PORT OF OAKLAND

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9:33 am, Jul 23, 2012

Alameda County
Environmental Health

July 19, 2012

Mr. Paresh Khatri
Hazardous Materials Specialist
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

RE: RO#0000010_2012 First Semi-Annual Groundwater Monitoring and Remediation System Operation and Maintenance Report - Port of Oakland, 651 Maritime Street, Oakland, CA_2012-07-19

Dear Mr. Khatri:

Please find enclosed the report entitled *2012 First Semi-Annual Groundwater Monitoring and Remediation System Operation and Maintenance Report - Port of Oakland, 651 Maritime Street, Oakland, CA ("Report")* dated July 2012, prepared by Malcolm Pirnie, Inc. ("Malcolm Pirnie") 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]

---

[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.

530 Water Street ■ Jack London Square ■ P.O. Box 2064 ■ Oakland, California 94604-2064
Telephone: (510) 627-1100 ■ Facsimile: (510) 627-1826 ■ Web Page: www.portofoakland.com

Mr. Paresh Khatri
Alameda County Health Care Services Agency

July 19, 2012

The Port has retained Malcolm Pirnie to perform groundwater monitoring and maintenance of the remediation system. Results of the first 2012 semi-annual sampling event are contained in the enclosed report. The next monitoring event will be performed during the November/December 2012 time frame. 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 Malcolm Pirnie 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 R. Jones
Supervisor
Environmental Programs and Planning

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

Enclosure: noted

Cc (w encl.): Michele Heffes
James McCarty (Baseline Environmental)

Cc (w/o encl.): Todd Miller (Malcolm Pirnie)
Yane Nordhav (Baseline Environmental)

Port of Oakland
530 Water Street • Oakland, CA 94607

2012 First Semi-Annual Groundwater Monitoring and Remediation System Operation and Maintenance Report

Port of Oakland
651 Maritime Street
Oakland, California

July 2012

Report Prepared By:

Malcolm Pirnie, Inc.

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4656016

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July 19, 2012

Mr. Jeffrey L. Rubin, CPSS REA
Associate Environmental Scientist
Port of Oakland
530 Water Street
Oakland, California 94607

Subject: **2012 First Semi-Annual Groundwater Monitoring and Remediation System Operation and Maintenance Report - Port of Oakland, 651 Maritime Street, Oakland, California**

Dear Mr. Rubin:

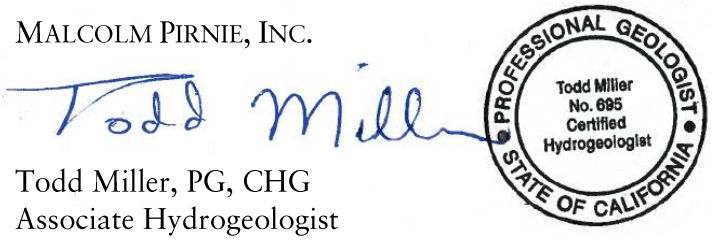
Enclosed please find the 2012 First Semi-Annual Groundwater Monitoring and Remediation System Operation and Maintenance Report for 651 Maritime Street (formerly 2277 and 2225 Seventh Street), Alameda County Local Oversight Program case number RO0000010. This report has been prepared for submittal to Alameda County Health Care Services, Department of Environmental Health (ACHCS) on behalf of the Port of Oakland (the Port) as required in ACHCS's letter to the Port dated March 23, 2006. The ACHCS requires semi-annual groundwater monitoring and reporting at the Site.

Malcolm Pirnie assumed responsibility for implementing the groundwater monitoring program and operation of the free product recovery system on May 1, 2009. The enclosed report documents the groundwater sampling event conducted at the subject site in June 2012 by Malcolm Pirnie and presents free product measurements collected since July 1, 2011.

Please call me at (510) 596-9695 or email me at tmiller@pirnie.com if you have questions.

Sincerely,

MALCOLM PIRNIE, INC.



Todd Miller, PG, CHG
Associate Hydrogeologist

Enclosure

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Acronyms Used in the Report

ACHCS	Alameda County Health Care Services
amsl	Above mean sea level
BTEX	Benzene, toluene, ethylbenzene, and total xylenes
C&T	Curtis & Tompkins, Ltd.
DO	Dissolved oxygen
FS/CAP	Feasibility Study/Corrective Action Plan
LOP	Local Oversight Program
MNA	Monitored natural attenuation
MSE	MSE Group
MTBE	Methyl tert-butyl ether
NESCO	National Environmental Service Company
O&M	Operation and Maintenance
ORC	Oxygen Releasing Compound™
ORP	Oxidation/reduction potential
PAHs	Polycyclic aromatic hydrocarbons
QA/QC	Quality assurance/quality control
RAMCON	RAMCON Engineering and Environmental Contracting
RPD	Relative percent difference
TPHd	Total petroleum hydrocarbons as diesel fuel
TPHg	Total petroleum hydrocarbons as gasoline
TPHmo	Total petroleum hydrocarbons as motor oil
Uribe	Uribe and Associates
USEPA	U.S. Environmental Protection Agency
UST	Underground storage tank
µg/L	Micrograms per liter

1. Introduction

This 2012 First Semi-Annual Groundwater Monitoring and Remediation System Operation and Maintenance Report (Report) for 651 Maritime Street, Oakland, California (Site)[1] has been prepared by Malcolm Pirnie on behalf of the Port of Oakland (Port). This Report includes the period from January through June 2012. The Alameda County Health Care Services (ACHCS) is providing regulatory oversight under the Local Oversight Program (LOP), case number RO0000010.

The Site encompasses an approximate 13-acre parcel, 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 Seventh Street and 2225 Seventh Street. A brief history of the two sites 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 tanks at the time of the removal and submitted them for laboratory analyses. The laboratory reported that soil contained total petroleum hydrocarbons as diesel fuel (TPHd) and 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 through MW-3) and 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 workplan 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 tanks in the cluster failed a tank integrity test in 1989. National Environmental Service Company (NESCO) removed the UST in March 1990. During the UST removal, NESCO collected soil and groundwater samples from the excavation. Analytical results indicated the presence of

[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.

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 tank). Soil samples collected from that excavation indicated the presence of TPHd, TPH as motor oil (TPHmo), benzene, xylenes, and polycyclic aromatic hydrocarbons (PAHs). A water sample collected from the excavation also contained TPHd. In 1993, RAMCON installed three groundwater monitoring wells (MW-1 through MW-3) at the site and in 1994 quarterly groundwater monitoring began, as required by the ACHCS.[2]

651 Maritime Site

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

Historic 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 was operated until 2003 when it was removed, with approval from the ACHCS.[3] The ACHCS approved the removal of the system with the stipulation that a new free product recovery system will be installed. A new system was installed in 2004.

In 1998, Harding Lawson Associates abandoned MW-8 to facilitate the 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 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.[4]

In 2006, the ACHCS approved a modification of the groundwater monitoring frequency from quarterly to semi-annually at the Site. The first semi-annual monitoring event

[2] Letter from ACHCS to Dongary Investments dated July 26, 1994.
[3] Letter from ACHCS to Port of Oakland dated March 27, 2003.
[4] February 2009, *Second Semi-Annual 2008 Groundwater Monitoring and Remediation System Operation and Maintenance Report*.

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 the groundwater at that location.[5]

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 is 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.[6] The wells were installed by MSE Group (MSE) and sampled in December 2008, along with the remaining Site wells. Well installation activities and sample results were reported by MSE in February 2009.[4]

[5] Letter from ACHCS to Port of Oakland dated March 23, 2006.
[6] Letter from Mr. Steven Plunkett (ACHCS) to Mr. Jeffrey Rubin (Port of Oakland) dated September 30, 2008.

2. Groundwater Sampling Activities

Malcolm Pirnie conducted the 2012 first semi-annual groundwater monitoring event at the Site on June 29, 2012. The June 2012 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 was measured to the nearest one-hundredth of a 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. 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 wells MW-3 and MW-1 (Table 1); hence, these wells were neither purged nor sampled. Water level measurements for the June 2012 monitoring event are summarized in Table 1 and included on the groundwater sampling forms in Appendix A.

Malcolm Pirnie purged wells 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. Malcolm Pirnie monitored field water quality parameters (including temperature, pH, oxidation/reduction potential (ORP), 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 June 2012 monitoring event is provided on groundwater sampling forms included in Appendix A.

After purging, Malcolm Pirnie collected groundwater samples directly into laboratory-supplied sample bottles using the peristaltic pump. Malcolm Pirnie collected a duplicate sample from monitoring well MW-4 (MW-4DUP). Following sample collection, each sample bottle was labeled with a 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. (C&T), a California-certified analytical laboratory, under appropriate chain-of-custody procedures for the following analyses:

- TPHg in accordance with U.S. 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.

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 non-petroleum-based organics that could potentially interfere with the analyses.

Under approval from the ACHCS, well MW-4 has historically been outfitted with ORC socks to increase the DO concentration in groundwater and stimulate aerobic biodegradation of the petroleum hydrocarbons. The ORC socks have historically been removed one-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 25 gallons of purge and decontamination water were generated during the June 2012 monitoring event. Malcolm Pirnie 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 first six months of 2012.

3.1. Groundwater Flow Direction

Based on the depth-to-water measurements collected, groundwater levels beneath the Site in June 2012 were slightly higher than those observed in September 2011. In September 2011, groundwater elevations ranged from 3.78 feet above mean sea level (amsl) to 6.09 feet amsl. In June 2012, groundwater elevations ranged from 3.95 feet amsl to 6.23 feet amsl. The groundwater flow direction was judged to range from the northeast to northwest. Groundwater gradients at the Site ranged from 0.003 to 0.021 feet per foot. A shallow groundwater elevation contour map for June 2012 is included as 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 wells MW-1 and MW-3 during the June 2012 monitoring event. The product thickness in MW-1 was not measurable with an interface probe, but product was observed on the interface probe after measuring the depth to water. Since April 2000, MW-1 has contained free-phase product ranging in thickness from not-measurable (a sheen) to 1.30 feet (Table 1). The product thickness in well MW-3 was measured to be 1.52 feet. Product thickness in this well has ranged from not-measurable to 2.70 feet since April 2000. .

3.3. Analytical Results

Analytical results for the groundwater samples collected during the June 2012 monitoring event are illustrated on Figure 5 and summarized in Table 2. The laboratory analytical reports are provided in Appendix B.

3.3.1. TPHg

The laboratory reported TPHg in the groundwater samples collected from wells MW-4, MW-9, MW-10, and MW-12 at concentrations ranging from 88 micrograms per liter (µg/L) to 330 µg/L. The laboratory also reported that chromatograms resulting from the TPHg analyses exhibited patterns that do not match the gasoline standard. Chromatograms are included in the laboratory reports in Appendix B.

Figure 6 illustrates the TPHg concentrations over 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 decreasing trend over time except for the concentrations reported in well MW-10, which is located near the edge of the free-product plume. TPHg concentrations reported during this sampling event are below the Site remedial goal of 3,700 µg/L.[7]

3.3.2. BTEX and MTBE

The laboratory reported benzene in the groundwater samples collected from wells MW-4 (19 µg/L), MW-9 (11 µg/L), and MW-10 (58 µg/L). Ethylbenzene was reported in the sample collected from well MW-10 at 2.9 µg/L. MTBE was reported in the sample collected from well MW-12 at 2.4 µg/L. Toluene and xylenes were reported to be below the analytical method reporting limit in the samples analyzed.

Figures 7 and 8 illustrate the benzene and MTBE concentrations over time for those wells where the 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). Figure 7 shows that except for well MW-10, benzene concentrations beneath the Site are stable and/or decreasing. The concentrations reported in well MW-10 show an increasing trend with time. The increase may be related to the location of the well relative to the free product plume. The reported concentration in MW-10 is above the Site remedial goal of 46 µg/L[7]. The remaining reported benzene concentrations are below the Site remedial goal. Figure 8 shows MTBE concentrations beneath the site are stable and/or decreasing, with reported concentrations below the Site remedial goal of 1,800 µg/L.[7]

3.3.3. TPHd and TPHmo

The laboratory reported TPHd in the groundwater samples collected from wells MW-9, MW-10, and MW-12 at concentrations ranging from 96 µg/L to 430 µg/L. The laboratory reported TPHmo concentrations below the analytical method reporting limit in the samples analyzed.

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

Figure 9 illustrates the TPHd concentrations over 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 contains free product). The graph shows TPHd concentrations beneath the Site are generally stable or decreasing. TPHd concentrations reported during this sampling event are below the Site remedial goal of 640 µg/L.

3.3.4. Monitored Natural Attenuation Parameters

In accordance with the *Feasibility Study/Corrective Action Plan* (FS/CAP),[7] samples were not analyzed for monitored natural attenuation (MNA) parameters during the June 2012 sampling event. Monitoring for MNA parameters will resume in 2013.

3.4. ORC Use

As described in Section 2, Malcolm Pirnie removed the ORC socks from well MW-4 on June 15, 2011. The socks were not replaced.

3.5. Quality Assurance / Quality Control

Malcolm Pirnie 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 19 µg/L and 20 µg/L. The relative percent difference (RPD) between the two samples is calculated below:

Benzene RPD |13-12|/ [(13+12)/2] = 5%

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

The laboratory prepared a trip blank using deionized water as a water quality control sample. The trip blank was stored in the coolers and accompanied groundwater samples from collection to transport to the laboratory. The trip blank was 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.

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

Based on the above QA/QC evaluation, Malcolm Pirnie considers the data collected during the June 2012 monitoring event reliable for its intended use.

4. Free Product Recovery System

On June 7, 2011, in accordance with the FS/CAP and the letter submitted to the Alameda County Health Care Services Agency on May 16, 2011, Malcolm Pirnie 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 were collected from monitoring and recovery wells on October 5, 2011, October 19, 2011, December 5, 2011, February 6, 2012, and June 20, 2012 to confirm stability of the free-phase product.

Free product and water level measurements for these dates are included in Table 4. Based on the measurements collected, the free-phase product plume appears stable. The observed area of free-phase product as assessed in June 2012 is illustrated on Figure 5. Field sheets documenting these measurements are provided in Appendix C.

5. Conclusions

The results of the June 2012 monitoring and free product recovery system operations and maintenance (O&M) tasks indicate that the free-phase product plume is stable, and groundwater concentrations are generally stable and/or decreasing (Figures 6 through 9). Remedial goals for the Site were derived following the RWQCB's Environmental Screening Level program and are based on: (1) dissolved constituents are not migrating off-Site at concentrations that would impact ecological receptors in the San Francisco Bay; and (2) groundwater beneath the Site is considered non-potable (TDS in well MW-11 exceeds 3,000 ppm) and risks are managed through implementation of institutional controls and deed restrictions. The historical data indicate that dissolved constituents of concern reported in monitoring wells beneath the Site other than MW-10, which is located in the immediate vicinity of the free product plume, are below their respective Site-specific remedial goals, signifying that active remediation of groundwater is not warranted.

Port of Oakland
530 Water Street • Oakland, CA 94607

Figures

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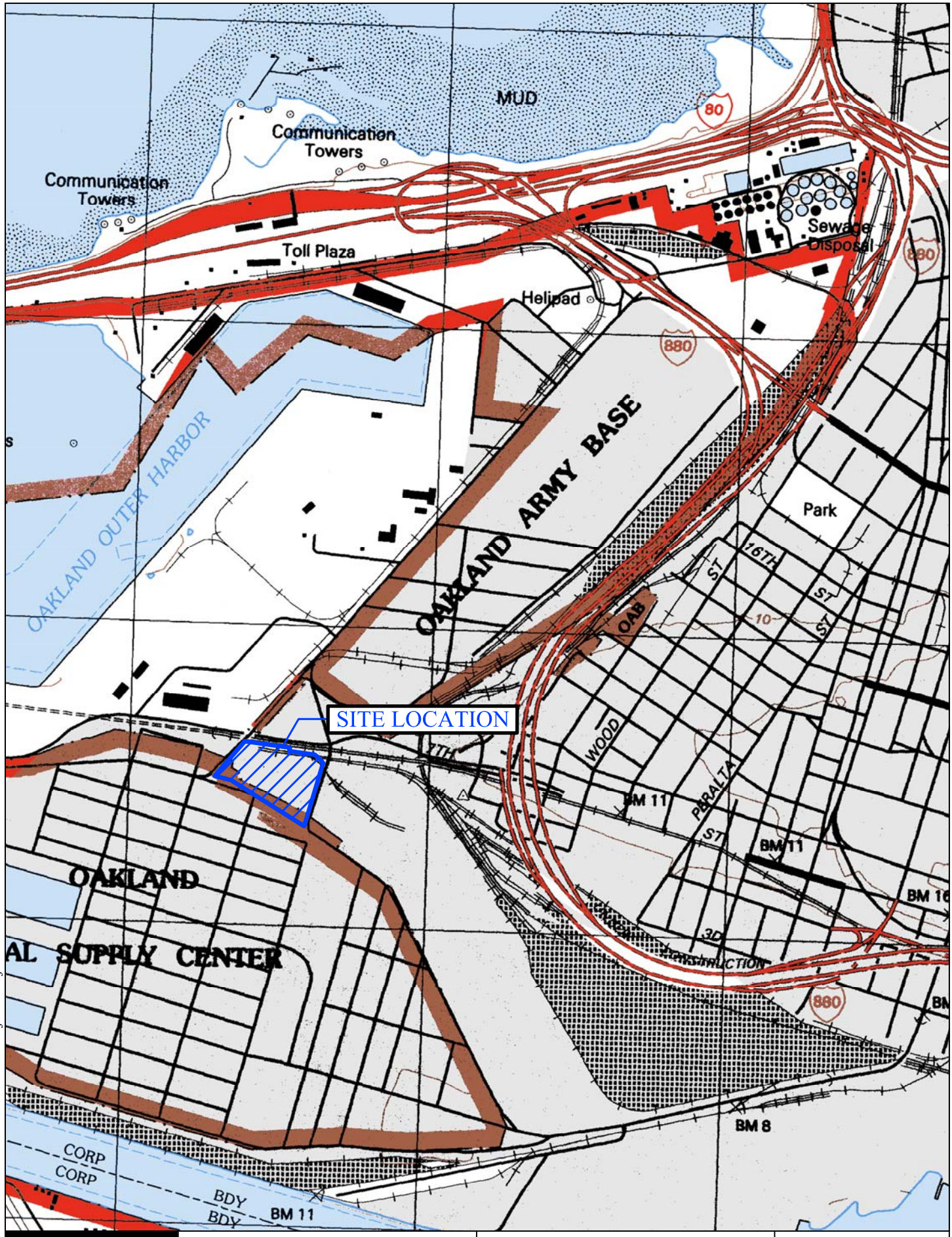
MALCOLM PIRNIE



MALCOLM PIRNIE

PORT OF OAKLAND
HARBOR FACILITIES
COMPLEX
651 MARITIME STREET

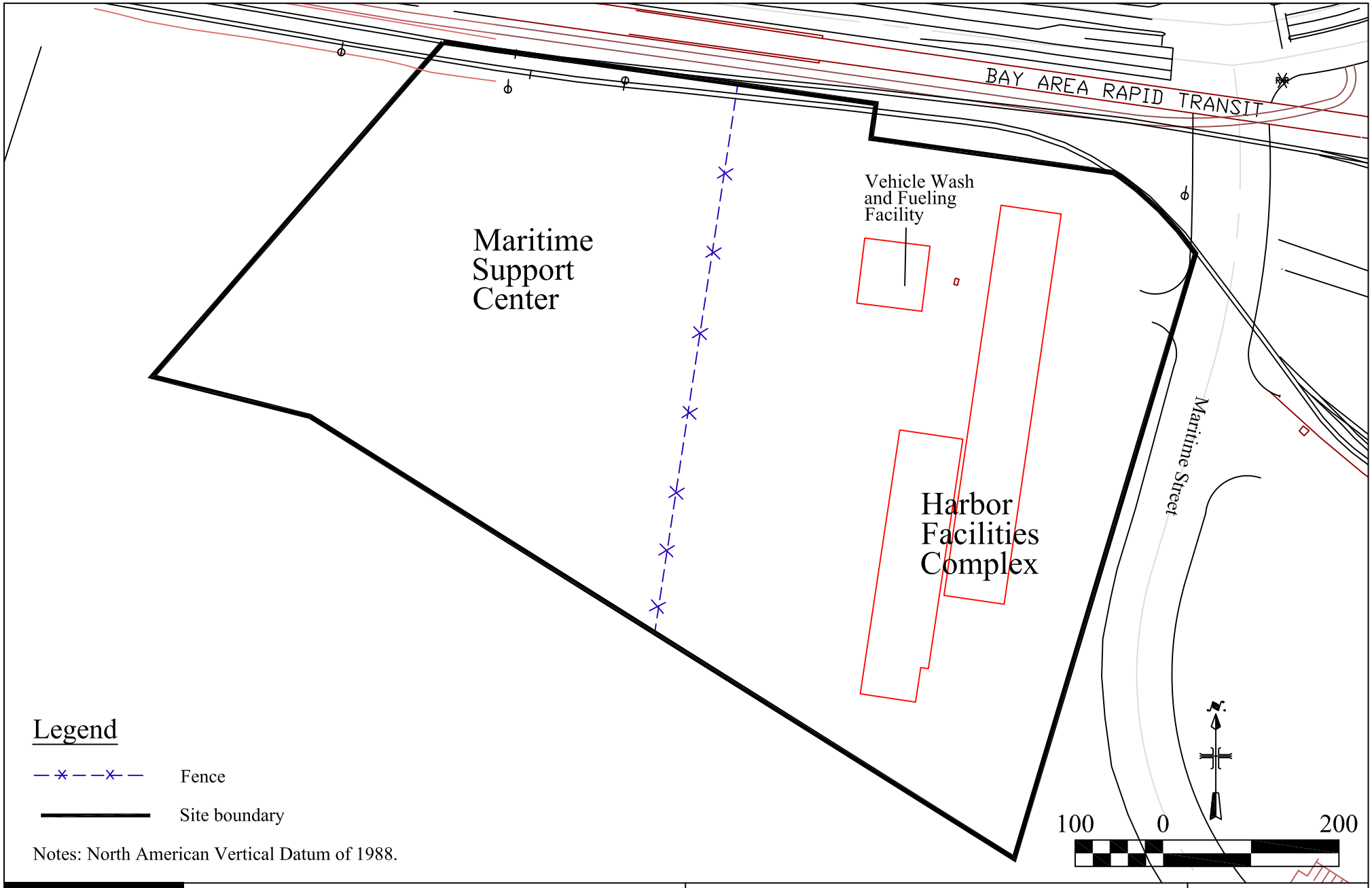
SITE LOCATION MAP

MALCOLM PIRNIE, INC.

