PORT OF OAKLAND

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Alameda County
Environmental Health

January 21, 2011

Ms. Donna L. Drogos, P. E.
Chief
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

RE: RO#0000010_2010 Second Semi-Annual Groundwater Monitoring and Remediation System Operation and Maintenance Report - Port of Oakland, 651 Maritime Street, Oakland, CA_2011-01-21

Dear Mr. Plunkett:

Please find enclosed the report entitled *2010 Second Semi-Annual Groundwater Monitoring and Remediation System Operation and Maintenance Report - Port of Oakland, 651 Maritime Street, Oakland, CA ("Report")* dated January 2011, 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 September 2, 2010[5].

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[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 C. Khatri (County) to Messrs. Jeffrey R. Jones and Jeffrey L. Rubin (Port) regarding *Feasibility Study Evaluation for Fuel Leak Case No. RO0000010 & RO0000187 (Geotracker Global ID T0600101866 & T0600100892), Port of Oakland, 651 Maritime Street, Oakland, CA*, dated September 2, 2010.

Ms. Donna L. Drogos, P. E.
Alameda County Health Care Services Agency

January 21, 2011

The Port has retained Malcolm Pirnie to perform groundwater monitoring and maintenance of the remediation system. Results of the second 2010 semi-annual sampling event are contained in the enclosed report. The next monitoring event will be performed during the June/July 2011 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

2010 Second Semi-Annual Groundwater Monitoring and Remediation System Operation and Maintenance Report

651 Maritime Street Oakland, California

January 2011

Report Prepared By:

Malcolm Pirnie, Inc.

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Emeryville, CA 94608
(510) 596-3060

4656016

MALCOLM PIRNIE

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January 24, 2011

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

Subject: **2010 Second Semi-Annual Groundwater Monitoring and Remediation System Operation and Maintenance Report - Port of Oakland, 651 Maritime Street, Oakland, California**

Dear Mr. Rubin:

Enclosed is the 2010 Second 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 December 2010 by Malcolm Pirnie. This report also presents the free product recovery system operation and maintenance data collected by Malcolm Pirnie since January 1, 2010.

If you have any questions or comments, please contact me at (510) 735-3014.

Sincerely,

Todd Miller, CHG
Project Manager

Enclosure

Contents

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Acronyms Used in the Report

ACHCS	Alameda County Health Care Services
amsl	Above mean sea level
BASELINE	BASELINE Environmental Consultants, Inc.
BTEX	Benzene, toluene, ethylbenzene, and total xylenes
C&T	Curtis & Tompkins, Ltd.
DO	Dissolved oxygen
LOP	Local Oversight Program
mg/L	Milligrams per liter
MSD	Matrix spike duplicate
MSE	MSE Group
MTBE	Methyl tert-butyl ether
NESCO	National Environmental Service Company
NAVD	North American Vertical Datum
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 2010 Second 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 July through December. 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 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 only 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 developed 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, and has been in operation continuously since.

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, several monitoring wells were abandoned to facilitate construction of the new Harbor Facilities Complex. Accordingly, 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.[4]

[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*.

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 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]

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 2010 second semi-annual groundwater monitoring event at the Site on December 14 and 15. The December 2010 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. The dual-phase interface probe was decontaminated before each measurement by washing it in a Liquinox solution then rinsing it with water. Field observations and instrument readings indicated that there was a detectable amount of free-phase product in monitoring wells MW-1 and MW-3 (Table 1); hence, these wells were neither purged nor sampled. Water level measurements for the December 2010 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, electrical conductivity, and turbidity) of the purge water using portable field instruments calibrated to manufacturer's specifications. Purging continued until water quality parameters stabilized and extracting at least two well casing volumes when recharge rates were sufficient. Slow recharge of well MW-2 allowed only one well casing volume to be purged. After purging, the water level in well MW-2 was allowed to recover to approximately 80 percent of the initial water level before collecting a sample. Field-measured groundwater quality information collected during the December 2010 monitoring event is provided on groundwater sampling forms included in Appendix A.

After purging, Malcolm Pirnie collected a groundwater sample 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, they were 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 been outfitted with ORC socks to increase the DO concentration in groundwater and stimulate aerobic biodegradation of the petroleum hydrocarbons. The ORC socks installed during a previous monitoring event were removed on December 8, 2010, approximately one week prior to conducting the December sampling. At the time the ORC socks were removed, the DO concentration in groundwater in well MW-4 was 8.19 mg/L. The socks were placed back in the well on December 15, 2010, following the sampling event.

Approximately 50 gallons of purge and decontamination water were generated during the December 2010 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 rules and regulations.

3. Results

The following sections summarize the field and laboratory results collected during the last six months of 2010.

3.1. Groundwater Flow Direction

Based on the depth-to-water measurements collected, groundwater beneath the Site rose in elevation between June 2010 and December 2010. In June 2010, groundwater elevations ranged from 3.24 feet above mean sea level (amsl) to 6.08 feet amsl. In December 2010, groundwater elevations ranged from 4.24 feet amsl to 6.38 feet amsl. The groundwater flow direction was judged to range from the northeast to northwest, with localized flow to the east and west in some areas of the Site. Groundwater gradients at the Site ranged from 0.024 to 0.0017 feet per foot. A shallow groundwater elevation contour map 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 December 2010 monitoring event. Product in MW-1 appeared as a sheen (no measureable thickness), which was observed on the interface probe after removing it from the well. Product thickness in well MW-1 has ranged from non-detectable to 1.30 feet since April 2000 (Table 1). The product thickness in well MW-3 was measured to be 0.61 feet. Product thickness in this well has ranged from non-detectable to 2.70 feet since April 2000. Product was manually removed from MW-3 on a weekly basis between July 2010 and December 2010 using a peristaltic pump and placed in the 500-gallon concrete-encased aboveground storage tank (Convault) located within the system enclosure.

3.3. Analytical Results

Analytical results for the groundwater samples collected during the December 2010 monitoring event are illustrated on Figure 5 and summarized in Table 1. 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-9, MW-10, and MW-12 at concentrations ranging from 100 micrograms per liter (µg/L) to 170 µg/L. The laboratory also reported that chromatographs resulting from the TPHg analyses exhibited patterns that do not match the gasoline standard. Chromatographs 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. The graph shows that except for well MW-10, TPHg concentrations beneath the Site are stable and/or decreasing. The concentrations reported in well MW-10 show a slight but not significant increase with time. The increase may be related to the location of the well relative to the free product plume. All reported concentrations are below a Site-specific screening level of 5,000 µg/L, derived from the Regional Water Quality Control Board's Environmental Screening Level (ESL) program for an industrial site with no impact to nearby surface water bodies and an on-Site designation for groundwater as non-potable through institutional controls.

3.3.2. BTEX and MTBE

The laboratory reported benzene in the groundwater samples collected from wells MW-4 (2.2 µg/L), MW-9 (34 µg/L), and MW-10 (47 µg/L). Xylenes were reported in the sample collected from well MW-9 at 0.6 µg/L. MTBE was reported in the sample collected from well MW-12 at 4.0 µg/L. Ethylbenzene and Toluene 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. 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. All reported concentrations are below a Site-specific screening level of 1,800 µg/L (derived as described above). Figure 8 shows MTBE concentrations beneath the site are stable and/or decreasing, with all reported concentrations being below a Site-specific screening level of 1,800 µg/L (derived as described above).

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 130 µg/L to 510 µg/L. The laboratory also reported that the chromatographs resulting from analysis of the samples collected from wells MW-9 and MW-10 exhibited patterns that do not match the diesel standard. The laboratory reported TPHmo concentrations to be below the method

reporting limit in the samples analyzed. Chromatographs are included in the laboratory reports in Appendix B.

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. The graph shows TPHd concentrations beneath the Site are stable and/or decreasing, with all concentrations being below a Site-specific screening level of 2,500 µg/L (derived as described above).

3.4. ORC Use

On December 8, six days before groundwater monitoring was performed at the Site, Malcolm Pirnie removed the ORC socks from well MW-4. The DO concentration measured in the groundwater in well MW-4 immediately after removal of the ORC socks indicated that they are still within their useful lifespan; thus, on December 15, 2010, following completion of the monitoring event, the ORC socks were placed back into the well.

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 TPHd, TPHg, BTEX and MTBE.

The laboratory reported detectable concentrations of benzene in sample MW-4 and duplicate sample MW-4DUP, at concentration of 2.2µg/L and 2.7µg/L. The relative percent difference (RPD) between the two samples is calculated below:

Benzene RPD |2.2-2.7|/ [(2.2+2.7)/2] = 20%

The RPD for benzene is at 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 laboratory reported that concentrations of the constituents of concern were below the method reporting limits for the analyses performed, indicating that the collection, preservation, storage, and analysis procedures did not compromise the sample integrity.

Malcolm Pirnie also reviewed the laboratory data for completeness and accuracy (see Quality Control Checklist in Appendix B). The laboratory Quality Assurance / Quality Control (QA/QC) goals were met and qualification of the data is not warranted.

Based on the above QA/QC evaluation, Malcolm Pirnie considers the data collected during the December 2010 monitoring event reliable for its intended use.

4. Free Product Recovery System

The Port installed the free product recovery system at the Harbor Facilities Complex in 2004, as required by the ACHCS in a letter dated March 27, 2003. The free product recovery system includes nine recovery wells, RW-1 through RW-9 (Figure 3). Each recovery well is protected by a flush-mounted utility box. Utilities supplied to each recovery well include a pneumatic line to operate a skimmer pump, a product discharge line, and a vacuum line. The Port operates six air-actuated skimmer pumps manufactured by Xitech Instruments, Inc. in the nine recovery wells. Historic field observations indicate that well RW-1 typically only contains a sheen, and free-phase product has not been observed historically in well RW-2. The remaining seven recovery wells contain measureable amounts of free-phase product. Currently, wells RW-1, RW-2 and RW-5 are not outfitted with skimmer pumps. A programmable controller is used to set the frequency and duration that each skimmer pump operates. The skimmers discharge recovered product into the 500-gallon aboveground Convault located in the system enclosure. The Convault is equipped with primary and secondary containment, as well as a sensor that activates a warning light and shuts off air supply to the skimmers when the tank is full.

Malcolm Pirnie operated the system during the second semi-annual monitoring period in 2010. Typical operation and maintenance (O&M) tasks include bi-weekly measurements of the product thickness in the recovery wells and confirmation of the position of the inlets of the recovery pumps in the wells relative to the interface of free product and groundwater. Pump inlet depths are adjusted as necessary to optimize recovery. In addition, pump functionality is checked, and filters are checked and changed as necessary. Bi-weekly free-phase product thickness measurements for the December 2010 semi-annual reporting period are summarized in Table 3. The observed area of free-phase product is shown on Figure 5. Weekly O&M field sheets are provided in Appendix C.

In July 2007, the free-phase product recovery system was upgraded to include the application of low vacuum on the wellheads to improve product recovery. Inducing a vacuum on the wellhead results in an air discharge containing petroleum vapors, which are removed by a series of two vessels, each containing 1,000 pounds of vapor-phase granular activated carbon. Treatment and discharge conditions are provided in a Permit-to-Operate from the Bay Area Air Quality Management District.

Prior to enhancement of the free-phase product recovery system with the installation of the low-vacuum blower, approximately 178 gallons of product were removed in 32

months (December 2004 through July 2007). After installation of the blower, 1,112 gallons of product has been recovered in 41 months (August 2007 through December 2010). A total of 1,290 gallons of product have been recovered since operation of the new free product recovery system began.

5. Conclusions

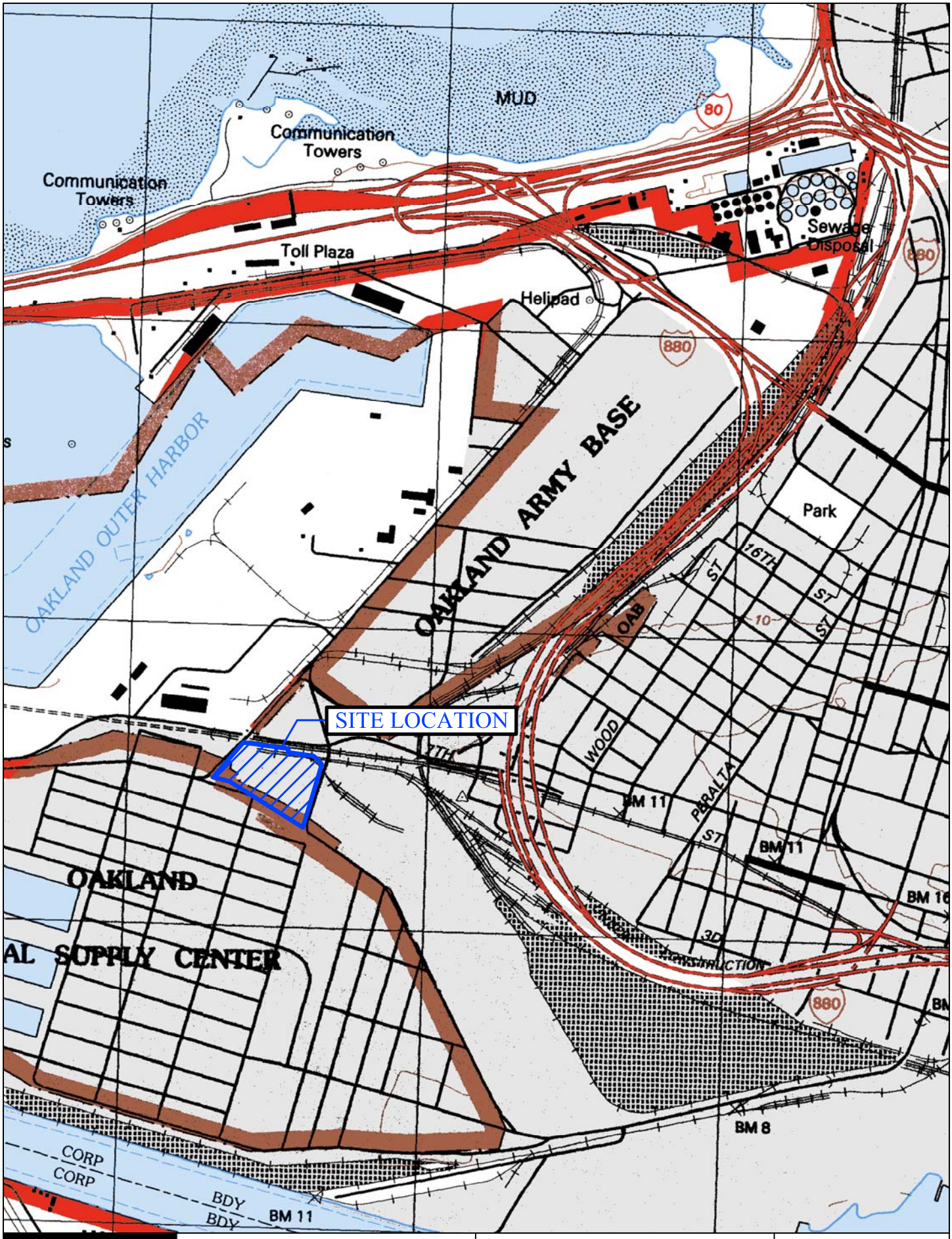
The results of the December 2010 monitoring and free product recovery system O&M tasks indicate that the free-phase product plume is stable, and groundwater concentrations are stable and/or decreasing (Figures 6 through 9). Screening levels for the Site were derived following the RWQCB's Environmental 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 designated non-potable through institutional controls and deed restrictions. The historical data indicate that dissolved constituents reported in the various monitoring wells beneath the Site are well below their respective Site-specific screening levels, indicating that remediation of groundwater is not warranted.

Port of Oakland
530 Water Street • Oakland, CA 94607

Figures

4656016

MALCOLM PIRNIE



User:Orsi Spec:PIRNIE STANDARD File:P:\4656\016\acad\2nd Semi 2010\FIGURES.DWG

MALCOLM PIRNIE

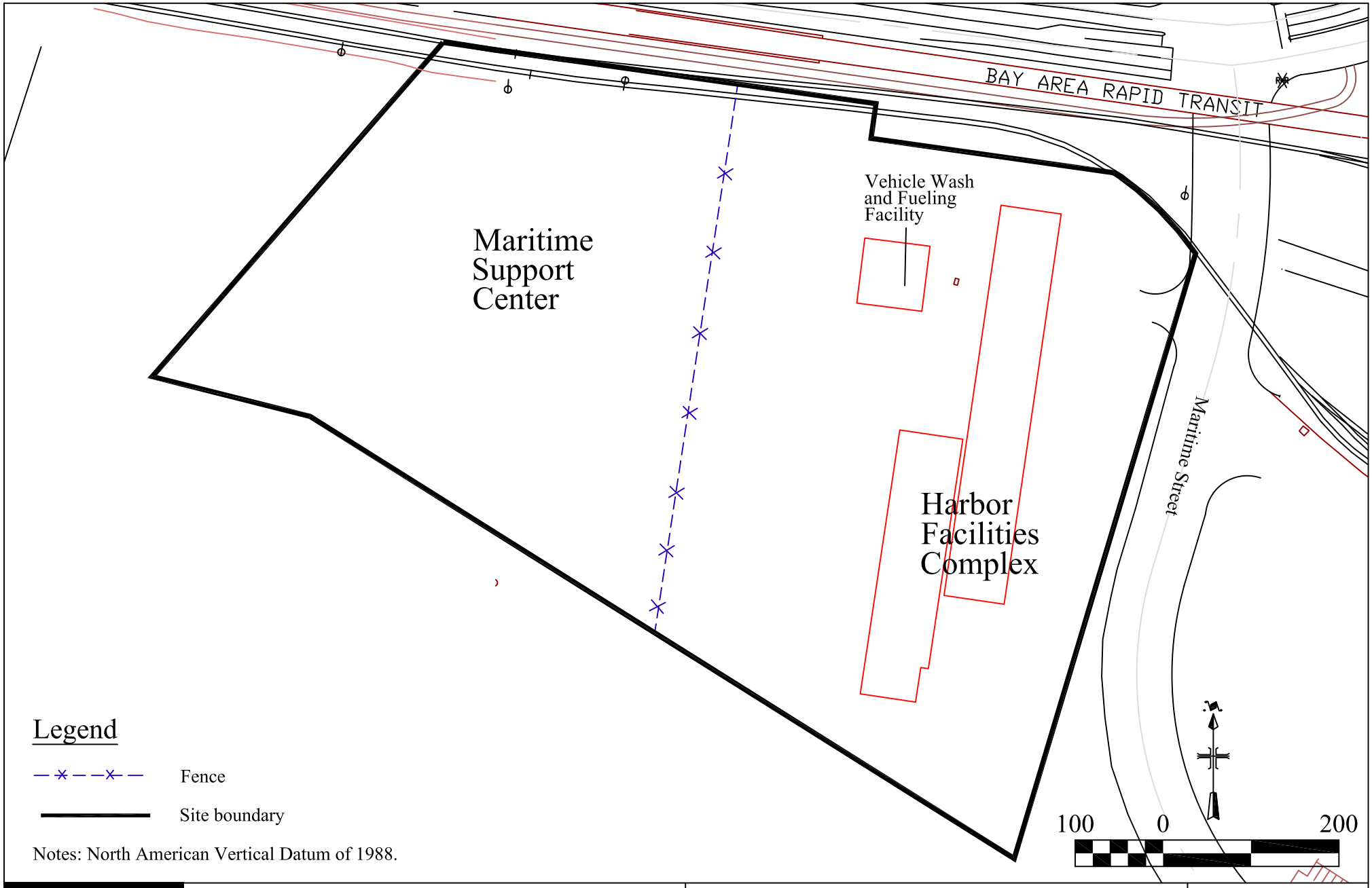
PORT OF OAKLAND
HARBOR FACILITIES COMPLEX
651 MARITIME STREET

SITE LOCATION MAP

MALCOLM PIRNIE, INC.

JANUARY 2011

FIGURE 1



MALCOLM PIRNIE

PORT OF OAKLAND

HARBOR FACILITIES COMPLEX
651 MARITIME STREET

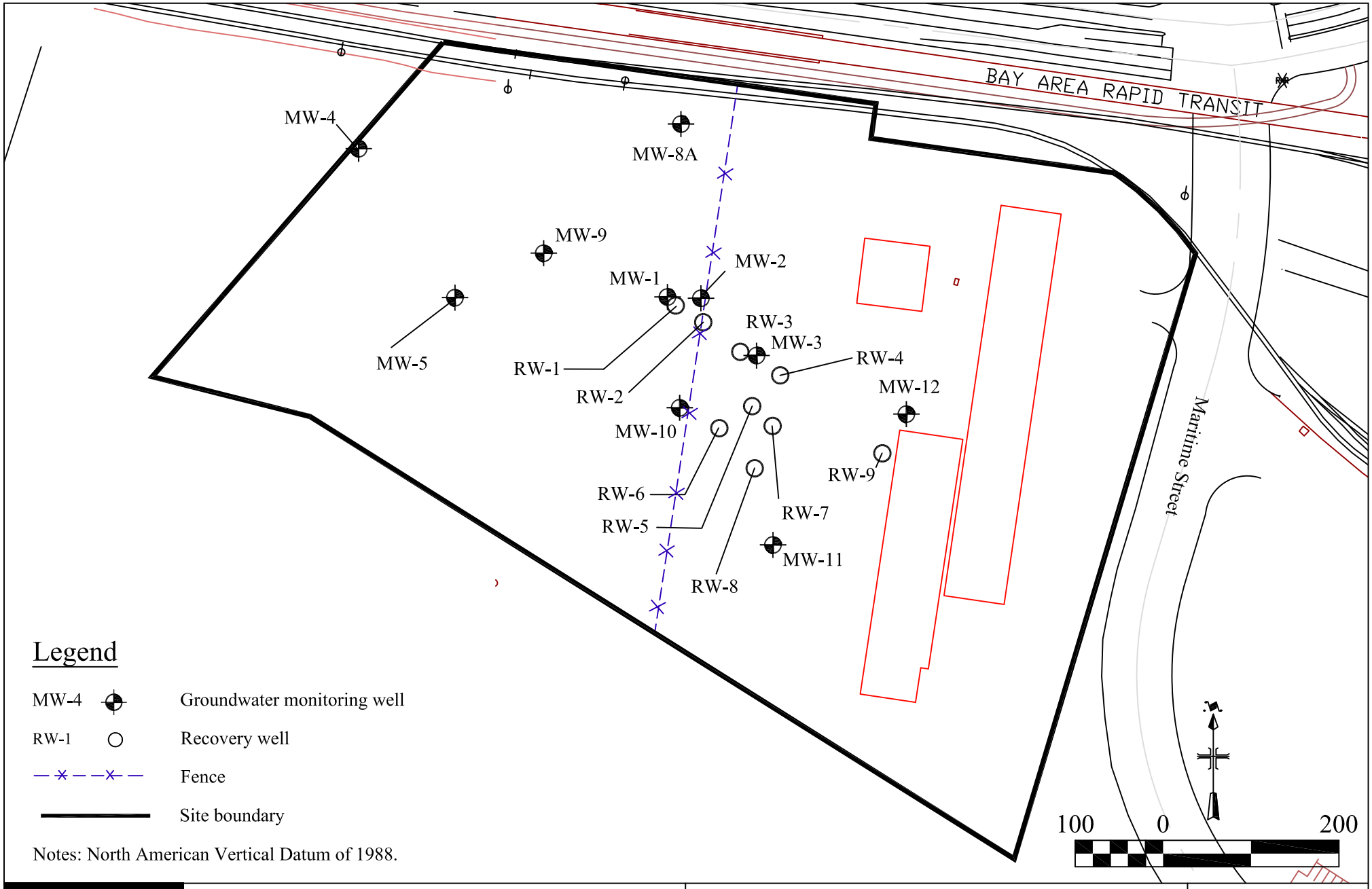
HARBOR FACILITIES COMPLEX LAYOUT

MALCOLM PIRNIE, INC.

JANUARY 2011

FIGURE 2

User:Orsi Spec:PIRNIE STANDARD File:P:\4656\016\acad\2nd Semi 2010\FIGURES.DWG



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PORT OF OAKLAND

HARBOR FACILITIES COMPLEX
651 MARITIME STREET

SITE PLAN

MALCOLM PIRNIE, INC.

