperature (w/o CF): 3.9 °C (w/ CF): 3.4 °C;  Blank  Sample  
 Sample(s) outside temperature criteria (PM/APM contacted by: \_\_\_\_\_)  
 Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling  
 Sample(s) received at ambient temperature; placed on ice for transport by courier  
 Ambient Temperature:  Air  Filter

Checked by: J36

**CUSTODY SEAL:**

Cooler  Present and Intact  Present but Not Intact  Not Present  N/A  
 Sample(s)  Present and Intact  Present but Not Intact  Not Present  N/A

Checked by: J36  
 Checked by: J36

SAMPLE CONDITION:	Yes	No	N/A
Chain-of-Custody (COC) document(s) received with samples .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Sampling date <input type="checkbox"/> Sampling time <input type="checkbox"/> Matrix <input type="checkbox"/> Number of containers			
<input type="checkbox"/> No analysis requested <input type="checkbox"/> Not relinquished <input type="checkbox"/> No relinquished date <input type="checkbox"/> No relinquished time			
Sampler's name indicated on COC .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container label(s) consistent with COC .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and in good condition .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers for analyses requested .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sufficient volume/mass for analyses requested .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Samples received within holding time .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aqueous samples for certain analyses received within 15-minute holding time			
<input type="checkbox"/> pH <input type="checkbox"/> Residual Chlorine <input type="checkbox"/> Dissolved Sulfide <input type="checkbox"/> Dissolved Oxygen .....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation chemical(s) noted on COC and/or sample container .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unpreserved aqueous sample(s) received for certain analyses			
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Total Metals <input type="checkbox"/> Dissolved Metals			
Acid/base preserved samples - pH within acceptable range .....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Container(s) for certain analysis free of headspace.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Volatile Organics <input type="checkbox"/> Dissolved Gases (RSK-175) <input type="checkbox"/> Dissolved Oxygen (SM 4500)			
<input type="checkbox"/> Carbon Dioxide (SM 4500) <input type="checkbox"/> Ferrous Iron (SM 3500) <input type="checkbox"/> Hydrogen Sulfide (Hach)			
Tedlar™ bag(s) free of condensation .....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**CONTAINER TYPE:** 8 (Trip Blank Lot Number: \_\_\_\_\_)

Aqueous:  VOA  VOA<sub>h</sub>  VOA<sub>na2</sub>  100PJ  100PJ<sub>na2</sub>  125AGB  125AGB<sub>h</sub>  125AGB<sub>p</sub>  125PB  125PB<sub>z</sub> (pH\_\_9)  
 250AGB  250CGB  250CGBs (pH\_\_2)  250PB  250PB<sub>n</sub> (pH\_\_2)  500AGB  500AG<sub>u</sub>  500AG<sub>js</sub> (pH\_\_2)  500PB  
 1AGB  1AGB<sub>na2</sub>  1AGBs (pH\_\_2)  1AGBs (O&G)  1PB  1PB<sub>na</sub> (pH\_\_12)  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_

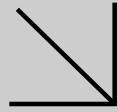
Solid:  4ozCGJ  8ozCGJ  16ozCGJ  Sleeve (\_\_\_\_)  EnCores® (\_\_\_\_)  TerraCores® (\_\_\_\_)  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_

Air:  Tedlar™  Canister  Sorbent Tube  PUF  \_\_\_\_\_ Other Matrix (\_\_\_\_):  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_

Container: A = Amber, B = Bottle, C = Clear, E = Envelope, G = Glass, J = Jar, P = Plastic, and Z = Ziploc/Resealable Bag  
 Preservative: b = buffered, f = filtered, h = HCl, n = HNO<sub>3</sub>, na = NaOH, na<sub>2</sub> = Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, p = H<sub>3</sub>PO<sub>4</sub>, Labeled/Checked by: J36  
 s = H<sub>2</sub>SO<sub>4</sub>, u = ultra-pure, x = Na<sub>2</sub>SO<sub>3</sub>+NaHSO<sub>4</sub>.H<sub>2</sub>O, z<sub>na</sub> = Zn (CH<sub>3</sub>CO<sub>2</sub>)<sub>2</sub> + NaOH Reviewed by: 1053



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**WORK ORDER NUMBER: 18-07-1883**

*The difference is service*



AIR | SOIL | WATER | MARINE CHEMISTRY

**Analytical Report For**

**Client:** Cardno

**Client Project Name:** ExxonMobil 99105/022783C

**Attention:** Scott Perkins  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

*Cecile de Guia*

Approved for release on 08/10/2018 by:  
Cecile deGuia  
Project Manager

ResultLink ▶

Email your PM ▶

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.



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Work Order Number: 18-07-1883

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**Condition Upon Receipt:**

Samples were received under Chain-of-Custody (COC) on 07/27/18. They were assigned to Work Order 18-07-1883.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

**Holding Times:**

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of  $\leq 15$  minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

**Quality Control:**

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

**Subcontractor Information:**

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

**Additional Comments:**

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

**DoD Projects:**

The test results contained in this report are accredited under the laboratory's ISO/IEC 17025:2005 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation ADE-1864.



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## Sample Summary

Client: Cardno	Work Order:	18-07-1883
601 North McDowell Blvd.	Project Name:	ExxonMobil 99105/022783C
Petaluma, CA 94954-2312	PO Number:	022783C
	Date/Time Received:	07/27/18 10:15
	Number of Containers:	5

Attn: Scott Perkins

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
VW2	18-07-1883-1	07/24/18 08:55	1	Air
VW3	18-07-1883-2	07/24/18 10:25	1	Air
VW4	18-07-1883-3	07/24/18 11:53	1	Air
VW4 DUP	18-07-1883-4	07/24/18 11:55	1	Air
QCTB	18-07-1883-5	07/24/18 00:00	1	Air


  
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## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/27/18  
Work Order: 18-07-1883  
Preparation: N/A  
Method: ASTM D-1946  
Units: %v

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>VW2</b>	<b>18-07-1883-1-A</b>	<b>07/24/18 08:55</b>	<b>Air</b>	<b>GC 65</b>	<b>N/A</b>	<b>07/27/18 16:58</b>	<b>180727L01</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
Methane		ND		0.500		1.00	
Carbon Dioxide		5.41		0.500		1.00	
Carbon Monoxide		ND		0.500		1.00	
Oxygen (+ Argon)		17.0		0.500		1.00	
<b>VW3</b>	<b>18-07-1883-2-A</b>	<b>07/24/18 10:25</b>	<b>Air</b>	<b>GC 65</b>	<b>N/A</b>	<b>07/27/18 16:37</b>	<b>180727L01</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
Methane		0.884		0.500		1.00	
Carbon Dioxide		14.1		0.500		1.00	
Carbon Monoxide		ND		0.500		1.00	
Oxygen (+ Argon)		9.73		0.500		1.00	
<b>VW4</b>	<b>18-07-1883-3-A</b>	<b>07/24/18 11:53</b>	<b>Air</b>	<b>GC 65</b>	<b>N/A</b>	<b>07/27/18 16:19</b>	<b>180727L01</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
Methane		35.4		0.500		1.00	
Carbon Dioxide		17.0		0.500		1.00	
Carbon Monoxide		ND		0.500		1.00	
Oxygen (+ Argon)		3.18		0.500		1.00	
<b>VW4 DUP</b>	<b>18-07-1883-4-A</b>	<b>07/24/18 11:55</b>	<b>Air</b>	<b>GC 65</b>	<b>N/A</b>	<b>07/27/18 15:59</b>	<b>180727L01</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
Methane		36.4		0.500		1.00	
Carbon Dioxide		17.7		0.500		1.00	
Carbon Monoxide		ND		0.500		1.00	
Oxygen (+ Argon)		2.29		0.500		1.00	
<b>QCTB</b>	<b>18-07-1883-5-A</b>	<b>07/24/18 00:00</b>	<b>Air</b>	<b>GC 65</b>	<b>N/A</b>	<b>07/27/18 15:40</b>	<b>180727L01</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
Methane		ND		0.500		1.00	
Carbon Dioxide		ND		0.500		1.00	
Carbon Monoxide		ND		0.500		1.00	
Oxygen (+ Argon)		0.796		0.500		1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/27/18  
Work Order: 18-07-1883  
Preparation: N/A  
Method: ASTM D-1946  
Units: %v

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>Method Blank</b>	<b>099-16-444-828</b>	<b>N/A</b>	<b>Air</b>	<b>GC 65</b>	<b>N/A</b>	<b>07/27/18 10:42</b>	<b>180727L01</b>

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Methane	ND	0.500	1.00	
Carbon Dioxide	ND	0.500	1.00	
Carbon Monoxide	ND	0.500	1.00	
Oxygen (+ Argon)	ND	0.500	1.00	





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## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/27/18  
Work Order: 18-07-1883  
Preparation: N/A  
Method: ASTM D-1946 (M)  
Units: %v

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>VW2</b>	<b>18-07-1883-1-A</b>	<b>07/24/18 08:55</b>	<b>Air</b>	<b>GC 55</b>	<b>N/A</b>	<b>07/27/18 18:07</b>	<b>180727L01</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
Helium		ND		0.0250		1.00	
<b>VW3</b>	<b>18-07-1883-2-A</b>	<b>07/24/18 10:25</b>	<b>Air</b>	<b>GC 55</b>	<b>N/A</b>	<b>07/27/18 17:24</b>	<b>180727L01</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
Helium		ND		0.0250		1.00	
<b>VW4</b>	<b>18-07-1883-3-A</b>	<b>07/24/18 11:53</b>	<b>Air</b>	<b>GC 55</b>	<b>N/A</b>	<b>07/27/18 16:55</b>	<b>180727L01</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
Helium		ND		0.0250		1.00	
<b>VW4 DUP</b>	<b>18-07-1883-4-A</b>	<b>07/24/18 11:55</b>	<b>Air</b>	<b>GC 55</b>	<b>N/A</b>	<b>07/27/18 16:04</b>	<b>180727L01</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
Helium		ND		0.0250		1.00	
<b>QCTB</b>	<b>18-07-1883-5-A</b>	<b>07/24/18 00:00</b>	<b>Air</b>	<b>GC 55</b>	<b>N/A</b>	<b>07/27/18 15:08</b>	<b>180727L01</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
Helium		ND		0.0250		1.00	
<b>Method Blank</b>	<b>099-12-872-1262</b>	<b>N/A</b>	<b>Air</b>	<b>GC 55</b>	<b>N/A</b>	<b>07/27/18 11:31</b>	<b>180727L01</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
Helium		ND		0.0250		1.00	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