JULY 2012

FIGURE 1

User:Orsi Spec:PIRNIE STANDARD File:G:\Projects\Projects\4656\016\acad\1st Semi 2012\FIGURES.DWG



MALCOLM PIRNIE

PORT OF OAKLAND

HARBOR FACILITIES COMPLEX
651 MARITIME STREET

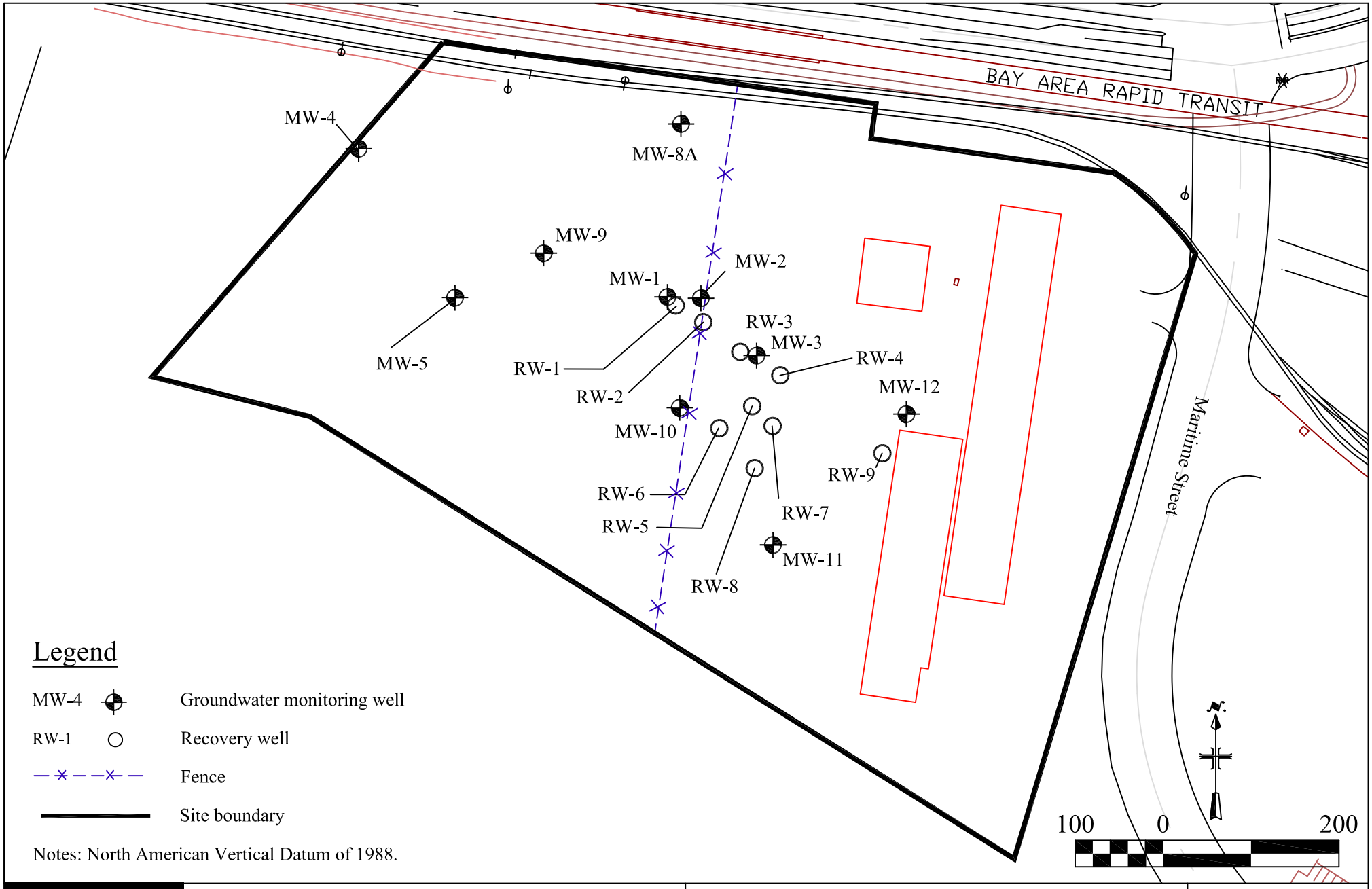
HARBOR FACILITIES COMPLEX LAYOUT

MALCOLM PIRNIE, INC.

JULY 2012

FIGURE 2

User:Orsi Spec:PIRNIE STANDARD File: G:\Projects\Projects\4656\016\acad\1st Semi 2012\FIGURES.DWG



MALCOLM PIRNIE

PORT OF OAKLAND

HARBOR FACILITIES COMPLEX
651 MARITIME STREET

SITE PLAN

MALCOLM PIRNIE, INC.

JULY 2012

FIGURE 3

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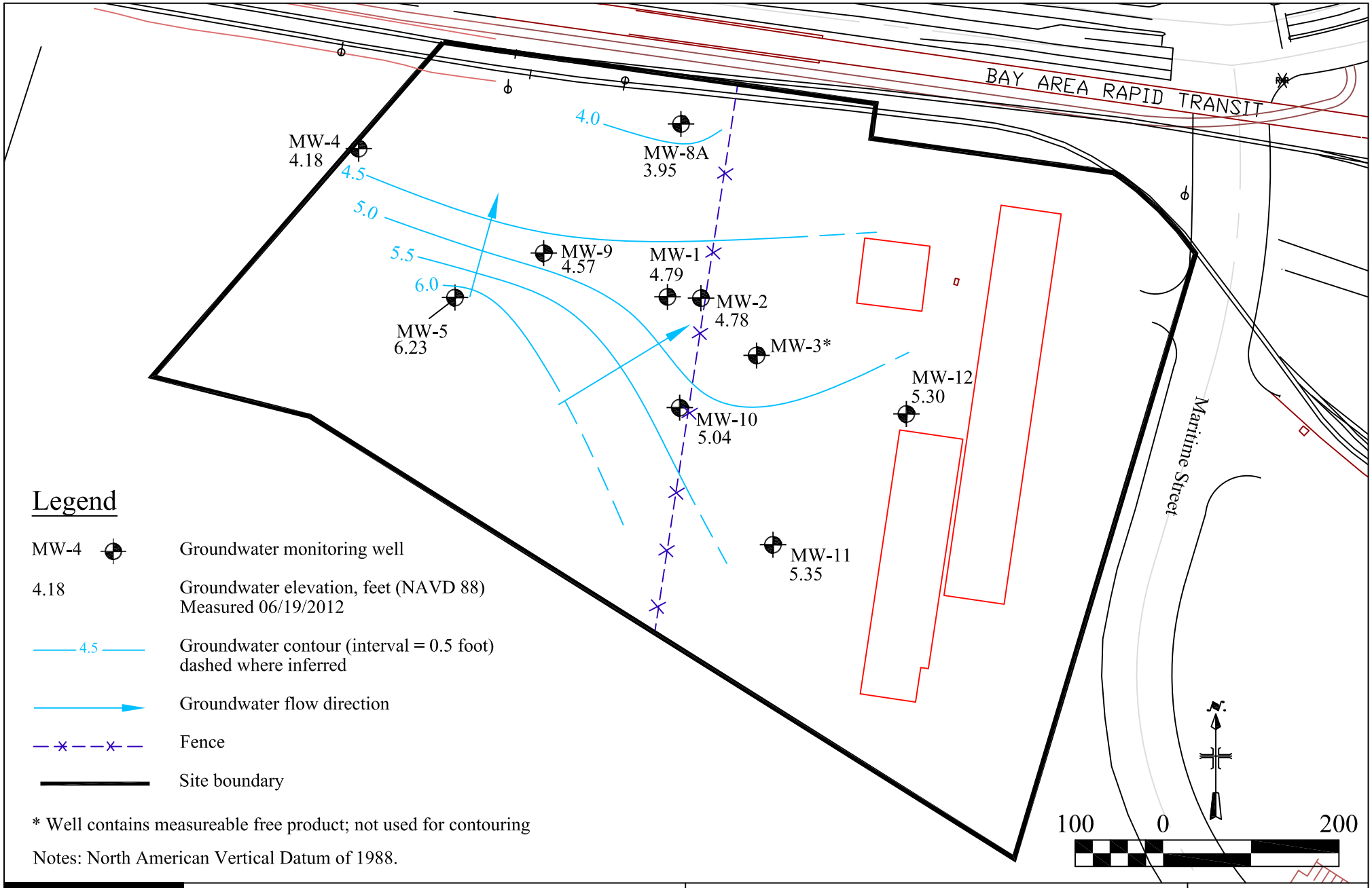

MALCOLM PIRNIE

PORT OF OAKLAND

HARBOR FACILITIES COMPLEX
651 MARITIME STREET

GROUNDWATER ELEVATION
ISOCONTOUR MAP - JUNE 2012

MALCOLM PIRNIE, INC.

JULY 2012

FIGURE 4

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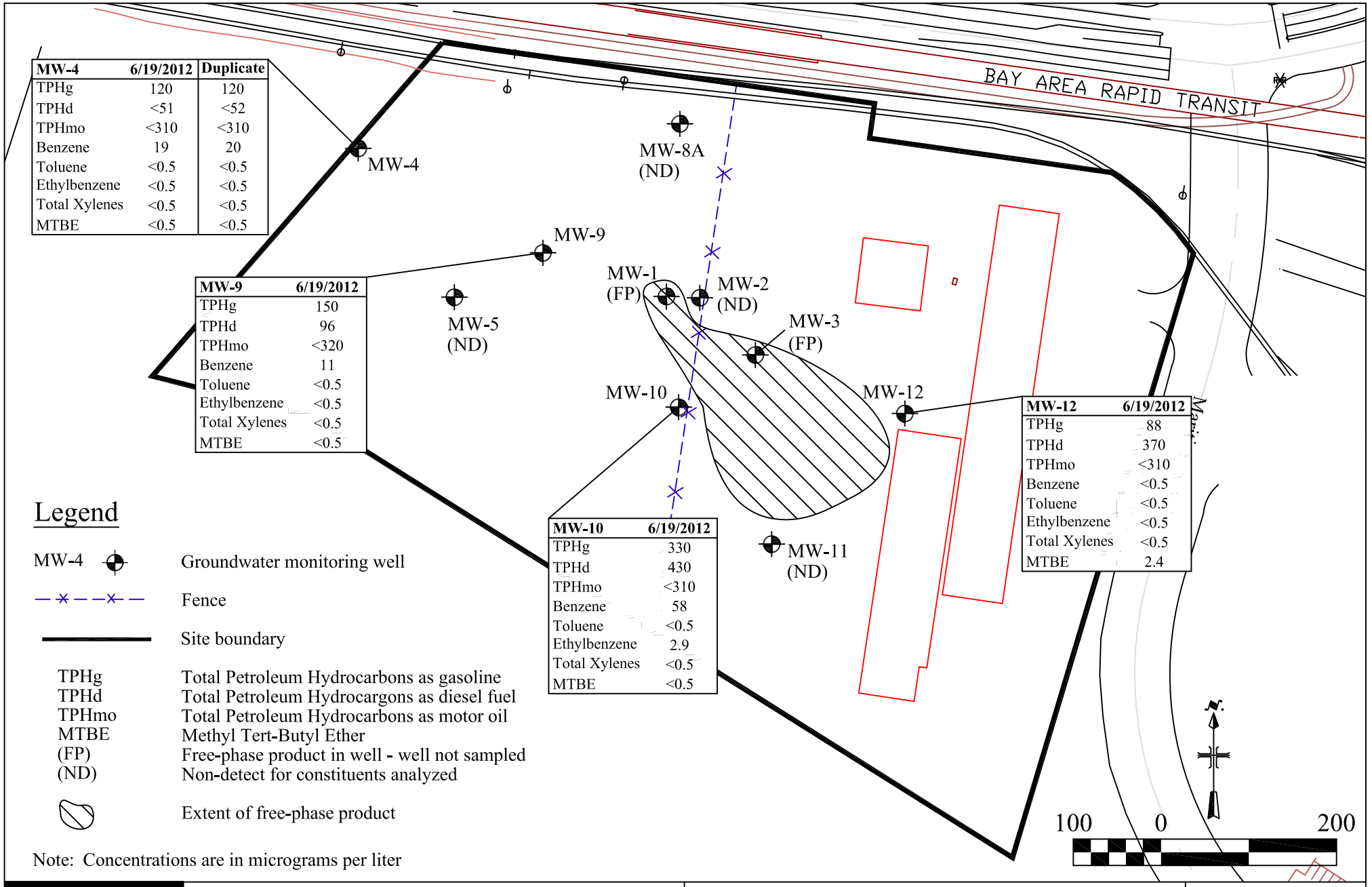

MW-4	6/19/2012	Duplicate
TPHg	120	120
TPHd	<51	<52
TPHmo	<310	<310
Benzene	19	20
Toluene	<0.5	<0.5
Ethylbenzene	<0.5	<0.5
Total Xylenes	<0.5	<0.5
MTBE	<0.5	<0.5

MW-9	6/19/2012
TPHg	150
TPHd	96
TPHmo	<320
Benzene	11
Toluene	<0.5
Ethylbenzene	<0.5
Total Xylenes	<0.5
MTBE	<0.5

MW-10	6/19/2012
TPHg	330
TPHd	430
TPHmo	<310
Benzene	58
Toluene	<0.5
Ethylbenzene	2.9
Total Xylenes	<0.5
MTBE	<0.5

MW-12	6/19/2012
TPHg	88
TPHd	370
TPHmo	<310
Benzene	<0.5
Toluene	<0.5
Ethylbenzene	<0.5
Total Xylenes	<0.5
MTBE	2.4

Legend

MW-4 — Groundwater monitoring well

Fence

Site boundary

TPHg — Total Petroleum Hydrocarbons as gasoline
TPHd — Total Petroleum Hydrocargons as diesel fuel
TPHmo — Total Petroleum Hydrocarbons as motor oil
MTBE — Methyl Tert-Butyl Ether
(FP) — Free-phase product in well - well not sampled
(ND) — Non-detect for constituents analyzed

Extent of free-phase product

Note: Concentrations are in micrograms per liter

MALCOLM PIRNIE

PORT OF OAKLAND

HARBOR FACILITIES COMPLEX
651 MARITIME STREET

SHALLOW GROUNDWATER
SAMPLE RESULTS - JUNE 2012

MALCOLM PIRNIE, INC.

JULY 2012

FIGURE 5

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Figure 6
TPHg Concentration versus Time