JANUARY 2011

FIGURE 3

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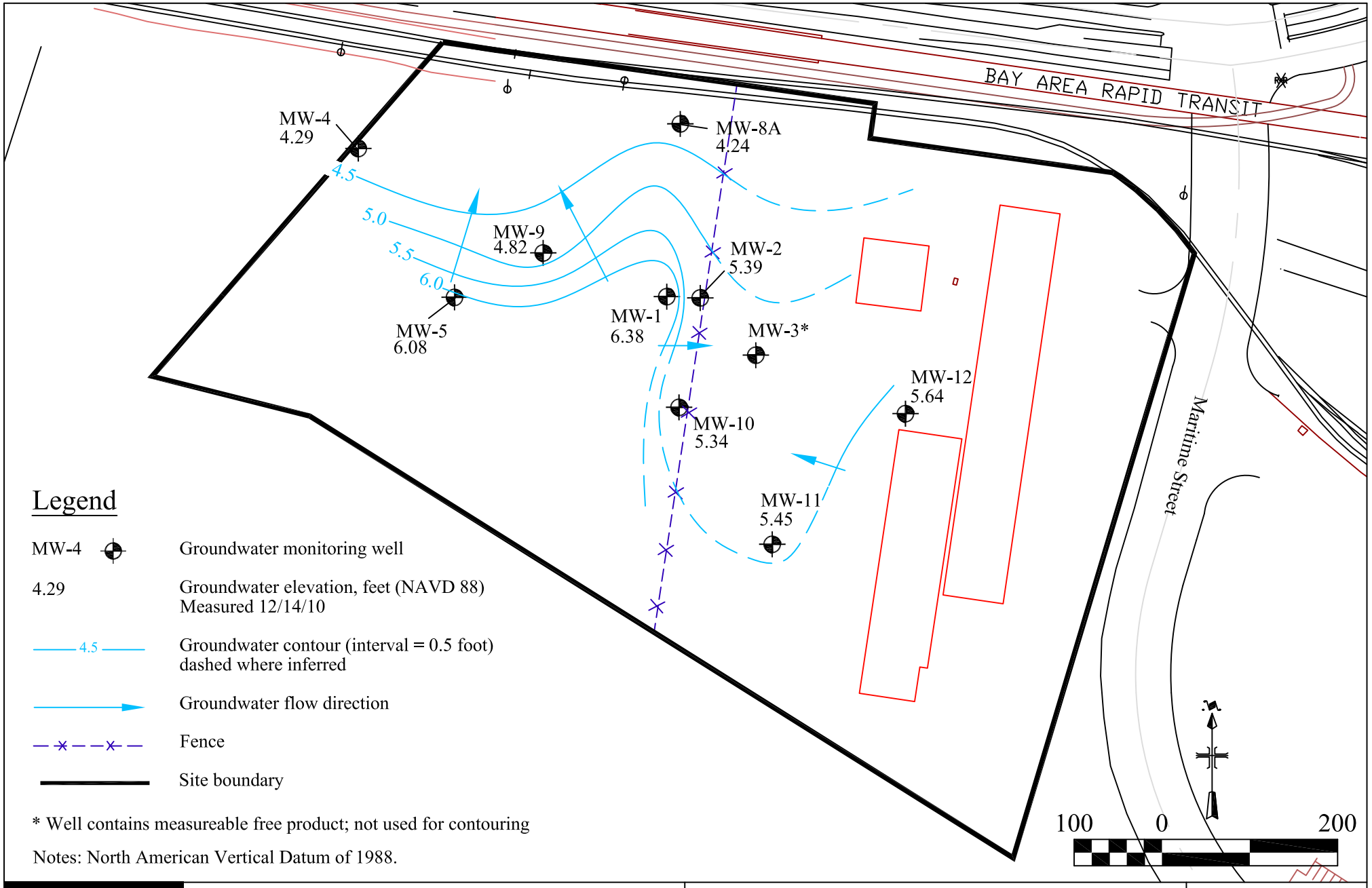


Legend

MW-4	Groundwater monitoring well
4.29	Groundwater elevation, feet (NAVD 88) Measured 12/14/10
4.5	Groundwater contour (interval = 0.5 foot) dashed where inferred
	Groundwater flow direction
	Fence
	Site boundary

* Well contains measureable free product; not used for contouring

Notes: North American Vertical Datum of 1988.

MALCOLM PIRNIE

PORT OF OAKLAND

HARBOR FACILITIES COMPLEX
651 MARITIME STREET

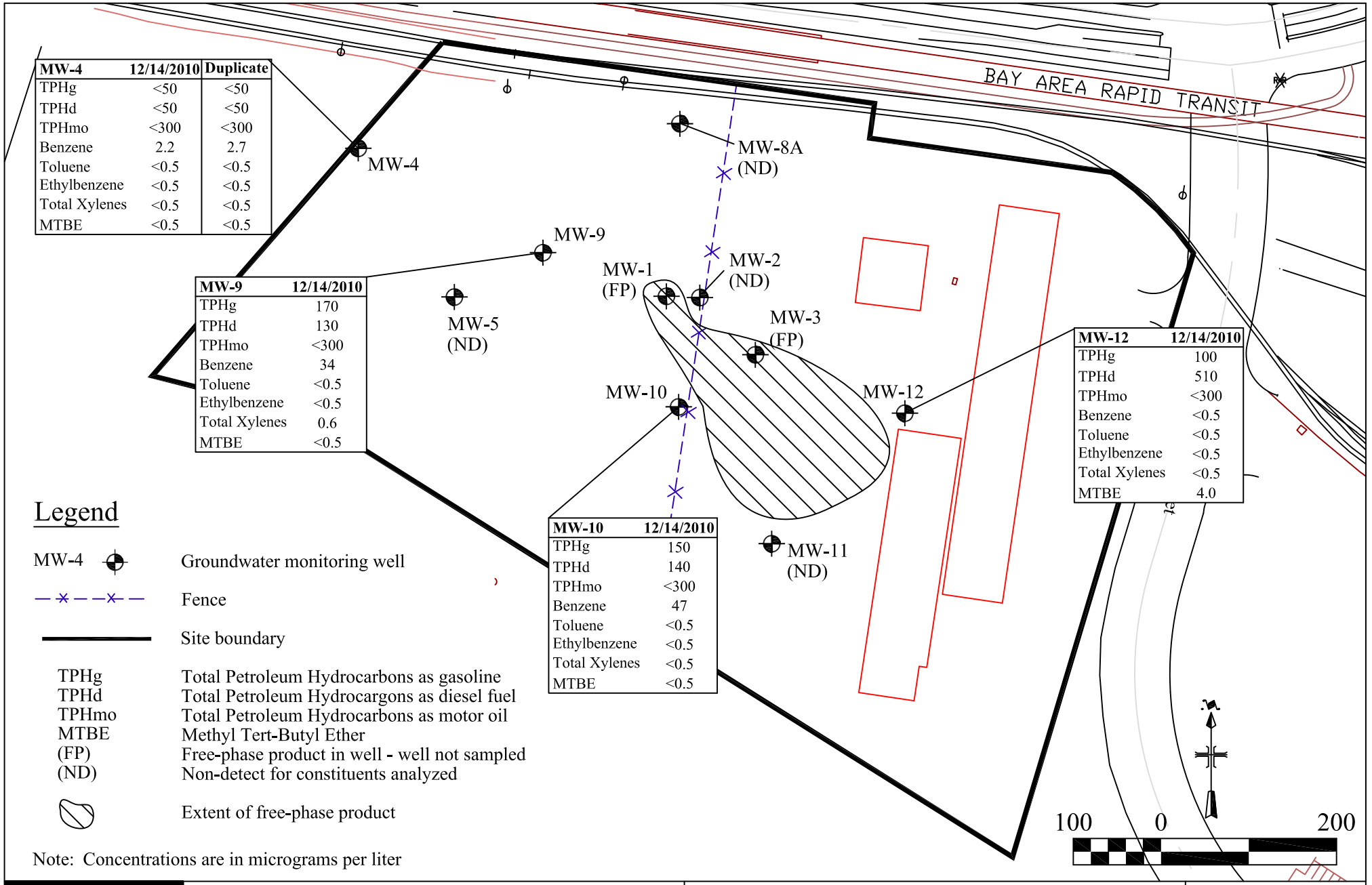
GROUNDWATER ELEVATION
ISOCONTOUR MAP - DECEMBER 2010

MALCOLM PIRNIE, INC.

JANUARY 2011

FIGURE 4

User:Orsi Spec:PIRNIE STANDARD File:P:\4656\016\acad\2nd Semi 2010\FIGURES.DWG



MW-4	12/14/2010	Duplicate
TPHg	<50	<50
TPHd	<50	<50
TPHmo	<300	<300
Benzene	2.2	2.7
Toluene	<0.5	<0.5
Ethylbenzene	<0.5	<0.5
Total Xylenes	<0.5	<0.5
MTBE	<0.5	<0.5

MW-9	12/14/2010
TPHg	170
TPHd	130
TPHmo	<300
Benzene	34
Toluene	<0.5
Ethylbenzene	<0.5
Total Xylenes	0.6
MTBE	<0.5

MW-10	12/14/2010
TPHg	150
TPHd	140
TPHmo	<300
Benzene	47
Toluene	<0.5
Ethylbenzene	<0.5
Total Xylenes	<0.5
MTBE	<0.5

MW-12	12/14/2010
TPHg	100
TPHd	510
TPHmo	<300
Benzene	<0.5
Toluene	<0.5
Ethylbenzene	<0.5
Total Xylenes	<0.5
MTBE	4.0

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

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PORT OF OAKLAND

HARBOR FACILITIES COMPLEX
651 MARITIME STREET

SHALLOW GROUNDWATER
SAMPLE RESULTS - DECEMBER 2010

MALCOLM PIRNIE, INC.

JANUARY 2011

FIGURE 5

User:Orsi Spec:PIRNIE STANDARD File:P:\4656\016\acad\2nd Semi 2010\FIGURES.DWG

Figure 6
TPHg Concentration versus Time

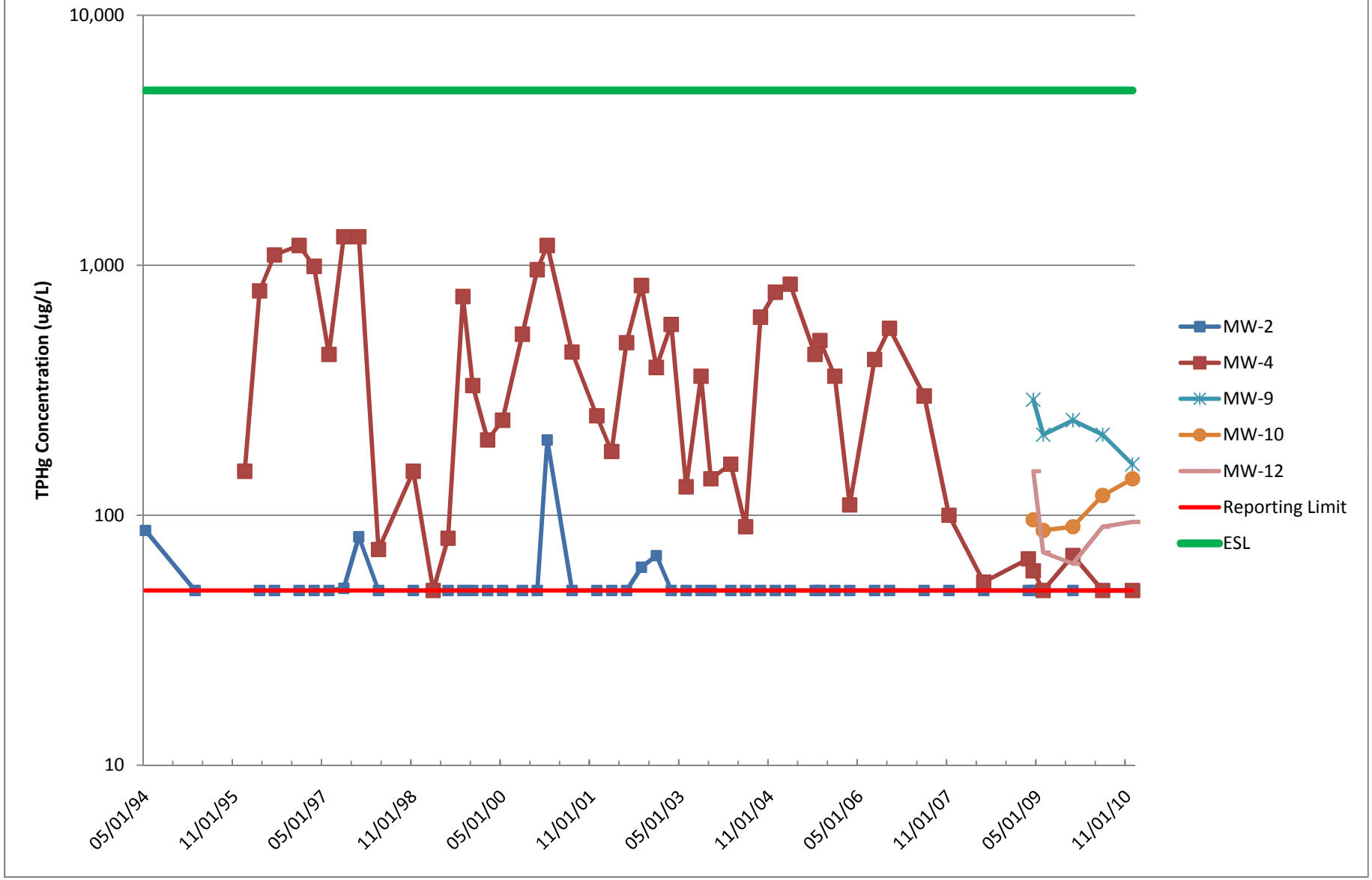


Figure 7
Benzene Concentration versus Time

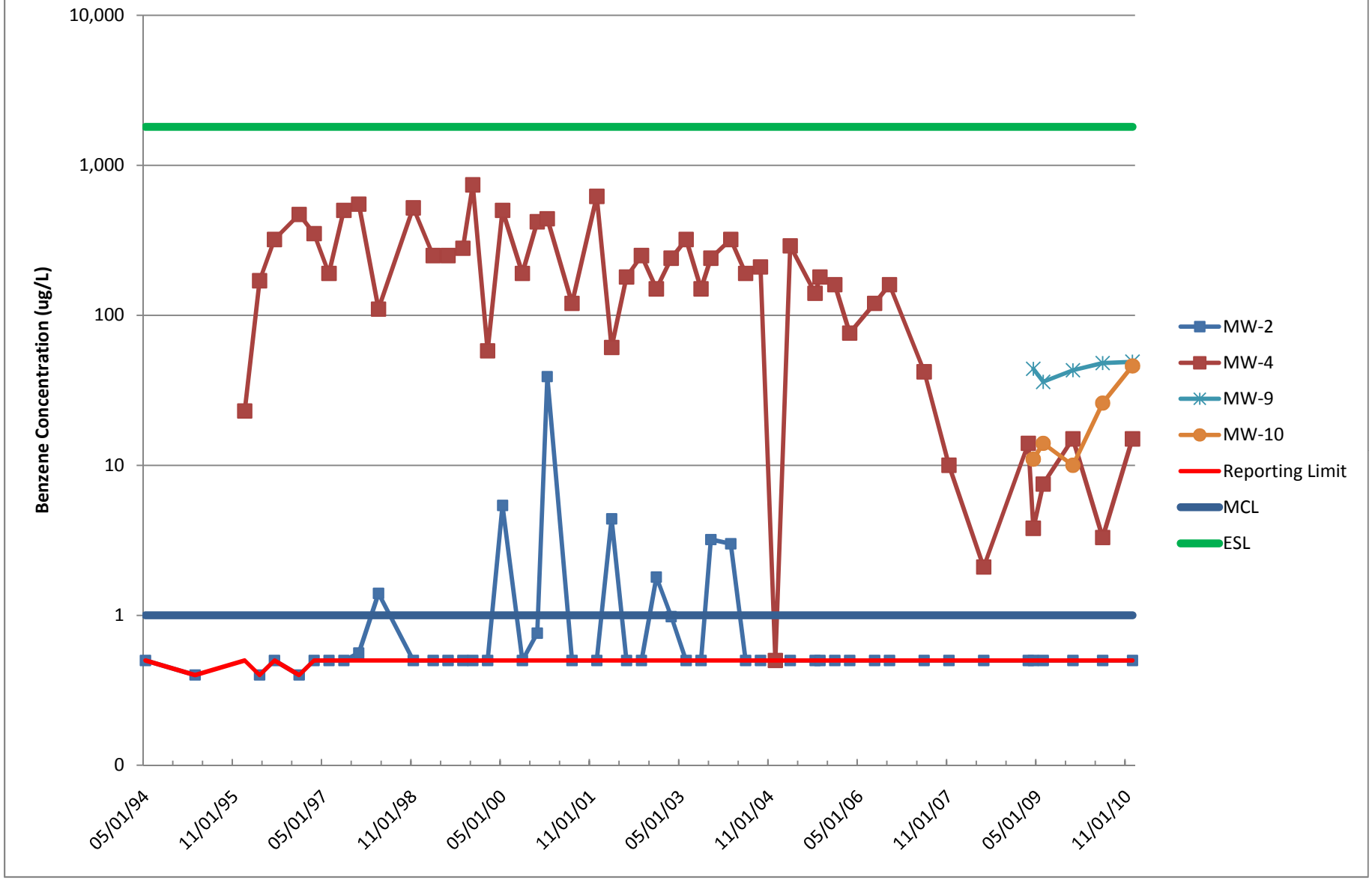


Figure 8
MTBE Concentration versus Time

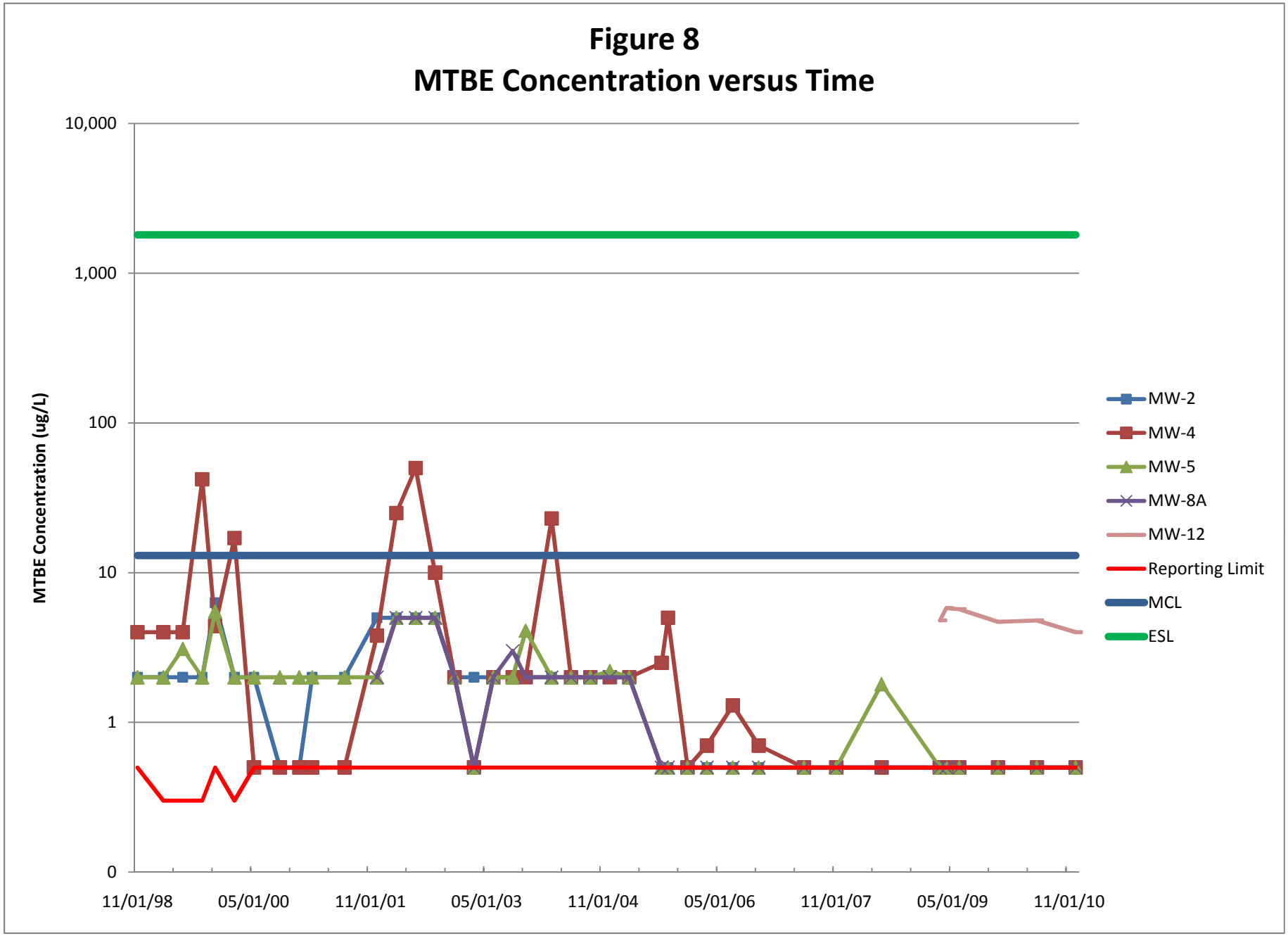
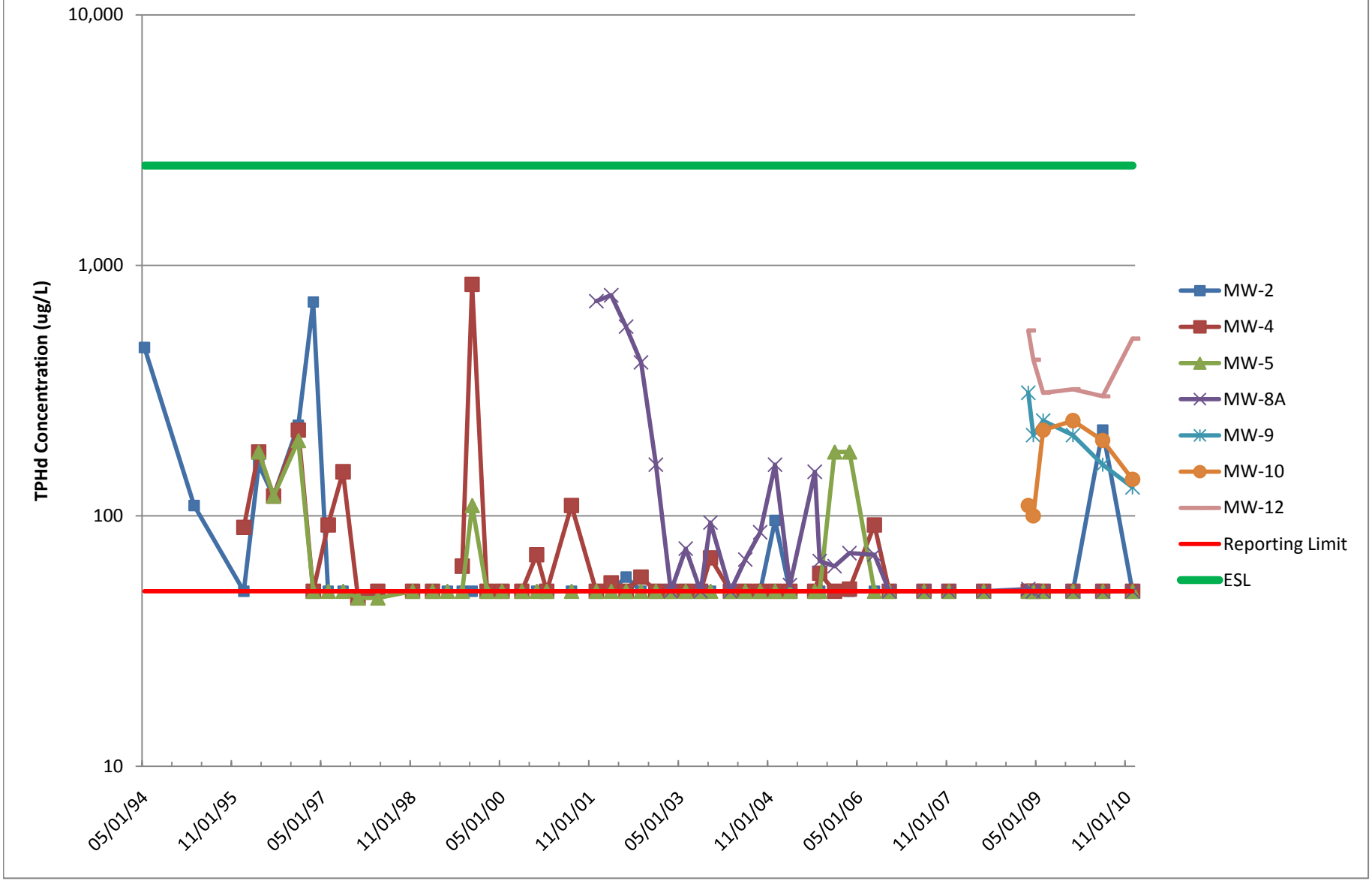


Figure 9
TPHd Concentration versus Time



Port of Oakland
530 Water Street • Oakland, CA 94607

Tables

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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, 5] (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	4.55
	12/12/01	13.65	NM	NA	NA	NA
	03/08/02	13.65	NM	NA	NA	NA
	06/13/02	13.65	8.70	10.00	1.30	4.63
	09/26/02	13.65	8.60	9.50	0.90	4.83
	03/17/03	13.65	7.61	8.88	1.27	5.72
	06/18/03	13.65	8.20	9.44	1.24	5.14
	09/03/03	13.65	8.50	9.40	0.90	4.93
	11/26/03	13.65	8.85	9.25	0.40	4.70
	03/05/04	13.65	6.76	7.07	0.31	6.81
	06/02/04	13.65	8.26	8.71	0.45	5.28
	09/03/04	13.65	8.70	9.11	0.41	4.85
	12/16/04	13.65	7.75	7.92	0.17	5.86
	03/29/05	13.65	6.21	6.38	0.17	7.40
	06/14/05	13.65	7.41	7.61	0.20	6.19
	08/10/05	13.65	8.05	8.55	0.50	5.48
	09/29/05	13.65	8.28	8.95	0.67	5.20
	12/21/05	13.65	5.70	5.90	0.20	7.90
	03/24/06	13.65	5.98	6.27	0.29	7.60
	07/28/06	13.65	7.88	8.35	0.47	5.65
	11/29/06	NA	10.58	10.81	0.23	NC
	06/01/07	15.80	11.11	11.45	0.34	4.61
	11/14/07	15.80	10.87	10.93	0.06	4.92
	06/05/08	15.80	11.36	11.46	0.10	4.42
	12/18/08	15.80	10.82	10.89	0.07	4.96
	03/04/09	15.80	9.38	9.52	0.14	6.39
	04/01/09	15.80	10.65	10.67	0.02	5.15
	06/17/09	15.80	11.21	11.28	0.07	4.57
	12/08/09	15.80	NP	10.79	0.00	5.01
	06/17/10	15.80	10.79 [4]	10.79	0.00	5.01
	12/14/10	15.80	9.42 [4]	9.42	0.00	6.38
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
	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

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, 5] (feet)
MW-2 (cont)	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
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
	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

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, 5] (feet)
MW-3 (cont)	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	4.58
	03/04/09	15.66	9.31	9.93	0.62	6.20
	04/01/09	15.66	10.38	11.10	0.72	5.10
	06/17/09	15.66	10.79	12.30	1.51	4.49
	12/08/09	15.66	11.05	12.81	1.76	4.17
	06/17/10	15.66	10.39	12.29	1.90	4.80
	12/15/10	15.66	10.13	10.74	0.61	5.38

TABLE 1. Historical Groundwater Elevation and Free Product Data
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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, 5] (feet)
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
	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

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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
	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

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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, 5] (feet)
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				
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				

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, 5] (feet)
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
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
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

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, 5] (feet)
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
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

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
-- = no measurable product.

