Louis Badertscher
5625 N. Highway 66
Kingman, AZ 86401

February 17, 2014

Mr. Keith Nowell
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

SUBJECT: CONCEPTUAL SITE MODEL AND DATA GAP INVESTIGATION WORK PLAN CERTIFICATION
ACEHS File # RO 280
Scooter Wilson Site
3600 MacArthur Boulevard
Oakland, California

Dear Mr. Nowell:

You will find enclosed one copy of the following document prepared by RGA Environmental, Inc. for the subject site.

- Conceptual Site Model and Data Gap Investigation Work Plan dated February 17, 2014 (document 0645.W1).

I declare, under penalty of perjury, that the information and/or recommendations contained in the above-mentioned document for the subject site is true and correct to the best of my knowledge.

Should you have any questions, please do not hesitate to contact me at (928) 814-9536.

Sincerely,

Louis Badertscher

Enclosure

0645.L1

February 17, 2014
Report 0645.W1
LOUIS34924

Mr. Keith Nowell
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

SUBJECT: CONCEPTUAL SITE MODEL AND DATA GAP INVESTIGATION WORK PLAN
ACEHS File # RO 280
Scooter Wilson
3600 MacArthur Boulevard
Oakland, California

Dear Mr. Nowell:

RGA Environmental, Inc. (RGA) has prepared this conceptual site model (CSM) and data gap investigation work plan for the subject site. The CSM is summarized in Table 1 with data gaps and associated recommended actions to address the data gaps identified in Table 2. The work scope includes drilling in MacArthur Boulevard to collect groundwater grab samples to evaluate the extent of petroleum hydrocarbons in groundwater adjacent to the subject site, installation and sampling of a permanent soil gas well at the property line adjacent to the residential structure that is located to the southeast of the subject site, and exploratory excavation to evaluate the presence of historical UST piping. This work plan also provides documentation of the re-development of the onsite groundwater monitoring wells on October 23, 2013 and the results of groundwater samples collected from the wells on October 25, 2013.

A Site Location Map is attached as Figure 1 and a site vicinity aerial photograph showing historical well and borehole locations at and near the site, and proposed sample collection locations is attached as Figure 2. All work will be performed under the direct supervision of a California Professional Geologist.

BACKGROUND

A November 20, 2002 Risk Assessment Report prepared for the site by Kodiak identified historical site use as a Phillips 66 service station prior to approximately 1973, with continued use as a service station until approximately 1983. The USTs were removed in 1994, and the site was most recently used as an automobile repair facility until some time in 2005.

Groundwater Monitoring Well Re-Development

On October 22, 2013 groundwater monitoring wells MW-1 through MW-3 were re-developed by surging and over-pumping by Environmental Field Services personnel of Patterson, California. Prior to re-development, the monitoring wells were monitored for depth to water to the nearest 0.01 feet using an electric water level indicator. The measured depth to groundwater prior to development on October 22, 2013 in wells MW-1, MW-2, and MW-3 was 4.12, 4.09, and 7.21 feet, respectively.

During re-development of the wells a petroleum hydrocarbon odor and slight sheen was reported for the water purged from well MW-1, but no odors or sheen were reported on the water purged from wells MW-2 and MW-3. Relatively high recharge rates were observed in wells MW-1 and MW-2, but well MW-3 went dry after pumping less than one casing volume. Approximately 26.25, 33.25, and 12.5 gallons of water were removed from each of wells, MW-1, MW-2, and MW-3, respectively. Water removed from the wells during development was stored in drums onsite, pending characterization and appropriate disposal. Copies of the well development data sheets are attached with this work plan.

Groundwater Monitoring Well Monitoring and Sampling

On October 25, 2013 RGA personnel monitored wells MW-1, MW-2, and MW-3 for depth to water to the nearest 0.01 foot using an electric water level indicator. The measured depth to groundwater prior to purging and sampling on October 25, 2013 in wells MW-1, MW-2, and MW-3 was 4.15, 4.41, and 7.52 feet, respectively.

On October 25, 2013 RGA personnel purged and sampled wells MW-1, MW-2, and MW-3. Prior to well sampling, the wells were purged with a peristaltic pump of a minimum of 15 minutes. Purging was performed at low flow rates to minimize turbulence and minimize the likelihood of sediments in the samples. During purging operations, the field parameters of depth to water, pH, electrical conductivity, temperature, dissolved oxygen (D.O), oxidation-reduction potential (ORP), and turbidity were monitored and recorded on a groundwater monitoring/well purging data sheet. During purging operations petroleum hydrocarbon odors and petroleum hydrocarbon sheen was not observed on the water purged from any of the wells. Once the field parameters were observed to stabilize, and a minimum of three casing volumes had been purged, water samples were collected from the discharge tubing to the pump. New tubing was used for each sample collection location. The samples were transferred to 40-milliliter glass Volatile Organic Analysis (VOA) vials that were sealed with Teflon-lined screw caps. The VOA vials were overturned and tapped to assure that no air bubbles were present. The VOA vials were then transferred to a cooler with ice, pending transport to the laboratory. Chain of custody documentation accompanied the samples to the laboratory. Records of the field parameters measured during well purging are attached with this work plan

The water level measurements are summarized in Table 3, and the sample results are summarized in Table 4. Copies of the well development data sheets are attached with this work plan as Appendix A, copies of the well purging data sheets for well sampling are attached with this work plan as

Appendix B, and a copy of the laboratory analytical report is attached with this work plan as Appendix C.

SCOPE OF WORK

To address data gaps identified in the CSM, RGA proposes to perform the following activities.

- Obtain an encroachment permit and drilling permit.
- Prepare a health and safety plan, a traffic control plan, and mark drilling locations for Underground Service Alert.
- Oversee exploratory excavation of the former UST piping.
- Oversee soil coring and groundwater grab sample collection at three locations.
- Oversee installation and sampling of one permanent soil gas well adjacent to the neighboring residential structure to the southeast of the site.
- Arrange for sample analysis.
- Prepare a subsurface investigation report.

Each of these is discussed below.

Obtain Permits

An encroachment permit will be obtained for work in the public right-of-way and permits will be obtained from the Alameda County Public Works Agency for borehole drilling. All necessary permit-related notifications will be made prior to drilling.

Prepare a Health and Safety Plan

A health and safety plan and a traffic control plan will be prepared for the scope of work identified in this work plan. In addition, the drilling locations will be marked with white paint and Underground Service Alert will be notified for underground utility location. Utility maps obtained from historical reports for the site will be used to assist in identification of underground utilities at the time of drilling.

Exploratory Excavation of Former UST Piping

Exploratory excavation with a backhoe will be performed to locate the former UST piping trench and determine if the piping was removed or grouted in-place.

Soil Coring and Groundwater Grab Sample Collection

Groundwater grab samples will be collected from first-encountered groundwater at locations B9 through B11 (see Figure 2) to evaluate the presence of petroleum hydrocarbons in groundwater between the subject site and borehole location B-15 that is located on the west side of MacArthur Boulevard. The boreholes will be continuously cored and logged as described above using Geoprobe direct-push technology. The soil from the borings will be logged in the field in accordance with standard geologic field techniques and the Unified Soil Classification System. All

soil from the boreholes will be evaluated with a Photoionization Detector (PID) equipped with a 10.6 eV bulb and calibrated using a 100 ppm isobutylene standard.

Once groundwater is encountered, a 1-inch diameter temporary slotted PVC pipe will be placed in each borehole and a groundwater sample collected at leach location using polyethylene tubing and a peristaltic pump. The groundwater samples will be transferred to 40-millileter VOA bottles, all of which will be supplied by the laboratory and contain hydrochloric acid preservative. The sample bottles will be labeled and placed in a cooler with ice pending delivery to the laboratory. Chain of custody procedures will be observed for all sample handling.

All drilling and sampling equipment will be cleaned by steam cleaning with an Alconox solution followed by a clean water rinse prior to use in each borehole. Following completion of logging and sample collection activities, the boreholes will be filled with neat cement grout. All soil and water generated during subsurface investigation will be stored in 55-gallon drums at the site and labeled pending characterization and proper disposal.

Soil Gas Sample Collection

One permanent soil gas well designated as SG1 (see Figure 2) will be constructed to a depth of 5 feet below the ground surface (bgs) to evaluate the presence of petroleum soil vapor concentrations in the vicinity of the subject site. A soil gas sample will be collected from the soil gas well in accordance with procedures set forth in the December 2013 San Francisco Bay Regional Water Quality Control Board User's Guide: Derivation and Application of Environmental Screening Levels, and the following Department of Toxic Substances Control (DTSC) documents:

- March 2013 – FAQ for the 2012 Advisory,
- April 2012 Advisory - Active Soil Gas Investigations,
- October 2011 – Vapor Intrusion Guidance,
- October 2011 – Vapor Intrusion Mitigation Advisory.

The soil gas wells will be constructed by Vironex, Inc. of Concord, California by hand augering to the depths described above using a 4-inch diameter hand auger. A #2/16 Lonestar sack sand will be poured into the borehole to fill the lowermost 6 inches of the borehole with sand. A 0.250-inch outside diameter (0.187-inch inside diameter) Teflon tube with a HDPE filter at the bottom of the tube will be inserted to the top of the sand (a depth of 6 inches above the bottom of the borehole), and additional #2/16 Lonestar sack sand will be poured into the borehole to one foot above the bottom of the borehole (the lowermost one foot of the borehole will be filled with sand with the filter at the end of the tube in the middle of the sand interval).

Granular bentonite (measuring approximately 1 to 2 millimeters in diameter) will be placed in the annular space above the sand to 6 inches above the sand, and the remaining borehole will be filled with hydrated bentonite slurry. The tubing length will be 6.5 feet, and the top of the soil gas well will be enclosed in a well box with a lid that is secured with bolts.

Following construction, the soil gas wells will not be sampled for a minimum of 48 hours. Soil gas samples will not be collected if more than ½ inch of precipitation has occurred during the five days prior to the scheduled sampling date.

A soil gas sampling manifold with a 6-liter Summa canister as the sampling canister for each location (see Figure 3) will be assembled in a shroud consisting of a 35-gallon Rubbermaid bin that has been modified by cutting viewing ports into the sides of the shroud and covering the viewing ports with transparent polycarbonate sheets. A hole measuring approximately two inches square in the bottom of the shroud allows the shroud to cover the soil gas well while still allowing access to the temporary well through the bottom of the bin. At the time that the sampling manifold is assembled, the vacuum for the sample canister will be verified with a vacuum gauge and recorded.

Prior to sampling the soil gas, a 10 minute shut-in test of the sampling manifold will be performed by closing the valve located between the filter and the pressure gauge, opening the purge canister valve, and recording the manifold system vacuum (see Figure 3). No purge testing for purge volume determination will be performed because the samples will be collected using Summa canisters. Following successful verification of the manifold shut-in test, a default of three purge volumes will be extracted prior to sample collection. The purge volume will be calculated based on the void space surrounding the HDPE filter and the volume of the tube. The purge time will be calculated using a nominal flow rate provided by the flow controller of 150 cubic centimeters per minute.

Following completion of the purging of three volumes, a lid will be placed onto the shroud and a tracer gas 1,1-Difluoroethane (DFA) will be sprayed into the shroud interior for one second through a tube connected to a hole in the side of the shroud. Gloves in the lid of the shroud will be used to open the sample canister valve. After verifying that low flow conditions are not present associated with the soil gas sample, an air sample will be collected from the shroud atmosphere to quantify the shroud tracer gas concentration while the soil gas sample is being collected. The shroud atmosphere sample will be collected into a Tedlar bag that is placed into a vacuum chamber with the Tedlar bag inlet connected to a new piece of Teflon or polyethylene tubing that is inserted into the shroud atmosphere through a hole in the side of the shroud.

Once the vacuum for the sample canister valve has decreased to 5 inches of mercury, the gloves in the lid of the bin will be used to close the sample canister valve. The pressure gage on the inlet side of the flow controller (see Figure 3) will be monitored during sample collection to ensure that the vacuum applied to the soil gas well does not exceed 100 inches of water.

One duplicate soil gas sample will be collected into a Summa canister from the soil gas well using a stainless steel sampling tee for the Summa canisters. Following soil gas sample collection, a PID will be connected to the Teflon tubing to obtain a preliminary field value for the sample collection location. The soil gas Summa canister samples will be stored in a box and promptly shipped to the laboratory for extraction and analysis.

Chain of custody procedures will be observed for all sample handling. Measurements of vacuums, purging and equilibration time intervals, and PID readings will be recorded on Soil Gas Sampling Data Sheets.

All hand augering equipment will be cleaned with an Alconox solution wash followed by a clean water rinse prior to use at each location. New Teflon tubing and a new HDPE filter will be used for soil gas well construction. Clean, unused vacuum gages and stainless steel sampling manifolds will be used for sample collection. All soil and water generated during soil gas well construction will be stored in a 55-gallon drum at the site and labeled pending characterization and proper disposal.

Sample Analysis

All of the groundwater samples will be analyzed at McCampbell Analytical, Inc. (McCampbell) in Pittsburg, California for TPH-G by EPA Method 5030 in conjunction with modified EPA Method 8015; TPH-D by EPA Method 3510 in conjunction with modified EPA Method 8015: and for BTEX, MTBE, and TBA by EPA Method 8260B. Chain of custody documentation will accompany the samples to the laboratory.

All of the Summa canister soil gas samples will be analyzed at Air Toxics Limited of Folsom California. The samples collected in Summa canisters will be analyzed for TPH-G, BTEX, MTBE, TBA, and DFA (the tracer gas) using EPA Method TO-15, and for oxygen, methane and carbon dioxide using method ASTM D-1946. The analyses will be performed with detection limits that equal or are less than SFRWQCB December 2013 Table E-2 soil gas residential Environmental Screening Levels (ESLs).

The Tedlar bag sample will be analyzed for the tracer gas DFA using EPA Method 8260B.

