PORT OF OAKLAND

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February 10, 2015

Mr. Keith E. Nowell, P.G., C.H.G.
Hazardous Materials Specialist
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

RE: RO#0000010_2014 Second Semi-Annual Groundwater Monitoring Report - Port of Oakland, 651 Maritime Street, Oakland, CA_2015-02-10

Dear Mr. Nowell:

Please find enclosed the report entitled *2014 Second Semi-Annual Groundwater Monitoring Report - Port of Oakland, 651 Maritime Street, Oakland, CA ("Report")* dated February 10, 2015, prepared by ARCADIS, U.S., Inc. ("ARCADIS") on behalf of the Port of Oakland ("Port")[1]. This Report is being submitted in accordance with Alameda County Health Care Services Agency ("County") requirements, as specified in County letters dated March 23, 2006[2], January 19, 2007[3], September 30, 2008[4], and June 23, 2011.[5]

The Port has retained ARCADIS to perform groundwater monitoring and maintenance of the remediation system. Results of the second 2014 semi-annual sampling event are

[1] The Site has been referred to historically as the "Shippers" and "Ringsby" sites, based on the Port tenants that occupied the site at the time of release discoveries. Prior to site redevelopment in 2004, the site was also referred to as 2277 and 2225 Seventh Street. After redevelopment, the Site address became 651 and 555 Maritime Street, although referenced hereafter (including within this Report) as only **651 Maritime Street *(Fuel Leak Case RO0000010).***

[2] Letter from Mr. Barney Chan (County) to Mr. Jeff Rubin (Port), regarding *Fuel Leak Cases RO0000010 and RO0000185, 2277 and 2225 7th St., Oakland, CA 94607*, dated March 23, 2006.

[3] Letter from Mr. Barney Chan (County) to Mr. Jeff Rubin (Port), regarding *Fuel Leak Cases RO0000010 and RO0000185, 2277 and 2225 7th St., Oakland, CA 94607*, dated January 19, 2007.

[4] Letter from Mr. Steven Plunkett (County) to Mr. Jeffrey Rubin (Port) regarding *Fuel Leak Case RO0000187 (Global ID# T0600100892), Port of Oakland, 651 Maritime Street, Oakland, CA*, dated September 30, 2008.

[5] Letter from Mr. Paresh Khatri (County) to Messrs. Jeffrey Jones and Jeffrey Rubin (Port) regarding *Feasibility Study Evaluation for Fuel Leak Case No. RO0000010 & RO0000187 (GeoTracker Global ID# T0600100892), Port of Oakland, 651 Maritime Street, Oakland, CA*, dated June 23, 2011.

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contained in the enclosed report. Based on the conclusions and recommendations of the report, the Port intends to cease groundwater monitoring at the site. If you have any questions or comments regarding the results, please contact Jeff Rubin at (510) 627-1134.

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached report prepared by ARCADIS are true and correct to the best of my knowledge. Please note that the report is stamped by a Registered Professional Geologist in the State of California.

Sincerely,

Jeffrey L. Rubin, CPSS, REPA
Port Associate Environmental Scientist
Environmental Programs and Planning

Enclosure: noted

Cc (w encl.): Michele Heffes

Cc (w/o encl.): Katherine Brandt, P.G. (ARCADIS)
Yane Nordhav (Baseline Environmental)

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PORT OF OAKLAND

2014 Second Semiannual Groundwater Monitoring Report

Port of Oakland
651 Maritime Street
Oakland, California

February 10, 2015

ARCADIS

Ali Hawkins
Environmental Engineer II

Katherine Brandt, P.G.
Principal Geologist

2014 Second Semiannual Groundwater Monitoring Report

Port of Oakland
651 Maritime Street
Oakland, California

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Port of Oakland

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Our Ref.:
04656020.HFC1

Date:
February 10, 2015

ARCADIS

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Acronyms and Abbreviations

ACHCS	Alameda County Health Care Services
amsl	above mean sea level
ARCADIS	ARCADIS U.S., Inc.
BTEX	benzene, toluene, ethylbenzene, and total xylenes
DO	dissolved oxygen
ESS	Environmental Sampling Services
GAC	granular activated carbon
MNA	Monitored natural attenuation
MSE	MSE Group
MTBE	methyl tert-butyl ether
NESCO	National Environmental Service Company
ORC	Oxygen Release Compound™
Port	Port of Oakland
QA	quality assurance
QC	quality control
RAMCON	RAMCON Engineering and Environmental Contracting
report	2014 Second Semiannual Groundwater Monitoring Report
reporting period	period from July through December 2014
RPD	relative percent difference
site	Port of Oakland Site located at 651 Maritime Street, Oakland, California
TDS	total dissolved solids
TPHd	total petroleum hydrocarbons as diesel
TPHg	total petroleum hydrocarbons as gasoline
TPHmo	total petroleum hydrocarbons as motor oil
Uribe	Uribe and Associates

USEPA	United States Environmental Protection Agency
UST	underground storage tank
µg/L	micrograms per liter

Executive Summary

On behalf of the Port of Oakland (Port), ARCADIS U.S., Inc. (ARCADIS) prepared this 2014 Second Semiannual Groundwater Monitoring Report for the Port's property located at 651 Maritime Street, Oakland, California (site)[1]. This report includes the period from July through December 2014 (reporting period). The Alameda County Health Care Services is providing regulatory oversight under the Local Oversight Program, case number RO0000010.

The January 2015 monitoring and free-phase product measurements indicate that the free-phase product plume is stable, and groundwater concentrations are generally stable. Free product measurements indicate that the free-phase product plume appears stable even though the recovery system has been off since May 2011. Water quality results from the January 2015 monitoring event support the assessment that groundwater concentrations are generally stable or decreasing and below their respective site-specific risk-based target levels. Results of the monitored natural attenuation assessment indicate that petroleum hydrocarbons are actively being reduced through anaerobic degradation.

Risk-based target levels for the site were derived following the Regional Water Quality Control Board's Environmental Screening Level Program, as indicated below:

- Dissolved constituents are not migrating off site at concentrations that would impact ecological receptors in San Francisco Bay.
- Groundwater beneath the site is considered non-potable (TDS in well MW-11 exceeds 3,000 parts per million).
- Risks are managed through implementation of institutional controls and deed restrictions.

Based on the results of the January 2015 monitoring event, previous events, results from the Natural Source Zone Depletion Study, and submission of a risk management plan, ARCADIS recommends ceasing groundwater sampling immediately and requests that the site be reviewed for case closure.

[1] The Site has been referred to in the past as the "Shippers" and "Ringsby" sites, based on the Port tenants occupying the site at the time of release discoveries. In addition, prior to site redevelopment in 2004, the site was referred to as 2277 and 2225 Seventh Street; the Site addresses after redevelopment are 651 and 555 Maritime Street, although referenced in this report as 651 Maritime Street.

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2014 Second Semiannual Groundwater Monitoring Report

Port of Oakland
651 Maritime Street
Oakland, California

1. Introduction

On behalf of the Port of Oakland (Port), ARCADIS U.S., Inc. (ARCADIS) prepared this 2014 Second Semiannual Groundwater Monitoring Report (report) for the Port's property located at 651 Maritime Street, Oakland, California (site)[2]. This report includes the period from July through December 2014 (reporting period). The Alameda County Health Care Services (ACHCS) is providing regulatory oversight under the Local Oversight Program, case number RO0000010.

The approximately 13-acre site is located between the former Oakland Naval Supply Center and former Oakland Army Base (Figure 1). Groundwater impacts beneath the site are related to petroleum releases from two former underground storage tank (UST) sites located at 2277 and 2225 Seventh Street. A brief history of the two Seventh Street sites, as well as the 651 Maritime Street Site is provided below.

Former 2277 Seventh Street Site

In 1993, Uribe and Associates (Uribe) removed four Port-owned USTs from 2277 Seventh Street. Uribe collected soil samples from beneath the USTs at the time of the removal and submitted the samples for laboratory analyses. The laboratory reported that the soil samples contained total petroleum hydrocarbons as diesel (TPHd) and total petroleum hydrocarbons as gasoline (TPHg), as well as benzene, toluene, ethylbenzene, and total xylenes (BTEX) compounds. Uribe also observed free-phase product on the groundwater within the excavation. In 1994, Uribe installed three groundwater monitoring wells (MW-1, MW-2, and MW-3). In 1995, Alisto Engineering Group installed five additional wells (MW-4 through MW-8). Quarterly groundwater monitoring was initiated in 1996 in accordance with an ACHCS-approved work plan dated April 18, 1995.

Former 2225 Seventh Street Site

Former Port tenant Ringsby Terminals (formerly Dongary Investments) and/or its tenant owned and operated nine USTs at 2225 Seventh Street. One of the USTs in the cluster failed an integrity test in 1989. National Environmental Service Company (NESCO) removed the UST in March 1990. During the UST removal, NESCO

[2] The Site has been referred to in the past as the "Shippers" and "Ringsby" sites, based on the Port tenants occupying the site at the time of release discoveries. In addition, prior to site redevelopment in 2004, the site was referred to as 2277 and 2225 Seventh Street; the Site addresses after redevelopment are 651 and 555 Maritime Street, although referenced in this report as 651 Maritime Street.

collected soil and groundwater samples from the excavation. Analytical results indicated the presence of TPHd and BTEX. RAMCON Engineering and Environmental Contracting (RAMCON) removed seven of the USTs (six diesel and one fuel oil) in 1992. RAMCON observed a hole in the fuel oil tank and a thin layer of an unspecified petroleum product floating on the groundwater in the excavation. During a separate event in 1992, RAMCON removed the remaining UST (a waste oil UST). Soil samples collected from that excavation indicated the presence of TPHd, total petroleum hydrocarbons as motor oil (TPHmo), benzene, xylenes, and polycyclic aromatic hydrocarbons. A water sample collected from the excavation also contained TPHd. In 1993, RAMCON installed three groundwater monitoring wells (MW-1, MW-2, and MW-3) at the site and in 1994 quarterly groundwater monitoring began, as required by the ACHCS.[3]

651 Maritime Street Site

In 2004, the Port completed the development of the eastern-most 8 acres of the site into the Harbor Facilities Complex at 651 Maritime Street (Figure 2). In 2006, the remaining 5 acres of the site were developed by the Port into the Maritime Support Center at 555 Maritime Street. The Maritime Support Center is currently leased to Shippers Transport Express.

Historical site investigations indicate that groundwater beneath the site is impacted by a co-mingled plume containing dissolved and free-phase petroleum hydrocarbons, primarily in the diesel fuel range. In addition, well MW-4 (Figure 3, the western-most well) has historically contained dissolved petroleum hydrocarbons in the gasoline range.

In 1996, the Port installed a remediation system to recover free-phase product from beneath the site. The free product recovery system operated until 2003 when it was removed, with approval from the ACHCS.[4] The ACHCS approved the removal of the system with the stipulation that a new free product recovery system be installed. A new system was installed in 2004.

In 1998, Harding Lawson Associates abandoned MW-8 to facilitate expansion of the railroad tracks to the north of the site. Replacement well MW-8A was installed in 2001 (Figure 3). In 2002, monitoring wells MW-1, MW-2, and MW-3 at the former 2225

[3] Letter from ACHCS to Dongary Investments dated July 26, 1994.
[4] Letter from ACHCS to Port of Oakland dated March 27, 2003.

Seventh Street Site, and MW-6 and MW-7 at the former 2277 Seventh Street Site were abandoned to facilitate construction of the new Harbor Facilities Complex. [5]

In 2006, the ACHCS approved a modification of the groundwater monitoring frequency from quarterly to semiannually at the site. The first semiannual monitoring event occurred on July 28, 2006. The ACHCS also approved the use of Oxygen Release Compound™ (ORC) in well MW-4 to increase the dissolved oxygen (DO) concentration in groundwater and stimulate aerobic biodegradation of the petroleum hydrocarbons present in groundwater at that location.[6]

In 2007, the product recovery system was enhanced by adding a low vacuum to the recovery well heads to increase product recovery rates. Air drawn from the recovery wells was treated with granular activated carbon (GAC) and discharged to the atmosphere under a permit from the Bay Area Air Quality Management District.

On September 30, 2008, ACHCS approved a plan to install four additional groundwater monitoring wells (MW-9 through MW-12 [Figure 3]), to enhance the existing monitoring well network and to replace wells removed during site redevelopment.[7] MSE Group (MSE) were installed and sampled the wells in December 2008, along with the remaining site wells. Well installation activities and sample results were reported by MSE in February 2009.

[5] MSE. 2009. Second Semi-Annual 2008 Groundwater Monitoring and Remediation System Operation and Maintenance Report. February.

[6] Letter from ACHCS to Port of Oakland dated March 23, 2006.

[7] Letter from Mr. Steven Plunkett (ACHCS) to Mr. Jeffrey Rubin (Port), dated September 30, 2008.

2. Groundwater Sampling Activities

Environmental Sampling Services (ESS), under contract with ARCADIS, conducted the 2014 second semiannual groundwater monitoring event at the site on January 6, 7, and 8, 2015. The January 2015 groundwater monitoring event consisted of measuring the depth to groundwater and free-phase product thickness, where present, in the 10 groundwater monitoring wells on site and collecting groundwater samples from the wells without free-phase product.

The depth to groundwater and free-phase product thickness were measured to the nearest one-hundredth of 1 foot from the top of the well casing, using a dual-phase interface probe where free product was anticipated or a water-level meter where free product was not anticipated. Measurements of both depth to water and depth to free-phase product were collected just prior to purging to allow sufficient time for groundwater to equilibrate with ambient barometric pressure. The dual-phase interface probe and water level meter were decontaminated before each measurement by washing in a Liquinox solution then rinsing with water. Field observations and instrument readings indicated that there was free-phase product in monitoring well MW-3; hence, this well was neither purged nor sampled. Water-level measurements for the January 2015 monitoring event are summarized in Table 1 and included on the groundwater sampling forms in Appendix A.

ESS purged wells MW-1, MW-2, MW-4, MW-5, MW-8A, MW-9, MW-10, MW-11, and MW-12 using a peristaltic pump equipped with dedicated silicone and polyethylene tubing. ESS monitored field water quality parameters (including temperature, pH, oxidation-reduction potential, DO concentration, and electrical conductivity) of the purge water using portable field instruments calibrated to manufacturer's specifications. Purging continued until water quality parameters stabilized as recharge rates permitted. Field-measured groundwater quality information collected during the January 2015 monitoring event is provided on groundwater sampling forms included in Appendix A.

After purging, ESS collected groundwater samples directly into laboratory-supplied sample bottles using the peristaltic pump. ESS collected a duplicate sample from monitoring well MW-4 (MW-4DUP). Following sample collection, each sample bottle was labeled with the project name, date and time of collection, samplers' initials, and unique sample identification, and stored in a cooler containing ice. The groundwater samples were submitted to Curtis and Tompkins, Ltd., a California-certified analytical laboratory, under appropriate chain of custody procedures for the following analyses:

- TPHg in accordance with United States Environmental Protection Agency (USEPA) Method 8015B
- TPHd and TPHmo in accordance with USEPA Method 8015B
- BTEX and methyl tert-butyl ether (MTBE) in accordance with USEPA Method 8260B
- Total dissolved solids (TDS) in accordance with USEPA Method 16.1
- Dissolved metals and cations (sodium, potassium, calcium, magnesium, manganese, and iron) in accordance with USEPA Methods 6010B and 200.7
- Major anions (sulfate, chloride, nitrate, and nitrite) in accordance with USEPA Method 300.0
- Alkalinity (bicarbonate and carbonate) in accordance with Standard Method 2320B
- Orthophosphate in accordance with Standard Method 4500P-E
- Dissolved sulfate in accordance with Standard Method 4500S2-D.

Samples collected for dissolved metals analysis were field filtered using a 0.45-micrometer glass fiber filter to remove suspended sediment.

Prior to analyzing the water samples for TPHd and TPHmo, each sample was passed through a silica gel column, in accordance with USEPA Method 3630C, to remove nonpetroleum-based organics that could potentially interfere with the analyses.

Under approval from the ACHCS, well MW-4 was outfitted in 2006 with ORC socks to increase the DO concentration in groundwater and stimulate aerobic biodegradation of the petroleum hydrocarbons. The ORC socks were removed 1 week prior to sampling and replaced immediately after sampling. As part of the free product recovery system shut-down activities in May and June 2011, the socks were removed on June 15, 2011 and not replaced.

Approximately 37 gallons of purge and decontamination water were generated during the January 2015 monitoring event. ESS placed the water in a properly labeled 55-gallon drum, which was stored in the free product recovery system enclosure located

within the Harbor Facilities Complex. The Port's environmental services contractor will dispose of the water in accordance with applicable laws and regulations.

3. Results

The following sections summarize the field and laboratory results collected during the last six months of 2014.

3.1 Groundwater Flow Direction

Based on the depth to water measurements collected, groundwater levels beneath the site in January 2015 were slightly higher than those observed in June 2014. In June 2014, groundwater elevations ranged from 3.73 feet above mean sea level (amsl) to 6.03 feet amsl. In January 2015, groundwater elevations ranged from 4.88 to 6.37 feet amsl. The groundwater gradient at the site was approximately 0.003 foot per foot. Groundwater flow is generally to the north. A shallow groundwater elevation contour map for January 2015 is included on Figure 4. Current and historical depth to water measurements and calculated groundwater elevations are summarized in Table 1.

3.2 Product Thickness

Free-phase product was identified in monitoring well MW-3 during the January 2015 monitoring event. The product thickness in well MW-3 was measured to be 0.97 foot. Product thickness in this well has ranged from not measurable to 2.70 feet since April 2000 (Table 1). Free-phase product was not observed in MW-1 for the fifth consecutive monitoring event. Free-phase product has not been observed in any other monitoring wells since records have been kept, beginning in 1997 for MW-2 and MW-5; 2001 for MW-8A; and 2008 for MW-9, MW-10, MW-11, and MW-12.

3.3 Analytical Results

Analytical results for the groundwater samples collected during the January 2015 monitoring event are shown on Figure 5 and summarized in Tables 2 and 3. The laboratory analytical reports are provided in Appendix B.

3.3.1 Total Petroleum Hydrocarbons as Gasoline

TPHg was detected in groundwater samples collected from wells MW-1, MW-4, MW-9, MW-10, and MW-12 at concentrations ranging from 86 micrograms per liter (µg/L) (MW-12) to 1,700 µg/L (MW-1). The laboratory also reported that chromatograms resulting from the TPHg analyses in all wells with TPHg detections exhibited patterns

that do not match the gasoline standard. Chromatograms are included in the laboratory reports in Appendix B.

Figure 6 shows the TPHg concentrations through time for those wells where it has been reported above the analytical method reporting limit in at least 10 percent of the samples (excluding MW-1, which historically has contained free product). The graph shows a stable trend through time for concentrations of TPHg in all wells, with the exception of slight increases in the TPHg concentration at MW-4 and MW-9 during this reporting period. The TPHg concentrations at MW-4 and MW-9 in January 2015 are within historical ranges. All TPHg concentrations reported during this sampling event are below the site remedial goal of 3,700 µg/L.[8]

3.3.2 Benzene, Toluene, Ethylbenzene, and Xylenes and Methyl-Tert Butyl Ether

Benzene was detected in groundwater samples collected from wells MW-1, MW-4, MW-9, and MW-10 at concentrations ranging from 27 µg/L (MW-1) to 69 µg/L (MW-9). Toluene was detected in samples collected from MW-1, MW-9, and MQ-10 at concentrations ranging from 0.6 µg/L (MW-10) to 1.6 µg/L (MW-1). Ethylbenzene was detected in samples collected from wells MW-1 (1.8 µg/L) and MW-9 (12 µg/L). Total xylenes were detected in samples collected from MW-1 (1.6 µg/L) and MW-9 (1.4 µg/L). MTBE was detected in the sample collected from MW-12 at a concentration of 4.3 µg/L.

Figures 7 and 8 show the benzene and MTBE concentrations, respectively, through time for wells where constituents have been reported above their respective analytical method reporting limits in at least 10 percent of the samples (except MW-1, which historically contains free product). As shown on Figure 7, benzene concentrations beneath the site have been stable and/or decreasing since 2010. The benzene concentration at MW-9 increased during this reporting period, but is still within its historical range. The reported concentrations in MW-9 and MW-10 are above the site remedial goal of 46 µg/L. The benzene concentration at MW-10 may be related to the proximity of the well to the free-phase product plume. The remaining reported benzene concentrations are below the site remedial goal. As shown on Figure 8, MTBE concentrations beneath the site are decreasing, with reported concentrations below the site remedial goal of 1,800 µg/L and the California maximum contaminant level of 13 µg/L.

[8] Malcolm Pirnie. 2011. Feasibility Study / Correct Action Plan, Port of Oakland's Harbor Facilities Complex, 651 Maritime Street, Oakland, CA. March 15.

3.3.3 Total Petroleum Hydrocarbons as Diesel and Total Petroleum Hydrocarbons as Motor Oil

TPHd was detected in groundwater samples collected from monitoring wells MW-1, MW-4, MW-9, MW-10, and MW-12 at concentrations ranging from 67 µg/L (MW-4) to 2,000 µg/L (MW-1). Chromatograms resulting from the TPHg analyses at MW-4 and MW-9 exhibited patterns that do not match the gasoline standard. Chromatograms are included in the laboratory reports in Appendix B. The laboratory reported TPHmo concentrations below the analytical method reporting limit in all of the samples analyzed.

Figure 9 shows the TPHd concentrations through time for those wells where it has been reported above the analytical method reporting limit in at least 10 percent of the samples (except MW-1, which historically contained free product). TPHd concentrations in site monitoring wells increased slightly during this reporting period, but remain within historical ranges. Monitoring well MW-10 is above the site remedial goal, but within historical ranges; all other wells are below the site remedial goal of 640 µg/L.

3.3.4 Monitored Natural Attenuation Parameters

Monitored natural attenuation (MNA) parameters were collected during the January 2015 sampling event. Samples were analyzed for dissolved sulfide by USEPA Method E376.2; anions by USEPA Method 300.0; dissolved sodium, calcium, potassium and magnesium by USEPA Method 200.7; and dissolved iron and manganese by USEPA Method SW6010B.

Ferrous iron was detected in eight of the nine monitoring wells (not detected in MW-2) at concentrations ranging from 0.53 mg/L to 15 mg/L. Dissolved sulfide was detected in three of the nine monitoring wells (MW-1, MW-4, MW-9) at concentrations ranging from 0.04 mg/L to 0.26 mg/L. Methane was not sampled during this event.

The above results and the results presented in Table 3 indicate that groundwater conditions beneath the site are consistent with a reduced environment. The presence of methane in previous events indicates strongly reducing conditions across the site. Ferrous iron in the wells nearest the free product plume also indicates that strongly reducing conditions appear to co-locate with areas of greater hydrocarbon impact. MW-2 appears to be in a moderately reducing area of the site, with low concentrations of ferrous iron (<0.10 mg/L). In general, the results indicate that anaerobic degradation

of the petroleum hydrocarbon constituents is still occurring, resulting from depressed oxygen levels and low oxygen reduction potential.

3.4 Quality Assurance/Quality Control

ESS collected a field duplicate from one monitoring well to assess the representativeness of the sample collection procedures. Two samples from well MW-4 (MW-4 and MW-4DUP) were analyzed for the constituents indicated in Section 2.

The laboratory reported benzene in sample MW-4 and duplicate sample MW-4DUP at concentrations of 29 and 28 µg/L, respectively. The relative percent difference (RPD) between the two samples is calculated below:

Benzene RPD |29-28| / [(29+28)/2] = 3.5%

The RPD is within the analytical laboratory's maximum allowable RPD for matrix spike duplicates and indicates that the field sampling procedures produced acceptable data.

The laboratory prepared trip blanks using deionized water as water quality control (QC) samples. The trip blanks were stored in the coolers and accompanied groundwater samples from collection to transport to the laboratory. One trip blank was submitted for each day of sampling and analyzed for TPHg, BTEX, and MTBE using USEPA Methods 8015M and 8260B. The laboratory reported concentrations of the constituents of concern below their respective method reporting limits for the analyses performed, indicating that volatile constituents of concern were not introduced into the samples through the collection, transportation, storage, and analysis procedures.

ARCADIS also reviewed the laboratory data for completeness and accuracy (see Quality Control Checklist in Appendix B). Laboratory quality assurance (QA)/QC goals were met.

Based on the QA/QC evaluation, ARCADIS considers the data collected during the January 2015 monitoring event reliable for its intended use.

4. Free Product Measurements

On June 7, 2011, in accordance with the Feasibility Study/Corrective Action Plan and the letter submitted to the ACHCS on May 16, 2011, ARCADIS shut down the free-phase product recovery system. The skimmer pumps were removed from the wells. The low vacuum system was also shut down, and the GAC vessels were removed from the site. Free product and water-level measurements are collected from monitoring and recovery wells during each groundwater monitoring event to confirm the stability of the free-phase product.

Free product and water-level measurements are included in Table 4. Based on the measurements collected, the free-phase product plume appears stable. Product thicknesses decreased in all wells and free product was not observed in any new wells in January 2015. The observed area of free-phase product as assessed in January 2015 is shown on Figure 5. Field sheets documenting these measurements are provided in Appendix C.

5. Conclusions

The January 2015 monitoring and free-phase product measurements indicate that the free-phase product plume is stable, and groundwater concentrations are generally stable (Figures 6 through 9). Free product measurements indicate that the free-phase product plume appears stable even though the recovery system has been off since May 2011. Water quality results from the January 2015 monitoring event support the assessment that groundwater concentrations are generally stable or decreasing and below their respective site-specific risk-based target levels. Results of the monitored natural attenuation assessment indicate that petroleum hydrocarbons are actively being reduced through anaerobic degradation.

Risk-based target levels for the site were derived following the Regional Water Quality Control Board's Environmental Screening Level Program, as indicated below:

- Dissolved constituents are not migrating off site at concentrations that would impact ecological receptors in San Francisco Bay.
- Groundwater beneath the site is considered non-potable (TDS in well MW-11 exceeds 3,000 parts per million).
- Risks are managed through implementation of institutional controls and deed restrictions.

Based on the results of the January 2015 monitoring event, previous events, results from the Natural Source Zone Depletion Study, and submission of a risk management plan, ARCADIS recommends ceasing groundwater sampling immediately and requests that the site be reviewed for case closure.

ARCADIS

Tables

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland
651 Maritime Street, Oakland, California

Monitoring Well	Date Measured	Elevation [1] Top of Casing (feet)	Depth to Product (feet btc)	Depth to Water (feet btc)	Product Thickness (feet)	Groundwater Elevation [1] (feet)
MW-1						
	04/18/00	13.65	NM	8.21	NA	NA
	05/22/00	13.65	NM	8.51	NA	NA
	07/10/01	13.65	8.8	10.00	1.20	4.49
	12/12/01	13.65	NM	NA	NA	NA
	03/08/02	13.65	NM	NA	NA	NA
	06/13/02	13.65	8.70	10.00	1.30	4.56
	09/26/02	13.65	8.60	9.50	0.90	4.78
	03/17/03	13.65	7.61	8.88	1.27	5.66
	06/18/03	13.65	8.20	9.44	1.24	5.08
	09/03/03	13.65	8.50	9.40	0.90	4.88
	11/26/03	13.65	8.85	9.25	0.40	4.68
	03/05/04	13.65	6.76	7.07	0.31	6.80
	06/02/04	13.65	8.26	8.71	0.45	5.26
	09/03/04	13.65	8.70	9.11	0.41	4.83
	12/16/04	13.65	7.75	7.92	0.17	5.85
	03/29/05	13.65	6.21	6.38	0.17	7.39
	06/14/05	13.65	7.41	7.61	0.20	6.18
	08/10/05	13.65	8.05	8.55	0.50	5.45
	09/29/05	13.65	8.28	8.95	0.67	5.17
	12/21/05	13.65	5.70	5.90	0.20	7.89
	03/24/06	13.65	5.98	6.27	0.29	7.58
	07/28/06	13.65	7.88	8.35	0.47	5.63
	11/29/06	NA	10.58	10.81	0.23	NA
	06/01/07	15.80	11.11	11.45	0.34	4.59
	11/14/07	15.80	10.87	10.93	0.06	4.91
	06/05/08	15.80	11.36	11.46	0.10	4.41
	12/18/08	15.80	10.82	10.89	0.07	4.96
	03/04/09	15.80	9.38	9.52	0.14	6.38
	04/01/09	15.80	10.65	10.67	0.02	5.14
	06/17/09	15.80	11.21	11.28	0.07	4.57
	12/08/09	15.80	NP	10.79	0.00	5.01
	06/17/10	15.80	10.79 [4]	10.79	0.00	5.01
	12/14/10	15.80	9.42 [4]	9.42	0.00	6.38
	06/07/11	15.80	NP	10.77	0.00	5.03
	06/21/11	15.80	NP	10.37	0.00	5.43
	09/26/11	15.80	11.23 [4]	11.23	0.00	4.57
	12/05/11	15.80	11.15 [4]	11.15	0.00	4.65
	02/06/12	15.80	10.89 [4]	10.89	0.00	4.91
	06/19/12	15.80	11.01 [4]	11.01	0.00	4.79
	09/19/12	15.80	11.40	11.41	0.01	4.40
	12/04/12	15.80	NP	9.05	0.00	6.75
	06/19/13	15.80	NP	11.34	0.00	4.46
	12/12/13	15.80	NP	10.87	0.00	4.93
	06/24/14	15.80	NP	11.19	0.00	4.61
	01/06/15	15.80	NP	9.87	0.00	5.93

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland
651 Maritime Street, Oakland, California

Monitoring Well	Date Measured	Elevation [1] Top of Casing (feet)	Depth to Product (feet btc)	Depth to Water (feet btc)	Product Thickness (feet)	Groundwater Elevation [1] (feet)
MW-2						
	12/31/97	13.87	NP	8.73	0.00	5.14
	04/13/98	13.87	NP	7.72	0.00	6.15
	11/06/98	13.87	NP	9.43	0.00	4.44
	03/19/99	13.87	NP	8.21	0.00	5.66
	06/24/99	13.87	NP	8.91	0.00	4.96
	09/28/99	13.87	NP	9.42	0.00	4.45
	11/12/99	13.87	NP	9.63	0.00	4.24
	02/11/00	13.87	NP	8.54	0.00	5.33
	05/22/00	13.87	NP	8.10	0.00	5.77
	09/06/00	13.87	NP	8.79	0.00	5.08
	12/19/00	13.87	NP	9.19	0.00	4.68
	02/21/01	13.87	NP	7.99	0.00	5.88
	04/03/01	13.87	NP	8.23	0.00	5.64
	07/10/01	13.87	NP	8.70	0.00	5.17
	12/12/01	13.87	NP	8.16	0.00	5.71
	01/22/02	13.87	NP	7.64	0.00	6.23
	03/08/02	13.87	NP	8.31	0.00	5.56
	06/13/02	13.87	NP	8.64	0.00	5.23
	09/26/02	13.87	NP	8.95	0.00	4.92
	12/12/02	13.87	NP	9.17	0.00	4.70
	03/17/03	13.87	NP	7.77	0.00	6.10
	06/18/03	13.87	NP	8.44	0.00	5.43
	09/03/03	13.87	NP	8.98	0.00	4.89
	11/26/03	16.72	NP	12.01	0.00	4.71
	03/05/04	16.72	NP	9.75	0.00	6.97
	06/02/04	16.72	NP	11.22	0.00	5.50
	09/03/04	16.72	NP	11.62	0.00	5.10
	12/16/04	16.72	NP	10.80	0.00	5.92
	03/29/05	16.72	NP	9.67	0.00	7.05
	06/14/05	16.72	NP	10.68	0.00	6.04
	08/10/05	16.72	NP	11.05	0.00	5.67
	09/29/05	16.72	NP	11.32	0.00	5.40
	12/21/05	16.47	NP	9.57	0.00	6.90
	03/24/06	16.47	NP	9.55	0.00	6.92
	07/28/06	16.47	NP	10.85	0.00	5.62
	11/29/06	NA	NP	11.69	0.00	NA
	06/01/07	16.43	NP	11.72	0.00	4.71
	11/14/07	16.43	NP	12.28	0.00	4.15
	06/05/08	16.43	NP	12.01	0.00	4.42
	12/18/08	16.43	NP	12.20	0.00	4.23
	03/04/09	16.43	NP	10.19	0.00	6.24
	04/01/09	16.43	NP	11.34	0.00	5.09
	06/17/09	16.43	NP	11.90	0.00	4.53
	12/09/09	16.43	NP	12.13	0.00	4.30
	06/16/10	16.43	NP	11.57	0.00	4.86

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland
651 Maritime Street, Oakland, California

Monitoring Well	Date Measured	Elevation [1] Top of Casing (feet)	Depth to Product (feet btc)	Depth to Water (feet btc)	Product Thickness (feet)	Groundwater Elevation [1] (feet)
MW-2 (cont)	12/14/10	16.43	NP	11.04	0.00	5.39
	06/07/11	16.43	NP	10.70	0.00	5.73
	06/21/11	16.43	NP	11.18	0.00	5.25
	09/26/11	16.43	NP	11.87	0.00	4.56
	12/05/11	16.43	NP	11.95	0.00	4.48
	02/06/12	16.43	NP	11.50	0.00	4.93
	06/19/12	16.43	NP	11.65	0.00	4.78
	09/19/12	16.43	NP	12.03	0.00	4.40
	12/04/12	16.43	NP	9.82	0.00	6.61
	06/19/13	16.43	NP	12.03	0.00	4.40
	12/12/13	16.43	NP	12.31	0.00	4.12
	06/24/14	16.43	NP	11.94	0.00	4.49
	01/08/15	16.43	NP	10.70	0.00	5.73
MW-3						
	11/06/98	13.73	8.84	9.94	1.10	4.56
	03/19/99	13.73	7.52	8.05	0.53	6.05
	06/24/99	13.73	8.38	8.56	0.18	5.30
	11/12/99	13.73	9.14	9.23	0.09	4.56
	02/11/00	13.73	7.97	8.37	0.40	5.64
	03/01/00	13.73	6.59	7.24	0.65	6.95
	03/21/00	13.73	6.50	6.56	0.06	7.21
	05/22/00	13.73	7.51	8.05	0.54	6.06
	06/26/00	13.73	7.82	8.20	0.38	5.80
	07/25/00	13.73	7.90	8.92	1.02	5.52
	08/31/00	13.73	8.15	9.50	1.35	5.18
	09/06/00	13.73	8.21	9.42	1.21	5.16
	09/21/00	13.73	8.30	8.88	0.58	5.26
	12/19/00	13.73	8.60	9.65	1.05	4.82
	02/22/01	13.73	6.36	8.15	1.79	6.83
	04/03/01	13.73	7.48	8.88	1.40	5.83
	04/23/01	13.73	7.85	9.10	1.25	5.51
	05/30/01	13.73	7.75	9.10	1.35	5.58
	07/10/01	13.73	8.10	9.60	1.50	5.18
	03/08/02	13.73	7.80	8.00	0.20	5.87
	04/03/02	13.73	7.60	7.70	0.10	6.10
	04/23/02	13.73	7.90	8.40	0.50	5.68
	04/25/02	13.73	7.90	8.80	0.90	5.56
	05/10/02	13.73	8.10	8.20	0.10	5.60
	05/24/02	13.73	8.05	8.10	0.05	5.67
	06/13/02	13.73	8.10	8.70	0.60	5.45
	07/05/02	13.73	8.10	8.95	0.85	5.38
	07/19/02	13.73	8.10	8.90	0.80	5.39
	07/30/02	13.73	8.10	8.90	0.80	5.39
	08/14/02	13.73	8.10	8.90	0.80	5.39
	09/13/02	13.73	8.30	9.30	1.00	5.13
	09/26/02	13.73	8.30	9.00	0.70	5.22

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland
651 Maritime Street, Oakland, California

Monitoring Well	Date Measured	Elevation [1] Top of Casing (feet)	Depth to Product (feet btc)	Depth to Water (feet btc)	Product Thickness (feet)	Groundwater Elevation [1] (feet)
MW-3 (cont)	10/14/02	13.73	8.60	9.50	0.90	4.86
	11/04/02	13.73	8.75	9.99	1.24	4.61
	11/21/02	13.73	8.59	11.29	2.70	4.33
	12/06/02	13.73	8.56	9.30	0.74	4.95
	12/18/02	13.73	7.35	8.43	1.08	6.06
	12/30/02	13.73	6.50	7.15	0.65	7.04
	01/02/03	13.73	6.20	6.20	0.00	7.53
	01/03/03	13.73	6.21	6.21	0.00	7.52
	01/14/03	13.73	6.20	6.21	0.01	7.53
	01/30/03	13.73	6.81	6.85	0.04	6.91
	02/18/02	13.73	7.09	7.15	0.06	6.62
	02/26/03	13.73	7.04	7.11	0.07	6.67
	03/13/03	13.73	7.22	8.11	0.89	6.24
	03/17/03	13.73	7.15	7.50	0.35	6.48
	04/16/03	13.73	7.27	8.25	0.98	6.17
	06/18/03	13.73	7.78	9.00	1.22	5.58
	09/03/03	13.73	8.31	9.96	1.65	4.93
	11/26/03	15.69	10.79	12.85	2.06	4.28
	03/05/04	15.69	8.39	9.85	1.46	6.86
	06/02/04	15.69	10.03	11.35	1.32	5.26
	09/03/04	15.69	10.46	12.06	1.60	4.75
	12/16/04	15.69	9.41	10.38	0.97	5.99
	03/29/05	15.69	8.17	9.01	0.84	7.27
	06/14/05	15.69	9.59	10.55	0.96	5.81
	08/10/05	15.69	9.91	11.15	1.24	5.41
	09/29/05	15.69	10.21	11.61	1.40	5.06
	12/21/05	15.69	8.21	8.28	0.07	7.46
	03/24/06	15.69	8.20	8.82	0.62	7.30
	07/28/06	15.69	9.81	9.83	0.02	5.87
	11/29/06	NA	10.72	11.70	0.98	NA
	06/01/07	15.66	10.77	11.46	0.69	4.68
	11/14/07	15.66	10.98	12.19	1.21	4.32
	06/05/08	15.66	10.51	11.96	1.45	4.72
	12/18/08	15.66	10.78	12.00	1.22	4.51
	03/04/09	15.66	9.31	9.93	0.62	6.16
	04/01/09	15.66	10.38	11.10	0.72	5.06
	06/17/09	15.66	10.79	12.30	1.51	4.42
	12/08/09	15.66	11.05	12.81	1.76	4.08
	06/17/10	15.66	10.39	12.29	1.90	4.70
	12/15/10	15.66	10.13	10.74	0.61	5.35
	06/07/11	15.66	9.91	10.95	1.04	5.44
	06/21/11	15.66	10.74	11.20	0.46	4.78
	09/26/11	15.66	10.71	12.55	1.84	4.40
	12/05/11	15.66	10.83	12.20	1.37	4.42
	02/06/12	15.66	10.60	11.42	0.82	4.81
	06/19/12	15.66	10.52	12.04	1.52	4.68

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland
651 Maritime Street, Oakland, California

Monitoring Well	Date Measured	Elevation [1] Top of Casing (feet)	Depth to Product (feet btc)	Depth to Water (feet btc)	Product Thickness (feet)	Groundwater Elevation [1] (feet)
MW-3 (cont)	09/19/12	15.66	10.90	13.01	2.11	4.13
	12/04/12	15.66	9.64	10.65	1.01	5.72
	06/19/13	15.66	10.92	12.45	1.53	4.28
	12/12/13	15.66	11.23	13.23	2.00	3.83
	06/24/14	15.66	10.83	11.84	1.01	4.53
	01/08/15	15.66	9.74	10.71	0.97	5.63
MW-4						
	12/31/97	12.66	NP	7.09	0.00	5.57
	04/13/98	12.66	NP	7.71	0.00	4.95
	11/06/98	12.66	NP	8.69	0.00	3.97
	03/19/99	12.66	NP	8.00	0.00	4.66
	06/24/99	12.66	NP	8.45	0.00	4.21
	09/28/99	12.66	NP	8.73	0.00	3.93
	11/12/99	12.66	NP	8.83	0.00	3.83
	02/11/00	12.66	NP	7.71	0.00	4.95
	05/22/00	12.66	NP	8.09	0.00	4.57
	09/06/00	12.66	NP	8.32	0.00	4.34
	12/19/00	12.66	NP	8.47	0.00	4.19
	02/21/01	12.66	NP	7.51	0.00	5.15
	04/03/01	12.66	NP	8.13	0.00	4.53
	07/10/01	12.66	NP	8.12	0.00	4.54
	12/12/01	12.66	NP	7.65	0.00	5.01
	01/22/02	12.66	NP	7.60	0.00	5.06
	03/08/02	12.66	NP	7.96	0.00	4.70
	06/13/02	12.66	NP	8.20	0.00	4.46
	09/26/02	12.66	NP	8.21	0.00	4.45
	12/12/02	12.66	NP	8.38	0.00	4.28
	03/17/03	12.66	NP	7.72	0.00	4.94
	06/18/03	12.66	NP	8.02	0.00	4.64
	09/03/03	12.66	NP	8.29	0.00	4.37
	11/26/03	12.66	NP	8.69	0.00	3.97
	03/05/04	12.66	NP	7.45	0.00	5.21
	06/02/04	12.66	NP	8.25	0.00	4.41
	09/03/04	12.66	NP	8.31	0.00	4.35
	12/16/04	12.66	NP	7.96	0.00	4.70
	03/29/05	12.66	NP	7.11	0.00	5.55
	06/14/05	12.66	NP	7.90	0.00	4.76
	08/10/05	12.66	NP	7.86	0.00	4.80
	09/29/05	12.66	NP	8.00	0.00	4.66
	12/21/05	12.66	NP	7.30	0.00	5.36
	03/24/06	12.66	NP	7.05	0.00	5.61
	07/28/06	12.66	NP	7.92	0.00	4.74
	11/29/06	NA	NP	11.63	0.00	NA
	06/01/07	15.91	NP	11.82	0.00	4.09
	11/14/07	15.91	NP	11.88	0.00	4.03
	06/05/08	15.91	NP	11.67	0.00	4.24

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland
651 Maritime Street, Oakland, California

Monitoring Well	Date Measured	Elevation [1] Top of Casing (feet)	Depth to Product (feet btc)	Depth to Water (feet btc)	Product Thickness (feet)	Groundwater Elevation [1] (feet)
MW-4 (cont)	12/18/08	15.91	NP	11.20	0.00	4.71
	03/04/09	15.91	NP	10.93	0.00	4.98
	04/01/09	15.91	NP	11.63	0.00	4.28
	06/17/09	15.91	NP	11.88	0.00	4.03
	12/08/09	15.91	NP	12.03	0.00	3.88
	06/16/10	15.91	NP	11.75	0.00	4.16
	12/14/10	15.91	NP	11.62	0.00	4.29
	06/07/11	15.91	NP	11.80	0.00	4.11
	06/21/11	15.91	NP	11.42	0.00	4.49
	09/26/11	15.91	NP	11.83	0.00	4.08
	12/05/11	15.91	NP	12.03	0.00	3.88
	02/06/12	15.91	NP	11.71	0.00	4.20
	06/19/12	15.91	NP	11.73	0.00	4.18
	09/19/12	15.91	NP	11.90	0.00	4.01
	12/04/12	15.91	NP	10.95	0.00	4.96
	06/19/13	15.91	NP	12.04	0.00	3.87
	12/12/13	15.91	NP	12.22	0.00	3.69
	06/24/14	15.91	NP	11.88	0.00	4.03
	01/07/15	15.91	NP	11.03	0.00	4.88
MW-5						
	12/31/97	13.00	NP	6.38	0.00	6.62
	04/13/98	13.00	NP	5.56	0.00	7.44
	11/06/98	13.00	NP	6.59	0.00	6.41
	03/19/99	13.00	NP	6.20	0.00	6.80
	06/24/99	13.00	NP	6.73	0.00	6.27
	09/28/99	13.00	NP	6.91	0.00	6.09
	11/12/99	13.00	NP	7.06	0.00	5.94
	02/11/00	13.00	NP	7.00	0.00	6.00
	05/22/00	13.00	NP	6.21	0.00	6.79
	09/06/00	13.00	NP	6.56	0.00	6.44
	12/19/00	13.00	NP	6.68	0.00	6.32
	02/21/01	13.00	NP	6.08	0.00	6.92
	04/03/01	13.00	NP	6.38	0.00	6.62
	07/10/01	13.00	NP	6.58	0.00	6.42
	12/12/01	13.00	NP	6.40	0.00	6.60
	01/22/02	13.00	NP	6.10	0.00	6.90
	03/08/02	13.00	NP	6.10	0.00	6.90
	06/13/02	13.00	NP	6.31	0.00	6.69
	09/26/02	13.00	NP	6.60	0.00	6.40
	12/12/02	13.00	NP	6.75	0.00	6.25
	03/17/03	13.00	NP	5.73	0.00	7.27
	06/18/03	13.00	NP	6.10	0.00	6.90
	09/03/03	13.00	NP	6.50	0.00	6.50
	11/26/03	13.00	NP	6.70	0.00	6.30
	03/05/04	13.00	NP	5.70	0.00	7.30
	06/02/04	13.00	NP	6.27	0.00	6.73

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland
651 Maritime Street, Oakland, California

Monitoring Well	Date Measured	Elevation [1] Top of Casing (feet)	Depth to Product (feet btc)	Depth to Water (feet btc)	Product Thickness (feet)	Groundwater Elevation [1] (feet)
MW-5 (cont)	09/03/04	13.00	NP	6.61	0.00	6.39
	12/16/04	13.00	NP	6.02	0.00	6.98
	03/29/05	13.00	NP	5.25	0.00	7.75
	06/14/05	13.00	NP	5.82	0.00	7.18
	08/10/05	13.00	NP	6.00	0.00	7.00
	09/29/05	13.00	NP	6.26	0.00	6.74
	12/21/05	13.00	NP	5.91	0.00	7.09
	03/24/06	13.00	NP	NA[2]	NA[2]	NA
	07/28/06	13.00	NP	6.08	0.00	6.92
	11/29/06	NA	NP	9.39	0.00	NA
	06/01/07	15.39	NP	10.60	0.00	4.79
	11/14/07	15.39	NP	9.77	0.00	5.62
	06/05/08	15.39	NP	9.74	0.00	5.65
	12/18/08	15.39	NP	9.80	0.00	5.59
	03/04/09	15.39	NP	8.78	0.00	6.61
	04/01/09	15.39	NP	9.16	0.00	6.23
	06/17/09	15.39	NP	9.51	0.00	5.88
	12/08/09	15.39	NP	9.52	0.00	5.87
	06/16/10	15.39	NP	9.31	0.00	6.08
	12/14/10	15.39	NP	9.31	0.00	6.08
	06/07/11	15.39	NP	9.06	0.00	6.33
	06/21/11	15.39	NP	9.06	0.00	6.33
	09/26/11	15.39	NP	9.30	0.00	6.09
	12/05/11	15.39	NP	9.31	0.00	6.08
	02/06/12	15.39	NP	9.32	0.00	6.07
	06/19/12	15.39	NP	9.16	0.00	6.23
	09/19/12	15.39	NP	9.39	0.00	6.00
	12/04/12	15.39	NP	9.17	0.00	6.22
	06/19/13	15.39	NP	9.32	0.00	6.07
	12/12/13	15.39	NP	9.47	0.00	5.92
	06/24/14	15.39	NP	9.36	0.00	6.03
	01/07/15	15.39	NP	9.02	0.00	6.37
MW-6						
	06/24/99	13.51	NP	8.61	0.00	4.90
	09/28/99	13.51	NP	9.26	0.00	4.25
	11/12/99	13.51	NP	8.01	0.00	5.50
	02/11/00	13.51	NP	7.20	0.00	6.31
	05/22/00	13.51	NP	7.13	0.00	6.38
	09/06/00	13.51	NP	7.12	0.00	6.39
	12/19/00	13.51	NP	7.57	0.00	5.94
	02/21/01	13.51	NP	7.50	0.00	6.01
	04/03/01	13.51	NP	6.88	0.00	6.63
	07/10/01	13.51	NP	7.15	0.00	6.36
	12/12/01	13.51	NP	9.50	0.00	4.01
	01/22/02	13.51	NP	6.69	0.00	6.82
	03/08/02	13.51	NP	6.98	0.00	6.53

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland
651 Maritime Street, Oakland, California