[1] Wells were resurveyed on January 24, 2009. Elevation data is relative to North American Vertical Datum of 1988 (NAVD 88).
[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
[5] Groundwater elevation adjusted to account for the presence of free-phase product assuming a specific gravity of 0.75 for the non-aqueous phase liquid.

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)							
		TPHg	TPHd	TPHmo	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	1400	1,200 [2]	<300	120	2.9	1.8	3	<1.0
	06/17/10	Not sampled due to the presence of free-phase product							
	12/14/10	Not sampled due to the presence of free-phase product							
MW-2									
	05/27/94	87	470	NA	<0.5	<0.5	<0.5	<0.5	NA
	03/29/95	<50	110	1,400	<0.4	<0.3	<0.3	<0.4	NA
	09/06/95	<50	NA	NA	<0.4	<0.3	<0.3	<0.4	NA
	01/08/96	<50	<50	1200	<0.4	<0.3	<0.3	<0.4	NA
	04/04/96	<50	160	320	<0.5	<0.5	<0.5	<1.0	NA
	07/10/96	<50	120	1400	<0.4	<0.3	<0.3	<0.4	NA
	12/03/96	<50	230 [1,2]	<250	<0.5	<0.5	<0.5	<1.0	NA
	03/28/97	<50	714	<250	<0.5	<0.5	<0.5	<1.0	NA
	06/13/97	51	<50	<250	<0.5	<0.5	<0.5	<1.0	NA
	09/18/97	82	<50	<250	0.56	<0.5	<0.5	<1.0	NA
	12/31/97	<50	<47	<280	1.4	<0.5	<0.5	<1.0	NA
	04/13/98	<50	<50	<300	<0.5	<0.5	<0.5	<1.0	NA
	11/06/98	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	03/19/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	06/24/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	09/28/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	11/12/99	<50	120 [2,6]	<300	<0.5	<0.5	<0.5	<0.5	6.3 [8,9]
	02/11/00	<50	<50	<300	5.4	<0.5	<0.5	<0.5	<2
	05/22/00	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2
	09/06/00	<50	<50	<300	0.76 [8]	<0.5	<0.5	<0.5	<0.5 [10]
	12/19/00	200 [3,11]	<50	<300	39	1.8	<0.5	2.6	<0.5 [10,12]
	02/21/01	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	07/10/01	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	12/05/01	<50	<50	<300	4.4	<0.5	<0.5	<0.5	5.0 [14]
	03/08/02	<50	<50	<500	<0.5	<0.5	<0.5	<0.5	<5.0
	06/13/02	62 [15]	<57	<570	<0.5	<0.5	<0.5	<0.5	<5.0
	09/26/02	69 [2]	<50	<500	1.8	<0.5	<0.5	<0.5	<5.0
	12/12/02	<50	<50	<300	0.98	<0.5	<0.5	<0.5	<2.0
	03/17/03	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	06/18/03	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	09/03/03	<50	<50	<300	3.2	<0.5	<0.5	<0.5	<2.0
	11/26/03	<50	<50	<300	3	<0.5	<0.5	<0.5	<2.0
	03/05/04	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	06/02/04	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	09/03/04	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	12/16/04	<50	96 [6, 15]	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	03/29/05	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	08/10/05	<50	<50	<250	<0.5	<0.5	<0.5	<0.5	<0.5

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

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

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)							
		TPHg	TPHd	TPHmo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-4 (cont)	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
MW-5									
	09/11/95	90	<300	2,500	3.3	<0.3	<0.3	<0.4	NA
	04/04/96	<50	180	520	<0.5	<0.5	<0.5	<1.0	NA
	07/10/96	<50	120	1,500	<0.4	<0.3	<0.3	<0.4	NA
	12/03/96	<50	200 [1,2]	<250	<0.5	<0.5	<0.5	<1.0	NA
	03/28/97	<50	<50	<250	<0.5	<0.5	<0.5	<1.0	NA
	06/13/97	<50	<50	<250	<0.5	<0.5	<0.5	<1.0	NA
	09/18/97	<50	<50	<250	<0.5	<0.5	<0.5	<1.0	NA
	12/31/97	<50	<47	<280	<0.5	<0.5	<0.5	<1.0	NA
	04/13/98	<50	<47	<280	<0.5	<0.5	<0.5	<1.0	NA
	11/06/98	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	03/19/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	06/24/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	3.1
	09/28/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	11/12/99	<50	110 [2,6]	<300	<0.5	<0.5	<0.5	<0.5	5.5 [9]
	02/11/00	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	05/22/00	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	09/06/00	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	12/19/00	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	02/21/01	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	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

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)							
		TPHg	TPHd	TPHmo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-5 (cont)	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
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

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)							
		TPHg	TPHd	TPHmo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-7 (cont)	12/31/97	<50	53 [2,3]	<280	<0.5	<0.5	<0.5	<1.0	NA
	04/13/98	<50	<48	<290	<0.5	<0.5	<0.5	<1.0	NA
	11/06/98	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<2
	03/19/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	5.3
	06/24/99	73	<50	<300	<0.5	<0.5	<0.5	<0.5	12
	09/28/99	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	14
	11/12/99	<50	600 [2,6]	420 [3]	<0.5	<0.5	<0.5	<0.5	15 [9]
	02/11/00	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	51
	05/22/00	110	53 [2]	<300	<0.5	<0.5	<0.5	<0.5	75
	09/06/00	50 [6]	<50	<300	<0.5	<0.5	<0.5	<0.5	40 [10]
	12/19/00	54 [11]	51 [5]	<300	<0.5	<0.5	<0.5	<0.5	47 [10,12]
	02/21/01	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	66 [10]
Dup.	02/21/01	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	60 [10]
	07/10/01	<50	51 [2]	<300	<0.5	<0.5	<0.5	<0.5	76 [10]
Dup.	07/10/01	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	75 [10]
	12/12/01	51	<50	<300	<0.5	<0.5	<0.5	<0.5	98 [14]
Dup.	12/12/01	64	52 [13, 15]	<300	<0.5	<0.5	<0.5	<0.5	96 [14]
	03/08/02	52 [2]	<50	<500	<0.5	<0.5	<0.5	<0.5	24 [14]
	06/13/02	87 [2]	54 [2]	<500	<0.5	<0.5	<0.5	<0.5	51
	09/26/02	83 [2]	84 [2]	<500	<0.5	<0.5	<0.5	<0.5	75 [10]
	12/12/02	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	58 [14]
	12/18/02	Monitoring well was destroyed							
MW-8									
	Not sampled due to the presence of free-phase product								
MW-8A									
	12/12/01	68	720 [11,15]	<300	<0.5	<0.5	<0.5	<0.5	<2.0
	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

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)							
		TPHg	TPHd	TPHmo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-8A (cont)	07/28/06	<50	70 [15]	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	11/29/06	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/01/07	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	11/14/07	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/05/08	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	12/18/08	350 [2]	7,800	2,200 [2]	<0.5	<0.5	<0.5	<0.5	1.3
	03/04/09	<50	51 [2]	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	04/01/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/17/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	12/08/09	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	06/16/10	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
	12/14/10	<50	<50	<300	<0.5	<0.5	<0.5	<0.5	<0.5
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
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
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
MW-12									
	12/18/08	25,000 [2]	19,000	980 [2]	<0.5	<0.5	<0.5	<0.5	5.1
	03/04/09	150 [2]	550 [2]	<300	<0.5	<0.5	<0.5	<0.5	4.8
	04/01/09	71 [2]	420 [2]	<300	<0.5	<0.5	<0.5	<0.5	5.8
	06/17/09	64 [2]	310 [2]	<300	<0.5	<0.5	<0.5	<0.5	5.7
Dup.	06/17/09	67 [2]	310 [2]	<300	<0.5	<0.5	<0.5	<0.5	5.4
	12/08/09	90 [2]	320 [2]	<300	<0.5	<0.5	<0.5	<0.5	4.7
	06/16/10	94 [2]	300	<300	<0.5	<0.5	<0.5	<0.5	4.8
	12/14/10	100 [2]	510	<300	<0.5	<0.5	<0.5	<0.5	4.0

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)							
		TPHg	TPHd	TPHmo	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE

Notes:

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

µg/L = micrograms per liter

Dup. = duplicate sample

NA = not analyzed

TPHg = total petroleum hydrocarbons in gasoline range.

TPHd = total petroleum hydrocarbons in diesel range.

TPHmo = total petroleum hydrocarbons in motor oil range.

MTBE = methyl tert-butyl ether

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

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

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

[4] Chromatographic pattern matches known laboratory contaminant.

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

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

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

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

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

TABLE 3. Free Product Recovery System Groundwater Elevation and Free Product Data
January 1, 2010 Through December 29, 2010
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						
	03/31/10	15.56	7.53 [3]	7.53	0.00	8.03
	06/17/10	15.56	NP	9.54	0.00	6.02
RW-3						
	01/06/10	15.56	10.85	11.13	0.28	4.43
	01/13/10	15.56	10.89	11.11	0.22	4.45
	01/20/10	15.56	9.36	10.65	1.29	4.91
	01/27/10	15.56	9.26	13.03	3.77	2.53
	02/03/10	15.56	9.51	12.20	2.69	3.36
	02/10/10	15.56	9.44	13.11	3.67	2.45
	02/17/10	15.56	9.75	12.29	2.54	3.27
	02/24/10	15.56	8.98	14.08	5.10	1.48
	03/02/10	15.56	8.92	12.78	3.86	2.78
	03/10/10	15.56	9.54	11.53	1.99	4.03
	03/17/10	15.56	9.57	12.40	2.83	3.16
	03/24/10	15.56	9.88	11.15	1.27	4.41
	03/31/10	15.56	NM	NM	NM	NM
	04/07/10	15.56	9.74	13.21	3.47	2.35
	04/14/10	15.56	9.43	13.38	3.95	2.18
	04/21/10	15.56	9.21	13.32	4.11	2.24
	04/28/10	15.56	9.73	11.98	2.25	3.58
	05/05/10	15.56	10.07	10.90	0.83	4.66
	05/12/10	15.56	10.22	10.65	0.43	4.91
	05/19/10	15.56	10.42	10.84	0.42	4.72
	05/26/10	15.56	10.38	10.63	0.25	4.93
	06/02/10	15.56	10.28	11.79	1.51	3.77
	06/09/10	15.56	10.41	11.65	1.24	3.91
	06/17/10	15.56	10.42	12.11	1.69	3.45
	06/23/10	15.56	10.46	11.63	1.17	3.93
	06/30/10	15.56	10.51	11.64	1.13	3.92
	07/07/10	15.56	10.51	11.78	1.27	3.78
	07/14/10	15.56	10.55	11.85	1.30	3.71
	07/21/10	15.56	10.60	11.44	0.84	4.12
	07/28/10	15.56	10.74	11.33	0.59	4.23
	08/11/10	15.56	10.81	11.19	0.38	4.37
	08/25/10	15.56	10.81	11.09	0.28	4.47
	09/01/10	15.56	10.89	11.08	0.19	4.48
	09/22/10	15.56	10.96	11.21	0.25	4.35
	10/06/10	15.56	11.12	11.30	0.18	4.26
	10/20/10	15.56	11.14	11.30	0.16	4.26
	11/03/10	15.56	10.99	11.72	0.73	3.84
	11/17/10	15.56	10.86	11.80	0.94	3.76

TABLE 3. Free Product Recovery System Groundwater Elevation and Free Product Data
January 1, 2010 Through December 29, 2010
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-3 (cont)	12/01/10	15.56	10.57	11.63	1.06	3.93
	12/15/10	15.56	10.14	11.34	1.20	4.22
	12/29/10	15.56	8.81	10.29	1.48	5.27
RW-4						
	01/06/10	14.92	10.09	10.69	0.60	4.23
	01/13/10	14.92	10.16	10.81	0.65	4.11
	01/20/10	14.92	9.13	9.86	0.73	5.06
	01/27/10	14.92	9.00	9.33	0.33	5.59
	02/03/10	14.92	9.12	9.33	0.21	5.59
	02/10/10	14.92	9.19	9.40	0.21	5.52
	02/17/10	14.92	9.30	10.01	0.71	4.91
	02/24/10	14.92	9.06	9.25	0.19	5.67
	03/10/10	14.92	8.97	9.14	0.17	5.78
	03/17/10	14.92	9.07	9.23	0.16	5.69
	03/24/10	14.92	9.25	9.41	0.16	5.51
	03/31/10	14.92	9.31	9.46	0.15	5.46
	04/07/10	14.92	9.36	9.51	0.15	5.41
	04/14/10	14.92	9.09	9.29	0.20	5.63
	04/21/10	14.92	8.95	9.14	0.19	5.78
	04/28/10	14.92	9.21	9.42	0.21	5.50
	05/05/10	14.92	9.37	9.69	0.32	5.23
	05/12/10	14.92	9.52	9.75	0.23	5.17
	05/19/10	14.92	9.66	9.91	0.25	5.01
	05/26/10	14.92	9.65	9.92	0.27	5.00
	06/02/10	14.92	9.69	9.82	0.13	5.10
	06/09/10	14.92	9.80	10.00	0.20	4.92
	06/17/10	14.92	9.82	10.14	0.32	4.78
	06/23/10	14.92	9.88	10.09	0.21	4.83
	06/30/10	14.92	9.89	10.16	0.27	4.76
	07/07/10	14.92	9.92	10.20	0.28	4.72
	07/14/10	14.92	9.94	10.29	0.35	4.63
	07/21/10	14.92	9.94	10.27	0.33	4.65
	07/28/10	14.92	10.04	10.38	0.34	4.54
	08/11/10	14.92	10.08	10.56	0.48	4.36
	08/25/10	14.92	10.05	10.77	0.72	4.15
	09/01/10	14.92	10.11	10.89	0.78	4.03
	09/22/10	14.92	10.17	11.31	1.14	3.61
	10/06/10	14.92	10.32	11.36	1.04	3.56
	10/20/10	14.92	10.31	11.42	1.11	3.50
	11/03/10	14.92	10.38	10.44	0.06	4.48
	11/17/10	14.92	10.28	10.59	0.31	4.33
	12/01/10	14.92	9.85	10.32	0.47	4.60
	12/15/10	14.92	9.42	10.50	1.08	4.42
	12/29/10	14.92	8.65	8.70	0.05	6.22

TABLE 3. Free Product Recovery System Groundwater Elevation and Free Product Data
January 1, 2010 Through December 29, 2010
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-5						
	01/20/10	14.79	7.54	9.37	1.83	5.42
	01/27/10	14.79	8.11	8.54	0.43	6.25
	02/03/10	14.79	6.60 [3]	6.60	0.00	8.19
	02/10/10	14.79	6.52 [3]	6.52	0.00	8.27
	06/17/10	14.79	6.70 [3]	6.70	0.00	8.09
	06/23/10	14.79	7.85 [3]	7.85	0.00	6.94
	07/14/10	14.79	7.84 [3]	7.84	0.00	6.95
	07/21/10	14.79	6.60 [3]	6.60	0.00	8.19
	08/25/10	14.79	6.89	9.23	2.34	5.56
	09/22/10	14.79	6.44	10.85	4.41	3.94
	10/20/10	14.79	6.42	13.13	6.71	1.66
	11/03/10	14.79	6.41	9.54	3.13	5.25
	12/01/10	14.79	6.41	9.57	3.16	5.22
	12/15/10	14.79	7.65	8.74	1.09	6.05
RW-6						
	01/06/10	15.75	8.70	10.74	2.04	5.01
	01/13/10	15.75	8.86	10.79	1.93	4.96
	01/20/10	15.75	8.58	10.58	2.00	5.17
	01/27/10	15.75	8.54	10.14	1.60	5.61
	02/03/10	15.75	8.55	9.81	1.26	5.94
	02/10/10	15.75	9.41	9.82	0.41	5.93
	02/17/10	15.75	8.62	9.44	0.82	6.31
	02/24/10	15.75	8.59	9.37	0.78	6.38
	03/10/10	15.75	8.53	9.14	0.61	6.61
	03/17/10	15.75	8.56	8.84	0.28	6.91
	03/24/10	15.75	8.68	8.91	0.23	6.84
	03/31/10	15.75	8.69	9.11	0.42	6.64
	04/07/10	15.75	8.59	9.21	0.62	6.54
	04/14/10	15.75	8.40	9.11	0.71	6.64
	04/21/10	15.75	8.39	8.92	0.53	6.83
	04/28/10	15.75	8.61	8.96	0.35	6.79
	05/05/10	15.75	8.62	8.94	0.32	6.81
	05/12/10	15.75	8.65	9.09	0.44	6.66
	05/19/10	15.75	8.64	9.35	0.71	6.40
	05/26/10	15.75	8.63	9.51	0.88	6.24
	06/02/10	15.75	8.56	9.55	0.99	6.20
	06/09/10	15.75	8.62	9.52	0.90	6.23
	06/17/10	15.75	8.65	9.62	0.97	6.13
	06/23/10	15.75	8.70	9.60	0.90	6.15
	06/30/10	15.75	8.55	9.65	1.10	6.10
	07/07/10	15.75	8.58	9.80	1.22	5.95
	07/14/10	15.75	8.59	9.88	1.29	5.87
	07/21/10	15.75	8.68	9.97	1.29	5.78

TABLE 3. Free Product Recovery System Groundwater Elevation and Free Product Data
January 1, 2010 Through December 29, 2010
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-6 (cont)	07/28/10	15.75	8.74	10.04	1.30	5.71
	08/11/10	15.75	8.78	10.14	1.36	5.61
	08/25/10	15.75	8.81	10.29	1.48	5.46
	09/01/10	15.75	8.81	10.42	1.61	5.33
	09/22/10	15.75	8.88	10.50	1.62	5.25
	10/06/10	15.75	8.93	10.64	1.71	5.11
	10/22/10	15.75	8.95	10.75	1.80	5.00
	11/03/10	15.75	8.84	10.61	1.77	5.14
	11/17/10	15.75	8.48	10.78	2.30	4.97
	12/01/10	15.75	8.55	10.42	1.87	5.33
	12/15/10	15.75	8.30	10.23	1.93	5.52
	12/29/10	15.75	7.85	9.79	1.94	5.96
RW-7						
	01/06/10	15.02	8.09	10.29	2.20	4.73
	01/13/10	15.02	8.00	10.56	2.56	4.46
	01/20/10	15.02	7.25	10.10	2.85	4.92
	01/27/10	15.02	7.71	9.14	1.43	5.88
	02/03/10	15.02	7.85	8.33	0.48	6.69
	02/10/10	15.02	7.89	8.45	0.56	6.57
	02/17/10	15.02	7.81	8.39	0.58	6.63
	02/24/10	15.02	7.15	8.30	1.15	6.72
	03/10/10	15.02	7.64	8.81	1.17	6.21
	03/17/10	15.02	7.79	8.05	0.26	6.97
	03/24/10	15.02	7.90	8.08	0.18	6.94
	03/31/10	15.02	7.96	8.15	0.19	6.87
	04/07/10	15.02	7.85	8.07	0.22	6.95
	04/14/10	15.02	7.78	7.99	0.21	7.03
	04/21/10	15.02	7.78	8.02	0.24	7.00
	04/28/10	15.02	7.85	8.20	0.35	6.82
	05/05/10	15.02	7.95	8.23	0.28	6.79
	05/12/10	15.02	7.60	7.92	0.32	7.10
	05/19/10	15.02	7.79	8.08	0.29	6.94
	05/26/10	15.02	7.66	7.98	0.32	7.04
	06/02/10	15.02	7.92	8.30	0.38	6.72
	06/09/10	15.02	8.01	8.45	0.44	6.57
	06/17/10	15.02	7.96	8.60	0.64	6.42
	06/23/10	15.02	8.04	8.83	0.79	6.19
	06/30/10	15.02	7.71	8.89	1.18	6.13
	07/07/10	15.02	7.83	8.98	1.15	6.04
	07/14/10	15.02	7.86	9.09	1.23	5.93
	07/21/10	15.02	7.63	9.13	1.50	5.89
	07/28/10	15.02	7.90	9.35	1.45	5.67
	08/11/10	15.02	7.87	9.59	1.72	5.43
	08/25/10	15.02	7.97	9.85	1.88	5.17

TABLE 3. Free Product Recovery System Groundwater Elevation and Free Product Data
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Port of Oakland's Harbor Facilities Complex Site
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Recovery Well	Date Measured	Elevation [1] Top of Casing (feet)	Depth to Product (feet btc)	Depth to Water (feet btc)	Product Thickness (feet)	Groundwater Elevation [1] (feet)
RW-7 (cont)	09/01/10	15.02	7.75	9.88	2.13	5.14
	09/22/10	15.02	7.77	10.09	2.32	4.93
	10/06/10	15.02	8.08	10.14	2.06	4.88
	10/20/10	15.02	8.00	10.21	2.21	4.81
	11/03/10	15.02	7.65	9.48	1.83	5.54
	11/17/10	15.02	7.20	10.48	3.28	4.54
	12/01/10	15.02	6.54	10.50	3.96	4.52
	12/15/10	15.02	7.70	9.76	2.06	5.26
	12/29/10	15.02	7.73	9.09	1.36	5.93
RW-8						
	01/06/10	15.91	9.46	10.30	0.84	5.61
	01/13/10	15.91	9.52	10.33	0.81	5.58
	01/20/10	15.91	9.35	9.90	0.55	6.01
	01/27/10	15.91	9.06	9.65	0.59	6.26
	02/03/10	15.91	9.26	9.84	0.58	6.07
	02/10/10	15.91	9.23	9.74	0.51	6.17
	02/17/10	15.91	9.12	9.56	0.44	6.35
	02/24/10	15.91	9.18	9.58	0.40	6.33
	03/10/10	15.91	9.10	9.41	0.31	6.50
	03/17/10	15.91	8.95	9.07	0.12	6.84
	03/24/10	15.91	9.12	9.19	0.07	6.72
	03/31/10	15.91	9.11	9.18	0.07	6.73
	04/07/10	15.91	9.10	9.15	0.05	6.76
	04/14/10	15.91	9.11	9.23	0.12	6.68
	04/21/10	15.91	9.07	9.24	0.17	6.67
	04/28/10	15.91	9.12	9.45	0.33	6.46
	05/05/10	15.91	9.14	9.33	0.19	6.58
	05/12/10	15.91	8.74	8.76	0.02	7.15
	05/19/10	15.91	9.23	9.31	0.08	6.60
	05/26/10	15.91	8.71	8.83	0.12	7.08
	06/02/10	15.91	9.13	10.25	1.12	5.66
	06/09/10	15.91	9.16	9.25	0.09	6.66
	06/17/10	15.91	9.13	9.24	0.11	6.67
	06/23/10	15.91	9.19	9.36	0.17	6.55
	06/30/10	15.91	9.20	9.41	0.21	6.50
	07/07/10	15.91	9.27	9.54	0.27	6.37
	07/14/10	15.91	9.23	9.53	0.30	6.38
	07/21/10	15.91	9.14	9.46	0.32	6.45
	07/28/10	15.91	9.12	9.51	0.39	6.40
	08/11/10	15.91	9.20	9.76	0.56	6.15
	08/25/10	15.91	9.25	10.05	0.80	5.86
	09/01/10	15.91	9.23	10.21	0.98	5.70
	09/22/10	15.91	9.41	10.44	1.03	5.47
	10/06/10	15.91	9.47	10.63	1.16	5.28
	10/20/10	15.91	9.47	10.84	1.37	5.07
	11/03/10	15.91	9.53	10.49	0.96	5.42

TABLE 3. Free Product Recovery System Groundwater Elevation and Free Product Data
January 1, 2010 Through December 29, 2010
Port of Oakland's Harbor Facilities Complex Site
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Recovery Well	Date Measured	Elevation [1] Top of Casing (feet)	Depth to Product (feet btc)	Depth to Water (feet btc)	Product Thickness (feet)	Groundwater Elevation [1] (feet)
RW-8 (cont)	11/17/10	15.91	9.27	10.17	0.90	5.74
	12/01/10	15.91	9.25	10.26	1.01	5.65
	12/15/10	15.91	9.25	9.93	0.68	5.98
	12/29/10	15.91	8.41	9.22	0.81	6.69
RW-9						
	01/06/10	16.57	10.09	10.50	0.41	6.07
	01/13/10	16.57	10.70	11.29	0.59	5.28
	01/20/10	16.57	9.71	10.20	0.49	6.37
	01/27/10	16.57	9.54	9.87	0.33	6.70
	02/03/10	16.57	9.46	9.52	0.06	7.05
	02/10/10	16.57	9.52	9.59	0.07	6.98
	02/17/10	16.57	9.46	9.52	0.06	7.05
	02/24/10	16.57	9.47	9.52	0.05	7.05
	03/10/10	16.57	9.35	9.44	0.09	7.13
	03/17/10	16.57	9.32	9.39	0.07	7.18
	03/24/10	16.57	9.59	9.62	0.03	6.95
	03/31/10	16.57	9.35	9.38	0.03	7.19
	04/07/10	16.57	9.35	9.36	0.01	7.21
	04/14/10	16.57	9.32	9.35	0.03	7.22
	04/21/10	16.57	9.30	9.32	0.02	7.25
	04/28/10	16.57	9.29	9.36	0.07	7.21
	05/05/10	16.57	9.57	9.63	0.06	6.94
	05/12/10	16.57	9.34	9.39	0.05	7.18
	05/19/10	16.57	9.39	9.45	0.06	7.12
	05/26/10	16.57	9.41	9.50	0.09	7.07
	06/02/10	16.57	9.44	9.59	0.15	6.98
	06/09/10	16.57	9.49	9.56	0.07	7.01
	06/17/10	16.57	9.52	9.61	0.09	6.96
	06/23/10	16.57	9.55	9.60	0.05	6.97
	06/30/10	16.57	9.59	9.63	0.04	6.94
	07/07/10	16.57	9.62	9.67	0.05	6.90
	07/14/10	NM - inaccessible				
	07/21/10	NM - inaccessible				
	07/28/10	16.57	9.73	9.79	0.06	6.78
	08/11/10	16.57	9.78	10.02	0.24	6.55
	08/25/10	16.57	9.74	10.40	0.66	6.17
	09/01/10	16.57	9.82	10.15	0.33	6.42
	09/22/10	16.57	9.89	10.19	0.30	6.38
	10/06/10	16.57	9.94	10.26	0.32	6.31
	10/20/10	16.57	9.97	10.27	0.30	6.30
	11/03/10	16.57	9.86	10.16	0.30	6.41
	12/01/10	16.57	9.67	9.89	0.22	6.68
	12/15/10	16.57	9.56	9.76	0.20	6.81
	12/29/10	16.57	9.34	9.53	0.19	7.04

