

**2<sup>ND</sup> QUARTER 2007  
GROUNDWATER  
MONITORING REPORT**

Former Val Strough Chevrolet Site  
327 34<sup>th</sup> Street, Oakland, California  
Fuel Leak Case No. RO0000134

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## 1.0 INTRODUCTION

At the request of the Strough Family Trust of 1983, LRM Consulting, Inc. (LRM) has prepared this 2<sup>nd</sup> Quarter 2007 *Groundwater Monitoring Report* for the former Val Strough Chevrolet located in Oakland, California. This report documents the procedures and findings of the 12 June 2007 groundwater monitoring event reflecting semi-annual water quality reporting for select onsite wells and water level gauging for all site wells per the existing ACHCSA-approved monitoring program for the site. This monitoring reflects groundwater conditions approximately one year following cessation of the dual phase extraction (DPE) system at the site; the operation of the DPE system was ceased on 30 June 2006. Groundwater monitoring data and well construction details are shown on the figures and presented in the tables. Groundwater monitoring protocols, field data, and analytical results are provided in the appendices.

### 1.1 General Site Information

<b>Site name:</b>	Former Val Strough Chevrolet
<b>Site address:</b>	327 34 <sup>th</sup> Street, Oakland, California
<b>Current property owner:</b>	Strough Family Trust of 1983
<b>Current site use:</b>	Automotive Dealership and Service Center
<b>Current phase of project:</b>	Groundwater monitoring and evaluation of need and approaches for additional remediation
<b>Tanks at site:</b>	Two former tanks (1 gasoline, 1 waste-oil) removed in 1993
<b>Number of wells:</b>	7 (all onsite)
<b>Site ID #:</b>	3035
<b>RO #:</b>	0000134

### 1.2 Site Contacts

<b>Consultant:</b>	Ram Rao, P.E. Mehrdad Javaherian LRM Consulting, Inc. 1534 Plaza Lane, # 145 Burlingame, CA 94010 (650) 343-4633
<b>Regulatory agency:</b>	Donna Drogos Alameda County Health Services Agency (ACHCSA) 1131 Harbor Bay Parkway, Suite 250 Alameda, CA 94502-6577 (510) 567-6746

## 2.0 SITE BACKGROUND

### 2.1 Site Description

**Site Location and Land Use:** The former Val Strough Chevrolet site is currently an active Honda automobile dealership and service center located on the southwestern corner of the intersection of Broadway (Auto Row) and 34<sup>th</sup> Street (Figure 1). The property is located south of Interstate 580. Land use in the area is primarily commercial.

The site is situated approximately 2 miles east of San Francisco Bay at approximately 61 feet above mean sea level (msl) (EDR, 2003). The land surface in the vicinity slopes toward the south. The nearest surface water body is Lake Merritt, located approximately 1 mile south of the site (Figure 1).

**Site Features:** The site consists of a multi-level building and an adjacent parking lot (Figure 2). The former fuel dispenser and underground storage tanks (USTs) were located in the northwestern portion of the site. Seven groundwater monitoring wells are located at the site. Construction details for the wells are presented in Table 1.

**Underground Utilities:** A box culvert for a former tributary of Glen Echo Creek is located approximately 17 feet below ground surface (bgs) in the eastern portion of the site (Figure 2). The culvert consists of a reinforced concrete box measuring 5 feet by 6 feet. During the winter of 1983, a section of the culvert collapsed and was replaced with a 5-foot-diameter pipeline.

Sanitary sewer, electrical, and natural gas utilities are generally present at depths less than 2 feet bgs at the site. Approximately 40 feet north of the site, along the northern edge of 34<sup>th</sup> Street, a storm sewer pipeline flows toward the east and into the box culvert. Sanitary sewer lines run parallel to both 34<sup>th</sup> Street and Broadway, north and east of the site, respectively. A lateral pipeline located along the western edge of the site connects to the sanitary sewer line below 34<sup>th</sup> Street. Natural gas service is located on the east side of the property. Water service appears to enter the site from the north.

**Water Supply Well Search:** A 2003 report compiled by EDR indicates that there are no federal U.S. Geological Survey wells and no public water supply wells located within a 1-mile radius of the site. No water supply wells were identified by the Alameda County Department of Public Works within a ½-mile radius of the site (ETIC, 2003).

### 2.2 Summary of Previous Investigations and Monitoring Activities

As presented in previous reports, the USTs were removed and multiple investigations, including the installation of seven groundwater monitoring wells, were conducted. In addition, a routine groundwater monitoring program has been in place since 1993. The following paragraphs summarize the findings of these activities.

**Site Hydrogeology:** In general, the site is underlain by silt and clay to depths ranging from approximately 15 to 20 feet bgs. Silty sand and fine-grained sand interbedded with thin clay intervals are encountered from approximately 20 feet bgs to the total explored depth of 35 feet bgs.

The depth to groundwater beneath the site has ranged from approximately 12.5 to 23 feet bgs. As shown in the modified rose diagram on Figure 2, the direction of groundwater flow is generally toward the southwest to south-southeast, with an average hydraulic gradient of approximately 0.01 to 0.03 foot/foot.

**Primary Sources:** Two USTs (one gasoline and one waste-oil) were located beneath the sidewalk on the northern side of the property. A fuel dispenser was located inside the building (Figure 2). These primary sources of petroleum hydrocarbons were removed from the site in 1993.

**Constituents of Potential Concern:** Based on the type of fuel stored in the USTs and the results of previous subsurface investigations, the constituents of potential concern (COPCs) at the site include total petroleum hydrocarbons as gasoline (TPH-g), benzene, toluene, ethylbenzene, and total xylenes (BTEX), and methyl t-butyl ether (MTBE). TPH as diesel (TPH-d) and TPH as motor oil (TPH-mo) are not routinely detected in groundwater samples and are considered secondary COPCs for the site.

**Residual Source Area:** Elevated concentrations of TPH-g, BTEX, and MTBE have been observed in soil in the vadose zone and upper portion of the water-bearing zone near the former USTs and fuel dispenser. Separate phase petroleum hydrocarbons (SPH) have been intermittently detected in wells MW2 and MW3. These data indicate that most of the residual petroleum hydrocarbon mass is present near the former USTs and fuel dispenser, herein referred to as the residual source area.

**Petroleum Hydrocarbon Distribution in Groundwater:** The highest concentrations of petroleum hydrocarbons have been detected in samples collected from wells MW2 and MW3. Generally lower levels of petroleum hydrocarbons have been detected in samples collected from well MW4, and the other site wells. The extent of dissolved-phase petroleum hydrocarbons in groundwater is largely defined by relatively low and stable TPH-g, BTEX, and MTBE concentrations detected in downgradient and cross-gradient monitoring wells MW5, MW6, and MW7 (Table 2). These data suggest that the petroleum hydrocarbon plume is stable.

In addition, fuel oxygenates (tertiary amyl methyl ether, ethyl tertiary butyl ether, di-isopropyl ether, tertiary butyl alcohol and ethanol) and lead scavengers (ethylene dibromide and ethylene dichloride) were detected near laboratory reporting limits or were not detected in groundwater samples collected from borings HP1 and HP3 in December 2003 (Table 3). Note that boring HP2 was dry during the December 2003 sampling event.

## 2.2 Summary of Interim Remedial Action Activities

Since 2004, in addition to the routine groundwater monitoring activities, remediation pilot testing and remediation activities were conducted at the site. A summary of these activities and associated regulatory correspondence with the ACHCSA are presented below:

***DPE Pilot Test:*** In March 2004, ETIC Engineering, Inc. (ETIC) performed a DPE pilot test at the site. As summarized in the June 2004 *Dual Phase Extraction Pilot Test and Interim Remedial Action Plan* (DPE and IRAP Report), vacuum was applied to source area wells MW2 and MW3 while water and vacuum levels were measured in nearby monitoring wells. The DPE pilot test induced more than 1 foot of drawdown up to 50 feet from the extraction wells and an estimated radius of vacuum influence of 55 to 70 feet. Based on vapor flow rates and petroleum hydrocarbon concentrations in the vapor stream during the short-term pilot test, removal rates of approximately 90 pounds of petroleum hydrocarbons per day were estimated.

***June 2004 DPE and IRAP Report:*** The DPE and IRAP Report (ETIC, 2004) described the planned reduction of residual petroleum hydrocarbon mass in the source area through temporary DPE system installation and operation and dual phase extraction from source area wells MW2 and MW3 to extract soil vapor and groundwater simultaneously. The system was designed to consist of a knockout vessel to be used for separation of the soil vapor and water streams. A thermal oxidizer (with propane as a supplemental fuel) was proposed for treatment of extracted vapor, and aqueous-phase granular activated carbon was proposed for treatment of extracted groundwater.

***Interim Remedial Action:*** Between February 2005 and June 2006, ETIC operated a DPE system on site. Vacuum was applied to remove groundwater and soil vapor from up to two wells (MW2 and/or MW3). The system was temporarily shutdown on 30 January 2006 for conversion of vapor treatment from thermal oxidation to carbon filtration, and remained offline until 22 May 2006, when it was restarted. Because the mass removal rates by the DPE system had reached asymptotic levels and high petroleum hydrocarbon concentrations continued to exist in extraction wells MW2 and MW3 despite the DPE operation, the benefit of continuation of DPE in its current configuration was considered to be low and the DPE operation was ceased on 30 June 2006. ETIC subsequently dismantled the remediation system and removed the skid mounted DPE unit from the site.