Monitoring Well	Date Measured	Elevation [1] Top of Casing (feet)	Depth to Product (feet btc)	Depth to Water (feet btc)	Product Thickness (feet)	Groundwater Elevation [1] (feet)
MW-6 (cont)	06/13/02	13.51	NP	7.45	0.00	6.06
	09/26/02	13.51	NP	7.95	0.00	5.56
	12/12/02	13.51	NP	7.71	0.00	5.80
	12/18/02	Monitoring well was destroyed				
MW-7						
	12/31/97	13.86	NP	8.88	0.00	4.98
	04/13/98	13.86	NP	7.86	0.00	6.00
	11/06/98	13.86	NP	9.55	0.00	4.31
	03/19/99	13.86	NP	8.41	0.00	5.45
	06/24/99	13.86	NP	9.08	0.00	4.78
	09/28/99	13.86	NP	9.60	0.00	4.26
	11/12/99	13.86	NP	9.77	0.00	4.09
	02/11/00	13.86	NP	8.67	0.00	5.19
	05/22/00	13.86	NP	8.43	0.00	5.43
	09/06/00	13.86	NP	8.88	0.00	4.98
	12/19/00	13.86	NP	9.21	0.00	4.65
	02/21/01	13.86	NP	8.13	0.00	5.73
	04/03/01	13.86	NP	8.45	0.00	5.41
	07/10/01	13.86	NP	8.87	0.00	4.99
	12/12/01	13.86	NP	8.39	0.00	5.47
	01/22/02	13.86	NP	7.99	0.00	5.87
	03/08/02	13.86	NP	8.51	0.00	5.35
	06/13/02	13.86	NP	8.90	0.00	4.96
	09/26/02	13.86	NP	9.00	0.00	4.86
	12/12/02	13.86	NP	9.28	0.00	4.58
	12/18/02	Monitoring well was destroyed				
MW-8 [3]						
	12/31/97	12.45	8.49	8.82	0.33	3.86
	11/06/98	12.45	9.25	10.30	1.05	2.89
	11/21/98	Monitoring well was destroyed and replaced with well MW-8A				
MW-8A						
	12/12/01	12.45	NP	7.20	0.00	NA
	01/22/02	12.45	NP	7.20	0.00	5.25
	03/08/02	12.45	NP	7.70	0.00	4.75
	06/13/02	12.45	NP	7.72	0.00	4.73
	09/26/02	12.45	NP	7.91	0.00	4.54
	12/12/02	12.45	NP	8.15	0.00	4.30
	03/17/03	12.45	NP	7.28	0.00	5.17
	06/18/03	12.45	NP	7.72	0.00	4.73
	09/03/03	12.45	NP	8.18	0.00	4.27
	11/26/03	12.45	NP	8.55	0.00	3.90
	03/05/04	12.45	NP	6.92	0.00	5.53
	06/02/04	12.45	NP	7.92	0.00	4.53
	09/03/04	12.45	NP	8.16	0.00	4.29
	12/16/04	12.45	NP	7.62	0.00	4.83
	03/29/05	12.45	NP	6.63	0.00	5.82
	06/14/05	12.45	NP	7.60	0.00	4.85
	08/10/05	12.45	NP	7.50	0.00	4.95
	09/29/05	12.45	NP	7.76	0.00	4.69

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland
651 Maritime Street, Oakland, California

Monitoring Well	Date Measured	Elevation [1] Top of Casing (feet)	Depth to Product (feet btc)	Depth to Water (feet btc)	Product Thickness (feet)	Groundwater Elevation [1] (feet)
MW-8A (cont)	12/21/05	12.45	NP	6.90	0.00	5.55
	03/24/06	12.45	NP	6.65	0.00	5.80
	07/28/06	12.45	NP	7.34	0.00	5.11
	11/29/06	NA	NP	11.41	0.00	NA
	06/01/07	14.99	NP	11.26	0.00	3.73
	11/14/07	14.99	NP	11.40	0.00	3.59
	06/05/08	14.99	NP	11.45	0.00	3.54
	12/18/08	14.99	NP	11.30	0.00	3.69
	03/04/09	14.99	NP	10.07	0.00	4.92
	04/01/09	14.99	NP	10.92	0.00	4.07
	06/17/09	14.99	NP	11.40	0.00	3.59
	12/08/09	14.99	NP	11.64	0.00	3.35
	06/16/10	14.99	NP	11.75	0.00	3.24
	12/14/10	14.99	NP	10.75	0.00	4.24
	06/07/11	14.99	NP	10.51	0.00	4.48
	06/21/11	14.99	NP	10.64	0.00	4.35
	09/26/11	14.99	NP	11.21	0.00	3.78
	12/05/11	14.99	NP	11.29	0.00	3.70
	02/06/12	14.99	NP	10.75	0.00	4.24
	06/19/12	14.99	NP	11.04	0.00	3.95
	09/19/12	14.99	NP	11.38	0.00	3.61
	12/04/12	14.99	NP	9.87	0.00	5.12
	06/19/13	14.99	NP	11.44	0.00	3.55
	12/12/13	14.99	NP	11.75	0.00	3.24
	06/24/14	14.99	NP	11.26	0.00	3.73
	01/07/15	14.99	NP	10.00	0.00	4.99
MW-9						
	12/18/08	16.33	NP	12.88	0.00	3.45
	03/04/09	16.33	NP	11.04	0.00	5.29
	04/01/09	16.33	NP	11.51	0.00	4.82
	06/17/09	16.33	NP	11.95	0.00	4.38
	12/08/09	16.33	NP	12.30	0.00	4.03
	06/16/10	16.33	NP	11.75	0.00	4.58
	12/14/10	16.33	NP	11.51	0.00	4.82
	06/07/11	16.33	NP	11.32	0.00	5.01
	06/21/11	16.33	NP	11.37	0.00	4.96
	09/26/11	16.33	NP	11.92	0.00	4.41
	12/05/11	16.33	NP	11.99	0.00	4.34
	02/06/12	16.33	NP	11.70	0.00	4.63
	06/19/12	16.33	NP	11.76	0.00	4.57
	09/19/12	16.33	NP	12.03	0.00	4.30
	12/04/12	16.33	NP	11.15	0.00	5.18
	06/19/13	16.33	NP	12.12	0.00	4.21
	12/12/13	16.33	NP	12.41	0.00	3.92
	06/24/14	16.33	NP	12.01	0.00	4.32
	01/07/15	16.33	NP	10.97	0.00	5.36
MW-10						
	12/18/08	15.65	NP	14.34	0.00	1.31
	03/04/09	15.65	NP	9.78	0.00	5.87
	04/01/09	15.65	NP	10.33	0.00	5.32

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland
651 Maritime Street, Oakland, California

Monitoring Well	Date Measured	Elevation [1] Top of Casing (feet)	Depth to Product (feet btc)	Depth to Water (feet btc)	Product Thickness (feet)	Groundwater Elevation [1] (feet)
MW-10 (cont)	06/17/09	15.65	NP	10.79	0.00	4.86
	12/08/09	15.65	NP	10.96	0.00	4.69
	06/16/10	15.65	NP	10.62	0.00	5.03
	12/14/10	15.65	NP	10.31	0.00	5.34
	06/07/11	15.65	NP	10.11	0.00	5.54
	06/21/11	15.65	NP	10.19	0.00	5.46
	09/26/11	15.65	NP	10.79	0.00	4.86
	12/05/11	15.65	NP	10.80	0.00	4.85
	02/06/12	15.65	NP	10.51	0.00	5.14
	06/19/12	15.65	NP	10.61	0.00	5.04
	09/19/12	15.65	NP	10.57	0.00	5.08
	12/04/12	15.65	NP	9.96	0.00	5.69
	06/19/13	15.65	NP	10.90	0.00	4.75
	12/12/13	15.65	NP	11.23	0.00	4.42
	06/24/14	15.65	NP	10.77	0.00	4.88
	01/06/15	15.65	NP	9.70	0.00	5.95
MW-11						
	12/18/08	15.47	NP	13.42	0.00	2.05
	03/04/09	15.47	NP	9.57	0.00	5.90
	04/01/09	15.47	NP	9.94	0.00	5.53
	06/17/09	15.47	NP	10.40	0.00	5.07
	12/09/09	15.47	NP	10.68	0.00	4.79
	06/16/10	15.47	NP	10.02	0.00	5.45
	12/01/10	15.47	NP	10.02	0.00	5.45
	06/07/11	15.47	NP	10.00	0.00	5.47
	06/21/11	15.47	NP	9.85	0.00	5.62
	09/26/11	15.47	NP	10.33	0.00	5.14
	12/05/11	15.47	NP	10.59	0.00	4.88
	02/06/12	15.47	NP	10.59	0.00	4.88
	06/19/12	15.47	NP	10.12	0.00	5.35
	09/19/12	15.47	NP	10.54	0.00	4.93
	12/04/12	15.47	NP	9.65	0.00	5.82
	06/19/13	15.47	NP	10.53	0.00	4.94
	12/12/13	15.47	NP	11.04	0.00	4.43
	06/24/14	15.47	NP	10.47	0.00	5.00
	01/08/15	15.47	NP	9.41	0.00	6.06
MW-12						
	12/18/08	16.79	NP	12.75	0.00	4.04
	03/04/09	16.79	NP	10.60	0.00	6.19
	04/01/09	16.79	NP	11.23	0.00	5.56
	06/17/09	16.79	NP	11.83	0.00	4.96
	12/08/09	16.79	NP	12.13	0.00	4.66
	06/16/10	16.79	NP	11.31	0.00	5.48
	12/14/10	16.79	NP	11.15	0.00	5.64
	06/07/11	16.79	NP	10.81	0.00	5.98
	06/21/11	16.79	NP	11.01	0.00	5.78
	09/26/11	16.79	NP	11.77	0.00	5.02
	12/05/11	16.79	NP	11.89	0.00	4.90
	02/06/12	16.79	NP	11.60	0.00	5.19
	06/19/12	16.79	NP	11.49	0.00	5.30

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland
651 Maritime Street, Oakland, California

Monitoring Well	Date Measured	Elevation [1] Top of Casing (feet)	Depth to Product (feet btc)	Depth to Water (feet btc)	Product Thickness (feet)	Groundwater Elevation [1] (feet)
MW-12 (cont)	09/19/12	16.79	NP	12.04	0.00	4.75
	12/04/12	16.79	NP	10.74	0.00	6.05
	06/19/13	16.79	NP	12.01	0.00	4.78
	12/12/13	16.79	NP	12.47	0.00	4.32
	06/24/14	16.79	NP	11.92	0.00	4.87
	01/08/15	16.79	NP	10.68	0.00	6.11

Notes:

Source of data prior to December 2005: Innovative Technical Solutions, Inc. *Third Quarter of 2005 Groundwter Monitoring and Product Monitoring Report* , 8 November 2005.

NP = no product detected with the interface probe

NC = not calculated due to the presence of free-phase product in the well

btc = below top of the well casing

NA = not available

NM = not measured

[1] Wells were resurveyed on January 24, 2009. Elevation data is relative to North American Vertical Datum of 1988 (NAVD 88). Groundwater elevation for wells MW-1, MW-3, and MW-8, when calculated, assumes the density of the free product is 0.70 .

[2] Well could not be measured due to abundant surface water covering well head.

[3] Viscous product not related to the lighter product identified in other wells.

[4] Product not measureable, but visible evidence of product on interface probe

TABLE 2. Groundwater Analytical Results Summary
Port of Oakland
651 Maritime Street, Oakland, California

Monitoring Well	Date Sampled	Concentration (µg/L)							
		TPH-G	TPH-D	TPH-MO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-1									
	05/22/00	3,600	41,000	<3,000	100	13 [8]	2.9	2.05	3.2 [8]
	12/08/09	1,400	1,200 [2]	<300	120	2.9	1.8	3.0	<1.0
	06/22/11	1,100 [2]	890 [24]	<300 [24]	46	1.9	2.6	2.0	<0.5
	06/19/13	1,600 [2]	3,100	<300	18	2.2	4.4	1.8	<0.5
	12/13/13	1,700	1,700	<300	10	2.6	1.2	3.3	<0.5
	06/24/14	1,500 [2]	1,500	<290	7	1.8	1.4	2.3	<0.5
	01/06/15	1,700 [2]	2,000	<300	27	1.6	1.8	1.6	<0.5
MW-2									
	05/27/94	87	470	NA	<0.5	<0.5	<0.5	<0.5	NA
	03/29/95	<50	110	1,400	<0.4	<0.3	<0.3	<0.4	NA
	09/06/95	<50	NA	NA	<0.4	<0.3	<0.3	<0.4	NA
	01/08/96	<50	<50	1200	<0.4	<0.3	<0.3	<0.4	NA
	04/04/96	<50	160	320	<0.5	<0.5	<0.5	<1.0	NA
	07/10/96	<50	120	1400	<0.4	<0.3	<0.3	<0.4	NA
	12/03/96	<50	230 [1,2]	<250	<0.5	<0.5	<0.5	<1.0	NA
	03/28/97	<50	714	<250	<0.5	<0.5	<0.5	<1.0	NA
	06/13/97	51	<50	<250	<0.5	<0.5	<0.5	<1.0	NA
	09/18/97	82	<50	<250	0.56	<0.5	<0.5	<1.0	NA
	12/31/97	<50	<47	<280	1.4	<0.5	<0.5	<1.0	NA
	04/13/98	<50	<50	<300	<0.5	<0.5	<0.5	<1.0	NA
	11/06/98	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	03/19/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	06/24/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	09/28/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	11/12/99	<50	120 [2,6]	<300	<0.5	<0.5	<0.5	<0.5	6.3 [8,9]
	02/11/00	<50	<50	<300	5.4	<0.5	<0.5	<0.5	<2
	05/22/00	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2
	09/06/00	<50	<50	<300	0.76 [8]	<0.5	<0.5	<0.5	<0.5 [10]
	12/19/00	200 [3,11]	<50	<300	39	1.8	<0.5	2.6	<0.5 [10,12]
	02/21/01	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	07/10/01	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	12/05/01	<50	<50	<300	4.4	<0.5	<0.5	<0.5	5.0 [14]
	03/08/02	<50	<50	<500	<0.5	<0.5	<0.5	<0.5	<5.0
	06/13/02	62 [15]	<57	<570	<0.5	<0.5	<0.5	<0.5	<5.0
	09/26/02	69 [2]	<50	<500	1.8	<0.5	<0.5	<0.5	<5.0
	12/12/02	<50	<50	<300	0.98	<0.5	<0.5	<0.5	<2.0
	03/17/03	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	06/18/03	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	09/03/03	<50	<50	<300	3.2	<0.5	<0.5	<0.5	<2.0
	11/26/03	<50	<50	<300	3	<0.5	<0.5	<0.5	<2.0
	03/05/04	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	06/02/04	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	09/03/04	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	12/16/04	<50	96 [6, 15]	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	03/29/05	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	08/10/05	<50	<50	<250	<0.5	<0.5	<0.5	<0.5	<0.5

TABLE 2. Groundwater Analytical Results Summary
Port of Oakland
651 Maritime Street, Oakland, California

Monitoring Well	Date Sampled	Concentration (µg/L)							
		TPH-G	TPH-D	TPH-MO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-2 (cont)	09/29/05	<50	<50	<250	<0.5	<0.5	<0.5	<0.5	<0.5
	12/21/05	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	03/24/06	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	07/28/06	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	11/29/06	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/01/07	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	11/14/07	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/05/08	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	12/18/08	390 [2]	840	<300	1.1	<0.5	0.9	<0.5	<0.5
	03/04/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	04/01/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/17/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	12/09/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/17/10	<50	220 [2]	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	12/15/10	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/22/11	<50	<50	<300 [2,3]	<0.5	<0.5	<0.5	<0.5	<0.5
	09/26/11	<50	<50 [24]	<300 [24]	<0.5	<0.5	<0.5	<0.5	<0.5
	06/19/12	<50	<53	<320	<0.5	<0.5	<0.5	<0.5	<0.5
	12/04/12	<50	<53	<320	<0.5	<0.5	<0.5	<0.5	<0.5
	06/19/13	<50	<51	<310	<0.5	<0.5	<0.5	<0.5	<0.5
	12/12/13	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/25/14	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	01/08/15	<50	<50	<300	<0.5	<0.5	<0.5	<1.0	<0.5
MW-3									
	Not sampled due to the presence of free-phase product								
MW-4									
	09/11/95	150	<200	500	23	<0.3	<0.3	<0.4	NA
	01/08/96	790	90	400	170	1.2	0.6	0.6	NA
	04/04/96	1,100	180	300	320	1.6	1.1	1.2	NA
	07/10/96	1,200	120	300	470	1.5	0.8	0.8	NA
	12/03/96	990	220 [1,2]	<250	350	3.3	1.3	1.3	NA
	03/28/97	440 [2]	<50	<250	190	1.2	0.64	<1.0	NA
	06/13/97	1,300	92 [5]	<250	500	5.5	3.4	2.8	NA
	09/18/97	1,300	150	<250	550	4.9	2.1	2.00	NA
	12/31/97	73 [1,2,3]	<47	<280	110 [1]	1.0 [1]	<0.5	<1.0	NA
	04/13/98	150 [2,3]	<50	<300	520	2.9	<2.5	<5.0	NA
	11/06/98	<50	<50	<300	250	1.7	<1.0	<1.0	<4
	03/19/99	81	<50	<300	250	<1	1.2	<1.0	<4
Dup.	06/24/99	190	<50	<300	360	1.4	2.2	1.0	24
	09/28/99	750 [3,5]	63 [3,5]	<300	280	1.5	<1.0	<1.0	<4
	11/12/99	330 [3]	840 [2]	<300	740	<2.5	<2.5	<2.5	42 [9]
	02/11/00	200 [2]	<50	<300	58	0.73	<0.5	<0.5	4.4 [8]
	05/22/00	240	<50	<300	500	<2.5	<2.5	<2.5	17
	09/06/00	530 [2,3]	<50	<300	190	0.93	0.6	0.57	<0.5 [10]
	12/19/00	960 [3,11]	70 [5]	<300	420	<2.5	<2.5	<2.5	<0.5 [10,12]
	12/19/00	1,200 [3,11]	<50	<300	440	<2.5	<2.5	<2.5	<0.5 [10,12]
	02/21/01	450 [13]	<50	<300	120	<0.5	<0.5	<0.5	<0.5 [10]

TABLE 2. Groundwater Analytical Results Summary
Port of Oakland
651 Maritime Street, Oakland, California

Monitoring Well	Date Sampled	Concentration (µg/L)							
		TPH-G	TPH-D	TPH-MO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-4 (cont)	07/10/01	<250	110 [2,13]	<300	620	2.6	2.9	<2.5	<0.5 [8,10]
	12/05/01	180	<50	<300	61	<0.5	<0.5	<0.5	3.8 [14]
	03/08/02	490 [2]	54 [2]	<500	180	<2.5	<2.5	<2.5	<25
	06/13/02	830 [2]	<50	<500	250	<5.0	<5.0	<5.0	<50
Dup.	06/13/02	820 [2]	<56	<560	240	<5.0	<5.0	<5.0	<50
	09/26/02	390 [2]	57	<500	150	2.1	<1.0	<1.0	<10
Dup.	09/26/02	500 [2]	<50 [16]	<500 [16]	200	1.5	<1.0	<1.0	<10
	12/12/02	580	<50	<300	240	1.4	0.56	<0.5	<2.0
Dup.	12/12/02	2,400	<50	<300	680	5.0	2.3	1.4	<2.0
	03/17/03	130 [15]	<50	<300	320 [17]	<0.5	<0.5	<0.5	<0.5 [10]
Dup.	03/17/03	82 [15]	<50	<300	190	0.64 [17]	0.56	0.53	<0.5 [10]
	06/18/03	360 [11, 15]	<50	<300	150	<0.5	<0.5	<0.5	<2.0
Dup.	06/18/03	330 [11, 15]	<50	<300	140	<0.5	<0.5	<0.5	<2.0
	09/03/03	140 [11, 15]	<50	<300	240	1.3	<0.5	<0.5	<2.0
Dup.	09/03/03	83 [11, 15]	<50	<300	130	0.58 [17]	<0.5	<0.5	<2.0
	11/26/03	160 [15]	68 [15]	<300	320	0.91 [17]	<0.5	0.53	<2.0
Dup.	11/26/03	120 [15]	<50	<300	210	0.66 [17]	<0.5	<0.5	<2.0
	03/05/04	90 [11]	<50	<300	190	1.1	0.55	0.50 [17]	23 [14,17], <0.5 [10]
Dup.	03/05/04	84 [11]	<50	<300	180	0.81	<0.5	<0.5	21 [14,17], <0.5 [10]
	06/02/04	620 [13]	<50	<300	210	0.55 [17]	<0.5	<0.5	<2.0
Dup.	06/02/04	400 [13]	<50	<300	130	<0.5	<0.5	<0.5	<2.0
	09/03/04	780 [13, 15]	<50	<300	<0.5	1.0 [17]	<0.5	0.57	<2.0
Dup.	09/03/04	370 [13, 15]	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	12/16/04	840	<50	<300	290	1.3 [17]	0.69	0.75	<2.0
Dup.	12/16/04	670	<50	<300	230	1.3 [17]	<0.5	<0.5	<2.0
	03/29/05	440 [13]	<50	<300	140	0.57	<0.5	<0.5	<2.0
Dup.	03/29/05	540 [13]	<50	<300	170	0.72	<0.5	<0.5	<2.0
	08/10/05	500 [18]	<50	<250	180	<2.5	<2.5	<2.5	<2.5
	09/29/05	360 [18]	59 [20]	<250	160	<5.0	<5.0	<5.0	<5.0
Dup.	09/29/05	420 [18]	<50	<250	150	<5.0	<5.0	<5.0	<5.0
	12/21/05	110	<50	<300	76	<0.5	<0.5	<0.5	<0.5
Dup.	12/21/05	160	<50	<300	76	<0.5	<0.5	<0.5	<0.5
	03/24/06	420	51	<300	120	0.8	<0.7	<0.7	<0.7
Dup.	03/24/06	440	<50	<300	130	<0.7	<0.7	<0.7	<0.7
	08/04/06	560	92 [2]	<300	160	<1.3	4.3	<1.3	<1.3
Dup.	08/04/06	590	100 [2]	<300	150	<1.3	4.5	<1.3	<1.3
	11/29/06	300	<50	<300	42	<0.7	1.0	<0.7	<0.7
Dup.	11/29/06	300	<50	<300	60	<0.7	<0.7	<0.7	<0.7
	06/01/07	100 [13, 15]	<50	<300	10	<0.5	<0.5	<0.5	<0.5
Dup.	06/01/07	100 [13, 15]	<50	<300	11	<0.5	<0.5	<0.5	<0.5
	11/14/07	54 [15]	<50	<300	2.1	<0.5	<0.5	<0.5	<0.5
Dup.	11/14/07	51 [15]	<50	<300	2.1	<0.5	<0.5	<0.5	<0.5
	06/05/08	67 [15]	<50	<300	14	<0.5	<0.5	<0.5	<0.5
Dup.	06/05/08	91 [15]	<50	<300	15	<0.5	<0.5	<0.5	<0.5
	12/18/08	99 [2]	520	<300	0.5	<0.5	<0.5	<0.5	<0.5
Dup.	12/18/08	88 [2]	850	<300	0.7	<0.5	0.6	<0.5	<0.5

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Monitoring Well	Date Sampled	Concentration (µg/L)							
		TPH-G	TPH-D	TPH-MO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-4 (cont)	03/04/09	60 [2]	<50	<300	3.8	<0.5	<0.5	<0.5	<0.5
Dup.	03/04/09	<50	<50	<300	4.4	<0.5	<0.5	<0.5	<0.5
	04/01/09	<50	<50	<300	7.5	<0.5	<0.5	<0.5	<0.5
Dup.	04/01/09	<50	<50	<300	7.8	<0.5	<0.5	<0.5	<0.5
	06/19/09	69 [2]	<50	<300	15	<0.5	<0.5	<0.5	<0.5
	12/08/09	<50	<50	<300	3.3	<0.5	<0.5	<0.5	<0.5
Dup.	12/08/09	<50	<50	<300	3.5	<0.5	<0.5	<0.5	<0.5
	06/16/10	<50	<50	<300	15	<0.5	<0.5	<0.5	<0.5
Dup.	06/16/10	<50	<50	<300	18	<0.5	<0.5	<0.5	<0.5
	12/14/10	<50	<50	<300	2.2	<0.5	<0.5	<0.5	<0.5
Dup.	12/14/10	<50	<50	<300	2.7	<0.5	<0.5	<0.5	<0.5
	06/21/11	160 [2]	<56	<330	30	<0.5	<0.5	<0.5	<0.5
Dup.	06/21/11	84 [2]	<53	<320	28	<0.5	<0.5	<0.5	<0.5
	09/27/11	130 [2]	72	<300	13	<0.5	<0.5	<0.5	<0.5
Dup.	09/27/11	130 [2]	57 [24]	<300 [24]	12	<0.5	<0.5	<0.5	<0.5
	06/19/12	120 [2]	<51	<310	19	<0.5	<0.5	<0.5	<0.5
Dup.	06/19/12	120 [2]	<52	<310	20	<0.5	<0.5	<0.5	<0.5
	12/04/12	76 [2]	<53	<320	1.7	<0.5	<0.5	<0.5	<0.5
Dup.	12/04/12	60 [2]	56 [2]	<310	1.3	<0.5	<0.5	<0.5	<0.5
	06/19/13	150 [2]	<56	<330	19	<0.5	<0.5	<0.5	<0.5
Dup.	06/19/13	150 [2]	<50	<300	19	<0.5	<0.5	<0.5	<0.5
	12/13/13	81	<50	<300	2.6	<0.5	<0.5	<0.5	<0.5
Dup.	12/13/13	85	<50	<300	2.4	<0.5	<0.5	<0.5	<0.5
	06/25/14	270 [2]	<50	<300	52	<0.5	<0.5	<0.5	<0.5
Dup.	06/25/14	280 [2]	<50	<300	54	<0.5	<0.5	<0.5	<0.5
	01/07/15	290 [2]	67 [2]	<300	29	<0.5	<0.5	<1.0	<0.5
Dup.	01/07/15	280 [2]	53 [2]	<300	28	<0.5	<0.5	<1.0	<0.5
MW-5									
	09/11/95	90	<300	2,500	3.3	<0.3	<0.3	<0.4	NA
	04/04/96	<50	180	520	<0.5	<0.5	<0.5	<1.0	NA
	07/10/96	<50	120	1,500	<0.4	<0.3	<0.3	<0.4	NA
	12/03/96	<50	200 [1,2]	<250	<0.5	<0.5	<0.5	<1.0	NA
	03/28/97	<50	<50	<250	<0.5	<0.5	<0.5	<1.0	NA
	06/13/97	<50	<50	<250	<0.5	<0.5	<0.5	<1.0	NA
	09/18/97	<50	<50	<250	<0.5	<0.5	<0.5	<1.0	NA
	12/31/97	<50	<47	<280	<0.5	<0.5	<0.5	<1.0	NA
	04/13/98	<50	<47	<280	<0.5	<0.5	<0.5	<1.0	NA
	11/06/98	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	03/19/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	06/24/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	3.1
	09/28/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	11/12/99	<50	110 [2,6]	<300	<0.5	<0.5	<0.5	<0.5	5.5 [9]
	02/11/00	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	05/22/00	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	09/06/00	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	12/19/00	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	02/21/01	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0

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Monitoring Well	Date Sampled	Concentration (µg/L)							
		TPH-G	TPH-D	TPH-MO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-5 (cont)	07/10/01	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	12/05/01	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	03/08/02	<50	<50	<500	<0.5	<0.5	<0.5	<0.5	<5.0
	06/13/02	<50	<50	<500	<0.5	<0.5	<0.5	<0.5	<5.0
	09/26/02	<50	<50	<500	<0.5	<0.5	<0.5	<0.5	<5.0
	12/12/02	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	03/17/03	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5 [10]
	06/18/03	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	09/03/03	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	11/26/03	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	4.1 [14], <0.5 [10]
	03/05/04	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	06/02/04	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	09/03/04	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	12/16/04	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	2.2 [14], <0.5 [10]
	03/29/05	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	08/10/05	<50	<50	<250	<0.5	<0.5	<0.5	<0.5	<0.5
Dup.	08/10/05	<50 [19]	<50 [19]	<250	<0.5	<0.5	<0.5	<0.5	<0.5
	09/29/05	<50	<50	<250	<0.5	<0.5	<0.5	<0.5	<0.5
	12/21/05	<50	180 [15,22]	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	07/28/06	<50	180	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	11/29/06	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/01/07	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	11/14/07	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/05/08	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	12/18/08	3,100 [2]	3,600	<300	0.5	<0.5	<0.5	<0.5	1.8
	03/04/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	04/01/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	04/01/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/19/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	12/08/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/16/10	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	12/14/10	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/22/11	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	09/27/11	<50	<50 [24]	<300 [24]	<0.5	<0.5	<0.5	<0.5	<0.5
	06/19/12	<50	<51	<310	<0.5	<0.5	<0.5	<0.5	<0.5
	12/04/12	<50	<54	<330	<0.5	<0.5	<0.5	<0.5	<0.5
	06/19/13	<50	<53	<320	<0.5	<0.5	<0.5	<0.5	<0.5
	12/16/13	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/24/14	<50	72 [2]	<290	<0.5	<0.5	<0.5	<0.5	<0.5
	01/07/15	<50	<50	<300	<0.5	<0.5	<0.5	<1.0	<0.5
MW-6									
	11/06/98	120	12,000	1,200	19	0.65	1.8	<0.5	<2
	03/19/99	170	3,800	580	21	0.86	1.5	2.9	<2
	06/24/99	120	1,700 [7]	<300 [7]	18	<0.5	1.0	<0.5	54
	09/28/99	130 [3,5]	820	<300	20	0.51	2.2	<0.5	<2
	11/12/99	150	11,000 [2,6]	3,000 [3,6]	27	<0.5	2.2	<0.5	13 [9]
	02/11/00	270 [2]	2,300	<300	23	0.51	2.7	<0.5	5.8

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Monitoring Well	Date Sampled	Concentration (µg/L)							
		TPH-G	TPH-D	TPH-MO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-6 (cont)	05/22/00	350	3,000	<300	18	0.51	<0.5	<0.5	7.7
	09/06/00	190	610	<300	26	<0.5	1.7	<0.5	<0.5 [10]
	12/19/00	130 [3,11]	620	<300	24	<0.5	1.6	<0.5	<2
	02/21/01	120 [13]	440	<300	21	<0.5	0.96	<0.5	<2
	07/10/01	120	560	<300	29	<0.5	0.99	<0.5	<2
	12/12/01	53	550	<300	27	<0.5	1.3	<0.5	<2.0
	03/08/02	160 [2]	640 [2]	<500	30	<0.5	<0.5	<0.5	5.0 [14]
	06/13/02	160 [2]	670 [2]	<500	34	<0.5	<0.5	<0.5	<5.0
	09/26/02	230 [2]	1400 [2]	<500	40	0.64	0.8	<0.5	<5.0
	12/12/02	53	110	<300	43	<0.5	<0.5	<0.5	<2.0
	12/18/02	Monitoring well was destroyed							
MW-7									
	09/06/95	<50	<300	800	<0.4	<0.3	<0.3	<0.4	NA
	01/08/96	<50	410	110	<0.4	<0.3	<0.3	<0.4	NA
	04/04/96	<50	530	340	<0.5	<0.5	<0.5	<1.0	NA
	07/10/96	80	840	1,700	<0.4	<0.3	<0.3	<0.4	NA
	12/03/96	<50	280 [1,2]	<250	<0.5	<0.5	<0.5	<1.0	NA
	03/28/97	65 [6]	94 [2]	<250	<0.5	<0.5	<0.5	<1.0	NA
	06/13/97	<50	100	<250	<0.5	<0.5	<0.5	<1.0	NA
	09/18/97	<50	240	<250	<0.5	<0.5	<0.5	<1.0	NA
	12/31/97	<50	53 [2,3]	<280	<0.5	<0.5	<0.5	<1.0	NA
	04/13/98	<50	<48	<290	<0.5	<0.5	<0.5	<1.0	NA
	11/06/98	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2
	03/19/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	5.3
	06/24/99	73	<50	<300	<0.5	<0.5	<0.5	<0.5	12
	09/28/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	14
	11/12/99	<50	600 [2,6]	420 [3]	<0.5	<0.5	<0.5	<0.5	15 [9]
	02/11/00	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	51
	05/22/00	110	53 [2]	<300	<0.5	<0.5	<0.5	<0.5	75
	09/06/00	50 [6]	<50	<300	<0.5	<0.5	<0.5	<0.5	40 [10]
	12/19/00	54 [11]	51 [5]	<300	<0.5	<0.5	<0.5	<0.5	47 [10,12]
	02/21/01	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	66 [10]
Dup.	02/21/01	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	60 [10]
	07/10/01	<50	51 [2]	<300	<0.5	<0.5	<0.5	<0.5	76 [10]
Dup.	07/10/01	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	75 [10]
	12/12/01	51	<50	<300	<0.5	<0.5	<0.5	<0.5	98 [14]
Dup.	12/12/01	64	52 [13, 15]	<300	<0.5	<0.5	<0.5	<0.5	96 [14]
	03/08/02	52 [2]	<50	<500	<0.5	<0.5	<0.5	<0.5	24 [14]
	06/13/02	87 [2]	54 [2]	<500	<0.5	<0.5	<0.5	<0.5	51
	09/26/02	83 [2]	84 [2]	<500	<0.5	<0.5	<0.5	<0.5	75 [10]
	12/12/02	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	58 [14]
	12/18/02	Monitoring well was destroyed							
MW-8									
	Not sampled due to the presence of free-phase product								
MW-8A									
	12/12/01	68	720 [11,15]	<300	<0.5	<0.5	<0.5	<0.5	<2.0

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		TPH-G	TPH-D	TPH-MO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-8A (cont)	03/08/02	<50	760 [2]	<570	<0.5	<0.5	<0.5	<0.5	<5.0
Dup.	03/08/02	<50	350 [2]	<580	<0.5	<0.5	<0.5	<0.5	<5.0
	06/13/02	<50	570 [2]	<570	<0.5	<0.5	<0.5	<0.5	<5.0
	09/26/02	<50	410 [2]	<500	<0.5	<0.5	<0.5	<0.5	<5.0
	12/12/02	<50	160 [15]	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	03/17/03	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5 [10]
	06/18/03	<50	74 [15]	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	09/03/03	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	3.0 [14]/<0.5 [10]
	11/26/03	<50	94 [15]	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	03/05/04	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	06/02/04	<50	67 [15]	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	09/03/04	<50	86 [15]	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	12/16/04	<50	160 [6, 15]	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	03/29/05	<50	53	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	08/10/05	<50 [19]	150 [15, 19]	<250	<0.5	<0.5	<0.5	<0.5	<0.5
	09/29/05	<50	66 [21]	<250	<0.5	<0.5	<0.5	<0.5	<0.5
	12/21/05	<50	63 [15,22]	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	03/24/06	<50	71	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	07/28/06	<50	70 [15]	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	11/29/06	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/01/07	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	11/14/07	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/05/08	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	12/18/08	350 [2]	7,800	2,200 [2]	<0.5	<0.5	<0.5	<0.5	1.3
	03/04/09	<50	51 [2]	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	04/01/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/17/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	12/08/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/16/10	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	12/14/10	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/23/11	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	09/26/11	<50	<50 [24]	<300 [24]	<0.5	<0.5	<0.5	<0.5	<0.5
	06/19/12	<50	<51	<310	<0.5	<0.5	<0.5	<0.5	<0.5
	12/04/12	<50	<53	<320	<0.5	<0.5	<0.5	<0.5	<0.5
	06/19/13	<50	<52	<310	<0.5	<0.5	<0.5	<0.5	<0.5
	12/13/13	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/25/14	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	01/07/15	<50	<50	<300	<0.5	<0.5	<0.5	<1.0	<0.5
MW-9									
	12/18/08	52 [2]	72	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	03/04/09	290 [2]	310 [2]	<300	44	<0.5	0.6	0.6	<0.5
	04/01/09	210 [2]	210 [2]	<300	36	<0.5	<0.5	<0.5	<0.5
	06/19/09	240 [2]	240 [2]	<300	43	<0.5	<0.5	<0.5	<0.5
	12/08/09	210 [2]	210 [2]	<300	48	<0.5	<0.5	<0.5	<0.5
	06/16/10	160 [2]	160 [2]	<300	49	<0.5	1.0	0.6	<0.5
	12/14/10	170 [2]	130 [2]	<300	34	<0.5	<0.5	0.6	<0.5
	06/22/11	200 [2]	160 [2]	<300	25	<0.5	<0.5	<0.5	<0.5

TABLE 2. Groundwater Analytical Results Summary
Port of Oakland
651 Maritime Street, Oakland, California

Monitoring Well	Date Sampled	Concentration (µg/L)							
		TPH-G	TPH-D	TPH-MO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-9 (cont)	09/27/11	190 [2]	180 [24]	<300 [24]	21	<0.5	<0.5	<0.5	<0.5
	06/19/12	150 [2]	96 [2]	<320	11	<0.5	<0.5	<0.5	<0.5
	12/04/12	140 [2]	200 [2]	<320	14	<0.5	1.8	1.5	<0.5
	06/19/13	130	100 [2]	<320	14	<0.5	1.1	<0.5	<0.5
	12/13/13	210	<50	<300	28	0.6	6.9	1.9	4.0
	06/24/14	200 [2]	110 [2]	<290	11	<0.5	0.6	<0.5	<0.5
	01/07/15	350 [2]	130 [2]	<300	69	0.7	12	1.4	<0.5
MW-10									
	12/18/08	140 [2]	8,000	430 [2]	<0.5	<0.5	<0.5	<0.5	1.0
	03/04/09	96 [2]	110 [2]	<300	11	<0.5	0.5	<0.5	<0.5
	04/01/09	87 [2]	100 [2]	<300	14	<0.5	0.5	<0.5	<0.5
	06/17/09	90 [2]	220 [2]	<300	10	<0.5	1.0	<0.5	<0.5
	12/08/09	120 [2]	240 [2]	<300	26	<0.5	0.8	<0.5	<0.5
	06/16/10	140 [2]	200	<300	46	<0.5	<0.5	<0.5	<0.5
	12/14/10	150 [2]	140 [2]	<300	47	<0.5	<0.5	<0.5	<0.5
	06/22/11	320 [2]	630	<300	54	<0.5	2.2	<0.5	<0.5
	09/26/11	260 [2]	780 [24]	<300 [24]	61	1	2.4	<0.5	<0.5
	06/19/12	330 [2]	430 [2]	<310	58	<0.5	2.9	<0.5	<0.5
	12/04/12	250 [2]	1,100	<320	59	<0.5	0.9	<0.5	<0.5
	06/19/13	320 [2]	280 [2]	<310	61	<0.5	1.2	<0.5	<0.5
	12/13/13	280	130 [2]	<300	57	0.6	<0.5	<0.5	<0.5
	06/24/14	320 [2]	260	<290	60	<0.5	<0.5	<0.5	<0.5
	01/06/15	310 [2]	820	<300	66	0.6	<0.5	<1.0	<0.5
MW-11									
	12/18/08	1,900 [2]	15,000	800 [2]	<0.5	<0.5	<0.5	<0.5	5.0
	03/04/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	04/01/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/19/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	12/09/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/16/10	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	12/14/10	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/21/11	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	09/26/11	<50	<50 [24]	<300 [24]	<0.5	<0.5	<0.5	<0.5	<0.5
	06/19/12	<50	<53	<320	<0.5	<0.5	<0.5	<0.5	<0.5
	12/04/12	<50	<53	<320	<0.5	<0.5	<0.5	<0.5	<0.5
	06/19/13	<50	<50	<300	<1.0	<1.0	<1.0	<1.0	<1.0
	12/12/13	<50	<50	<300	<1.0	<1.0	<1.0	<1.0	<1.0
	06/25/14	<50	<50	<300	<2.5	<2.5	<2.5	<2.5	<2.5
	01/08/15	<50	<50	<300	<0.5	<0.5	<0.5	<1.0	<0.5
MW-12									
	12/18/08	25,000 [2]	19,000	980 [2]	<0.5	<0.5	<0.5	<0.5	5.1
	03/04/09	150 [2]	550 [2]	<300	<0.5	<0.5	<0.5	<0.5	4.8
	04/01/09	71 [2]	420 [2]	<300	<0.5	<0.5	<0.5	<0.5	5.8
	06/17/09	64 [2]	310 [2]	<300	<0.5	<0.5	<0.5	<0.5	5.7
Dup.	06/17/09	67 [2]	310 [2]	<300	<0.5	<0.5	<0.5	<0.5	5.4
	12/08/09	90 [2]	320 [2]	<300	<0.5	<0.5	<0.5	<0.5	4.7
	06/16/10	94 [2]	300	<300	<0.5	<0.5	<0.5	<0.5	4.8

TABLE 2. Groundwater Analytical Results Summary
Port of Oakland
651 Maritime Street, Oakland, California

Monitoring Well	Date Sampled	Concentration (µg/L)							
		TPH-G	TPH-D	TPH-MO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-12 (cont)	12/14/10	100 [2]	510	<300	<0.5	<0.5	<0.5	<0.5	4.0
	06/23/11	100 [2]	270 [2]	<300	<0.5	<0.5	<0.5	<0.5	3.2
	09/26/11	62 [2]	500 [24]	<300 [24]	<0.5	<0.5	<0.5	<0.5	4.2
	06/19/12	88	370 [2]	<310	<0.5	<0.5	<0.5	<0.5	2.4
	12/04/12	95 [2]	390 [2]	<320	<0.5	<0.5	<0.5	<0.5	3.9
	06/19/13	66 [2]	220 [2]	<300	<0.5	<0.5	<0.5	<0.5	4.5
	12/12/13	82 [2]	240 [2]	<300	<0.5	<0.5	<0.5	0.9	4.9
	06/25/14	67 [2]	260 [2]	<300	<0.5	<0.5	<0.5	<0.5	4.2
	01/08/15	86 [2]	310	<300	<0.5	<0.5	<0.5	<1.0	4.3
RW-4									
	06/25/14	1,300 [2]	5,200	<300	<0.5	<0.5	<0.5	<0.5	<0.5
RW-8									
	06/25/14	850 [2]	7,200	<290	53	<0.5	<0.5	<0.5	<0.5

TABLE 2. Groundwater Analytical Results Summary
Port of Oakland
651 Maritime Street, Oakland, California

Monitoring Well	Date Sampled	Concentration (µg/L)							
		TPH-G	TPH-D	TPH-MO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE

Notes:

Data prior to December 2005 from *3rd Quarterly Groundwater Monitoring, and Product Recovery Report* dated 8 November 2005, by Innovative Technical Solutions, Inc.

µg/L = micrograms per liter

Dup. = duplicate sample

NA = not analyzed

TPHg = total petroleum hydrocarbons in gasoline range.

TPHd = total petroleum hydrocarbons in diesel range.

TPHmo = total petroleum hydrocarbons in motor oil range.

MTBE = methyl tert-butyl ether

[1] Analyte found in the associated blank as well as in the sample.

[2] Hydrocarbons present do not match profile of laboratory standard.

[3] Low boiling point/lighter hydrocarbons are present in the sample.

[4] Chromatographic pattern matches known laboratory contaminant.

[5] Hydrocarbons are present in the requested fuel quantification range, but do not resemble pattern of available fuel standard.

[6] High boiling point/heavier hydrocarbons are present in sample.

[7] Sample did not pass laboratory QA/QC and may be biased low.

[8] Presence of this compound confirmed by second column, however, the confirmation concentration differed from the reported result by more than a factor of two.

[9] Trip blank contained MTBE at a concentration of 4.2 ÿg/L.

[10] MTBE detections confirmed by EPA Test Method 8260; 8260 results displayed.

[11] Sample exhibits unknown single peak or peaks.

[12] EPA Method 8260 confirmation analyzed past holding time.

[13] Lighter hydrocarbons contributed to the quantitation.

[14] MTBE results from EPA Test Method 8021B.

[15] Sample exhibits fuel pattern that does not resemble standard.

[16] Sample extracted out of hold time.

[17] Presence confirmed, but Relative Percent Difference (RPD) between columns exceeds 40%.

[18] Unmodified or weakly modified gasoline is significant.

[19] Liquid sample contains greater than ~1 vol. % sediment.

[20] Gasoline compounds are significant.

[21] Diesel range compounds are significant; no recognizable pattern.

[22] Heavier hydrocarbons contributed to the quantitation.

[23] Analyzed outside of holdtime after confirmation of laboratory contamination by (2-ethylhexyl)phthalate.

[24] Analyzed both pre- and post-silica gel cleanup. Post-silica gel cleanup results are reported herein. Pre-silica gel cleanup results are included in Appendix B.