## Analytical Report

Cardno	Date Received:	07/27/18
601 North McDowell Blvd.	Work Order:	18-07-1883
Petaluma, CA 94954-2312	Preparation:	N/A
	Method:	EPA TO-15
	Units:	ug/m3

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VW2	18-07-1883-1-A	07/24/18 08:55	Air	GC/MS K	N/A	08/02/18 03:09	180801L01

Parameter	Result	RL	DF	Qualifiers
Acetone	9.8	4.8	1.00	
Benzene	ND	1.6	1.00	
Benzyl Chloride	ND	7.8	1.00	
Bromodichloromethane	ND	3.4	1.00	
Bromoform	ND	5.2	1.00	
Bromomethane	ND	1.9	1.00	
2-Butanone	ND	4.4	1.00	
Carbon Disulfide	ND	6.2	1.00	
Carbon Tetrachloride	ND	3.1	1.00	
Chlorobenzene	ND	2.3	1.00	
Chloroethane	ND	1.3	1.00	
Chloroform	ND	2.4	1.00	
Chloromethane	ND	1.0	1.00	
Dibromochloromethane	ND	4.3	1.00	
Dichlorodifluoromethane	ND	2.5	1.00	
Diisopropyl Ether (DIPE)	ND	8.4	1.00	
1,1-Dichloroethane	ND	2.0	1.00	
1,1-Dichloroethene	ND	2.0	1.00	
1,2-Dibromoethane	ND	3.8	1.00	
Dichlorotetrafluoroethane	ND	14	1.00	
1,2-Dichlorobenzene	ND	3.0	1.00	
1,2-Dichloroethane	ND	2.0	1.00	
1,2-Dichloropropane	ND	2.3	1.00	
1,3-Dichlorobenzene	ND	3.0	1.00	
1,4-Dichlorobenzene	ND	3.0	1.00	
c-1,3-Dichloropropene	ND	2.3	1.00	
c-1,2-Dichloroethene	ND	2.0	1.00	
t-1,2-Dichloroethene	ND	2.0	1.00	
t-1,3-Dichloropropene	ND	4.5	1.00	
Ethanol	ND	9.4	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	8.4	1.00	
Ethylbenzene	ND	2.2	1.00	
4-Ethyltoluene	ND	2.5	1.00	
Hexachloro-1,3-Butadiene	ND	16	1.00	
2-Hexanone	ND	6.1	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

## Analytical Report

Cardno	Date Received:	07/27/18
601 North McDowell Blvd.	Work Order:	18-07-1883
Petaluma, CA 94954-2312	Preparation:	N/A
	Method:	EPA TO-15
	Units:	ug/m3
Project: ExxonMobil 99105/022783C		Page 2 of 12

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Methyl-t-Butyl Ether (MTBE)	ND	7.2	1.00	
Methylene Chloride	ND	17	1.00	
4-Methyl-2-Pentanone	ND	6.1	1.00	
Naphthalene	ND	26	1.00	
o-Xylene	ND	2.2	1.00	
p/m-Xylene	ND	8.7	1.00	
Xylenes (total)	ND	2.2	1.00	
Styrene	ND	6.4	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	8.4	1.00	
Tert-Butyl Alcohol (TBA)	ND	6.1	1.00	
Tetrachloroethene	ND	3.4	1.00	
Toluene	ND	1.9	1.00	
Trichloroethene	ND	2.7	1.00	
Trichlorofluoromethane	ND	5.6	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	11	1.00	
1,1,1-Trichloroethane	5.1	2.7	1.00	
1,1,2-Trichloroethane	ND	2.7	1.00	
1,3,5-Trimethylbenzene	ND	2.5	1.00	
1,1,2,2-Tetrachloroethane	ND	6.9	1.00	
1,2,4-Trimethylbenzene	ND	7.4	1.00	
1,2,4-Trichlorobenzene	ND	15	1.00	
Vinyl Acetate	ND	7.0	1.00	
Vinyl Chloride	ND	1.3	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	110	68-134	
1,2-Dichloroethane-d4	121	67-133	
Toluene-d8	98	70-130	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/27/18  
Work Order: 18-07-1883  
Preparation: N/A  
Method: EPA TO-15  
Units: ug/m3

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VW3	18-07-1883-2-A	07/24/18 10:25	Air	GC/MS K	N/A	08/02/18 04:05	180801L01

Parameter	Result	RL	DF	Qualifiers
Acetone	8.7	5.1	1.07	
Benzene	ND	1.7	1.07	
Benzyl Chloride	ND	8.3	1.07	
Bromodichloromethane	ND	3.6	1.07	
Bromoform	ND	5.5	1.07	
Bromomethane	ND	2.1	1.07	
2-Butanone	ND	4.7	1.07	
Carbon Disulfide	ND	6.7	1.07	
Carbon Tetrachloride	ND	3.4	1.07	
Chlorobenzene	ND	2.5	1.07	
Chloroethane	ND	1.4	1.07	
Chloroform	3.9	2.6	1.07	
Chloromethane	ND	1.1	1.07	
Dibromochloromethane	ND	4.6	1.07	
Dichlorodifluoromethane	ND	2.6	1.07	
Diisopropyl Ether (DIPE)	ND	8.9	1.07	
1,1-Dichloroethane	ND	2.2	1.07	
1,1-Dichloroethene	ND	2.1	1.07	
1,2-Dibromoethane	ND	4.1	1.07	
Dichlorotetrafluoroethane	ND	15	1.07	
1,2-Dichlorobenzene	ND	3.2	1.07	
1,2-Dichloroethane	ND	2.2	1.07	
1,2-Dichloropropane	ND	2.5	1.07	
1,3-Dichlorobenzene	ND	3.2	1.07	
1,4-Dichlorobenzene	ND	3.2	1.07	
c-1,3-Dichloropropene	ND	2.4	1.07	
c-1,2-Dichloroethene	ND	2.1	1.07	
t-1,2-Dichloroethene	ND	2.1	1.07	
t-1,3-Dichloropropene	ND	4.9	1.07	
Ethanol	ND	10	1.07	
Ethyl-t-Butyl Ether (ETBE)	ND	8.9	1.07	
Ethylbenzene	ND	2.3	1.07	
4-Ethyltoluene	ND	2.6	1.07	
Hexachloro-1,3-Butadiene	ND	17	1.07	
2-Hexanone	ND	6.6	1.07	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

## Analytical Report

Cardno	Date Received:	07/27/18
601 North McDowell Blvd.	Work Order:	18-07-1883
Petaluma, CA 94954-2312	Preparation:	N/A
	Method:	EPA TO-15
	Units:	ug/m3
Project: ExxonMobil 99105/022783C		Page 4 of 12

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Methyl-t-Butyl Ether (MTBE)	ND	7.7	1.07	
Methylene Chloride	ND	19	1.07	
4-Methyl-2-Pentanone	ND	6.6	1.07	
Naphthalene	ND	28	1.07	
o-Xylene	ND	2.3	1.07	
p/m-Xylene	ND	9.3	1.07	
Xylenes (total)	ND	2.3	1.00	
Styrene	ND	6.8	1.07	
Tert-Amyl-Methyl Ether (TAME)	ND	8.9	1.07	
Tert-Butyl Alcohol (TBA)	ND	6.5	1.07	
Tetrachloroethene	13	3.6	1.07	
Toluene	ND	2.0	1.07	
Trichloroethene	ND	2.9	1.07	
Trichlorofluoromethane	12	6.0	1.07	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	12	1.07	
1,1,1-Trichloroethane	ND	2.9	1.07	
1,1,2-Trichloroethane	ND	2.9	1.07	
1,3,5-Trimethylbenzene	ND	2.6	1.07	
1,1,2,2-Tetrachloroethane	ND	7.3	1.07	
1,2,4-Trimethylbenzene	ND	7.9	1.07	
1,2,4-Trichlorobenzene	ND	16	1.07	
Vinyl Acetate	ND	7.5	1.07	
Vinyl Chloride	ND	1.4	1.07	
<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>	
1,4-Bromofluorobenzene	108	68-134		
1,2-Dichloroethane-d4	121	67-133		
Toluene-d8	98	70-130		

## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/27/18  
Work Order: 18-07-1883  
Preparation: N/A  
Method: EPA TO-15  
Units: ug/m3

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VW4	18-07-1883-3-A	07/24/18 11:53	Air	GC/MS K	N/A	08/02/18 15:18	180801L01

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	4800	1000	
Benzene	14000	1600	1000	
Benzyl Chloride	ND	7800	1000	
Bromodichloromethane	ND	3400	1000	
Bromoform	ND	5200	1000	
Bromomethane	ND	1900	1000	
2-Butanone	ND	4400	1000	
Carbon Disulfide	ND	6200	1000	
Carbon Tetrachloride	ND	3100	1000	
Chlorobenzene	ND	2300	1000	
Chloroethane	ND	1300	1000	
Chloroform	ND	2400	1000	
Chloromethane	ND	1000	1000	
Dibromochloromethane	ND	4300	1000	
Dichlorodifluoromethane	ND	2500	1000	
Diisopropyl Ether (DIPE)	ND	8400	1000	
1,1-Dichloroethane	ND	2000	1000	
1,1-Dichloroethene	ND	2000	1000	
1,2-Dibromoethane	ND	3800	1000	
Dichlorotetrafluoroethane	ND	14000	1000	
1,2-Dichlorobenzene	ND	3000	1000	
1,2-Dichloroethane	ND	2000	1000	
1,2-Dichloropropane	ND	2300	1000	
1,3-Dichlorobenzene	ND	3000	1000	
1,4-Dichlorobenzene	ND	3000	1000	
c-1,3-Dichloropropene	ND	2300	1000	
c-1,2-Dichloroethene	ND	2000	1000	
t-1,2-Dichloroethene	ND	2000	1000	
t-1,3-Dichloropropene	ND	4500	1000	
Ethanol	ND	9400	1000	
Ethyl-t-Butyl Ether (ETBE)	ND	8400	1000	
Ethylbenzene	100000	2200	1000	
4-Ethyltoluene	17000	2500	1000	
Hexachloro-1,3-Butadiene	ND	16000	1000	
2-Hexanone	ND	6100	1000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