TABLE 3. Free Product Recovery System Groundwater Elevation and Free Product Data
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Recovery Well	Date Measured	Elevation [1] Top of Casing (feet)	Depth to Product (feet btc)	Depth to Water (feet btc)	Product Thickness (feet)	Groundwater Elevation [1] (feet)
MW-3						
	01/06/10	15.66	10.78	11.85	1.07	3.81
	01/13/10	15.66	10.70	11.29	0.59	4.37
	01/20/10	15.66	9.31	10.00	0.69	5.66
	01/27/10	15.66	9.44	10.34	0.90	5.32
	02/03/10	15.66	9.71	10.47	0.76	5.19
	02/10/10	15.66	9.62	10.41	0.79	5.25
	02/17/10	15.66	9.95	10.74	0.79	4.92
	02/24/10	15.66	9.11	10.56	1.45	5.1
	03/10/10	15.66	9.58	10.51	0.93	5.15
	03/17/10	15.66	9.72	10.49	0.77	5.17
	03/24/10	15.66	9.91	10.55	0.64	5.11
	03/31/10	15.66	9.97	10.50	0.53	5.16
	04/07/10	15.66	10.02	10.75	0.73	4.91
	04/14/10	15.66	9.65	10.72	1.07	4.94
	04/21/10	15.66	9.34	10.73	1.39	4.93
	04/28/10	15.66	9.82	10.68	0.86	4.98
	05/05/10	15.66	10.02	10.99	0.97	4.67
	05/12/10	15.66	10.12	11.25	1.13	4.41
	05/19/10	15.66	10.22	11.50	1.28	4.16
	05/26/10	15.66	10.23	11.80	1.57	3.86
	06/02/10	15.66	10.23	11.81	1.58	3.85
	06/09/10	15.66	10.32	12.21	1.89	3.45
	06/17/10	15.66	10.34	12.18	1.84	3.48
	06/23/10	15.66	10.39	12.29	1.90	3.37
	06/30/10	15.66	10.40	12.42	2.02	3.24
	07/07/10	15.66	10.45	12.42	1.97	3.24
	07/14/10	15.66	10.48	12.55	2.07	3.11
	07/21/10	15.66	10.47	12.26	1.79	3.40
	07/28/10	15.66	10.54	12.55	2.01	3.11
	08/04/10	15.66	10.59	12.50	1.91	3.16
	08/11/10	15.66	10.60	12.60	2.00	3.06
	08/18/10	15.66	10.64	12.67	2.03	2.99
	08/25/10	15.66	10.65	12.43	1.78	3.23
	09/01/10	15.66	10.74	12.56	1.82	3.10
	09/07/10	15.66	10.71	12.58	1.87	3.08
	09/14/10	15.66	10.80	12.77	1.97	2.89
	09/22/10	15.66	10.80	12.71	1.91	2.95
	09/29/10	15.66	10.82	12.66	1.84	3.00
	10/06/10	15.66	10.91	13.11	2.20	2.55
	10/20/10	15.66	10.94	12.84	1.90	2.82
	10/27/10	15.66	10.87	12.59	1.72	3.07
	11/03/10	15.66	10.93	12.68	1.75	2.98

TABLE 3. Free Product Recovery System Groundwater Elevation and Free Product Data
January 1, 2010 Through December 29, 2010
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)	11/10/10	15.66	10.80	11.66	0.86	4.00
	11/17/10	15.66	10.82	11.85	1.03	3.81
	11/24/10	15.66	10.51	11.03	0.52	4.63
	12/01/10	15.66	10.65	11.56	0.91	4.10
	12/15/10	15.66	10.13	10.74	0.61	4.92
	12/22/10	15.66	NM	NM	NM	NM
	12/29/10	15.66	9.05 [3]	9.05	0.00	6.61
Convault						
	01/06/10	NA	1.99	2.41	0.42	NA
	01/13/10	NA	1.95	2.35	0.40	NA
	01/20/10	NA	1.94	2.34	0.40	NA
	01/27/10	NA	1.90	2.34	0.44	NA
	02/03/10	NA	1.86	2.33	0.47	NA
	02/10/10	NA	1.85	2.33	0.48	NA
	02/17/10	NA	1.81	2.38	0.57	NA
	02/24/10	NA	1.81	2.30	0.49	NA
	03/10/10	NA	1.71	2.23	0.52	NA
	03/17/10	NA	1.70	2.25	0.55	NA
	03/24/10	NA	1.69	2.04	0.35	NA
	03/31/10	NA	NM	NM	NM	NA
	04/07/10	NA	1.68	2.26	0.58	NA
	04/14/10	NA	1.68	2.30	0.62	NA
	04/21/10	NA	1.64	2.28	0.64	NA
	04/28/10	NA	1.65	2.23	0.58	NA
	05/05/10	NA	1.62	2.24	0.62	NA
	05/12/10	NA	1.62	2.23	0.61	NA
	05/19/10	NA	1.61	2.24	0.63	NA
	05/26/10	NA	1.60	2.28	0.68	NA
	06/02/10	NA	1.60	2.42	0.82	NA
	06/09/10	NA	1.59	2.23	0.64	NA
	06/17/10	NA	1.58	2.25	0.67	NA
	06/23/10	NA	1.55	2.24	0.69	NA
	06/30/10	NA	1.46	2.22	0.76	NA
	07/07/10	NA	1.47	2.23	0.76	NA
	07/14/10	NA	1.39 [4]	2.14	0.75	NA
	07/21/10	NA	1.32	2.15	0.83	NA
	07/28/10	NA	1.24	2.10	0.86	NA
	08/11/10	NA	1.16	2.11	0.95	NA
	08/25/10	NA	1.01	2.08	1.07	NA
	09/01/10	NA	0.96	2.02	1.06	NA
	09/07/10	NA	0.85	2.01	1.16	NA
	09/22/10	NA	empty	empty	0.00	NA

TABLE 3. Free Product Recovery System Groundwater Elevation and Free Product Data
January 1, 2010 Through December 29, 2010
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)
Convault	09/29/10	NA	2.40	2.49	0.09	NA
(cont)	10/06/10	NA	2.36	2.50	0.14	NA
	10/20/10	NA	2.29	2.50	0.21	NA
	11/03/10	NA	2.15	2.45	0.30	NA
	11/17/10	NA	2.08	2.42	0.34	NA
	12/01/10	NA	1.96	2.47	0.51	NA
	12/15/10	NA	1.90	2.35	0.45	NA
	12/29/10	NA	1.80	2.33	0.53	NA

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).
[2] All measurements made before the system ran on given day unless otherwise noted.
[3] Product not measureable, but visible evidence of product on interface probe.
[4] Measured after approximately four gallons of product were removed from MW-3.

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: overcast, ~60°
Precip. in past 5 days (in.): 0.59
Source: Oakland Fire Services Agency ONO
Water level instrument: Heron Instruments H.OIL

Recorded by: CO Date: 12/14/10
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): 6.38
Water level from TOC (feet): 9.42 Time: 1010
Product level from TOC (feet): — Time: —

CALCULATION OF WELL VOLUME:

(17.65 ft - 0.00 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:

	Time	Temperature (°C)	pH (S.U.)	DO (%)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)
Calibration Standard:							
Before Purging:							
After Purging:							

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)	Cumulative Gallons Removed
Not sampled - water level meter probe had free product on tip.							

Purge method: _____ Sample Time: _____
Duplicate/blank number: _____ Duplicate Sample Time: _____
Sampling equipment: _____ VOA attachment: _____
Sample containers: _____
Sample analyses: _____ Laboratory: _____
Decontamination method: _____ Rinsate disposal: _____
Comments: _____

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

GROUNDWATER SAMPLING

Well No.: **MW-2**

Project No.	4656016	Recorded by: CD	Date: 12/14/10
Project Name:	Harbor Facilities Center	Depth of well from TOC (feet):	18.06
Location:	Port of Oakland	Well diameter (inches):	2
	651 Maritime Street, Oakland, California	Screened interval from TOC (feet):	8.06-18.06
Weather:	Rain	TOC elevation, NAVD 88 (feet):	16.43
Precip. in past 5 days (in.):	0.59	Groundwater elevation, NAVD 88 (feet):	5.39
Source:	Oakland Fire Services Agency ONO	Water level from TOC (feet): 11.04	Time: 1045
Water level instrument:	Heron Instruments H.OIL	Product level from TOC (feet): —	Time: —

CALCULATION OF WELL VOLUME:

(18.06 ft - 0.00 ft) x (0.083 ft)² x π x 7.48 gal/ft³ = 1.14 gallons in one casing volume

well depth - water level x (well radius)² x π x gal/ft³ = 4.6 total gallons removed

CALIBRATION:

	Time	Temperature (°C)	pH (S.U.)	DO (%)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)
Calibration Standard:							
Before Purging:							
After Purging:							

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC (~~µmho/cm~~ mho/cm TDS ppm)	~~Turbidity~~ (NTU)	Cumulative Gallons Removed
1515	17.89	7.80	3.95	-116.1	19600	31	0
1518	18.33	7.21	1.05	-98.1	2449	205	0.2
1520	18.49	7.18	0.61	-94.9	2210	227	0.4
1522	18.57	7.20	0.48	-95.7	2026	247	0.6
1524	18.54	7.21	0.40	-98.0	1870	270	0.8
1526	18.63	7.20	0.35	-99.9	1772	282	1
well dry - only pumping air after 1.2 gal							
1536 - WL approx. 13.00 ft							

Purge method: Geopump — Sample Time: 1435

Duplicate/blank number: N/A — Duplicate Sample Time: N/A

Sampling equipment: N/A — VOA attachment: none

Sample containers: 6x VOAs; 2-500mL glass ambers

Sample analyses: TPH-g, d/mo 8015M; BTEX + MTBE 8260 — Laboratory: CRT

Decontamination method: none - dedicated tubing — Rinsate disposal: N/A

Comments:

TOC = top of casing

NAVD 88 = North American Vertical Datum of 1988.

BOH = 14.82

WL @ 1545 = 12.81

WL @ 1558 = 12.59

80% recovery = 11.80 ft

90% reavery = 11.42

Time	Temp	Ph	DO	ORP	EC	Turbidity	Gal Rem
1600	Restarted pump						
1602	17.8	7.94	2.68	-176.9	1344	371	1.4
1605	NM						
1607	18.13	7.28	1.17	-130.3	1542	324	1.6
1610	18.09	7.20	1.00	-129.7	1389	354	1.8
1612	18.29	7.20	0.96	-127.3	1417	354	2.0
1614	18.43	7.19	1.00	-127.6	1395	358	2.2
1616	18.47	7.31	1.00	-137.1	1333	376	2.3
1618	18.32	7.14	1.06	-132.1	1286	387	2.4
1620	Well Dry						

12/15/10

925 - WL @ 11.06

931 - Began pumping

Time	Temp	Ph	DO	ORP	EC	TDS (ppm) Turbio	Gal Removed
933	18.27	7.52	8.24	-166.4	1080	463	0.1
935	18.25	7.28	8.55	-118.0	1118	447	0.25
938	18.36	7.22	17.48	-84.4	1184	422	0.5
940	18.45	7.20	14.14	-71.0	1192	419	0.65
943	18.39	7.15	7.66	-59.4	1194	419	0.8
946	18.58	7.48	4.45	-97.7	1174	426	1
949	18.74	7.14	3.49	-62.8	1187	423	1.25
952	18.69	7.11	1.79	-62.7	1121	444	1.5
955	16.82	7.14	1.69	-63.3	1183	423	1.75
958	18.94	7.10	1.05	-81.1	1128	444	2

959 - Well Dry - WL @ 14.73

1309 - WL = 12.15

1411 - WL = 11.83

1430 - Restarted pump @ MW-2

Time	Temp	pH	DO	ORP	EC	TDS	Gal
1434	19.05	7.19	3.80	-101.2	998	501	0.2

1435 Collected Sample

GROUNDWATER SAMPLING

Well No.: **MW-3**

Project No. 4656016
Project Name: Harbor Facilities Center
Location: Port of Oakland
651 Maritime Street, Oakland, California
Weather: Mostly cloudy, ~60°
Precip. in past 5 days (in.): 0.59
Source: Oakland Fire Services Agency "OAK"
Water level instrument: Heron Instruments H. OIL

Recorded by: CO Date: 12/15/10
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): 5.53
Product ~~Water~~ level from TOC (feet): 10.13 Time: 1145
~~Product~~ water level from TOC (feet): 10.74 Time: 1145

CALCULATION OF WELL VOLUME:

(17.47 ft - 0.00 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:

	Time	Temperature (°C)	pH (S.U.)	DO (%)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)
Calibration Standard:							
Before Purging:							
After Purging:							

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)	Cumulative Gallons Removed
Not sampled - well contained free product							

Purge method: _____ Sample Time: _____
Duplicate/blank number: _____ Duplicate Sample Time: _____
Sampling equipment: _____ VOA attachment: _____
Sample containers: _____
Sample analyses: _____ Laboratory: _____
Decontamination method: _____ Rinsate disposal: _____
Comments: _____

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

GROUNDWATER SAMPLING

Well No.: **MW-4**

Project No.	4656016	Recorded by: SC	Date: 12/14/10
Project Name:	Harbor Facilities Center	Depth of well from TOC (feet):	22.05
Location:	Port of Oakland	Well diameter (inches):	2
	651 Maritime Street, Oakland, California	Screened interval from TOC (feet):	11.25-22.05
Weather:	Cloudy, cool	TOC elevation, NAVD 88 (feet):	15.91
Precip. in past 5 days (in.):	0.59	Groundwater elevation, NAVD 88 (feet):	4.29
Source:	Oakland Fire Services Agency ONO	Water level from TOC (feet): 11.62	Time: 935
Water level instrument:	Heron Instruments A. OIL	Product level from TOC (feet): —	Time: —

CALCULATION OF WELL VOLUME:

0.006889

(22.05 ft - 0.00 ft) x $(0.083 \text{ ft})^2$ x π x 7.48 gal/ft^3 =

well depth - water level x $(\text{well radius})^2$ x π x gal/ft^3 =

1.6 gallons in one casing volume

7.5 total gallons removed

CALIBRATION:

	Time	Temperature (°C)	pH (S.U.)	DO (%)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)
Calibration Standard:							
Before Purging:							
After Purging:							

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC ~~(µmho/cm)~~ mS/cm	Turbidity (NTU)	Cumulative Gallons Removed
956	20.09	11.89	11.32	-24	2.73	20.4	0
959	20.28	12.00	9.41	-51	2.79	12.4	0.25
1002	20.77	11.85	8.77	-45	2.82	80.6	0.50
Stop pumping - inspect pH sensor. Appears functional							
1004	20.72	10.85	9.18	-26	1.43	109	0.50
1008	20.83	9.94	3.93	-24	1.45	278	1
~~1012~~ 1012	20.82	9.28	2.60	-75	1.62	800*	2
~~1016~~ 1016	20.84	9.20	1.47	-105	1.72	800*	3
~~1020~~ 1020	20.86	9.06	1.33	-100	1.90	780	4

* = exceeds range of meter

Purge method: GeoPump — Sample Time: 1039

Duplicate/blank number: MW-4DUP — Duplicate Sample Time: 1048

Sampling equipment: N/A — VOA attachment: N/A

Sample containers: 6 VOAs, 2-500mL amber glass

Sample analyses: TPH-g, d/mo 8015M; BTEX + MTBE 8260 — Laboratory: C&T

Decontamination method: none - disposable/dedicated tubing — Rinsate disposal: N/A

Comments:

TOC = top of casing

NAVD 88 = North American Vertical Datum of 1988.

Time	Temp	pH	DO	ORP	EC	Turbidity	Cum. Vol. Removed
~~1024~~							
1024	20.87	8.86	1.17	-132	2.01	434	5
1027	20.87	8.82	1.12	-155	2.10	314	5.5
1030	20.86	8.69	1.15	-172	2.22	180	6
1033	20.86	8.57	1.12	-179	2.29	117	7
1036	20.85	8.39	1.03	-181	2.39	59.0	7.5
1089	Sample Collected						

GROUNDWATER SAMPLING

Well No.: **MW-5**

Project No.	4656016	Recorded by: SC	Date: 12/14/10
Project Name:	Harbor Facilities Center	Depth of well from TOC (feet):	20.8
Location:	Port of Oakland	Well diameter (inches):	2
	651 Maritime Street, Oakland, California	Screened interval from TOC (feet):	10.4-20.8
Weather:	cloudy, cool	TOC elevation, NAVD 88 (feet):	15.39
Precip. in past 5 days (in.):	0.59	Groundwater elevation, NAVD 88 (feet):	6.08
Source:	Oakland Fire Services Agency ONO	Water level from TOC (feet): 9.31	Time: 945
Water level instrument:	Heron Instruments H.OIL	Product level from TOC (feet): —	Time: —

CALCULATION OF WELL VOLUME:

(11.49) (20.80 ft - 0.00 ft) x (0.083 ft)^2 (0.006889) x π x 7.48 gal/ft^3 = 1.86 gallons in one casing volume

well depth - water level x (well radius)^2 x π x gal/ft^3 = 5.0 total gallons removed

CALIBRATION:

	Time	Temperature (°C)	pH (S.U.)	DO (%)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)
Calibration Standard:							
Before Purging:							
After Purging:							

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC (mS/cm) (~~µmho/cm~~)	Turbidity (NTU)	Cumulative Gallons Removed
1120	19.21	7.81	10.74	-147	1.82	27.3	0
1123	19.59	7.36	9.20	-132	1.83	19.7	0.5
1126	19.63	7.32	8.80	-117	1.82	15.7	0.7
1129	19.52	7.32	8.67	-111	1.57	14.4	1.5
1132	19.44	7.30	8.45	-104	1.52	12.1	2
1135	19.43	7.29	8.25	-102	1.64	7.6	2.5
1138	19.45	7.28	8.08	-99	1.70	3.7	3
1141	19.45	7.27	7.98	-96	1.73	1.6	3.5
1144	19.45	7.27	7.87	-94	1.76	0.8	4

Purge method:	Geo Pump	Sample Time:	1153
Duplicate/blank number:	N/A	Duplicate Sample Time:	N/A
Sampling equipment:	N/A	VOA attachment:	N/A
Sample containers:	6 VOAs; 2-500 mL glass ambers		
Sample analyses:	TPH-g, d/mo 8015M; BTEX + MTBE 8260	Laboratory:	CET
Decontamination method:	none - dedicated tubing	Rinsate disposal:	N/A
Comments:			

TOC = top of casing

NAVD 88 = North American Vertical Datum of 1988.

Time	Temp	pH	DO	ORP	EC	Turbidity	Cum. Vol. Removed
1147	19.45	7.26	7.75	-93	1.78	0	4.5
1150	19.44	7.26	7.67	-91	1.81	0	5
1153	Sample collected						

GROUNDWATER SAMPLING

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

Project No.	4656016	Recorded by:	Date: 12/14/10
Project Name:	Harbor Facilities Center	Depth of well from TOC (feet):	23.14
Location:	Port of Oakland	Well diameter (inches):	2
	651 Maritime Street, Oakland, California	Screened interval from TOC (feet):	7.54-22.54
Weather:	Overcast, ~60°	TOC elevation, NAVD 88 (feet):	14.99
Precip. in past 5 days (in.):	0.59	Groundwater elevation, NAVD 88 (feet):	4.24
Source:	Oakland Fire Services Agency ONO	Water level from TOC (feet): 10.75	Time: 1040
Water level instrument:	Heron Instruments H. OIL	Product level from TOC (feet): —	Time: —

CALCULATION OF WELL VOLUME:

(23.14 ft - 0.00 ft) x (0.083 ft)² x π x 7.48 gal/ft³ = 2.00 gallons in one casing volume

well depth - water level x (well radius)² x π x gal/ft³ = 4.5 total gallons removed

CALIBRATION:

	Time	Temperature (°C)	pH (S.U.)	DO (%)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)
Calibration Standard:							
Before Purging:							
After Purging:							

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC ~~(µmho/cm)~~ Ω/cm TDS ppm	Turbidity (NTU)	Cumulative Gallons Removed
1119	19.44	7.46	23.2%	-209.1	~~00005~~		0.5
1122	19.53	7.09	0.95	-222.5	0.~~00~~5	978	0.75
1124	19.49	7.02	0.44	-226.1	~~00005~~	955	1
1127	19.53	6.96	0.30	-227.4	532	940	1.5
1130	19.54	6.93	0.19	-229.3	526	949	2
1133	19.54	6.91	0.13	-230.9	523	955	2.5
1135	19.53	6.90	0.11	-231.9	542	924	3
1137	19.53	6.89	0.09	-232.6	530	945	3.5
1140	19.55	6.88	0.07	-233.9	525	955	4
1143	19.53	6.87	0.08	-235.0	519	962	4.5

Purge method: Geopump — Sample Time: 1145

Duplicate/blank number: N/A — Duplicate Sample Time: N/A

Sampling equipment: N/A — VOA attachment: N/A

Sample containers: 6 VOAs; 2 - 500mL amber glass

Sample analyses: TPH-g, d/mo 8015M; BTEX + MTBE 8260 — Laboratory: C&T

Decontamination method: none - dedicated tubing — Rinsate disposal: N/A

Comments: Purge water had slight hydrocarbon odor

TOC = top of casing

NAVD 88 = North American Vertical Datum of 1988.

GROUNDWATER SAMPLING

Well No.: **MW-9**

Project No. 4656016 | Recorded by: SC | Date: 12/14/10
Project Name: Harbor Facilities Center | Depth of well from TOC (feet): 25
Location: Port of Oakland | Well diameter (inches): 2
651 Maritime Street, Oakland, California | Screened interval from TOC (feet): 15 - 25
Weather: Cloudy, cool | TOC elevation, NAVD 88 (feet): 16.33
Precip. in past 5 days (in.): 0.59 | Groundwater elevation, NAVD 88 (feet): 4.82
Source: Oakland Fire Services Agency ONO | Water level from TOC (feet): 11.51 Time: 950
Water level instrument: Heron Instruments H-OIL | Product level from TOC (feet): — Time: —

CALCULATION OF WELL VOLUME:

13.49
(25.00 ft - 0.00 ft) x (0.083 ft)² x π x 7.48 gal/ft³ = 2.18 gallons in one casing volume
well depth - water level x (well radius)² x π x gal/ft³ = 4 total gallons removed

CALIBRATION:

	Time	Temperature (°C)	pH (S.U.)	DO (%)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)
Calibration Standard:							
Before Purging:							
After Purging:							

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC ~~(µmho/cm)~~ mS/cm	Turbidity (NTU)	Cumulative Gallons Removed
1344	20.12	7.23	2.84	-168	2.08	2.0	0
1347	20.49	7.22	1.73	-176	2.04	1.3	0.5
1350	20.60	7.22	1.32	-181	2.01	1.5	1
1353	20.63	7.22	1.16	-185	1.99	0.4	1.5
1356	20.61	7.22	1.09	-187	1.98	0.4	2
~~1400~~ 1359	20.64	7.22	1.00	-189	1.97	0.0	3
1402	20.65	7.22	0.94	-190	1.96	0.3	4

Purge method: Geopump | Sample Time: 1405
Duplicate/blank number: N/A | Duplicate Sample Time: N/A
Sampling equipment: N/A | VOA attachment: N/A
Sample containers: 6 VOAs; 2 - 500 mL glass ambers
Sample analyses: TPH-g,d/mo 8015M; BTEX+MTBE 8260 | Laboratory: CET
Decontamination method: none - dedicated tubing | Rinsate disposal: N/A
Comments:

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

GROUNDWATER SAMPLING

Well No.: **MW-10**

Project No.	4656016	Recorded by:	@ Date: 12/14/10
Project Name:	Harbor Facilities Center	Depth of well from TOC (feet):	25
Location:	Port of Oakland	Well diameter (inches):	2
	651 Maritime Street, Oakland, California	Screened interval from TOC (feet):	15 - 25
Weather:	Overcast, ~ 60°, Showers	TOC elevation, NAVD 88 (feet):	15.65
Precip. in past 5 days (in.):	0.59	Groundwater elevation, NAVD 88 (feet):	5.34
Source:	Oakland Fire Services Agency AND	Water level from TOC (feet): 10.31	Time: 1000
Water level instrument:	Heron Instruments H. OIL	Product level from TOC (feet): —	Time: —

CALCULATION OF WELL VOLUME:

(25.00 ft - 0.00 ft) x (0.083 ft)² x π x 7.48 gal/ft³ = 2.37 gallons in one casing volume

well depth - water level x (well radius)² x π x gal/ft³ = 4.5 total gallons removed

CALIBRATION:

	Time	Temperature (°C)	pH (S.U.)	DO (%)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)
Calibration Standard:							
Before Purging:							
After Purging:							

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC mho/cm (µmho/cm)	Turbidity TDS ppm (NTU)	Cumulative Gallons Removed
1348	19.51	6.81	11.39	-220.9	337	1485	0.5
1351	19.63	6.59	4.34	-223.9	336	1489	0.8
1354	19.65	6.52	4.22	-228.0	336	1488	1.2
1357	19.66	6.49	3.83	-231.6	336	1490	2
1400	19.64	6.47	3.83	-238.2	336	1490	2.5
1403	19.64	6.58	4.36	-243.3	341	1467	3
1406	19.66	6.48	4.67	-246.5	336	1487	3.5
1408	19.64	6.46	4.97	-247.5	336	1488	4
1410	19.66	6.46	5.31	-249.8	336	1488	4.25
1412	19.64	6.46	5.70	-251.9	336	1488	4.5

Purge method:	Geopump	Sample Time:	1415
Duplicate/blank number:	N/A	Duplicate Sample Time:	N/A
Sampling equipment:	N/A	VOA attachment:	N/A
Sample containers:	6 VOAs; 2 - 500 mL glass ambers		
Sample analyses:	TPH-g, d/mo 8015M; BTEX + MTBE 8260	Laboratory:	CLT
Decontamination method:	none - dedicated tubing	Rinsate disposal:	N/A
Comments:			

TOC = top of casing

NAVD 88 = North American Vertical Datum of 1988.