Table 3
Groundwater Analytical Results Summary,
Monitored Natural Attenuation Parameters

Port of Oakland
651 Maritime Street
Oakland, California

Monitoring Well	Date Sampled	Field Parameters			Analytical Concentrations																	
		DO (mg/L)	ORP (mV)	Iron (II) (mg/L)	Carbon Dioxide (mg/L)	Methane (µg/L)	Iron (II) (mg/L)	Manganese (II) (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Sulfide (Dissolved, mg/L)	Nitrate (as N, mg/L)	Nitrite (as N, mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Orthophosphate (as P, mg/L)	Carbonate (mg/L)	Bicarbonate (mg/L)	Alkalinity, Total (as $CaCO_3$, mg/L)	Total Dissolved Solids (mg/L)
MW-1																						
	09/26/11	Not sampled due to the presence of free-phase product																				
	12/13/13	0.10	-107.1	NA	NA	5,800	6.9	0.61	24	18	<5	58	0.17	<0.05	<0.05	<0.50	7.1	0.046	<6.7	250	250	270
	06/24/14	1.05	-99.6	NA	5.56	8,500	0.67	0.69	23	17	1	46	0.21	<0.05	<0.05	<0.50	8.2	0.048	<6.7	230	230	250
	01/06/15	1.48	-123.0	NA	NA	NA	0.57	0.42	17	13	0.57	47	0.21	<0.05	<0.05	<0.50	6.6	0.18	<6.7	220	220	240
MW-2																						
	09/26/11	0.38	108.5	0.00	31	18	<0.10	0.19	29	29	1.3	180	<0.04	<0.05	<0.05	29	23	0.15	<10	560	560	660
	12/12/13	0.74	-15.6	NA	NA	270	<0.10	0.51	32	36	1.4	240	<0.04	<0.05	<0.05	25	21	0.17	<2.0	640	640	680
	06/25/14	0.86	43.7	NA	20.3	14	<0.10	0.28	28	32	1.1	140	<0.04	<0.05	<0.05	27	16	0.17	<6.7	590	590	640
	01/08/15	2.05	156.5	NA	NA	NA	<0.10	0.034	32	33	1.0	150	<0.04	<0.05	<0.05	32	9.8	0.12	<6.7	570	570	620
MW-3																						
	09/26/11	Not sampled due to the presence of free-phase product																				
	12/12/13	Not sampled due to the presence of free-phase product																				
	06/24/14	Not sampled due to the presence of free-phase product																				
	01/06/15	Not sampled due to the presence of free-phase product																				
MW-4																						
	09/27/11	0.42	-137.0	0.51	15	4,100	0.46	0.31	41	68	9.8	250	<0.04	<0.05	<0.05	1.9	170	0.53	<10	860	860	1,150 [1]
Dup.	09/27/11	0.42	-137.0	0.51	16	4,100	0.27	0.25	36	65	9.2	240	<0.04	<0.05	<0.05	2.0	150	0.51	<10	810	810	1,150 [1]
	12/13/13	0.23	-162.1	NA	NA	3,900	3.0	0.89	67	100	21	450	<0.04	<0.05	<0.05	2.6	500	0.27	<6.7	890	890	1,690
Dup.	12/13/13	0.23	-162.1	NA	NA	3,200	3.0	0.87	66	100	21	470	<0.04	<0.05	<0.05	2.5	490	0.27	<6.7	890	890	1,610
	06/25/14	1.45	-159.2	NA	11.7	5,300	3.5	0.70	47	66	11	250	<0.04	<0.05	<0.05	<0.50	200	0.40	<6.7	830	830	1,090
Dup.	06/25/14	1.45	-159.2	NA	30.5	6,100	3.5	0.7	52	73	14	260	<0.04	<0.05	<0.05	<0.50	200	0.37	<6.7	800	800	1,100
	01/07/15	1.08	-174.9	NA	NA	NA	3.3	0.64	39	59	13	250	<0.04	<0.05	<0.05	1.1	110	1.4	<6.7	760	760	950
	01/07/15	1.08	174.9	NA	NA	NA	3.3	0.63	40	58	12	250	0.04	<0.05	<0.05	1.1	110	1.4	<6.7	740	740	970
MW-5																						
	09/27/11	0.33	-68.5	0.59	30	78	0.59	0.77	54	22	17	260	<0.04	<0.05	<0.05	74	290	0.33	<10	350	350	1,010 [1]
	12/16/13	0.50	-94.1	NA	NA	53	0.50	0.77	62	29	20	300	<0.04	<0.05	<0.05	72	350	<0.13	<5.0	410	410	1,080
	06/24/14	0.80	-84.9	NA	20.6	88	0.52	0.7	130	29	20	650	<0.04	<0.05	<0.05	74	400	0.25	<5.0	300	300	1,190
	01/07/15	1.87	-150.3	NA	NA	NA	0.53	0.86	64	35	20	330	<0.04	<0.05	<0.05	76	440	0.32	<6.7	430	430	1,260
MW-6																						
	12/18/02	Monitoring well was destroyed																				
MW-7																						
	12/18/02	Monitoring well was destroyed																				
MW-8																						
	11/21/98	Monitoring well was destroyed and replaced with well MW-8A																				
MW-8A																						
	09/26/11	0.16	-109.1	2.57	52	310	2.9	0.85	53	65	18	280	<0.04	<0.05	<0.05	47	160	1.3	<10	810	810	360
	12/13/13	0.17	-149.8	NA	NA	89	2.8	0.85	58	72	20	290	<0.04	<0.05	<0.05	39	170	0.37	<6.7	780	780	1,150
	06/25/14	1.04	-142.5	NA	28.3	130	2.8	0.7	50	65	16	220	<0.04	<0.05	<0.05	45	150	0.4	<6.7	760	760	1,080
	01/07/15	1.37	-129.9	NA	NA	NA	2.7	0.9	52	71	15	250	<0.04	<0.05	<0.05	30	180	1.0	<6.7	800	800	1,120
MW-9																						
	09/27/11	0.22	-122.2	3.62	71	9,500	6.6	0.93	71	46	15	350	0.08	<0.05	<0.05	0.69	270	1.3	<10	770	770	1,360 [1]
	12/13/13	0.30	-139.1	NA	NA	5,000	4.8	0.60	40	49	7.7	390	0.14	<0.05	<0.05	2.60	170	0.48	<6.7	930	930	1,260
	06/24/14	1.01	-125.7	NA	47.3	10,000	6.5	0.89	69	130	13	700	0.12	<0.05	<0.05	<0.50	290	0.13	<6.7	530	530	1,260
	01/07/15	1.01	-163.3	NA	NA	NA	5.2	0.71	46	59	5.7	320	0.26	<0.05	<0.05	0.62	240	1.1	<6.7	860	860	1,790
MW-10																						
	09/26/11	0.15	-138.7	2.1	170	7,300	8.8	4.5	150	72	31	450	0.11	<0.05	<0.05	28	520	0.60	<10	1,100	1,100	680
	12/13/13	0.15	-139.3	NA	NA	5,500	13	5.6	170	82	34	440	0.09	<0.05	<0.05	10	500	0.07	<6.7	1,100	1,100	2,050
	06/24/14	2.81	-134.7	NA	45.3	7,200	14	5.7	380	200	32	990	0.14	<0.05	<0.05	2.5	560	<0.03	<6.7	1,100	1,100	2,070
	01/06/15	3.71	-135.4	NA	NA	NA	15	6.4	150	92	31	490	<0.04	<0.25	<0.25	<2.5	650	0.54	<10	1,200	1,200	2,140

Table 3
Groundwater Analytical Results Summary,
Monitored Natural Attenuation Parameters

Port of Oakland
651 Maritime Street
Oakland, California

Monitoring Well	Date Sampled	Field Parameters			Analytical Concentrations																	
		DO (mg/L)	ORP (mV)	Iron (II) (mg/L)	Carbon Dioxide (mg/L)	Methane (µg/L)	Iron (II) (mg/L)	Manganese (II) (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Sulfide (Dissolved, mg/L)	Nitrate (as N, mg/L)	Nitrite (as N, mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Orthophosphate (as P, mg/L)	Carbonate (mg/L)	Bicarbonate (mg/L)	Alkalinity, Total (as $CaCO_3$, mg/L)	Total Dissolved Solids (mg/L)
MW-11																						
	09/26/11	0.20	-198.9	0.47	46	8,300	1.5	0.38	25	51	49	1,100	<0.04	<0.05	<0.05	<1.0	1,000	7.7	<10	1,500	1,500	3,180
	12/12/13	1.00	-188.3	NA	NA	6,300	2.0	0.34	25	54	56	1,200	<0.04	<0.25	<0.25	<2.5	940	1.7	<2.0	1,500	1,500	3,130
	06/25/14	1.44	-170.2	NA	29.2	5,200	1.7	0.32	25	55	48	1,000	<0.04	<0.25	<0.25	<2.5	940	6.8	<6.7	1,500	1,500	3,130
	01/08/15	3.77	-176.0	NA	NA	NA	1.7	0.33	27	55	46	970	<0.04	<0.25	<0.25	<2.5	980	8.2	<6.7	1,600	1,600	3,340
MW-12																						
	09/26/11	0.36	-260.9	0.40	88	4,900	0.67	1.4	96	43	15	180	3.3	<0.05	<0.05	1.5	180	0.73	<10	640	640	1,000
	12/12/13	0.31	-120.3	NA	NA	6,800	1.3	1.4	91	43	16	240	0.56	<0.05	<0.05	<0.5	170	0.21	<2.0	660	660	930
	06/24/14	0.41	-180	NA	61.3	4,700	0.6	1.3	100	50	15	150	1.5	<0.05	<0.05	2.6	190	0.57	<6.7	660	660	950
	01/08/15	0.66	-121.4	NA	NA	NA	0.94	1.4	90	41	15	160	<0.04	<0.05	<0.05	0.51	140	0.58	<6.7	640	640	870
RW-4																						
	06/25/14	0.37	-124.5	NA	84	6,400	13	2.2	110	27	11	66	0.05	<0.05	<0.05	<0.5	71	<0.03	<10	540	540	730
RW-8																						
	06/25/14	0.95	-134.8	NA	91.2	8,600	24	5.4	180	68	35	570	0.21	<0.25	<0.25	<2.5	890	0.04	<10	960	960	2,500

Notes:

* Sample iron (II) concentration exceeded range of instrument.
$CaCO_3$ = calcium carbonate
DO = dissolved oxygen
J = estimated value
mg/L = milligrams per liter
Dup. = Duplicate Sample
mV = millivolts
N = nitrogen
NA = not analyzed
ORP = oxidation-reduction potential
P = phosphorus
Y = Sample exhibits chromatographic pattern which does not resemble standard
[1] Batch spike duplicate for TDS outside of acceptable relative percent difference range.
µg/L = micrograms per liter
< = Not detected above laboratory reporting limits

TABLE 4. Free Product Recovery System Groundwater Elevation and Free Product Data
January 1, 2011 Through January 6, 2015
Port of Oakland
651 Maritime Street, Oakland, California

Recovery Well	Date Measured	Elevation [1] Top of Casing (feet)	Depth to Product (feet btc)	Depth to Water (feet btc)	Product Thickness (feet)	Groundwater Elevation [1] (feet)
RW-1						
Well inaccessible; product and water levels not measured						
RW-2						
	06/07/11	15.56	NP	7.19	0.00	8.37
	06/21/11	15.56	NP	9.02	0.00	6.54
	12/05/11	15.56	NP	9.44	0.00	6.12
	02/06/12	15.56	NP	9.22	0.00	6.34
	06/20/12	15.56	NP	9.80	0.00	5.76
	09/19/12	15.56	NP	10.35	0.00	5.21
	12/04/12	15.56	NP	6.89	0.00	8.67
	06/19/13	15.56	NP	10.13	0.00	5.43
	12/12/13	15.56	NP	10.11	0.00	5.45
	06/24/14	15.56	NP	10.09	0.00	5.47
	01/06/15	15.56	NP	8.78	0.00	6.78
RW-3						
	01/12/11	15.56	9.87	11.04	1.17	5.34
	01/26/11	15.56	10.28	10.43	0.15	5.24
	02/10/11	15.56	10.45	10.90	0.45	4.98
	02/24/11	15.56	9.42	12.13	2.71	5.33
	03/09/11	15.56	9.45	13.04	3.60	5.04
	03/23/11	15.56	8.63	12.18	3.55	5.87
	04/06/11	15.56	9.10	11.49	2.39	5.74
	04/20/11	15.56	9.70	10.88	1.18	5.51
	05/04/11	15.56	10.05	10.47	0.42	5.38
	05/18/11	15.56	9.95	10.17	0.22	5.54
	06/07/11	15.56	9.73	13.52	3.79	4.69
	06/21/11	15.56	10.10	11.20	1.10	5.13
	09/26/11	15.56	10.63	12.66	2.03	4.32
	10/05/11	15.56	10.48	10.98	0.50	4.93
	10/19/11	15.56	10.64	11.91	1.27	4.54
	12/05/11	15.56	10.75	12.67	1.92	4.23
	02/06/12	15.56	10.32	12.54	2.22	4.57
	06/20/12	15.56	10.38	12.56	2.18	4.53
	09/19/12	15.56	10.87	13.07	2.20	4.03
	12/04/12	15.56	9.35	13.54	4.19	4.95
	06/19/13	15.56	10.75	13.62	2.87	3.95
	12/12/13	15.56	11.12	14.12	3.00	3.54
	06/24/14	15.56	NP	10.84	0.00	4.72
	01/06/15	15.56	NP	9.81	0.00	5.75
RW-4						
	01/12/11	14.92	9.12	9.20	0.08	5.78
	01/26/11	14.92	9.39	9.89	0.50	5.38
	02/10/11	14.92	9.52	10.54	1.02	5.09
	02/24/11	14.92	8.80	9.10	0.30	6.03
	03/09/11	14.92	8.93	8.96	0.03	5.98
	03/23/11	14.92	8.39	8.43	0.04	6.52

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Recovery Well	Date Measured	Elevation [1] Top of Casing (feet)	Depth to Product (feet btc)	Depth to Water (feet btc)	Product Thickness (feet)	Groundwater Elevation [1] (feet)
RW-4 (cont)	04/06/11	14.92	8.46	8.50	0.04	6.45
	04/14/11	14.92	8.88	8.91	0.03	6.03
	05/04/11	14.92	9.13	9.17	0.04	5.78
	05/18/11	14.92	9.18	9.20	0.02	5.73
	06/07/11	14.92	NP	8.95	0.00	5.97
	06/21/11	14.92	9.33 [2]	9.33	0.00	5.59
	09/26/11	14.92	9.82	10.41	0.59	4.92
	10/05/11	14.92	9.68	10.17	0.49	5.09
	10/19/11	14.92	9.60	10.26	0.66	5.12
	12/05/11	14.92	9.70	10.00	0.30	5.13
	02/06/12	14.92	9.10	10.66	1.56	5.35
	06/20/12	14.92	9.20	9.27	0.07	5.70
	09/19/12	14.92	9.62	14.21	4.59	3.92
	12/04/12	14.92	8.37	11.69	3.32	5.55
	06/19/13	14.92	9.94	14.27	4.33	3.68
	12/12/13	14.92	9.95	14.07	4.12	3.73
	06/24/14	14.92	9.44 [2]	9.44	0.00	5.48
	01/06/15	14.92	8.44	12.42	3.98	5.29
RW-5						
	04/14/11	14.79	6.74	9.72	2.98	7.16
	05/18/11	14.79	6.78 [2]	6.78	0.00	8.01
	06/07/11	14.79	7.38	7.47	0.09	7.38
	09/26/11	14.79	8.95	9.75	0.80	5.60
	10/05/11	14.79	8.66	9.09	0.43	6.00
	02/06/12	14.79	8.47	12.01	3.54	5.26
	06/20/12	Well not accessible				
	09/19/12	Well not accessible				
	12/04/12	Well not accessible				
	06/19/13	Well not accessible				
	12/12/13	Well not accessible				
	06/24/14	Well not accessible				
	01/06/15	Well not accessible				
RW-6						
	01/12/11	15.75	8.51	9.68	1.17	6.89
	01/26/11	15.75	8.65	9.55	0.90	6.83
	02/10/11	15.75	8.44	9.74	1.30	6.92
	02/24/11	15.75	8.15	9.82	1.67	7.10
	03/09/11	15.75	8.25	9.37	1.12	7.16
	03/23/11	15.75	8.18	8.96	0.78	7.34
	04/06/11	15.75	8.19	8.95	0.76	7.33
	04/20/11	15.75	8.43	8.54	0.11	7.29
	05/04/11	15.75	8.51	8.62	0.11	7.21
	05/18/11	15.75	8.53	8.70	0.17	7.17
	06/07/11	15.75	8.82	9.05	0.23	6.86
	06/21/11	15.75	8.89	9.20	0.31	6.77

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RW-6 (cont)	09/26/11	15.75	8.86	10.20	1.34	6.49
	10/05/11	15.75	9.05	9.72	0.67	6.50
	10/19/11	15.75	8.99	10.16	1.17	6.41
	12/05/12	15.75	9.05	10.62	1.57	6.23
	02/06/12	15.75	8.95	10.82	1.87	6.24
	06/20/12	15.75	8.92	9.99	1.07	6.51
	09/19/12	15.75	9.10	10.83	1.73	6.13
	12/04/12	15.75	8.83	10.79	1.96	6.33
	06/19/13	15.75	8.86	10.35	1.49	6.44
	12/12/13	15.75	9.19	14.07	4.88	5.10
	06/24/14	15.75	9.00	10.84	1.84	6.20
	01/06/15	15.75	8.84	10.12	1.28	6.53
RW-7						
	01/12/11	15.02	7.86	7.91	0.05	7.15
	01/26/11	15.02	7.55	7.64	0.09	7.44
	02/10/11	15.02	7.50	7.68	0.18	7.47
	02/24/11	15.02	7.82	8.92	1.10	6.87
	03/09/11	15.02	7.42	7.53	0.11	7.57
	03/23/11	15.02	NP	7.24	0.00	7.78
	04/06/11	15.02	7.73	7.73	0.00	7.29
	04/20/11	15.02	7.54	7.56	0.02	7.47
	05/04/11	15.02	7.68	7.74	0.06	7.32
	05/18/11	15.02	7.35 [2]	7.35	0.00	7.67
	06/07/11	15.02	7.98 [2]	7.98	0.00	7.04
	06/21/11	15.02	8.07	8.09	0.00	6.93
	09/26/11	15.02	8.29	8.90	0.61	6.55
	10/05/11	15.02	8.19	8.45	0.26	6.75
	10/19/11	15.02	8.24	8.90	0.66	6.58
	12/05/11	15.02	8.26	9.77	1.51	6.31
	02/06/12	15.02	8.18	9.86	1.68	6.34
	06/20/12	15.02	8.35	8.41	0.06	6.65
	09/19/12	15.02	8.45	11.44	2.99	5.67
	12/04/12	15.02	8.25	8.33	0.08	6.75
	06/19/13	15.02	8.25	13.75	5.50	5.12
	12/12/13	15.02	8.47	16.13	7.66	4.25
	06/24/14	15.02	8.24	12.65	4.41	5.46
	01/06/15	15.02	8.19	8.81	0.62	6.64
RW-8						
	01/12/11	15.91	9.07	9.21	0.14	6.80
	01/26/11	15.91	9.23	9.31	0.08	6.66
	02/10/11	15.91	9.13	9.33	0.20	6.72
	02/24/11	15.91	8.86	9.23	0.37	6.94
	03/09/11	15.91	8.78	9.01	0.23	7.06
	03/23/11	15.91	8.42	8.70	0.28	7.41
	04/06/11	15.91	8.55	8.80	0.25	7.29
	04/20/11	15.91	8.92	9.14	0.22	6.92

TABLE 4. Free Product Recovery System Groundwater Elevation and Free Product Data
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Recovery Well	Date Measured	Elevation [1] Top of Casing (feet)	Depth to Product (feet btc)	Depth to Water (feet btc)	Product Thickness (feet)	Groundwater Elevation [1] (feet)
RW-8 (cont)	05/04/11	15.91	9.04	9.20	0.16	6.82
	05/18/11	15.91	8.85	9.10	0.25	6.99
	06/07/11	15.91	10.23	10.34	0.11	5.65
	06/21/11	15.91	9.27	9.41	0.14	6.60
	09/26/11	15.91	9.23	9.62	0.39	6.56
	10/05/11	15.91	9.28	9.40	0.12	6.59
	10/19/11	15.91	9.54	9.77	0.23	6.30
	12/05/11	15.91	9.62	10.19	0.57	6.12
	02/06/12	15.91	9.21	10.22	1.01	6.40
	06/20/12	15.91	9.36	10.28	0.92	6.27
	09/19/12	15.91	10.55	11.45	0.90	5.09
	12/04/12	15.91	9.29	11.32	2.03	6.01
	06/19/13	15.91	9.42	11.11	1.69	5.98
	12/12/13	15.91	9.29	12.24	2.95	5.74
	06/24/14	15.91	9.41	11.55	2.14	5.86
	01/06/15	15.91	9.02	9.99	0.97	6.60
RW-9						
	01/12/11	16.57	9.26	9.45	0.19	7.25
	01/26/11	16.57	9.32	9.53	0.21	7.19
	02/10/11	16.57	9.42	9.63	0.21	7.09
	02/24/11	16.57	9.24	9.43	0.19	7.27
	03/09/11	16.57	9.16	9.35	0.19	7.35
	03/23/11	16.57	9.07	9.23	0.16	7.45
	04/06/11	16.57	9.00	9.16	0.16	7.52
	04/20/11	16.57	9.10	9.29	0.19	7.41
	05/04/11	16.57	9.19	9.40	0.21	7.32
	05/18/11	16.57	9.26	9.46	0.20	7.25
	06/07/11	16.57	9.35	9.56	0.21	7.16
	06/21/11	16.57	9.30	9.50	0.20	7.21
	09/26/11	16.57	9.67	9.85	0.18	6.85
	10/05/11	16.57	9.70	9.81	0.11	6.84
	10/19/11	16.57	9.67	9.78	0.11	6.87
	12/05/11	16.57	9.75	10.14	0.39	6.70
	02/06/12	16.57	9.88	10.37	0.49	6.54
	06/20/12	16.57	9.49	10.40	0.91	6.81
	09/19/12	16.57	9.81	11.04	1.23	6.39
	12/04/12	16.57	9.50	11.06	1.56	6.60
	06/19/13	16.57	9.68	10.76	1.08	6.57
	12/12/13	16.57	10.11	10.14	0.03	6.45
	06/24/14	16.57	9.90	11.91	2.01	6.07
	01/06/15	16.57	9.65	10.49	0.84	6.67

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MW-3						
	01/05/11	15.66	9.58	9.67	0.09	6.05
	01/12/11	15.66	9.85	10.39	0.54	5.65
	01/21/11	15.66	10.03	10.97	0.94	5.35
	01/26/11	15.66	9.32	9.53	0.21	6.28
	02/02/11	15.66	10.28	11.43	1.15	5.04
	02/10/11	15.66	10.35	11.50	1.15	4.97
	02/24/11	15.66	9.53	10.74	1.21	5.77
	03/09/11	15.66	9.63	10.79	1.16	5.68
	03/16/11	15.66	9.26	10.43	1.17	6.05
	03/23/11	15.66	8.71	9.07	0.36	6.84
	03/30/11	15.66	8.87	9.54	0.67	6.59
	04/06/11	15.66	9.16	10.42	1.26	6.12
	04/14/11	15.66	9.65	10.53	0.88	5.75
	04/20/11	15.66	9.69	10.61	0.92	5.69
	04/27/11	15.66	9.88	11.07	1.19	5.42
	05/04/11	15.66	9.95	11.14	1.19	5.35
	05/13/11	15.66	10.16	11.45	1.29	5.11
	05/18/11	15.66	9.78	11.60	1.82	5.33
	06/07/11	15.66	9.91	10.95	1.04	5.44
	06/21/11	15.66	10.74	11.20	0.46	4.78
	09/26/11	15.66	10.71	12.55	1.84	4.40
	10/05/11	15.66	10.21	11.73	1.52	4.99
	10/19/11	15.66	10.65	12.11	1.46	4.57
	12/05/11	15.66	10.83	12.20	1.37	4.42
	02/06/12	15.66	10.60	11.43	0.83	4.81
	06/19/12	15.66	10.52	12.04	1.52	4.68
	09/19/12	15.66	10.90	13.01	2.11	4.13
	12/04/12	15.66	9.64	10.65	1.01	5.72
	06/19/13	15.66	10.92	12.45	1.53	4.28
	12/12/13	15.66	11.23	13.23	2.00	3.83
	06/24/14	15.66	10.83	11.84	1.01	4.53
	01/06/15	15.66	9.74	10.71	0.97	5.63

Notes:
NP = no product detected with the interface probe
btc = below top of the well casing
NA = not available
NM = not measured
[1] Wells were resurveyed on January 24, 2009. Elevation data is relative to North American Vertical Datum of 1988 (NAVD 88). Groundwater elevation for well MW-3, when calculated, assumes the density of the free product is 0.70.
[2] Product not measureable, but visible evidence of product on interface probe.

ARCADIS

Figures

REFERENCE: BASE MAP USGS 7.5. MIN. TOPO. QUAD., OAKLAND WEST, CALIFORNIA, 2012.

0 2000' 4000'

Approximate Scale: 1 in. = 2000 ft.

CALIFORNIA

PORT OF OAKLAND
651 MARITIME STREET, OAKLAND, CALIFORNIA

SITE LOCATION MAP

ARCADIS

FIGURE
1

CITY: SAN RAFAEL, CA (PETALUMA) DIV/GROUP: ENVCAD DB: J. HARRIS
C:\Users\jharris\Desktop\ENVCAD\04656020\HFC\100004\1Q15\DWG\04656020 N01.dwg LAYOUT: 1 SAVED: 1/25/2015 1:42 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: SETUP1 PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 2/3/2015 7:32 AM BY: HARRIS, JESSICA
XREFS: IMAGES: PROJECTNAME: ---
Oakland West 2012 with aerial.jpg

BAY AREA RAPID TRANSIT

CANOPY

MARITIME STREET

LEGEND

SITE BOUNDARY

FENCE

UST REMOVAL EXCAVATION

FORMER BUILDING

0 100' 200'

GRAPHIC SCALE

PORT OF OAKLAND
651 MARITIME STREET, OAKLAND, CALIFORNIA

HARBOR FACILITIES COMPLEX LAYOUT

ARCADIS

FIGURE
2

CITY: SAN RAFAEL, CA (PETALUMA) DIV/GROUP: ENVCAD DB: J. HARRIS
C:\Users\jharris\Desktop\ENVCAD\04656020\HFC\100004\1Q15\DWG\04656020 B01.dwg LAYOUT: 2 SAVED: 1/25/2015 1:42 PM ACADVER: 18.1S (LMS TECH) PAGESETUP: SETUP1 PLOTSTYLETABLE: ARCADIS.CTB PLOTTED: 2/3/2015 7:35 AM BY: HARRIS, JESSICA
XREFS: IMAGES: PROJECTNAME: ---
04656020X01

BAY AREA RAPID TRANSIT

MARITIME STREET

CANOPY

PZ-A (CPT-1)
PZ-B (CPT-4)
PZ-D (CPT-19)
PZ-C (CPT-20)
PZ-E (CPT-24)
PZ-F (CPT-14)

MW-1 MW-2 MW-3 MW-4 MW-5 MW-6 MW-7 MW-8 MW-8A MW-9 MW-10 MW-11 MW-12
MW1 MW2

RW-1 RW-2 RW-3 RW-4 RW-5 RW-6 RW-7 RW-8 RW-9

CPT-2 CPT-3 CPT-5 CPT-6 CPT-7 CPT-8 CPT-9 CPT-10 CPT-11 CPT-12 CPT-13 CPT-15 CPT-16 CPT-17 CPT-18 CPT-21 CPT-22 CPT-23 CPT-25 CPT-26 CPT-27 CPT-28 CPT-29 CPT-30 CPT-31 CPT-32

MFC-01 MFC-02 MFC-03 MFC-04 MFC-05 MFC-06 MFC-07 MFC-08 MFC-09 MFC-10 MFC-11 MFC-12 MFC-13 MFC-14 MFC-15 MFC-16 MFC-17 MFC-18 MFC-19 MFC-20 MFC-21 MFC-22 MFC-23 MFC-24 MFC-25 MFC-26 MFC-27 MFC-28 MFC-29 MFC-30 MFC-31 MFC-32 MFC-33 MFC-34 MFC-35 MFC-36 MFC-37 MFC-38 MFC-39 MFC-40 MFC-41 MFC-42 MFC-43 MFC-44 MFC-45 MFC-46

LEGEND

- SITE BOUNDARY
- FENCE
- UST REMOVAL EXCAVATION
- FORMER BUILDING
- GROUNDWATER MONITORING WELL
- DESTROYED GROUNDWATER MONITORING WELL
- RECOVERY WELL
- SOIL BORING
- SOIL AND GRAB GROUNDWATER BORING
- CPT LOCATION (ITSI, 2002)
- PIEZOMETER LOCATION (ITSI, 2002)

0 100' 200'
GRAPHIC SCALE

PORT OF OAKLAND
651 MARITIME STREET, OAKLAND, CALIFORNIA

SITE PLAN

ARCADIS

FIGURE
3

BAY AREA RAPID TRANSIT

MARITIME STREET

MW-4 (4.88)
MW-8A (4.99)
MW-9 (5.36)
MW-5 (6.37)
MW-1 (5.93)
MW-2 (5.73)
MW-3*
MW-10 (5.95)
MW-11 (6.06)
MW-12 (6.11)

5.0
5.5
6.0

CANOPY

0 100' 200'
GRAPHIC SCALE

LEGEND

- SITE BOUNDARY
- FENCE
- FORMER BUILDING
- GROUNDWATER MONITORING WELL
- (5.36) GROUNDWATER ELEVATION, FEET (NAVD 88); MEASURED 1/6/2015
- 5.5 GROUNDWATER CONTOUR (INTERVAL = 0.5 FOOT); DASHED WHERE INFERRED
- GROUNDWATER FLOW DIRECTION
- * WELL CONTAINS MEASURABLE FREE PRODUCT; NOT USED FOR CONTOURING
- NAVD 88 NORTH AMERICAN VERTICAL DATUM OF 1988

PORT OF OAKLAND
651 MARITIME STREET, OAKLAND, CALIFORNIA

GROUNDWATER ELEVATION ISOCONTOUR MAP - JANUARY 2015

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FIGURE
4

MW–4	
Date	1/7/15
TPHg	290 Y/280 Y
TPHd	67 Y/53 Y
TPHmo	<300/<300
B	29/28
T	<0.5/<0.5
E	<0.5/<0.5
X	<1.0/<1.0
MTBE	<0.5/<0.5

MW–9	
Date	1/7/15
TPHg	350 Y
TPHd	130 Y
TPHmo	<300
B	69
T	0.7
E	12
X	1.4
MTBE	<0.5

MW–1	
Date	1/6/15
TPHg	1,700 Y
TPHd	2,000
TPHmo	<300
B	27
T	1.6
E	1.8
X	1.6
MTBE	<0.5

MW–12	
Date	1/8/15
TPHg	86 Y
TPHd	310
TPHmo	<300
B	<0.5
T	<0.5
E	<0.5
X	<1.0
MTBE	4.3

MW–10	
Date	1/6/15
TPHg	310 Y
TPHd	820
TPHmo	<300
B	66
T	0.6
E	<0.5
X	<1.0
MTBE	<0.5

BAY AREA RAPID TRANSIT

MARITIME STREET

MW-4
MW-9
MW-8A (ND)
MW-5 (ND)
MW-1
RW-1
MW-2 (ND)
RW-2
RW-3
MW-3 (FP)
RW-4
MW-10
RW-5
RW-6
RW-7
RW-8
RW-9
MW-12
MW-11 (ND)
CANOPY

LEGEND

- SITE BOUNDARY
- FENCE
- FORMER BUILDING
- GROUNDWATER MONITORING WELL
- RECOVERY WELL
- EXTENT OF FREE PHASE PRODUCT

TPHg	TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
TPHd	TOTAL PETROLEUM HYDROCARBONS AS DIESEL FUEL
TPHmo	TOTAL PETROLEUM HYDROCARBONS AS MOTOR OIL
B	BENZENE
T	TOLUENE
E	ETHYLBENZENE
X	TOTAL XYLENES
MTBE	METHYL TERT-BUTYL ETHER
ND	NON-DETECT
FP	FREE PHASE PRODUCT DETECTED
<	LESS THAN LABORATORY REPORTING LIMIT SHOWN
Y	HYDROCARBONS PRESENT DO NOT MATCH PROFILE OF LABORATORY STANDARD
29/28	RESULT/DUPLICATE RESULT
	ALL CONCENTRATIONS ARE IN MICROGRAMS PER LITER (µg/L)

0 100' 200'
GRAPHIC SCALE

PORT OF OAKLAND
651 MARITIME STREET, OAKLAND, CALIFORNIA

SHALLOW GROUNDWATER SAMPLE RESULTS - JANUARY 2015

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FIGURE 5

Figure 6
TPHg Concentration versus Time

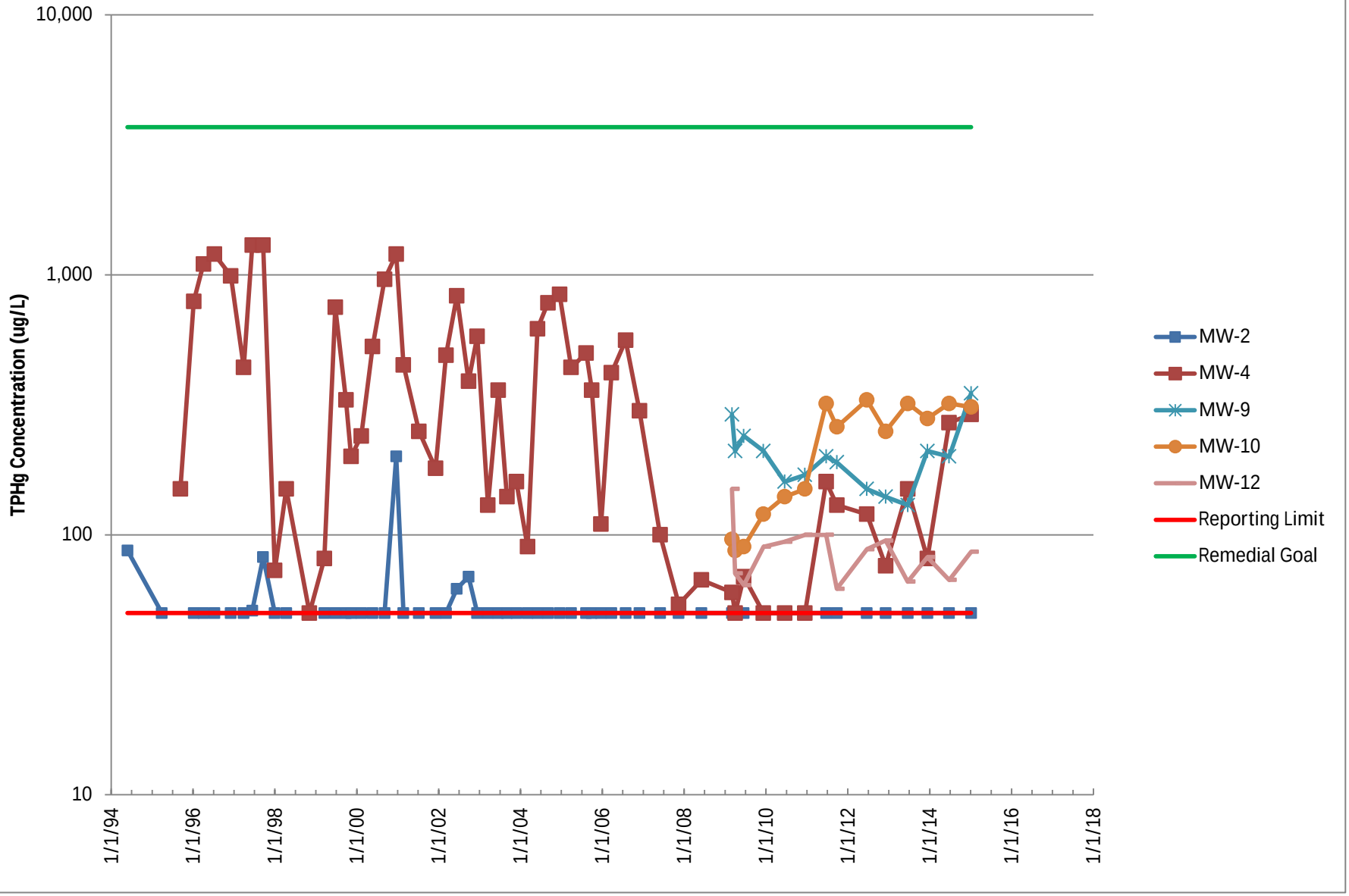


Figure 7
Benzene Concentration versus Time

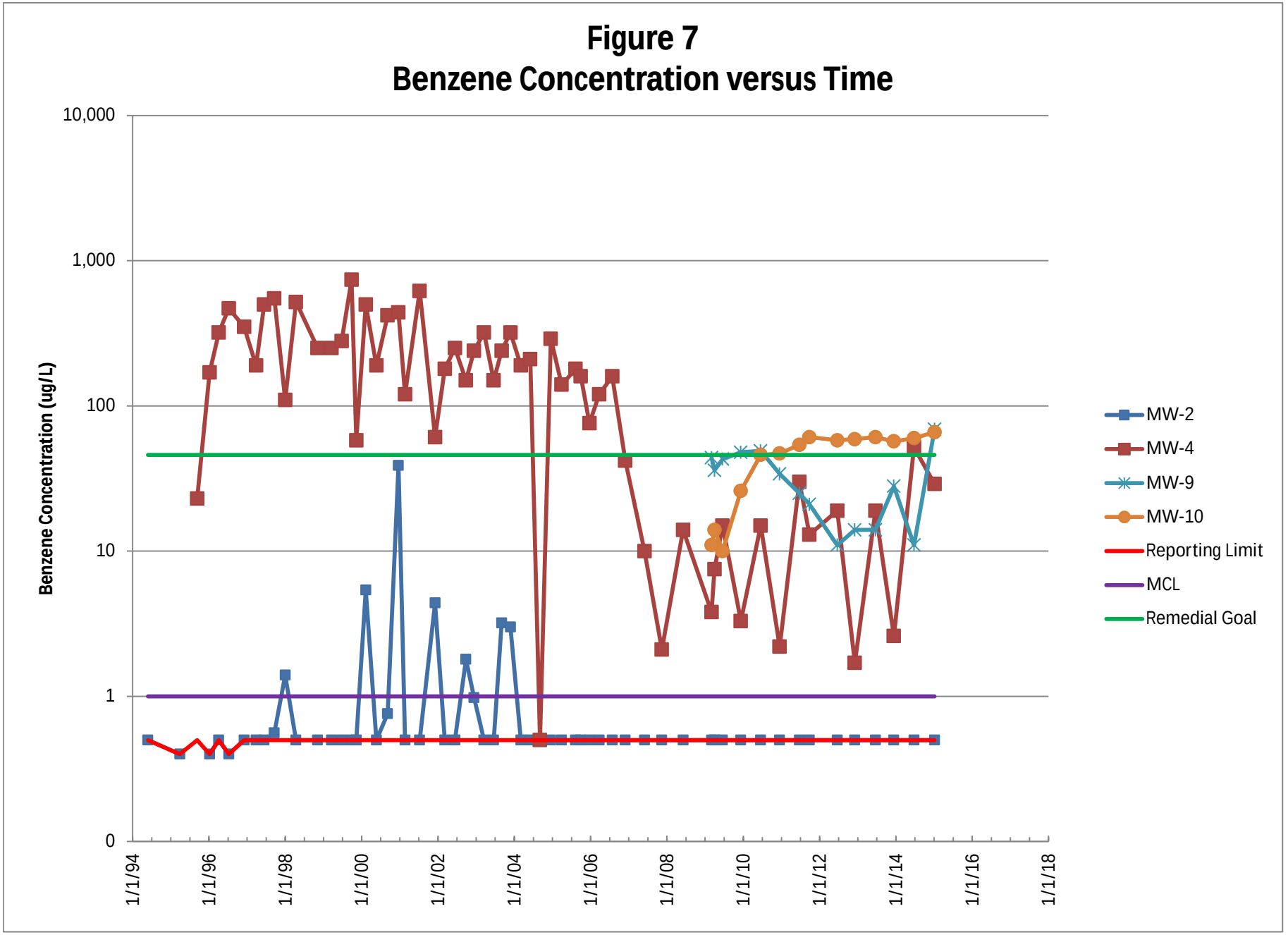


Figure 8
MTBE Concentration versus Time

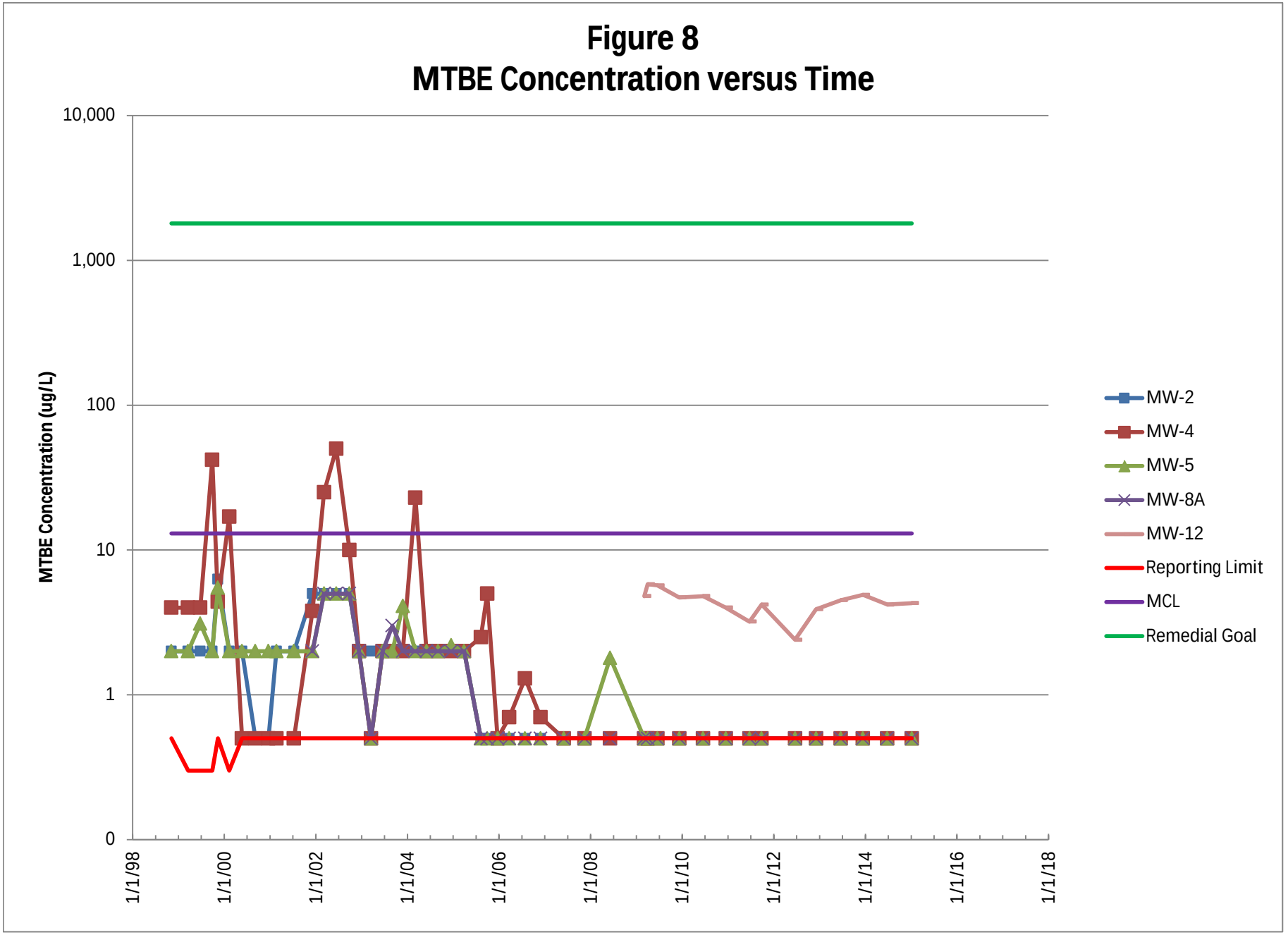
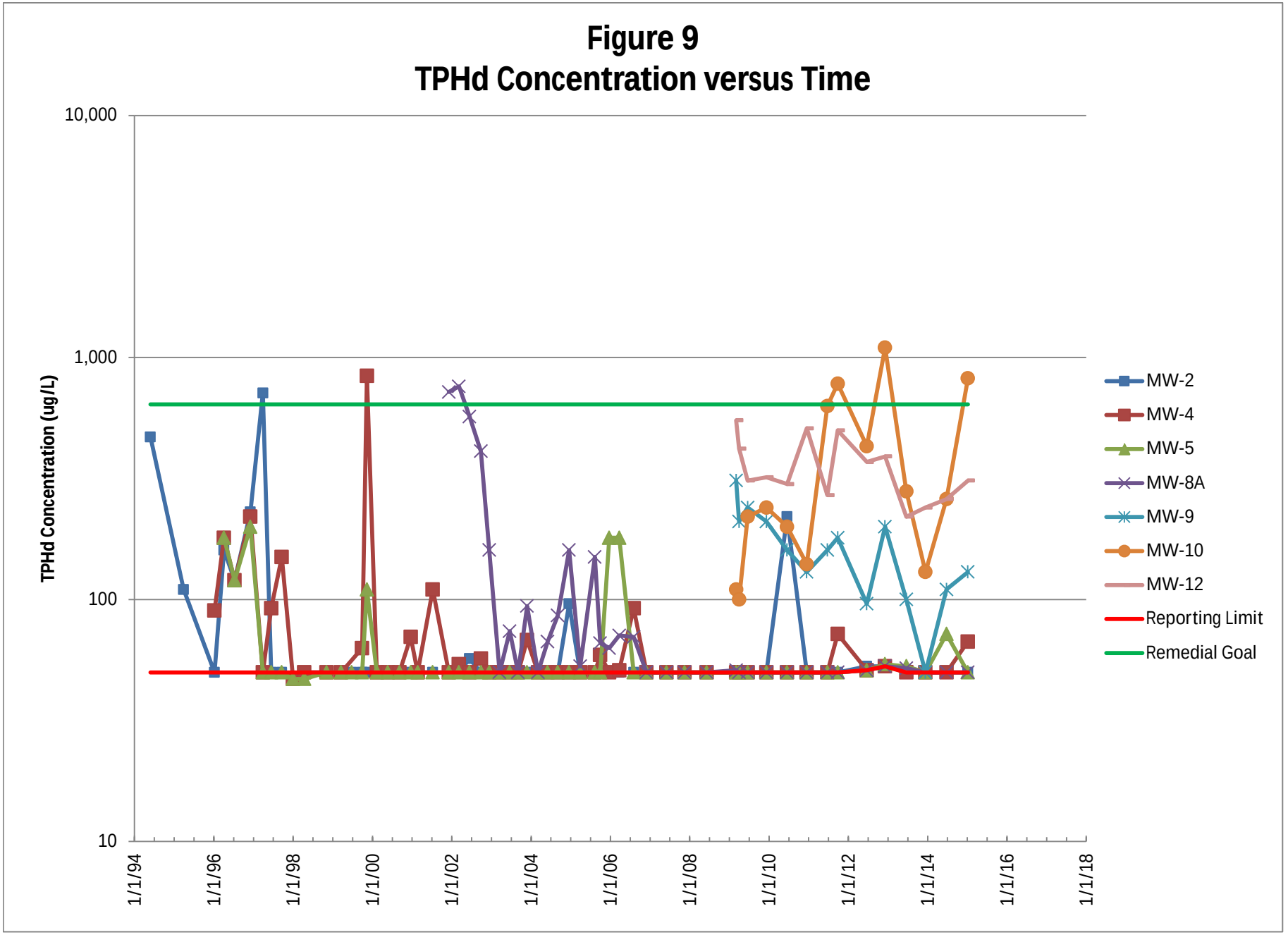


Figure 9
TPHd Concentration versus Time



ARCADIS

Appendix A

Groundwater Sampling Forms

Environmental
Sampling Services, LLC

January 23, 2015

Ms. Katherine Brandt, P.G
Senior Geologist
Arcadis U.S., Inc.
2000 Powell Street, 7th Floor
Emeryville, California 94608-1805

SUBJECT: January 2015 Semi-Annual Groundwater Monitoring Event for Port of Oakland-Harbor Facilities Complex, Oakland, California

Dear Ms. Brandt,

Please find enclosed the Field Activity Report for Port of Oakland's semi-annual groundwater monitoring event that occurred on January 6, 7, and 8, 2015. This report contains all pertinent documentation associated with this monitoring event.

If you have any questions or concerns regarding this Field Activity Report, please do not hesitate to contact me electronically at spen@envsampling.com or directly at (925) 372-8108.

Sincerely,
Environmental Sampling Services, LLC

Stephen Penman
Manager

Enclosure

FIELD ACTIVITY REPORT
FOR

JANUARY 2015
SEMI-ANNUAL GROUNDWATER
MONITORING EVENT

HARBOR FACILITIES COMPLEX
PORT OF OAKLAND
651 MARITIME STREET
OAKLAND, CALIFORNIA

Prepared for: ARCADIS U.S., Inc.
2000 Powell Street, 7th Floor
Emeryville, California 94608-1805

Date Prepared: January 23, 2015

Environmental
Sampling Services, LLC

FIELD ACTIVITY REPORT
FOR

JANUARY 2015
SEMI-ANNUAL GROUNDWATER
MONITORING EVENT

PORT OF OAKLAND
HARBOR FACILITIES COMPLEX
OAKLAND, CALIFORNIA

Task 1: Obtain depth to groundwater level measurements from ten monitoring wells and nine recovery wells
Task 2: Collect groundwater samples from monitoring wells without free product
ESS Personnel: Stephen Penman
Date of Activities: January 6, 7, and 8, 2015

DECONTAMINATION PROCEDURES

All downhole equipment was cleaned with a Liqui-Nox® laboratory grade soap solution, rinsed with potable water, followed by a final rinse with distilled water prior to use and between each well.

TASK 1: PRODUCT/GROUNDWATER LEVEL MEASUREMENTS

Depth to groundwater for both recovery and monitoring wells were measured and recorded following atmospheric equilibration of approximately thirty minutes.

All readings were performed with a Solinst® Oil/Water Level Interface Meter, Serial Number 9371-1. Three successive readings that agreed to within one-hundredth of a foot determined depth to product/groundwater. All measurements were referenced to the surveyor's mark (Table 1).

Floating product was detected in monitoring well MW-3 at 9.74 feet with groundwater at 9.99 feet below top of casing.

Floating product was also detected in recovery wells RW-4, RW-6, RW-7, RW-8 and RW-9 (Table 1).

TASK 2: GROUNDWATER MONITORING AND SAMPLING

Field Equipment and Calibration

A Multi-parameter meter, equipped with in-line flow cell, and Turbidity meter were used for monitoring purposes.

Equipment calibration was performed in accordance with the instruments' calibration and operating procedures. The following standard solutions were used for calibration purposes: pH 4, 7, and 10; 1,000 µS/cm^c for Specific Conductivity and Zobell® for Oxidation Reduction Potential (ORP). Dissolved Oxygen (DO) was calibrated to air (100% saturation). Turbidity was checked against a 0.02 Nephelometric (NTU) standard.

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Water Quality Indicator Parameters

The following indicator parameters were monitored and recorded during purging activities: pH, Specific Conductivity, DO, ORP, Turbidity, and Temperature. Physical parameters such as drawdown, color and odor were also recorded (see Water Quality Sample Log Sheet).

Low-Flow Well Purging Procedures

Nine monitoring wells were purged using a peristaltic pump. Dedicated pump tubing was used at each monitoring well. New pump tubing was installed in MW-1 and MW-11. Pump intake was placed either at mid-screen interval or, if water column was less than the screen length, at mid-water column.

EPA recommended stabilization guidelines for low-flow sampling were used. Stabilization was achieved after the indicator parameters stabilized for three successive readings. The following criteria were used: ± 0.1 for pH, ± 3 % for Specific Conductivity, ± 0.3 mg/L for DO and ± 10 mV for ORP.

The following criteria were used to determine turbidity stabilization:

0-10 NTU, no criterion
10-50 NTU, ±5 NTU
more than 50 NTU, ±10% NTU

Low-Flow Sampling Procedures

Following stabilization of water quality parameters, the pump tubing was disconnected from the in-line flow cell for sample collection. If necessary, pump rate was reduced for samples requiring zero headspace; otherwise, low-flow rate established during purging was maintained during sampling.

During filling, each VOA container was slightly tilted to avoid aeration or degassing and was filled until there was a meniscus at the top. After capping, the container was inverted and tapped lightly to check for air bubbles. The absence of air bubbles indicated a successful seal.

All preserved sample containers were not overfilled. All non-preserved containers were filled to maximum capacity.

CHEMICAL ANALYSES AND LABORATORIES

All nine monitoring wells were sampled for TPH-Gasoline (EPA Method 8015B), BTEX & MTBE (EPA Method 8260B), TPH-Diesel and Motor Oil with and without Silica Gel Cleanup (EPA Method 8015B), Anions (Bicarbonate, Carbonate, Sulfate, Chloride, Nitrate, Nitrite, and Orthophosphate by EPA Method 300.0), Total Dissolved Solids (EPA Method 40 CFR 136/160.1), Dissolved Sulfide (EPA E376.2) and Dissolved Cations (Sodium, Potassium, Calcium and Magnesium by EPA 200.7) and Dissolved Manganese and Iron (EPA SW 6010B). All samples were submitted to Curtis Tompkins, Ltd. of Berkeley, California (CTB) for chemical analyses.