Report Preparation

Upon receipt of the laboratory analytical results, a report will be prepared. The report will document the the groundwater and soil gas sample collection procedures and sample results. The report will include maps showing the sample collection locations, a well construction diagram for the soil gas well, boring logs, tables summarizing the sample results, recommendations based on the results, and the stamp of an appropriately registered professional. A copy of the report and associated laboratory and borehole information will be uploaded to GeoTracker.

Should you have any questions, please do not hesitate to contact us at (510) 658-4363.

Sincerely,
RGA Environmental, Inc.

Paul H. King
Professional Geologist # 5901
Expires: 12/31/15

Attachments:

Table 1 – Conceptual Site Model
Table 2 – Data Gap Summary and Proposed Investigation
Table 3 – Groundwater Level Monitoring Data
Table 4 – Summary of Groundwater Monitoring Well Sample Laboratory Analytical Results

Figure 1 – Site Location Map
Figure 2 – Site Vicinity Aerial Photograph Showing Well and Sample Collection Locations
Figure 3 – Typical Soil Gas Sampling Manifold

Appendix A – Well Development Data Sheets
Appendix B – Well Monitoring and Purge Data Sheets
Appendix C – Laboratory Report and Chain of Custody Documentation

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0645.W1

TABLES

Table 1
Site Conceptual Model

CSM Element	CSM Sub-Element	Description	Data Gap Item #	Resolution
Geology and Hydrogeology	Regional	As described by Kodiak Consulting, LLC, (Kodiak), the site is located in the East Bay Plain Groundwater Basin at the eastern edge of the basin, approximately 2,000 feet southwest of the Hayward Fault. The East Bay Plain is regionally subdivided into two major basins, the San Pablo Basin and the San Francisco Basin. The site lies within the San Francisco Basin and is a part of the Oakland Sub-Area, defined by a series of alluvial fans ranging from 300 to 700 feet deep, all overlying a west-sloping bedrock surface. There are no well-defined aquitards reported to be in this area. Groundwater in this basin is designated beneficial for municipal, industrial, and agricultural uses. There is no historical evidence that groundwater supplies are sufficient for municipal use, primarily due to low recharge rates. The ground surface in the vicinity of the site is west-sloping.	None	NA

Table 1
Site Conceptual Model (Continued)

CSM Element	CSM Sub-Element	Description	Data Gap Item #	Resolution
Geology and Hydrogeology	Site	Subsurface materials at the site consist of silt, silty clay, and clay to a depth of approximately 5 feet bgs, below which coarse-grained materials consisting of silty sand, clayey sand, and sandy gravel are predominantly encountered to the total depths explored of genrally 15 feet bgs (20 feet bgs at one location). These materials are consistent with the subsurface materials encountered at the gasoline station located immediately to the northwest of the site across Magee Avenue at 3530 MacArthur Boulevard, where silty sand was encountered to a depth of approximately 30 feet bgs. These coarse-grained materials are interpreted to be a segment of an alluvial fan distributary paleochannel. The measured depth to water at the site has historically ranged from approximately 1 to 4 feet bgs, which is similar to the shallow depth to groundwater of approximately 3 to 6 feet encountered at the 3530 MacArthur Boulevard site located across Magee Avenue from the subject site, and is also similar to shallow water levels of 2 to 8 feet bgs encountered at gasoline stations located approximately 2,400 feet to the southwest of the subject site at the intersection of High Street and MacArthur Boulevard. Review of water levels in all of the wells at the subject site shows that the majority of the historical water levels in wells MW-1 and MW-2 (located closer to the street) have been higher than the water level in well MW-3 (located farthest from the street). Review of utility maps shows that a buried water main is located approximately 10 feet from the northern side of the property beneath Magee Avenue, and approximately 30 feet to the west of the site beneath MacArthur Boulevard. It is possible that a leak in the water pipe could be causing artificially elevated water levels in the water main trench, resulting in associated artificially elevated water levels in the wells located closest to the street. Based on the shallow water levels encountered in wells at nearby sites, the	None	NA

Table 1
Site Conceptual Model (Continued)

CSM Element	CSM Sub-Element	Description	Data Gap Item #	Resolution
		shallow water levels encountered in the wells could also be the result of shallow groundwater levels resulting from shallow alluvial fan distributary stream channel segments that are recharged at higher elevations to the east of the site. Review of historical groundwater flow directions at the site shows a range of calculated groundwater flow directions ranging from the southeast to the west-northwest. Comparison of historical differences in water levels between the onsite wells shows that in 1998 and 2000 the groundwater elevation was lower in wells MW-1 and MW-2 than in MW-3. With the exception of these monitoring events, the groundwater flow direction at the site has been to the southeast. Review of historical groundwater flow directions at the 3530 MacArthur Boulevard site located across Magee Avenue from the subject site shows that the groundwater flow direction has been consistently to the southeast. Based on the subject site and adjacent site groundwater flow direction information, the groundwater flow direction is interpreted to be to the southeast at and near the subject site. Drinking water at the site is obtained from the East Bay Municipal Utilities District. There are no current uses of groundwater as a drinking water source at the site.		
Surface Water Bodies		The closest surface water bodies to the subject site are as follows: There are portions of Peralta Creek that daylight approximately 950 feet to the northeast (upgradient) of the subject site and there are underground channelized culverts and storm drains containing portions of Courtland Creek approximately 1,000 feet to the southeast of the subject site. Additionally, the San Francisco Bay Tidal Canal that connects the Brooklyn Basin to San Leandro Bay is approximately 12,000 feet (2.3 miles) southwest of the subject site.	None	NA

Table 1
Site Conceptual Model (Continued)

CSM Element	CSM Sub-Element	Description	Data Gap Item #	Resolution
Nearby Wells		A Subsurface Investigation Work Plan dated March 30, 2012 prepared by Kodiak summarizing historical information for the site and documenting the collection of samples from boreholes KB-1 through KB-8 also discusses that in April 2001 North State Environmental performed a Department of Water Resources well survey within a ¼-mile radius of the site and identified one irrigation well drilled in 1977 to 62 feet bgs at 3397 Arkansas Street in Oakland (located approximately 1,500 feet west-southwest of the subject site). The well was described as screened from 20 to 24 feet bgs with blank casing extending to 62 feet bgs, with the well listed as sealed with cement from 20 feet bgs to the surface. Additionally, Kodiak reported that this well has not been identified in sensitive receptor surveys performed at contaminated sites closer to 3397 Arkansas Street and that there is little likelihood of the subject site impacting the well due to its distance from the site. The State Water Resources Control Board (SWRCB) GeoTracker GAMA website provides the locations of water supply wells proximal to the site. The nearest supply wells are shown to be located approximately 2.3 miles and 2.7 miles northwest of the site in Redwood Regional Park. There are three groundwater monitoring wells located at the subject site. Additionally, there are three groundwater monitoring wells immediately to the northwest and west of the site at the site located across Magee Avenue at 3530 MacArthur Boulevard, and at other fuel release investigation sites located in the vicinity of the subject site.	None	NA
Release Source and Volume		On March 31, 1994 two steel 8,000-gallon capacity gasoline USTs and one fiberglass 6,000-gallon capacity UST were removed from the same UST pit, and one steel 100-gallon capacity waste oil UST was removed from a separate UST pit at the site. Approximately	1) Unknown if the former piping from the former fuel USTs to the former	1) Perform exploratory excavation to identify the former

Table 1
Site Conceptual Model (Continued)

CSM Element	CSM Sub-Element	Description	Data Gap Item #	Resolution
		60 feet of piping extending from the former fuel USTs to the former fuel dispenser was reported to have been removed or grouted in place in 1999, but there are no reports or documentation of the grouting or removal of the piping. Removal of the USTs appears to have resulted in abatement of any source for the release. The volume of the release is unknown. The results of lead analysis for soil samples collected at the time of UST removal did not identify lead concentrations of concern. TPH-G, BTEX and TPH-D were detected in groundwater samples collected from each of the fuel UST pit and from the separate waste oil UST pit at the time of UST removal, and also in boreholes B1 and B2 that were subsequently drilled adjacent to the dispenser island. Analysis of a soil sample collected from the waste oil UST pit did not identify elevated concentrations of TPH-G or TPH-D, with all other waste oil constituents (Total Extractable Petroleum Hydrocarbons (TEPH), VOCs by EPA Method 8010, SVOCs by EPA 8270) not detected with the exception of 87 mg/kg TEPH. All but two of the soil sample TPH-D results were identified as having a chromatogram that did not match a typical diesel pattern. The two TPH-D soil sample results that were not identified as having chromatograms that did not match a typical diesel pattern (collected in 1994 and 1998) were for samples that had TPH-G concentrations that were higher than the reported TPH-D results. It is possible that these results that were reported as TPH-D were diesel-range gasoline compounds. The results of all historical groundwater samples collected from groundwater monitoring wells MW-1 (installed near the dispenser island), MW-2 (installed near the fuel UST pit), and MW-3 (installed near the waste oil UST pit) have only shown detectable concentrations of TPH-G, BTEX, and TPH-D in well MW-1 located adjacent to the fuel dispenser (with the exception of low	fuel dispenser are present or were grouted in-place. 2) The downgradient extent of petroleum in groundwater is not yet defined. 3) The origin of elevated TPH-D and TPH-G in groundwater on the west side of MacArthur Boulevard at location B-15 is unknown.	piping trench and determine if the piping is still present in the trench. 2) Drill boreholes to evaluate the extent of petroleum in groundwater. 3) Drill boreholes to determine if TPH-D is present downgradient of MW-1 and upgradient of offsite borehole B-15.

Table 1
Site Conceptual Model (Continued)

CSM Element	CSM Sub-Element	Description	Data Gap Item #	Resolution
		concentrations of TPH-D detected in wells MW-2 and MW-3 on 10/1/99 which the laboratory identified as not matching a diesel chromatogram). All but one of the historical detected TPH-D groundwater monitoring well sample results were identified by the laboratory as having a chromatogram that did not match a typical diesel pattern. The one well MW-1 TPH-D groundwater sample result that was not identified by the laboratory as having a chromatogram that did not match a typical diesel pattern (collected 11/12/98) was for a sample that had a TPH-G concentration (6,200 ug/L) that was higher than the reported TPH-D result (540 ug/L). It is possible that this result that was reported as TPH-D was diesel-range gasoline compounds. MTBE has not been detected in any of the soil or groundwater samples for the site, with the exception of the two most recent water samples collected from well MW-3 where 0.72 and 0.85 ug/L were detected. On 3/28/12 Kodiak oversaw air knife drilling at locations KB-1 through KB-5 in the public right-of-way along MacArthur Boulevard to evaluate utility trench backfill materials and the presence of petroleum hydrocarbons downgradient of well MW-1, in addition to drilling on 3/29/12 at onsite locations KB-6 through KB-8. The investigation report concluded that native clay material was used to backfill the utility trenches that were investigated. Review of the soil and groundwater sample results shows that TPH-D, TPH-G and BTEX were not detected in sample KB-1. For samples KB-2 through KB-5, none of the results were identified as having a chromatogram with a diesel pattern. Additionally, TPH-D was not detected in the onsite soil or groundwater samples from boreholes KB-6 through KB-8. Based on the detected presence in groundwater of 12,000 ug/L TPH-MO at KB-2, 370 ug/L TPH-G and 10 ug/L benzene at KB-3, and 700 ug/L TPH-G and 7.4 ug/L		

Table 1
Site Conceptual Model (Continued)

CSM Element	CSM Sub-Element	Description	Data Gap Item #	Resolution
		benzene at KB-4, the downgradient extent of petroleum hydrocarbons in groundwater has not been defined. The most recent prior well sampling event was 5/6/08. Although the results of the 5/6/08 well sampling event identified 6,800 ug/L TPH-D detected in well MW-1, review of the laboratory report shows that the TPH-D results were identified as gasoline-range compounds, consistent with the TPH-G and BTEX compounds detected in the MW-1 sample. The wells were re-developed on 10/22/13 and sampled 10/25/13 using US EPA low flow purge methods. The most recent (10/25/13) well sample results show that no TPH-G, BTEX or TPH-D were detected in any of the samples with the exception of MW-1 where 160 ug/L TPH-G and 2.9 ug/L benzene were detected.. In May 2010 Conestoga-Rovers & Associates (CRA) performed a subsurface investigation along the west side of MacArthur Boulevard for the adjacent site located at 3530 MacArthur Boulevard (across Magee Avenue from the subject site). Borehole B-14 was drilled across the street from the south side of Magee Avenue and B-15 was drilled almost directly across the street from well MW-1 that is located adjacent to the former dispenser island at the subject site. Borehole B-14 was drilled to a depth of approximately 8.0 feet bgs, and groundwater was encountered at a depth of approximately 7.5 feet bgs. One soil sample was collected at a depth of 7 feet bgs and one groundwater grab sample was collected. Analysis for TPH-D was not performed for either of the samples. TPH-G, BTEX and fuel oxygenates were not detected in either sample with the exception of 0.6 ug/L MTBE in the groundwater sample.		

Table 1
Site Conceptual Model (Continued)

CSM Element	CSM Sub-Element	Description	Data Gap Item #	Resolution
		Borehole B-15 was drilled to a depth of approximately 7.5 feet bgs, and groundwater was encountered at a depth of approximately 7.5 feet bgs. One soil sample was collected at a depth of 7 feet bgs and one groundwater grab sample was collected. Analysis for TPH-D was not performed for the soil sample. TPH-G was detected in the soil sample at a concentration of 56 mg/kg and benzene, toluene, ethylbenzene, and xylenes were detected in the soil sample at concentrations of 0.004, 0.003, 0.27, and 0.19 mg/kg, respectively. In the groundwater sample TPH-D and TPH-G were detected at concentrations of 40,000 and 17,000 ug/L, respectively. In addition, benzene, toluene, ethylbenzene, and xylenes were detected at concentrations of 34, 17, 490, and 65 ug/L, respectively. Review of the laboratory analytical report for the sample results did not reveal any laboratory notes for the chromatograms for the TPH-G or TPH-D results. At the time of UST removal, only one UST pit soil sample result exceeded 6 mg/kg, which was sample B on the southeast side of the fuel UST pit where 5,000 mg/kg TPH-G was detected. Based on the fuel UST pit TPH-G sidewall sample results collected from the remaining fuel UST pit sidewalls of 6 mg/kg or less the impact in the former fuel UST pit appears to be localized on the side of the fuel UST pit that is not located closest to utility trenches. The highest TPH-G groundwater concentration detected at the subject site was 14,000 ug/L in well MW-1 on 5/6/08, which is lower than the 40,000 ug/L TPH-G concentration detected in borehole B-15. In addition, almost all of the TPH-D soil and water results for the subject site have been identified as having a chromatogram that is not diesel, and the remaining two soil and one groundwater TPH-D results are associated with higher TPH-G concentrations and could be diesel-range gasoline compounds.		