GROUNDWATER SAMPLING

Well No.: **MW-11**

Project No.	4656016	Recorded by: SC	Date: 12/14/10
Project Name:	Harbor Facilities Center	Depth of well from TOC (feet):	25
Location:	Port of Oakland	Well diameter (inches):	2
	651 Maritime Street, Oakland, California	Screened interval from TOC (feet):	15 - 25
Weather:	raining, cloudy, cool	TOC elevation, NAVD 88 (feet):	15.47
Precip. in past 5 days (in.):	0.59	Groundwater elevation, NAVD 88 (feet):	5.45
Source:	Oakland Fire Services Agency ONO	Water level from TOC (feet): 10.02	Time: 915
Water level instrument:	Heron Instruments H.OIL	Product level from TOC (feet): —	Time: —

CALCULATION OF WELL VOLUME:

14.98
(25.00 ft - 0.00 ft) x $(0.083 \text{ ft})^2$ x π x 7.48 gal/ft^3 =
well depth - water level x $(\text{well radius})^2$ x π x gal/ft^3 =

2.42 gallons in one casing volume
5.0 total gallons removed

CALIBRATION:

	Time	Temperature (°C)	pH (S.U.)	DO (%)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)
Calibration Standard:							
Before Purging:							
After Purging:							

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)	Cumulative Gallons Removed
~~1604~~	~~17.50~~						
1607	20.19	7.57	3.42	-160	5.10	224	0
1610	21.10	7.59	1.36	-203	5.39	55.1	0.5
1613	21.44	7.60	1.28	-216	5.40	21.6	1
1616	21.47	7.60	1.09	-219	5.39	8.9	1.5
1619	21.52	7.60	0.81	-220	5.38	6.4	2.5
1622	21.52	7.61	0.81	-223	5.36	6.3	3.5
1625	21.49	7.61	0.77	-225	5.36	7.1	4.0
1628	21.48	7.61	0.67	-227	5.35	7.2	5.0

Purge method: Grapump — Sample Time: 1630
Duplicate/blank number: N/A — Duplicate Sample Time: N/A
Sampling equipment: N/A — VOA attachment: N/A
Sample containers: 6 VOAs; 2 - 500 mL glass ambers
Sample analyses: TPH-g, d/mo 8015M; BTEX + MTBE 8260 — Laboratory: C&T
Decontamination method: none - dedicated tubing — Rinsate disposal: N/A
Comments:

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

GROUNDWATER SAMPLING

Well No.: **MW-12**

Project No.	4656016	Recorded by: SC	Date: 12/14/10
Project Name:	Harbor Facilities Center	Depth of well from TOC (feet):	25
Location:	Port of Oakland	Well diameter (inches):	2
	651 Maritime Street, Oakland, California	Screened interval from TOC (feet):	15 - 25
Weather:	raining, cloudy, cool	TOC elevation, NAVD 88 (feet):	16.79
Precip. in past 5 days (in.):	0.59	Groundwater elevation, NAVD 88 (feet):	5.64
Source:	Oakland Fire Services Agency AND	Water level from TOC (feet): 11.15	Time: 900
Water level instrument:	Heron Instruments H.OIL	Product level from TOC (feet): —	Time: —

CALCULATION OF WELL VOLUME:

13.85
(25.00 ft - 0.00 ft) x $(0.083 \text{ ft})^2$ x π x 7.48 gal/ft^3 =
well depth - water level x $(\text{well radius})^2$ x π x gal/ft^3 =

2.24 gallons in one casing volume
5.0 total gallons removed

CALIBRATION:

	Time	Temperature (°C)	pH (S.U.)	DO (%)	ORP (mV)	EC (µmho/cm)	Turbidity (NTU)
Calibration Standard:							
Before Purging:							
After Purging:							

FIELD MEASUREMENTS:

Time	Temperature (°C)	pH S.U.	DO (mg/L)	ORP (mV)	EC (mS/cm) (µmho/cm)	Turbidity (NTU)	Cumulative Gallons Removed
1517	18.32	7.07	3.11	-156	1.56	6.6	0
1520	18.70	7.01	1.26	-184	1.57	4.5	0.5
1523	18.78	7.00	0.94	-235	1.57	1.6	1.25
1526	18.75	7.04	0.99	-252	1.57	0.0	2.0
1529	18.76	7.00	0.74	-271	1.56	1.5	3
1532	18.77	7.00	0.70	-277	1.56	3.0	3.5
1535	18.76	7.00	0.66	-285	1.56	1.5	4
1538	18.78	7.00	0.64	-288	1.56	1.4	4.5
1541	18.76	7.00	0.59	-295	1.55	2.2	5

Purge method:	Geopump	Sample Time:	1545
Duplicate/blank number:	N/A	Duplicate Sample Time:	N/A
Sampling equipment:	N/A	VOA attachment:	N/A
Sample containers:	6e VOAs; 2 - 500mL glass ambers		
Sample analyses:	TPH-g, d/mo 8015M; BTEX+MTBE 8260	Laboratory:	C&T
Decontamination method:	none - dedicated tubing	Rinsate disposal:	N/A
Comments:	purge water has a v. sheen, appears blackish, has sulfur odor slight		

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

Port of Oakland
530 Water Street • Oakland, CA 94607

Appendix B
Laboratory Analytical Reports

4656016

MALCOLM PIRNIE

Data Validation Worksheet

Lab Report # 224710 DV by: CO
Project Port Harbor Facilities Complex Date: 01/03/10

Lab IDs	Sample IDs	Date Collected	Parameters			
			TPHg (8015B)	TPHd/mo (8015B)	MTBE + BTEX (8260B)	
-001	MW-4	12/14/10	X	X	X	
-002	MW-4DUP	12/14/10	X	X	X	
-003	MW-5	12/14/10	X	X	X	
-004	MW-8A	12/14/10	X	X	X	
-005	MW-9	12/14/10	X	X	X	
-006	MW-10	12/14/10	X	X	X	
-007	MW-12	12/14/10	X	X	X	
-008	MW-11	12/14/10	X	X	X	
-009	TB-121410	12/14/10			X	

Lab ID: C+T **NO QUALS**
Cooler Temperature: 2.8
Chain-of-Custody: OK
Samples preservatives: OK

Parameter: **TPHg**

HTs: 14 days – analyzed 12/15/10 (1) and 12/16/10 (2)
Batch IDs: 169999
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 12/16/10 (2), 12/17/10 (3), 12/21/10 (7)
Batch IDs: 170003
Surrogates: OK
Method Blank: OK, surrogates OK
BS/BSD: BS OK, surrogates OK
BSD OK, surrogates OK

Parameter: **BTEX + MTBE**

HTs: 14 days – analyzed 12/16/10 (2) and 12/17/10 (3)
Batch IDs: 170065, 170019
Surrogates: OK
Method Blank: OK, surrogates OK
BS/BSD: BS OK, surrogates OK
BSD OK, surrogates OK

Data Validation Worksheet

Lab Report # 224732 DV by: CO
Project Port Harbor Facilities Complex Date: 01/03/10

Lab IDs	Sample IDs	Date Collected	Parameters			
			TPHg (8015B)	TPHd/mo (8015B)	MTBE + BTEX (8260B)	
-001	MW-2	12/15/10	X	X	X	
-002	TB-121510	12/15/10			X	

Lab ID: C+T **NO QUALS**
Cooler Temperature: 5.0
Chain-of-Custody: OK
Samples preservatives: OK

Parameter: **TPHg**

HTs: 14 days – analyzed 12/16/10 (1)
Batch IDs: 170050
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 12/16/10 (1)
Batch IDs: 170055
Surrogates: OK
Method Blank: OK, surrogates OK
LCS: OK, surrogates OK
MS/MSD: MS OK, surrogates OK
MSD OK, surrogates OK

Parameter: **BTEX + MTBE**

HTs: 14 days – analyzed 12/17/10 (2)
Batch IDs: 170048
Surrogates: OK
Method Blank: OK, surrogates OK
BS/BSD: BS OK, surrogates OK
BSD OK, surrogates OK


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 224710
ANALYTICAL REPORT

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

Sample ID	Lab ID
MW-4	224710-001
MW-4 DUP	224710-002
MW-5	224710-003
MW-8A	224710-004
MW-9	224710-005
MW-10	224710-006
MW-12	224710-007
MW-11	224710-008
TB-121410	224710-009

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: _____ Date: 12/23/2010
Project Manager

NELAP # 01107CA

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**224710**
Client:	**Malcolm Pirnie, Inc.**
Project:	**4656016**
Location:	**Port Of Oakland - HFC**
Request Date:	**12/15/10**
Samples Received:	**12/15/10**

This data package contains sample and QC results for nine water samples, requested for the above referenced project on 12/15/10. The samples were received cold and intact.

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

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

Volatile Organics by GC/MS (EPA 8260B):
Low response was observed for MTBE in the CCV analyzed 12/17/10 08:35; this analyte met minimum response criteria, and affected data was qualified with "b". No other analytical problems were encountered.

CHAIN OF CUSTODY

Curtis & Tompkins Laboratories
ENVIRONMENTAL ANALYTICAL TESTING LABORATORY
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2323 Fifth Street
Berkeley, CA 94710

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Fax (510) 486-0532

Chain of Custody # _____

C&T LOGIN # 224710

Project No: 46560116
Project Name: Port HFC
Project P. O. No:
EDD Format: Report Level ☒ II ☐ III ☐ IV
Turnaround Time: ☐ RUSH _____ ☐ Standard

Sampler: Caroline Orsi / Sarah Carman
Report To: Todd Miller
Company: Malcolm Pirnie
Telephone: 510-596-3060
Email:

Lab No.	Sample ID.	SAMPLING		MATRIX				# of Containers	CHEMICAL PRESERVATIVE					ANALYTICAL REQUEST		
		Date Collected	Time Collected	Water	Solid				HCl	H2SO4	HNO3	NaOH	None	TPHd/mo + SG cleanup 8015M	TPHg 8015M	MTBE + BTEX 8260
1-	MW-4	12/14/10	1039	X				8	X				X	X	X	X
2-	MW-4DUP	↓	1048	↓				↓	↓				↓	↓	↓	↓
3-	MW-5		1153													
4-	MW-8A		1145													
5-	MW-9		1405													
6-	MW-10		1415													
7-	MW-12		1545													
8-	MW-11		1630													
9-	TB-121410	↓		↓				3	↓				↓			

Notes:

SAMPLE RECEIPT
☐ Intact
☐ Cold
☒ On Ice
☐ Ambient

RELINQUISHED BY:
DATE: 12/14/10 TIME: 5:30
DATE: TIME:
DATE: TIME:

RECEIVED BY:
Pat Dougherty 12/14/10 DATE: TIME: 5:30 pm
DATE: TIME:
DATE: TIME:

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 22472/10 Date Received 12/14/10 Number of coolers 1
Client MALCOLM PIRNIE Project PORT HFC

Date Opened 12/14/10 By (print) M. VILLARUEL (sign) [signature]
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:

Type of ice used: ☑ Wet ☐ Blue/Gel ☐ None Temp(°C) 2.8

☐ Samples Received on ice & cold without a temperature blank

☐ 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 samples in the appropriate containers for indicated tests? _____ (YES) NO
11. Are sample labels present, in good condition and complete? _____ (YES) NO
12. Do the sample labels agree with custody papers? _____ (YES) NO
13. Was sufficient amount of sample sent for tests requested? _____ (YES) NO
14. Are the samples appropriately preserved? _____ (YES) NO N/A
15. Are bubbles > 6mm absent in VOA samples? _____ (YES) NO N/A
16. Was the client contacted concerning this sample delivery? _____ (YES) NO
   If YES, Who was called? Todd By Trg Date: 12-15-10

COMMENTS

Unable to do the trip blank on TEN

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	169999
Units:	ug/L	Sampled:	12/14/10
Diln Fac:	1.000	Received:	12/15/10

Field ID: MW-4 Lab ID: 224710-001
Type: SAMPLE Analyzed: 12/15/10

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	98	75-130

Field ID: MW-4 DUP Lab ID: 224710-002
Type: SAMPLE Analyzed: 12/15/10

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	97	75-130

Field ID: MW-5 Lab ID: 224710-003
Type: SAMPLE Analyzed: 12/15/10

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	95	75-130

Field ID: MW-8A Lab ID: 224710-004
Type: SAMPLE Analyzed: 12/15/10

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	98	75-130

Field ID: MW-9 Lab ID: 224710-005
Type: SAMPLE Analyzed: 12/16/10

Analyte	Result	RL
Gasoline C7-C12	170 Y	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	98	75-130

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

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	169999
Units:	ug/L	Sampled:	12/14/10
Diln Fac:	1.000	Received:	12/15/10

Field ID: MW-10 Lab ID: 224710-006
Type: SAMPLE Analyzed: 12/16/10

Analyte	Result	RL
Gasoline C7-C12	150 Y	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	103	75-130

Field ID: MW-12 Lab ID: 224710-007
Type: SAMPLE Analyzed: 12/16/10

Analyte	Result	RL
Gasoline C7-C12	100 Y	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	107	75-130

Field ID: MW-11 Lab ID: 224710-008
Type: SAMPLE Analyzed: 12/16/10

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	105	75-130

Field ID: TB-121410 Lab ID: 224710-009
Type: SAMPLE Analyzed: 12/15/10

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	97	75-130

Type: BLANK Analyzed: 12/15/10
Lab ID: QC572517

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	94	75-130

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 #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC572516	Batch#:	169999
Matrix:	Water	Analyzed:	12/15/10
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	962.8	96	75-126

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	93	75-130

Curtis & Tompkins, Ltd.

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8015B
Field ID:	MW-4	Batch#:	169999
MSS Lab ID:	224710-001	Sampled:	12/14/10
Matrix:	Water	Received:	12/15/10
Units:	ug/L	Analyzed:	12/15/10
Diln Fac:	1.000		

Type: MS Lab ID: QC572518

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	31.14	2,000	1,855	91	68-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	104	75-130

Type: MSD Lab ID: QC572519

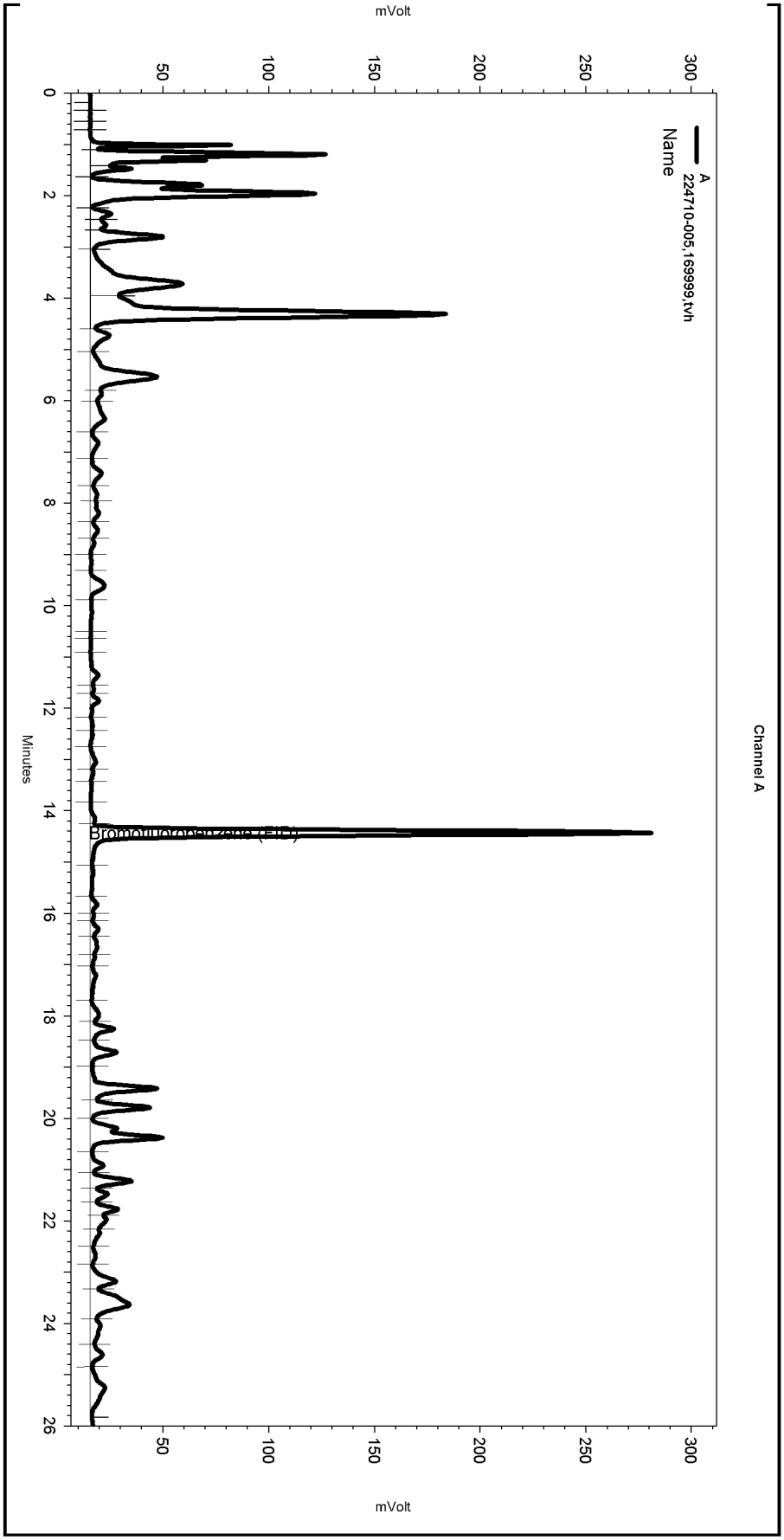
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,862	92	68-120	0	26

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	102	75-130

RPD= Relative Percent Difference

Sequence File: **\\Lims\gdrive\ezchrom\Projects\GC04\Sequence\349.seq**
Sample Name: **224710-005,169999,tvh**
Data File: **\\Lims\gdrive\ezchrom\Projects\GC04\Data\349-017**
Instrument: GC04 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)
Method Name: \\Lims\gdrive\ezchrom\Projects\GC04\Method\tvhbtxe246.met

Software Version 3.1.7
Run Date: 12/16/2010 1:29:58 AM
Analysis Date: 12/16/2010 10:52:23 AM
Sample Amount: 5 Multiplier: 5
Vial & pH or Core ID: a1.0



---< General Method Parameters >---

No items selected for this section

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No items selected for this section

Integration Events

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Width	0	0	0.2
Yes	Threshold	0	0	50

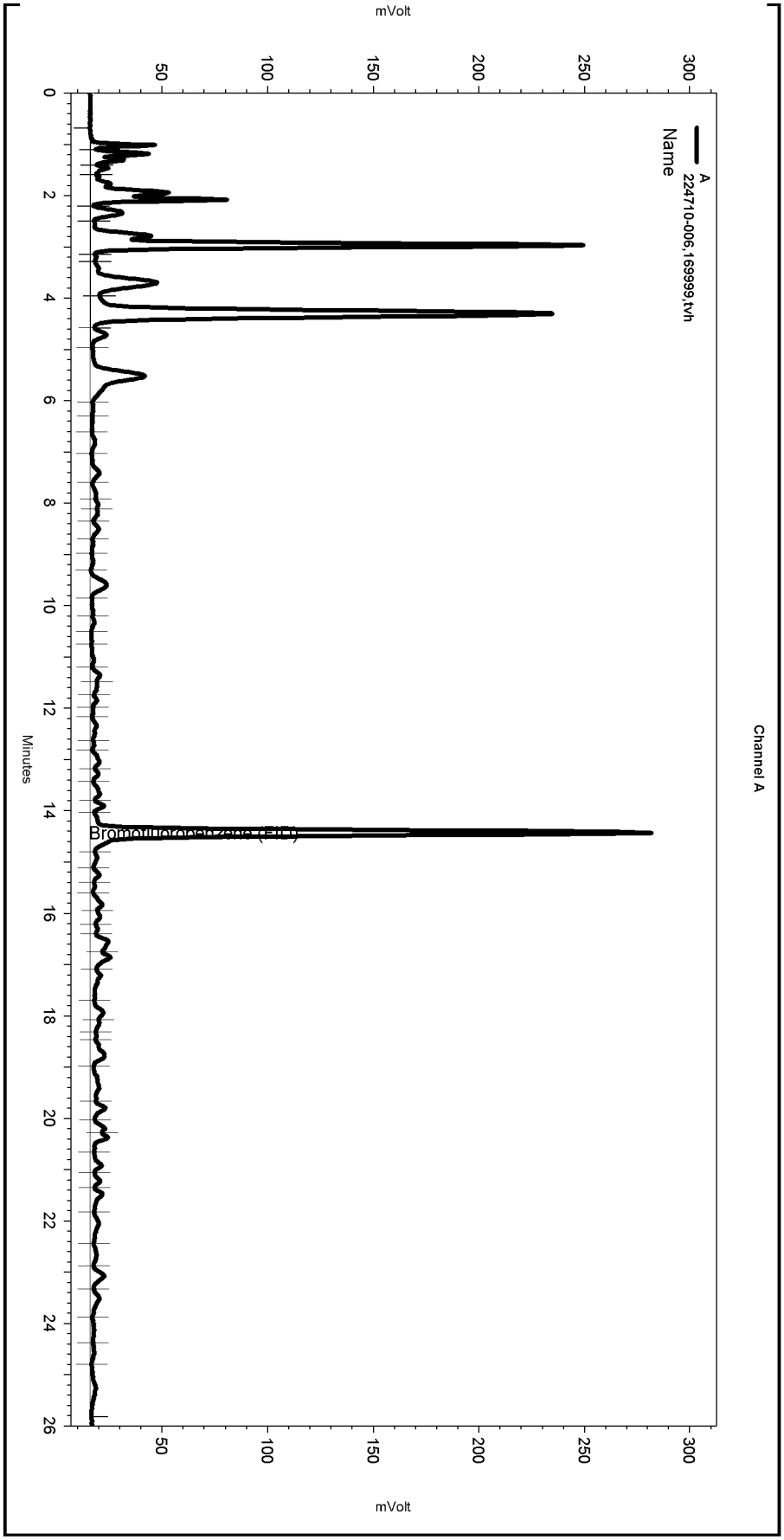
Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC04\Data\349-017

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Lowest Point Horizontal Baseli	0.309	26.007	0

Sequence File: **\\Lims\gdrive\ezchrom\Projects\GC04\Sequence\349.seq**
Sample Name: **224710-006,169999,tvh**
Data File: **\\Lims\gdrive\ezchrom\Projects\GC04\Data\349-018**
Instrument: GC04 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)
Method Name: \\Lims\gdrive\ezchrom\Projects\GC04\Method\tvhbtxe246.met

Software Version 3.1.7
Run Date: 12/16/2010 2:07:34 AM
Analysis Date: 12/16/2010 10:53:26 AM
Sample Amount: 5 Multiplier: 5
Vial & pH or Core ID: a1.0



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No items selected for this section

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No items selected for this section

Integration Events

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Width	0	0	0.2
Yes	Threshold	0	0	50

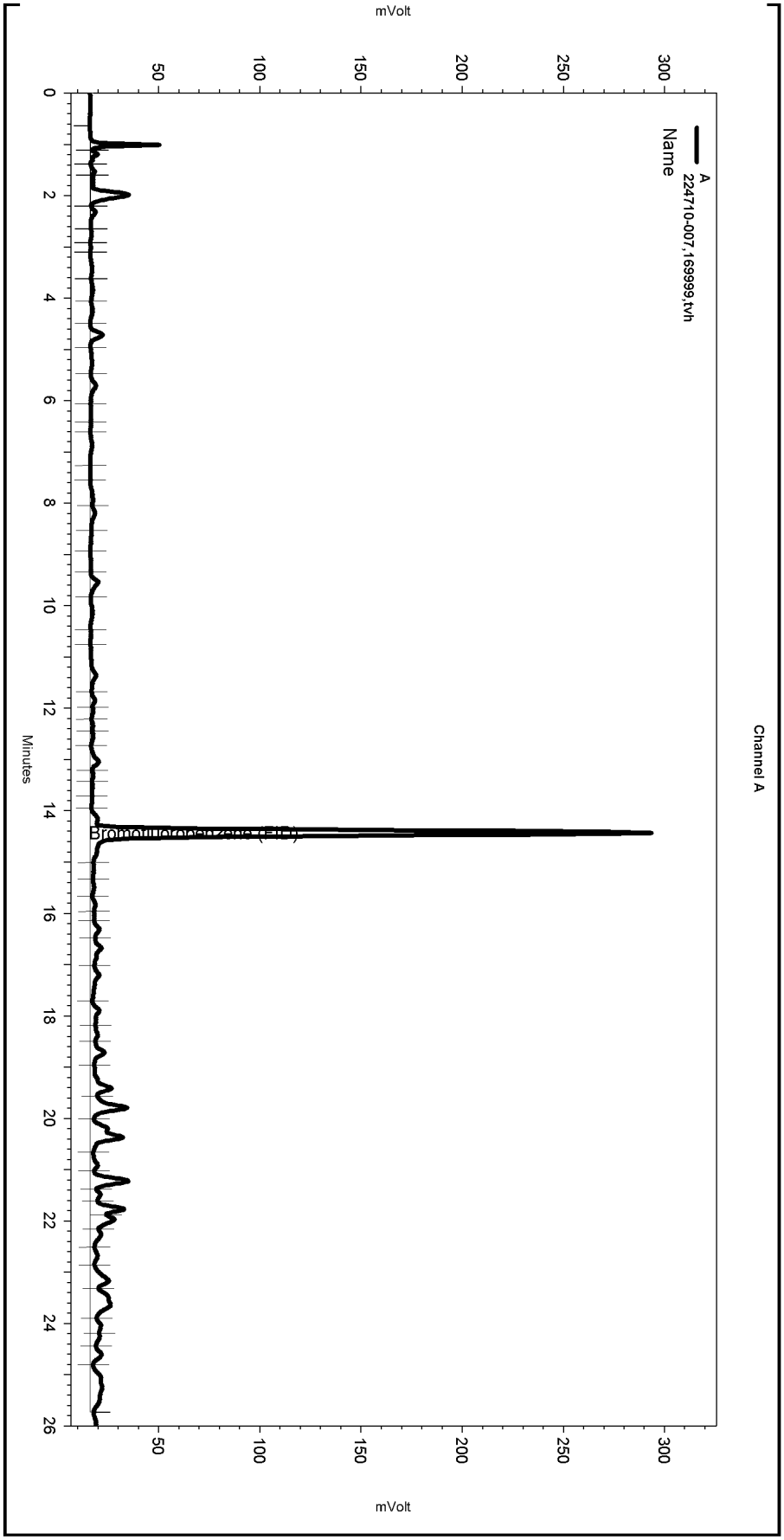
Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC04\Data\349-018