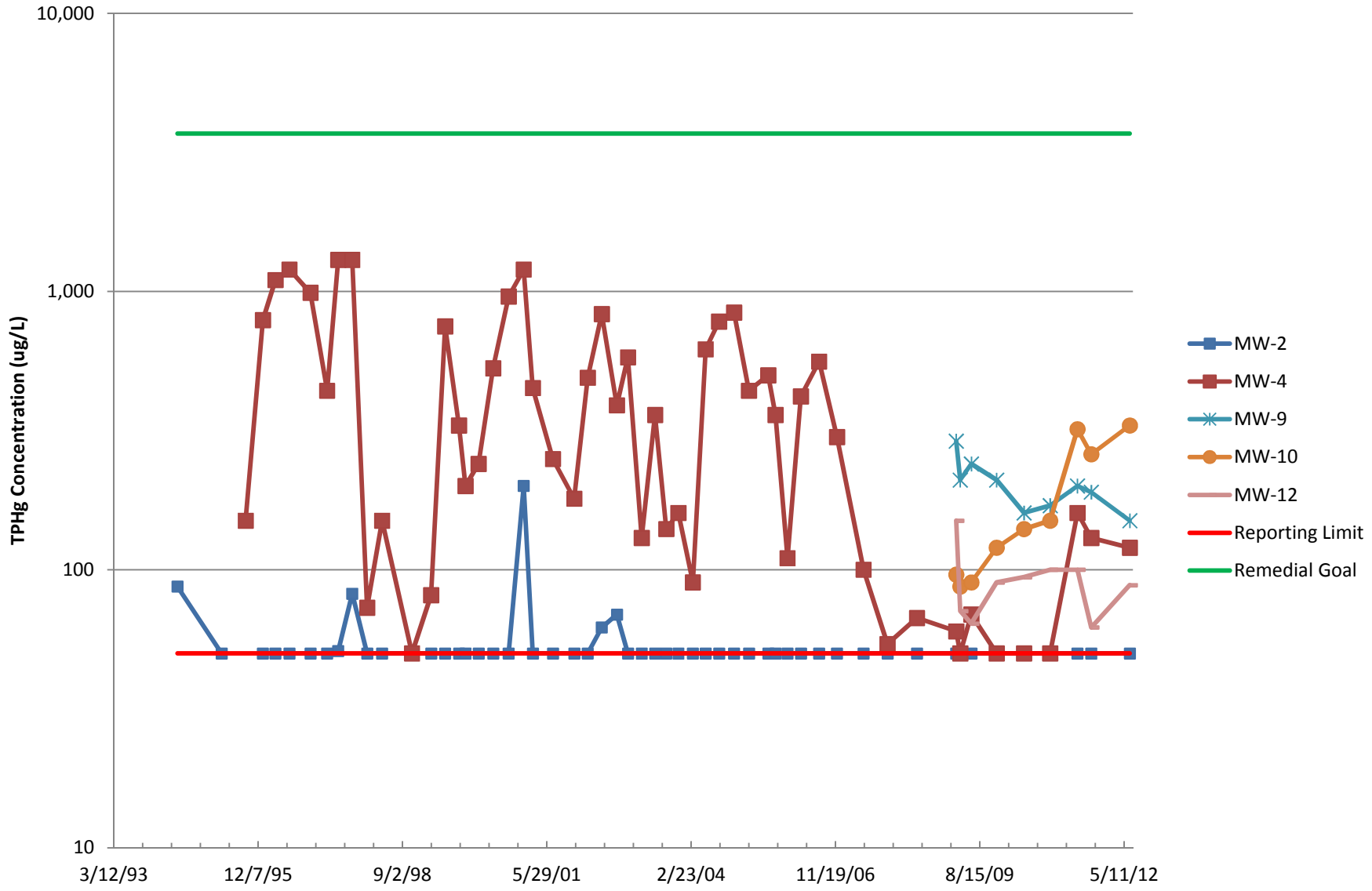


Figure 7
Benzene Concentration versus Time

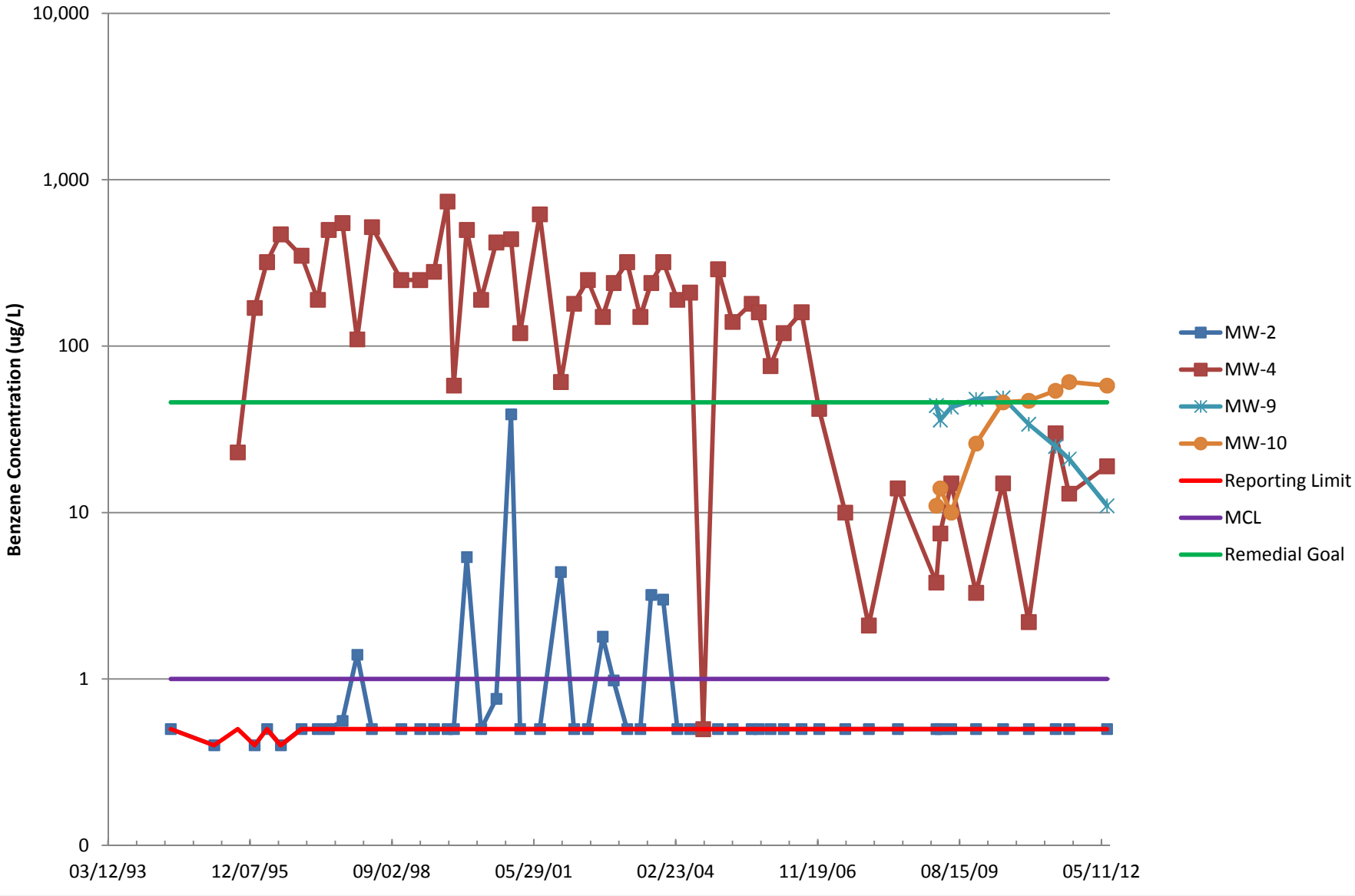


Figure 8
MTBE Concentration versus Time

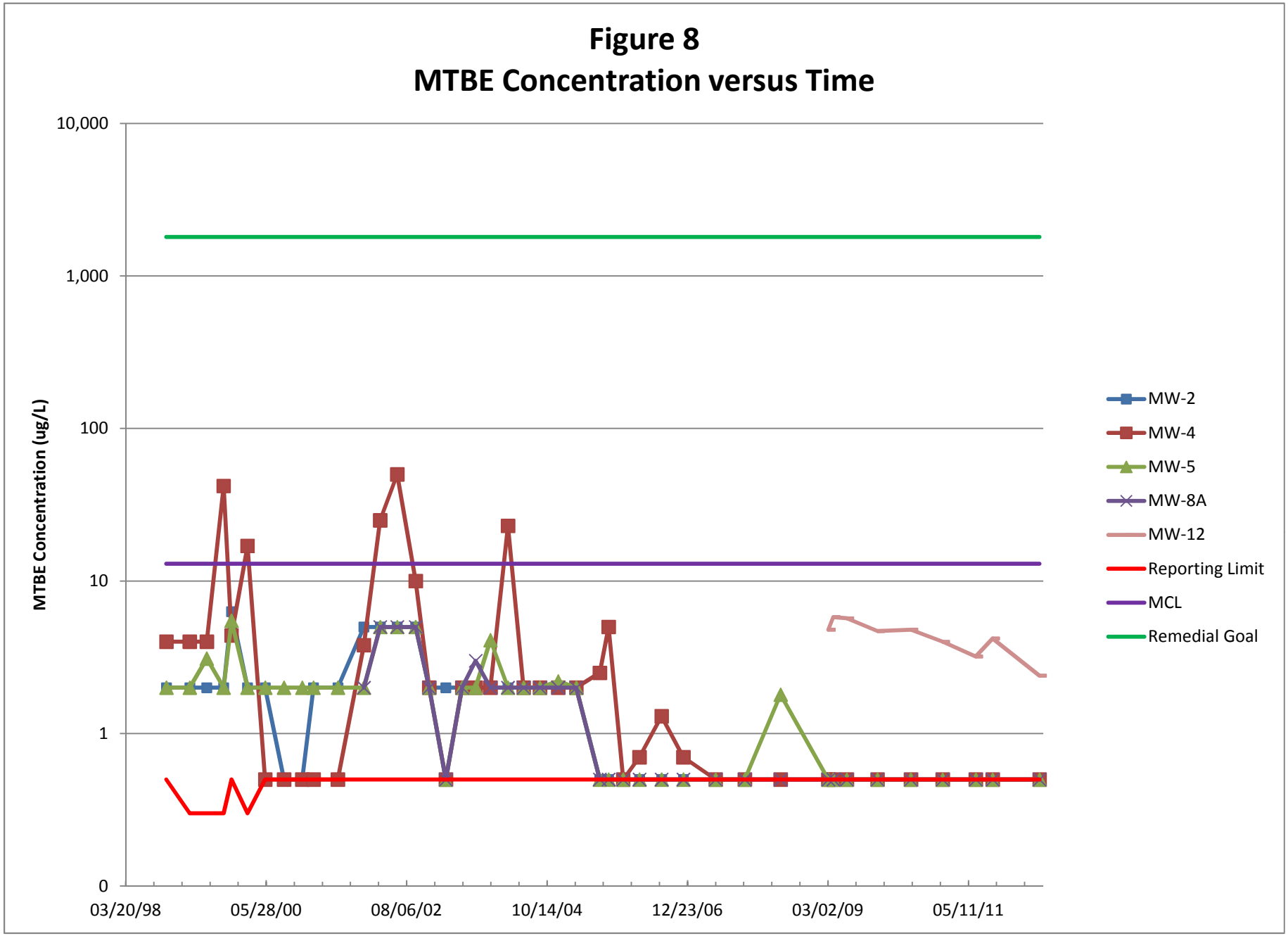
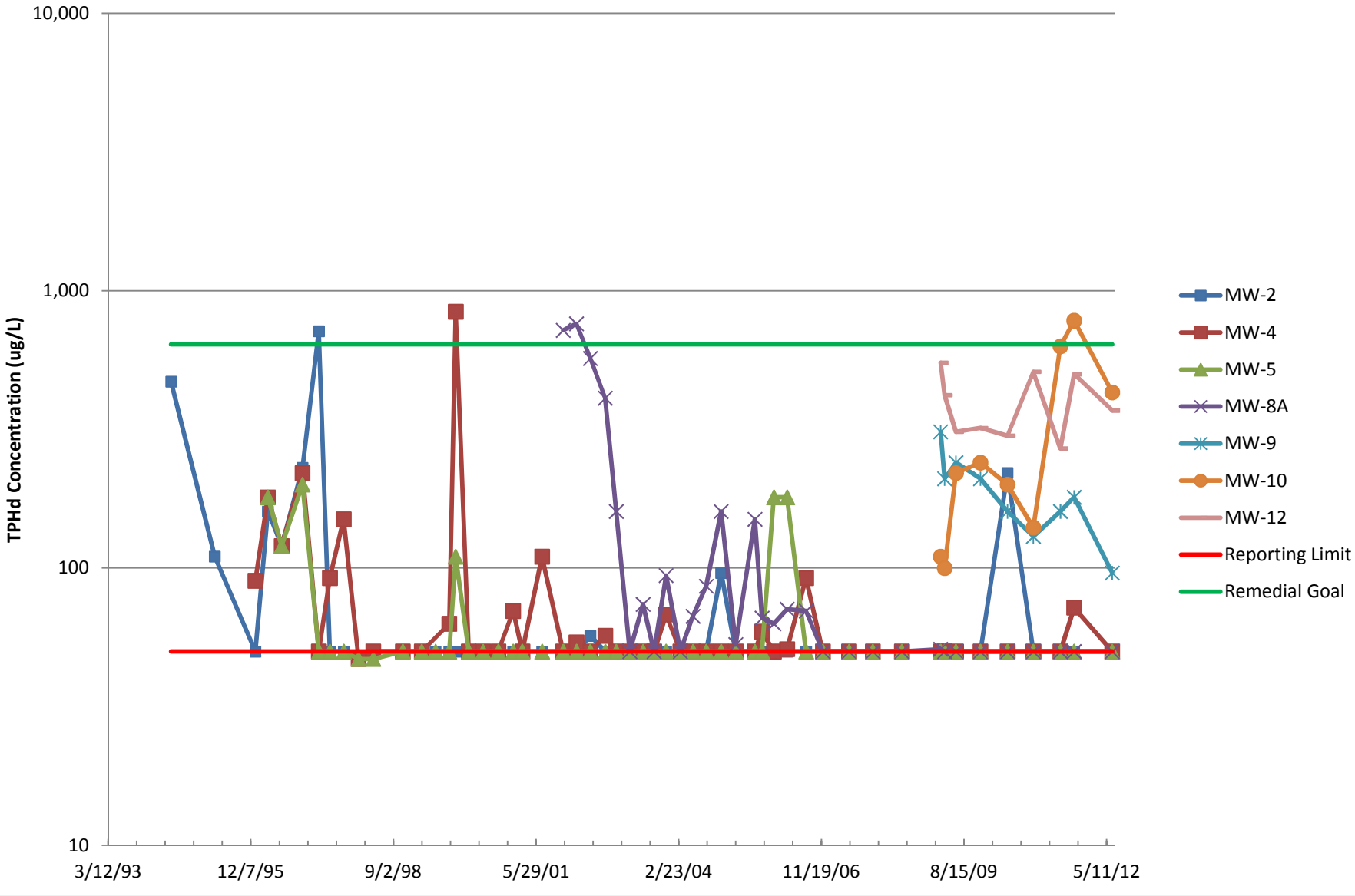


Figure 9
TPHd Concentration versus Time



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Tables

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MALCOLM PIRNIE

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland's Harbor Facilities Complex Site
555 - 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	0.0	5.44
	05/22/00	13.65	NM	8.51	0.0	5.14
	07/10/01	13.65	8.8	10.00	1.20	3.65
	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	3.65
	09/26/02	13.65	8.60	9.50	0.90	4.15
	03/17/03	13.65	7.61	8.88	1.27	4.77
	06/18/03	13.65	8.20	9.44	1.24	4.21
	09/03/03	13.65	8.50	9.40	0.90	4.25
	11/26/03	13.65	8.85	9.25	0.40	4.40
	03/05/04	13.65	6.76	7.07	0.31	6.58
	06/02/04	13.65	8.26	8.71	0.45	4.94
	09/03/04	13.65	8.70	9.11	0.41	4.54
	12/16/04	13.65	7.75	7.92	0.17	5.73
	03/29/05	13.65	6.21	6.38	0.17	7.27
	06/14/05	13.65	7.41	7.61	0.20	6.04
	08/10/05	13.65	8.05	8.55	0.50	5.10
	09/29/05	13.65	8.28	8.95	0.67	4.70
	12/21/05	13.65	5.70	5.90	0.20	7.75
	03/24/06	13.65	5.98	6.27	0.29	7.38
	07/28/06	13.65	7.88	8.35	0.47	5.30
	11/29/06	NA	10.58	10.81	0.23	NA
	06/01/07	15.80	11.11	11.45	0.34	4.35
	11/14/07	15.80	10.87	10.93	0.06	4.87
	06/05/08	15.80	11.36	11.46	0.10	4.34
	12/18/08	15.80	10.82	10.89	0.07	4.91
	03/04/09	15.80	9.38	9.52	0.14	6.28
	04/01/09	15.80	10.65	10.67	0.02	5.13
	06/17/09	15.80	11.21	11.28	0.07	4.52
	12/08/09	15.80	NP	10.79	0.0	5.01
	06/17/10	15.80	10.79 [4]	10.79	0.0	5.01
	12/14/10	15.80	9.42 [4]	9.42	0.0	6.38
	06/07/11	15.80	NP	10.77	0.0	5.03
	06/21/11	15.80	NP	10.37	0.0	5.43
	09/26/11	15.80	11.23 [4]	11.23	0.0	4.57
	12/05/11	15.80	11.15 [4]	11.15	0.0	4.65
	02/06/12	15.80	10.89 [4]	10.89	0.0	4.91
	06/19/12	15.80	11.01 [4]	11.01	0.0	4.79
MW-2						
	12/31/97	13.87	NP	8.73	0.0	5.14
	04/13/98	13.87	NP	7.72	0.0	6.15
	11/06/98	13.87	NP	9.43	0.0	4.44
	03/19/99	13.87	NP	8.21	0.0	5.66
	06/24/99	13.87	NP	8.91	0.0	4.96
	09/28/99	13.87	NP	9.42	0.0	4.45
	11/12/99	13.87	NP	9.63	0.0	4.24
	02/11/00	13.87	NP	8.54	0.0	5.33
	05/22/00	13.87	NP	8.10	0.0	5.77
	09/06/00	13.87	NP	8.79	0.0	5.08
	12/19/00	13.87	NP	9.19	0.0	4.68
	02/21/01	13.87	NP	7.99	0.0	5.88

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland's Harbor Facilities Complex Site
555 - 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)	04/03/01	13.87	NP	8.23	0.0	5.64
	07/10/01	13.87	NP	8.70	0.0	5.17
	12/12/01	13.87	NP	8.16	0.0	5.71
	01/22/02	13.87	NP	7.64	0.0	6.23
	03/08/02	13.87	NP	8.31	0.0	5.56
	06/13/02	13.87	NP	8.64	0.0	5.23
	09/26/02	13.87	NP	8.95	0.0	4.92
	12/12/02	13.87	NP	9.17	0.0	4.70
	03/17/03	13.87	NP	7.77	0.0	6.10
	06/18/03	13.87	NP	8.44	0.0	5.43
	09/03/03	13.87	NP	8.98	0.0	4.89
	11/26/03	16.72	NP	12.01	0.0	4.71
	03/05/04	16.72	NP	9.75	0.0	6.97
	06/02/04	16.72	NP	11.22	0.0	5.50
	09/03/04	16.72	NP	11.62	0.0	5.10
	12/16/04	16.72	NP	10.80	0.0	5.92
	03/29/05	16.72	NP	9.67	0.0	7.05
	06/14/05	16.72	NP	10.68	0.0	6.04
	08/10/05	16.72	NP	11.05	0.0	5.67
	09/29/05	16.72	NP	11.32	0.0	5.40
	12/21/05	16.47	NP	9.57	0.0	6.90
	03/24/06	16.47	NP	9.55	0.0	6.92
	07/28/06	16.47	NP	10.85	0.0	5.62
	11/29/06	NA	NP	11.69	0.0	NA
	06/01/07	16.43	NP	11.72	0.0	4.71
	11/14/07	16.43	NP	12.28	0.0	4.15
	06/05/08	16.43	NP	12.01	0.0	4.42
	12/18/08	16.43	NP	12.20	0.0	4.23
	03/04/09	16.43	NP	10.19	0.0	6.24
	04/01/09	16.43	NP	11.34	0.0	5.09
	06/17/09	16.43	NP	11.90	0.0	4.53
	12/09/09	16.43	NP	12.13	0.0	4.30
	06/16/10	16.43	NP	11.57	0.0	4.86
	12/14/10	16.43	NP	11.04	0.0	5.39
	06/07/11	16.43	NP	10.70	0.0	5.73
	06/21/11	16.43	NP	11.18	0.0	5.25
	09/26/11	16.43	NP	11.87	0.0	4.56
	12/05/11	16.43	NP	11.95	0.0	4.48
	02/06/12	16.43	NP	11.50	0.0	4.93
	06/19/12	16.43	NP	11.65	0.0	4.78
MW-3						
	11/06/98	13.73	8.84	9.94	1.10	NC
	03/19/99	13.73	7.52	8.05	0.53	NC
	06/24/99	13.73	8.38	8.56	0.18	NC
	11/12/99	13.73	9.14	9.23	0.09	NC
	02/11/00	13.73	7.97	8.37	0.40	NC
	03/01/00	13.73	6.59	7.24	0.65	NC
	03/21/00	13.73	6.50	6.56	0.06	NC
	05/22/00	13.73	7.51	8.05	0.54	NC
	06/26/00	13.73	7.82	8.20	0.38	NC
	07/25/00	13.73	7.90	8.92	1.02	NC
	08/31/00	13.73	8.15	9.50	1.35	NC
	09/06/00	13.73	8.21	9.42	1.21	NC
	09/21/00	13.73	8.30	8.88	0.58	NC

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland's Harbor Facilities Complex Site
555 - 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)	12/19/00	13.73	8.60	9.65	1.05	NC
	02/22/01	13.73	6.36	8.15	1.79	NC
	04/03/01	13.73	7.48	8.88	1.40	NC
	04/23/01	13.73	7.85	9.10	1.25	NC
	05/30/01	13.73	7.75	9.10	1.35	NC
	07/10/01	13.73	8.10	9.60	1.50	NC
	03/08/02	13.73	7.80	8.00	0.20	NC
	04/03/02	13.73	7.60	7.70	0.10	NC
	04/23/02	13.73	7.90	8.40	0.50	NC
	04/25/02	13.73	7.90	8.80	0.90	NC
	05/10/02	13.73	8.10	8.20	0.10	NC
	05/24/02	13.73	8.05	8.10	0.05	NC
	06/13/02	13.73	8.10	8.70	0.60	NC
	07/05/02	13.73	8.10	8.95	0.85	NC
	07/19/02	13.73	8.10	8.90	0.80	NC
	07/30/02	13.73	8.10	8.90	0.80	NC
	08/14/02	13.73	8.10	8.90	0.80	NC
	09/13/02	13.73	8.30	9.30	1.00	NC
	09/26/02	13.73	8.30	9.00	0.70	NC
	10/14/02	13.73	8.60	9.50	0.90	NC
	11/04/02	13.73	8.75	9.99	1.24	NC
	11/21/02	13.73	8.59	11.29	2.70	NC
	12/06/02	13.73	8.56	9.30	0.74	NC
	12/18/02	13.73	7.35	8.43	1.08	NC
	12/30/02	13.73	6.50	7.15	0.65	NC
	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	7.52
	01/30/03	13.73	6.81	6.85	0.04	6.88
	02/18/02	13.73	7.09	7.15	0.06	NC
	02/26/03	13.73	7.04	7.11	0.07	NC
	03/13/03	13.73	7.22	8.11	0.89	NC
	03/17/03	13.73	7.15	7.50	0.35	NC
	04/16/03	13.73	7.27	8.25	0.98	NC
	06/18/03	13.73	7.78	9.00	1.22	NC
	09/03/03	13.73	8.31	9.96	1.65	NC
	11/26/03	15.69	10.79	12.85	2.06	NC
	03/05/04	15.69	8.39	9.85	1.46	NC
	06/02/04	15.69	10.03	11.35	1.32	NC
	09/03/04	15.69	10.46	12.06	1.60	NC
	12/16/04	15.69	9.41	10.38	0.97	NC
	03/29/05	15.69	8.17	9.01	0.84	NC
	06/14/05	15.69	9.59	10.55	0.96	NC
	08/10/05	15.69	9.91	11.15	1.24	NC
	09/29/05	15.69	10.21	11.61	1.40	NC
	12/21/05	15.69	8.21	8.28	0.07	NC
	03/24/06	15.69	8.20	8.82	0.62	NC
	07/28/06	15.69	9.81	9.83	0.02	NC
	11/29/06	NA	10.72	11.70	0.98	NA
	06/01/07	15.66	10.77	11.46	0.69	NC
	11/14/07	15.66	10.98	12.19	1.21	NC
	06/05/08	15.66	10.51	11.96	1.45	NC
	12/18/08	15.66	10.78	12.00	1.22	4.51
	03/04/09	15.66	9.31	9.93	0.62	5.73

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland's Harbor Facilities Complex Site
555 - 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)	04/01/09	15.66	10.38	11.10	0.72	4.56
	06/17/09	15.66	10.79	12.30	1.51	3.36
	12/08/09	15.66	11.05	12.81	1.76	2.85
	06/17/10	15.66	10.39	12.29	1.90	3.37
	12/15/10	15.66	10.13	10.74	0.61	4.92
	06/07/11	15.66	9.91	10.95	1.04	4.71
	06/21/11	15.66	10.74	11.20	0.46	4.46
	09/26/11	15.66	10.71	12.55	1.84	3.11
	12/05/11	15.66	10.83	12.20	1.37	3.46
	02/06/12	15.66	10.60	11.42	0.82	4.24
	06/19/12	15.66	10.52	12.04	1.52	3.62
MW-4						
	12/31/97	12.66	NP	7.09	0.0	5.57
	04/13/98	12.66	NP	7.71	0.0	4.95
	11/06/98	12.66	NP	8.69	0.0	3.97
	03/19/99	12.66	NP	8.00	0.0	4.66
	06/24/99	12.66	NP	8.45	0.0	4.21
	09/28/99	12.66	NP	8.73	0.0	3.93
	11/12/99	12.66	NP	8.83	0.0	3.83
	02/11/00	12.66	NP	7.71	0.0	4.95
	05/22/00	12.66	NP	8.09	0.0	4.57
	09/06/00	12.66	NP	8.32	0.0	4.34
	12/19/00	12.66	NP	8.47	0.0	4.19
	02/21/01	12.66	NP	7.51	0.0	5.15
	04/03/01	12.66	NP	8.13	0.0	4.53
	07/10/01	12.66	NP	8.12	0.0	4.54
	12/12/01	12.66	NP	7.65	0.0	5.01
	01/22/02	12.66	NP	7.60	0.0	5.06
	03/08/02	12.66	NP	7.96	0.0	4.70
	06/13/02	12.66	NP	8.20	0.0	4.46
	09/26/02	12.66	NP	8.21	0.0	4.45
	12/12/02	12.66	NP	8.38	0.0	4.28
	03/17/03	12.66	NP	7.72	0.0	4.94
	06/18/03	12.66	NP	8.02	0.0	4.64
	09/03/03	12.66	NP	8.29	0.0	4.37
	11/26/03	12.66	NP	8.69	0.0	3.97
	03/05/04	12.66	NP	7.45	0.0	5.21
	06/02/04	12.66	NP	8.25	0.0	4.41
	09/03/04	12.66	NP	8.31	0.0	4.35
	12/16/04	12.66	NP	7.96	0.0	4.70
	03/29/05	12.66	NP	7.11	0.0	5.55
	06/14/05	12.66	NP	7.90	0.0	4.76
	08/10/05	12.66	NP	7.86	0.0	4.80
	09/29/05	12.66	NP	8.00	0.0	4.66
	12/21/05	12.66	NP	7.30	0.0	5.36
	03/24/06	12.66	NP	7.05	0.0	5.61
	07/28/06	12.66	NP	7.92	0.0	4.74
	11/29/06	NA	NP	11.63	0.0	NA
	06/01/07	15.91	NP	11.82	0.0	4.09
	11/14/07	15.91	NP	11.88	0.0	4.03
	06/05/08	15.91	NP	11.67	0.0	4.24
	12/18/08	15.91	NP	11.20	0.0	4.71
	03/04/09	15.91	NP	10.93	0.0	4.98
	04/01/09	15.91	NP	11.63	0.0	4.28