SAMPLE CONTAINERS

All sample containers were provided by CTB.

Each BTEX/MTBE sample set was contained in three, amber, 40-ml VOA clear, glass containers preserved with Hydrochloric Acid.

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Each TPH-Gasoline sample set was contained in three, amber, 40-ml VOA clear, glass containers preserved with Hydrochloric Acid.

Each TPH-Diesel & Motor Oil sample set was contained in two, non-preserved, 500-ml amber glass containers.

Each Anions sample was contained in a non-preserved, 1-liter High Density Polyethylene (HDPE) container.

Each TDS sample was contained in a non-preserved, 250-ml HDPE container.

Each Dissolved Sulfide sample was contained in a 500-ml HDPE container preserved with Sodium Hydroxide.

Each Dissolved Cations, Manganese and Iron sample was filtered through a 0.45-micron filter prior to containment. Approximately 50-100 ml was flushed through the filter prior to collecting sample. A 500-ml HDPE container preserved with Nitric Acid was used for containment.

QUALITY ASSURANCE / QUALITY CONTROL (QA/QC) SAMPLES

Trip Blank
Two Trip Blank sets, prepared by CTB were submitted for analysis. The Trip Blank was labeled "QCTB-1, QCTB-2".

Duplicate
One duplicate sample was collected from monitoring well MW-4. The designated duplicate sample identification of MW-4DUP was assigned to the duplicate sample set. Each VOA duplicate sample container was collected in immediate succession by alternating between each VOA primary sample container. Each non-volatile container was filled by alternating between the primary and duplicate sample container. The duplicate sample identification was recorded on the appropriate Water Quality Sample Log sheet.

SAMPLE HANDLING

All groundwater sample sets were stored in Ziploc® bags and placed in chilled coolers for storage. Samples collected remained in ESS's possession and were relinquished directly to CTB.

CHAIN OF CUSTODY (COC) FORMS

Standard chain of custody information was used for documentation purposes. The COCs included: sampler's name and signature, sample identification, sample date and time, and analysis request section. PDF, EDD, Electronic Data Format (EDF), Level II, and standard turnaround time were requested.

STORAGE/DISPOSAL OF INVESTIGATATIVE DERIVED WASTEWATER (IDW) AND SOLID DEBRIS

Approximately twenty-five (25) gallons of IDW were generated during this sampling event. Approximately twenty (20) gallons were transferred into an existing 55-gallon steel drum. An additional five (5) gallons were transferred into a new steel drum provided by ESS. The drum is stored inside the secured Treatment System compound.

All solid debris was stored in large plastic bag and placed in a debris box for proper disposal.

The Treatment System compound was secured after all tasks were completed.

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COMMENTS

Water levels were collected on January 6th, with the exception of MW-9 which was not accessible until January 7th.

Environmental Sampling Services, LLC

Stephen Penman
Project Manager

Attachments:
Table 1: Depth to Water and Free Product Measurements
Water Quality Sample Log Sheets
Equipment Calibration Sheet
Chain of Custodies

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Table 1: Summary of January 2015 Semi-Annual Groundwater Monitoring Event
Site Name: Harbor Facilities Complex, Port of Oakland
Site Location: 651 Maritime Street, Oakland, California

Well Identification	Measurement Date (mm/dd/yy)	Measurement Time	Depth to Product (Ft., below TOC)	Depth to Groundwater (Ft., below TOC)	Sample Date (mm/dd/yy)	Sample Time	QA/QC Type	QA/QC Sample Identification	QA/QC Sample Time
RW-1	01/06/15	NA	NA	INACCESSIBLE	NS	NA	NA	NA	NA
RW-2	01/06/15	11:13	ND	8.78	NS	NA	NA	NA	NA
RW-3	01/06/15	10:25	ND	9.81	NS	NA	NA	NA	NA
RW-4	01/06/15	10:29	10:33	12.42	NS	NA	NA	NA	NA
RW-5	01/06/15	11:05	NA	INACCESSIBLE	NS	NA	NA	NA	NA
RW-6	01/06/15	10:41	8.84	10.12	NS	NA	NA	NA	NA
RW-7	01/06/15	10:36	8.19	8.81	NS	NA	NA	NA	NA
RW-8	01/06/15	10:47	9.02	9.99	NS	NA	NA	NA	NA
RW-9	01/06/15	10:54	9.65	10.49	NS	NA	NA	NA	NA
MW-1	01/06/15	13:02	ND	9.90	01/06/15	16:23	None	NA	NA
MW-2	01/06/15	10:21	ND	10.70	01/08/15	11:20	None	NA	NA
MW-3	01/06/15	10:31	9.74	10.71	NS	NS	None	NA	NA
MW-4	01/06/15	12:31	ND	10.84	01/07/15	14:54	Duplicate	MW-4DUP	14:54
MW-5	01/06/15	12:39	ND	9.01	01/07/15	13:27	None	NA	NA
MW-8A	01/06/15	12:55	ND	10.00	01/07/15	10:37	None	NA	NA
MW-9*	01/07/15	11:33	ND	10.97	01/07/15	12:05	None	NA	NA
MW-10	01/06/15	13:22	ND	9.70	01/06/15	15:05	None	NA	NA
MW-11	01/06/15	10:12	ND	9.50	01/08/15	12:50	None	NA	NA
MW-12	01/06/15	10:16	ND	10.68	01/08/15	13:51	None	NA	NA

Notes:
NA = Not Applicable
ND = Not Detected
TOC = Top of Casing
NS = Not Sampled
*MW-9 was not accessible on January 6th.

GROUNDWATER SAMPLING

Well No.: **MW-1**

Project No. 04656020.HFC1
Project Name: Harbor Facilities Center
Location: Port of Oakland
651 Maritime Street, Oakland, California
Weather: Clear + warm 66°F
Precip. in past 5 days (in.): 0
Source: NOAA Ports
Water level instrument: Solinst ~~5005~~ 9971-1

Recorded by: S. Perryman (ESS, LLC) Date: 1/06/14
Depth of well from TOC (feet): 17.65
Well diameter (inches): 2
Screened interval from TOC (feet): 7.65-17.65
TOC elevation, NAVD 88 (feet): 15.80
Groundwater elevation, NAVD 88 (feet):
Water level from TOC (feet): 9.87 Time: 15:53
Product level from TOC (feet): ND Time:

CALCULATION OF WELL VOLUME:

(17.65 ft - 9.87 ft x (0.083 ft)² x π x 7.48 gal/ft³ = 1.27 gallons in one casing volume
well depth - water level x (well radius)² x π x gal/ft³ = 4.0 total ~~gallons~~ liters removed

CALIBRATION:

See "Daily Equipment Calibration Sheet"

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)	Depth to Water (ft btoc)	Cumulative ~~Gallons~~ Liters Removed
15:55	19.10	7.74	1.48	-123.0	484	14.8	10.12	Initial
15:58	19.15	7.50	0.81	-125.3	444	9.68	10.25	0.5
16:01	19.17	7.39	0.65	-126.4	421	9.45	10.33	1.0
16:04	19.22	7.36	0.65	-125.1	411	7.89	10.41	1.5
16:07	19.26	7.30	0.52	-126.2	4000	6.01	10.48	2.0
16:10	19.27	7.32	0.51	-125.6	402	5.70	10.56	2.5
16:13	19.26	7.28	0.51	-127.1	400	5.25	10.61	3.0
16:18	19.25	7.30	0.52	-126.2	397	5.19	10.67	3.5
16:21	19.27	7.31	0.51	-125.4	397	4.84	10.71	4.0

Purge method: Peristaltic Pump - low flow
Sample Time: 16:23
Duplicate/blank number: None
Duplicate Sample Time: NA
Sampling equipment: Peristaltic Pump & tubing
VOA attachment: None.
Sample containers: VOAs, HDPE + amber Glass Liters
Sample analyses: See "COC"
Laboratory: Curtis & Tompkins, Ltd.
Decontamination method: Soap wash, Tap Rinse, DI Rinse
Rinsate disposal: —
Comments: Installed new tubing in well. Purge water has a hydrocarbon odor and a light sheen.

TOC = top of casing
NAVD 88 = North American Vertical Datum of 1988.

GROUNDWATER SAMPLING

Well No.: **MW-2**

Project No.	04656020.HFC1	Recorded by:	S. Penman (GSS, LLC) Date: 1/8/15
Project Name:	Harbor Facilities Center	Depth of well from TOC (feet):	18.06
Location:	Port of Oakland	Well diameter (inches):	2
	651 Maritime Street, Oakland, California	Screened interval from TOC (feet):	8.06-18.06
Weather:	Partly cloudy 57°F	TOC elevation, NAVD 88 (feet):	16.43
Precip. in past 5 days (in.):	0	Groundwater elevation, NAVD 88 (feet):	
Source:	NOAA Ports	Water level from TOC (feet): 10.70	Time: 10:36
Water level instrument:	Solinst ~~5385~~ 9371-1	Product level from TOC (feet): ND	Time: 10:36

CALCULATION OF WELL VOLUME:

(18.06 ft - 10.70 ft x (0.083 ft)² x π x 7.48 gal/ft³ = 1.20 gallons in one casing volume
well depth - water level x (well radius)² x π x gal/ft³ = 4.0 total ~~gallons~~ Liters removed

CALIBRATION: See "Daily Equipment Calibration Sheet"

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)	Depth to Water (ft btoc)	Cumulative ~~Gallons~~ Liters Removed
10:40	18.13	7.68	2.05	156.5	1047	2.76	10.98	Initial
10:44	18.15	7.86	1.28	135.8	1000	1.35	11.11	0.5
10:48	18.16	7.87	1.22	181.4	979	1.06	11.23	1.0
10:53	18.05	7.87	1.09	142.5	971	0.32	11.39	1.5
10:58	18.16	7.85	0.95	125.6	963	0.42	11.55	2.0
11:03	18.27	7.86	0.88	116.5	960	0.15	11.71	2.5
11:08	18.09	7.85	0.80	107.6	955	0.45	11.90	3.0
11:13	18.13	7.86	0.74	102.6	958	0.660	11.98	3.5
11:18	18.11	7.86	0.74	99.6	965	0.24	12.08	4.0

Purge method: Peristaltic pump - low flow — Sample Time: 11:20
Duplicate/blank number: None — Duplicate Sample Time: NA
Sampling equipment: Peristaltic Pump — VOA attachment: none
Sample containers: VOAs, HDPE + Amber Glass Liters
Sample analyses: See "COC"
Laboratory: Curtis & Tompkins
Decontamination method: Soap wash, tap rinse, DI rinse — Rinsate disposal: —
Comments:

TOC - top of casing
NAVD 88 - North American Vertical Datum of 1988.

GROUNDWATER SAMPLING

Well No.: **MW-3**

Project No.	04656020.HFC1	Recorded by:	S. Penman (ESS, LLC) Date: 1/6/15
Project Name:	Harbor Facilities Center	Depth of well from TOC (feet):	17.47
Location:	Port of Oakland	Well diameter (inches):	2
	651 Maritime Street, Oakland, California	Screened interval from TOC (feet):	7.47-17.47
Weather:	Clear + warm 77°F	TOC elevation, NAVD 88 (feet):	
Precip. in past 5 days (in.):	0	Groundwater elevation, NAVD 88 (feet):	
Source:	NOAA Ports	Water level from TOC (feet):	10.71 Time: 10:31
Water level instrument:	Solinst 9371-1	Product level from TOC (feet):	9.74 Time: 10:31

CALCULATION OF WELL VOLUME:

(17.47 ft - _____ ft x (0.083 ft)^2 x π x 7.48 gal/ft^3 = _____ gallons in one casing volume

well depth - water level x (well radius)^2 x π x gal/ft^3 = _____ total gallons removed

CALIBRATION: _____

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)	Depth to Water (ft btoc)	Cumulative Gallons Removed

Purge method: None Sample Time: —

Duplicate/blank number: _____ Duplicate Sample Time: —

Sampling equipment: _____ VOA attachment: _____

Sample containers: _____

Sample analyses: _____

Laboratory: _____

Decontamination method: _____ Rinsate disposal: _____

Comments: Product in well - Did not Sample
There is .97' of product in well

TOC = top of casing

NAVD 88 = North American Vertical Datum of 1988.

GROUNDWATER SAMPLING

Well No.: **MW-4**

Project No. 04656020.HFC1
Recorded by: S. Pearson (GES, LLC) Date: 1/7/15
Project Name: Harbor Facilities Center
Depth of well from TOC (feet): 22.05
Location: Port of Oakland
Well diameter (inches): 2
651 Maritime Street, Oakland, California
Screened interval from TOC (feet): 11.25-22.05
Weather: Clear + warm 63°F
TOC elevation, NAVD 88 (feet): 15.91
Precip. in past 5 days (in.): 0
Groundwater elevation, NAVD 88 (feet):
Source: NOAA Ports
Water level from TOC (feet): 11.03 Time: 14:19
Water level instrument: Solinst 9371-1
Product level from TOC (feet): ND Time: 14:19

CALCULATION OF WELL VOLUME:

(22.05 ft - 11.03 ft x (0.083 ft)² x π x 7.48 gal/ft³ = 1.8 gallons in one casing volume
well depth - water level x (well radius)² x π x gal/ft³ = 3.5 liters total ~~gallons~~ removed

CALIBRATION:

see "Daily Equipment Calibration Sheet"

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)	Depth to Water (ft btoc)	Cumulative ~~Gallons~~ Liters Removed
14:22	20.16	7.67	1.08	-174.9	1396	3.96	11.77	Initial
14:26	19.81	7.29	0.42	-167.4	1384	2.61	11.77	0.5
14:31	19.70	7.34	0.41	-168.5	1431	1.94	11.77	1.0
14:35	19.71	7.34	0.37	-170.8	1458	4.07	11.77	1.5
14:39	19.74	7.36	0.33	-173.7	1491	6.30	11.77	2.0
14:44	19.81	7.39	0.28	-175.3	1503	5.76	11.77	2.5
14:48	19.87	7.40	0.28	-175.4	1508	5.49	11.77	3.0
14:52	19.86	7.41	0.29	-176.1	1513	4.00	11.77	3.5

Purge method: Peristaltic pump - low flow
Sample Time: 14:54
Duplicate/blank number: MW-4 DUP
Duplicate Sample Time: 14:54
Sampling equipment: Peristaltic pump
VOA attachment: None
Sample containers: VOAs, HDPE + amber glass liters
Sample analyses: See "COC"
Laboratory: Curtis & Tompkins, Ltd.
Decontamination method: Soap wash, tap rinse, DI rinse
Rinsate disposal:
Comments:

TOC = top of casing
NAVD 88 = North American Vertical Datum of 1988.

GROUNDWATER SAMPLING

Well No.: **MW-5**

Project No. 04656020.HFC1
Project Name: Harbor Facilities Center
Location: Port of Oakland
651 Maritime Street, Oakland, California
Weather: Clear & Warm 62°F
Precip. in past 5 days (in.): 0
Source: NOAA Ports
Water level instrument: Solinst 9371-1

Recorded by: S. Penman (ESS, UC) Date: 1/7/15
Depth of well from TOC (feet): 20.8
Well diameter (inches): 2
Screened interval from TOC (feet): 10.4-20.8
TOC elevation, NAVD 88 (feet): 15.39
Groundwater elevation, NAVD 88 (feet):
Water level from TOC (feet): 9.02 Time: 12:48
Product level from TOC (feet): ND Time: 12:48

CALCULATION OF WELL VOLUME:

(20.80 ft - 9.02 ft x (0.083 ft)² x π x 7.48 gal/ft³ = 1.92 gallons in one casing volume
well depth - water level x (well radius)² x π x gal/ft³ = 4.0 total ~~gallons~~ liters removed

CALIBRATION:

See "Daily Equipment Calibration Sheet"

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)	Depth to Water (ft btoc)	Cumulative ~~Gallons~~ Liters Removed
12:53	19.31	7.54	1.87	-150.3	2242	4.91	9.50	Initial
12:57	19.00	7.24	0.40	-113.3	2289	2.49	9.51	0.5
13:01	19.01	7.20	0.35	-103.0	2300	1.80	9.53	1.0
13:05	18.98	7.20	0.34	-101.3	2304	1.26	9.56	1.5
13:09	19.01	7.21	0.36	-95.5	2304	1.27	9.58	2.0
13:13	19.01	7.22	0.36	-90.4	2303	1.47	9.58	2.5
13:17	19.04	7.23	0.32	-87.7	2299	1.39	9.58	3.0
13:21	19.06	7.28	0.33	-92.0	2265	1.43	9.58	3.5
13:25	19.08	7.25	0.31	-91.4	2245	1.37	9.58	4.0

Purge method: Peristaltic pump - low flow
Sample Time: 13:27
Duplicate/blank number: None
Duplicate Sample Time: NA
Sampling equipment: Peristaltic pump
VOA attachment: None
Sample containers: VOAs, HDPE, Amber glass liters
Sample analyses: See "COC"
Laboratory: Curtis & Tompkins, Ltd.
Decontamination method: Soap wash, Tap Rinse, DI Rinse
Rinsate disposal: NA
Comments:

TOC = top of casing
NAVD 88 = North American Vertical Datum of 1988.

GROUNDWATER SAMPLING

Well No.: **MW-8A**

Project No. 04656020.HFC1
Project Name: Harbor Facilities Center
Location: Port of Oakland
651 Maritime Street, Oakland, California
Weather: Clear & Warm ~56°F
Precip. in past 5 days (in.): 0
Source: NOAA Ports
Water level instrument: Solinst 9371-1

Recorded by: S. Penman (EGS, LLC) Date: 1/7/15
Depth of well from TOC (feet): 23.14
Well diameter (inches): 2
Screened interval from TOC (feet): 7.54-22.54
TOC elevation, NAVD 88 (feet): 14.99
Groundwater elevation, NAVD 88 (feet):
Water level from TOC (feet): 10.00 Time: 10:11
Product level from TOC (feet): ND Time: 10:11

CALCULATION OF WELL VOLUME:

(23.14 ft - 10.00 ft x (0.083 ft)² x π x 7.48 gal/ft³ = 2.14 gallons in one casing volume
well depth - water level x (well radius)² x π x gal/ft³ = 4.5 total ~~gallons~~ Liters removed

CALIBRATION:

see "Daily Equipment Calibration Sheet"

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)	Depth to Water (ft btoc)	Cumulative ~~Gallons~~ Liters Removed
10:17	16.94	7.27	1.37	-129.9	2294	6.63	10.21	Initial
10:19	17.80	7.38	0.78	-147.9	2204	4.68	10.25	0.5
10:21	18.26	7.41	0.67	-155.2	2140	3.66	10.26	1.0
10:23	18.58	7.42	0.81	-159.4	2079	2.75	10.26	1.5
10:25	18.76	7.43	0.86	-161.6	1995	1.79	10.28	2.0
10:27	18.83	7.44	0.77	-161.5	1963	1.02	10.30	2.5
10:29	18.88	7.44	0.70	-159.9	1938	1.19	10.30	3.0
10:31	18.92	7.44	0.65	-160.4	1921	0.76	10.30	3.5
10:33	18.94	7.44	0.61	-157.0	1911	0.98	10.30	4.0
10:35	18.95	7.44	0.60	-157.7	1911	0.72	10.30	4.5

Purge method: Peristaltic Pump - low flow
Sample Time: 10:37
Duplicate/blank number: None
Duplicate Sample Time: NA
Sampling equipment: Peristaltic pump
VOA attachment: None
Sample containers: VOAs, HDPE, Amber glass liters
Sample analyses: See "COC"
Laboratory: Curtis & Tompkins, Ltd.
Decontamination method: Soap wash, Tap rinse, DI Rinse
Rinsate disposal:
Comments:

TOC = top of casing
NAVD 88 = North American Vertical Datum of 1988.

GROUNDWATER SAMPLING

Well No.: **MW-9**

Project No.	04656020.HFC1	Recorded by:	S. Penman (EOS, LLC.) Date: 1/7/15
Project Name:	Harbor Facilities Center	Depth of well from TOC (feet):	25
Location:	Port of Oakland	Well diameter (inches):	2
	651 Maritime Street, Oakland, California	Screened interval from TOC (feet):	15 - 25
Weather:	Clear & Warm 61°F	TOC elevation, NAVD 88 (feet):	16.33
Precip. in past 5 days (in.):	-0	Groundwater elevation, NAVD 88 (feet):	
Source:	NOAA Ports	Water level from TOC (feet): 10.97	Time: 11:33
Water level instrument:	Solinst 9371-1	Product level from TOC (feet): ND	Time: 11:33

CALCULATION OF WELL VOLUME:

(25.00 ft - 10.97 ft x (0.083 ft)² x π x 7.48 gal/ft³ = 2.3 gallons in one casing volume
well depth - water level x (well radius)² x π x gal/ft³ = 3.5 total ~~gallons~~ liters removed

CALIBRATION: see "Daily Equipment Calibration Sheet"

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)	Depth to Water (ft btoc)	Cumulative ~~Gallons~~ Liters Removed
11:41	19.85	7.51	1.01	-163.3	1988	4.19	11.05	Initial
11:44	19.84	7.36	0.48	-157.5	2006	3.03	11.05	0.5
11:48	19.89	7.31	0.58	-157.5	2016	2.91	11.07	1.0
11:51	19.90	7.32	0.57	-158.5	2019	2.84	11.07	1.5
11:54	20.00	7.32	0.46	-160.8	2018	2.41	11.07	2.0
11:57	19.97	7.32	0.44	-162.2	2024	1.70	11.07	2.5
12:00	20.00	7.33	0.45	-162.4	2026	1.67	11.07	3.0
12:03	20.00	7.32	0.46	-164.3	2032	1.49	11.07	3.5

Purge method:	Peristaltic pump - low flow	Sample Time:	12:05
Duplicate/blank number:	None	Duplicate Sample Time:	NA
Sampling equipment:	Peristaltic pump	VOA attachment:	None
Sample containers:	VOAs, HDPE & Amber glass liters		
Sample analyses:	See "COC"		
Laboratory:	Curtis & Tompkins, Ltd.		
Decontamination method:	Soap wash, Tap rinse, DI rinse	Rinsate disposal:	
Comments:			

TOC = top of casing
NAVD 88 = North American Vertical Datum of 1988.

GROUNDWATER SAMPLING

Well No.: **MW-10**

Project No. 04656020.HFC1
Project Name: Harbor Facilities Center
Location: Port of Oakland
651 Maritime Street, Oakland, California
Weather: Clear + warm
Precip. in past 5 days (in.): 0
Source: NOAA Ports
Water level instrument: Solinst Interface meter #122 9371-1

Recorded by: S. Penman (ESS LLC) Date: 1/6/15
Depth of well from TOC (feet): 25
Well diameter (inches): 2
Screened interval from TOC (feet): 15 - 25
TOC elevation, NAVD 88 (feet): 15.65
Groundwater elevation, NAVD 88 (feet):
Water level from TOC (feet): 9.70 Time: 14:18
Product level from TOC (feet): ND Time: 14:18

CALCULATION OF WELL VOLUME:

(25.00 ft - 9.70 ft x (0.083 ft)² x π x 7.48 gal/ft³ = 2.5 gallons in one casing volume
well depth - water level x (well radius)² x π x gal/ft³ = 6.5 liters total ~~gallons~~ removed

CALIBRATION: See "Daily Calibration Sheet"

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)	Depth to Water (ft btoc)	Cumulative ~~Gallons~~ Liters Removed
14:22	18.46	7.02	3.71	-135.4	3521	3.78	10.49	Initial
14:26	18.61	6.92	2.98	-131.2	3573	2.43	10.66	0.5
14:29	18.72	6.90	2.92	-128.0	3601	2.41	10.84	1.0
14:32	18.73	6.92	2.00	-140.2	3618	2.13	10.94	1.5
14:35	18.70	6.92	1.79	-144.0	3624	2.24	10.99	2.0
14:38	18.70	6.92	1.62	-146.7	3632	3.76	10.99	2.5
14:41	18.65	6.95	1.08	-129.4	3625	2.73	10.89	3.0
14:44	18.69	6.91	1.14	-119.3	3622	2.91	11.04	3.5
14:47	18.72	6.91	0.97	-119.8	3624	2.45	11.32	4.0
14:50	18.75	6.94	0.80	-121.0	3631	2.36	11.46	4.5
14:53	18.97	6.87	0.69	-125.0	3636	2.15	11.51	5.0
14:56	18.77	6.87	0.64	-122.9	3636	2.10	11.54	6.5
14:59	18.78	6.87	0.62	-123.1	3635	2.28	11.53	6.0
15:03	18.80	6.88	0.59	-124.4	3632	1.94	11.45	6.5

Purge method: Peristaltic Pump - low flow
Sample Time: 15:05
Duplicate/blank number: NA
Duplicate Sample Time: NA
Sampling equipment: Peristaltic Pump + tubing
VOA attachment: None
Sample containers: VOAs, HDPE + Glass Ambers
Sample analyses: See "COC"
Laboratory: Curtis & Tompkins, Ltd.
Decontamination method: Liquinox wash, tap rinse + DI rinse
Rinsate disposal: ~~Drum~~ Pump
Comments:

TOC = top of casing
NAVD 88 = North American Vertical Datum of 1988.

GROUNDWATER SAMPLING

Well No.: **MW-11**

Project No.	04656020.HFC1	Recorded by:	S. Penman (ESS, UC) Date: 1/8/15
Project Name:	Harbor Facilities Center	Depth of well from TOC (feet):	25
Location:	Port of Oakland	Well diameter (inches):	2
	651 Maritime Street, Oakland, California	Screened interval from TOC (feet):	15 - 25
Weather:	Overcast + cool 57°F	TOC elevation, NAVD 88 (feet):	15.47
Precip. in past 5 days (in.):	-0-	Groundwater elevation, NAVD 88 (feet):	
Source:	NOAA Parts	Water level from TOC (feet): 9.41	Time: 12:19
Water level instrument:	Solinst 9371-1	Product level from TOC (feet): ND	Time: 12:19

CALCULATION OF WELL VOLUME:

(25.00 ft - 9.41 ft x (0.083 ft)² x π x 7.48 gal/ft³ = 2.54 gallons in one casing volume

well depth - water level x (well radius)² x π x gal/ft³ = 3.5 total ~~gallons~~ liters removed

CALIBRATION: see "Daily Equipment calibration sheet"

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)	Depth to Water (ft btoc)	Cumulative ~~Gallons~~ Liters Removed
12:22	20.49	8.16	3.77	-176.0	5194	10.7	9.67	Initial
12:26	20.74	8.12	0.35	-191.5	5309	11.5	9.57	0.5
12:29	20.81	8.13	0.33	-184.6	5325	11.1	9.60	1.0
12:33	20.86	8.11	0.31	-196.1	5330	8.95	9.60	1.5
12:37	20.90	8.14	0.29	-202.0	5334	8.37	9.60	2.0
12:40	20.99	8.13	0.27	-203.9	5336	8.11	9.61	2.5
12:44	21.07	8.14	0.28	-204.9	5341	6.93	9.61	3.0
12:48	21.09	8.14	0.28	-207.6	5343	6.32	9.61	3.5

Purge method: Peristaltic pump - low flow — Sample Time: 12:50

Duplicate/blank number: None — Duplicate Sample Time: NA

Sampling equipment: Peristaltic pump — VOA attachment: None

Sample containers: VOAs, HDPE + amber glass liters

Sample analyses: see "COC"

Laboratory: Curtis & Tompkins

Decontamination method: Soap wash, Tap rinse, DI rinse — Rinsate disposal:

Comments: Purgewater has a yellow tint.
Installed new tubing in well

TOC = top of casing

NAVD 88 = North American Vertical Datum of 1988.

GROUNDWATER SAMPLING

Well No.: **MW-12**

Project No.	04656020.HFC1	Recorded by:	S. Forman (Esquis)
Project Name:	Harbor Facilities Center	Date:	1/8/15
Location:	Port of Oakland	Depth of well from TOC (feet):	25
	651 Maritime Street, Oakland, California	Well diameter (inches):	2
Weather:	Overcast & cool 57°F	Screened interval from TOC (feet):	15 - 25
Precip. in past 5 days (in.):	0	TOC elevation, NAVD 88 (feet):	16.79
Source:	NOAA Parts	Groundwater elevation, NAVD 88 (feet):	
Water level instrument:	Solinst 9371-1	Water level from TOC (feet):	10.68 Time: 13:29
		Product level from TOC (feet):	ND Time: 13:29

CALCULATION OF WELL VOLUME:

(25.00 ft - 10.68 ft x (0.083 ft)² x π x 7.48 gal/ft³ = 2.33 gallons in one casing volume

well depth - water level x (well radius)² x π x gal/ft³ = 3.5 total ~~gallons~~ liters removed

CALIBRATION: See "Daily Equipment Calibration Sheet"

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)	Depth to Water (ft btoc)	Cumulative ~~Gallons~~ Liters Removed
13:32	17.71	7.42	0.66	-121.4	1599	19.2	10.81	Initial
13:34	17.94	7.31	0.42	-119.5	1543	16.0	10.81	0.5
13:36	18.08	7.28	0.39	-123.7	1512	10.3	10.81	1.0
13:39	18.11	7.27	0.40	-127.6	1502	9.34	10.81	1.5
13:41	18.11	7.27	0.37	-130.3	1498	7.28	10.81	2.0
13:44	18.14	7.28	0.34	-133.3	1492	5.91	10.81	2.5
13:46	18.18	7.28	0.34	-135.6	1488	5.80	10.81	3.0
13:49	18.15	7.28	0.36	-137.3	1484	3.86	10.81	3.5

Purge method:	Peristaltic pump - low flow	Sample Time:	13:51
Duplicate/blank number:	None	Duplicate Sample Time:	NA
Sampling equipment:	Peristaltic pump	VOA attachment:	None
Sample containers:	VOAs, HDPE + amber glass liters		
Sample analyses:	See "COC"		
Laboratory:	Curtis & Tompkins, Ltd.		
Decontamination method:	Soap wash, Tap rinse, DI rinse	Rinsate disposal:	
Comments:			

TOC = top of casing

NAVD 88 = North American Vertical Datum of 1988.

Environmental
Sampling Services, LLC

Project Name: Port of Oakland-Harbor Facilities Complex
Project Address: 651 Maritime Street, Oakland, California
Task: January 2015 Semi-Annual Groundwater Monitoring Event

DAILY EQUIPMENT CALIBRATION SHEET

Date	Time	Instrument Serial Number	Probe Serial Number	Dissolved Oxygen (%)	pH			Specific Conductivity (1,000 µs/cm^c)	ORP (231 mV)	Turbidity (0.02 NTU)
					4	7	10			
1/6/15	13:40	556MPS	09C100611	100.0	3.99	7.00	10.01	1,000	230.8	0.02
1/7/15	9:35	556MPS	09C100611	100.1	3.99	7.00	10.02	1,000	230.6	0.02
1/8/15	10:05	556MPS	09C100611	100.4	3.99	7.00	10.01	1,000	231.0	0.02

Environmental Sampling Services, LLC
6680 Alhambra Avenue, #102
Martinez, California 94553-6105
Telephone: (925) 372-8108
www.envsampling.com

CHAIN OF CUSTODY RECORD

Page 1 of 1

TURN AROUND TIME Other:

LABORATORY: Curtis Tompkins, Ltd. Berkeley, CA

☐ 24 Hours	☐ 48 Hours	☐ 1 Week	☑ Normal

Report To: Ms. Katherine Brandt **Telephone/Fax:** 510-596-9675 / 510-652-4906
Company: Arcadis U.S., Inc. **Project Name:** Port of Oakland-HFC
Address: 2000 Powell Street, 7th Floor, Emeryville, CA 94608 **Project Number:** 04656016.0000
Bill To: Port of Oakland
E-Mail Results to & cc: katherine.brandt@arcadis-us.com
Sampler(s): Stephen Penman ☑ **Sampler's Signature:**

Reporting Requirement: PDF: Yes ☑ No ☐ **EPA Data Report:** Level II
EDD File: Yes ☑ No ☐ Electronic (EDF) : Yes ☑ No ☐

Analysis Request

SAMPLE ID	Sample Date	Sample Time	Number of Containers	Type of Container[1]	Matrix: Water	Groundwater	Soil	Soil Vapor	Other	Preservative: Ice	HCl	HNO_3	NaOH	TPH-Gasoline (EPA 8015B)	BTEX & MTBE (EPA 8260B)	TPH-D & MO (EPA 8015B) w/Silica Gel Cleanup	TDS (40CFR136/160.1)	Dissolved Sulfide (EPA E376.2)	Anions (EPA 300.0) * see "comments"	TPH-D+MO (EPA 8015B)	Field Filtered (FF): Dissolved Na, Ca, K, and Mg (EPA 200.7)	Dissolved Fe and Mn (EPA SW6010B)
QCTB-1	1/06/15	13:30	4	1	X					X	X			X	X							
MW-10	1/06/15	15:05	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X
MW-1	1/06/15	16:23	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X
MW-8A	1/07/15	10:37	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X
MW-9	1/07/15	12:05	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X
MW-5	1/07/15	13:27	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X
MW-4	1/07/15	14:54	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X
MW-4DUP	1/07/15	14:54	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X

Comments

Anions = bicarbonate, carbonate, sulfate chloride, nitrate, nitrite & orthophosphate.
Analyze: TPH-D + MO with + Without Silica Gel Cleanup

Relinquished By:	Date:	Time:	Received By:
	1/07/15	16:54	
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

1 = Sample Container Type: 1 =VOA 2=Glass 3=High Density Polyethylene 4=Summa

QUESTIONS REGARDING COC, CALL ESS
Send confirmation to: katherine.brandt@arcadis-us.com
After log-in, please email COC to: spen@envsampling.com

SAMPLE RECEIPT
☐ Intact ☐ Cold
☐ On Ice ☐ Ambient
Preservative Correct?
☐ Yes ☐ No ☐ NA

Environmental Sampling Services, LLC
6680 Alhambra Avenue, #102
Martinez, California 94553-6105
Telephone: (925) 372-8108
www.envsampling.com

CHAIN OF CUSTODY RECORD

Page 1 of 1

TURN AROUND TIME Other:

LABORATORY: Curtis Tompkins, Ltd. Berkeley, CA

☐ 24 Hours	☐ 48 Hours	☐ 1 Week	☑ Normal

Report To: Ms. Katherine Brandt **Telephone/Fax:** 510-596-9675 / 510-652-4906
Company: Arcadis U.S., Inc. **Project Name:** Port of Oakland-HFC
Address: 2000 Powell Street, 7th Floor, Emeryville, CA 94608 **Project Number:** 04656016.0000
Bill To: Port of Oakland
E-Mail Results to & cc: katherine.brandt@arcadis-us.com
Sampler(s): Stephen Penman ☑ **Sampler's Signature:**

Reporting Requirement: PDF: Yes ☑ No ☐ **EPA Data Report:** Level II
EDD File: Yes ☑ No ☐ Electronic (EDF) : Yes ☑ No ☐

SAMPLE ID	Sample Date	Sample Time	Number of Containers	Type of Container[1]	Matrix: Water	Groundwater	Soil	Soil Vapor	Other	Preservative: Ice	HCl	HNO_3	NaOH	TPH-Gasoline (EPA 8015B)	BTEX & MTBE (EPA 8260B)	TPH-D & MO (EPA 8015B) w/Silica Gel Cleanup	TDS (40CFR136/160.1)	Dissolved Sulfide (EPA E376.2)	Anions (EPA 300.0)* see "comments"	TPH-D+MO (EPA 8015B)	Field Filtered (FF): Dissolved Na, Ca, K, and Mg (EPA 200.7)	Dissolved Fe and Mn (EPA SW6010B)
QCTB-2	1/08/15	10:00	4	1	x					x	x			x	x							
MW-2	1/08/15	11:20	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X
MW-11	1/08/15	12:50	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X
MW-12	1/08/15	13:51	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X

Comments:
Anions = bicarbonate, carbonate, sulfate chloride, nitrate, nitrite & orthophosphate.
Analyze TPH-D+MO with and without Silica Gel Cleanup

Relinquished By:	Date:	Time:	Received By:
	1/8/15	15:15	
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

1 = Sample Container Type: 1 =VOA 2=Glass 3=High Density Polyethylene 4=Summa

QUESTIONS REGARDING COC, CALL ESS
Send confirmation to: katherine.brandt@arcadis-us.com
After log-in, please email COC to: spen@envsampling.com
Cold since

SAMPLE RECEIPT
☐ Intact ☐ Cold
☐ On Ice ☐ Ambient
Preservative Correct?
☐ Yes ☐ No ☐ NA

Appendix B

Laboratory Analytical Reports


Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 263750
ANALYTICAL REPORT

Arcadis	Project : 04656016.0000
2000 Powell St.	Location : Port of Oakland-HFC
Emeryville, CA 94608	Level : II

Sample ID	Lab ID
QCTB-1	263750-001
MW-10	263750-002
MW-1	263750-003
MW-8A	263750-004
MW-9	263750-005
MW-5	263750-006
MW-4	263750-007
MW-4 DUP	263750-008

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: Will Rice Date: 01/15/2015

Will S Rice
Project Manager
will.rice@ctberk.com

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**263750**
Client:	**Arcadis**
Project:	**04656016.0000**
Location:	**Port of Oakland-HFC**
Request Date:	**01/07/15**
Samples Received:	**01/07/15**

This data package contains sample and QC results for eight water samples, requested for the above referenced project on 01/07/15. The samples were received cold and intact.

TPH-Purgeables and/or BTXE by GC (EPA 8015B):
No analytical problems were encountered.

TPH-Extractables by GC (EPA 8015B):
No analytical problems were encountered.

Volatile Organics by GC/MS (EPA 8260B):
No analytical problems were encountered.

Metals (EPA 6010B):
No analytical problems were encountered.

Metals (EPA 200.7):
The samples were filtered outside the 40CFR136 recommended 15 minute holding time. No other analytical problems were encountered.

Ion Chromatography (EPA 300.0):
MW-10 (lab # 263750-002) was diluted due to high chloride concentration. No other analytical problems were encountered.

Alkalinity (SM2320B):
No analytical problems were encountered.

Dissolved Sulfide (SM4500S2-D):
No analytical problems were encountered.

Total Dissolved Solids (TDS) (SM2540C):
No analytical problems were encountered.

Orthophosphate Phosphorous (SM4500P-E):
No analytical problems were encountered.

263750

Environmental Sampling Services, LLC

6680 Alhambra Avenue, #102
Martinez, California 94553-6105
Telephone: (925) 372-8108
www.envsampling.com

CHAIN OF CUSTODY RECORD

Page 1 of 1

TURN AROUND TIME — Other:

LABORATORY: Curtis Tompkins, Ltd. Berkeley, CA

☐ 24 Hours	☐ 48 Hours	☐ 1 Week	☑ Normal

Report To: Ms. Katherine Brandt — **Telephone/Fax:** 510-596-9675 / 510-652-4906
Company: Arcadis U.S., Inc. — **Project Name:** Port of Oakland-HFC
Address: 2000 Powell Street, 7th Floor, Emeryville, CA 94608 — **Project Number:** 04656016.0000
Bill To: Port of Oakland
E-Mail Results to & cc: katherine.brandt@arcadis-us.com
Sampler(s): Stephen Penman ☑ — **Sampler's Signature:**

Reporting Requirement: PDF: Yes ☑ No ☐ — **EPA Data Report:** Level II
EDD File: Yes ☑ No ☐ — Electronic (EDF) : Yes ☑ No ☐

	SAMPLE ID	Sample Date	Sample Time	Number of Containers	Type of Container[1]	Matrix: Water	Groundwater	Soil	Soil Vapor	Other	Preservative: Ice	HCl	HNO_3	NaOH	Analysis Request: TPH-Gasoline (EPA 8015B)	BTEX & MTBE (EPA 8260B)	TPH-D & MO (EPA 8015B) w/Silica Gel Cleanup	TDS (40CFR136/160.1)	Dissolved Sulfide (EPA E376.2)	Anions (EPA 300.0) * see "comments"	TPH-D+MO (EPA 8015B)	Field Filtered (FF): Dissolved Na, Ca, K, and Mg (EPA 200.7)	Dissolved Fe and Mn (EPA SW6010B)
1	QCTB-1	1/06/15	13:30	4	1	X					X	X			X	X							
2	MW-10	1/06/15	15:05	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X
3	MW-1	1/06/15	16:23	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X
4	MW-8A	1/07/15	10:37	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X
5	MW-9	1/07/15	12:05	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X
6	MW-5	1/07/15	13:27	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X
7	MW-4	1/07/15	14:54	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X
8	MW-4DUP	1/07/15	14:54	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X

Comments:
Anions = bicarbonate, carbonate, sulfate chloride, nitrate, nitrite & orthophosphate.
Analyze: TPH-D + MO with + without Silica Gel Cleanup

Relinquished By:	Date:	Time:	Received By:
[signature]	1/07/15	16:54	[signature]
Relinquished By:	Date:	Time:	Received By:
Relinquished By:	Date:	Time:	Received By:

1 = Sample Container Type: 1 =VOA 2=Glass 3=High Density Polyethylene 4=Summa

QUESTIONS REGARDING COC, CALL ESS
Send confirmation to: katherine.brandt@arcadis-us.com
After log-in, please email COC to: spen@envsampling.com

SAMPLE RECEIPT
☐ Intact ☐ Cold
☐ On Ice ☐ Ambient
Preservative Correct?
☐ Yes ☐ No ☐ NA

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 263750 Date Received 1/7/15 Number of coolers 1
Client Environmental Sampling Services Project Port of Oakland - 14FC

Date Opened 1/7 By (print) SC (sign)
Date Logged in 1/7 By (print) MC (sign)

1. Did cooler come with a shipping slip (airbill, etc) YES (NO)
Shipping info

2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☒ NO
How many Name Date
2B. Were custody seals intact upon arrival? YES NO (N/A)
3. Were custody papers dry and intact when received? YES NO
4. Were custody papers filled out properly (ink, signed, etc)? YES NO
5. Is the project identifiable from custody papers? (If so fill out top of form) YES NO
6. Indicate the packing in cooler: (if other, describe)

☐ Bubble Wrap ☒ Foam blocks ☒ Bags ☐ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☒ Wet ☐ Blue/Gel ☐ None Temp(°C) 5.7°, 1.8°

☐ Samples Received on ice & cold without a temperature blank; temp. taken with IR gun

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? YES (NO)
If YES, what time were they transferred to freezer?
9. Did all bottles arrive unbroken/unopened? YES NO
10. Are there any missing / extra samples? YES (NO)
11. Are samples in the appropriate containers for indicated tests? YES NO
12. Are sample labels present, in good condition and complete? YES NO
13. Do the sample labels agree with custody papers? YES NO
14. Was sufficient amount of sample sent for tests requested? YES NO
15. Are the samples appropriately preserved? (YES) NO N/A
16. Did you check preservatives for all bottles for each sample? YES NO N/A
17. Did you document your preservative check? YES NO N/A
18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO (N/A)
19. Did you change the hold time in LIMS for preserved terracores? YES NO (N/A)
20. Are bubbles > 6mm absent in VOA samples? YES NO (N/A)
21. Was the client contacted concerning this sample delivery? YES (NO)
If YES, Who was called? By Date:

COMMENTS

Rev 10, 9/12

Curtis & Tompkins Sample Preservation for 263750

Sample	pH: <2	>9	>12	Other
-002a	[ ]	[ ]	[ ]	_____
b	[ ]	[ ]	[ ]	_____
c	[ ]	[ ]	[ ]	_____
d	[ ]	[ ]	[ ]	_____
e	[ ]	[ ]	[ ]	_____
f	[ ]	[ ]	[ ]	_____
g	[ ]	[ ]	[ ]	_____
h	[X]	[ ]	[ ]	_____
i	[ ]	[ ]	[X]	_____
j	[ ]	[ ]	[ ]	_____
k	[ ]	[ ]	[ ]	_____
l	[ ]	[ ]	[ ]	_____
-003a	[ ]	[ ]	[ ]	_____
b	[ ]	[ ]	[ ]	_____
c	[ ]	[ ]	[ ]	_____
d	[ ]	[ ]	[ ]	_____
e	[ ]	[ ]	[ ]	_____
f	[ ]	[ ]	[ ]	_____
g	[ ]	[ ]	[ ]	_____
h	[X]	[ ]	[ ]	_____
i	[ ]	[ ]	[X]	_____
j	[ ]	[ ]	[ ]	_____
k	[ ]	[ ]	[ ]	_____
l	[ ]	[ ]	[ ]	_____
-004a	[ ]	[ ]	[ ]	_____
b	[ ]	[ ]	[ ]	_____
c	[ ]	[ ]	[ ]	_____
d	[ ]	[ ]	[ ]	_____
e	[ ]	[ ]	[ ]	_____
f	[ ]	[ ]	[ ]	_____
g	[ ]	[ ]	[ ]	_____
h	[X]	[ ]	[ ]	_____
i	[ ]	[ ]	[X]	_____
j	[ ]	[ ]	[ ]	_____
k	[ ]	[ ]	[ ]	_____
l	[ ]	[ ]	[ ]	_____
-005a	[ ]	[ ]	[ ]	_____
b	[ ]	[ ]	[ ]	_____
c	[ ]	[ ]	[ ]	_____
d	[ ]	[ ]	[ ]	_____
e	[ ]	[ ]	[ ]	_____
f	[ ]	[ ]	[ ]	_____
g	[ ]	[ ]	[ ]	_____
h	[X]	[ ]	[ ]	_____
i	[ ]	[ ]	[X]	_____
j	[ ]	[ ]	[ ]	_____
k	[ ]	[ ]	[ ]	_____
l	[ ]	[ ]	[ ]	_____
-006a	[ ]	[ ]	[ ]	_____
b	[ ]	[ ]	[ ]	_____
c	[ ]	[ ]	[ ]	_____
d	[ ]	[ ]	[ ]	_____
e	[ ]	[ ]	[ ]	_____
f	[ ]	[ ]	[ ]	_____
g	[ ]	[ ]	[ ]	_____
h	[X]	[ ]	[ ]	_____
i	[ ]	[ ]	[X]	_____
j	[ ]	[ ]	[ ]	_____
k	[ ]	[ ]	[ ]	_____
l	[ ]	[ ]	[ ]	_____
-007a	[ ]	[ ]	[ ]	_____
b	[ ]	[ ]	[ ]	_____
c	[ ]	[ ]	[ ]	_____
d	[ ]	[ ]	[ ]	_____
e	[ ]	[ ]	[ ]	_____
f	[ ]	[ ]	[ ]	_____
g	[ ]	[ ]	[ ]	_____
h	[X]	[ ]	[ ]	_____
i	[ ]	[ ]	[X]	_____
j	[ ]	[ ]	[ ]	_____
k	[ ]	[ ]	[ ]	_____
l	[ ]	[ ]	[ ]	_____
-008a	[ ]	[ ]	[ ]	_____
b	[ ]	[ ]	[ ]	_____
c	[ ]	[ ]	[ ]	_____
d	[ ]	[ ]	[ ]	_____
e	[ ]	[ ]	[ ]	_____
f	[ ]	[ ]	[ ]	_____
g	[ ]	[ ]	[ ]	_____
h	[X]	[ ]	[ ]	_____
i	[ ]	[ ]	[X]	_____
j	[ ]	[ ]	[ ]	_____
k	[ ]	[ ]	[ ]	_____
l	[ ]	[ ]	[ ]	_____

Analyst: SL

Date: 1/7/15

Page 1 of 1

Curtis & Tompkins, Ltd.

Detections Summary for 263750

Results for any subcontracted analyses are not included in this summary.

Client : Arcadis
Project : 04656016.0000
Location : Port of Oakland-HFC

Client Sample ID : QCTB-1 Laboratory Sample ID : 263750-001

No Detections

Client Sample ID : MW-10 Laboratory Sample ID : 263750-002

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	310	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 5030B
Diesel C10-C24	31,000		250	ug/L	As Recd	5.000	EPA 8015B	EPA 3520C
Diesel C10-C24	820		50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Motor Oil C24-C36	6,000		1,500	ug/L	As Recd	5.000	EPA 8015B	EPA 3520C
Benzene	66		0.5	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B
Toluene	0.6		0.5	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B
Iron	15,000		1,000	ug/L	DISS.	10.00	EPA 6010B	METHOD
Manganese	6,400		50	ug/L	DISS.	10.00	EPA 6010B	METHOD
Calcium	150,000		4,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Potassium	31,000		5,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Magnesium	92,000		2,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Sodium	490,000		5,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Chloride	650		20	mg/L	TOTAL	100.0	EPA 300.0	METHOD
Alkalinity, Bicarbonate	1,200		10	mg/L	TOTAL	10.00	SM2320B	METHOD
Alkalinity, Total as CaCO3	1,200		10	mg/L	TOTAL	10.00	SM2320B	METHOD
Orthophosphate (as P)	0.54		0.030	mg/L	TOTAL	1.000	SM4500P-E	METHOD
Total Dissolved Solids	2,140		14	mg/L	TOTAL	1.429	SM2540C	METHOD

Curtis & Tompkins, Ltd.