Table 1
Site Conceptual Model (Continued)

CSM Element	CSM Sub-Element	Description	Data Gap Item #	Resolution
		Based on almost all of the detected TPH-D results having been identified by the laboratory as having a chromatogram that is not diesel, in addition to the remaining three TPH-D results having TPH-G concentrations that are higher than the identified TPH-D results, it appears that although diesel-range compounds have been detected at the site that diesel is not a contaminant of concern at the site. The TPH-D and TPH-G detected in borehole B-15 do not appear to be related to the subject site for the following reasons. • The subject site sample results and laboratory notes show that diesel is not a contaminant of concern for the subject site, which is not consistent with elevated TPH-D in the B-15 groundwater sample; • The highest historical TPH-G groundwater concentration at the site of 14,000 ug/L in well MW-1 on 5/6/08 is lower than the 17,000 ug/L TPH-G in the B-15 groundwater sample; • The highest TPH-G groundwater concentration in boreholes KB-2 through KB-5 (located between well MW-1 and borehole B-15) of 700 ug/L at location KB-4 (located approximately 10 feet from well MW-1) is lower than the 17,000 ug/L TPH-G in the B-15 groundwater sample.		
LNAPL		Sheen was noted on the groundwater in the waste oil UST pit in the 3/31/94 County Environmental Health Department field inspection report that is attached to the June 1994 Tank Removal Activity Report for the site. No Light Non-Aqueous Phase Liquids have been identified in any of the boring logs for any of the boreholes or reported for any of the groundwater monitoring wells for the site with the exception of slight sheen in well MW-1.	None	NA

Table 1
Site Conceptual Model (Continued)

CSM Element	CSM Sub-Element	Description	Data Gap Item #	Resolution
Source Removal Activities		The USTs were removed in 1994 and approximately 60 feet of piping extending from the former fuel USTs to the former fuel dispenser was reported to have been removed or grouted in place in 1999, but there are no reports or documentation of the grouting or removal of the piping. Based on review of the June 1994 Tank Removal Activity Report no additional excavation of petroleum-impacted soil was performed at the site. Soil that was excavated from the former UST pits was placed back into the pits on top of a sheet of plastic following UST removal. The surface of the former diesel and gasoline UST pit has been unpaved since UST removal activities. It does not appear that additional excavation was performed for secondary source removal. Based on the shallow depth to groundwater at the site and the absence of detectable concentrations of petroleum hydrocarbons in groundwater samples collected from well MW-2 (located adjacent to the former fuel UST pit and approximately 20 feet downgradient of the one fuel UST pit soil sample that had elevated TPH values), secondary source removal is not required for the site in the vicinity of the UST pits.	1) Unknown if the former piping from the former fuel USTs to the former fuel dispenser are present or were grouted in-place.	1) Perform exploratory excavation to identify the former piping trench and determine if the piping is still present in the trench.
Contaminants of Potential Concern		Based on the historical presence of gasoline, diesel and waste oil USTs at the site and review of all historical soil and groundwater sample results for the site associated with sample collection at the time of UST removal, during subsequent drilling at the site, and groundwater monitoring well sampling, the Contaminants of Potential Concern (COPCs) are limited to TPH-G, BTEX, and TPH-MO.	None	NA
Petroleum Hydrocarbons		Elevated petroleum concentrations in soil were encountered at UST pit sample location B (located on the southeast side of the fuel UST	None	NA

Table 1
Site Conceptual Model (Continued)

CSM Element	CSM Sub-Element	Description	Data Gap Item #	Resolution
in Soil		pit). Based on the shallow depth to groundwater at the site, the coarse-grained nature of materials below a depth of approximately 5 feet bgs at the site, and the absence of detectable concentrations of petroleum hydrocarbons in groundwater samples collected from well MW-2 (located adjacent to the former fuel UST pit and approximately 20 feet downgradient of the one fuel UST pit soil sample that had elevated TPH values), and the absence of detectable concentrations of petroleum hydrocarbons in borehole KB-6 (drilled approximately 10 feet away from UST pit sample B) the presence of petroleum hydrocarbons in soil at this location is not considered to be a concern. The highest benzene concentration encountered in soil at the site (10 mg/kg) was detected in borehole B2 (located near the former dispenser island) at a depth of 7 feet bgs, consistent with the highest PID values encountered during drilling borehole B2, and consistent with the only groundwater monitoring well at the site where petroleum hydrocarbons have consistently been encountered (see Petroleum Hydrocarbons in Groundwater below).		
Petroleum Hydrocarbons in Groundwater		Following removal of the USTs, the only onsite location where petroleum has been encountered in groundwater is at well MW-1 (located adjacent to the former dispenser), and in boreholes KB-7 and KB-8 where oil-range compounds were detected at concentrations fo 650 and 510 ug/L, respectively. At offsite locations near MW-1 petroleum has also been encountered in boreholes KB-2 through KB-8.	2) The downgradient extent of petroleum in groundwater is not yet defined.	2) Drill boreholes to evaluate the extent of petroleum in groundwater.
Nearby Sites		A gasoline station is located at 3530 MacArthur Boulevard, across Magee Avenue from and upgradient of the subject site. Three groundwater monitoring wells were historically installed and sampled at the site. The contaminant of concern has been MTBE. The historical use of USTs was not identified in the documents that		

Table 1
Site Conceptual Model (Continued)

CSM Element	CSM Sub-Element	Description	Data Gap Item #	Resolution
		we reviewed for the site, however, the investigators maintained that diesel fuel was not stored or sold at the property. The basis for this position is unknown. The fuel release case for the site has been eligible for closure since April 2013.		
Risk Evaluation		A November 20, 2002 Risk Assessment Report prepared for the site by Kodiak identified historical site use as a Phillips 66 service station prior to approximately 1973, with continued use as a service station until approximately 1983. The USTs were removed in 1994, and the site was most recently used as an automobile repair facility until some time in 2005. Based on laboratory notes identifying TPH-D results as having chromatograms that are not a diesel pattern, diesel is not considered to be a concern at the site. Similarly, MTBE has not been detected in soil or water samples at the site with the exception of well MW-3 during the last two well sampling events. Based on the results of the well survey for the site and evaluation of the location of municipal wells in the vicinity of the site, and the use of municipal water at the site, the site does not pose a threat to drinking water or wells at or near the subject site. The only UST pit soil sample results that exceed SFRWQCB December 2013 Table A-1 residential land use soil screening levels for shallow soil or Table A-2 commercial land use soil Environmental Screening Levels (ESLs) for shallow soil are at sample location B (located on the southeast side of the fuel UST pit) where TPH-G, TPH-D, and BTEX all exceed their respective Table A-1 and A-2 soil ESL values.	4) No soil gas data is available for the site.	4) Install a permanent soil gas well to a depth of 5 feet bgs, and analyze a soil gas sample collected from the well for TPH-G, BTEX, and oxygen.

Table 1
Site Conceptual Model (Continued)

CSM Element	CSM Sub-Element	Description	Data Gap Item #	Resolution
		Soil sample results collected from soil borings exceed December 2013 Table A-1 and A-2 soil ESL values at boring B2 (located near the former dispenser island) for BTEX, at boring B3 (located near the former fuel UST pit) for benzene, and in boring B5 (located in the former waste oil UST pit) for TPH-MO. None of the soil sample results exceed Low Threat Closure Policy (LTCP) Table 1 (Concentrations of Petroleum Constituents in Soil That Will Have No Significant Risk of Adversely Affecting Human Health) values with the exception of 10 mg/kg benzene in borehole B2 at a depth of 7.0 feet bgs. Review of historical groundwater monitoring well water quality data shows that SFRWQCB December 2013 Table F-1a groundwater ESLs are exceeded only for well MW-1 TPH-G and benzene concentrations. For offsite boreholes KB-2 through KB-5 petroleum hydrocarbons consisting of gasoline-range, oil-range, and mineral spirit-range compounds have been detected in groundwater at concentrations exceeding Table F-1a groundwater ESL values. A comparison of detected BTEX concentrations in groundwater at the site to December 2013 Table E-1 ESLs for groundwater to vapor intrusion concerns show that benzene concentrations detected in well MW-1 historically exceed both the Table E-1 residential and commercial/industrial ESLs (fine-coarse mix soils) for benzene of 27 and 270 µg/L, respectively, and twice exceeded the Table E-1 residential ESL for ethylbenzene of 310 ug/L. A residential structure is located immediately to the southeast and downgradient of the site. Review of historical groundwater levels in the wells for the site shows that the measured depth to water in well MW-3 (located closest to the residential structure) has been 7 feet		

Table 1
Site Conceptual Model (Continued)

CSM Element	CSM Sub-Element	Description	Data Gap Item #	Resolution
		or greater since 2006. No soil gas information is available for the subject site.		

Table 2
Data Gaps Summary and Proposed Investigation

Item	Data Gap Item #	Proposed Investigation	Rationale	Analyses
1)	1) Unknown if the former piping from the former fuel USTs to the former fuel dispenser are present or were grouted in-place.	1) Perform exploratory excavation to identify the former piping trench and determine if the piping is still present in the trench.	Verify that all components of the UST system were removed from the site or grouted in place.	Visual.
2)	2) The downgradient extent of petroleum in groundwater is not yet defined.	2) Drill boreholes to evaluate the extent of petroleum in groundwater.	Collect groundwater samples to determine if detectable concentrations of petroleum are present to define the extent of petroleum in groundwater in the vicinity of well MW-1.	TPH-G by EPA Method 5030 in conjunction with modified EPA Method 8015; TPH-D by EPA Method 3510 in conjunction with modified EPA Method 8015: and for BTEX, MTBE, and TBA by EPA Method 8260B.
3)	3) The origin of elevated TPH-D and TPH-G in groundwater on the west side of MacArthur Boulevard at location B-15 is unknown.	3) Drill boreholes to determine if TPH-D is present downgradient of MW-1 and upgradient of offsite borehole B-15.	Collect groundwater samples to determine if detectable concentrations of petroleum are present between onsite well MW-1 and offsite borehole B-15 .	TPH-G by EPA Method 5030 in conjunction with modified EPA Method 8015; TPH-D by EPA Method 3510 in conjunction with modified EPA Method 8015: and for BTEX, MTBE, and TBA by EPA Method 8260B.
4)	4) No soil gas data is available for the site.	4) Install a permanent soil gas well to a depth of 5 feet bgs, and analyze a soil gas sample collected from the well for TPH-G, BTEX, and oxygen.	Evaluate risk and hazard of vapor intrusion to indoor air for closest residential sensitive receptor.	TPH-G, BTEX, MTBE, TBA, and DFA (the tracer gas) using EPA Method TO-15, and for oxygen, methane and carbon dioxide using method ASTM D-1946.

Table 3
Summary of Groundwater Level Monitoring Data

Well ID	Date Monitored	Total Depth of Well (ft)	Screened Interval (ft)	Top of Casing Elevation (ft)*	Depth to Water (ft)	Water Table Elevation (ft)
MW-1	10/25/2013	14.00	4.00-14.00	201.38	4.15	197.23
	10/23/2013**				4.12	197.26
	5/6/2008				3.49	197.89
	3/28/2006				1.07	200.31
	12/23/2005				1.65	199.73
	9/19/2005				3.68	197.70
	7/14/2000				not measured	
	6/30/2000				2.96	198.42
	1/31/2000				1.88	199.50
	10/1/1999				6.51	194.87
	4/9/1999				not measured	
	4/6/1999				1.76	199.62
	11/12/1998				3.24	198.14
MW-2	10/25/2013	14.00	4.00-14.00	201.87	4.41	197.46
	10/23/2013**				4.09	197.78
	5/6/2008				3.45	198.42
	3/28/2006				0.91	200.96
	12/23/2005				1.44	200.43
	9/19/2005				3.64	198.23
	7/14/2000				not measured	
	6/30/2000				2.74	199.13
	1/31/2000				1.61	200.26
	10/1/1999				3.29	198.58
	4/9/1999				not measured	
	4/6/1999				1.43	200.44
	11/12/1998				2.85	199.02
MW-3	10/25/2013	14.00	4.00-14.00	202.11	7.52	194.59
	10/23/2013**				7.21	194.90
	5/6/2008				7.08	195.03
	3/28/2006				7.56	194.55
	12/23/2005				5.35	196.76
	9/19/2005				7.18	194.93
	7/14/2000				not measured	
	6/30/2000				1.83	200.28
	1/31/2000				1.12	200.99
	10/1/1999				8.42	193.69
	4/9/1999				not measured	
	4/6/1999				2.91	199.20
	11/12/1998				3.43	198.68

Notes
NA = Not Available.
* = Surveyed on 11/12/98 by unnamed Registered Civil Engineer. .
** = Prior to well re-development.