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland's Harbor Facilities Complex Site
555 - 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)	06/17/09	15.91	NP	11.88	0.0	4.03
	12/08/09	15.91	NP	12.03	0.0	3.88
	06/16/10	15.91	NP	11.75	0.0	4.16
	12/14/10	15.91	NP	11.62	0.0	4.29
	06/07/11	15.91	NP	11.80	0.0	4.11
	06/21/11	15.91	NP	11.42	0.0	4.49
	09/26/11	15.91	NP	11.83	0.0	4.08
	12/05/11	15.91	NP	12.03	0.0	3.88
	02/06/12	15.91	NP	11.71	0.0	4.20
	06/19/12	15.91	NP	11.73	0.0	4.18
MW-5						
	12/31/97	13.00	NP	6.38	0.0	6.62
	04/13/98	13.00	NP	5.56	0.0	7.44
	11/06/98	13.00	NP	6.59	0.0	6.41
	03/19/99	13.00	NP	6.20	0.0	6.80
	06/24/99	13.00	NP	6.73	0.0	6.27
	09/28/99	13.00	NP	6.91	0.0	6.09
	11/12/99	13.00	NP	7.06	0.0	5.94
	02/11/00	13.00	NP	7.00	0.0	6.00
	05/22/00	13.00	NP	6.21	0.0	6.79
	09/06/00	13.00	NP	6.56	0.0	6.44
	12/19/00	13.00	NP	6.68	0.0	6.32
	02/21/01	13.00	NP	6.08	0.0	6.92
	04/03/01	13.00	NP	6.38	0.0	6.62
	07/10/01	13.00	NP	6.58	0.0	6.42
	12/12/01	13.00	NP	6.40	0.0	6.60
	01/22/02	13.00	NP	6.10	0.0	6.90
	03/08/02	13.00	NP	6.10	0.0	6.90
	06/13/02	13.00	NP	6.31	0.0	6.69
	09/26/02	13.00	NP	6.60	0.0	6.40
	12/12/02	13.00	NP	6.75	0.0	6.25
	03/17/03	13.00	NP	5.73	0.0	7.27
	06/18/03	13.00	NP	6.10	0.0	6.90
	09/03/03	13.00	NP	6.50	0.0	6.50
	11/26/03	13.00	NP	6.70	0.0	6.30
	03/05/04	13.00	NP	5.70	0.0	7.30
	06/02/04	13.00	NP	6.27	0.0	6.73
	09/03/04	13.00	NP	6.61	0.0	6.39
	12/16/04	13.00	NP	6.02	0.0	6.98
	03/29/05	13.00	NP	5.25	0.0	7.75
	06/14/05	13.00	NP	5.82	0.0	7.18
	08/10/05	13.00	NP	6.00	0.0	7.00
	09/29/05	13.00	NP	6.26	0.0	6.74
	12/21/05	13.00	NP	5.91	0.0	7.09
	03/24/06	13.00	NP	NA[2]	NA[2]	NA
	07/28/06	13.00	NP	6.08	0.0	6.92
	11/29/06	NA	NP	9.39	0.0	NA
	06/01/07	15.39	NP	10.60	0.0	4.79
	11/14/07	15.39	NP	9.77	0.0	5.62
	06/05/08	15.39	NP	9.74	0.0	5.65
	12/18/08	15.39	NP	9.80	0.0	5.59
	03/04/09	15.39	NP	8.78	0.0	6.61
	04/01/09	15.39	NP	9.16	0.0	6.23
	06/17/09	15.39	NP	9.51	0.0	5.88

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland's Harbor Facilities Complex Site
555 - 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)	12/08/09	15.39	NP	9.52	0.0	5.87
	06/16/10	15.39	NP	9.31	0.0	6.08
	12/14/10	15.39	NP	9.31	0.0	6.08
	06/07/11	15.39	NP	9.06	0.0	6.33
	06/21/11	15.39	NP	9.06	0.0	6.33
	09/26/11	15.39	NP	9.30	0.0	6.09
	12/05/11	15.39	NP	9.31	0.0	6.08
	02/06/12	15.39	NP	9.32	0.0	6.07
	06/19/12	15.39	NP	9.16	0.0	6.23
MW-6						
	06/24/99	13.51	NP	8.61	0.0	4.90
	09/28/99	13.51	NP	9.26	0.0	4.25
	11/12/99	13.51	NP	8.01	0.0	5.50
	02/11/00	13.51	NP	7.20	0.0	6.31
	05/22/00	13.51	NP	7.13	0.0	6.38
	09/06/00	13.51	NP	7.12	0.0	6.39
	12/19/00	13.51	NP	7.57	0.0	5.94
	02/21/01	13.51	NP	7.50	0.0	6.01
	04/03/01	13.51	NP	6.88	0.0	6.63
	07/10/01	13.51	NP	7.15	0.0	6.36
	12/12/01	13.51	NP	9.50	0.0	4.01
	01/22/02	13.51	NP	6.69	0.0	6.82
	03/08/02	13.51	NP	6.98	0.0	6.53
	06/13/02	13.51	NP	7.45	0.0	6.06
	09/26/02	13.51	NP	7.95	0.0	5.56
	12/12/02	13.51	NP	7.71	0.0	5.80
	12/18/02	Monitoring well was destroyed				
MW-7						
	12/31/97	13.86	NP	8.88	0.0	4.98
	04/13/98	13.86	NP	7.86	0.0	6.00
	11/06/98	13.86	NP	9.55	0.0	4.31
	03/19/99	13.86	NP	8.41	0.0	5.45
	06/24/99	13.86	NP	9.08	0.0	4.78
	09/28/99	13.86	NP	9.60	0.0	4.26
	11/12/99	13.86	NP	9.77	0.0	4.09
	02/11/00	13.86	NP	8.67	0.0	5.19
	05/22/00	13.86	NP	8.43	0.0	5.43
	09/06/00	13.86	NP	8.88	0.0	4.98
	12/19/00	13.86	NP	9.21	0.0	4.65
	02/21/01	13.86	NP	8.13	0.0	5.73
	04/03/01	13.86	NP	8.45	0.0	5.41
	07/10/01	13.86	NP	8.87	0.0	4.99
	12/12/01	13.86	NP	8.39	0.0	5.47
	01/22/02	13.86	NP	7.99	0.0	5.87
	03/08/02	13.86	NP	8.51	0.0	5.35
	06/13/02	13.86	NP	8.90	0.0	4.96
	09/26/02	13.86	NP	9.00	0.0	4.86
	12/12/02	13.86	NP	9.28	0.0	4.58
	12/18/02	Monitoring well was destroyed				

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland's Harbor Facilities Complex Site
555 - 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-8 [3]						
	12/31/97	12.45	8.49	8.82	0.33	NC
	11/06/98	12.45	9.25	10.30	1.05	NC
	11/21/98	Monitoring well was destroyed and replaced with well MW-8A				
MW-8A						
	12/12/01	12.45	NP	7.20	0.0	NA
	01/22/02	12.45	NP	7.20	0.0	5.25
	03/08/02	12.45	NP	7.70	0.0	4.75
	06/13/02	12.45	NP	7.72	0.0	4.73
	09/26/02	12.45	NP	7.91	0.0	4.54
	12/12/02	12.45	NP	8.15	0.0	4.30
	03/17/03	12.45	NP	7.28	0.0	5.17
	06/18/03	12.45	NP	7.72	0.0	4.73
	09/03/03	12.45	NP	8.18	0.0	4.27
	11/26/03	12.45	NP	8.55	0.0	3.90
	03/05/04	12.45	NP	6.92	0.0	5.53
	06/02/04	12.45	NP	7.92	0.0	4.53
	09/03/04	12.45	NP	8.16	0.0	4.29
	12/16/04	12.45	NP	7.62	0.0	4.83
	03/29/05	12.45	NP	6.63	0.0	5.82
	06/14/05	12.45	NP	7.60	0.0	4.85
	08/10/05	12.45	NP	7.50	0.0	4.95
	09/29/05	12.45	NP	7.76	0.0	4.69
	12/21/05	12.45	NP	6.90	0.0	5.55
	03/24/06	12.45	NP	6.65	0.0	5.80
	07/28/06	12.45	NP	7.34	0.0	5.11
	11/29/06	NA	NP	11.41	0.0	NA
	06/01/07	14.99	NP	11.26	0.0	3.73
	11/14/07	14.99	NP	11.40	0.0	3.59
	06/05/08	14.99	NP	11.45	0.0	3.54
	12/18/08	14.99	NP	11.30	0.0	3.69
	03/04/09	14.99	NP	10.07	0.0	4.92
	04/01/09	14.99	NP	10.92	0.0	4.07
	06/17/09	14.99	NP	11.40	0.0	3.59
	12/08/09	14.99	NP	11.64	0.0	3.35
	06/16/10	14.99	NP	11.75	0.0	3.24
	12/14/10	14.99	NP	10.75	0.0	4.24
	06/07/11	14.99	NP	10.51	0.0	4.48
	06/21/11	14.99	NP	10.64	0.0	4.35
	09/26/11	14.99	NP	11.21	0.0	3.78
	12/05/11	14.99	NP	11.29	0.0	3.70
	02/06/12	14.99	NP	10.75	0.0	4.24
	06/19/12	14.99	NP	11.04	0.0	3.95
MW-9						
	12/18/08	16.33	NP	12.88	0.0	3.45
	03/04/09	16.33	NP	11.04	0.0	5.29
	04/01/09	16.33	NP	11.51	0.0	4.82
	06/17/09	16.33	NP	11.95	0.0	4.38
	12/08/09	16.33	NP	12.30	0.0	4.03
	06/16/10	16.33	NP	11.75	0.0	4.58
	12/14/10	16.33	NP	11.51	0.0	4.82
	06/07/11	16.33	NP	11.32	0.0	5.01
	06/21/11	16.33	NP	11.37	0.0	4.96
	09/26/11	16.33	NP	11.92	0.0	4.41
	12/05/11	16.33	NP	11.99	0.0	4.34
	02/06/12	16.33	NP	11.70	0.0	4.63
	06/19/12	16.33	NP	11.76	0.0	4.57

TABLE 1. Historical Groundwater Elevation and Free Product Data
Port of Oakland's Harbor Facilities Complex Site
555 - 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						
	12/18/08	15.65	NP	14.34	0.0	1.31
	03/04/09	15.65	NP	9.78	0.0	5.87
	04/01/09	15.65	NP	10.33	0.0	5.32
	06/17/09	15.65	NP	10.79	0.0	4.86
	12/08/09	15.65	NP	10.96	0.0	4.69
	06/16/10	15.65	NP	10.62	0.0	5.03
	12/14/10	15.65	NP	10.31	0.0	5.34
	06/07/11	15.65	NP	10.11	0.0	5.54
	06/21/11	15.65	NP	10.19	0.0	5.46
	09/26/11	15.65	NP	10.79	0.0	4.86
	12/05/11	15.65	NP	10.80	0.0	4.85
	02/06/12	15.65	NP	10.51	0.0	5.14
	06/19/12	15.65	NP	10.61	0.0	5.04
MW-11						
	12/18/08	15.47	NP	13.42	0.0	2.05
	03/04/09	15.47	NP	9.57	0.0	5.90
	04/01/09	15.47	NP	9.94	0.0	5.53
	06/17/09	15.47	NP	10.40	0.0	5.07
	12/09/09	15.47	NP	10.68	0.0	4.79
	06/16/10	15.47	NP	10.02	0.0	5.45
	12/01/10	15.47	NP	10.02	0.0	5.45
	06/07/11	15.47	NP	10.00	0.0	5.47
	06/21/11	15.47	NP	9.85	0.0	5.62
	09/26/11	15.47	NP	10.33	0.0	5.14
	12/05/11	15.47	NP	10.59	0.0	4.88
	02/06/12	15.47	NP	10.59	0.0	4.88
	06/19/12	15.47	NP	10.12	0.0	5.35
MW-12						
	12/18/08	16.79	NP	12.75	0.0	4.04
	03/04/09	16.79	NP	10.60	0.0	6.19
	04/01/09	16.79	NP	11.23	0.0	5.56
	6/17/2009	16.79	NP	11.83	0.0	4.96
	12/8/2009	16.79	NP	12.13	0.0	4.66
	6/16/2010	16.79	NP	11.31	0.0	5.48
	12/14/2010	16.79	NP	11.15	0.0	5.64
	6/7/2011	16.79	NP	10.81	0.0	5.98
	6/21/2011	16.79	NP	11.01	0.0	5.78
	9/26/2011	16.79	NP	11.77	0.0	5.02
	12/5/2011	16.79	NP	11.89	0.0	4.90
	2/6/2012	16.79	NP	11.60	0.0	5.19
	6/19/2012	16.79	NP	11.49	0.0	5.30

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 well MW-3, 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's Harbor Facilities Complex Site
555 - 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
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

TABLE 2. Groundwater Analytical Results Summary
Port of Oakland's Harbor Facilities Complex Site
555 - 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)	08/10/05	<50	<50	<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	<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
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]

TABLE 2. Groundwater Analytical Results Summary
Port of Oakland's Harbor Facilities Complex Site
555 - 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.)	02/21/01	450 [13]	<50	<300	120	<0.5	<0.5	<0.5	<0.5 [10]
	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

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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)	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
	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
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

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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)	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	<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

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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									
	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
	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]

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		TPH-G	TPH-D	TPH-MO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-7 (cont)	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
	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

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		TPH-G	TPH-D	TPH-MO	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-8A (cont)	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
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
	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
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
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
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

TABLE 2. Groundwater Analytical Results Summary
Port of Oakland's Harbor Facilities Complex Site
555 - 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)	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
	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

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 µg/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. Free Product Recovery System Groundwater Elevation and Free Product Data
January 1, 2011 Through June 20, 2012
Port of Oakland's Harbor Facilities Complex Site
555 - 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
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
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
	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

TABLE 3. Free Product Recovery System Groundwater Elevation and Free Product Data
January 1, 2011 Through June 20, 2012
Port of Oakland's Harbor Facilities Complex Site
555 - 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-4 (cont)	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
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				
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
	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

TABLE 3. Free Product Recovery System Groundwater Elevation and Free Product Data
January 1, 2011 Through June 20, 2012
Port of Oakland's Harbor Facilities Complex Site
555 - 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-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
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
	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

TABLE 3. Free Product Recovery System Groundwater Elevation and Free Product Data
January 1, 2011 Through June 20, 2012
Port of Oakland's Harbor Facilities Complex Site
555 - 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-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
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

TABLE 3. Free Product Recovery System Groundwater Elevation and Free Product Data
January 1, 2011 Through June 20, 2012
Port of Oakland's Harbor Facilities Complex Site
555 - 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)
MW-3 (cont)	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

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.

Port of Oakland
530 Water Street • Oakland, CA 94607

Appendix A
Groundwater Sampling Forms

4656016

MALCOLM PIRNIE

GROUNDWATER SAMPLING

Well No.: **MW-1**

Project No. 4656016
Project Name: Harbor Facilities Center
Location: Port of Oakland
651 Maritime Street, Oakland, California
Weather: Sunny, 70's
Precip. in past 5 days (in.): 0
Source: Oakland Airport
Water level instrument: Solinst

Recorded by: CD Date: 6/19/12
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): 4.79
Water level from TOC (feet): 11.01 Time: 0845
Product level from TOC (feet): 11.01 Time: 0845

CALCULATION OF WELL VOLUME:

(17.65 ft - _____ ft x (0.083 ft)² x π x 7.48 gal/ft³ = _____ gallons in one casing volume
well depth - water level x (well radius)² x π x gal/ft³ = _____ 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: _____ Sample Time: _____
Duplicate/blank number: _____ Duplicate Sample Time: _____
Sampling equipment: _____ VOA attachment: _____
Sample containers: _____
Sample analyses: _____
Laboratory: _____
Decontamination method: _____ Rinsate disposal: _____
Comments: Trace product on WL probe - well not sampled

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

GROUNDWATER SAMPLING

Well No.: **MW-2**

Project No. 4656016
Project Name: Harbor Facilities Center
Location: Port of Oakland
651 Maritime Street, Oakland, California
Weather: Sunny, 70's
Precip. in past 5 days (in.): 0
Source: Oakland Airport
Water level instrument: Solinst

Recorded by: CO Date: 6/19/12
Depth of well from TOC (feet): 18.06
Well diameter (inches): 2
Screened interval from TOC (feet): 8.06-18.06
TOC elevation, NAVD 88 (feet): 16.43
Groundwater elevation, NAVD 88 (feet): 4.78
Water level from TOC (feet): 11.65 Time: 1355
Product level from TOC (feet): — Time: —

CALCULATION OF WELL VOLUME:

(18.06 ft - 11.65 ft x (0.083 ft)² x π x 7.48 gal/ft³ = 1.03 gallons in one casing volume
well depth - water level x (well radius)² x π x gal/ft³ = 1.0 total gallons removed

CALIBRATION:

See cal sheets for YSI-556.18

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
1358	Started pumping							
1400	22.75	7.68	1.74	124.9	1048		11.84	
1403	20.47	7.37	0.96	-259.0	994		11.97	
1406	20.77	7.31	0.74	-239.0	995		12.03	0.2
1409	21.09	7.31	0.61	-234.0	999		12.13	
1412	21.26	7.31	0.58	-226.8	998		12.22	
1415	21.29	7.30	0.49	-236.6	992		12.31	0.3
1418	21.20	7.30	0.47	-235.0	990		12.40	
1421	21.33	7.29	0.38	-234.4	996		12.48	0.4
1424	21.44	7.30	0.36	-235.8	1002		12.56	
1427	21.55	7.30	0.29	-230.8	1006		12.59	0.5
1430	21.76	7.31	0.24	-237.4	1012		12.68	
1433	21.81	7.31	0.28	-256.8	1015		12.73	0.6
1436	21.51	7.30	0.26	-253.6	1012		12.79	
1439	21.34	7.29	0.19	-249.9	1010		12.85	
1442	21.17	7.29	0.19	-248.7	1008		12.91	0.75
1448	22.08	7.33	0.63	226.6	1038		12.94	
1453	21.86	7.30	0.81	242.0	1052		13.03	0.85
1457	21.80	7.28	0.91	239.7	1046		13.10	

Pump stalled

Continues on back

Purge method: peristaltic pump
Sample Time: 1510
Duplicate/blank number: NA
Duplicate Sample Time: —
Sampling equipment: peristaltic pump & dedicated tubing
VOA attachment: none
Sample containers: 6-40 mL VOAs, 2-0.5 L ambers
Sample analyses: TPH-g, TPH-d/mo, BTEX
Laboratory: CTL
Decontamination method: dedicated tubing, liquinox
Rinsate disposal: NA
Comments:

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

Time	Temp	pH	DO	ORP	EC	DTW	GR
1501	21.15	7.28	0.85	238.0	1029	13.20	1.0
1504	21.19	7.27	0.69	238.1	1028	13.29	
1508	20.77	7.27	0.46	227.7	1027	13.36	
1510	Sample collected						

GROUNDWATER SAMPLING

Well No.: **MW-3**

Project No. 4656016
Project Name: Harbor Facilities Center
Location: Port of Oakland
651 Maritime Street, Oakland, California
Weather: Sunny, 70's
Precip. in past 5 days (in.): 0
Source: Oakland Airport
Water level instrument: Solinst

Recorded by: CO Date: 6/19/12
Depth of well from TOC (feet): 17.47
Well diameter (inches): 2
Screened interval from TOC (feet): 7.47-17.47
TOC elevation, NAVD 88 (feet): 15.66
Groundwater elevation, NAVD 88 (feet): 3.62
Water level from TOC (feet): 12.04 Time: 1530
Product level from TOC (feet): 10.52 Time: 1530

CALCULATION OF WELL VOLUME:

(17.47 ft - _____ ft x (0.083 ft)² x π x 7.48 gal/ft³ = _____ gallons in one casing volume
well depth - water level x (well radius)² x π x gal/ft³ = _____ 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: _____ Sample Time: _____
Duplicate/blank number: _____ Duplicate Sample Time: _____
Sampling equipment: _____ VOA attachment: _____
Sample containers: _____
Sample analyses: _____
Laboratory: _____
Decontamination method: _____ Rinsate disposal: _____
Comments: Free product in well – not sampled

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

GROUNDWATER SAMPLING

Well No.: **MW-4**

Project No. 4656016
Project Name: Harbor Facilities Center
Location: Port of Oakland
651 Maritime Street, Oakland, California
Weather: Sunny, 70's
Precip. in past 5 days (in.): Ø
Source: Oakland Airport
Water level instrument: Solinst

Recorded by: SC Date: 6/19/12
Depth of well from TOC (feet): 22.05
Well diameter (inches): 2
Screened interval from TOC (feet): 11.25-22.05
TOC elevation, NAVD 88 (feet): 15.91
Groundwater elevation, NAVD 88 (feet): 4.18
Water level from TOC (feet): 11.73 Time: 1110
Product level from TOC (feet): Time:

CALCULATION OF WELL VOLUME:

(22.05 ft - 11.73 ft x (0.083 ft)² x π x 7.48 gal/ft³ = 1.7 gallons in one casing volume
well depth - water level x (well radius)² x π x gal/ft³ = 1.0 total gallons removed