## Analytical Report

Cardno	Date Received:	07/27/18
601 North McDowell Blvd.	Work Order:	18-07-1883
Petaluma, CA 94954-2312	Preparation:	N/A
	Method:	EPA TO-15
	Units:	ug/m3
Project: ExxonMobil 99105/022783C		Page 6 of 12

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Methyl-t-Butyl Ether (MTBE)	ND	7200	1000	
Methylene Chloride	ND	17000	1000	
4-Methyl-2-Pentanone	ND	6100	1000	
Naphthalene	ND	26000	1000	
o-Xylene	ND	2200	1000	
p/m-Xylene	14000	8700	1000	
Xylenes (total)	14000	2200	1.00	
Styrene	ND	6400	1000	
Tert-Amyl-Methyl Ether (TAME)	ND	8400	1000	
Tert-Butyl Alcohol (TBA)	ND	6100	1000	
Tetrachloroethene	ND	3400	1000	
Toluene	ND	1900	1000	
Trichloroethene	ND	2700	1000	
Trichlorofluoromethane	ND	5600	1000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	11000	1000	
1,1,1-Trichloroethane	ND	2700	1000	
1,1,2-Trichloroethane	ND	2700	1000	
1,3,5-Trimethylbenzene	48000	2500	1000	
1,1,2,2-Tetrachloroethane	ND	6900	1000	
1,2,4-Trimethylbenzene	140000	7400	1000	
1,2,4-Trichlorobenzene	ND	15000	1000	
Vinyl Acetate	ND	7000	1000	
Vinyl Chloride	ND	1300	1000	
<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>	
1,4-Bromofluorobenzene	121	68-134		
1,2-Dichloroethane-d4	116	67-133		
Toluene-d8	85	70-130		

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



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## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/27/18  
Work Order: 18-07-1883  
Preparation: N/A  
Method: EPA TO-15  
Units: ug/m3

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VW4 DUP	18-07-1883-4-A	07/24/18 11:55	Air	GC/MS K	N/A	08/02/18 16:05	180801L01

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	4800	1000	
Benzene	14000	1600	1000	
Benzyl Chloride	ND	7800	1000	
Bromodichloromethane	ND	3400	1000	
Bromoform	ND	5200	1000	
Bromomethane	ND	1900	1000	
2-Butanone	ND	4400	1000	
Carbon Disulfide	ND	6200	1000	
Carbon Tetrachloride	ND	3100	1000	
Chlorobenzene	ND	2300	1000	
Chloroethane	ND	1300	1000	
Chloroform	ND	2400	1000	
Chloromethane	ND	1000	1000	
Dibromochloromethane	ND	4300	1000	
Dichlorodifluoromethane	ND	2500	1000	
Diisopropyl Ether (DIPE)	ND	8400	1000	
1,1-Dichloroethane	ND	2000	1000	
1,1-Dichloroethene	ND	2000	1000	
1,2-Dibromoethane	ND	3800	1000	
Dichlorotetrafluoroethane	ND	14000	1000	
1,2-Dichlorobenzene	ND	3000	1000	
1,2-Dichloroethane	ND	2000	1000	
1,2-Dichloropropane	ND	2300	1000	
1,3-Dichlorobenzene	ND	3000	1000	
1,4-Dichlorobenzene	ND	3000	1000	
c-1,3-Dichloropropene	ND	2300	1000	
c-1,2-Dichloroethene	ND	2000	1000	
t-1,2-Dichloroethene	ND	2000	1000	
t-1,3-Dichloropropene	ND	4500	1000	
Ethanol	ND	9400	1000	
Ethyl-t-Butyl Ether (ETBE)	ND	8400	1000	
Ethylbenzene	100000	2200	1000	
4-Ethyltoluene	17000	2500	1000	
Hexachloro-1,3-Butadiene	ND	16000	1000	
2-Hexanone	ND	6100	1000	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



## Analytical Report

Cardno	Date Received:	07/27/18
601 North McDowell Blvd.	Work Order:	18-07-1883
Petaluma, CA 94954-2312	Preparation:	N/A
	Method:	EPA TO-15
	Units:	ug/m3
Project: ExxonMobil 99105/022783C		Page 8 of 12

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Methyl-t-Butyl Ether (MTBE)	ND	7200	1000	
Methylene Chloride	ND	17000	1000	
4-Methyl-2-Pentanone	ND	6100	1000	
Naphthalene	ND	26000	1000	
o-Xylene	ND	2200	1000	
p/m-Xylene	14000	8700	1000	
Xylenes (total)	14000	2200	1.00	
Styrene	ND	6400	1000	
Tert-Amyl-Methyl Ether (TAME)	ND	8400	1000	
Tert-Butyl Alcohol (TBA)	ND	6100	1000	
Tetrachloroethene	ND	3400	1000	
Toluene	ND	1900	1000	
Trichloroethene	ND	2700	1000	
Trichlorofluoromethane	ND	5600	1000	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	11000	1000	
1,1,1-Trichloroethane	ND	2700	1000	
1,1,2-Trichloroethane	ND	2700	1000	
1,3,5-Trimethylbenzene	49000	2500	1000	
1,1,2,2-Tetrachloroethane	ND	6900	1000	
1,2,4-Trimethylbenzene	140000	7400	1000	
1,2,4-Trichlorobenzene	ND	15000	1000	
Vinyl Acetate	ND	7000	1000	
Vinyl Chloride	ND	1300	1000	
<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>	
1,4-Bromofluorobenzene	128	68-134		
1,2-Dichloroethane-d4	115	67-133		
Toluene-d8	84	70-130		

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/27/18  
Work Order: 18-07-1883  
Preparation: N/A  
Method: EPA TO-15  
Units: ug/m3

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
QCTB	18-07-1883-5-A	07/24/18 00:00	Air	GC/MS K	N/A	08/02/18 02:12	180801L01

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	4.8	1.00	
Benzene	ND	1.6	1.00	
Benzyl Chloride	ND	7.8	1.00	
Bromodichloromethane	ND	3.4	1.00	
Bromoform	ND	5.2	1.00	
Bromomethane	ND	1.9	1.00	
2-Butanone	ND	4.4	1.00	
Carbon Disulfide	ND	6.2	1.00	
Carbon Tetrachloride	ND	3.1	1.00	
Chlorobenzene	ND	2.3	1.00	
Chloroethane	ND	1.3	1.00	
Chloroform	ND	2.4	1.00	
Chloromethane	ND	1.0	1.00	
Dibromochloromethane	ND	4.3	1.00	
Dichlorodifluoromethane	ND	2.5	1.00	
Diisopropyl Ether (DIPE)	ND	8.4	1.00	
1,1-Dichloroethane	ND	2.0	1.00	
1,1-Dichloroethene	ND	2.0	1.00	
1,2-Dibromoethane	ND	3.8	1.00	
Dichlorotetrafluoroethane	ND	14	1.00	
1,2-Dichlorobenzene	ND	3.0	1.00	
1,2-Dichloroethane	ND	2.0	1.00	
1,2-Dichloropropane	ND	2.3	1.00	
1,3-Dichlorobenzene	ND	3.0	1.00	
1,4-Dichlorobenzene	ND	3.0	1.00	
c-1,3-Dichloropropene	ND	2.3	1.00	
c-1,2-Dichloroethene	ND	2.0	1.00	
t-1,2-Dichloroethene	ND	2.0	1.00	
t-1,3-Dichloropropene	ND	4.5	1.00	
Ethanol	ND	9.4	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	8.4	1.00	
Ethylbenzene	ND	2.2	1.00	
4-Ethyltoluene	ND	2.5	1.00	
Hexachloro-1,3-Butadiene	ND	16	1.00	
2-Hexanone	ND	6.1	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

## Analytical Report

Cardno	Date Received:	07/27/18
601 North McDowell Blvd.	Work Order:	18-07-1883
Petaluma, CA 94954-2312	Preparation:	N/A
	Method:	EPA TO-15
	Units:	ug/m3
Project: ExxonMobil 99105/022783C		Page 10 of 12

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Methyl-t-Butyl Ether (MTBE)	ND	7.2	1.00	
Methylene Chloride	ND	17	1.00	
4-Methyl-2-Pentanone	ND	6.1	1.00	
Naphthalene	ND	26	1.00	
o-Xylene	ND	2.2	1.00	
p/m-Xylene	ND	8.7	1.00	
Xylenes (total)	ND	2.2	1.00	
Styrene	ND	6.4	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	8.4	1.00	
Tert-Butyl Alcohol (TBA)	ND	6.1	1.00	
Tetrachloroethene	ND	3.4	1.00	
Toluene	ND	1.9	1.00	
Trichloroethene	ND	2.7	1.00	
Trichlorofluoromethane	ND	5.6	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	11	1.00	
1,1,1-Trichloroethane	ND	2.7	1.00	
1,1,2-Trichloroethane	ND	2.7	1.00	
1,3,5-Trimethylbenzene	ND	2.5	1.00	
1,1,2,2-Tetrachloroethane	ND	6.9	1.00	
1,2,4-Trimethylbenzene	ND	7.4	1.00	
1,2,4-Trichlorobenzene	ND	15	1.00	
Vinyl Acetate	ND	7.0	1.00	
Vinyl Chloride	ND	1.3	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,4-Bromofluorobenzene	110	68-134	
1,2-Dichloroethane-d4	118	67-133	
Toluene-d8	99	70-130	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/27/18  
Work Order: 18-07-1883  
Preparation: N/A  
Method: EPA TO-15  
Units: ug/m3

Project: ExxonMobil 99105/022783C

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Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
Method Blank	095-01-021-20497	N/A	Air	GC/MS K	N/A	08/02/18 00:07	180801L01