Table 4
Summary of Groundwater Monitoring Well Sample Laboratory Analytical Results

Sample ID	Sampling Date	TPH-G	TPH-D	TPH-BO	TPH-MO	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	Other VOCs by EPA Method 8260B
MW-1	10/24/2013	**160**	ND<50	ND<100	ND<250	ND<0.50	**2.9**	ND<0.50	ND<0.50	ND<0.50	All ND
	5/6/2008	**14,000**	**6,800, ****	NA	**280**	ND<5.0	**420**	**120**	**760**	**790**	All ND
	3/28/2006	**3,400**	ND<260	NA	ND<1,000	ND<5	**140**	27	**170**	**160**	All ND
	12/23/2005	**2,100**	ND<50	NA	ND<200	ND<5.0	**75**	7.0	25	5.6	All ND
	9/19/2005	**2,700**	ND<50	NA	ND<250	ND<25	**69**	6.5	14	3.3	NA
	7/14/2000*	NA	**1,500, ****	NA	NA	NA	NA	NA	NA	NA	ND<100
	6/30/2000	**4,100**	NA	NA	NA	ND<0.5	**260**	**69**	**320**	**510**	NA
	1/31/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/1/1999	**2,600**	**190, ****	NA	NA	ND<0.5	**290**	20	**190**	**46**	NA
	4/9/1999	**4,400**	ND<50	NA	NA	ND<0.5	**320**	33	**240**	**240**	NA
	4/6/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/12/1998	**6,200**	**540**	NA	ND<50	ND<0.5	**420**	**47**	ND<0.5	**210**	NA
MW-2	10/24/2013	ND<50	ND<50	ND<100	ND<250	ND<0.50	ND<0.50	ND<0.50	ND<0.50	ND<0.50	All ND
	5/6/2008	ND<50	ND<50	NA	ND<250	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	All ND
	3/28/2006	ND<25	ND<52	NA	ND<210	ND<1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	All ND
	12/23/2005	ND<25	ND<50	NA	ND<200	ND<1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	All ND
	9/19/2005	ND<25	ND<50	NA	ND<250	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	All ND
	7/14/2000*	NA	ND<50, **	NA	NA	NA	NA	NA	NA	NA	NA
	6/30/2000	**130**	NA	NA	NA	ND<0.5	0.7	ND<0.5	1.0	2.0	NA
	1/31/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/1/1999	ND<50	**110, ****	NA	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<1	NA
	4/9/1999	ND<50	ND<50	NA	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<1	NA
	4/6/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/12/1998	ND<50	ND<50	NA	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<1	NA
MW-3	10/24/2013	ND<50	ND<50	ND<100	ND<250	0.85	ND<0.50	ND<0.50	ND<0.50	ND<0.50	All ND
	5/6/2008	ND<50	ND<50	NA	ND<250	0.72	ND<0.5	ND<0.5	ND<0.5	ND<0.5	All ND
	3/28/2006	ND<25	ND<59	NA	ND<240	ND<1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	All ND
	12/23/2005	ND<25	ND<50	NA	ND<200	ND<1.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	All ND
	9/19/2005	ND<25	ND<50	NA	ND<250	ND<5.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	All ND
	7/14/2000*	NA	ND<50, **	NA	NA	NA	NA	NA	NA	NA	NA
	6/30/2000	ND<50	NA	NA	NA	ND<0.5	0.8	0.5	0.9	3.0	NA
	1/31/2000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	10/1/1999	ND<50	80, **	NA	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<1	NA
	4/9/1999	ND<50	ND<50	NA	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<1	NA
	4/6/1999	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	11/12/1998	ND<50	ND<50	NA	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<1	NA
ESL $_1$		*100*	*100*	*100*	*100*	*5.0*	*1.0*	*40*	*30*	*20*	*Various*
ESL $_2$		*No Value*	*No Value*	*No Value*	*No Value*	*9,900*	*27*	*95,000*	*310*	*37,000*	*Various*
ESL $_3$		*No Value*	*No Value*	*No Value*	*No Value*	*100,000*	*270*	*No Value*	*3,100*	*No Value*	*Various*

NOTES:
TPH-G = Total Petroleum Hydrocarbons as Gasoline.
TPH-D = Total Petroleum Hydrocarbons as Diesel.
TPH-BO = Total Petroleum Hydrocarbons as Bunker Oil.
TPH-MO = Total Petroleum Hydrocarbons as Motor Oil
MTBE = Methyl-tert butyl Ether.
ND = Not Detected.
NA = Not Analyzed.
* = Well not purged prior to sample collection. North State Environmental (NSE) sampled 6/30/00. The TPH-D sample expired prior to analysis. NSE returned to the site 7/14/00 and collected samples for TPH-D analysis without purging first.
** = Chromatogram does not match diesel.
ESL_1 = Environmental Screening Level, by San Francisco Bay – Regional Water Quality Control Board Board updated, December 2013, from Table F-1a - Groundwater Screening Levels groundwater is a current or potential source of drinking water.
ESL_2 = Environmental Screening Level, by San Francisco Bay – Regional Water Quality Control Board Board updated, December 2013, from Table E-1 - Groundwater Screening Levels fo Evaluation of Potential Vapor Intrusion. Fine-coarse Mix. Residential Land Use.
ESL_3 = Environmental Screening Level, by San Francisco Bay – Regional Water Quality Control Board Board updated, December 2013, from Table E-1 - Groundwater Screening Levels fo Evaluation of Potential Vapor Intrusion. Fine-coarse Mix. Commercial/Industrial Land Use.
BOLD = Concentration in excess of applicable ESL_1 value.
Results and ESLs in µg/L (micrograms per liter), unless otherwise indicated.

FIGURES

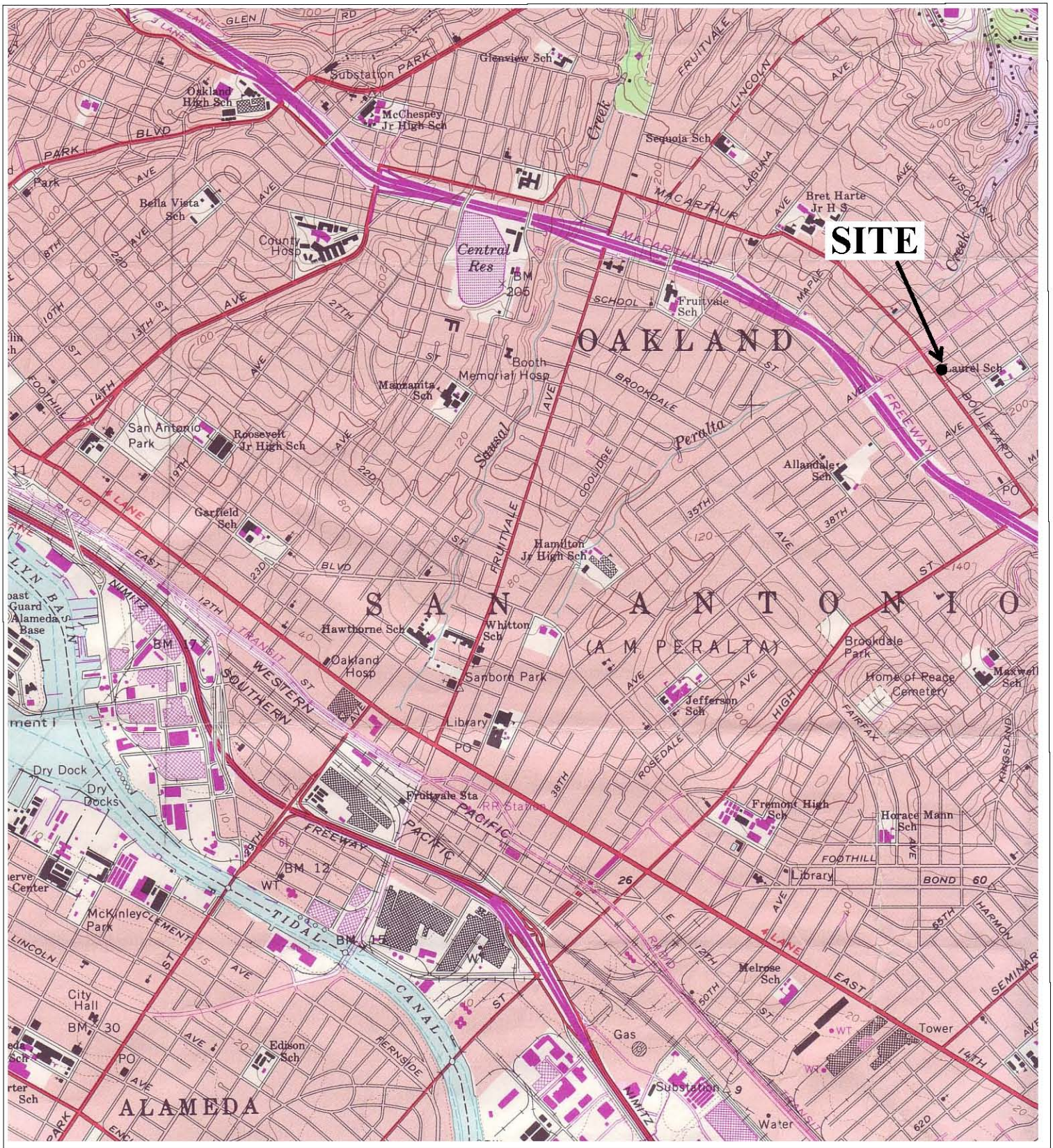

Figure 1
Site Location Map
3600 MacArthur Boulevard
Oakland, California

Base Map From:
U.S. Geological Survey
Oakland East, California
7.5-Minute Quadrangle
Photorevised 1980

RGA Environmental, Inc.
55 Santa Clara Ave., Suite 240
Oakland, CA 94610

0 1,000 2,000
Approximate Scale In Feet

N

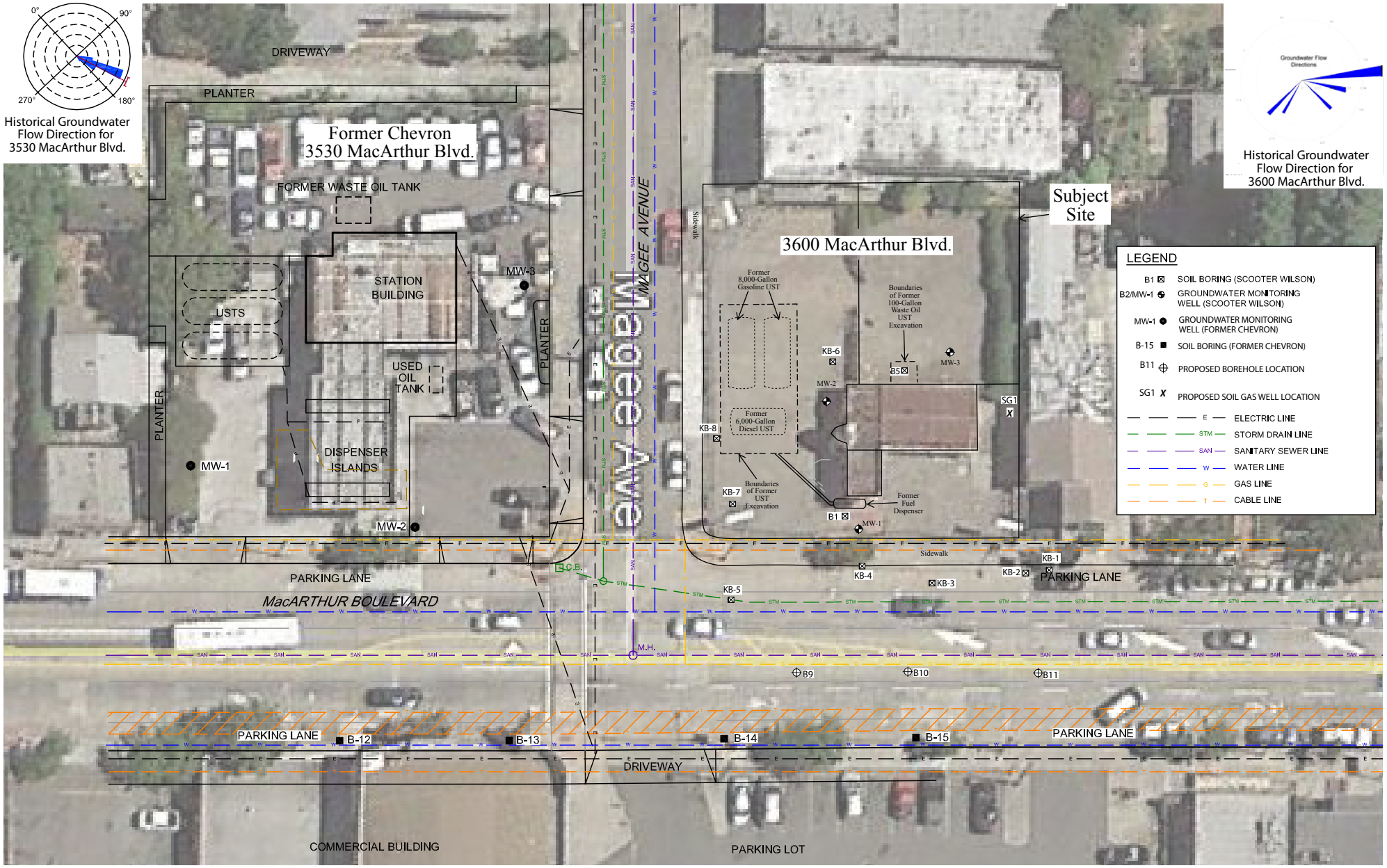

Figure 2
Site Vicinity Aerial Photograph Showing Well and Sample Collection Locations
3600 MacArthur Boulevard
Oakland, California

Base Map from:
Conestoga-Rovers & Associates, September 2010,
Kodiak Consulting, LLC, March 2012, and
Google Earth, image dated August 2012

RGA Environmental, Inc.
55 Santa Clara Ave., Suite 240
Oakland, CA 94610

0 20 40
Approximate Scale in Feet

N

Figure 3
Typical Soil Gas Sampling Manifold
3600 MacArthur Boulevard
Oakland, California

APPENDIX A

WELL DEVELOPMENT DATA SHEETS

Field Data Sheet

Date: 10-22-13 Project Name: 3600 MacArthur Blvd Project Number: 0645

Technician: C. Arroyo Location: Oakland, CA Global ID :