Client Sample ID : MW-1 Laboratory Sample ID : 263750-003

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	1,700	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 5030B
Diesel C10-C24	4,100		50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Diesel C10-C24	2,000		50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Motor Oil C24-C36	560		300	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Benzene	27		0.5	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B
Toluene	1.6		0.5	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B
Ethylbenzene	1.8		0.5	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B
m,p-Xylenes	0.7		0.5	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B
o-Xylene	0.9		0.5	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B
Iron	570		100	ug/L	DISS.	1.000	EPA 6010B	METHOD
Manganese	420		50	ug/L	DISS.	10.00	EPA 6010B	METHOD
Calcium	17,000		4,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Potassium	570		500	ug/L	DISS.	1.000	EPA 200.7	METHOD
Magnesium	13,000		2,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Sodium	47,000		5,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Chloride	6.6		0.20	mg/L	TOTAL	1.000	EPA 300.0	METHOD
Alkalinity, Bicarbonate	220		6.7	mg/L	TOTAL	6.700	SM2320B	METHOD
Alkalinity, Total as CaCO3	220		6.7	mg/L	TOTAL	6.700	SM2320B	METHOD
Dissolved Sulfide	0.21		0.04	mg/L	TOTAL	1.000	SM4500S2-D	METHOD
Orthophosphate (as P)	0.18		0.030	mg/L	TOTAL	1.000	SM4500P-E	METHOD
Total Dissolved Solids	240		10	mg/L	TOTAL	1.000	SM2540C	METHOD

Client Sample ID : MW-8A Laboratory Sample ID : 263750-004

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	900	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Motor Oil C24-C36	760		300	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Iron	2,700		1,000	ug/L	DISS.	10.00	EPA 6010B	METHOD
Manganese	900		50	ug/L	DISS.	10.00	EPA 6010B	METHOD
Calcium	52,000		4,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Potassium	15,000		5,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Magnesium	71,000		2,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Sodium	250,000		5,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Chloride	180		4.0	mg/L	TOTAL	20.00	EPA 300.0	METHOD
Sulfate	30		0.50	mg/L	TOTAL	1.000	EPA 300.0	METHOD
Alkalinity, Bicarbonate	800		6.7	mg/L	TOTAL	6.700	SM2320B	METHOD
Alkalinity, Total as CaCO3	800		6.7	mg/L	TOTAL	6.700	SM2320B	METHOD
Orthophosphate (as P)	1.0		0.060	mg/L	TOTAL	2.000	SM4500P-E	METHOD
Total Dissolved Solids	1,120		10	mg/L	TOTAL	1.000	SM2540C	METHOD

Curtis & Tompkins, Ltd.

Client Sample ID : MW-9 Laboratory Sample ID : 263750-005

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	350	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 5030B
Diesel C10-C24	2,100		50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Diesel C10-C24	130	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Motor Oil C24-C36	1,200		300	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Benzene	69		0.5	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B
Toluene	0.7		0.5	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B
Ethylbenzene	12		0.5	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B
o-Xylene	1.4		0.5	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B
Iron	5,200		1,000	ug/L	DISS.	10.00	EPA 6010B	METHOD
Manganese	710		50	ug/L	DISS.	10.00	EPA 6010B	METHOD
Calcium	46,000		4,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Potassium	5,700		500	ug/L	DISS.	1.000	EPA 200.7	METHOD
Magnesium	59,000		2,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Sodium	320,000		5,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Chloride	240		4.0	mg/L	TOTAL	20.00	EPA 300.0	METHOD
Sulfate	0.62		0.50	mg/L	TOTAL	1.000	EPA 300.0	METHOD
Alkalinity, Bicarbonate	860		6.7	mg/L	TOTAL	6.700	SM2320B	METHOD
Alkalinity, Total as CaCO3	860		6.7	mg/L	TOTAL	6.700	SM2320B	METHOD
Dissolved Sulfide	0.26		0.04	mg/L	TOTAL	1.000	SM4500S2-D	METHOD
Orthophosphate (as P)	1.1		0.060	mg/L	TOTAL	2.000	SM4500P-E	METHOD
Total Dissolved Solids	1,790		11	mg/L	TOTAL	1.111	SM2540C	METHOD

Client Sample ID : MW-5 Laboratory Sample ID : 263750-006

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	1,300	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Motor Oil C24-C36	1,200		300	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Iron	530		100	ug/L	DISS.	1.000	EPA 6010B	METHOD
Manganese	860		50	ug/L	DISS.	10.00	EPA 6010B	METHOD
Calcium	64,000		4,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Potassium	20,000		5,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Magnesium	35,000		2,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Sodium	330,000		5,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Chloride	440		10	mg/L	TOTAL	50.00	EPA 300.0	METHOD
Sulfate	76		10	mg/L	TOTAL	20.00	EPA 300.0	METHOD
Alkalinity, Bicarbonate	430		6.7	mg/L	TOTAL	6.700	SM2320B	METHOD
Alkalinity, Total as CaCO3	430		6.7	mg/L	TOTAL	6.700	SM2320B	METHOD
Orthophosphate (as P)	0.32		0.030	mg/L	TOTAL	1.000	SM4500P-E	METHOD
Total Dissolved Solids	1,260		11	mg/L	TOTAL	1.111	SM2540C	METHOD

Curtis & Tompkins, Ltd.

Client Sample ID : MW-4 Laboratory Sample ID : 263750-007

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	290	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 5030B
Diesel C10-C24	1,400		50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Diesel C10-C24	67	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Motor Oil C24-C36	720		300	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Benzene	29		0.5	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B
Iron	3,300		1,000	ug/L	DISS.	10.00	EPA 6010B	METHOD
Manganese	640		50	ug/L	DISS.	10.00	EPA 6010B	METHOD
Calcium	39,000		4,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Potassium	13,000		5,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Magnesium	59,000		2,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Sodium	250,000		5,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Chloride	110		4.0	mg/L	TOTAL	20.00	EPA 300.0	METHOD
Sulfate	1.1		0.50	mg/L	TOTAL	1.000	EPA 300.0	METHOD
Alkalinity, Bicarbonate	760		6.7	mg/L	TOTAL	6.700	SM2320B	METHOD
Alkalinity, Total as CaCO3	760		6.7	mg/L	TOTAL	6.700	SM2320B	METHOD
Orthophosphate (as P)	1.4		0.060	mg/L	TOTAL	2.000	SM4500P-E	METHOD
Total Dissolved Solids	950		10	mg/L	TOTAL	1.000	SM2540C	METHOD

Client Sample ID : MW-4 DUP Laboratory Sample ID : 263750-008

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	280	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 5030B
Diesel C10-C24	1,500		50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Diesel C10-C24	53	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Motor Oil C24-C36	1,200		300	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Benzene	28		0.5	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B
Iron	3,300		1,000	ug/L	DISS.	10.00	EPA 6010B	METHOD
Manganese	630		50	ug/L	DISS.	10.00	EPA 6010B	METHOD
Calcium	40,000		4,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Potassium	12,000		5,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Magnesium	58,000		2,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Sodium	250,000		5,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Chloride	110		4.0	mg/L	TOTAL	20.00	EPA 300.0	METHOD
Sulfate	1.1		0.50	mg/L	TOTAL	1.000	EPA 300.0	METHOD
Alkalinity, Bicarbonate	740		6.7	mg/L	TOTAL	6.700	SM2320B	METHOD
Alkalinity, Total as CaCO3	740		6.7	mg/L	TOTAL	6.700	SM2320B	METHOD
Dissolved Sulfide	0.04		0.04	mg/L	TOTAL	1.000	SM4500S2-D	METHOD
Orthophosphate (as P)	1.4		0.060	mg/L	TOTAL	2.000	SM4500P-E	METHOD
Total Dissolved Solids	970		10	mg/L	TOTAL	1.000	SM2540C	METHOD

Y = Sample exhibits chromatographic pattern which does not resemble standard

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	219210
Units:	ug/L	Received:	01/07/15
Diln Fac:	1.000		

Field ID: QCTB-1 Sampled: 01/06/15
Type: SAMPLE Analyzed: 01/08/15
Lab ID: 263750-001

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	108	77-128

Field ID: MW-10 Sampled: 01/06/15
Type: SAMPLE Analyzed: 01/08/15
Lab ID: 263750-002

Analyte	Result	RL
Gasoline C7-C12	310 Y	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	104	77-128

Field ID: MW-1 Sampled: 01/06/15
Type: SAMPLE Analyzed: 01/08/15
Lab ID: 263750-003

Analyte	Result	RL
Gasoline C7-C12	1,700 Y	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	112	77-128

Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	219210
Units:	ug/L	Received:	01/07/15
Diln Fac:	1.000		

Field ID: MW-8A
Type: SAMPLE
Lab ID: 263750-004
Sampled: 01/07/15
Analyzed: 01/08/15

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	107	77-128

Field ID: MW-9
Type: SAMPLE
Lab ID: 263750-005
Sampled: 01/07/15
Analyzed: 01/08/15

Analyte	Result	RL
Gasoline C7-C12	350 Y	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	102	77-128

Field ID: MW-5
Type: SAMPLE
Lab ID: 263750-006
Sampled: 01/07/15
Analyzed: 01/08/15

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	103	77-128

Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	219210
Units:	ug/L	Received:	01/07/15
Diln Fac:	1.000		

Field ID: MW-4 Sampled: 01/07/15
Type: SAMPLE Analyzed: 01/08/15
Lab ID: 263750-007

Analyte	Result	RL
Gasoline C7-C12	290 Y	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	107	77-128

Field ID: MW-4 DUP Sampled: 01/07/15
Type: SAMPLE Analyzed: 01/09/15
Lab ID: 263750-008

Analyte	Result	RL
Gasoline C7-C12	280 Y	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	106	77-128

Type: BLANK Analyzed: 01/08/15
Lab ID: QC772488

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	104	77-128

Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC772487	Batch#:	219210
Matrix:	Water	Analyzed:	01/08/15
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	1,022	102	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	103	77-128

Curtis & Tompkins, Ltd.

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	219210
MSS Lab ID:	263724-006	Sampled:	01/06/15
Matrix:	Water	Received:	01/06/15
Units:	ug/L	Analyzed:	01/08/15
Diln Fac:	1.000		

Type: MS Lab ID: QC772489

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	16.30	2,000	2,035	101	74-120

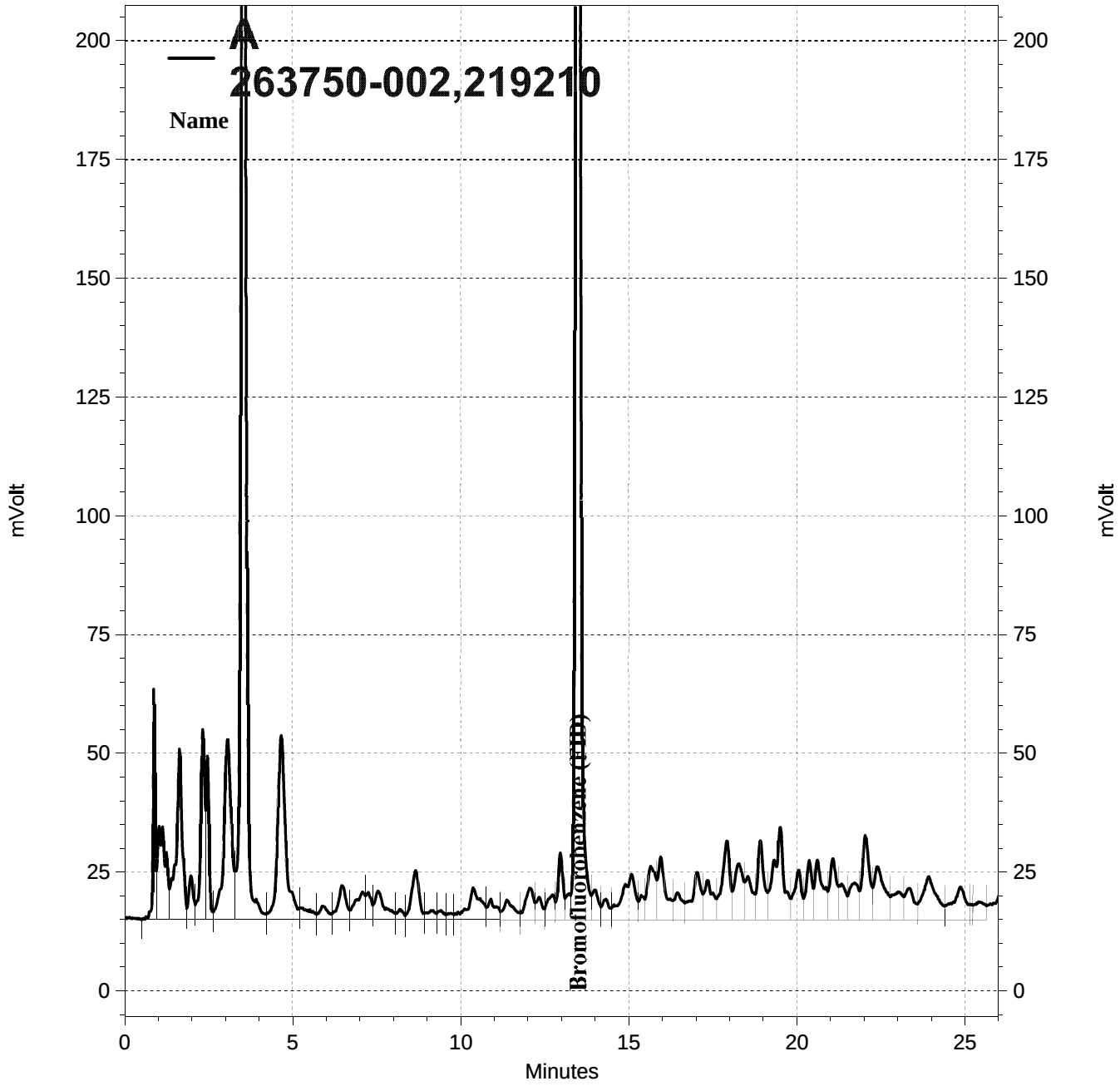
Surrogate	%REC	Limits
Bromofluorobenzene (FID)	104	77-128

Type: MSD Lab ID: QC772490

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	2,027	101	74-120	0	27

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	104	77-128

RPD= Relative Percent Difference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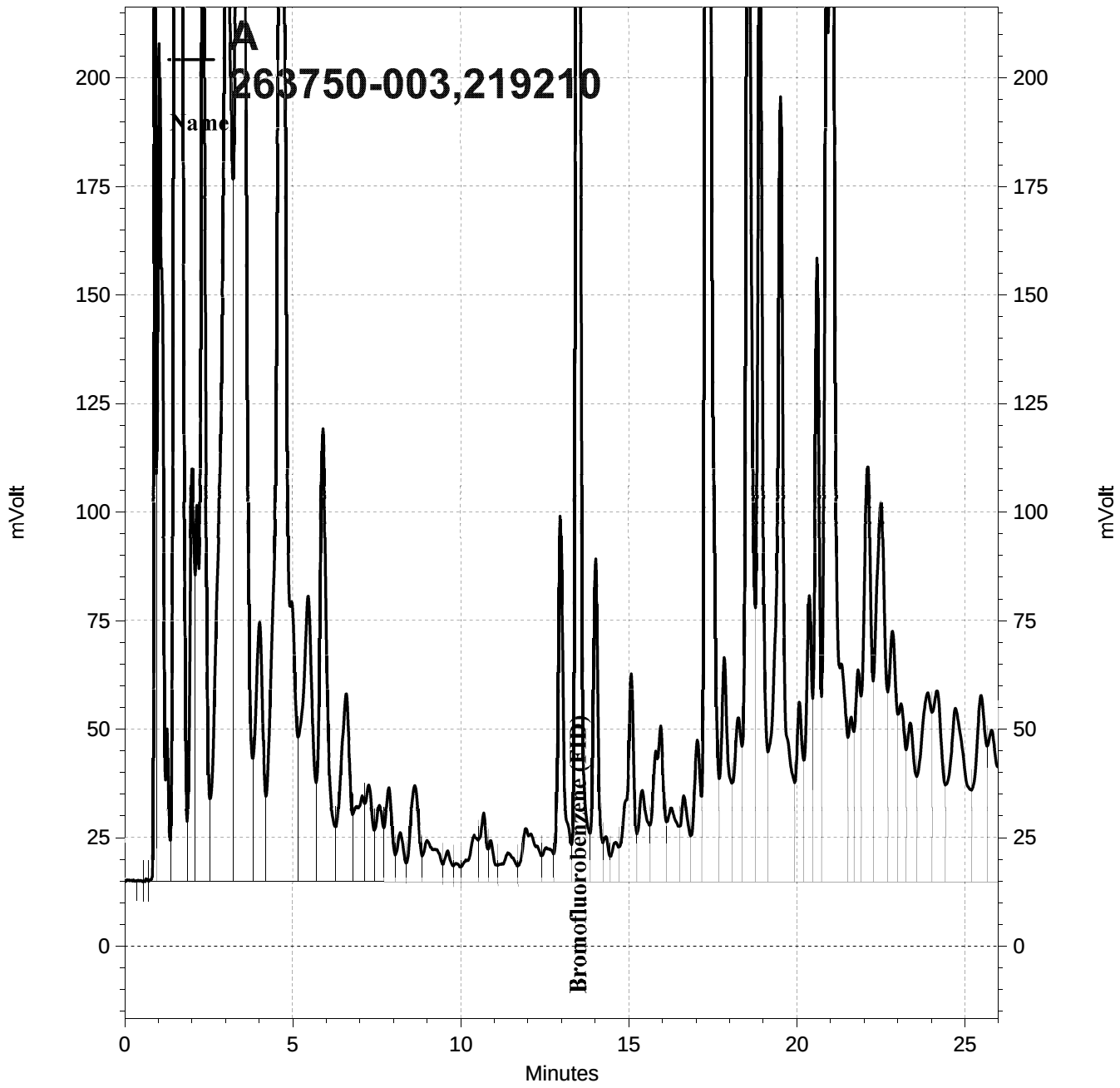
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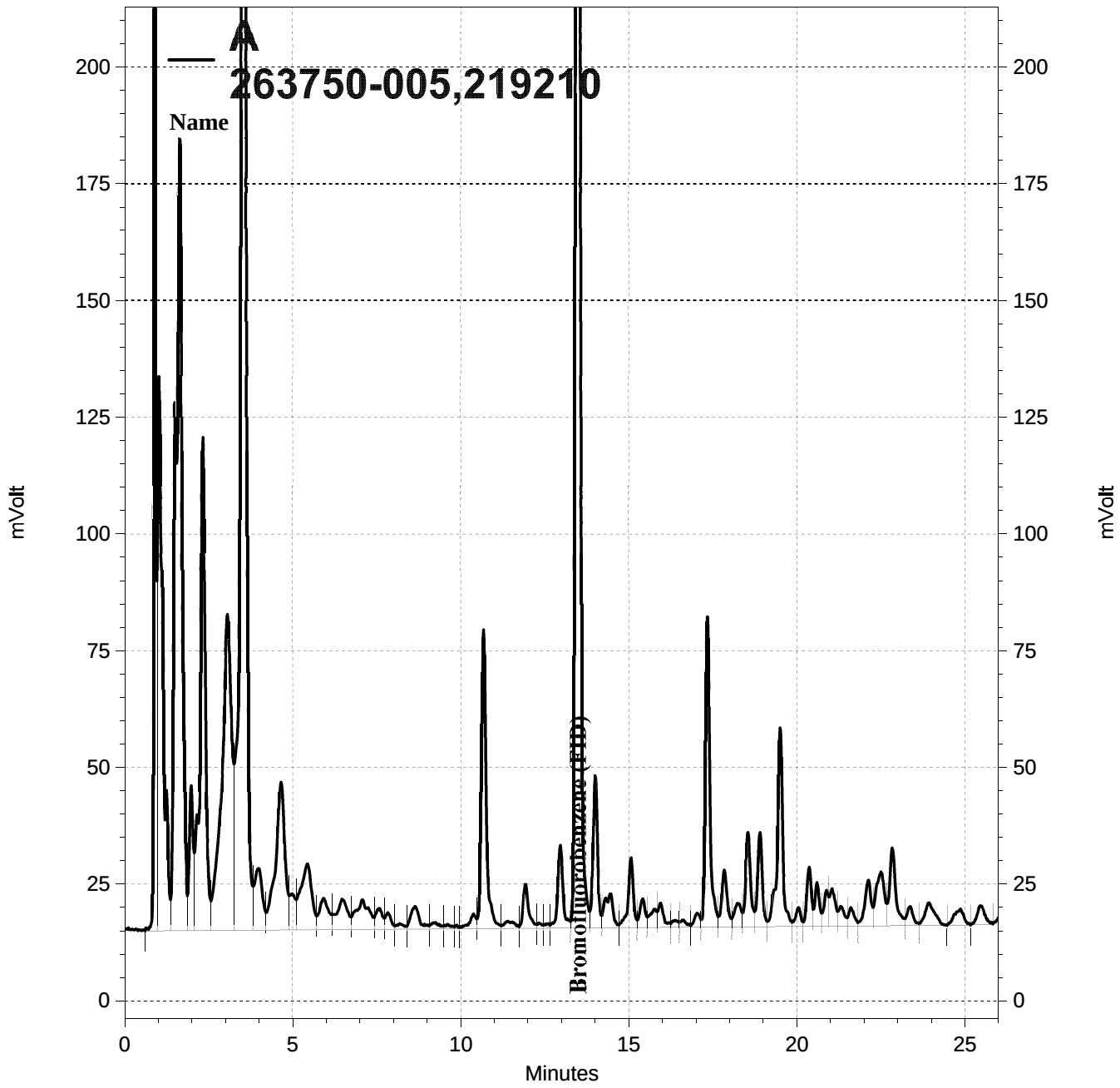
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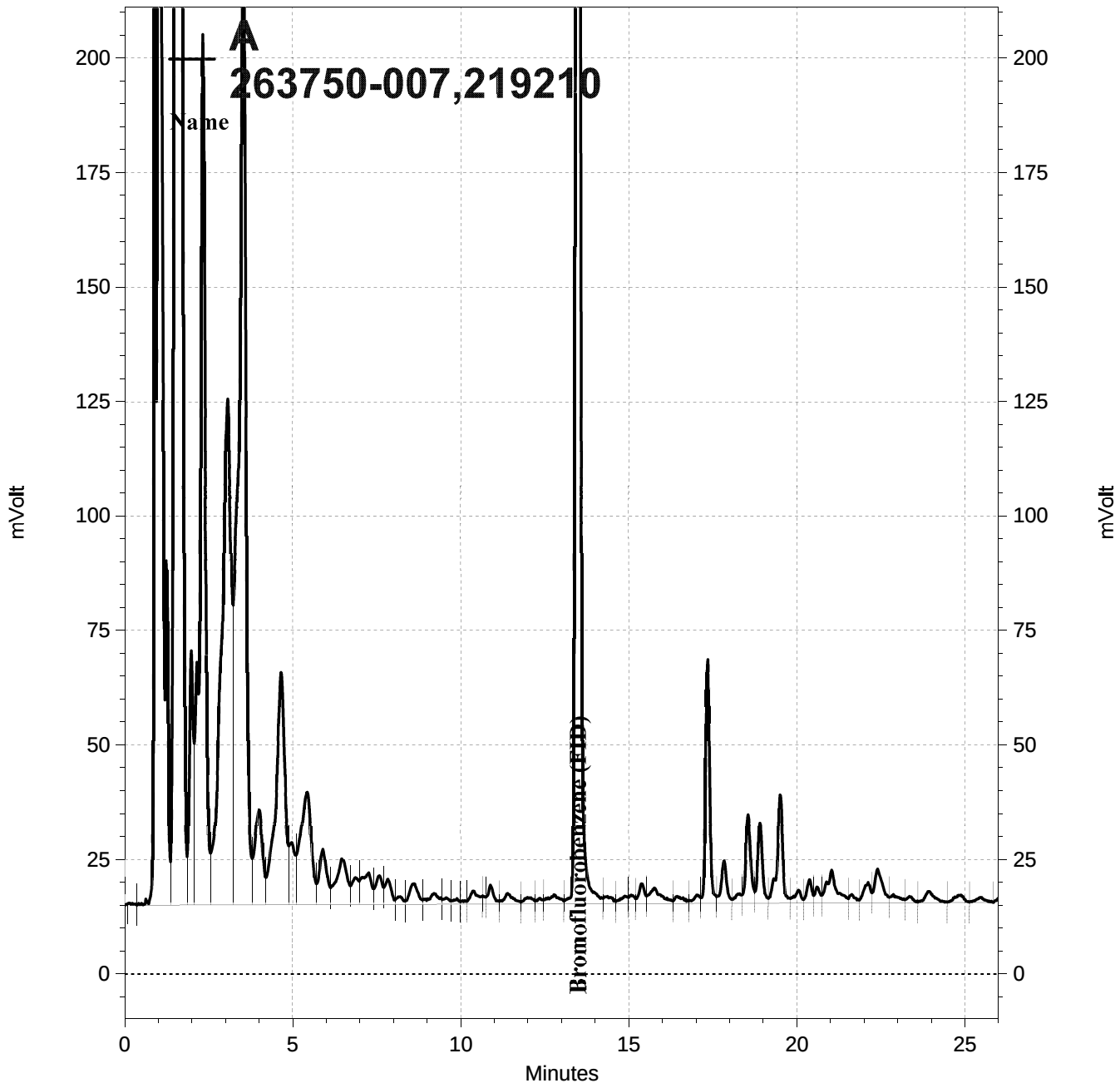
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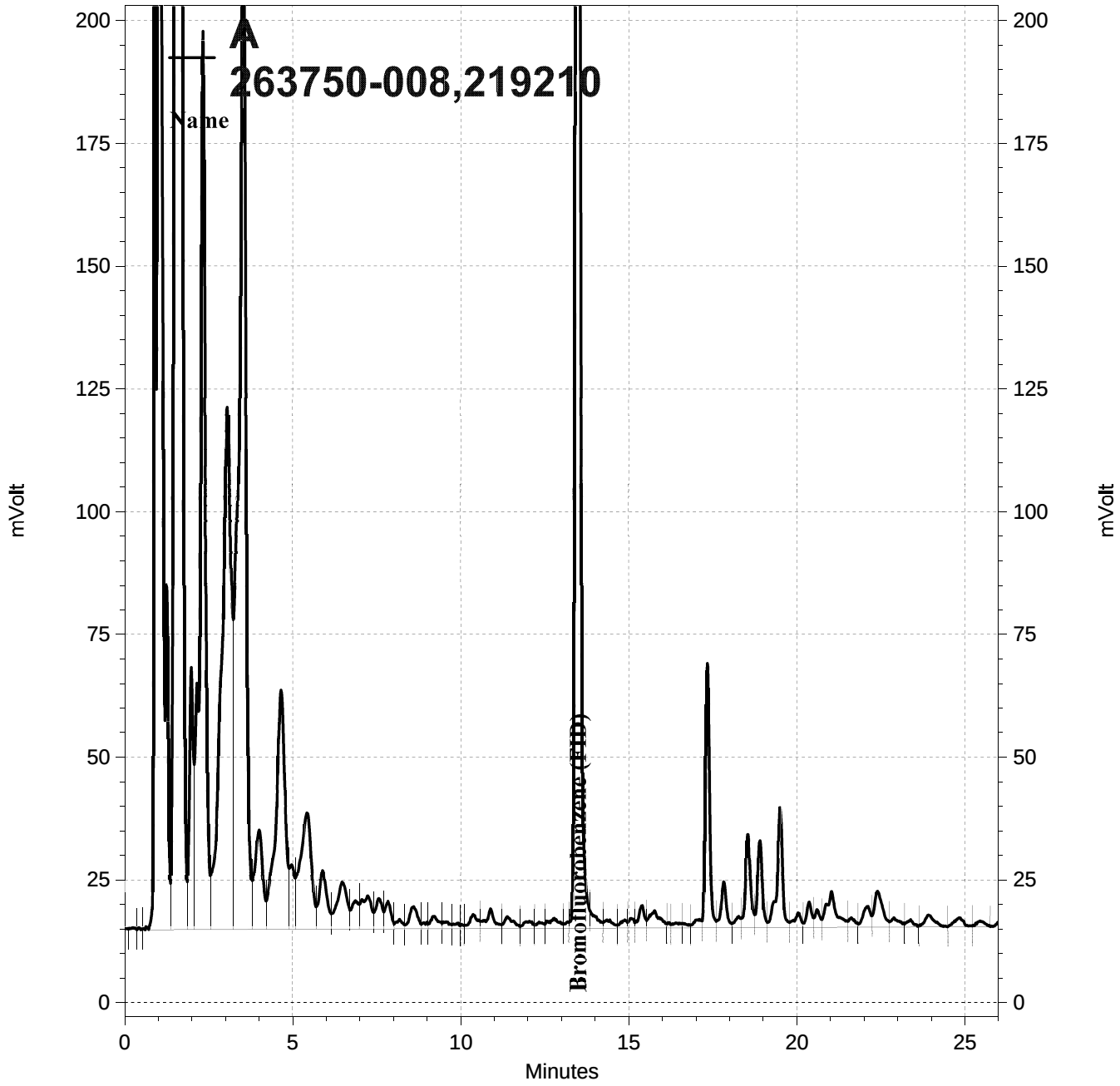
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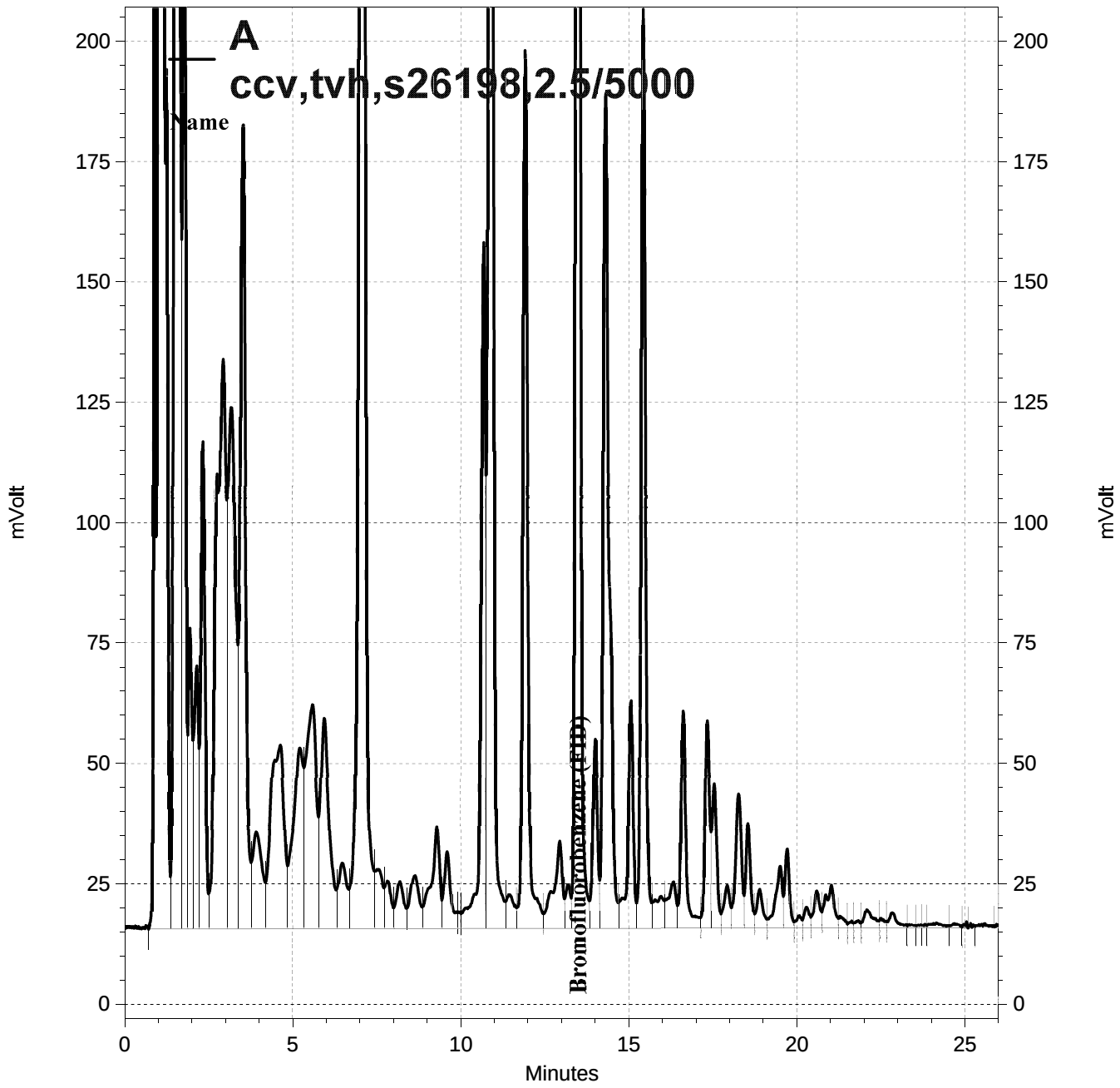
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Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 3520C
Project#:	04656016.0000	Analysis:	EPA 8015B
Matrix:	Water	Received:	01/07/15
Units:	ug/L		

Field ID:	MW-10	Sampled:	01/06/15
Type:	SAMPLE	Prepared:	01/09/15
Lab ID:	263750-002	Cleanup Method:	EPA 3630C
Batch#:	219263		

Analyte	Result	RL	Diln Fac	Analyzed
Diesel C10-C24	31,000	250	5.000	01/13/15
Diesel C10-C24 (SGCU)	820	50	1.000	01/12/15
Motor Oil C24-C36	6,000	1,500	5.000	01/13/15
Motor Oil C24-C36 (SGCU)	ND	300	1.000	01/12/15

Surrogate	%REC	Limits	Diln Fac	Analyzed
o-Terphenyl	109	66-129	5.000	01/13/15
o-Terphenyl (SGCU)	96	66-129	1.000	01/12/15

Field ID:	MW-1	Sampled:	01/06/15
Type:	SAMPLE	Prepared:	01/09/15
Lab ID:	263750-003	Analyzed:	01/12/15
Diln Fac:	1.000	Cleanup Method:	EPA 3630C
Batch#:	219263		

Analyte	Result	RL
Diesel C10-C24	4,100	50
Diesel C10-C24 (SGCU)	2,000	50
Motor Oil C24-C36	560	300
Motor Oil C24-C36 (SGCU)	ND	300

Surrogate	%REC	Limits
o-Terphenyl	101	66-129
o-Terphenyl (SGCU)	96	66-129

Field ID:	MW-8A	Sampled:	01/07/15
Type:	SAMPLE	Prepared:	01/09/15
Lab ID:	263750-004	Analyzed:	01/12/15
Diln Fac:	1.000	Cleanup Method:	EPA 3630C
Batch#:	219263		

Analyte	Result	RL
Diesel C10-C24	900 Y	50
Diesel C10-C24 (SGCU)	ND	50
Motor Oil C24-C36	760	300
Motor Oil C24-C36 (SGCU)	ND	300

Surrogate	%REC	Limits
o-Terphenyl	95	66-129
o-Terphenyl (SGCU)	86	66-129

Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit
SGCU= Silica gel cleanup

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 3520C
Project#:	04656016.0000	Analysis:	EPA 8015B
Matrix:	Water	Received:	01/07/15
Units:	ug/L		

Field ID:	MW-9	Sampled:	01/07/15
Type:	SAMPLE	Prepared:	01/09/15
Lab ID:	263750-005	Analyzed:	01/12/15
Diln Fac:	1.000	Cleanup Method:	EPA 3630C
Batch#:	219263		

Analyte	Result	RL
Diesel C10-C24	2,100	50
Diesel C10-C24 (SGCU)	130 Y	50
Motor Oil C24-C36	1,200	300
Motor Oil C24-C36 (SGCU)	ND	300

Surrogate	%REC	Limits
o-Terphenyl	109	66-129
o-Terphenyl (SGCU)	101	66-129

Field ID:	MW-5	Sampled:	01/07/15
Type:	SAMPLE	Prepared:	01/09/15
Lab ID:	263750-006	Analyzed:	01/12/15
Diln Fac:	1.000	Cleanup Method:	EPA 3630C
Batch#:	219263		

Analyte	Result	RL
Diesel C10-C24	1,300 Y	50
Diesel C10-C24 (SGCU)	ND	50
Motor Oil C24-C36	1,200	300
Motor Oil C24-C36 (SGCU)	ND	300

Surrogate	%REC	Limits
o-Terphenyl	102	66-129
o-Terphenyl (SGCU)	99	66-129

Field ID:	MW-4	Sampled:	01/07/15
Type:	SAMPLE	Prepared:	01/09/15
Lab ID:	263750-007	Analyzed:	01/12/15
Diln Fac:	1.000	Cleanup Method:	EPA 3630C
Batch#:	219263		

Analyte	Result	RL
Diesel C10-C24	1,400	50
Diesel C10-C24 (SGCU)	67 Y	50
Motor Oil C24-C36	720	300
Motor Oil C24-C36 (SGCU)	ND	300

Surrogate	%REC	Limits
o-Terphenyl	100	66-129
o-Terphenyl (SGCU)	94	66-129

Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit
SGCU= Silica gel cleanup

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 3520C
Project#:	04656016.0000	Analysis:	EPA 8015B
Matrix:	Water	Received:	01/07/15
Units:	ug/L		

Field ID:	MW-4 DUP	Sampled:	01/07/15
Type:	SAMPLE	Prepared:	01/13/15
Lab ID:	263750-008	Analyzed:	01/14/15
Diln Fac:	1.000	Cleanup Method:	EPA 3630C
Batch#:	219376		

Analyte	Result	RL
Diesel C10-C24	1,500	50
Diesel C10-C24 (SGCU)	53 Y	50
Motor Oil C24-C36	1,200	300
Motor Oil C24-C36 (SGCU)	ND	300

Surrogate	%REC	Limits
o-Terphenyl	95	66-129
o-Terphenyl (SGCU)	85	66-129

Type:	BLANK	Prepared:	01/09/15
Lab ID:	QC772700	Analyzed:	01/12/15
Diln Fac:	1.000	Cleanup Method:	EPA 3630C
Batch#:	219263		

Analyte	Result	RL
Diesel C10-C24	ND	50
Diesel C10-C24 (SGCU)	ND	50
Motor Oil C24-C36	ND	300
Motor Oil C24-C36 (SGCU)	ND	300

Surrogate	%REC	Limits
o-Terphenyl	100	66-129
o-Terphenyl (SGCU)	104	66-129

Type:	BLANK	Prepared:	01/13/15
Lab ID:	QC773170	Analyzed:	01/14/15
Diln Fac:	1.000	Cleanup Method:	EPA 3630C
Batch#:	219376		

Analyte	Result	RL
Diesel C10-C24	ND	50
Diesel C10-C24 (SGCU)	ND	50
Motor Oil C24-C36	ND	300
Motor Oil C24-C36 (SGCU)	ND	300

Surrogate	%REC	Limits
o-Terphenyl	101	66-129
o-Terphenyl (SGCU)	92	66-129

Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit
SGCU= Silica gel cleanup

Curtis & Tompkins, Ltd.

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 3520C
Project#:	04656016.0000	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	219263
Units:	ug/L	Prepared:	01/09/15
Diln Fac:	1.000	Analyzed:	01/12/15

Type: BS Cleanup Method: EPA 3630C
Lab ID: QC772701

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,153	86	61-120
Diesel C10-C24 (SGCU)	2,500	2,425	97	61-120

Surrogate	%REC	Limits
o-Terphenyl	99	66-129
o-Terphenyl (SGCU)	111	66-129

Type: BSD Cleanup Method: EPA 3630C
Lab ID: QC772702

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	2,276	91	61-120	6	45
Diesel C10-C24 (SGCU)	2,500	2,273	91	61-120	6	45

Surrogate	%REC	Limits
o-Terphenyl	103	66-129
o-Terphenyl (SGCU)	103	66-129

RPD= Relative Percent Difference
SGCU= Silica gel cleanup

Curtis & Tompkins, Ltd.

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 3520C
Project#:	04656016.0000	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	219376
Units:	ug/L	Prepared:	01/13/15
Diln Fac:	1.000	Analyzed:	01/14/15

Type: BS Cleanup Method: EPA 3630C
Lab ID: QC773171

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,080	83	61-120
Diesel C10-C24 (SGCU)	2,500	1,838	74	61-120

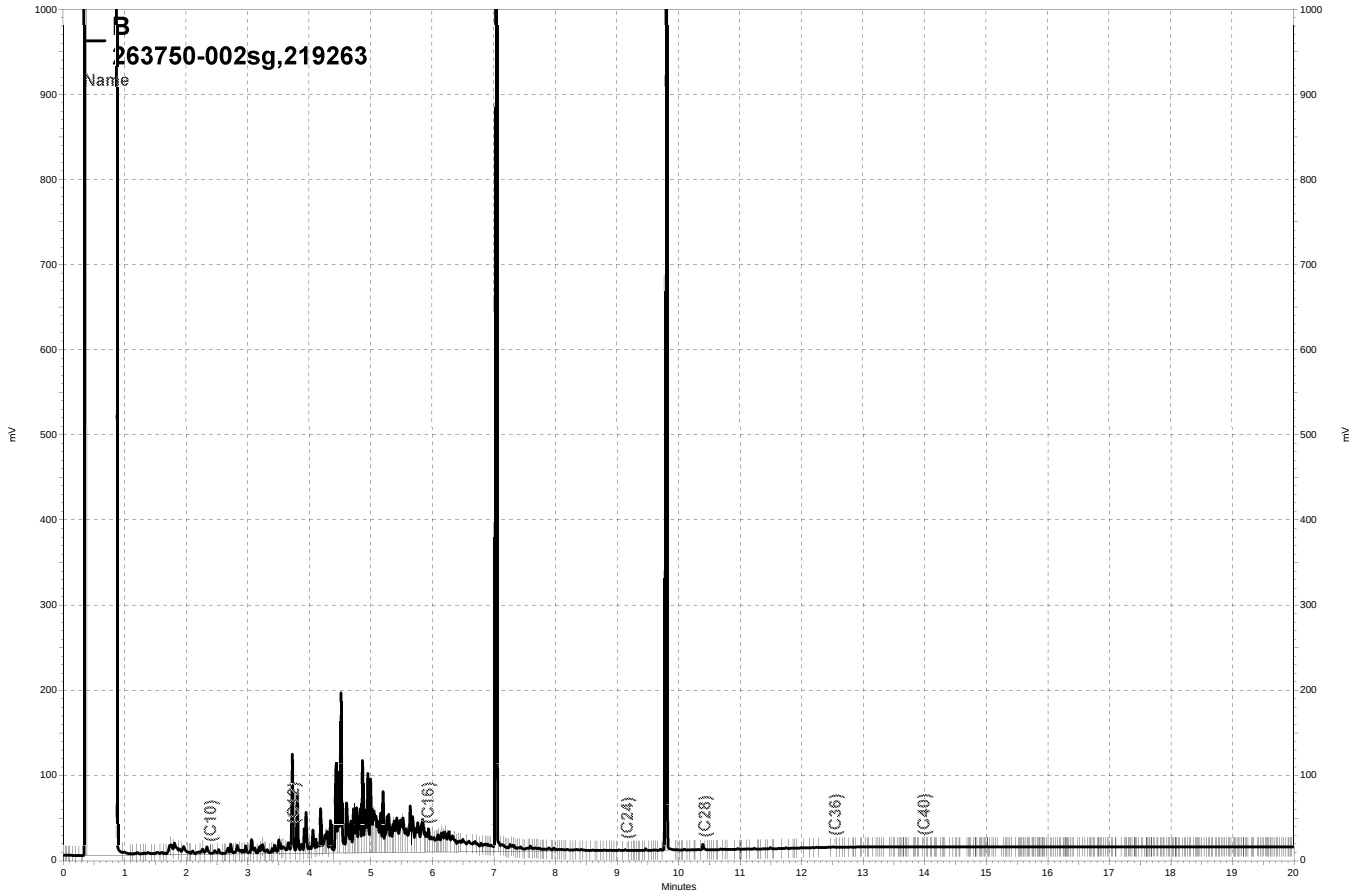
Surrogate	%REC	Limits
o-Terphenyl	97	66-129
o-Terphenyl (SGCU)	88	66-129

Type: BSD Cleanup Method: EPA 3630C
Lab ID: QC773172

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	1,988	80	61-120	5	45
Diesel C10-C24 (SGCU)	2,500	1,729	69	61-120	6	45

Surrogate	%REC	Limits
o-Terphenyl	93	66-129
o-Terphenyl (SGCU)	84	66-129

RPD= Relative Percent Difference
SGCU= Silica gel cleanup



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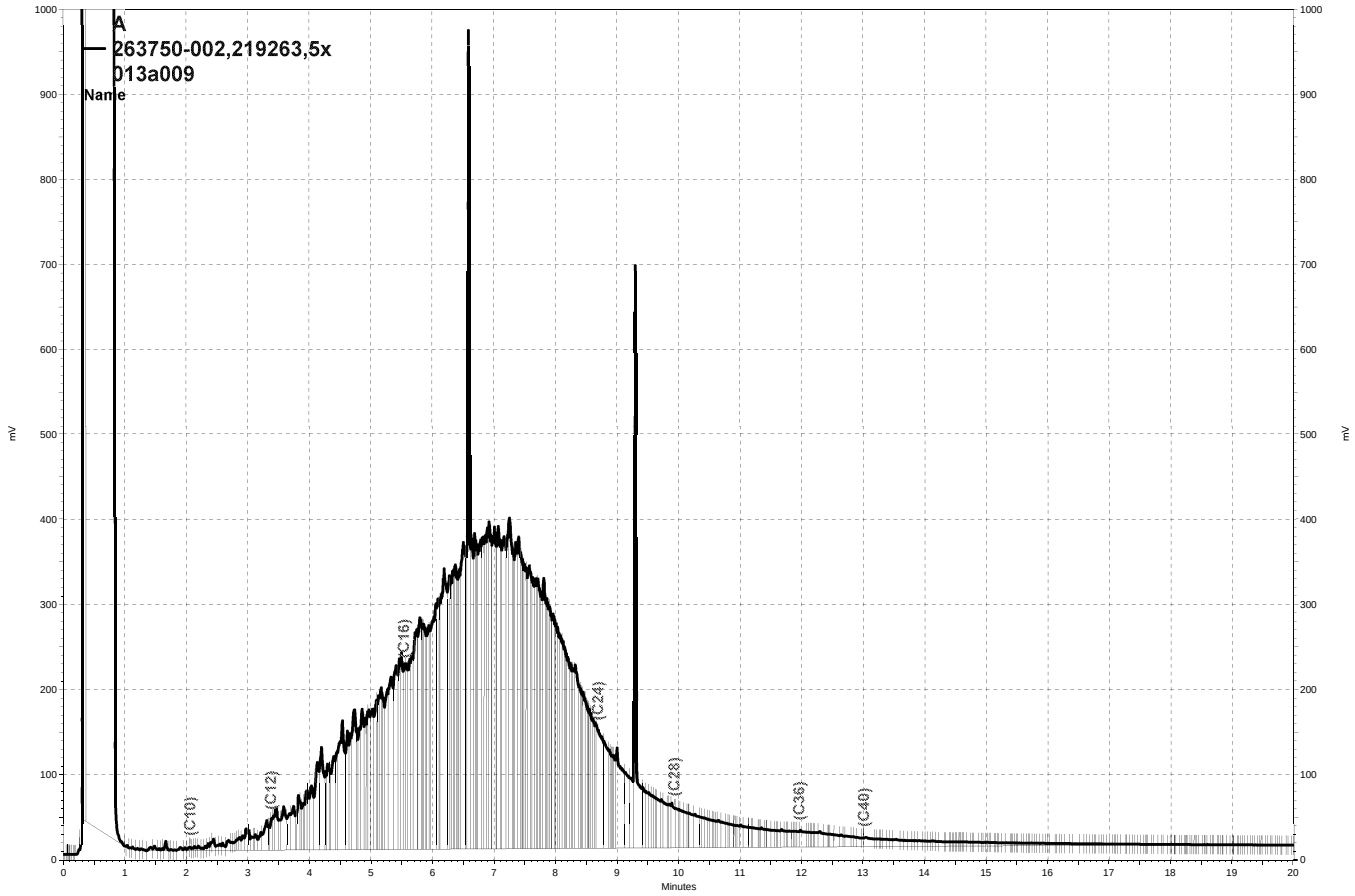

