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**THIRD QUARTER 2007  
GROUNDWATER MONITORING  
REPORT**

**2836 UNION STREET  
OAKLAND, CALIFORNIA**

*Prepared for:*

**THE ESTATE OF LAWRENCE WADLER  
2525 MANDELA PARKWAY  
OAKLAND, CA 94607**

**July 2007**

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OAKLAND, CALIFORNIA**

*Prepared for:*

**THE ESTATE OF LAWRENCE WADLER  
2525 MANDELA PARKWAY  
OAKLAND, CA 94607**

*Prepared by:*

**STELLAR ENVIRONMENTAL SOLUTIONS, INC.  
2198 SIXTH STREET, SUITE 201  
BERKELEY, CALIFORNIA 94710**

**July 23, 2007**

July 23, 2007

Mr. Barney Chan  
Hazardous Materials Specialist  
Alameda County Environmental Health Care Services Agency  
Department of Environmental Health – Local Oversight Program  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502

Subject: Third Quarter 2007 Groundwater Monitoring Report  
Former Modern Mail Service, 2836 Union Street, Oakland, California  
Alameda County Environmental Health Department Fuel Leak Case No. RO2901

Dear Mr. Chan:

On behalf of the property owner and “Responsible Party” (Estate of Lawrence Wadler), Stellar Environmental Solutions, Inc. (SES) is submitting this Third Quarter 2007 Groundwater Monitoring Report for the former Modern Mail Service Facility at 2836 Union Street, Oakland, California. This report documents the Q3-2007 groundwater monitoring and sampling event of July 2007 related to petroleum contamination from a former underground fuel storage tank. This is the 4th consecutive quarterly groundwater monitoring event conducted at this site. The report has been uploaded to Alameda County Environmental Health and to the State Water Resources Control Board’s GeoTracker system.

In our professional opinion, the recent installation of ten monitoring wells to conduct quarterly groundwater monitoring is the appropriate action to further evaluate the magnitude and stability of the contaminant plume over time, to determine whether additional corrective action might be warranted, and if site closure criteria can be met.

I 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.

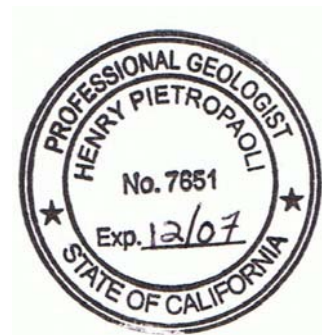
Sincerely,



Henry Pietropaoli, R.G., R.E.A.  
Project Manager



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



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## 1.0 INTRODUCTION

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### PROJECT BACKGROUND

Stellar Environmental Solutions, Inc. (SES) was contracted by Mr. Lawrence Wadler (property owner currently referred to as 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. A list of all known environmental reports is included in Section 6.0. This report discusses the third quarter groundwater monitoring event conducted on July 12, 2007. Figure 1 shows the site location. Figure 2 shows the site plan with the locations of groundwater wells, borings, and the former UFST.

### SITE DESCRIPTION AND HISTORY

The approximately 7,200-square foot rectangular 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); and
- A sidewalk, then Union Street, then an auto body repair facility (to the west).

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 Alameda County Environmental Health permit (permit No. STID 4065) 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 SES 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 (SES, 2005b).



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

**2836 Union Street  
Oakland, CA**

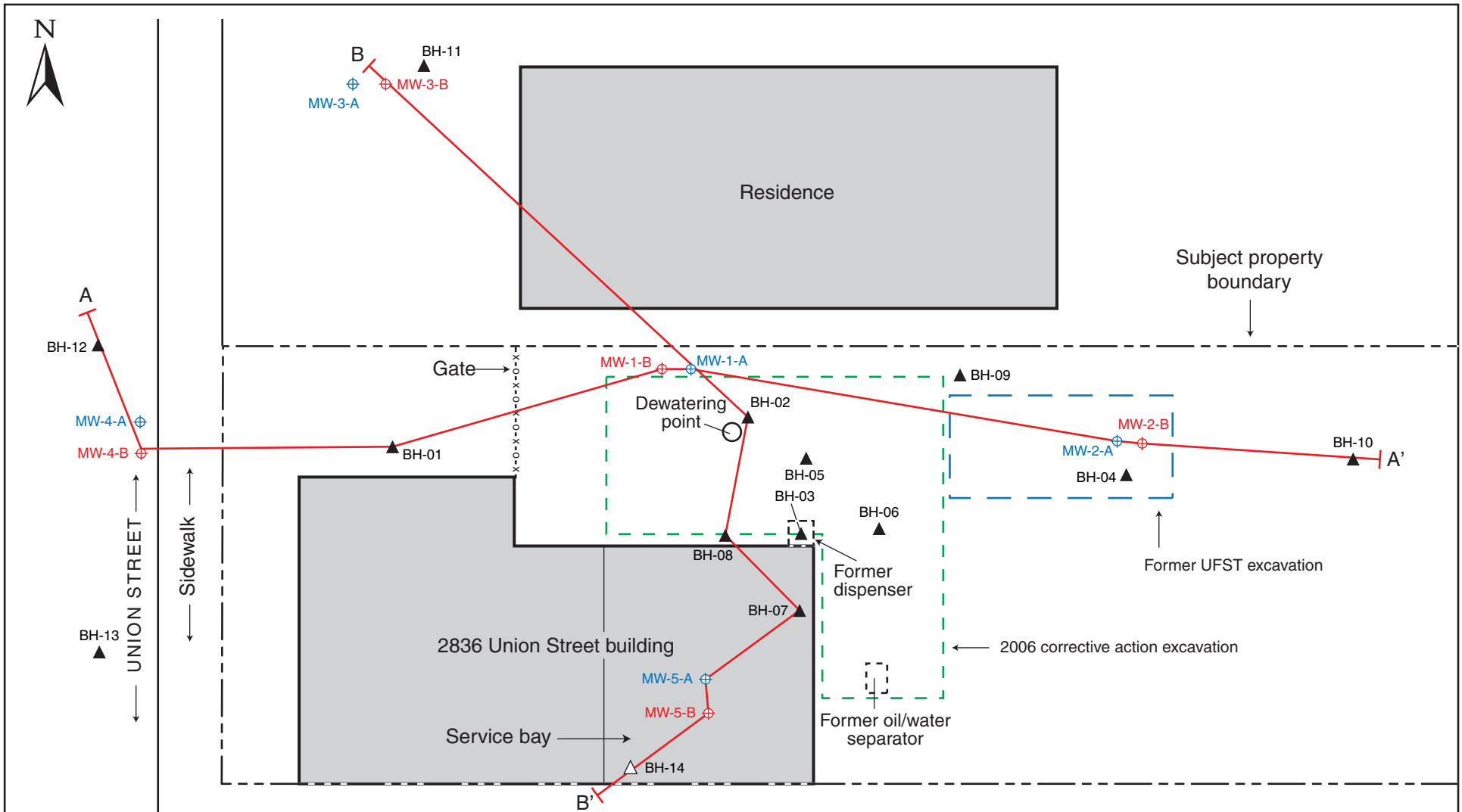
By: MJC

NOVEMBER 2005

**Figure 1**



2005-65-01



SCALE IN FEET (approx.)

**LEGEND**

- MW-1-A Groundwater monitoring well; 10'-13' deep screened interval
- MW-1-B Groundwater monitoring well; 19'-25' deep screened interval
- A-A' Cross-section A-A'
- BH-14 Exploratory borehole drilled during this investigation
- BH-01 Previous exploratory borehole (November 2005 and April 2006)

**SITE PLAN SHOWING LOCATIONS OF SOIL BORINGS**  
**2836 Union Street, Oakland, CA**

**Figure 2**

by: MJC NOVEMBER 2006

2005-65-47





Additional site investigation in April 2006 involved the advancing 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 warranting groundwater monitoring and the removal of the remaining (accessible) contaminated soils by excavation, as an interim corrective action. That investigation is summarized in a technical report (SES, 2006b).

A corrective action implementing the April 2006 recommendations conducted between September and December 2006 involved: the installation of ten monitoring wells; the advancement of one soil boring; the removal of 398 tons of contaminated soil; the pumping of 5,100 gallons of contaminated groundwater from the backfilled excavation; and the first groundwater monitoring event. Approximately 30 to 40 cubic yards of petroleum hydrocarbon-contaminated soil, at estimated concentrations of 1,000+ milligrams per kilogram (mg/kg), was inaccessible for removal and still resides beneath the building on site (SES, 2006c).

In December 2006, an additional 4,000 gallons of petroleum-contaminated water was pumped from a temporary dewatering point in the backfilled excavation and disposed of at a certified recycler. This action is discussed along with the results of the second groundwater monitoring event (SES, 2007).

## **REGULATORY STATUS**

The Alameda County Environmental Health Care Services Agency, Department of Environmental Health (Alameda County Environmental Health) is the lead regulatory agency for the case, acting as a Local Oversight Program (LOP) for the Regional Water Quality Control Board – San Francisco Bay Region (Water Board). There are no Alameda County Environmental Health or Water Board cleanup orders for the site; however, all site work has been conducted under oversight of Alameda County Environmental Health. Alameda County Environmental Health has assigned the site to its fuel leak case system (RO#2901), and a case officer has been assigned. The case has been assigned No. T0600105641 in the Water Board's GeoTracker system. Electronic uploads of required data/reports are submitted to both agencies.

The site has been granted a Letter of Commitment (and has been receiving financial reimbursement) from the California Underground Storage Tank Cleanup Fund.

## **SCOPE OF WORK**

This report discusses third quarter groundwater monitoring event conducted on July 12, 2007.

## **2.0 PHYSICAL SETTING**

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### **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.