Well ID	Casing Diameter	Total Depth	DTP	DTW	Thickness	Comments
MW-1	2"	14.06	-	4.12	-	
MW-2	2"	13.99	-	4.09	-	
MW-3	2"	13.85	-	7.21	-	

Environmental Field Services

Well Development Record

Project Name:	3600 MacArthur Blvd	Date:	10/22/13
Project Number:	645	Well ID:	MW-1
Method Of Purging:	Honda Pump	Well Diameter:	2
Initial Depth to Water:	4.12	Casing Volume:	9.89 ft. (1.68)
Total Depth of Well:	14.01	Pump Depth:	14.00
Total Depth After Dvlp.:	14.06	Total Casing Vol. Removed:	15

Volume Purged (gal.)	Time	DTW	Conductivity (uS/cm)	pH	Temp. °C	Turbidity (NTU)	Comments:
Initial	1010	-	836	7.41	17.3	+1000	Dark gray
1.75	1012	-	511	7.09	22.2	+1000	Dark gray
3.5	1014	-	487	7.08	23.1	+1000	Dark gray
5.25	1016	-	493	7.08	23.6	+1000	Dark gray
7	1018	-	491	7.07	23.9	+1000	Dark gray
8.75	1020	-	499	7.04	24.4	+1000	Dark gray
10.5	1022	-	497	7.12	24.6	+1000	light gray
12.25	1024	-	496	7.09	24.7	921	light gray
14	1026	-	493	7.07	25.0	784	light gray
15.75	1028	-	499	7.06	25.2	360	Clearing
17.5	1030	-	493	7.05	25.0	203	Clearing

pH Calibration

Buffer Solution: 3 Point Calibration: 4 , 7 , 10

Notes: Hydrocarbon smell and light sheen

Environmental Field Services

Well Development Record

Project Name: 3600 MacArthur Blvd
Date: 10/22/13
Project Number: 645
Well ID: MW-1
Method Of Purging: Honda Pump
Well Diameter: 2
Initial Depth to Water:
Casing Volume:
Total Depth of Well:
Pump Depth:
Total Depth After Dvlp.:
Total Casing Vol. Removed:

Volume Purged (gal.)	Time	DTW	Conductivity (uS/cm)	pH	Temp. °C	Turbidity (NTU)	Comments:
~~Initial~~							
14.25	1032	-	505	7.01	25.3	130	Cloudy
21	1034	-	493	7.00	25.3	103	Clearing
22.75	1036	-	494	6.99	25.2	81.2	Clearing
24.5	1038	-	494	6.99	24.8	59.4	Clearing
26.25	1040	-	492	7.01	24.5	28.6	Clear

pH Calibration

Buffer Solution: 3 Point Calibration: 4 , 7 , 10

Notes:

Environmental Field Services

Well Development Record

Project Name:	3600 MacArthur Blvd	Date:	10/22/13
Project Number:	645	Well ID:	MW-2
Method Of Purging:	Honda Pump	Well Diameter:	2
Initial Depth to Water:	4.09	Casing Volume:	9.92 Pl. (1.68)
Total Depth of Well:	13.99 [redacted]	Pump Depth:	13.99
Total Depth After Dvlp.:	14.02	Total Casing Vol. Removed:	19

Volume Purged (gal.)	Time	DTW	Conductivity (uS/cm)	pH	Temp. °C	Turbidity (NTU)	Comments:
Initial	1101	–	474	7.50	24.2	+1000	Dark brown
1.75	1103	–	453	7.18	23.1	+1000	Dark brown
3.5	1105	–	452	7.13	22.7	+1000	Dark brown
5.25	1107	–	454	7.21	24.6	+1000	Dark Brown
7	1109	–	464	7.06	25.0	+1000	Dark Brown
8.75	1113	–	462	7.06	25.2	+1000	Dark Brown
10.5	1116	–	464	7.05	25.2	+1000	Dark Brown
12.25	1118	–	473	7.10	23.4	+1000	Dark Brown } went dry @ 13 gal
14	1148	–	450	7.45	26.9	+1000	Dark Brown
15.75	1150	–	477	7.18	23.6	874	light Brown
17.5	[redacted] 1231	–	580	7.31	25.7	701	light Brown } went dry @ 16 gal

pH Calibration

Buffer Solution: 3 Point Calibration: 4 , 7 , 10

Notes:

Environmental Field Services

2

Well Development Record

Project Name: 3600 MacArthur Blvd Date: 10/22/13

Project Number: 645 Well ID: MW-2

Method Of Purging: Honda Pump Well Diameter: 2

Initial Depth to Water: _____ Casing Volume: _____

Total Depth of Well: _____ Pump Depth: _____

Total Depth After Dvlp.: _____ Total Casing Vol. Removed: _____

Volume Purged (gal.)	Time	DTW	Conductivity (uS/cm)	pH	Temp. °C	Turbidity (NTU)	Comments:
~~Initial~~							
19.25	1234	–	488	7.16	24.2	438	light brown
21	1238	–	486	7.10	24.2	264	Clearing
22.75	1240	–	483	7.07	25.7	211	Clearing
24.5	1242	–	481	7.06	23.9	169	Clearing
26.25	1326	–	480	7.27	28.4	274	Clearing
28	1329	–	481	7.13	24.6	132	Clearing
29.75	1332	–	483	7.10	24.5	90.3	Clearing
31.5	1334	–	483	7.07	24.7	42.9	Clearing
33.25	1336	–	481	7.05	24.6	20.5	Clear

pH Calibration

Buffer Solution: 3 Point Calibration: 4 , 7 , 10

Notes: _____

Environmental Field Services

Well Development Record

Project Name:	3600 MacArthur Blvd	Date:	10/22/13
Project Number:	645	Well ID:	MW-3
Method Of Purging:	Honda Pump	Well Diameter:	2
Initial Depth to Water:	7.21	Casing Volume:	6.61 Ft. (1.12)
Total Depth of Well:	13.82	Pump Depth:	13.80
Total Depth After Dvlp.:	13.95	Total Casing Vol. Removed:	9

Volume Purged (gal.)	Time	DTW	Conductivity (uS/cm)	pH	Temp. °C	Turbidity (NTU)	Comments:
Initial	1221	—	550	7.35	28.0	+1000	Dark Brown
1.25	1223	—	618	6.93	25.9	+1000	Dark Brown
2.5	1225	—	627	6.89	23.5	+1000	Dark Brown
3.75	1227	—	621	6.86	25.5	+1000	Dark Brown
5	1246	—	484	7.23	26.8	+1000	Dark Brown
6.25	1358	—	484	7.31	26.0	+1000	Dark Brown
7.5	1401	—	575	7.11	25.2	887	light Brown
8.75	1403	—	589	7.07	25.9	640	light Brown
10	~~1449~~	—	1017	6.86	29.6	322	Clearing
11.25	1517	—	319	7.20	25.3	194	Clearing
12.5		—					

went dry @ 4 gal

went dry @ 6 gal

went dry @ volume

went dry @ volume

went dry @ volume

pH Calibration

Buffer Solution: 3 Point Calibration: 4 , 7 , 10

Notes: Recovery is really slow!!

Daily Field Report

Date: October 22 2013

Company: RGA Environmental

Contact: Paul King

Project Name: 3600 MacArthur Blvd

Location: Oakland, CA

Prepared by:

Environmental Field Services, LLC

Peter Arroyo

227 Palomino Way

Patterson CA, 95363

(209)321-6255

Fax: (209) 892-1190

Notes:

Arrive on-site, locate & open well, allow well to equilibrate. PH meter calibrated using 3 point calibration.

Wells were gauged using a Solonist water level meter(TD & DTW). Well were surged with a 1.66" surge block for approximately 10-15 minutes each.

All equipment was decontaminated before arriving and between each use using Alcanox, water & steam.

The wells were purged using a Honda pump, new tubing was used for each well.

MW-1 a total of 15 volumes were removed for a total of 26.25 gallons, Turbidity 28.6

MW-2 a total of 19 volumes were removed for a total of 33.25 gallons, Turbidity 20.5

MW-3 a total of 9 volumes were removed for a total of 11.25 gallons, Turbidity 25.3

All purge water was left on site, 2 drums are on site approx 75 gallons, all drums were sealed and labeled.

Signature:

APPENDIX B

WELL MONITORING AND PURGE DATA SHEETS

RGA Environmental, Inc.
Groundwater Monitoring/Well Purging Data Sheet

Site Name 3600 N. ARTHUR BLVD
Job Number 0645
TOC to Water (ft.) 4.15
Well Depth (ft.) 15
Well Diameter 2"
Flow Rate (mL/minute) 350
Start Purge Time 1010

Well No. MW1
Date 10/25/13
Sheen NONE
Free Product Thickness 0
Sample Collection Method PERISTALTIC PUMP & NEW PE TUBING

Time	Vol. Purged (mL)	Depth to Water (ft.)	pH	Electrical Conductivity (µS/cm)	Temperature (C°)	Dissolved Oxygen (mg/L)	Oxidation/ Reduction Potential (mV)	Turbidity (NTU)
1011	350	4.37	6.86	287.8	22.3	1.32	62.1	0.00
1014	1,400	4.48	6.89	286.3	22.3	0.84	53.8	0.00
1017	2,450	4.56	6.89	285.8	22.4	0.61	44.1	0.00
1020	3,500	4.61	6.91	285.8	22.5	0.50	35.1	0.00
1023	4,550	4.64	6.91	285.2	22.4	0.47	29.4	0.00
1026	5,600	4.67	6.93	285.5	22.4	0.41	24.1	0.00

NOTES

NO odor or sheen.
Sample MW1 collected @ 1030

Stability Parameters
p.H. = +/- 0.1
Sp. Conductivity = +/-3%
Turbidity = +/- 10%
D.O. = +/- 10%

RGA Environmental, Inc.
Groundwater Monitoring/Well Purging Data Sheet

Site Name 3600 Mt. ARTHUR BLVD.
Job Number 0645
TOC to Water (ft.) 4.41
Well Depth (ft.) 15
Well Diameter 2"
Flow Rate (mL/minute) 350
Start Purge Time 1051

Well No. MW2
Date 10/25/13
Sheen NONE
Free Product Thickness Ø
Sample Collection Method PERISTALTIC PUMP & NEW PE TUBING.

Time	Vol. Purged (mL)	Depth to Water (ft.)	pH	Electrical Conductivity (µS/cm)	Temperature (C°)	Dissolved Oxygen (mg/L)	Oxidation/ Reduction Potential (mV)	Turbidity (NTU)
1052	350	4.51	6.81	271.7	21.3	3.58	107.8	0.00
1055	1,400	4.61	6.86	271.3	21.3	2.79	112.8	0.00
1058	2,450	4.69	6.86	271.9	21.4	2.30	123.7	0.00
1101	3,500	4.76	6.86	271.9	21.4	2.23	130.6	0.00
1104	4,550	4.79	6.86	271.7	21.3	1.90	135.3	0.00
1107	5,600	4.83	6.86	271.4	21.3	1.90	138.9	0.00

NOTES

Stability Parameters
p.H. = +/- 0.1
Sp. Conductivity = +/-3%
Turbidity = +/- 10%
D.O. = +/- 10%

no odor or sheen
Sample MW2 collected at 1110

RGA Environmental, Inc.
Groundwater Monitoring/Well Purging Data Sheet

Site Name 3600 MCARTHUR BLVD.
Job Number 0645
TOC to Water (ft.) 7.52
Well Depth (ft.) 15
Well Diameter 2"
Flow Rate (mL/minute) 350
Start Purge Time 1132

Well No. MW3
Date 10/25/13
Sheen NONE
Free Product Thickness Ø
Sample Collection Method PERISTALTIC PUMP & NEW PE TUBING

Time	Vol. Purged (mL)	Depth to Water (ft.)	pH	Electrical Conductivity (µS/cm)	Temperature (C°)	Dissolved Oxygen (mg/L)	Oxidation/ Reduction Potential (mV)	Turbidity (NTU)
1133	350	7.21	7.01	347.8	21.0	10.78	127.1	0.00
1136	1,400	7.57	6.92	347.6	21.0	4.72	128.3	0.00
1139	2,450	7.94	6.90	346.5	21.0	4.81	128.8	0.00
1142	3,500	8.19	6.89	345.0	21.1	4.85	129.0	0.00
1145	4,550	8.59	6.88	344.4	21.0	4.81	129.5	0.00
1148	5,600	8.91	6.88	343.5	21.0	4.95	129.7	0.00

NOTES

No odor or sheen.
Sample MW3 collected at 1150

Stability Parameters
p.H. = +/- 0.1
Sp. Conductivity = +/-3%
Turbidity = +/- 10%
D.O. = +/- 10%

APPENDIX C

LABORATORY REPORTS AND CHAIN OF CUSTODY DOCUMENTATION

McCampbell Analytical, Inc.

"When Quality Counts"

Analytical Report

WorkOrder: 1310874

Report Created for: RGA Environmental
1466 66th Street
Emeryville, CA 94608

Project Contact: Paul King
Project P.O.:
Project Name: #LOU1533737/0645; 3600 McArthur Blvd. Oakland, CA
Project Received: 10/25/2013

Analytical Report reviewed & approved for release on 11/04/2013 by:

Question about your data?