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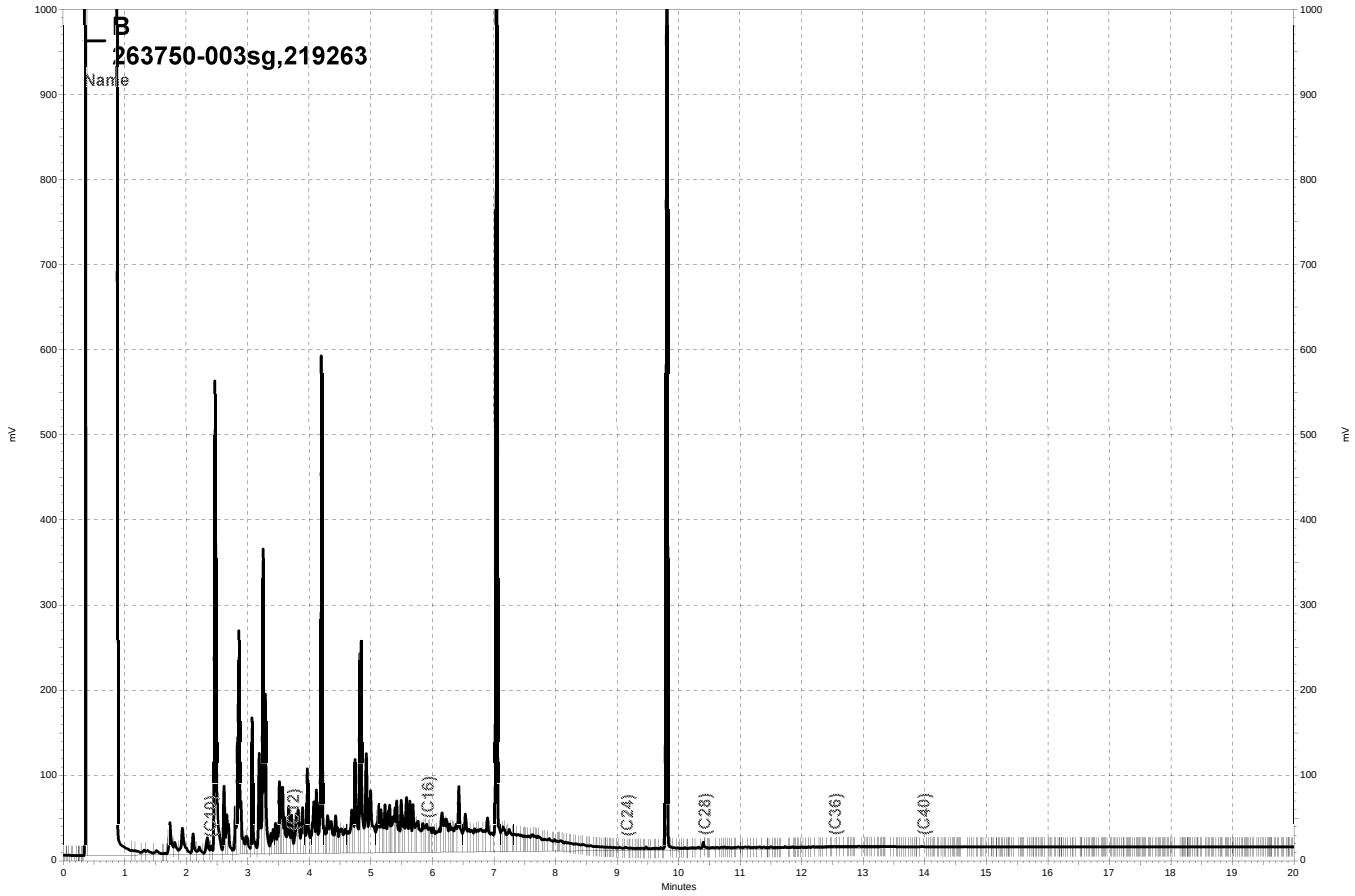

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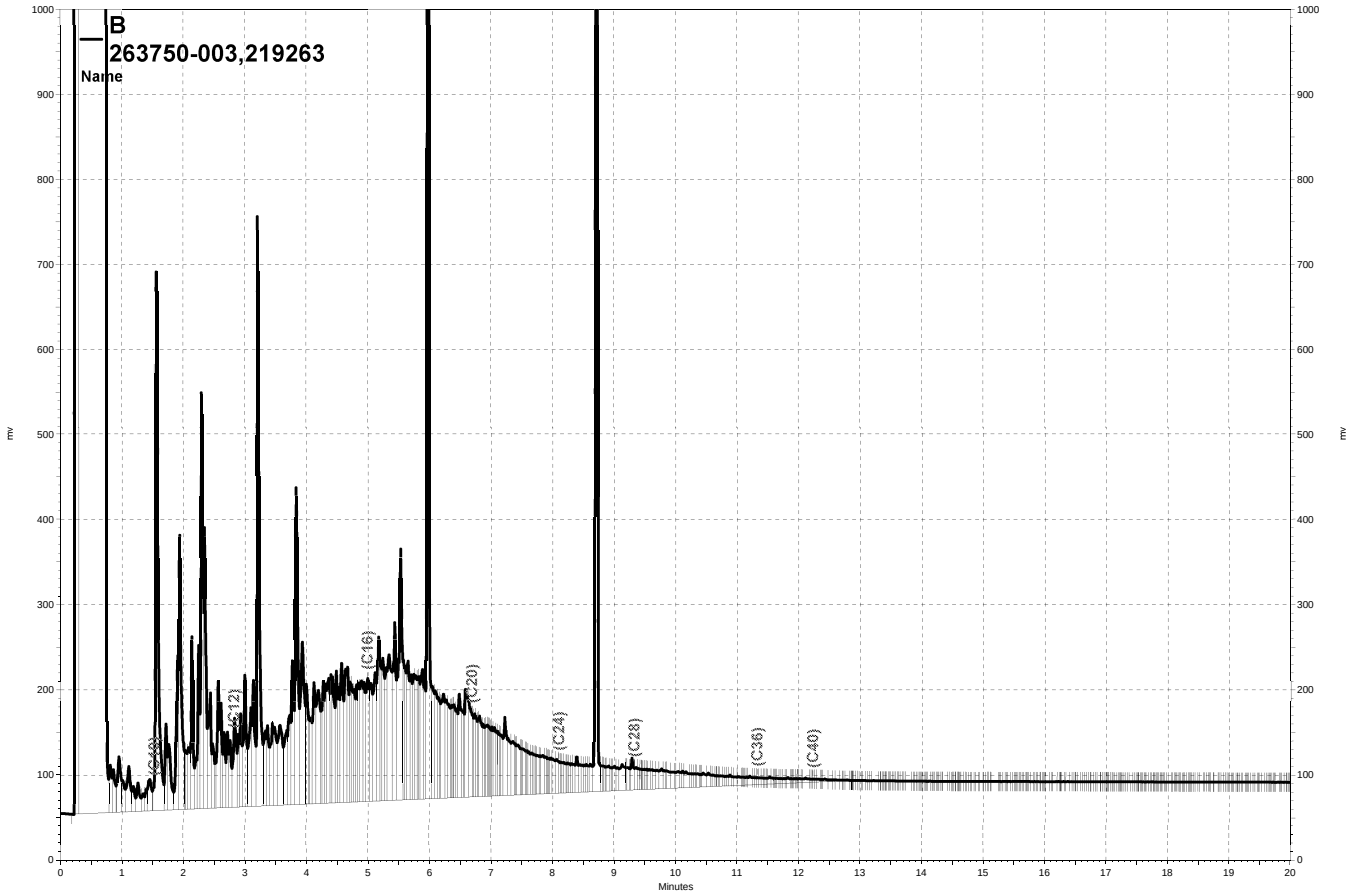

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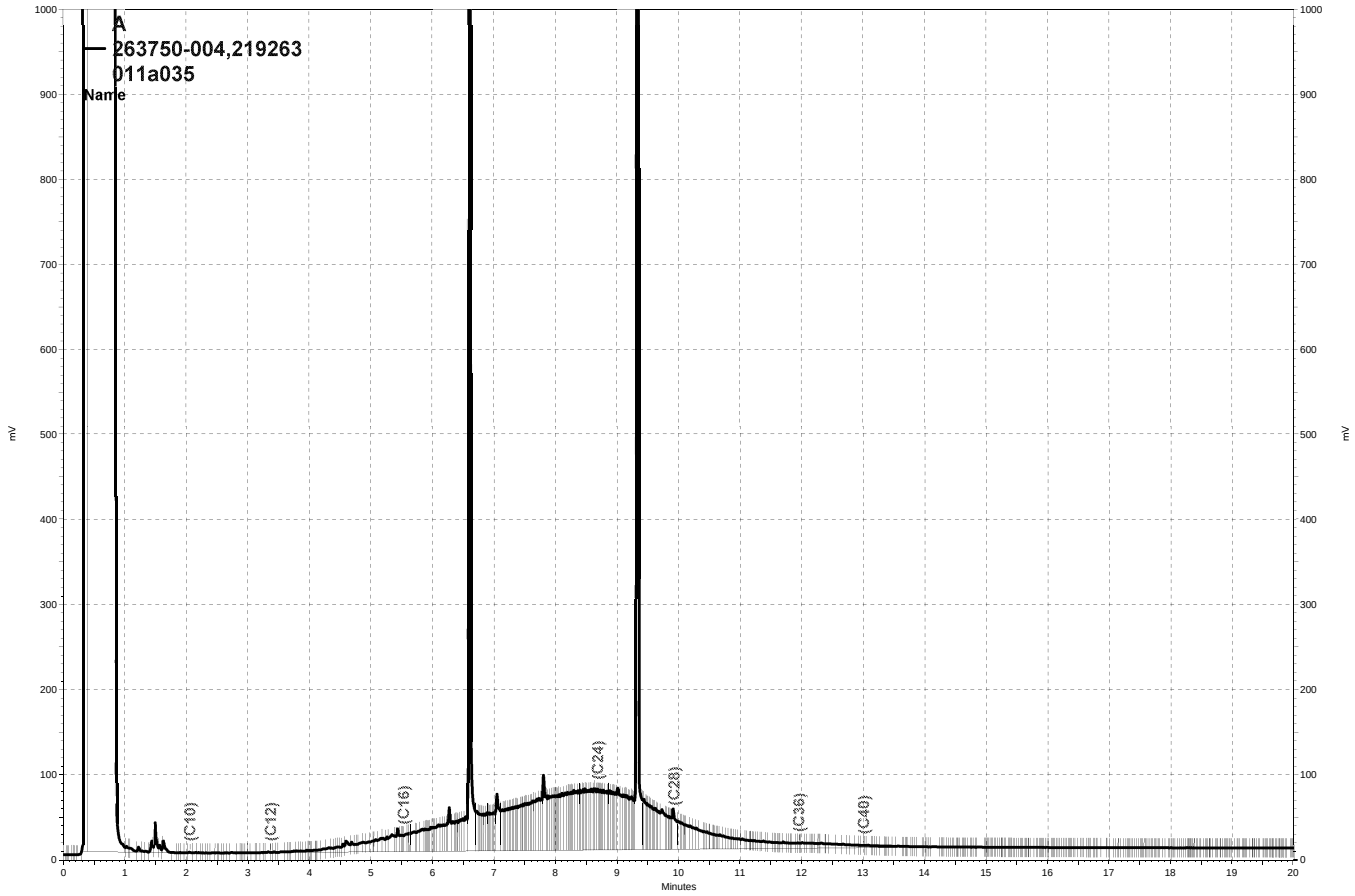

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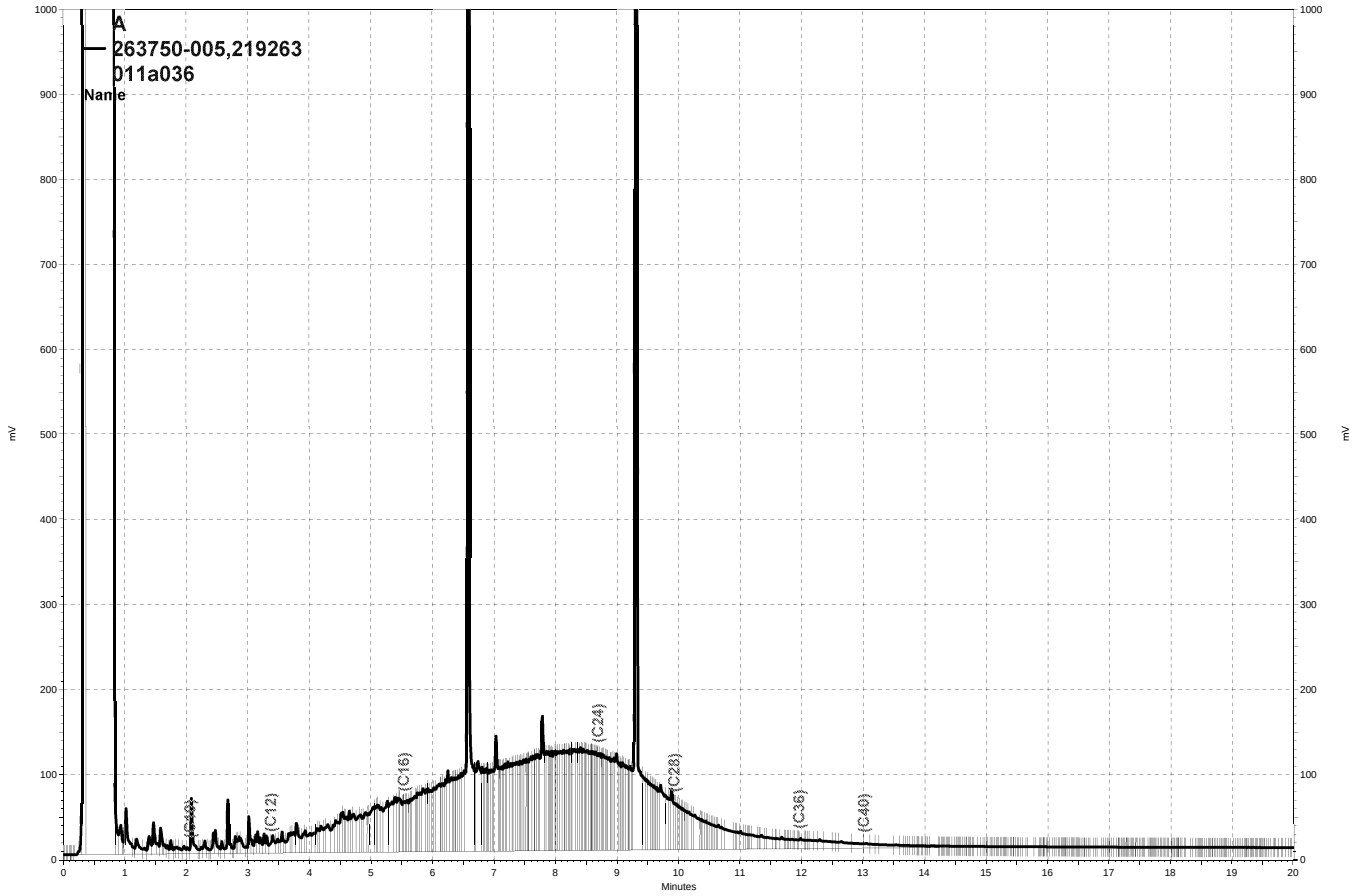

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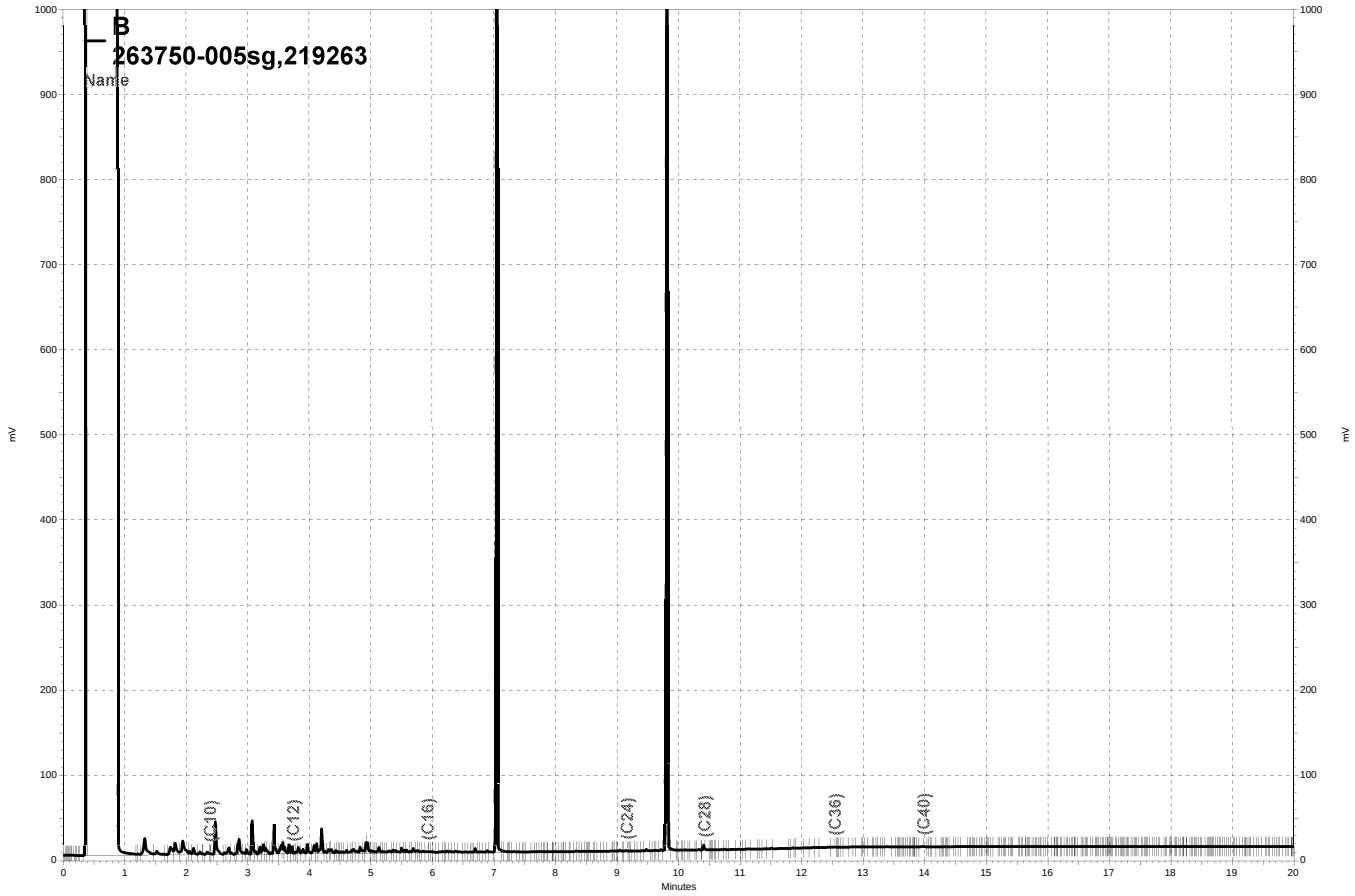

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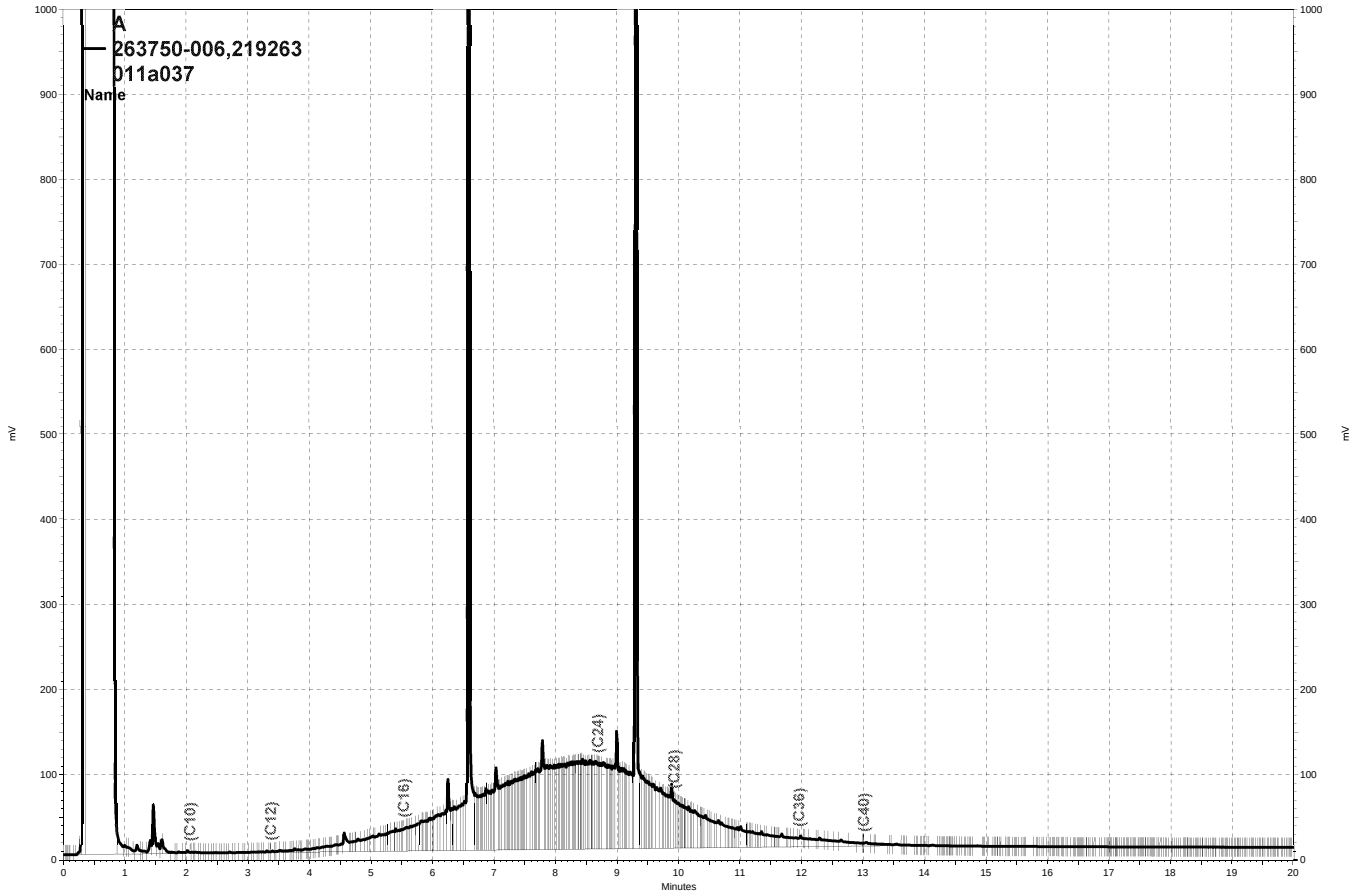

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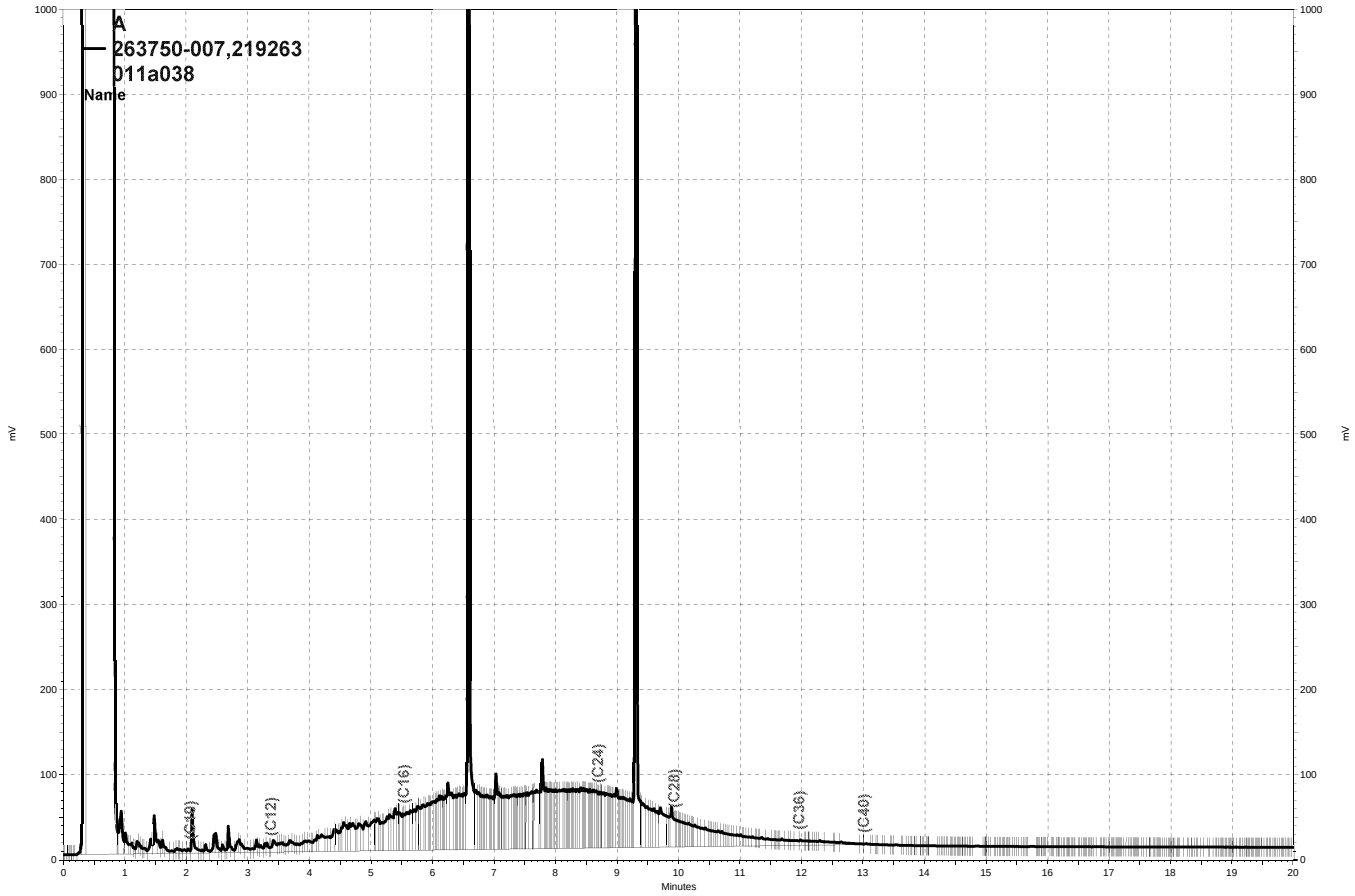

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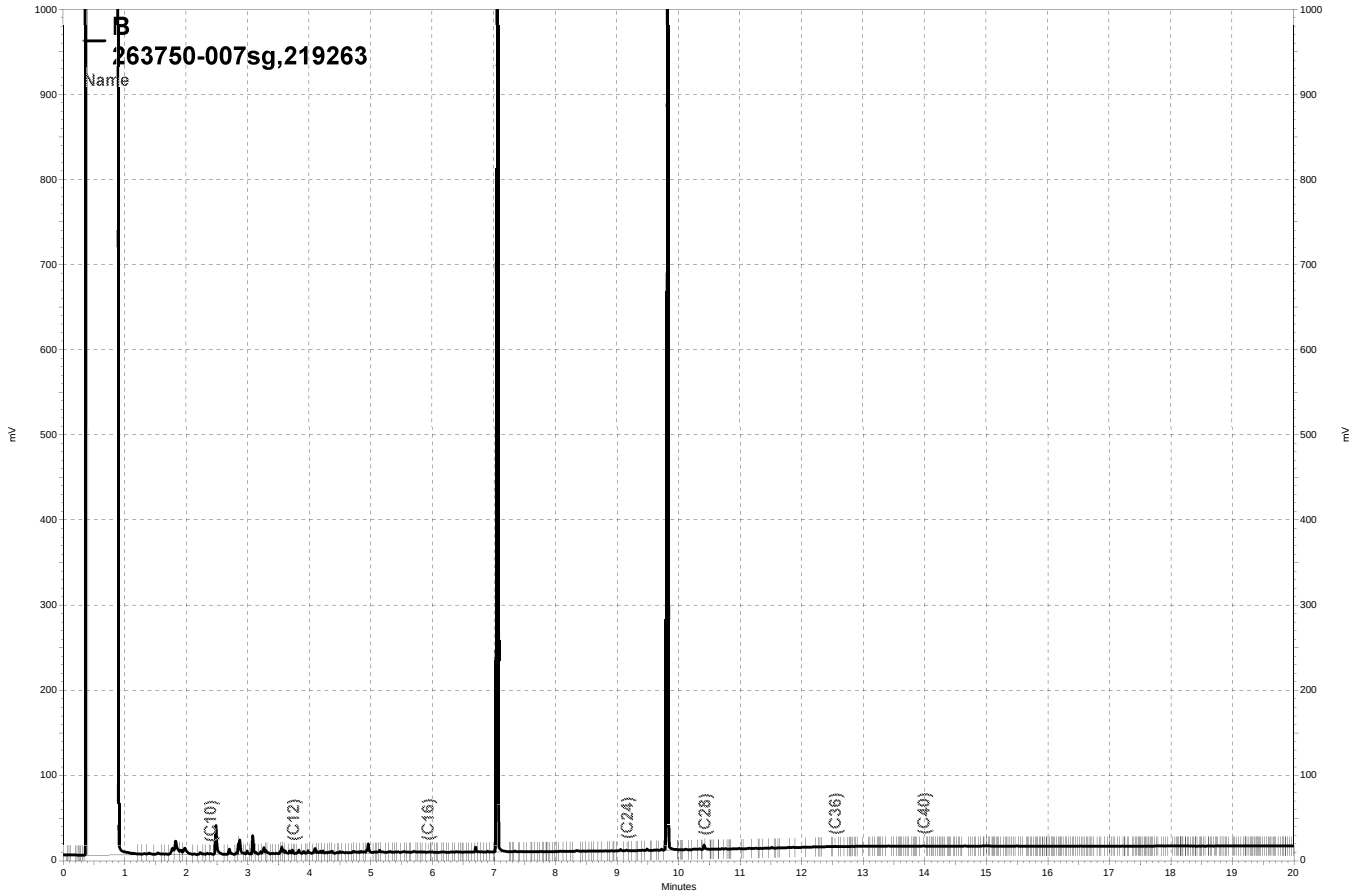

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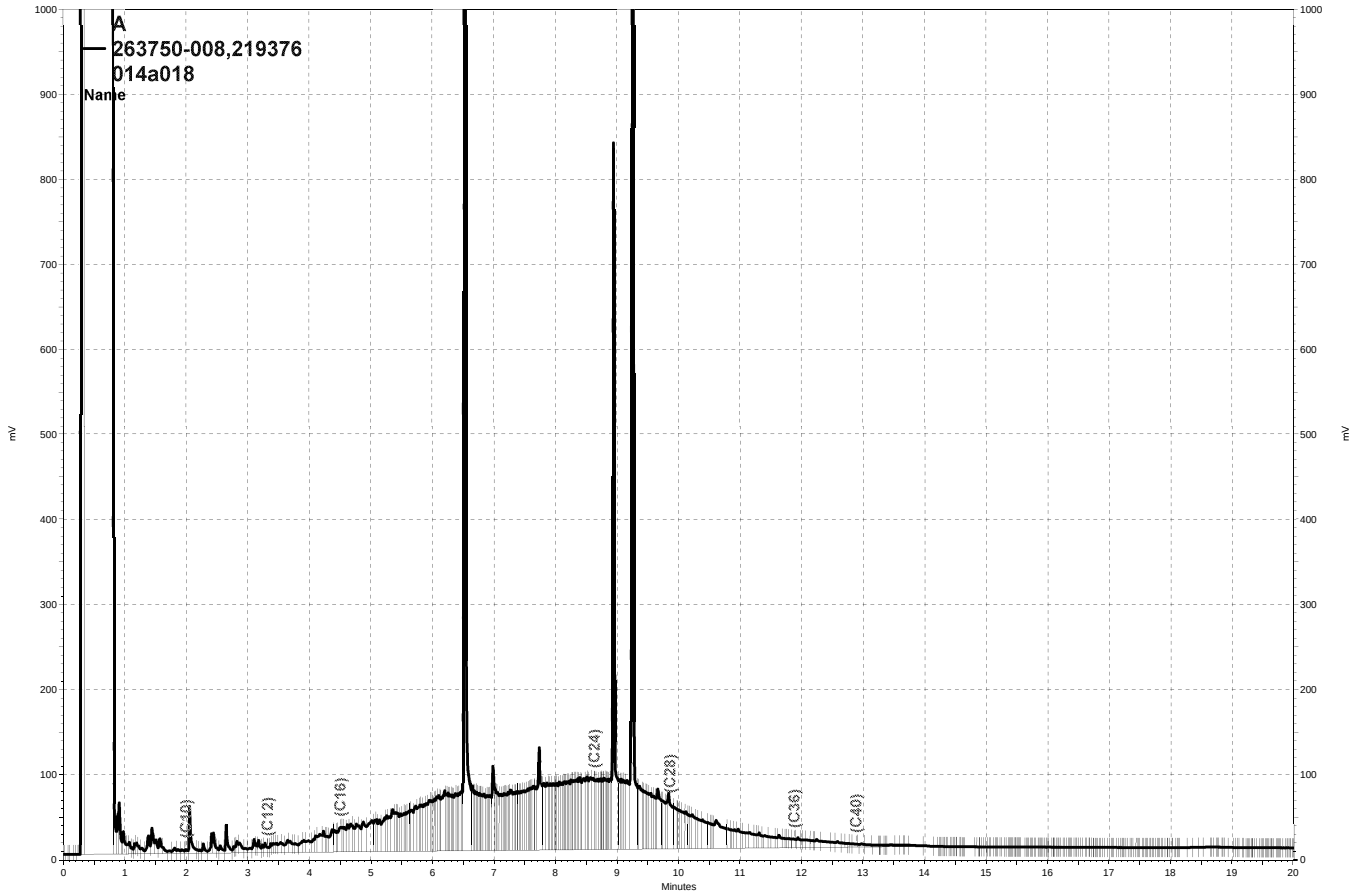

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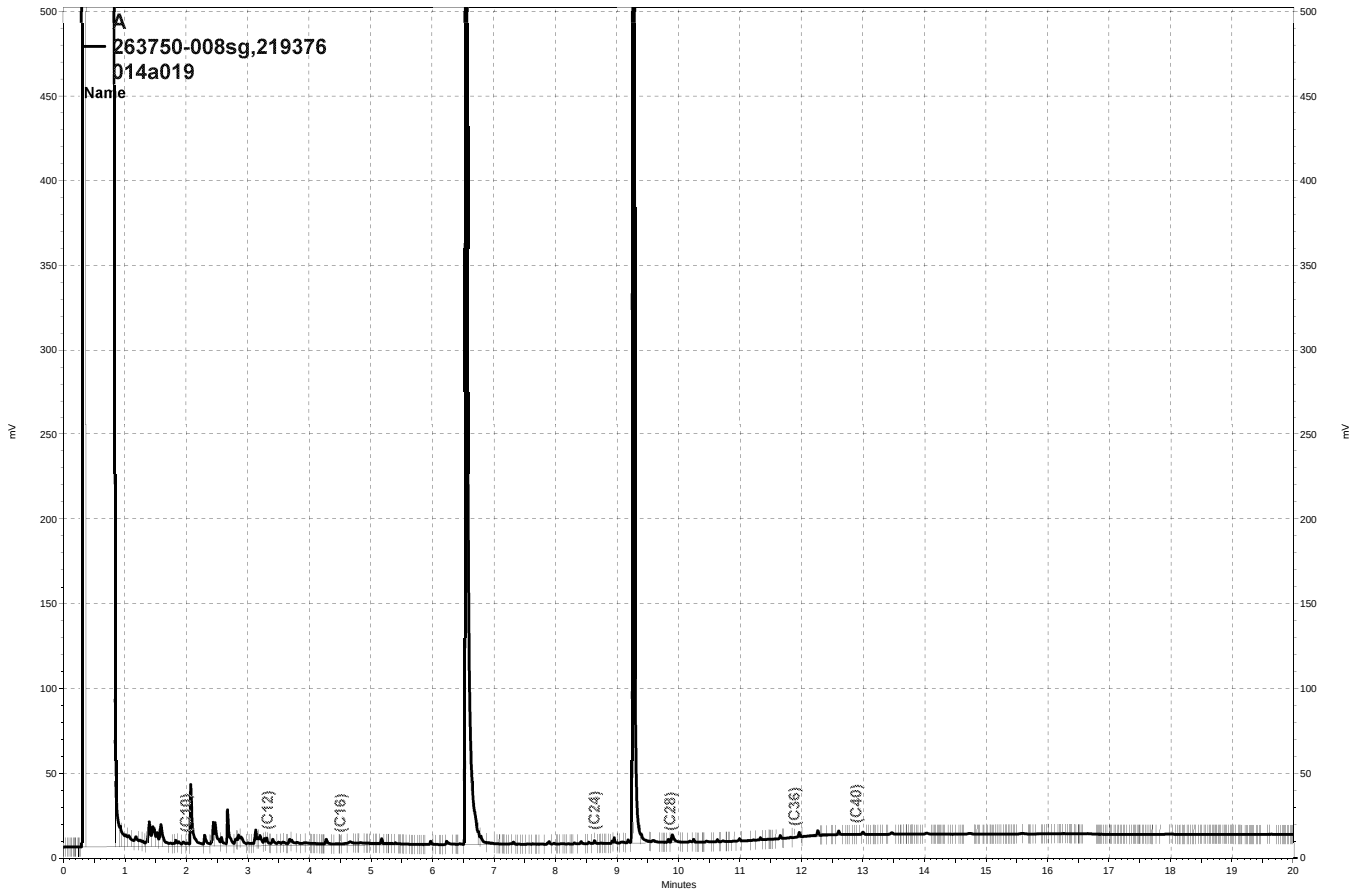

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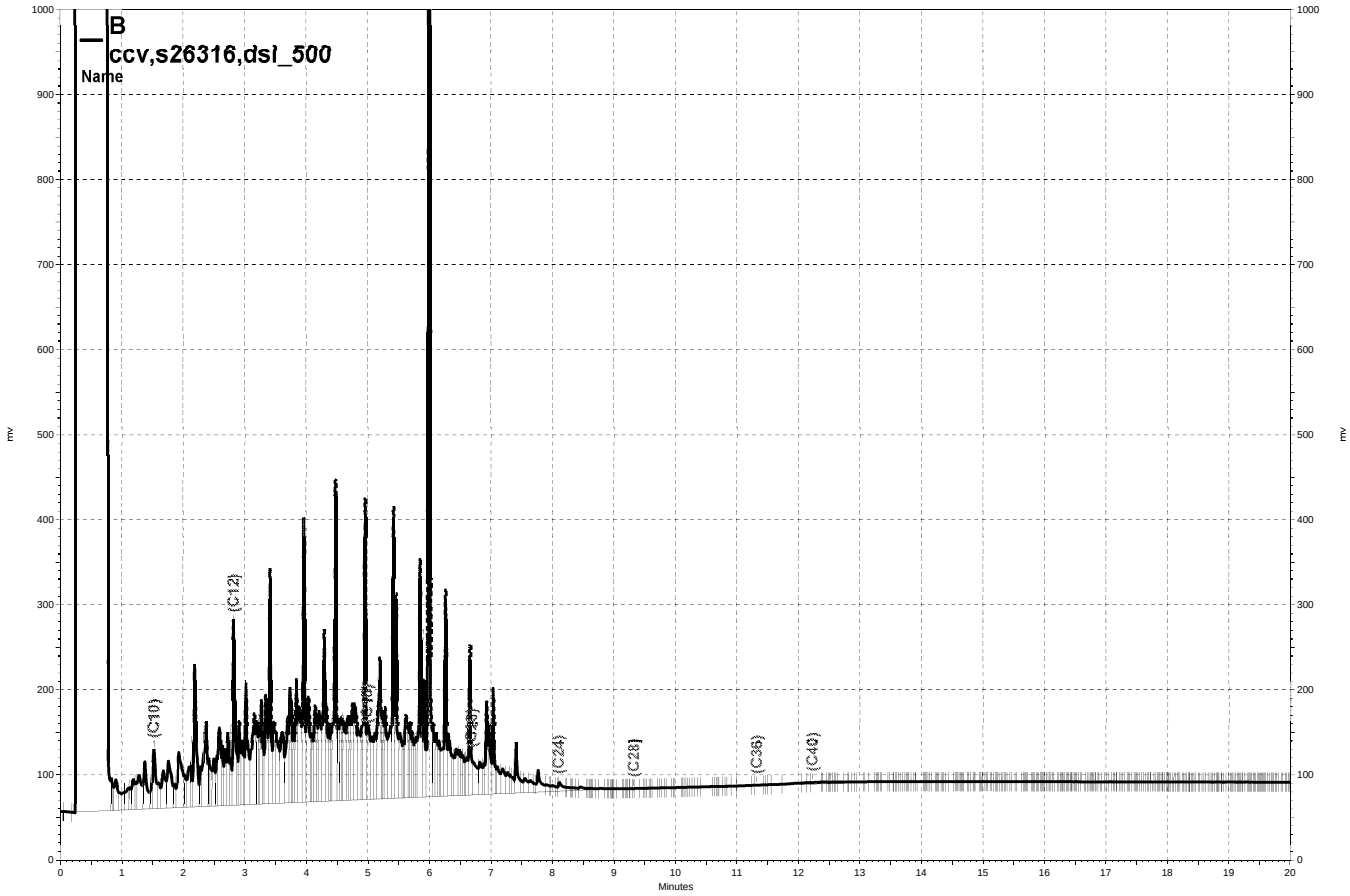

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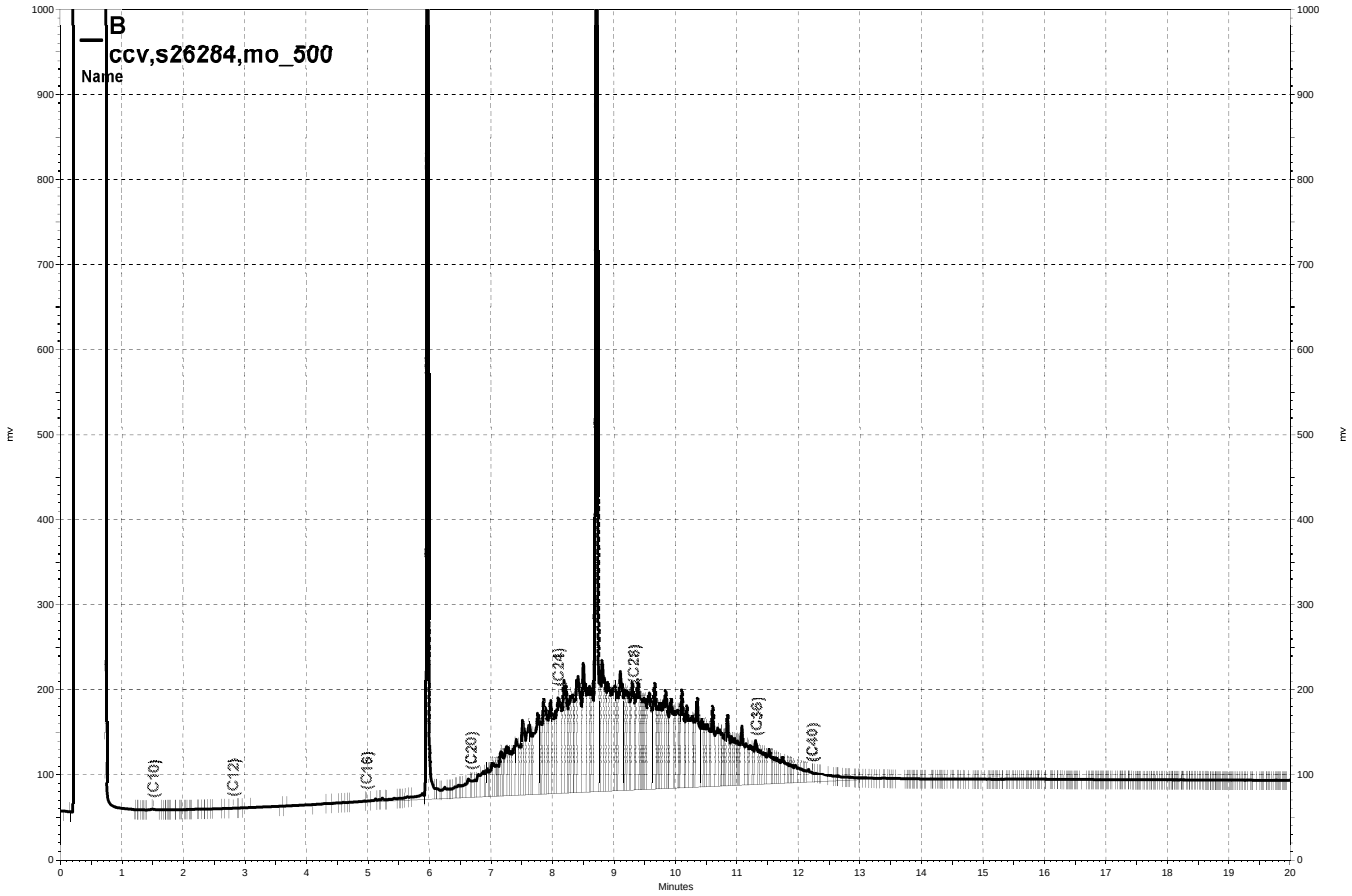

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Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8260B
Field ID:	QCTB-1	Batch#:	219202
Lab ID:	263750-001	Sampled:	01/06/15
Matrix:	Water	Received:	01/07/15
Units:	ug/L	Analyzed:	01/08/15
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	115	77-136
1,2-Dichloroethane-d4	115	75-139
Toluene-d8	107	80-120
Bromofluorobenzene	107	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8260B
Field ID:	MW-10	Batch#:	219202
Lab ID:	263750-002	Sampled:	01/06/15
Matrix:	Water	Received:	01/07/15
Units:	ug/L	Analyzed:	01/08/15
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	66	0.5
Toluene	0.6	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	115	77-136
1,2-Dichloroethane-d4	116	75-139
Toluene-d8	107	80-120
Bromofluorobenzene	108	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8260B
Field ID:	MW-1	Batch#:	219202
Lab ID:	263750-003	Sampled:	01/06/15
Matrix:	Water	Received:	01/07/15
Units:	ug/L	Analyzed:	01/08/15
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	27	0.5
Toluene	1.6	0.5
Ethylbenzene	1.8	0.5
m,p-Xylenes	0.7	0.5
o-Xylene	0.9	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	111	77-136
1,2-Dichloroethane-d4	104	75-139
Toluene-d8	104	80-120
Bromofluorobenzene	106	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8260B
Field ID:	MW-8A	Batch#:	219202
Lab ID:	263750-004	Sampled:	01/07/15
Matrix:	Water	Received:	01/07/15
Units:	ug/L	Analyzed:	01/08/15
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	111	77-136
1,2-Dichloroethane-d4	106	75-139
Toluene-d8	100	80-120
Bromofluorobenzene	107	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8260B
Field ID:	MW-9	Batch#:	219202
Lab ID:	263750-005	Sampled:	01/07/15
Matrix:	Water	Received:	01/07/15
Units:	ug/L	Analyzed:	01/08/15
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	69	0.5
Toluene	0.7	0.5
Ethylbenzene	12	0.5
m,p-Xylenes	ND	0.5
o-Xylene	1.4	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	110	77-136
1,2-Dichloroethane-d4	109	75-139
Toluene-d8	103	80-120
Bromofluorobenzene	106	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8260B
Field ID:	MW-5	Batch#:	219202
Lab ID:	263750-006	Sampled:	01/07/15
Matrix:	Water	Received:	01/07/15
Units:	ug/L	Analyzed:	01/08/15
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	109	77-136
1,2-Dichloroethane-d4	109	75-139
Toluene-d8	103	80-120
Bromofluorobenzene	109	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8260B
Field ID:	MW-4	Batch#:	219202
Lab ID:	263750-007	Sampled:	01/07/15
Matrix:	Water	Received:	01/07/15
Units:	ug/L	Analyzed:	01/08/15
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	29	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	109	77-136
1,2-Dichloroethane-d4	110	75-139
Toluene-d8	104	80-120
Bromofluorobenzene	107	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8260B
Field ID:	MW-4 DUP	Batch#:	219202
Lab ID:	263750-008	Sampled:	01/07/15
Matrix:	Water	Received:	01/07/15
Units:	ug/L	Analyzed:	01/08/15
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	28	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	110	77-136
1,2-Dichloroethane-d4	108	75-139
Toluene-d8	104	80-120
Bromofluorobenzene	109	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	219202
Units:	ug/L	Analyzed:	01/08/15
Diln Fac:	1.000		

Type: BS Lab ID: QC772455

Analyte	Spiked	Result	%REC	Limits
MTBE	12.50	12.08	97	64-121
Benzene	12.50	14.06	113	80-124
Toluene	12.50	13.85	111	80-122
Ethylbenzene	12.50	13.41	107	80-124
m,p-Xylenes	25.00	26.90	108	80-122
o-Xylene	12.50	12.55	100	77-120

Surrogate	%REC	Limits
Dibromofluoromethane	110	77-136
1,2-Dichloroethane-d4	112	75-139
Toluene-d8	105	80-120
Bromofluorobenzene	100	80-120