***25 August 2006 LRM Consulting, Inc. Correspondence and 11 December 2006 LRM Supplemental Source Area Investigation Work Plan:*** In a 25 August 2006 correspondence, LRM notified the ACHCSA of a project consultant change from ETIC to LRM. Also, based on a review of the available site data, the response of the hydrocarbon concentrations to past DPE operations, and the ACHCSA's comments on ETIC's Work Plan, LRM recommended a technical meeting with the ACHCSA to discuss the project direction. However, because of other commitments of Don Hwang and other ACHCSA staff, a technical meeting could not be scheduled. During a 19 October 2006 telephone conversation with Don Hwang, LRM

presented an approach to conduct a supplemental investigation to define the magnitude and extent of the residual source area in the vicinity of the former fuel dispenser and wells MW2 and MW3. Based on these discussions and as agreed by Mr. Hwang, a supplemental source area investigation work plan outlining the proposed scope of work was prepared and submitted to ACHCSA on 11 December 2006; this work plan remains under review by ACHCSA. LRM understands that Mr. Hwang is no longer the lead regulator on the site.

***April 2007 LRM Consulting, Inc. Quarterly Monitoring Report:*** In April 2007, LRM submitted the first quarter 2007 monitoring report for the site, which included within it a request for transition of the site toward semi-annual groundwater monitoring until such time that the ACHCSA assigns a lead regulator to the site and provides formal approval of LRM's December 2006 *Supplemental Source Area Investigation Work Plan*. This request for transition toward comprehensive semi-annual monitoring has yet to receive any response from the ACHCSA. As such, the current report reflects the 2<sup>nd</sup> Quarter 2007 monitoring event as required by the current ACHCSA-approved monitoring plan for the site.



### **3.0 PROTOCOLS FOR GROUNDWATER MONITORING**

The following sections of this report present information relevant to the methods employed during the collection of groundwater samples from site wells on 12 June 2007. The scope of work for the quarterly groundwater monitoring event at the site included:

- Checking all wells for SPH.
- Gauging the depth to groundwater in all wells.
- Purging the monitoring wells to be sampled.
- Collecting and analyzing groundwater samples from the wells where no SPH is detected.
- Estimating the hydraulic gradient and general flow direction.
- Evaluating the data and preparing a written report summarizing the results of the monitoring event.

#### **3.1 Groundwater Gauging**

For this round of monitoring, groundwater gauging was performed for all seven onsite wells. The monitoring wells were opened prior to gauging to allow the groundwater level to equilibrate with atmospheric pressure. The depth to groundwater and depth to SPH, if present, were then measured to the nearest 0.01 feet using an electronic water level meter or optical interface probe. The measurements were made from a fixed reference point at the top of the well casing.

The groundwater elevation map (Figure 2) for this monitoring event was constructed using depth-to-groundwater measurements collected during the current sampling event. Depth-to-groundwater measurements and calculated groundwater elevations are presented in Table 2. Field data forms are presented in Appendix B.

#### **3.2 Well Purging**

For this round of monitoring, groundwater sampling and field parameters were analyzed for three onsite wells (MW2, MW3, and MW4). As such, three well casing volumes of water were purged from wells MW2, MW3, and MW4. Field parameters including temperature, pH, specific conductance, and dissolved oxygen were measured during purging of all three wells. Groundwater monitoring protocols are presented in Appendix A.

#### **3.3 Groundwater Sampling**

After purging, groundwater in each of the three well was sampled using dedicated tubing and a WaTerra inertial pump, or a disposable bailer. Sample containers were sealed, labeled, stored in a cooler and transported under chain-of-custody protocol to Kiff Analytical LLC



(Kiff), a state-certified analytical laboratory in Davis, California. Groundwater analytical results and chain-of-custody documentation are presented in Appendix C.

## **4.0 MONITORING RESULTS**

### **4.1 Separate-Phase Hydrocarbon Monitoring**

The wells were monitored for the presence of SPH using a disposable bailer and/or interface probe. SPH was not detected in monitoring wells during this monitoring event.

### **4.2 Groundwater Elevation and Hydraulic Gradient**

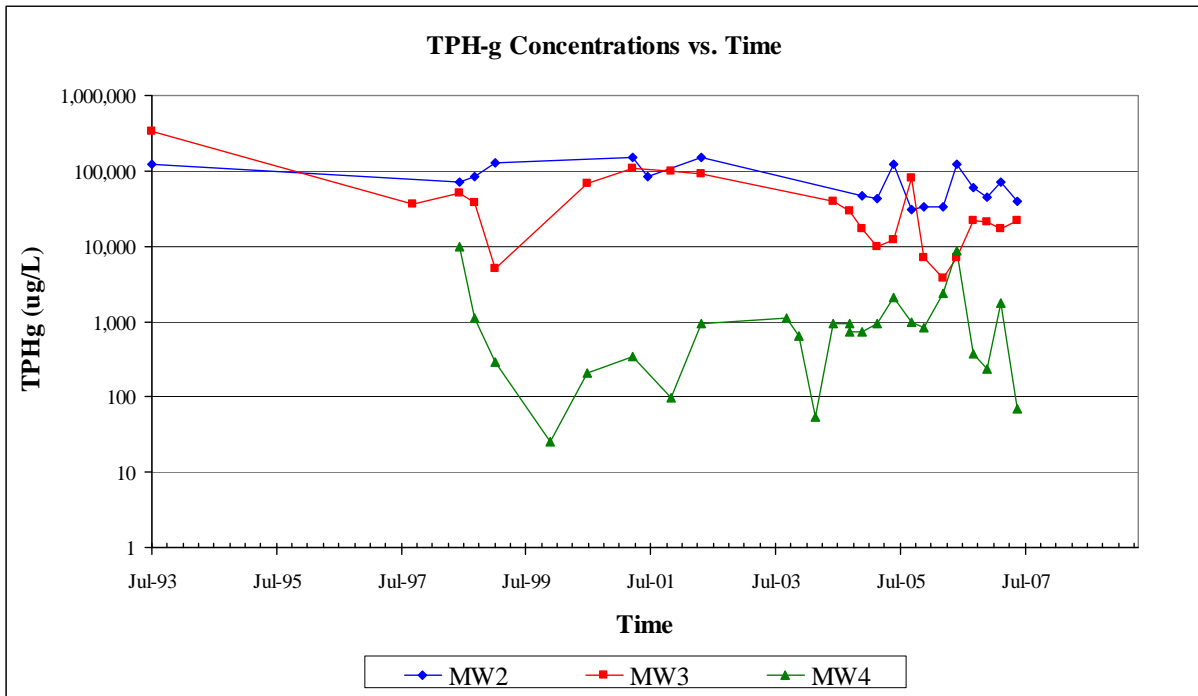
On 12 June 2007, the depth to water beneath the site ranged from 16.20 to 22.78 feet bgs (Table 2). Groundwater elevations in the site wells during this monitoring event ranged from 43.65 feet above msl in well MW4 to 44.99 feet above msl in wells MW3 (Figure 2), reflecting an approximately 0.4-foot rise in levels from the previous quarter. The hydraulic gradient is approximately 0.017ft/ft and flow direction is generally toward the south-southeast. At the request of the ACHCSA, a rose diagram depicting historical hydraulic gradients and groundwater flow directions is also presented on Figure 2.

### **4.3 Groundwater Analytical Results**

On 12 June 2007, groundwater samples were collected from wells MW2, MW3, and MW4 and analyzed by Kiff for TPH-g, BTEX, and MTBE by EPA Method 8260B and for TPH-d and TPH-mo by modified EPA Method 8015. Analytical results for this event are presented on Figure 3, and historical results are presented in Table 2. Copies of the chain-of-custody and laboratory analytical reports for the groundwater samples are presented in Appendix C. Laboratory analytical results are summarized below:

- TPH-g was detected in the samples collected from well MW2 at 40,000 µg/L, MW3 at 22,000 µg/L, and in MW4 at 70 µg/L.
- Benzene was detected in the samples collected from well MW2 at 1,300 µg/L, well MW3 at 1,800 µg/L, and well MW4 at 9.3µg/L.
- MTBE was detected in the samples collected from well MW2 at 130 µg/L, well MW3 at 150 µg/L, and well MW4 at 150 µg/L.
- TPH-d was not detected in groundwater samples collected from any wells this quarter, although detection limits in samples from wells MW2 and MW3 were elevated due to interference from gasoline-range hydrocarbons (see Appendix C).
- TPH-mo was not detected in groundwater samples collected from any wells this quarter.

The figure below depicts TPH-g concentration trends near the residual source area for wells MW2, MW3, and MW4.



As indicated on the graph, a negligible increase in the TPH-g concentration with respect to the previous quarter is observed for well MW3; a decline in levels is observed for MW2 and MW4. The detected levels in this quarter remain within the past range of detections and reflect the generally stable trend, with residual mass remaining in the immediately vicinity of MW2.

## **5.0 INTERIM REMEDIAL ACTION SUMMARY**

### **5.1 DPE System Operational Status**

***Operational Status:*** The DPE system began operation on 23 February 2005 and continued to operate until 30 January 2006. The system remained offline from 30 January 2006 to 22 May 2006, when it was restarted. In the interim, the vapor abatement system was modified from a thermal oxidizer with propane supplemental fuel to vapor-phase carbon adsorption. Following the restart in May 2006, operation of the DPE system was ceased by ETIC on 30 June 2006 due to frequent shutdowns caused by reported overheating of the electrical phase-converter. Currently, the skid-mounted DPE unit has been mobilized offsite. No remediation is intended until the proposed supplemental investigation has been performed.

## **6.0 PLANNED ACTIVITIES**

### **6.1 Additional Investigation/Remediation Activities**

Based on the operational behavior of the DPE system and the observed responses in hydrocarbon concentrations in wells MW2 and MW3, LRM recommended further investigation of the extent and magnitude of residual hydrocarbons in the area targeted by the DPE system (i.e., former residual source area in the vicinity of these wells) (see LRM's *Supplemental Source Area Investigation Work Plan*, dated 11 December 2006). Through this investigation, LRM plans to determine the need, extent, and nature of corrective action, including additional remediation and/or monitoring. LRM is prepared to proceed with the actions set forth in the 11 December 2006 work plan as soon as written approvals provided by the ACHCSA.

### **6.2 Planned Monitoring Activities**

Until such time that the ACHCSA provides a response to the referenced work plan, it is once again proposed that the site move toward a semi-annual monitoring program. Table 4 reflects the proposed monitoring frequency, with all previous quarterly activities changed toward semi-annual activities; all other monitoring frequencies will remain unchanged from the past quarter (see Table 4). Once the planned supplemental investigation is approved by ACHCSA and performed, should more frequent monitoring be required in support of site closure, the monitoring frequency may be accordingly revised.

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## **TABLES**

TABLE 1 WELL CONSTRUCTION DETAILS  
 FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Well ID	Well Installation Date	Top-of-Casing Elevation* (feet)	Casing Material	Total Depth of Borehole (ft bgs)	Casing Diameter (inches)	Screened Interval (ft bgs)	Slot Size (inches)	Filter Pack Interval (ft bgs)	Filter Pack Material
MW1	07/19/93	64.69	PVC	32	2	17-32	0.020	15-32	Gravel Pack
MW2	07/20/93	65.95	PVC	33	2	18-33	0.020	16-33	Gravel Pack
MW3	07/20/93	65.99	PVC	34	2	18-34	0.020	16-34	Gravel Pack
MW4	06/26/98	63.35†	PVC	31	2	15-31	0.020	13-31.5	Lonestar #3 Sand
MW5	06/26/98	65.59	PVC	31	2	15-31	0.020	13-31.5	Lonestar #3 Sand
MW6	07/17/00	59.60	PVC	31.5	2	10-30	0.020	8-30	Lonestar #3 Sand
MW7	07/17/00	59.47	PVC	36.5	2	15-35	0.020	13-35	Lonestar #3 Sand

\* Elevations based on a survey conducted August 2002 and referenced benchmark with known elevation (NGVD 29) of 60.40 feet above mean sea level.

† The casing elevation is uncertain.

PVC Polyvinyl chloride.

ft bgs Feet below ground surface.

TABLE 2 CUMULATIVE GROUNDWATER ELEVATION AND ANALYTICAL DATA  
FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Well Number	Date	Casing Elevation (feet)	Depth to Water (feet)	GW Elevation (feet)	SPH Thickness (feet)	Concentration (µg/L)								Concentration (mg/L)									
						Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-g	TPH-d	TPH-mo	MTBE	CO <sub>2</sub> (lab)	DO (field)	Eh (mv) (field)	pH (field)	Fe(II)	Mn	SO <sub>4</sub>	N-NH <sub>3</sub>	N-NO <sub>3</sub>	o-PO <sub>4</sub>
MW1	07/27/93	100.00	a 20.79	79.21	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	--	--	--	--	--	--	--	--	--	--	--	
MW1	10/02/97	100.00	a 21.22	78.78	0.00	<0.50	<0.50	<0.50	<0.50	<50	--	--	<2.0	--	--	--	--	--	--	--	--	--	
MW1	06/30/98	100.00	a 18.21	81.79	0.00	<0.50	<0.50	2.1	0.6	84	--	--	2.1	204	5	--	6.16	0.15	0.046	55	<0.10	<0.10	2
MW1	07/29/98	100.00	a 18.74	81.26	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW1	08/26/98	100.00	a 19.28	80.72	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW1	10/01/98	100.00	a 19.93	80.07	0.00	<1.0	<1.0	<1.0	<1.0	<50	--	--	<2.0	192	3.6	--	6.49	--	--	--	--	--	
MW1	10/30/98	100.00	a 20.22	79.78	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW1	11/30/98	100.00	a 19.99	80.01	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW1	12/28/98	100.00	a 19.81	80.19	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW1	01/25/99	100.00	a 19.62	80.38	0.00	<1.0	<1.0	<1.0	<1.0	<50	--	--	<2.0	389	3.4	--	6.72	--	--	--	--	--	
MW1	02/26/99	100.00	a 17.18	82.82	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW1	03/24/99	100.00	a 17.28	82.72	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW1	05/12/99	100.00	a 17.91	82.09	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW1	12/15/99	100.00	a 21.01	78.99	0.00	<0.50	<0.50	<0.50	<0.50	<50	--	--	<0.50	--	3.31	--	6.52	--	--	--	--	--	
MW1	03/20/00	100.00	a 16.25	83.75	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW1	07/20/00	100.00	a 19.63	80.37	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	3.4	120	7.37	--	6.66	0.13	<0.01	54	<0.10	3.4	<0.2
MW1	10/11/00	100.00	a 20.80	79.20	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW1	04/10-11/01	100.00	a 18.81	81.19	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	1.2	117	NR	--	NR	<0.10	0.045	57	<0.10	6.6	0.15
MW1	07/10/01	100.00	a 20.51	79.49	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW1	11/20/01	64.69	b 21.36	43.33	0.00	<0.50	1.3	<0.50	0.81	<50	<50	<300	<2.0	-- <sup>c</sup>	0.65	--	6.47	0.32	1.8	63	<0.10	--	<0.20
MW1	02/19/02	64.69	b 18.95	45.74	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW1	05/21/02	64.69	b 19.82	44.87	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	<2.0	120	0.96	--	6.25	<0.10	0.5	58	<0.10	5.5	<0.20
MW1	06/27/03	64.69	b 19.93	44.76	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW1	09/29/03	64.69	b 21.24	43.45	0.00	<0.50	<0.50	<0.50	<1.0	<50	<50	<500	<0.50	--	--	--	--	--	--	--	--	--	
MW1	12/12/03	64.69	b 21.27	43.42	0.00	<0.50	<0.50	<0.50	1.1	<50	58	<500	<0.50	--	--	--	--	--	--	--	--	--	
MW1	03/15/04	64.69	b 18.18	46.51	0.00	<0.50	<0.50	<0.50	<1.0	<50	<50	<500	<0.50	--	0.14	--	--	--	--	--	--	--	
MW1	06/24/04	64.69	b 20.48	44.21	0.00	<0.50	<0.50	<0.50	<1.0	<50	<50	<500	<0.50	--	0.15	--	--	--	--	--	--	--	
MW1	09/29/04	64.69	b 21.37	43.32	0.00	<0.50	0.51	<0.50	<1.0	<50	<50	<500	<0.50	--	1.01	--	6.42	--	--	--	--	--	
MW1	12/13/04	64.69	b 20.63	44.06	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW1	03/14/05	64.69	b 18.69	46.00	0.00	<0.50	<0.50	<0.50	<1.0	<50	73	h <500	<0.50	--	1.96	--	6.04	--	--	--	--	--	
MW1	06/15/05	64.69	b 20.32	44.37	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW1	09/26/05	64.69	b 22.10	42.59	0.00	<0.50	<0.50	<0.50	<1.0	<50	i <50	<500	<0.50	--	1.84	317.4	6.43	--	--	--	--	--	
MW1	12/12/05	64.69	b 22.39	42.30	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW1	03/29/06	64.69	b 15.24	49.45	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	74	--	1.57	--	6.73	--	--	--	--	--	
MW1	06/19/06	64.69	b 18.27	46.42	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW1	09/29/06	64.69	b 20.06	44.63	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	8 <100	0 7.9	--	0.43	--	6.40	--	--	--	--	--	
MW1	12/12/06	64.69	b 20.32	44.37	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	9.4	--	0.38	--	6.39	--	--	--	--	--	
MW1	03/01/07	64.69	b 18.68	46.01	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	3.5	--	0.86	--	6.39	--	--	--	--	--	
MW1	06/12/07	64.69	b 20.28	44.41	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW2	07/27/93	101.27	a 22.10	79.17	0.00	10,000	27,000	2,900	20,000	120,000	--	--	--	--	--	--	--	--	--	--	--	--	
MW2	10/02/97	101.27	a 22.91	78.36	0.43	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	
MW2	06/30/98	101.27	a 19.69	81.58	0.45	7,300	18,000	2,500	15,600	72,000	--	--	5,500	185	2.2	--	5.98	--	--	--	--	--	
MW2	07/29/98	101.27	a 20.11	81.16	0.29	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW2	08/26/98	101.27	a 20.54	80.73	0.08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW2	10/01/98	101.27	a 21.52	79.75	0.42	6,400	17,000	2,600	17,000	84,000	--	--	2,000	--	2.7	--	6.47	--	--	--	--	--	
MW2	10/30/98	101.27	a 21.54	79.73	0.10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW2	11/30/98	101.27	a 21.21	80.06	0.04	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
MW2	12/28/98	101.27	a 21.10	80.17	0.02	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	

TABLE 2 CUMULATIVE GROUNDWATER ELEVATION AND ANALYTICAL DATA  
FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Well Number	Date	Casing Elevation (feet)	Depth to Water (feet)	GW Elevation (feet)	SPH Thickness (feet)	Concentration (µg/L)								Concentration (mg/L)										
						Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-g	TPH-d	TPH-mo	MTBE	CO <sub>2</sub> (lab)	DO (field)	Eh (mv) (field)	pH (field)	Fe(II)	Mn	SO <sub>4</sub>	N-NH <sub>3</sub>	N-NO <sub>3</sub>	o-PO <sub>4</sub>	
MW2	01/25/99	101.27	a	20.80	80.47	0.01	9,000	26,000	3,800	27,500	130,000	--	--	5,800	386	0.3	--	6.69	--	--	--	--	--	--
MW2	02/26/99	101.27	a	18.00	83.27	sheen	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	03/24/99	101.27	a	18.27	83.00	trace	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	05/12/99	101.27	a	19.08	82.19	trace	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	12/15-16/99	101.27	a	22.42	78.85	0.025	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW2	03/20/00	101.27	a	17.09	84.18	0.026	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	07/20/00	101.27	a	20.86	80.41	0.017	*	*	*	*	*	*	*	*	*	0.88	*	6.37	*	*	*	*	*	*
MW2	10/11/00	101.27	a	22.10	79.17	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	04/10-11/01	101.27	a	19.98	81.29	0.00	8,000	22,000	2,600	23,500	150,000	1,500	<600	3,600	168	NR	--	NR	3.1	2.5	16	0.14	0.19	<0.20
MW2	07/10/01	101.27	a	21.85	79.42	0.00	5,900	15,000	2,300	12,100	83,000	5,700	<1,500	2,800	--	--	--	--	--	--	--	--	--	--
MW2	11/20/01	65.95	b	22.75	43.20	0.00	--	--	--	--	--	--	--	--	120	NR	--	6.15	1.8	2	16	<0.10	--	<0.20
MW2	02/19/02	65.95	b	20.12	45.83	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	05/21/02	65.95	b	21.10	44.85	0.00	8,600	25,000	3,500	26,000	150,000	31,000	<3,000	4,800	160	0.88	--	5.99	3.9	1.7	13	<0.10	0.54	<0.20
MW2	06/27/03	65.95	b	21.48	44.47	0.35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	09/29/03	65.95	b	23.04	42.91	0.48	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW2 <sup>e</sup>	12/12/03	65.95	b	22.75	43.31	0.16	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW2 <sup>e</sup>	03/15/04	65.95	b	19.24	46.72	0.01	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW2 <sup>e</sup>	06/24/04	65.95	b	22.10	44.06	0.31	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW2 <sup>e</sup>	09/29/04	65.95	b	22.81	43.14	sheen	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW2 <sup>e</sup>	12/13/04	65.95	b	22.06	43.95	0.08	3,700	12,000	1,900	10,000	47,000	2,600	<500	1,200	*	0.27	*	6.63	*	*	*	*	*	*
MW2 <sup>l</sup>	03/14/05	65.95	b	25.00	40.95	0.00	780	3,700	920	6,400	43,000	43,000 h	<5,000	<200	*	*	*	*	*	*	*	*	*	*
MW2	06/15/05	65.95	b	21.14	44.81	0.00	2,900	15,000	2,400	22,000	120,000	13,000	<2,500	810	--	3.05	-147.6	--	--	--	--	--	--	--
MW2	07/18/05	65.95	NM	NC	NM	2,700	13,000	1,800	15,000	120,000	17,000	--	530	--	--	--	--	--	--	--	--	--	--	--
MW2	09/26/05	65.95	22.93	43.02	0.00	570	4,000	620	6,200	31,000	63,000	28,000 k	<50	--	--	--	--	--	--	--	--	--	--	--
MW2	12/12/05	65.95	25.40	40.55	0.00	670	5,300	1,100	9,800	34,000	2,800	<500	65	--	--	--	--	--	--	--	--	--	--	--
MW2	03/29/06	65.95	15.66	50.29	sheen	620	2,800	540	4,700	33,000	<4,000	<100	37	--	7.59	--	6.9	--	--	--	--	--	--	--
MW2	06/19/06	65.95	19.14	46.81	sheen	680	5,200	990	16,000	120,000	<30,000	1,900	170	--	1.78	--	6.21	--	--	--	--	--	--	--
MW2	09/29/06	65.95	b	21.16	44.79	0.00	1,200	5,100	1,200	9,300	59,000	<8000	300	230	--	1.71	--	6.66	--	--	--	--	--	--
MW2	12/12/06	65.95	b	21.46	44.49	0.00	850	4,400	1,100	8,900	45,000	<10000	360	110	--	1.5	--	6.61	--	--	--	--	--	--
MW2	03/01/07	65.95	b	19.48	46.47	0.00	1,400	5,200	980	9,500	71,000	<18000	460	160	--	1.2	--	6.7	--	--	--	--	--	--
MW2	06/12/07	65.95	b	20.98	44.97	0.00	<b>1,300</b>	<b>4,900</b>	<b>1,200</b>	<b>8,900</b>	<b>40,000</b>	<b>&lt;3000 #</b>	<b>&lt;100</b>	<b>130</b>	--	<b>1.12</b>	--	<b>6.7</b>	--	--	--	--	--	--
MW3	07/27/93	101.29	a	22.28	79.01	0.02	9,100	24,000	5,300	33,000	330,000	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	10/02/97	101.29	a	22.71	78.58	0.03	4,200	11,000	1,800	10,600	36,000	--	--	3,500	--	--	--	--	--	--	--	--	--	--
MW3	06/30/98	101.29	a	19.47	81.82	0.00	4,800	11,000	1,200	7,100	51,000	--	--	3,900	300	2	--	6.03	1.4	9.8	13	1.4	<0.10	2.4
MW3	07/29/98	101.29	a	20.01	81.28	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	08/26/98	101.29	a	20.62	80.67	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	10/01/98	101.29	a	21.33	79.96	0.00	3,900	8,500	1,200	6,000	38,000	--	--	2,300	240	2	--	6.65	--	--	--	--	--	--
MW3	10/30/98	101.29	a	21.62	79.67	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	11/30/98	101.29	a	21.31	79.98	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	12/28/98	101.29	a	21.15	80.14	0.06	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	01/25/99	101.29	a	20.79	80.50	0.00	4,000	10,000	1200	6700	5,100	--	--	2900	238	1	--	7.01	--	--	--	--	--	--
MW3	02/26/99	101.29	a	18.02	83.27	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	03/24/99	101.29	a	18.37	82.92	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	05/12/99	101.29	a	19.22	82.07	0.0083	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	12/15-16/99	101.29	a	22.43	78.86	0.00	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW3	03/20/00	101.29	a	17.14	84.15	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	07/20/00	101.29	a	20.98	80.31	0.00	5,700	14,000	1,600	9,300	69,000	2,900	<300	3,300	128	2.05	--	6.73	3.9	6.6	20	<0.10	0.55	<0.20
MW3	10/11/00	101.29	a	22.24	79.05	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 2 CUMULATIVE GROUNDWATER ELEVATION AND ANALYTICAL DATA  
FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Well Number	Date	Casing Elevation (feet)	Depth to Water (feet)	GW Elevation (feet)	SPH Thickness (feet)	Concentration (µg/L)								Concentration (mg/L)									
						Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-g	TPH-d	TPH-mo	MTBE	CO <sub>2</sub> (lab)	DO (field)	Eh (mv) (field)	pH (field)	Fe(II)	Mn	SO <sub>4</sub>	N-NH <sub>3</sub>	N-NO <sub>3</sub>	o-PO <sub>4</sub>
MW3	04/10-11/01	101.29	a 20.70	80.59	0.00	7,200	<0.001	2,300	12,900	110,000	4,700	<1,500	4,300	137	NR	--	NR	1	6	8.2	<0.10	0.13	<0.20
MW3	07/10/01	101.29	a 21.97	79.32	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	11/20/01	65.99	b 22.80	43.19	0.00	6,300	16,000	2,400	14,900	100,000	5,900	<900	4,000	120	2.93	--	6.67	0.84	12	31	<0.10	--	<0.20
MW3	02/19/02	65.99	b 20.11	45.88	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	05/21/02	65.99	b 21.20	44.79	0.00	6,500	17,000	2,200	12,700	91,000	14,000	<3,000	2,200	130	1.01	--	6.62	4.2	9.6	25	<0.10	0.77	<0.20
MW3	06/27/03	65.99	b 21.32	44.67	sheen	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	09/29/03	65.99	b 22.79	43.20	sheen	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW3 <sup>c</sup>	12/12/03	65.99	b 22.73	43.27	0.01	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW3 <sup>c</sup>	03/15/04	65.99	b 19.32	46.67	sheen	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
MW3	06/24/04	65.99	b 21.99	44.00	0.00	3,400	7,700	1,000	4,800	39,000	1,700	<500	1,100	--	0.07	--	--	--	--	--	--	--	--
MW3	09/29/04	65.99	b 22.54	43.45	0.00	2,900	6,700	980	4,300	29,000	2,200	<500	1,100	--	0.80	--	6.42	--	--	--	--	--	--
MW3	12/13/04	65.99	b 22.06	43.93	0.00	1,700	2,900	790	3,400	17,000	1,300	<500	490	--	0.16	--	6.7	--	--	--	--	--	--
MW3 <sup>l</sup>	03/14/05	65.99	b 24.00	41.99	0.00	680	1,700	380	1,600	10,000	670	<500	67	--	--	--	--	--	--	--	--	--	--
MW3	06/15/05	65.99	b 21.13	44.86	0.00	260	960	330	1,400	12,000	1,200	<500	31	--	1.93	-150.4	--	--	--	--	--	--	--
MW3	07/18/05	65.99	b NM	NC	NM	1,000	5,600	1,100	4,300	23,000	1,700	--	81	--	--	--	--	--	--	--	--	--	--
MW3	09/26/05	65.99	b 22.92	43.07	0.00	4,000	17,000	1,900	17,000	79,000	5,100	540	270	--	--	--	--	--	--	--	--	--	--
MW3	12/12/05	65.99	b 23.30	42.69	0.00	200	710	450	1,400	7,000	550	<500	<10	--	--	--	--	--	--	--	--	--	--
MW3	03/29/06	65.99	b 15.70	50.29	0.00	110	300	130	490	3,800	<200	<100	13	--	1.23	--	6.89	--	--	--	--	--	--
MW3	06/19/06	65.99	b 19.11	46.88	0.00	160	500	320	840	7,000	<300	<100	3.1	--	2.30	--	6.40	--	--	--	--	--	--
MW3	09/29/06	65.99	b 21.15	44.84	0.00	1,300	2,300	720	2,900	22,000	<1500	<100	110	--	1.05	--	6.78	--	--	--	--	--	--
MW3	12/12/06	65.99	b 21.38	44.61	0.00	1,400	2,200	670	2,600	21,000	<1500	<100	130	--	0.6	--	6.72	--	--	--	--	--	--
MW3	03/01/07	65.99	b 19.50	46.49	0.00	1,100	2,500	510	2,200	17,000	<600	<100	51	--	1.11	--	6.76	--	--	--	--	--	--
MW3	06/12/07	65.99	b 21.00	44.99	0.00	<b>1,800</b>	<b>4,000</b>	<b>800</b>	<b>3,300</b>	<b>22,000</b>	<1500	# <100	<b>150</b>	--	<b>0.97</b>	--	<b>6.74</b>	--	--	--	--	--	--
MW4	06/30/98	98.65	a 16.93	81.72	0.00	2,200	930	850	2,100	10,000	--	--	1,800	222	2.6	--	6.18	0.14	4.3	14	0.8	0.8	1.5
MW4	07/29/98	98.65	a 17.48	81.17	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	08/26/98	98.65	a 18.65	80.00	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	10/01/98	98.65	a 18.74	79.91	0.00	570	46	130	36	1,100	--	--	1,300	320	3.4	--	<0.001	--	--	--	--	--	--
MW4	10/30/98	98.65	a 19.02	79.63	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	11/30/98	98.65	a 18.74	79.91	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	12/28/98	98.65	a 18.60	80.05	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	01/25-26/99	98.65	a 18.32	80.33	0.00	230	<8.3	<8.3	<8.3	290	--	--	1,300	475	6.7	--	7	--	--	--	--	--	--
MW4	02/26/99	98.65	a 15.81	82.84	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	03/24/99	98.65	a 16.01	82.64	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	05/12/99	98.65	a 17.71	80.94	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	12/15-16/99	98.65	a 19.83	78.82	0.00	5.8	<0.50	<0.50	<0.50	<50	--	--	1,400	--	1.75	--	7.02	--	--	--	--	--	--
MW4	03/20/00	98.65	a 14.9	83.75	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	07/20/00	98.65	a 18.38	80.27	0.00	91	4.6	19	12.9	210	<50	<300	1,500	126	3.88	--	6.67	9.5	5.3	11	<0.10	0.04	<0.20
MW4	10/11/00	98.65	a 19.61	79.04	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	04/10-11/01	98.65	a 17.55	81.10	0.00	110	<5.0	<5.0	<5.0	350	<50	<300	1,100	107	NR	--	NR	0.8	6.3	10	<0.10	<0.05	<0.20
MW4	07/10/01	98.65	a 19.34	79.31	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	11/20/01	63.35	b 20.16	43.19	0.00	<2.5	4	<2.5	3.7	96	<50	<300	2,500	130	0.83	--	6.51	1.6	10	11	<0.10	--	<0.20
MW4	02/19/02	63.35	b 17.34	46.01	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	05/21/02	63.35	b 18.57	44.78	0.00	340	5.7	70	<1.0	940	83	<300	1,600	150	1.65	--	6.32	3.1	8.4	9	<0.10	0.06	<0.20
MW4	06/27/03	63.35	b 18.72	44.63	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	09/29/03	63.35	b 20.11	43.24	0.00	<5.0	<5.0	<5.0	<10	1,100	<50	d <500	1,700	--	--	--	--	--	--	--	--	--	--
MW4	12/12/03	63.35	b 20.06	43.29	0.00	<13	<13	<13	<25	<1,300	<50	<500	1,000	--	--	--	--	--	--	--	--	--	--
MW4	03/15/04	63.35	b 16.89	46.46	0.00	1.5	<0.50	<0.50	<1.0	54	d <50	<500	41	--	0.16	--	--	--	--	--	--	--	--
MW4	06/24/04	63.35	b 19.31	44.04	0.00	69	<5.0	<5.0	<10	920	d <50	<500	1,100	--	0.15	--	--	--	--	--	--	--	--

TABLE 2 CUMULATIVE GROUNDWATER ELEVATION AND ANALYTICAL DATA  
FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Well Number	Date	Casing Elevation (feet)	Depth to Water (feet)	GW Elevation (feet)	SPH Thickness (feet)	Concentration (µg/L)								Concentration (mg/L)										
						Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-g	TPH-d	TPH-mo	MTBE	CO <sub>2</sub> (lab)	DO (field)	Eh (mv) (field)	pH (field)	Fe(II)	Mn	SO <sub>4</sub>	N-NH <sub>3</sub>	N-NO <sub>3</sub>	o-PO <sub>4</sub>	
MW4	09/29/04	63.35	b 20.20	43.15	0.00	<5.0	<5.0	<5.0	<10	940	g	<50	<500	1,200	--	0.13	--	6.63	--	--	--	--	--	--
MW4	12/13/04	**	b 20.44	NC	0.00	<5.0	<5.0	<5.0	<10	740		<50	<500	860	--	0.58	--	6.84	--	--	--	--	--	--
MW4	03/14/05	**	b 18.30	NC	0.00	20	<5.0	<5.0	<10	930	i	<50	<500	930	--	0.28	--	6.34	--	--	--	--	--	--
MW4	06/15/05	**	b 20.03	NC	0.00	350	6.1	<5.0	<10	2100		89	<500	1,100	--	0.46	-98.9	--	--	--	--	--	--	--
MW4	07/18/05	**	NM	NC	NM	11	<5.0	<5.0	<10	540	i	<50	--	1,100	--	--	--	--	--	--	--	--	--	--
MW4	09/26/05	**	21.79	NC	0.00	<5.0	<5.0	<5.0	<10	960	i	<50	<500	660	--	2.20	210.4	6.73	--	--	--	--	--	--
MW4	12/12/05	**	21.89	NC	0.00	<5.0	<5.0	<5.0	<10	820		<50	<500	1,000	--	2.05	--	6.62	--	--	--	--	--	--
MW4	03/29/06	**	14.85	NC	0.00	49	160	120	300	2,400		<100	<100	130	--	1.07	--	6.82	--	--	--	--	--	--
MW4	06/19/06	**	17.96	NC	0.00	100	940	540	1,800	8,800		<400	<100	55	--	2.49	--	5.76	--	--	--	--	--	--
MW4	09/29/06	63.35	b 19.85	43.50	0.00	18.0	2.6	1.5	3.5	370.0		<50	<100	180	--	0.25	--	6.66	--	--	--	--	--	--
MW4	12/12/06	63.35	b 20.03	43.32	0.00	11.0	0.77	<0.5	<0.5	230.0		<50	<100	260	--	0.90	--	6.61	--	--	--	--	--	--
MW4	03/01/07	63.35	b 18.33	45.02	0.00	63.0	7.10	40.0	190.0	1,800.0		<50	<100	130	--	0.76	--	6.6	--	--	--	--	--	--
MW4	06/12/07	63.35	b 19.70	43.65	0.00	<b>9.3</b>	<b>&lt;0.5</b>	<b>&lt;0.5</b>	<b>&lt;0.5</b>	<b>70.0</b>		<50	# <100	<b>150</b>	--	<b>1.06</b>	--	<b>6.9</b>	--	--	--	--	--	--
MW5	06/30/98	100.9	a 20.60	80.30	0.00	<0.50	<0.50	<0.50	<0.50	<50		--	--	23	220	4.3	--	6.1	--	--	--	--	--	--
MW5	07/29/98	100.9	a 21.52	79.38	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	08/26/98	100.9	a 22.21	78.69	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	10/01/98	100.9	a 22.95	77.95	0.00	<1.0	<1.0	<1.0	<1.0	<50		--	--	<2.0	256	4.8	--	6.71	--	--	--	--	--	--
MW5	10/30/98	100.9	a 23.23	77.67	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	11/30/98	100.9	a 23.12	77.78	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	12/28/98	100.9	a 23.18	77.72	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	01/25-26/99	100.9	a 22.61	78.29	0.00	<1.0	<1.0	<1.0	<1.0	<50		--	--	<2.0	305	9.7	--	7.04	--	--	--	--	--	--
MW5	02/26/99	100.9	a 19.78	81.12	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	03/24/99	100.9	a 20.25	80.65	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	05/12/99	100.9	a 21.06	79.84	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	12/15-16/99	100.9	a 24.19	76.71	0.00	<0.50	<0.50	<0.50	<0.50	<50		--	--	<0.50	--	2.72	--	7.19	--	--	--	--	--	--
MW5	03/20/00	100.9	a 19.15	81.75	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	07/20/00	100.9	a 21.84	79.06	0.00	<0.50	0.98	<0.50	<0.50	<50		<50	<300	1.9	134	5.58	--	6.35	0.11	0.017	49	<0.10	3.9	<0.20
MW5	10/11/00	100.9	a 23.4	77.50	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	04/10-11/01	100.9	a 22.3	78.60	0.00	<0.50	2.6	<0.50	0.6	<50		<50	<300	1.5	183	66	--	NR	<0.10	0.042	45	<0.10	2.9	0.11
MW5	07/10/01	100.9	a 23.64	77.26	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	11/20/01	65.59	b 24.65	40.94	0.00	0.83	12	1.2	11	140		860	2,500	10	-- <sup>c</sup>	66	--	6.01	0.2	2.5	42	<0.10	--	<0.20
MW5	02/19/02	65.59	b 22.37	43.22	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	05/21/02	65.59	b 23.10	42.49	0.00	<0.50	<0.50	<0.50	<0.50	<50		2,200	<300	<2.0	140	66	--	6.3	<0.1	0.22	44	<0.10	3	<0.20
MW5	06/27/03	65.59	b 23.07	42.52	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	09/29/03	65.59	b 24.38	41.21	0.00	<0.50	0.52	7.1	35	100		<50	d <500	1.4	--	--	--	--	--	--	--	--	--	--
MW5	12/12/03	65.59	b 23.90	41.69	0.00	<0.50	<0.50	<0.50	<1	<50		<50	<500	1.5	--	--	--	--	--	--	--	--	--	--
MW5	03/15/04	65.59	b 20.82	44.77	0.00	<0.50	<0.50	<0.50	<1.0	<50		<50	<500	<0.50	--	6.4	--	--	--	--	--	--	--	--
MW5	06/24/04	65.59	b 23.57	42.02	0.00	<0.50	<0.50	<0.50	<1.0	<50		130	f <500	0.79	--	5.56	--	--	--	--	--	--	--	--
MW5	09/29/04	65.59	b 24.44	41.15	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	12/13/04	65.59	b 23.87	41.72	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	03/14/05	65.59	b 20.18	45.41	0.00	<0.50	1.3	1.5	8.6	82		<50	<500	<0.50	--	3.91	--	5.57	--	--	--	--	--	--
MW5	06/15/05	65.59	b 12.96	52.63	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	09/26/05	65.59	b 23.60	41.99	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	12/12/05	65.59	b 23.84	41.75	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW5	03/29/06	65.59	b 17.19	48.40	0.00	<0.50	<0.50	<0.50	<0.50	73		<50	<100	<0.50	--	2.3	--	6.3	--	--	--	--	--	--
MW5	06/19/06	65.59	b 20.22	45.37	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	09/29/06	65.59	b 22.80	42.79	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
MW-5	12/12/06	65.59	b 23.08	42.51	0.00	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 2 CUMULATIVE GROUNDWATER ELEVATION AND ANALYTICAL DATA  
FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Well Number	Date	Casing Elevation (feet)	Depth to Water (feet)	GW Elevation (feet)	SPH Thickness (feet)	Concentration (µg/L)								Concentration (mg/L)									
						Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-g	TPH-d	TPH-mo	MTBE	CO <sub>2</sub> (lab)	DO (field)	Eh (mv) (field)	pH (field)	Fe(II)	Mn	SO <sub>4</sub>	N-NH <sub>3</sub>	N-NO <sub>3</sub>	o-PO <sub>4</sub>
MW-5	03/01/07	65.59	b 21.02	44.57	0.00	<0.50	<0.50	<0.50	<0.50	54	<50	<100	<0.50	--	4.35	--	6.08	--	--	--	--	--	--
MW-5	06/12/07	65.59	b 22.78	42.81	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	07/20/00	96.60	a 18.30	78.30	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	160	122	2.72	--	6.66	120	1.9	53	6	0.05	<0.20
MW6	10/11/00	96.60	a 18.69	77.91	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	04/10-11/01	96.60	a 17.85	78.75	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	180	142	NR	--	NR	22	2.2	0.69	5.2	<0.05	<0.20
MW6	07/10/01	96.60	a 18.43	78.17	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	11/20/01	59.60	b 18.67	40.93	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	450	100	2.03	--	6.44	29	5.2	1.1	3.4	--	<0.20
MW6	02/19/02	59.60	b 17.40	42.20	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	05/21/02	59.60	b 17.68	41.92	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	170	100	0.76	--	6.6	11	3.4	1.4	8.9	0.65	<0.20
MW6	06/27/03	59.60	b 17.73	41.87	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	09/29/03	59.60	b 18.48	41.12	0.00	<1.0	<1.0	<1.0	<2.0	230	d <50	<500	340	--	--	--	--	--	--	--	--	--	--
MW6	12/12/03	59.60	b 17.89	41.71	0.00	<2.5	<2.5	<2.5	<5.0	<250	51	<500	190	--	--	--	--	--	--	--	--	--	--
MW6	03/15/04	59.60	b 16.46	43.14	0.00	<1.0	<1.0	<1.0	<2.0	200	<50	<500	220	--	0.11	--	--	--	--	--	--	--	--
MW6	06/24/04	59.60	b 17.97	41.63	0.00	<1.0	<1.0	<1.0	<2.0	130	<50	<500	190	--	0.05	--	--	--	--	--	--	--	--
MW6	09/29/04	59.60	b 18.55	41.05	0.00	<0.50	0.61	<0.50	1.2	210	g <50	<500	190	--	0.37	--	6.60	--	--	--	--	--	--
MW6	12/13/04	59.60	b 17.88	41.72	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	03/14/05	59.60	b 16.82	42.78	0.00	<0.50	<0.50	<0.50	1.8	160	<50	<500	190	--	0.08	--	5.65	--	--	--	--	--	--
MW6	06/15/05	59.60	b 17.60	42.00	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	09/26/05	59.60	b NM	NM	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	12/12/05	59.60	b 18.33	41.27	0.00	0.62	<0.50	<0.50	1.0	81	<50	<500	140	--	1.52	--	6.61	--	--	--	--	--	--
MW6	03/29/06	59.60	b 14.53	45.07	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	120	--	6.93	--	6.06	--	--	--	--	--	--
MW6	06/19/06	59.60	b 16.46	43.14	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW6	09/29/06	59.60	b 17.60	42.00	0.00	0.87	<0.50	<0.50	<0.50	<50	<50	<100	140	--	0.16	--	6.49	--	--	--	--	--	--
MW6	12/12/06	59.60	b 16.93	42.67	0.00	0.67	<0.50	<0.50	<0.50	<50	<50	230	89	--	0.5	--	6.68	--	--	--	--	--	--
MW6	03/01/07	59.60	b 16.30	43.30	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	78	--	0.83	--	6.66	--	--	--	--	--	--
MW6	06/12/07	59.60	b 17.38	42.22	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	07/20/00	96.75	a 15.93	80.82	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	<0.50	32.2	7.15	--	7.43	<0.1	0.002	7.5	<0.10	2.6	0.13
MW7	10/11/00	96.75	a 16.90	79.85	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	04/10-11/01	96.75	a 15.80	80.95	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	<0.50	77.6	NR	--	NR	0.18	0.048	49	<0.10	2.7	0.31
MW7	07/10/01	96.75	a 16.71	80.04	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	11/20/01	59.47	b 16.17	43.30	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	<2.0	62	0.96	--	7.11	0.16	1.8	63	<0.10	--	<0.20
MW7	02/19/02	59.47	b 14.92	44.55	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	05/21/02	59.47	b 15.18	44.29	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<300	<0.50	68	1.03	--	7.57	0.11	0.35	51	<0.10	2.8	0.11
MW7	06/27/03	59.47	b 16.28	43.19	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	09/29/03	59.47	b 16.88	42.59	0.00	<0.50	<0.50	<0.50	<1.0	<50	<50	<500	0.62	--	--	--	--	--	--	--	--	--	--
MW7	12/12/03	59.47	b 14.95	44.52	0.00	<0.50	<0.50	<0.50	<1.0	<50	<50	<500	<0.50	--	--	--	--	--	--	--	--	--	--
MW7	03/15/04	59.47	b 14.77	44.70	0.00	<0.50	<0.50	<0.50	<1.0	<50	<50	<500	<0.50	--	0.54	--	--	--	--	--	--	--	--
MW7	06/24/04	59.47	b 16.33	43.14	0.00	<0.50	<0.50	<0.50	<1.0	<50	300	f <500	<0.50	--	0.20	--	--	--	--	--	--	--	--
MW7	09/29/04	59.47	b 16.88	42.59	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	12/13/04	59.47	b 15.26	44.21	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	03/14/05	59.47	b 15.00	44.47	0.00	<0.50	<0.50	<0.50	<1.0	<50	<50	<500	<0.50	--	0.47	--	6.15	--	--	--	--	--	--
MW7	06/15/05	59.47	b 15.32	44.15	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	09/26/05	59.47	b NM	NM	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	12/12/05	59.47	b 15.99	43.48	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	03/29/06	59.47	b 12.65	46.82	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	--	0.72	--	5.81	--	--	--	--	--	--
MW7	06/19/06	59.47	b 14.49	44.98	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	09/29/06	59.47	b 16.67	42.80	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE 2 CUMULATIVE GROUNDWATER ELEVATION AND ANALYTICAL DATA  
FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Well Number	Date	Casing Elevation (feet)	Depth to Water (feet)	GW Elevation (feet)	SPH Thickness (feet)	Concentration (µg/L)								Concentration (mg/L)										
						Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-g	TPH-d	TPH-mo	MTBE	CO <sub>2</sub> (lab)	DO (field)	Eh (mv) (field)	pH (field)	Fe(II)	Mn	SO <sub>4</sub>	N-NH <sub>3</sub>	N-NO <sub>3</sub>	o-PO <sub>4</sub>	
MW7	12/12/06	59.47	b 15.21	44.26	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW7	03/01/07	59.47	b 14.68	44.79	0.00	<0.50	<0.50	<0.50	<0.50	<50	<50	<100	<0.50	--	0.92	--	6.84	--	--	--	--	--	--	--
MW7	06/12/07	59.47	b 16.2	43.27	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

SPH Separate-phase hydrocarbons.

CO<sub>2</sub> Carbon dioxide.

DO Dissolved oxygen.

Fe(II) Ferrous iron.

Mn Manganese.

SO<sub>4</sub> Sulfate.

N-NH<sub>3</sub> Ammonia.

N-NO<sub>3</sub> Nitrate.

o-PO<sub>4</sub> Ortho-Phosphate.

GW Groundwater.

TPH-g Total Petroleum Hydrocarbons as gasoline.

TPH-d Total Petroleum Hydrocarbons as diesel.

TPH-mo Total Petroleum Hydrocarbons as motor oil.

MTBE Methyl tertiary butyl ether.

NC Not calculated.

NM Not measured.

NR Not reported.

µg/L Micrograms per liter.

mg/L Milligrams per liter.

\* SPH present; not sampled.

\*\* Well MW4 elevation modified due to site renovation activities. Not Surveyed.

-- Not analyzed or not sampled.

< Less than the laboratory reporting limits.

a Elevations are referenced to monitoring well MW1, with assumed datum of 100.00 feet.

b Elevations based on a survey conducted August 2002 and referenced benchmark with known elevation (NGVD 29) of 60.40 feet above mean sea level.

c Analysis not conducted due to broken sample containers.

d Hydrocarbon reported in the gasoline range does not match laboratory gasoline standard.

e Groundwater elevation in wells with LPH are corrected by multiplying the specific gravity of gasoline (0.69) by the LPH thickness and adding this value to the water elevation.

f Hydrocarbon reported is in the early diesel range, and does not match the laboratory diesel standard.

g Sample contained discrete peak in gasoline range and identified by lab as MTBE.

h Quantity of unknown hydrocarbon(s) in sample based on diesel.

i The concentration reported reflect(s) individual or discrete unidentified peaks not matching a typical fuel pattern.

j Depth to groundwater is based on the depth of the stingers.

k Quantity of unknown hydrocarbon(s) in sample based on motor oil.



TABLE 3 HISTORICAL GRAB GROUNDWATER ANALYTICAL DATA  
FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Boring ID	Date	Depth (feet)	Concentrations (µg/L)													
			Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-g	TPH-d	TPH-mo	TBA	MTBE	DIPE	ETBE	TAME	1,2-DCA	EDB
HP1	12/18/2003	26-30	<5.0	<5.0	<5.0	<b>11</b>	<b>410</b>	<b>180</b>	<500	<50	<b>480</b>	<10	<5.0	<5.0	<5.0	<5.0
HP3	12/18/2003	32-36	<0.50	<0.50	<0.50	<1.0	<50	<b>75</b>	<500	<5.0	<b>0.55</b>	<1.0	<0.50	<0.50	<b>1.3</b>	<0.50

TPH-g Total Petroleum Hydrocarbons as gasoline.  
 TPH-d Total Petroleum Hydrocarbons as diesel.  
 TPH-mo Total Petroleum Hydrocarbons as motor oil.  
 TBA t-butyl alcohol.  
 MTBE Methyl tertiary butyl ether.  
 DIPE di-isopropyl ether.  
 ETBE ethyl t-butyl ether.  
 TAME t-amyl methyl ether.  
 1,2-DCA 1,2-dichloroethane.  
 EDB ethylene dibromide.  
 < less than the laboratory reporting limits.

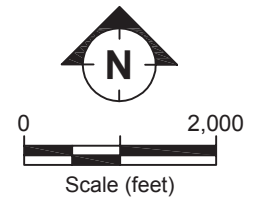
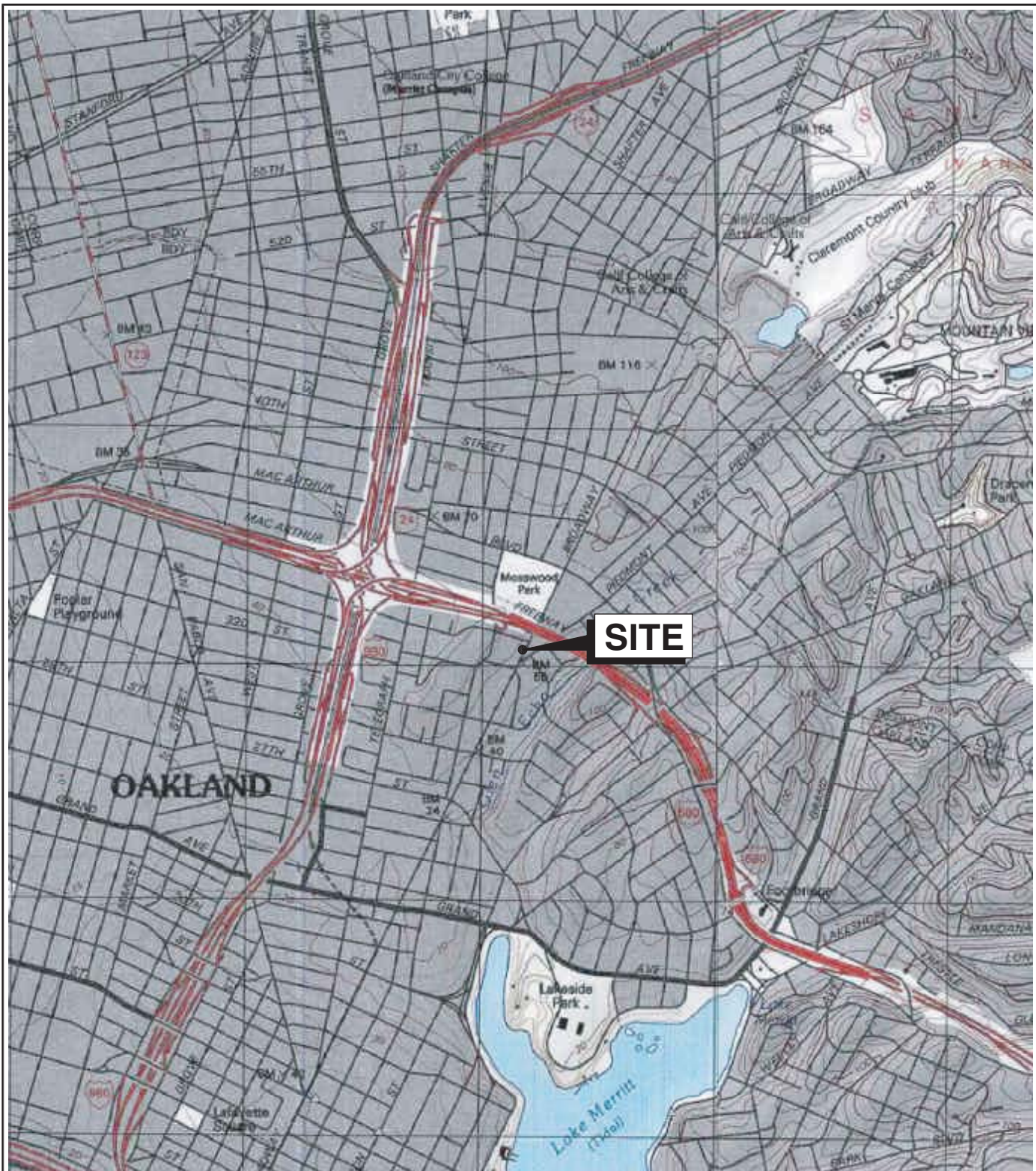
TABLE 4 GROUNDWATER MONITORING SCHEDULE  
 FORMER VAL STROUGH CHEVROLET, 327 34th STREET OAKLAND, CALIFORNIA

Well Number	Groundwater Gauging Frequency	Groundwater Sampling and Analysis Frequency		
		BTEX and TPH-g	MTBE	TEPH
MW1	S	S	S	S
MW2	S	S	S	S
MW3	S	S	S	S
MW4	S	S	S	S
MW5	S	A	A	A
MW6	S	S	S	S
MW7	S	A	A	A

Q = Quarterly.  
 S = Semiannual.  
 A = Annual.