Click here to email McCampbell

Angela Rydelius,
Laboratory Manager

1534 Willow Pass Rd. Pittsburg, CA 94565 ♦ TEL: (877) 252-9262 ♦ FAX: (925) 252-9269 ♦ www.mccampbell.com
NELAP: 12283CA ♦ ELAP: 1644 ♦ ISO/IEC: 17025:2005 ♦ WSDE: C972-11 ♦ ADEC: UST-098 ♦ UCMR3

McCampbell Analytical, Inc.
"When Quality Counts"

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Glossary of Terms & Qualifier Definitions

Client: RGA Environmental
Project: #LOU1533737/0645; 3600 McArthur Blvd. Oakland, CA
WorkOrder: 1310874

Glossary Abbreviation	Description
95% Interval	95% Confident Interval
DF	Dilution Factor
DUP	Duplicate
LCS	Laboratory Control Sample
MB	Method Blank
MB % Rec	% Recovery of Surrogate in Method Blank, if applicable
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ND	Not detected at or above the indicated MDL or RL
NR	Analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix; or sample diluted due to high matrix or analyte content.
RD	Relative Difference
RL	Reporting Limit
RPD	Relative Percent Deviation
SPK Val	Spike Value
SPKRef Val	Spike Reference Value

Analytical Qualifier	
d1	weakly modified or unmodified gasoline is significant

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Analytical Report

Client:	RGA Environmental	**WorkOrder:**	1310874
Project:	#LOU1533737/0645; 3600 McArthur Blvd. Oakland	**Extraction Method**	SW5030B
Date Received:	10/25/13 20:07	**Analytical Method:**	SW8260B
Date Prepared:	10/28/13	**Unit:**	µg/L

Volatile Organics by P&T and GC/MS (Basic Target List)

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MW1	**1310874-001B**	**Water**	**10/25/2013 10:10**	**GC18**	**83410**

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	10	1	10/28/2013 13:56
tert-Amyl methyl ether (TAME)	ND	0.50	1	10/28/2013 13:56
Benzene	**2.9**	0.50	1	10/28/2013 13:56
Bromobenzene	ND	0.50	1	10/28/2013 13:56
Bromochloromethane	ND	0.50	1	10/28/2013 13:56
Bromodichloromethane	ND	0.50	1	10/28/2013 13:56
Bromoform	ND	0.50	1	10/28/2013 13:56
Bromomethane	ND	0.50	1	10/28/2013 13:56
2-Butanone (MEK)	ND	2.0	1	10/28/2013 13:56
t-Butyl alcohol (TBA)	ND	2.0	1	10/28/2013 13:56
n-Butyl benzene	ND	0.50	1	10/28/2013 13:56
sec-Butyl benzene	ND	0.50	1	10/28/2013 13:56
tert-Butyl benzene	ND	0.50	1	10/28/2013 13:56
Carbon Disulfide	ND	0.50	1	10/28/2013 13:56
Carbon Tetrachloride	ND	0.50	1	10/28/2013 13:56
Chlorobenzene	ND	0.50	1	10/28/2013 13:56
Chloroethane	ND	0.50	1	10/28/2013 13:56
Chloroform	ND	0.50	1	10/28/2013 13:56
Chloromethane	ND	0.50	1	10/28/2013 13:56
2-Chlorotoluene	ND	0.50	1	10/28/2013 13:56
4-Chlorotoluene	ND	0.50	1	10/28/2013 13:56
Dibromochloromethane	ND	0.50	1	10/28/2013 13:56
1,2-Dibromo-3-chloropropane	ND	0.20	1	10/28/2013 13:56
1,2-Dibromoethane (EDB)	ND	0.50	1	10/28/2013 13:56
Dibromomethane	ND	0.50	1	10/28/2013 13:56
1,2-Dichlorobenzene	ND	0.50	1	10/28/2013 13:56
1,3-Dichlorobenzene	ND	0.50	1	10/28/2013 13:56
1,4-Dichlorobenzene	ND	0.50	1	10/28/2013 13:56
Dichlorodifluoromethane	ND	0.50	1	10/28/2013 13:56
1,1-Dichloroethane	ND	0.50	1	10/28/2013 13:56
1,2-Dichloroethane (1,2-DCA)	ND	0.50	1	10/28/2013 13:56
1,1-Dichloroethene	ND	0.50	1	10/28/2013 13:56
cis-1,2-Dichloroethene	ND	0.50	1	10/28/2013 13:56
trans-1,2-Dichloroethene	ND	0.50	1	10/28/2013 13:56
1,2-Dichloropropane	ND	0.50	1	10/28/2013 13:56
1,3-Dichloropropane	ND	0.50	1	10/28/2013 13:56
2,2-Dichloropropane	ND	0.50	1	10/28/2013 13:56
1,1-Dichloropropene	ND	0.50	1	10/28/2013 13:56

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Analytical Report

Client:	RGA Environmental	**WorkOrder:**	1310874
Project:	#LOU1533737/0645; 3600 McArthur Blvd. Oakland	**Extraction Method**	SW5030B
Date Received:	10/25/13 20:07	**Analytical Method:**	SW8260B
Date Prepared:	10/28/13	**Unit:**	µg/L

Volatile Organics by P&T and GC/MS (Basic Target List)

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MW1	**1310874-001B**	**Water**	**10/25/2013 10:10**	**GC18**	**83410**

Analytes	Result	RL	DF	Date Analyzed
cis-1,3-Dichloropropene	ND	0.50	1	10/28/2013 13:56
trans-1,3-Dichloropropene	ND	0.50	1	10/28/2013 13:56
Diisopropyl ether (DIPE)	ND	0.50	1	10/28/2013 13:56
Ethylbenzene	ND	0.50	1	10/28/2013 13:56
Ethyl tert-butyl ether (ETBE)	ND	0.50	1	10/28/2013 13:56
Freon 113	ND	0.50	1	10/28/2013 13:56
Hexachlorobutadiene	ND	0.50	1	10/28/2013 13:56
Hexachloroethane	ND	0.50	1	10/28/2013 13:56
2-Hexanone	ND	0.50	1	10/28/2013 13:56
Isopropylbenzene	ND	0.50	1	10/28/2013 13:56
4-Isopropyl toluene	ND	0.50	1	10/28/2013 13:56
Methyl-t-butyl ether (MTBE)	ND	0.50	1	10/28/2013 13:56
Methylene chloride	ND	0.50	1	10/28/2013 13:56
4-Methyl-2-pentanone (MIBK)	ND	0.50	1	10/28/2013 13:56
Naphthalene	ND	0.50	1	10/28/2013 13:56
n-Propyl benzene	ND	0.50	1	10/28/2013 13:56
Styrene	ND	0.50	1	10/28/2013 13:56
1,1,1,2-Tetrachloroethane	ND	0.50	1	10/28/2013 13:56
1,1,2,2-Tetrachloroethane	ND	0.50	1	10/28/2013 13:56
Tetrachloroethene	ND	0.50	1	10/28/2013 13:56
Toluene	ND	0.50	1	10/28/2013 13:56
1,2,3-Trichlorobenzene	ND	0.50	1	10/28/2013 13:56
1,2,4-Trichlorobenzene	ND	0.50	1	10/28/2013 13:56
1,1,1-Trichloroethane	ND	0.50	1	10/28/2013 13:56
1,1,2-Trichloroethane	ND	0.50	1	10/28/2013 13:56
Trichloroethene	ND	0.50	1	10/28/2013 13:56
Trichlorofluoromethane	ND	0.50	1	10/28/2013 13:56
1,2,3-Trichloropropane	ND	0.50	1	10/28/2013 13:56
1,2,4-Trimethylbenzene	ND	0.50	1	10/28/2013 13:56
1,3,5-Trimethylbenzene	ND	0.50	1	10/28/2013 13:56
Vinyl Chloride	ND	0.50	1	10/28/2013 13:56
Xylenes, Total	ND	0.50	1	10/28/2013 13:56

Surrogates	REC (%)	Limits	
Dibromofluoromethane	102	70-130	10/28/2013 13:56
Toluene-d8	96	70-130	10/28/2013 13:56
4-BFB	96	70-130	10/28/2013 13:56

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Analytical Report

Client:	RGA Environmental	**WorkOrder:**	1310874
Project:	#LOU1533737/0645; 3600 McArthur Blvd. Oakland	**Extraction Method**	SW5030B
Date Received:	10/25/13 20:07	**Analytical Method:**	SW8260B
Date Prepared:	10/28/13	**Unit:**	µg/L

Volatile Organics by P&T and GC/MS (Basic Target List)

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MW2	**1310874-002B**	**Water**	**10/25/2013 11:10**	**GC18**	**83410**

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	10	1	10/28/2013 14:34
tert-Amyl methyl ether (TAME)	ND	0.50	1	10/28/2013 14:34
Benzene	ND	0.50	1	10/28/2013 14:34
Bromobenzene	ND	0.50	1	10/28/2013 14:34
Bromochloromethane	ND	0.50	1	10/28/2013 14:34
Bromodichloromethane	ND	0.50	1	10/28/2013 14:34
Bromoform	ND	0.50	1	10/28/2013 14:34
Bromomethane	ND	0.50	1	10/28/2013 14:34
2-Butanone (MEK)	ND	2.0	1	10/28/2013 14:34
t-Butyl alcohol (TBA)	ND	2.0	1	10/28/2013 14:34
n-Butyl benzene	ND	0.50	1	10/28/2013 14:34
sec-Butyl benzene	ND	0.50	1	10/28/2013 14:34
tert-Butyl benzene	ND	0.50	1	10/28/2013 14:34
Carbon Disulfide	ND	0.50	1	10/28/2013 14:34
Carbon Tetrachloride	ND	0.50	1	10/28/2013 14:34
Chlorobenzene	ND	0.50	1	10/28/2013 14:34
Chloroethane	ND	0.50	1	10/28/2013 14:34
Chloroform	ND	0.50	1	10/28/2013 14:34
Chloromethane	ND	0.50	1	10/28/2013 14:34
2-Chlorotoluene	ND	0.50	1	10/28/2013 14:34
4-Chlorotoluene	ND	0.50	1	10/28/2013 14:34
Dibromochloromethane	ND	0.50	1	10/28/2013 14:34
1,2-Dibromo-3-chloropropane	ND	0.20	1	10/28/2013 14:34
1,2-Dibromoethane (EDB)	ND	0.50	1	10/28/2013 14:34
Dibromomethane	ND	0.50	1	10/28/2013 14:34
1,2-Dichlorobenzene	ND	0.50	1	10/28/2013 14:34
1,3-Dichlorobenzene	ND	0.50	1	10/28/2013 14:34
1,4-Dichlorobenzene	ND	0.50	1	10/28/2013 14:34
Dichlorodifluoromethane	ND	0.50	1	10/28/2013 14:34
1,1-Dichloroethane	ND	0.50	1	10/28/2013 14:34
1,2-Dichloroethane (1,2-DCA)	ND	0.50	1	10/28/2013 14:34
1,1-Dichloroethene	ND	0.50	1	10/28/2013 14:34
cis-1,2-Dichloroethene	ND	0.50	1	10/28/2013 14:34
trans-1,2-Dichloroethene	ND	0.50	1	10/28/2013 14:34
1,2-Dichloropropane	ND	0.50	1	10/28/2013 14:34
1,3-Dichloropropane	ND	0.50	1	10/28/2013 14:34
2,2-Dichloropropane	ND	0.50	1	10/28/2013 14:34
1,1-Dichloropropene	ND	0.50	1	10/28/2013 14:34

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Analytical Report

Client:	RGA Environmental	**WorkOrder:**	1310874
Project:	#LOU1533737/0645; 3600 McArthur Blvd. Oakland	**Extraction Method**	SW5030B
Date Received:	10/25/13 20:07	**Analytical Method:**	SW8260B
Date Prepared:	10/28/13	**Unit:**	µg/L

Volatile Organics by P&T and GC/MS (Basic Target List)

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MW2	**1310874-002B**	**Water**	**10/25/2013 11:10**	**GC18**	**83410**

Analytes	Result	RL	DF	Date Analyzed
cis-1,3-Dichloropropene	ND	0.50	1	10/28/2013 14:34
trans-1,3-Dichloropropene	ND	0.50	1	10/28/2013 14:34
Diisopropyl ether (DIPE)	ND	0.50	1	10/28/2013 14:34
Ethylbenzene	ND	0.50	1	10/28/2013 14:34
Ethyl tert-butyl ether (ETBE)	ND	0.50	1	10/28/2013 14:34
Freon 113	ND	0.50	1	10/28/2013 14:34
Hexachlorobutadiene	ND	0.50	1	10/28/2013 14:34
Hexachloroethane	ND	0.50	1	10/28/2013 14:34
2-Hexanone	ND	0.50	1	10/28/2013 14:34
Isopropylbenzene	ND	0.50	1	10/28/2013 14:34
4-Isopropyl toluene	ND	0.50	1	10/28/2013 14:34
Methyl-t-butyl ether (MTBE)	ND	0.50	1	10/28/2013 14:34
Methylene chloride	ND	0.50	1	10/28/2013 14:34
4-Methyl-2-pentanone (MIBK)	ND	0.50	1	10/28/2013 14:34
Naphthalene	ND	0.50	1	10/28/2013 14:34
n-Propyl benzene	ND	0.50	1	10/28/2013 14:34
Styrene	ND	0.50	1	10/28/2013 14:34
1,1,1,2-Tetrachloroethane	ND	0.50	1	10/28/2013 14:34
1,1,2,2-Tetrachloroethane	ND	0.50	1	10/28/2013 14:34
Tetrachloroethene	ND	0.50	1	10/28/2013 14:34
Toluene	ND	0.50	1	10/28/2013 14:34
1,2,3-Trichlorobenzene	ND	0.50	1	10/28/2013 14:34
1,2,4-Trichlorobenzene	ND	0.50	1	10/28/2013 14:34
1,1,1-Trichloroethane	ND	0.50	1	10/28/2013 14:34
1,1,2-Trichloroethane	ND	0.50	1	10/28/2013 14:34
Trichloroethene	ND	0.50	1	10/28/2013 14:34
Trichlorofluoromethane	ND	0.50	1	10/28/2013 14:34
1,2,3-Trichloropropane	ND	0.50	1	10/28/2013 14:34
1,2,4-Trimethylbenzene	ND	0.50	1	10/28/2013 14:34
1,3,5-Trimethylbenzene	ND	0.50	1	10/28/2013 14:34
Vinyl Chloride	ND	0.50	1	10/28/2013 14:34
Xylenes, Total	ND	0.50	1	10/28/2013 14:34

Surrogates	REC (%)	Limits	
Dibromofluoromethane	103	70-130	10/28/2013 14:34
Toluene-d8	96	70-130	10/28/2013 14:34
4-BFB	99	70-130	10/28/2013 14:34

(Cont.)

