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SECOND SEMIANNUAL 2011 GROUNDWATER MONITORING REPORT AND PETITION FOR CASE CLOSURE

2836 UNION STREET
OAKLAND, CALIFORNIA

Prepared for:

ESTATE OF LARRY M. WADLER
2525 MANDELA PARKWAY
OAKLAND, CA 94607

November 2011

STELLAR
ENVIRONMENTAL SOLUTIONS, INC.

GEOSCIENCE & ENGINEERING CONSULTING

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STELLAR ENVIRONMENTAL SOLUTIONS, INC.
2198 SIXTH STREET, SUITE 201
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November 8, 2011

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November 8, 2011

Ms. Barbara Jakub
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Subject: Second Semiannual 2011 Groundwater Monitoring Report and Case Closure Petition
Former Modern Mail Service, 2836 Union Street, Oakland, California
Alameda County Environmental Health Fuel Leak Case No. RO2901

Dear Ms. Jakub:

On behalf of the property owner and "Responsible Party" (Estate of Lawrence M. Wadler), Stellar Environmental Solutions, Inc. is submitting this Semiannual Groundwater Monitoring Report and Petition for Case Closure for the former Modern Mail Service Facility at 2836 Union Street, Oakland, California. This report documents the Second Semiannual 2011 groundwater monitoring event related to petroleum contamination from a former underground fuel storage tank, which is the 16th consecutive groundwater monitoring event conducted at this site. This report has been uploaded to the Alameda County Environmental Health ftp site and the State Water Board's GeoTracker database.

This report evaluates hydrologic and contaminant data and remedial actions from the project start through the present, and includes an assessment of residual contamination distribution and the potential for migration in support of case closure. The past year of groundwater monitoring has shown a stable and reducing contaminant groundwater plume, and in our professional opinion, the site meets case closure criteria. On behalf of the Responsible Party, we hereby petition the Alameda County Department of Environmental Health to grant closure, which would include the discontinuation of groundwater monitoring and permanent decommissioning of the site wells.

We declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report are true and correct to the best of my knowledge. If you have any questions regarding this report, please contact us at (510) 644-3123.

Sincerely,

Henry Pietropaoli
Environmental Scientist

Elana Aabas
Property Estate Trustee

Richard S. Makdisi, R.G., R.E.A.
Principal

REGISTERED GEOLOGIST
RICHARD S. MAKDISI
No 4652
Exp. 4/2012
STATE OF CALIFORNIA

cc: State Water Board GeoTracker database; Alameda County Environmental Health ftp site

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1.0 INTRODUCTION

PROJECT BACKGROUND

Stellar Environmental Solutions, Inc. (Stellar Environmental) was contracted by the trustee of the Estate of Lawrence Wadler to conduct corrective actions related to soil and groundwater contamination associated with a 10,000-gallon underground fuel storage tank (UFST) at 2836 Union Street in Oakland, California. Section 6.0 contains a list of all known environmental reports relevant to this site. This report discusses the second semiannual 2011 groundwater monitoring conducted on October 19, 2011. Figure 1 shows the site location, and Figure 2 is the site plan that shows the locations of groundwater wells, historical borings, and the former UFST.

SITE OBJECTIVES AND SCOPE OF WORK

The overall objective of the latest remedial action is to continue the attempt to reduce residual hydrocarbons in the source area and downgradient along Union Street (the subject property border). Historical remedial efforts have shown that residual hydrocarbons entrained in subsurface material and/or stratigraphic traps are continuing to release significant amounts of hydrocarbons into the groundwater. This report discusses the following activities conducted/coordinated by Stellar Environmental during the first 2011 semiannual period:

- Collecting water levels in site wells to determine shallow groundwater flow direction
- Sampling site wells for contaminant analysis and natural attenuation indicators
- Performing semiannual monitoring

DESCRIPTION AND HISTORY

The approximately 7,200-square-foot rectangular-shaped subject property is developed with one approximately 1,500-square-foot, two-story building. A narrow driveway borders the building to the north, and the rear of the property is undeveloped (paved). Adjacent uses include:

- A residence (to the north)
- A paved parking area (to the east)
- A residence (to the south)
- A sidewalk, then Union Street, then a moving company (to the west)

1000 ft Scale: 1 : 43,750 Detail: 12-2 Datum: WGS84

N

SITE LOCATION ON U.S.G.S. TOPOGRAPHIC MAP

2836 Union Street
Oakland, CA

By: MJC

NOVEMBER 2005

Figure 1

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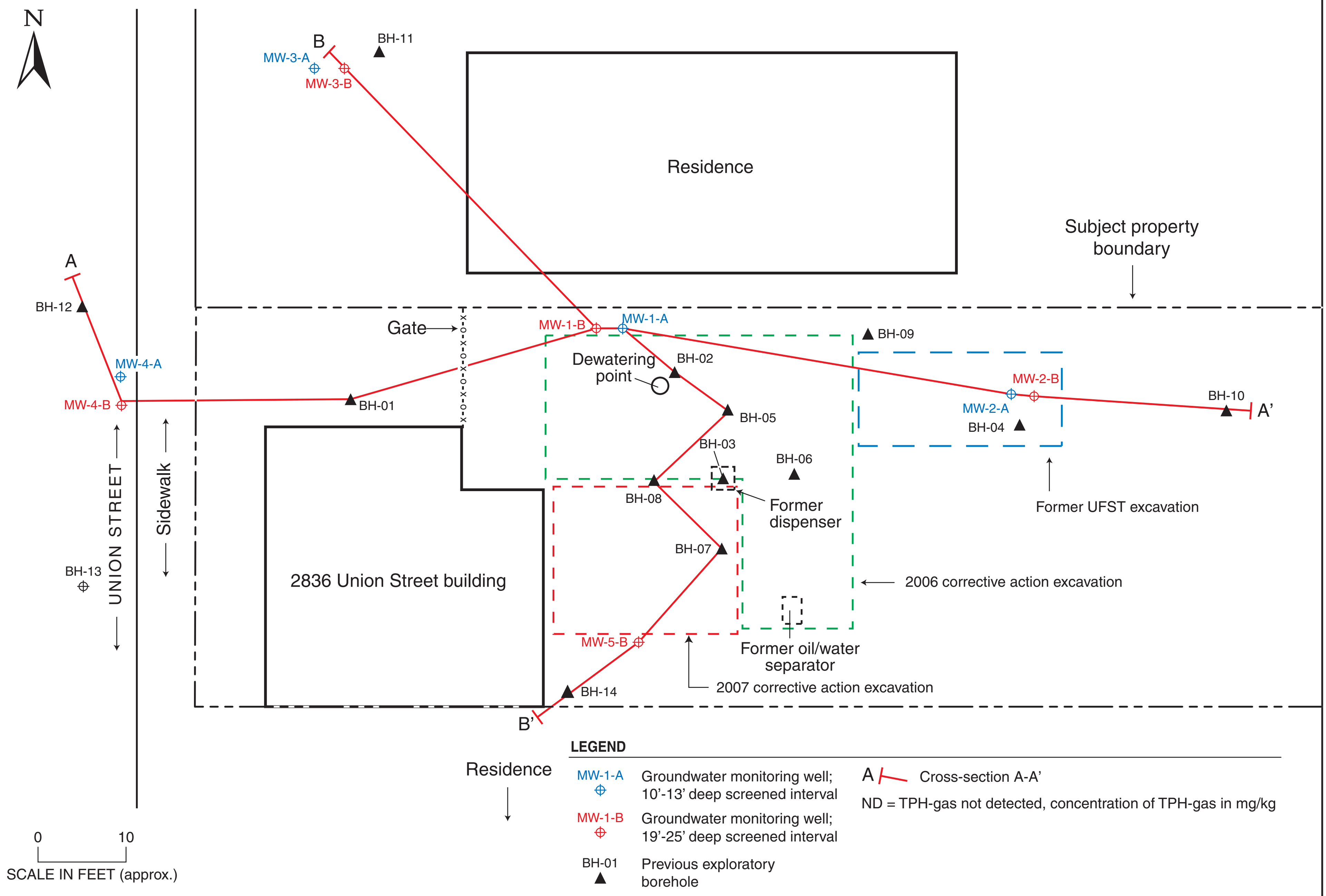
2005-65-01



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SITE PLAN SHOWING LOCATIONS OF SOIL BORINGS AND MONITORING WELLS
2836 Union Street, Oakland, CA

Figure 2

by: MJC

NOVEMBER 2008

2005-65-72

The property operated as an express courier facility (Modern Mail Services, Inc.) between 1951 and 2003. One 10,000-gallon gasoline UFST was installed in the late 1970s. The UFST operated under permit (No. STID 4065) by the Alameda County Department of Environmental Health (ACEH) until it was removed in 1998. The tank closure report was submitted to the Oakland Fire Department (Golden Gate Tank Removal, 1998).

An initial site characterization conducted by Stellar Environmental in November 2005, which included the advancement of four borings, revealed gasoline and associated aromatic hydrocarbons at elevated levels in both soil and groundwater. That investigation was summarized in a technical report (Stellar Environmental, 2005b).

Additional site investigations in April 2006 involved the advancement of nine exploratory boreholes to determine the areal and vertical extent of soil and groundwater contamination. Site data indicated the presence of petroleum hydrocarbons in soil and groundwater. Actions such as groundwater monitoring, and the removal of any remaining (accessible) contaminated soils by excavation, were recommended as an interim corrective action. The April 2006 investigation is summarized in a technical report (Stellar Environmental, 2006b).

A corrective action implementing the April 2006 recommendations was conducted between September and December 2006. Ten monitoring wells were installed, one soil boring was advanced, 398 tons of contaminated soil was removed, and 5,100 gallons of contaminated groundwater was pumped from the backfilled excavation. Some residual contaminated soil was inaccessible for removal, and remained beneath the onsite building. Removal of this portion of the building and the previously inaccessible soil was conducted in November 2007. This corrective action was effective in removing 212 tons of contaminated soil, and included the purging of contaminated groundwater and the application of Advanced Oxygen Reducing Compound (ORC™) product into the open excavation. Monitoring well MW-5A was destroyed by excavation during the November 2007 activity. These investigations are summarized in technical reports (Stellar Environmental, 2006d; Stellar Environmental, 2007f).

Groundwater monitoring, conducted since October 2006, has shown a relatively flat groundwater gradient on the site, averaging approximately 0.005 feet/foot. Monitoring in the downgradient wells (MW-3B and MW-4B) has shown steady or increased contaminant concentrations, with maximum gasoline concentrations exceeding 4,000 micrograms per liter (µg/L) in comparison to the source area where a significant reduction in contaminant concentrations has been achieved in response to the November 2007 ORC™ injection.

In spring 2010, at the request of the property owners, Stellar Environmental prepared a corrective action workplan (CAP) to accelerate site remediation and move the property toward regulatory case closure. The CAP entailed the injection of ORC™ in the downgradient area of the plume

(Stellar Environmental, 2010b). The CAP was uploaded to the ACEH ftp site and the State Water Board GeoTracker database, and ACEH was notified by email of these uploads on May 26, 2010. ACEH did not respond within the 60-day Local Oversight Program (LOP) review period (as stipulated by California Code of Regulations, Title 23, Division 3, Chapter 16, Underground Tank Regulations), and Stellar Environmental proceeded with implementation of the CAP after the review period expired. The CAP was implemented on September 1 and 2, 2010, and is documented in a technical report (Stellar Environmental, 2010c). The September 2010 Advanced ORC™ injection was designed to create highly oxygenated treatment zones at critical locations transverse to the plume, focusing on the suspected hydrocarbon contaminant mass in groundwater downgradient from the historical source. All practical remedial measures have been implemented, and the past year of monitoring has shown that the contaminant plume in groundwater has been stable and is reducing; therefore, in our professional opinion, regulatory closure is justified.

The site wells have been monitored quarterly since October 2006. At the request of ACEH, a "Preferential Pathway Utility and Well Survey" was conducted during the fourth quarter of 2008, the results of which are discussed in another technical report (Stellar Environmental, 2008e). The frequency of groundwater monitoring was reduced in 2009 from a quarterly to semiannual basis in accordance with the ACEH directive (dated July 24, 2009).

REGULATORY STATUS

ACEH is the lead regulatory agency for the case, acting as a LOP for the Regional Water Quality Control Board – San Francisco Bay Region (Water Board). There are no ACEH or Water Board cleanup orders for the site; however, all site work has been conducted under the oversight of ACEH. ACEH assigned the site to its fuel leak case system (RO#2901), and the current case officer is Ms. Barbara Jakub.

The case has been assigned as No. T0600105641 in the State Water Board's GeoTracker database system. Electronic uploads of required data/reports are submitted to both the State Water Board and ACEH. The site has been granted a Letter of Commitment, and has been receiving financial reimbursement from the California Underground Storage Tank Cleanup Fund.

2.0 PHYSICAL SETTING

TOPOGRAPHY AND DRAINAGE

The mean elevation of the property is approximately 18 feet above mean sea level (amsl), and the general topographic gradient in the site vicinity is slight and to the west-southwest (toward San Francisco Bay). The site itself has no discernible slope. The nearest downgradient (to the west) permanent surface water body is the Airport Channel of San Leandro Bay (which is connected to San Francisco Bay), approximately 2 miles west of the subject property. According to the commercially available database, the site is not located within a flood zone or wetland.

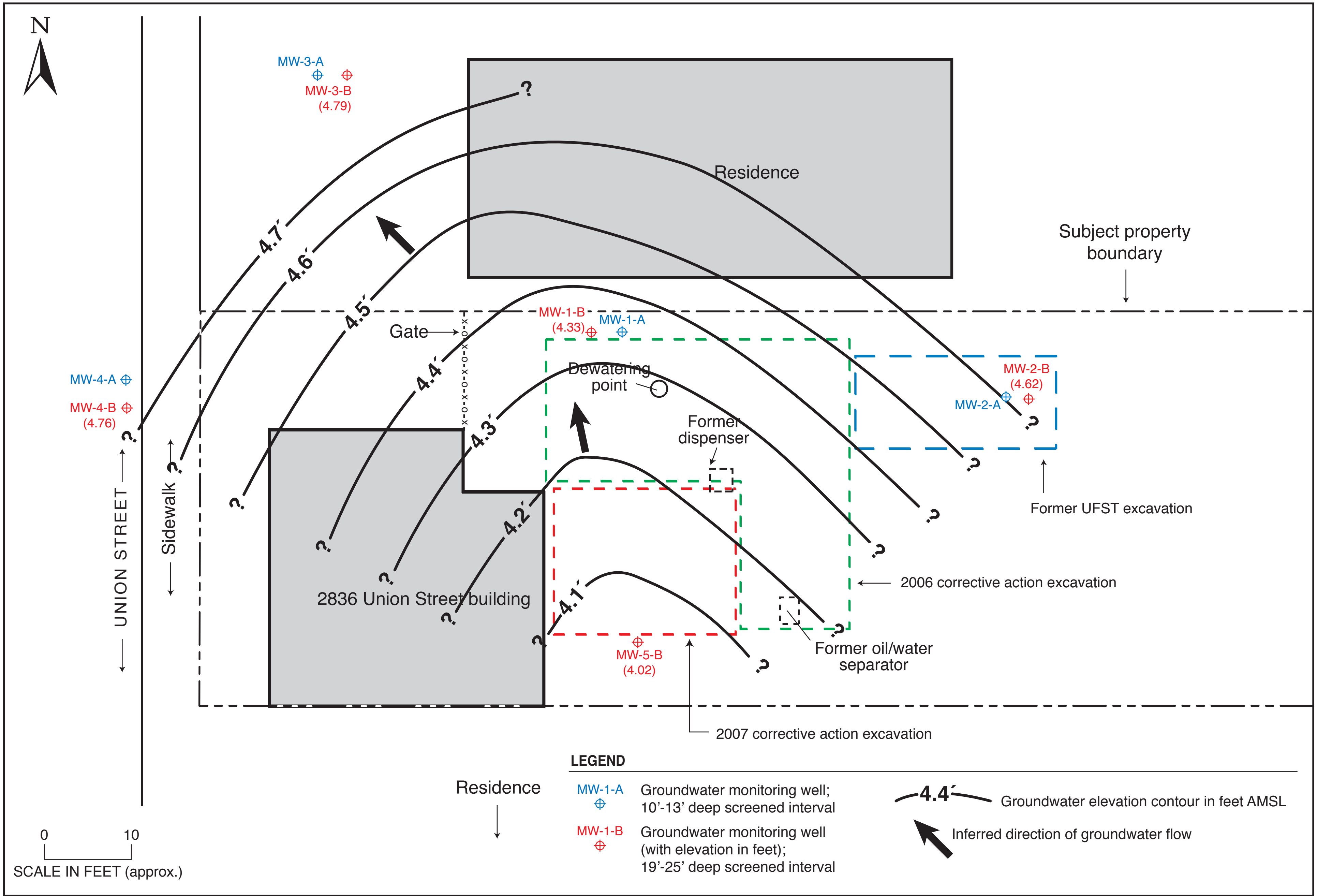
LITHOLOGY AND HYDROGEOLOGY

The predominant soil type in all site boreholes was generally firm and plastic silty clay. Several of the boreholes had no obvious sand or gravel units, although minor amounts of sand and gravel were occasionally present in the overall clay matrix. Groundwater occurred in these units with higher sandy gravel than clay content. Local heterogeneities in shallow lithology and groundwater levels are typical of the alluvial deposits in this area.

Local groundwater flow direction is generally to the west (toward San Francisco Bay and following local topography) in this area of west Oakland. Groundwater in the immediate vicinity of the former UFST occurs at a depth of less than 10 feet, and appears to be under semi-confining conditions, rising from approximately 20 feet below ground surface to as high as 6 feet below grade such that groundwater is in contact with residual contaminated soil. The groundwater contaminant plume has not been fully delineated, but appears to have an elliptical configuration with the long axis trending east to west-northwest.

GROUNDWATER FLOW DIRECTION

Figure 3 is a groundwater elevation map based on the October 19, 2011 groundwater elevation measurements. The groundwater gradient during this event averaged approximately 0.007 feet/foot across the site, with a gradient to the north-slightly northwest, generally consistent with historical data. The groundwater gradient has varied since October 2006 between approximately 0.001 feet/foot and 0.01 feet/foot, averaging approximately 0.005 feet/foot.



2005-65-92

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GROUNDWATER ELEVATION MAP (B-WELLS)

2836 Union Street, Oakland, CA

Figure 3

by: MJC

NOVEMBER 2011

3.0 SECOND SEMIANNUAL 2011 GROUNDWATER MONITORING

This section discusses the groundwater sampling and analytical methods for the most recent event (second semiannual 2011), conducted on October 19, 2011.

Groundwater monitoring well water level measurements, sampling, and field analyses were conducted by Blaine Tech Services on October 19, 2011. To minimize the potential for cross-contamination, wells were purged and sampled using new disposable tubing at each well. Any equipment used was decontaminated between wells.

As the first monitoring task, static water levels were measured in the nine site wells using an electric water level indicator. Monitoring well MW-5A was destroyed by excavation during the November 2007 corrective action, and thus is no longer available for monitoring. The wells were purged of three well casing volumes using a peristaltic pump, during which the groundwater quality parameters of temperature, pH, conductivity, turbidity, and dissolved oxygen (DO) were field measured using daily-calibrated instruments; this was followed by sampling with a disposable bailer. Three of the shallow wells (MW-1A, MW-2A, and MW-4A) did not contain sufficient groundwater to purge prior to sampling, and therefore a pre-purge sample from these wells was submitted for analysis.

The samples were placed in an ice chest with ice at approximately 4°C and transported to the analytical laboratory under chain-of-custody the same day. Laboratory analysis was conducted by Curtis and Tompkins, Ltd. (Berkeley, California), which is certified by the State of California Environmental Laboratory Accreditation Program (ELAP). Approximately 7.5 gallons of sampling purge water was generated and containerized onsite, and will be disposed of at later date after subsequent monitoring events and additional purge water has accumulated.

The locations of all site monitoring wells are shown on Figure 2. Well construction information and groundwater elevation data are summarized in Table 1. Appendix A contains the groundwater monitoring field records for the current event. Appendix B outlines Stellar Environmental's standard sampling protocol for groundwater. Groundwater analytical results are presented and discussed in Section 4.0. Historical groundwater elevation data and analytical results are contained in Appendix D.

Table 1
Monitoring Well Groundwater Elevation Data (October 19, 2011)
2836 Union Street, Oakland, California

Well	Well Depth Below TOC	Rim Elevation	TOC Elevation	Groundwater Elevation (10-19-2011)
MW-1A	12.56	12.52	12.25	5.08
MW-1B	22.48	12.48	12.05	4.33
MW-2A	12.60	13.06	12.82	5.38
MW-2B	24.51	13.16	12.96	4.62
MW-3A	12.94	11.76	11.59	4.94
MW-3B	25.51	12.10	11.95	4.79
MW-4A	12.20	11.25	11.02	5.07
MW-4B	24.29	11.25	11.04	4.76
MW-5B	25.32	12.57	12.38	4.02

Notes:

TOC = top of casing

Wells are 1-inch diameter.

All elevations are in feet above mean sea level.

4.0 REGULATORY CONSIDERATIONS, ANALYTICAL RESULTS, AND DISCUSSION OF FINDINGS

REGULATORY CONSIDERATIONS AND SCREENING LEVELS

The Water Board has established Environmental Screening Levels (ESLs) for evaluating the likelihood of environmental impact. ESLs are conservative screening-level criteria for soil and groundwater, designed to be generally protective of both drinking water resources and aquatic environments; they incorporate both environmental and human health risk considerations. ESLs are not cleanup criteria (i.e., health-based numerical values or disposal-based values). Rather, they are used as a preliminary guide in determining whether additional remediation and/or investigation may be warranted. Exceedance of ESLs suggests that additional investigation and/or remediation is warranted.

ESLs differ for commercial/industrial vs. residential land use, sites where groundwater <u>is</u> a potential drinking water resource vs. <u>is not</u> a drinking water resource, and the type of receiving water body. A Water Board-published map of the East Bay shows areas where groundwater is, and is not, a potential drinking water resource. The appropriate ESLs for the subject site are based on the following:

- Commercial/industrial use (for the subject property itself) and residential land use (for the residences adjoining the property). Note: All of the ESLs for the soil and groundwater site contaminants are identical for commercial/industrial and residential land uses.
- Groundwater <u>is</u> a potential drinking water resource.
- The receiving body for groundwater discharge is an estuary (San Francisco Bay).

Although the property itself is zoned as commercial/industrial, it has adjacent residential use. In addition, the designation for this area of Oakland in the *East Bay Plain Groundwater Basin Beneficial Use Evaluation Report* is “Zone A – Significant Drinking Water Resource” (Water Board, 1999). Therefore, in our professional opinion, the appropriate ESLs for the subject site are <u>commercial/industrial land use</u> and <u>groundwater is a potential drinking water resource</u>.

The State of California has also promulgated drinking water standards (Maximum Contaminant Levels [MCLs]) for some of the site contaminants. Drinking water standards may also be utilized by regulatory agencies to evaluate the potential risk associated with groundwater contamination. For the site contaminants, MCLs are generally the same as the ESLs, except that there is no MCL for gasoline.

Once ESLs or drinking water standards are exceeded, the need for and/or type of additional investigative and corrective actions are generally driven by the potential risk associated with the contamination. Minimum regulatory criteria generally applied to fuel leak cases in groundwater include:

- The contaminant source has been removed, including reasonably accessible contaminated soils that pose a long-term impact to groundwater.
- The extent of residual contamination has been fully characterized to obtain sufficient lithologic and hydrogeologic understanding (generally referred to as a Site Conceptual Model).
- Groundwater wells have been installed and are monitored periodically to evaluate groundwater contaminant concentrations and hydrochemical trends.
- The stability of the contaminant plume has been evaluated to determine whether it is moving or increasing in concentration.
- A determination has been made as to whether the residual contamination poses an unacceptable risk to sensitive receptors.

As stated above, ESLs are used as a preliminary guide in determining whether additional remediation or other action is warranted. Exceedance of ESLs may warrant additional actions, such as monitoring plume stability to demonstrate no risk to sensitive receptors in the case of sites where drinking water is not threatened.

ANALYTICAL METHODS

The initial site characterization documented contamination by the following LUFT-related constituents: gasoline; benzene toluene, ethyl benzene, and xylenes (BTEX); and methyl tertiary-butyl ether (MTBE). As required by ACEH, the following additional contaminants were analyzed for:

- Fuel oxygenates – tertiary-butyl alcohol (TBA), di-isopropyl ether (DIPE), ethyl tertiary-butyl ether (ETBE), and tertiary-amyl methyl ether (TAME)
- Lead scavengers – 1,2-dichloroethane (EDC) and 1,2-dibromoethane (EDB)

The fuel oxygenates and lead scavengers were analyzed in monitoring wells that showed previous laboratory detectable concentrations for these constituents.

Groundwater samples were analyzed for:

- Total volatile hydrocarbons as gasoline (TVHg) – by EPA Method 8015M
- BTEX and MTBE – by EPA Method 8260
- TBA, DIPE, ETBE, and TAME – by EPA Method 8260B
- EDC and EDB – by EPA Method 8260B

All groundwater samples were analyzed by Curtis & Tompkins, Ltd. (Berkeley, California) which maintains current ELAP certifications for all the analytical methods utilized in this investigation.

Field parameters—including temperature, pH, conductivity, turbidity, and DO—were measured using a Horiba U22 meter, which was calibrated the same day of sample collection.

QUALITY CONTROL SAMPLE ANALYTICAL RESULTS

Laboratory quality control (QC) samples (e.g., method blanks, matrix spikes, surrogate spikes) were analyzed by the laboratory in accordance with requirements of each analytical method. All laboratory QC sample results and sample holding times were within the acceptance limits of the methods (see Appendix C).

ANALYTICAL RESULTS AND DISTRIBUTION OF CONTAMINANTS

Table 2 summarizes the groundwater monitoring analytical results for TVHg and associated constituents and the DO field measurements. Table 3 presents the analytic results of the fuel oxygenates and lead scavengers analyses. The certified analytical results and chain-of-custody record are contained in Appendix C. Historical groundwater monitoring analytical results are contained in Appendix D.

Groundwater Analytical Results

TVHg was detected above its ESL of 100 µg/L in monitoring wells MW-2A and MW-5B. TVHg was also detected in monitoring well MW-1A and MW-3B, but below its ESL. MTBE was detected above its ESL of 5.0 µg/L in wells MW-2B, MW-3A, and MW-5B. BTEX were detected only in well MW-1A, and all were below the ESLs. EDC was detected above its ESL of 0.5 µg/L in both wells in which it was detected (MW-1B and MW-2B). TBA was detected in well MW-2B, at 3.6 µg/L, which is below its ESL of 12 µg/L. There were no detections of EDB, ETBE, TAME, or DIPE above the laboratory detection limits in any of the groundwater monitoring wells sampled during this event.

Table 2
Groundwater Sample Analytical Results (October 19, 2011) – TVHg, BTEX, and MTBE
2836 Union Street, Oakland, California

Sample	TVHg	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	DO (mg/L)
Monitoring Wells							
MW-1A	86	0.98	1.3	1.7	5.7	*<5.0*	*NS*
MW-1B	<50	*<0.5*	*<0.5*	*<0.5*	*<0.5*	<5.0	2.44
MW-2A	**150**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	0.39
MW-2B	<50	*<0.5*	*<0.5*	*<0.5*	*<0.5*	**24**	0.52
MW-3A	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	**18**	1.68
MW-3B	55	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	2.88
MW-4A	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	*NS*
MW-4B	<50	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<5.0*	0.52
MW-5B	**110**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	**58**	0.64
Groundwater ESLs	100 / 210	1.0 / 46	40 / 130	30 / 43	20 / 100	5 / 1,800	NLP

Notes:

ESLs = Water Board Environmental Screening Levels for commercial/industrial sites where groundwater is/is not a potential drinking water resource. Sample concentrations in **bold-face** type exceed the ESL criterion where groundwater is a potential drinking water resource.

TVHg = total volatile hydrocarbons as gasoline
MTBE = methyl tertiary-butyl ether
DO = dissolved oxygen

NS = not sampled, insufficient sample amount
NLP = no level published

mg/L = milligrams per liter

All concentrations are in micrograms per liter (µg/L) unless otherwise noted.

Since the first semiannual 2011 event, contaminant concentrations have shown a steady generally decreasing contaminant concentration trend and dramatic decrease in the downgradient monitoring wells MW-1B, MW-4An and MW-3B, which indicates that the September 2010 ORC™ injection has reached the downgradient areas of the plume.

Figure 5 is an isoconcentration contour map of TVHg in groundwater based on the October 2011 monitoring well analytical results. The plume geometry indicates a west-by-northwest migrational pattern, which is in line with general groundwater flow direction in this area.

Table 3
Groundwater Sample Analytical Results (October 19, 2011) – Lead Scavengers and Fuel Oxygenates
2836 Union Street, Oakland, California

Sample I.D.	EDC	EDB	ETBE	DIPE	TAME	TBA
Groundwater Analyses (µg/L)						
MW-1A	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
MW-1B	**5.5**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
MW-2A	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
MW-2B	**3.5**	*<0.5*	*<0.5*	*<0.5*	*<0.5*	3.6
MW-3A	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
MW-3B	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
MW-4A	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
MW-4B	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
MW-5B	*<1.0*	*<1.0*	*<1.0*	*<1.0*	<1.0	*<4.0*
Groundwater ESLs	0.5 / 690	0.05 / 510	NLP	NLP	NLP	12/ 18,000

Notes:

ESLs = Water Board Environmental Screening Levels for residential sites where groundwater is/is not considered a potential drinking water resource. Sample concentrations in **bold-face** type exceed the ESL criterion where groundwater is a potential drinking water resource.

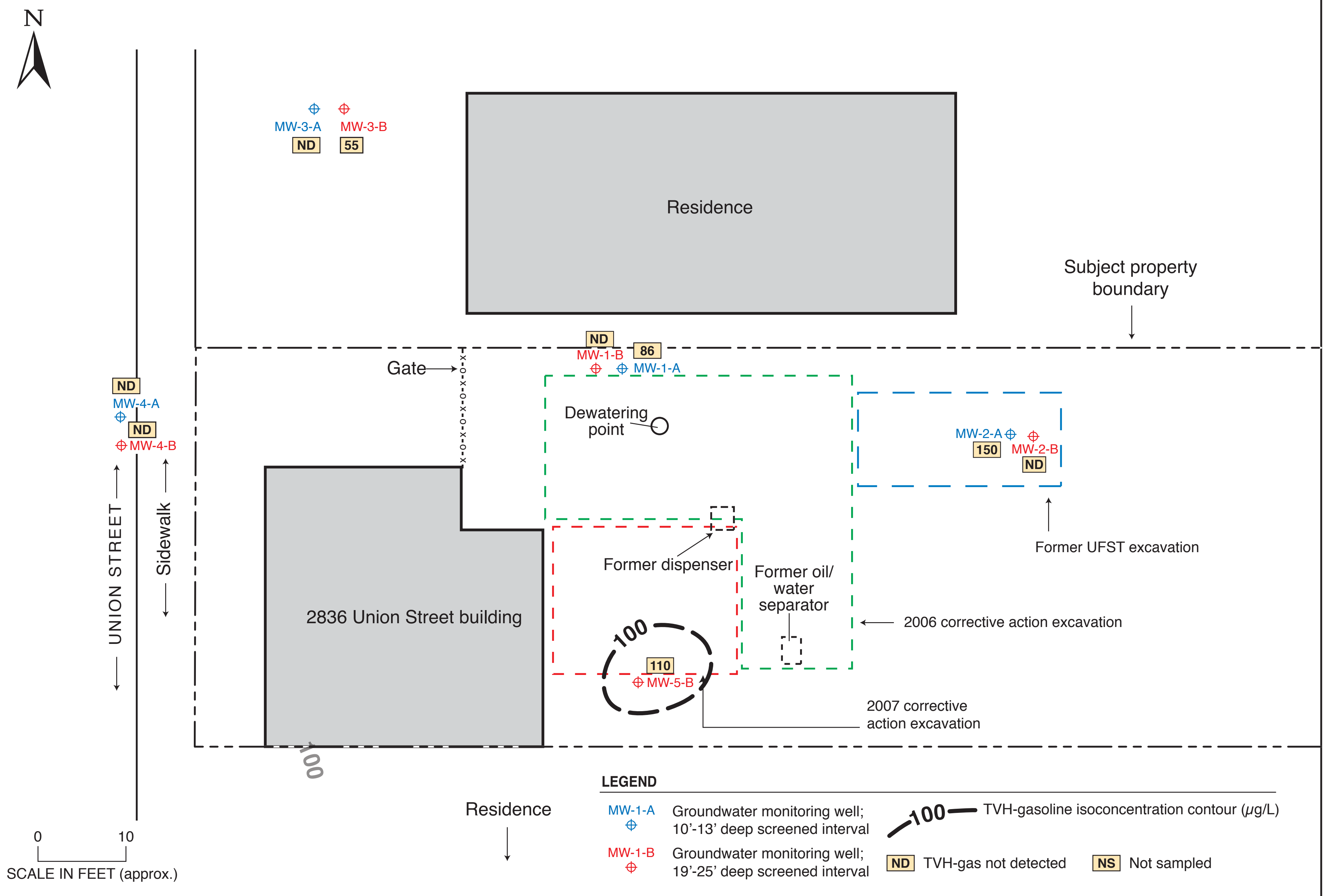
EDC = ethylene dichloride
EDB = ethylene dibromide
ETBE = ethyl tertiary-butyl ether
DIPE = isopropyl ether
TAME = tertiary-amyl methyl ether
TBA = tertiary-butyl alcohol;

NS = not sampled
NLP = no level published

All concentrations are in micrograms per liter (µg/L).

Dissolved Oxygen

DO is the most thermodynamically favored electron acceptor used in aerobic biodegradation of hydrocarbons. Active aerobic biodegradation of petroleum hydrocarbon compounds requires at least 1 to 2 milligrams per liter (mg/L) of DO in groundwater. During aerobic biodegradation, DO levels are reduced in the hydrocarbon plume as respiration occurs. Therefore, DO levels that vary inversely to hydrocarbon concentrations are consistent with the occurrence of aerobic biodegradation. As shown in Table 2, DO concentrations measured during the current event ranged from 0.52 to 2.88 mg/L. Of the nine wells sampled, two (MW-1A and MW-4A) could not be sampled for DO due to an insufficient quantity of water. All of the measurements show decreasing DO concentrations as compared to the previous event, indicating that less oxygen is being induced by the September 2010 Advanced ORC™ injection.



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TVH-GASOLINE PLUME — OCTOBER 19, 2011, B-ZONE WELLS

2836 Union Street, Oakland, CA

Figure 4

by: MJC

OCTOBER 2011

2005-65-91

5.0 EVALUATION OF HYDROCHEMICAL TRENDS AND PLUME STABILITY

This section evaluates the observed hydrologic and hydrochemical trends with regard to plume stability and contaminant migration. An assessment is made of the nature of residual contaminated soil that acts as a continued source of groundwater contamination. A conceptual model (incorporating site lithology, hydrogeology, and hydrochemistry) is presented to explain the spatial extent and magnitude of the dissolved hydrocarbon plume.

CONTAMINANT SOURCE ASSESSMENT

One 10,000-gallon gasoline UFST was installed in the late 1970s. The UFST operated under ACEH permit (No. STID 4065) until its removal in 1998.

Site soil and groundwater has been contaminated by gasoline and associated aromatic hydrocarbons. Soil analytical results show that soil contamination began at a depth of approximately 6 to 7 feet, and did not extend deeper than approximately 11 feet.

Soil contamination above ESL criteria appears to be constrained onsite in the area of MW-1A and MW-1B where it could not be removed over the property boundary; however, these wells show concentrations below their respective ESLs, suggesting minimal dissolved phase contribution from this area.

While past corrective actions removed most of the contaminant mass, shallow groundwater may continue to be slightly impacted by the remaining residual soil contamination by desorption from soil into groundwater.

As evidenced by soil boring sample analysis, the dissolved phase hydrocarbon contamination in the groundwater does not appear to be adsorbing onto downgradient soils.

The mass of unsaturated zone soil contamination has been removed to the extent practical, and subsequent groundwater monitoring indicates that no significant residual contamination remains in site soils.

WATER LEVEL TRENDS

Appendix D contains historical groundwater elevations. The data support the following conclusions:

- Groundwater elevations in all wells show general correlation with rainy versus dry seasons. Decreases in elevation are seen from approximately April through December, followed by an increase from December through April. This is a common seasonal trend observed in the upper water-bearing zone in the Bay Area region.
- The range of water level elevations in the B-wells screened from approximately 19 to 25 feet bgs has varied by less than 2 feet, and no substantial differences in elevations (beyond the seasonal fluctuations) have been noted since October 2006.
- The A-wells, screened from approximately 10 to 13 feet bgs, exhibit very slow recharge. These well are screened across units that are not laterally continuous and have not been used in the construction of the site groundwater elevation maps or the calculation of groundwater gradient. They have been used primarily to monitor shallow contamination.
- Groundwater at the site occurs at a depth of less than 10 feet, and appears to be under at least semi-confining conditions, rising in previous investigation borings from approximately 20 feet bgs to as high as 6 feet below grade, such that groundwater was in contact with residual contaminated soil.
- Historical groundwater flow direction has been predominantly to the west-northwest with minor deviations produced by local dewatering of contaminated water.
- Subject property groundwater gradient in previous events has been relatively flat, and was observed during this event at an average of 0.007 feet/foot. Historical groundwater gradient (since October 2006) has varied between approximately 0.001 feet/foot and 0.01 feet/foot, averaging approximately 0.005 feet/foot.

HYDROCHEMICAL TRENDS

The contaminants of concern (those above regulatory ESLs) have been determined to be TVHg, benzene, MTBE, and EDC. Historical groundwater analytical results are included in Appendix D. The highest residual dissolved hydrocarbon concentrations above ESLs are located in downgradient wells MW-3B and MW-4B and source area well MW-5B. However, the concentrations at these wells had decreased significantly over the past 2 years due to the source removals, in-situ injection, and natural attenuation.

Since the first semiannual 2011 event, there has been a dramatic decrease in contaminant concentrations in downgradient monitoring wells MW-1B, MW-4A, and MW-3B, indicating that the September 2010 remedial ORC™ injection has migrated though the aquifer to reach these downgradient areas of the plume.

Gasoline

Figure 5 show hydrochemical trend data for gasoline in the site wells. In general, source area wells MW-5B and historical source area wells MW-2A and MW-2B have shown an overall trend of decreased gasoline concentrations since monitoring began in October 2006. This is most likely a direct response to the removal of contaminated soil during the 1998 UFST excavation and subsequent 2006 and 2007 corrective action excavations. Source area well MW-5B and historical source area well MW-2B showed a slight increase during the second semiannual 2010 event as compared to both the previous event and the second semiannual 2009 event; however, the concentrations have not risen above the pre-2007 excavation concentrations. Historical source area well MW-2A showed a generally stable concentrations compared to the historic high detected in January 2007.

In general, downgradient wells MW-3B and MW-4B as well as source area well MW-1B have shown a general increase in gasoline concentrations up to April 2010, and since have shown a generally decreasing contaminant trend. Downgradient wells MW-3A and MW-4A have not had gasoline concentrations above the laboratory detection limit since monitoring began. This indicates that dissolved phase contamination had migrated in the deeper aquifer (represented by the B wells screened from approximately 19 to 25 feet bgs). Since the October 2010 event, there has been a dramatic decrease in the concentration of the primary contaminant, TVHg, with an 82 percent, 97 percent, and 96 percent reduction in wells MW-1B, MW-4B, and MW-3B, respectively. This indicates that the September 2010 remedial ORC™ injection had successfully migrated though the aquifer to reach these downgradient and transgradient areas of the plume.

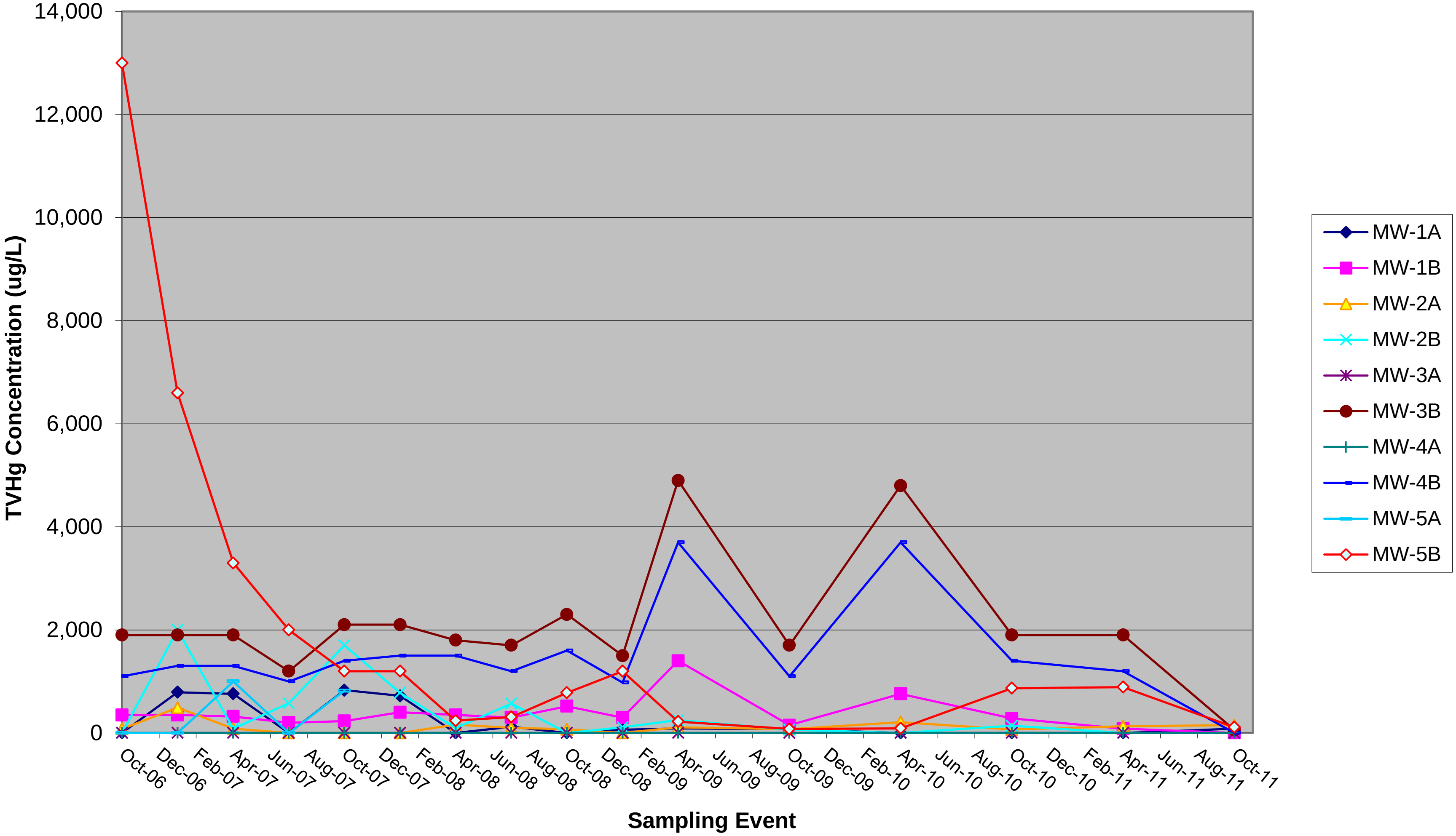
Benzene

Benzene was not detected above the laboratory detection limit in any of the wells sampled during this event. Well MW-1A (downgradient from the UST dispenser) has historically had the highest benzene concentration.

MTBE and EDC

Concentrations of MTBE have remained relatively stable in all of the wells in which it has been detected. MTBE has been detected at relatively higher concentrations in the shallower A-wells, and has been the only detected contaminant in wells MW-3A and MW-4A downgradient from the source area, demonstrating its high soluble mobility. TBA was detected for the first time in well MW-2B.

Figure 5: Historical Groundwater Analytical Results
Total Volatile Hydrocarbons as Gasoline (TVHg)
October 2006 - October 2011



Stellar Environmental Solutions, Inc.

EDC has been consistently detected in onsite wells MW-1B and MW-2B since monitoring began. EDC has also historically been detected in MW-3A, and there have been sporadic detections of TAME in well MW-5B.

Dissolved Oxygen

As discussed in the previous section, only three of the eight wells sampled for DO contained concentrations higher than 1.0 mg/L (monitoring well MW-1A could not be sampled for DO due to insufficient water quantity). This indicates that the effect of the September 2010 ORC™ remedial injection is diminishing.

PLUME GEOMETRY AND MIGRATION INDICATIONS

The groundwater contaminant plume has been sufficiently delineated and monitored over time and after site remediation to establish that the gasoline contaminant plume in groundwater is now relatively stable and below the ESLs in the downgradient offsite B zone wells (while remaining slightly above the residential ESLs in the onsite source area wells MW-2A and MW-5B). The plume is triangular in nature, extending out from former source area well MW-5B to widen and encompass downgradient wells MW-3B and MW-4B. Concentrations of MTBE above the ESL are generally limited to the upgradient and former source area wells (MW-2B and MW-5B), but it has been detected above the residential ESLs in the shallow offsite well MW-3A.

The plume geometry has not varied substantially since monitoring began in October 2006, although seasonal fluctuations in contaminant concentrations have been observed. While benzene appears to be remaining relatively stable or decreasing, overall, increasing gasoline concentrations in downgradient wells suggest that downgradient migration of this constituent could be occurring.

Groundwater contaminant migration appears to be controlled locally by hydrogeologic conditions. Based on our experience, it is likely that the contaminant concentrations attenuate to below ESL criteria relatively rapidly offsite. The conduit survey showed no potential conduits of concern and no sensitive receptors. A record of groundwater monitoring since 2006 suggest that, given the source removal and in-situ injections, the residual plume is expected to be relatively stable and reducing.

CLOSURE CRITERIA ASSESSMENT AND PROPOSED ACTIONS

The Water Board generally requires that the following criteria be met before issuing regulatory closure of contaminant cases:

- ***The contaminant source has been removed (i.e., the source of the discharge and obviously-contaminated soil).*** This criterion has been met. The UFST and associated piping and dispenser and residual soil contamination sources have been removed to the extent possible, and borehole and excavation soil sampling have shown that the substantial mass that would act as an ongoing source of groundwater contamination has been removed.

- ***The groundwater contaminant plume is well characterized, and is stable or reducing in magnitude and extent.*** In our professional opinion, this criterion has generally been met, with a reducing (due to bioremediation compound injections) and relatively stable plume. The residual concentration of TVHg has been reduced to below the residential ESLs, particularly in the downgradient portions of the plume. Since the October 2010 monitoring event, there has been a dramatic decrease in TVHg concentrations—82 percent, 97 percent, and 96 percent in wells MW-1B, MW-4B, and MW-3B, respectively. This indicates that the September 2010 remedial ORC™ injection has successfully migrated though the aquifer to reach these areas of the plume. Concentrations of MTBE above the residential ESLs are generally limited to the upgradient and former source area wells (MW-2B and MW-5B), but has been detected above the ESLs in the shallow offsite well MW-3A. However, concentrations have been reduced to the extent that natural attenuation should continue without the need for additional bioremediation compound injections based on the stable and generally decreasing contaminant trend.
- If residual contamination (soil or groundwater) exists, there is no reasonable risk to sensitive receptors (i.e., contaminant discharge to surface water or water supply wells) or to site occupants. This criterion has been met by conducting a Risk-Based Corrective Action (RBCA) assessment that modeled the fate and transport of residual contamination in the context of potential impacts to sensitive receptors (e.g., water wells, residential land use). Stellar Environmental completed this investigation in December 2008, and it was determined that there are no potential sensitive receptors that could be impacted by the groundwater plume.

Stellar Environmental concludes that, although the hydrocarbon concentrations are still slightly above the regulatory residential ESLs in the source area wells MW-1B, MW-2A, and MW-5B, and downgradient well MW-3A, the site should be considered for low-risk regulatory closure based on the reducing nature of the residual hydrocarbon plume and lack of receptors.

6.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

SUMMARY AND CONCLUSIONS

- One 10,000-gallon gasoline UFST was installed in the late 1970s. The UFST operated under an Alameda County permit until its removal in 1998.
- A preliminary investigation was conducted in August 2005, additional site characterization investigations were conducted in October 2005 and April 2006, and corrective action entailing contaminated soil excavation and the installation of 10 monitoring wells was conducted in September to October 2006. The remaining accessible contaminated soil was removed in November 2007 from beneath the former garage building, and the excavation area was treated with ORC™. The November 2007 corrective action also entailed destruction by excavation of monitoring well MW-5A.
- The primary source (UFST) and secondary source (contaminated soil) have been remediated by excavation. All known accessible residual contaminated soil has been excavated from this site. Residual TVHg soil contamination (790 to 270 mg/kg) above regulatory ESLs was documented during the October 2006 corrective action along the northern property boundary in the area of well MW-1A and MW-1B, but was inaccessible for removal over the property line.
- The September 2010 corrective ORC™ treatment injection was designed to target hydrocarbon-impacted groundwater in the downgradient zone, represented by wells MW-3B and MW-4B, and in the downgradient and slightly transgradient area of MW-1B. The past year of monitoring indicates that the remedial injections have successfully migrated though the aquifer to reach these areas of the plume.
- TVHg was detected during this event above the ESL of 100 µg/L in monitoring wells MW-2A and MW-5B. TVHg was also detected in monitoring wells MW-1A and MW-3B, but below the ESL, and the past year of groundwater monitoring has indicated a decreasing concentration trend.
- MTBE was detected above its ESL of 5.0 µg/L in wells MW-2B, MW-3A, and MW-5B.
- BTEX was not found above the laboratory detection limit in any of the wells sampled.
- The lead scavenger EDC was detected in only two wells (MW-1B and MW-2B), and both at concentrations above the ESL of 0.5 µg/L.

- TBA was the only fuel oxygenate detected above the laboratory detection limit. However, it was below its ESL and only found in source well MW-2B.

- At the request of ACEH, analysis for lead scavengers and fuel oxygenates is limited to the wells with a historical detection—MW-1A, MW-1B, MW-2B, MW-3A, MW-3B, MW-4B, and MW-5B.

- DO concentrations were measured in wells during the current event and ranged from 0.39 to 2.88 mg/L. All of the measurements showed a decrease in DO concentrations compared to the previous event, indicating that less oxygen is being induced by the September 2010 Advanced ORC™ injection. DO in wells MW-1A and MW-4A could not be measured due to insufficient water.

- The groundwater contaminant plume has not been fully delineated, but appears to be currently triangular in configuration with its long axis trending east by west-northwest.

- The groundwater gradient during this event averaged approximately 0.007 feet/foot across the site, with a gradient to the north-northwest, consistent with historical data. The groundwater gradient has varied since October 2006 between approximately 0.001 feet/foot and 0.01 feet/foot, averaging approximately 0.005 feet/foot.

- The November 2007 excavation and ORC™ treatment appear to have been effective in lowering contaminant concentrations in the source area, as indicated by the historical maximum TVHg concentrations observed in the source well MW-5B.

- The September 2010 remedial ORC™ injection has successfully migrated though the aquifer to reach the downgradient and transgradient areas of the plume, as indicated by the historical TVHg concentrations observed in wells MW-1B, MW-3B, and MW-4B.

- Compared to the October 2010 event, there has been a dramatic decrease in the concentration of the primary contaminant, TVHg, with an 82 percent, 97 percent, and 96 percent reduction in wells MW-1B, MW-4B and MW-3B, respectively. This indicates that the September 2010 remedial ORC™ injection has successfully migrated though the aquifer to reach these downgradient and transgradient areas of the plume.

- All technically feasible and practical remedial measures have been implemented at this site, and past groundwater monitoring indicates a stable reducing plume.

RECOMMENDATIONS

- Stellar Environmental recommends that ACEH consider the site for low-risk regulatory closure based on the stable and decreasing contaminant concentration trend over the past year of groundwater monitoring and the absence of downgradient sensitive receptors.

- Stellar Environmental recommends following up with ACEH following its receipt of this report, to discuss the requirements for moving the site toward regulatory closure.

- We recommend that all future technical reports be provided to the appropriate regulatory agencies, including electronic uploads to ACEH’s ftp system and the State Water Board’s GeoTracker database.
- Reimbursement requests should continue to be submitted under the State of California Tank Cleanup Fund until regulatory site closure is achieved.

7.0 REFERENCES

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8.0 LIMITATIONS

This report has been prepared for exclusive use by the Estate of Mr. Lawrence Wadler (subject property owner), the regulatory agencies, and their authorized assigns and/or representatives. No reliance on this report shall be made by anyone other than those for whom it was prepared.

The findings and conclusions presented in this report are based solely on the findings of the investigations discussed herein. This report has been prepared in accordance with generally accepted methodologies and standards of practice of the area. The personnel performing this assessment are qualified to perform such investigations and have accurately reported the information available, but cannot attest to the validity of that information. No warranty, expressed or implied, is made as to the findings, conclusions, and recommendations included in the report.

APPENDIX A

GROUNDWATER MONITORING AND SAMPLING FIELD REPORT

WELL GAUGING DATA

Project # 111019-IW1 Date 10/19/11 Client STELLAR

Site 2836 UNION ST., OAKLAND, CA

Well ID	Time	Well Size (in.)	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or [✓ TOC]	Notes
MW-1A	0856	3/4					7.17	12.56		
MW-1B	0848	3/4					7.72	22.48		
MW-2A	0842	3/4					7.44	12.60		
MW-2B	0932	3/4					8.34	24.51		
MW-3A	0949	3/4					6.65	12.94		
MW-3B	0922	3/4					7.16	25.05		
MW-4A	0836	3/4					5.95	12.20		
MW-4B	0909	3/4					6.28	24.29		
MW-5B	0940	3/4					8.36	25.32		

* REMOVED ALL CAPS PRIOR TO GAUGING AND CALLED INTO PM TO REVIEW WATER LEVELS PRIOR TO PURGING.

WELLHEAD INSPECTION CHECKLIST

Page 1 of 1

Date 10/19/11 Client STELLAR

Site Address 2836 UNION ST., OAKLAND, CA

Job Number 111019-IW1 Technician IW

Well ID	Well Inspected - No Corrective Action Required	Water Bailed From Wellbox	Wellbox Components Cleaned	Cap Replaced	Debris Removed From Wellbox	Lock Replaced	Other Action Taken (explain below)	Well Not Inspected (explain below)
MW-1A	X							
MW-1B	X							
MW-2A	X							
MW-2B		1/2 BOLTS MISSING.						
MW-3A	X							
MW-3B	X							
MW-4A	X							
MW-4B	X							
MW-5B	X							

NOTES:

TEST EQUIPMENT CALIBRATION LOG

PROJECT NAME STELLAR @ 2836 UNION ST., OAKLAND, CA

PROJECT NUMBER 111019-IW1

EQUIPMENT NAME	EQUIPMENT NUMBER	DATE/TIME OF TEST	STANDARDS USED	EQUIPMENT READING	CALIBRATED TO: OR WITHIN 10%:	TEMP.	INITIALS
MYRON L ULTRAMETER II		10/19/11 / 0636	= 3900 uS →	= 3896 uS	YES	21.6	IW
				= 7.00 = 10.00 pH → = 4.00	= 6.99 YES = 9.96 pH = 3.98	21.8	IW
YSI 550		10/19/11 / 0644	= 100% DO →	= 99.8% DO	YES	20.1	IW

W L MONITORING DATA SHE

Project #: 111019-IW1	Client: STELLAR
Sampler: IW	Date: 10/19/11
Well I.D.: MW-1A	Well Diameter: 2 3 4 6 8 3/4"
Total Well Depth (TD): 12.56	Depth to Water (DTW): 7.17
Depth to Free Product: ———	Thickness of Free Product (feet): ———
Referenced to: [✓ PVC] Grade	D.O. Meter (if req'd): [✓ YSI] HACH

DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 8.25

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, [✓ Peristaltic], Extraction Pump, Other________

Sampling Method: Bailer, Disposable Bailer, Extraction Port, [✓ Dedicated Tubing], Other: ________

0.13 (Gals.) X 3 = 0.39 Gals.
1 Case Volume, Specified Volumes, Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F or [✓ °C])	pH	Cond. (mS or [✓ µS])	Turbidity (NTUs)	Gals. Removed	Observations
1059	20.8	6.88	996	42	0.08	
WELL DEWATERED @ 0.08 GALLONS.						DTW = 10.99
INSUF. WATER FOR DO, DTW = 11.99. 6 VOAS FILLED AT BEGINNING						
OF PURGE.						
1345 WELL DID NOT RECOVER. DTW = 11.62 TO ALLOW SAMPLING. INSUF. WATER						* PRE-PURGE VOAS SUBMITTED DUE TO DRAWDOWN.

Did well dewater? [✓ Yes] No Gallons actually evacuated: 0.08

Sampling Date: 10/19/11 Sampling Time: 1055 * Depth to Water: 7.17

Sample I.D.: MW-1A Laboratory: Kiff CalScience Other McCAMPBELL

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: SEE COC

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	——— mg/L	Post-purge:	——— mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 111019-IW1	Client: STELLAR
Sampler: IW	Date: 10/19/11
Well I.D.: MW-1B	Well Diameter: 2 3 4 6 8 3/4"
Total Well Depth (TD): 22.48	Depth to Water (DTW): 7.72
Depth to Free Product: —	Thickness of Free Product (feet): —
Referenced to: [✓ PVC] Grade	D.O. Meter (if req'd): [✓ YSI] HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 10.68	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, [✓ Peristaltic], Extraction Pump, Other______

Sampling Method: Bailer, Disposable Bailer, Extraction Port, [✓ Dedicated Tubing], Other: ______

0.34 (Gals.) X 3 = 1.02 Gals.
1 Case Volume, Specified Volumes, Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	$\text{radius}^2 * 0.163$

Time	Temp (°F or [✓ °C])	pH	Cond (mS or [✓ µS])	Turbidity (NTUs)	Gals. Removed	Observations
1136	20.0	6.68	1165	41	0.34	
1141	19.6	6.46	1085	23	0.68	
WELL DEWATERED @ 0.80 GALLONS					0.80	DTW = 22.06
1405	20.1	6.62	1078	32	GRAB	

Did well dewater? [✓ Yes] No Gallons actually evacuated: 0.80

Sampling Date: 10/19/11 Sampling Time: 1405 Depth to Water: 10.21

Sample I.D.: MW-1B Laboratory: Kiff CalScience Other McCAMPBELL

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: SEE COC

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	2.26 mg/L	Post-purge:	2.44 mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 111019-IW1	Client: STELLAR
Sampler: IW	Date: 10/19/11
Well I.D.: MW-2A	Well Diameter: 2 3 4 6 8 3/4"
Total Well Depth (TD): 12.60	Depth to Water (DTW): 7.44
Depth to Free Product: ——	Thickness of Free Product (feet): ——
Referenced to: [✓ PVC] Grade	D.O. Meter (if req'd): [✓ YSI] HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 8.48	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, [✓ Peristaltic], Extraction Pump, Other______

Sampling Method: Bailer, Disposable Bailer, Extraction Port, [✓ Dedicated Tubing], Other: ______

0.12 (Gals.) X 3 = 0.36 Gals.
1 Case Volume · Specified Volumes · Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius^2 * 0.163

Time	Temp (°F or [✓ °C])	pH	Cond. (mS or [✓ µS])	Turbidity (NTUs)	Gals. Removed	Observations
1034	20.3	6.28	981	851	0.12	
1038	20.1	6.49	986	418	0.24	
1041	20.4	6.52	988	286	0.36	

Did well dewater? Yes [✓ No]	Gallons actually evacuated: 0.36
Sampling Date: 10/19/11 Sampling Time: 1045	Depth to Water: 8.08
Sample I.D.: MW-2A	Laboratory: Kiff CalScience Other McCAMPBELL
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5)	Other: SEE COC
EB I.D. (if applicable): @ Time	Duplicate I.D. (if applicable):
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5)	Other:
D.O. (if req'd): Pre-purge: 0.50 mg/L	Post-purge: 0.39 mg/L
O.R.P. (if req'd): Pre-purge: mV	Post-purge: mV

WELL MONITORING DATA SHEET

Project #: 111019-IW1	Client: STELLAR
Sampler: IW	Date: 10/19/11
Well I.D.: MW-2B	Well Diameter: 2 3 4 6 8 3/4"
Total Well Depth (TD): 24.51	Depth to Water (DTW): 8.34
Depth to Free Product: ——	Thickness of Free Product (feet): ——
Referenced to: [✓ PVC] Grade	D.O. Meter (if req'd): [✓ YSI] HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 11.58	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, [✓ Peristaltic], Extraction Pump, Other ______

Sampling Method: Bailer, Disposable Bailer, Extraction Port, [✓ Dedicated Tubing], Other: ______

0.38 (Gals.) X 3 = 1.14 Gals.
1 Case Volume — Specified Volumes — Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius^2 * 0.163

Time	Temp (°F or [✓ °C])	pH	Cond (mS or [✓ µS])	Turbidity (NTUs)	Gals. Removed	Observations
1258	20.0	6.65	924	128	0.40	
1304	WELL DEWATERED @			0.60 GAL.	0.60	DTW = 23.26
~~130~~ IW						
1455	20.6	6.70	948	72	GRAB	

Did well dewater? [✓ Yes] No — Gallons actually evacuated: 0.60

Sampling Date: 10/19/11 — Sampling Time: 1455 — Depth to Water: 11.22

Sample I.D.: MW-2B — Laboratory: Kiff CalScience Other McCAMPBELL

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: SEE COC

EB I.D. (if applicable): @ Time — Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	0.45 mg/L	Post-purge:	0.52 mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

W L MONITORING DATA SHE

Project #: 111019-IW1	Client: STELLAR
Sampler: IW	Date: 10/19/11
Well I.D.: MW-3A	Well Diameter: 2 3 4 6 8 3/4"
Total Well Depth (TD): 12.94	Depth to Water (DTW): 6.65
Depth to Free Product: ——	Thickness of Free Product (feet): ——
Referenced to: [✓ PVC] Grade	D.O. Meter (if req'd): [✓ YSI] HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 7.91	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, [✓ Peristaltic], Extraction Pump, Other______

Sampling Method: Bailer, Disposable Bailer, Extraction Port, [✓ Dedicated Tubing], Other: ______

0.15 (Gals.) X 3 = 0.45 Gals.
1 Case Volume / Specified Volumes / Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius^2 * 0.163

Time	Temp (°F or [✓ °C])	pH	Cond (mS or [✓ µS])	Turbidity (NTUs)	Gals. Removed	Observations
1112	20.0	6.92	1237	31	0.15	
WELL DEWATERED @ 0.28 GALLONS					0.28	DTW=12.21
1355	WELL DID NOT RECOVER TO ALLOW SAMPLING					DTW=11.78
	POST DEWATER. INSUFF. WATER.					
* PRE-PURGE VOAS SUBMITTED DUE TO DRAWDOWN/SLOW RECHARGE.						

Did well dewater? [✓ Yes] No   Gallons actually evacuated: 0.28

Sampling Date: 10/19/11   Sampling Time: 1110 *   Depth to Water: 6.65

Sample I.D.: MW-3A   Laboratory: Kiff CalScience Other McCAMPBELL

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: SEE COC

EB I.D. (if applicable): @ Time   Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	1.61 mg/L	Post-purge:	1.68 mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

W L MONITORING DATA SHE

Project #: 111019 - IW1	Client: STELLAR
Sampler: IW	Date: 10/19/11
Well I.D.: MW - 3B	Well Diameter: 2 3 4 6 8 3/4"
Total Well Depth (TD): 25.05	Depth to Water (DTW): 7.16
Depth to Free Product: ———	Thickness of Free Product (feet): ———
Referenced to: [✓ PVC] Grade	D.O. Meter (if req'd): [✓ YSI] HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 10.74	

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, [✓ Peristaltic], Extraction Pump, Other______

Sampling Method: Bailer, Disposable Bailer, Extraction Port, [✓ Dedicated Tubing], Other: ______

0.42 (Gals.) X 3 = 1.26 Gals.
1 Case Volume, Specified Volumes, Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius^2 * 0.163

Time	Temp (°F or [✓ °C])	pH	Cond. (mS or [✓ µS])	Turbidity (NTUs)	Gals. Removed	Observations
1226	19.3	6.53	909	23	0.42	
1232	18.9	6.48	926	12	0.84	
1236	18.8	6.44	931	9	1.26	

Did well dewater? Yes [✓ No] Gallons actually evacuated: 1.26

Sampling Date: 10/19/11 Sampling Time: 1240 Depth to Water: 8.29

Sample I.D.: MW - 3B Laboratory: Kiff CalScience Other MCCAMPBELL

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: SEE COC

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	2.69 mg/L	Post-purge:	2.88 mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 111019-IW1	Client: STELLAR
Sampler: IW	Date: 10/19/11
Well I.D.: MW-4A	Well Diameter: 2 3 4 6 8 3/4"
Total Well Depth (TD): 12.20	Depth to Water (DTW): 5.95
Depth to Free Product: —	Thickness of Free Product (feet): —
Referenced to: [✓ PVC] Grade	D.O. Meter (if req'd): [✓ YSI] HACH

DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 7.20

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, [✓ Peristaltic], Extraction Pump, Other________

Sampling Method: Bailer, Disposable Bailer, Extraction Port, [✓ Dedicated Tubing], Other: ________

0.15 (Gals.) X 3 = 0.45 Gals.
1 Case Volume — Specified Volumes — Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius^2 * 0.163

Time	Temp (°F or [✓ °C])	pH	Cond (mS or [✓ µS])	Turbidity (NTUs)	Gals. Removed	Observations
1006	ONLY ABLE TO FILL 4 VOAS. WELL DEWATERED)					
INSUF.	WATER FOR D.O., DTW = 11.81					
1340	INSUF. WATER TO SAMPLE. DTW = 11.44					
* PRE-	PURGE VOAS SUBMITTED DUE TO DRAWDOWN / SLOW RECHARGE.					

Did well dewater? [✓ Yes] No	Gallons actually evacuated: —
Sampling Date: 10/19/11 Sampling Time: 1005 *	Depth to Water: 5.95
Sample I.D.: MW-4A	Laboratory: Kiff CalScience Other McCAMPBELL
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5)	Other: SEE COC
EB I.D. (if applicable): @ Time	Duplicate I.D. (if applicable):
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5)	Other:

D.O. (if req'd):	Pre-purge:	— mg/L	Post-purge:	— mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 111019-IW1	Client: STELLAR
Sampler: IW	Date: 10/19/11
Well I.D.: MW-4B	Well Diameter: 2 3 4 6 8 3/4"
Total Well Depth (TD): 24.29	Depth to Water (DTW): 6.28
Depth to Free Product: ——	Thickness of Free Product (feet): ——
Referenced to: [✓ PVC] Grade	D.O. Meter (if req'd): [✓ YSI] HACH

DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 9.89

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, [✓ Peristaltic], Extraction Pump, Other______

Sampling Method: Bailer, Disposable Bailer, Extraction Port, [✓ Dedicated Tubing], Other: ______

0.42 (Gals.) X 3 = 1.26 Gals.
1 Case Volume — Specified Volumes — Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius^2 * 0.163

Time	Temp (°F or [✓ °C])	pH	Cond (mS or [✓ µS])	Turbidity (NTUs)	Gals. Removed	Observations
1159	19.0	6.52	873	40	0.42	
1204	18.6	6.52	864	17	0.84	
1209	18.4	6.50	861	13	1.26	

Did well dewater? Yes [✓ No] Gallons actually evacuated: 1.26

Sampling Date: 10/19/11 Sampling Time: 1215 Depth to Water:

Sample I.D.: MW-4B Laboratory: Kiff CalScience Other McCAMPBELL

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: SEE COC

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	0.66 mg/L	Post-purge:	0.52 mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

W. L MONITORING DATA SHE

Project #: 111019 - IW1	Client: STELLAR
Sampler: IW	Date: 10/19/11
Well I.D.: MW - 5B	Well Diameter: 2 3 4 6 8 3/4"
Total Well Depth (TD): 25.32	Depth to Water (DTW): 8.36
Depth to Free Product: ———	Thickness of Free Product (feet): ———
Referenced to: [✓ PVC] Grade	D.O. Meter (if req'd): [✓ YSI] HACH

DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: 11.76

Purge Method: Bailer, Disposable Bailer, Positive Air Displacement, Electric Submersible, Waterra, [✓ Peristaltic], Extraction Pump, Other________

Sampling Method: Bailer, Disposable Bailer, Extraction Port, [✓ Dedicated Tubing], Other: ________

0.40 (Gals.) X 3 = 1.20 Gals.
1 Case Volume / Specified Volumes / Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius^2 * 0.163

Time	Temp (°F or [✓ °C])	pH	Cond (mS or [✓ µS])	Turbidity (NTUs)	Gals. Removed	Observations
1316	20.3	7.28	932	61	0.40	
1321	19.8	6.68	944	43	0.80	
1326	19.7	6.62	948	70	1.20	

Did well dewater? Yes [✓ No] Gallons actually evacuated: 1.20

Sampling Date: 10/19/11 Sampling Time: 1330 Depth to Water:

Sample I.D.: MW - 5B Laboratory: Kiff CalScience Other McCAMPBELL

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: SEE COC

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

D.O. (if req'd):	Pre-purge:	0.58 mg/L	Post-purge:	0.64 mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

APPENDIX B

STELLAR ENVIRONMENTAL GROUNDWATER STANDARD SAMPLING PROTOCOLS

APPENDIX B
STELLAR ENVIRONMENTAL GROUNDWATER STANDARD SAMPLING PROTOCOLS

SAMPLING AND ANALYSIS PERSONNEL

Sampling and analysis is conducted by Blaine Tech Services, a subcontractor to Stellar Environmental, which uses appropriately trained personnel to perform the water level measurements, sampling, and analyses of key natural attenuation indicators.

SUMMARY OF SAMPLING PROCEDURES

Activities that will occur during groundwater sampling are summarized as follows:

- Pre-arrangement with testing laboratory
- Assembly and preparation of equipment and supplies
- Groundwater sampling
  - water-level measurements
  - immiscible material measurements (with an interface probe, if applicable)
  - visual inspection of borehole water
  - well bore evacuation
  - sampling
- Sample preservation and shipment
  - sample preparation
  - onsite measurement of parameters using direct read instruments
  - sample labeling
- Completion of sample records
- Completion of chain-of-custody records
- Samples placed in chilled cooler
- Sample shipment

Detailed sampling and analysis procedures are presented in the following sections.

ARRANGEMENTS WITH ANALYTICAL LABORATORY

Prior to sampling, arrangements will be made with an analytical laboratory to conduct the sample analyses. Samples will be analyzed by Curtis and Tompkins, Ltd. (C&T), an analytical laboratory in Berkeley, California. C&T has the required Department of Toxic Substances Control (DTSC) certification to perform the analyses, and will provide a sufficient number of sample containers for the wells to be sampled and the blanks to be included. C&T will determine the proper type and size for the containers based on the analyses requested. For samples requiring chemical preservation, preservatives will be added to containers by the C&T prior to shipping containers to the facility. Shipping containers (ice chests with adequate container padding) will be sent to the facility with the sample containers.

PREPARATION FOR SAMPLING

Prior to the sampling episode, equipment to be used will be assembled and its operating condition verified, calibrated (if required), and properly cleaned (if required). In addition, all record-keeping materials will be prepared.

Equipment Calibration

Where appropriate, equipment will be calibrated according to the manufacturer's specifications prior to field use. This applies to the equipment for making onsite chemical measurements of pH, conductivity, water temperature, and photoionization detector (PID).

Equipment Cleaning

Portions of sampling and test equipment that will come into contact with the sample will be thoroughly cleaned before use. Such equipment includes water-level probe, bailers, lifting line, and other equipment or portions thereof that may be immersed. The procedure for cleaning non-dedicated equipment is as follows:

- Clean with potable water and phosphate-free detergent;
- Rinse with potable water;
- Rinse with distilled or deionized water; and
- Air-dry the equipment prior to use.

Any deviations from these procedures will be documented in the permanent record of the sampling event.

Laboratory-supplied sample containers will be cleaned and sealed by the laboratory before shipping. The type of container provided and the method of container cleaning should be in the laboratory's permanent record of the sampling event.

Sampling equipment to be disposed of after use will be cleaned with potable water and phosphate-free detergent before disposal as solid waste. Rinse water will be stored in properly labeled 55-gallon drums for proper disposal, pending receipt of laboratory results of groundwater and soil sample analyses with assistance from SES.

SAMPLING PROCEDURES

Special care will be exercised to prevent contamination of the groundwater and extracted samples during the sampling activities. Contamination of a sample can occur through contact with improperly cleaned equipment. Cross-contamination of the groundwater can occur through insufficient cleaning of equipment between wells. Pre-cleaned disposable sampling equipment will be rinsed with distilled water prior to use. Sampling equipment and sample containers will be thoroughly cleaned before and after field use and between uses at different sampling locations according to the procedures discussed above. In addition to the use of properly cleaned equipment, two further precautions will be taken:

- A new pair of clean, disposable latex (or similar) gloves will be worn each time a different well is sampled.
- Sample collection activities will progress from the least affected (upgradient) area to the most affected (downgradient) area. Wells described as "background" or "upgradient" wells will be sampled first.

The following paragraphs present procedures for the several activities that comprise groundwater sample acquisition. These activities will be performed in the same order as presented below. Exceptions to this procedure will be noted in the permanent sampling record.

Preparation of Location

Prior to starting the sampling procedure, the area around the well will be cleared of foreign materials, such as brush, rocks, debris, etc. A clean (new) disposable plastic sheet will be placed around the well casing so that the sheet is flat on the ground. The sheet will be placed such that the flush-mount well projects through the center of the sheet. This preparation will prevent sampling equipment from inadvertently contacting the ground or exterior parts of the well.

Water-Level Measurement

The first sampling operation is water-level measurement. An electrical probe or a weighted tape will be used to measure the depth to groundwater below the datum to the nearest 0.01 foot. The datum, usually the top of the inner casing (inside and below the protective steel cover), will be described in the monitoring well records. A permanent mark or scribe will be marked on the inner casing.

If the wells to be sampled are closely spaced, the water levels at all of the closely-spaced wells will be measured before any of the wells are evacuated. The water-level probe or weighted tape will be cleaned with phosphate-free detergent in distilled water and with a distilled water rinse between usage at different wells.

Total Depth Measurement

Once the water level and immiscible material thickness is measured and recorded, the water-level probe or weighted tape will be slowly lowered to the bottom of the well. The depth to the bottom will be measured and recorded. The probe or tape will then be slowly withdrawn from the well. The bottom of the probe or tape will be observed after withdrawal to determine any evidence of viscous, heavy contaminants. Descriptions (and measurements, if possible) of such materials will be made from observation of the probe or tape.

Visual Inspection of Well Water

Prior to well evacuation, a small quantity of water will be removed with a bailer that is not completely immersed. The recovered sample is representative of the top of the water column in the well casing. If immiscible materials are present as measured by the interface probe at the top of the water column, this technique can allow their detection. The water will be observed for the presence of any floating films or other indications of immiscible materials. Any sample odors will be noted. Observations regarding odor or visual evidence of immiscible materials will be recorded in the sampling record.

The well water sample will be discarded unless the site-specific protocol calls for retention of this sample. The sample will be placed in a labeled container for proper disposal.

Well Bore Evacuation

Water contained within and adjacent to the well casing can potentially reflect chemical interaction with the atmosphere (by diffusion of gases down the casing) or the well construction materials (through prolonged residence adjacent to the casing).

Observations of this water will be recorded during removal and prior to it being discarded. Onsite parameter measurements of the purged water, as described in this section, will indicate when water-quality parameters have stabilized, and also will be recorded.

The volume of water contained within the well bore at the time of sampling will be calculated, and 4 times the calculated water volume will be removed from the well and discarded. A bailer will be used for well evacuation. The volume of water to be evacuated will be calculated as follows:

Number of Bailers:

$$\text{Number of bailers} = 4 \text{ x } \frac{\text{Volume of water in well (Vw)}}{\text{Volume of bailer (Vb)}}$$

Volume of Water in Well:

$$\frac{Vw = 3.142 \text{ x } dw^2 \text{ x } Lw}{4}$$

where: Vw = water volume in well (ft^3)

dw = inside diameter of well (ft)

Lw = length of water column in well (ft)

Volume of Water in Full Bailer:

$$\frac{Vb = 3.142 \text{ x } db2 \text{ x } Lb}{4}$$

where: Vb = water volume in bailer (ft^3)

db = inside diameter of bailer (ft)

Lb = length of bailer (ft)

Wells that can be evacuated to a dry state will be evacuated completely; samples will be taken as soon as sufficient water for sampling is present. Sample compositing—sampling over a lengthy period by accumulating small volumes of water at different times to eventually obtain a sample of sufficient volume—will not be conducted.

Water produced during well evacuation will be contained in a suitable container and temporarily stored onsite pending proper disposal.

Some chemical and physical parameters in water can change significantly within a short time of sample acquisition. The following parameters cannot be accurately measured in a laboratory located more than a few hours from the facility, and will be measured onsite with portable equipment:

- pH
- Specific conductance
- Temperature
- Turbidity units

These parameters will be measured in unfiltered, unpreserved, "fresh" water, using the same sampling technique as for laboratory analyses. The measurements will be made in a clean glass container separate from those intended for laboratory analyses. The tested sample will be discarded after use. The measured values will be recorded in the sampling record.

Natural Attenuation Field Measurements

In addition to the meter reading above, following the indicators that groundwater has been purged sufficiently to represent water within the water bearing materials, natural attenuation parameters were measured by the Blaine Tech sampling personnel. These include meter readings for:

- Oxidation reduction potential;
- Dissolved oxygen; and
- Dissolved ferrous iron.

Sample Extraction

Natural attenuation parameters are measured before the water is purged and sampled. Care will be taken during insertion of sampling equipment to prevent undue disturbance of water in the well.

The pump or bailer will be lowered into the water gently to prevent splashing, and extracted gently to prevent creation of an excessive vacuum in the well. The sample will be transferred directly into the appropriate container. While pouring water from a bailer, the water will be carefully poured down the inside of the sample bottle to prevent significant aeration of the sample. Unless other instructions are given by the analytical laboratory, the sample containers will be completely filled so that no air space remains in the container. Excess water taken during sampling will be placed in a container for proper disposal.

SAMPLE HANDLING

Sample Preservation

Water samples will be properly prepared for transportation to the laboratory by refrigeration and chemical preservation, as necessary. The laboratory providing sample containers will add any necessary chemical preservatives to the sealed containers provided prior to shipment.

Container and Labels

Glass containers and appropriate container lids will be provided by the laboratory. The containers will be filled and container lids tightly closed. Sample container lids will be sealed so as to make obvious any seal tampered with or broken. The label will be firmly attached to the container side (rather than the lid). The following information will be written with permanent marker on the label:

- Facility name;
- Sample identification;
- Sample type (groundwater, surface water, etc.);
- Sampling date;
- Sampling time; and
- Preservatives added, and sample collector’s initials.

Sample Shipment

In most instances, the concentration and type of compounds present in the groundwater are considered by the U.S. Department of Transportation to be non-hazardous. Thus, the following packaging and labeling requirements for the sample materials are appropriate for shipping the sample to the testing laboratory:

- Package sample so that is does not leak, spill, or vaporize from its packaging
- Label package with:
  - sample collector’s name, address, and telephone number
  - laboratory’s name, address, and telephone number

  - description of sample
  - quantity of sample
  - date of shipment

To comply with packaging regulations and prevent damage to expensive groundwater samples, SES will follow packaging and shipping instructions supplied by the certified testing laboratory.

Chain-of-Custody Control

After samples are obtained, chain-of-custody procedures will be followed to establish a written record concerning sample movement between the sampling site and the testing laboratory. Each shipping container will contain a chain-of-custody form to be completed by the sampling personnel packing the samples. The chain-of-custody form for each container will be completed in triplicate. One copy of this form will be maintained at the site; the other two copies will remain at the laboratory. One of the laboratory copies will become a part of the permanent record for the sample and will be returned with the sample analyses.

The record will contain the following minimum information:

- Collector's sample number
- Signature of collector
- Date and time of collection
- Place and address of collection
- Material type
- Preservatives added
- Analyses requested
- Signatures involved in the chain of possession
- Inclusive dates of possession

The shipping container will be sealed so as to make obvious any seal tampered with or broken. The chain-of-custody documentation will be placed inside the container so that it is immediately apparent to the laboratory personnel receiving the container, but could not be damaged or lost during shipping.

SAMPLING RECORDS

To provide complete documentation of sampling, detailed records containing the following information will be maintained during sampling:

- Sample location (facility name)
- Sample identification (name and sample number)
- Sample location map or detailed sketch
- Date and time of sampling
- Sampling method
- Field observations of sample appearance and odor
- Weather conditions
- Samples identification
- Any other significant information

APPENDIX C

CERTIFIED ANALYTICAL LABORATORY REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION

McCampbell Analytical, Inc.
"When Quality Counts"

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

Analytical Report

Stellar Environmental Solutions	Client Project ID: #2005-65; Wadler	Date Sampled: 10/19/11
2198 Sixth St. #201		Date Received: 10/20/11
	Client Contact: Richard Makdisi	Date Reported: 10/27/11
Berkeley, CA 94710	Client P.O.:	Date Completed: 10/25/11

WorkOrder: 1110623

October 27, 2011

Dear Richard:

Enclosed within are:

1) The results of the **9** analyzed samples from your project: **#2005-65; Wadler,**
2) A QC report for the above samples,
3) A copy of the chain of custody, and
4) An invoice for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits.

If you have any questions or concerns, please feel free to give me a call. Thank you for choosing McCampbell Analytical Laboratories for your analytical needs.

Best regards,

Angela Rydelius
Laboratory Manager
McCampbell Analytical, Inc.

The analytical results relate only to the items tested.

1110623

Chain of Custody Record

Lab job no.
Date 10/19/11
Page 1 of 1

Laboratory C&T
Address 2323 FIFTH ST
BERKELEY, CA

Method of Shipment LAB COURIER
Shipment No.
Airbill No.
Cooler No.

Project Owner LARRY WADLER
Site Address 2836 UNION ST.
OAKLAND, CA
Project Name WADLER
Project Number 2005-65

Project Manager R. MAKDISI
Telephone No. (510) 644-3123
Fax No. (510) 644-3859
Samplers: *(Signature)*

	Field Sample Number	Location/ Depth	Date	Time	Sample Type	Type/Size of Container	Preservation: Cooler	Preservation: Chemical	Filtered	No. of Containers	TPH-G/BTEX/MTBE 8015/8260	(5) OXYS BY 8260B	EDC + EDB BY 8260B								Remarks
+	MW-1A		10/19/11	1055	W	40ml HCL VOAS	X	HCL		6	X	X	X								
+	MW-1B		↓	1405	W	↓	X	↓		6	X	X	X								
+2	MW-2A			1045	W		X			6	X										
+	MW-2B			1455	W		X			6	X	X	X								
↓	MW-3A			1110	W		X			6	X	X	X								
	MW-3B			1240	W		X			6	X	X	X								
	MW-4A			1005	W		X			4	X										
	MW-4B			1215	W		X			6	X	X	X								
	MW-5B			1330	W		X			6	X	X	X								

Relinquished by:	Date	Received by:	Date	Relinquished by:	Date	Received by:	Date
Signature	10/19/11	Signature	10/19/11	Signature	10/20/11	Signature	10/20/11
Printed IAN WILLIAMS	Time	Printed IAN WILLIAMS	Time	Printed W. JONES (Sample Custodian)	Time	Printed Ben Yslas	Time
Company BLAINETECH SERVICES	1630	Company BLAINETECH SERVICES	1630	Company BCS	1410	Company McCampbel	1410

Turnaround Time: STANDARD
Comments: EDF REQUIRED
GLOBAL ID: T0600105641

Relinquished by:	Date	Received by:	Date
Signature	10/20	Signature	10/20/11
Printed	Time	Printed Zuraida Cortez	Time
Company	1855	Company MAI	1855

2000-00-01

ICE/t° 4.8
GOOD CONDITION___
HEAD SPACE ABSENT___
DECHLORINATED IN LAB___
APPROPRIATE CONTAINERS___
PRESERVED IN LAB___

PRESERVATION | VOAS | O&G | METALS | OTHER

★ Stellar Environmental Solutions

2198 Sixth Street #201, Berkeley, CA 94710

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

CHAIN-OF-CUSTODY RECORD

Page 1 of 1

WorkOrder: 1110623 **ClientCode: SESB**

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

Report to:
Richard Makdisi
Stellar Environmental Solutions
2198 Sixth St. #201
Berkeley, CA 94710
(510) 644-3123 FAX: (510) 644-3859

Email: rmakdisi@stellar-environmental.com;hpietr
cc:
PO:
ProjectNo: #2005-65; Wadler

Bill to:
Accounts Payable
Stellar Enviormental Solutions
2198 Sixth St. #201
Berkeley, CA 94710

Requested TAT: **5 days**

Date Received: **10/20/2011**
Date Printed: **10/20/2011**

					Requested Tests (See legend below)											
Lab ID	**Client ID**	**Matrix**	**Collection Date**	**Hold**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1110623-001	MW-1A	Water	10/19/2011 10:55	☐	B	A										
1110623-002	MW-1B	Water	10/19/2011 14:05	☐	B	A										
1110623-003	MW-2A	Water	10/19/2011 10:45	☐		A										
1110623-004	MW-2B	Water	10/19/2011 14:55	☐	B	A										
1110623-005	MW-3A	Water	10/19/2011 11:10	☐	B	A										
1110623-006	MW-3B	Water	10/19/2011 12:40	☐	B	A										
1110623-007	MW-4A	Water	10/19/2011 10:05	☐		A										
1110623-008	MW-4B	Water	10/19/2011 12:15	☐	B	A										
1110623-009	MW-5B	Water	10/19/2011 13:30	☐	B	A										

Test Legend:

1	**5-OXYS+PBSCV_W**	**2**	**G-MBTEX_W**	**3**		**4**		**5**	
6		**7**		**8**		**9**		**10**	
11		**12**							

Prepared by: Zoraida Cortez

Comments:

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

Sample Receipt Checklist

Client Name: **Stellar Environmental Solutions**
Date and Time Received: **10/20/2011 7:27:36 PM**
Project Name: **#2005-65; Wadler**
Checklist completed and reviewed by: Zoraida Cortez
WorkOrder N°: **1110623** Matrix: Water
Carrier: Benjamin Yslas (MAI Courier)

Chain of Custody (COC) Information

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

Sample Receipt Information

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

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature	Cooler Temp: 4.8°C		NA ☐
Water - VOA vials have zero headspace / no bubbles?	Yes ☑	No ☐	No VOA vials submitted ☐
Sample labels checked for correct preservation?	Yes ☑	No ☐	
Metal - pH acceptable upon receipt (pH<2)?	Yes ☐	No ☐	NA ☑
Samples Received on Ice?	Yes ☑	No ☐	
	(Ice Type: WET ICE)		

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

Client contacted:
Date contacted:
Contacted by:

Comments:

Stellar Environmental Solutions 2198 Sixth St. #201 Berkeley, CA 94710	Client Project ID: #2005-65; Wadler	Date Sampled: 10/19/11
		Date Received: 10/20/11
	Client Contact: Richard Makdisi	Date Extracted: 10/21/11-10/25/11
	Client P.O.:	Date Analyzed: 10/21/11-10/25/11

Oxygenated Volatile Organics + EDB and 1,2-DCA by P&T and GC/MS*

Extraction Method: SW5030B
Analytical Method: SW8260B
Work Order: 1110623

Lab ID	1110623-001B	1110623-002B	1110623-004B	1110623-005B	Reporting Limit for DF =1	
Client ID	MW-1A	MW-1B	MW-2B	MW-3A		
Matrix	W	W	W	W		
DF	1	1	1	1	S	W
Compound	**Concentration**				ug/kg	µg/L
tert-Amyl methyl ether (TAME)	ND	ND	ND	ND	NA	0.5
t-Butyl alcohol (TBA)	ND	ND	3.6	ND	NA	2.0
1,2-Dibromoethane (EDB)	ND	ND	ND	ND	NA	0.5
1,2-Dichloroethane (1,2-DCA)	ND	5.5	3.5	ND	NA	0.5
Diisopropyl ether (DIPE)	ND	ND	ND	ND	NA	0.5
Ethyl tert-butyl ether (ETBE)	ND	ND	ND	ND	NA	0.5
Methyl-t-butyl ether (MTBE)	9.5	ND	16	26	NA	0.5
Surrogate Recoveries (%)						
%SS1:	105	106	104	105		
Comments						

* water and vapor samples are reported in µg/L, soil/sludge/solid samples in mg/kg, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts are reported in mg/L, wipe samples in µg/wipe.

ND means not detected above the reporting limit/method detection limit; N/A means analyte not applicable to this analysis; %SS = Percent Recovery of Surrogate Standard; DF = Dilution Factor

surrogate diluted out of range or coelutes with another peak; &) low surrogate due to matrix interference.

DHS ELAP Certification 1644

Angela Rydelius, Lab Manager

Stellar Environmental Solutions 2198 Sixth St. #201 Berkeley, CA 94710	Client Project ID: #2005-65; Wadler	Date Sampled: 10/19/11
		Date Received: 10/20/11
	Client Contact: Richard Makdisi	Date Extracted: 10/21/11-10/25/11
	Client P.O.:	Date Analyzed: 10/21/11-10/25/11

Oxygenated Volatile Organics + EDB and 1,2-DCA by P&T and GC/MS*

Extraction Method: SW5030B Analytical Method: SW8260B Work Order: 1110623

Lab ID	1110623-006B	1110623-008B	1110623-009B		Reporting Limit for DF =1	
Client ID	MW-3B	MW-4B	MW-5B			
Matrix	W	W	W			
DF	1	1	2		S	W
Compound	**Concentration**				ug/kg	µg/L
tert-Amyl methyl ether (TAME)	ND	ND	ND<1.0		NA	0.5
t-Butyl alcohol (TBA)	ND	ND	ND<4.0		NA	2.0
1,2-Dibromoethane (EDB)	ND	ND	ND<1.0		NA	0.5
1,2-Dichloroethane (1,2-DCA)	ND	ND	ND<1.0		NA	0.5
Diisopropyl ether (DIPE)	ND	ND	ND<1.0		NA	0.5
Ethyl tert-butyl ether (ETBE)	ND	ND	ND<1.0		NA	0.5
Methyl-t-butyl ether (MTBE)	0.66	0.72	56		NA	0.5
Surrogate Recoveries (%)						
%SS1:	106	105	104			
Comments						

* water and vapor samples are reported in µg/L, soil/sludge/solid samples in mg/kg, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts are reported in mg/L, wipe samples in µg/wipe.

ND means not detected above the reporting limit/method detection limit; N/A means analyte not applicable to this analysis; %SS = Percent Recovery of Surrogate Standard; DF = Dilution Factor

\# surrogate diluted out of range or coelutes with another peak; &) low surrogate due to matrix interference.

DHS ELAP Certification 1644

AR Angela Rydelius, Lab Manager

Stellar Environmental Solutions 2198 Sixth St. #201 Berkeley, CA 94710	Client Project ID: #2005-65; Wadler	Date Sampled: 10/19/11 Date Received: 10/20/11
	Client Contact: Richard Makdisi	Date Extracted: 10/22/11-10/26/11
	Client P.O.:	Date Analyzed: 10/22/11-10/26/11

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

Extraction method: SW5030B   Analytical methods: SW8021B/8015Bm   Work Order: 1110623

Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS	Comments
001A	MW-1A	W	86	ND	0.98	1.3	1.7	5.7	1	100	d1
002A	MW-1B	W	ND	ND	ND	ND	ND	ND	1	92	
003A	MW-2A	W	150	ND	ND	0.55	ND	ND	1	114	d9,b1
004A	MW-2B	W	ND	24	ND	ND	ND	ND	1	105	
005A	MW-3A	W	ND	18	ND	ND	ND	ND	1	102	
006A	MW-3B	W	55	ND	ND	ND	ND	ND	1	99	d6
007A	MW-4A	W	ND	ND	ND	ND	ND	ND	1	107	
008A	MW-4B	W	ND	ND	ND	ND	ND	ND	1	114	
009A	MW-5B	W	110	58	ND	ND	ND	ND	1	100	d9

Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	5.0	0.5	0.5	0.5	0.5	µg/L
	S	1.0	0.05	0.005	0.005	0.005	0.005	mg/Kg

* water and vapor samples are reported in ug/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples and all TCLP & SPLP extracts in mg/L.

cluttered chromatogram; sample peak coelutes w/surrogate peak; low surrogate recovery due to matrix interference. %SS = Percent Recovery of Surrogate Standard; DF = Dilution Factor

The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation:
b1) aqueous sample that contains greater than ~1 vol. % sediment
d1) weakly modified or unmodified gasoline is significant
d6) one to a few isolated non-target peaks present in the TPH(g) chromatogram
d9) no recognizable pattern

DHS ELAP Certification 1644   Angela Rydelius, Lab Manager

QC SUMMARY REPORT FOR SW8260B

W.O. Sample Matrix: Water   QC Matrix: Water   BatchID: 62038   WorkOrder: 1110623

EPA Method: SW8260B   **Extraction: SW5030B**   **Spiked Sample ID: 1110623-001B**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
tert-Amyl methyl ether (TAME)	ND	10	97.8	99.8	1.99	85	87.1	2.36	70 - 130	30	70 - 130	30
t-Butyl alcohol (TBA)	ND	50	106	107	0.395	91.2	92.6	1.44	70 - 130	30	70 - 130	30
1,2-Dibromoethane (EDB)	ND	10	108	113	3.78	96.3	99.2	2.96	70 - 130	30	70 - 130	30
1,2-Dichloroethane (1,2-DCA)	ND	10	116	120	3.41	95.6	98.5	3.03	70 - 130	30	70 - 130	30
Diisopropyl ether (DIPE)	ND	10	117	119	2.41	96.9	99.2	2.42	70 - 130	30	70 - 130	30
Ethyl tert-butyl ether (ETBE)	ND	10	101	103	2.41	91.7	94.6	3.10	70 - 130	30	70 - 130	30
Methyl-t-butyl ether (MTBE)	9.5	10	108	115	3.50	87.5	89.8	2.39	70 - 130	30	70 - 130	30
%SS1:	105	25	114	116	1.79	101	102	0.606	70 - 130	30	70 - 130	30

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
NONE

BATCH 62038 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1110623-001B	10/19/11 10:55 AM	10/21/11	10/21/11 1:25 PM	1110623-002B	10/19/11 2:05 PM	10/21/11	10/21/11 5:17 PM
1110623-004B	10/19/11 2:55 PM	10/21/11	10/21/11 5:55 PM	1110623-005B	10/19/11 11:10 AM	10/21/11	10/21/11 7:51 PM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

Laboratory extraction solvents such as methylene chloride and acetone may occasionally appear in the method blank at low levels.

DHS ELAP Certification 1644   QA/QC Officer

QC SUMMARY REPORT FOR SW8260B

W.O. Sample Matrix: Water | QC Matrix: Water | BatchID: 62086 | WorkOrder: 1110623

EPA Method: SW8260B | **Extraction: SW5030B** | **Spiked Sample ID: 1110636-010B**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
tert-Amyl methyl ether (TAME)	ND	10	85.6	87.8	2.42	72.3	82.3	12.9	70 - 130	30	70 - 130	30
t-Butyl alcohol (TBA)	ND	50	89.9	97.2	7.77	74.6	85.6	13.7	70 - 130	30	70 - 130	30
1,2-Dibromoethane (EDB)	ND	10	102	104	2.48	86.1	98.7	13.7	70 - 130	30	70 - 130	30
1,2-Dichloroethane (1,2-DCA)	ND	10	104	103	0.192	86.5	97.7	12.2	70 - 130	30	70 - 130	30
Diisopropyl ether (DIPE)	ND	10	113	114	0.893	84.2	95.5	12.6	70 - 130	30	70 - 130	30
Ethyl tert-butyl ether (ETBE)	ND	10	93.7	94	0.258	78.8	90.7	14.1	70 - 130	30	70 - 130	30
Methyl-t-butyl ether (MTBE)	ND	10	108	110	1.42	75.4	86.5	13.0	70 - 130	30	70 - 130	30
%SS1:	104	25	114	112	1.12	102	103	0.432	70 - 130	30	70 - 130	30

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
NONE

BATCH 62086 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1110623-006B	10/19/11 12:40 PM	10/21/11	10/21/11 8:29 PM	1110623-008B	10/19/11 12:15 PM	10/25/11	10/25/11 1:08 AM
1110623-009B	10/19/11 1:30 PM	10/25/11	10/25/11 1:46 AM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

Laboratory extraction solvents such as methylene chloride and acetone may occasionally appear in the method blank at low levels.

DHS ELAP Certification 1644 ________ QA/QC Officer

QC SUMMARY REPORT FOR SW8021B/8015Bm

W.O. Sample Matrix: Water   QC Matrix: Water   BatchID: 62022   WorkOrder: 1110623

EPA Method: SW8021B/8015Bm   **Extraction: SW5030B**   **Spiked Sample ID: 1110576-007A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
TPH(btex)£	ND	60	95.9	95.2	0.730	95.4	96.9	1.58	70 - 130	20	70 - 130	20
MTBE	ND	10	116	118	1.57	113	121	7.03	70 - 130	20	70 - 130	20
Benzene	ND	10	109	107	1.87	110	110	0	70 - 130	20	70 - 130	20
Toluene	ND	10	95.6	95.8	0.181	97.4	99.1	1.72	70 - 130	20	70 - 130	20
Ethylbenzene	ND	10	97.1	96.5	0.639	98.5	98.5	0	70 - 130	20	70 - 130	20
Xylenes	ND	30	109	108	0.875	111	112	1.13	70 - 130	20	70 - 130	20
%SS:	93	10	103	101	1.99	102	103	0.553	70 - 130	20	70 - 130	20

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
NONE

BATCH 62022 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1110623-001A	10/19/11 10:55 AM	10/26/11	10/26/11 1:39 AM	1110623-002A	10/19/11 2:05 PM	10/22/11	10/22/11 2:58 PM
1110623-003A	10/19/11 10:45 AM	10/26/11	10/26/11 3:06 AM	1110623-004A	10/19/11 2:55 PM	10/22/11	10/22/11 3:58 PM
1110623-005A	10/19/11 11:10 AM	10/22/11	10/22/11 4:28 PM				

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = matrix interference and/or analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content, or inconsistency in sample containers.

DHS ELAP Certification 1644   QA/QC Officer

QC SUMMARY REPORT FOR SW8021B/8015Bm

W.O. Sample Matrix: Water QC Matrix: Water BatchID: 62085 WorkOrder: 1110623

EPA Method: SW8021B/8015Bm **Extraction: SW5030B** **Spiked Sample ID: 1110623-007A**

Analyte	Sample	Spiked	MS	MSD	MS-MSD	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)			
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	MS / MSD	RPD	LCS/LCSD	RPD
TPH(btex)£	ND	60	96.1	94.5	1.77	96.6	93.6	3.21	70 - 130	20	70 - 130	20
MTBE	ND	10	98.5	103	4.05	93.9	95.9	2.05	70 - 130	20	70 - 130	20
Benzene	ND	10	115	120	4.00	114	117	2.20	70 - 130	20	70 - 130	20
Toluene	ND	10	102	106	3.25	102	104	1.64	70 - 130	20	70 - 130	20
Ethylbenzene	ND	10	105	107	2.51	103	104	0.672	70 - 130	20	70 - 130	20
Xylenes	ND	30	118	122	2.85	117	117	0	70 - 130	20	70 - 130	20
%SS:	107	10	106	109	2.28	103	108	4.61	70 - 130	20	70 - 130	20

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:
NONE

BATCH 62085 SUMMARY

Lab ID	Date Sampled	Date Extracted	Date Analyzed	Lab ID	Date Sampled	Date Extracted	Date Analyzed
1110623-006A	10/19/11 12:40 PM	10/26/11	10/26/11 4:32 AM	1110623-007A	10/19/11 10:05 AM	10/26/11	10/26/11 3:34 AM
1110623-008A	10/19/11 12:15 PM	10/22/11	10/22/11 8:00 PM	1110623-009A	10/19/11 1:30 PM	10/22/11	10/22/11 8:30 PM

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = matrix interference and/or analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content, or inconsistency in sample containers.

DHS ELAP Certification 1644 QA/QC Officer

APPENDIX D

HISTORICAL GROUNDWATER ELEVATION AND ANALYTICAL DATA

TABLE A
Historical Groundwater Monitoring Well Data
2836 Union Street, Oakland, California

MW-1A

Sampling Event No.	Date Sampled	Depth to Groundwater (a)	Groundwater Elevation (b)	Dissolved Oxygen	TVH-g	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
1	Oct-06	dry	dry	NA	NS	NS	NS	NS	NS	NS
2	Jan-07	9.80	2.45	NA	790	94	< 0.5	8.6	< 0.5	100
3	Apr-07	7.49	4.76	NA	760	63	<0.5	1.9	<0.5	150
4	Jul-07	7.16	5.09	NA	NS	NS	NS	NS	NS	NS
5	Oct-07	7.29	4.96	NA	830	28	<0.7	13	<0.7	110
6	Jan-08	6.82	5.70	NA	720	8.1	< 0.5	< 0.5	< 0.5	130
7	Apr-08	6.32	5.70	NA	NS	NS	NS	NS	NS	NS
8	Jul-08	8.25	4.00	NA	120	1.0	<0.5	<0.5	<0.5	86
9	Oct-08	9.04	3.21	NS	NS	NS	NS	NS	NS	NS
10	Jan-09	7.00	5.25	NA	63	1.2	<0.5	<0.5	<0.5	77
11	Apr-09	5.62	6.63	7,100	89	8.7	<0.5	0.75	<0.5	150
12	Oct-09	7.62	4.63	1,700	72	1.5	<0.5	<0.5	<0.5	110
13	Apr-10	5.74	6.51	3,400	<50	<0.5	<0.5	<0.5	<0.5	28
14	Oct-10	7.60	4.65	NS	NS	NS	NS	NS	NS	NS
15	Apr-11	5.92	6.83	NS	<50	<0.5	<0.5	<0.5	<0.5	2
16	Oct-11	7.17	5.08	NS	86	0.98	1.3	1.7	5.7	<5.0

MW-1B

Sampling Event No.	Date Sampled	Depth to Groundwater (a)	Groundwater Elevation (b)	Dissolved Oxygen	TVH-g	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
1	Oct-06	7.44	4.56	NA	350	<1.3	<1.3	<1.3	<1.3	2.7
2	Jan-07	6.40	5.65	NA	350	<1.3	<1.3	<1.3	<1.3	3.6
3	Apr-07	6.42	5.63	NA	320	<0.5	<0.5	<0.5	<0.5	4.2
4	Jul-07	7.19	4.86	NA	200	<1.3	<1.3	<1.3	<1.3	3.2
5	Oct-07	7.10	4.95	NA	230	<0.7	<0.7	<0.7	<0.7	6.0
6	Jan-08	5.81	6.67	NA	400	< 0.5	< 0.5	< 0.5	< 0.5	6.2
7	Apr-08	6.82	5.23	NA	350	<0.5	<0.5	<0.5	<0.5	7.8
8	Jul-08	7.62	4.43	NA	300	<0.5	<0.5	<0.5	<0.5	8.4
9	Oct-08	8.21	3.84	3,600	520	<0.5	<0.5	<0.5	<0.5	5.9
10	Jan-09	6.89	5.16	6,160	300	<0.5	<0.5	<0.5	<0.5	7.5
11	Apr-09	6.27	5.78	6,000	1,400	<1.0	<1.0	<1.0	<1.0	7.7
12	Oct-09	7.32	4.73	700	150	<0.5	<0.5	<0.5	<0.5	8.5
13	Apr-10	4.92	7.13	600	760	<0.5	<0.5	<0.5	<0.5	5.8
14	Oct-10	7.58	4.47	1,170	280	<0.5	<0.5	<0.5	<0.5	8.4
15	Apr-11	5.84	6.21	2,560	81	<0.5	<0.5	<0.5	<0.5	17
16	Oct-11	7.72	4.33	2,440	<50	<0.5	<0.5	<0.5	<0.5	<5.0

MW-2A

Sampling Event No.	Date Sampled	Depth to Groundwater (a)	Groundwater Elevation (b)	Dissolved Oxygen	TVH-g	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
1	Oct-06	7.93	4.87	NA	80	<0.5	<0.5	<0.5	<0.5	<0.5
2	Jan-07	6.58	6.24	NA	490	<0.5	<0.5	<0.5	<0.5	<0.5
3	Apr-07	6.52	6.30	NA	83	<0.5	<0.5	<0.5	<0.5	<0.5
4	Jul-07	7.37	5.45	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5
5	Oct-07	7.33	5.49	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5
6	Jan-08	5.50	7.56	NA	<50	<0.5	<0.5	<0.5	<0.5	<2.0
7	Apr-08	6.86	5.96	NA	160	<0.5	<0.5	<0.5	<0.5	3.0
8	Jul-08	7.70	5.12	NA	97	<0.5	<0.5	<0.5	<0.5	5.5
9	Oct-08	8.44	4.38	3,280	71	<0.5	<0.5	<0.5	<0.5	<2.0
10	Jan-09	6.99	5.83	2,120	<50	<0.5	<0.5	<0.5	<0.5	<2.0
11	Apr-09	6.47	6.35	5,800	110	<0.5	<0.5	<0.5	<0.5	1.9
12	Oct-09	6.93	5.89	700	75	<0.5	<0.5	<0.5	<0.5	<2.0
13	Apr-10	4.82	8.00	500	210	<0.5	<0.5	<0.5	<0.5	3.1
14	Oct-10	7.90	4.92	7,900	68	<0.5	<0.5	<0.5	<0.5	NS
15	Apr-11	6.08	6.74	1,800	130	<0.5	<0.5	<0.5	<0.5	2.4
16	Oct-11	7.44	5.38	390	150	<0.5	0.55	<0.5	<0.5	<5.0

Table A continued

MW-2B

Sampling Event No.	Date Sampled	Depth to Groundwater (a)	Groundwater Elevation (b)	Dissolved Oxygen	TVH-g	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
1	Oct-06	7.90	5.06	NA	NS	NS	NS	NS	NS	NS
2	Jan-07	6.59	6.37	NA	2,000	<0.5	1.1	6.7	0.8	19
3	Apr-07	6.20	6.76	NA	84	<0.5	<0.5	<0.5	<0.5	18
4	Jul-07	7.33	5.63	NA	580	<0.5	<0.5	<0.5	<0.5	6.0
5	Oct-07	7.12	5.84	NA	1,700	<0.5	<0.5	<0.5	<0.5	83
6	Jan-08	5.51	7.65	NA	780	< 0.5	< 0.5	< 0.5	< 0.5	32
7	Apr-08	6.56	6.40	NA	92	<0.5	<0.5	<0.5	<0.5	2.4
8	Jul-08	7.78	5.18	NA	570	<0.5	<0.5	<0.5	0.72	17
9	Oct-08	8.62	4.34	NS	NS	NS	NS	NS	NS	NS
10	Jan-09	7.03	5.93	2,160	110	<0.5	<0.5	<0.5	<0.5	27
11	Apr-09	6.21	6.75	5,800	250	<0.5	<0.5	<0.5	<0.5	30
12	Oct-09	8.03	4.93	1,400	65	<0.5	<0.5	<0.5	<0.5	22
13	Apr-10	5.73	7.23	1,100	<50	3.2	<0.5	0.68	<0.5	86
14	Oct-10	7.60	5.36	980	140	<0.5	<0.5	<0.5	<0.5	20
15	Apr-11	4.45	8.51	2,690	<50	<0.5	<0.5	<0.5	<0.5	25
16	Oct-11	8.34	4.62	520	<50	<0.5	<0.5	<0.5	<0.5	24

MW-3A

Sampling Event No.	Date Sampled	Depth to Groundwater (a)	Groundwater Elevation (b)	Dissolved Oxygen	TVH-g	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
1	Oct-06	dry	dry	NA	NS	NS	NS	NS	NS	NS
2	Jan-07	6.32	5.27	NA	NS	NS	NS	NS	NS	NS
3	Apr-07	5.75	5.84	NA	<50	<0.5	<0.5	<0.5	<0.5	75
4	Jul-07	6.19	5.40	NA	NS	NS	NS	NS	NS	NS
5	Oct-07	6.50	5.09	NA	<50	<0.5	<0.5	<0.5	<0.5	<0.5
6	Jan-08	5.69	6.07	NA	<50	< 0.5	< 0.5	< 0.5	< 0.5	70
7	Apr-08	6.56	6.40	NA	<50	<0.5	<0.5	<0.5	<0.5	77
8	Jul-08	6.73	4.86	NA	<50	<0.5	<0.5	<0.5	<0.5	56
9	Oct-08	8.68	2.91	NS	NS	NS	NS	NS	NS	NS
10	Jan-09	6.28	5.31	NS	NS	NS	NS	NS	NS	NS
11	Apr-09	5.58	6.01	8,100	<50	<0.5	<0.5	<0.5	<0.5	52
12	Oct-09	6.89	4.70	7,100	NS	NS	NS	NS	NS	NS
13	Apr-10	5.67	5.92	9,500	<50	<0.5	<0.5	<0.5	<0.5	25
14	Oct-10	7.13	4.46	NS	NS	NS	NS	NS	NS	NS
15	Apr-11	5.93	5.66	1,770	<50	<0.5	<0.5	<0.5	<0.5	18
16	Oct-11	6.65	4.94	1,680	<50	<0.5	<0.5	<0.5	<0.5	18