Parameter	Result	RL	DF	Qualifiers
Acetone	ND	4.8	1.00	
Benzene	ND	1.6	1.00	
Benzyl Chloride	ND	7.8	1.00	
Bromodichloromethane	ND	3.4	1.00	
Bromoform	ND	5.2	1.00	
Bromomethane	ND	1.9	1.00	
2-Butanone	ND	4.4	1.00	
Carbon Disulfide	ND	6.2	1.00	
Carbon Tetrachloride	ND	3.1	1.00	
Chlorobenzene	ND	2.3	1.00	
Chloroethane	ND	1.3	1.00	
Chloroform	ND	2.4	1.00	
Chloromethane	ND	1.0	1.00	
Dibromochloromethane	ND	4.3	1.00	
Dichlorodifluoromethane	ND	2.5	1.00	
Diisopropyl Ether (DIPE)	ND	8.4	1.00	
1,1-Dichloroethane	ND	2.0	1.00	
1,1-Dichloroethene	ND	2.0	1.00	
1,2-Dibromoethane	ND	3.8	1.00	
Dichlorotetrafluoroethane	ND	14	1.00	
1,2-Dichlorobenzene	ND	3.0	1.00	
1,2-Dichloroethane	ND	2.0	1.00	
1,2-Dichloropropane	ND	2.3	1.00	
1,3-Dichlorobenzene	ND	3.0	1.00	
1,4-Dichlorobenzene	ND	3.0	1.00	
c-1,3-Dichloropropene	ND	2.3	1.00	
c-1,2-Dichloroethene	ND	2.0	1.00	
t-1,2-Dichloroethene	ND	2.0	1.00	
t-1,3-Dichloropropene	ND	4.5	1.00	
Ethanol	ND	9.4	1.00	
Ethyl-t-Butyl Ether (ETBE)	ND	8.4	1.00	
Ethylbenzene	ND	2.2	1.00	
4-Ethyltoluene	ND	2.5	1.00	
Hexachloro-1,3-Butadiene	ND	16	1.00	
2-Hexanone	ND	6.1	1.00	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

## Analytical Report

Cardno	Date Received:	07/27/18
601 North McDowell Blvd.	Work Order:	18-07-1883
Petaluma, CA 94954-2312	Preparation:	N/A
	Method:	EPA TO-15
	Units:	ug/m3
Project: ExxonMobil 99105/022783C		Page 12 of 12

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Methyl-t-Butyl Ether (MTBE)	ND	7.2	1.00	
Methylene Chloride	ND	17	1.00	
4-Methyl-2-Pentanone	ND	6.1	1.00	
Naphthalene	ND	26	1.00	
o-Xylene	ND	2.2	1.00	
p/m-Xylene	ND	8.7	1.00	
Xylenes (total)	ND	2.2	1.00	
Styrene	ND	6.4	1.00	
Tert-Amyl-Methyl Ether (TAME)	ND	8.4	1.00	
Tert-Butyl Alcohol (TBA)	ND	6.1	1.00	
Tetrachloroethene	ND	3.4	1.00	
Toluene	ND	1.9	1.00	
Trichloroethene	ND	2.7	1.00	
Trichlorofluoromethane	ND	5.6	1.00	
1,1,2-Trichloro-1,2,2-Trifluoroethane	ND	11	1.00	
1,1,1-Trichloroethane	ND	2.7	1.00	
1,1,2-Trichloroethane	ND	2.7	1.00	
1,3,5-Trimethylbenzene	ND	2.5	1.00	
1,1,2,2-Tetrachloroethane	ND	6.9	1.00	
1,2,4-Trimethylbenzene	ND	7.4	1.00	
1,2,4-Trichlorobenzene	ND	15	1.00	
Vinyl Acetate	ND	7.0	1.00	
Vinyl Chloride	ND	1.3	1.00	
<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>	
1,4-Bromofluorobenzene	106	68-134		
1,2-Dichloroethane-d4	116	67-133		
Toluene-d8	99	70-130		

## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/27/18  
Work Order: 18-07-1883  
Preparation: N/A  
Method: GC/MS C6-C12 AS GASOLINE  
Units: ug/m3

Project: ExxonMobil 99105/022783C

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VW2	18-07-1883-1-A	07/24/18 08:55	Air	GC/MS K	N/A	08/02/18 03:09	G180801L01

Parameter	Result	RL	DF	Qualifiers
TPH as Gasoline (C6-C12)	ND	470	1.00	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,2-Dichloroethane-d4	100	50-150	
1,4-Bromofluorobenzene	102	50-150	
Toluene-d8	100	50-150	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VW3	18-07-1883-2-A	07/24/18 10:25	Air	GC/MS K	N/A	08/02/18 04:05	G180801L01

Parameter	Result	RL	DF	Qualifiers
TPH as Gasoline (C6-C12)	ND	500	1.07	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,2-Dichloroethane-d4	99	50-150	
1,4-Bromofluorobenzene	100	50-150	
Toluene-d8	100	50-150	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VW4	18-07-1883-3-A	07/24/18 11:53	Air	GC/MS K	N/A	08/02/18 04:57	G180801L01

Parameter	Result	RL	DF	Qualifiers
TPH as Gasoline (C6-C12)	100000000	4700000	10000	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,2-Dichloroethane-d4	95	50-150	
1,4-Bromofluorobenzene	100	50-150	
Toluene-d8	102	50-150	

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
VW4 DUP	18-07-1883-4-A	07/24/18 11:55	Air	GC/MS K	N/A	08/02/18 05:47	G180801L01

Parameter	Result	RL	DF	Qualifiers
TPH as Gasoline (C6-C12)	99000000	4700000	10000	

Surrogate	Rec. (%)	Control Limits	Qualifiers
1,2-Dichloroethane-d4	87	50-150	
1,4-Bromofluorobenzene	101	50-150	
Toluene-d8	100	50-150	

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

## Analytical Report

Cardno	Date Received:	07/27/18
601 North McDowell Blvd.	Work Order:	18-07-1883
Petaluma, CA 94954-2312	Preparation:	N/A
	Method:	GC/MS C6-C12 AS GASOLINE
	Units:	ug/m3

Project: ExxonMobil 99105/022783C Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>QCTB</b>	<b>18-07-1883-5-A</b>	<b>07/24/18 00:00</b>	<b>Air</b>	<b>GC/MS K</b>	<b>N/A</b>	<b>08/02/18 02:12</b>	<b>G180801L01</b>

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
TPH as Gasoline (C6-C12)	ND	470	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,2-Dichloroethane-d4	88	50-150	
1,4-Bromofluorobenzene	103	50-150	
Toluene-d8	100	50-150	

<b>Method Blank</b>	<b>099-16-014-151</b>	<b>N/A</b>	<b>Air</b>	<b>GC/MS K</b>	<b>N/A</b>	<b>08/02/18 00:07</b>	<b>G180801L01</b>
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<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
TPH as Gasoline (C6-C12)	ND	470	1.00	

<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>
1,2-Dichloroethane-d4	84	50-150	
1,4-Bromofluorobenzene	98	50-150	
Toluene-d8	100	50-150	

Return to Contents

RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.



Calscience

## Quality Control - LCS/LCSD

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/27/18  
Work Order: 18-07-1883  
Preparation: N/A  
Method: ASTM D-1946

Project: ExxonMobil 99105/022783C

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-16-444-828	LCS	Air	GC 65	N/A	07/27/18 10:00	180727L01			
099-16-444-828	LCSD	Air	GC 65	N/A	07/27/18 10:21	180727L01			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Methane	4.530	4.426	98	4.436	98	80-120	0	0-30	
Carbon Dioxide	15.01	14.83	99	15.03	100	80-120	1	0-30	
Carbon Monoxide	7.020	6.784	97	6.783	97	80-120	0	0-30	
Oxygen (+ Argon)	3.990	3.952	99	3.866	97	80-120	2	0-30	

RPD: Relative Percent Difference. CL: Control Limits





Calscience

## Quality Control - LCS/LCSD

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/27/18  
Work Order: 18-07-1883  
Preparation: N/A  
Method: ASTM D-1946 (M)

Project: ExxonMobil 99105/022783C

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-12-872-1262	LCS	Air	GC 55	N/A	07/27/18 10:24	180727L01			
099-12-872-1262	LCSD	Air	GC 55	N/A	07/27/18 10:50	180727L01			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Helium	1.000	0.9963	100	1.019	102	80-120	2	0-30	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

## Quality Control - LCS/LCSD

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/27/18  
Work Order: 18-07-1883  
Preparation: N/A  
Method: EPA TO-15

Project: ExxonMobil 99105/022783C

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
095-01-021-20497	LCS	Air	GC/MS K	N/A	08/01/18 18:55	180801L01
095-01-021-20497	LCSD	Air	GC/MS K	N/A	08/01/18 19:46	180801L01

Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Acetone	59.39	72.92	123	72.58	122	67-133	56-144	0	0-30	
Benzene	79.87	76.10	95	77.46	97	70-130	60-140	2	0-30	
Benzyl Chloride	129.4	167.3	129	168.9	130	38-158	18-178	1	0-30	
Bromodichloromethane	167.5	196.2	117	197.6	118	70-130	60-140	1	0-30	
Bromoform	258.4	304.4	118	306.5	119	63-147	49-161	1	0-30	
Bromomethane	97.08	114.9	118	113.2	117	70-139	58-150	1	0-30	
2-Butanone	73.73	68.98	94	70.26	95	66-132	55-143	2	0-30	
Carbon Disulfide	77.85	62.70	81	62.44	80	68-146	55-159	0	0-30	
Carbon Tetrachloride	157.3	209.8	133	207.1	132	70-136	59-147	1	0-30	
Chlorobenzene	115.1	122.5	106	122.8	107	70-130	60-140	0	0-30	
Chloroethane	65.96	81.56	124	81.43	123	65-149	51-163	0	0-30	
Chloroform	122.1	135.9	111	135.2	111	70-130	60-140	0	0-30	
Chloromethane	51.63	50.70	98	50.72	98	69-141	57-153	0	0-30	
Dibromochloromethane	213.0	255.1	120	255.3	120	70-138	59-149	0	0-30	
Dichlorodifluoromethane	123.6	125.7	102	123.8	100	67-139	55-151	2	0-30	
Diisopropyl Ether (DIPE)	104.5	90.01	86	90.54	87	63-130	52-141	1	0-30	
1,1-Dichloroethane	101.2	104.0	103	104.9	104	70-130	60-140	1	0-30	
1,1-Dichloroethene	99.12	93.41	94	92.67	93	70-135	59-146	1	0-30	
1,2-Dibromoethane	192.1	208.1	108	210.4	110	70-133	60-144	1	0-30	
Dichlorotetrafluoroethane	174.8	190.7	109	188.3	108	51-135	37-149	1	0-30	
1,2-Dichlorobenzene	150.3	153.3	102	154.9	103	48-138	33-153	1	0-30	
1,2-Dichloroethane	101.2	123.5	122	123.6	122	70-132	60-142	0	0-30	
1,2-Dichloropropane	115.5	108.4	94	110.5	96	70-130	60-140	2	0-30	
1,3-Dichlorobenzene	150.3	153.3	102	155.8	104	56-134	43-147	2	0-30	
1,4-Dichlorobenzene	150.3	150.6	100	151.0	100	52-136	38-150	0	0-30	
c-1,3-Dichloropropene	113.5	126.1	111	127.1	112	70-130	60-140	1	0-30	
c-1,2-Dichloroethene	99.12	99.47	100	100.4	101	70-130	60-140	1	0-30	
t-1,2-Dichloroethene	99.12	102.8	104	103.8	105	70-130	60-140	1	0-30	
t-1,3-Dichloropropene	113.5	137.3	121	137.6	121	70-147	57-160	0	0-30	
Ethanol	188.4	216.9	115	216.6	115	37-139	20-156	0	0-30	
Ethyl-t-Butyl Ether (ETBE)	104.5	98.95	95	99.44	95	67-130	56-140	0	0-30	
Ethylbenzene	108.6	115.1	106	116.0	107	70-130	60-140	1	0-30	
4-Ethyltoluene	122.9	128.0	104	129.5	105	68-130	58-140	1	0-30	
Hexachloro-1,3-Butadiene	266.6	311.3	117	316.0	119	44-146	27-163	1	0-30	
2-Hexanone	102.4	100.6	98	101.9	99	70-136	59-147	1	0-30	
Methyl-t-Butyl Ether (MTBE)	90.13	97.47	108	97.77	108	68-130	58-140	0	0-30	

RPD: Relative Percent Difference. CL: Control Limits



Calscience

## Quality Control - LCS/LCSD

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/27/18  
Work Order: 18-07-1883  
Preparation: N/A  
Method: EPA TO-15

Project: ExxonMobil 99105/022783C

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Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	ME CL	RPD	RPD CL	Qualifiers
Methylene Chloride	86.84	79.98	92	79.36	91	69-130	59-140	1	0-30	
4-Methyl-2-Pentanone	102.4	97.07	95	98.48	96	70-130	60-140	1	0-30	
Naphthalene	131.1	145.3	111	149.1	114	24-144	4-164	3	0-30	
o-Xylene	108.6	113.6	105	115.0	106	69-130	59-140	1	0-30	
p/m-Xylene	217.1	239.3	110	240.8	111	70-132	60-142	1	0-30	
Styrene	106.5	107.1	101	109.3	103	65-131	54-142	2	0-30	
Tert-Amyl-Methyl Ether (TAME)	104.5	100.8	97	101.6	97	69-130	59-140	1	0-30	
Tert-Butyl Alcohol (TBA)	151.6	131.1	86	130.6	86	66-144	53-157	0	0-30	
Tetrachloroethene	169.6	185.5	109	186.0	110	70-130	60-140	0	0-30	
Toluene	94.21	92.56	98	93.31	99	70-130	60-140	1	0-30	
Trichloroethene	134.3	150.1	112	150.6	112	70-130	60-140	0	0-30	
Trichlorofluoromethane	140.5	176.3	126	172.4	123	63-141	50-154	2	0-30	
1,1,2-Trichloro-1,2,2-Trifluoroethane	191.6	162.6	85	160.4	84	70-136	59-147	1	0-30	
1,1,1-Trichloroethane	136.4	167.2	123	166.3	122	70-130	60-140	1	0-30	
1,1,2-Trichloroethane	136.4	139.0	102	141.0	103	70-130	60-140	1	0-30	
1,3,5-Trimethylbenzene	122.9	131.2	107	132.5	108	62-130	51-141	1	0-30	
1,1,2,2-Tetrachloroethane	171.6	163.5	95	166.8	97	63-130	52-141	2	0-30	
1,2,4-Trimethylbenzene	122.9	137.6	112	138.2	112	60-132	48-144	0	0-30	
1,2,4-Trichlorobenzene	185.5	217.0	117	220.8	119	31-151	11-171	2	0-30	
Vinyl Acetate	88.03	83.02	94	85.03	97	58-130	46-142	2	0-30	
Vinyl Chloride	63.91	72.79	114	72.49	113	70-134	59-145	0	0-30	

Total number of LCS compounds: 57

Total number of ME compounds: 0

Total number of ME compounds allowed: 3

LCS ME CL validation result: Pass

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits



Calscience

## Quality Control - LCS/LCSD

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/27/18  
Work Order: 18-07-1883  
Preparation: N/A  
Method: GC/MS C6-C12 AS GASOLINE

Project: ExxonMobil 99105/022783C

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Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-16-014-151	LCS	Air	GC/MS K	N/A	08/01/18 21:29	G180801L01			
099-16-014-151	LCSD	Air	GC/MS K	N/A	08/01/18 22:21	G180801L01			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
TPH as Gasoline (C6-C12)	4663	3382	73	3397	73	50-150	0	0-30	

Return to Contents

RPD: Relative Percent Difference. CL: Control Limits

**Summa Canister Vacuum Summary**

Work Order: 18-07-1883

Page 1 of 1

<b>Sample Name</b>	<b>Vacuum Out</b>	<b>Vacuum In</b>	<b>Equipment</b>	<b>Description</b>
VW2	-29.50 in Hg	-2.80 in Hg	LC607	Summa Canister 1L
VW3	-29.50 in Hg	-5.40 in Hg	LC564	Summa Canister 1L
VW4	-29.50 in Hg	-6.00 in Hg	LC406	Summa Canister 1L
VW4 DUP	-29.50 in Hg	-2.50 in Hg	LC846	Summa Canister 1L
QCTB	10.00 psi	10.30 psi	LC1237	Summa Canister 1L

## Sample Analysis Summary Report

Work Order: 18-07-1883

Page 1 of 1

<u>Method</u>	<u>Extraction</u>	<u>Chemist ID</u>	<u>Instrument</u>	<u>Analytical Location</u>
ASTM D-1946	N/A	1158	GC 65	2
ASTM D-1946 (M)	N/A	1158	GC 55	2
EPA TO-15	N/A	866	GC/MS K	2
GC/MS C6-C12 AS GASOLINE	N/A	866	GC/MS K	2

<u>Qualifiers</u>	<u>Definition</u>
AZ	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
B	Analyte was present in the associated method blank.
BA	The MS/MSD RPD was out of control due to suspected matrix interference.
BB	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
DF	Reporting limits elevated due to matrix interferences.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
GE	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
HD	Chromat. profile inconsistent with pattern(s) of ref. fuel stnds.
HO	High concentration matrix spike recovery out of limits
HT	Analytical value calculated using results from associated tests.
HX	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to matrix interference. The associated LCS was in control.
IL	Relative percent difference out of control.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
LD	Analyte presence was not confirmed by second column or GC/MS analysis.
LP	The LCS and/or LCSD recoveries for this analyte were above the upper control limit. The associated sample was non-detected. Therefore, the sample data was reported without further clarification.
LQ	LCS recovery above method control limits.
LR	LCS recovery below method control limits.
ND	Parameter not detected at the indicated reporting limit.
QO	Compound did not meet method-described identification guidelines. Identification was based on additional GC/MS characteristics.
RU	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
SG	A silica gel cleanup procedure was performed.
SN	See applicable analysis comment.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of  $\leq 15$  minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.



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WO # / USE ONLY
18-07-1883

DATE: 7/24/2018
PAGE: 1 OF 1

LABORATORY CLIENT: Exxon Mobil / Cardno
CLIENT PROJECT NAME / NUMBER: Former Mobil 99105
ADDRESS: 601 N. McDowell Blvd
PROJECT ADDRESS: 6301 San Pablo Avenue
CITY: Petaluma STATE: CA ZIP: 94954
CITY: Oakland STATE: CA ZIP:
TEL: 707-766-2000 E-MAIL: scott.perkins@cardno.com
PROJECT CONTACT: Scott Perkins
P.O. NO.: 2783CX
LAB CONTACT OR QUOTE NO.:
SAMPLER(S): (PRINT) Nadya Vicente

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):
[ ] SAME DAY [ ] 24 HR [ ] 48 HR [ ] 72 HR [ ] 5 DAYS \* STANDARD \* EDD [ ] UNITS
REQUESTED ANALYSES

SPECIAL INSTRUCTIONS:
ASTMD-1946 = He, CO2, O2, CH4, Ar (% Volume) TO-15 Scan includes VOCs, BTEX, MTBE, Napthalene Report final vacuum readings
Reporting Limits - ug/m3
Global ID = T0600101855

EDF deliverable to norcallabs@cardno.com

Table with columns: LAB USE ONLY, SAMPLE ID, FIELD ID / POINT OF COLLECTION, Air Type, Sampling Equipment, Start Sampling Information, Stop Sampling Information, TO-15 Scan, TPHg (C6-C12), TO-15, He, CO2, O2, CH4, Ar. Rows 1-5 contain sample data.

Relinquished by: (Signature) Received by: (Signature/Affiliation) Date: Time:
7/26/18 1113
7/27/18 1015

Page 99 of 92





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1883

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ALAN KEMP  
5063 COMMERCIAL CIRCLE  
#H  
CONCORD, CA 94520

**Tracking #: 541463389**

**NPS**



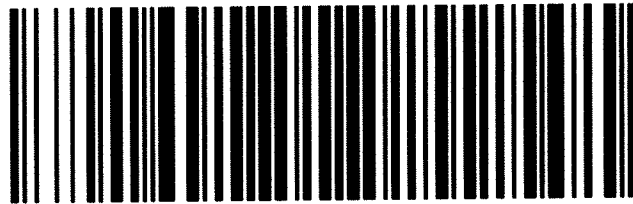
**Ship To**  
CEL  
SAMPLE RECEIVING  
7440 LINCOLN WAY  
GARDEN GROVE, CA 92841

**ORC**  
**GARDEN GROVE**

**A**

**COD:** \$0.00  
**Weight:** 0 lb(s)  
**Reference:**  
CARDNO ERI  
**Delivery Instructions:**

**D92845A**



87979404

**Signature Type:** STANDARD

Print Date: 7/26/2018 2:25 PM

Package 1 of 4

**LABEL INSTRUCTIONS:**

- Do not copy or reprint this label for additional shipments - each package must have a unique barcode.**
- Step 1: Use the "Print Label" button on this page to print the shipping label on a laser or inkjet printer.
- Step 2: Fold this page in half.
- Step 3: Securely attach this label to your package and do not cover the barcode.

**TERMS AND CONDITIONS:**

By giving us your shipment to deliver, you agree to all of the GSO service terms & conditions including, but not limited to; limits of liability, declared value conditions, and claim procedures which are available on our website at www.gso.com.

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SAMPLE RECEIPT CHECKLIST

COOLER 0 OF 0

CLIENT: Cardno

DATE: 07/27/2018

TEMPERATURE: (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)

Thermometer ID: SC6 (CF: -0.5°C); Temperature (w/o CF): \_\_\_\_\_°C (w/ CF): \_\_\_\_\_°C;  Blank  Sample

Sample(s) outside temperature criteria (PM/APM contacted by: \_\_\_\_\_)

Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling

Sample(s) received at ambient temperature; placed on ice for transport by courier

Ambient Temperature:  Air  Filter

Checked by: 836

CUSTODY SEAL: BOX

Cooler  Present and Intact  Present but Not Intact  Not Present  N/A

Checked by: 836

Sample(s)  Present and Intact  Present but Not Intact  Not Present  N/A

Checked by: 836

SAMPLE CONDITION:

Chain-of-Custody (COC) document(s) received with samples .....  Yes  No  N/A

COC document(s) received complete .....  Yes  No  N/A

Sampling date  Sampling time  Matrix  Number of containers

No analysis requested  Not relinquished  No relinquished date  No relinquished time

Sampler's name indicated on COC .....  Yes  No  N/A

Sample container label(s) consistent with COC .....  Yes  No  N/A

Sample container(s) intact and in good condition .....  Yes  No  N/A

Proper containers for analyses requested .....  Yes  No  N/A

Sufficient volume/mass for analyses requested .....  Yes  No  N/A

Samples received within holding time .....  Yes  No  N/A

Aqueous samples for certain analyses received within 15-minute holding time

pH  Residual Chlorine  Dissolved Sulfide  Dissolved Oxygen .....  Yes  No  N/A

Proper preservation chemical(s) noted on COC and/or sample container .....  Yes  No  N/A

Unpreserved aqueous sample(s) received for certain analyses

Volatile Organics  Total Metals  Dissolved Metals

Acid/base preserved samples - pH within acceptable range .....  Yes  No  N/A

Container(s) for certain analysis free of headspace.....  Yes  No  N/A

Volatile Organics  Dissolved Gases (RSK-175)  Dissolved Oxygen (SM 4500)

Carbon Dioxide (SM 4500)  Ferrous Iron (SM 3500)  Hydrogen Sulfide (Hach)

Tedlar™ bag(s) free of condensation .....  Yes  No  N/A

CONTAINER TYPE:

(Trip Blank Lot Number: \_\_\_\_\_)

Aqueous:  VOA  VOA<sub>h</sub>  VOA<sub>na2</sub>  100PJ  100PJ<sub>na2</sub>  125AGB  125AGB<sub>h</sub>  125AGB<sub>p</sub>  125PB  125PB<sub>z<sub>na</sub></sub> (pH\_\_9)

250AGB  250CGB  250CGB<sub>s</sub> (pH\_\_2)  250PB  250PB<sub>n</sub> (pH\_\_2)  500AGB  500AGJ  500AGJ<sub>s</sub> (pH\_\_2)  500PB

1AGB  1AGB<sub>na2</sub>  1AGB<sub>s</sub> (pH\_\_2)  1AGB<sub>s</sub> (O&G)  1PB  1PB<sub>na</sub> (pH\_\_12)  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_

Solid:  4ozCGJ  8ozCGJ  16ozCGJ  Sleeve (\_\_\_\_)  EnCores® (\_\_\_\_)  TerraCores® (\_\_\_\_)  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_

Air:  Tedlar™  Canister  Sorbent Tube  PUF  \_\_\_\_\_ Other Matrix (\_\_\_\_):  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_

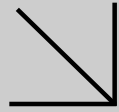
Container: A = Amber, B = Bottle, C = Clear, E = Envelope, G = Glass, J = Jar, P = Plastic, and Z = Ziploc/Resealable Bag

Preservative: b = buffered, f = filtered, h = HCl, n = HNO<sub>3</sub>, na = NaOH, na<sub>2</sub> = Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, p = H<sub>3</sub>PO<sub>4</sub>, Labeled/Checked by: 836

s = H<sub>2</sub>SO<sub>4</sub>, u = ultra-pure, x = Na<sub>2</sub>SO<sub>3</sub>+NaHSO<sub>4</sub>.H<sub>2</sub>O, z<sub>na</sub> = Zn (CH<sub>3</sub>CO<sub>2</sub>)<sub>2</sub> + NaOH Reviewed by: 1053



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**WORK ORDER NUMBER: 18-07-1963**

*The difference is service*



AIR | SOIL | WATER | MARINE CHEMISTRY

**Analytical Report For**

**Client:** Cardno

**Client Project Name:** ExxonMobil 99105/022783C

**Attention:** Scott Perkins  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

*Cecile de Guia*

Approved for release on 08/10/2018 by:  
Cecile deGuia  
Project Manager

ResultLink ▶

Email your PM ▶

Eurofins Calscience (Calscience) certifies that the test results provided in this report meet all NELAC Institute requirements for parameters for which accreditation is required or available. Any exceptions to NELAC Institute requirements are noted in the case narrative. The original report of subcontracted analyses, if any, is attached to this report. The results in this report are limited to the sample(s) tested and any reproduction thereof must be made in its entirety. The client or recipient of this report is specifically prohibited from making material changes to said report and, to the extent that such changes are made, Calscience is not responsible, legally or otherwise. The client or recipient agrees to indemnify Calscience for any defense to any litigation which may arise.



# Contents

Client Project Name: ExxonMobil 99105/022783C  
Work Order Number: 18-07-1963

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	3.1 EPA TO-17 Volatiles (Sorbent Tubes) (Air). . . . .	5
4	Quality Control Sample Data. . . . .	7
	4.1 LCS/LCSD. . . . .	7
5	Sample Analysis Summary. . . . .	8
6	Glossary of Terms and Qualifiers. . . . .	9
7	Chain-of-Custody/Sample Receipt Form. . . . .	10

**Condition Upon Receipt:**

Samples were received under Chain-of-Custody (COC) on 07/27/18. They were assigned to Work Order 18-07-1963.

Unless otherwise noted on the Sample Receiving forms all samples were received in good condition and within the recommended EPA temperature criteria for the methods noted on the COC. The COC and Sample Receiving Documents are integral elements of the analytical report and are presented at the back of the report.

**Holding Times:**

All samples were analyzed within prescribed holding times (HT) and/or in accordance with the Calscience Sample Acceptance Policy unless otherwise noted in the analytical report and/or comprehensive case narrative, if required.

Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of  $\leq 15$  minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.

**Quality Control:**

All quality control parameters (QC) were within established control limits except where noted in the QC summary forms or described further within this report.

**Subcontractor Information:**

Unless otherwise noted below (or on the subcontract form), no samples were subcontracted.

**Additional Comments:**

Air - Sorbent-extracted air methods (EPA TO-4A, EPA TO-10, EPA TO-13A, EPA TO-17): Analytical results are converted from mass/sample basis to mass/volume basis using client-supplied air volumes.

Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are always reported on a wet weight basis.

**DoD Projects:**

The test results contained in this report are accredited under the laboratory's ISO/IEC 17025:2005 and DoD-ELAP accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation ADE-1864.



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## Sample Summary

Client: Cardno	Work Order:	18-07-1963
601 North McDowell Blvd.	Project Name:	ExxonMobil 99105/022783C
Petaluma, CA 94954-2312	PO Number:	022783C
	Date/Time Received:	07/27/18 10:15
	Number of Containers:	4

Attn: Scott Perkins

Sample Identification	Lab Number	Collection Date and Time	Number of Containers	Matrix
ST-VW2	18-07-1963-1	07/24/18 08:57	1	Air
ST-VW3	18-07-1963-2	07/24/18 10:28	1	Air
ST-VW4	18-07-1963-3	07/24/18 12:00	1	Air
ST-VW4 REP	18-07-1963-4	07/24/18 12:05	1	Air


  
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## Analytical Report

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/27/18  
Work Order: 18-07-1963  
Preparation: N/A  
Method: EPA TO-17 (M)  
Units: ug/m3

Project: ExxonMobil 99105/022783C

Page 1 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>ST-VW2</b>	<b>18-07-1963-1-A</b>	<b>07/24/18 08:57</b>	<b>Air</b>	<b>GC/MS MMM</b>	<b>N/A</b>	<b>08/08/18 23:01</b>	<b>180808L01</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
Naphthalene		ND		20		1.00	
<u>Surrogate</u>		<u>Rec. (%)</u>		<u>Control Limits</u>		<u>Qualifiers</u>	
1,4-Bromofluorobenzene		119		57-129			
<b>ST-VW3</b>	<b>18-07-1963-2-A</b>	<b>07/24/18 10:28</b>	<b>Air</b>	<b>GC/MS MMM</b>	<b>N/A</b>	<b>08/08/18 23:43</b>	<b>180808L01</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
Naphthalene		ND		20		1.00	
<u>Surrogate</u>		<u>Rec. (%)</u>		<u>Control Limits</u>		<u>Qualifiers</u>	
1,4-Bromofluorobenzene		120		57-129			
<b>ST-VW4</b>	<b>18-07-1963-3-A</b>	<b>07/24/18 12:00</b>	<b>Air</b>	<b>GC/MS MMM</b>	<b>N/A</b>	<b>08/09/18 00:26</b>	<b>180808L01</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
Naphthalene		4500		20		1.00	
<u>Surrogate</u>		<u>Rec. (%)</u>		<u>Control Limits</u>		<u>Qualifiers</u>	
1,4-Bromofluorobenzene		539		57-129		2,7	
<b>ST-VW4 REP</b>	<b>18-07-1963-4-A</b>	<b>07/24/18 12:05</b>	<b>Air</b>	<b>GC/MS MMM</b>	<b>N/A</b>	<b>08/09/18 01:09</b>	<b>180808L01</b>
<u>Parameter</u>		<u>Result</u>		<u>RL</u>		<u>DF</u>	<u>Qualifiers</u>
Naphthalene		4100		20		1.00	
<u>Surrogate</u>		<u>Rec. (%)</u>		<u>Control Limits</u>		<u>Qualifiers</u>	
1,4-Bromofluorobenzene		489		57-129		2,7	

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RL: Reporting Limit. DF: Dilution Factor. MDL: Method Detection Limit.

## Analytical Report

Cardno	Date Received:	07/27/18
601 North McDowell Blvd.	Work Order:	18-07-1963
Petaluma, CA 94954-2312	Preparation:	N/A
	Method:	EPA TO-17 (M)
	Units:	ug/m3
Project: ExxonMobil 99105/022783C		Page 2 of 2

Client Sample Number	Lab Sample Number	Date/Time Collected	Matrix	Instrument	Date Prepared	Date/Time Analyzed	QC Batch ID
<b>Method Blank</b>	<b>099-15-178-100</b>	<b>N/A</b>	<b>Air</b>	<b>GC/MS MMM</b>	<b>N/A</b>	<b>08/08/18 22:18</b>	<b>180808L01</b>

Comment(s): - MB data is reported in ng/sample.

<u>Parameter</u>	<u>Result</u>	<u>RL</u>	<u>DF</u>	<u>Qualifiers</u>
Naphthalene	ND	2.0	1.00	
<u>Surrogate</u>	<u>Rec. (%)</u>	<u>Control Limits</u>	<u>Qualifiers</u>	
1,4-Bromofluorobenzene	121	57-129		





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## Quality Control - LCS/LCSD

Cardno  
601 North McDowell Blvd.  
Petaluma, CA 94954-2312

Date Received: 07/27/18  
Work Order: 18-07-1963  
Preparation: N/A  
Method: EPA TO-17 (M)

Project: ExxonMobil 99105/022783C

Page 1 of 1

Quality Control Sample ID	Type	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number			
099-15-178-100	LCS	Air	GC/MS MMM	N/A	08/08/18 20:05	180808L01			
099-15-178-100	LCSD	Air	GC/MS MMM	N/A	08/08/18 20:48	180808L01			
Parameter	Spike Added	LCS Conc.	LCS %Rec.	LCSD Conc.	LCSD %Rec.	%Rec. CL	RPD	RPD CL	Qualifiers
Naphthalene	100.0	112.0	112	97.39	97	40-190	14	0-35	

  
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RPD: Relative Percent Difference. CL: Control Limits



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# Sample Analysis Summary Report

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Work Order: 18-07-1963

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<u>Method</u>	<u>Extraction</u>	<u>Chemist ID</u>	<u>Instrument</u>	<u>Analytical Location</u>
EPA TO-17 (M)	N/A	1145	GC/MS MMM	2

  
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Location 2: 7445 Lampson Avenue, Garden Grove, CA 92841

## Glossary of Terms and Qualifiers

Work Order: 18-07-1963

Page 1 of 1

<u>Qualifiers</u>	<u>Definition</u>
*	See applicable analysis comment.
<	Less than the indicated value.
>	Greater than the indicated value.
1	Surrogate compound recovery was out of control due to a required sample dilution. Therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike (MS) or Matrix Spike Duplicate (MSD) compound was out of control due to suspected matrix interference. The associated LCS recovery was in control.
4	The MS/MSD RPD was out of control due to suspected matrix interference.
5	The PDS/PDSD or PES/PESD associated with this batch of samples was out of control due to suspected matrix interference.
6	Surrogate recovery below the acceptance limit.
7	Surrogate recovery above the acceptance limit.
B	Analyte was present in the associated method blank.
BU	Sample analyzed after holding time expired.
BV	Sample received after holding time expired.
CI	See case narrative.
E	Concentration exceeds the calibration range.
ET	Sample was extracted past end of recommended max. holding time.
HD	The chromatographic pattern was inconsistent with the profile of the reference fuel standard.
HDH	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but heavier hydrocarbons were also present (or detected).
HDL	The sample chromatographic pattern for TPH matches the chromatographic pattern of the specified standard but lighter hydrocarbons were also present (or detected).
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
JA	Analyte positively identified but quantitation is an estimate.
ME	LCS Recovery Percentage is within Marginal Exceedance (ME) Control Limit range (+/- 4 SD from the mean).
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
SG	The sample extract was subjected to Silica Gel treatment prior to analysis.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.
	Solid - Unless otherwise indicated, solid sample data is reported on a wet weight basis, not corrected for % moisture. All QC results are reported on a wet weight basis.
	Any parameter identified in 40CFR Part 136.3 Table II that is designated as "analyze immediately" with a holding time of <= 15 minutes (40CFR-136.3 Table II, footnote 4), is considered a "field" test and the reported results will be qualified as being received outside of the stated holding time unless received at the laboratory within 15 minutes of the collection time.
	A calculated total result (Example: Total Pesticides) is the summation of each component concentration and/or, if "J" flags are reported, estimated concentration. Component concentrations showing not detected (ND) are summed into the calculated total result as zero concentrations.



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WO # / LAB USE ONLY  
18-07-1968

AIR CHAIN OF CUSTODY RECORD

DATE: 7/24/2018

PAGE: 1 OF 1

LABORATORY CLIENT: Exxon Mobil / Cardno		CLIENT PROJECT NAME / NUMBER: Former Mobil 99105		P.O. NO.: 022783CX	
ADDRESS: 601 N. McDowell Blvd		PROJECT ADDRESS: 6301 San Pablo Avenue		LAB CONTACT OR QUOTE NO.:	
CITY: Petaluma	STATE: CA	ZIP: 94954	CITY: Oakland	STATE: CA	ZIP:
TEL: 707-766-2000	E-MAIL: scott.perkins@cardno.com		PROJECT CONTACT: Scott Perkiins		SAMPLER(S): (PRINT) Nadya Vicente

TURNAROUND TIME (Rush surcharges may apply to any TAT not "STANDARD"):  
 SAME DAY  24 HR  48 HR  72 HR  5 DAYS  STANDARD

EDD  UNITS \_\_\_\_\_

REQUESTED ANALYSE

SPECIAL INSTRUCTIONS:

Reporting Limits - ug/m<sup>3</sup>  
 Global ID = T0600101855

EDF deliverable to norcallabs@cardno.com

LAB USE ONLY	SAMPLE ID	FIELD ID / POINT OF COLLECTION	Air Type	Sampling Equipment			Start Sampling Information			Stop Sampling Information			TO-17 Naphthalene
			(I) Indoor (SV) Soil Vap. (A) Ambient	Media ID #	Tube Size	Flow Controller ID #	Date	Time (24 hr clock)	Canister Pressure ("Hg)	Date	Time (24 hr clock)	Canister Pressure ("Hg)	
1	ST-VW2	VW2	SV	G0150657	100ml	NA	7/24/2018	NA	NA	7/24/2018	0857	NA	X
2	ST-VW3	VW3	SV	G0189328	100ml	NA	7/24/2018	NA	NA	7/24/2018	1028	NA	X
3	ST-VW4	VW4	SV	G0189658	100ml	NA	7/24/2018	NA	NA	7/24/2018	1200	NA	X
4	ST-VW4 REP	VW4	SV	G0141304	100ml	NA	7/24/2018	NA	NA	7/24/2018	1205	NA	X

Relinquished by: (Signature) <i>[Signature]</i>	Received by: (Signature/Affiliation) <i>Tomalley ECI</i>	Date: 7/26/18	Time: 1113
Relinquished by: (Signature) <i>Tomalley TO GSO 7/26/18 1230</i>	Received by: (Signature/Affiliation) <i>[Signature]</i>	Date: 7/27/18	Time: 1015
Relinquished by: (Signature)	Received by: (Signature/Affiliation)	Date:	Time:

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**Tracking #: 541465163**

**NPS**



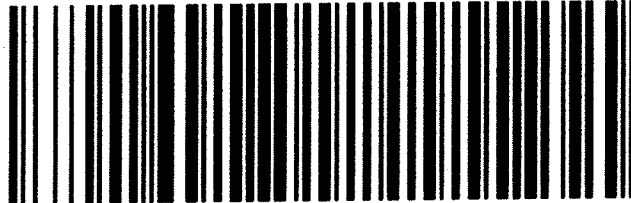
**Ship To**  
CEL  
SAMPLE RECEIVING  
7440 LINCOLN WAY  
GARDEN GROVE, CA 92841

**ORC**  
**GARDEN GROVE**

**A**

**COD:** \$0.00  
**Weight:** 0 lb(s)  
**Reference:**  
GHD, CARDNO ERI, TPG, PORT COSTA,  
ARCADIS  
**Delivery Instructions:**

**D92845A**



87983667

**Signature Type:** STANDARD

Print Date: 7/26/2018 3:09 PM

**LABEL INSTRUCTIONS:**

- Do not copy or reprint this label for additional shipments - each package must have a unique barcode.**
- Step 1: Use the "Print Label" button on this page to print the shipping label on a laser or inkjet printer.
- Step 2: Fold this page in half.
- Step 3: Securely attach this label to your package and do not cover the barcode.

**TERMS AND CONDITIONS:**

By giving us your shipment to deliver, you agree to all of the GSO service terms & conditions including, but not limited to; limits of liability, declared value conditions, and claim procedures which are available on our website at www.gso.com.