CALIBRATION: See Cal sheets for YSI-556.14

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC ~~(µmho/cm)~~ mS/cm	Turbidity (NTU)	Depth to Water (ft btoc)	Cumulative Gallons Removed
1115			Begin Purging					
1116							12.10	
1119	19.27	7.47	0.26	-133.9	1.900		12.40	
1122	19.29	7.47	0.21	-136.5	1.903		12.55	0.2
1125	19.30	7.46	0.18	-139.5	1.905		12.61	
1128	19.31	7.48	0.18	-144.9	1.916		12.65	0.5
1130			Collect Sample					

Purge method: Peristaltic pump
Duplicate/blank number: MW-4DUP
Sampling equipment: Peri pump & dedicated tubing
Sample containers: 6- 40 mL VOAs, 2 - 0.5 L ambers
Sample analyses: TPH-g, TPH-d/mo, BTEX
Laboratory: CTL
Decontamination method: Dedicated tubing, liquinox
Comments:

Sample Time: 1130
Duplicate Sample Time: 1130
VOA attachment: None
Rinsate disposal: NA

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

GROUNDWATER SAMPLING

Well No.: **MW-5**

Project No. 4656016
Project Name: Harbor Facilities Center
Location: Port of Oakland
651 Maritime Street, Oakland, California
Weather: Clear, Cool
Precip. in past 5 days (in.): 0
Source: Oakland Airport
Water level instrument: Solinst

Recorded by: SC Date: 6/19/12
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): 6.23
Water level from TOC (feet): 9.16 Time: 840
Product level from TOC (feet): - Time: 840

CALCULATION OF WELL VOLUME:

(20.80 ft - 9.16 ft x (0.083 ft)² x π x 7.48 gal/ft³ = 1.9 gallons in one casing volume
well depth - water level x (well radius)² x π x gal/ft³ = 1 total gallons removed

CALIBRATION:

See cal sheets for YSI-556.14

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC ~~(umho/cm)~~ mS/cm	Turbidity (NTU)	Depth to Water (ft btoc)	Cumulative Gallons Removed
845				begin purging			~~4.1~~	
850				flow through cell leaking			9.47	
				Stop purging to trouble shoot flow thru cell				
902				o-ring adjusted, Begin purging			9.11	
907							9.53	
910	18.28	7.20	4.12	NM	1.736		9.68	
913	18.30	7.18	0.53	-43.1	1.737		9.83	0.3
916	18.32	7.18	0.45	-47.0	1.736		9.86	0.5
919	18.31	7.17	0.42	-50.3	1.726		9.88	0.6
922	18.32	7.17	0.39	-51.1	1.707		9.90	0.7
925				Collect Sample				

Purge method: Peristaltic pump
Duplicate/blank number: NA
Sampling equipment: Peri pump & dedicated tubing
Sample containers: 6-40 mL VOAs, 2-0.5 L ambers
Sample analyses: TPH-g, TPH-d/mo, BTEX
Laboratory: CTL
Decontamination method: Dedicated tubing, liquinox

Sample Time: 925
Duplicate Sample Time: -
VOA attachment: None
Rinsate disposal: NA
Comments:

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

GROUNDWATER SAMPLING

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

Project No. 4656016
Project Name: Harbor Facilities Center
Location: Port of Oakland
651 Maritime Street, Oakland, California
Weather: Sunny, 70's
Precip. in past 5 days (in.): — 0
Source: Oakland Airport
Water level instrument: Solinst

Recorded by: CD Date: 6/19/12
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): 3.95
Water level from TOC (feet): 11.04 Time: 0911
Product level from TOC (feet): — Time:

CALCULATION OF WELL VOLUME:

(23.14 ft - 11.04 ft x (0.083 ft)² x π x 7.48 gal/ft³ =
well depth - water level x (well radius)² x π x gal/ft³ =

1.9 gallons in one casing volume
2.75 total gallons removed

CALIBRATION:

See cal sheet for YSI-556.18

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC µS/cm (~~µmho/cm~~)	Turbidity (NTU)	Depth to Water (ft btoc)	Cumulative Gallons Removed
0921	Began pumping							
0922	18.65	7.19	6.31	-75.0	2260		11.20	0.2
0926	18.55	7.13	0.75	124.3	2223		11.26	0.3
0929	18.38	7.13	0.30	43.5	2143		11.25	0.4
0932	18.47	7.15	0.15	20.6	1986		11.25	0.5
0935	18.42	7.16	0.13	-7.2	1871		11.28	0.6
0938	18.45	7.17	0.13	27.5	1809		11.29	0.75
0941	18.45	7.18	0.13	6.5	1784		11.24	
Stopped Pumping - battery dead								
1036	started pump again						11.18	
1039	19.24	7.18	0.46	-39.1	1966		11.20	1
1042	18.77	7.20	0.25	-98.6	1902		11.25	
1045	18.62	7.19	0.16	-39.1	1825		11.27	
1048	18.50	7.19	0.12	-30.6	1750		11.27	2.5
1051	18.49	7.19	0.10	-25.7	1716		11.27	2.75
1055	Collected sample							

Purge method: Peristaltic Pump
Sample Time: 1055
Duplicate/blank number: NA
Duplicate Sample Time: —
Sampling equipment: Peri pump & dedicated tubing
VOA attachment: None
Sample containers: 6-40mL VOAs, 2-0.5L ambers
Sample analyses: TPH-g, TPH-d/mo, BTEX
Laboratory: CTL
Decontamination method: Dedicated tubing, liquinox
Rinsate disposal: NA
Comments:

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

GROUNDWATER SAMPLING

Well No.: **MW-9**

Project No. 4656016
Project Name: Harbor Facilities Center
Location: Port of Oakland
651 Maritime Street, Oakland, California
Weather: Clear, cool
Precip. in past 5 days (in.): 0
Source: Oakland Airport
Water level instrument: Solinst

Recorded by: SC
Date: 6/19/12
Depth of well from TOC (feet): 25
Well diameter (inches): 2
Screened interval from TOC (feet): 15 - 25
TOC elevation, NAVD 88 (feet): 16.33
Groundwater elevation, NAVD 88 (feet): 4.57
Water level from TOC (feet): 11.76 Time: 1010
Product level from TOC (feet): — Time: 1010

CALCULATION OF WELL VOLUME:

(25.00 ft - 11.76 ft x (0.083 ft)² x π x 7.48 gal/ft³ = 2.1 gallons in one casing volume
well depth - water level x (well radius)² x π x gal/ft³ = 0.8 total gallons removed

CALIBRATION: see cal sheets for YSI-556, 14

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC ~~(umho/cm)~~ mS/cm	Turbidity (NTU)	Depth to Water (ft btoc)	Cumulative Gallons Removed
1014			Begin Purging					
1015							11.79	
1018	19.07	7.15	0.80	-136.6	2.206		11.85	0.2
1021	19.12	7.15	0.56	-143.1	2.240		11.86	
1024	19.16	7.06	0.49	-142.5	2.255		11.86	0.3
1027	19.17	7.06	0.49	-146.2	2.261		11.87	
1030	19.16	7.06	0.51	-148.1	2.258		11.88	0.4
1033				Collect	Sample			

Purge method: Peristaltic pump
Sample Time: 1033
Duplicate/blank number: NA
Duplicate Sample Time: —
Sampling equipment: Peri pump & dedicated tubing
VOA attachment: None
Sample containers: 6-40 mL VOAs, 2-0.5 L ambers
Sample analyses: TPH-g, TPH-d/mo, BTEX
Laboratory: CTL
Decontamination method: Dedicated tubing, liquinox
Rinsate disposal: NA
Comments:

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

GROUNDWATER SAMPLING

Well No.: **MW-10**

Project No. 4656016
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: Oakland Airport
Water level instrument: Solinst

Recorded by: EC Date: 6/19/12
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): 5.04
Water level from TOC (feet): 10.61 Time: 1245
Product level from TOC (feet): — Time: 1245

CALCULATION OF WELL VOLUME:

(25.00 ft - 10.61 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 = 0.8 total gallons removed

CALIBRATION:

See cal sheets for YSI-556.14

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
1250			Begin Purging					
1252							10.84	
1255	18.81	6.85	0.23	-109.4	3.242		10.91	
1258	18.75	6.86	0.23	-111.0	3.241		10.94	0.2
1301	18.74	6.84	0.15	-112.6	3.241		10.95	
1304	18.76	6.87	0.10	-114.3	3.243		10.95	0.4
1307			Sample Collected					

Purge method: Peristaltic pump
Sample Time: 1307
Duplicate/blank number: NA
Duplicate Sample Time: —
Sampling equipment: Peri pump & dedicated tubing
VOA attachment: None
Sample containers: 6 - 40 mL VOAs, 2 - 0.5 L ambers
Sample analyses: TPH-g, TPH-d/mo, BTEX
Laboratory: CTL
Decontamination method: Dedicated tubing, liquinox
Rinsate disposal: NA
Comments: Hydrocarbon odor

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

GROUNDWATER SAMPLING

Well No.: **MW-11**

Project No. 4656016
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: Oakland Airport
Water level instrument: Solinst

Recorded by: SC Date: 6/19/12
Depth of well from TOC (feet): 25
Well diameter (inches): 2
Screened interval from TOC (feet): 15 - 25
TOC elevation, NAVD 88 (feet): 15.47
Groundwater elevation, NAVD 88 (feet): 5.35
Water level from TOC (feet): 10.12 Time: 1355
Product level from TOC (feet): — Time: 1355

CALCULATION OF WELL VOLUME:

(25.00 ft - 10.12 ft x (0.083 ft)² x π x 7.48 gal/ft³ = 2.4 gallons in one casing volume
well depth - water level x (well radius)² x π x gal/ft³ = 10 total gallons removed

CALIBRATION: See cal sheet for YSI-556.14

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
1359			Begin purging					
1400							10.26	
1404	22.87	7.60	0.18	-184.0	5,512		10.34	0.2
1407	22.55	7.57	0.19	-185.3	5,462		10.38	
1410	22.40	7.60	0.21	-186.3	5,433		10.40	0.5
1413	22.30	7.62	0.25	-186.7	5,410		10.41	
1416	22.19	7.56	0.21	-186.5	5,390		10.42	0.7
1419	22.16	7.59	0.20	-186.7	5,381		10.42	
1422			Sample collected					

Purge method: Peristaltic pump
Duplicate/blank number: NA
Sampling equipment: Peri pump & dedicated tubing
Sample containers: 6 - 40 mL VOAs, 2 - 0.5 L ambers
Sample analyses: TPH-g, TPH-d/mo, BTEX
Laboratory: CTL
Decontamination method: Dedicated tubing, Liquinox
Comments: hydrocarbon odor, cloudy purge water

Sample Time: 1422
Duplicate Sample Time: —
VOA attachment: None
Rinsate disposal: NA

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

GROUNDWATER SAMPLING

Well No.: **MW-12**

Project No. 4656016
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: Oakland Airport
Water level instrument: Solinst water level meter

Recorded by: SC Date: 6/19/12
Depth of well from TOC (feet): 25
Well diameter (inches): 2
Screened interval from TOC (feet): 15 - 25
TOC elevation, NAVD 88 (feet): 16.79
Groundwater elevation, NAVD 88 (feet): 5.30
Water level from TOC (feet): 11.49 Time: 1500
Product level from TOC (feet): Time:

CALCULATION OF WELL VOLUME:

(25.00 ft - 11.49 ft x (0.083 ft)² x π x 7.48 gal/ft³ = 2.2 gallons in one casing volume
well depth - water level x (well radius)² x π x gal/ft³ = 1.0 total gallons removed

CALIBRATION: See cal sheets for YSI-556.14

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC ~~(µmho/cm)~~ mS/cm	Turbidity (NTU)	Depth to Water (ft btoc)	Cumulative Gallons Removed
1506			Begin	Purging				
1508							11.60	
1511	19.05	6.90	0.22	-120.1	1.581		11.62	
1514	18.74	6.86	0.23	-122.6	1.553		11.63	0.2
1517	18.60	6.84	0.24	-125.9	1.545		11.63	
1520	18.55	6.83	0.24	-128.7	1.544		11.62	0.5
1523	18.49	6.82	0.21	-132.9	1.545		11.62	
1525			Sample Collected					

Purge method: Peristaltic pump
Duplicate/blank number: NA
Sampling equipment: Peri pump & dedicated tubing
Sample containers: 6-40 mL VOAs, 2-0.5 L ambers
Sample analyses: TPH-g, TPH-d/mo, BTEX
Laboratory: CTL
Decontamination method: Dedicated tubing, liquinox
Comments: Strong sulfide odor

Sample Time: 1525
Duplicate Sample Time: —
VOA attachment: None
Rinsate disposal: NA

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

ARCADIS

MULTIPARAMETER INSTRUMENT CALIBRATION RECORD

Project No.:

Location:

Instrument: YSI 556

Serial Number: YSI556.14

Date	Calibrated by	Parameter	Standards Used	Calibration Achieved (Y/N)	Remarks
6/19/12	SC	pH	pH 4.0, 7.0, 10.0	Y	
		EC	1000 µS/cm	Y	
		DO	sat (~~8.4 mg/L~~ 100%)	Y	
6/19/12	CO	pH	4.0, 7.0, 10.0		4.10, 7.15, 9.81
end of day		EC	1,000 µS/cm		1,175

ARCADIS

MULTIPARAMETER INSTRUMENT CALIBRATION RECORD

Project No.:

Location:

Instrument: YSI 556

Serial Number: YSI-556.18

Date	Calibrated by	Parameter	Standards Used	Calibration Achieved (Y/N)	Remarks
6/19/12	CO	pH	4.0, 7.0, 10.0	Y	
		EC	1,000 µS/cm	Y	
		DO	Sat (100% 8.4 mg/L)	Y	
6/19/12	CO	pH	4.0, 7.0, 10.0		3.95, 7.06, 9.85
End day point check		EC	1,000 µs/cm		1098 µs/cm

Port of Oakland
530 Water Street • Oakland, CA 94607

Appendix B
Laboratory Analytical Reports

4656016

MALCOLM PIRNIE


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 237278
ANALYTICAL REPORT

Malcolm Pirnie, Inc.	Project : 4656016
2000 Powell St.	Location : Port Of Oakland, CA
Emeryville, CA 94608	Level : II

Sample ID	Lab ID
MW-4	237278-001
MW-4DUP	237278-002
MW-5	237278-003
MW-8A	237278-004
MW-9	237278-005
MW-10	237278-006
MW-11	237278-007
MW-12	237278-008
MW-2	237278-009
TRIP BLANK	237278-010

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: Desiree N. Tetrault Date: 06/26/2012
Project Manager

NELAP # 01107CA

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**237278**
Client:	**Malcolm Pirnie, Inc.**
Project:	**4656016**
Location:	**Port Of Oakland, CA**
Request Date:	**06/19/12**
Samples Received:	**06/19/12**

This data package contains sample and QC results for ten water samples, requested for the above referenced project on 06/19/12. The samples were received on ice and intact, directly from the field.

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):
Low recovery was observed for MTBE in the MS for batch 187787; the parent sample was not a project sample, the BS/BSD were within limits, and the associated RPD was within limits. No other analytical problems were encountered.

ARCADIS
Infrastructure · Water · Environment · Buildings

ID#: 237278

CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page 1 of 1

Lab Work Order #

Send Results to:

Contact & Company Name: ARCADIS - C. Orsi
Telephone:
Address:
Fax: File
City State Zip
E-mail Address:

Project Name/Location (City, State): Port of Oakland, CA
Project #: 04656616.0000.00083
Sampler's Printed Name:
Sampler's Signature:

Preservative	HCL	HCl	~~HCl~~ So					
Filtered (✓)								
# of Containers	3 ea	3 ea	2 ea					
Container Information	VOAs	VOAs	500ml Amber					

PARAMETER ANALYSIS & METHOD

Keys

Preservation Key:
A. H_2SO_4
B. HCL
C. HNO_3
D. NaOH
E. None
F. Other: _____
G. Other: _____
H. Other: _____

Container Information Key:
1. 40 ml Vial
2. 1 L Amber
3. 250 ml Plastic
4. 500 ml Plastic
5. Encore
6. 2 oz. Glass
7. 4 oz. Glass
8. 8 oz. Glass
9. Other: _____
10. Other: _____

Matrix Key:
SO - Soil | SE - Sediment | NL - NAPL/Oil
W - Water | SL - Sludge | SW - Sample Wipe
T - Tissue | A - Air | Other: _____

	Sample ID	Collection Date	Collection Time	Type (✓) Comp	Type (✓) Grab	Matrix	TPH-G (8015B)	BTEX/MTBE (8260B)	TPH-D/MO + SG cleanup (8015M)					REMARKS
1	MW-4	6/19/12	1130			W	X	X	X					
2	MW-4 DUP		1130											
3	MW-5		900											
4	MW-8A		1055											
5	MW-9		1033											
6	MW-10		1307											
7	MW-11		1422											
8	MW-12		1525											
9	MW-2		1510											

Special Instructions/Comments:

EDF needed, BILL TO PORT OO

☐ Special QA/QC Instructions(✓):

Laboratory Information and Receipt		Relinquished By	Received By	Relinquished By	Laboratory Received By
Lab Name:	Cooler Custody Seal (✓)	Printed Name: Caroline Orsi	Printed Name: DESIREE TETRAULT	Printed Name:	Printed Name:
☐ Cooler packed with ice (✓)	☐ Intact ☐ Not Intact	Signature:	Signature:	Signature:	Signature:
Specify Turnaround Requirements:	Sample Receipt:	Firm: ARCADIS	Firm/Courier: CET	Firm/Courier:	Firm:
Shipping Tracking #:	Condition/Cooler Temp: _____	Date/Time: 6/19/12 1645	Date/Time: 6/19/12 1645	Date/Time:	Date/Time:

Distribution: WHITE – Laboratory returns with results YELLOW – Lab copy PINK – Retained by ARCADIS

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 237278 Date Received 6/19/12 Number of coolers 2
Client Arcadis Project 04656016.0000.0083

Date Opened 6/19/12 By (print) Eileen Leung (sign) Eileen
Date Logged in ↓ By (print) ↓ (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) 3.9°C, ~~10.0°C~~ 10.0°C

☐ 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~~ E.L.
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
10) Rec'd 4 VOAs labelled trip blank not on COC
20) -007: MW-11 2 of 6 VOAs rec'd ~1/4 bubbles

Rev 10, 11/11

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	06/19/12
Units:	ug/L	Received:	06/19/12
Diln Fac:	1.000		

Field ID: MW-4 Batch#: 187793
Type: SAMPLE Analyzed: 06/20/12
Lab ID: 237278-001

Analyte	Result	RL
Gasoline C7-C12	120 Y	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	95	76-121

Field ID: MW-4DUP Batch#: 187793
Type: SAMPLE Analyzed: 06/20/12
Lab ID: 237278-002

Analyte	Result	RL
Gasoline C7-C12	120 Y	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	95	76-121

Field ID: MW-5 Batch#: 187793
Type: SAMPLE Analyzed: 06/20/12
Lab ID: 237278-003

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	95	76-121

Field ID: MW-8A Batch#: 187793
Type: SAMPLE Analyzed: 06/20/12
Lab ID: 237278-004

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	94	76-121

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

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	06/19/12
Units:	ug/L	Received:	06/19/12
Diln Fac:	1.000		

Field ID: MW-9 Batch#: 187793
Type: SAMPLE Analyzed: 06/20/12
Lab ID: 237278-005

Analyte	Result	RL
Gasoline C7-C12	150 Y	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	102	76-121

Field ID: MW-10 Batch#: 187793
Type: SAMPLE Analyzed: 06/20/12
Lab ID: 237278-006

Analyte	Result	RL
Gasoline C7-C12	330 Y	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	108	76-121

Field ID: MW-11 Batch#: 187793
Type: SAMPLE Analyzed: 06/20/12
Lab ID: 237278-007

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	102	76-121

Field ID: MW-12 Batch#: 187793
Type: SAMPLE Analyzed: 06/20/12
Lab ID: 237278-008

Analyte	Result	RL
Gasoline C7-C12	88	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	101	76-121

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

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	06/19/12
Units:	ug/L	Received:	06/19/12
Diln Fac:	1.000		

Field ID: MW-2 Batch#: 187793
Type: SAMPLE Analyzed: 06/20/12
Lab ID: 237278-009

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	98	76-121

Field ID: TRIP BLANK Batch#: 187847
Type: SAMPLE Analyzed: 06/21/12
Lab ID: 237278-010

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	90	76-121

Type: BLANK Batch#: 187793
Lab ID: QC644935 Analyzed: 06/20/12

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	87	76-121

Type: BLANK Batch#: 187847
Lab ID: QC645159 Analyzed: 06/21/12

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	86	76-121

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 #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC644934	Batch#:	187793
Matrix:	Water	Analyzed:	06/20/12
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	995.5	100	79-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	86	76-121

Curtis & Tompkins, Ltd.

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8015B
Field ID:	MW-4	Batch#:	187793
MSS Lab ID:	237278-001	Sampled:	06/19/12
Matrix:	Water	Received:	06/19/12
Units:	ug/L	Analyzed:	06/20/12
Diln Fac:	1.000		

Type: MS Lab ID: QC644936

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	120.6	2,000	2,102	99	68-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	100	76-121

Type: MSD Lab ID: QC644937

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,933	91	68-120	8	21

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	97	76-121

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC645158	Batch#:	187847
Matrix:	Water	Analyzed:	06/21/12
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	1,002	100	79-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	93	76-121

Curtis & Tompkins, Ltd.

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	187847
MSS Lab ID:	237316-005	Sampled:	06/19/12
Matrix:	Water	Received:	06/20/12
Units:	ug/L	Analyzed:	06/22/12
Diln Fac:	1.000		

Type: MS Lab ID: QC645160

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	121.8	2,000	2,071	97	68-120

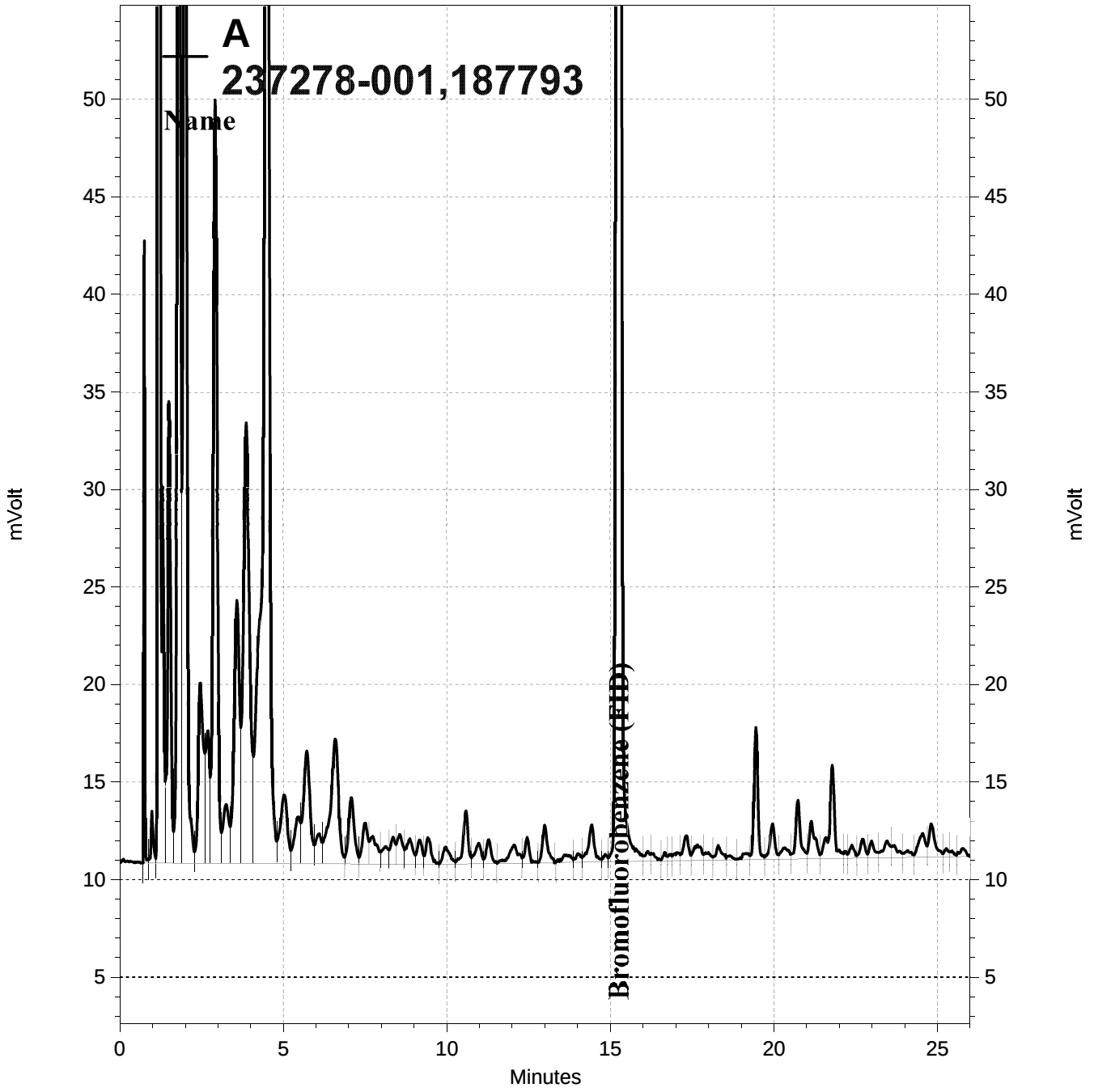
Surrogate	%REC	Limits
Bromofluorobenzene (FID)	108	76-121

Type: MSD Lab ID: QC645161

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	2,165	102	68-120	4	21

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	107	76-121

RPD= Relative Percent Difference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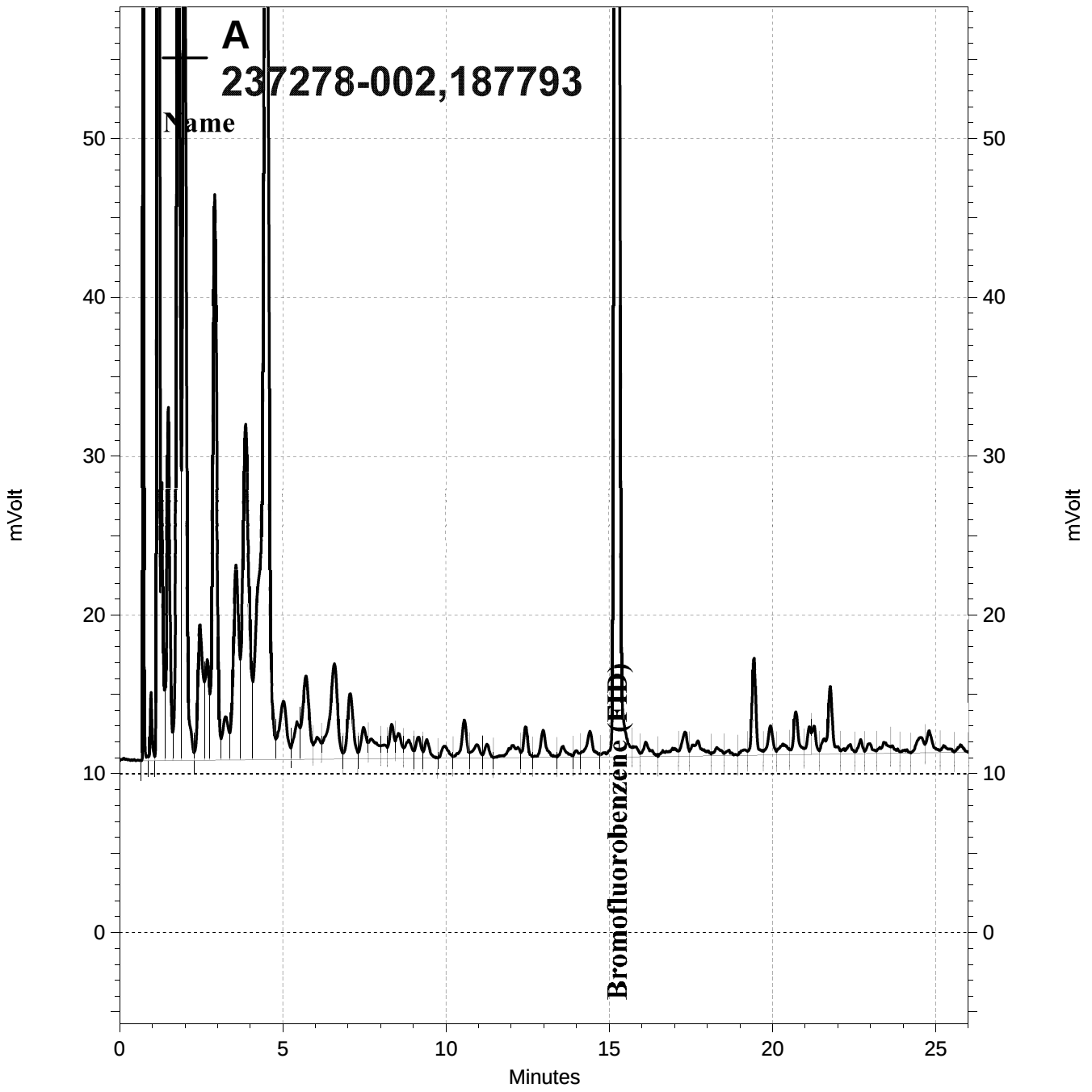
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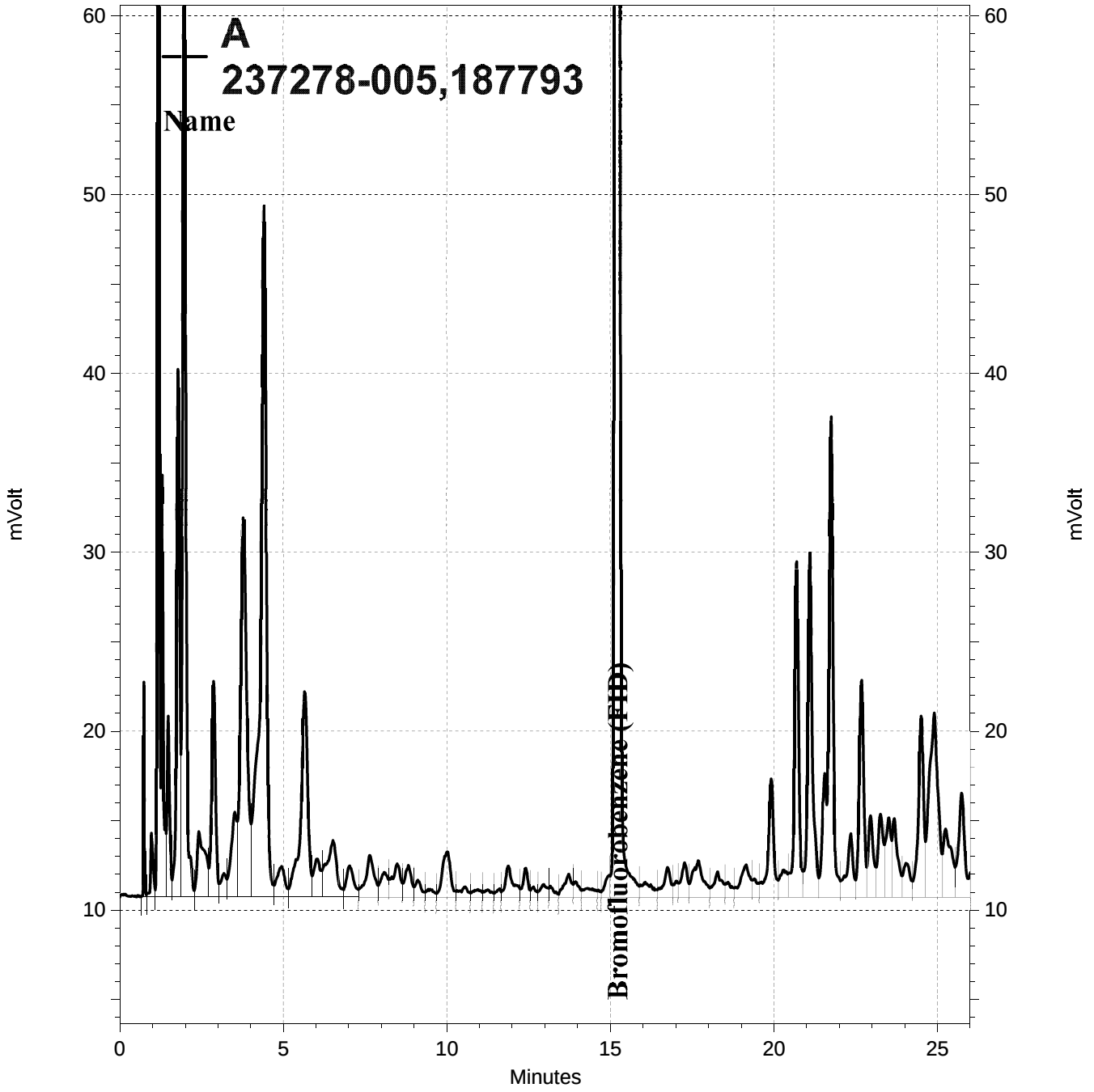

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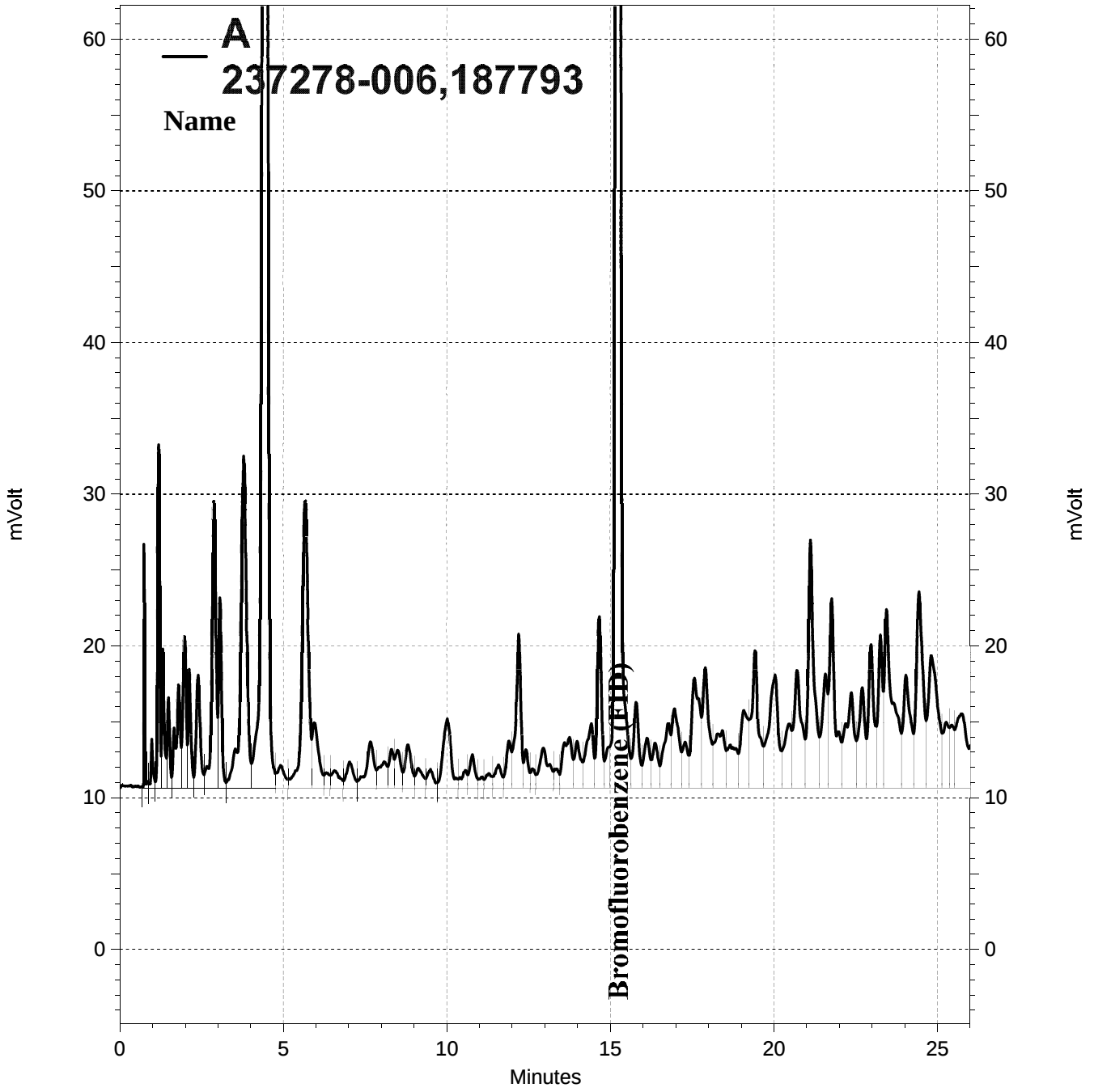
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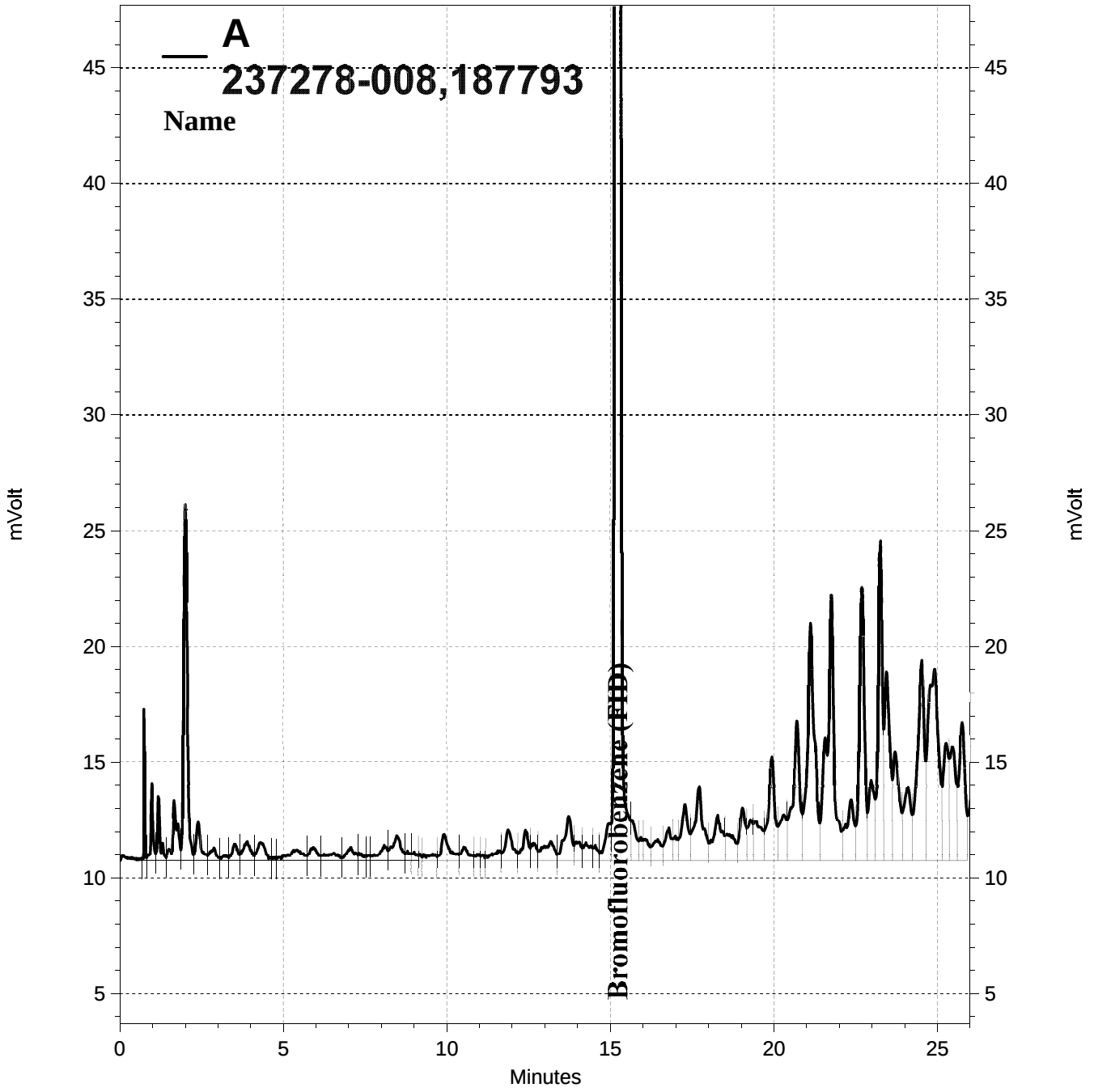

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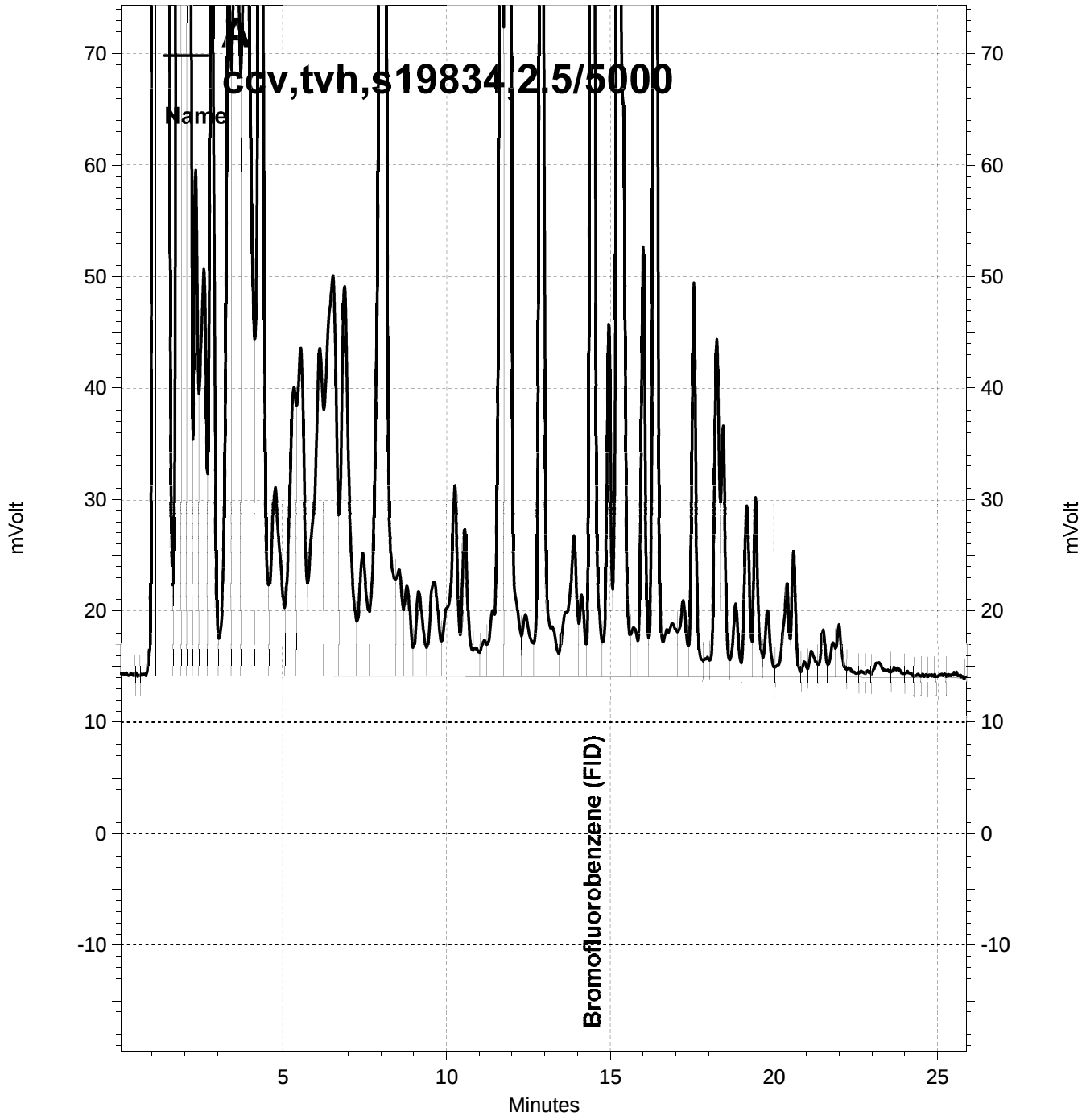