Type: BSD Lab ID: QC772456

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	12.50	11.79	94	64-121	2	20
Benzene	12.50	13.78	110	80-124	2	20
Toluene	12.50	13.64	109	80-122	1	20
Ethylbenzene	12.50	13.20	106	80-124	2	20
m,p-Xylenes	25.00	26.00	104	80-122	3	20
o-Xylene	12.50	12.58	101	77-120	0	20

Surrogate	%REC	Limits
Dibromofluoromethane	110	77-136
1,2-Dichloroethane-d4	111	75-139
Toluene-d8	105	80-120
Bromofluorobenzene	98	80-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC772457	Batch#:	219202
Matrix:	Water	Analyzed:	01/08/15
Units:	ug/L		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	116	77-136
1,2-Dichloroethane-d4	114	75-139
Toluene-d8	106	80-120
Bromofluorobenzene	109	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8260B
Field ID:	ZZZZZZZZZZ	Batch#:	219202
MSS Lab ID:	263724-006	Sampled:	01/06/15
Matrix:	Water	Received:	01/06/15
Units:	ug/L	Analyzed:	01/08/15
Diln Fac:	2.000		

Type: MS Lab ID: QC772527

Analyte	MSS Result	Spiked	Result	%REC	Limits
MTBE	<0.2000	25.00	24.74	99	66-120
Benzene	<0.2000	25.00	27.62	110	80-127
Toluene	<0.2000	25.00	26.50	106	80-123
Ethylbenzene	<0.2642	25.00	26.36	105	80-126
m,p-Xylenes	<0.2247	50.00	51.04	102	80-123
o-Xylene	<0.2000	25.00	25.08	100	76-120

Surrogate	%REC	Limits
Dibromofluoromethane	110	77-136
1,2-Dichloroethane-d4	112	75-139
Toluene-d8	103	80-120
Bromofluorobenzene	101	80-120

Type: MSD Lab ID: QC772528

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	25.00	24.08	96	66-120	3	27
Benzene	25.00	28.17	113	80-127	2	23
Toluene	25.00	27.12	108	80-123	2	22
Ethylbenzene	25.00	26.28	105	80-126	0	22
m,p-Xylenes	50.00	51.70	103	80-123	1	22
o-Xylene	25.00	24.80	99	76-120	1	23

Surrogate	%REC	Limits
Dibromofluoromethane	112	77-136
1,2-Dichloroethane-d4	111	75-139
Toluene-d8	104	80-120
Bromofluorobenzene	101	80-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Dissolved Iron

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 6010B
Analyte:	Iron	Received:	01/07/15
Matrix:	Filtrate	Prepared:	01/12/15
Units:	ug/L	Analyzed:	01/13/15
Batch#:	219328		

Field ID	Type	Lab ID	Result	RL	Diln Fac	Sampled
MW-10	SAMPLE	263750-002	15,000	1,000	10.00	01/06/15
MW-1	SAMPLE	263750-003	570	100	1.000	01/06/15
MW-8A	SAMPLE	263750-004	2,700	1,000	10.00	01/07/15
MW-9	SAMPLE	263750-005	5,200	1,000	10.00	01/07/15
MW-5	SAMPLE	263750-006	530	100	1.000	01/07/15
MW-4	SAMPLE	263750-007	3,300	1,000	10.00	01/07/15
MW-4 DUP	SAMPLE	263750-008	3,300	1,000	10.00	01/07/15
	BLANK	QC772982	ND	100	1.000	

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Dissolved Manganese

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 6010B
Analyte:	Manganese	Received:	01/07/15
Matrix:	Filtrate	Prepared:	01/12/15
Units:	ug/L	Analyzed:	01/13/15
Batch#:	219328		

Field ID	Type	Lab ID	Result	RL	Diln Fac	Sampled
MW-10	SAMPLE	263750-002	6,400	50	10.00	01/06/15
MW-1	SAMPLE	263750-003	420	50	10.00	01/06/15
MW-8A	SAMPLE	263750-004	900	50	10.00	01/07/15
MW-9	SAMPLE	263750-005	710	50	10.00	01/07/15
MW-5	SAMPLE	263750-006	860	50	10.00	01/07/15
MW-4	SAMPLE	263750-007	640	50	10.00	01/07/15
MW-4 DUP	SAMPLE	263750-008	630	50	10.00	01/07/15
	BLANK	QC772982	ND	5.0	1.000	

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Dissolved Iron

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 6010B
Analyte:	Iron	Batch#:	219328
Field ID:	ZZZZZZZZZZ	Sampled:	01/05/15
MSS Lab ID:	263702-001	Received:	01/06/15
Matrix:	Filtrate	Prepared:	01/12/15
Units:	ug/L	Analyzed:	01/13/15
Diln Fac:	1.000		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC772983		10,000	9,707	97	79-120		
BSD	QC772984		10,000	9,946	99	79-120	2	21
MS	QC772985	<7.638	10,000	10,010	100	66-127		
MSD	QC772986		10,000	9,798	98	66-127	2	21

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Dissolved Manganese

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 6010B
Analyte:	Manganese	Batch#:	219328
Field ID:	ZZZZZZZZZZ	Sampled:	01/05/15
MSS Lab ID:	263702-001	Received:	01/06/15
Matrix:	Filtrate	Prepared:	01/12/15
Units:	ug/L	Analyzed:	01/13/15
Diln Fac:	1.000		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC772983		100.0	97.99	98	80-120		
BSD	QC772984		100.0	100.9	101	80-120	3	20
MS	QC772985	3.571	100.0	105.0	101	70-128		
MSD	QC772986		100.0	105.3	102	70-128	0	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Dissolved Metals Analytical Report

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 200.7
Analyte:	Calcium	Received:	01/07/15
Matrix:	Filtrate	Prepared:	01/12/15
Units:	ug/L	Analyzed:	01/13/15
Batch#:	219328		

Field ID	Type	Lab ID	Result	RL	Diln Fac	Sampled
MW-10	SAMPLE	263750-002	150,000	4,000	10.00	01/06/15
MW-1	SAMPLE	263750-003	17,000	4,000	10.00	01/06/15
MW-8A	SAMPLE	263750-004	52,000	4,000	10.00	01/07/15
MW-9	SAMPLE	263750-005	46,000	4,000	10.00	01/07/15
MW-5	SAMPLE	263750-006	64,000	4,000	10.00	01/07/15
MW-4	SAMPLE	263750-007	39,000	4,000	10.00	01/07/15
MW-4 DUP	SAMPLE	263750-008	40,000	4,000	10.00	01/07/15
	BLANK	QC772982	ND	500	1.000	

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Dissolved Metals Analytical Report

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 200.7
Analyte:	Potassium	Received:	01/07/15
Matrix:	Filtrate	Prepared:	01/12/15
Units:	ug/L	Analyzed:	01/13/15
Batch#:	219328		

Field ID	Type	Lab ID	Result	RL	Diln Fac	Sampled
MW-10	SAMPLE	263750-002	31,000	5,000	10.00	01/06/15
MW-1	SAMPLE	263750-003	570	500	1.000	01/06/15
MW-8A	SAMPLE	263750-004	15,000	5,000	10.00	01/07/15
MW-9	SAMPLE	263750-005	5,700	500	1.000	01/07/15
MW-5	SAMPLE	263750-006	20,000	5,000	10.00	01/07/15
MW-4	SAMPLE	263750-007	13,000	5,000	10.00	01/07/15
MW-4 DUP	SAMPLE	263750-008	12,000	5,000	10.00	01/07/15
	BLANK	QC772982	ND	500	1.000	

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Dissolved Metals Analytical Report

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 200.7
Analyte:	Magnesium	Received:	01/07/15
Matrix:	Filtrate	Prepared:	01/12/15
Units:	ug/L	Analyzed:	01/13/15
Batch#:	219328		

Field ID	Type	Lab ID	Result	RL	Diln Fac	Sampled
MW-10	SAMPLE	263750-002	92,000	2,000	10.00	01/06/15
MW-1	SAMPLE	263750-003	13,000	2,000	10.00	01/06/15
MW-8A	SAMPLE	263750-004	71,000	2,000	10.00	01/07/15
MW-9	SAMPLE	263750-005	59,000	2,000	10.00	01/07/15
MW-5	SAMPLE	263750-006	35,000	2,000	10.00	01/07/15
MW-4	SAMPLE	263750-007	59,000	2,000	10.00	01/07/15
MW-4 DUP	SAMPLE	263750-008	58,000	2,000	10.00	01/07/15
	BLANK	QC772982	ND	500	1.000	

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Dissolved Metals Analytical Report

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 200.7
Analyte:	Sodium	Received:	01/07/15
Matrix:	Filtrate	Prepared:	01/12/15
Units:	ug/L	Analyzed:	01/13/15
Batch#:	219328		

Field ID	Type	Lab ID	Result	RL	Diln Fac	Sampled
MW-10	SAMPLE	263750-002	490,000	5,000	10.00	01/06/15
MW-1	SAMPLE	263750-003	47,000	5,000	10.00	01/06/15
MW-8A	SAMPLE	263750-004	250,000	5,000	10.00	01/07/15
MW-9	SAMPLE	263750-005	320,000	5,000	10.00	01/07/15
MW-5	SAMPLE	263750-006	330,000	5,000	10.00	01/07/15
MW-4	SAMPLE	263750-007	250,000	5,000	10.00	01/07/15
MW-4 DUP	SAMPLE	263750-008	250,000	5,000	10.00	01/07/15
	BLANK	QC772982	ND	500	1.000	

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Dissolved Metals Analytical Report

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 200.7
Analyte:	Calcium	Batch#:	219328
Field ID:	ZZZZZZZZZZ	Sampled:	01/05/15
MSS Lab ID:	263702-001	Received:	01/06/15
Matrix:	Filtrate	Prepared:	01/12/15
Units:	ug/L	Analyzed:	01/13/15

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Diln Fac
BS	QC772983		10,000	9,873	99	80-120			1.000
BSD	QC772984		10,000	9,920	99	80-120	0	20	1.000
MS	QC772985	290,100	10,000	294,500	NM	67-126			100.0
MSD	QC772986		10,000	295,600	NM	67-126	0	20	100.0

NM= Not Meaningful: Sample concentration > 4X spike concentration
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Dissolved Metals Analytical Report

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 200.7
Analyte:	Potassium	Batch#:	219328
Field ID:	ZZZZZZZZZZ	Sampled:	01/05/15
MSS Lab ID:	263702-001	Received:	01/06/15
Matrix:	Filtrate	Prepared:	01/12/15
Units:	ug/L	Analyzed:	01/13/15
Diln Fac:	1.000		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC772983		10,000	8,975	90	77-120		
BSD	QC772984		10,000	9,172	92	77-120	2	20
MS	QC772985	6,424	10,000	15,940	95	71-126		
MSD	QC772986		10,000	15,810	94	71-126	1	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Dissolved Metals Analytical Report

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 200.7
Analyte:	Magnesium	Batch#:	219328
Field ID:	ZZZZZZZZZZ	Sampled:	01/05/15
MSS Lab ID:	263702-001	Received:	01/06/15
Matrix:	Filtrate	Prepared:	01/12/15
Units:	ug/L	Analyzed:	01/13/15
Diln Fac:	1.000		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC772983		10,000	9,747	97	80-120		
BSD	QC772984		10,000	9,943	99	80-120	2	20
MS	QC772985	122,600	10,000	115,600 >LR	-69 NM	71-120		
MSD	QC772986		10,000	115,500 >LR	-71 NM	71-120	NC	20

NC= Not Calculated
NM= Not Meaningful: Sample concentration > 4X spike concentration
>LR= Response exceeds instrument's linear range
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Dissolved Metals Analytical Report

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 200.7
Analyte:	Sodium	Batch#:	219328
Field ID:	ZZZZZZZZZZ	Sampled:	01/05/15
MSS Lab ID:	263702-001	Received:	01/06/15
Matrix:	Filtrate	Prepared:	01/12/15
Units:	ug/L	Analyzed:	01/13/15
Diln Fac:	1.000		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
BS	QC772983		10,000	9,221	92	79-120		
BSD	QC772984		10,000	9,440	94	79-120	2	20
MS	QC772985	338,500	10,000	322,900 >LR	-156 NM	66-127		
MSD	QC772986		10,000	320,100 >LR	-183 NM	66-127	NC	28

NC= Not Calculated
NM= Not Meaningful: Sample concentration > 4X spike concentration
>LR= Response exceeds instrument's linear range
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 300.0
Matrix:	Water	Received:	01/07/15
Units:	mg/L		

Field ID: MW-10
Type: SAMPLE
Lab ID: 263750-002
Batch#: 219195
Sampled: 01/06/15 15:05

Analyte	Result	RL	Diln Fac	Analyzed
Chloride	650	20	100.0	01/07/15 23:55
Nitrogen, Nitrite	ND	0.25	5.000	01/07/15 18:42
Nitrogen, Nitrate	ND	0.25	5.000	01/07/15 18:42
Sulfate	ND	2.5	5.000	01/07/15 18:42

Field ID: MW-1
Type: SAMPLE
Lab ID: 263750-003
Diln Fac: 1.000
Batch#: 219195
Sampled: 01/06/15 16:23
Analyzed: 01/07/15 19:17

Analyte	Result	RL
Chloride	6.6	0.20
Nitrogen, Nitrite	ND	0.05
Nitrogen, Nitrate	ND	0.05
Sulfate	ND	0.50

Field ID: MW-8A
Type: SAMPLE
Lab ID: 263750-004
Batch#: 219195
Sampled: 01/07/15 10:37

Analyte	Result	RL	Diln Fac	Analyzed
Chloride	180	4.0	20.00	01/08/15 00:30
Nitrogen, Nitrite	ND	0.05	1.000	01/07/15 19:52
Nitrogen, Nitrate	ND	0.05	1.000	01/07/15 19:52
Sulfate	30	0.50	1.000	01/07/15 19:52

Field ID: MW-9
Type: SAMPLE
Lab ID: 263750-005
Batch#: 219195
Sampled: 01/07/15 12:05

Analyte	Result	RL	Diln Fac	Analyzed
Chloride	240	4.0	20.00	01/08/15 00:48
Nitrogen, Nitrite	ND	0.05	1.000	01/07/15 20:26
Nitrogen, Nitrate	ND	0.05	1.000	01/07/15 20:26
Sulfate	0.62	0.50	1.000	01/07/15 20:26

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 300.0
Matrix:	Water	Received:	01/07/15
Units:	mg/L		

Field ID: MW-5 Lab ID: 263750-006
Type: SAMPLE Sampled: 01/07/15 13:27

Analyte	Result	RL	Diln Fac	Batch#	Analyzed
Chloride	440	10	50.00	219211	01/08/15 10:36
Nitrogen, Nitrite	ND	0.05	1.000	219195	01/07/15 21:01
Nitrogen, Nitrate	ND	0.05	1.000	219195	01/07/15 21:01
Sulfate	76	10	20.00	219195	01/08/15 01:05

Field ID: MW-4 Batch#: 219195
Type: SAMPLE Sampled: 01/07/15 14:54
Lab ID: 263750-007

Analyte	Result	RL	Diln Fac	Analyzed
Chloride	110	4.0	20.00	01/08/15 01:22
Nitrogen, Nitrite	ND	0.05	1.000	01/07/15 21:36
Nitrogen, Nitrate	ND	0.05	1.000	01/07/15 21:36
Sulfate	1.1	0.50	1.000	01/07/15 21:36

Field ID: MW-4 DUP Batch#: 219195
Type: SAMPLE Sampled: 01/07/15 14:54
Lab ID: 263750-008

Analyte	Result	RL	Diln Fac	Analyzed
Chloride	110	4.0	20.00	01/08/15 01:40
Nitrogen, Nitrite	ND	0.05	1.000	01/07/15 22:11
Nitrogen, Nitrate	ND	0.05	1.000	01/07/15 22:11
Sulfate	1.1	0.50	1.000	01/07/15 22:11

Type: BLANK Batch#: 219195
Lab ID: QC772432 Analyzed: 01/07/15 10:50
Diln Fac: 1.000

Analyte	Result	RL
Chloride	ND	0.20
Nitrogen, Nitrite	ND	0.05
Nitrogen, Nitrate	ND	0.05
Sulfate	ND	0.50

Type: BLANK Batch#: 219211
Lab ID: QC772493 Analyzed: 01/08/15 10:18
Diln Fac: 1.000

Analyte	Result	RL
Chloride	ND	0.20

ND= Not Detected
RL= Reporting Limit

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 300.0
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC772433	Batch#:	219195
Matrix:	Water	Analyzed:	01/07/15 11:08
Units:	mg/L		

Analyte	Spiked	Result	%REC	Limits
Chloride	4.000	4.055	101	80-120
Nitrogen, Nitrite	1.000	0.9875	99	80-120
Nitrogen, Nitrate	1.000	1.008	101	80-120
Sulfate	10.00	10.30	103	80-120

Curtis & Tompkins, Ltd.

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 300.0
Field ID:	MW-10	Diln Fac:	100.0
MSS Lab ID:	263750-002	Batch#:	219195
Matrix:	Water	Sampled:	01/06/15 15:05
Units:	mg/L	Received:	01/07/15

Type: MS Analyzed: 01/08/15 01:57
Lab ID: QC772434

Analyte	MSS Result	Spiked	Result	%REC	Limits
Chloride	649.0	200.0	805.8	78	75-120
Nitrogen, Nitrite	<0.06434	50.00	51.52	103	80-120
Nitrogen, Nitrate	0.1084	50.00	50.59	101	80-120
Sulfate	1.129	500.0	516.3	103	79-120

Type: MSD Analyzed: 01/08/15 02:15
Lab ID: QC772435

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Chloride	200.0	822.8	87	75-120	2	20
Nitrogen, Nitrite	50.00	49.06	98	80-120	5	23
Nitrogen, Nitrate	50.00	50.20	100	80-120	1	20
Sulfate	500.0	503.3	100	79-120	3	20

RPD= Relative Percent Difference

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 300.0
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC772494	Batch#:	219211
Matrix:	Water	Analyzed:	01/08/15 11:09
Units:	mg/L		

Analyte	Spiked	Result	%REC	Limits
Chloride	4.000	4.197	105	80-120

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 300.0
Field ID:	ZZZZZZZZZZ	Diln Fac:	5.000
MSS Lab ID:	263774-001	Batch#:	219211
Matrix:	Water	Sampled:	01/08/15 09:10
Units:	mg/L	Received:	01/08/15

Type: MS Analyzed: 01/08/15 21:03
Lab ID: QC772609

Analyte	MSS Result	Spiked	Result	%REC	Limits
Chloride	7.864	10.00	17.62	98	75-120

Type: MSD Analyzed: 01/08/15 21:20
Lab ID: QC772610

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Chloride	10.00	17.63	98	75-120	0	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Alkalinity

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM2320B
Matrix:	Water	Received:	01/07/15
Units:	mg/L	Analyzed:	01/14/15
Batch#:	219407		

Field ID: MW-10 Diln Fac: 10.00
Type: SAMPLE Sampled: 01/06/15
Lab ID: 263750-002

Analyte	Result	RL
Alkalinity, Bicarbonate	1,200	10
Alkalinity, Carbonate	ND	10
Alkalinity, Hydroxide	ND	10
Alkalinity, Total as CaCO3	1,200	10

Field ID: MW-1 Diln Fac: 6.700
Type: SAMPLE Sampled: 01/06/15
Lab ID: 263750-003

Analyte	Result	RL
Alkalinity, Bicarbonate	220	6.7
Alkalinity, Carbonate	ND	6.7
Alkalinity, Hydroxide	ND	6.7
Alkalinity, Total as CaCO3	220	6.7

Field ID: MW-8A Diln Fac: 6.700
Type: SAMPLE Sampled: 01/07/15
Lab ID: 263750-004

Analyte	Result	RL
Alkalinity, Bicarbonate	800	6.7
Alkalinity, Carbonate	ND	6.7
Alkalinity, Hydroxide	ND	6.7
Alkalinity, Total as CaCO3	800	6.7

Field ID: MW-9 Diln Fac: 6.700
Type: SAMPLE Sampled: 01/07/15
Lab ID: 263750-005

Analyte	Result	RL
Alkalinity, Bicarbonate	860	6.7
Alkalinity, Carbonate	ND	6.7
Alkalinity, Hydroxide	ND	6.7
Alkalinity, Total as CaCO3	860	6.7

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Alkalinity

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM2320B
Matrix:	Water	Received:	01/07/15
Units:	mg/L	Analyzed:	01/14/15
Batch#:	219407		

Field ID: MW-5 Diln Fac: 6.700
Type: SAMPLE Sampled: 01/07/15
Lab ID: 263750-006

Analyte	Result	RL
Alkalinity, Bicarbonate	430	6.7
Alkalinity, Carbonate	ND	6.7
Alkalinity, Hydroxide	ND	6.7
Alkalinity, Total as CaCO3	430	6.7

Field ID: MW-4 Diln Fac: 6.700
Type: SAMPLE Sampled: 01/07/15
Lab ID: 263750-007

Analyte	Result	RL
Alkalinity, Bicarbonate	760	6.7
Alkalinity, Carbonate	ND	6.7
Alkalinity, Hydroxide	ND	6.7
Alkalinity, Total as CaCO3	760	6.7

Field ID: MW-4 DUP Diln Fac: 6.700
Type: SAMPLE Sampled: 01/07/15
Lab ID: 263750-008

Analyte	Result	RL
Alkalinity, Bicarbonate	740	6.7
Alkalinity, Carbonate	ND	6.7
Alkalinity, Hydroxide	ND	6.7
Alkalinity, Total as CaCO3	740	6.7

Type: BLANK Diln Fac: 1.000
Lab ID: QC773295

Analyte	Result	RL
Alkalinity, Bicarbonate	ND	1.0
Alkalinity, Carbonate	ND	1.0
Alkalinity, Hydroxide	ND	1.0
Alkalinity, Total as CaCO3	ND	1.0

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Alkalinity

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM2320B
Analyte:	Alkalinity, Total as CaCO3	Units:	mg/L
Type:	LCS	Diln Fac:	4.000
Lab ID:	QC773296	Batch#:	219407
Matrix:	Water	Analyzed:	01/14/15

Spiked	Result	%REC	Limits
200.0	208.0	104	90-110

Curtis & Tompkins, Ltd.

Batch QC Report

Alkalinity

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM2320B
Analyte:	Alkalinity, Total as CaCO3	Diln Fac:	10.00
Field ID:	MW-10	Batch#:	219407
MSS Lab ID:	263750-002	Sampled:	01/06/15
Matrix:	Water	Received:	01/07/15
Units:	mg/L	Analyzed:	01/14/15

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
MS	QC773297	1,225	500.0	1,729	101	80-120		
MSD	QC773298		500.0	1,685	92	80-120	3	25

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Dissolved Sulfide

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM4500S2-D
Analyte:	Dissolved Sulfide	Batch#:	219243
Matrix:	Water	Received:	01/07/15
Units:	mg/L	Analyzed:	01/09/15
Diln Fac:	1.000		

Field ID	Type	Lab ID	Result	RL	Sampled
MW-10	SAMPLE	263750-002	ND	0.04	01/06/15
MW-1	SAMPLE	263750-003	0.21	0.04	01/06/15
MW-8A	SAMPLE	263750-004	ND	0.04	01/07/15
MW-9	SAMPLE	263750-005	0.26	0.04	01/07/15
MW-5	SAMPLE	263750-006	ND	0.04	01/07/15
MW-4	SAMPLE	263750-007	ND	0.04	01/07/15
MW-4 DUP	SAMPLE	263750-008	0.04	0.04	01/07/15
	BLANK	QC772622	ND	0.04	

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Dissolved Sulfide

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM4500S2-D
Analyte:	Dissolved Sulfide	Diln Fac:	1.000
Field ID:	ZZZZZZZZZZ	Batch#:	219243
MSS Lab ID:	263754-001	Sampled:	01/07/15
Matrix:	Water	Received:	01/08/15
Units:	mg/L	Analyzed:	01/09/15

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
MS	QC772623	0.04010	0.7470	0.6692	84	57-131		
MSD	QC772624		0.7470	0.6724	85	57-131	0	21
LCS	QC772625		0.7470	0.7165	96	80-120		

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Orthophosphate Phosphorous

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM4500P-E
Analyte:	Orthophosphate (as P)	Batch#:	219204
Matrix:	Water	Received:	01/07/15
Units:	mg/L	Analyzed:	01/08/15 00:00

Field ID	Type	Lab ID	Result	RL	Diln Fac	Sampled
MW-10	SAMPLE	263750-002	0.54	0.030	1.000	01/06/15 15:05
MW-1	SAMPLE	263750-003	0.18	0.030	1.000	01/06/15 16:23
MW-8A	SAMPLE	263750-004	1.0	0.060	2.000	01/07/15 10:37
MW-9	SAMPLE	263750-005	1.1	0.060	2.000	01/07/15 12:05
MW-5	SAMPLE	263750-006	0.32	0.030	1.000	01/07/15 13:27
MW-4	SAMPLE	263750-007	1.4	0.060	2.000	01/07/15 14:54
MW-4 DUP	SAMPLE	263750-008	1.4	0.060	2.000	01/07/15 14:54
	BLANK	QC772461	ND	0.030	1.000	

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Orthophosphate Phosphorous

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM4500P-E
Analyte:	Orthophosphate (as P)	Batch#:	219204
Field ID:	MW-10	Sampled:	01/06/15 15:05
MSS Lab ID:	263750-002	Received:	01/07/15
Matrix:	Water	Analyzed:	01/08/15 00:00
Units:	mg/L		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Diln Fac
MS	QC772462	0.5446	0.8000	1.340	99	80-120			2.000
MSD	QC772463		0.8000	1.392	106	80-120	4	20	2.000
LCS	QC772464		0.4000	0.4067	102	80-120			1.000

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Dissolved Solids (TDS)

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM2540C
Analyte:	Total Dissolved Solids	Received:	01/07/15
Matrix:	Water	Prepared:	01/13/15
Units:	mg/L	Analyzed:	01/14/15
Batch#:	219374		

Field ID	Type	Lab ID	Result	RL	Diln Fac	Sampled
MW-10	SAMPLE	263750-002	2,140	14	1.429	01/06/15
MW-1	SAMPLE	263750-003	240	10	1.000	01/06/15
MW-8A	SAMPLE	263750-004	1,120	10	1.000	01/07/15
MW-9	SAMPLE	263750-005	1,790	11	1.111	01/07/15
MW-5	SAMPLE	263750-006	1,260	11	1.111	01/07/15
MW-4	SAMPLE	263750-007	950	10	1.000	01/07/15
MW-4 DUP	SAMPLE	263750-008	970	10	1.000	01/07/15
	BLANK	QC773163	ND	10	1.000	

ND= Not Detected
RL= Reporting Limit

Batch QC Report

Total Dissolved Solids (TDS)

Lab #:	263750	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM2540C
Analyte:	Total Dissolved Solids	Batch#:	219374
Field ID:	ZZZZZZZZZZ	Prepared:	01/13/15
Matrix:	Water	Analyzed:	01/14/15
Units:	mg/L		

Type	MSS Lab ID	Lab ID	MSS Result	Spiked	Result	RL	%REC	Limits	RPD	Lim	Diln Fac	Sampled	Received
LCS		QC773164		104.0	92.00		88	74-120			1.000		
SDUP	263724-006	QC773165	1,538		1,545	12.50			0	5	1.250	01/06/15	01/06/15
SDUP	263745-002	QC773166	232.0		236.0	10.00			2	5	1.000	01/07/15	01/07/15

RL= Reporting Limit
RPD= Relative Percent Difference

43.0

Curtis & Tompkins, Ltd.


Curtis & Tompkins, Ltd.
Analytical Laboratories, Since 1878

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 263768
ANALYTICAL REPORT

Arcadis	Project : 04656016.0000
2000 Powell St.	Location : Port of Oakland-HFC
Emeryville, CA 94608	Level : II

Sample ID	Lab ID
QCTB-2	263768-001
MW-2	263768-002
MW-11	263768-003
MW-12	263768-004

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature: Will Rice Date: 01/19/2015

Will S Rice
Project Manager
will.rice@ctberk.com

CA ELAP# 2896, NELAP# 4044-001

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**263768**
Client:	**Arcadis**
Project:	**04656016.0000**
Location:	**Port of Oakland-HFC**
Request Date:	**01/08/15**
Samples Received:	**01/08/15**

This data package contains sample and QC results for four water samples, requested for the above referenced project on 01/08/15. The samples were received cold and intact.

TPH-Purgeables and/or BTXE by GC (EPA 8015B):
Low surrogate recovery was observed for bromofluorobenzene (FID) in the MSD of MW-12 (lab # 263768-004). No other analytical problems were encountered.

TPH-Extractables by GC (EPA 8015B):
No analytical problems were encountered.

Volatile Organics by GC/MS (EPA 8260B):
MW-11 (lab # 263768-003) was diluted due to foaming. No other analytical problems were encountered.

Metals (EPA 6010B):
No analytical problems were encountered.

Metals (EPA 200.7):
The samples were filtered outside the 40CFR136 recommended 15 minute holding time. No other analytical problems were encountered.

Ion Chromatography (EPA 300.0):
MW-11 (lab # 263768-003) was diluted due to high chloride concentration. No other analytical problems were encountered.

Alkalinity (SM2320B):
No analytical problems were encountered.

Dissolved Sulfide (SM4500S2-D):
No analytical problems were encountered.

Total Dissolved Solids (TDS) (SM2540C):
No analytical problems were encountered.

Orthophosphate Phosphorous (SM4500P-E):
No analytical problems were encountered.

263768

Environmental Sampling Services, LLC

6680 Alhambra Avenue, #102
Martinez, California 94553-6105
Telephone: (925) 372-8108
www.envsampling.com

CHAIN OF COUSTODY RECORD

Page 1 of 1

Other:

TURN AROUND TIME

☐ 24 Hours ☐ 48 Hours ☐ 1 Week ☑ Normal

LABORATORY:
Curtis Tompkins, Ltd.
Berkeley, CA

Report To: Ms. Katherine Brandt
Company: Arcadis U.S., Inc.
Address: 2000 Powell Street, 7th Floor, Emeryville, CA 94608
E-Mail Results to katherine.brandt@arcadis-us.com
& cc:
Sampler(s): Stephen Penman ☑

Telephone/Fax: 510-596-9675 / 510-652-4906
Project Name: Port of Oakland-HFC
Project Number: 04656016.0000
Bill To: Port of Oakland
Sampler's Signature: [signature]

Reporting Requirement: PDF: Yes ☑ No ☐ **EPA Data Report:** Level II
EDD File: Yes ☑ No ☐ Electronic (EDF) : Yes ☑ No ☐

	SAMPLE ID	Sample Date	Sample Time	Number of Containers	Type of Container[1]	Matrix: Water	Matrix: Groundwater	Matrix: Soil	Matrix: Soil Vapor	Matrix: Other	Preservative: Ice	Preservative: HCl	Preservative: HNO_3	Preservative: NaOH	TPH-Gasoline (EPA 8015B)	BTEX & MTBE (EPA 8260B)	TPH-D & MO (EPA 8015B) w/Silica Gel Cleanup	TDS (40CFR136/160.1)	Dissolved Sulfide (EPA E376.2)	Anions (EPA 300.0) * see "comments"	TPH-D+MO (EPA 8015B)	FF: Dissolved Na, Ca, K, and Mg (EPA 200.7)	FF: Dissolved Fe and Mn (EPA SW6010B)	Comments
1	QCTB-2	1/08/15	10:00	4	1	x					x	x			x	x								Anions = bicarbonate, carbonate, sulfate chloride, nitrate, nitrite & orthophosphate.
2	MW-2	1/08/15	11:20	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X	Analyze TPH-D/MO with and without Silica Gel Cleanup
3	MW-11	1/08/15	12:50	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X	
4	MW-12	1/08/15	13:51	12	1,2,3		X				X	X	X	X	X	X	X	X	X	X	X	X	X	

Relinquished By:	Date:	Time:	Received By:
[signature]	1/8/15	15:15	[signature]

1 = Sample Container Type: 1 =VOA 2=Glass 3=High Density Polyethylene 4=Summa

QUESTIONS REGARDING COC, CALL ESS
Send confirmation to: katherine.brandt@arcadis-us.com
After log-in, please email COC to: spen@envsampling.com

Cold [illegible]

SAMPLE RECEIPT
☐ Intact ☐ Cold
☐ On Ice ☐ Ambient
Preservative Correct?
☐ Yes ☐ No ☐ NA

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 263768 Date Received 01/08/15 Number of coolers 1
Client Arcadis Project 04656016.0000

Date Opened 01/08 By (print) MC (sign)
Date Logged in 1 By (print) 1 (sign) 1

1. Did cooler come with a shipping slip (airbill, etc) YES (NO)
Shipping info

2A. Were custody seals present? .... ☐ YES (circle) on cooler on samples ☒ NO
How many Name Date
2B. Were custody seals intact upon arrival? YES NO (N/A)
3. Were custody papers dry and intact when received? (YES) NO
4. Were custody papers filled out properly (ink, signed, etc)? (YES) NO
5. Is the project identifiable from custody papers? (If so fill out top of form) (YES) NO
6. Indicate the packing in cooler: (if other, describe)

☒ Bubble Wrap ☐ Foam blocks ☒ Bags ☐ None
☐ Cloth material ☐ Cardboard ☐ Styrofoam ☐ Paper towels

7. Temperature documentation: * Notify PM if temperature exceeds 6°C

Type of ice used: ☒ Wet ☐ Blue/Gel ☐ None Temp(°C) 2.1

☐ Samples Received on ice & cold without a temperature blank; temp. taken with IR gun

☐ Samples received on ice directly from the field. Cooling process had begun

8. Were Method 5035 sampling containers present? YES (NO)
If YES, what time were they transferred to freezer?
9. Did all bottles arrive unbroken/unopened? (YES) NO
10. Are there any missing / extra samples? YES (NO)
11. Are samples in the appropriate containers for indicated tests? (YES) NO
12. Are sample labels present, in good condition and complete? (YES) NO
13. Do the sample labels agree with custody papers? (YES) NO
14. Was sufficient amount of sample sent for tests requested? (YES) NO
15. Are the samples appropriately preserved? YES (NO) N/A
16. Did you check preservatives for all bottles for each sample? (YES) NO N/A
17. Did you document your preservative check? (YES) NO N/A
18. Did you change the hold time in LIMS for unpreserved VOAs? YES NO (N/A)
19. Did you change the hold time in LIMS for preserved terracores? YES NO (N/A)
20. Are bubbles > 6mm absent in VOA samples? (YES) NO N/A
21. Was the client contacted concerning this sample delivery? YES (NO)
If YES, Who was called? By Date:

COMMENTS
#15) -003: (metals) received w/ pH >2; added HNO3 (lot # 50770) on 01/08/15 @ 1750 to pH <2

Rev 10, 9/12

Curtis & Tompkins Sample Preservation for 263768

Sample	pH: <2	>9	>12	Other
-002a	[ ]	[ ]	[ ]	_____
b	[ ]	[ ]	[ ]	_____
c	[ ]	[ ]	[ ]	_____
d	[ ]	[ ]	[ ]	_____
e	[ ]	[ ]	[ ]	_____
f	[ ]	[ ]	[ ]	_____
g	[ ]	[ ]	[ ]	_____
h	[ ]	[ ]	[ ]	_____
i	[ ]	[ ]	[ ]	_____
j	[X]	[ ]	[ ]	_____
k	[X]	[ ]	[ ]	_____
l	[ ]	[ ]	[ ]	_____
-003a	[ ]	[ ]	[ ]	_____
b	[ ]	[ ]	[ ]	_____
c	[ ]	[ ]	[ ]	_____
d	[ ]	[ ]	[ ]	_____
e	[ ]	[ ]	[ ]	_____
f	[ ]	[ ]	[ ]	_____
g	[ ]	[ ]	[ ]	_____
h	[ ]	[ ]	[ ]	_____
i	[ ]	[ ]	[ ]	_____
j	[X]	[ ]	[ ]	_____
k	[X]	[ ]	[ ]	_____
l	[ ]	[ ]	[ ]	_____
-004a	[ ]	[ ]	[ ]	_____
b	[ ]	[ ]	[ ]	_____
c	[ ]	[ ]	[ ]	_____
d	[ ]	[ ]	[ ]	_____
e	[ ]	[ ]	[ ]	_____
f	[ ]	[ ]	[ ]	_____
g	[ ]	[ ]	[ ]	_____
h	[ ]	[ ]	[ ]	_____
i	[ ]	[ ]	[ ]	_____
j	[X]	[ ]	[ ]	_____
k	[X]	[ ]	[ ]	_____
l	[ ]	[ ]	[ ]	_____

Analyst: MC
Date: 1/8/15

Curtis & Tompkins, Ltd.

Detections Summary for 263768

Results for any subcontracted analyses are not included in this summary.

Client : Arcadis
Project : 04656016.0000
Location : Port of Oakland-HFC

Client Sample ID : QCTB-2 Laboratory Sample ID : 263768-001

No Detections

Client Sample ID : MW-2 Laboratory Sample ID : 263768-002

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	92	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Manganese	34		5.0	ug/L	DISS.	1.000	EPA 6010B	METHOD
Calcium	32,000		500	ug/L	DISS.	1.000	EPA 200.7	METHOD
Magnesium	33,000		500	ug/L	DISS.	1.000	EPA 200.7	METHOD
Potassium	1,000		500	ug/L	DISS.	1.000	EPA 200.7	METHOD
Sodium	150,000		5,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Chloride	9.8		0.40	mg/L	TOTAL	2.000	EPA 300.0	METHOD
Sulfate	32		0.50	mg/L	TOTAL	1.000	EPA 300.0	METHOD
Alkalinity, Bicarbonate	570		6.7	mg/L	TOTAL	6.700	SM2320B	METHOD
Alkalinity, Total as CaCO3	570		6.7	mg/L	TOTAL	6.700	SM2320B	METHOD
Orthophosphate (as P)	0.12		0.030	mg/L	TOTAL	1.000	SM4500P-E	METHOD
Total Dissolved Solids	620		10	mg/L	TOTAL	1.000	SM2540C	METHOD

Client Sample ID : MW-11 Laboratory Sample ID : 263768-003

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Diesel C10-C24	4,600	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Motor Oil C24-C36	1,700		300	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Iron	1,700		1,000	ug/L	DISS.	10.00	EPA 6010B	METHOD
Manganese	330		50	ug/L	DISS.	10.00	EPA 6010B	METHOD
Calcium	27,000		4,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Magnesium	55,000		4,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Potassium	46,000		5,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Sodium	970,000		500,000	ug/L	DISS.	1000	EPA 200.7	METHOD
Chloride	980		10	mg/L	TOTAL	50.00	EPA 300.0	METHOD
Alkalinity, Bicarbonate	1,600		6.7	mg/L	TOTAL	6.700	SM2320B	METHOD
Alkalinity, Total as CaCO3	1,600		6.7	mg/L	TOTAL	6.700	SM2320B	METHOD
Orthophosphate (as P)	8.2		0.30	mg/L	TOTAL	10.00	SM4500P-E	METHOD
Total Dissolved Solids	3,340		20	mg/L	TOTAL	2.000	SM2540C	METHOD

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Client Sample ID : MW-12 Laboratory Sample ID : 263768-004

Analyte	Result	Flags	RL	Units	Basis	IDF	Method	Prep Method
Gasoline C7-C12	86	Y	50	ug/L	As Recd	1.000	EPA 8015B	EPA 5030B
Diesel C10-C24	5,200		50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Diesel C10-C24	310		50	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
Motor Oil C24-C36	1,300		300	ug/L	As Recd	1.000	EPA 8015B	EPA 3520C
MTBE	4.3		0.5	ug/L	As Recd	1.000	EPA 8260B	EPA 5030B
Iron	940		100	ug/L	DISS.	1.000	EPA 6010B	METHOD
Manganese	1,400		5.0	ug/L	DISS.	1.000	EPA 6010B	METHOD
Calcium	90,000		500	ug/L	DISS.	1.000	EPA 200.7	METHOD
Magnesium	41,000		500	ug/L	DISS.	1.000	EPA 200.7	METHOD
Potassium	15,000		500	ug/L	DISS.	1.000	EPA 200.7	METHOD
Sodium	160,000		5,000	ug/L	DISS.	10.00	EPA 200.7	METHOD
Chloride	140		2.0	mg/L	TOTAL	10.00	EPA 300.0	METHOD
Sulfate	0.51		0.50	mg/L	TOTAL	1.000	EPA 300.0	METHOD
Alkalinity, Bicarbonate	640		6.7	mg/L	TOTAL	6.700	SM2320B	METHOD
Alkalinity, Total as CaCO3	640		6.7	mg/L	TOTAL	6.700	SM2320B	METHOD
Orthophosphate (as P)	0.58		0.030	mg/L	TOTAL	1.000	SM4500P-E	METHOD
Total Dissolved Solids	870		10	mg/L	TOTAL	1.000	SM2540C	METHOD

Y = Sample exhibits chromatographic pattern which does not resemble standard

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	01/08/15
Units:	ug/L	Received:	01/08/15
Diln Fac:	1.000	Analyzed:	01/12/15
Batch#:	219315		

Field ID: QCTB-2 Lab ID: 263768-001
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	111	77-128

Field ID: MW-2 Lab ID: 263768-002
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	115	77-128

Field ID: MW-11 Lab ID: 263768-003
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	106	77-128

Field ID: MW-12 Lab ID: 263768-004
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	86 Y	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	102	77-128

Type: BLANK Lab ID: QC772930

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	104	77-128

Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC772929	Batch#:	219315
Matrix:	Water	Analyzed:	01/12/15
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	1,027	103	80-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	115	77-128

Curtis & Tompkins, Ltd.

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8015B
Field ID:	MW-12	Batch#:	219315
MSS Lab ID:	263768-004	Sampled:	01/08/15
Matrix:	Water	Received:	01/08/15
Units:	ug/L	Analyzed:	01/12/15
Diln Fac:	1.000		

Type: MS Lab ID: QC772931

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	86.19	2,000	1,854	88	74-120

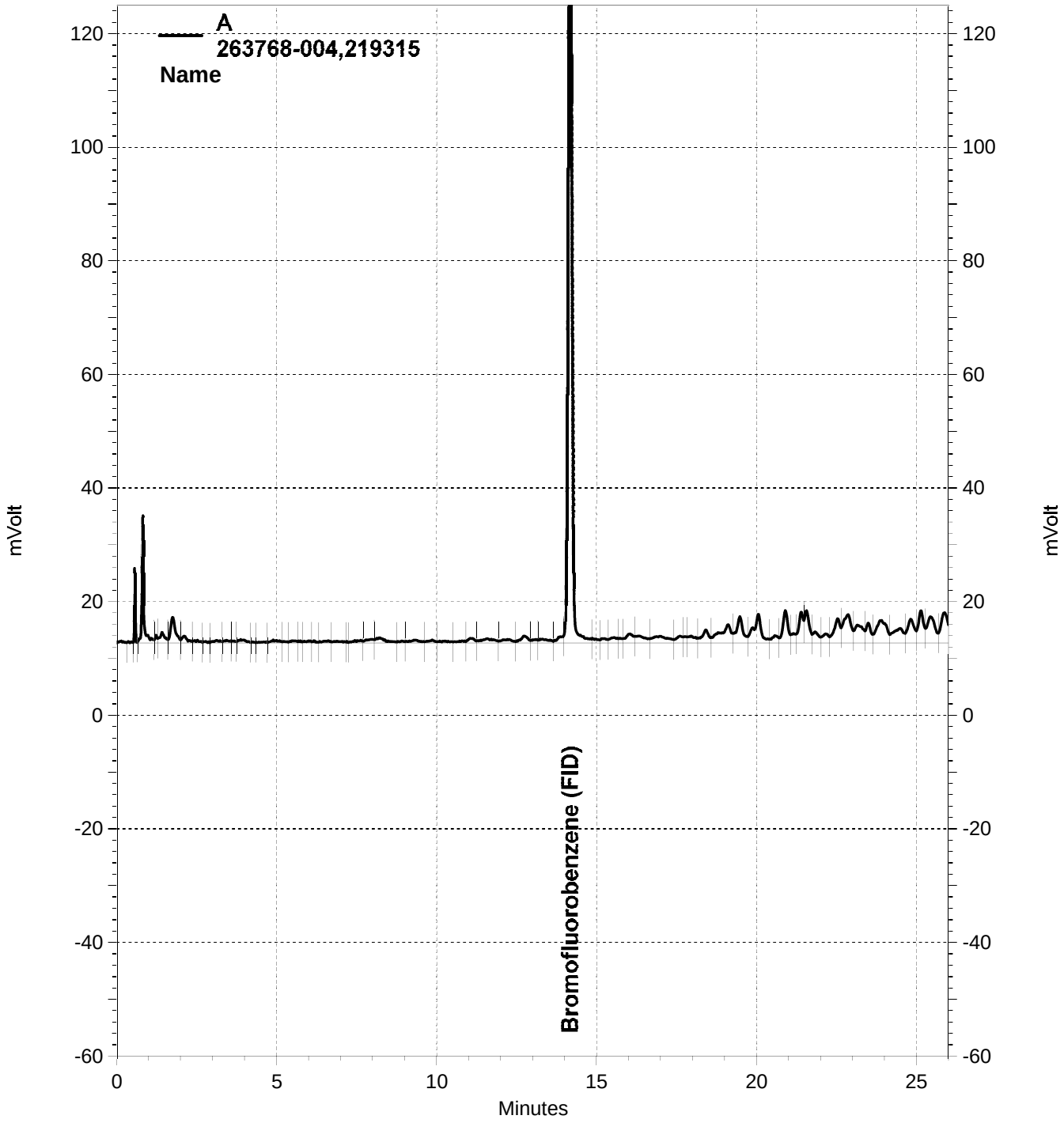
Surrogate	%REC	Limits
Bromofluorobenzene (FID)	96	77-128

Type: MSD Lab ID: QC772932

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	1,000	854.4	77	74-120	12	27

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	64 *	77-128

*= Value outside of QC limits; see narrative
RPD= Relative Percent Difference



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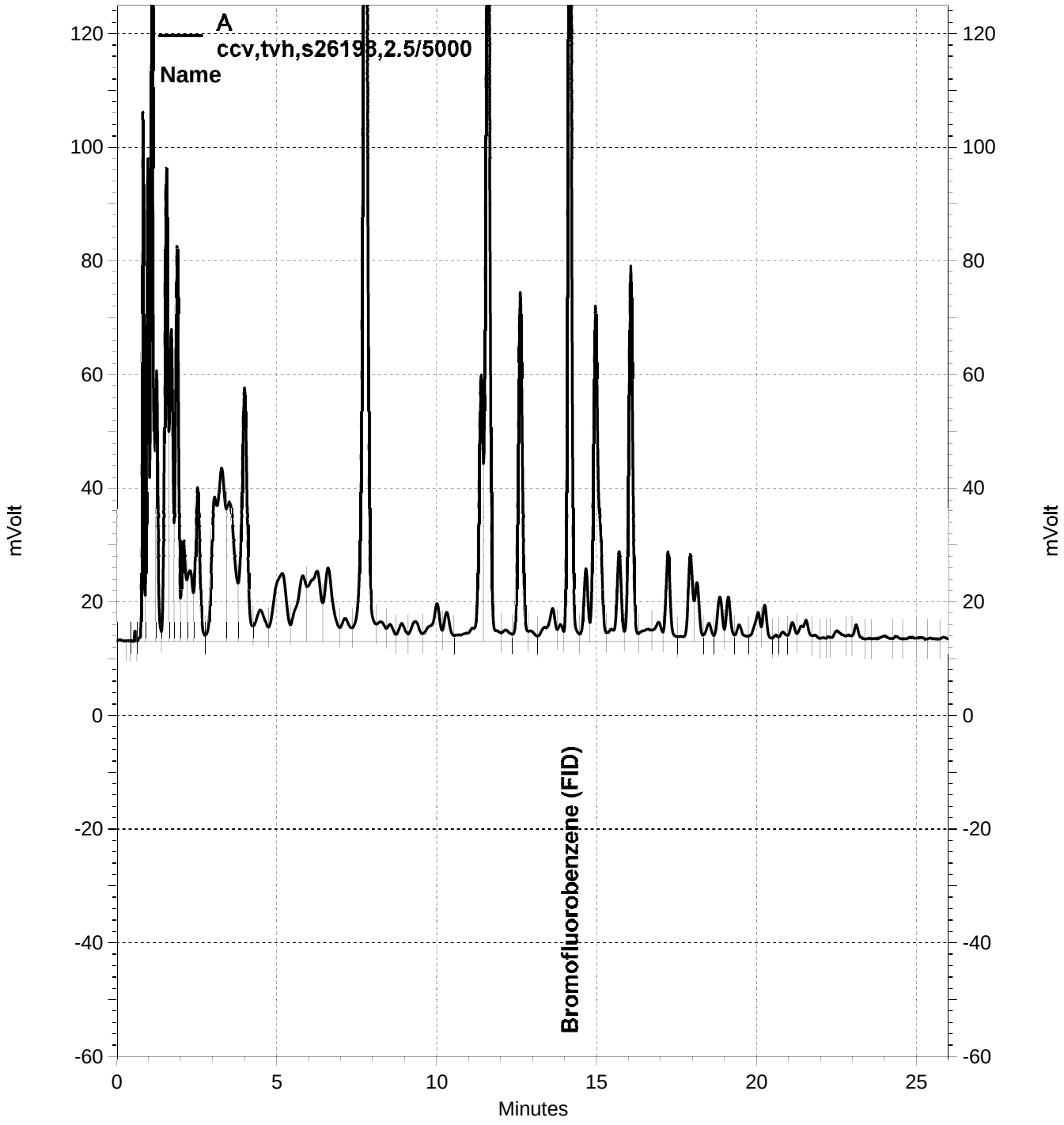

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Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 3520C
Project#:	04656016.0000	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	01/08/15
Units:	ug/L	Received:	01/08/15
Diln Fac:	1.000	Prepared:	01/09/15
Batch#:	219263	Analyzed:	01/12/15

Field ID: MW-2 Lab ID: 263768-002
Type: SAMPLE Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	92 Y	50
Diesel C10-C24 (SGCU)	ND	50
Motor Oil C24-C36	ND	300
Motor Oil C24-C36 (SGCU)	ND	300

Surrogate	%REC	Limits
o-Terphenyl	110	66-129
o-Terphenyl (SGCU)	92	66-129

Field ID: MW-11 Lab ID: 263768-003
Type: SAMPLE Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	4,600 Y	50
Diesel C10-C24 (SGCU)	ND	50
Motor Oil C24-C36	1,700	300
Motor Oil C24-C36 (SGCU)	ND	300

Surrogate	%REC	Limits
o-Terphenyl	99	66-129
o-Terphenyl (SGCU)	97	66-129

Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit
SGCU= Silica gel cleanup

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 3520C
Project#:	04656016.0000	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	01/08/15
Units:	ug/L	Received:	01/08/15
Diln Fac:	1.000	Prepared:	01/09/15
Batch#:	219263	Analyzed:	01/12/15

Field ID: MW-12 Lab ID: 263768-004
Type: SAMPLE Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	5,200	50
Diesel C10-C24 (SGCU)	310	50
Motor Oil C24-C36	1,300	300
Motor Oil C24-C36 (SGCU)	ND	300

Surrogate	%REC	Limits
o-Terphenyl	92	66-129
o-Terphenyl (SGCU)	87	66-129

Type: BLANK Cleanup Method: EPA 3630C
Lab ID: QC772700

Analyte	Result	RL
Diesel C10-C24	ND	50
Diesel C10-C24 (SGCU)	ND	50
Motor Oil C24-C36	ND	300
Motor Oil C24-C36 (SGCU)	ND	300

Surrogate	%REC	Limits
o-Terphenyl	100	66-129
o-Terphenyl (SGCU)	104	66-129

Y= Sample exhibits chromatographic pattern which does not resemble standard
ND= Not Detected
RL= Reporting Limit
SGCU= Silica gel cleanup

Curtis & Tompkins, Ltd.

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 3520C
Project#:	04656016.0000	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	219263
Units:	ug/L	Prepared:	01/09/15
Diln Fac:	1.000	Analyzed:	01/12/15

Type: BS Cleanup Method: EPA 3630C
Lab ID: QC772701

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,153	86	61-120
Diesel C10-C24 (SGCU)	2,500	2,425	97	61-120

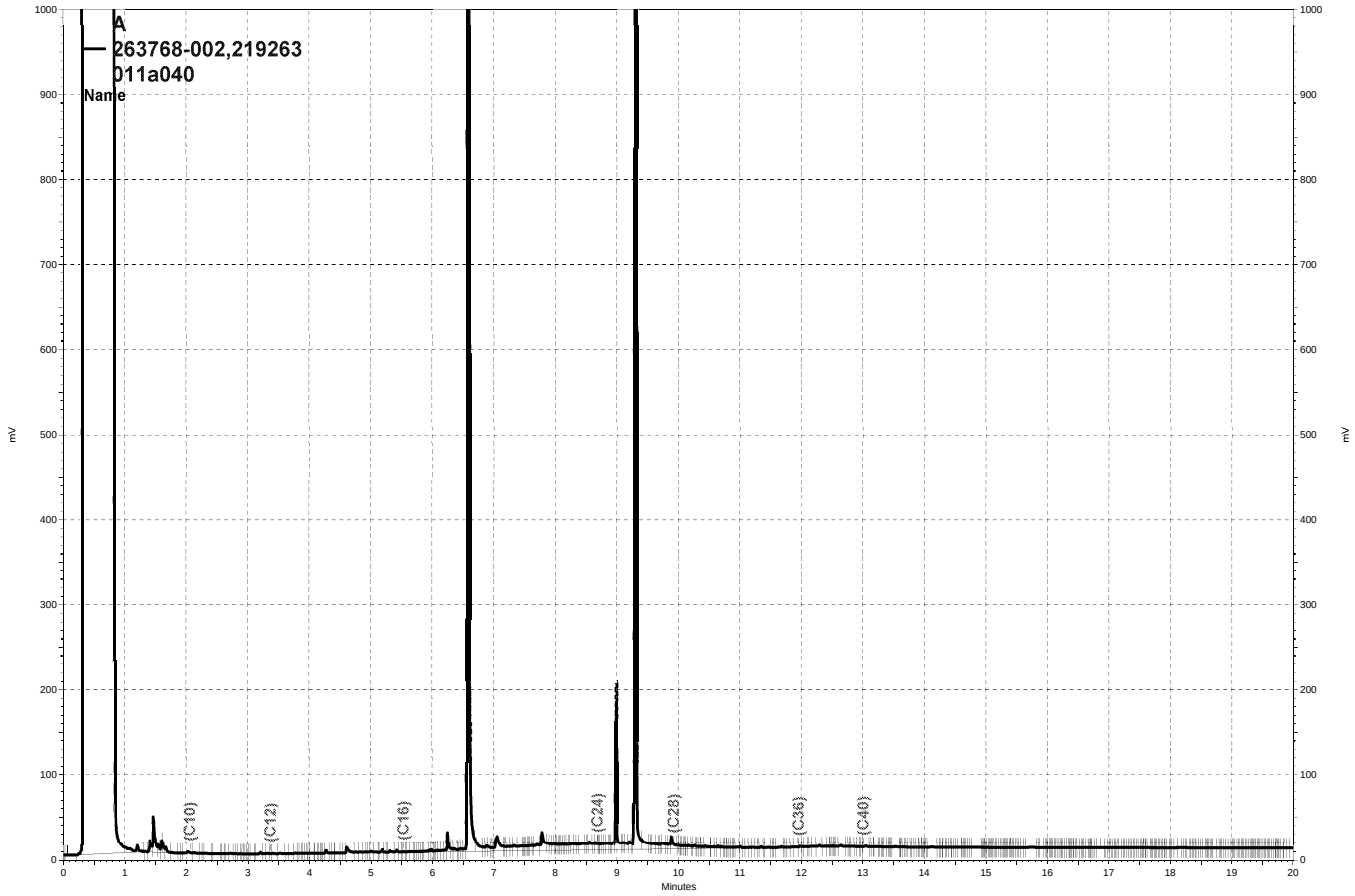
Surrogate	%REC	Limits
o-Terphenyl	99	66-129
o-Terphenyl (SGCU)	111	66-129

Type: BSD Cleanup Method: EPA 3630C
Lab ID: QC772702

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	2,276	91	61-120	6	45
Diesel C10-C24 (SGCU)	2,500	2,273	91	61-120	6	45

Surrogate	%REC	Limits
o-Terphenyl	103	66-129
o-Terphenyl (SGCU)	103	66-129

RPD= Relative Percent Difference
SGCU= Silica gel cleanup



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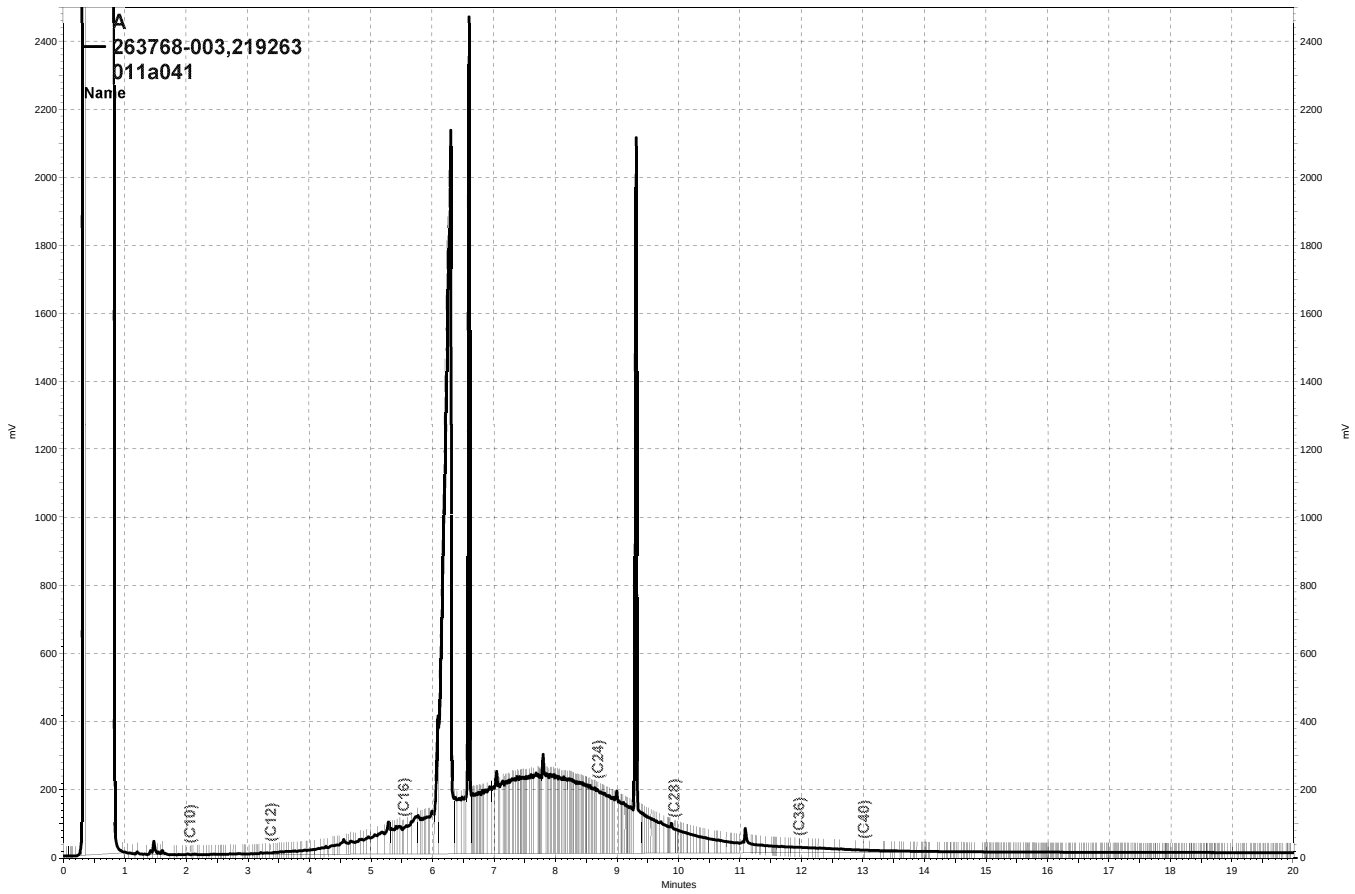

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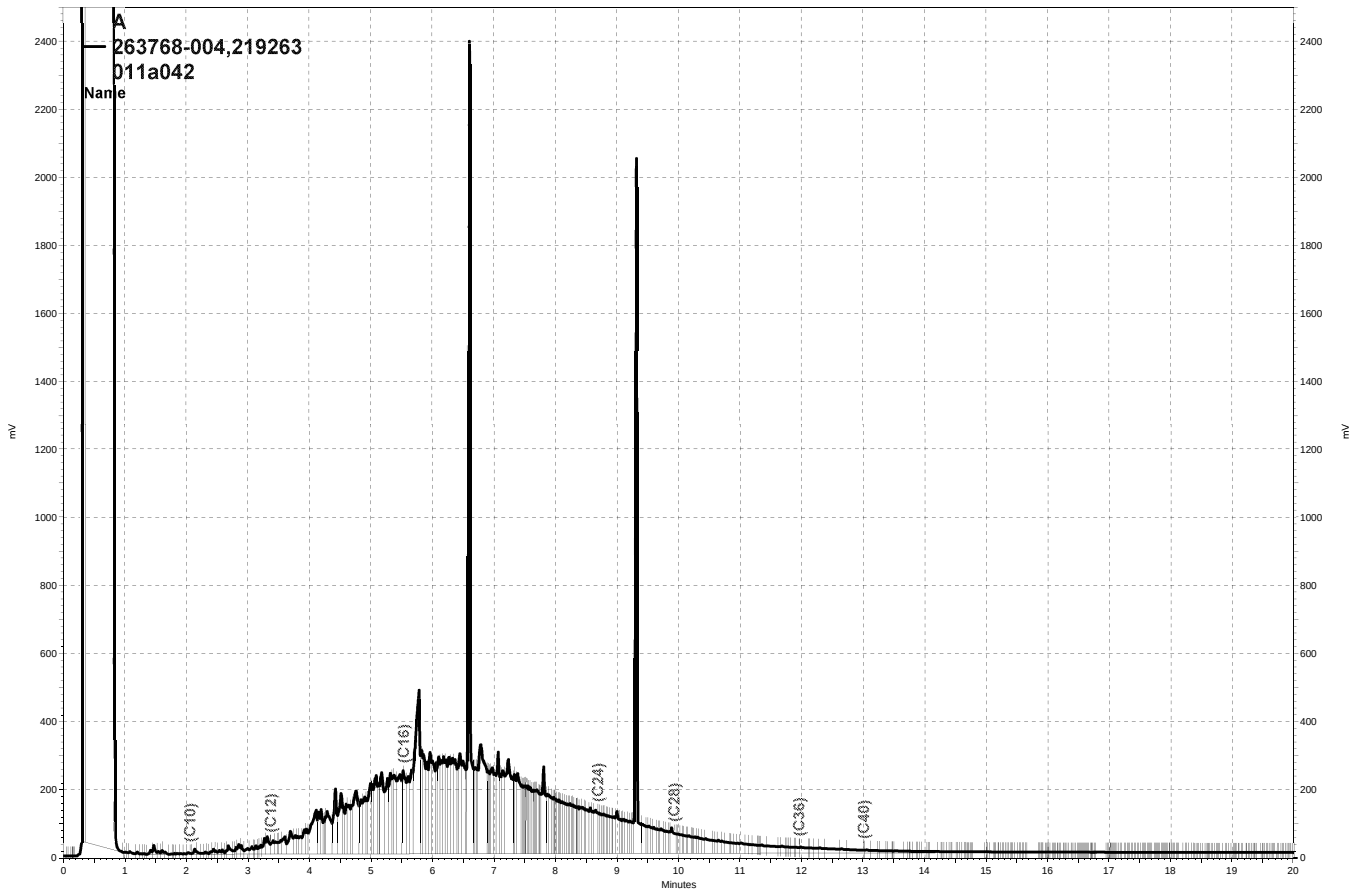

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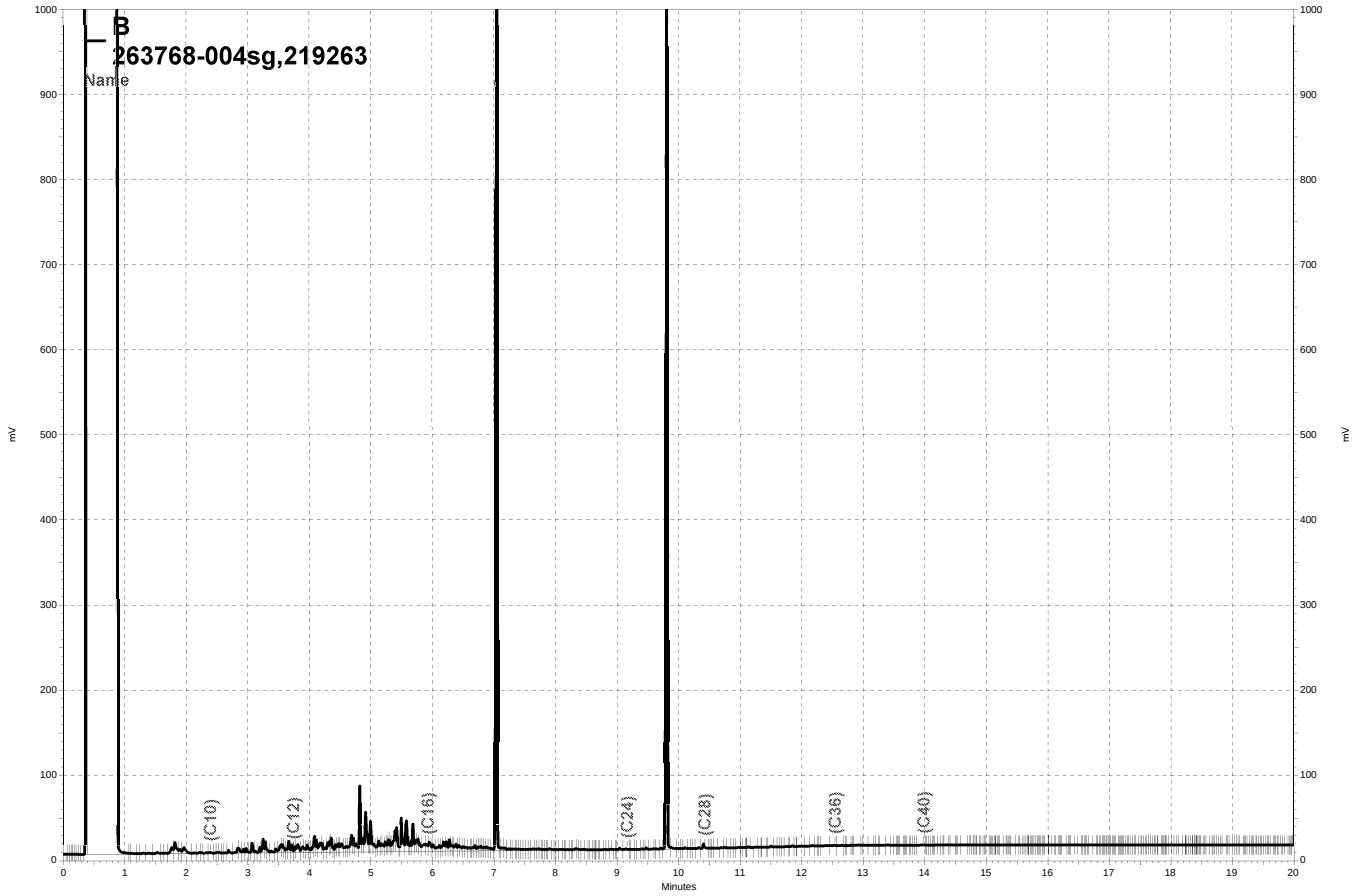

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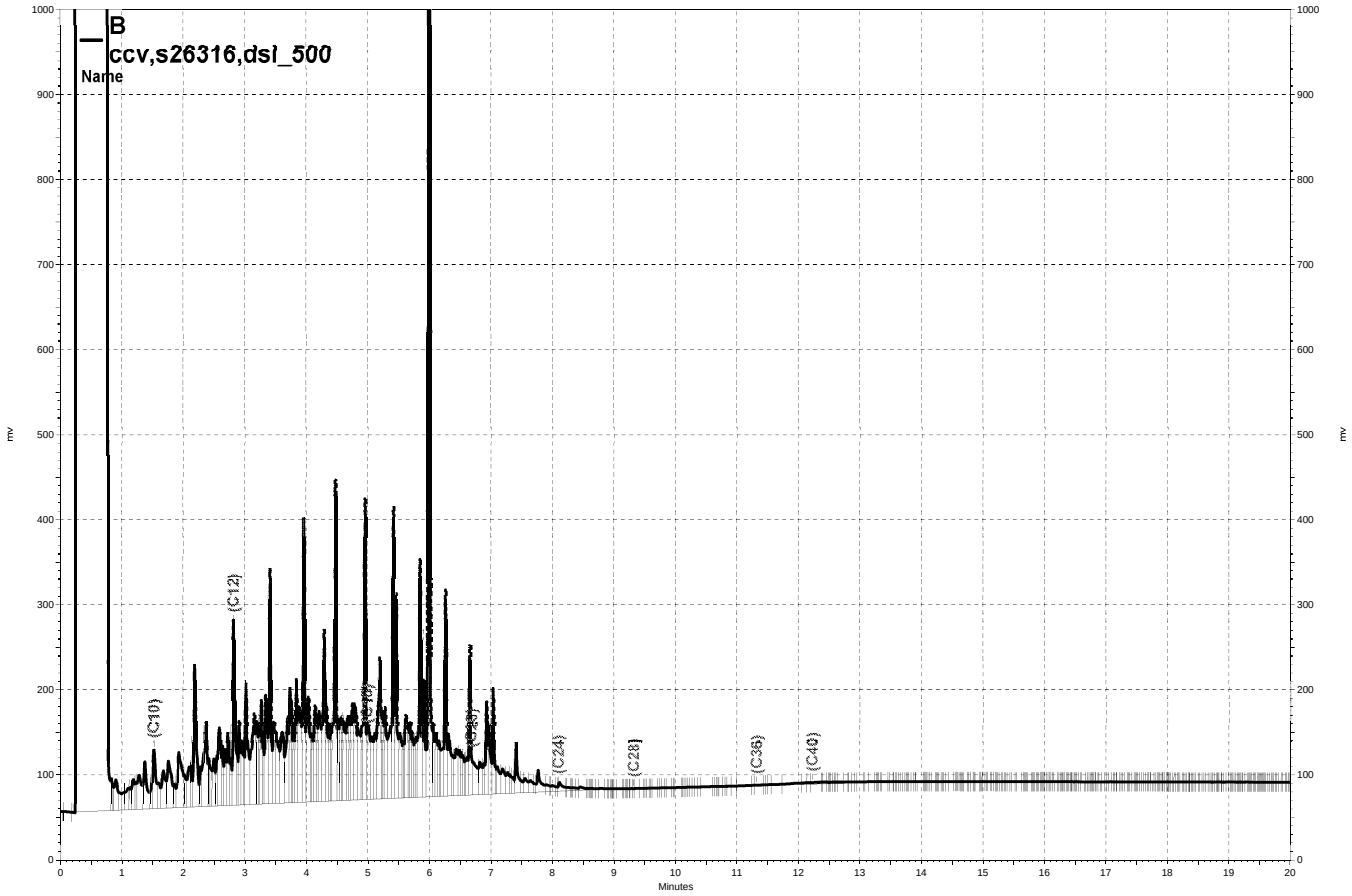

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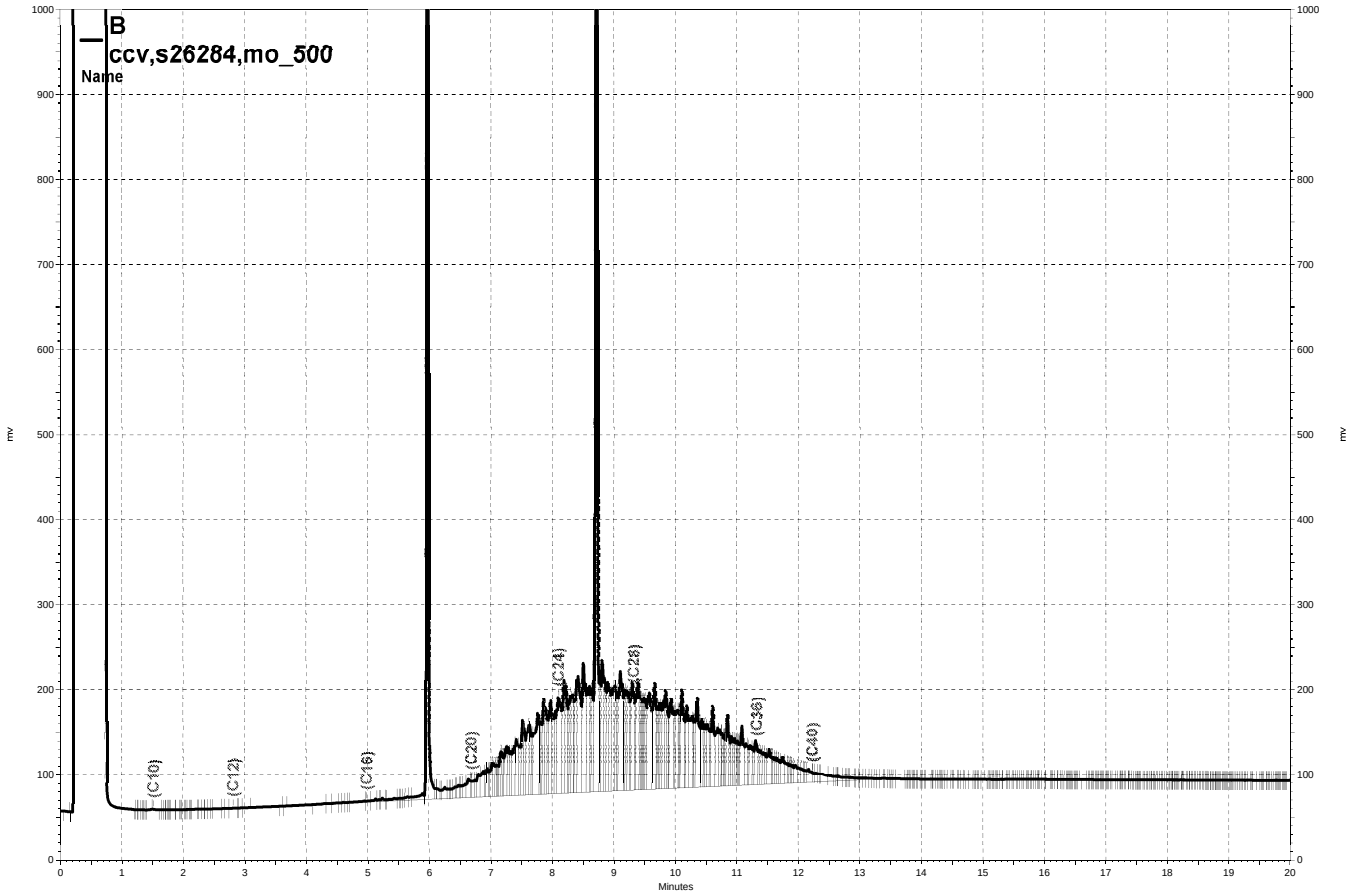

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Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8260B
Field ID:	QCTB-2	Batch#:	219250
Lab ID:	263768-001	Sampled:	01/08/15
Matrix:	Water	Received:	01/08/15
Units:	ug/L	Analyzed:	01/09/15
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	102	77-136
1,2-Dichloroethane-d4	116	75-139
Toluene-d8	106	80-120
Bromofluorobenzene	91	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8260B
Field ID:	MW-2	Batch#:	219250
Lab ID:	263768-002	Sampled:	01/08/15
Matrix:	Water	Received:	01/08/15
Units:	ug/L	Analyzed:	01/09/15
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	101	77-136
1,2-Dichloroethane-d4	119	75-139
Toluene-d8	106	80-120
Bromofluorobenzene	90	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8260B
Field ID:	MW-11	Batch#:	219250
Lab ID:	263768-003	Sampled:	01/08/15
Matrix:	Water	Received:	01/08/15
Units:	ug/L	Analyzed:	01/09/15
Diln Fac:	5.000		

Analyte	Result	RL
MTBE	ND	2.5
Benzene	ND	2.5
Toluene	ND	2.5
Ethylbenzene	ND	2.5
m,p-Xylenes	ND	2.5
o-Xylene	ND	2.5

Surrogate	%REC	Limits
Dibromofluoromethane	101	77-136
1,2-Dichloroethane-d4	119	75-139
Toluene-d8	105	80-120
Bromofluorobenzene	91	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8260B
Field ID:	MW-12	Batch#:	219250
Lab ID:	263768-004	Sampled:	01/08/15
Matrix:	Water	Received:	01/08/15
Units:	ug/L	Analyzed:	01/09/15
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	4.3	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	103	77-136
1,2-Dichloroethane-d4	118	75-139
Toluene-d8	106	80-120
Bromofluorobenzene	90	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC772650	Batch#:	219250
Matrix:	Water	Analyzed:	01/09/15
Units:	ug/L		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	100	77-136
1,2-Dichloroethane-d4	117	75-139
Toluene-d8	105	80-120
Bromofluorobenzene	90	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8260B
Field ID:	ZZZZZZZZZZ	Batch#:	219250
MSS Lab ID:	263708-001	Sampled:	01/05/15
Matrix:	Water	Received:	01/06/15
Units:	ug/L	Analyzed:	01/09/15
Diln Fac:	4.000		

Type: MS Lab ID: QC772722

Analyte	MSS Result	Spiked	Result	%REC	Limits
MTBE	<0.4000	50.00	42.16	84	66-120
Benzene	<0.4000	50.00	49.52	99	80-127
Toluene	<0.4000	50.00	51.75	103	80-123
Ethylbenzene	<0.4495	50.00	50.31	101	80-126
m,p-Xylenes	<0.4000	100.0	106.2	106	80-123
o-Xylene	<0.4000	50.00	46.96	94	76-120

Surrogate	%REC	Limits
Dibromofluoromethane	104	77-136
1,2-Dichloroethane-d4	119	75-139
Toluene-d8	103	80-120
Bromofluorobenzene	86	80-120

Type: MSD Lab ID: QC772723

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	50.00	41.54	83	66-120	1	27
Benzene	50.00	47.42	95	80-127	4	23
Toluene	50.00	49.90	100	80-123	4	22
Ethylbenzene	50.00	47.71	95	80-126	5	22
m,p-Xylenes	100.0	100.2	100	80-123	6	22
o-Xylene	50.00	44.04	88	76-120	6	23

Surrogate	%REC	Limits
Dibromofluoromethane	101	77-136
1,2-Dichloroethane-d4	119	75-139
Toluene-d8	105	80-120
Bromofluorobenzene	86	80-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	EPA 5030B
Project#:	04656016.0000	Analysis:	EPA 8260B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC773073	Batch#:	219250
Matrix:	Water	Analyzed:	01/09/15
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
MTBE	12.50	10.32	83	64-121
Benzene	12.50	11.45	92	80-124
Toluene	12.50	12.55	100	80-122
Ethylbenzene	12.50	12.05	96	80-124
m,p-Xylenes	25.00	25.92	104	80-122
o-Xylene	12.50	11.08	89	77-120

Surrogate	%REC	Limits
Dibromofluoromethane	102	77-136
1,2-Dichloroethane-d4	117	75-139
Toluene-d8	106	80-120
Bromofluorobenzene	85	80-120

Curtis & Tompkins, Ltd.

Dissolved Iron

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 6010B
Analyte:	Iron	Sampled:	01/08/15
Matrix:	Filtrate	Received:	01/08/15
Units:	ug/L	Prepared:	01/13/15
Batch#:	219383		

Field ID	Type	Lab ID	Result	RL	Diln Fac	Analyzed
MW-2	SAMPLE	263768-002	ND	100	1.000	01/15/15
MW-11	SAMPLE	263768-003	1,700	1,000	10.00	01/14/15
MW-12	SAMPLE	263768-004	940	100	1.000	01/15/15
	BLANK	QC773201	ND	100	1.000	01/14/15

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Dissolved Manganese

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 6010B
Analyte:	Manganese	Sampled:	01/08/15
Matrix:	Filtrate	Received:	01/08/15
Units:	ug/L	Prepared:	01/13/15
Batch#:	219383		

Field ID	Type	Lab ID	Result	RL	Diln Fac	Analyzed
MW-2	SAMPLE	263768-002	34	5.0	1.000	01/15/15
MW-11	SAMPLE	263768-003	330	50	10.00	01/14/15
MW-12	SAMPLE	263768-004	1,400	5.0	1.000	01/15/15
	BLANK	QC773201	ND	5.0	1.000	01/14/15

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Dissolved Iron

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 6010B
Analyte:	Iron	Diln Fac:	1.000
Field ID:	ZZZZZZZZZZ	Batch#:	219383
Matrix:	Filtrate	Prepared:	01/13/15
Units:	ug/L	Analyzed:	01/14/15

Type	MSS Lab ID	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Sampled	Received
BS		QC773202		10,000	10,370	104	79-120				
BSD		QC773203		10,000	10,360	104	79-120	0	21		
MS	263745-001	QC773204	17.51	10,000	10,210	102	66-127			01/07/15	01/07/15
MSD	263745-001	QC773205		10,000	10,340	103	66-127	1	21	01/07/15	01/07/15
MS	263774-002	QC773206	<5.983	10,000	9,861	99	66-127			01/08/15	01/08/15
MSD	263774-002	QC773207		10,000	9,962	100	66-127	1	21	01/08/15	01/08/15

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Dissolved Manganese

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 6010B
Analyte:	Manganese	Diln Fac:	1.000
Field ID:	ZZZZZZZZZZ	Batch#:	219383
Matrix:	Filtrate	Prepared:	01/13/15
Units:	ug/L	Analyzed:	01/14/15

Type	MSS Lab ID	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim	Sampled	Received
BS		QC773202		100.0	101.9	102	80-120				
BSD		QC773203		100.0	101.7	102	80-120	0	20		
MS	263745-001	QC773204	<1.000	100.0	103.0	103	70-128			01/07/15	01/07/15
MSD	263745-001	QC773205		100.0	104.9	105	70-128	2	20	01/07/15	01/07/15
MS	263774-002	QC773206	1.864	100.0	97.79	96	70-128			01/08/15	01/08/15
MSD	263774-002	QC773207		100.0	99.24	97	70-128	1	20	01/08/15	01/08/15

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Dissolved Metals Analytical Report

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 200.7
Matrix:	Filtrate	Sampled:	01/08/15
Units:	ug/L	Received:	01/08/15
Batch#:	219383	Prepared:	01/13/15

Field ID: MW-2 Lab ID: 263768-002
Type: SAMPLE

Analyte	Result	RL	Diln Fac	Analyzed
Calcium	32,000	500	1.000	01/15/15
Magnesium	33,000	500	1.000	01/15/15
Potassium	1,000	500	1.000	01/15/15
Sodium	150,000	5,000	10.00	01/14/15

Field ID: MW-11 Lab ID: 263768-003
Type: SAMPLE

Analyte	Result	RL	Diln Fac	Analyzed
Calcium	27,000	4,000	10.00	01/14/15
Magnesium	55,000	4,000	10.00	01/14/15
Potassium	46,000	5,000	10.00	01/14/15
Sodium	970,000	500,000	1,000	01/15/15

Field ID: MW-12 Lab ID: 263768-004
Type: SAMPLE

Analyte	Result	RL	Diln Fac	Analyzed
Calcium	90,000	500	1.000	01/15/15
Magnesium	41,000	500	1.000	01/15/15
Potassium	15,000	500	1.000	01/15/15
Sodium	160,000	5,000	10.00	01/14/15

Type: BLANK Diln Fac: 1.000
Lab ID: QC773201 Analyzed: 01/14/15

Analyte	Result	RL
Calcium	ND	500
Magnesium	ND	500
Potassium	ND	500
Sodium	ND	500

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Dissolved Metals Analytical Report

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 200.7
Matrix:	Filtrate	Batch#:	219383
Units:	ug/L	Prepared:	01/13/15
Diln Fac:	1.000	Analyzed:	01/14/15

Type: BS Lab ID: QC773202

Analyte	Spiked	Result	%REC	Limits
Calcium	10,000	10,270	103	80-120
Magnesium	10,000	10,170	102	80-120
Potassium	10,000	9,605	96	77-120
Sodium	10,000	9,883	99	79-120

Type: BSD Lab ID: QC773203

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Calcium	10,000	10,270	103	80-120	0	20
Magnesium	10,000	10,160	102	80-120	0	20
Potassium	10,000	9,525	95	77-120	1	20
Sodium	10,000	9,841	98	79-120	0	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Dissolved Metals Analytical Report

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 200.7
Field ID:	ZZZZZZZZZZ	Batch#:	219383
MSS Lab ID:	263745-001	Sampled:	01/07/15
Matrix:	Filtrate	Received:	01/07/15
Units:	ug/L	Prepared:	01/13/15
Diln Fac:	1.000	Analyzed:	01/14/15

Type: MS Lab ID: QC773204

Analyte	MSS Result	Spiked	Result	%REC	Limits
Calcium	29,640	10,000	38,780	91	67-126
Magnesium	14,790	10,000	24,240	94	71-120
Potassium	1,438	10,000	10,770	93	71-126
Sodium	14,800	10,000	24,050	93	66-127

Type: MSD Lab ID: QC773205

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Calcium	10,000	38,920	93	67-126	0	20
Magnesium	10,000	24,410	96	71-120	1	20
Potassium	10,000	10,830	94	71-126	1	20
Sodium	10,000	24,160	94	66-127	0	28

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Dissolved Metals Analytical Report

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 200.7
Field ID:	ZZZZZZZZZZ	Batch#:	219383
MSS Lab ID:	263774-002	Sampled:	01/08/15
Matrix:	Filtrate	Received:	01/08/15
Units:	ug/L	Prepared:	01/13/15
Diln Fac:	1.000	Analyzed:	01/14/15

Type: MS Lab ID: QC773206

Analyte	MSS Result	Spiked	Result	%REC	Limits
Calcium	24,190	10,000	33,380	92	67-126
Magnesium	8,447	10,000	17,950	95	71-120
Potassium	1,659	10,000	10,810	91	71-126
Sodium	14,220	10,000	23,290	91	66-127

Type: MSD Lab ID: QC773207

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Calcium	10,000	33,410	92	67-126	0	20
Magnesium	10,000	18,010	96	71-120	0	20
Potassium	10,000	10,850	92	71-126	0	20
Sodium	10,000	23,150	89	66-127	1	28

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Curtis & Tompkins Laboratories Analytical Report

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 300.0
Matrix:	Water	Batch#:	219211
Units:	mg/L	Received:	01/08/15

Field ID: MW-2 Lab ID: 263768-002
Type: SAMPLE Sampled: 01/08/15 11:20

Analyte	Result	RL	Diln Fac	Analyzed
Chloride	9.8	0.40	2.000	01/08/15 19:36
Nitrogen, Nitrite	ND	0.05	1.000	01/08/15 15:31
Nitrogen, Nitrate	ND	0.05	1.000	01/08/15 15:31
Sulfate	32	0.50	1.000	01/08/15 15:31

Field ID: MW-11 Lab ID: 263768-003
Type: SAMPLE Sampled: 01/08/15 12:50

Analyte	Result	RL	Diln Fac	Analyzed
Chloride	980	10	50.00	01/08/15 19:53
Nitrogen, Nitrite	ND	0.25	5.000	01/08/15 16:06
Nitrogen, Nitrate	ND	0.25	5.000	01/08/15 16:06
Sulfate	ND	2.5	5.000	01/08/15 16:06

Field ID: MW-12 Lab ID: 263768-004
Type: SAMPLE Sampled: 01/08/15 13:51

Analyte	Result	RL	Diln Fac	Analyzed
Chloride	140	2.0	10.00	01/08/15 20:11
Nitrogen, Nitrite	ND	0.05	1.000	01/08/15 16:41
Nitrogen, Nitrate	ND	0.05	1.000	01/08/15 16:41
Sulfate	0.51	0.50	1.000	01/08/15 16:41

Type: BLANK Diln Fac: 1.000
Lab ID: QC772493 Analyzed: 01/08/15 10:18

Analyte	Result	RL
Chloride	ND	0.20
Nitrogen, Nitrite	ND	0.05
Nitrogen, Nitrate	ND	0.05
Sulfate	ND	0.50

ND= Not Detected
RL= Reporting Limit

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 300.0
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC772494	Batch#:	219211
Matrix:	Water	Analyzed:	01/08/15 11:09
Units:	mg/L		

Analyte	Spiked	Result	%REC	Limits
Chloride	4.000	4.197	105	80-120
Nitrogen, Nitrite	1.000	1.012	101	80-120
Nitrogen, Nitrate	1.000	1.068	107	80-120
Sulfate	10.00	10.48	105	80-120

Curtis & Tompkins, Ltd.

Batch QC Report

Curtis & Tompkins Laboratories Analytical Report

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	EPA 300.0
Field ID:	ZZZZZZZZZZ	Diln Fac:	5.000
MSS Lab ID:	263774-001	Batch#:	219211
Matrix:	Water	Sampled:	01/08/15 09:10
Units:	mg/L	Received:	01/08/15

Type: MS Analyzed: 01/08/15 21:03
Lab ID: QC772609

Analyte	MSS Result	Spiked	Result	%REC	Limits
Chloride	7.864	10.00	17.62	98	75-120
Nitrogen, Nitrite	<0.01287	2.500	2.468	99	80-120
Nitrogen, Nitrate	3.062	2.500	5.598	101	80-120
Sulfate	10.26	25.00	39.62	117	79-120

Type: MSD Analyzed: 01/08/15 21:20
Lab ID: QC772610

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Chloride	10.00	17.63	98	75-120	0	20
Nitrogen, Nitrite	2.500	2.417	97	80-120	2	23
Nitrogen, Nitrate	2.500	5.558	100	80-120	1	20
Sulfate	25.00	35.06	99	79-120	12	20

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Alkalinity

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM2320B
Matrix:	Water	Sampled:	01/08/15
Units:	mg/L	Received:	01/08/15
Batch#:	219505	Analyzed:	01/17/15

Field ID: MW-2 Lab ID: 263768-002
Type: SAMPLE Diln Fac: 6.700

Analyte	Result	RL
Alkalinity, Bicarbonate	570	6.7
Alkalinity, Carbonate	ND	6.7
Alkalinity, Hydroxide	ND	6.7
Alkalinity, Total as CaCO3	570	6.7

Field ID: MW-11 Lab ID: 263768-003
Type: SAMPLE Diln Fac: 6.700

Analyte	Result	RL
Alkalinity, Bicarbonate	1,600	6.7
Alkalinity, Carbonate	ND	6.7
Alkalinity, Hydroxide	ND	6.7
Alkalinity, Total as CaCO3	1,600	6.7

Field ID: MW-12 Lab ID: 263768-004
Type: SAMPLE Diln Fac: 6.700

Analyte	Result	RL
Alkalinity, Bicarbonate	640	6.7
Alkalinity, Carbonate	ND	6.7
Alkalinity, Hydroxide	ND	6.7
Alkalinity, Total as CaCO3	640	6.7

Type: BLANK Diln Fac: 1.000
Lab ID: QC773676

Analyte	Result	RL
Alkalinity, Bicarbonate	ND	1.0
Alkalinity, Carbonate	ND	1.0
Alkalinity, Hydroxide	ND	1.0
Alkalinity, Total as CaCO3	ND	1.0

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Alkalinity

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM2320B
Analyte:	Alkalinity, Total as CaCO3	Units:	mg/L
Type:	LCS	Diln Fac:	4.000
Lab ID:	QC773677	Batch#:	219505
Matrix:	Water	Analyzed:	01/17/15

Spiked	Result	%REC	Limits
200.0	204.0	102	90-110

Curtis & Tompkins, Ltd.

Batch QC Report

Alkalinity

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM2320B
Analyte:	Alkalinity, Total as CaCO3	Diln Fac:	10.00
Field ID:	ZZZZZZZZZZ	Batch#:	219505
MSS Lab ID:	263774-001	Sampled:	01/08/15
Matrix:	Water	Received:	01/08/15
Units:	mg/L	Analyzed:	01/17/15

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
MS	QC773678	103.5	500.0	607.0	101	80-120		
MSD	QC773679		500.0	628.0	105	80-120	3	25

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Dissolved Sulfide

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM4500S2-D
Analyte:	Dissolved Sulfide	Batch#:	219243
Matrix:	Water	Sampled:	01/08/15
Units:	mg/L	Received:	01/08/15
Diln Fac:	1.000	Analyzed:	01/09/15

Field ID	Type	Lab ID	Result	RL
MW-2	SAMPLE	263768-002	ND	0.04
MW-11	SAMPLE	263768-003	ND	0.04
MW-12	SAMPLE	263768-004	ND	0.04
	BLANK	QC772622	ND	0.04

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Dissolved Sulfide

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM4500S2-D
Analyte:	Dissolved Sulfide	Diln Fac:	1.000
Field ID:	ZZZZZZZZZZ	Batch#:	219243
MSS Lab ID:	263754-001	Sampled:	01/07/15
Matrix:	Water	Received:	01/08/15
Units:	mg/L	Analyzed:	01/09/15

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
MS	QC772623	0.04010	0.7470	0.6692	84	57-131		
MSD	QC772624		0.7470	0.6724	85	57-131	0	21
LCS	QC772625		0.7470	0.7165	96	80-120		

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Orthophosphate Phosphorous

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM4500P-E
Analyte:	Orthophosphate (as P)	Received:	01/08/15
Matrix:	Water	Prepared:	01/09/15 10:50
Units:	mg/L	Analyzed:	01/09/15 11:13
Batch#:	219254		

Field ID	Type	Lab ID	Result	RL	Diln Fac	Sampled
MW-2	SAMPLE	263768-002	0.12	0.030	1.000	01/08/15 11:20
MW-11	SAMPLE	263768-003	8.2	0.30	10.00	01/08/15 12:50
MW-12	SAMPLE	263768-004	0.58	0.030	1.000	01/08/15 13:51
	BLANK	QC772663	ND	0.030	1.000	

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Orthophosphate Phosphorous

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM4500P-E
Analyte:	Orthophosphate (as P)	Batch#:	219254
Field ID:	MW-2	Sampled:	01/08/15 11:20
MSS Lab ID:	263768-002	Received:	01/08/15
Matrix:	Water	Prepared:	01/09/15 10:50
Units:	mg/L	Analyzed:	01/09/15 11:13
Diln Fac:	1.000		

Type	Lab ID	MSS Result	Spiked	Result	%REC	Limits	RPD	Lim
MS	QC772664	0.1164	0.4000	0.5251	102	80-120		
MSD	QC772665		0.4000	0.5247	102	80-120	0	20
LCS	QC772666		0.4000	0.4080	102	80-120		

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Dissolved Solids (TDS)

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM2540C
Analyte:	Total Dissolved Solids	Sampled:	01/08/15
Matrix:	Water	Received:	01/08/15
Units:	mg/L	Prepared:	01/15/15
Batch#:	219435	Analyzed:	01/16/15

Field ID	Type	Lab ID	Result	RL	Diln Fac
MW-2	SAMPLE	263768-002	620	10	1.000
MW-11	SAMPLE	263768-003	3,340	20	2.000
MW-12	SAMPLE	263768-004	870	10	1.000
	BLANK	QC773412	ND	10	1.000

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Dissolved Solids (TDS)

Lab #:	263768	Location:	Port of Oakland-HFC
Client:	Arcadis	Prep:	METHOD
Project#:	04656016.0000	Analysis:	SM2540C
Analyte:	Total Dissolved Solids	Batch#:	219435
Field ID:	ZZZZZZZZZZ	Sampled:	01/08/15
Matrix:	Water	Received:	01/08/15
Units:	mg/L	Prepared:	01/15/15
Diln Fac:	1.000	Analyzed:	01/16/15

Type	MSS Lab ID	Lab ID	MSS Result	Spiked	Result	RL	%REC	Limits	RPD	Lim
LCS		QC773413		104.0	104.0		100	74-120		
SDUP	263774-001	QC773414	184.0		188.0	10.00			2	5
SDUP	263778-007	QC773415	322.0		320.0	10.00			1	5

RL= Reporting Limit
RPD= Relative Percent Difference

Appendix C

Free Product and Water Level Measurement Field Sheets

Depth to Water and Free Product Measurements
Harbor Facilities Complex
Port of Oakland, CA

	Site Visit Date:	January 6, 2015			
	Recorded By:	Stephen Penman (ESS, LLC)			
	Recovery Well	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	
	RW-1	Inaccessible			
12	RW-2	ND	8.78	0	11:13
4	RW-3	ND	9.81	Product on probe didn't register ~5" of product	10:25
5	RW-4	8.44	12.42	3.98	10:29
11	RW-5	cannot locate well			11:05
8	RW-6	8.84	10.12	1.28	10:41
7	RW-7	~~8.19~~ 8.19	8.81	0.62	10:36
9	RW-8	9.02	9.99	0.97	10:47
10	RW-9	9.65	10.49	0.84	10:54
16	MW-1	ND	9.90	0	13:02
3	MW-2	ND	10.70	0	10:21
6	MW-3	9.74	10.71	0.97	10:31
13	MW-4	ND	10.84	0	12:31
14	MW-5	ND	9.01	0	12:39
15	MW-8A	ND	10.00	0	12:55
18	MW-9	Blocked on 1/6/15 ND	10.97	0	1/7/15 @ 11:33 Not accessible on 1/6/15
17	MW-10	ND	9.70	0	13:22
1	MW-11	ND	9.50	0	10:12
2	MW-12	ND	10.68	0	10:16