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http://www.mccampbell.com / E-mail: main@mccampbell.com

Analytical Report

Client:	RGA Environmental	**WorkOrder:**	1310874
Project:	#LOU1533737/0645; 3600 McArthur Blvd. Oakland	**Extraction Method**	SW5030B
Date Received:	10/25/13 20:07	**Analytical Method:**	SW8260B
Date Prepared:	10/28/13	**Unit:**	µg/L

Volatile Organics by P&T and GC/MS (Basic Target List)

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MW3	**1310874-003B**	**Water**	**10/25/2013 11:50**	**GC18**	**83410**

Analytes	Result	RL	DF	Date Analyzed
Acetone	ND	10	1	10/28/2013 17:08
tert-Amyl methyl ether (TAME)	ND	0.50	1	10/28/2013 17:08
Benzene	ND	0.50	1	10/28/2013 17:08
Bromobenzene	ND	0.50	1	10/28/2013 17:08
Bromochloromethane	ND	0.50	1	10/28/2013 17:08
Bromodichloromethane	ND	0.50	1	10/28/2013 17:08
Bromoform	ND	0.50	1	10/28/2013 17:08
Bromomethane	ND	0.50	1	10/28/2013 17:08
2-Butanone (MEK)	ND	2.0	1	10/28/2013 17:08
t-Butyl alcohol (TBA)	ND	2.0	1	10/28/2013 17:08
n-Butyl benzene	ND	0.50	1	10/28/2013 17:08
sec-Butyl benzene	ND	0.50	1	10/28/2013 17:08
tert-Butyl benzene	ND	0.50	1	10/28/2013 17:08
Carbon Disulfide	ND	0.50	1	10/28/2013 17:08
Carbon Tetrachloride	ND	0.50	1	10/28/2013 17:08
Chlorobenzene	ND	0.50	1	10/28/2013 17:08
Chloroethane	ND	0.50	1	10/28/2013 17:08
Chloroform	ND	0.50	1	10/28/2013 17:08
Chloromethane	ND	0.50	1	10/28/2013 17:08
2-Chlorotoluene	ND	0.50	1	10/28/2013 17:08
4-Chlorotoluene	ND	0.50	1	10/28/2013 17:08
Dibromochloromethane	ND	0.50	1	10/28/2013 17:08
1,2-Dibromo-3-chloropropane	ND	0.20	1	10/28/2013 17:08
1,2-Dibromoethane (EDB)	ND	0.50	1	10/28/2013 17:08
Dibromomethane	ND	0.50	1	10/28/2013 17:08
1,2-Dichlorobenzene	ND	0.50	1	10/28/2013 17:08
1,3-Dichlorobenzene	ND	0.50	1	10/28/2013 17:08
1,4-Dichlorobenzene	ND	0.50	1	10/28/2013 17:08
Dichlorodifluoromethane	ND	0.50	1	10/28/2013 17:08
1,1-Dichloroethane	ND	0.50	1	10/28/2013 17:08
1,2-Dichloroethane (1,2-DCA)	ND	0.50	1	10/28/2013 17:08
1,1-Dichloroethene	ND	0.50	1	10/28/2013 17:08
cis-1,2-Dichloroethene	ND	0.50	1	10/28/2013 17:08
trans-1,2-Dichloroethene	ND	0.50	1	10/28/2013 17:08
1,2-Dichloropropane	ND	0.50	1	10/28/2013 17:08
1,3-Dichloropropane	ND	0.50	1	10/28/2013 17:08
2,2-Dichloropropane	ND	0.50	1	10/28/2013 17:08
1,1-Dichloropropene	ND	0.50	1	10/28/2013 17:08

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Analytical Report

Client:	RGA Environmental	**WorkOrder:**	1310874
Project:	#LOU1533737/0645; 3600 McArthur Blvd. Oakland	**Extraction Method**	SW5030B
Date Received:	10/25/13 20:07	**Analytical Method:**	SW8260B
Date Prepared:	10/28/13	**Unit:**	µg/L

Volatile Organics by P&T and GC/MS (Basic Target List)

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MW3	**1310874-003B**	**Water**	**10/25/2013 11:50**	**GC18**	**83410**

Analytes	Result	RL	DF	Date Analyzed
cis-1,3-Dichloropropene	ND	0.50	1	10/28/2013 17:08
trans-1,3-Dichloropropene	ND	0.50	1	10/28/2013 17:08
Diisopropyl ether (DIPE)	ND	0.50	1	10/28/2013 17:08
Ethylbenzene	ND	0.50	1	10/28/2013 17:08
Ethyl tert-butyl ether (ETBE)	ND	0.50	1	10/28/2013 17:08
Freon 113	ND	0.50	1	10/28/2013 17:08
Hexachlorobutadiene	ND	0.50	1	10/28/2013 17:08
Hexachloroethane	ND	0.50	1	10/28/2013 17:08
2-Hexanone	ND	0.50	1	10/28/2013 17:08
Isopropylbenzene	ND	0.50	1	10/28/2013 17:08
4-Isopropyl toluene	ND	0.50	1	10/28/2013 17:08
Methyl-t-butyl ether (MTBE)	**0.85**	0.50	1	10/28/2013 17:08
Methylene chloride	ND	0.50	1	10/28/2013 17:08
4-Methyl-2-pentanone (MIBK)	ND	0.50	1	10/28/2013 17:08
Naphthalene	ND	0.50	1	10/28/2013 17:08
n-Propyl benzene	ND	0.50	1	10/28/2013 17:08
Styrene	ND	0.50	1	10/28/2013 17:08
1,1,1,2-Tetrachloroethane	ND	0.50	1	10/28/2013 17:08
1,1,2,2-Tetrachloroethane	ND	0.50	1	10/28/2013 17:08
Tetrachloroethene	ND	0.50	1	10/28/2013 17:08
Toluene	ND	0.50	1	10/28/2013 17:08
1,2,3-Trichlorobenzene	ND	0.50	1	10/28/2013 17:08
1,2,4-Trichlorobenzene	ND	0.50	1	10/28/2013 17:08
1,1,1-Trichloroethane	ND	0.50	1	10/28/2013 17:08
1,1,2-Trichloroethane	ND	0.50	1	10/28/2013 17:08
Trichloroethene	ND	0.50	1	10/28/2013 17:08
Trichlorofluoromethane	ND	0.50	1	10/28/2013 17:08
1,2,3-Trichloropropane	ND	0.50	1	10/28/2013 17:08
1,2,4-Trimethylbenzene	ND	0.50	1	10/28/2013 17:08
1,3,5-Trimethylbenzene	ND	0.50	1	10/28/2013 17:08
Vinyl Chloride	ND	0.50	1	10/28/2013 17:08
Xylenes, Total	ND	0.50	1	10/28/2013 17:08

Surrogates	REC (%)	Limits	
Dibromofluoromethane	107	70-130	10/28/2013 17:08
Toluene-d8	96	70-130	10/28/2013 17:08
4-BFB	100	70-130	10/28/2013 17:08

CDPH ELAP 1644 ♦ NELAP 12283CA KF Analyst's Initial Angela Rydelius, Lab Manager

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Analytical Report

Client:	RGA Environmental	**WorkOrder:**	1310874
Project:	#LOU1533737/0645; 3600 McArthur Blvd. Oakland	**Extraction Method**	SW5030B
Date Received:	10/25/13 20:07	**Analytical Method:**	SW8021B/8015Bm
Date Prepared:	10/29/13	**Unit:**	µg/L

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MW1	**1310874-001A**	**Water**	**10/25/2013 10:10**	**GC3**	**83360**

Analytes	Result	RL	DF	Date Analyzed
TPH(g)	**160**	50	1	10/29/2013 04:30
MTBE	**---**	5.0	1	10/29/2013 04:30
Benzene	**---**	0.50	1	10/29/2013 04:30
Toluene	**---**	0.50	1	10/29/2013 04:30
Ethylbenzene	**---**	0.50	1	10/29/2013 04:30
Xylenes	**---**	0.50	1	10/29/2013 04:30

Surrogates	REC (%)	Limits	Analytical Comments: d1	
aaa-TFT	127	70-130		10/29/2013 04:30

MW2	1310874-002A	Water	10/25/2013 11:10	GC3	83360

Analytes	Result	RL	DF	Date Analyzed
TPH(g)	ND	50	1	10/29/2013 05:59
MTBE	**---**	5.0	1	10/29/2013 05:59
Benzene	**---**	0.50	1	10/29/2013 05:59
Toluene	**---**	0.50	1	10/29/2013 05:59
Ethylbenzene	**---**	0.50	1	10/29/2013 05:59
Xylenes	**---**	0.50	1	10/29/2013 05:59

Surrogates	REC (%)	Limits	
aaa-TFT	103	70-130	10/29/2013 05:59

MW3	1310874-003A	Water	10/25/2013 11:50	GC3	83360

Analytes	Result	RL	DF	Date Analyzed
TPH(g)	ND	50	1	10/29/2013 06:28
MTBE	**---**	5.0	1	10/29/2013 06:28
Benzene	**---**	0.50	1	10/29/2013 06:28
Toluene	**---**	0.50	1	10/29/2013 06:28
Ethylbenzene	**---**	0.50	1	10/29/2013 06:28
Xylenes	**---**	0.50	1	10/29/2013 06:28

Surrogates	REC (%)	Limits	
aaa-TFT	103	70-130	10/29/2013 06:28

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Analytical Report

Client:	RGA Environmental	**WorkOrder:**	1310874
Project:	#LOU1533737/0645; 3600 McArthur Blvd. Oakland	**Extraction Method**	SW3510C
Date Received:	10/25/13 20:07	**Analytical Method:**	SW8015B
Date Prepared:	10/25/13	**Unit:**	µg/L

Total Extractable Petroleum Hydrocarbons

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MW1	**1310874-001A**	**Water**	**10/25/2013 10:10**	**GC6A**	**83294**

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	50	1	10/31/2013 20:32
TPH-Motor Oil (C18-C36)	ND	250	1	10/31/2013 20:32
TPH-Bunker Oil (C10-C36)	ND	100	1	10/31/2013 20:32
Surrogates	REC (%)	Limits		
C9	98	70-130		10/31/2013 20:32

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MW2	**1310874-002A**	**Water**	**10/25/2013 11:10**	**GC6A**	**83294**

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	50	1	10/31/2013 19:19
TPH-Motor Oil (C18-C36)	ND	250	1	10/31/2013 19:19
TPH-Bunker Oil (C10-C36)	ND	100	1	10/31/2013 19:19
Surrogates	REC (%)	Limits		
C9	87	70-130		10/31/2013 19:19

Client ID	Lab ID	Matrix/ExtType	Date Collected	Instrument	Batch ID
MW3	**1310874-003A**	**Water**	**10/25/2013 11:50**	**GC11A**	**83294**

Analytes	Result	RL	DF	Date Analyzed
TPH-Diesel (C10-C23)	ND	50	1	11/02/2013 00:45
TPH-Motor Oil (C18-C36)	ND	250	1	11/02/2013 00:45
TPH-Bunker Oil (C10-C36)	ND	100	1	11/02/2013 00:45
Surrogates	REC (%)	Limits		
C9	99	70-130		11/02/2013 00:45

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Quality Control Report

Client:	RGA Environmental	**WorkOrder:**	1310874
Date Prepared:	10/25/13	**BatchID:**	83294
Date Analyzed:	10/26/13	**Extraction Method**	SW3510C
Instrument:	GC9b	**Analytical Method:**	SW8015B
Matrix:	Water	**Unit:**	µg/L
Project:	#LOU1533737/0645; 3600 McArthur Blvd. Oakland, CA	**Sample ID:**	MB/LCS-83294

QC SUMMARY REPORT FOR SW8015B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
TPH-Diesel (C10-C23)	ND	992	50	1000	-	99.2	70-130
Surrogate Recovery							
C9	530.4	536.6		625	85	86	70-130

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Quality Control Report

Client:	RGA Environmental	**WorkOrder:**	1310874
Date Prepared:	10/29/13	**BatchID:**	83410
Date Analyzed:	10/28/13	**Extraction Method**	SW5030B
Instrument:	GC18	**Analytical Method:**	SW8260B
Matrix:	Water	**Unit:**	µg/L
Project:	#LOU1533737/0645; 3600 McArthur Blvd. Oakland, CA	**Sample ID:**	MB/LCS-83410 1310874-002BMS/MSD