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Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 3520C
Project#:	4656016	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	06/19/12
Units:	ug/L	Received:	06/19/12
Diln Fac:	1.000	Prepared:	06/20/12
Batch#:	187803	Analyzed:	06/21/12

Field ID: MW-4 Lab ID: 237278-001
Type: SAMPLE Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	51
Motor Oil C24-C36	ND	310

Surrogate	%REC	Limits
o-Terphenyl	105	61-129

Field ID: MW-4DUP Lab ID: 237278-002
Type: SAMPLE Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	52
Motor Oil C24-C36	ND	310

Surrogate	%REC	Limits
o-Terphenyl	114	61-129

Field ID: MW-5 Lab ID: 237278-003
Type: SAMPLE Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	51
Motor Oil C24-C36	ND	310

Surrogate	%REC	Limits
o-Terphenyl	108	61-129

Field ID: MW-8A Lab ID: 237278-004
Type: SAMPLE Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	51
Motor Oil C24-C36	ND	310

Surrogate	%REC	Limits
o-Terphenyl	113	61-129

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

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 3520C
Project#:	4656016	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	06/19/12
Units:	ug/L	Received:	06/19/12
Diln Fac:	1.000	Prepared:	06/20/12
Batch#:	187803	Analyzed:	06/21/12

Field ID: MW-9 Lab ID: 237278-005
Type: SAMPLE Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	96 Y	53
Motor Oil C24-C36	ND	320

Surrogate	%REC	Limits
o-Terphenyl	86	61-129

Field ID: MW-10 Lab ID: 237278-006
Type: SAMPLE Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	430 Y	52
Motor Oil C24-C36	ND	310

Surrogate	%REC	Limits
o-Terphenyl	100	61-129

Field ID: MW-11 Lab ID: 237278-007
Type: SAMPLE Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	53
Motor Oil C24-C36	ND	320

Surrogate	%REC	Limits
o-Terphenyl	115	61-129

Field ID: MW-12 Lab ID: 237278-008
Type: SAMPLE Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	370 Y	52
Motor Oil C24-C36	ND	310

Surrogate	%REC	Limits
o-Terphenyl	113	61-129

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

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 3520C
Project#:	4656016	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	06/19/12
Units:	ug/L	Received:	06/19/12
Diln Fac:	1.000	Prepared:	06/20/12
Batch#:	187803	Analyzed:	06/21/12

Field ID:	MW-2	Lab ID:	237278-009
Type:	SAMPLE	Cleanup Method:	EPA 3630C

Analyte	Result	RL
Diesel C10-C24	ND	53
Motor Oil C24-C36	ND	320

Surrogate	%REC	Limits
o-Terphenyl	105	61-129

Type:	BLANK	Cleanup Method:	EPA 3630C
Lab ID:	QC644967		

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

Surrogate	%REC	Limits
o-Terphenyl	101	61-129

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

Curtis & Tompkins, Ltd.

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 3520C
Project#:	4656016	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	187803
Units:	ug/L	Prepared:	06/20/12
Diln Fac:	1.000	Analyzed:	06/21/12

Type: BS Cleanup Method: EPA 3630C
Lab ID: QC644968

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	1,659	66	59-120

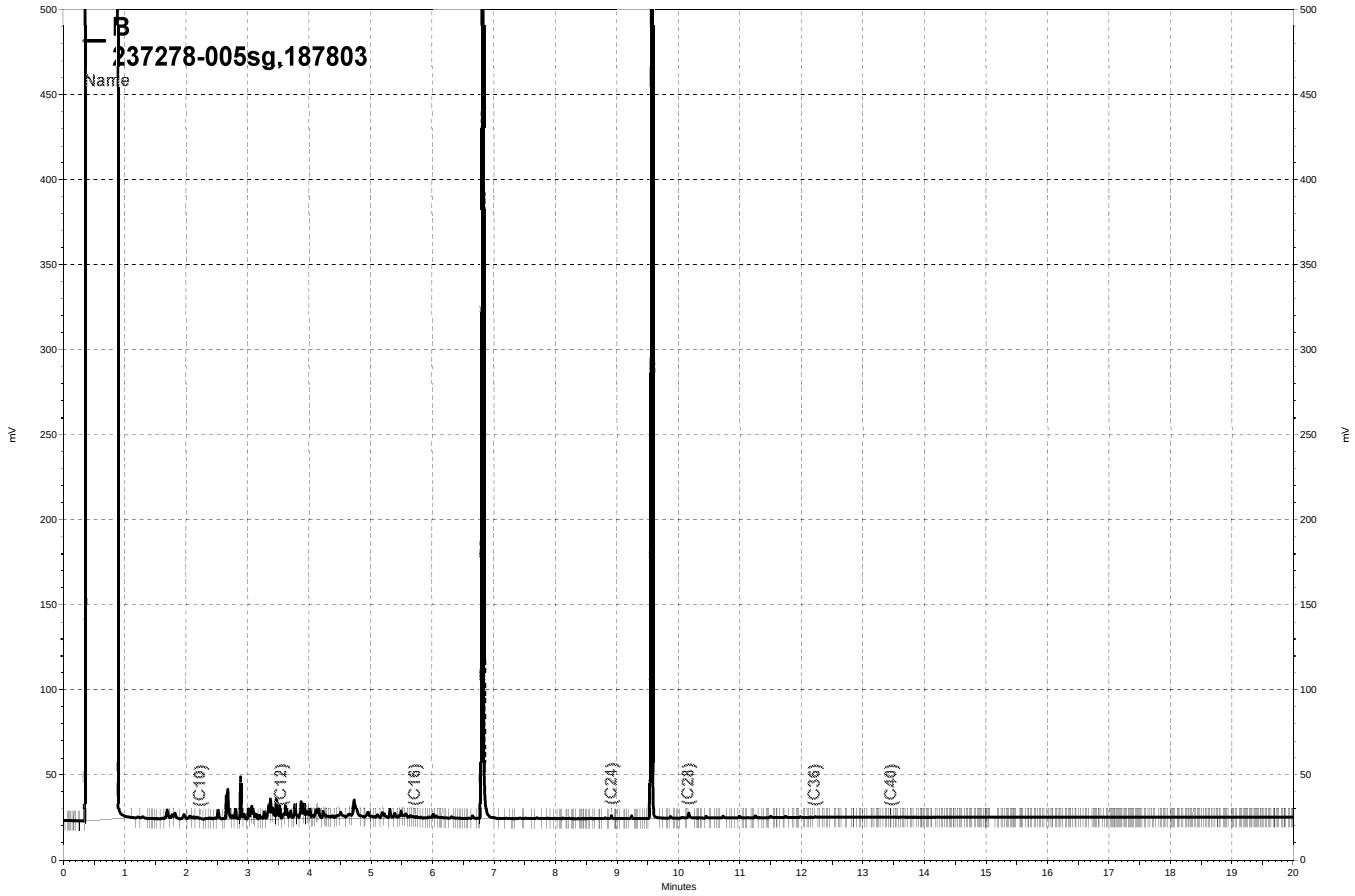
Surrogate	%REC	Limits
o-Terphenyl	89	61-129

Type: BSD Cleanup Method: EPA 3630C
Lab ID: QC644969

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	1,946	78	59-120	16	52

Surrogate	%REC	Limits
o-Terphenyl	102	61-129

RPD= Relative Percent Difference



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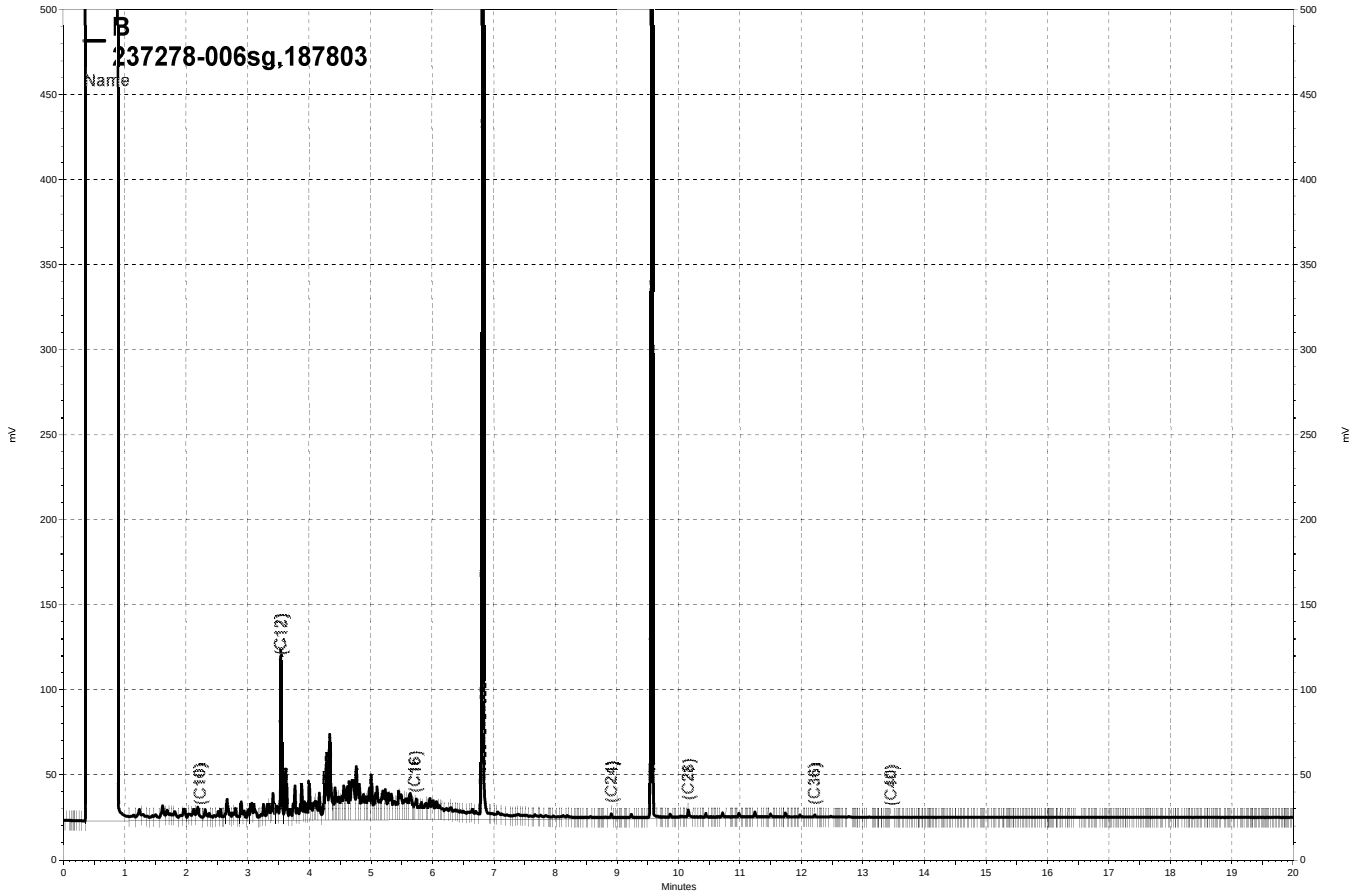

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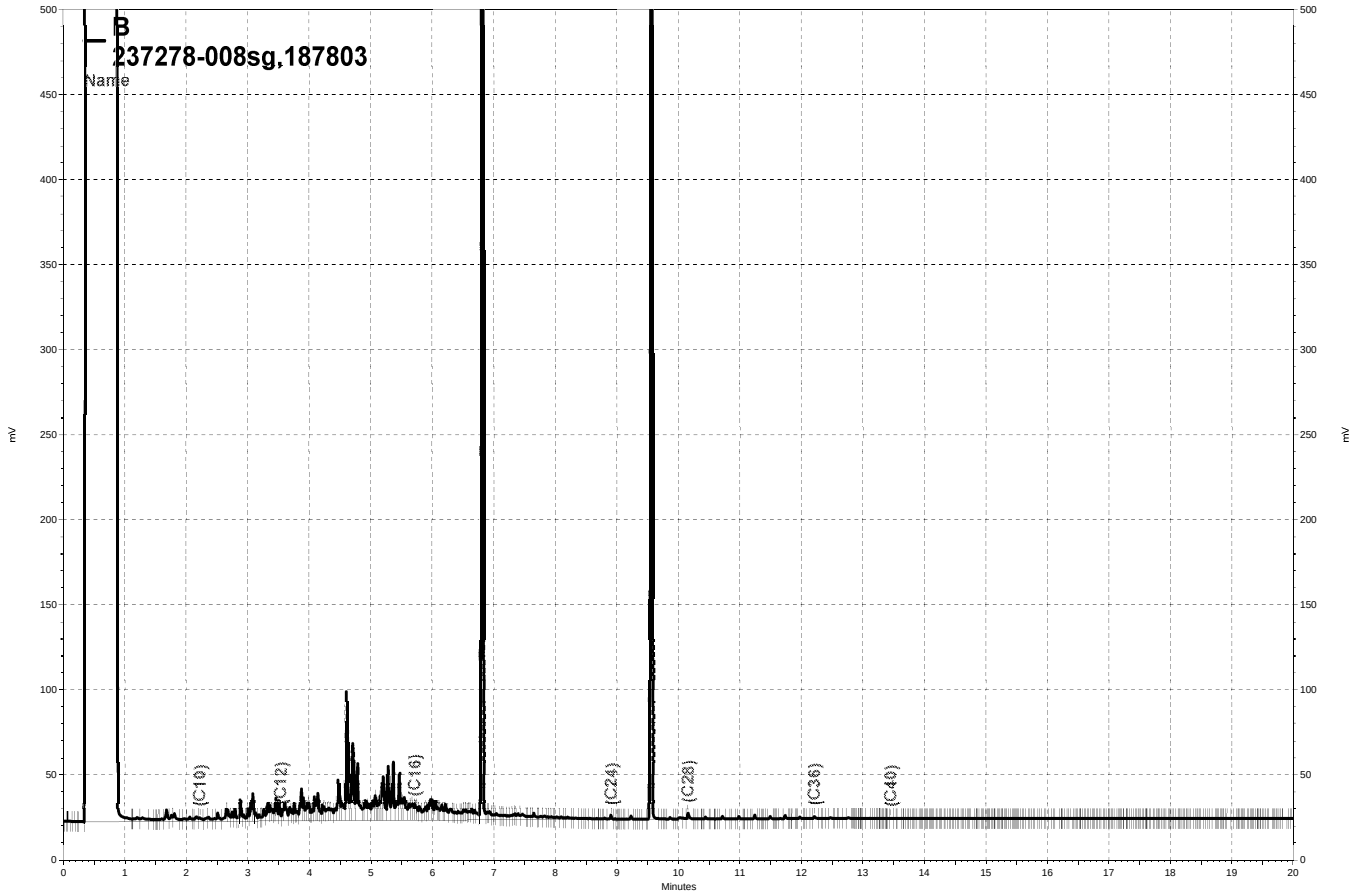

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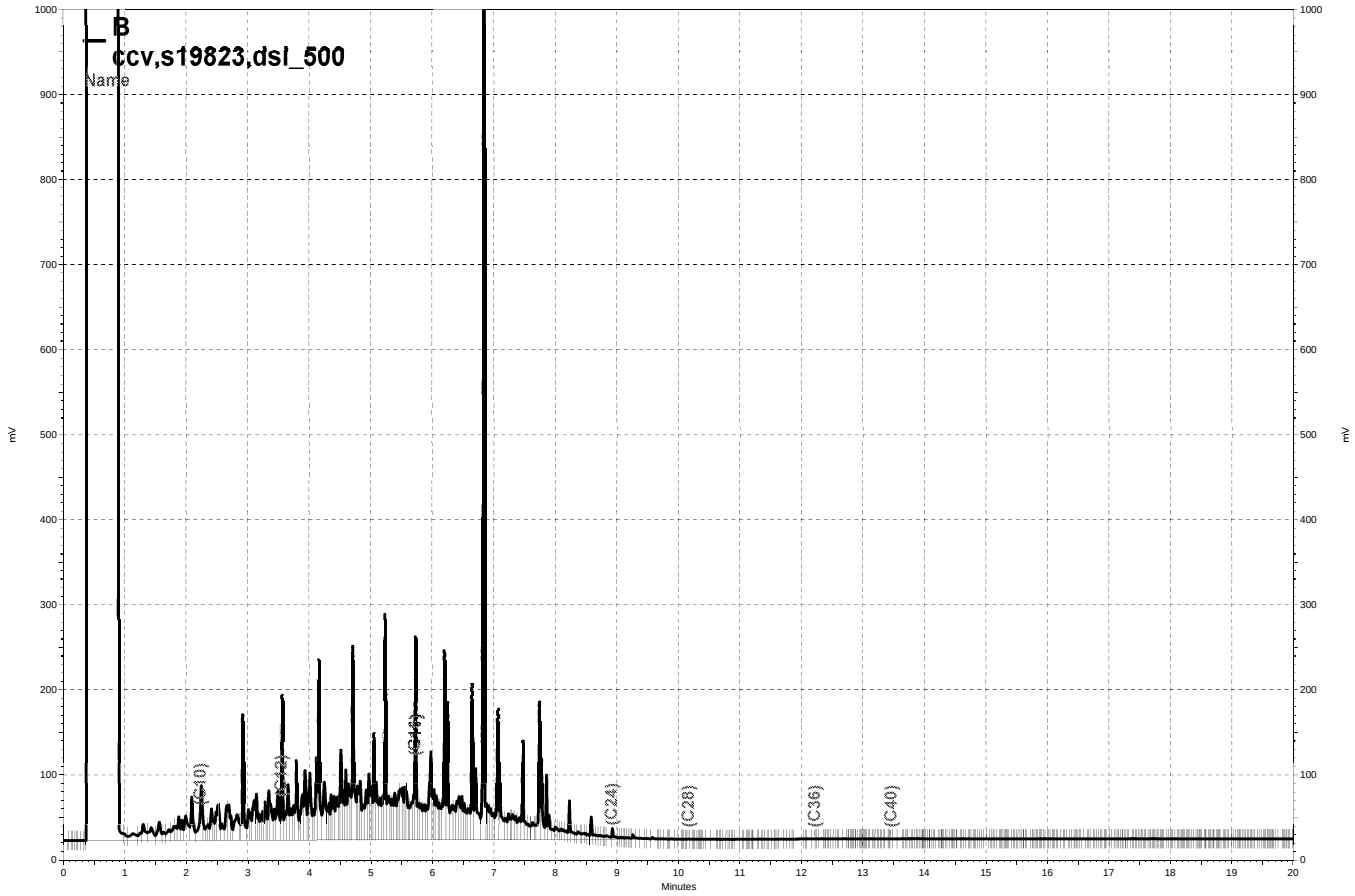

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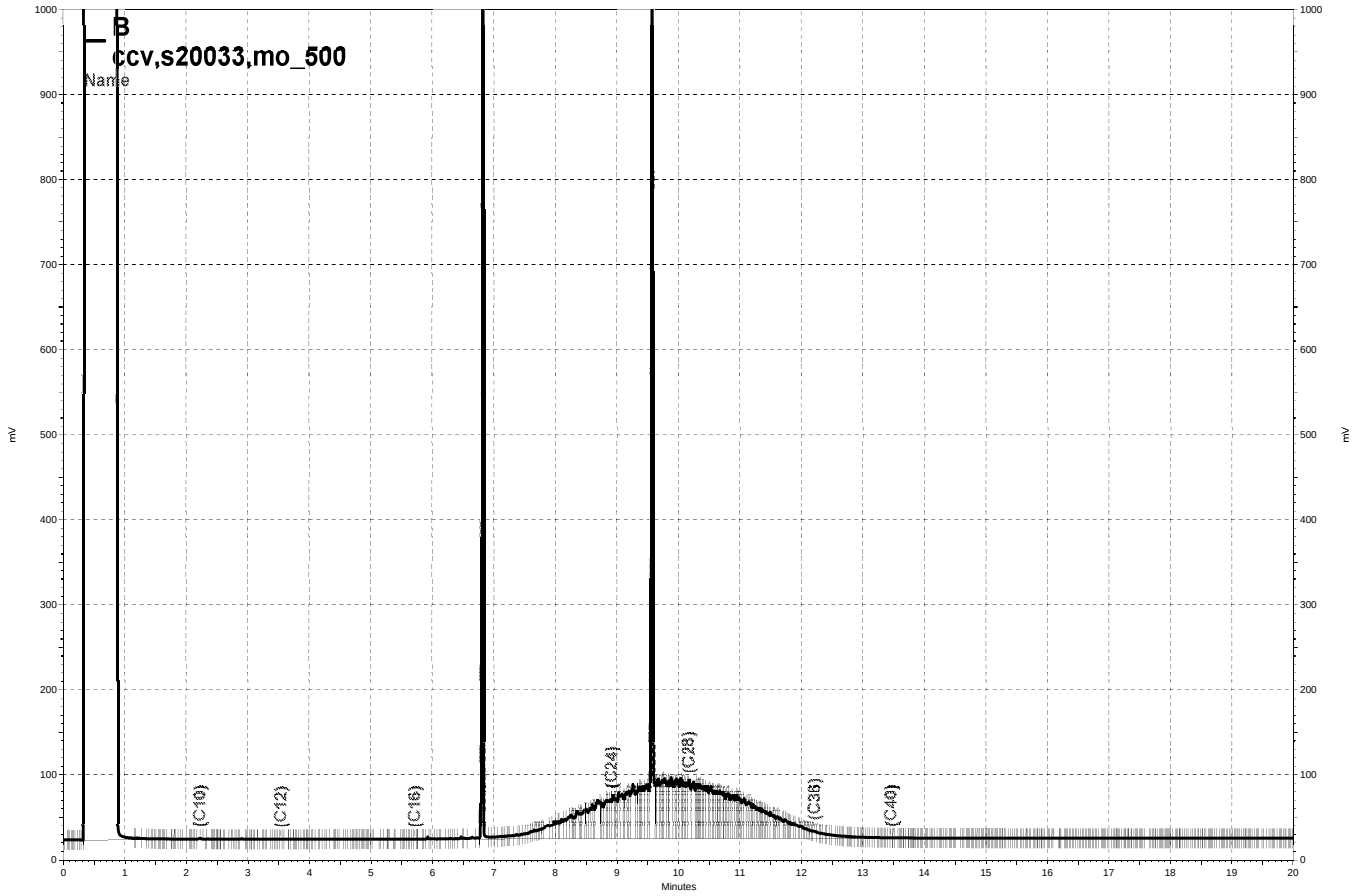