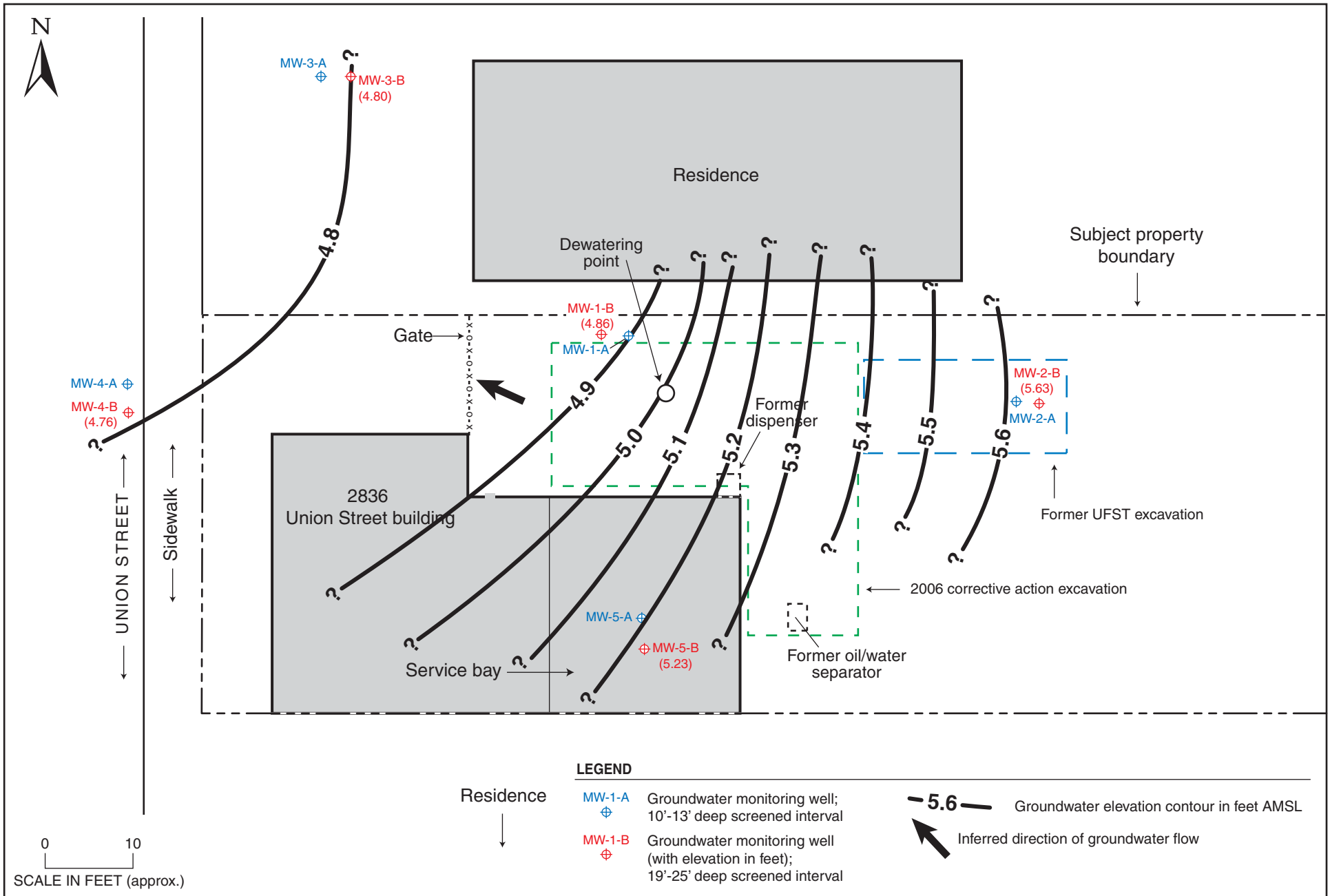
### **LITHOLOGY AND HYDROGEOLOGY**

The predominant soil type in all site boreholes was silty clay, generally firm and plastic. 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 with the occurrence of groundwater coincident in 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 under at least 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 July 12, 2007 groundwater elevation measurements. The flow direction is indicated to be to toward the west-northwest (toward San Francisco Bay), generally parallel to the long dimension of the groundwater contaminant plume. Subject property groundwater gradient in the current event was relatively flat, at approximately 0.009 feet/foot.



**GROUNDWATER ELEVATION MAP (B-WELLS)**  
**2836 Union Street, Oakland, CA**

**Figure 3**

by: MJC      JULY 2007

2005-65-55



### **3.0 THIRD QUARTER 2007 GROUNDWATER MONITORING AND SAMPLING**

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This section presents the groundwater sampling and analytical methods for the most recent event (Third Quarter 2007), conducted on July 12, 2007.

#### **GROUNDWATER MONITORING**

Groundwater monitoring well water level measurements, sampling, and field analyses were conducted by Blaine Tech Services (San Jose, California) on July 12, 2007, under the direct supervision of SES personnel. To minimize the potential for cross-contamination, wells were purged and sampled in order of anticipated increasing contamination (based on analytical results from the previous quarter).

As the first monitoring task, static water levels were measured in the ten site wells using an electric water level indicator. The wells were then sampled with a peristaltic pump, during which the groundwater quality parameters of temperature, pH, conductivity, and turbidity were field-measured using daily-calibrated instruments. Approximately 6.9 gallons of sampling purge water was generated and containerized onsite. The purge water will be disposed of at later date after subsequent monitoring events and additional purge water has accumulated. 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), an analytical laboratory certified by the State of California Environmental Laboratory Accreditation Program (ELAP).

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 SES's standard sampling protocol for groundwater. Groundwater analytical results are presented and discussed in Section 4.0. The certified analytical results are contained in Appendix C

**Table 1**  
**Monitoring Well Groundwater Elevation Data – July 12, 2007**  
**2836 Union Street, Oakland, California**

Well	Well Depth Below TOC	Rim Elevation	TOC Elevation	Groundwater Elevation (7/12/07)
MW-1A	12.59	12.52	12.25	5.09
MW-1B	22.52	12.48	12.05	4.86
MW-2A	12.69	13.06	12.82	5.45
MW-2B	24.59	13.16	12.96	5.63
MW-3A	13.06	11.76	11.59	5.40
MW-3B	25.06	12.10	11.95	4.80
MW-4A	12.28	11.25	11.02	5.31
MW-4B	24.32	11.25	11.04	4.76
MW-5A	12.58	12.56	12.42	5.44
MW-5B	25.39	12.57	12.38	5.23

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**

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### **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.

Different ESLs are published for commercial/industrial vs. residential land use, for sites where groundwater is a potential drinking water resource vs. is not 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.

In our professional opinion, the appropriate ESLs for the subject site are based on the following:

- Residential land use (due to the residence adjoining the property) and commercial/industrial use (for the subject property itself). Note that, for both soil and groundwater contaminants, all ESLs for site contaminants are the same for both residential and commercial/industrial land use.
- Groundwater is a potential drinking water resource. In our professional opinion, the appropriate ESLs for the subject site are *commercial/industrial land use* and *groundwater is a potential drinking water resource*. This is based on both the property zoning status (commercial/industrial) and the designation of this area of Oakland as “Zone A – Significant Drinking Water Resource (Water Board, 1999).
- The receiving body for groundwater discharge is an estuary (San Francisco Bay).

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 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; BTEX; and methyl *tertiary*-butyl ether (MTBE). In addition, several other contaminants were analyzed (as required by Alameda County Environmental Health)—ethanol; fuel oxygenates (*tertiary*-butyl alcohol [TBA], di-isopropyl ether [DIPE], ethyl *tertiary*-butyl ether [ETBE], and *tertiary*-amyl methyl ether [TAME]); and lead scavengers (1,2-dichloroethane [EDC] and 1,2-dibromoethane [EDB]). Fuel oxygenates and lead scavengers were analyzed in monitoring wells for which there were no data or in those that showed previous laboratory detectable concentrations for these constituents.

Groundwater samples were analyzed using the following methods for:

- Total volatile hydrocarbons (TVH) – gasoline range, by EPA Method 8015M
- BTEX and MTBE, by EPA Method 8260
- TBA, DIPE, ETBE, and TAME, by EPA Method 8260B (in accordance with Alameda County Environmental Health requirement)
- EDC and EDB, by EPA Method 8260B (in accordance with Alameda County Environmental Health requirement)

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.

## **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, associated hydrocarbons, and MTBE. Table 3 presents the analytic results of the fuel oxygenates and lead scavengers. The certified laboratory reports are contained in Appendix C.

### **Groundwater Analytical Results**

The ESLs for TVHg and all the BTEX components were exceeded in groundwater collected from the temporary excavation dewatering point. TVHg was detected above its ESLs in all five of the B zone wells. All of the A zone wells were below the detection limits for TVHg (MW-1A, MW-3A, and MW-5A could not be sampled due to insufficient groundwater volume). MTBE was detected in MW-1B below the ESL. MTBE was detected above its ESL in wells MW-2B, MW-4A, and MW-5B. Benzene was detected in MW-5B (1.1 µg/L) just slightly over the ESL (1.0 µg/L). Ethylbenzene was detected below its ESL in MW-5B. The lead scavenger 1,2-dichloroethane (EDC) was detected above its ESL in both wells where it was analyzed; MW-1B and MW-2B.

Figure 4 shows an isoconcentration contour map of TVHg concentration in groundwater based on the July 2007 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. Contamination levels have risen in upgradient wells MW-2A and MW-2B from the Q2-2007 sampling event. This is most likely a rebound from the 2006 remedial activities. The source area well MW-5B showed a decrease from the Q2-2007 sampling event, dropping from 3,300 to 2,000 µg/L in TVHg concentration. Concentrations in the peripheral wells; MW-1B, MW-3B, and MW-4B remained consistent with the previous three sampling events. Monitoring wells MW-1A, MW-3A, and MW-5A were not sampled due to insufficient groundwater volumes. This is due to low levels of precipitation and groundwater recharge.



**Table 2**  
**July 2007 Groundwater Analytical Results**  
**2836 Union Street, Oakland, California**

Sample	TVHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
<b>Monitoring Wells</b>						
MW-1A*	NS	NS	NS	NS	NS	NS
MW-1B	<b>200</b>	<1.3	<1.3	<1.3	<1.3	3.2
MW-2A	<50	<0.5	<0.5	<0.5	<0.5	<0.5
MW-2B	<b>580</b>	<0.5	<0.5	<0.5	<0.5	<b>6.0</b>
MW-3A*	NS	NS	NS	NS	NS	NS
MW-3B	<b>1,200</b>	<2.0	<2.0	<2.0	<2.0	<2.0
MW-4A	<50	<0.5	<0.5	<0.5	<0.5	<b>64</b>
MW-4B	<b>1,000</b>	<4.2	<4.2	<4.2	<4.2	<4.2
MW-5A*	NS	NS	NS	NS	NS	NS
MW-5B	<b>2,000</b>	<b>1.1</b>	<0.5	2.2	<0.5	<b>26</b>
EDW-1	<b>4,300</b>	<b>26</b>	<b>66</b>	<b>190</b>	<b>430</b>	<b>26</b>
<b>Groundwater ESLs</b>	100	1.0	40	30	20	5.0

Notes:

ESLs = Water Board Environmental Screening Levels for residential or commercial/industrial sites where groundwater is a potential drinking water resource (Water Board, 2005).

MTBE = methyl tertiary-butyl ether

TVHg = total volatile hydrocarbons as gasoline

NA = not analyzed for this constituent; NS = not sampled

\* = Well not sampled due to insufficient groundwater volume

EDW-1 = sample collected from temporary excavation dewatering point

All concentrations are in micrograms per liter (µg/L). Samples in **bold-face** type exceed the ESL criterion.

**Table 3**  
**July 2007 Groundwater Sample Analytical Results**  
**Lead Scavengers and Fuel Oxygenates**  
**2836 Union Street, Oakland, California**

Sample I.D.	EDC	EDB	ETBE	DIPE	TAME	TBA
<b>Groundwater Analyses (µg/L)</b>						
MW-1A*	NA	NA	NA	NA	NA	NA
MW-1B	<b>3.4</b>	< 1.3	< 1.3	< 1.3	< 1.3	<25
MW-2A	NA	NA	NA	NA	NA	NA
MW-2B	<b>1.4</b>	< 0.5	< 0.5	< 0.5	<0.5	<10
MW-3A*	NS	NS	NS	NS	NS	NS
MW-3B	NA	NA	NA	NA	NA	NA
MW-4A	NA	NA	NA	NA	NA	NA
MW-4B	NA	NA	NA	NA	NA	NA
MW-5A*	NS	NS	NS	NS	NS	NS
MW-5B	NA	NA	NA	NA	NA	NA
<b>Water Board Environmental Screening Levels</b>						
<b>Groundwater ESLs</b>	0.5	0.05	NLP	NLP	NLP	NLP

Notes:

ESLs = Water Board Environmental Screening Levels for residential or commercial/industrial sites where groundwater is a potential drinking water resource.

NLP = no level published

EDB = ethylene dibromide (1,2-dibromoethane)

EDC = ethylene dichloride (1,2-dichloroethane).