QC SUMMARY REPORT FOR SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Acetone	ND	-	10	-	-	-	-
tert-Amyl methyl ether (TAME)	ND	20.94	0.50	20	-	105	70-130
Benzene	ND	19.68	0.50	20	-	98.4	70-130
Bromobenzene	ND	-	0.50	-	-	-	-
Bromochloromethane	ND	-	0.50	-	-	-	-
Bromodichloromethane	ND	-	0.50	-	-	-	-
Bromoform	ND	-	0.50	-	-	-	-
Bromomethane	ND	-	0.50	-	-	-	-
2-Butanone (MEK)	ND	-	2.0	-	-	-	-
t-Butyl alcohol (TBA)	ND	83.02	2.0	80	-	104	70-130
n-Butyl benzene	ND	-	0.50	-	-	-	-
sec-Butyl benzene	ND	-	0.50	-	-	-	-
tert-Butyl benzene	ND	-	0.50	-	-	-	-
Carbon Disulfide	ND	-	0.50	-	-	-	-
Carbon Tetrachloride	ND	-	0.50	-	-	-	-
Chlorobenzene	ND	19.1	0.50	20	-	95.5	70-130
Chloroethane	ND	-	0.50	-	-	-	-
Chloroform	ND	-	0.50	-	-	-	-
Chloromethane	ND	-	0.50	-	-	-	-
2-Chlorotoluene	ND	-	0.50	-	-	-	-
4-Chlorotoluene	ND	-	0.50	-	-	-	-
Dibromochloromethane	ND	-	0.50	-	-	-	-
1,2-Dibromo-3-chloropropane	ND	-	0.20	-	-	-	-
1,2-Dibromoethane (EDB)	ND	18.76	0.50	20	-	93.8	70-130
Dibromomethane	ND	-	0.50	-	-	-	-
1,2-Dichlorobenzene	ND	-	0.50	-	-	-	-
1,3-Dichlorobenzene	ND	-	0.50	-	-	-	-
1,4-Dichlorobenzene	ND	-	0.50	-	-	-	-
Dichlorodifluoromethane	ND	-	0.50	-	-	-	-
1,1-Dichloroethane	ND	-	0.50	-	-	-	-
1,2-Dichloroethane (1,2-DCA)	ND	17.99	0.50	20	-	89.9	70-130
1,1-Dichloroethene	ND	17.43	0.50	20	-	87.1	70-130
cis-1,2-Dichloroethene	ND	-	0.50	-	-	-	-
trans-1,2-Dichloroethene	ND	-	0.50	-	-	-	-
1,2-Dichloropropane	ND	-	0.50	-	-	-	-
1,3-Dichloropropane	ND	-	0.50	-	-	-	-
2,2-Dichloropropane	ND	-	0.50	-	-	-	-
1,1-Dichloropropene	ND	-	0.50	-	-	-	-
cis-1,3-Dichloropropene	ND	-	0.50	-	-	-	-
trans-1,3-Dichloropropene	ND	-	0.50	-	-	-	-

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Quality Control Report

Client:	RGA Environmental	**WorkOrder:**	1310874
Date Prepared:	10/29/13	**BatchID:**	83410
Date Analyzed:	10/28/13	**Extraction Method**	SW5030B
Instrument:	GC18	**Analytical Method:**	SW8260B
Matrix:	Water	**Unit:**	µg/L
Project:	#LOU1533737/0645; 3600 McArthur Blvd. Oakland, CA	**Sample ID:**	MB/LCS-83410 1310874-002BMS/MSD

QC SUMMARY REPORT FOR SW8260B

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
Diisopropyl ether (DIPE)	ND	20.1	0.50	20	-	101	70-130
Ethylbenzene	ND	-	0.50	-	-	-	-
Ethyl tert-butyl ether (ETBE)	ND	19.79	0.50	20	-	99	70-130
Freon 113	ND	-	0.50	-	-	-	-
Hexachlorobutadiene	ND	-	0.50	-	-	-	-
Hexachloroethane	ND	-	0.50	-	-	-	-
2-Hexanone	ND	-	0.50	-	-	-	-
Isopropylbenzene	ND	-	0.50	-	-	-	-
4-Isopropyl toluene	ND	-	0.50	-	-	-	-
Methyl-t-butyl ether (MTBE)	ND	19.52	0.50	20	-	97.6	70-130
Methylene chloride	ND	-	0.50	-	-	-	-
4-Methyl-2-pentanone (MIBK)	ND	-	0.50	-	-	-	-
Naphthalene	ND	-	0.50	-	-	-	-
n-Propyl benzene	ND	-	0.50	-	-	-	-
Styrene	ND	-	0.50	-	-	-	-
1,1,1,2-Tetrachloroethane	ND	-	0.50	-	-	-	-
1,1,2,2-Tetrachloroethane	ND	-	0.50	-	-	-	-
Tetrachloroethene	ND	-	0.50	-	-	-	-
Toluene	ND	19.43	0.50	20	-	97.2	70-130
1,2,3-Trichlorobenzene	ND	-	0.50	-	-	-	-
1,2,4-Trichlorobenzene	ND	-	0.50	-	-	-	-
1,1,1-Trichloroethane	ND	-	0.50	-	-	-	-
1,1,2-Trichloroethane	ND	-	0.50	-	-	-	-
Trichloroethene	ND	19.87	0.50	20	-	99.4	70-130
Trichlorofluoromethane	ND	-	0.50	-	-	-	-
1,2,3-Trichloropropane	ND	-	0.50	-	-	-	-
1,2,4-Trimethylbenzene	ND	-	0.50	-	-	-	-
1,3,5-Trimethylbenzene	ND	-	0.50	-	-	-	-
Vinyl Chloride	ND	-	0.50	-	-	-	-
Xylenes, Total	ND	-	0.50	-	-	-	-
Surrogate Recovery							
Dibromofluoromethane	24.95	25		25	100	100	70-130
Toluene-d8	24.31	24.39		25	97	98	70-130
4-BFB	2.536	2.429		2.5	101	97	70-130

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Quality Control Report

Client:	RGA Environmental	**WorkOrder:**	1310874
Date Prepared:	10/29/13	**BatchID:**	83410
Date Analyzed:	10/28/13	**Extraction Method**	SW5030B
Instrument:	GC18	**Analytical Method:**	SW8260B
Matrix:	Water	**Unit:**	µg/L
Project:	#LOU1533737/0645; 3600 McArthur Blvd. Oakland, CA	**Sample ID:**	MB/LCS-83410 1310874-002BMS/MSD

QC SUMMARY REPORT FOR SW8260B

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
tert-Amyl methyl ether (TAME)	24.66	23.56	20	ND	123	118	70-130	4.57	20
Benzene	20.58	20.22	20	ND	103	101	70-130	1.77	20
t-Butyl alcohol (TBA)	103.3	100.8	80	ND	129	126	70-130	2.42	20
Chlorobenzene	20.39	19.75	20	ND	102	98.7	70-130	3.21	20
1,2-Dibromoethane (EDB)	23.4	22.17	20	ND	117	111	70-130	5.41	20
1,2-Dichloroethane (1,2-DCA)	23.18	21.33	20	ND	116	107	70-130	8.32	20
1,1-Dichloroethene	19.64	18.04	20	ND	98.2	90.2	70-130	8.46	20
Diisopropyl ether (DIPE)	22.69	21.94	20	ND	113	110	70-130	3.37	20
Ethyl tert-butyl ether (ETBE)	23.31	22.17	20	ND	117	111	70-130	5.02	20
Methyl-t-butyl ether (MTBE)	24.88	23.2	20	ND	124	116	70-130	6.98	20
Toluene	20.16	19.61	20	ND	101	98.1	70-130	2.76	20
Trichloroethene	20.98	20.57	20	ND	105	103	70-130	1.95	20
Surrogate Recovery									
Dibromofluoromethane	27.35	26.35	25		109	105	70-130	3.72	20
Toluene-d8	24.05	24.15	25		96	97	70-130	0.415	20
4-BFB	2.439	2.401	2.5		98	96	70-130	1.55	20

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Quality Control Report

Client:	RGA Environmental	**WorkOrder:**	1310874
Date Prepared:	10/28/13	**BatchID:**	83360
Date Analyzed:	10/28/13	**Extraction Method**	SW5030B
Instrument:	GC3	**Analytical Method:**	SW8021B/8015Bm
Matrix:	Water	**Unit:**	µg/L
Project:	#LOU1533737/0645; 3600 McArthur Blvd. Oakland, CA	**Sample ID:**	MB/LCS-83360 1310874-002AMS/MSD

QC SUMMARY REPORT FOR SW8021B/8015Bm

Analyte	MB Result	LCS Result	RL	SPK Val	MB SS %REC	LCS %REC	LCS Limits
TPH(btex)	ND	58.37	40	60	-	97.3	70-130
MTBE	ND	10.4	5.0	10	-	104	70-130
Benzene	ND	11.01	0.50	10	-	110	70-130
Toluene	ND	10.8	0.50	10	-	108	70-130
Ethylbenzene	ND	10.64	0.50	10	-	106	70-130
Xylenes	ND	32.18	0.50	30	-	107	70-130
Surrogate Recovery							
aaa-TFT	10.3	10.57		10	103	106	70-130

Analyte	MS Result	MSD Result	SPK Val	SPKRef Val	MS %REC	MSD %REC	MS/MSD Limits	RPD	RPD Limit
TPH(btex)	61.07	59.79	60	ND	102	99.6	70-130	2.12	20
MTBE	10.48	10.61	10	ND	105	106	70-130	1.18	20
Benzene	10.59	10.89	10	ND	106	109	70-130	2.79	20
Toluene	10.54	10.79	10	ND	105	108	70-130	2.38	20
Ethylbenzene	10.39	10.62	10	ND	104	106	70-130	2.24	20
Xylenes	31.45	31.9	30	ND	105	106	70-130	1.42	20
Surrogate Recovery									
aaa-TFT	9.962	10.44	10		100	104	70-130	4.65	20

McCampbell Analytical, Inc.
1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262

CHAIN-OF-CUSTODY RECORD

WorkOrder: 1310874 **ClientCode: RGAE**

☐ WaterTrax ☐ WriteOn ☐ EDF ☐ Excel ☐ EQuIS ☑ Email ☐ HardCopy ☐ ThirdParty ☐ J-flag

Report to:
Paul King
RGA Environmental
1466 66th Street
Emeryville, CA 94608
(510) 658-6916 FAX: (510) 834-0152

Email: paul.king@rgaenv.com; pdking0000@aol.c
cc:
PO:
ProjectNo: #LOU1533737/0645; 3600 McArthur Blvd. Oakland, CA

Bill to:
Nick Hecht
RGA Environmental
1466 66th Street
Emeryville, CA 94608
nick.hecht@rgaenv.com

Requested TAT: 5 days

Date Received: **10/25/2013**
Date Printed: **10/28/2013**

Lab ID	Client ID	Matrix	Collection Date	Hold	Requested Tests (See legend below) 1	2	3	4	5	6	7	8	9	10	11	12
1310874-001	MW1	Water	10/25/2013 10:10	☐	B	A										
1310874-002	MW2	Water	10/25/2013 11:10	☐	B	A										
1310874-003	MW3	Water	10/25/2013 11:50	☐	B	A										

Test Legend:

1	8260B_W	2	G-MBTEX_W	3		4		5	
6		7		8		9		10	
11		12							

The following SampIDs: 001A, 002A, 003A contain testgroup.

Prepared by: Jena Alfaro

Comments:

NOTE: Soil samples are discarded 60 days after results are reported unless other arrangements are made (Water samples are 30 days).
Hazardous samples will be returned to client or disposed of at client expense.

CHAIN OF CUSTODY RECORD

1310874 PAGE 1 OF 1

RGA ENVIRONMENTAL

RGA Environmental, Inc.
1466 66th Street
Emeryville, CA 94608
(510) 658-4363

PROJECT NUMBER: LOUIS33737/0645

PROJECT NAME: 3600 McARTHUR BLVD. OAKLAND, CA

SAMPLED BY: (PRINTED & SIGNATURE)
MICHAEL BASS-DESCHENES

SAMPLE NUMBER	DATE	TIME	TYPE	SAMPLE LOCATION	NUMBER OF CONTAINERS	ANALYSIS(ES): TPH(G,D,BD,MO); EPA 8260 WITH FUEL OXYGENATES	PRESERVATIVE	REMARKS
MW1	10/25/13	1010	H2O		7	X X	ICE	NORMAL TAT
MW2	"	1110	"		7	X X	"	"
MW3	"	1150	"		7	X X	"	"

ICE (t): 3.2
GOOD CONDITION
HEAD SPACE ABSENT
DECHLORINATED IN LAB
APPROPRIATE CONTAINERS
PRESERVED IN LAB
VOAS | O & G | METALS | OTHER
PRESERVATION

RELINQUISHED BY: (SIGNATURE)	DATE	TIME	RECEIVED BY: (SIGNATURE)
MICHAEL BASS-DESCHENES	10/25/13	1430	
	10/28/13	1515	
	DATE	TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)

Total No. of Samples (This Shipment): 3
Total No. of Containers (This Shipment): 21

LABORATORY: McCAMPBELL ANALYTICAL, INC.
LABORATORY CONTACT: ANGELA RYDELIUS
LABORATORY PHONE NUMBER: (877) 252-9262

SAMPLE ANALYSIS REQUEST SHEET ATTACHED: ( ) YES (X) NO

Results and billing to:
RGA Environmental, Inc.
paul.king@rgaenv.com

REMARKS: ALL VOAS PRESERVED WITH HCL

McCampbell Analytical, Inc.
"When Quality Counts"

1534 Willow Pass Road, Pittsburg, CA 94565-1701
Toll Free Telephone: (877) 252-9262 / Fax: (925) 252-9269
http://www.mccampbell.com / E-mail: main@mccampbell.com

Sample Receipt Checklist

Client Name: **RGA Environmental** Date and Time Received: **10/25/2013 8:07:53 PM**

Project Name: **#LOU1533737/0645; 3600 McArthur Blvd. Oakland, CA** LogIn Reviewed by: Jena Alfaro

WorkOrder N°: **1310874** Matrix: Water Carrier: Rob Pringle (MAI Courier)

Chain of Custody (COC) Information

Chain of custody present?	Yes ☑	No ☐
Chain of custody signed when relinquished and received?	Yes ☑	No ☐
Chain of custody agrees with sample labels?	Yes ☑	No ☐
Sample IDs noted by Client on COC?	Yes ☑	No ☐
Date and Time of collection noted by Client on COC?	Yes ☑	No ☐
Sampler's name noted on COC?	Yes ☑	No ☐

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	NA ☑
Shipping container/cooler in good condition?	Yes ☑	No ☐	
Samples in proper containers/bottles?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature	Cooler Temp: 3.2°C		NA ☐
Water - VOA vials have zero headspace / no bubbles?	Yes ☑	No ☐	NA ☐
Sample labels checked for correct preservation?	Yes ☑	No ☐	
Metal - pH acceptable upon receipt (pH<2)?	Yes ☐	No ☐	NA ☑
Samples Received on Ice?	Yes ☑	No ☐	

(Ice Type: WET ICE)

** NOTE: If the "No" box is checked, see comments below.*

Comments: