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# **FIRST QUARTER 2008 SITE MONITORING REPORT**

**REDWOOD REGIONAL PARK  
SERVICE YARD  
OAKLAND, CALIFORNIA**

*Prepared for:*

**EAST BAY REGIONAL PARK DISTRICT  
OAKLAND, CALIFORNIA**

**April 2008**

**FIRST QUARTER 2008  
SITE MONITORING REPORT**

**REDWOOD REGIONAL PARK  
SERVICE YARD  
OAKLAND, CALIFORNIA**

*Prepared for:*

**EAST BAY REGIONAL PARK DISTRICT  
P.O. BOX 5381  
OAKLAND, CALIFORNIA 94605**

*Prepared by:*

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

**April 29 2008**

Project No. 2008-02

April 29, 2008

Mr. Jerry Wickham, P.G.  
Hazardous Materials Specialist, Local Oversight Program  
Alameda County Department of Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502

Subject: First Quarter 2008 Site Monitoring Report  
Redwood Regional Park Service Yard Site – Oakland, California  
Alameda County Environmental Health Fuel Leak Case No. RO0000246

Dear Mr. Wickham:

Attached is the referenced Stellar Environmental Solutions, Inc. report for the underground fuel storage tank (UFST) site at the Redwood Regional Park Service Yard, located at 7867 Redwood Road, Oakland, California. This project is being conducted for the East Bay Regional Park District (EBRPD), and follows previous site investigation and remediation activities (conducted since 1993) associated with former leaking UFSTs. The key regulatory agencies for this investigation are the Alameda County Department of Environmental Health, the Regional Water Quality Control Board, and the California Department of Fish and Game.

This report summarizes groundwater and surface monitoring and sampling activities between January 1 and March 31, 2008 (First Quarter 2008) with an additional discussion of purging and sampling of monitoring well MW-2 conducted on January 17 and April 3, 2008. Remedial bioventing activities are reported in separate technical submittals; however, a summary of these activities is included in the quarterly groundwater monitoring report.

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

Sincerely,



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

cc: Carl Wilcox, California Department of Fish and Game  
Neal Fujita, East Bay Regional Park District  
State of California GeoTracker system; Alameda County Environmental Health ftp  
system



# TABLE OF CONTENTS

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Section	Page
1.0 INTRODUCTION.....	1
Project Background.....	1
Objectives and Scope of Work.....	1
Historical Corrective Actions and Investigations .....	1
Site Description.....	2
Regulatory Oversight .....	2
2.0 PHYSICAL SETTING.....	6
Site Lithology.....	6
Hydrogeology.....	10
3.0 Q1 2008 ACTIVITIES .....	13
Groundwater and Surface Water Monitoring Activities .....	13
Bioventing-Related Activities.....	15
Monitoring Well MW-2 Concentration Increase and Purging Remedy .....	15
4.0 REGULATORY CONSIDERATIONS .....	18
Groundwater Contamination.....	18
Surface Water Contamination.....	18
5.0 MONITORING EVENT ANALYTICAL RESULTS .....	20
Current Event Groundwater and Surface Water Results .....	20
Quality Control Sample Analytical Results.....	22
6.0 SUMMARY, CONCLUSIONS, AND PROPOSED ACTIONS.....	24
Summary and Conclusions.....	24
Proposed Actions .....	25
7.0 REFERENCES AND BIBLIOGRAPHY .....	27
8.0 LIMITATIONS .....	32

## **Appendices**

- Appendix A     Historical Groundwater Monitoring Well Water Level Data
- Appendix B     Groundwater Monitoring Field Documentation
- Appendix C     Analytical Laboratory Report and Chain-of-Custody Record
- Appendix D     Historical Groundwater and Surface Water Analytical Results

## TABLES AND FIGURES

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<b>Tables</b>	<b>Page</b>
Table 1 Groundwater Monitoring Well Construction and Groundwater Elevation Data – March 14, 2008 Monitoring Event Redwood Regional Park Corporation Yard, Oakland, California .....	14
Table 2 Groundwater and Surface Water Sample Analytical Results – March 14, 2008 Redwood Regional Park Corporation Yard, Oakland, California .....	21

<b>Figures</b>	<b>Page</b>
Figure 1 Site Location Map .....	3
Figure 2 Site Plan and Historical Sampling Locations .....	4
Figure 3 Geologic Cross-Section Locations .....	7
Figure 4 Geologic Cross-Sections A-A' through C-C' .....	8
Figure 5 Geologic Cross-Sections D-D' through F-F' .....	9
Figure 6 Groundwater Elevation Map – March 14, 2008 .....	11
Figure 7 Gasoline and Diesel Hydrochemical Trends in Monitoring Well MW-2 .....	17
Figure 8 Groundwater Analytical Results and Gasoline Plume – March 2008 .....	23

## **1.0 INTRODUCTION**

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### **PROJECT BACKGROUND**

The subject property is the East Bay Regional Park District (EBRPD) Redwood Regional Park Service Yard located at 7867 Redwood Road in Oakland, Alameda County, California. The site has undergone site investigations and remediation since 1993 to address subsurface contamination caused by leakage from one or both of two former underground fuel storage tanks (UFSTs) that contained gasoline and diesel fuel. The Alameda County Department of Environmental Health (Alameda County Environmental Health) has provided regulatory oversight of the investigation since its inception (Alameda County Environmental Health Fuel Leak Case No. RO0000246). Other regulatory agencies with historical involvement in site review include the Regional Water Quality Control Board (Water Board) and the California Department of Fish and Game (CDFG).

### **OBJECTIVES AND SCOPE OF WORK**

This report discusses the following activities conducted/coordinated by Stellar Environmental Solutions, Inc. (SES) between January 1 and April 3, 2008:

- Collecting water levels in site wells to determine shallow groundwater flow direction;
- Sampling site wells for contaminant analysis and natural attenuation indicators;
- Collecting surface water samples for contaminant analysis; and
- Additional purging and sampling of groundwater from monitoring well MW-2.

### **HISTORICAL CORRECTIVE ACTIONS AND INVESTIGATIONS**

Previous SES reports have provided discussions of previous site remediation and investigations; site geology and hydrogeology; residual site contamination; conceptual model for contaminant fate and transport; and hydrochemical trends and plume stability. Section 7.0 (References and Bibliography) of this report provides a listing of all technical reports for the site.

The general phases of site work included:

- An October 2000 Feasibility Study report for the site submitted to Alameda County Environmental Health, which provided detailed analyses of the regulatory implications of the site contamination and an assessment of viable corrective actions (SES, 2000d).

- Two instream bioassessment events conducted in April 1999 and January 2000 to evaluate potential impacts to stream biota associated with the site contamination (no impacts were documented).
- Additional monitoring well installations and corrective action by ORC™ injection proposed by SES and approved by Alameda County Environmental Health in its January 8, 2001 letter to the EBRPD. Two phases of ORC™ injection were conducted—in September 2001 and July 2002.
- A total of 45 groundwater monitoring events, conducted on a quarterly basis since project inception (November 1994); a total of 11 groundwater monitoring wells are currently available for monitoring.
- A bioventing pilot test conducted in September and October 2004 to evaluate the feasibility of this corrective action strategy, and installation of the full-scale bioventing system in November and December 2005. Two additional bioventing wells (VW-4 and VW-5) were installed on March 4, 2008. Bioventing activities conducted to date have been, and will continue to be, discussed in bioventing-specific technical reports, and updates will be provided in groundwater monitoring progress reports as they relate to this ongoing program.

## **SITE DESCRIPTION**

Figure 1 shows the location of the project site. The site slopes to the west, from an elevation of approximately 564 feet above mean sea level (amsl) at the eastern edge of the service yard to approximately 530 feet amsl at Redwood Creek, which defines the approximate western edge of the project site with regard to this investigation. Figure 2 shows the site plan.

## **REGULATORY OVERSIGHT**

The lead regulatory agency for the site investigation and remediation is Alameda County Environmental Health (Case No. RO0000246), with oversight provided by the Water Board (GeoTracker Global ID T0600100489). The CDFG is also involved with regard to water quality impacts to Redwood Creek. All workplans and reports have been submitted to these agencies. Historical Alameda County Environmental Health-approved revisions to the groundwater sampling program have included:

- Discontinuing hydrochemical sampling and analysis in wells MW-1, MW-3, MW-5, and MW-6;
- Discontinuing creek surface water sampling at upstream location SW-1;
- Discontinuing field measurement and laboratory analyses for natural attenuation indicators, to be re-implemented following the bioventing corrective action; and





3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS 750 ft Scale: 1 : 25,000 Detail: 13-0 Datum: WGS84



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

Redwood Reg. Park Service Yard  
Oakland, CA

By: MJC

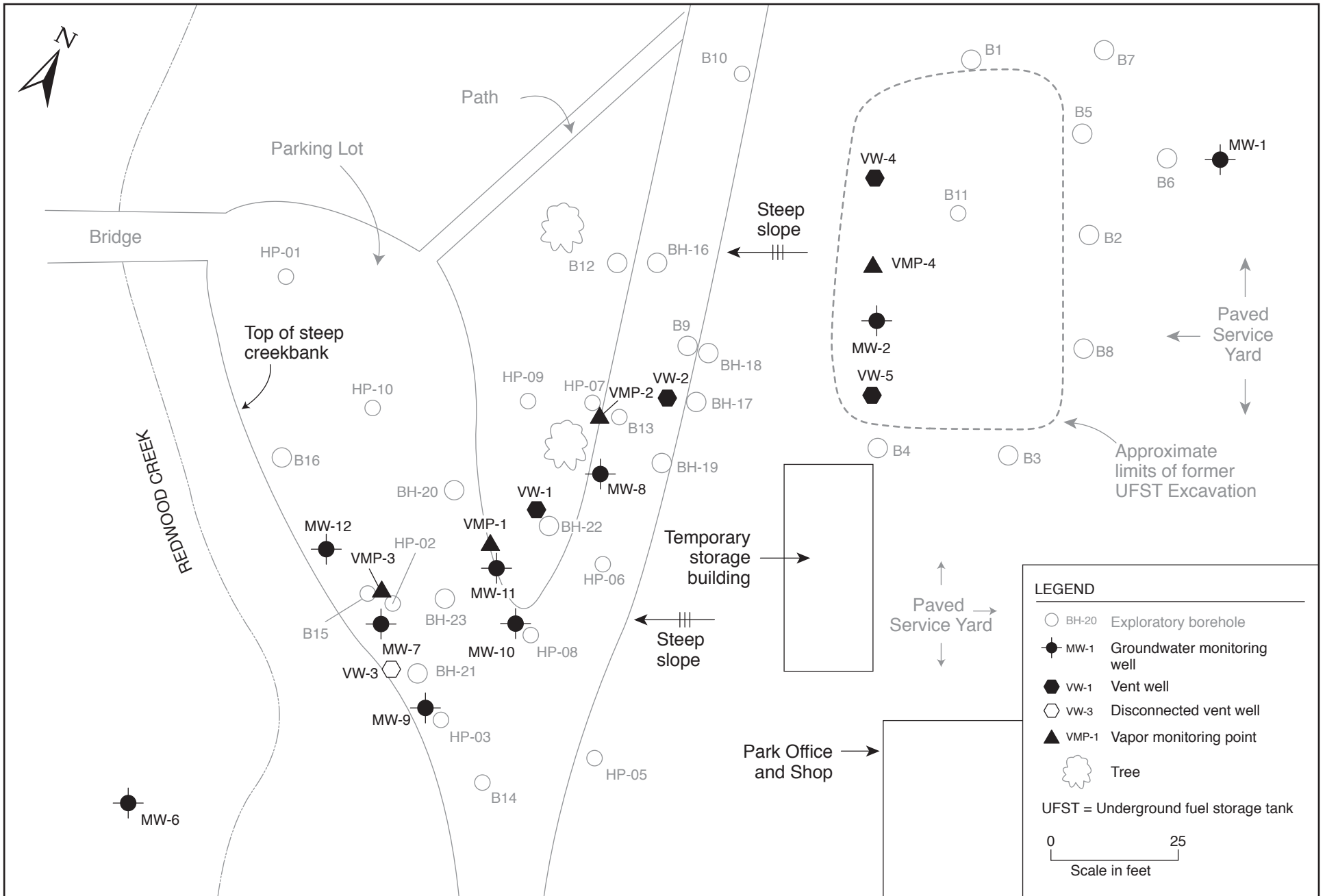
MARCH 2006

Figure 1



2006-17-01





2008-02-02

- Reducing the frequency of creek surface water sampling from quarterly to semi-annually. The latter recommendation has not yet been implemented due to the EBRPD's continued concern over potential impacts to Redwood Creek.

The site is in compliance with State of California GeoTracker requirements for uploading of electronic data and reports. In addition, electronic copies of technical documentation reports published since Q2-2005 have been uploaded to Alameda County Environmental Health's file transfer protocol (ftp) system.

## 2.0 PHYSICAL SETTING

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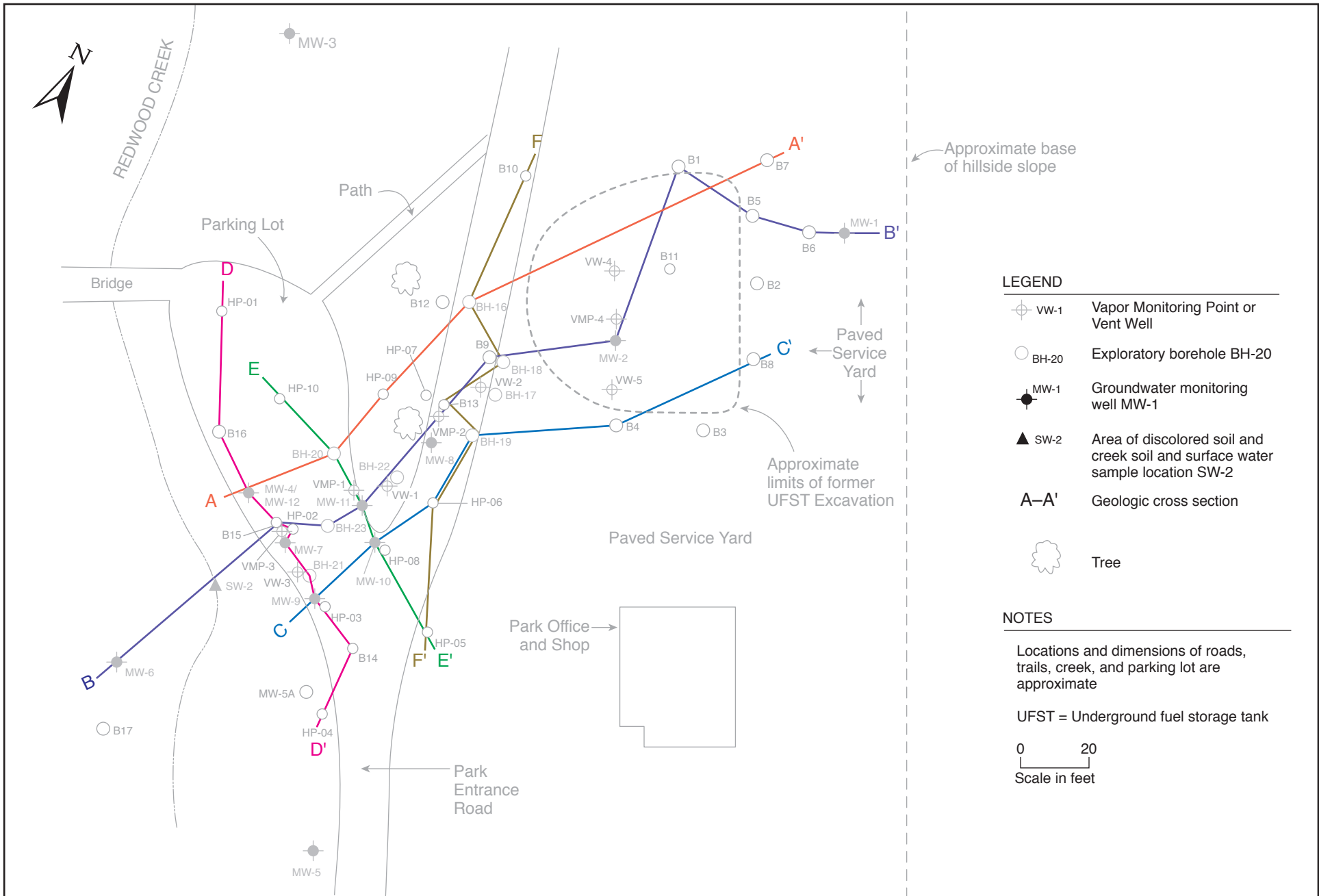
This section discusses the site hydrogeologic conditions based on geologic logging and water level measurements collected at the site since September 1993. Previous SES reports have included detailed discussions of site lithologic and hydrogeologic conditions. In May 2004, Alameda County Environmental Health requested, via email, additional evaluation of site lithology—specifically, the preparation of multiple geologic cross-sections parallel to and perpendicular to the contaminant plume's long axis.

### SITE LITHOLOGY

Figure 3 shows the location of the geologic cross-sections. Figure 4 shows three sub-parallel geologic cross-sections (A-A' through C-C') along the long axis of the groundwater contaminant plume (i.e., along local groundwater flow direction). Figure 5 shows three sub-parallel geologic cross-sections (D-D' through F-F') roughly perpendicular to groundwater direction. In each figure, the three sub-parallel sections are presented together for ease of comparison. Due to the small scale, these sections show only lithologic conditions (i.e., soil type and bedrock depth). Additional information on water level depths, historical range of water levels, and inferred thickness of soil contamination was presented in a previous report (SES, 2004c) for cross-section B-B'.

Shallow soil stratigraphy consists of a surficial 3- to 10-foot-thick clayey silt unit underlain by a 5- to 15-foot-thick silty clay unit. In the majority of boreholes, a 5- to 10-foot-thick clayey coarse-grained sand and clayey gravel unit that laterally grades to a clay or silty clay was encountered. This unit overlies a weathered siltstone at the base of the observed soil profile. Soils in the vicinity of MW-1 are inferred to be landslide debris.

A previous SES report (SES, 2004c) presented a bedrock surface isopleth map (elevation contours for the top of the bedrock surface) in the contaminant plume area. The isopleth map from that report, and Figures 4 and 5 from this report, indicate the following: the bedrock surface slopes steeply, approximately 0.3 feet/foot from east to west (toward Redwood Creek) in the upgradient portion of the site (from the service yard to under the entrance road), then shows a gentle east-to-west slope in the downgradient portion of the site (under the gravel parking area) toward Redwood Creek. This general gradient corresponds to the local groundwater flow direction. On the southern side of the plume area, bedrock slopes gently from south to north (the opposite of the general



**LEGEND**

	Vw-1 Vapor Monitoring Point or Vent Well
	BH-20 Exploratory borehole BH-20
	MW-1 Groundwater monitoring well MW-1
	SW-2 Area of discolored soil and creek soil and surface water sample location SW-2
A-A' Geologic cross section	
	Tree

**NOTES**

Locations and dimensions of roads, trails, creek, and parking lot are approximate

UFST = Underground fuel storage tank

0 20  
Scale in feet

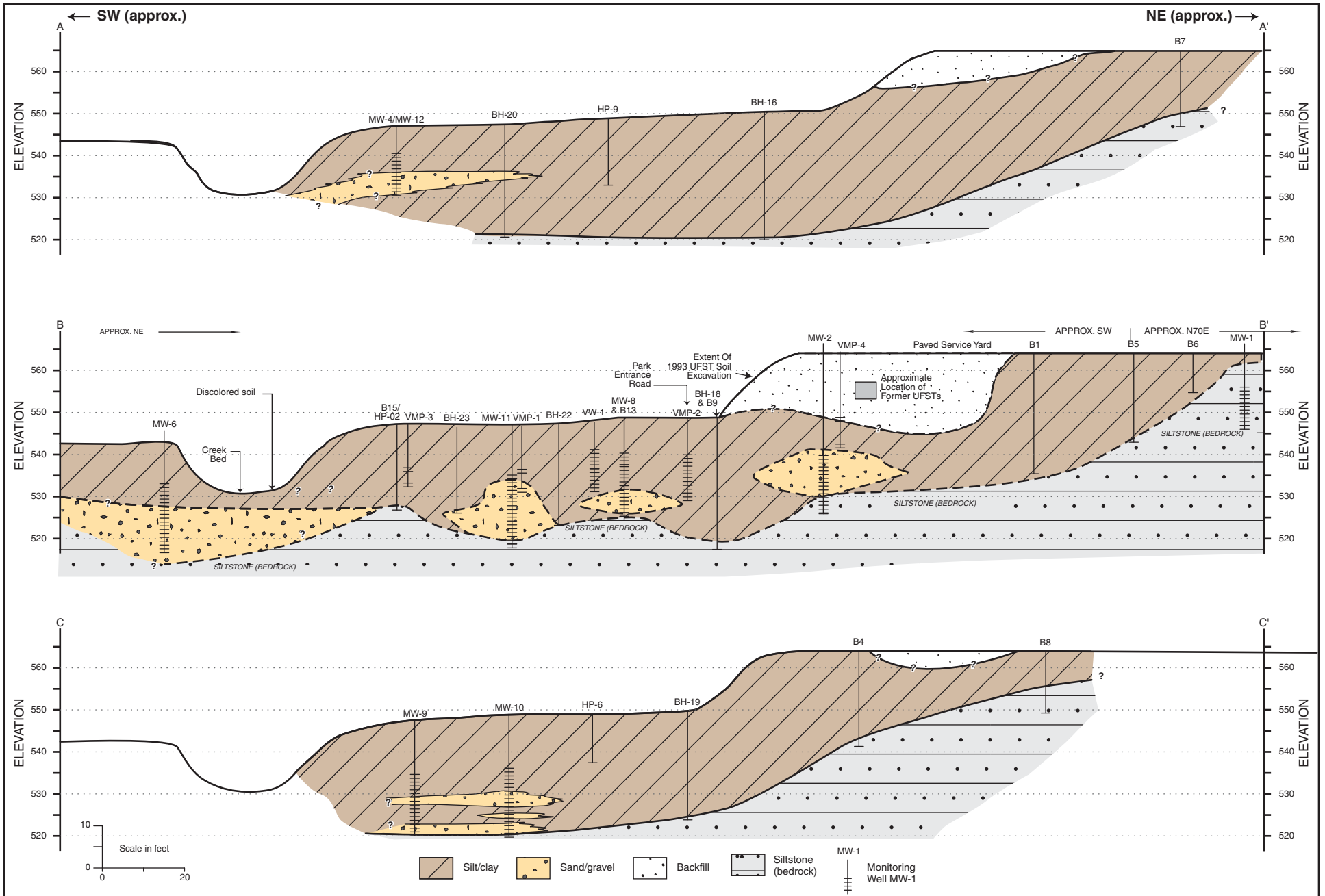
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**GEOLOGIC CROSS-SECTION LOCATIONS  
Redwood Regional Park Service Yard, Oakland, CA**

**Figure 3**

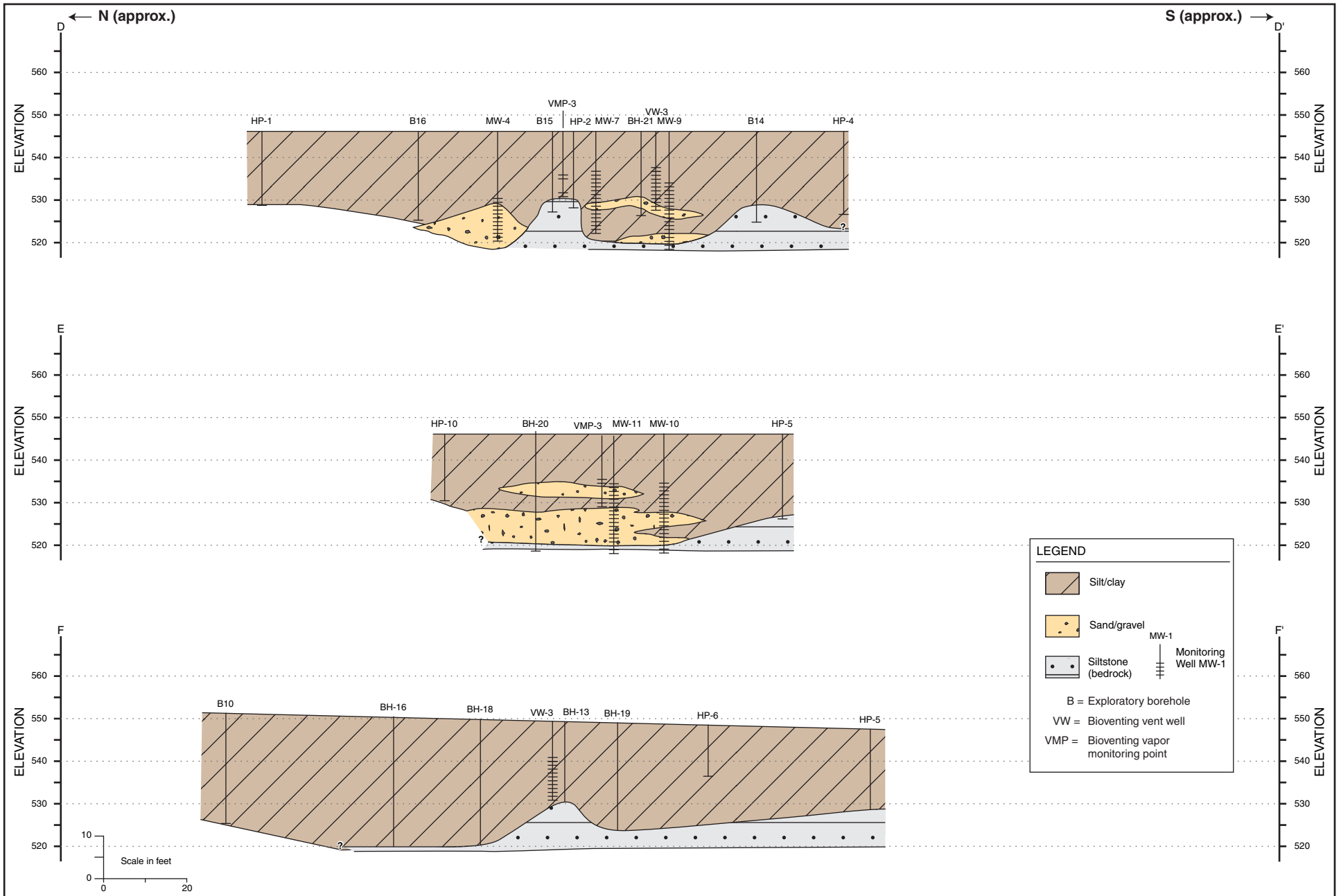
by: MJC	MARCH 2008
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**Figure 4**

by: MJC

DECEMBER 2007



**GEOLOGIC CROSS SECTIONS — D-D' through F-F'**  
**Redwood Regional Park Service Yard, Oakland, CA**

**Figure 5**

by: MJC

DECEMBER 2005

topographic gradient). Bedrock topography on the northern side of the plume cannot be determined from the available data.

In the central and downgradient portions of the groundwater contaminant plume (under the entrance road and the parking area), the bedrock surface has local, fairly steep elevation highs and lows, expressing a hummocky surface. Bedrock elevations vary by up to 10 feet over distances of less than 20 feet in this area. Local bedrock elevation highs are observed at upgradient location BH-13 (see cross-section F-F') and at downgradient location B15/HP-02 (see cross-section B-B'). Intervening elevation lows create troughs that trend north-south in the central portion of the plume and east-west in the downgradient portion of the plume.

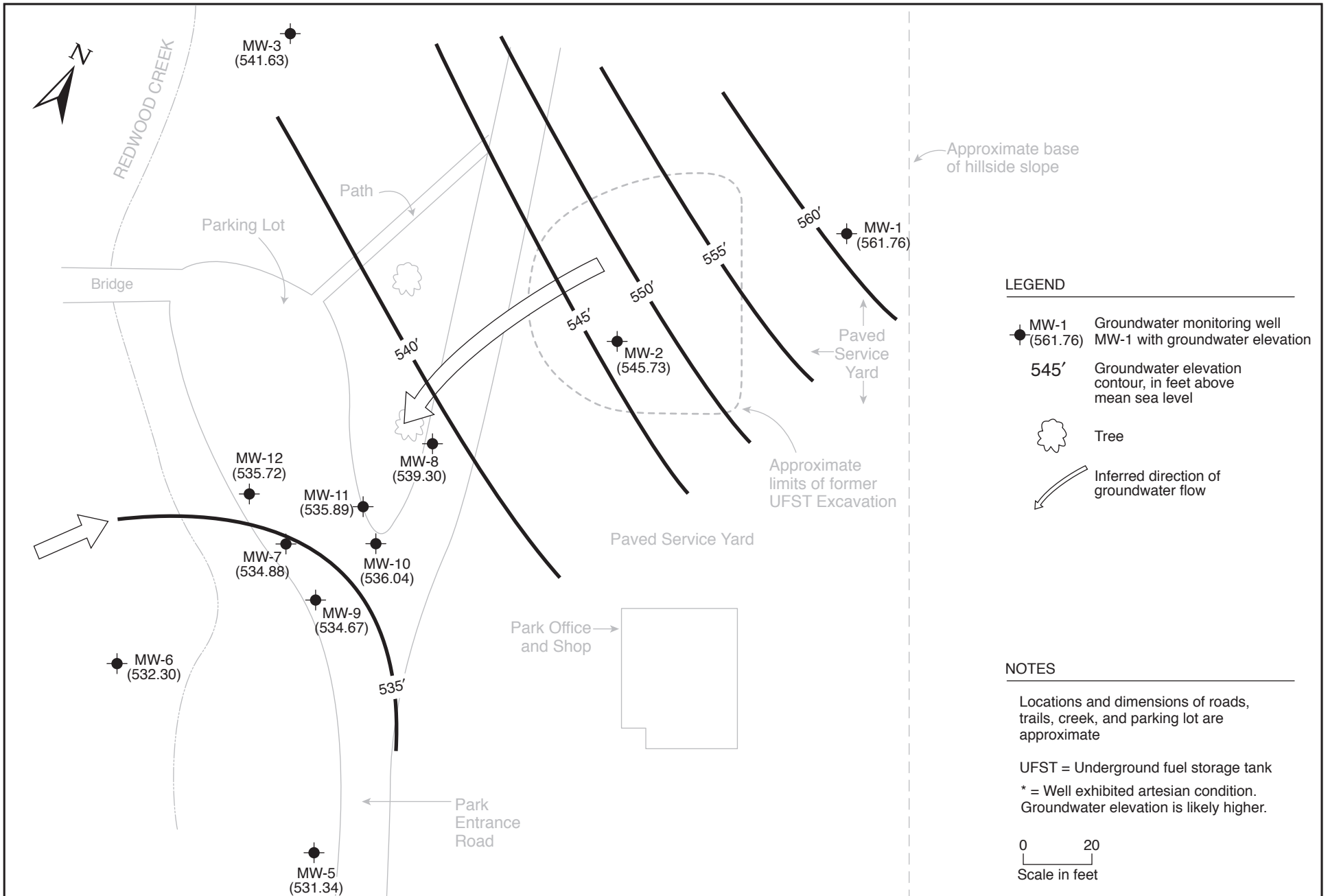
The bedrock surface (and overlying unconsolidated sediment lithology) suggests that the bedrock surface may have at one time undergone channel erosion from a paleostream(s) flowing sub-parallel to present-day Redwood Creek. Because groundwater flows in the unconsolidated sediments that directly overlie the bedrock surface, it is likely that the hummocky bedrock surface affects local groundwater depth and flow direction. This is an important hydrogeologic control that should be considered if groundwater-specific corrective action is contemplated.

## **HYDROGEOLOGY**

Groundwater at the site occurs under unconfined and semi-confined conditions, generally within the clayey, silty, sand-gravel zone. The top of this zone varies between approximately 12 and 19 feet below ground surface (bgs), and the bottom of the water-bearing zone (approximately 25 to 28 feet bgs) corresponds to the top of the siltstone bedrock unit. Seasonal fluctuations in groundwater depth create a capillary fringe of several feet that is saturated in the rainy period (late fall through early spring) and unsaturated during the remainder of the year. The thickness of the saturated zone plus the capillary fringe varies between approximately 10 and 15 feet in the area of contamination. Local perched water zones have been observed well above the top of the capillary fringe.

Figure 6 is a groundwater elevation map constructed from the current event monitoring well equilibrated water levels. Table 1 (in Section 3.0) summarizes current event groundwater elevation data. Appendix A contains historical groundwater elevation data. Consistent with the bedrock isopleth map showing an elevation depression in the vicinity of MW-11, historical groundwater elevations in MW-11 are sporadically lower than in the surrounding area. As discussed in the previous sub-section, local groundwater flow direction is likely more variable than expressed by groundwater monitoring well data, due to local variations in bedrock surface topography.





**GROUNDWATER ELEVATION MAP—March 14, 2008**  
**Redwood Regional Park Service Yard, Oakland, CA**

**Figure 6**

by: MJC

MARCH 2008

In the upgradient portion of the site (between well MW-1 and MW-2, in landslide deposit and the former UFST excavation backfill), the groundwater gradient is approximately 0.21 feet per foot. Downgradient from (west of) the UFST source area (between MW-2 and Redwood Creek), the groundwater gradient is approximately 0.05 feet per foot. Groundwater elevations are near historical highs, resulting from the high precipitation levels prior to the monitoring event. The direction of shallow groundwater flow during the current event was to the west-southwest (toward Redwood Creek), which is consistent with historical site groundwater flow direction.

We assume a site groundwater velocity of 7 to 10 feet per year, using general look-up tables for permeability characteristics for the site-specific lithologic data obtained from site investigations. This velocity estimate is conservatively low, but does meet minimum-distance-traveled criteria from the date when contamination was first observed in Redwood Creek (1993) relative to the time of the UFST installations (late 1970s). Locally, however, the groundwater velocity could vary significantly. Calculating the specific hydraulic conductivity critical to accurately estimating site-specific groundwater velocity would require direct testing of the water-bearing zone through a slug or pumping test.

Redwood Creek, which borders the site to the west, is a seasonal creek known for the occurrence of rainbow trout. Creek flow in the vicinity of the site shows significant seasonal variation, with little to no flow during the summer and fall dry season, and vigorous flow with depths exceeding 1 foot during the winter and spring wet season. The creek is a gaining stream (i.e., it is recharged by groundwater seeps and springs) in the vicinity of the site, and discharges into Upper San Leandro Reservoir approximately 1 mile southeast of the site. During low-flow conditions, the groundwater table is below the creek bed in most locations (including the area of historical contaminated groundwater discharge); consequently, there is little to no observable creek flow at these times.

## 3.0 Q1 2008 ACTIVITIES

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This section presents the creek surface water and groundwater sampling and analytical methods for the most recent groundwater monitoring event (Q1 2008), conducted on March 14, 2008 and an additional discussion of purging and sampling of monitoring well MW-2 that was conducted on January 17<sup>th</sup>, April 3, 2008. A summary of bioventing-related activities is also provided.

### GROUNDWATER AND SURFACE WATER MONITORING ACTIVITIES

Groundwater and surface water analytical results are summarized in Section 5.0. Monitoring and sampling protocols were in accordance with the Alameda County Environmental Health-approved SES technical workplan (SES, 1998a). Current event activities included:

- Measuring static water levels in all 11 site wells.
- Collecting post-purge groundwater samples for laboratory analysis of site contaminants from wells located within (or potentially within) the groundwater plume (MW-2, MW-7, MW-8, MW-9, MW-10, MW-11, and MW-12).
- Collecting Redwood Creek surface water samples for laboratory analysis from locations SW-2 and SW-3.

Creek sampling and groundwater monitoring/sampling was conducted on March 14, 2008. The creek sampling was conducted by the SES project manager. The locations of all site monitoring wells and creek water sampling locations are shown on Figure 2 (in Section 1.0). Well construction information and water level data are summarized in Table 1. Appendix B contains the groundwater monitoring field records for the current event.

Because it appears that the previously-injected ORC™ has been depleted, continued monitoring of the natural attenuation parameters—dissolved oxygen, oxidation-reduction potential, nitrate, ferrous iron, and sulfate—is of marginal value until such time as additional corrective actions that would increase oxygen concentrations are implemented. Thus, monitoring for natural attenuation parameters was discontinued following the Q3 2004 event.

**Table 1**  
**Groundwater Monitoring Well Construction and Groundwater Elevation Data –**  
**March 14, 2008 Monitoring Event**  
**Redwood Regional Park Corporation Yard, Oakland, California**

Well	Well Depth	Screened Interval	TOC Elevation	Groundwater Elevation (3/14/08)
MW-1	18	7 to 17	565.83	561.76
MW-2	36	20 to 35	566.42	545.73
MW-3	42	7 to 41	560.81	541.63
MW-5	26	10 to 25	547.41	531.34
MW-6	26	10 to 25	545.43	532.30
MW-7	24	9 to 24	547.56	534.88
MW-8	23	8 to 23	549.13	539.30
MW-9	26	11 to 26	549.28	534.67
MW-10	26	11 to 26	547.22	536.04
MW-11	26	11 to 26	547.75	535.89
MW-12	25	10 to 25	544.67	535.72

Notes:

TOC = Top of casing.

Wells MW-1 through MW-6 are 4-inch diameter; all other wells are 2-inch diameter.

All elevations are feet above U.S. Geological Survey mean sea level.

**Groundwater Level Monitoring and Sampling**

Groundwater monitoring well water level measurements, purging, sampling, and field analyses were conducted by Blaine Tech Services under the supervision of SES personnel. Groundwater sampling was conducted in accordance with State of California guidelines for sampling dissolved analytes in groundwater associated with leaking UFSTs (State Water Resources Control Board, 1989), and followed the methods and protocols approved by Alameda County Environmental Health in the SES 1998 workplan (SES, 1998a).

As the first task of the monitoring event, static water levels were measured using an electric water level indicator. Pre-purge groundwater samples were then collected for field and laboratory analysis of natural attenuation indicators. The wells to be sampled for contaminant analyses were then purged (by bailing and/or pumping) of three wetted casing volumes. Aquifer stability parameters (temperature, pH, and electrical conductivity) were measured after each purged casing volume to ensure that representative formation water would be sampled. To minimize the potential for cross-contamination, wells were purged and sampled in order of increasing contamination (based on the analytical results of the previous quarter).

The sampling-derived purge water and decontamination rinseate (approximately 79 gallons) from the current event was containerized in the onsite plastic tank. Purge water from future events will continue to be accumulated in the onsite tank until it is full, at which time the water will be transported offsite for proper disposal.

### **Creek Surface Water Sampling**

Surface water sampling was conducted by SES on March 14, 2008. Surface water samples were collected from two Redwood Creek locations: SW-2 (immediately downgradient of the former UFST source area and within the area of documented creek bank soil contamination) and SW-3 (approximately 500 feet downstream of the SW-2 location). In accordance with a previous SES recommendation approved by Alameda County Environmental Health, upstream sample location SW-1 is no longer part of the surface water sampling program.

At the time of sampling, the creek was at a high stage; water depths were approximately 1 to 1.5 feet with a brisk flow. At the SW-2 location, where contaminated groundwater discharge to the creek historically has been observed, an orange algae was noted growing on the saturated portion of the creek bank. This algae likely is utilizing the petroleum as a carbon source, and therefore is a good indicator of the presence of petroleum contamination. However, neither petroleum sheen nor odor was evident on the water surface.

### **BIOVENTING-RELATED ACTIVITIES**

The bioventing system was installed and started up in December 2005/January 2006. Weekly system monitoring and air flow optimization events were conducted for 1 month in January and February 2006. Bioventing system operations and maintenance (O&M) events have been conducted monthly since March 2006. As noted previously, two new bioventing wells, VW-4 and VW-5, were installed on March 4, 2008 to replace VW-3 which has historically seen no change in pressurization. Bioventing activities are discussed in detail in separate technical documents.

### **MONITORING WELL MW-2 CONCENTRATION INCREASE AND PURGING REMEDY**

Starting in Q3-2007 groundwater well MW-2 which had a 14 year history of concentration well generally below 2,000 micrograms per liter ( $\mu\text{g/L}$ ) total extractable hydrocarbons as diesel (TEHd) and total volatile hydrocarbons as gasoline (TVHg) showed a dramatic “spiked” increase in concentration for both TEHd and TVHg.

Well MW-2, located in the upgradient area of the plume in the location of the historical excavation, has historically contained relatively minor concentrations of diesel and gasoline, as expected given the excavation source removal in the area of the well, with previous maximum concentrations detected in February 1998 of 2,000 µg/L of TVHg and 200 µg/L of TEHd.

In Q3-2007, TVHg was detected at 2,600 µg/L TVHg and 260 µg/L of TEHd. In Q4-2007, TVHg was detected at 16,000 µg/L TVHg and 5,800 µg/L of TEHd. In the previous sampling events (Q3-2007 and Q4-2007), gasoline and diesel concentrations in MW-2 were detected at historically high concentrations.

Due to this increase in hydrocarbon concentration at MW-2, SES purged approximately 80 gallons of contaminated groundwater MW-2 on January 17, 2008. Groundwater samples taken from the well immediately after purging showed a dramatic drop in contamination to 480 µg/L of TVHg and 200 µg/L of TEHd.

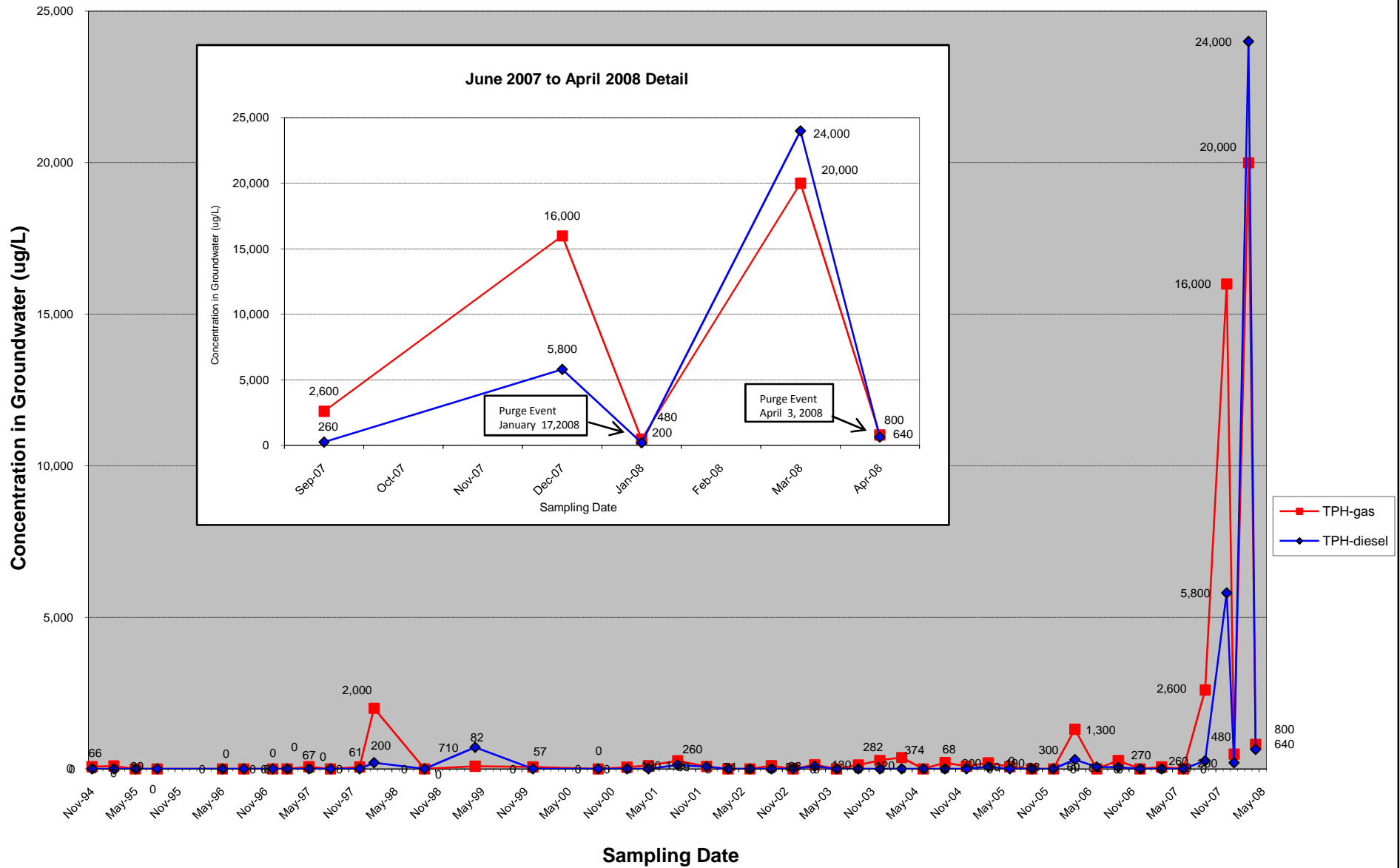
The analytical results of MW-2 during the current Q1-2008 monitoring event showed another contaminant spike with 20,000 µg/L of TVHg and 24,000 µg/L of TEHd. SES subsequently purged another 80 gallons from MW-2 on April 3, 2008, the analytical results of which showed significant reduction to 800 µg/L of TVHg and 640 µg/L of TEHd.

The high concentration of the recent increase in contamination and the response of the limited (80 gallons) pumping to effect a marked reduction in concentration yields some clues about how systemic versus confined or isolated this contamination appears to be. The long history of sustained lower TEHd and TVHg concentrations at MW-2 argue against the recent increase being the result of the residual contamination in the source area suddenly yielding higher contamination, as that would be expected to have happened already given the groundwater velocity and proximity.

The only definitive environmental change over the last 10 years has been the recent (2006-07 and 2007-08) lower than normal rainfall. This lower groundwater elevation may have released some previously sorbed hydrocarbons, however, periods of lowered groundwater elevation in the last 10 years do not correlate with detected contaminant spikes. An alternative explanation could be that the spike in contamination may be due to an isolated spill event, or a confined pocket of residual contamination. Either way the rapid reduction in concentration resulting from limited purging indicated that this dissolved fraction of contamination is not extensive or it would remain high with sustained pumping. The quick response suggests that the contamination may be entrained in the soil and requires sufficient contact time with groundwater to increase the soluble fraction.

Figure 7 shows the TEHd and TVHg concentration plot for MW-2 over time. See Appendix C for the certified laboratory analytical reports.

**Figure 7: Gasoline and Diesel Hydrochemical Trends: Well MW-2  
Redwood Regional Park Service Yard, Oakland, California**



## **4.0 REGULATORY CONSIDERATIONS**

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The following is a summary of regulatory considerations regarding surface water and groundwater contamination. There are no Alameda County Environmental Health or Water Board cleanup orders for the site, although all site work has been conducted under oversight of these agencies.

### **GROUNDWATER CONTAMINATION**

As specified in the Water Board's *San Francisco Bay Region Water Quality Control Plan* (Water Board, 1986), all groundwaters are considered potential sources of drinking water unless otherwise approved by the Water Board, and are also assumed to ultimately discharge to a surface water body and potentially impact aquatic organisms. While it is likely that site groundwater would satisfy geology-related criteria for exclusion as a drinking water source (excessive total dissolved solids and/or insufficient sustained yield), Water Board approval for this exclusion has not been obtained for the site. As summarized in Table 2 (in Section 5.0), site groundwater contaminant levels are compared to two sets of criteria: 1) Water Board Tier 1 Environmental Screening Levels (ESLs) for residential sites where groundwater is a current or potential drinking water source; and 2) ESLs for residential sites where groundwater is not a current or potential drinking water source.

As stipulated in the ESL document (Water Board, 2007), the ESLs are not cleanup criteria; rather, they are conservative screening-level criteria designed to be protective of both drinking water resources and aquatic environments in general. The groundwater ESLs are composed of multiple components, including ceiling value, human toxicity, indoor air impacts, and aquatic life protection. Exceedance of ESLs suggests that additional investigation and/or remediation is warranted. While drinking water standards [e.g., Maximum Contaminant Levels (MCLs)] are published for the site contaminants of concern, Alameda County Environmental Health has indicated that impacts to nearby Redwood Creek are of primary importance, and that site target cleanup standards should be evaluated primarily in the context of surface water quality criteria.

### **SURFACE WATER CONTAMINATION**

As summarized in Table 2 (in Section 5.0), site surface water contaminant levels are compared to the most stringent screening level criteria published by the State of California, U.S. Environmental Protection Agency, and U.S. Department of Energy. These screening criteria address chronic and acute exposures to aquatic life. As discussed in the ESL document (Water Board, 2007), benthic



communities at the groundwater/surface water interface (e.g., at site groundwater discharge location SW-2) are assumed to be exposed to the full concentration of groundwater contamination prior to dilution/mixing with the surface water). This was also a fundamental assumption in the instream benthic macroinvertebrate bioassessment events, which documented no measurable impacts.

Historical surface water sampling in the immediate vicinity of contaminated groundwater discharge (SW-2) has sporadically documented petroleum contamination, usually in periods of low stream flow, and generally at concentrations several orders of magnitude less than adjacent (within 20 feet) groundwater monitoring well concentrations. It is likely that mixing/dilution between groundwater and surface water precludes obtaining an “instantaneous discharge” surface water sample that is wholly representative of groundwater contamination at the discharge location. Therefore, the most conservative assumption is that surface water contamination at the groundwater/surface water interface is equivalent to the upgradient groundwater contamination (e.g., site downgradient wells MW-7, MW-9 and MW-12).

While site target cleanup standards for groundwater have not been determined, it is likely that no further action will be required by regulatory agencies when groundwater (and surface water) contaminant concentrations are all below their respective screening level criteria. Residual contaminant concentrations in excess of screening level criteria might be acceptable to regulatory agencies if a more detailed risk assessment (e.g., Tier 2 and/or Tier 3) demonstrates that no significant impacts are likely.

## 5.0 MONITORING EVENT ANALYTICAL RESULTS

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This section presents the field and laboratory analytical results of the most recent monitoring event. Table 2 summarizes the contaminant analytical results, and Figure 7 shows the contaminant analytical results and the inferred limits of the gasoline groundwater plume. Appendix C contains the certified analytical laboratory report and chain-of-custody record for the current event; Appendix D contains a summary of historical groundwater and surface analytical results.

### CURRENT EVENT GROUNDWATER AND SURFACE WATER RESULTS

Current quarter site groundwater concentrations in all of the sampled monitoring wells (MW-2, MW-7, MW-8, MW-9, MW-10, MW-11, and MW-12) exceeded their respective groundwater ESLs for total extractable hydrocarbons as diesel (TEHd), and as total volatile hydrocarbons as gasoline (TVHg) in all wells (with the exception of MW-10 for TVHg) under both the *groundwater is and is not a drinking water resource* criteria. Concentrations of benzene exceeded the ESL for drinking water in MW-2, MW-7, MW-8, MW-9, MW-10, and MW-11. The ESL where groundwater is not is not a drinking water resource was not exceeded. Ethylbenzene concentrations exceeded the ESL for drinking water in MW-2, MW-8, MW-9, and MW-11. Monitoring wells MW-2, MW-8, and MW-9 were also at or above the ESL where groundwater is not a drinking water resource. Total xylenes exceeded the groundwater ESLs under both criteria in wells MW-2 and MW-8, and where groundwater is not a drinking water resource for MW-9. MTBE concentrations did not exceed the drinking water ESL in any of the wells; but MW-2, MW-7, MW-8, and MW-9 exceeded the ESL where groundwater is not a drinking water resource.

Maximum TVHg, TEHd, and total xylene concentrations for this monitoring event were all detected in MW-2, located in the former source area. This anomaly is discussed in more detail in Section 3.0.

All other maximum concentrations for this event (benzene, ethyl benzene, and MTBE) were detected in well MW-8 (located approximately half the distance between the former source area and the creek). Elevated contaminant concentrations were also detected in downgradient wells MW-7, MW-9, and MW-11. The northern edge of the plume in the downgradient area of the plume is defined by well MW-12. The southern edge of the plume in the downgradient area is not strictly defined; however, based on historical groundwater data, it appears to be located between well MW-9 and well MW-5. While the center of contaminant mass in groundwater has historically been located

downgradient of the former source area, elevated contaminant concentration in MW-2 (located in the former source area) have been observed for the last two groundwater monitoring events.

**Table 2**  
**Groundwater and Surface Water Sample**  
**Analytical Results – March 14, 2008**  
**Redwood Regional Park Corporation Yard, Oakland, California**

Location	Contaminant						
	TVHg	TEHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
<b>GROUNDWATER SAMPLES</b>							
MW-2	<b>20,000</b>	<b>24,000</b>	<b>21</b>	39	<b>300</b>	<b>2,620</b>	<b>13</b>
MW-7	<b>5,400</b>	<b>5,900</b>	<b>21</b>	<0.5	150	15	<b>51</b>
MW-8	<b>11,000</b>	<b>13,000</b>	<b>150</b>	13	<b>1,100</b>	<b>950</b>	<b>76</b>
MW-9	<b>6,400</b>	<b>3,500</b>	<b>67</b>	5.2	<b>480</b>	<b>177.6</b>	<b>38</b>
MW-10	78	<b>170</b>	<b>1.7</b>	<0.5	3.1	0.97	2.4
MW-11	<b>5,300</b>	<b>4,000</b>	<b>130</b>	<0.5	120	13	8.8
MW-12	<b>720</b>	<b>500</b>	<0.5	4.4	9.0	2.8	<2.0
<b>Groundwater ESLs</b> <sup>(a)</sup>	100 / 100	100 / 100	1.0 / 500	150 / 500	300 / 400	420 / 420	13 / 100
<b>REDWOOD CREEK SURFACE WATER SAMPLES</b>							
SW-2	<50	<b>130</b>	<0.5	<0.5	<0.5	<0.5	<2.0
SW-3	<50	<b>200</b>	<0.5	<0.5	<0.5	0.61	<2.0
<b>Surface Water Screening Levels</b> <sup>(a, b)</sup>	100	100	1.0	40	30	20	5.0

Notes:

<sup>(a)</sup> Water Board Environmental Screening Levels (groundwater *is/is not* a potential drinking water resource) (Water Board, 2007).

<sup>(b)</sup> Water Board Surface Water Screening Levels for freshwater habitats (Water Board, 2007).

MTBE = methyl *tertiary*-butyl ether

TVHg = total volatile hydrocarbons - gasoline range

TEHd = total extractable hydrocarbons - diesel range

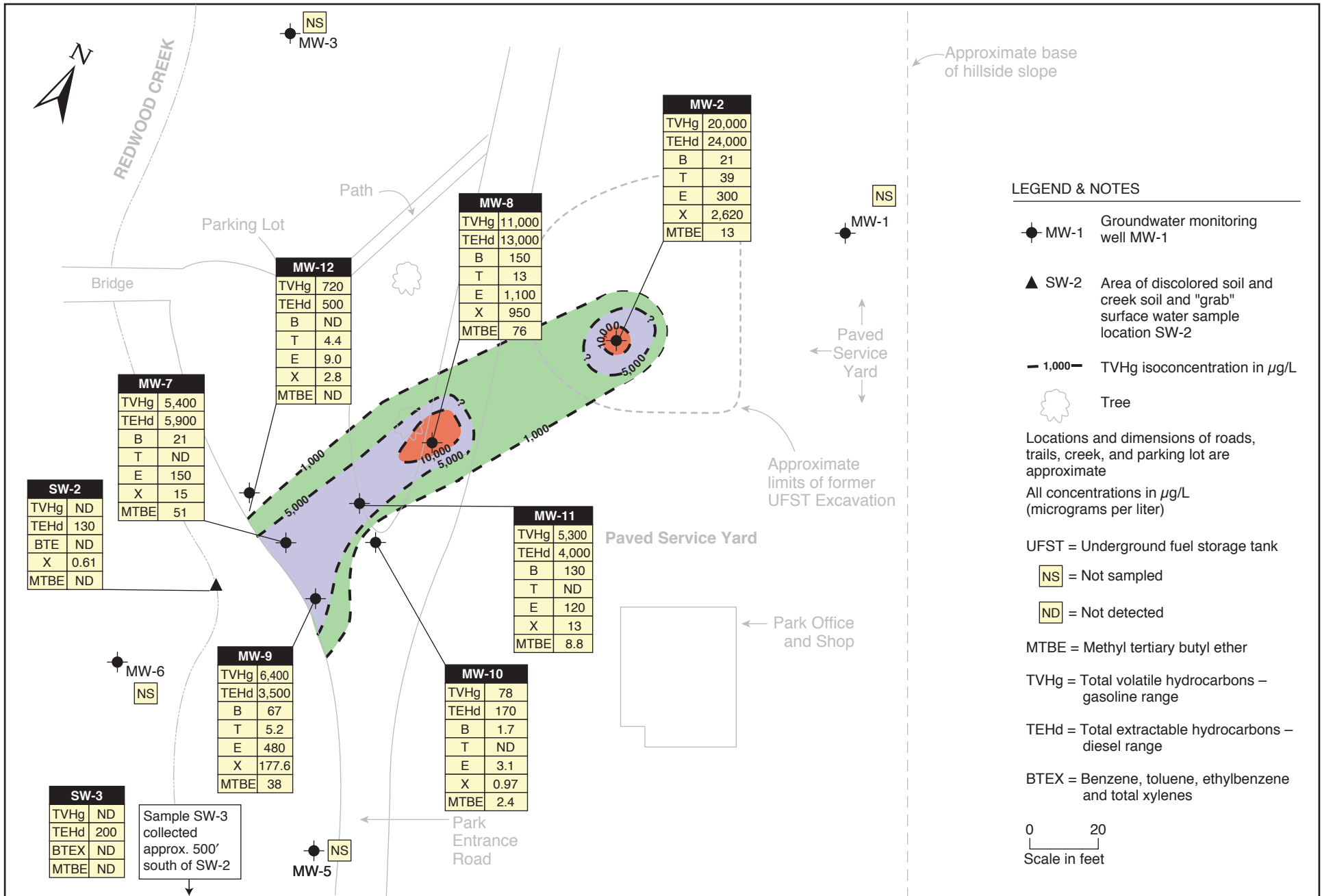
All concentrations expressed in micrograms per liter (µg/L), equivalent to parts per billion.

Samples in **bold-face type** exceed the ESL and/or surface water screening levels.

Both of the two surface water samples collected (SW-2 at 130 µg/L and SW-3 at 200µg/L) had concentrations of TEHd above the ESL of 100 µg/L. This represents the maximum concentration of TEHd observed at the SW-3 location. No other contaminants were detected in either sample, with the exception of total xylenes in SW-2 (0.61 µg/L). However, the concentration was well below the ESL of 20 µg/L.

## **QUALITY CONTROL SAMPLE ANALYTICAL RESULTS**

Laboratory quality control 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).



## **6.0 SUMMARY, CONCLUSIONS, AND PROPOSED ACTIONS**

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The following conclusions and proposed actions are based on the findings of the current event activities, as well as on salient historical findings.

### **SUMMARY AND CONCLUSIONS**

- Groundwater sampling has been conducted approximately on a quarterly basis since November 1994 (45 events in the initial site wells). A total of 11 site wells are available for monitoring; 7 of the available wells are currently monitored for contamination.
- Site contaminants of concern include gasoline, diesel, BTEX, and MTBE. Current contaminant concentrations exceed regulatory screening levels for groundwater and surface water.
- The primary environmental risk is discharge of contaminated groundwater to the adjacent Redwood Creek. A stream bioassessment concluded that there were no direct impacts to the surface water benthic community; however, groundwater contamination is sporadically detected in surface water samples, and there is historical visual evidence of plume discharge at the creek/groundwater interface. Surface water samples have sporadically exceeded surface water ESL criteria for gasoline, diesel, and benzene, and generally only under low creek flow conditions. An in-stream bioassessment evaluation in 1999-2000 determined no impacts to the benthic macroinvertebrate community.
- The existing well layout adequately constrains the lateral extent of groundwater contamination, and the downward vertical limit is very likely the top of the near-surface (25 to 28 feet) siltstone bedrock. The saturated interval extends approximately 12 to 15 feet from top of bedrock through the capillary fringe. Groundwater elevations fluctuate seasonally, creating a capillary fringe that varies seasonally in thickness.
- The groundwater contaminant plume has become disconnected from its original source, but continues to be fed from the residual hydrocarbon concentrations in the soil. The groundwater plume has migrated well beyond the former source area (represented by well MW-2) toward Redwood Creek.
- The plume of groundwater contamination above environmental screening levels appears to be within an area approximately 130 feet long and 25 to 50 feet wide.

- Historical high concentrations of petroleum hydrocarbons have been detected in the source area monitoring well MW-2 for the last three consecutive quarters since the Q3-2007. Shortly after the last two monitoring events, the well was purged to the extent it would yield for an entire day (approximately 80 gallons); on January 17, 2007 following the Q4 -2007 event and another 80 gallons on April 3, 2008 following the Q1-2008 event. A sharp decrease in gasoline and diesel concentrations was observed in samples collected after each all-day purging. It is suspected that contamination in this well may be due to an isolated spill event, or a confined pocket of residual contamination.
- Compared to the same monitoring event a year ago, the contaminant concentrations in the downgradient wells MW-7, MW-9, and MW-12 have decreased as well as in MW-8 located just downgradient of the former source area. However, concentrations in monitoring wells MW-2 (located in the former source area), and MW-10 and MW-11 (located between the closest downgradient and farthest downgradient wells from the source area) have increased.
- The contaminant plume is neither stable nor reducing, as groundwater contaminant concentrations fluctuate seasonally, and the center of mass of the contaminant plume (represented by maximum concentrations) has alternated between mid-plume and downgradient wells in recent history.
- Soil bioventing was implemented as a remedy in December 2005 to remediate the vadose zone soil contamination that has continued to provide an input source to the groundwater. Bioventing appears to be slowly reducing the residual contaminant mass, as seen in the dissolved hydrocarbon concentrations. Two additional bioventing wells, VW-4 and VW-5, were installed in March 2008 to augment the system in the vicinity of MW-2 where a trend of increasing high concentrations have been detected since the third quarter of 2007.

## **PROPOSED ACTIONS**

The EBRPD proposes to implement the following actions to address regulatory concerns:

- Initiate monthly sampling of monitoring well MW-2 until it can be determined whether the recent anonymously high contaminant detections can be attributed to a spill or residual contamination that has just appeared.
- Continue the quarterly program of creek and groundwater sampling and reporting.
- Continue to inform regulators of site progress and seek their concurrence with proposed actions.
- Operate the bioventing system as a corrective action to move the site toward closure, and report those results in bioventing-specific technical reports.
- Continue to evaluate analytical results (and bioventing contaminant removal data) in the context of hydrochemical trends, impacts of groundwater contamination on Redwood Creek, and the effectiveness of the corrective action.

- Continue to make required Electronic Data Format uploads to the GeoTracker database, and upload an electronic copy of technical reports to Alameda County Environmental Health's ftp system.



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## 8.0 LIMITATIONS

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This report has been prepared for the exclusive use of the East Bay Regional Park District, its authorized representatives, and the regulatory agencies. 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 on the review of previous investigators' findings at the site, as well as onsite activities conducted by SES since September 1998. This report provides neither a certification nor guarantee that the property is free of hazardous substance contamination. This report has been prepared in accordance with generally accepted methodologies and standards of practice. The SES personnel who performed this work 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.

The findings of this report are valid as of the present. Site conditions may change with the passage of time, natural processes, or human intervention, which can invalidate the findings and conclusions presented in this report. As such, this report should be considered a reflection of the current site conditions as based on the investigation and remediation completed.

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## **APPENDIX A**

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### **Historical Groundwater Monitoring Well Water Level Data**

**HISTORICAL GROUNDWATER ELEVATIONS IN MONITORING WELLS  
REDWOOD REGIONAL PARK SERVICE YARD  
7867 REDWOOD ROAD, OAKLAND, CALIFORNIA**

Well I.D.	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12
<b>TOC Elevation (a)</b>	565.83	566.42	560.81	548.10	547.41	545.43	547.56	549.13	549.28	547.22	547.75	544.67
<b>Date Monitored</b>	<b>Groundwater Elevations (feet above mean sea level)</b>											
09/18/98	563.7	544.2	540.8	534.5	531.1	545.6						
04/06/99	565.2	546.9	542.3	535.6	532.3	532.9						
12/20/99	562.9	544.7	541.5	534.9	531.2	532.2						
09/28/00	562.8	542.7	538.3	532.2	530.9	532.0						
01/11/01	562.9	545.1	541.7	535.0	531.2	532.3	534.9	538.1				
04/13/01	562.1	545.7	541.7	535.1	531.5	532.4	535.3	539.8				
09/01/01	560.9	542.0	537.7	533.9	530.7	531.8	534.0	535.6				
12/17/01	562.2	545.2	542.2	534.8	531.4	532.4	534.8	538.4	534.6	535.7	535.2	
03/14/02	563.0	547.1	542.2	535.5	532.4	533.3	535.7	541.8	535.0	537.6	536.6	
06/18/02	562.1	544.7	541.1	534.6	531.2	532.2	534.8	537.9	534.7	535.6	535.3	
09/24/02	561.4	542.2	537.3	533.5	530.6	531.8	533.5	535.5	535.3	533.8	531.7	
12/18/02	562.4	545.0	542.0	534.8	531.5	532.5	534.6	537.1	536.5	535.2	532.8	
03/27/03	562.6	545.7	541.7	534.8	531.6	532.4	535.1	539.9	537.2	536.2	533.6	
06/19/03	562.3	544.9	541.5	534.8	531.3	532.3	534.9	538.2	536.9	535.7	533.2	
09/10/03	561.6	542.1	537.9	533.8	530.8	531.9	533.7	535.6	535.6	534.1	531.9	
12/10/03	562.4	542.7	537.6	533.7	530.9	531.9	533.7	535.2	535.5	533.8	531.7	
03/18/04	563.1	546.6	541.9	535.0	531.7	532.4	535.2	540.9	537.4	536.6	533.8	
06/17/04	562.1	544.3	540.7	534.3	531.0	532.1	534.6	537.4	536.5	535.1	532.7	
09/21/04	561.5	541.1	536.5	533.1	530.5	531.6	533.1	534.7	532.7	533.2	533.2	
12/14/04	562.2	545.3	541.7	534.7	531.4	532.2	534.6	540.4	536.7	535.5	532.9	
03/16/05	563.8	547.3	541.7	535.3	532.4	532.8	535.6	541.8	538.0	537.1	534.2	
06/15/05	562.9	545.9	541.6	535.0	531.7	532.5	535.0	540.0	535.0	536.1	535.6	
09/13/05	562.3	543.5	539.7	534.4	530.9	532.2	534.3	536.7	536.1	534.7	532.4	
12/15/05	562.2	544.3	541.4	(b)	531.0	532.2	534.5	537.3	534.1	534.7	534.9	535.1
03/30/06	565.8	548.6	542.7	(b)	533.9	534.4	536.2	542.3	536.4	537.3	537.6	535.7
06/20/06	563.6	545.4	541.6	(b)	531.5	532.5	534.9	538.6	534.6	536.2	535.5	535.0
09/29/06	561.9	542.8	539.0	(b)	530.7	532.1	535.1	536.1	533.7	534.6	534.7	534.7
12/14/06	562.9	544.2	541.5	(b)	531.1	532.3	534.7	536.7	534.0	534.8	535.2	535.0
03/21/07	562.5	545.2	541.7	(b)	531.4	532.4	534.9	539.3	534.6	535.6	535.6	535.1
06/20/07	561.5	543.5	540.8	(b)	531.0	532.4	534.6	537.1	531.1	535.2	535.3	534.9
9/14/2007	560.71	541.02	536.99	(b)	530.46	531.58	533.42	534.86	532.64	533.47	533.68	533.74
12/6/2007	560.62	541.22	536.85	(b)	530.68	531.48	533.21	535.08	532.62	533.3	533.61	533.64
3/14/2008	561.76	545.73	541.63	(b)	531.34	532.30	534.88	539.30	534.67	536.04	535.89	535.72

TOC = Top of well Casing

(a) TOC Elevations resurveyed on December 15, 2005 in accordance GeoTracker requirements.

(b) Well decommissioned and replaced by MW-12 in December 2005.



## **APPENDIX B**

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### **Groundwater Monitoring Field Documentation**

# WELLHEAD INSPECTION CHECKLIST

Date 03/14/08 Client STELLAR

Site Address REDWOOD REGIONAL PARK SERVICE YARD, OAKLAND, CA

Job Number 080314-WW1 Technician WW

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-1	X							
MW-2	X							
MW-3	X							
MW-5	X							
MW-6	X							
MW-7	X							
MW-8		3/3 bolts missing (water bailed from box)						
MW-9	X							
MW-10	<del>X</del> (P)	ANNULAR SEAL SUNKEN						
MW-11	X							
MW-12	X							

NOTES: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## WELL GAUGING DATA

Project # 680314-mw1 Date 03/14/28 Client STELLAR

Site REDWOOD REGIONAL PARK, OAKLAND, CA  
SERVICES YARD

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 <del>TOB</del>	Notes
MW-1	0908	4		NO SPH			4.07	19.20		sph? incl G-C
MW-2	0858	4					20.69	38.82		
MW-3	0916	4					19.18	45.03		G-0
MW-5	0930	4					16.07	26.98		G-0
MW-6	0940	4					13.13	27.45		G-0
MW-7	0924	2					12.68	25.33		
MW-8	0952	2					9.83	22.22		Tr
MW-9	0927	2					14.61	30.20		
MW-10	0934	2					11.18	28.40		
MW-11	0922	2					11.86	28.71		
MW-12	0936	2					8.95	23.85		



# WELL MONITORING DATA SHEET

Project #: <b>80314 - MW1</b>	Client: <b>STELLAR</b>
Sampler: <b>WW</b>	Date: <b>03/14/08</b>
Well I.D.: <b>MW-2</b>	Well Diameter: <input checked="" type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 6 <input type="radio"/> 8 <input type="radio"/> _____
Total Well Depth (TD): <b>38.82</b>	Depth to Water (DTW): <b>20.69</b>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <input checked="" type="radio"/> <b>PG</b> Grade	D.O. Meter (if req'd):                      YSI                      HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: <b>24.32</b>	

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

$\frac{11.8 \text{ (Gals.)} \times 3}{\text{Specified Volumes}} = \frac{35.4}{\text{Calculated Volume}} \text{ Gals.}$	<table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <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)	Gals. Removed	Observations
<del>0959</del> <del>1245</del>	15.1	7.70	923	77	11.8	odor
1001	15.2	7.28	965	463	23.6	"
1003	15.4	7.36	929	413	35.4	"

Did well dewater?    Yes <input checked="" type="radio"/> No	Gallons actually evacuated: <b>35.4</b>
Sampling Date: <b>03/14/08</b> Sampling Time: <b>1340</b>	Depth to Water: <b>23.58</b>
Sample I.D.: <b>MW-2</b>	Laboratory: <del>CalSci</del> CalScience    Other: <b>CTT</b>
Analyzed for:    TPH-G    BTEX    MTBE    TPH-D    Oxygenates (5)    Other: <b>see we</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 #: <b>080314-WW1</b>	Client: <b>STELLAR</b>
Sampler: <b>WW</b>	Date: <b>03/14/08</b>
Well I.D.: <b>MW-7</b>	Well Diameter: <b>2</b> 3 4 6 8 _____
Total Well Depth (TD): <b>25.33</b>	Depth to Water (DTW): <b>12.68</b>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <b>AVC</b> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: <b>15.21</b>	

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

**2.0** (Gals.) X **3** = **6.0** 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
1040	12.2	7.17	838	453	2	odor
1042	12.1	6.95	842	261	4	"
1046	12.8	6.91	812	462	6	"

Did well dewater? Yes  No  Gallons actually evacuated: **6**

Sampling Date: **03/14/08** Sampling Time: **1057** Depth to Water: **13.41**

Sample I.D.: **MW-7** Laboratory: Kiff CalScience Other **CAT**

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

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 #: 080314-WW1	Client: STELLAR
Sampler: WW	Date: 03/14/08
Well I.D.: MW-8	Well Diameter: <u>2</u> 3 4 6 8
Total Well Depth (TD): 22.22	Depth to Water (DTW): 9.83
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]: 12.31	

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

$2.0 \text{ (Gals.)} \times 3 = 6.0 \text{ Gals.}$ 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)	Gals. Removed	Observations
1206	15.2	7.51	996	360	2	odor
1207	15.7	6.81	957	642	4	"
1208	16.1	6.70	962	791	6	"

Did well dewater?    Yes <input checked="" type="checkbox"/> No	Gallons actually evacuated: 6	
Sampling Date: 03/14/08	Sampling Time: 1210	Depth to Water: 10.70
Sample I.D.: MW-8	Laboratory: Kiff    CalScience    Other: <u>CPT</u>	
Analyzed for: TPH-G    BTEX    MTBE    TPH-D    Oxygenates (5)    Other: <u>see LOC</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	

**WELL MONITORING DATA SHEET**

Project #: <b>080314-ww1</b>	Client: <b>STELLAR</b>
Sampler: <b>WW</b>	Date: <b>03/14/08</b>
Well I.D.: <b>MW-9</b>	Well Diameter: <b>(2)</b> 3 4 6 8 _____
Total Well Depth (TD): <b>30.20</b>	Depth to Water (DTW): <b>14.61</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]: <b>17.73</b>	

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

**2.5** (Gals.) X **3** = **7.5** 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
1134	13.0	7.05	950	440	2.5	odor
1136	13.3	7.01	932	>1000	5	"
1138	13.4	7.03	916	>1000	7.5	"

Did well dewater? Yes  No  Gallons actually evacuated: **7.5**

Sampling Date: **03/14/08** Sampling Time: **12:16-1144** Depth to Water: **17.44**

Sample I.D.: **MW-9** Laboratory: Kiff CalScience Other **CT**

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

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 #: <b>80314 - WW1</b>	Client: <b>STELLAR</b>
Sampler: <b>WW</b>	Date: <b>03/14/08</b>
Well I.D.: <b>MW-10</b>	Well Diameter: <b>Ø 3 4 6 8</b> _____
Total Well Depth (TD): <b>28.40</b>	Depth to Water (DTW): <b>11.18</b>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <input checked="" type="checkbox"/> <b>RVC</b> Grade	D.O. Meter (if req'd): <b>YSI</b> <b>HACH</b>
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]: <b>14.62</b>	

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

<b>2.8</b> (Gals.) X	<b>3</b>	= <b>8.4</b> 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
10:20	13.4	7.73	790	>1000	2.8	odor
10:23	13.4	7.88	769	>1000	5.6	"
10:26	14.0	7.62	784	>1000	8.4	"

Did well dewater? Yes  No  Gallons actually evacuated: **8.4**

Sampling Date: **03/14/08** Sampling Time: **11:41** Depth to Water: **13.46**

Sample I.D.: **MW-10** Laboratory: **Kiff CalScience** Other: **CAT**

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

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
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O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV
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## WELL MONITORING DATA SHEET

Project #: <u>080314 - WW1</u>	Client: <u>STELLAR</u>
Sampler: <u>WW</u>	Date: <u>03/14/08</u>
Well I.D.: <u>MW-11</u>	Well Diameter: <u>(2)</u> 3 4 6 8 _____
Total Well Depth (TD): <u>28.71</u>	Depth to Water (DTW): <u>11.86</u>
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]: <u>15.23</u>	

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

$\frac{2.7 \text{ (Gals.)} \times 3}{\text{Specified Volumes}} = \frac{8.1 \text{ Gals.}}{\text{Calculated Volume}}$	<table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <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)	Gals. Removed	Observations
1245	12.4	7.50	621	>1000	2.7	odor
1248	12.7	7.13	679	>1000	5.4	"
1251	12.7	6.95	704	>1000	8.1	"

Did well dewater? Yes  No  Gallons actually evacuated: 8.1

Sampling Date: 03/14/08 Sampling Time: 1257 Depth to Water: 12.58

Sample I.D.: MW-11 Laboratory: Kiff CalScience Other CAT

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

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
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O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV
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## WELL MONITORING DATA SHEET

Project #: <u>000314-NW1</u>	Client: <u>STELLAR</u>
Sampler: <u>NW</u>	Date: <u>03/14/08</u>
Well I.D.: <u>MW-12</u>	Well Diameter: <u>(2)</u> 3 4 6 8 _____
Total Well Depth (TD): <u>23.85</u>	Depth to Water (DTW): <u>8.95</u>
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]: <u>11.93</u>	

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

$2.4 \text{ (Gals.)} \times 3 = 7.2 \text{ Gals.}$ 1 Case Volume      Specified Volumes      Calculated Volume	<table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <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)	Gals. Removed	Observations
1113	12.2	7.00	698	>1000	2.4	
1116	12.2	7.01	706	>1000	4.8	
1119	12.5	6.84	698	>1000	7.2	

Did well dewater? Yes  No  Gallons actually evacuated: 7.2

Sampling Date: 03/14/08 Sampling Time: 1129 Depth to Water: 10.40

Sample I.D.: MW-12 Laboratory: Kiff CalScience Other C&T

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

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

## **APPENDIX C**

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# **Analytical Laboratory Report and Chain-of-Custody Record**

# Chain of Custody Record

Laboratory Curtis and Tompkins, Ltd. Method of Shipment Hand Delivery  
 Address 2323 Fifth Street Shipment No. \_\_\_\_\_  
Berkeley, California 94710 Airbill No. \_\_\_\_\_  
510-486-0900 Cooler No. \_\_\_\_\_  
 Project Owner East Bay Regional Park District Project Manager Richard Makdisi  
 Site Address 7867 Redwood Road Telephone No. (510) 644-3123  
Oakland, California Fax No. (510) 644-3859  
 Project Name Redwood Regional Park Samplers: (Signature) WILLIAM WONG  
 Project Number 2006-16

Lab job no. 201956  
 Date 03-14-08  
 Page 1 of 1

Analyzed for PCBs per  
 Teal  
 TD 3-14-08

	Field Sample Number	Location/ Depth	Date	Time	Sample Type	Type/Size of Container	Preservation		Filtered	No. of Containers	Analysis Required										Remarks					
							Cooler	Chemical																		
-1	MW-2		03/14/08	1340		3 HCl Vials / 1 amber			4	X	X															
-2	MW-7		3/14/08	1057		↓																				
-3	MW-8			1216																						
-4	MW-9			1144																						
-5	MW-10			1141																						
-6	MW-11			1257																						
-7	MW-12			1129									X	X												

Relinquished by: <u>WILLIAM WONG</u> Signature _____ Printed _____ Company <u>Stellar Environmental</u>	Date <u>03/14/08</u> Time <u>14:37</u>	Received by: _____ Signature _____ Printed _____ Company _____	Date _____ Time _____	Relinquished by: _____ Signature _____ Printed _____ Company _____	Date _____ Time _____	Received by: <u>King Wu</u> Signature _____ Printed <u>C&amp;T</u> Company _____	Date <u>3/14/08</u> Time <u>14:37</u>
--	---	---	--------------------------	---	--------------------------	---	--

Turnaround Time: <u>5 Day TAT</u> Comments: <u>Please provide a GeoTracker EDF for groundwater samples only</u> <u>Surface water samples collected by Stellar Environmental Solutions.</u> <u>Groundwater samples collected by Blaine Tech Services.</u> <u>on ice, intact</u>	Relinquished by: _____ Signature _____ Printed _____ Company _____	Date _____ Time _____	Received by: _____ Signature _____ Printed _____ Company _____	Date _____ Time _____
--	---	--------------------------	---	--------------------------

2000-00-01

COOLER RECEIPT CHECKLIST



Curtis & Tompkins, Ltd.

Login # 201956 Date Received 3/14/08 Number of coolers 1
Client Stellar Project Redwood Regional Park

Date Opened 3/14 By (print) K Wellbrock (sign) [Signature]
Date Logged in 3/14 By (print) K Wellbrock (sign) [Signature]

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

2A. Were custody seals present? .... [ ] YES (circle) on cooler on samples [X] NO
How many \_\_\_\_\_ Name \_\_\_\_\_ Date \_\_\_\_\_

2B. Were custody seals intact upon arrival? ..... YES NO (N/A)

3. Were custody papers dry and intact when received?..... (YES) NO

4. Were custody papers filled out properly (ink, signed, etc)?..... (YES) NO

5. Is the project identifiable from custody papers? (If so fill out top of form)..... (YES) NO

6. Indicate the packing in cooler: (if other, describe) \_\_\_\_\_

- [ ] Bubble Wrap [ ] Foam blocks [X] Bags [ ] None
[ ] Cloth material [ ] Cardboard [ ] Styrofoam [ ] Paper towels

7. If required, was sufficient ice used? Samples should be < or = 6°C ..... YES NO N/A

Type of ice used: [X] WET [ ] BLUE [ ] NONE Temp(°C) no temp 0

[ ] SAMPLES RECEIVED ON ICE DIRECTLY FROM FIELD. COOLING PROCESS HAD BEGUN.

8. Were soil Encore sampling devices present? ..... YES (NO)
If YES, what time were they transferred to freezer? \_\_\_\_\_

9. Did all bottles arrive unbroken/unopened?..... (YES) NO

10. Are samples in the appropriate containers for indicated tests? ..... (YES) NO

11. Are sample labels present, in good condition and complete? ..... (YES) NO

12. Do the sample labels agree with custody papers? ..... (YES) NO

13. Was sufficient amount of sample sent for tests requested? ..... (YES) NO

14. Are the samples appropriately preserved? ..... (YES) NO N/A

15. Are bubbles absent in VOA samples?..... (YES) NO N/A

16. Was the client contacted concerning this sample delivery?..... YES NO

If YES, Who was called? \_\_\_\_\_ By \_\_\_\_\_ Date: \_\_\_\_\_

COMMENTS

Multiple horizontal lines for handwritten comments.



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

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

Laboratory Job Number 201956  
ANALYTICAL REPORT

Stellar Environmental Solutions  
2198 6th Street  
Berkeley, CA 94710

Project : 2006-16  
Location : Redwood Regional Park  
Level : II

<u>Sample ID</u>	<u>Lab ID</u>
MW-2	201956-001
MW-7	201956-002
MW-8	201956-003
MW-9	201956-004
MW-10	201956-005
MW-11	201956-006
MW-12	201956-007

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

Signature:   
Project Manager

Date: 03/31/2008

Signature:   
Operations Manager

Date: 04/01/2008

### CASE NARRATIVE

Laboratory number: 201956  
Client: Stellar Environmental Solutions  
Project: 2006-16  
Location: Redwood Regional Park  
Request Date: 03/14/08  
Samples Received: 03/14/08

This hardcopy data package contains sample and QC results for seven water samples, requested for the above referenced project on 03/14/08. The samples were received cold and intact.

**TPH-Purgeables and/or BTXE by GC (EPA 8015B and EPA 8021B):**

High surrogate recoveries were observed for bromofluorobenzene (FID) and trifluorotoluene (FID) in a number of samples, due to interference from coeluting hydrocarbon peaks. No other analytical problems were encountered.

**TPH-Extractables by GC (EPA 8015B):**

No analytical problems were encountered.











**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	201956	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2006-16		
Matrix:	Water	Sampled:	03/14/08
Units:	ug/L	Received:	03/14/08

Type:	BLANK	Batch#:	136513
Lab ID:	QC435118	Analyzed:	03/29/08
Diln Fac:	1.000		

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	99	69-140	EPA 8015B
Bromofluorobenzene (FID)	121	73-144	EPA 8015B
Trifluorotoluene (PID)	76	60-146	EPA 8021B
Bromofluorobenzene (PID)	91	65-143	EPA 8021B

\*= Value outside of QC limits; see narrative  
 C= Presence confirmed, but RPD between columns exceeds 40%  
 NA= Not Analyzed  
 ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	201956	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2006-16	Analysis:	EPA 8021B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC434102	Batch#:	136273
Matrix:	Water	Analyzed:	03/22/08
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
MTBE	10.00	11.29	113	70-129

Surrogate	%REC	Limits
Trifluorotoluene (PID)	96	60-146
Bromofluorobenzene (PID)	88	65-143

## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	201956	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2006-16	Analysis:	EPA 8021B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC435119	Batch#:	136513
Matrix:	Water	Analyzed:	03/28/08
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
MTBE	10.00	10.60	106	70-129
Benzene	10.00	8.652	87	80-120
Toluene	10.00	9.003	90	80-120
Ethylbenzene	10.00	9.666	97	80-120
m,p-Xylenes	10.00	9.664	97	80-120
o-Xylene	10.00	9.839	98	80-120

Surrogate	%REC	Limits
Trifluorotoluene (PID)	77	60-146
Bromofluorobenzene (PID)	90	65-143

## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	201956	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2006-16	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC435120	Batch#:	136513
Matrix:	Water	Analyzed:	03/28/08
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	973.9	97	80-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	115	69-140
Bromofluorobenzene (FID)	121	73-144



## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	201956	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2006-16	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	136513
MSS Lab ID:	202221-009	Sampled:	03/26/08
Matrix:	Water	Received:	03/27/08
Units:	ug/L	Analyzed:	03/29/08
Diln Fac:	1.000		

Type: MS Lab ID: QC435121

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	20.90	1,818	1,894	103	67-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	130	69-140
Bromofluorobenzene (FID)	141	73-144

Type: MSD Lab ID: QC435122

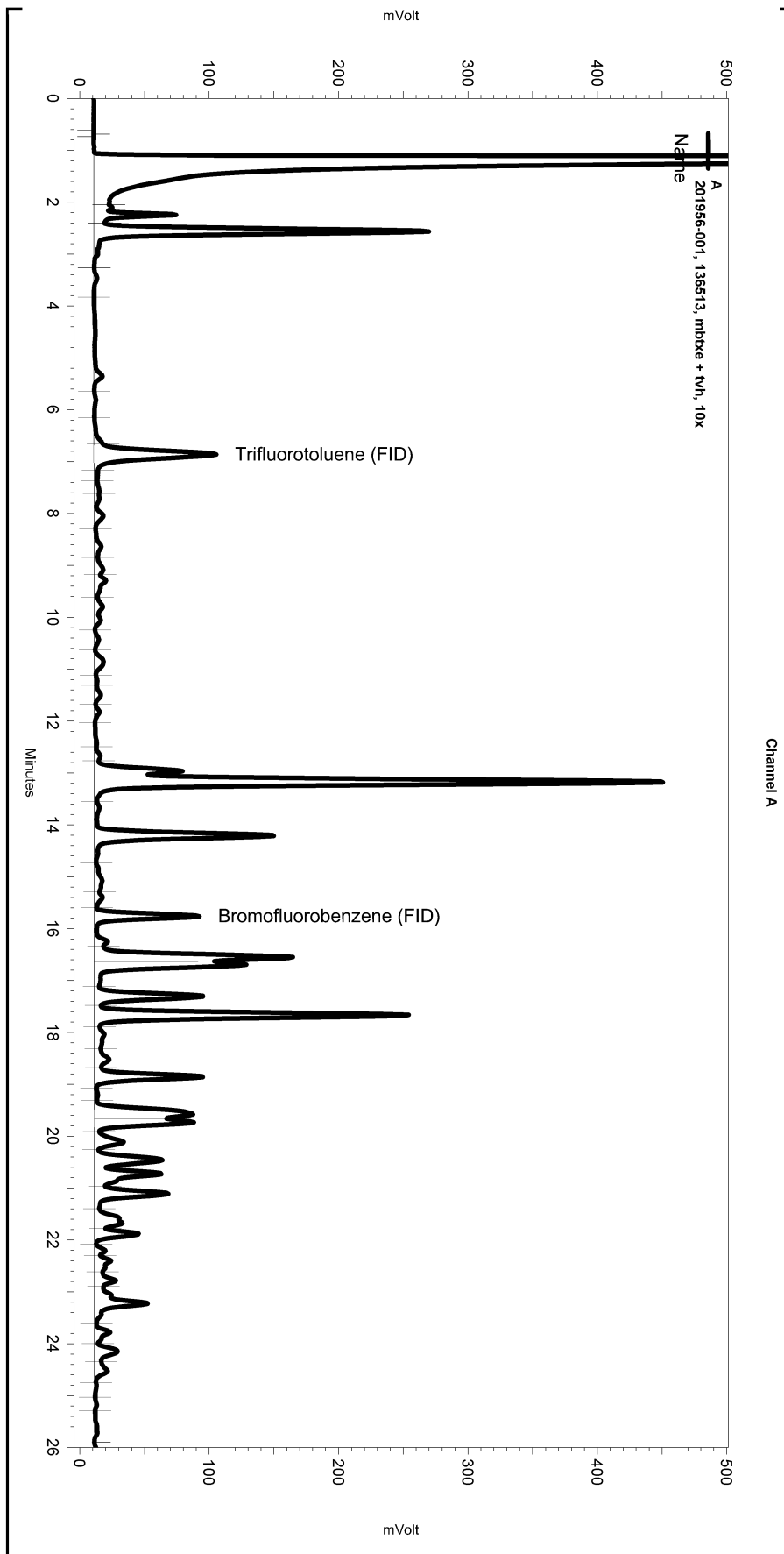
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	1,818	1,867	102	67-120	1	20

Surrogate	%REC	Limits
Trifluorotoluene (FID)	126	69-140
Bromofluorobenzene (FID)	137	73-144

RPD= Relative Percent Difference

Sequence File: \\Lims\gdrive\ezchrom\Projects\GC19\Sequence\088.seq  
 Sample Name: 201956-001, 136513, mbtixe + tvh, 10x  
 Data File: \\Lims\gdrive\ezchrom\Projects\GC19\Data\088\_006  
 Instrument: GC19 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
 Method Name: \\Lims\gdrive\ezchrom\Projects\GC19\Method\tvhbtixe079.met

Software Version 3.1.7  
 Run Date: 3/28/2008 11:39:17 AM  
 Analysis Date: 3/31/2008 3:29:26 PM  
 Sample Amount: 5 Multiplier: 5  
 Vial & pH or Core ID: c1.3



---< General Method Parameters >---

No items selected for this section

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No items selected for this section

Integration Events

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

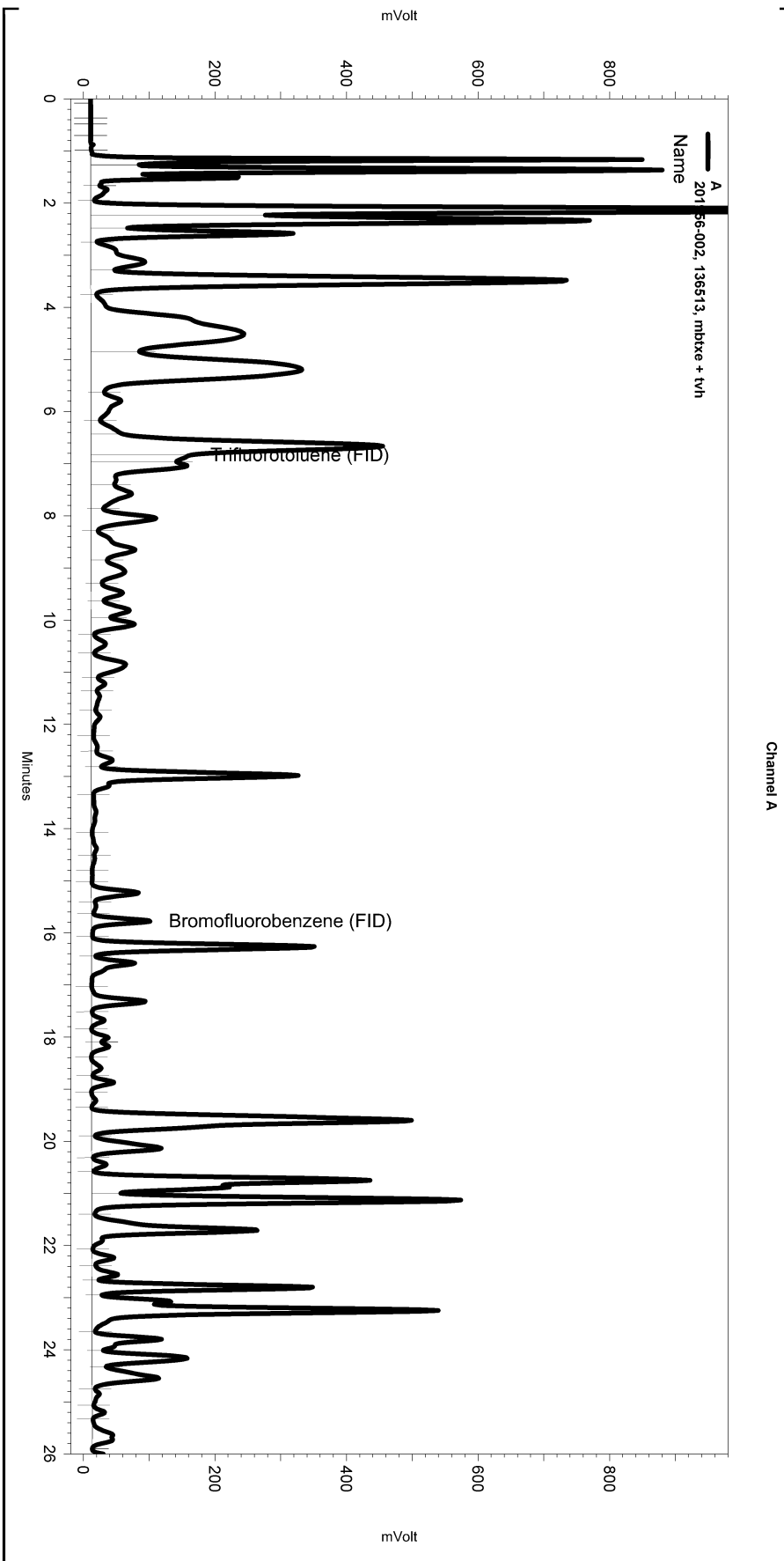
Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC19\Data\088\_006

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Split Peak	6.661	0	0
Yes	Split Peak	7.167	0	0

Sequence File: \\Lims\gdrive\ezchrom\Projects\GC19\Sequence\088.seq  
 Sample Name: 201956-002, 136513, mbtixe + tvh  
 Data File: \\Lims\gdrive\ezchrom\Projects\GC19\Data\088\_007  
 Instrument: GC19 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
 Method Name: \\Lims\gdrive\ezchrom\Projects\GC19\Method\tvhbtixe079.met

Software Version 3.1.7  
 Run Date: 3/28/2008 12:16:52 PM  
 Analysis Date: 3/31/2008 3:29:30 PM  
 Sample Amount: 5 Multiplier: 5  
 Vial & pH or Core ID: c1.0



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Integration Events

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

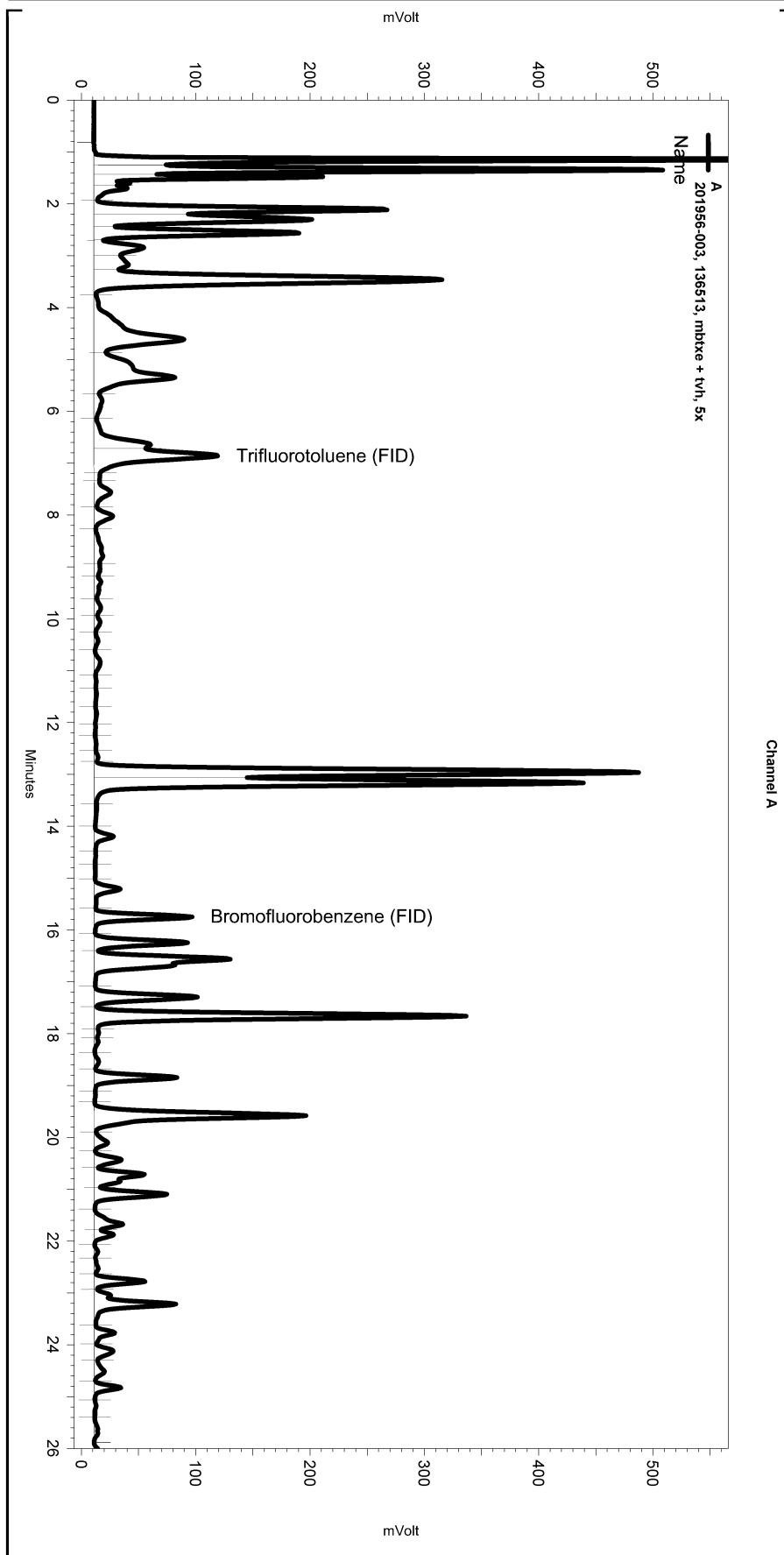
Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC19\Data\088\_007

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Split Peak	6.432	0	0
Yes	Split Peak	6.829	0	0

Sequence File: \\Lims\gdrive\ezchrom\Projects\GC19\Sequence\088.seq  
 Sample Name: 201956-003, 136513, mbtXe + tvh, 5x  
 Data File: \\Lims\gdrive\ezchrom\Projects\GC19\Data\088\_008  
 Instrument: GC19 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
 Method Name: \\Lims\gdrive\ezchrom\Projects\GC19\Method\TVHBTXE079.met

Software Version 3.1.7  
 Run Date: 3/28/2008 12:54:26 PM  
 Analysis Date: 3/31/2008 4:11:48 PM  
 Sample Amount: 5 Multiplier: 5  
 Vial & pH or Core ID: c1.0



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Integration Events

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

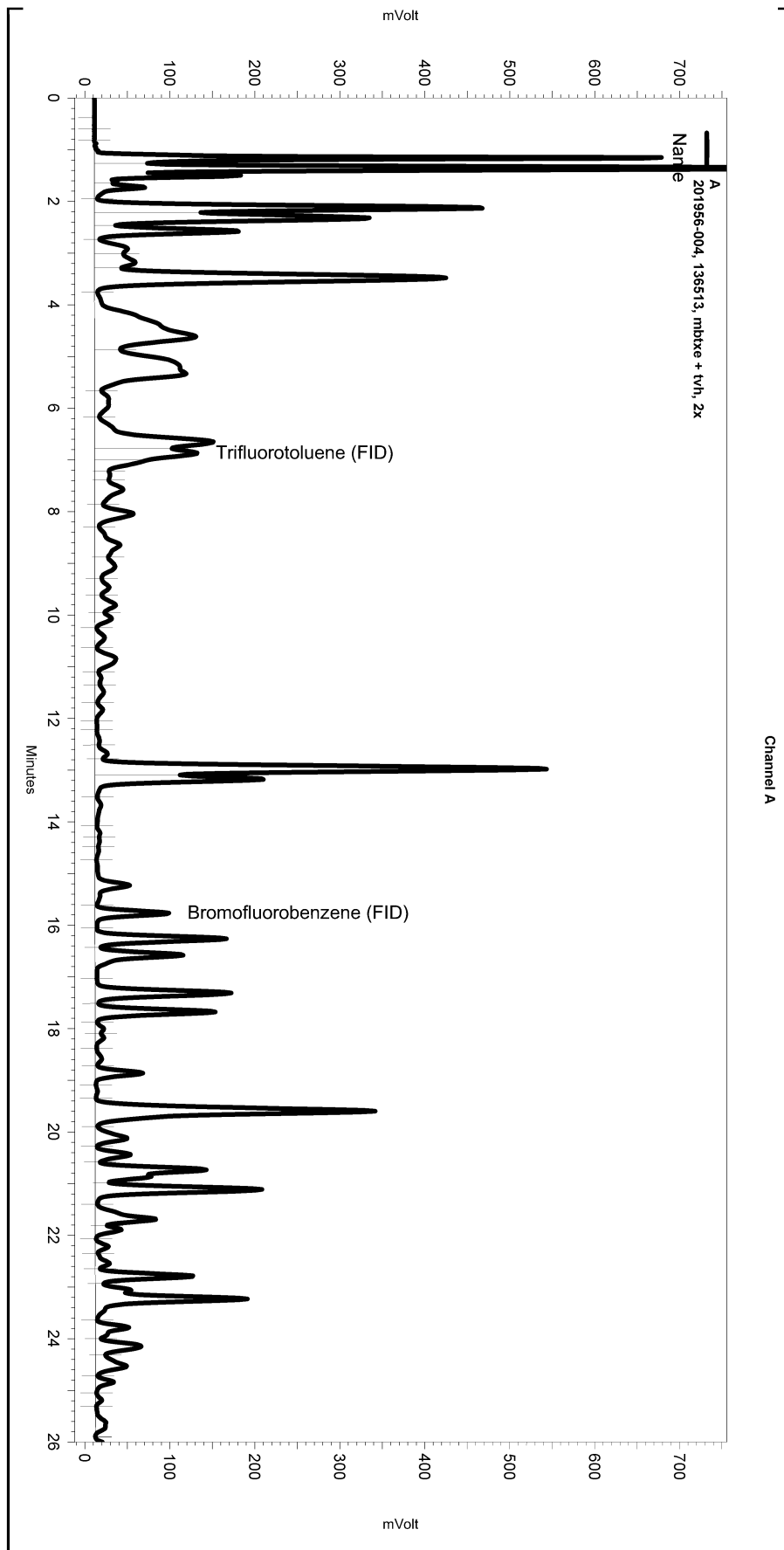
Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC19\Data\088\_008

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Split Peak	6.72	0	0
Yes	Split Peak	7.18	0	0

Sequence File: \\Lims\gdrive\ezchrom\Projects\GC19\Sequence\088.seq  
 Sample Name: 201956-004, 136513, mbtixe + tvh, 2x  
 Data File: \\Lims\gdrive\ezchrom\Projects\GC19\Data\088\_009  
 Instrument: GC19 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
 Method Name: \\Lims\gdrive\ezchrom\Projects\GC19\Method\tvhbtxe079.met

Software Version 3.1.7  
 Run Date: 3/28/2008 1:32:00 PM  
 Analysis Date: 3/31/2008 3:29:37 PM  
 Sample Amount: 5 Multiplier: 5  
 Vial & pH or Core ID: c1.3



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Integration Events

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

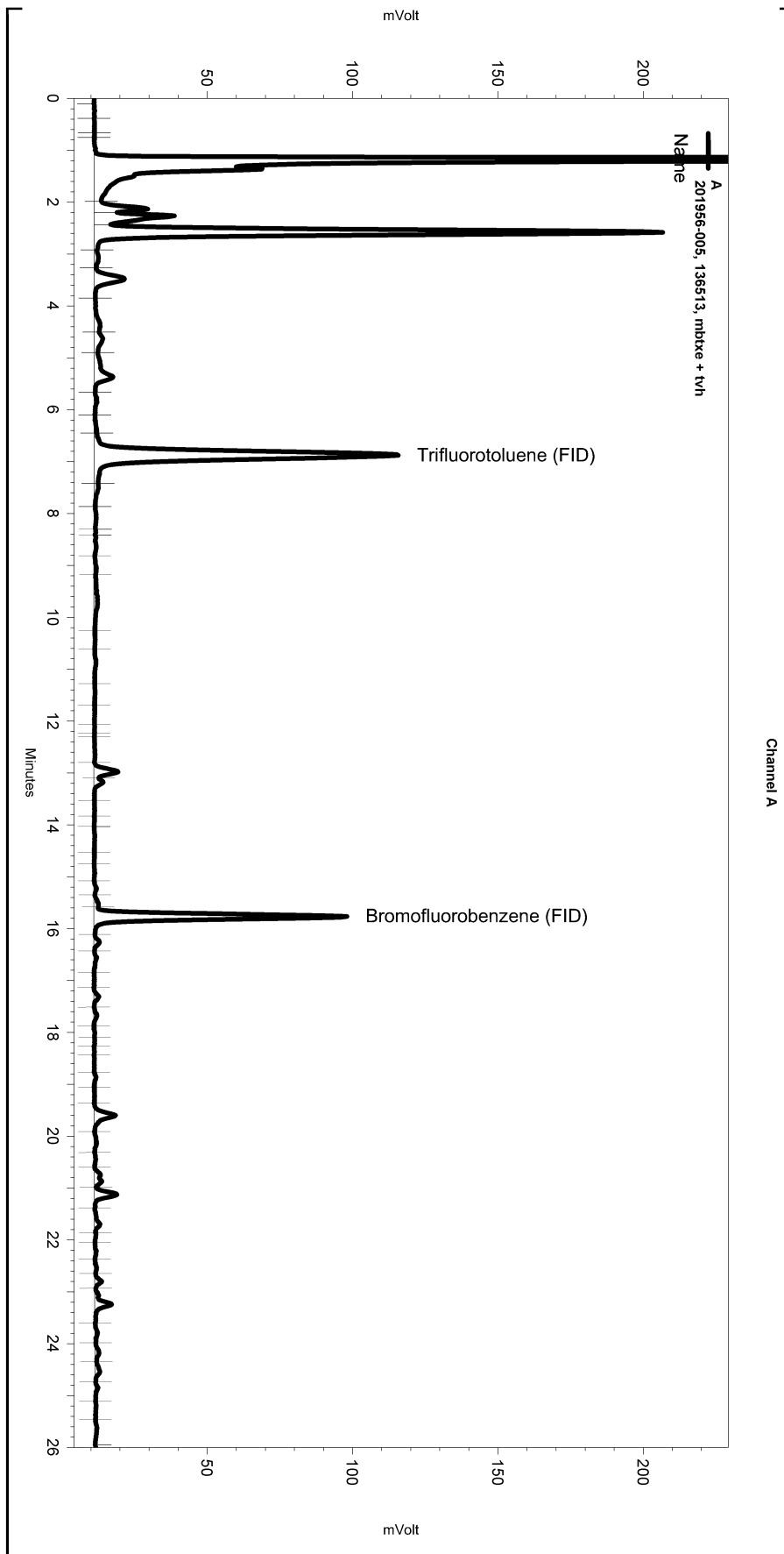
Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC19\Data\088\_009

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Split Peak	7.004	0	0

Sequence File: \\Lims\gdrive\ezchrom\Projects\GC19\Sequence\088.seq  
 Sample Name: 201956-005, 136513, mbtixe + tvh  
 Data File: \\Lims\gdrive\ezchrom\Projects\GC19\Data\088\_010  
 Instrument: GC19 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
 Method Name: \\Lims\gdrive\ezchrom\Projects\GC19\Method\lvhbtixe079.met

Software Version 3.1.7  
 Run Date: 3/28/2008 2:09:31 PM  
 Analysis Date: 3/31/2008 3:29:41 PM  
 Sample Amount: 5 Multiplier: 5  
 Vial & pH or Core ID: c1.0



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Integration Events

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

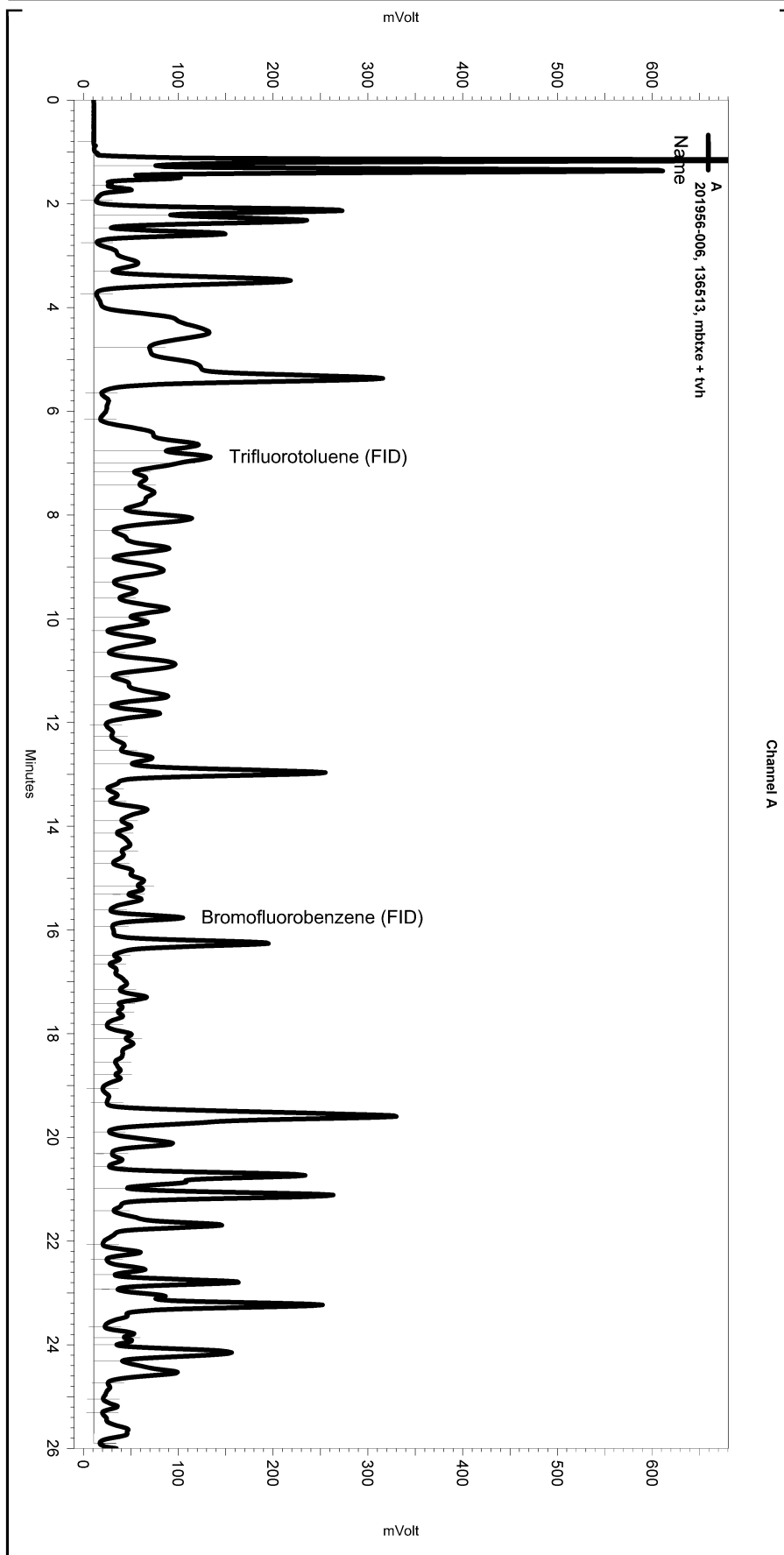
Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC19\Data\088\_010

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Split Peak	6.457	0	0
Yes	Split Peak	15.583	0	0

Sequence File: \\Lims\gdrive\ezchrom\Projects\GC19\Sequence\088.seq  
 Sample Name: 201956-006, 136513, mbtXe + tvh  
 Data File: \\Lims\gdrive\ezchrom\Projects\GC19\Data\088\_011  
 Instrument: GC19 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
 Method Name: \\Lims\gdrive\ezchrom\Projects\GC19\Method\tvhbtXe079.met

Software Version 3.1.7  
 Run Date: 3/28/2008 2:47:02 PM  
 Analysis Date: 3/31/2008 3:29:45 PM  
 Sample Amount: 5 Multiplier: 5  
 Vial & pH or Core ID: c1.3



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Integration Events

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

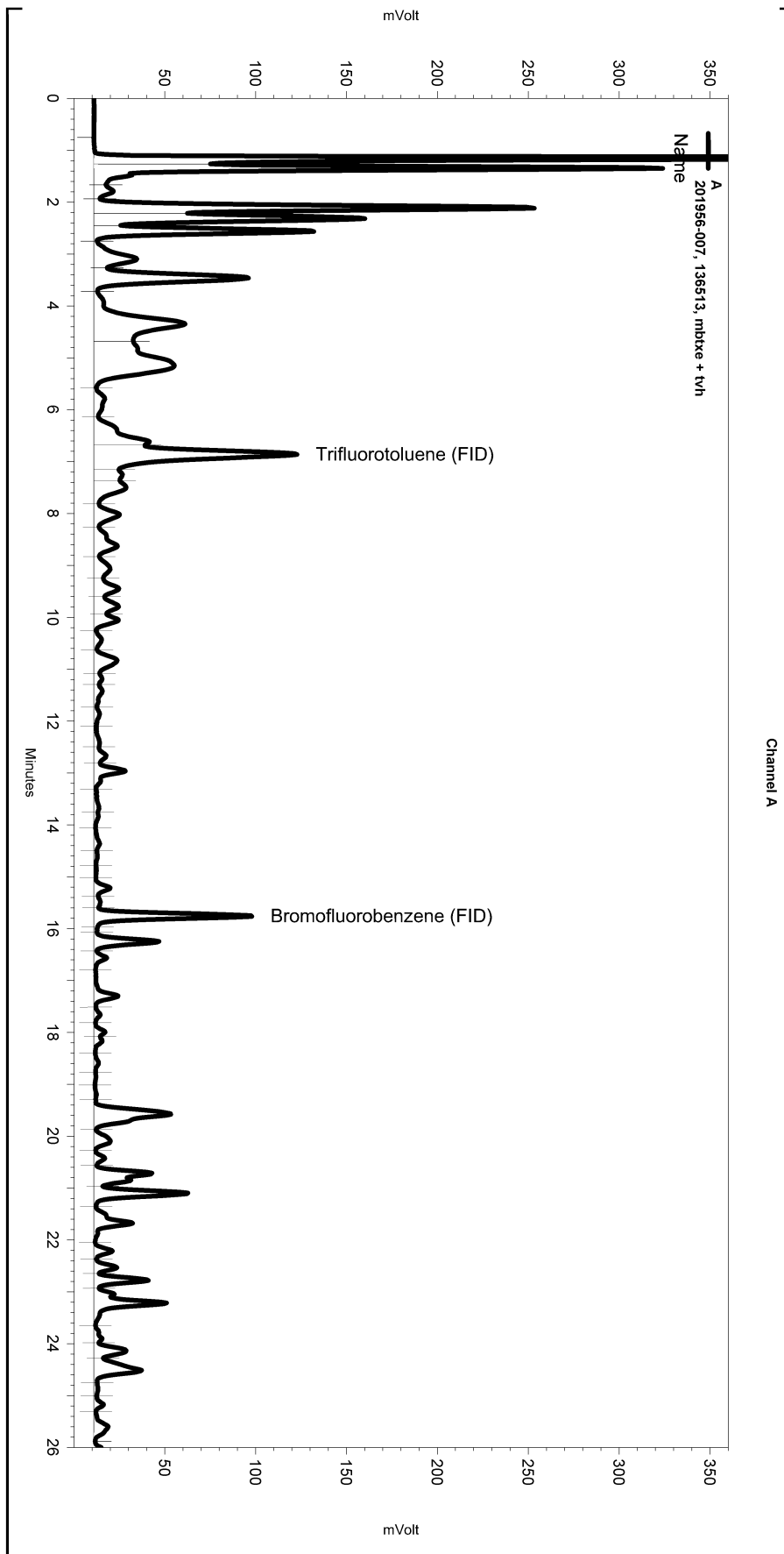
Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC19\Data\088\_011

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Horizontal Baseline	0.864	25.917	0
Yes	Split Peak	7.003	0	0

Sequence File: \\Lims\gdrive\ezchrom\Projects\GC19\Sequence\088.seq  
 Sample Name: 201956-007, 136513, mbtixe + tvh  
 Data File: \\Lims\gdrive\ezchrom\Projects\GC19\Data\088\_012  
 Instrument: GC19 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
 Method Name: \\Lims\gdrive\ezchrom\Projects\GC19\Method\tvhbtixe079.met

Software Version 3.1.7  
 Run Date: 3/28/2008 3:29:08 PM  
 Analysis Date: 3/31/2008 3:29:49 PM  
 Sample Amount: 5 Multiplier: 5  
 Vial & pH or Core ID: c1.3



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Integration Events

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

Manual Integration Fixes

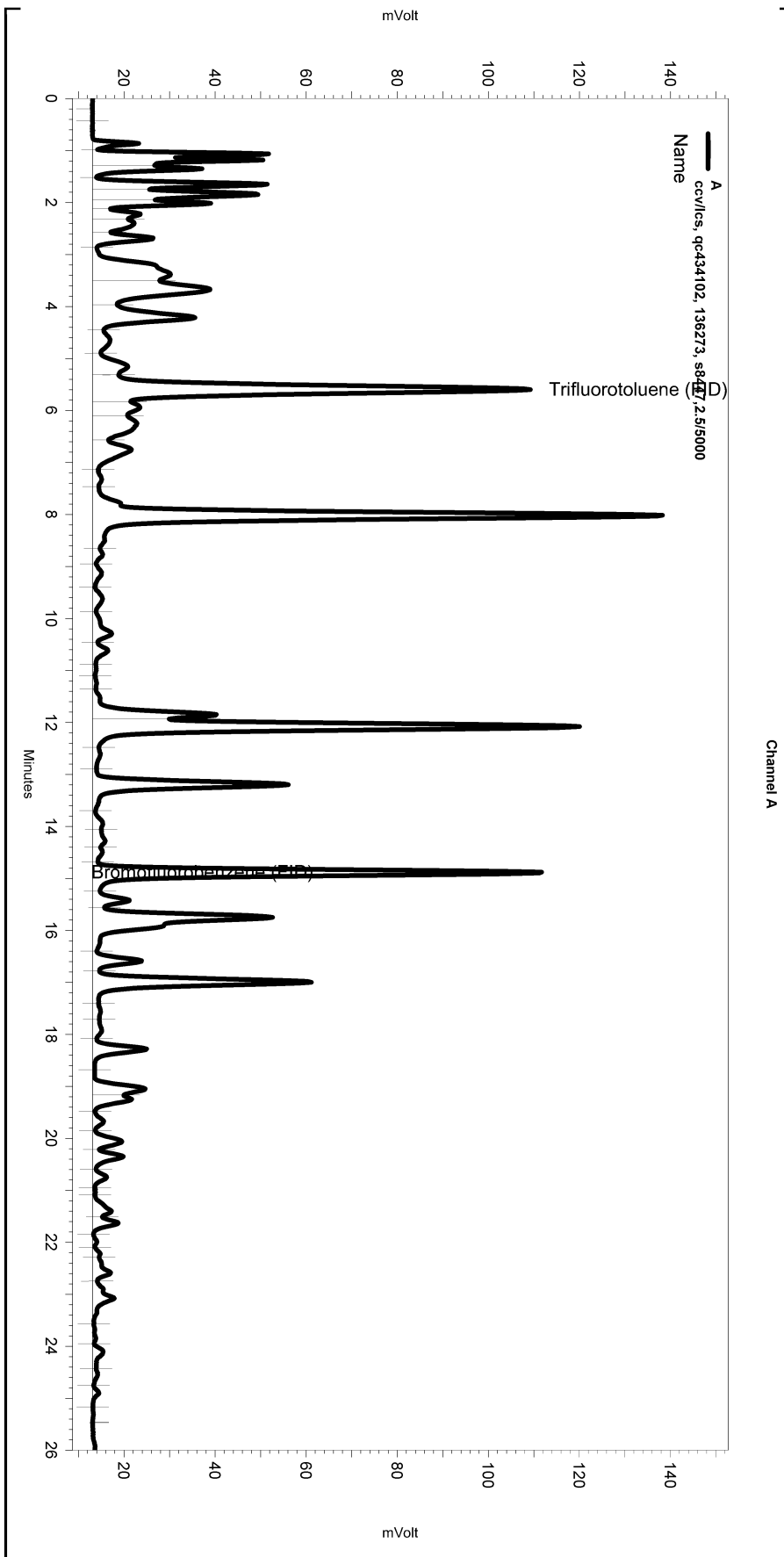
Data File: \\Lims\gdrive\ezchrom\Projects\GC19\Data\088\_012

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Horizontal Baseline	0.718	25.869	0
Yes	Split Peak	6.685	0	0
Yes	Split Peak	15.969	0	0



Sequence File: \\Lims\gdrive\ezchrom\Projects\GC07\Sequence\082.seq  
 Sample Name: ccv/lcs, qc434102, 136273, s8447, 2.5/5000  
 Data File: \\Lims\gdrive\ezchrom\Projects\GC07\Data\082\_005  
 Instrument: GC07 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
 Method Name: \\Lims\gdrive\ezchrom\Projects\GC07\Method\lvhbtxe082rupdate.met

Software Version 3.1.7  
 Run Date: 3/22/2008 11:44:13 AM  
 Analysis Date: 3/31/2008 4:33:20 PM  
 Sample Amount: 5 Multiplier: 5  
 Vial & pH or Core ID: {Data Description}



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Integration Events

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

Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC07\Data\082\_005

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
None				





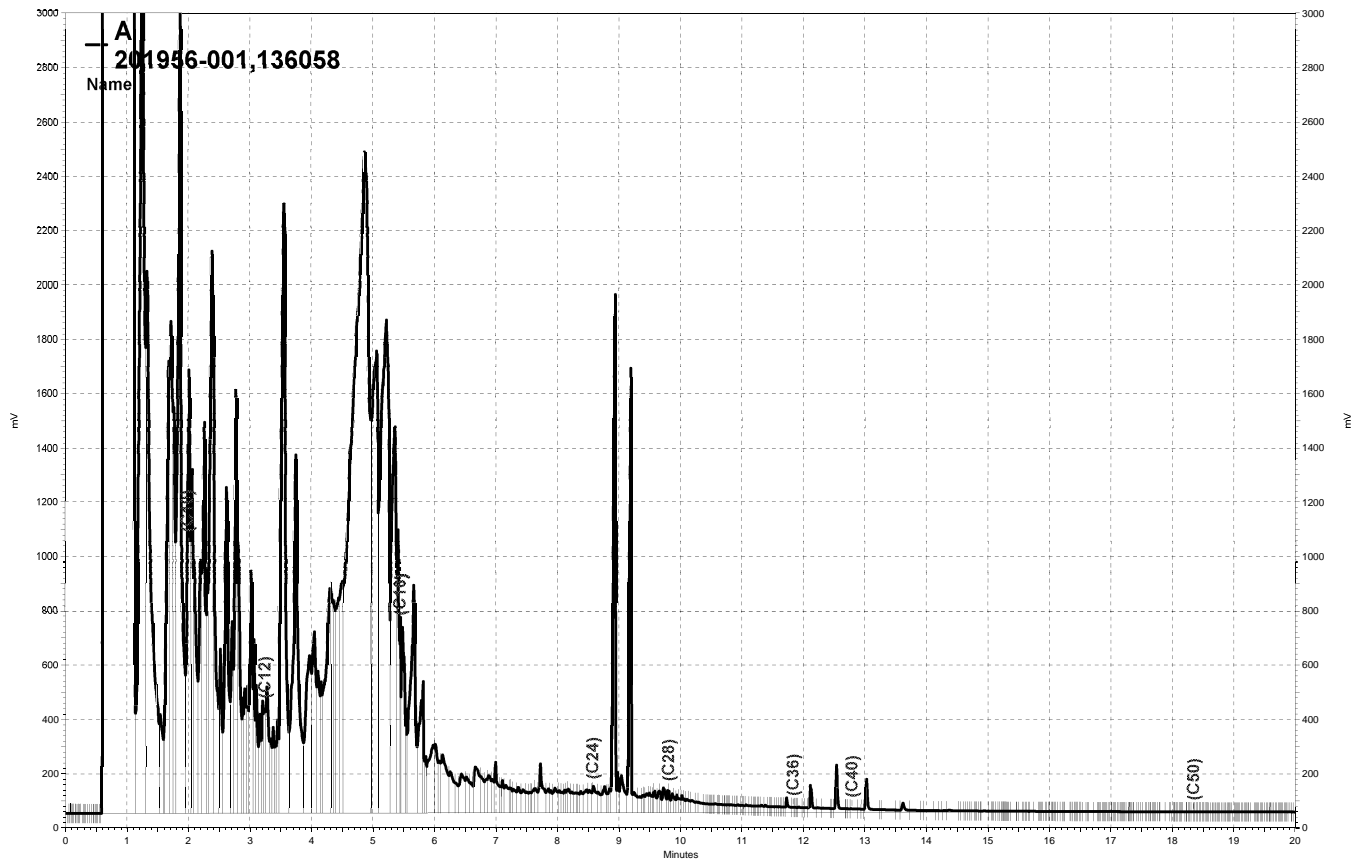
## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	201956	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2006-16	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC433209	Batch#:	136058
Matrix:	Water	Prepared:	03/17/08
Units:	ug/L	Analyzed:	03/18/08

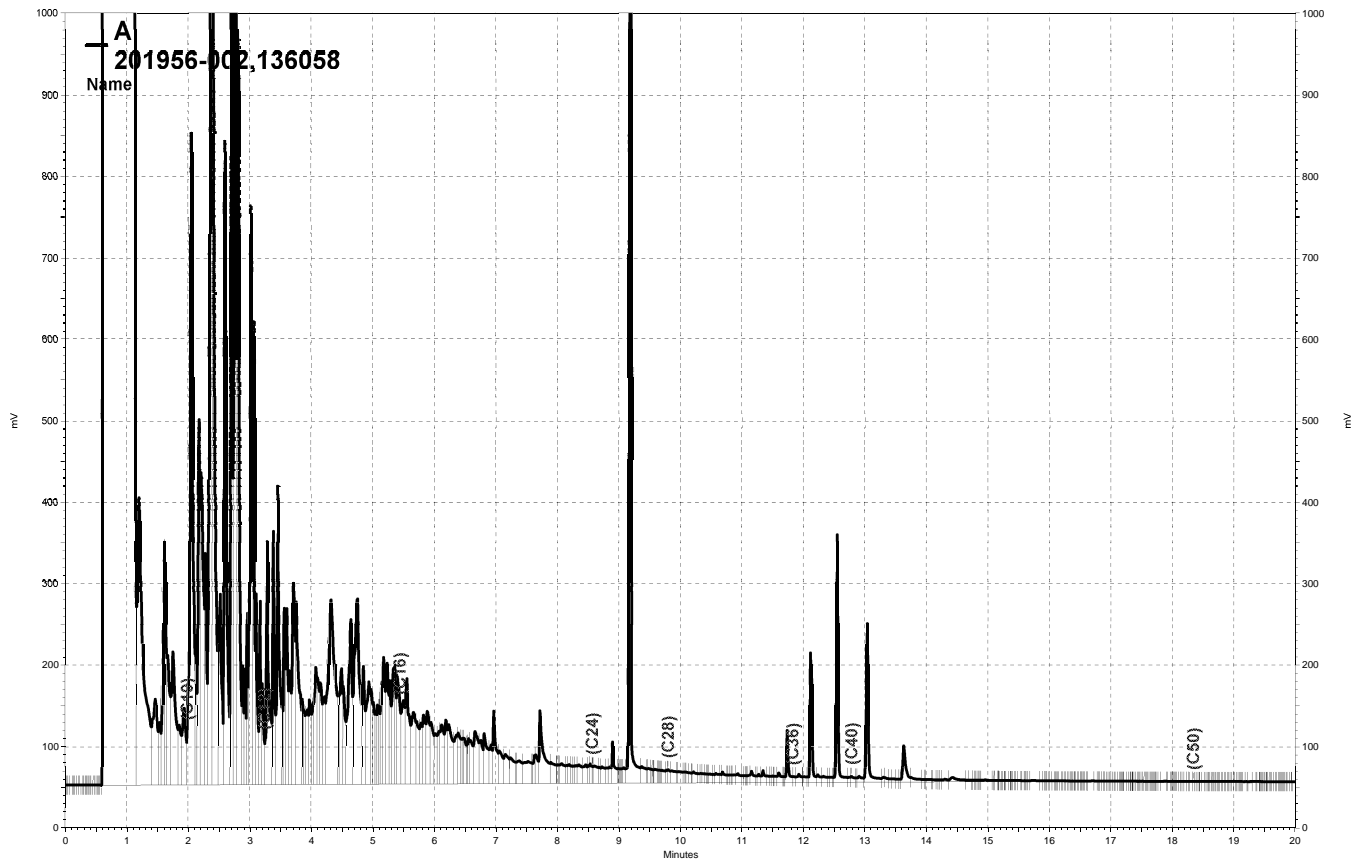
Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,143	86	61-120

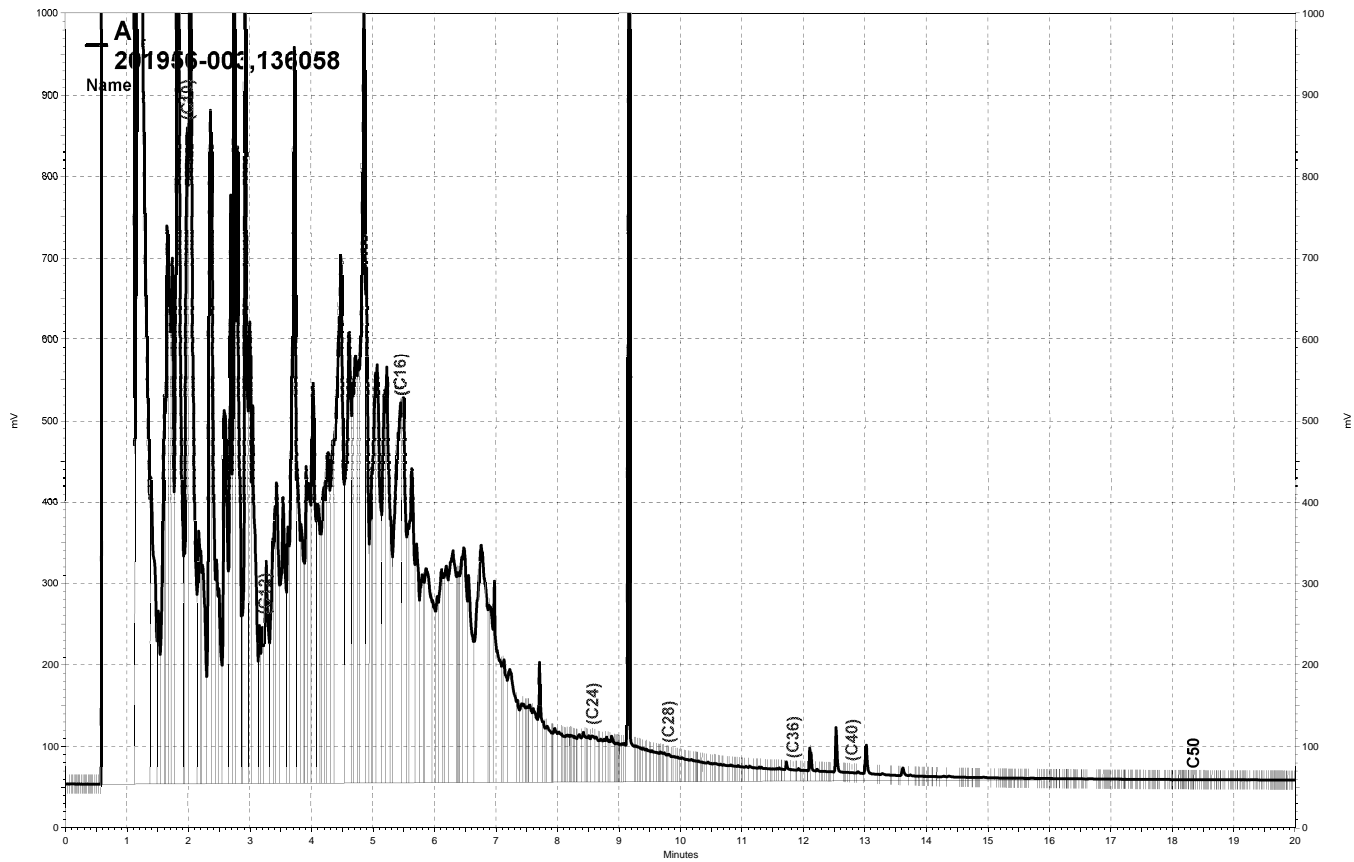
Surrogate	%REC	Limits
Hexacosane	92	63-130



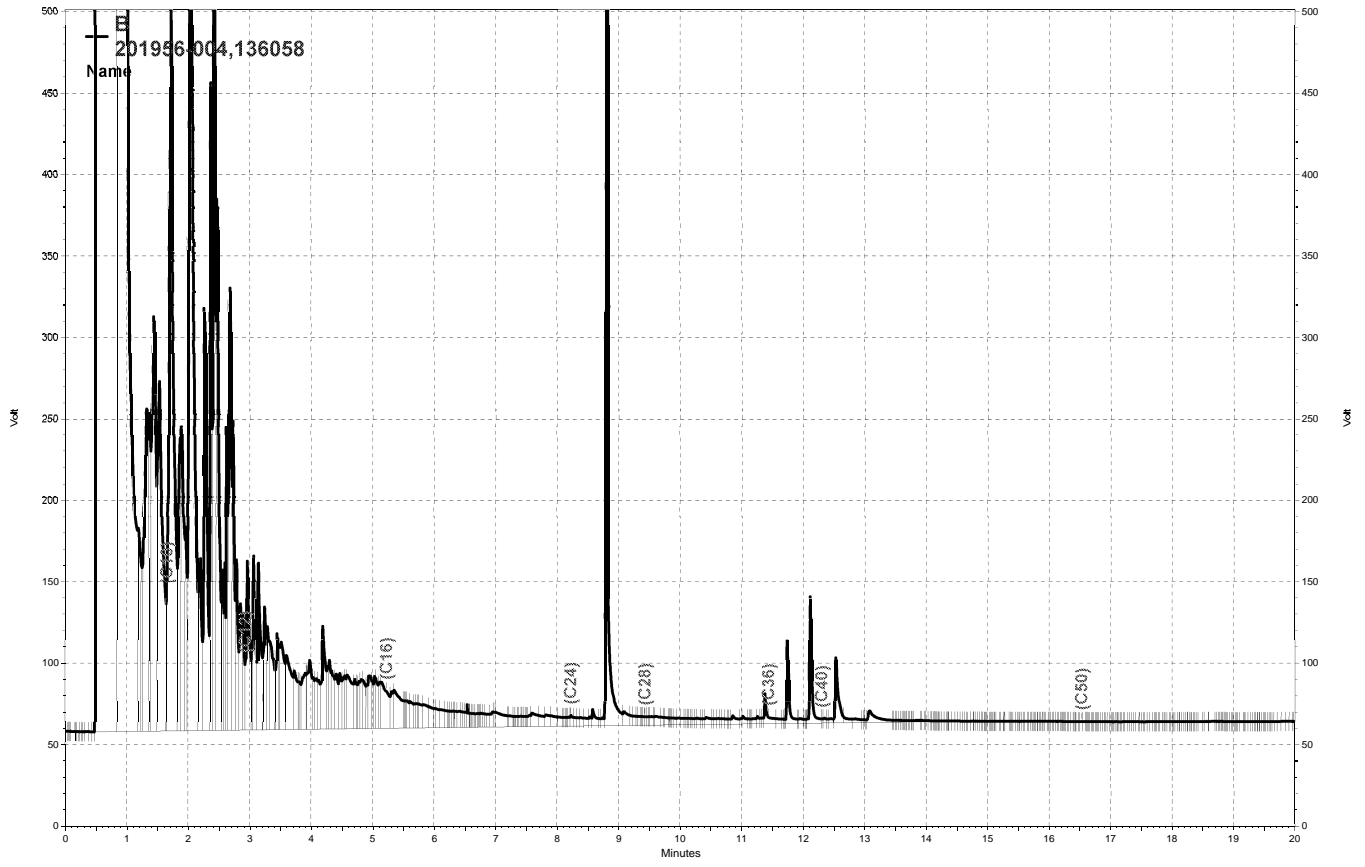
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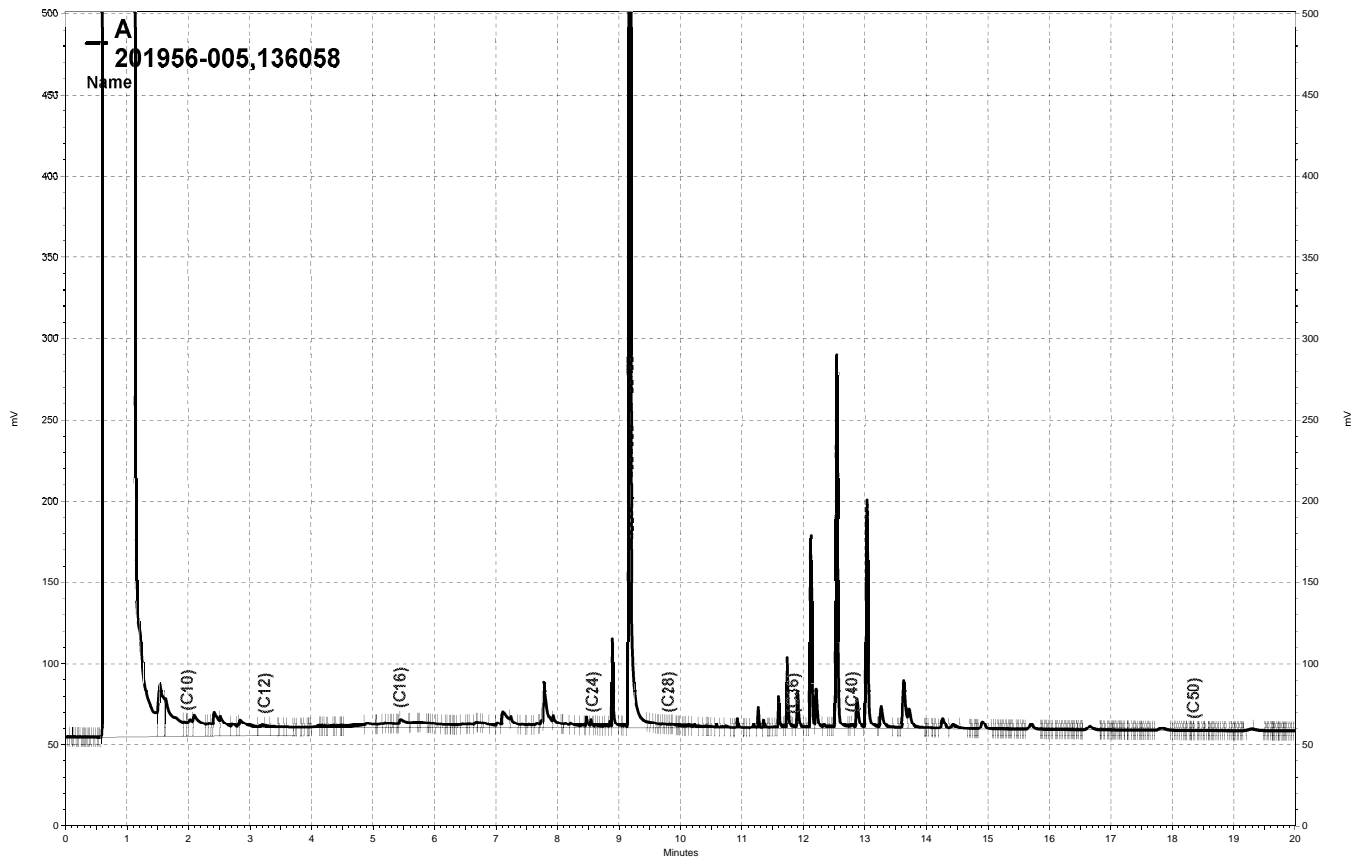


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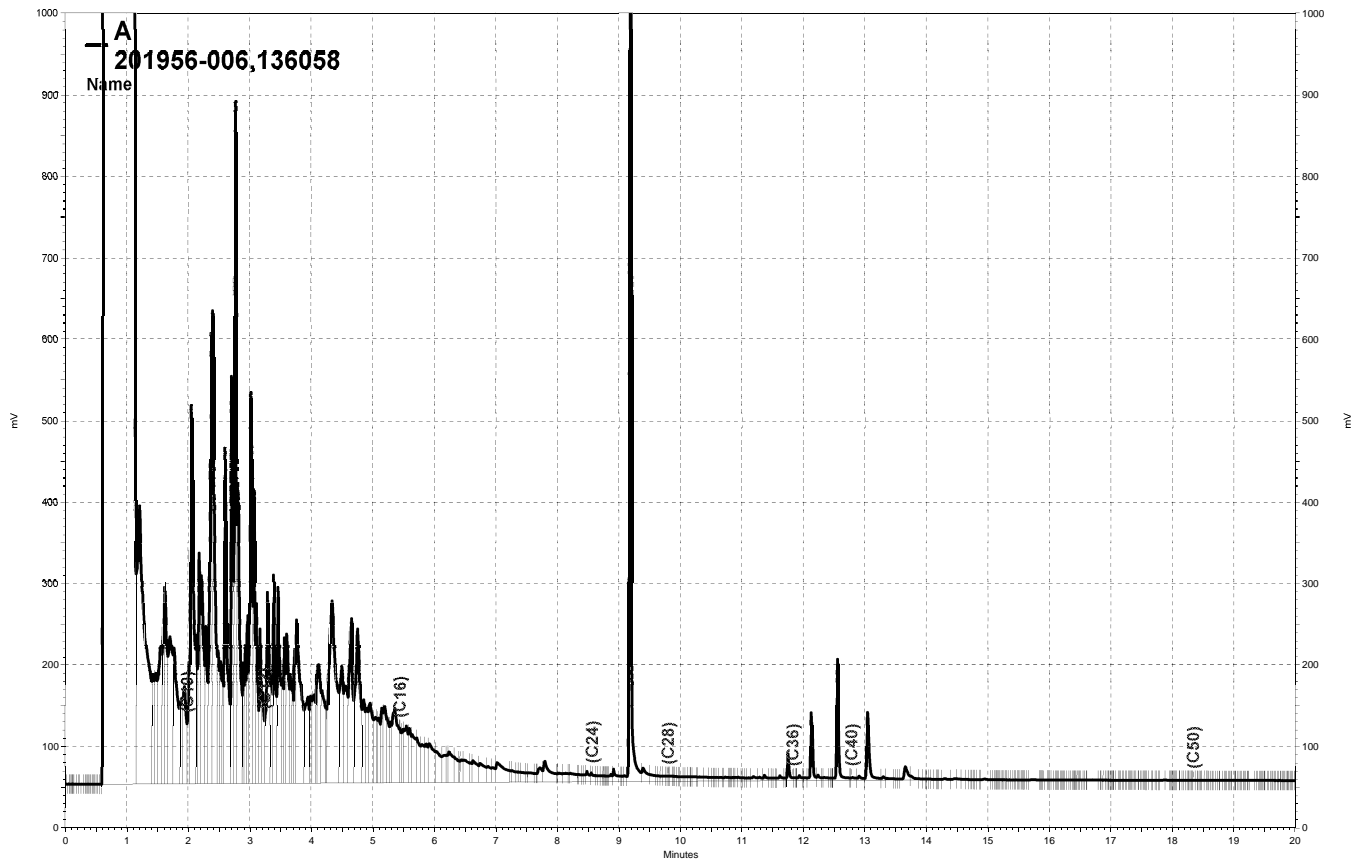


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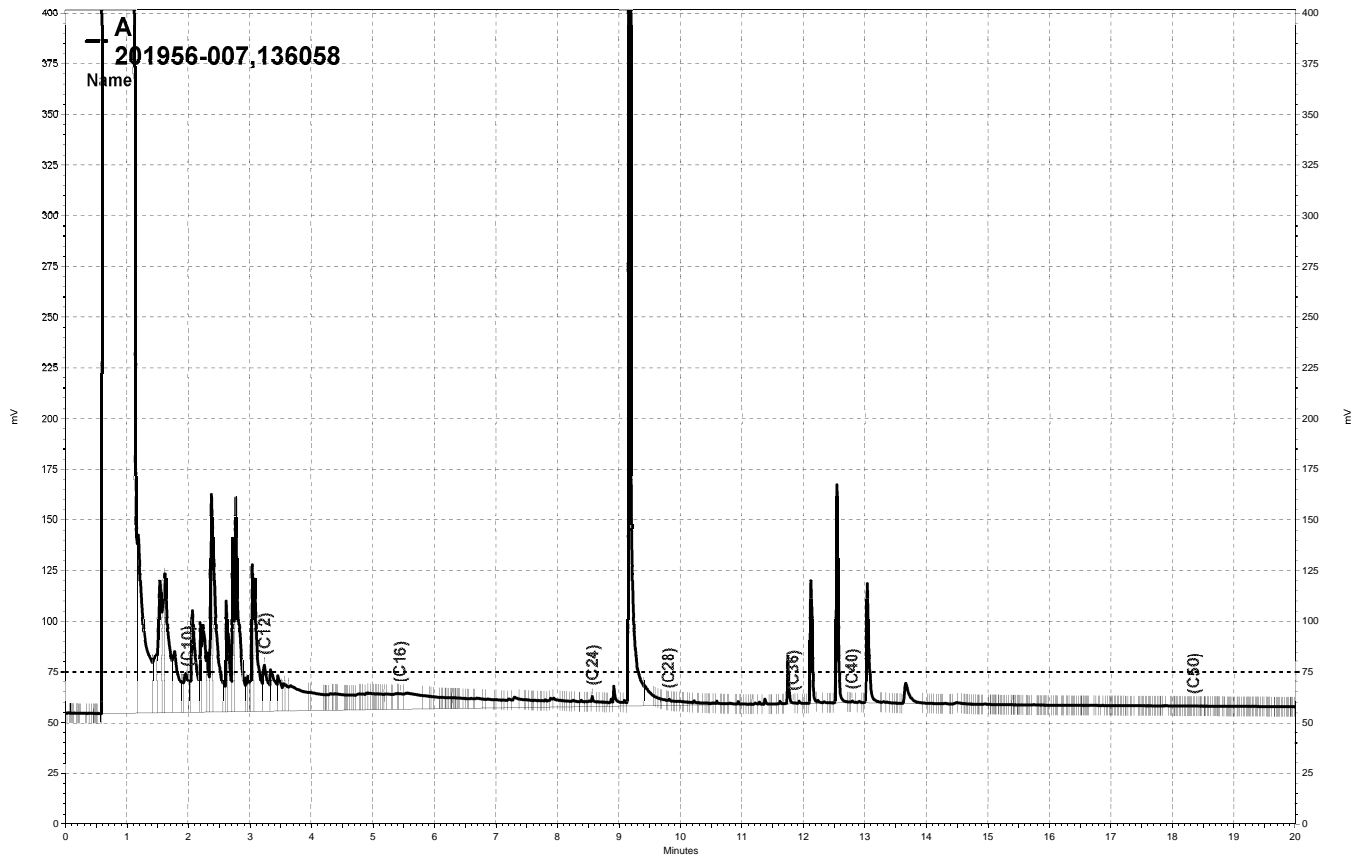




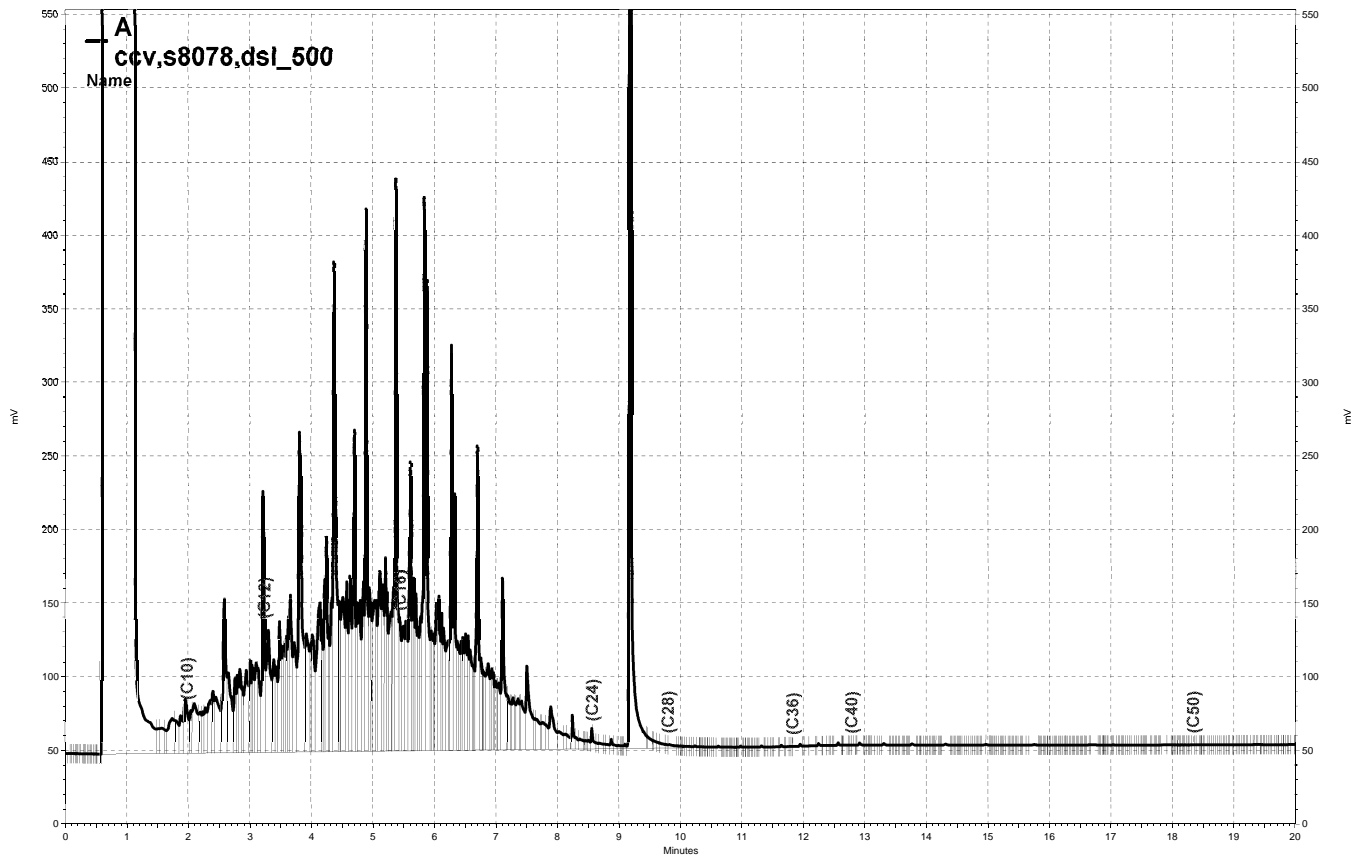
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\\Lims\gdrive\ezchrom\Projects\GC11A\Data\078a013, A



COOLER RECEIPT CHECKLIST



Curtis & Tompkins, Ltd.

Login # 201955 Date Received 3/14/08 Number of coolers 1
Client Stewas Project Redwood Regional Park

Date Opened 3/14 By (print) J Wellbrook (sign) J Wellbrook
Date Logged in 3/14 By (print) J Wellbrook (sign) J Wellbrook

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

2A. Were custody seals present? .... YES (circle) on cooler on samples NO
How many Name Date

2B. Were custody seals intact upon arrival? ..... YES NO (N/A)

3. Were custody papers dry and intact when received?..... YES NO

4. Were custody papers filled out properly (ink, signed, etc)?..... YES NO

5. Is the project identifiable from custody papers? (If so fill out top of form)..... YES NO

6. Indicate the packing in cooler: (if other, describe)

- Bubble Wrap, Foam blocks, Bags, None, Cloth material, Cardboard, Styrofoam, Paper towels

7. If required, was sufficient ice used? Samples should be < or = 6°C ..... YES NO N/A

Type of ice used: WET BLUE NONE Temp(°C) no temp

SAMPLES RECEIVED ON ICE DIRECTLY FROM FIELD. COOLING PROCESS HAD BEGUN.

8. Were soil Encore sampling devices present? ..... YES (NO)

If YES, what time were they transferred to freezer?

9. Did all bottles arrive unbroken/unopened?..... YES NO

10. Are samples in the appropriate containers for indicated tests?..... YES NO

11. Are sample labels present, in good condition and complete?..... YES NO

12. Do the sample labels agree with custody papers?..... YES NO

13. Was sufficient amount of sample sent for tests requested?..... YES NO

14. Are the samples appropriately preserved?..... YES NO N/A

15. Are bubbles absent in VOA samples?..... YES NO N/A

16. Was the client contacted concerning this sample delivery?..... YES NO

If YES, Who was called? By Date:

COMMENTS

Multiple horizontal lines for handwritten comments.



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

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

**Laboratory Job Number 201955  
ANALYTICAL REPORT**

Stellar Environmental Solutions  
2198 6th Street  
Berkeley, CA 94710

Project : 2006-16  
Location : Redwood Regional Park  
Level : II

Sample ID

SW-2

SW-3

Lab ID

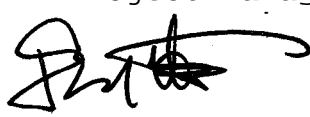
201955-001

201955-002

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

Signature:   
Project Manager

Date: 03/31/2008

Signature:   
Operations Manager

Date: 03/31/2008

**CASE NARRATIVE**

Laboratory number: 201955  
Client: Stellar Environmental Solutions  
Project: 2006-16  
Location: Redwood Regional Park  
Request Date: 03/14/08  
Samples Received: 03/14/08

This hardcopy data package contains sample and QC results for two water samples, requested for the above referenced project on 03/14/08. The samples were received cold and intact.

**TPH-Purgeables and/or BTXE by GC (EPA 8015B and EPA 8021B):**

No analytical problems were encountered.

**TPH-Extractables by GC (EPA 8015B):**

Matrix spikes were not reported for this analysis because the parent sample was reextracted in another batch. No other analytical problems were encountered.







## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	201955	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2006-16	Analysis:	EPA 8021B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC434861	Batch#:	136458
Matrix:	Water	Analyzed:	03/27/08
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
MTBE	10.00	9.806	98	70-129
Benzene	10.00	9.766	98	80-120
Toluene	10.00	9.919	99	80-120
Ethylbenzene	10.00	8.696	87	80-120
m,p-Xylenes	10.00	8.703	87	80-120
o-Xylene	10.00	10.20	102	80-120

Surrogate	%REC	Limits
Trifluorotoluene (PID)	95	60-146
Bromofluorobenzene (PID)	114	65-143

## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	201955	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2006-16	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC434862	Batch#:	136458
Matrix:	Water	Analyzed:	03/27/08
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	963.8	96	80-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	104	69-140
Bromofluorobenzene (FID)	115	73-144

## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	201955	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2006-16	Analysis:	EPA 8015B
Field ID:	SW-2	Batch#:	136458
MSS Lab ID:	201955-001	Sampled:	03/14/08
Matrix:	Water	Received:	03/14/08
Units:	ug/L	Analyzed:	03/27/08
Diln Fac:	1.000		

Type: MS Lab ID: QC434905

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	39.73	2,000	1,721	84	67-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	128	69-140
Bromofluorobenzene (FID)	143	73-144

Type: MSD Lab ID: QC434906

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,977	97	67-120	14	20

Surrogate	%REC	Limits
Trifluorotoluene (FID)	124	69-140
Bromofluorobenzene (FID)	136	73-144

RPD= Relative Percent Difference

## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	201955	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2006-16	Analysis:	EPA 8021B
Matrix:	Water	Batch#:	136553
Units:	ug/L	Analyzed:	03/24/08
Diln Fac:	1.000		

Type: BS Lab ID: QC435283

Analyte	Spiked	Result	%REC	Limits
m,p-Xylenes	10.00	9.242	92	80-120

Surrogate	%REC	Limits
Trifluorotoluene (PID)	102	60-146
Bromofluorobenzene (PID)	97	65-143

Type: BSD Lab ID: QC435284

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
m,p-Xylenes	10.00	9.338	93	80-120	1	20

Surrogate	%REC	Limits
Trifluorotoluene (PID)	87	60-146
Bromofluorobenzene (PID)	86	65-143

RPD= Relative Percent Difference



## Batch QC Report

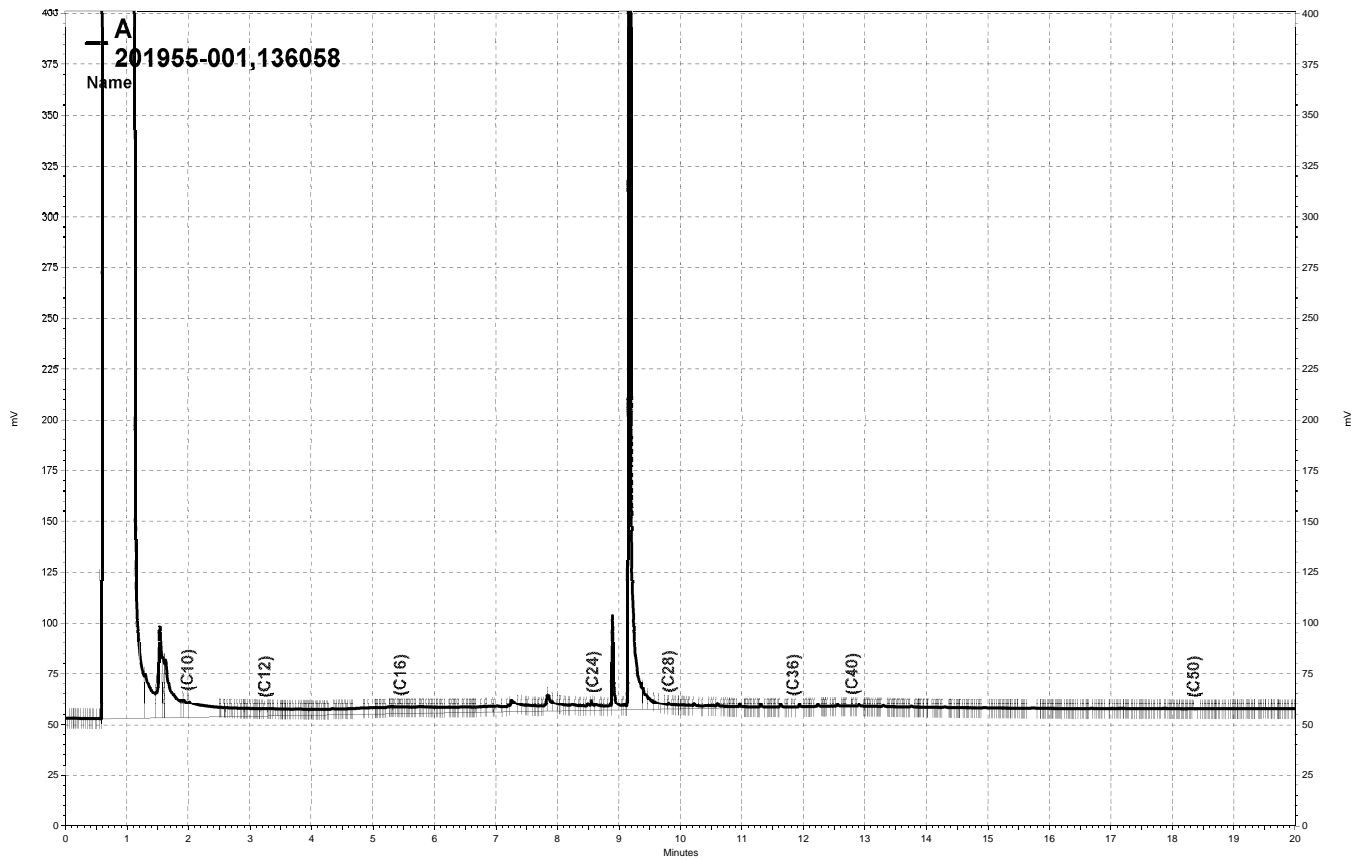
Total Extractable Hydrocarbons			
Lab #:	201955	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2006-16	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC433209	Batch#:	136058
Matrix:	Water	Prepared:	03/17/08
Units:	ug/L	Analyzed:	03/18/08

Cleanup Method: EPA 3630C

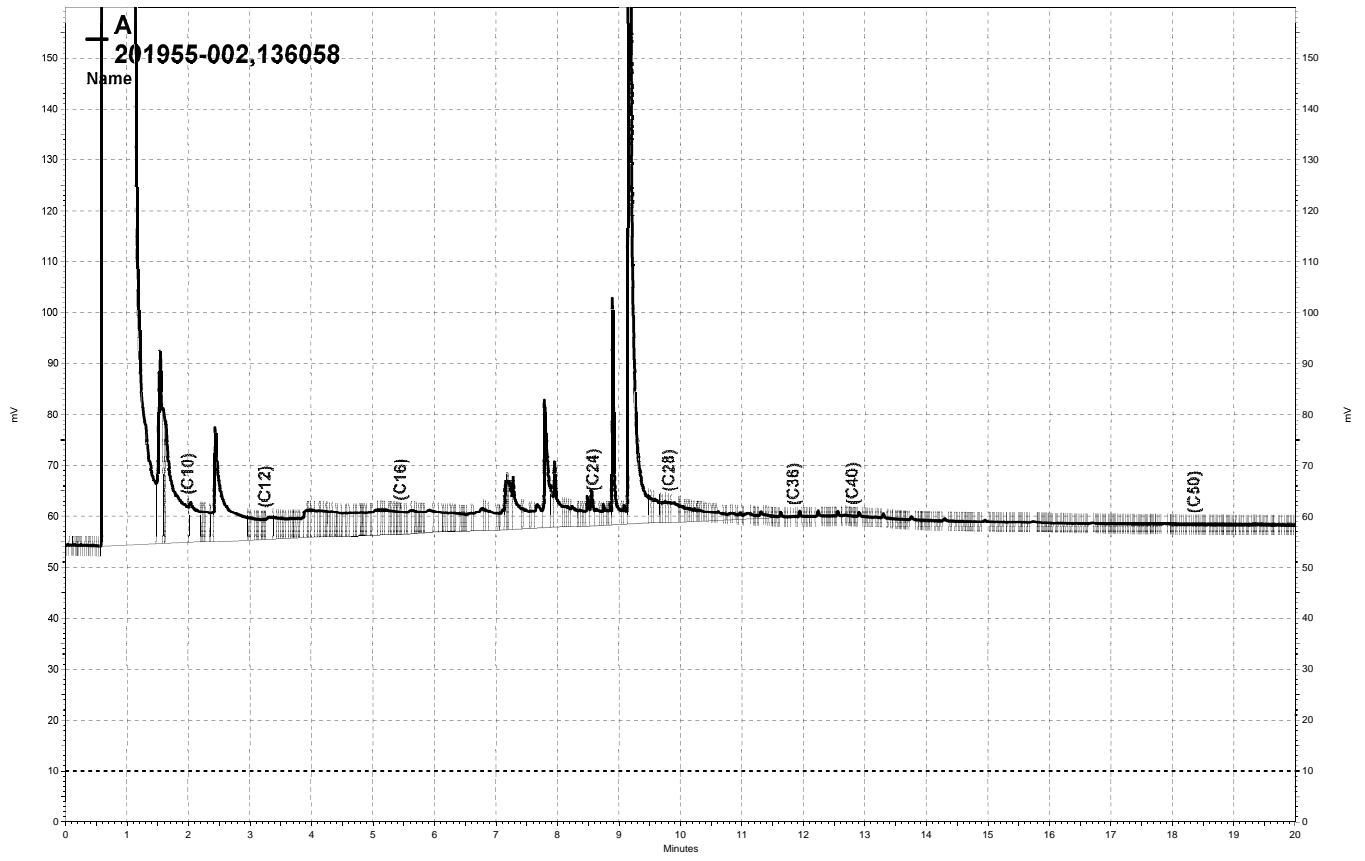
Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,143	86	61-120

Surrogate	%REC	Limits
Hexacosane	92	63-130

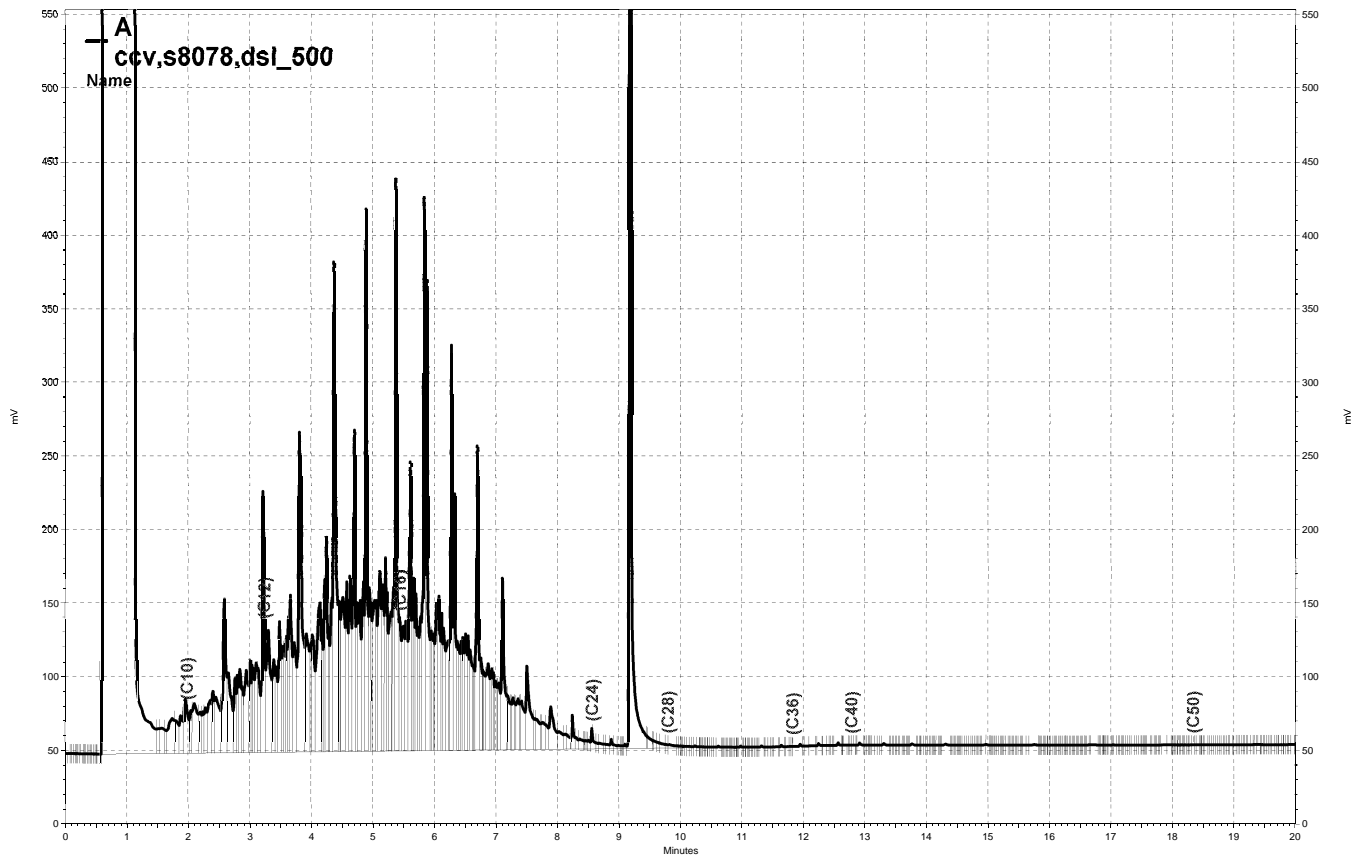




— \\Lims\gdrive\ezchrom\Projects\GC11A\Data\078a021, A



— \\Lims\gdrive\ezchrom\Projects\GC11A\Data\078a022, A



\\Lims\gdrive\ezchrom\Projects\GC11A\Data\078a013, A





Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

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

Laboratory Job Number 200605  
ANALYTICAL REPORT

Stellar Environmental Solutions  
2198 6th Street  
Berkeley, CA 94710

Project : 2008-02  
Location : Redwood Regional Park  
Level : II

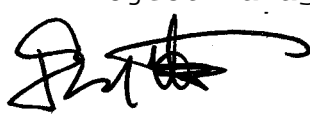
Sample ID  
MW-2

Lab ID  
200605-001

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

Signature:   
Project Manager

Date: 01/25/2008

Signature:   
Operations Manager

Date: 01/28/2008

**CASE NARRATIVE**

Laboratory number: 200605  
Client: Stellar Environmental Solutions  
Project: 2008-02  
Location: Redwood Regional Park  
Request Date: 01/18/08  
Samples Received: 01/18/08

This hardcopy data package contains sample and QC results for one water sample, requested for the above referenced project on 01/18/08. The sample was received cold and intact.

**TPH-Purgeables and/or BTXE by GC (EPA 8015B and EPA 8021B):**

MW-2 (lab # 200605-001) had pH greater than 2. No other analytical problems were encountered.

**TPH-Extractables by GC (EPA 8015B):**

No analytical problems were encountered.

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	200605	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2008-02		
Field ID:	MW-2	Batch#:	133910
Matrix:	Water	Sampled:	01/17/08
Units:	ug/L	Received:	01/18/08
Diln Fac:	1.000		

Type: SAMPLE Analyzed: 01/19/08  
 Lab ID: 200605-001

Analyte	Result	RL	Analysis
Gasoline C7-C12	480	50	EPA 8015B
MTBE	11	2.0	EPA 8021B
Benzene	1.1	0.50	EPA 8021B
Toluene	3.2	0.50	EPA 8021B
Ethylbenzene	5.5	0.50	EPA 8021B
m,p-Xylenes	53	0.50	EPA 8021B
o-Xylene	15	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	109	73-134	EPA 8015B
Bromofluorobenzene (FID)	107	77-140	EPA 8015B
Trifluorotoluene (PID)	99	65-142	EPA 8021B
Bromofluorobenzene (PID)	105	74-135	EPA 8021B

Type: BLANK Analyzed: 01/18/08  
 Lab ID: QC424648

Analyte	Result	RL	Analysis
Gasoline C7-C12	ND	50	EPA 8015B
MTBE	ND	2.0	EPA 8021B
Benzene	ND	0.50	EPA 8021B
Toluene	ND	0.50	EPA 8021B
Ethylbenzene	ND	0.50	EPA 8021B
m,p-Xylenes	ND	0.50	EPA 8021B
o-Xylene	ND	0.50	EPA 8021B

Surrogate	%REC	Limits	Analysis
Trifluorotoluene (FID)	109	73-134	EPA 8015B
Bromofluorobenzene (FID)	98	77-140	EPA 8015B
Trifluorotoluene (PID)	104	65-142	EPA 8021B
Bromofluorobenzene (PID)	95	74-135	EPA 8021B

ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	200605	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2008-02	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC424649	Batch#:	133910
Matrix:	Water	Analyzed:	01/18/08
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	994.6	99	79-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	114	73-134
Bromofluorobenzene (FID)	115	77-140



## Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	200605	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2008-02	Analysis:	EPA 8021B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC424650	Batch#:	133910
Matrix:	Water	Analyzed:	01/18/08
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
MTBE	10.00	10.78	108	73-123
Benzene	10.00	10.79	108	80-120
Toluene	10.00	10.96	110	80-120
Ethylbenzene	10.00	11.09	111	80-120
m,p-Xylenes	10.00	10.63	106	80-121
o-Xylene	10.00	10.59	106	80-120

Surrogate	%REC	Limits
Trifluorotoluene (PID)	105	65-142
Bromofluorobenzene (PID)	99	74-135

Batch QC Report

**Curtis & Tompkins Laboratories Analytical Report**

Lab #:	200605	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2008-02	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Diln Fac:	1.000
MSS Lab ID:	200610-001	Batch#:	133910
Matrix:	Water	Sampled:	01/18/08
Units:	ug/L	Received:	01/18/08

Type: MS Analyzed: 01/18/08  
 Lab ID: QC424651

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	37.40	2,000	1,843	90	72-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	86	73-134
Bromofluorobenzene (FID)	85	77-140

Type: MSD Analyzed: 01/19/08  
 Lab ID: QC424652

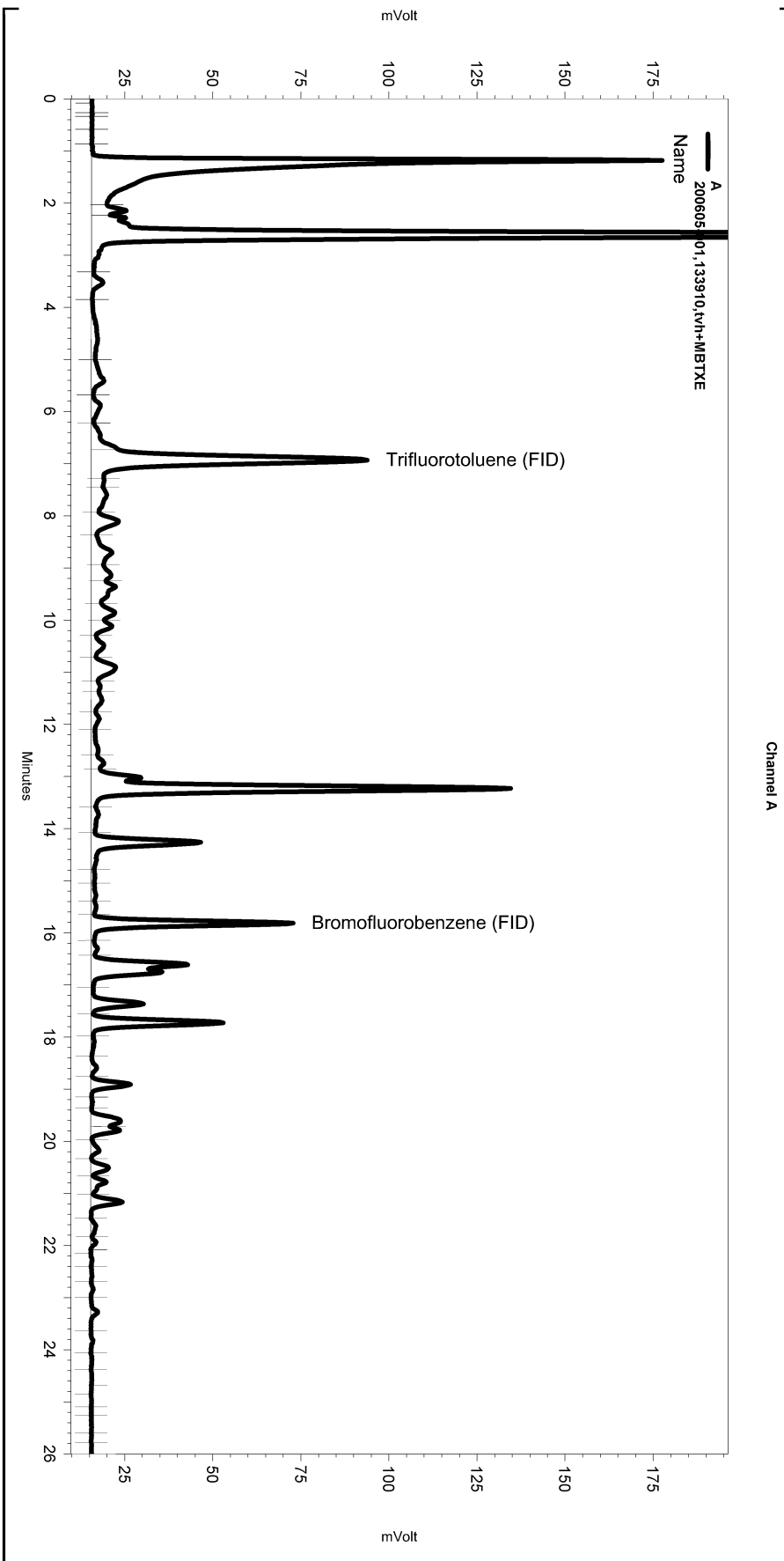
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,833	90	72-120	1	20

Surrogate	%REC	Limits
Trifluorotoluene (FID)	104	73-134
Bromofluorobenzene (FID)	104	77-140

RPD= Relative Percent Difference

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 Sample Name: 200605-001,133910,tvh+MBTXE  
 Data File: \\Lims\gdrive\ezchrom\Projects\GC19\Data\018\_026  
 Instrument: GC19 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
 Method Name: \\Lims\gdrive\ezchrom\Projects\GC19\Method\tvhbtxe015.met

Software Version 3.1.7  
 Run Date: 1/19/2008 6:07:17 AM  
 Analysis Date: 1/19/2008 2:31:14 PM  
 Sample Amount: 5 Multiplier: 5  
 Vial & pH or Core ID: a3.0



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

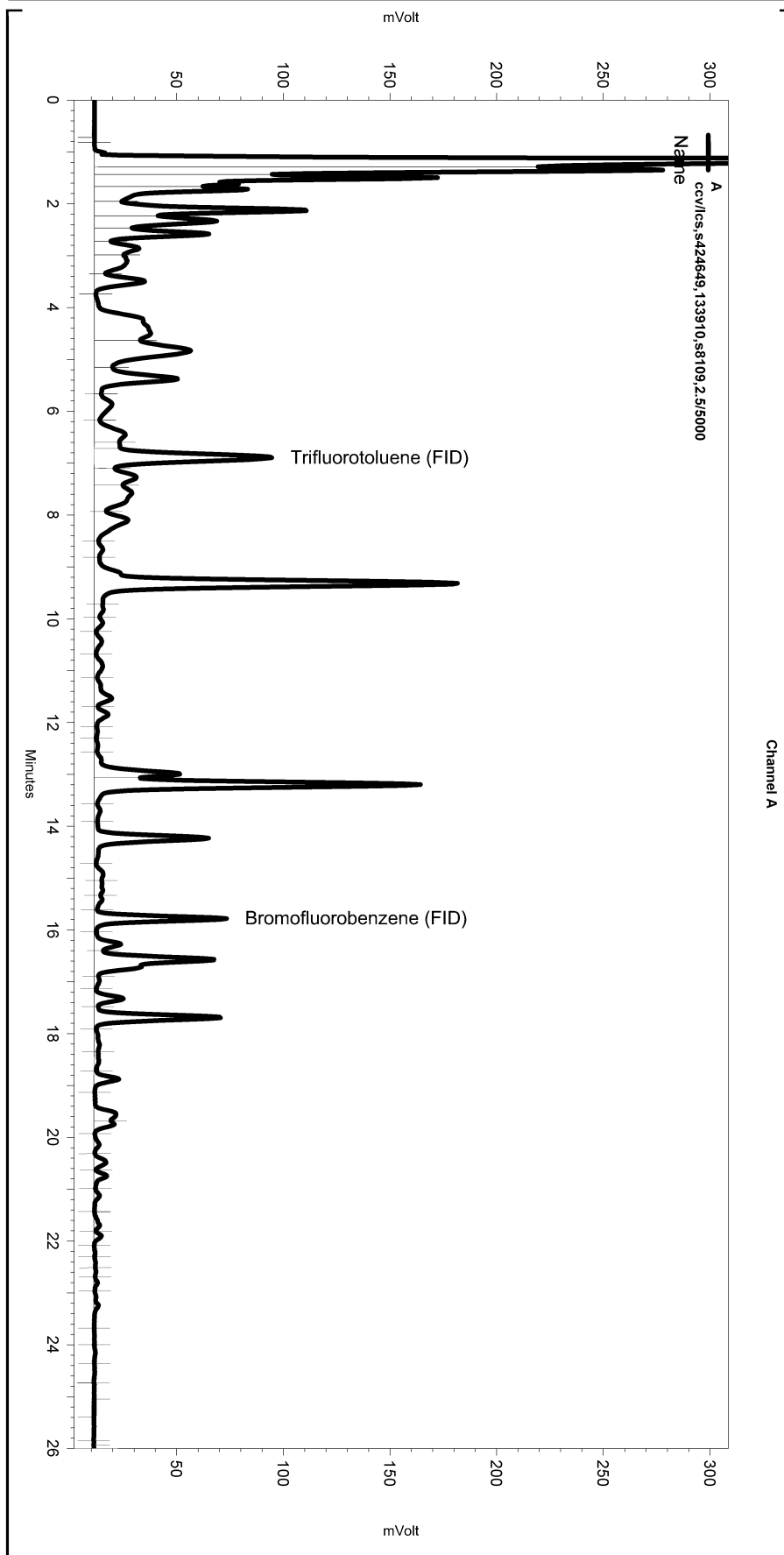
Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC19\Data\018\_026

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Split Peak	6.736	0	0

Sequence File: \\Lims\gdrive\ezchrom\Projects\GC19\Sequence\018.seq  
 Sample Name: ccv/lcs,s424649,133910,s8109,2.5/5000  
 Data File: \\Lims\gdrive\ezchrom\Projects\GC19\Data\018\_004  
 Instrument: GC19 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
 Method Name: \\Lims\gdrive\ezchrom\Projects\GC19\Method\tvhbtxe015.met

Software Version 3.1.7  
 Run Date: 1/18/2008 12:21:10 PM  
 Analysis Date: 1/19/2008 2:22:10 PM  
 Sample Amount: 5 Multiplier: 5  
 Vial & pH or Core ID: {Data Description}



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No items selected for this section

Integration Events

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

Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC19\Data\018\_004

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Split Peak	6.724	0	0

**Total Extractable Hydrocarbons**

Lab #:	200605	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2008-02	Analysis:	EPA 8015B
Field ID:	MW-2	Sampled:	01/17/08
Matrix:	Water	Received:	01/18/08
Units:	ug/L	Prepared:	01/22/08
Diln Fac:	1.000	Analyzed:	01/24/08
Batch#:	134009		

Type: SAMPLE Lab ID: 200605-001

Analyte	Result	RL
Diesel C10-C24	200 Y	50

Surrogate	%REC	Limits
Hexacosane	100	61-133

Type: BLANK Lab ID: QC425101

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	112	61-133

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

## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	200605	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2008-02	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC425102	Batch#:	134009
Matrix:	Water	Prepared:	01/22/08
Units:	ug/L	Analyzed:	01/24/08

Cleanup Method: EPA 3630C

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	1,604	64	58-128

Surrogate	%REC	Limits
Hexacosane	80	61-133

## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	200605	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2008-02	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	134009
MSS Lab ID:	200624-001	Sampled:	01/17/08
Matrix:	Water	Received:	01/18/08
Units:	ug/L	Prepared:	01/22/08
Diln Fac:	1.000	Analyzed:	01/24/08

Type: MS Lab ID: QC425103

Analyte	MSS Result	Spiked	Result	%REC	Limits
Diesel C10-C24	31.92	2,500	1,784	70	58-129

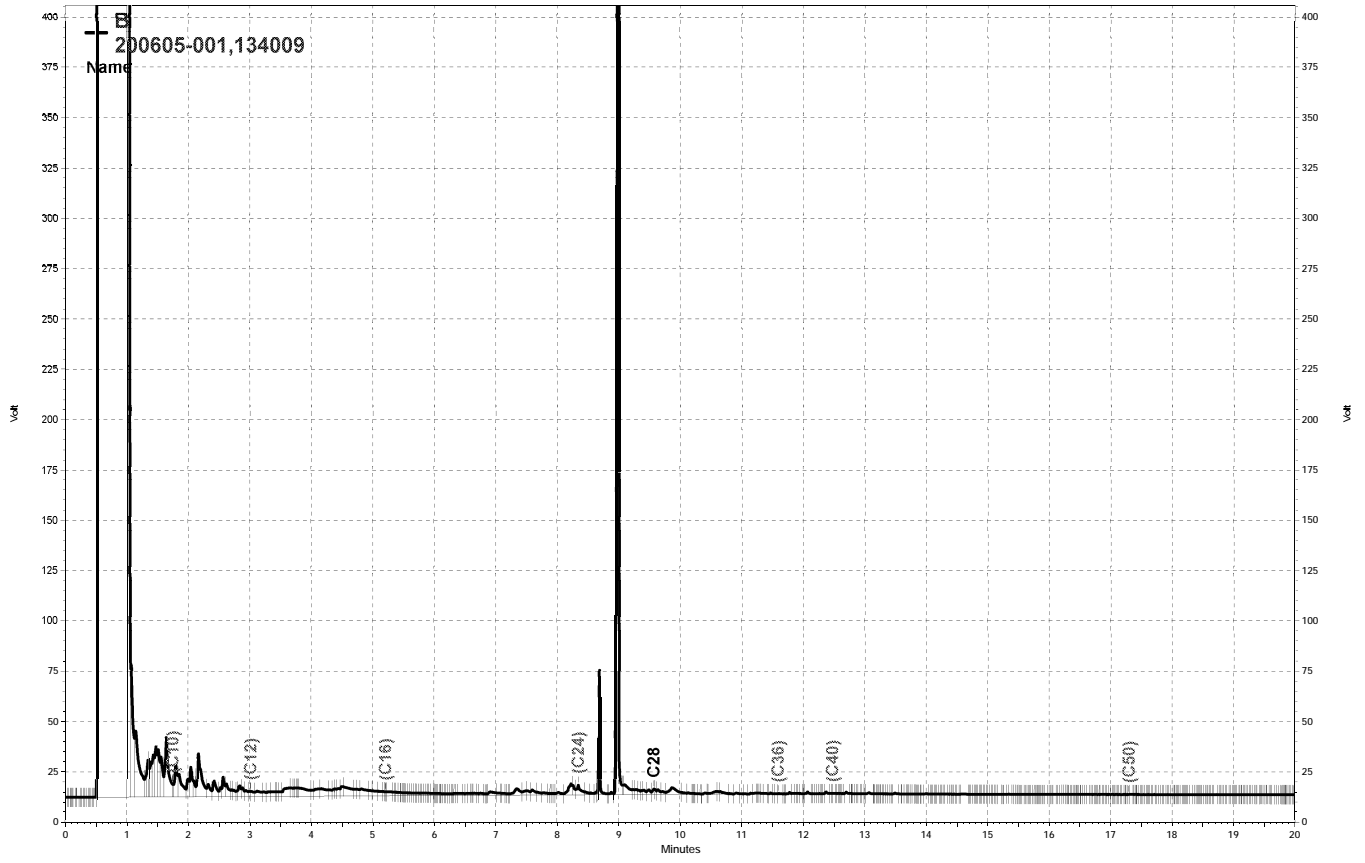
Surrogate	%REC	Limits
Hexacosane	71	61-133

Type: MSD Lab ID: QC425104

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	2,049	81	58-129	14	27

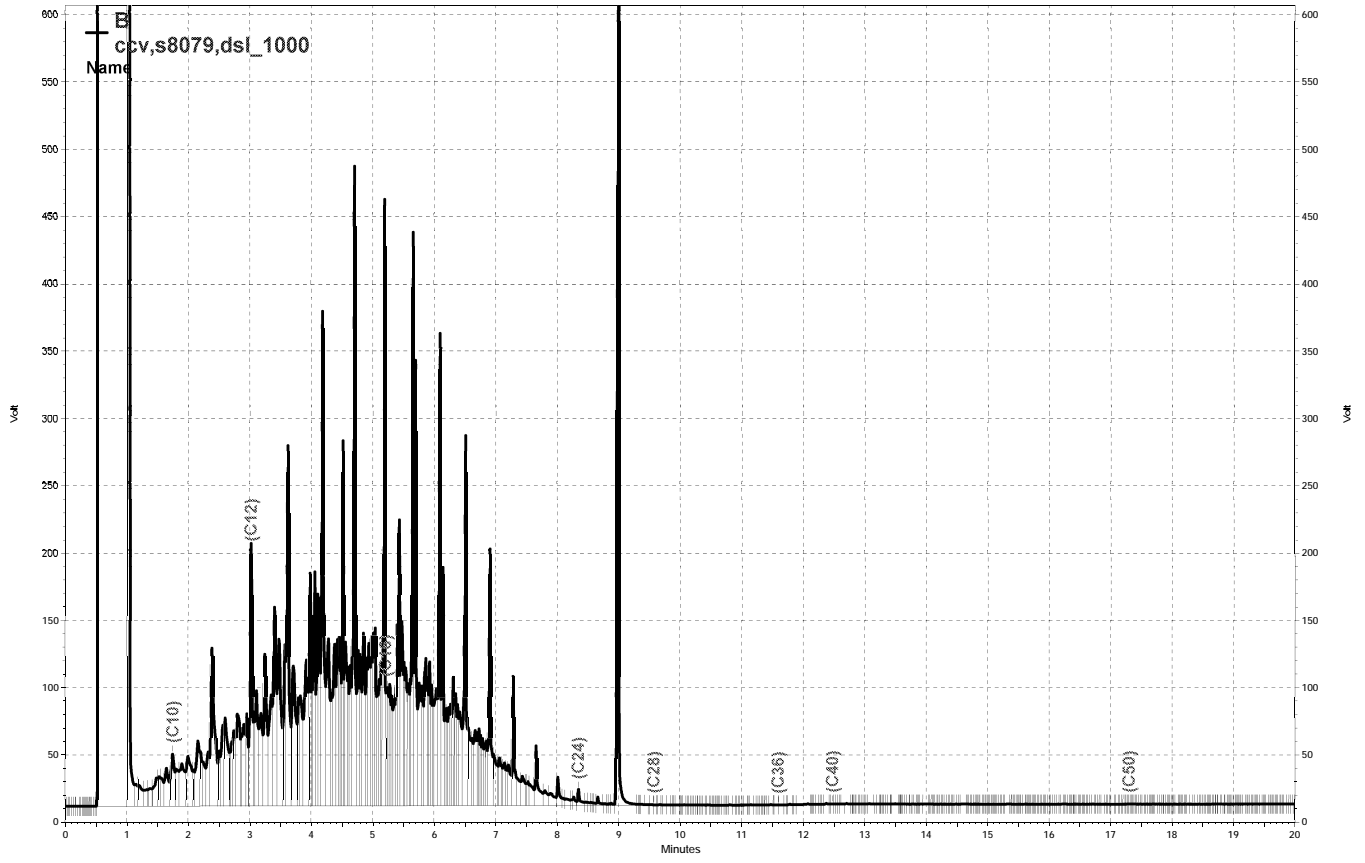
Surrogate	%REC	Limits
Hexacosane	97	61-133

RPD= Relative Percent Difference



— \\Lims\gdrive\ezchrom\Projects\GC15B\Data\023b041, B





\\Lims\gdrive\ezchrom\Projects\GC15B\Data\023b029, B





Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

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

Laboratory Job Number 202420  
ANALYTICAL REPORT

Stellar Environmental Solutions  
2198 6th Street  
Berkeley, CA 94710

Project : 2006-16  
Location : Redwood Regional Park  
Level : II

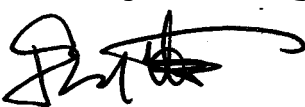
Sample ID  
MW2

Lab ID  
202420-001

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

Signature:   
Project Manager

Date: 04/23/2008

Signature:   
Operations Manager

Date: 04/24/2008

### CASE NARRATIVE

Laboratory number: 202420  
Client: Stellar Environmental Solutions  
Project: 2006-16  
Location: Redwood Regional Park  
Request Date: 04/04/08  
Samples Received: 04/04/08

This hardcopy data package contains sample and QC results for one water sample, requested for the above referenced project on 04/04/08. The sample was received cold and intact.

**TPH-Purgeables and/or BTXE by GC (EPA 8015B):**

MW2 (lab # 202420-001) had pH greater than 2. Since the pH was greater than 2, the TVH analysis was run outside the 7-day holding time for unpreserved samples. No other analytical problems were encountered.

**TPH-Extractables by GC (EPA 8015B):**

No analytical problems were encountered.

**Volatile Organics by GC/MS (EPA 8260B):**

MW2 (lab # 202420-001) had pH greater than 2. No other analytical problems were encountered.

Total Volatile Hydrocarbons			
Lab #:	202420	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2006-16	Analysis:	EPA 8015B
Field ID:	MW2	Batch#:	136950
Matrix:	Water	Sampled:	04/03/08
Units:	ug/L	Received:	04/04/08
Diln Fac:	1.000		

Type: SAMPLE Analyzed: 04/11/08  
 Lab ID: 202420-001

Analyte	Result	RL
Gasoline C7-C12	800	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	116	69-140
Bromofluorobenzene (FID)	109	73-144

Type: BLANK Analyzed: 04/10/08  
 Lab ID: QC436998

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	95	69-140
Bromofluorobenzene (FID)	93	73-144

ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	202420	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2006-16	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	136950
Units:	ug/L	Analyzed:	04/10/08
Diln Fac:	1.000		

Type: BS Lab ID: QC436999

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	3,000	2,595	86	80-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	132	69-140
Bromofluorobenzene (FID)	117	73-144

Type: BSD Lab ID: QC437024

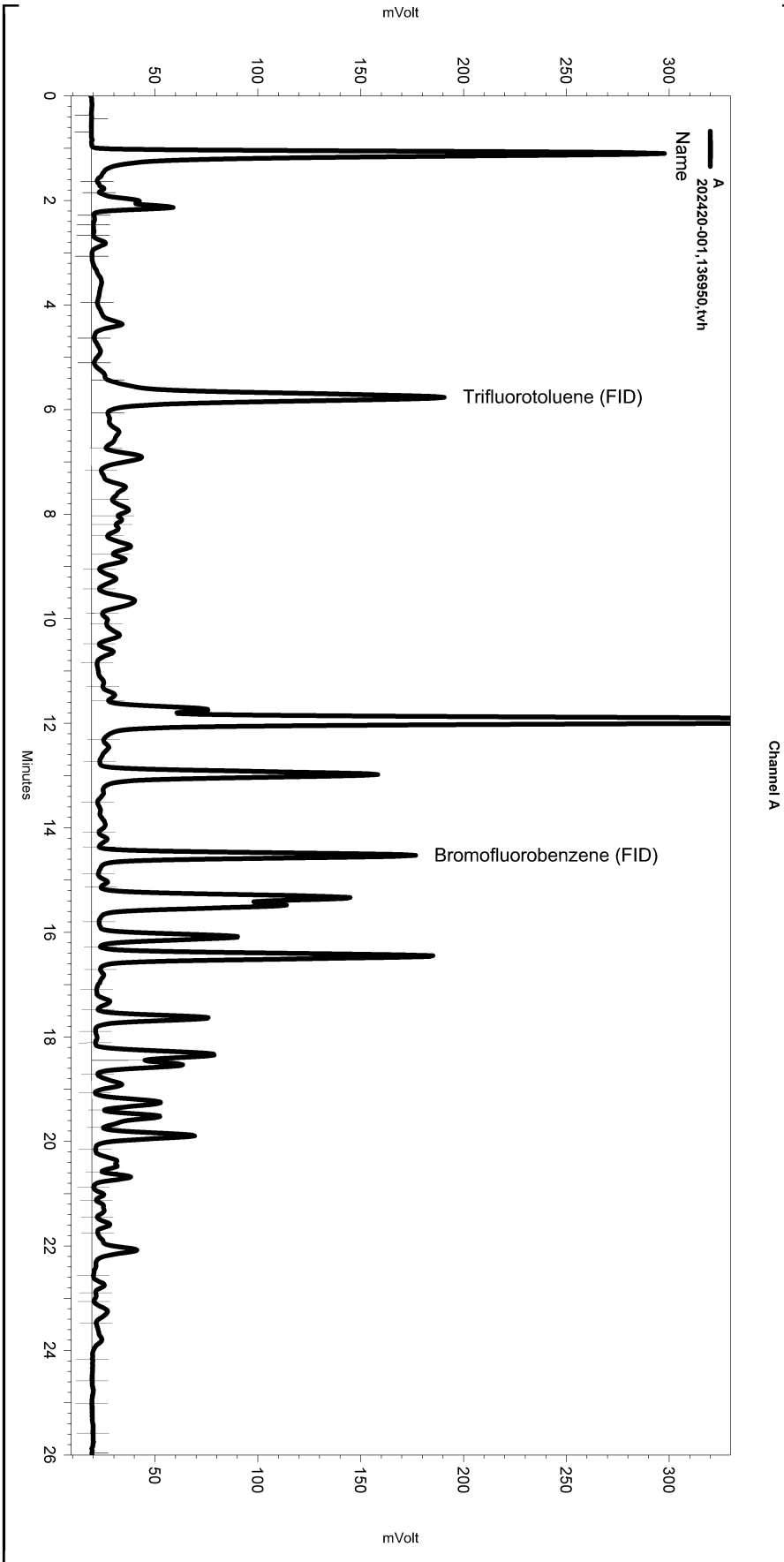
Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	1,737	87	80-120	0	20

Surrogate	%REC	Limits
Trifluorotoluene (FID)	138	69-140
Bromofluorobenzene (FID)	111	73-144

RPD= Relative Percent Difference

Sequence File: \\Lims\gdrive\ezchrom\Projects\GC04\Sequence\101.seq  
 Sample Name: 202420-001,136950,tvh  
 Data File: \\Lims\gdrive\ezchrom\Projects\GC04\Data\101\_021  
 Instrument: GC04 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
 Method Name: \\Lims\gdrive\ezchrom\Projects\GC04\Method\tvhbtxe055.met

Software Version 3.1.7  
 Run Date: 4/11/2008 4:59:02 AM  
 Analysis Date: 4/12/2008 11:03:07 AM  
 Sample Amount: 5 Multiplier: 5  
 Vial & pH or Core ID: a3



---< General Method Parameters >---

No items selected for this section

---< A >---

No items selected for this section

Integration Events

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

Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC04\Data\101\_021

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Split Peak	5.434	0	0





Total Extractable Hydrocarbons			
Lab #:	202420	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2006-16	Analysis:	EPA 8015B
Field ID:	MW2	Batch#:	136863
Matrix:	Water	Sampled:	04/03/08
Units:	ug/L	Received:	04/04/08
Diln Fac:	1.000	Prepared:	04/08/08

Type: SAMPLE Analyzed: 04/13/08  
 Lab ID: 202420-001

Analyte	Result	RL
Diesel C10-C24	640 Y	50

Surrogate	%REC	Limits
Hexacosane	95	63-130

Type: BLANK Analyzed: 04/12/08  
 Lab ID: QC436626

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	97	63-130

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

## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	202420	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2006-16	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	136863
Units:	ug/L	Prepared:	04/08/08
Diln Fac:	1.000	Analyzed:	04/12/08

Type: BS Cleanup Method: EPA 3630C  
 Lab ID: QC436627

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	1,649	66	61-120

Surrogate	%REC	Limits
Hexacosane	71	63-130

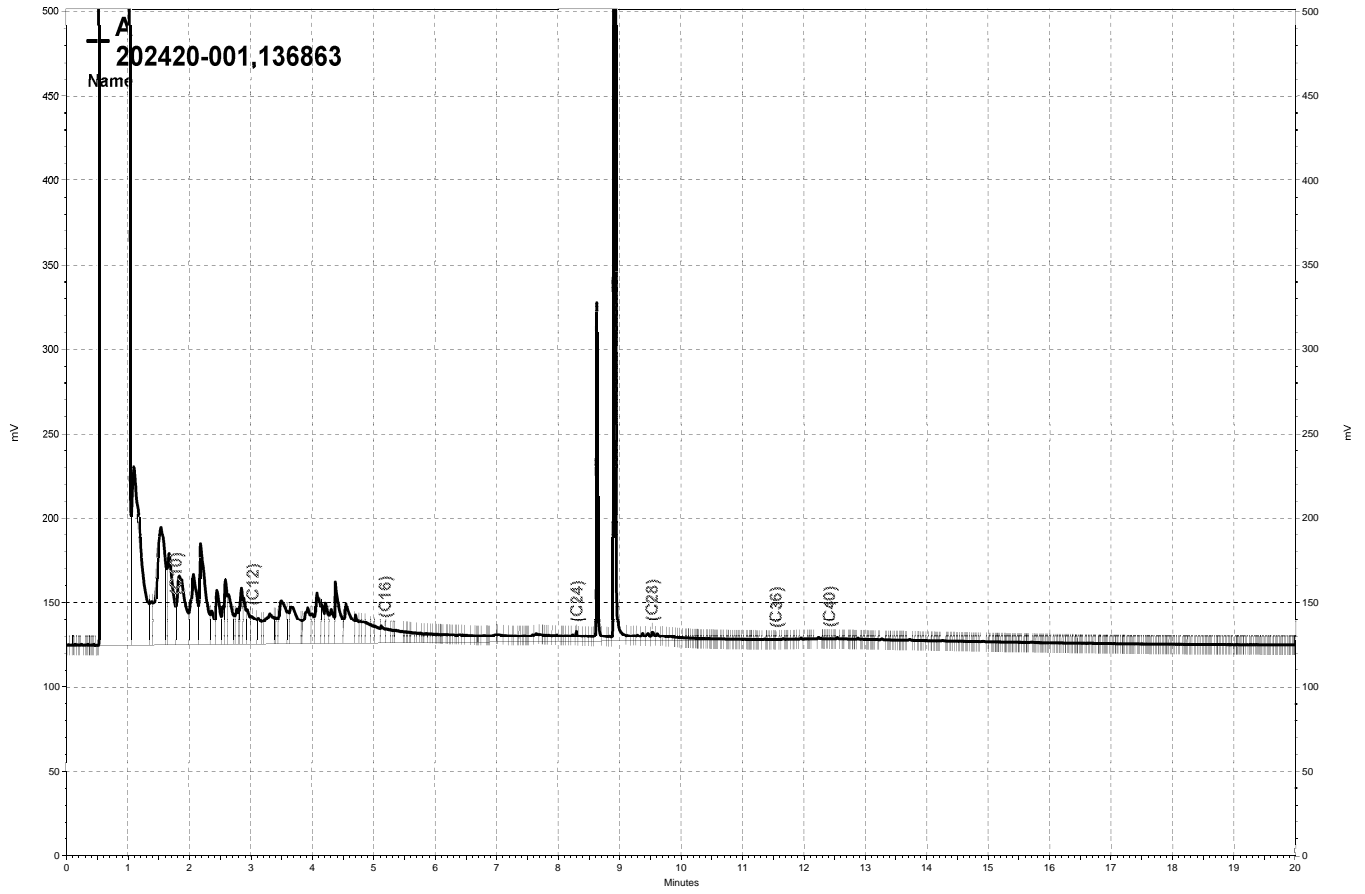
Type: BSD Cleanup Method: EPA 3630C  
 Lab ID: QC436628