MW-3B

Sampling Event No.	Date Sampled	Depth to Groundwater (a)	Groundwater Elevation (b)	Dissolved Oxygen	TVH-g	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
1	Oct-06	7.34	4.61	NA	1,900	<10	<10	<10	<10	<10
2	Jan-07	6.41	5.54	NA	1,900	<8.3	<8.3	<8.3	<8.3	<8.3
3	Apr-07	6.39	5.56	NA	1,900	<0.5	<0.5	<0.5	<0.5	<0.5
4	Jul-07	7.15	4.80	NA	1,200	<2.0	<2.0	<2.0	<2.0	<2.0
5	Oct-07	7.11	4.84	NA	2,100	<7.1	<7.1	<7.1	<7.1	<7.1
6	Jan-08	5.60	6.50	NA	2,100	< 0.5	< 0.5	< 0.5	< 0.5	<2.0
7	Apr-08	6.77	5.18	NA	1,800	<0.5	<0.5	<0.5	<0.5	<2.0
8	Jul-08	7.50	4.45	NA	1,700	<0.5	<0.5	<0.5	<0.5	<2.0
9	Oct-08	8.11	3.84	1,490	2,300	<0.5	<0.5	<0.5	<0.5	<2.0
10	Jan-09	6.84	5.11	1,480	1,500	<0.5	<0.5	<0.5	<0.5	<2.0
11	Apr-09	6.24	5.71	5,300	4,900	<0.5	<0.5	<0.5	<0.5	<2.0
12	Oct-09	6.49	5.46	400	1,700	<0.5	<0.5	<0.5	<0.5	<2.0
13	Apr-10	4.98	6.97	300	4,800	<0.5	<0.5	<0.5	<0.5	<5.0
14	Oct-10	7.58	4.37	2,050	1,900	<0.5	<0.5	<0.5	NS	<0.5
15	Apr-11	5.86	6.09	7,810	1,900	<5.0	<5.0	<5.0	<5.0	<5.0
16	Oct-11	7.16	4.79	2,880	55	<0.5	<0.5	<0.5	<0.5	<5.0

Table A continued

MW-4A										
Sampling Event No.	**Date Sampled**	**Depth to Groundwater (a)**	**Groundwater Elevation (b)**	**Dissolved Oxygen**	**TVH-g**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**MTBE**
1	Oct-06	9.74	1.28	*NA*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
2	Jan-07	5.64	5.38	*NA*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	72
3	Apr-07	5.34	5.68	*NA*	*<50*	*<0.5*	*0.6*	*<0.5*	0.6	77
4	Jul-07	5.71	5.31	*NA*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	64
5	Oct-07	6.09	4.93	*NA*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	73
6	Jan-08	5.53	5.72	*NA*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
7	Apr-08	5.56	5.46	*NA*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	61
8	Jul-08	6.30	4.34	*NA*	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	46
9	Oct-08	10.45	0.57	1,870	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	66
10	Jan-09	6.00	5.02	2,350	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	6.7
11	Apr-09	5.45	5.57	7,100	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	11
12	Oct-09	6.41	4.61	3,100	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
13	Apr-10	4.15	6.87	6,900	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	16
14	Oct-10	6.17	4.85	810	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
15	Apr-11	5.23	5.79	1,810	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*6.8*
16	Oct-11	5.95	5.07	NS	*<50*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<5.0*

MW-4B										
Sampling Event No.	**Date Sampled**	**Depth to Groundwater (a)**	**Groundwater Elevation (b)**	**Dissolved Oxygen**	**TVH-g**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**MTBE**
1	Oct-06	6.63	4.41	*NA*	1,100	*<2.5*	*<2.5*	*<2.5*	*<2.5*	*<2.5*
2	Jan-07	5.55	5.49	*NA*	1,300	*<4.2*	*<4.2*	*<4.2*	*<4.2*	*<4.2*
3	Apr-07	5.45	5.59	*NA*	1,300	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*
4	Jul-07	6.28	4.76	*NA*	1,000	*<4.2*	*<4.2*	*<4.2*	*<4.2*	*<4.2*
5	Oct-07	6.13	4.91	*NA*	1,400	*<4.2*	*<4.2*	*<4.2*	*<4.2*	*<4.2*
6	Jan-08	4.81	6.44	*NA*	1,500	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
7	Apr-08	5.90	5.14	*NA*	1,500	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
8	Jul-08	6.70	4.34	*NA*	1,200	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
9	Oct-08	7.24	3.80	1,960	1,600	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
10	Jan-09	6.00	5.04	1,620	980	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*
11	Apr-09	5.35	5.69	5,200	3,700	*<4.2*	*<4.2*	*<4.2*	*<4.2*	<4.2
12	Oct-09	5.61	5.43	500	1,100	*<0.5*	*<0.5*	*<0.5*	*<0.5*	<2.0
13	Apr-10	4.01	7.03	500	3,700	*<4..2*	*<4..2*	*<4..2*	*<4..2*	*<4..2*
14	Oct-10	6.60	4.44	160	1,400	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*NS*
15	Apr-11	4.88	6.16	1,630	1,200	*<4.2*	*<4.2*	*<4.2*	*<4.2*	*<4.2*
16	Oct-11	6.28	4.76	520	<50	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<5.0*

Table A continued

MW-5A										
Sampling Event No.	**Date Sampled**	**Depth to Groundwater (a)**	**Groundwater Elevation (b)**	**Dissolved Oxygen**	**TVH-g**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**MTBE**
1	Oct-06	9.60	2.82	*NA*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
2	Jan-07	6.72	6.10	*NA*	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
3	Apr-07	5.74	6.68	*NA*	1,000	6.6	*<0.5*	29	7.6	79
4	Jul-07	6.98	5.44	*NA*	NS	*NS*	*NS*	*NS*	*NS*	*NS*
5	Oct-07	8.32	4.10	*NA*	820	6.6	*<0.5*	6.6	1.8	78
Well Destoyed in November 2007										

MW-5B										
Sampling Event No.	**Date Sampled**	**Depth to Groundwater (a)**	**Groundwater Elevation (b)**	**Dissolved Oxygen**	**TVH-g**	**Benzene**	**Toluene**	**Ethylbenzene**	**Total Xylenes**	**MTBE**
1	Oct-06	9.07	3.31	*NA*	13,000	9.6	0.6	21	1.9	37
2	Jan-07	6.45	5.93	*NA*	6,600	4.0	*<0.5*	10	1.0	22
3	Apr-07	6.45	5.93	*NA*	3,300	0.7	*<0.5*	2.7	*<0.5*	*<0.5*
4	Jul-07	7.15	5.23	*NA*	2,000	1.1	*<0.5*	2.2	*<0.5*	26
5	Oct-07	7.28	5.10	*NA*	1,200	*<0.5*	*<0.5*	*<0.5*	*<0.5*	45
6	Jan-08	4.94	7.63	*NA*	1,200	*<0.5*	*<0.5*	4.1	*<0.5*	69
7	Apr-08	6.51	5.87	*NA*	240	*<0.5*	*<0.5*	<0.5	*<0.5*	65
8	Jul-08	7.64	4.74	*NA*	310	*<0.5*	*<0.5*	<0.5	*<0.5*	68
9	Oct-08	8.24	4.14	1,670	780	*<0.5*	*<0.5*	<0.5	*<0.5*	84
10	Jan-09	6.93	5.45	3,210	1,200	*<0.5*	*<0.5*	<0.5	4.2	56
11	Apr-09	5.82	6.56	5,900	220	*<0.5*	*<0.5*	*<0.5*	*<0.5*	73
12	Oct-09	7.34	5.04	7,100	76	*<0.5*	*<0.5*	*<0.5*	*<0.5*	71
13	Apr-10	4.71	7.67	7,900	90	*<0.5*	*<0.5*	*<0.5*	*<0.5*	4.9
14	Oct-10	7.34	5.04	1,930	870	*<0.5*	*<0.5*	*<0.5*	*<0.5*	66
15	Apr-11	5.64	6.75	3,190	890	*<0.5*	*<0.5*	*<0.5*	*<0.5*	95
16	Oct-11	8.36	4.02	640	110	*<0.5*	*<0.5*	*<0.5*	*<0.5*	58

Notes:

All concentrations reported in micrograms per liter.

TVH-g = Total volatile hydrocarbons – gasoline range.

NA = Not analyzed for this constituent. NS = Not sampled

(a) Feet below top of casing

(b) Relative to mean sea level

TABLE B

Historical Groundwater Monitoring Well Groundwater Analytical Results

Lead Scavengers and Fuel Oxygenates (µg/L)

2836 Union Street, Oakland, California

MW-1A							
Sampling Event No.	**Date Sampled**	**EDC**	**EDB**	**ETBE**	**DIPE**	**TAME**	**TBA**
1	Oct-06	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
2	Jan-07	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*
3	Apr-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
4	Jul-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
5	Oct-07	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*
6	Jan-08	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
7	Apr-08	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
8	Jul-08	*<0.5*	*<0.5*	*<0.5*	*<0.5*	1	*<10*
9	Oct-08	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
10	Jan-09	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
11	Apr-09	*<0.5*	*<0.5*	*<0.5*	*<0.5*	0.8	12
12	Oct-09	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<20*
13	Apr-10	3.5	*<0.5*	*<0.5*	*<0.5*	<0.5	<10
14	Oct-10	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
15	Apr-11	<0.5	<0.5	<0.5	<0.5	<0.5	<10
16	Oct-11	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0

MW-1B							
Sampling Event No.	**Date Sampled**	**EDC**	**EDB**	**ETBE**	**DIPE**	**TAME**	**TBA**
1	Oct-06	3.1	*<1.3*	*<1.3*	*<1.3*	*<1.3*	*<25*
2	Jan-07	3.3	*<1.3*	*<1.3*	*<1.3*	*<1.3*	*<25*
3	Apr-07	4.8	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
4	Jul-07	3.4	*<1.3*	*<1.3*	*<1.3*	*<1.3*	*<25*
5	Oct-07	3.3	*<1.3*	*<1.3*	*<1.3*	*<1.3*	*<25*
6	Jan-08	4.7	*<1.3*	*<1.3*	*<1.3*	*<1.3*	*<25*
7	Apr-08	4.7	*<1.3*	*<1.3*	*<1.3*	*<1.3*	*<25*
8	Jul-08	5.4	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
9	Oct-08	3	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<20*
10	Jan-09	4.4	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<20*
11	Apr-09	2.9	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<20*
12	Oct-09	3.9	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<20*
13	Apr-10	1.7	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<20*
14	Oct-10	3.3	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
15	Apr-11	4.5	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
16	Oct-11	5.5	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*

Table B continued

MW-2A

Sampling Event No.	Date Sampled	EDC	EDB	ETBE	DIPE	TAME	TBA
1	Oct-06	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
2	Jan-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
3	Apr-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
4	Jul-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
5	Oct-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
6	Jan-08	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
7	Apr-08	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
8	Jul-08	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
9	Oct-08	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
10	Jan-09	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
11	Apr-09	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
12	Oct-09	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
13	Apr-10	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
14	Oct-10	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
15	Apr-11	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
16	Oct-11	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*

MW-2B

Sampling Event No.	Date Sampled	EDC	EDB	ETBE	DIPE	TAME	TBA
1	Oct-06	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
2	Jan-07	4.1	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
3	Apr-07	6.9	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
4	Jul-07	1.4	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
5	Oct-07	4.1	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
6	Jan-08	3.9	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
7	Apr-08	3.9	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
8	Jul-08	1.3	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
9	Oct-08	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
10	Jan-09	4.3	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
11	Apr-09	2.4	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
12	Oct-09	4.4	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
13	Apr-10	<0.5	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
14	Oct-10	0.8	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
15	Apr-11	1.0	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
16	Oct-11	3.5	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*3.6*

Table B continued

MW-3A							
Sampling Event No.	**Date Sampled**	**EDC**	**EDB**	**ETBE**	**DIPE**	**TAME**	**TBA**
1	Oct-06	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
2	Jan-07	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
3	Apr-07	0.9	*<0.5*	*<0.5*	*<0.5*	*<0.5*	14
4	Jul-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
5	Oct-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
6	Jan-08	0.8	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
7	Apr-08	0.8	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
8	Jul-08	0.8	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
9	Oct-08	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
10	Jan-09	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
11	Apr-09	1.2	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
12	Oct-09	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
13	Apr-10	<0.5	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
14	Oct-10	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
15	Apr-11	0.5	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
16	Oct-11	<0.5	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*

MW-3B							
Sampling Event No.	**Date Sampled**	**EDC**	**EDB**	**ETBE**	**DIPE**	**TAME**	**TBA**
1	Oct-06	*<10*	*<10*	*<10*	*<10*	*<10*	*<200*
2	Jan-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
3	Apr-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
4	Jul-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
5	Oct-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
6	Jan-08	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
7	Apr-08	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
8	Jul-08	*<6.3*	*<6.3*	*<6.3*	*<6.3*	*<6.3*	*<130*
9	Oct-08	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<100*
10	Jan-09	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<100*
11	Apr-09	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<5.0*	*<100*
12	Oct-09	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
13	Apr-10	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
14	Oct-10	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
15	Apr-11	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<100*
16	Oct-11	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*

Table B continued

MW-4A

Sampling Event No.	Date Sampled	EDC	EDB	ETBE	DIPE	TAME	TBA
1	Oct-06	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
2	Jan-07	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*
3	Apr-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
4	Jul-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
5	Oct-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
6	Jan-08	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
7	Apr-08	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
8	Jul-08	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
9	Oct-08	*<4.2*	*<4.2*	*<4.2*	*<4.2*	*<4.2*	*<83*
10	Jan-09	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
11	Apr-09	11	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
12	Oct-09	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
13	Apr-10	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
14	Oct-10	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
15	Apr-11	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
16	Oct-11	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*

MW-4B

Sampling Event No.	Date Sampled	EDC	EDB	ETBE	DIPE	TAME	TBA
1	Oct-06	*<2.5*	*<0.5*	*<1*	*<1*	*<2.5*	*<50*
2	Jan-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
3	Apr-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
4	Jul-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
5	Oct-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
6	Jan-08	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
7	Apr-08	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
8	Jul-08	*<4.2*	*<4.2*	*<4.2*	*<4.2*	*<4.2*	*<83*
9	Oct-08	*<4.2*	*<4.2*	*<4.2*	*<4.2*	*<4.2*	*<83*
10	Jan-09	*<4.2*	*<4.2*	*<4.2*	*<4.2*	*<4.2*	*<83*
11	Apr-09	*<4.2*	*<4.2*	*<4.2*	*<4.2*	*<4.2*	*<83*
12	Oct-09	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
13	Apr-10	*<4.2*	*<4.2*	*<4.2*	*<4.2*	*<4.2*	*<83*
14	Oct-10	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
15	Apr-11	*<4.2*	*<4.2*	*<4.2*	*<4.2*	*<4.2*	*<83*
16	Oct-11	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<2.0*

Table B continued

MW-5A							
Sampling Event No.	**Date Sampled**	**EDC**	**EDB**	**ETBE**	**DIPE**	**TAME**	**TBA**
1	Oct-06	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
2	Jan-07	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
3	Apr-07	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*4.3*	*<10*
4	Jul-07	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
5	Oct-07	*NS*	*NS*	*NS*	*NS*	*NS*	*NS*
Well Destoyed in November 2007							

Table B continued

MW-5B							
Sampling Event No.	**Date Sampled**	**EDC**	**EDB**	**ETBE**	**DIPE**	**TAME**	**TBA**
1	Oct-06	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*1.5*	*<10*
2	Jan-07	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
3	Apr-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
4	Jul-07	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
5	Oct-07	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<10*
6	Jan-08	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
7	Apr-08	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
8	Jul-08	*<0.5*	*<0.5*	*<0.5*	*<0.5*	3.3	*<10*
9	Oct-08	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*	*<0.5*
10	Jan-09	*<0.5*	*<0.5*	*<0.5*	*<0.5*	2.3	*<10*
11	Apr-09	*<0.5*	*<0.5*	*<0.5*	*<0.5*	3.5	*<10*
12	Oct-09	*<0.5*	*<0.5*	*<0.5*	*<0.5*	4.5	*<10*
13	Apr-10	*<0.5*	*<0.5*	*<0.5*	*<0.5*	4.9	*<10*
14	Oct-10	*<0.5*	*<0.5*	*<0.5*	*<0.5*	3.1	*<10*
15	Apr-11	*<0.5*	*<0.5*	*<0.5*	*<0.5*	3.7	*<10*
16	Oct-11	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<4.0*

Notes:

NA = Not analyzed for this constituent. NS = Not sampled

EDB = Ethylene dibromide (1,2-dibromoethane). EDC = Ethylene dichloride (1,2-dichloroethane).

DIPE = isopropyl ether. ETBE = Ethyl-tertbutyl ether. TAME = Tert-amylmethylether

TBA = Tertiary butyl alcohol