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Lowest Point Horizontal Baseli	0.336	25.684	0

Sequence File: **\\Lims\gdrive\ezchrom\Projects\GC04\Sequence\349.seq**
Sample Name: **224710-007,169999,tvh**
Data File: **\\Lims\gdrive\ezchrom\Projects\GC04\Data\349-019**
Instrument: GC04 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)
Method Name: \\Lims\gdrive\ezchrom\Projects\GC04\Method\tvhbtxe246.met

Software Version 3.1.7
Run Date: 12/16/2010 2:45:14 AM
Analysis Date: 12/16/2010 10:54:06 AM
Sample Amount: 5 Multiplier: 5
Vial & pH or Core ID: a1.0



---< General Method Parameters >---

No items selected for this section

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No items selected for this section

Integration Events

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Width	0	0	0.2
Yes	Threshold	0	0	50

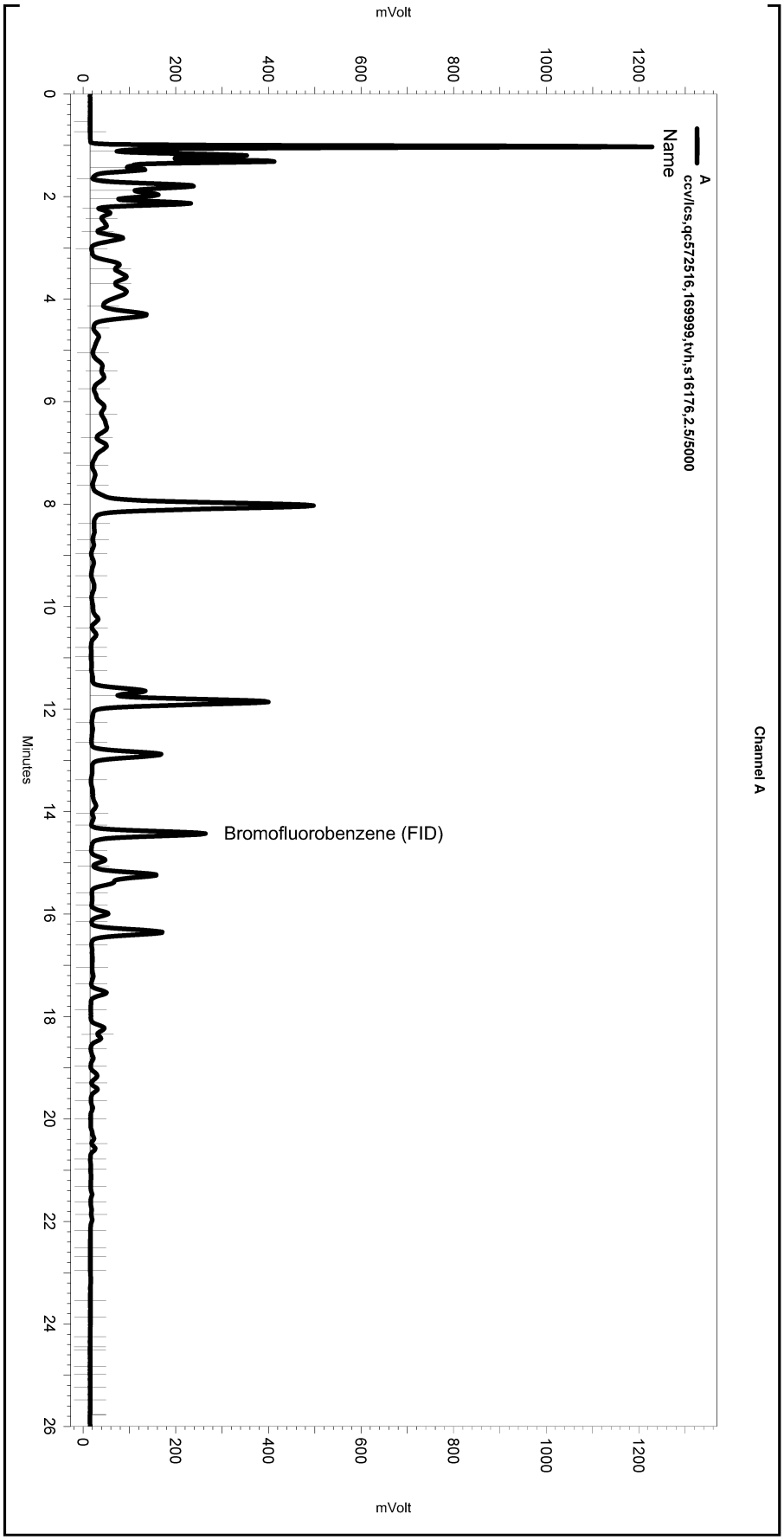
Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC04\Data\349-019

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Lowest Point Horizontal Baseli	0.317	25.926	0

Sequence File: **\\Lims\gdrive\ezchrom\Projects\GC04\Sequence\349.seq**
Sample Name: **ccv/lcs,qc572516,169999,tvh,s16176,2.5/5000**
Data File: **\\Lims\gdrive\ezchrom\Projects\GC04\Data\349-002**
Instrument: GC04 (Offline) Vial: N/A Operator: Tvh 1. Analyst (lims2k3\tvh1)
Method Name: \\Lims\gdrive\ezchrom\Projects\GC04\Method\tvhbtxe246.met

Software Version 3.1.7
Run Date: 12/15/2010 11:26:22 AM
Analysis Date: 12/15/2010 4:43:05 PM
Sample Amount: 5 Multiplier: 5
Vial & pH or Core ID: {Data Description}



---< General Method Parameters >---

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No items selected for this section

Integration Events

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Width	0	0	0.2
Yes	Threshold	0	0	50

Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC04\Data\349-002

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value

None

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 3520C
Project#:	4656016	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	12/14/10
Units:	ug/L	Received:	12/15/10
Diln Fac:	1.000	Prepared:	12/15/10
Batch#:	170003		

Field ID:	MW-4	Analyzed:	12/17/10
Type:	SAMPLE	Cleanup Method:	EPA 3630C
Lab ID:	224710-001		

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

Surrogate	%REC	Limits
o-Terphenyl	96	60-129

Field ID:	MW-4 DUP	Analyzed:	12/17/10
Type:	SAMPLE	Cleanup Method:	EPA 3630C
Lab ID:	224710-002		

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

Surrogate	%REC	Limits
o-Terphenyl	98	60-129

Field ID:	MW-5	Analyzed:	12/17/10
Type:	SAMPLE	Cleanup Method:	EPA 3630C
Lab ID:	224710-003		

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

Surrogate	%REC	Limits
o-Terphenyl	87	60-129

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

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 3520C
Project#:	4656016	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	12/14/10
Units:	ug/L	Received:	12/15/10
Diln Fac:	1.000	Prepared:	12/15/10
Batch#:	170003		

Field ID: MW-8A
Type: SAMPLE
Lab ID: 224710-004
Analyzed: 12/17/10
Cleanup Method: EPA 3630C

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

Surrogate	%REC	Limits
o-Terphenyl	96	60-129

Field ID: MW-9
Type: SAMPLE
Lab ID: 224710-005
Analyzed: 12/17/10
Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	130 Y	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
o-Terphenyl	96	60-129

Field ID: MW-10
Type: SAMPLE
Lab ID: 224710-006
Analyzed: 12/17/10
Cleanup Method: EPA 3630C

Analyte	Result	RL
Diesel C10-C24	140 Y	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
o-Terphenyl	87	60-129

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

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 3520C
Project#:	4656016	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	12/14/10
Units:	ug/L	Received:	12/15/10
Diln Fac:	1.000	Prepared:	12/15/10
Batch#:	170003		

Field ID: MW-12 Analyzed: 12/21/10
Type: SAMPLE Cleanup Method: EPA 3630C
Lab ID: 224710-007

Analyte	Result	RL
Diesel C10-C24	510	50
Motor Oil C24-C36	ND	300

Surrogate	%REC	Limits
o-Terphenyl	126	60-129

Field ID: MW-11 Analyzed: 12/16/10
Type: SAMPLE Cleanup Method: EPA 3630C
Lab ID: 224710-008

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

Surrogate	%REC	Limits
o-Terphenyl	87	60-129

Type: BLANK Analyzed: 12/17/10
Lab ID: QC572532 Cleanup Method: EPA 3630C

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

Surrogate	%REC	Limits
o-Terphenyl	103	60-129

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 #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 3520C
Project#:	4656016	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	170003
Units:	ug/L	Prepared:	12/15/10
Diln Fac:	1.000	Analyzed:	12/17/10

Type: BS Cleanup Method: EPA 3630C
Lab ID: QC572533

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,366	95	53-128

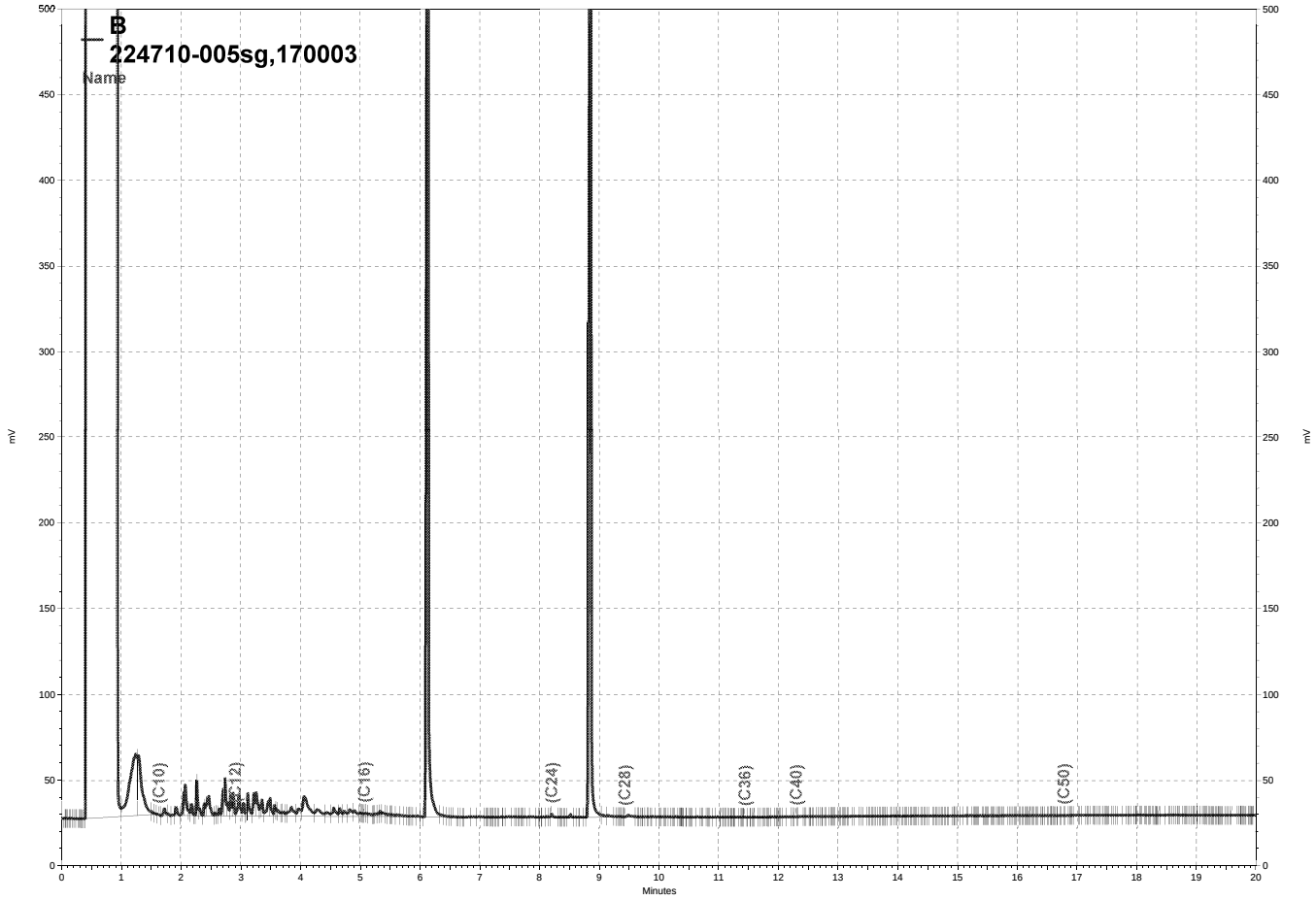
Surrogate	%REC	Limits
o-Terphenyl	97	60-129

Type: BSD Cleanup Method: EPA 3630C
Lab ID: QC572534

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	2,787	111	53-128	16	48

Surrogate	%REC	Limits
o-Terphenyl	116	60-129

RPD= Relative Percent Difference



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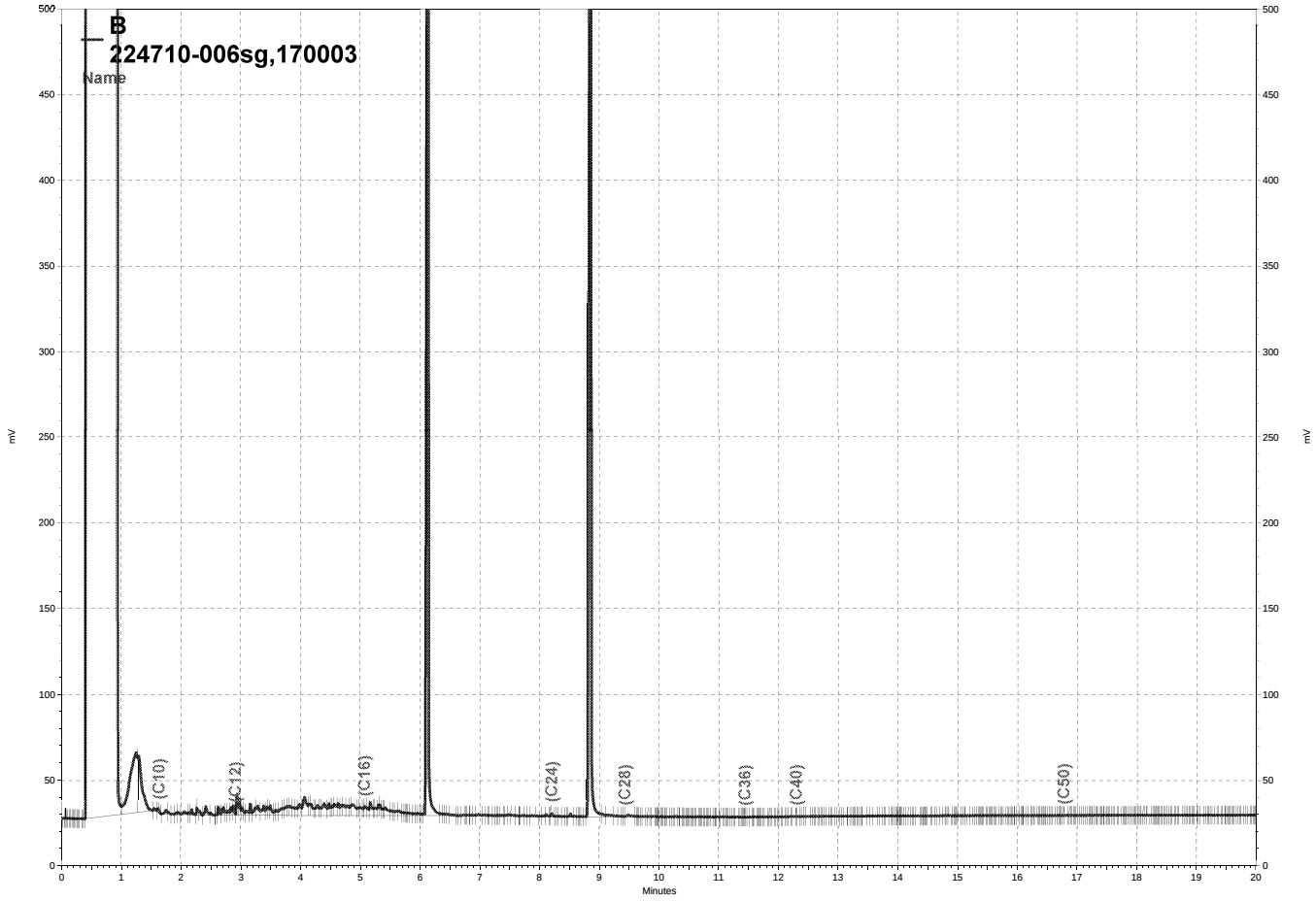

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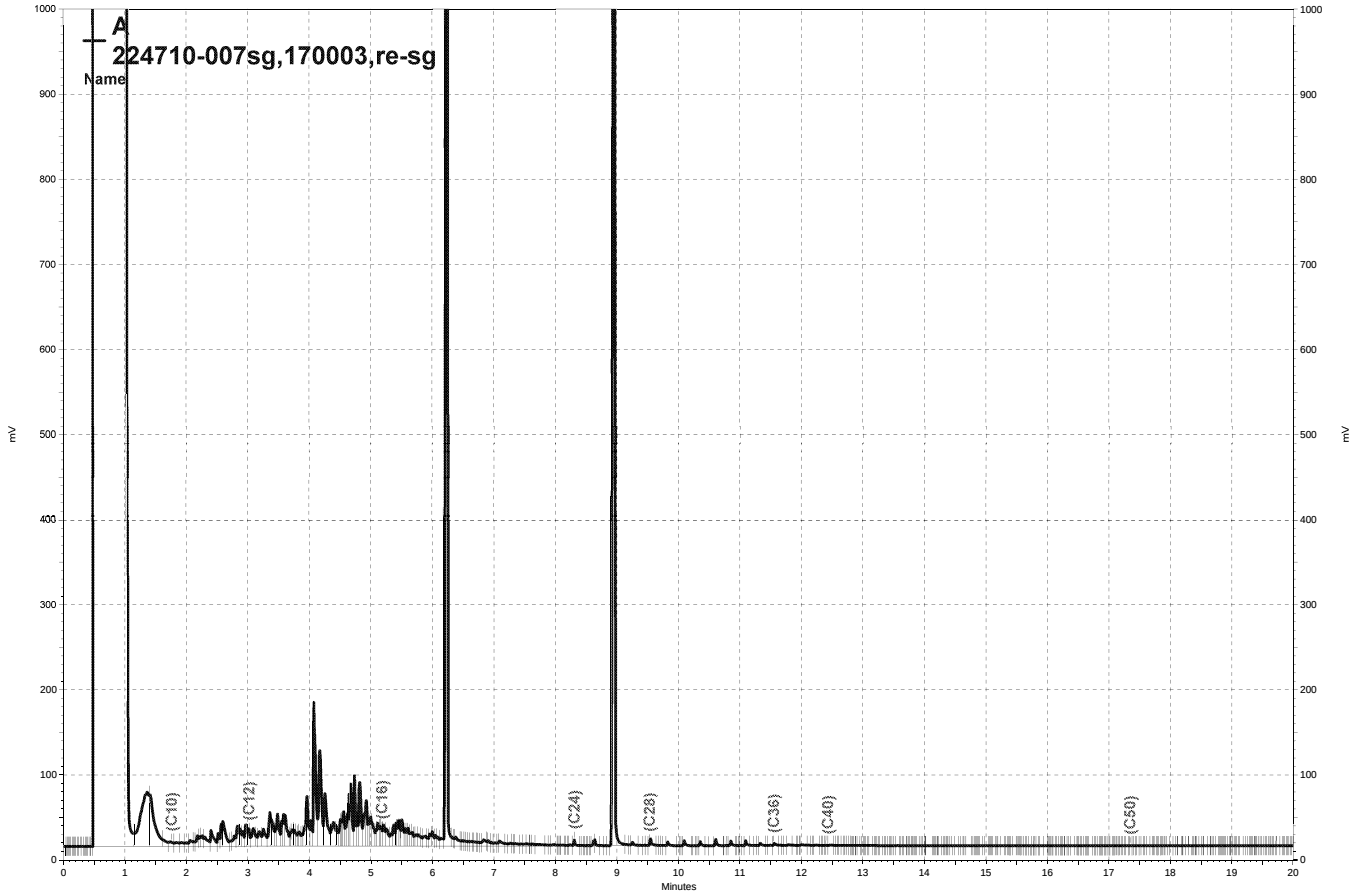

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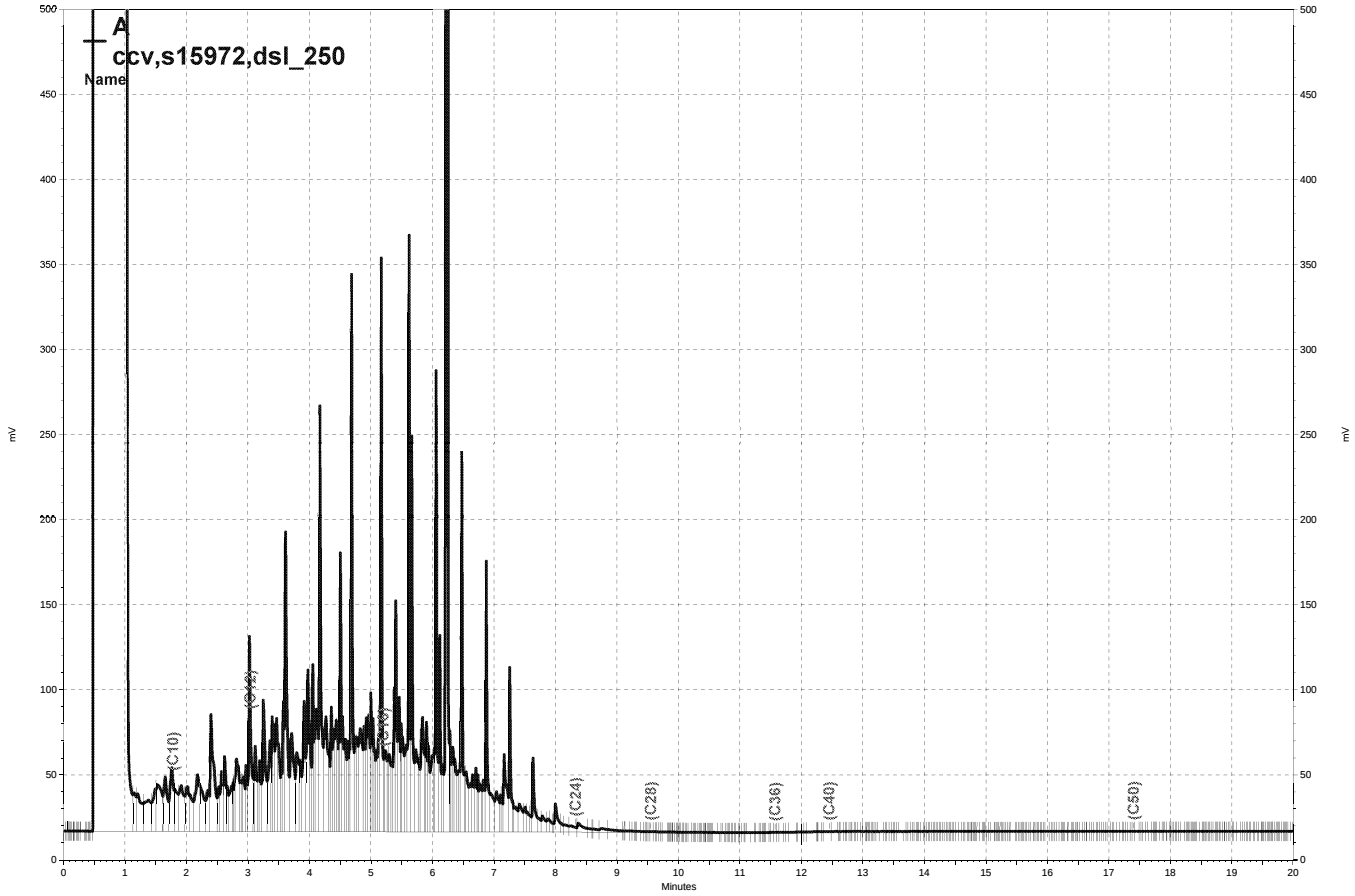