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	2,123	85	61-120	25	29

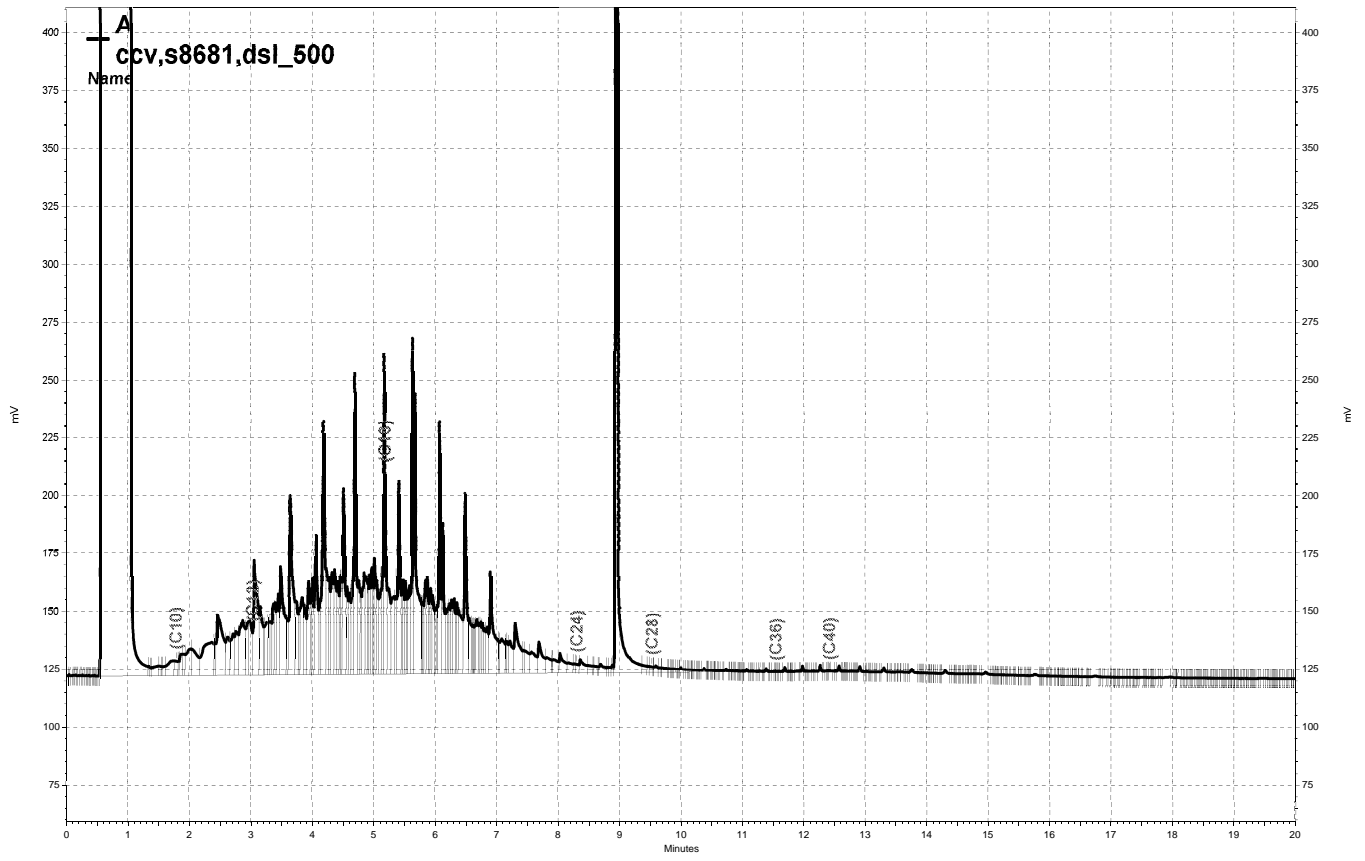
  

Surrogate	%REC	Limits
Hexacosane	88	63-130

RPD= Relative Percent Difference



— \\Lims\gdrive\ezchrom\Projects\GC11A\Data\104a016, A



\\Lims\gdrive\ezchrom\Projects\GC11A\Data\104a004, A

**Purgeable Aromatics by GC/MS**

Lab #:	202420	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2006-16	Analysis:	EPA 8260B
Field ID:	MW2	Batch#:	136851
Lab ID:	202420-001	Sampled:	04/03/08
Matrix:	Water	Received:	04/04/08
Units:	ug/L	Analyzed:	04/08/08
Diln Fac:	1.000		

Analyte	Result	RL
MTBE	13	0.5
Benzene	2.6	0.5
Toluene	2.1	0.5
Ethylbenzene	13	0.5
m,p-Xylenes	120	0.5
o-Xylene	35	0.5

Surrogate	%REC	Limits
1,2-Dichloroethane-d4	114	76-138
Toluene-d8	103	80-120
Bromofluorobenzene	113	80-120

RL= Reporting Limit

## Batch QC Report

Purgeable Aromatics by GC/MS			
Lab #:	202420	Location:	Redwood Regional Park
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2006-16	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC436581	Batch#:	136851
Matrix:	Water	Analyzed:	04/08/08
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	112	76-138
Toluene-d8	103	80-120
Bromofluorobenzene	113	80-120

ND= Not Detected

RL= Reporting Limit



## **APPENDIX D**

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### **Historical Groundwater and Surface Water Analytical Results**



**HISTORICAL GROUNDWATER MONITORING WELLS ANALYTICAL RESULTS**  
**REDWOOD REGIONAL PARK SERVICE YARD, OAKLAND, CALIFORNIA**  
(all concentrations in ug/L, equivalent to parts per billion [ppb])

Well MW-2									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Nov-94	66	< 50	3.4	< 0.5	< 0.5	0.9	4.3	NA
2	Feb-95	89	< 50	18	2.4	1.7	7.5	30	NA
3	May-95	< 50	< 50	3.9	< 0.5	1.6	2.5	8.0	NA
4	Aug-95	< 50	< 50	5.7	< 0.5	< 0.5	< 0.5	5.7	NA
5	May-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
6	Aug-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
7	Dec-96	< 50	< 50	6.3	< 0.5	1.6	< 0.5	7.9	NA
8	Feb-97	< 50	< 50	0.69	< 0.5	0.55	< 0.5	1.2	NA
9	May-97	67	< 50	8.9	< 0.5	5.1	< 1.0	14	NA
10	Aug-97	< 50	< 50	4.5	< 0.5	1.1	< 0.5	5.6	NA
11	Dec-97	61	< 50	21	< 0.5	6.5	3.9	31	NA
12	Feb-98	2,000	200	270	92	150	600	1,112	NA
13	Sep-98	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	7.0
14	Apr-99	82	710	4.2	< 0.5	3.4	4.0	12	7.5
15	Dec-99	57	< 50	20	0.6	5.9	< 0.5	27	4.5
16	Sep-00	< 50	< 50	0.72	< 0.5	< 0.5	< 0.5	0.7	7.9
17	Jan-01	51	< 50	8.3	< 0.5	1.5	< 0.5	9.8	8.0
18	Apr-01	110	< 50	10	< 0.5	11	6.4	27	10
19	Aug-01	260	120	30	6.7	1.6	6.4	45	27
20	Dec-01	74	69	14	0.8	3.7	3.5	22	6.6

Well MW-2 (continued)									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
21	Mar-02	< 50	< 50	2.3	0.51	1.9	1.3	8.3	8.2
22	Jun-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	7.7
23	Sep-02	98	< 50	5.0	< 0.5	< 0.5	< 0.5	—	13
24	Dec-02	< 50	< 50	4.3	< 0.5	< 0.5	< 0.5	—	< 2.0
25	Mar-03	130	82	39	< 0.5	20	4.1	63	16
26	Jun-03	< 50	< 50	1.9	< 0.5	< 0.5	< 0.5	1.9	8.7
27	Sep-03	120	< 50	8.6	0.51	0.53	< 0.5	9.6	23
28	Dec-03	282	<100	4.3	1.6	1.3	1.2	8.4	9.4
29	Mar-04	374	<100	81	1.2	36	7.3	126	18
30	Jun-04	< 50	< 50	0.75	< 0.5	< 0.5	< 0.5	< 0.5	15
31	Sep-04	200	< 50	23	< 0.5	< 0.5	0.70	24	16
32	Dec-04	80	< 50	14	< 0.5	2.9	0.72	18	20
33	Mar-05	190	68	27	<0.5	14	11	52	26
34	Jun-05	68	< 50	7.1	< 0.5	6.9	1.8	16	24
35	Sep-05	< 50	< 50	2.5	< 0.5	< 0.5	< 1.0	2.5	23
36	Dec-05	< 50	< 50	3.9	< 0.5	< 0.5	< 1.0	3.9	23
37	Mar-06	1300	300	77	4.4	91	250	422	18
38	Jun-06	< 50	60	< 0.5	< 0.5	< 0.5	< 1.0	—	17
39	Sep-06	270	52	31	< 0.5	15	6.69	53	17
40	Dec-06	< 50	< 50	2.1	< 0.5	< 0.5	< 0.5	2	16
41	Mar-07	59	< 50	4	< 0.5	< 0.5	< 0.5	< 0.5	14
42	Jun-07	<50	<50	3.5	<0.5	<0.5	<0.5	3.5	8
43	Sep-07	2,600	260	160	44	86	431	721	15
44	Dec-07	16,000	5,800	23	91	230	2,420	2764	16
44a	Jan-08	480	200	1.1	3.2	5.5	68	77.8	11
45	Mar-08	20,000	24,000	21	39	300	2,620	2980	13
45a	Apr-08	800	640	2.6	2.1	13	155	172.7	13

Well MW-4									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Nov-94	2,600	230	120	4.8	150	88	363	NA
2	Feb-95	11,000	330	420	17	440	460	1,337	NA
3	May-95	7,200	440	300	13	390	330	1,033	NA
4	Aug-95	1,800	240	65	6.8	89	67	227	NA
5	May-96	1,100	140	51	< 0.5	< 0.5	47	98	NA
6	Aug-96	3,700	120	63	2.0	200	144	409	NA
7	Dec-96	2,700	240	19	< 0.5	130	93	242	NA
8	Feb-97	3,300	< 50	120	1.0	150	103	374	NA
9	May-97	490	< 50	2.6	6.7	6.4	6.7	22	NA
10	Aug-97	1,900	150	8.6	3.5	78	53	143	NA
11	Dec-97	1,000	84	4.6	2.7	61	54	123	NA
12	Feb-98	5,300	340	110	24	320	402	856	NA
13	Sep-98	1,800	< 50	8.9	< 0.5	68	27	104	23
14	Apr-99	2,900	710	61	1.2	120	80	263	32
15	Dec-99	1,000	430	4.0	2.0	26	14	46	< 2.0
16	Sep-00	570	380	< 0.5	< 0.5	16	4.1	20	2.4
17	Jan-01	1,600	650	4.2	0.89	46	13.8	65	8.4
18	Apr-01	1,700	1,100	4.5	2.8	48	10.7	66	5.0
19	Aug-01	1,300	810	3.2	4.0	29	9.7	46	< 2.0
20	Dec-01	< 50	110	< 0.5	< 0.5	< 0.5	1.2	1.2	< 2.0
21	Mar-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0
22	Jun-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0
23	Sep-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0
24	Dec-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0
25	Mar-03	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0
26	Jun-03	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0
27	Sep-03	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0
28	Dec-03	< 50	< 100	< 0.3	< 0.3	< 0.3	< 0.6	—	< 5.0
29	Mar-04	< 50	< 100	< 0.3	< 0.3	< 0.3	< 0.6	—	< 5.0
30	Jun-04	< 50	2,500	< 0.3	< 0.3	< 0.3	< 0.6	—	< 5.0
31	Sep-04	< 50	< 50	< 0.5	< 0.5	< 0.5	< 1.0	—	< 2.0
32	Dec-04	< 50	< 50	< 0.5	< 0.5	< 0.5	< 1.0	—	< 2.0
33	Mar-05	< 50	< 50	< 0.5	< 0.5	< 0.5	< 1.0	—	< 2.0
34	Jun-05	< 50	< 50	< 0.5	< 0.5	< 0.5	< 1.0	—	< 2.0
35	Sep-05	< 50	< 50	< 0.5	< 0.5	< 0.5	< 1.0	—	< 2.0
Groundwater monitoring in this well discontinued with Alameda County Health Care Services Agency approval.									

Well MW-5									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Nov-94	50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
2	Feb-95	70	< 50	0.6	< 0.5	< 0.5	< 0.5	0.6	NA
3	May-95	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
4	Aug-95	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
5	May-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
6	Aug-96	80	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
7	Dec-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
8	Feb-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
9	May-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
10	Aug-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
11	Dec-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
12	Feb-98	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
13	Sep-98	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2
Groundwater monitoring in this well discontinued in 1998 with Alameda County Health Care Services Agency approval.									
Subsequent groundwater monitoring conducted to confirm plume's southern limit									
14	Jun-04	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	5.9
15	Sep-04	< 50	< 50	< 0.5	< 0.5	< 0.5	< 1.0	—	< 2.0

Well MW-7									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Jan-01	13,000	3,100	95	4	500	289	888	95
2	Apr-01	13,000	3,900	140	< 0.5	530	278	948	52
3	Aug-01	12,000	5,000	55	25	440	198	718	19
4	Dec-01	9,100	4,600	89	< 2.5	460	228	777	< 10
5	Mar-02	8,700	3,900	220	6.2	450	191	867	200
6	Jun-02	9,300	3,500	210	6.3	380	155	751	18
7	Sep-02	9,600	3,900	180	< 0.5	380	160	720	< 2.0
8	Dec-02	9,600	3,700	110	< 0.5	400	189	699	< 2.0
9	Mar-03	10,000	3,600	210	12	360	143	725	45
10	Jun-03	9,300	4,200	190	< 10	250	130	570	200
11	Sep-03	10,000	3,300	150	11	300	136	597	< 2.0
12	Dec-03	9,140	1,100	62	45	295	184	586	89
13	Mar-04	8,170	600	104	41	306	129	580	84
14	Jun-04	9,200	2,700	150	< 0.5	290	91	531	< 2.0
15	Sep-04	9,700	3,400	98	< 0.5	300	125	523	< 2.0
16	Dec-04	8200	4,000	95	< 0.5	290	124	509	< 2.0
17	Mar-05	10,000	4,300	150	<0.5	370	71	591	<2.0
18	Jun-05	10,000	3,300	210	<1.0	410	56	676	<4.0
19	Sep-05	7,600	2,700	110	<1.0	310	54	474	<4.0
20	Dec-05	2,900	3,300	31	<1.0	140	41	212	<4.0
21	Mar-06	6,800	3,000	110	< 1.0	280	42	432	110
22	Jun-06	6,900	3,600	63	< 2.5	290	43	396	< 10
23	Sep-06	7,900	3,600	64	< 0.5	260	58	382	49
24	Dec-06	7,300	2,400	50	< 0.5	220	42	312	< 2.0
25	Mar-07	6,200	2,900	34	< 0.5	190	15	239	< 2.0
26	Jun-07	6,800	3,000	30	<1.0	160	27	217	<4.0
27	Sep-07	6,400	3,000	<0.5	<0.5	170	43	213	<2.0
28	Dec-07	4,800	2,800	<0.5	<0.5	100	26.5	126.5	2.7
30	Mar-08	5,400	5,900	21	<0.5	150	15	186	51

Well MW-8									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Jan-01	14,000	1,800	430	17	360	1230	2,037	96
2	Apr-01	11,000	3,200	320	13	560	1,163	2,056	42
3	Aug-01	9,600	3,200	130	14	470	463	1,077	14
4	Dec-01	3,500	950	69	2.4	310	431	812	< 4.0
5	Mar-02	14,000	3,800	650	17	1,200	1,510	3,377	240
6	Jun-02	2,900	1,100	70	2.0	170	148	390	19
7	Sep-02	1,000	420	22	< 0.5	64	50	136	< 2.0
8	Dec-02	3,300	290	67	< 0.5	190	203	460	< 2.0
9	Mar-03	13,000	3,500	610	12	1,100	958	2,680	< 10
10	Jun-03	7,900	2,200	370	7.4	620	562	1,559	< 4.0
11	Sep-03	3,600	400	120	3.3	300	221	644	< 2.0
12	Dec-03	485	100	19	1.5	26	36	83	< 5.0
13	Mar-04	16,000	900	592	24	1,060	1,870	3,546	90
14	Jun-04	5,900	990	260	9.9	460	390	1,120	< 10
15	Sep-04	2,000	360	100	< 2.5	180	102	382	< 10
16	Dec-04	15,000	4,000	840	21	1,200	1,520	3,581	< 10
17	Mar-05	24,000	7,100	840	51	1,800	2,410	5,101	<10
18	Jun-05	33,000	5,700	930	39	2,500	3,860	7,329	<20
19	Sep-05	5,600	1,200	270	6.6	400	390	1,067	<20
20	Dec-05	3,700	1,300	110	< 5.0	320	356	786	<20
21	Mar-06	22,000	4,300	550	30	1,800	2,380	4,760	<20
22	Jun-06	19,000	5,000	500	28	1,800	1,897	4,225	<20
23	Sep-06	9,000	820	170	7.7	730	539	1,447	<10
24	Dec-06	4,400	800	75	4.2	320	246	645	< 2.0
25	Mar-07	15,000	4,500	340	19	1,300	1,275	2,934	< 20
26	Jun-07	10,000	3,500	220	11	670	675	1,576	<4.0
27	Sep-07	9,400	3,400	200	6.9	1,000	773	1,980	<8.0
28	Dec-07	1,200	500	15	0.88	95	57.7	168.58	<2.0
30	Mar-08	11,000	13,000	150	13	1,100	950.0	2,213	76

Well MW-9									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Aug-01	11,000	170	340	13	720	616	1,689	48
2	Dec-01	9,400	2,700	250	5.1	520	317	1,092	< 10
3	Mar-02	1,700	300	53	4.2	120	67	244	20
4	Jun-02	11,000	2,500	200	16	600	509	1,325	85
5	Sep-02	3,600	2,800	440	11	260	39	750	< 4.0
6	Dec-02	7,000	3,500	380	9.5	730	147	1,266	< 10
7	Mar-03	4,400	1,400	320	6.9	400	93	820	< 2.0
8	Jun-03	7,600	1,600	490	10	620	167	1,287	< 4.0
9	Sep-03	8,300	2,900	420	14	870	200	1,504	< 10
10	Dec-03	7,080	700	287	31	901	255	1,474	< 10
11	Mar-04	3,550	600	122	15	313	84	534	35
12	Jun-04	6,800	1,700	350	< 2.5	620	99	1,069	< 10
13	Sep-04	7,100	1,900	160	8.1	600	406	1,174	< 10
14	Dec-04	4,700	2,800	160	< 2.5	470	< 0.5	630	< 10
15	Mar-05	4,200	1,600	97	< 2.5	310	42	449	< 10
16	Jun-05	9,900	2,000	170	< 2.5	590	359	1,119	< 10
17	Sep-05	3,600	1,200	250	< 0.5	330	36	616	< 2.0
18	Dec-05	8,700	1,500	150	4	650	551	1,355	< 4.0
19	Mar-06	3,600	880	37	< 1.0	210	165	412	< 4.0
20	Jun-06	3,200	1,300	39	< 1.0	220	144	403	4.2
21	Sep-06	12,000	3,300	130	8	850	604	1,592	< 1.0
22	Dec-06	12,000	2,800	140	9.4	880	634	1,663	< 10
23	Mar-07	9,600	2,900	120	8.7	780	453	1,362	< 10
24	Jun-07	7,100	2,200	75	5.2	480	298	858	< 4.0
25	Sep-07	4,500	2,100	60	3.8	420	227	710	< 4.0
26	Dec-07	6,200	2,000	51	< 0.5	340	128.8	519.8	< 2.0
27	Mar-08	6,400	3,500	67	5.2	480	177.6	724.6	38

Well MW-10									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Aug-01	550	2,100	17	< 0.5	31	44	92	40
2	Dec-01	< 50	81	< 0.5	< 0.5	< 0.5	< 0.5	—	25
3	Mar-02	< 50	< 50	0.61	< 0.5	< 0.5	< 0.5	0.61	6.0
4	Jun-02	< 50	< 50	0.59	< 0.5	0.58	< 0.5	1.2	9.0
5	Sep-02	160	120	10	< 0.5	6.7	3.6	20	26
6	Dec-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	16
7	Mar-03	110	< 50	11	< 0.5	12	1.3	24	15
8	Jun-03	110	< 50	9.6	< 0.5	6.8	< 0.5	16	9.0
9	Sep-03	< 50	< 50	1.1	< 0.5	1.5	< 0.5	2.6	7.0
10	Dec-03	162	<100	6.9	<0.3	8.0	<0.6	15	9.9
11	Mar-04	94	<100	2.8	<0.3	5.7	7.0	16	<5.0
12	Jun-04	150	56	11	< 0.5	12	< 0.5	23	15
13	Sep-04	< 50	< 50	1.6	< 0.5	1.9	< 1.0	3.5	5.8
14	Dec-04	64	< 50	3.7	< 0.5	3.7	0.7	8.1	10
15	Mar-05	95	98	8.3	<0.5	7.7	0.77	17	13
16	Jun-05	150	57	14	<0.5	10	1.0	25	<2.0
17	Sep-05	87	< 50	5.0	<0.5	3.6	<1.0	8.6	<2.0
18	Dec-05	< 50	< 50	1.2	<0.5	<0.5	<1.0	1.2	7.8
19	Mar-06	58	71	3.2	<0.5	2.2	<1.0	5.4	8.8
20	Jun-06	73	140	4.9	<0.5	2.5	<1.0	7.4	5.3
21	Sep-06	88	51	<0.5	<0.5	<0.5	<0.5	<0.5	9.6
22	Dec-06	<50	<50	0.61	<0.5	0.55	<0.5	1.2	3.7
23	Mar-07	57	<50	3.6	<0.5	2.2	<0.5	5.8	3.1
24	Jun-07	60	65	2.4	<0.5	1.6	<0.5	4.0	4.0
25	Sep-07	84	<50	3.6	<0.5	2.3	0.52	6.4	3.6
26	Dec-07	130	67	0.77	<0.5	340	0.83	341.6	<2.0
27	Mar-08	78	170	1.7	<0.5	3.1	0.97	5.8	2.4



Well MW-11									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Aug-01	17,000	7,800	390	17	820	344	1,571	< 10
2	Dec-01	5,800	2,800	280	7.8	500	213	1,001	< 10
3	Mar-02	100	94	< 0.5	< 0.5	0.64	< 0.5	0.64	2.4
4	Jun-02	8,200	2,600	570	13	560	170	1,313	< 4
5	Sep-02	12,000	4,400	330	13	880	654	1,877	< 10
6	Dec-02	18,000	4,500	420	< 2.5	1,100	912	2,432	< 10
7	Mar-03	7,800	2,600	170	4.7	530	337	1,042	53
8	Jun-03	14,000	3,800	250	< 2.5	870	693	1,813	< 10
9	Sep-03	10,000	3,000	250	9.9	700	527	1,487	< 4
10	Dec-03	15,000	1,100	314	60	1,070	802	2,246	173
11	Mar-04	4,900	400	72	17	342	233	664	61
12	Jun-04	10,000	2,300	210	2.8	690	514	1,417	< 10
13	Sep-04	7,200	2,300	340	< 2.5	840	75	1,255	< 10
14	Dec-04	11,000	3,900	180	5.1	780	695	1,660	< 10
15	Mar-05	4,600	1,900	69	< 2.5	300	206	575	< 10
16	Jun-05	1,400	590	85	< 0.5	110	8.2	203	< 2.0
17	Sep-05	12,000	3,100	220	< 1.0	840	762	1,822	< 4.0
18	Dec-05	2,500	2,100	120	< 2.5	260	16	396	< 10
19	Mar-06	2,200	1,300	27	< 2.5	130	5.2	162	< 10
20	Jun-06	3,700	1,900	170	< 1.0	230	14	414	< 4.0
21	Sep-06	3,600	2,100	80	< 0.5	230	8.8	319	< 2.0
22	Dec-06	6,000	3,500	83	< 1.0	260	16.4	359	< 4.0
23	Mar-07	4,500	1,900	110	< 0.5	170	7.9	288	< 2.0
24	Jun-07	4	2,200	120	< 0.5	140	6.6	267	< 4.0
25	Sep-07	5,500	2,700	86	< 0.5	180	16.1	282	< 2.0
26	Dec-07	7,100	4,000	68	< 0.5	140	14	222	35
27	Mar-08	5,300	4,000	130	< 0.5	120	13	263	8.8

Well MW-12									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Dec-05	1,300	700	< 0.5	< 0.5	33	5.6	39	< 2.0
2	Mar-06	1,100	540	< 0.5	< 0.5	8.5	1.5	10	49
3	Jun-06	680	400	< 0.5	< 0.5	5.8	1.4	7.2	< 2.0
4	Sep-06	910	480	< 0.5	< 0.5	9.9	1.5	11.4	21
5	Dec-06	770	230	< 0.5	< 0.5	7.4	2.0	9.4	< 2.0
6	Mar-07	390	110	< 0.5	< 0.5	1.7	1.7	3.4	< 2.0
7	Jun-07	590	280	< 0.5	< 0.5	4.5	0.9	5.4	< 2.0
8	Sep-07	390	180	< 0.5	< 0.5	2.4	2.4	4.8	< 2.0
9	Dec-07	210	140	< 0.5	< 0.5	2.1	1.3	3.4	< 2.0
10	Mar-08	720	500	< 0.5	4.4	9.0	2.8	16.2	< 2.0

**HISTORICAL SURFACE WATER ANALYTICAL RESULTS  
REDWOOD REGIONAL PARK SERVICE YARD, OAKLAND, CALIFORNIA**

(all concentrations in ug/L, equivalent to parts per billion [ppb])

<b>Sampling Location SW-1 (Upstream of Contaminated Groundwater Discharge Location SW-2)</b>									
<b>Event</b>	<b>Date</b>	<b>TVHg</b>	<b>TEHd</b>	<b>Benzene</b>	<b>Toluene</b>	<b>Ethylbenzene</b>	<b>Total Xylenes</b>	<b>Total BTEX</b>	<b>MTBE</b>
1	Feb-94	50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
2	May-95	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
3	May-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
4	Aug-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
5	Dec-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
6	Feb-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
7	Aug-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
8	Dec-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
9	Feb-98	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA
10	Sep-98	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0
11	Apr-99	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0
Sampling at this location discontinued after April 1999 with Alameda County Health Services Agency approval.									

Sampling Location SW-2 (Area of Historical Contaminated Groundwater Discharge)									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	Feb-94	130	< 50	1.9	< 0.5	4.4	3.2	9.5	NA
2	May-95	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	NA
3	Aug-95	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	NA
4	May-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	NA
5	Aug-96	200	< 50	7.5	< 0.5	5.4	< 0.5	13	NA
6	Dec-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	NA
7	Feb-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	NA
8	Aug-97	350	130	13	0.89	19	11	44	NA
9	Dec-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	NA
10	Feb-98	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	NA
11	Sep-98	< 50	<50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 2.0
12	Apr-99	81	<50	2.0	< 0.5	2.5	1.3	5.8	2.3
13	Dec-99	1,300	250	10	1.0	47	27	85	2.2
14	Sep-00	160	100	2.1	< 0.5	5.2	1.9	9.2	3.4
15	Jan-01	< 50	< 50	< 0.5	< 0.5	0.53	< 0.5	0.5	< 2.0
16	Apr-01	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 2.0
17	Sep-01	440	200	2.1	< 0.5	17	1.3	20	10
18	Dec-01	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 2.0
19	Mar-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 2.0
20	Jun-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 2.0
21	Sep-02	220	590	10	< 0.5	13	< 0.5	23	< 2.0
22	Dec-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 2.0
23	Mar-03	< 50	< 50	< 0.5	< 0.5	0.56	< 0.5	0.56	2.8
24	Jun-03	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 2.0
25	Sep-03	190	92	2.1	< 0.5	4.2	< 0.5	6.3	< 2.0
26	Dec-03	86	< 100	< 0.3	< 0.3	< 0.3	< 0.6	<0.6	< 5.0
27	Mar-04	<50	<100	<0.3	<0.3	1.1	<0.6	1.1	< 5.0
28	Jun-04	<50	<50	<0.5	<0.5	0.83	<0.5	0.83	< 2.0
29	Sep-04	260	370	4.4	<0.5	6.3	< 1.0	11	< 2.0
30	Dec-04	<50	<50	<0.5	<0.5	<0.5	< 1.0	1.0	< 2.0
31	Mar-05	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0
32	Jun-05	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0
33	Sep-05	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0
34	Dec-05	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0
35	Mar-06	<50	62	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0
36	Jun-06	<50	110	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0
37	Sep-06	62	94	<0.5	<0.5	0.81	<0.5	0.8	< 2.0
38	Dec-06	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0
39	Mar-07	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0
40	Jun-07	<50	<50	<0.5	<0.5	<0.5	<0.5	<1.0	<2.0
41	Sep-07	<50	77	<0.5	<0.5	<0.5	<0.5	<1.0	<2.0
42	Dec-07	130	430	<0.5	<0.5	1.5	<0.5	1.5	<2.0
43	Mar-08	<50	130	<0.5	<0.5	<0.5	0.61	0.61	<2.0

Sampling Location SW-3 (Downstream of Contaminated Groundwater Discharge Location SW-2)									
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE
1	May-95	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA
2	Aug-95	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA
3	May-96	< 50	<b>74</b>	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA
4	Aug-96	<b>69</b>	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA
5	Dec-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA
6	Feb-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA
7	Aug-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA
8	Dec-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA
9	Feb-98	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA
10	Sep-98	< 50	<50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0
11	Apr-99	< 50	<50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0
12	Dec-99	< 50	<50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0
13	Sep-00	NS	NS	NS	NS	NS	NS	NS	NS
14	Jan-01	< 50	<50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0
15	Apr-01	< 50	<50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0
16	Sep-01	NS	NS	NS	NS	NS	NS	< 0.5	NS
17	Dec-01	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0
18	Mar-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0
19	Jun-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<b>2.4</b>
20	Sep-02	NS	NS	NS	NS	NS	NS	NS	NS
21	Dec-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0
22	Mar-03	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0
23	Jun-03	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0
24	Sep-03	NS	NS	NS	NS	NS	NS	NS	NS
25	Dec-03	<b>60</b>	< 100	< 0.3	< 0.3	< 0.3	< 0.6	< 0.6	< 5.0
26	Mar-04	<50	<100	<0.3	<0.3	<0.6	<0.6	<0.6	< 5.0
27	Jun-04	NS	NS	NS	NS	NS	NS	NS	NS
28	Sep-04	NS	NS	NS	NS	NS	NS	NS	NS
29	Dec-04	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0
30	Mar-05	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0
31	Jun-05	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0
32	Sep-05	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0
33	Dec-05	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0
34	Mar-06	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0
35	Jun-06	<50	<b>120</b>	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0
36	Sep-06	<50	<b>120</b>	<0.5	<0.5	<0.5	<0.5	0.5	<b>7.8</b>
37	Dec-06	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0
38	Mar-07	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	<b>3.3</b>
39	Jun-07	<50	<50	<0.5	<0.5	<0.5	<0.5	0.5	<2.0
40	Sep-07	NS	NS	NS	NS	NS	NS	NS	NS
41	Dec-07	NS	NS	NS	NS	NS	NS	NS	NS
42	Mar-08	<50	<b>200</b>	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0

NS = Not Sampled (no surface water present during sampling event)