ETBE = ethyl tertiary-butyl ether

DIPE = isopropyl ether

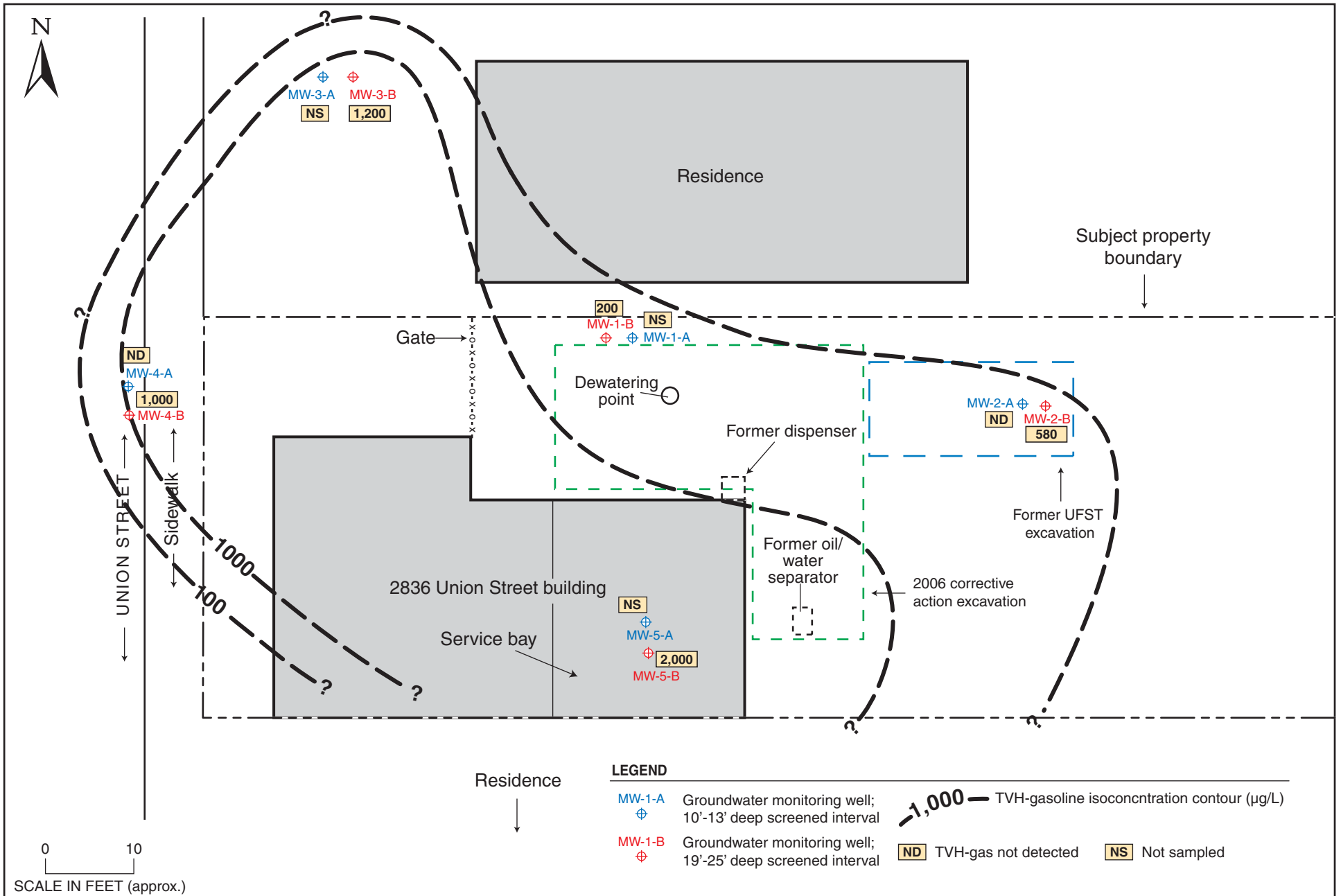
TAME = tertiary-amyl methyl ether

TBA = tertiary-butyl alcohol

NA = not analyzed for this constituent; NS = not sampled

\* = Well not sampled due to insufficient groundwater volume.

All concentrations are in micrograms per liter (µg/L). Samples in **bold-face** type exceed the ESL criterion.



**TVH-GASOLINE PLUME — JULY 12, 2007**  
**2836 Union Street, Oakland, CA**

**Figure 4**

by: MJC

JULY 2007

## **5.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS**

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### **SUMMARY AND CONCLUSIONS**

- One 10,000-gallon gasoline UFST was installed in the late 1970s. The UFST operated under Alameda County Environmental Health permit until its removal in 1998.
- A preliminary investigation was conducted in August 2005, additional site characterization investigations in October 2005 and April 2006 and a corrective action entailing contaminated soil excavation and the installation of ten monitoring wells was conducted in September to October 2006.
- Third Quarter 2007 groundwater analytical results show a general reduction in TVHg (a decrease from 3,300 to 2,000  $\mu\text{g/L}$ ) in the source area and stability of contaminants in the peripheral wells. There was an increase in the TVHg concentration in the upgradient well MW-2B. This is most likely a rebound from the 2006 remedial activities.
- The primary source (UFST) and secondary source (contaminated soil) have been remediated by excavation to the extent practical, without removing the garage building. It is estimated that between 30 and 40 cubic yards of contaminated material containing TVHg at present concentrations (estimated at 1,200 mg/kg) is located beneath the garage portion of the building and cannot be directly accessed without structurally compromising the building. The property owner is currently considering removal of part of the garage building to access the remaining contaminated soil.
- Shallow groundwater will likely continue to be impacted by the remaining residual soil contamination by desorption from soil into groundwater. Groundwater contamination will continue to migrate downgradient from the source area, primarily by advection.
- The groundwater contaminate plume has not been fully delineated, but appears to be in elliptical configuration with its long axis trending east by west-northwest.
- Excavation dewatering resulted in the capture of contaminant mass but has not resulted in the plume being drawn back on-site.
- The property owner has no plans to utilize site groundwater for any purpose, and assuming approval for site development is achieved, the former source area would remain paved to prevent any infiltrating precipitation from providing a migrational mechanism for the hydrocarbons still entrained in the soil. Groundwater in the immediate vicinity of

the site is not likely to be a potential drinking water source, given its shallow depth and turbidity.

## **RECOMMENDATIONS**

- We recommend following up with Alameda County Environmental Health following its receipt of this report, to discuss the requirements to move the site toward regulatory closure. We further recommend that the Alameda County Environmental Health-requested work be implemented, and that all future technical reports be provided to the appropriate regulatory agencies, including electronic uploads to Alameda County Environmental Health's ftp system and the State Water Board's GeoTracker system.
- Quarterly groundwater monitoring should be continued to delineate seasonal trends and changes in flow direction and hydrochemistry.
- Analysis for lead scavengers and fuel oxygenates should be limited to the wells with a historical detection—namely, MW-1B, MW-2B, MW-3A and MW-5A.
- Additional excavation dewatering should be completed, followed by collection of post-pumping groundwater samples to evaluate the effectiveness of the pumping on controlling the plume migration.
- Additional remediation such as soil vapor extraction or excavation of the remaining contaminated soil should be considered should natural attenuation fail to demonstrate a stable or reducing plume.

## 6.0 REFERENCES

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Stellar Environmental Solutions, Inc. (SES), 2007b. Second Quarter 2007 Groundwater Monitoring Report – 2836 Union Street, Oakland, California. April 6.

## 7.0 LIMITATIONS

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This report has been prepared for the exclusive use of 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**

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# **GROUNDWATER MONITORING AND SAMPLING FIELD REPORT**

## WELL GAUGING DATA

Project # 070712-DR1 Date 7/12/07 Client Stellar Env.

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	0816	3/4"					7.16	12.45		
MW-1B	0818	3/4"					7.19	22.49		
MW-2A	0812	3/4"					7.37	12.74		
MW-2B	0814	3/4"					7.33	24.61		
MW-3A	0828	3/4"					6.19	12.95		
MW-3B	0830	3/4"					7.15	25.03		
MW-4A	0825	3/4"					5.71	12.14		
MW-4B	0822	3/4"					6.28	24.30		
MW-5A	0821	3/4"					6.98	12.50		
MW-5B	0820	3/4"					7.15	25.31		
EDW-1	0832	4"					7.61	12.60		↓

# WELLHEAD INSPECTION CHECKLIST

Date 7/12/07 Client Stellar Env.  
 Site Address 2836 Union St. Oakland CA.  
 Job Number 070712 - DRI Technician DR

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	X							
MW-3A	X							
MW-3B	X							
MW-4A	X							
MW-4B	X							
MW-5A	X							
MW-5B	X							
EDW-1							X	

NOTES: No lid. Only top and cone are covering well.



## WELL MONITORING DATA SHEET

Project #: <b>070712-DR1</b>	Client: <b>Sella</b>
Sampler: <b>DR</b>	Date: <b>7/12/07</b>
Well I.D.: <b>MW-1A</b>	Well Diameter: 2 3 4 6 8 <b>8 1/4 (11)</b>
Total Well Depth (TD): <b>12.45</b>	Depth to Water (DTW): <b>7.16</b>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <b>PVC</b> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer Disposable Bailer Positive Air Displacement Electric Submersible	Waterra Peristaltic Extraction Pump Other _____	Sampling Method: Bailer Disposable Bailer Extraction Port <del>Dedicated Tubing</del> Other: _____
--	--	--

$$400 \text{ mL (Case)} \times 3 = 1200 \text{ mL (Calculated)}$$

I 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 <sup>2</sup> * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
<b>* Well</b>	<b>dewatered</b>					<b>prior to getting even 1 case volume.</b>
<b>went</b>	<b>back</b>					<b>to well periodically throughout the day. No recharge.</b>
<b>No</b>	<b>sample</b>	<b>taken.</b>	<b>DTW = 12.45</b>			

Did well dewater? <b>Yes</b> No	Gallons actually evacuated:
Sampling Date: <b>7/12/07</b>	Sampling Time:      Depth to Water:
Sample I.D.: <b>MW-1A</b>	Laboratory: Kiff CalScience Other <b>CT</b>
Analyzed for: TPH-G BTEX MTBE TPH-D	Oxygenates (5) Other: <b>See CC</b>
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 #: 070712-DR1	Client: Sella
Sampler: DR	Date: 7/12/07
Well I.D.: MW-2A	Well Diameter: 2 3 4 6 8 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">3/4"</span>
Total Well Depth (TD): 12.74	Depth to Water (DTW): 7.37
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">PVC</span> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: _____	

Purge Method: Bailer	Watterra	Sampling Method: Bailer
Disposable Bailer	<input checked="" type="checkbox"/> Peristaltic	Disposable Bailer
Positive Air Displacement	Extraction Pump	Extraction Port
Electric Submersible	Other _____	<input checked="" type="checkbox"/> Dedicated Tubing
Other: _____		

407 <sup>ml</sup> ( <del>gals.</del> ) X 3 = 1221 <sup>ml</sup> ( <del>gals.</del> )		
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 <sup>2</sup> * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">µS</span> )	Turbidity (NTUs)	<sup>ml</sup> <del>gals.</del> Removed	Observations
1110	19.9	7.1	1019	103	407	clear
1113	20.3	7.1	955	111	814	"
1116	20.4	7.0	922	108	1221	"