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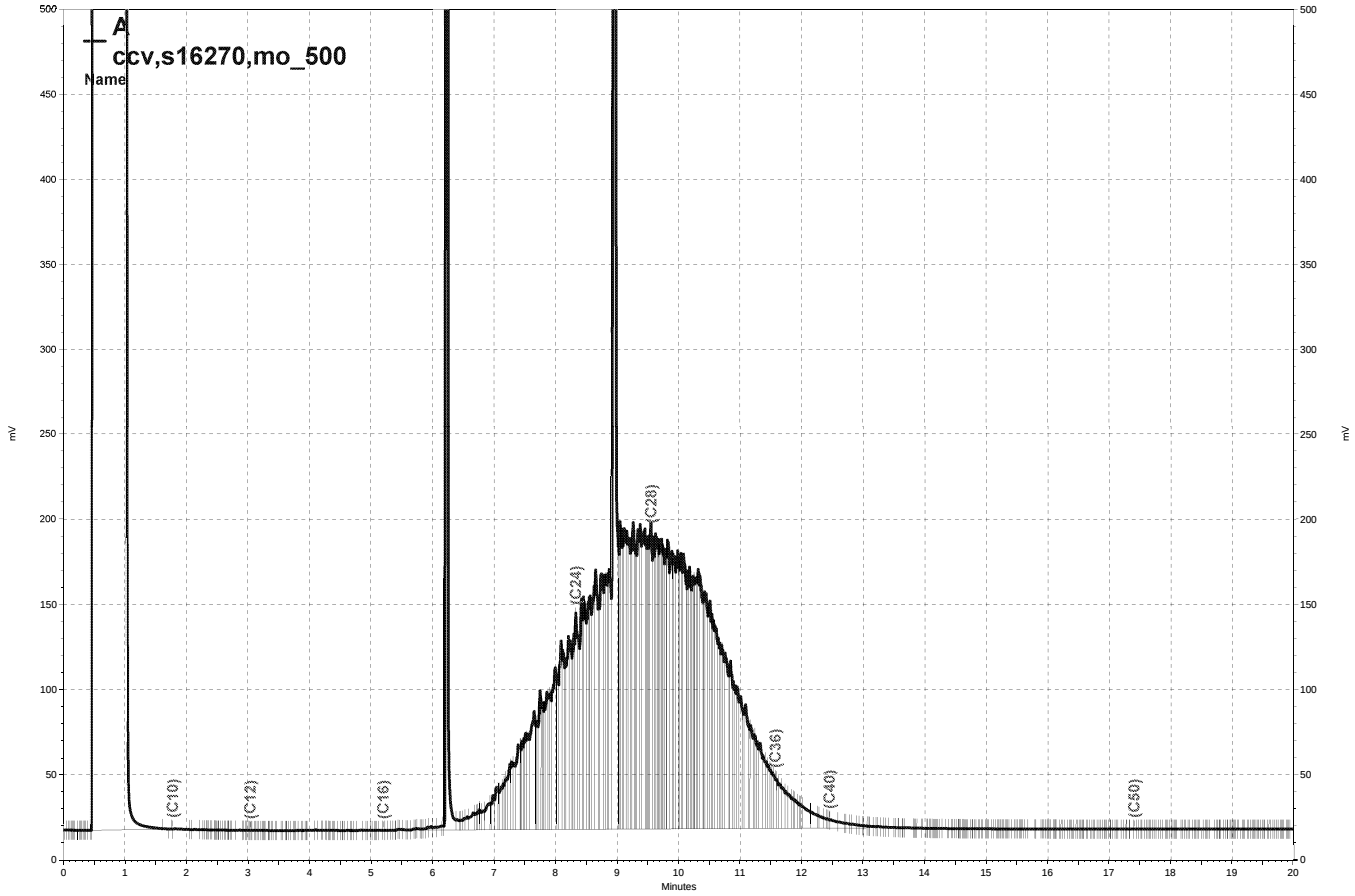

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Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	MW-4	Batch#:	170065
Lab ID:	224710-001	Sampled:	12/14/10
Matrix:	Water	Received:	12/15/10
Units:	ug/L	Analyzed:	12/17/10
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	2.2	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	102	71-146
Toluene-d8	108	80-120
Bromofluorobenzene	96	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	MW-4 DUP	Batch#:	170065
Lab ID:	224710-002	Sampled:	12/14/10
Matrix:	Water	Received:	12/15/10
Units:	ug/L	Analyzed:	12/17/10
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	2.7	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	103	71-146
Toluene-d8	108	80-120
Bromofluorobenzene	97	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	MW-5	Batch#:	170019
Lab ID:	224710-003	Sampled:	12/14/10
Matrix:	Water	Received:	12/15/10
Units:	ug/L	Analyzed:	12/16/10
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
1,2-Dichloroethane-d4	97	71-146
Toluene-d8	101	80-120
Bromofluorobenzene	103	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	MW-8A	Batch#:	170019
Lab ID:	224710-004	Sampled:	12/14/10
Matrix:	Water	Received:	12/15/10
Units:	ug/L	Analyzed:	12/16/10
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
1,2-Dichloroethane-d4	96	71-146
Toluene-d8	102	80-120
Bromofluorobenzene	104	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	MW-9	Batch#:	170019
Lab ID:	224710-005	Sampled:	12/14/10
Matrix:	Water	Received:	12/15/10
Units:	ug/L	Analyzed:	12/16/10
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	34	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	0.6	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	97	71-146
Toluene-d8	103	80-120
Bromofluorobenzene	102	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	MW-10	Batch#:	170019
Lab ID:	224710-006	Sampled:	12/14/10
Matrix:	Water	Received:	12/15/10
Units:	ug/L	Analyzed:	12/16/10
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	ND	0.5
Benzene	47	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	97	71-146
Toluene-d8	102	80-120
Bromofluorobenzene	97	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	MW-12	Batch#:	170019
Lab ID:	224710-007	Sampled:	12/14/10
Matrix:	Water	Received:	12/15/10
Units:	ug/L	Analyzed:	12/16/10
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	4.0	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
1,2-Dichloroethane-d4	96	71-146
Toluene-d8	104	80-120
Bromofluorobenzene	105	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	MW-11	Batch#:	170019
Lab ID:	224710-008	Sampled:	12/14/10
Matrix:	Water	Received:	12/15/10
Units:	ug/L	Analyzed:	12/16/10
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
1,2-Dichloroethane-d4	96	71-146
Toluene-d8	105	80-120
Bromofluorobenzene	99	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	TB-121410	Batch#:	170019
Lab ID:	224710-009	Sampled:	12/14/10
Matrix:	Water	Received:	12/15/10
Units:	ug/L	Analyzed:	12/16/10
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
1,2-Dichloroethane-d4	95	71-146
Toluene-d8	105	80-120
Bromofluorobenzene	103	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	170019
Units:	ug/L	Analyzed:	12/16/10
Diln Fac:	1.000		

Type: BS Lab ID: QC572597

Analyte	Spiked	Result	%REC	Limits
MTBE	25.00	21.73	87	60-123
Benzene	25.00	24.93	100	80-124
Toluene	25.00	24.97	100	80-120
Ethylbenzene	25.00	26.32	105	80-122
m,p-Xylenes	50.00	53.33	107	80-123
o-Xylene	25.00	26.04	104	80-121

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	94	71-146
Toluene-d8	101	80-120
Bromofluorobenzene	100	80-120

Type: BSD Lab ID: QC572598

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	25.00	21.13	85	60-123	3	20
Benzene	25.00	25.86	103	80-124	4	20
Toluene	25.00	27.55	110	80-120	10	20
Ethylbenzene	25.00	28.89	116	80-122	9	20
m,p-Xylenes	50.00	57.95	116	80-123	8	20
o-Xylene	25.00	28.16	113	80-121	8	20

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	95	71-146
Toluene-d8	107	80-120
Bromofluorobenzene	97	80-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC572599	Batch#:	170019
Matrix:	Water	Analyzed:	12/16/10
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
1,2-Dichloroethane-d4	96	71-146
Toluene-d8	102	80-120
Bromofluorobenzene	102	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	170065
Units:	ug/L	Analyzed:	12/17/10
Diln Fac:	1.000		

Type: BS Lab ID: QC572795

Analyte	Spiked	Result	%REC	Limits
MTBE	25.00	17.28 b	69	60-123
Benzene	25.00	24.03	96	80-124
Toluene	25.00	23.02	92	80-120
Ethylbenzene	25.00	22.66	91	80-122
m,p-Xylenes	50.00	50.45	101	80-123
o-Xylene	25.00	22.31	89	80-121

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	101	71-146
Toluene-d8	105	80-120
Bromofluorobenzene	93	80-120

Type: BSD Lab ID: QC572796

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	25.00	18.29 b	73	60-123	6	20
Benzene	25.00	23.55	94	80-124	2	20
Toluene	25.00	22.09	88	80-120	4	20
Ethylbenzene	25.00	22.09	88	80-122	3	20
m,p-Xylenes	50.00	48.85	98	80-123	3	20
o-Xylene	25.00	21.68	87	80-121	3	20

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	101	71-146
Toluene-d8	104	80-120
Bromofluorobenzene	94	80-120

b= See narrative
RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	224710	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC572797	Batch#:	170065
Matrix:	Water	Analyzed:	12/17/10
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
1,2-Dichloroethane-d4	103	71-146
Toluene-d8	107	80-120
Bromofluorobenzene	96	80-120

ND= Not Detected
RL= Reporting Limit


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Analytical Laboratories, Since 1878

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2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 224732
ANALYTICAL REPORT

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

Sample ID	Lab ID
MW-2	224732-001
TB-121510	224732-002

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: _____ Date: 12/23/2010
Project Manager

NELAP # 01107CA

Curtis & Tompkins, Ltd.

CASE NARRATIVE

Laboratory number:	**224732**
Client:	**Malcolm Pirnie, Inc.**
Project:	**4656016**
Location:	**Port Of Oakland - HFC**
Request Date:	**12/15/10**
Samples Received:	**12/15/10**

This data package contains sample and QC results for two water samples, requested for the above referenced project on 12/15/10. The samples were received cold and intact.

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

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

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

CHAIN OF CUSTODY

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Page 1 of 1

Chain of Custody # ______

C&T LOGIN # 224732

Project No: 4656016

Project Name: Port HFC

Project P. O. No:

EDD Format: Report Level ☒ II ☐ III ☐ IV

Turnaround Time: ☐ RUSH ______ ☒ Standard

Sampler: Caroline Orsi

Report To: Todd Miller

Company: Malcolm Pirnie

Telephone: 510-596-3060

Email: tmiller@pirnie.com

Lab No.	Sample ID.	SAMPLING Date Collected	SAMPLING Time Collected	MATRIX Water	MATRIX Solid	MATRIX	MATRIX	# of Containers	CHEMICAL PRESERVATIVE HCl	H2SO4	HNO3	NaOH	None	ANALYTICAL REQUEST: TPH-d/mo + SG Cleanup 8015M	TPHg 8015M	MTBE + BTEX 8260
	MW-2	12/15/10	1435	X				8	X				X	X	X	X
	TB-121510	↓		X				3	X						X	X

Notes:

SAMPLE RECEIPT
☐ Intact
☐ Cold
☒ On Ice
☐ Ambient

RELINQUISHED BY:			RECEIVED BY:		
[signature]	DATE: 12/15/10	TIME: 1520	Pat [signature]	DATE: 12/15/10	TIME: 3:20 pm
	DATE:	TIME:		DATE:	TIME:
	DATE:	TIME:		DATE:	TIME:

COOLER RECEIPT CHECKLIST

Curtis & Tompkins, Ltd.

Login # 224732 Date Received 12/15/10 Number of coolers 1
Client MPI Project 4656016

Date Opened 12/15 By (print) Tracy Bobier (sign) Tracy Bobier
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:

   Type of ice used: ☒ Wet ☐ Blue/Gel ☐ None Temp(°C) 5.2

   ☐ Samples Received on ice & cold without a temperature blank

   ☐ 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 samples in the appropriate containers for indicated tests? ____ (YES) NO
11. Are sample labels present, in good condition and complete? ____ (YES) NO
12. Do the sample labels agree with custody papers? ____ (YES) NO
13. Was sufficient amount of sample sent for tests requested? ____ (YES) NO
14. Are the samples appropriately preserved? ____ (YES) NO N/A
15. Are bubbles > 6mm absent in VOA samples? ____ (YES) NO N/A
16. Was the client contacted concerning this sample delivery? ____ YES (NO)
   If YES, Who was called? ____ By ____ Date: ____

COMMENTS

Curtis & Tompkins, Ltd.

Total Volatile Hydrocarbons

Lab #:	224732	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	12/15/10
Units:	ug/L	Received:	12/15/10
Diln Fac:	1.000	Analyzed:	12/16/10
Batch#:	170050		

Field ID: MW-2 Lab ID: 224732-001
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	100	75-130

Field ID: TB-121510 Lab ID: 224732-002
Type: SAMPLE

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	98	75-130

Type: BLANK Lab ID: QC572724

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	89	75-130

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	224732	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC572723	Batch#:	170050
Matrix:	Water	Analyzed:	12/16/10
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	938.2	94	75-126

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	89	75-130

Curtis & Tompkins, Ltd.

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	224732	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	170050
MSS Lab ID:	224752-003	Sampled:	12/15/10
Matrix:	Water	Received:	12/15/10
Units:	ug/L	Analyzed:	12/17/10
Diln Fac:	1.000		

Type: MS Lab ID: QC572725

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	28.03	2,000	1,872	92	68-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	107	75-130

Type: MSD Lab ID: QC572726

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,920	95	68-120	3	26

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	105	75-130

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	224732	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	170050
MSS Lab ID:	224747-004	Sampled:	12/15/10
Matrix:	Water	Received:	12/15/10
Units:	ug/L	Analyzed:	12/17/10
Diln Fac:	1.000		

Type: MS Lab ID: QC572829

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	19.45	2,000	1,896	94	68-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	104	75-130

Type: MSD Lab ID: QC572830

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,894	94	68-120	0	26

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	106	75-130

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Total Volatile Hydrocarbons

Lab #:	224732	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	170050
MSS Lab ID:	224747-005	Sampled:	12/15/10
Matrix:	Water	Received:	12/15/10
Units:	ug/L	Analyzed:	12/17/10
Diln Fac:	1.000		

Type: MS Lab ID: QC572831

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	14.82	2,000	1,911	95	68-120

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	105	75-130

Type: MSD Lab ID: QC572832

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,919	95	68-120	0	26

Surrogate	%REC	Limits
Bromofluorobenzene (FID)	104	75-130

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Total Extractable Hydrocarbons

Lab #:	224732	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 3520C
Project#:	4656016	Analysis:	EPA 8015B
Field ID:	MW-2	Batch#:	170055
Matrix:	Water	Sampled:	12/15/10
Units:	ug/L	Received:	12/15/10
Diln Fac:	1.000	Prepared:	12/16/10

Type:	SAMPLE	Analyzed:	12/18/10
Lab ID:	224732-001	Cleanup Method:	EPA 3630C

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

Surrogate	%REC	Limits
o-Terphenyl	103	60-129

Type:	BLANK	Analyzed:	12/17/10
Lab ID:	QC572742	Cleanup Method:	EPA 3630C

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

Surrogate	%REC	Limits
o-Terphenyl	105	60-129

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	224732	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 3520C
Project#:	4656016	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC572743	Batch#:	170055
Matrix:	Water	Prepared:	12/16/10
Units:	ug/L	Analyzed:	12/19/10

Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,620	105	53-128

Surrogate	%REC	Limits
o-Terphenyl	110	60-129

Curtis & Tompkins, Ltd.

Batch QC Report

Total Extractable Hydrocarbons

Lab #:	224732	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 3520C
Project#:	4656016	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	170055
MSS Lab ID:	224752-003	Sampled:	12/15/10
Matrix:	Water	Received:	12/15/10
Units:	ug/L	Prepared:	12/16/10
Diln Fac:	1.000	Analyzed:	12/20/10

Type: MS Cleanup Method: EPA 3630C
Lab ID: QC572744

Analyte	MSS Result	Spiked	Result	%REC	Limits
Diesel C10-C24	10.69	2,500	2,919	116	50-126

Surrogate	%REC	Limits
o-Terphenyl	118	60-129

Type: MSD Cleanup Method: EPA 3630C
Lab ID: QC572745

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	3,090	123	50-126	6	47

Surrogate	%REC	Limits
o-Terphenyl	126	60-129

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	224732	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	MW-2	Batch#:	170048
Lab ID:	224732-001	Sampled:	12/15/10
Matrix:	Water	Received:	12/15/10
Units:	ug/L	Analyzed:	12/17/10
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
1,2-Dichloroethane-d4	108	71-146
Toluene-d8	104	80-120
Bromofluorobenzene	107	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Purgeable Aromatics by GC/MS

Lab #:	224732	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Field ID:	TB-121510	Batch#:	170048
Lab ID:	224732-002	Sampled:	12/15/10
Matrix:	Water	Received:	12/15/10
Units:	ug/L	Analyzed:	12/17/10
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
1,2-Dichloroethane-d4	108	71-146
Toluene-d8	105	80-120
Bromofluorobenzene	106	80-120

ND= Not Detected
RL= Reporting Limit

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	224732	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	170048
Units:	ug/L	Analyzed:	12/16/10
Diln Fac:	1.000		

Type: BS Lab ID: QC572714

Analyte	Spiked	Result	%REC	Limits
MTBE	25.00	23.72	95	60-123
Benzene	25.00	24.13	97	80-124
Toluene	25.00	21.21	85	80-120
Ethylbenzene	25.00	24.13	97	80-122
m,p-Xylenes	50.00	49.75	99	80-123
o-Xylene	25.00	24.23	97	80-121

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	108	71-146
Toluene-d8	89	80-120
Bromofluorobenzene	120	80-120

Type: BSD Lab ID: QC572715

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	25.00	23.71	95	60-123	0	20
Benzene	25.00	23.76	95	80-124	2	20
Toluene	25.00	25.04	100	80-120	17	20
Ethylbenzene	25.00	23.78	95	80-122	1	20
m,p-Xylenes	50.00	51.59	103	80-123	4	20
o-Xylene	25.00	25.37	101	80-121	5	20

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	104	71-146
Toluene-d8	110	80-120
Bromofluorobenzene	98	80-120

RPD= Relative Percent Difference

Curtis & Tompkins, Ltd.

Batch QC Report

Purgeable Aromatics by GC/MS

Lab #:	224732	Location:	Port Of Oakland - HFC
Client:	Malcolm Pirnie, Inc.	Prep:	EPA 5030B
Project#:	4656016	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC572716	Batch#:	170048
Matrix:	Water	Analyzed:	12/16/10
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
1,2-Dichloroethane-d4	107	71-146
Toluene-d8	98	80-120
Bromofluorobenzene	104	80-120

ND= Not Detected
RL= Reporting Limit

Port of Oakland
530 Water Street • Oakland, CA 94607

Appendix C
Free Product Recovery System Operation and Maintenance Field Sheets

4656016

MALCOLM PIRNIE

Note: all pumps except 8 run @ 11:30

Site Visit Date: 7/7/10 **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										Inactive
RW-2										Inactive
RW-3	Pre-run	10.51	11.78	1.27	10.71	P=7 D=30		47:49	NM	
	Post-run	10.74	11.43	0.69				48:19		
RW-4	Pre-run	~~8.~~9.92	10.20	0.28	10.38	P=7 D=15		103:34	NM	
	Post-run	9.93	10.18	0.25				103:49		
RW-5		NM- inaccessible								Inactive
RW-6	Pre-run	8.58	9.80	1.22	9.3	P=7 D=15	5.6	382:57	NM	
	Post-run	8.72	8.99	0.27			5.6	383:12		
RW-7	Pre-run	7.83	8.98	1.15	8.7	P=7 D=30	4.7	446:21	NM	
	Post-run	7.84	8.13	0.29			6.5	446:51		
RW-8	Pre-run	9.27	9.54	0.27	9.5	P=7 D=15	4.0	118:37	NM	
	Post-run	9.25	9.42	0.17			4.0	118:52		
RW-9	Pre-run	9.1~~8~~	9.67	0.05	9.5	P=7 D=0		1:30	–	Did not run pump; product thickness < 0.25 ft
	Post-run	–	–	–				1:30		
MW-3	Pre-run	10.45	12.42	1.97					16	well recovering at a rate of pumping
	Post-run	10.85	11.04	0.09						

Elapsed Time @ Blower (hrs): 19027
Sight Column Water Level: (empty) 1/4 1/2 3/4 full (empty @ 1/2 or more)
Depth of product in convault (feet): 1.47
Approximate total volume recovered:

Compressor condensate emptied? Y
Depth to interface (feet): 2.33
emptied blower condensate

Site Visit Date: 7/14/10 **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										Inactive
RW-2										Inactive
RW-3	Pre-run	10.55	11.85	1.30	10.71	P=7 D=~~30~~		48:19	NM	may need to adjust pump next week if WL continues to drop
	Post-run	10.72	11.52	0.80				~~48:49~~ ~~103:49~~		
RW-4	Pre-run	9.94	10.29	0.35	10.38	P=7 D=15		103:49	NM	
	Post-run	9.97	10.25	~~0.28~~				104:04		
RW-5		–	7.84	product/water emulsion visible on probe						Inactive
RW-6	Pre-run	8.59	9.88	1.29	9.3	P=7 D=15	5.0	383:12	NM	
	Post-run	8.73	8.95	0.22			5.3	383:27		
RW-7	Pre-run	7.86	9.09	1.23	8.7	P=7 D=15	5.0	446:51	NM	
	Post-run	8.09	8.32	0.13			4.8	447:06		
RW-8	Pre-run	9.23	9.53	0.30	9.5	P=7 D=15	5.0	118:52	NM	
	Post-run	9.22	9.40	0.18			4.4	119:07		
RW-9	Pre-run	NM- inaccesible	– did	not run pump				1:30	–	historically contains <0.25' of product
	Post-run	–	–	–				–		
MW-3	Pre-run	10.48	12.55	2.07					18	4+3+3+4+4
	Post-run	11.02	11.10	0.08						

Elapsed Time @ Blower (hrs): 19195
Sight Column Water Level: (empty) 1/4 1/2 3/4 full (empty @ 1/2 or more)
Depth of product in convault (feet): 1.39*
Approximate total volume recovered:

Compressor condensate emptied? Y
Depth to interface (feet): 2.14*
*convault measurements after addition of 4 gal from MW-3
reset all pumps to run at 12:00

Site Visit Date:		7/21/10				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										Inactive
RW-2										Inactive
RW-3	Pre-run	10.60	11.44	0.84	10.71	P=7 D=15		48:49	NM	pump depth ok
	Post-run	10.75	11.32	0.57				49:04		
RW-4	Pre-run	9.94	10.27	0.33	10.38	P=7 D=15		104:04	NM	
	Post-run	9.92	10.22	0.30				104:19		
RW-5			6.60	product not measurable, but oil/water emulsion visible on probe						Inactive
RW-6	Pre-run	8.68	9.97	1.29	9.3	P=7 D=15	4.3	383:27	NM	
	Post-run	8.82	9.00	0.18			4.4	383:42		
RW-7	Pre-run	~~7.63~~	9.13	1.50	8.7	P=7 ~~D=30~~ D=15	6.8	447:06	NM	
	Post-run	8.02	8.49	0.47			4.8	447:21		
RW-8	Pre-run	9.14	9.46	0.32	9.5	P=7 D=15	6.4	119:07	NM	
	Post-run	9.18	9.37	0.19			5.4	119:22		
RW-9	Pre-run	inaccessible	—	—	9.5	P=7 D=0		1:30	—	Did not run based on historical product thickness <0.25 ft
	Post-run							1:30		
MW-3	Pre-run	10.47	12.26	1.79					17	4+3+4+3+3
	Post-run	11.05	11.12	0.07						

Elapsed Time @ Blower (hrs): 19363
Sight Column Water Level: empty 1/4 1/2 3/4 full (empty @ 1/2 or more)
Depth of product in convault (feet): 1.32
Approximate total volume recovered:

Compressor condensate emptied?
Depth to interface (feet): 2.15
blower condensate emptied

Site Visit Date:		7/28/10				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										Inactive
RW-2										Inactive
RW-3	Pre-run	10.74	11.33	0.59	10.71	P=7 D=15		49:04	NM	
	Post-run	10.83	11.30	0.47				49:19		
RW-4	Pre-run	10.04	10.38	0.34	10.38	P=7 D=15		104:19	NM	
	Post-run	10.06	10.33	0.27				104:34		
RW-5		NM- inaccessible - car parked on top of vault								Inactive
RW-6	Pre-run	8.74	10.04	1.30	9.3	P=7 D=15	4.0	383:42	NM	
	Post-run	8.87	10.10	0.23			4.0	383:57		
RW-7	Pre-run	7.90	9.35	1.45	8.7	P=7 D=15	4.5	447:21	NM	
	Post-run	8.08	8.54	0.46			4.4	447:36		
RW-8	Pre-run	9.12	9.51	0.39	9.5	P=7 D=15	6.2	119:22	NM	
	Post-run	9.22	9.46	0.24			4.8	119:37		
RW-9	Pre-run	9.73	9.79	0.06	9.5	P=7 D=0		1:30	-	Did not run pump; product thickness <0.25 ft.
	Post-run	-	-	-				1:30		
MW-3	Pre-run	10.54	12.55	2.01					10 gal	
	Post-run	10.86	11.02	0.16						

Elapsed Time @ Blower (hrs): 19531
Sight Column Water Level: empty 1/4 1/2 3/4 full (empty @ 1/2 or more)
Depth of product in convault (feet): 1.24
Approximate total volume recovered:

Compressor condensate emptied? ✓
Depth to interface (feet): 2.10

Site Visit Date:	8/4/10				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									Inactive
RW-2									Inactive
RW-3 Pre-run	NM								Settings same as previous week. No measurements taken except at MW-3
RW-3 Post-run	NM								
RW-4 Pre-run	NM								
RW-4 Post-run	NM								
RW-5									Inactive
RW-6 Pre-run	NM								
RW-6 Post-run	NM								
RW-7 Pre-run	NM								
RW-7 Post-run	NM								
RW-8 Pre-run	NM								
RW-8 Post-run	NM								
RW-9 Pre-run	NM								
RW-9 Post-run	NM								
MW-3 Pre-run	10.59	12.50	1.91					4	
MW-3 Post-run	11.07	11.20	0.13						

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):
Approximate total volume recovered:

Compressor condensate emptied?
Depth to interface (feet):

Site Visit Date: 8/11/10 **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										Inactive
RW-2										Inactive
RW-3	Pre-run	10.81	11.19	0.38	10.71	P=7 D=15		49:34	NM	
	Post-run	10.89	11.17	0.28				49:49		
RW-4	Pre-run	10.08	10.56	0.48	10.38	P=7 D=15		104:49	NM	
	Post-run	10.13	10.54	0.41				105:04		
RW-5		NM- inaccessible - truck parked on vault								Inactive
RW-6	Pre-run	8.78	10.14	1.36	9.3	P=7 D=15	3.4	384:12	NM	
	Post-run	~~8.87~~ 8.93	9.29	0.36			3.6	384:27		
RW-7	Pre-run	7.87	9.59	1.72	8.7	P=7 D=15	5.2	447:51	NM	
	Post-run	7.95	8.68	0.73			6.2	448:06		
RW-8	Pre-run	9.20	9.76	0.56	9.5	P=7 D=15	4.4	119:52	NM	
	Post-run	9.27	9.73	0.46			4.4	120:07		
RW-9	Pre-run	9.78	10.02	0.24	9.5	P=7 D=0		1:30	—	Did not run pump; product thickness < 0.25 ft.
	Post-run	—	—	—				1:30		
MW-3	Pre-run	10.60	12.60	2.00					H	Replaced silicone tubing for dedicated 4,5,3,2 purge tubing
	Post-run	10.95	11.15	0.20						