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Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	MW-4	Batch#:	187782
Lab ID:	237278-001	Sampled:	06/19/12
Matrix:	Water	Received:	06/19/12
Units:	ug/L	Analyzed:	06/20/12
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	19	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	96	80-125
1,2-Dichloroethane-d4	108	69-145
Toluene-d8	95	80-120
Bromofluorobenzene	91	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	MW-4DUP	Batch#:	187782
Lab ID:	237278-002	Sampled:	06/19/12
Matrix:	Water	Received:	06/19/12
Units:	ug/L	Analyzed:	06/20/12
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	20	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	96	80-125
1,2-Dichloroethane-d4	104	69-145
Toluene-d8	94	80-120
Bromofluorobenzene	96	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	MW-5	Batch#:	187787
Lab ID:	237278-003	Sampled:	06/19/12
Matrix:	Water	Received:	06/19/12
Units:	ug/L	Analyzed:	06/20/12
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	112	80-125
1,2-Dichloroethane-d4	125	69-145
Toluene-d8	94	80-120
Bromofluorobenzene	90	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	MW-8A	Batch#:	187787
Lab ID:	237278-004	Sampled:	06/19/12
Matrix:	Water	Received:	06/19/12
Units:	ug/L	Analyzed:	06/20/12
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	113	80-125
1,2-Dichloroethane-d4	126	69-145
Toluene-d8	94	80-120
Bromofluorobenzene	90	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	MW-9	Batch#:	187787
Lab ID:	237278-005	Sampled:	06/19/12
Matrix:	Water	Received:	06/19/12
Units:	ug/L	Analyzed:	06/20/12
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	11	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	107	80-125
1,2-Dichloroethane-d4	127	69-145
Toluene-d8	95	80-120
Bromofluorobenzene	89	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	MW-10	Batch#:	187787
Lab ID:	237278-006	Sampled:	06/19/12
Matrix:	Water	Received:	06/19/12
Units:	ug/L	Analyzed:	06/20/12
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	58	0.5
Toluene	ND	0.5
Ethylbenzene	2.9	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	103	80-125
1,2-Dichloroethane-d4	126	69-145
Toluene-d8	93	80-120
Bromofluorobenzene	90	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	MW-11	Batch#:	187787
Lab ID:	237278-007	Sampled:	06/19/12
Matrix:	Water	Received:	06/19/12
Units:	ug/L	Analyzed:	06/20/12
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	108	80-125
1,2-Dichloroethane-d4	123	69-145
Toluene-d8	93	80-120
Bromofluorobenzene	90	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	MW-12	Batch#:	187787
Lab ID:	237278-008	Sampled:	06/19/12
Matrix:	Water	Received:	06/19/12
Units:	ug/L	Analyzed:	06/20/12
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	2.4	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	110	80-125
1,2-Dichloroethane-d4	125	69-145
Toluene-d8	93	80-120
Bromofluorobenzene	90	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	MW-2	Batch#:	187787
Lab ID:	237278-009	Sampled:	06/19/12
Matrix:	Water	Received:	06/19/12
Units:	ug/L	Analyzed:	06/20/12
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	107	80-125
1,2-Dichloroethane-d4	123	69-145
Toluene-d8	94	80-120
Bromofluorobenzene	92	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	TRIP BLANK	Batch#:	187827
Lab ID:	237278-010	Sampled:	06/19/12
Matrix:	Water	Received:	06/19/12
Units:	ug/L	Analyzed:	06/22/12
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	116	80-125
1,2-Dichloroethane-d4	110	69-145
Toluene-d8	104	80-120
Bromofluorobenzene	99	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	187782
Units:	ug/L	Analyzed:	06/20/12
Diln Fac:	1.000		

Type: BS Lab ID: QC644886

Analyte	Spiked	Result	%REC	Limits
MTBE	25.00	24.78	99	61-121
Benzene	25.00	24.25	97	80-121
Toluene	25.00	24.41	98	80-120
Ethylbenzene	25.00	22.49	90	80-120
m,p-Xylenes	50.00	46.49	93	80-121
o-Xylene	25.00	23.64	95	80-121

Surrogate	%REC	Limits
Dibromofluoromethane	104	80-125
1,2-Dichloroethane-d4	117	69-145
Toluene-d8	94	80-120
Bromofluorobenzene	93	80-120

Type: BSD Lab ID: QC644887

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	25.00	25.24	101	61-121	2	20
Benzene	25.00	23.20	93	80-121	4	20
Toluene	25.00	24.05	96	80-120	1	20
Ethylbenzene	25.00	22.37	89	80-120	1	20
m,p-Xylenes	50.00	46.61	93	80-121	0	20
o-Xylene	25.00	22.28	89	80-121	6	20

Surrogate	%REC	Limits
Dibromofluoromethane	99	80-125
1,2-Dichloroethane-d4	119	69-145
Toluene-d8	97	80-120
Bromofluorobenzene	94	80-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC644888	Batch#:	187782
Matrix:	Water	Analyzed:	06/20/12
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	96	80-125
1,2-Dichloroethane-d4	107	69-145
Toluene-d8	107	80-120
Bromofluorobenzene	99	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	187787
Units:	ug/L	Analyzed:	06/20/12
Diln Fac:	1.000		

Type: BS Lab ID: QC644903

Analyte	Spiked	Result	%REC	Limits
MTBE	25.00	17.91	72	61-121
Benzene	25.00	25.62	102	80-121
Toluene	25.00	25.09	100	80-120
Ethylbenzene	25.00	26.02	104	80-120
m,p-Xylenes	50.00	51.16	102	80-121
o-Xylene	25.00	22.34	89	80-121

Surrogate	%REC	Limits
Dibromofluoromethane	105	80-125
1,2-Dichloroethane-d4	128	69-145
Toluene-d8	95	80-120
Bromofluorobenzene	90	80-120

Type: BSD Lab ID: QC644904

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	25.00	18.34	73	61-121	2	20
Benzene	25.00	25.66	103	80-121	0	20
Toluene	25.00	25.15	101	80-120	0	20
Ethylbenzene	25.00	25.92	104	80-120	0	20
m,p-Xylenes	50.00	50.76	102	80-121	1	20
o-Xylene	25.00	22.39	90	80-121	0	20

Surrogate	%REC	Limits
Dibromofluoromethane	102	80-125
1,2-Dichloroethane-d4	126	69-145
Toluene-d8	94	80-120
Bromofluorobenzene	91	80-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC644905	Batch#:	187787
Matrix:	Water	Analyzed:	06/20/12
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	112	80-125
1,2-Dichloroethane-d4	126	69-145
Toluene-d8	95	80-120
Bromofluorobenzene	93	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	ZZZZZZZZZZ	Batch#:	187787
MSS Lab ID:	237233-003	Sampled:	06/18/12
Matrix:	Water	Received:	06/18/12
Units:	ug/L	Analyzed:	06/20/12
Diln Fac:	1.000		

Type: MS Lab ID: QC644960

Analyte	MSS Result	Spiked	Result	%REC	Limits
MTBE	<0.1000	25.00	18.28	73 *	74-120
Benzene	<0.1000	25.00	26.81	107	80-120
Toluene	<0.1000	25.00	25.62	102	80-120
Ethylbenzene	<0.1124	25.00	27.32	109	80-120
m,p-Xylenes	<0.1000	50.00	53.24	106	80-120
o-Xylene	<0.1000	25.00	23.38	94	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	102	80-125
1,2-Dichloroethane-d4	128	69-145
Toluene-d8	92	80-120
Bromofluorobenzene	87	80-120

Type: MSD Lab ID: QC644961

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	25.00	19.05	76	74-120	4	20
Benzene	25.00	26.17	105	80-120	2	20
Toluene	25.00	25.37	101	80-120	1	20
Ethylbenzene	25.00	27.13	109	80-120	1	20
m,p-Xylenes	50.00	53.05	106	80-120	0	20
o-Xylene	25.00	23.52	94	80-120	1	20

Surrogate	%REC	Limits
Dibromofluoromethane	100	80-125
1,2-Dichloroethane-d4	125	69-145
Toluene-d8	92	80-120
Bromofluorobenzene	88	80-120

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

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	187827
Units:	ug/L	Analyzed:	06/21/12
Diln Fac:	1.000		

Type: BS Lab ID: QC645065

Analyte	Spiked	Result	%REC	Limits
MTBE	25.00	20.63	83	61-121
Benzene	25.00	26.93	108	80-121
Toluene	25.00	27.24	109	80-120
Ethylbenzene	25.00	29.00	116	80-120
m,p-Xylenes	50.00	54.19	108	80-121
o-Xylene	25.00	23.42	94	80-121

Surrogate	%REC	Limits
Dibromofluoromethane	115	80-125
1,2-Dichloroethane-d4	115	69-145
Toluene-d8	103	80-120
Bromofluorobenzene	100	80-120

Type: BSD Lab ID: QC645066

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	25.00	20.03	80	61-121	3	20
Benzene	25.00	26.29	105	80-121	2	20
Toluene	25.00	26.78	107	80-120	2	20
Ethylbenzene	25.00	28.57	114	80-120	1	20
m,p-Xylenes	50.00	53.40	107	80-121	1	20
o-Xylene	25.00	23.37	93	80-121	0	20

Surrogate	%REC	Limits
Dibromofluoromethane	113	80-125
1,2-Dichloroethane-d4	114	69-145
Toluene-d8	103	80-120
Bromofluorobenzene	101	80-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC645119	Batch#:	187827
Matrix:	Water	Analyzed:	06/21/12
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	122	80-125
1,2-Dichloroethane-d4	114	69-145
Toluene-d8	105	80-120
Bromofluorobenzene	102	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	237278	Location:	Port Of Oakland, CA
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	ZZZZZZZZZZ	Batch#:	187827
MSS Lab ID:	237316-005	Sampled:	06/19/12
Matrix:	Water	Received:	06/20/12
Units:	ug/L	Analyzed:	06/22/12
Diln Fac:	1.000		

Type: MS Lab ID: QC645136

Analyte	MSS Result	Spiked	Result	%REC	Limits
MTBE	<0.1000	25.00	20.97	84	74-120
Benzene	<0.1000	25.00	26.17	105	80-120
Toluene	<0.1000	25.00	27.23	109	80-120
Ethylbenzene	0.1189	25.00	28.92	115	80-120
m,p-Xylenes	<0.1000	50.00	53.77	108	80-120
o-Xylene	<0.1000	25.00	24.24	97	80-120

Surrogate	%REC	Limits
Dibromofluoromethane	108	80-125
1,2-Dichloroethane-d4	107	69-145
Toluene-d8	102	80-120
Bromofluorobenzene	99	80-120

Type: MSD Lab ID: QC645137

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	25.00	21.05	84	74-120	0	20
Benzene	25.00	25.79	103	80-120	1	20
Toluene	25.00	26.93	108	80-120	1	20
Ethylbenzene	25.00	28.47	113	80-120	2	20
m,p-Xylenes	50.00	53.41	107	80-120	1	20
o-Xylene	25.00	24.14	97	80-120	0	20

Surrogate	%REC	Limits
Dibromofluoromethane	107	80-125
1,2-Dichloroethane-d4	105	69-145
Toluene-d8	101	80-120
Bromofluorobenzene	99	80-120

RPD= Relative Percent Difference

Data Validation Worksheet

Lab Report # 237278 DV by: CO
Project Port Harbor Facilities Complex Date: 07/12/12

Lab IDs	Sample IDs	Date Collected	Parameters		
			TPHg (8015B)	TPHd/mo (8015B)	MTBE BTEX (8260B)
-001	MW-4	6/19/12	X	X	X
-002	MW-4DUP	6/19/12	X	X	X
-003	MW-5	6/19/12	X	X	X
-004	MW-8A	6/19/12	X	X	X
-005	MW-9	6/19/12	X	X	X
-006	MW-10	6/19/12	X	X	X
-007	MW-11	6/19/12	X	X	X
-008	MW-12	6/19/12	X	X	X
-009	MW-2	6/19/12	X	X	X
-010	TRIP BLANK	6/19/12	X		X

Lab ID: C+T **NO QUALS**
Cooler Temperature: 3.9 C one cooler, 10.0 C one cooler
Chain-of-Custody: Missing trip blank
Samples preservatives: OK

Parameter: **TPHg**

HTs: 14 days – analyzed 6/20/12 (1) and 6/21/12 (2)
Batch IDs: 187793, 187847
Surrogates: OK
Method Blank: OK, surrogates OK
LCS: OK, surrogates OK
MS/MSD: MS OK, surrogates OK
MSD OK, surrogates OK

Parameter: **TPHd/mo**

HTs: 7 days – analyzed 6/21/12 (2)
Batch IDs: 187803
Surrogates: OK
Method Blank: OK, surrogates OK
BS/BSD: BS OK, surrogates OK
BSD OK, surrogates OK

Parameter: **BTEX + MTBE**

HTs: 14 days – analyzed 6/20/12 (1) and 6/22/12 (3)
Batch IDs: 187782, 187787, 187827
Surrogates: OK
Method Blank: OK, surrogates OK
BS/BSD: BS OK, surrogates OK
BSD OK, surrogates OK
MS/MSD: MS batch 187787 out of range, QC sample → NO QUAL
MSD OK, surrogates OK

Port of Oakland
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Appendix C
Free Product and Water Level Measurement Field Sheets

4656016

MALCOLM PIRNIE

Site Visit Date: **Recorded By:**

Recovery Well		Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Depth to Pump (feet)	Cycles or Period Duration	Vacuum (in H20)	Total Run Time (hr:mm)	Product removed (gal)	Comments
RW-1					Pump inactive					
RW-2					Pump inactive					
RW-3	Pre-run	10.48	10.98	0.50						
	Post-run									
RW-4	Pre-run	9.68	10.17	0.49						
	Post-run									
RW-5		8.66	9.09	0.43	Pump inactive					
RW-6	Pre-run	9.05	9.72	0.65						
	Post-run									
RW-7	Pre-run	8.19	8.45	0.26						
	Post-run									
RW-8	Pre-run	9.28	9.40	0.12						
	Post-run									
RW-9	Pre-run	9.70	9.81	0.11						
	Post-run									
MW-3	Pre-run	10.21	11.73	1.51						
	Post-run									

Elapsed Time @ Blower (hrs):

Sight Column Water Level: empty 1/4 1/2 3/4 full (empty @ 1/2 or more)

Depth of product in convault (feet):

Compressor condensate emptied?

Depth to interface (feet):

Site Visit Date:			Recorded By:							
Recovery Well		Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Depth to Pump (feet)	Cycles or Period Duration	Vacuum (in H20)	Total Run Time (hr:mm)	Product removed (gal)	Comments
RW-1					Pump inactive					
RW-2					Pump inactive					
RW-3	Pre-run	10.64	11.91	1.27						
	Post-run	—	—	—						
RW-4	Pre-run	9.60 ~~10.64~~	10.26 ~~11.91~~	0.66 ~~1.27~~						
	Post-run	—	—	—						
RW-5		N/A	N/A	N/A	Pump inactive					Inaccessible
RW-6	Pre-run	8.99	10.16	1.17						
	Post-run	—	—	—						
RW-7	Pre-run	8.24	8.90	0.64						
	Post-run	—	—	—						
RW-8	Pre-run	9.54	9.77	0.23						
	Post-run	—	—	—						
RW-9	Pre-run	9.67	9.78	0.11						
	Post-run	—	—	—						
MW-3	Pre-run	10.65	12.11	1.46						
	Post-run	—	—	—						

Elapsed Time @ Blower (hrs):

Sight Column Water Level: empty 1/4 1/2 3/4 full (empty @ 1/2 or more)

Compressor condensate emptied?

Depth of product in convault (feet):

Depth to interface (feet):

MALCOLM PIRNIE | ARCADIS

ARCADIS U.S., Inc.
BY. SC DATE 12/5/11 SHEET NO. ..... OF .....
CHKD. BY. ..... DATE ..... JOB NO. .....
SUBJECT. Free Product / Water Level Measurements - Port HFC

	DTP	DTW	
MW-1	-	11.15	product visible on probe, strong odor
MW-2	-	11.95	
MW-3	10.83	12.20	
4	-	12.03	
5	-	9.31	
8A	-	11.29	
9	-	~~9.31~~	11.99
10	-	10.80	
11		10.59	
12		11.89	

Site Visit Date: 12/5/11 **Recorded By:** SC

Recovery Well		Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Depth to Pump (feet)	Cycles or Period Duration	Vacuum (in H20)	Total Run Time (hr:mm)	Product removed (gal)	Comments
RW-1					Pump inactive					
RW-2		—	9.44	0.0	Pump inactive					
RW-3	Pre-run	~~10.75~~	12.67	1.92	—	—		—	—	
	Post-run	—	—	—				—		
RW-4	Pre-run	9.70	10.00	6.30	—	—		—	—	
	Post-run	—	—	—				—		
RW-5		inaccessible			Pump inactive					
RW-6	Pre-run	9.05	10.62	1.57	—	—	—	—	—	from top of cap
	Post-run	—	—	—			—	—		
RW-7	Pre-run	8.26	9.77	1.51	—	—	—	—	—	
	Post-run	—	—	—			—	—		
RW-8	Pre-run	~~9.62~~ ~~10.62~~	10.19	0.57	—	—	—	—	—	from top of cap
	Post-run	—	—	—			—	—		
RW-9	Pre-run	9.75	10.14	0.39	—	—		—	—	
	Post-run	—	—	—				—		
MW-3	Pre-run	10.83	12.20	1.37					—	
	Post-run	—	—	—						

Elapsed Time @ Blower (hrs):

Sight Column Water Level: empty 1/4 1/2 3/4 full (empty @ 1/2 or more)

Depth of product in convault (feet): ~~NM~~ 12/5/11 1.36

Compressor condensate emptied?

Depth to interface (feet): 2.03

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

Site Visit Date:	02/06/12		
Recorded By:	CO		
Recovery Well	Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)
RW-1	Inaccessible		
RW-2	—	9.22	0.00
RW-3	10.32	12.54	2.22
RW-4	9.10	10.66	1.56
RW-5	8.47	12.01	3.54
RW-6	8.95	10.82	1.87
RW-7	8.18	9.86	1.68
RW-8	9.21	10.22	1.01
RW-9	9.88	10.37	0.59
MW-1	—	10.89	Sheen
MW-2	—	11.50	0.00
MW-3	10.60	11.42	0.82
MW-4	—	11.71	0.00
MW-5	—	9.32	0.00
MW-8A	—	10.75	0.00
MW-9	—	11.70	0.00
MW-10	—	10.51	0.00
MW-11	—	10.59	0.00
MW-12	—	11.60	0.00

FP on interface probe

Site Visit Date: 6/20/12 **Recorded By:** Caroline Orsi

Recovery Well		Depth to Product (feet)	Depth to Water (feet)	Product Thickness (feet)	Depth to Pump (feet)	Cycles or Period Duration	Vacuum (in H20)	Total Run Time (hr:mm)	Product removed (gal)	Comments
RW-1					Pump inactive					
RW-2		No Product	9.80		Pump inactive					
RW-3	Pre-run	10.38	12.56	2.18	X	X		X		
	Post-run	—	—	—						
RW-4	Pre-run	9.20	9.27	0.07	X	X		X		
	Post-run	—	—	—						
RW-5		NA	NA	—	Pump inactive					Truck parked over vault
RW-6	Pre-run	8.92	9.99	1.07	X	X	X	X		
	Post-run	—	—	—						
RW-7	Pre-run	8.35	8.41	0.06	X	X	X	X		
	Post-run	—	—	—						
RW-8	Pre-run	9.36	10.28	0.92	X	X	X	X		
	Post-run	—	—	—						
RW-9	Pre-run	9.49	10.40	0.91	X	X		X		
	Post-run	—	—	—						
MW-3	Pre-run	—	—	—						Measurement recorded on GW monitoring sheet
	Post-run	—	—	—						

Elapsed Time @ Blower (hrs):

Sight Column Water Level: empty 1/4 1/2 3/4 full (empty @ 1/2 or more)

Depth of product in convault (feet):

Compressor condensate emptied?

Depth to interface (feet):