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SAMPLE RECEIPT CHECKLIST

COOLER / OF /

CLIENT: Cardno

DATE: 07/27/2018

**TEMPERATURE:** (Criteria: 0.0°C – 6.0°C, not frozen except sediment/tissue)  
 Thermometer ID: SC6 (CF: -0.5°C); Temperature (w/o CF): 1-9 °C (w/ CF): 1-4 °C;  Blank  Sample  
 Sample(s) outside temperature criteria (PM/APM contacted by: \_\_\_\_\_)  
 Sample(s) outside temperature criteria but received on ice/chilled on same day of sampling  
 Sample(s) received at ambient temperature; placed on ice for transport by courier  
 Ambient Temperature:  Air  Filter Checked by: 836

**CUSTODY SEAL:**  
 Cooler  Present and Intact  Present but Not Intact  Not Present  N/A Checked by: 836  
 Sample(s)  Present and Intact  Present but Not Intact  Not Present  N/A Checked by: 619

SAMPLE CONDITION:	Yes	No	N/A
Chain-of-Custody (COC) document(s) received with samples .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COC document(s) received complete .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> Sampling date <input type="checkbox"/> Sampling time <input type="checkbox"/> Matrix <input type="checkbox"/> Number of containers			
<input type="checkbox"/> No analysis requested <input type="checkbox"/> Not relinquished <input type="checkbox"/> No relinquished date <input type="checkbox"/> No relinquished time			
Sampler's name indicated on COC .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container label(s) consistent with COC .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample container(s) intact and in good condition .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Proper containers for analyses requested .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sufficient volume/mass for analyses requested .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Samples received within holding time .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aqueous samples for certain analyses received within 15-minute holding time			
<input type="checkbox"/> pH <input type="checkbox"/> Residual Chlorine <input type="checkbox"/> Dissolved Sulfide <input type="checkbox"/> Dissolved Oxygen .....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Proper preservation chemical(s) noted on COC and/or sample container .....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Unpreserved aqueous sample(s) received for certain analyses			
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Total Metals <input type="checkbox"/> Dissolved Metals			
Acid/base preserved samples - pH within acceptable range .....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Container(s) for certain analysis free of headspace.....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> Volatile Organics <input type="checkbox"/> Dissolved Gases (RSK-175) <input type="checkbox"/> Dissolved Oxygen (SM 4500)			
<input type="checkbox"/> Carbon Dioxide (SM 4500) <input type="checkbox"/> Ferrous Iron (SM 3500) <input type="checkbox"/> Hydrogen Sulfide (Hach)			
Tedlar™ bag(s) free of condensation .....	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**CONTAINER TYPE:** (Trip Blank Lot Number: \_\_\_\_\_)  
**Aqueous:**  VOA  VOA<sub>h</sub>  VOA<sub>na2</sub>  100PJ  100PJ<sub>na2</sub>  125AGB  125AGB<sub>h</sub>  125AGB<sub>p</sub>  125PB  125PB<sub>z</sub>na (pH\_9)  
 250AGB  250CGB  250CGBs (pH\_2)  250PB  250PB<sub>n</sub> (pH\_2)  500AGB  500AGJ  500AGJs (pH\_2)  500PB  
 1AGB  1AGB<sub>na2</sub>  1AGBs (pH\_2)  1AGBs (O&G)  1PB  1PB<sub>na</sub> (pH\_12)  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_  
**Solid:**  4ozCGJ  8ozCGJ  16ozCGJ  Sleeve (\_\_\_\_)  EnCores® (\_\_\_\_)  TerraCores® (\_\_\_\_)  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_  
**Air:**  Tedlar™  Canister  Sorbent Tube  PUF  \_\_\_\_\_ **Other Matrix** (\_\_\_\_):  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_  
 Container: **A** = Amber, **B** = Bottle, **C** = Clear, **E** = Envelope, **G** = Glass, **J** = Jar, **P** = Plastic, and **Z** = Ziploc/Resealable Bag  
 Preservative: **b** = buffered, **f** = filtered, **h** = HCl, **n** = HNO<sub>3</sub>, **na** = NaOH, **na<sub>2</sub>** = Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>, **p** = H<sub>3</sub>PO<sub>4</sub>, Labeled/Checked by: 619  
**s** = H<sub>2</sub>SO<sub>4</sub>, **u** = ultra-pure, **x** = Na<sub>2</sub>SO<sub>3</sub>+NaHSO<sub>4</sub>.H<sub>2</sub>O, **z**na = Zn (CH<sub>3</sub>CO<sub>2</sub>)<sub>2</sub> + NaOH Reviewed by: 619

## **APPENDIX F**

### **REMAINING MASS CALCULATIONS**

**Mass Removal Calculations**

Grid	Length	Width	Area	Depth	Thickness	Original Native Soil	Excavated Native Soil	Remaining Native Soil	Density	Average TPHd	Average TPHg	Average Benzene	Average MTBE	1 pound	TPHd Mass Remaining	TPHg Mass Remaining	Benzene Mass Remaining	MTBE Mass Remaining
	(feet)	(feet)	(feet <sup>2</sup> )	(feet)	(feet)	(feet <sup>3</sup> )	(feet <sup>3</sup> )	(feet <sup>3</sup> )	(kg/feet <sup>3</sup> )	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(453,592 mg)	(pounds)	(pounds)	(pounds)	(pounds)
1	11	11	121	0-8	8	968	0	968	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
1	11	11	121	8-12	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
1	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
2	11	11	121	0-8	8	968	0	968	42.48	3.4	0	0	---	453,592	0.31	0.00	0.00	0.00
2	11	11	121	8-12	4	484	0	484	42.48	0	0	0	---	453,592	0.00	0.00	0.00	0.00
2	11	11	121	12-16	4	484	0	484	42.48	4.2	0	0	---	453,592	0.19	0.00	0.00	0.00
3	11	11	121	0-8	8	968	0	968	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
3	11	11	121	8-12	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
3	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
4	11	11	121	0-8	8	968	880	88	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
4	11	11	121	8-12	4	484	0	484	42.48	---	73	0	---	453,592	0.00	3.31	0.00	0.00
4	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
5	11	11	121	0-8	8	968	968	0	42.48	E	E	E	E	453,592	0.00	0.00	0.00	0.00
5	11	11	121	8-12	4	484	0	484	42.48	---	0.84	0	---	453,592	0.04	0.04	0.00	0.00
5	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
6	11	11	121	0-8	8	968	968	0	42.48	E	E	E	E	453,592	0.00	0.00	0.00	0.00
6	11	11	121	8-12	4	484	0	484	42.48	---	40	0	---	453,592	0.00	1.81	0.00	0.00
6	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
7	11	11	121	0-8	8	968	968	0	42.48	E	E	E	E	453,592	0.00	0.00	0.00	0.00
7	11	11	121	8-12	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
7	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
8	11	11	121	0-8	8	968	968	0	42.48	E	E	E	E	453,592	0.00	0.00	0.00	0.00
8	11	11	121	8-12	4	484	0	484	42.48	---	6.5	0.18	---	453,592	0.00	0.29	0.01	0.00
8	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
9	11	11	121	0-8	8	968	968	0	42.48	E	E	E	E	453,592	0.00	0.00	0.00	0.00
9	11	11	121	8-12	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
9	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
10	11	11	121	0-8	8	968	968	0	42.48	E	E	E	E	453,592	0.00	0.00	0.00	0.00
10	11	11	121	8-12	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
10	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
11	11	11	121	0-8	8	968	968	0	42.48	E	E	E	E	453,592	0.00	0.00	0.00	0.00
11	11	11	121	8-12	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
11	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
12	11	11	121	0-8	8	968	968	0	42.48	E	E	E	E	453,592	0.00	0.00	0.00	0.00
12	11	11	121	8-12	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
12	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
13	11	11	121	0-8	8	968	968	0	42.48	E	E	E	E	453,592	0.00	0.00	0.00	0.00
13	11	11	121	8-12	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
13	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
14	11	11	121	0-8	8	968	968	0	42.48	E	E	E	E	453,592	0.00	0.00	0.00	0.00
14	11	11	121	8-12	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
14	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
15	11	11	121	0-8	8	968	968	0	42.48	E	E	E	E	453,592	0.00	0.00	0.00	0.00
15	11	11	121	8-12	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
15	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
16	11	11	121	0-8	8	968	968	0	42.48	E	E	E	E	453,592	0.00	0.00	0.00	0.00
16	11	11	121	8-12	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
16	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
17	11	11	121	0-8	8	968	968	0	42.48	E	E	E	E	453,592	0.00	0.00	0.00	0.00
17	11	11	121	8-12	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
17	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00



**Mass Removal Calculations**

Grid	Length	Width	Area	Depth	Thickness	Original Native Soil	Excavated Native Soil	Remaining Native Soil	Density	Average TPHd	Average TPHg	Average Benzene	Average MTBE	1 pound	TPHd Mass Remaining	TPHg Mass Remaining	Benzene Mass Remaining	MTBE Mass Remaining
	(feet)	(feet)	(feet <sup>2</sup> )	(feet)	(feet)	(feet <sup>3</sup> )	(feet <sup>3</sup> )	(feet <sup>3</sup> )	(kg/feet <sup>3</sup> )	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(453,592 mg)	(pounds)	(pounds)	(pounds)	(pounds)
18	11	11	121	0-8	8	968	703	265	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
18	11	11	121	8-12	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
18	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
19	11	11	121	0-8	8	968	0	968	42.48	---	230	0	0.28	453,592	0.00	20.85	0.00	0.03
19	11	11	121	8-12	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
19	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
20	11	11	121	0-8	8	968	928	41	42.48	E	E	E	E	453,592	0.00	0.00	0.00	0.00
20	11	11	121	8-12	4	484	0	484	42.48	7.7	6	0.11	---	453,592	0.35	0.27	0.00	0.00
20	11	11	121	12-16	4	484	0	484	42.48	2.1	6	0.076	---	453,592	0.10	0.27	0.00	0.00
21	11	11	121	0-8	8	968	351	617	42.48	37	120	0.12	---	453,592	2.14	6.93	0.01	0.00
21	11	11	121	8-12	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
21	11	11	121	12-16	4	484	0	484	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
22	10	11	110	0-8	8	880	80	800	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
22	10	11	110	8-12	4	440	0	440	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
22	10	11	110	12-16	4	440	0	440	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
23	10	11	110	0-8	8	880	340	540	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
23	10	11	110	8-12	4	440	0	440	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
23	10	11	110	12-16	4	440	0	440	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
24	10	11	110	0-8	8	880	210	670	42.48	3.2	0	0	---	453,592	0.20	0.00	0.00	0.00
24	10	11	110	8-12	4	440	0	440	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00
24	10	11	110	12-16	4	440	0	440	42.48	---	---	---	---	453,592	0.00	0.00	0.00	0.00

<b>Totals</b>						<b>44,968.0</b>	<b>16,075.5</b>	<b>28,892.5</b>							<b>3.32</b>	<b>33.78</b>	<b>0.02</b>	<b>0.03</b>
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**Notes**

Results below the reporting limit were assumed to be 0.

- TPHd = Total petroleum hydrocarbons as diesel.
- TPHg = Total petroleum hydrocarbons as gasoline.
- MTBE = Methyl tertiary butyl ether.
- kg = Kilograms.
- mg = Milligrams.
- E = Depth completely excavated.
- = Samples not collected or samples not analyzed for this analyte.