Did well dewater? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Gallons actually evacuated: 1221 mL	
Sampling Date: 7/12/07	Sampling Time: 1120	Depth to Water: 9.09
Sample I.D.: MW-2A	Laboratory: Kiff CalScience	Other: <u>CT</u>
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5)	Other: <u>See CC</u>	
EB I.D. (if applicable): @ _____	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 #: 070712-DRI	Client: SK/WR
Sampler: DR	Date: 7/12/07
Well I.D.: MW-2B	Well Diameter: 2 3 4 6 8 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">3/4"</span>
Total Well Depth (TD): 24.61	Depth to Water (DTW): 7.33
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">PVC</span> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer	Waterra	Sampling Method: Bailer
Disposable Bailer	<input checked="" type="checkbox"/> Peristaltic	Disposable Bailer
Positive Air Displacement	Extraction Pump	Extraction Port
Electric Submersible	Other _____	<input checked="" type="checkbox"/> Dedicated Tubing
Other: _____		

1308 <sup>ml</sup> (Gals.) X 3 = 3924 <sup>ml</sup> (Gals.)	
l 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 <sup>2</sup> * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	<sup>ml</sup> <del>Gals.</del> Removed	Observations
0953	22.41	9.2	667	816	1310	cloudy
1000	21.2	8.3	956	>1000	2620	"
1007	21.0	8.1	1009	>1000	3930	"

Did well dewater? Yes  No  Gallons actually evacuated: 3930 ml

Sampling Date: 7/12/07      Sampling Time: 1015      Depth to Water: 22.18

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

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

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



**V LL MONITORING DATA SHEET**

Project #: <u>070712-DR1</u>	Client: <u>Sf/llw</u>
Sampler: <u>DR</u>	Date: <u>7/12/07</u>
Well I.D.: <u>MW-3A</u>	Well Diameter: 2 3 4 6 8 <u>3 1/4"</u>
Total Well Depth (TD): <u>12.95</u>	Depth to Water (DTW): <u>6.19</u>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): <u>YSI</u> <u>HACH</u>
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: _____	

Purge Method: Bailer  Waterra  Sampling Method: Bailer   
 Disposable Bailer   Peristaltic  Disposable Bailer   
 Positive Air Displacement  Extraction Pump  Extraction Port   
 Electric Submersible  Other \_\_\_\_\_  Dedicated Tubing   
 Other: \_\_\_\_\_

$512 \frac{\text{mL}}{\text{Gals}} \times 3 = 1536 \frac{\text{mL}}{\text{Gals}}$ 1 Case Volume      Specified Volumes      Calculated Volume	<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Well Diameter</th> <th>Multiplier</th> <th>Well Diameter</th> <th>Multiplier</th> </tr> </thead> <tbody> <tr> <td>1"</td> <td>0.04</td> <td>4"</td> <td>0.65</td> </tr> <tr> <td>2"</td> <td>0.16</td> <td>6"</td> <td>1.47</td> </tr> <tr> <td>3"</td> <td>0.37</td> <td>Other</td> <td>radius<sup>2</sup> * 0.163</td> </tr> </tbody> </table>	Well Diameter	Multiplier	Well Diameter	Multiplier	1"	0.04	4"	0.65	2"	0.16	6"	1.47	3"	0.37	Other	radius <sup>2</sup> * 0.163
Well Diameter	Multiplier	Well Diameter	Multiplier														
1"	0.04	4"	0.65														
2"	0.16	6"	1.47														
3"	0.37	Other	radius <sup>2</sup> * 0.163														

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	<u>mL</u> Gals. Removed	Observations
1030	21.4	7.3	1319	421	515	cloudy / color
1034	20.9	6.9	1334	309	1030	"
* Well dewatered. Checked throughout the day for recharge. Too slow of recharge for a sample.						

Did well dewater? Yes No      Gallons actually evacuated: 1050 mL

Sampling Date: 7/12/07      Sampling Time:      Depth to Water:

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

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

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





V. WELL MONITORING DATA SHEET

Project #: 070712-DR1	Client: Sella
Sampler: DR	Date: 7/12/07
Well I.D.: mw-4B	Well Diameter: 2 3 4 6 8 <u>3/4"</u>
Total Well Depth (TD): 2430	Depth to Water (DTW): 620
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: _____	

Purge Method: Bailer	Waterra	Sampling Method: Bailer
Disposable Bailer	<input checked="" type="checkbox"/> Peristaltic	Disposable Bailer
Positive Air Displacement	Extraction Pump	Extraction Port
Electric Submersible	Other _____	<input checked="" type="checkbox"/> Dedicated Tubing
		Other: _____

1364 <sup>mL</sup> (Gals) X 3 = 4092 <sup>mL</sup> (Gals)	Well Diameter	Multiplier	Well Diameter	Multiplier
1 Case Volume	Specified Volumes	Calculated Volume	1"	0.04
			4"	0.65
			2"	0.16
			6"	1.47
			3"	0.37
			Other	radius <sup>2</sup> * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or <u>µS</u> )	Turbidity (NTUs)	<sup>mL</sup> Gals. Removed	Observations
1145	19.6	7.0	929	88	1364	clear
1148	20.2	6.8	913	94	2728	"
1151	20.5	6.8	908	108	4092	"

Did well dewater? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Gallons actually evacuated: 3480 mL	
Sampling Date: 7/12/07	Sampling Time: 1200	Depth to Water: 16.41
Sample I.D.: mw-4B	Laboratory: Kiff CalScience	Other: <u>CT</u>
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5)	Other: <u>Seu CC</u>	
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	

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V LL MONITORING DATA SHEET

Project #: 070712-DR1	Client: Sella
Sampler: DR	Date: 7/12/07
Well I.D.: EDW-1	Well Diameter: 2 3 <u>4</u> 6 8
Total Well Depth (TD): 12.60	Depth to Water (DTW): 7.61
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer	Waterra	Sampling Method: Bailer
<input checked="" type="checkbox"/> Disposable Bailer	Peristaltic	<input checked="" type="checkbox"/> Disposable Bailer
Positive Air Displacement	Extraction Pump	Extraction Port
Electric Submersible	Other _____	<input checked="" type="checkbox"/> Dedicated Tubing
		Other: _____

3.2 (Gals.) X 3 = 9.6 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 <sup>2</sup> * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1316	21.2	11.3	977	38	3.2	clear/odor
1321	21.3	11.6	1298	52	6.4	"
1326	21.2	11.8	1318	70	9.6	"

Did well dewater? Yes  No  Gallons actually evacuated: 9.6

Sampling Date: 7/12/07 Sampling Time: 1330 Depth to Water: 8.02

Sample I.D.: EDW-1 Laboratory: Kiff CalScience Other CTI

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

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

## SPH or Purge Water Drum Log

Client: Stellar  
 Site Address: 2836 Union St. Oakland CA

STATUS OF DRUM(S) UPON ARRIVAL						
Date	10/5/06	1/9/07	4/6/07	7/12/07		
Number of drum(s) empty:	0	3 (Non-BTS)				
Number of drum(s) 1/4 full:			1 (~5 gal)	1 (BTS)		
Number of drum(s) 1/2 full:						
Number of drum(s) 3/4 full:						
Number of drum(s) full:	0					
Total drum(s) on site: Baker Tanks	0		1 BTS	1		
Are the drum(s) properly labeled?			yes	Y		
Drum ID & Contents:			Purge H <sub>2</sub> O	Purge H <sub>2</sub> O		
If any drum(s) are partially or totally filled, what is the first use date:			-	-		

- If you add any SPH to an empty or partially filled drum, drum must have at least 20 gals. of Purge water or DI Water.
- If drum contains SPH, the drum MUST be steel AND labeled with the appropriate label.
- All BTS drums MUST be labeled appropriately.

STATUS OF DRUM(S) UPON DEPARTURE						
Date	10/5/06	1/9/07	4/6/07	7/12/07		
Number of drums empty:	0					
Number of drum(s) 1/4 full:		1 (~10 gal)	1 (~15 gal)	1 (25 gal)		
Number of drum(s) 1/2 full:						
Number of drum(s) 3/4 full:						
Number of drum(s) full:	0					
Total drum(s) on site:	0	1 (BTS) 3 (Non-BTS)	1 BTS	1 (BTS)		
Are the drum(s) properly labeled?		BTS Yes	yes	Y		
Drum ID & Contents:		→ Purge H <sub>2</sub> O	Purge H <sub>2</sub> O	Purge H <sub>2</sub> O		

**LOCATION OF DRUM(S)**  
 Describe location of drum(s): 2 Baker Tanks along the fence line on 4/6/07  
55 gal. drums inside garage.

FINAL STATUS						
Number of new drum(s) left on site this event	0	1	0	0		
Date of inspection:	10/5/06	1/9/07	4/6/07	7/12/07		
Drum(s) labelled properly:	-	Y	Y	Y		
Logged by BTS Field Tech:	BR	BR	WC	BR		
Office reviewed by:	W	H	H	W		



## **APPENDIX B**

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# **SES GROUNDWATER STANDARD SAMPLING PROTOCOLS**

## **APPENDIX B: SES GROUNDWATER STANDARD SAMPLING PROTOCOLS**

### **SAMPLING AND ANALYSIS PERSONNEL**

Sampling and analysis is conducted by Blaine Tech Services, a subcontractor to SES, 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 will be 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:

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

Volume of Water in Well:

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

where:      Vw = water volume in well (ft<sup>3</sup>)  
               dw = inside diameter of well (ft)  
               Lw = length of water column in well (ft)

Volume of Water in Full Bailer:

$$\frac{Vb = 3.142 \times db^2 \times Lb}{4}$$

where:      Vb = water volume in bailer (ft<sup>3</sup>)  
               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 it 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**

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# **CERTIFIED ANALYTICAL LABORATORY REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION**

Total Volatile Hydrocarbons			
Lab #:	195986	Location:	Wadler Property
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2005-65	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	07/12/07
Units:	ug/L	Received:	07/13/07
Batch#:	127281		

Field ID: MW-1B Diln Fac: 1.000  
 Type: SAMPLE Analyzed: 07/16/07  
 Lab ID: 195986-001

Analyte	Result	RL
Gasoline C7-C12	200 Y Z	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	85	72-136
Bromofluorobenzene (FID)	88	78-131

Field ID: MW-2A Diln Fac: 1.000  
 Type: SAMPLE Analyzed: 07/16/07  
 Lab ID: 195986-002

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	96	72-136
Bromofluorobenzene (FID)	97	78-131

Field ID: MW-2B Diln Fac: 1.000  
 Type: SAMPLE Analyzed: 07/16/07  
 Lab ID: 195986-003

Analyte	Result	RL
Gasoline C7-C12	580 H L Y	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	114	72-136
Bromofluorobenzene (FID)	98	78-131

Field ID: MW-3B Diln Fac: 1.000  
 Type: SAMPLE Analyzed: 07/16/07  
 Lab ID: 195986-004

Analyte	Result	RL
Gasoline C7-C12	1,200 Y Z	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	94	72-136
Bromofluorobenzene (FID)	88	78-131

H= Heavier hydrocarbons contributed to the quantitation  
 L= Lighter hydrocarbons contributed to the quantitation  
 Y= Sample exhibits chromatographic pattern which does not resemble standard  
 Z= Sample exhibits unknown single peak or peaks  
 ND= Not Detected  
 RL= Reporting Limit

Total Volatile Hydrocarbons			
Lab #:	195986	Location:	Wadler Property
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2005-65	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	07/12/07
Units:	ug/L	Received:	07/13/07
Batch#:	127281		

Field ID: MW-4A Diln Fac: 1.000  
 Type: SAMPLE Analyzed: 07/16/07  
 Lab ID: 195986-005

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	100	72-136
Bromofluorobenzene (FID)	104	78-131

Field ID: MW-4B Diln Fac: 1.000  
 Type: SAMPLE Analyzed: 07/16/07  
 Lab ID: 195986-006

Analyte	Result	RL
Gasoline C7-C12	1,000 Y Z	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	95	72-136
Bromofluorobenzene (FID)	94	78-131

Field ID: MW-5B Diln Fac: 2.000  
 Type: SAMPLE Analyzed: 07/16/07  
 Lab ID: 195986-007

Analyte	Result	RL
Gasoline C7-C12	2,000 H L Y	100

Surrogate	%REC	Limits
Trifluorotoluene (FID)	123	72-136
Bromofluorobenzene (FID)	104	78-131

Field ID: EDW-1 Diln Fac: 1.000  
 Type: SAMPLE Analyzed: 07/17/07  
 Lab ID: 195986-008

Analyte	Result	RL
Gasoline C7-C12	4,300 H L	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	119	72-136
Bromofluorobenzene (FID)	112	78-131

H= Heavier hydrocarbons contributed to the quantitation  
 L= Lighter hydrocarbons contributed to the quantitation  
 Y= Sample exhibits chromatographic pattern which does not resemble standard  
 Z= Sample exhibits unknown single peak or peaks  
 ND= Not Detected  
 RL= Reporting Limit

Total Volatile Hydrocarbons			
Lab #:	195986	Location:	Wadler Property
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2005-65	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	07/12/07
Units:	ug/L	Received:	07/13/07
Batch#:	127281		

Type: BLANK Diln Fac: 1.000  
 Lab ID: QC396392 Analyzed: 07/16/07

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	109	72-136
Bromofluorobenzene (FID)	112	78-131

H= Heavier hydrocarbons contributed to the quantitation  
 L= Lighter hydrocarbons contributed to the quantitation  
 Y= Sample exhibits chromatographic pattern which does not resemble standard  
 Z= Sample exhibits unknown single peak or peaks  
 ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	195986	Location:	Wadler Property
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2005-65	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC396394	Batch#:	127281
Matrix:	Water	Analyzed:	07/16/07
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	2,000	1,887	94	80-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	119	72-136
Bromofluorobenzene (FID)	118	78-131

## Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	195986	Location:	Wadler Property
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2005-65	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	127281
MSS Lab ID:	195966-005	Sampled:	07/12/07
Matrix:	Water	Received:	07/13/07
Units:	ug/L	Analyzed:	07/16/07
Diln Fac:	100.0		

Type: MS Lab ID: QC396395

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	407,300	200,000	372,700	-17 *	79-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	126	72-136
Bromofluorobenzene (FID)	131	78-131

Type: MSD Lab ID: QC396396

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	200,000	352,700	-27 *	79-120	5	20

Surrogate	%REC	Limits
Trifluorotoluene (FID)	110	72-136
Bromofluorobenzene (FID)	116	78-131

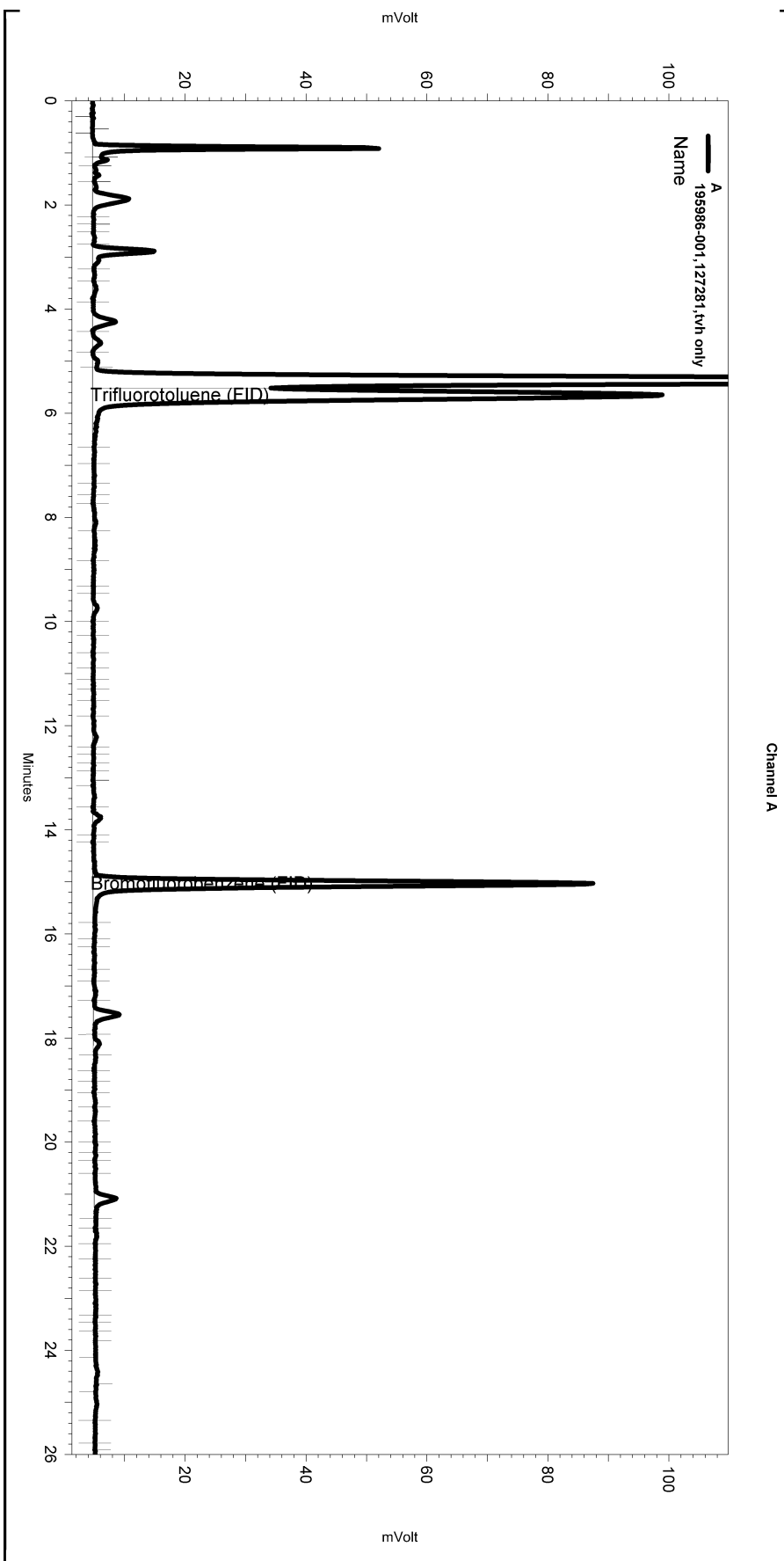
\*= Value outside of QC limits; see narrative

RPD= Relative Percent Difference



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Yes	Threshold	0	0	50

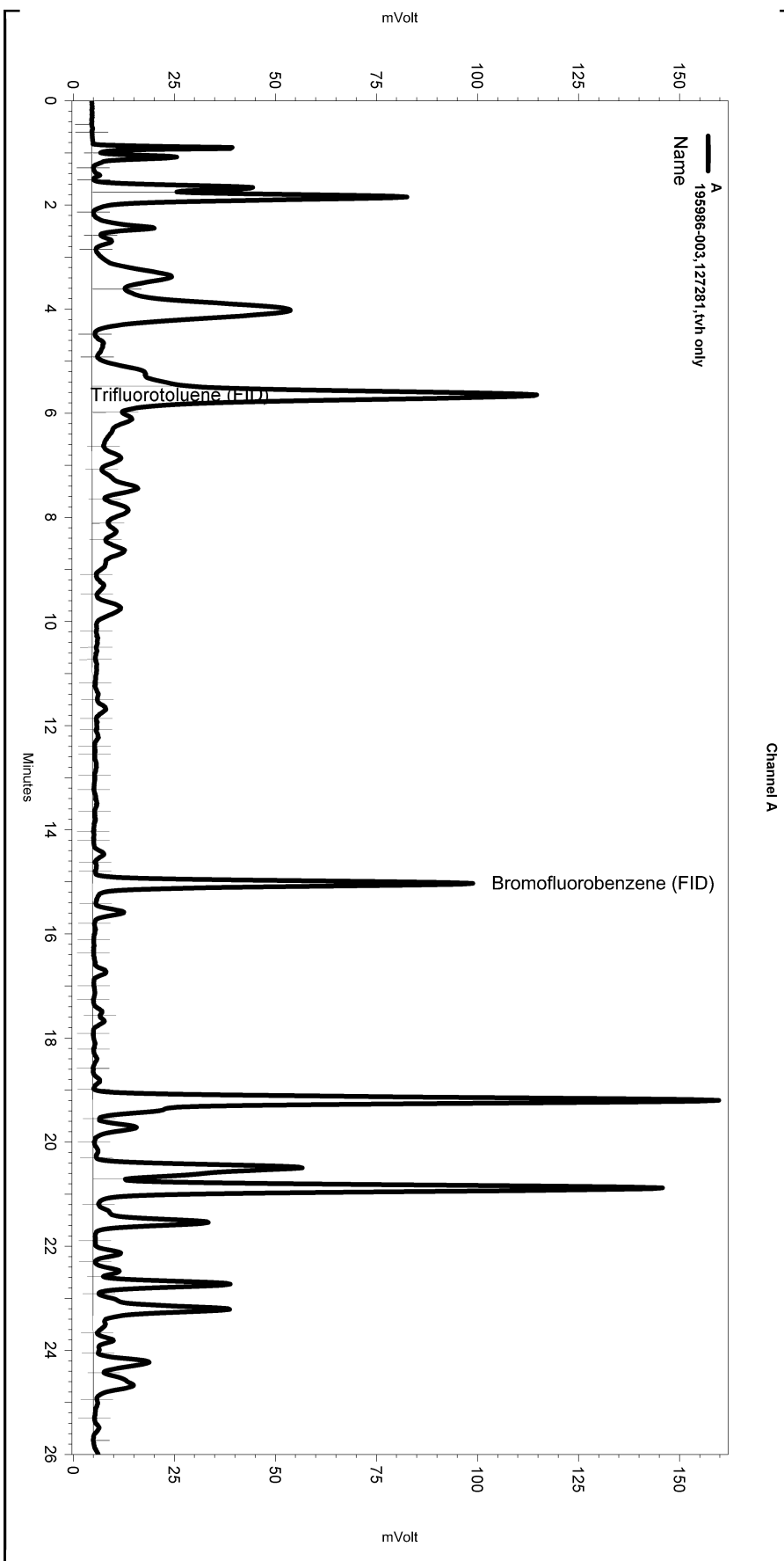
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 Vial & pH or Core ID: B1.3



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Yes	Threshold	0	0	50

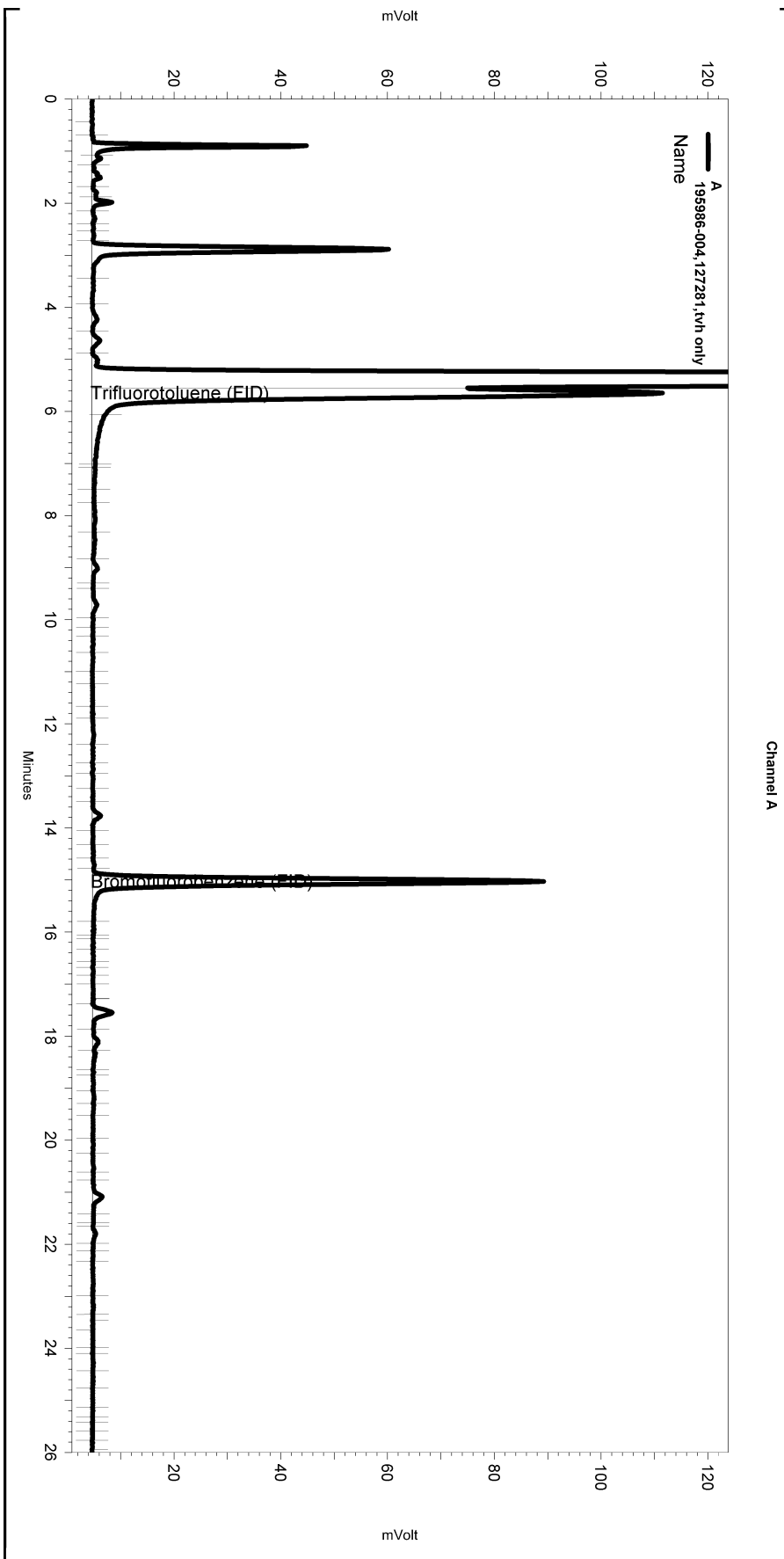
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Yes	Split Peak	5.476	0	0

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Software Version 3.1.7  
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 Analysis Date: 7/17/2007 10:30:03 AM  
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 Vial & pH or Core ID: C1.3



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Yes	Threshold	0	0	50

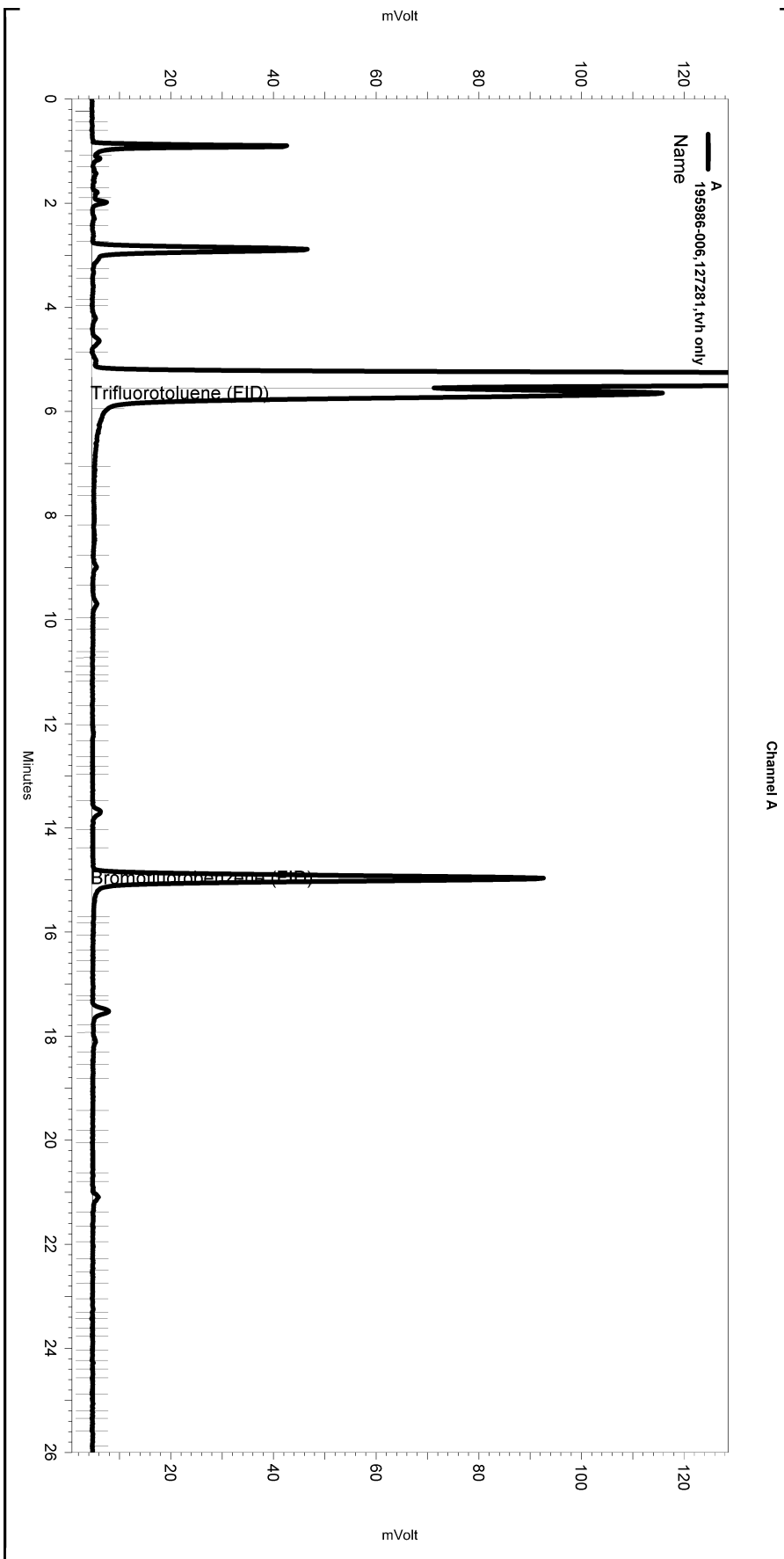
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Yes	Split Peak	6.061	0	0

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 Data File: \\Lims\gdrive\ezchrom\Projects\GC05\Data\197\_022  
 Instrument: GC05 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
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Software Version 3.1.7  
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 Vial & pH or Core ID: B1.3



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Yes	Threshold	0	0	50

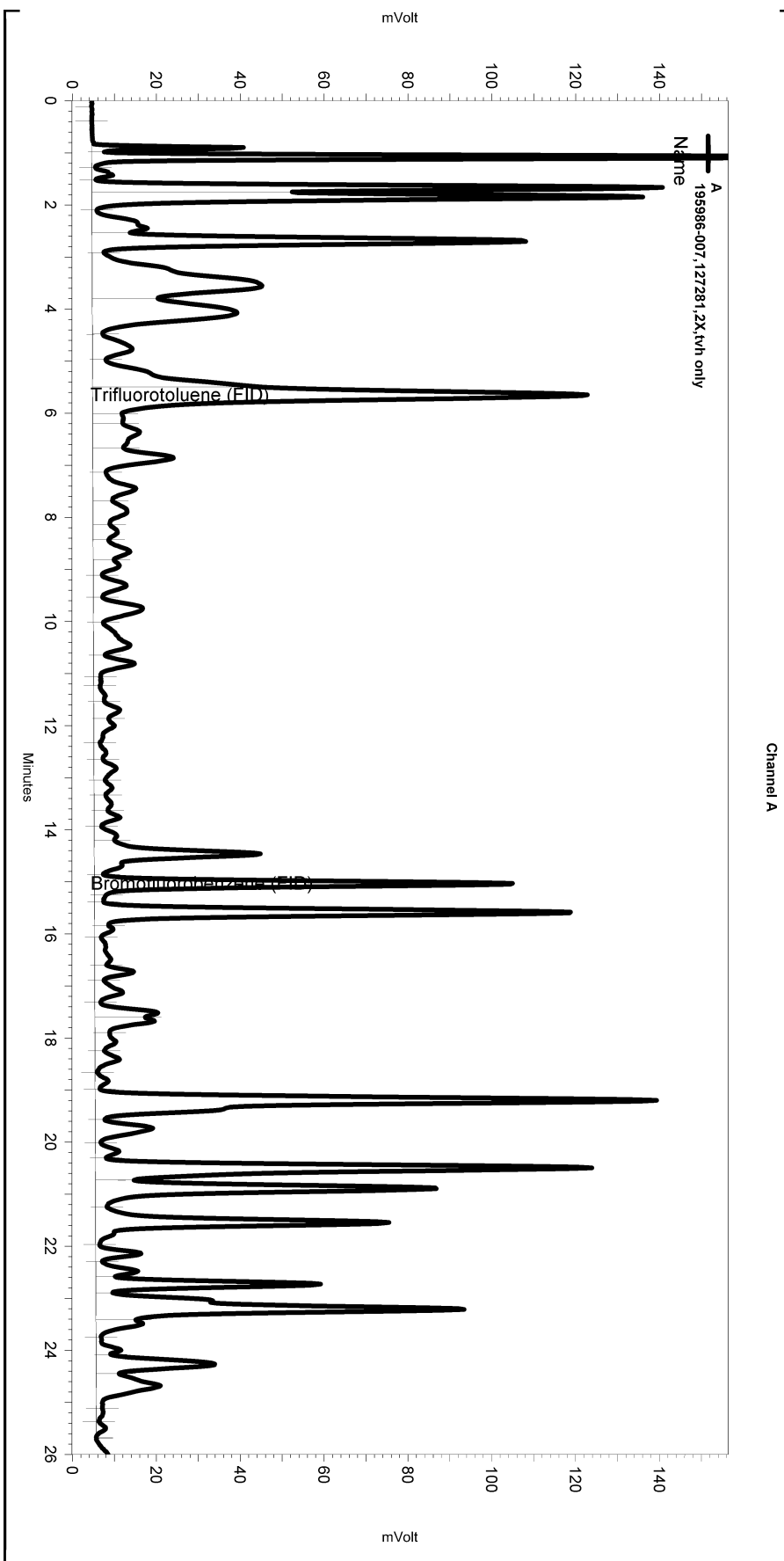
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 Manual Integration Fixes  
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Yes	Split Peak	5.948	0	0

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 Data File: \\Lims\gdrive\ezchrom\Projects\GC05\Data\197\_023  
 Instrument: GC05 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
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Software Version 3.1.7  
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 Vial & pH or Core ID: C1.3



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Yes	Threshold	0	0	50

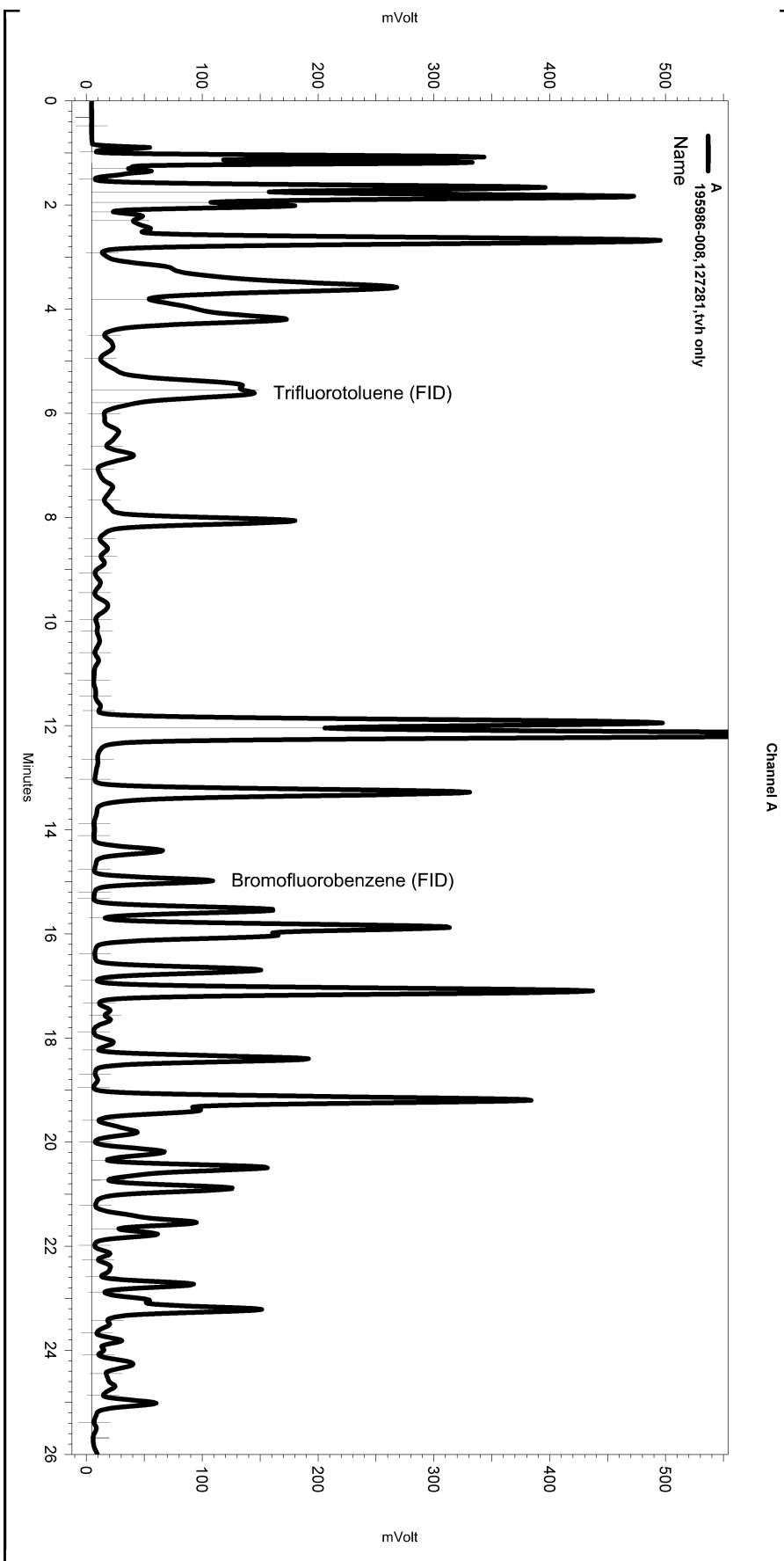
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Yes	Split Peak	15.248	0	0

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 Data File: \\Lims\gdrive\ezchrom\Projects\GC05\Data\197\_025  
 Instrument: GC05 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
 Method Name: \\Lims\gdrive\ezchrom\Projects\GC05\Method\TVHBTXE191.MET

Software Version 3.1.7  
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 Analysis Date: 7/17/2007 10:30:25 AM  
 Sample Amount: 5 Multiplier: 5  
 Vial & pH or Core ID: B1.3



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

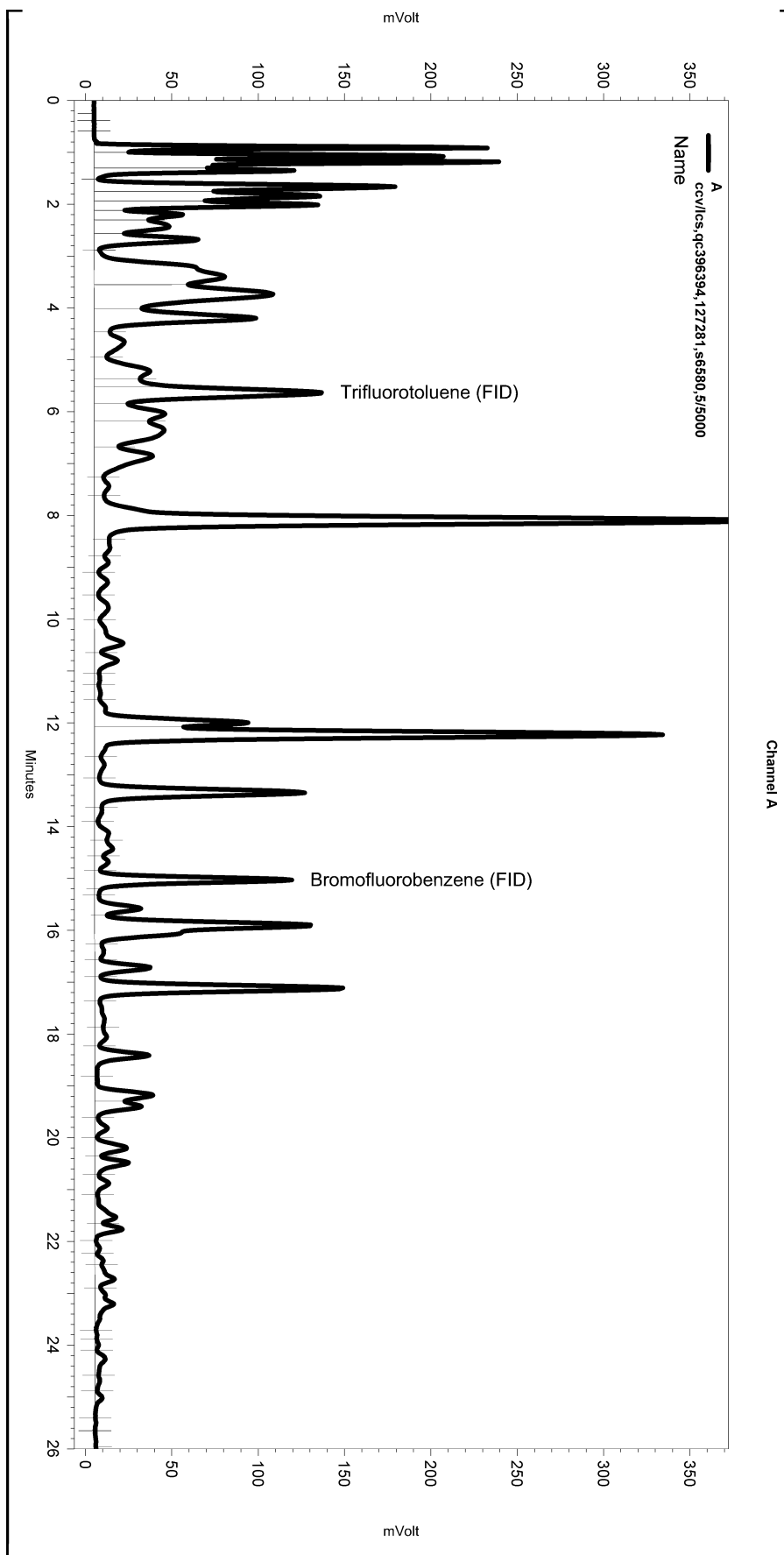
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 Manual Integration Fixes  
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Yes	Lowest Point Horizontal Baseli	0.034	26.017	0
Yes	Split Peak	5.543	0	0
Yes	Split Peak	5.801	0	0
Yes	Split Peak	15.201	0	0

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 Sample Name: ccv/lcs,qc396394,127281,s6580,5/5000  
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 Instrument: GC05 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
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Software Version 3.1.7  
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 Analysis Date: 7/17/2007 10:28:52 AM  
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Integration Events

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

Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC05\Data\197\_002

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Split Peak	5.515	0	0
Yes	Split Peak	15.2	0	0

**Purgeable Aromatics by GC/MS**

Lab #:	195986	Location:	Wadler Property
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2005-65	Analysis:	EPA 8260B
Field ID:	MW-2A	Batch#:	127269
Lab ID:	195986-002	Sampled:	07/12/07
Matrix:	Water	Received:	07/13/07
Units:	ug/L	Analyzed:	07/16/07
Diln Fac:	1.000		

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

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	97	79-134
Toluene-d8	96	80-120
Bromofluorobenzene	97	80-122

ND= Not Detected  
 RL= Reporting Limit



**Purgeable Aromatics by GC/MS**

Lab #:	195986	Location:	Wadler Property
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2005-65	Analysis:	EPA 8260B
Field ID:	MW-3B	Batch#:	127269
Lab ID:	195986-004	Sampled:	07/12/07
Matrix:	Water	Received:	07/13/07
Units:	ug/L	Analyzed:	07/16/07
Diln Fac:	4.000		

Analyte	Result	RL
MTBE	ND	2.0
Benzene	ND	2.0
Toluene	ND	2.0
Ethylbenzene	ND	2.0
m,p-Xylenes	ND	2.0
o-Xylene	ND	2.0

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	96	79-134
Toluene-d8	98	80-120
Bromofluorobenzene	98	80-122

ND= Not Detected  
 RL= Reporting Limit

**Purgeable Aromatics by GC/MS**

Lab #:	195986	Location:	Wadler Property
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2005-65	Analysis:	EPA 8260B
Field ID:	MW-4A	Batch#:	127269
Lab ID:	195986-005	Sampled:	07/12/07
Matrix:	Water	Received:	07/13/07
Units:	ug/L	Analyzed:	07/16/07
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	64	0.5
Benzene	ND	0.5
Toluene	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	97	79-134
Toluene-d8	97	80-120
Bromofluorobenzene	101	80-122

ND= Not Detected  
 RL= Reporting Limit

**Purgeable Aromatics by GC/MS**

Lab #:	195986	Location:	Wadler Property
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2005-65	Analysis:	EPA 8260B
Field ID:	MW-4B	Batch#:	127269
Lab ID:	195986-006	Sampled:	07/12/07
Matrix:	Water	Received:	07/13/07
Units:	ug/L	Analyzed:	07/16/07
Diln Fac:	8.333		