Elapsed Time @ Blower (hrs): 19,867.57
Sight Column Water Level: (empty) 1/4 1/2 3/4 full (empty @ 1/2 or more)
Depth of product in convault (feet): 1.16
Approximate total volume recovered:

Compressor condensate emptied?
Depth to interface (feet): 2.11
emptied blower condensate

Site Visit Date: 8/18/10 **Recorded By:** (1)

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										Inactive
RW-2										Inactive
RW-3	Pre-run	NM			→	P=7 D=15		49:49	NM	
	Post-run	NM			→			—		
RW-4	Pre-run	NM			→	P=7 D=15		105:04	NM	
	Post-run	NM			→			—		
RW-5										Inactive
RW-6	Pre-run	NM			→	P=7 D=15	—	384:27	NM	
	Post-run	NM			→		—	—		
RW-7	Pre-run	NM			→	P=7 D=15	—	448:06	NM	
	Post-run	NM			→		—	—		
RW-8	Pre-run	NM			→	P=7 D=15	—	120:07	NM	
	Post-run	NM			→		—	—		
RW-9	Pre-run	NM			→	P=7 D=0		—	NM	
	Post-run	NM			→			—		
MW-3	Pre-run	10.64	12.67	2.03					17	
	Post-run	11.13	11.27	0.14						

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):
Approximate total volume recovered:

Compressor condensate emptied?
Depth to interface (feet):

Site Visit Date: 8/25/10 **Recorded By:** CB

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										Inactive
RW-2										Inactive
RW-3	Pre-run	10.81	11.09	0.28	10.71	P=7 D=15		50:04	nm	
	Post-run	10.86	10.95	0.09				50:19		
RW-4	Pre-run	10.05	10.77	0.62	10.38	P=7 D=15		105:19	nm	
	Post-run	10.11	10.65	0.54				105:34		
RW-5		6.89	9.23	2.34					4	Inactive
RW-6	Pre-run	8.81	10.29	1.48	9.3 ↓ 10.3	P=7 D=15	3.5	384:42	nm	
	Post-run	8.90	9.83	0.93			3.6	384:57		
RW-7	Pre-run	7.97	9.85	1.88	8.7 ↓ 9.7	P=7 D=15	3.9	448:21	nm	
	Post-run	8.13	8.91	0.78			5.0	448:36		
RW-8	Pre-run	9.25	10.05	0.80	9.5	P=7 D=15	4.1	120:22	nm	
	Post-run	9.33	9.98	0.65			4.0	120:37		
RW-9	Pre-run	9.74	10.46	0.66	9.5 ↓ 10.5	P=7 D=15		1:30	nm	
	Post-run	10.05	10.14	0.09				1:45		
MW-3	Pre-run	10.65	12.43	1.78					9	
	Post-run	11.31	11.40	0.09						

Elapsed Time @ Blower (hrs): 20201.83
Sight Column Water Level: (empty) 1/4 1/2 3/4 full (empty @ 1/2 or more)
Depth of product in convault (feet): 1.01
Approximate total volume recovered:

Compressor condensate emptied? ✓
Depth to interface (feet): 2.08

Site Visit Date:		9/1/10				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										Inactive
RW-2										Inactive
RW-3	Pre-run	10.89	11.08	0.19	10.71	P=7 D=0		50:19	—	Did not run pump; product thickness <0.25'
	Post-run	—	—	—				50:19		
RW-4	Pre-run	10.11	10.89	0.78	10.38	P=7 D=30		105:34	NM	
	Post-run	10.14	10.64	0.50				106:04		
RW-5										Inactive
RW-6	Pre-run	8.81	10.42	1.61	10.3	P=7 D=30	3.2	384:57	NM	
	Post-run	8.91	9.82	0.89			3.2	385:27		
RW-7	Pre-run	7.75	9.88	~~7.0~~ 2.13	9.7	P=7 D=15	6.2	448:36	NM	
	Post-run	7.90	9.00	1.10			6.4	448:51		
RW-8	Pre-run	9.23	10.21	0.98	9.5	P=7 ~~D=15~~ D=30	4.0	120:37	NM	Removed + inspected pump; appears intact; replaced pump back in well
	Post-run	9.37	10.18	0.81			2.8	121:07		
RW-9	Pre-run	9.82	10.15	0.33	10.5	P=7 D=5		1:45		
	Post-run	9.85	9.99	0.14				2:00		
MW-3	Pre-run	10.74	12.56	1.82					20	4444+4
	Post-run	11.02	11.19	0.17						

Elapsed Time @ Blower (hrs): ~~2037~~ 0

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

Depth of product in convault (feet): 0.96

Approximate total volume recovered:

Compressor condensate emptied? Y

Depth to interface (feet): 2.02

Site Visit Date:	9/7/10	Recorded By:	CO

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										Inactive
RW-2										Inactive
RW-3	Pre-run	nm								
	Post-run	nm								
RW-4	Pre-run	nm								
	Post-run	nm								
RW-5										Inactive
RW-6	Pre-run	nm								
	Post-run	nm								
RW-7	Pre-run	nm								
	Post-run	nm								
RW-8	Pre-run	nm								
	Post-run	nm								
RW-9	Pre-run	nm								
	Post-run	nm								
MW-3	Pre-run	10.71	12.58	1.87					8	
	Post-run	11.49	11.58	0.09						

Did not measure product & water levels. Pumps ran as set last week (9/1/10)

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): 0.82
Approximate total volume recovered:

Compressor condensate emptied?
Depth to interface (feet): 2.01

Visit Date: 9/14/10 **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										Inactive
RW-2										Inactive
RW-3	Pre-run									
	Post-run									
RW-4	Pre-run									
	Post-run									
RW-5										Inactive
RW-6	Pre-run									
	Post-run									
RW-7	Pre-run									
	Post-run									
RW-8	Pre-run									
	Post-run									
RW-9	Pre-run									
	Post-run									
MW-3	Pre-run	10.80	12.77	1.97					6	
	Post-run	11.34	11.49	0.15						

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): ~0.80 (estimate)
Approximate total volume recovered:

Compressor condensate emptied?
Depth to interface (feet): 2.00

Site Visit Date:		9/22/10				Recorded By:		CO		
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										Inactive
RW-2										Inactive
RW-3	Pre-run	10.96	11.21	0.25	10.71	P=7 D=15		50:19	NM	
	Post-run	10.98	11.15	0.17				50:34		
RW-4	Pre-run	10.17	11.31	1.14	10.38	P=7 D=30		107:04	NM	
	Post-run	10.25	11.23	0.98				107:34		final PL 11.58, final WL 11.62
RW-5		6.44	10.85	~~1.07~~ 4.41					6	Inactive
RW-6	Pre-run	8.88	10.50	1.62	10.3	P=7 D=30	3.0	386:27	NM	
	Post-run	9.08	9.79	0.71			3.2	386:57		
RW-7	Pre-run	7.77	10.09	2.32	9.7	P=7 D=30	6.4	449:21	NM	
	Post-run	8.49	8.74	0.25			3.8	449:51		
RW-8	Pre-run	9.41	10.44	1.03	9.5	P=7 D=30	2.8	122:07	NM	
	Post-run	9.55	10.26	0.71			2.7	122:37		
RW-9	Pre-run	9.89	10.19	0.30	10.5	P=7 D=15		2:30	NM	
	Post-run	9.96	10.14	0.20				2:45		
MW-3	Pre-run	10.80	12.71	1.91					10	
	Post-run	11.32	11.52	0.20						

Elapsed Time @ Blower (hrs): 20873.70

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

Depth of product in convault (feet): Empty

Approximate total volume recovered:

Compressor condensate emptied? ✓

Depth to interface (feet):

Site Visit Date:		9/27/10				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										Inactive
RW-2										Inactive
RW-3	Pre-run									
	Post-run									
RW-4	Pre-run									
	Post-run									
RW-5										Inactive
RW-6	Pre-run									
	Post-run									
RW-7	Pre-run									
	Post-run									
RW-8	Pre-run									
	Post-run									
RW-9	Pre-run									
	Post-run									
MW-3	Pre-run	10.82	12.66	1.84						
	Post-run	10.32	10.55	0.23					7	

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): 2.40
Approximate total volume recovered:

Compressor condensate emptied?
Depth to interface (feet): 2.49

Site Visit Date: 10/6/10 **Recorded By:** CD

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										Inactive
RW-2										Inactive
RW-3	Pre-run	11.12	11.30	0.18	10.71	P=7 D=0		50:49	NM	Did not run pump
	Post-run	—	—	—				50:49		
RW-4	Pre-run	10.32	11.36	1.04	10.38	P=7 D=30		108:04	NM	
	Post-run	10.33	11.21	0.88				108:34		
RW-5		NM	NM	NM						Truck blocking
RW-6	Pre-run	8.93	10.64	1.71	10.30	P=7 D=15	2.9	387:27	NM	
	Post-run	9.02	9.79	0.77			2.6	387:42		
RW-7	Pre-run	8.08	10.14	2.06	9.7	P=7 D=30	3.4	450:21	NM	
	Post-run	8.27	8.56	0.29			4.2	450:51		
RW-8	Pre-run	9.47	10.63	1.16	9.5	P=7 D=30	2.7	123:07	NM	
	Post-run	9.58	10.68	1.10			2.2	123:37		
RW-9	Pre-run	9.94	10.26	0.32	10.5	P=7 D=15		3:06	NM	
	Post-run	9.99	10.18	0.19				3:15		
MW-3	Pre-run	10.91	13.11	2.20					12	
	Post-run	11.50	11.66	0.16						

Elapsed Time @ Blower (hrs): 21209.37
Sight Column Water Level: (empty) 1/4 1/2 3/4 full (empty @ 1/2 or more)
Depth of product in convault (feet): 2.36
Approximate total volume recovered:

Compressor condensate emptied? ✓
Depth to interface (feet): 2.50

Site Visit Date: 10/20/10 **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										Inactive
RW-2										Inactive
RW-3	Pre-run	11.14	11.30	0.16	10.71	P=7 D=0		50:49	-	Do not run pump
	Post-run	—	—	—				50:49		
RW-4	Pre-run	10.37	11.42	1.11	10.38	P=7 ~~D=45~~ D=30		109:04	NM	
	Post-run	10.44	10.80	0.36				109:34		post purge RW-5 PTP 12.80 DTW 12.95
RW-5		6.42	13.13	6.71					7	Inactive
RW-6	Pre-run	8.95	10.72	1.97	10.3	P=7 D=15	~~4.2~~ 2.6	387:57	NM	
	Post-run	9.06	~~10~~ 9.86	0.80			2.2	388:12		
RW-7	Pre-run	8.00	10.21	2.21	9.7	P=7 D=30	4.2	451:21	NM	
	Post-run	8.55	8.66	0.11			4.2	451:51		
RW-8	Pre-run	9.47	10.84	1.37	9.5 ↓ 10.1	P=7 D=30	2.0	124:07	NM	Inspected pump; No apparent issues
	Post-run	9.60	10.60	1.00			2.2	124:37		
RW-9	Pre-run	9.97	10.27	0.30	10.5	P=7 D=15		3:30	NM	
	Post-run	10.00	10.20	0.20				3:45		
MW-3	Pre-run	10.94	12.87	1.93					11	
	Post-run	11.58	11.62	0.04						

Elapsed Time @ Blower (hrs): ~~2154~~ 0.37
Sight Column Water Level: (empty) 1/4 1/2 3/4 full (empty @ 1/2 or more)
Depth of product in convault (feet): 2.29
Approximate total volume recovered:

Compressor condensate emptied? Y
Depth to interface (feet): 2.50

Site Visit Date: 10/27/10 **Recorded By:** CD

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										Inactive
RW-2										Inactive
RW-3	Pre-run									
	Post-run									
RW-4	Pre-run									
	Post-run									
RW-5										Inactive
RW-6	Pre-run									
	Post-run									
RW-7	Pre-run									
	Post-run									
RW-8	Pre-run									
	Post-run									
RW-9	Pre-run									
	Post-run									
MW-3	Pre-run	10.87	12.59	1.74					1.4	
	Post-run	11.24	11.40	0.16						

Elapsed Time @ Blower (hrs): 21712.06
Sight Column Water Level: empty 1/4 1/2 3/4 full (empty @ 1/2 or more)
Depth of product in convault (feet): 2.20
Approximate total volume recovered:

Compressor condensate emptied? ✓
Depth to interface (feet): 2.55

Site Visit Date:		4/03/10				Recorded By:	CO, HT, CF			
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										Inactive
RW-2										Inactive
RW-3	Pre-run	10.99	11.72	0.73	10.71	P=7		50:49	nm	
	Post-run	10.96	11.71	0.75		D=15				
RW-4	Pre-run	10.38	10.44	0.06	10.38	P=7		110:19	nm	Did not run pump
	Post-run	—	—	—		D=0				
RW-5		6.41	9.54	3.13					4	WL 10.06 PL 10.09 Inactive
RW-6	Pre-run	8.84	10.61	1.77	10.3	P=7	2.6 ↓ 6.0	388:27	nm	
	Post-run	8.74	9.90	1.24		D=30	6.6			
RW-7	Pre-run	7.65	9.48	1.83	9.7	P=7	2.7	452:21	nm	Vacuum gauge at RW-7 isn't reading – seems wet. May have been submerged.
	Post-run	8.26	9.35	1.09		D=30	N/A			
RW-8	Pre-run	9.53	10.49	0.96	10.1	P=7	0.5 ↓ 8.0	125:67	nm	
	Post-run	9.05	9.26	0.21		D=15	5.5			
RW-9	Pre-run	9.86	10.16	0.30	10.5	P=7		4:00	nm	
	Post-run	9.89	10.04	0.15		D=15				
MW-3	Pre-run	10.93	12.68	1.75					3.5	
	Post-run	11.25	11.52	0.27						

Elapsed Time @ Blower (hrs): 21882.10

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

Depth of product in convault (feet): 2.15

Approximate total volume recovered:

Compressor condensate emptied? ✓

Depth to interface (feet): 2.45

Site Visit Date: 11/10/10 **Recorded By:** Hazim Tuğun

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										Inactive
RW-2										Inactive
RW-3	Pre-run									
	Post-run									
RW-4	Pre-run									
	Post-run									
RW-5										Inactive
RW-6	Pre-run									
	Post-run									
RW-7	Pre-run									
	Post-run									
RW-8	Pre-run									
	Post-run									
RW-9	Pre-run									
	Post-run									
MW-3	Pre-run	10.80	11.66	0.86						Measurements pre & post manual FP removal. system was ~~pacha~~ ON during ~~removal~~ part of the removal. Removed about 2 gals, very thin layer of FP.
	Post-run	11.09	11.13	0.04						

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):
Approximate total volume recovered:

Compressor condensate emptied?
Depth to interface (feet):

Site Visit Date: 11/17/10 **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										Inactive
RW-2										Inactive
RW-3	Pre-run	10.86	11.80	0.94	10.71	P=7 D=30		51:19	NM	
	Post-run	10.86	11.61	0.75				51:49		
RW-4	Pre-run	10.28	10.59	0.31	10.38	P=7 D=15		110:19	NM	
	Post-run	10.20	10.37	0.17				110:34		
RW-5		NM	NM	NM						Inaccesible Inactive
RW-6	Pre-run	8.48	10.78	2.30	10.3	P=7 D=40	8.2	389:27	NM	
	Post-run	8.54	9.80	1.26			8.2	390:07		
RW-7	Pre-run	7.20	10.48	3.28	9.7 ↓ 9.75	P=7 D=30	NM	453:21	NM	Keyring safety line secured to rusted through; Tied safety line back on at 9.75 !
	Post-run	7.25	8.90	1.65			NM	453:51		
RW-8	Pre-run	9.27	10.17	0.90	9.5	P=7 D=30	4.0	125:48	NM	
	Post-run	9.54	9.70	0.16			3.4	126:18		
RW-9	Pre-run	NM	NM	NM	10.5	P=7 D=15		4:43	NM	Running upon arrival Verified pumping product
	Post-run	9.84	9.85	0.01				5:45		
MW-3	Pre-run	10.82	11.85	1.03					1.5 gal	
	Post-run	11.45	11.47	0.02						

Elapsed Time @ Blower (hrs): 22220.07
Sight Column Water Level: ~~empty~~ 1/4 1/2 3/4 full (empty @ 1/2 or more)
Depth of product in convault (feet): 2.08
Approximate total volume recovered:

Compressor condensate emptied? Y
Depth to interface (feet): 2.42

Site Visit Date:	11/24/10	Recorded By:	CD

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										Inactive
RW-2										Inactive
RW-3	Pre-run									
	Post-run									
RW-4	Pre-run									
	Post-run									
RW-5										Inactive
RW-6	Pre-run									
	Post-run									
RW-7	Pre-run									
	Post-run									
RW-8	Pre-run									
	Post-run									
RW-9	Pre-run									
	Post-run									
MW-3	Pre-run	10.51	11.03	0.52					0.5	
	Post-run	10.94	10.86	0.02						

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):
Approximate total volume recovered:

Compressor condensate emptied?
Depth to interface (feet):

Site Visit Date: 12/1/10 **Recorded By:** CO

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										Inactive
RW-2										Inactive
RW-3	Pre-run	10.57	11.63	1.06	10.71	P=7 D=30		52:19		
	Post-run	10.78	11.44	0.66				52:49		
RW-4	Pre-run	9.85	10.32	0.47	10.38	P=7 D=15		110:49		
	Post-run	9.83	10.14	0.31				111:04		
RW-5		6.41	9.57	3.16					3.5	PL 10.41 WL 10.63 Inactive
RW-6	Pre-run	8.55	10.42	1.87	10.3	P=7 D=45	7.0	390:47		
	Post-run	8.79	9.98	1.20			6.8	391:32		
RW-7	Pre-run	6.54	10.50	3.96	9.75	P=7 D=45	15↓8.0	454:21 ~~[illegible]~~		
	Post-run	8.50	9.17	0.67			7.0	455:06		
RW-8	Pre-run	9.25	10.26	1.01	~~9.5~~ 10.1	P=7 D=30	4.4	126:48 ~~[illegible]~~		
	Post-run	9.52	9.85	0.33			8.0	127:18		
RW-9	Pre-run	9.67	9.89	0.22	10.5	P=7 D=0		6:00	—	Pump not run; Product thickness <0.25 ft
	Post-run	—	—	—				6:00		
MW-3	Pre-run	10.65	11.56	0.91					0.5	
	Post-run	10.90	10.91	0.01						

Elapsed Time @ Blower (hrs): 22342.80
Sight Column Water Level (empty) 1/4 1/2 3/4 full (empty @ 1/2 or more)
Depth of product in convault (feet): 1.96
Approximate total volume recovered:

Compressor condensate emptied?
Depth to interface (feet): 2.47

Site Visit Date:	12/08/10	Recorded By:	CD

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										Inactive
RW-2										Inactive
RW-3	Pre-run									
	Post-run									
RW-4	Pre-run									
	Post-run									
RW-5										Inactive
RW-6	Pre-run									
	Post-run									
RW-7	Pre-run									
	Post-run									
RW-8	Pre-run									
	Post-run									
RW-9	Pre-run									
	Post-run									
MW-3	Pre-run									Could not measure or purge— well box flooded. Raining too hard for pumping to be effective.
	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):
Approximate total volume recovered:

Compressor condensate emptied?
Depth to interface (feet):

Site Visit Date: 12/15/10 **Recorded By:** CO

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										Inactive
RW-2										Inactive
RW-3	Pre-run	10.14	11.34	1.20	10.71	P=7 D=30		53:19	nm	
	Post-run	10.30	11.13	0.83				53:49		
RW-4	Pre-run	9.42	10.50	1.08	10.38	P=7 D=30		111:19	nm	
	Post-run	9.51	9.89	0.38				111:49		
RW-5		7.65	8.74	1.09						Inactive
RW-6	Pre-run	8.30	10.23	1.93	10.3	P=7 D=45	8.2	392:17	nm	Unable to measure final PL due to faulty water level meter ↓
	Post-run	nm	9.98	na			8.4	393:02		
RW-7	Pre-run	7.70	9.76	2.06	9.75	P=7 D=45	>15→9.0	455:51	nm	
	Post-run	nm	8.23	na			0→11.0	456:36		
RW-8	Pre-run	9.25	9.93	0.68	10.1	P=7 D=15	1.2→10.0	127:48	nm	
	Post-run	8.93	9.26	0.33			11.8	128:03		
RW-9	Pre-run	9.56	9.76	0.20	10.5	P=7 D=0		6:00	nm	Did not run pump; Product thickness < 0.25 ft
	Post-run	nm	nm	nm				6:00		
MW-3	Pre-run	10.13	10.74	0.61					<0.5	
	Post-run	not measurable	10.24	na						

Elapsed Time @ Blower (hrs): 22342.80
Sight Column Water Level: (empty) 1/4 1/2 3/4 full (empty @ 1/2 or more)
Depth of product in convault (feet): 1.90
Approximate total volume recovered:

Compressor condensate emptied? ✓
Depth to interface (feet): 2.35

Site Visit Date:	12/22/10				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									Inactive
RW-2									Inactive
RW-3 Pre-run									
RW-3 Post-run									
RW-4 Pre-run									
RW-4 Post-run									
RW-5									Inactive
RW-6 Pre-run									
RW-6 Post-run									
RW-7 Pre-run									
RW-7 Post-run									
RW-8 Pre-run									
RW-8 Post-run									
RW-9 Pre-run									
RW-9 Post-run									
MW-3 Pre-run	NM →							0	unable to measure DTW/DTP b/c replacement interface meter has not arrived
MW-3 Post-run	NM →								

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):
Approximate total volume recovered:

Compressor condensate emptied?
Depth to interface (feet):

Site Visit Date: 12/29/10 **Recorded By:** CD

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										Inactive
RW-2										Inactive
RW-3	Pre-run	8.81	10.29	1.48	10.71	P=7 D=30		54:19	nm	
	Post-run	8.93	10.06	1.13				54:49		
RW-4	Pre-run	8.65	8.70	0.05	10.38	P=7 D=0		112:19	na	Did not run pump PT<0.25 ft
	Post-run	—	—	—				112:19		
RW-5		na - truck parked on well								Inactive
RW-6	Pre-run	7.85	9.79	1.94	10.3	P=7 D=45	>15→80	393:47	nm	
	Post-run	~~8.45~~	~~9.92~~	1.48			8.3	394:32		
RW-7	Pre-run	7.73	9.09	1.36	9.75	P=7 D=30	10.0	457:21	nm	
	Post-run	7.96	8.26	0.30			0→7.0	457:51		
RW-8	Pre-run	8.41	9.22	0.81	10.1	P=7 D=15	14.5→9.0	128:18	nm	
	Post-run	8.95	9.22	0.37			9.0	128:33		
RW-9	Pre-run	9.34	9.53	0.19	10.5	P=7 D=0		6:00	na	Did not run pump PT<0.25 ft
	Post-run	—	—	—				6:00		
MW-3	Pre-run	N/A	9.05	—					na	no measurable product
	Post-run	—	—	—						

Elapsed Time @ Blower (hrs): 22574.71
Sight Column Water Level: (empty) 1/4 1/2 3/4 full (empty @ 1/2 or more)
Depth of product in convault (feet): 1.80
Approximate total volume recovered:

Compressor condensate emptied? ✓
Depth to interface (feet): 2.33

Product Recovery System's Low Vacuum Air Discharge Monitoring Log
Port of Oakland Harbor Facilities

Date/Time	PID Reading (ppm)			Air Flow		Vacuum (IWC)	Comments
	SP-1	SP-2	SP-3	(mps) AD-1	(cfm)	SP-1	
7/7/10 / 1150	64.7	0.0	0.0	8.9	41	72	
7/14/10 / 1150	57.7	0.0	0.2	8.6	37	72	ambient reading 0.0-0.5
7/21/10 / 1210	50.4	0.0	0.0	6.4	28	74	
7/28/10 / 1200	58.7	0.0	1.0	8.9	41	71	
8/4/10 / 1210	58.0	0.0	0.7	7.1	30	72	
8/11/10 / 1210	51.3	0.0	0.0	7.0	30	74	
8/13/10 / 1030	49.1	0.0	0.0-0.9	NM	NM	NM	ambient 0.0-0.2
8/18/10 / 1030	106.8	0.3	0.0	6.5	28	72	ambient 0.0-2.2
8/25/10 / 1130	77.7	0.0	0.0	7.4	32	73	
9/1/10 / 1210	150	0.0	0.0	9.4	40	74	
9/7/10 / 1015	57.8	0.0	0.0	6.7	28	73	
9/14/10 / 1315	51.4	0.0	0.0	6.7	28	75	
9/22/10 / 1180	77.7	0.0	0.0	8.1	35	70	
9/29/10 / 1045	85.3	0.0	0.3	7.1	30	74	
10/6/10 / 1100	79.3	0.0	0.0	7.1	30	75	
10/20/10 / 1200	57.8	0.0	0.0	6.0	26	75	
10/27/10 / 1000	73.7	0.4	0.0	6.7	28	75	ambient 0.0-0.9
11/3/10 / 1210	98.8	0.0	0.0	8.1	35	73	
11/10/10 / 1215	88.0	0.0	0.0	7.0	30	76	ambient ~0.0
11/17/10 / 1230	99.8	0.6	0.6	9.0	38	75	ambient 0.4-0.9
11/24/10 / 0930	81.6	0.0	0.0	8.5	36	77	
12/01/10 / 0930	64.2	0.0	0.0	6.4	23	76	
12/8/10 / 1330	72.0	0.0	0.0	7.0	30	75	
12/15/10 / 1100	108	1.7	2.1	7.4	32	73	
12/22/10 1430	54.2	1.0	1.0	← w/ filter			Bag ~ 1.8 ppm - 2.5 ppm
12/22/10 1430	54.2	2.4	2.5	5.9	26	75	Bag ~ 0.5 - 1.9 ppm w/out filter
12/29/10 / 1130	33.2	0.8	2.1	5.5	24	76	Bag ~ 2 - 6.6 ppm w/out filter
							ambient 2.0-3.0
As of 8/25	SP-3 = bag						
	SP-2 = bad						

Note :SP-2 reading can not exceed 10 ppmv (as hexane)