Analyte	Result	RL
MTBE	ND	4.2
Benzene	ND	4.2
Toluene	ND	4.2
Ethylbenzene	ND	4.2
m,p-Xylenes	ND	4.2
o-Xylene	ND	4.2

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	97	79-134
Toluene-d8	99	80-120
Bromofluorobenzene	100	80-122

ND= Not Detected  
 RL= Reporting Limit

**Purgeable Aromatics by GC/MS**

Lab #:	195986	Location:	Wadler Property
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2005-65	Analysis:	EPA 8260B
Field ID:	MW-5B	Batch#:	127311
Lab ID:	195986-007	Sampled:	07/12/07
Matrix:	Water	Received:	07/13/07
Units:	ug/L	Analyzed:	07/17/07
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	26	0.5
Benzene	1.1	0.5
Toluene	ND	0.5
Ethylbenzene	2.2	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	102	79-134
Toluene-d8	96	80-120
Bromofluorobenzene	93	80-122

ND= Not Detected  
 RL= Reporting Limit

**Purgeable Aromatics by GC/MS**

Lab #:	195986	Location:	Wadler Property
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2005-65	Analysis:	EPA 8260B
Field ID:	EDW-1	Batch#:	127269
Lab ID:	195986-008	Sampled:	07/12/07
Matrix:	Water	Received:	07/13/07
Units:	ug/L	Analyzed:	07/16/07
Diln Fac:	2.000		

Analyte	Result	RL
MTBE	26	1.0
Benzene	36	1.0
Toluene	66	1.0
Ethylbenzene	190	1.0
m,p-Xylenes	300	1.0
o-Xylene	130	1.0

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	100	79-134
Toluene-d8	98	80-120
Bromofluorobenzene	97	80-122

RL= Reporting Limit



## Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	195986	Location:	Wadler Property
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2005-65	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC396341	Batch#:	127269
Matrix:	Water	Analyzed:	07/16/07
Units:	ug/L		

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

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	97	79-134
Toluene-d8	91	80-120
Bromofluorobenzene	98	80-122

ND= Not Detected

RL= Reporting Limit

## Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	195986	Location:	Wadler Property
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2005-65	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	127311
Units:	ug/L	Analyzed:	07/17/07
Diln Fac:	1.000		

Type: BS Lab ID: QC396552

Analyte	Spiked	Result	%REC	Limits
MTBE	25.00	22.51	90	71-120
Benzene	25.00	25.55	102	80-120
Toluene	25.00	27.17	109	80-120
Ethylbenzene	25.00	27.73	111	80-124
m,p-Xylenes	50.00	57.42	115	80-127
o-Xylene	25.00	28.41	114	80-124

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	98	79-134
Toluene-d8	97	80-120
Bromofluorobenzene	92	80-122

Type: BSD Lab ID: QC396553

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
MTBE	25.00	20.85	83	71-120	8	20
Benzene	25.00	24.04	96	80-120	6	20
Toluene	25.00	24.92	100	80-120	9	20
Ethylbenzene	25.00	26.02	104	80-124	6	20
m,p-Xylenes	50.00	55.14	110	80-127	4	20
o-Xylene	25.00	26.57	106	80-124	7	20

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	98	79-134
Toluene-d8	98	80-120
Bromofluorobenzene	94	80-122

RPD= Relative Percent Difference



## Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	195986	Location:	Wadler Property
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2005-65	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC396554	Batch#:	127311
Matrix:	Water	Analyzed:	07/17/07
Units:	ug/L		

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

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	96	79-134
Toluene-d8	95	80-120
Bromofluorobenzene	98	80-122

ND= Not Detected

RL= Reporting Limit

BTXE & Oxygenates			
Lab #:	195986	Location:	Wadler Property
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2005-65	Analysis:	EPA 8260B
Field ID:	MW-1B	Batch#:	127269
Lab ID:	195986-001	Sampled:	07/12/07
Matrix:	Water	Received:	07/13/07
Units:	ug/L	Analyzed:	07/16/07
Diln Fac:	2.500		

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	ND	25
MTBE	3.2	1.3
Isopropyl Ether (DIPE)	ND	1.3
Ethyl tert-Butyl Ether (ETBE)	ND	1.3
1,2-Dichloroethane	3.4	1.3
Benzene	ND	1.3
Methyl tert-Amyl Ether (TAME)	ND	1.3
Toluene	ND	1.3
1,2-Dibromoethane	ND	1.3
Ethylbenzene	ND	1.3
m,p-Xylenes	ND	1.3
o-Xylene	ND	1.3

Surrogate	%REC	Limits
Dibromofluoromethane	94	80-123
1,2-Dichloroethane-d4	100	79-134
Toluene-d8	95	80-120
Bromofluorobenzene	95	80-122

ND= Not Detected  
 RL= Reporting Limit

<b>BTXE &amp; Oxygenates</b>			
Lab #:	195986	Location:	Wadler Property
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2005-65	Analysis:	EPA 8260B
Field ID:	MW-2B	Batch#:	127269
Lab ID:	195986-003	Sampled:	07/12/07
Matrix:	Water	Received:	07/13/07
Units:	ug/L	Analyzed:	07/16/07
Diln Fac:	1.000		

<b>Analyte</b>	<b>Result</b>	<b>RL</b>
tert-Butyl Alcohol (TBA)	ND	10
MTBE	6.0	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
1,2-Dichloroethane	1.4	0.5
Benzene	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
Toluene	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

<b>Surrogate</b>	<b>%REC</b>	<b>Limits</b>
Dibromofluoromethane	92	80-123
1,2-Dichloroethane-d4	99	79-134
Toluene-d8	98	80-120
Bromofluorobenzene	93	80-122

ND= Not Detected  
 RL= Reporting Limit

**Batch QC Report**

<b>BTXE &amp; Oxygenates</b>			
Lab #:	195986	Location:	Wadler Property
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2005-65	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	127269
Units:	ug/L	Analyzed:	07/16/07
Diln Fac:	1.000		

Type: BS Lab ID: QC396339

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)	125.0	106.0	85	68-132
MTBE	25.00	22.61	90	71-120
Isopropyl Ether (DIPE)	25.00	21.57	86	65-120
Ethyl tert-Butyl Ether (ETBE)	25.00	20.85	83	75-124
1,2-Dichloroethane	25.00	24.72	99	79-121
Benzene	25.00	26.61	106	80-120
Methyl tert-Amyl Ether (TAME)	25.00	25.13	101	77-120
Toluene	25.00	28.60	114	80-120
1,2-Dibromoethane	25.00	24.56	98	80-120
Ethylbenzene	25.00	28.47	114	80-124
m,p-Xylenes	50.00	60.01	120	80-127
o-Xylene	25.00	28.49	114	80-124

Surrogate	%REC	Limits
Dibromofluoromethane	93	80-123
1,2-Dichloroethane-d4	100	79-134
Toluene-d8	99	80-120
Bromofluorobenzene	95	80-122

Type: BSD Lab ID: QC396340

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
tert-Butyl Alcohol (TBA)	125.0	101.2	81	68-132	5	20
MTBE	25.00	20.94	84	71-120	8	20
Isopropyl Ether (DIPE)	25.00	19.31	77	65-120	11	20
Ethyl tert-Butyl Ether (ETBE)	25.00	18.99	76	75-124	9	20
1,2-Dichloroethane	25.00	23.23	93	79-121	6	20
Benzene	25.00	24.42	98	80-120	9	20
Methyl tert-Amyl Ether (TAME)	25.00	22.78	91	77-120	10	20
Toluene	25.00	25.76	103	80-120	10	20
1,2-Dibromoethane	25.00	23.67	95	80-120	4	20
Ethylbenzene	25.00	26.65	107	80-124	7	20
m,p-Xylenes	50.00	55.95	112	80-127	7	20
o-Xylene	25.00	27.37	109	80-124	4	20

Surrogate	%REC	Limits
Dibromofluoromethane	91	80-123
1,2-Dichloroethane-d4	96	79-134
Toluene-d8	95	80-120
Bromofluorobenzene	93	80-122

RPD= Relative Percent Difference

**Batch QC Report**

<b>BTXE &amp; Oxygenates</b>			
Lab #:	195986	Location:	Wadler Property
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2005-65	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC396341	Batch#:	127269
Matrix:	Water	Analyzed:	07/16/07
Units:	ug/L		

<b>Analyte</b>	<b>Result</b>	<b>RL</b>
tert-Butyl Alcohol (TBA)	ND	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
Toluene	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

<b>Surrogate</b>	<b>%REC</b>	<b>Limits</b>
Dibromofluoromethane	89	80-123
1,2-Dichloroethane-d4	97	79-134
Toluene-d8	91	80-120
Bromofluorobenzene	98	80-122

ND= Not Detected

RL= Reporting Limit

195986

# Chain of Custody Record

Lab job no. \_\_\_\_\_

Date 7/12/07

Page 1 of 1

Laboratory CAT Method of Shipment CONSIGNEE  
 Address 2323 FIRM ST Shipment No. \_\_\_\_\_  
BERKELEY, CA Airbill No. \_\_\_\_\_  
 Project Owner LARRY WADLER Cooler No. \_\_\_\_\_  
 Site Address 2836 UNION ST Project Manager R. MARDISI  
OAKLAND, CA Telephone No. (510) 644-3123  
 Project Name USTCF CLAIM #018639 Fax No. (510) 644-3859  
 Project Number 2005-65 Samplers: (Signature) DR

Field Sample Number	Location/Depth	Date	Time	Sample Type	Type/Size of Container	Preservation		Analysis Required					Remarks
						Cooler	Chemical	Filtered	No. of Containers	TPH-G (DOLIP)	BTEX/NH3 (B200)	TBA, DIBP, PTE (B200)	
MW-1B		7/12/07	1220	W	6x40mL vials	Y	HCL	6	X	X	X	X	
MW-2A			1120			Y	HCL	6	Y	X	X	X	
MW-2B			1015			Y	HCL	6	X	Y	X	X	
MW-3B			1245			Y	HCL	6	X	Y	X	X	
MW-4A			1115		2x20mL vials	Y	HCL	2	Y	Y			
MW-4B			1200		6x40mL vials	Y	HCL	6	Y	X	X	X	
MW-5B			1310			Y	HCL	6	X	X	X	X	
EDW-1			1330			Y	HCL	6	X	X	X	X	

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

Relinquished by: Signature <u>DR</u> Printed <u>Devon Reyna</u> Company <u>BTS</u>	Date <u>7/12/07</u> Time <u>1430</u>	Received by: Signature <u>DR (Sample Custodian)</u> Printed <u>Devon Reyna</u> Company <u>BTS</u>	Date <u>7/12/07</u> Time <u>1530</u>	Relinquished by: Signature <u>[Signature]</u> Printed <u>[Signature]</u> Company <u>BTS</u>	Date <u>7/12/07</u> Time <u>1535</u>	Received by: Signature <u>[Signature]</u> Printed <u>Rick Grams</u> Company <u>CAT</u>	Date <u>7/12/07</u> Time <u>1535</u>
Turnaround Time: _____				Relinquished by: Signature _____ Printed _____ Company _____			
Comments: <u>GLOBAL ID : T0600105641</u>				Received by: Signature _____ Printed _____ Company _____			

2198 Sixth Street #201, Berkeley, CA 94710

intact cold rc

2000-00-01