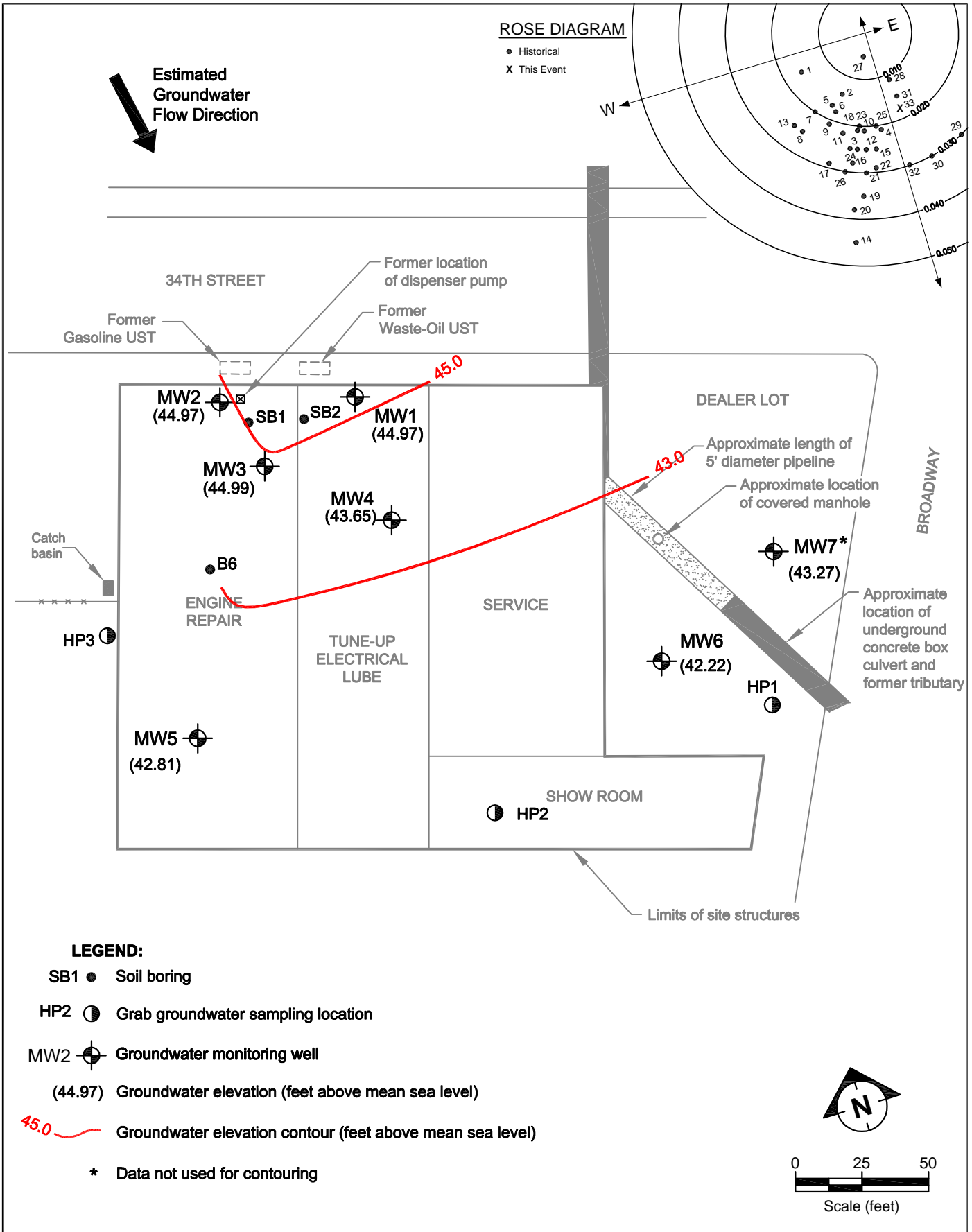
BTEX = Benzene, toluene, ethylbenzene, total xylenes.  
 MTBE = Methyl tertiary butyl ether.  
 TPH-g = Total Petroleum Hydrocarbons as gasoline.  
 TEPH = Total Extractable Petroleum Hydrocarbons, includes TPH-diesel and TPH-motor oil.

## **FIGURES**



**SITE LOCATION MAP**  
 FORMER VAL STROUGH CHEVROLET  
 327 34TH STREET, OAKLAND, CALIFORNIA  
 12 JUNE 2007

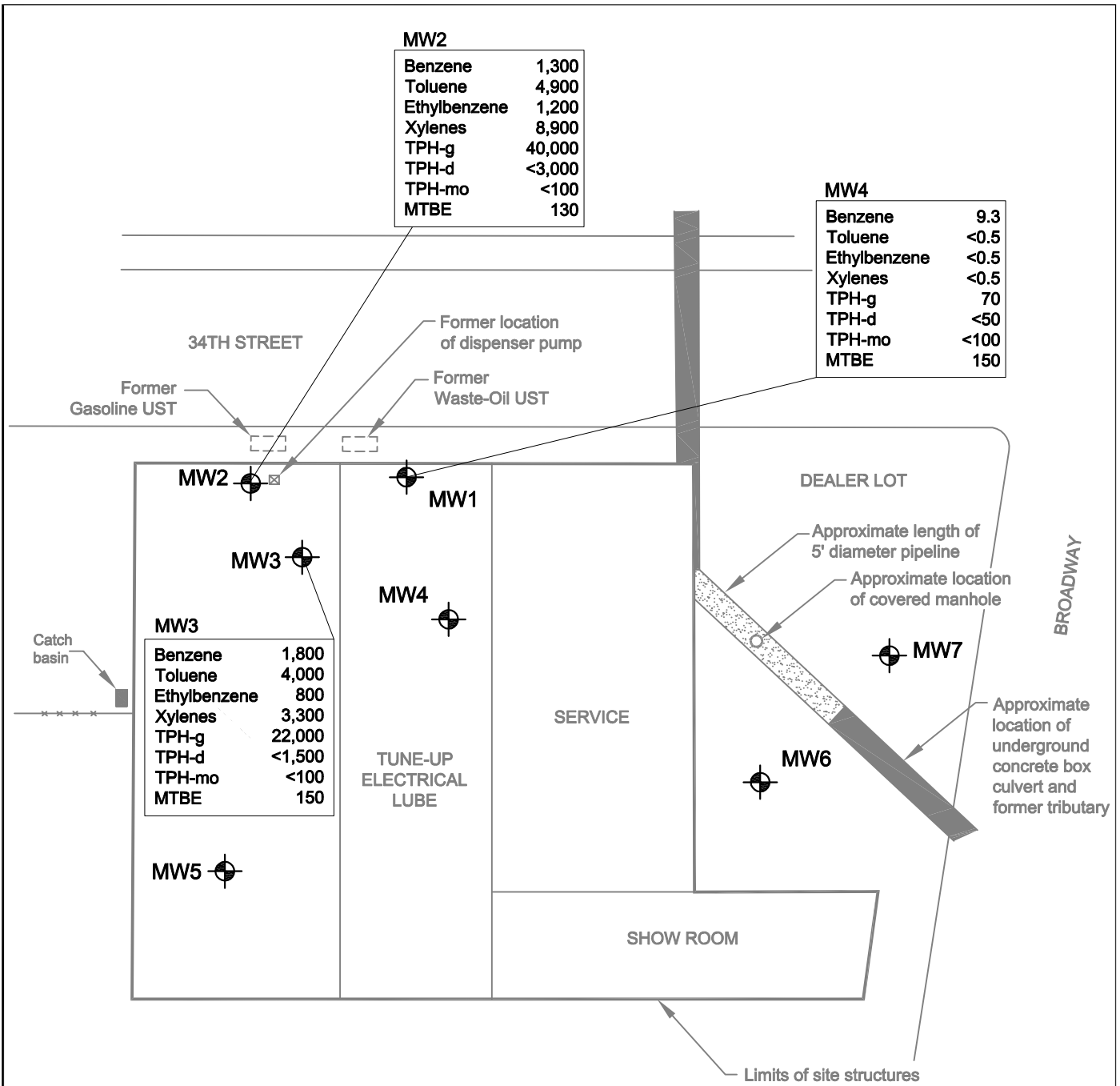
FIGURE:  
**1**




**GROUNDWATER CONTOUR MAP AND ROSE DIAGRAM**  
 FORMER VAL STROUGH CHEVROLET  
 327 34TH STREET, OAKLAND, CALIFORNIA  
 12 JUNE 2007

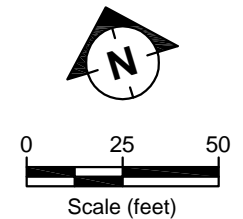
FIGURE:

**2**



**LEGEND:**

- MW5  Groundwater monitoring well
  - TPH-g Total Petroleum Hydrocarbons as gasoline
  - TPH-d Total Petroleum Hydrocarbons as diesel
  - TPH-mo Total Petroleum Hydrocarbons as motor oil
  - MTBE Methyl Tertiary Butyl Ether
- All concentrations are reported in micrograms per liter (ug/L)



**GROUNDWATER ANALYTICAL DATA**  
 FORMER VAL STROUGH CHEVROLET  
 327 34TH STREET, OAKLAND, CALIFORNIA  
 12 JUNE 2007

FIGURE:  
**3**

**APPENDIX A**

**PROTOCOLS FOR GROUNDWATER MONITORING**



## **APPENDIX A**

### **PROTOCOLS FOR GROUNDWATER MONITORING**

#### **GROUNDWATER GAUGING**

Wells are opened prior to gauging to allow the groundwater level in the wells to equilibrate with atmospheric pressure. The depth to groundwater and depth to liquid-phase hydrocarbons, if present, are then measured to the nearest 0.01 feet using an electronic water level meter or optical interface probe. The measurements are made from a permanent reference point at the top of the well casing. If less than 1 foot of water is measured in a well, the water is bailed from the well and, if the well does not recover, the well is considered “functionally dry.” Wells with a sheen or measurable liquid-phase hydrocarbons are generally not purged or sampled.

#### **WELL PURGING**

After the wells are gauged, each well is purged of approximately 3 well casing volumes of water to provide representative groundwater samples for analysis. Field parameters of pH, temperature, and electrical conductance are measured during purging to ensure that these parameters have stabilized before groundwater in a well is sampled. Groundwater in each well is purged using an inertial pump (WaTerra), an electric submersible pump, or a bailer. After the well is purged, the water level is checked to ensure that the well has recharged to at least 80 percent of its original water level.

#### **GROUNDWATER SAMPLING**

After purging, groundwater in each well is sampled using dedicated tubing and an inertial pump (WaTerra) or a factory-cleaned disposable bailer. Samples from extraction wells are typically collected from sample ports associated with the groundwater remediation system. Samples collected for volatile organic analysis are placed in Teflon septum-sealed 40-milliliter glass vials. Samples collected for diesel analysis are placed in 1-liter amber glass bottles. Each sample bottle is labeled with the site name, well number, date, sampler’s initials, and preservative. The samples are placed in a cooler with ice for delivery to a state-certified laboratory. The information for each sample is entered on a chain-of-custody form prior to transport to the laboratory.



**APPENDIX B**  
**FIELD DOCUMENTS**

## WELL GAUGING DATA

Project # 070612-PC 2      Date 6/12/07      Client LRM

Site 327 34th St. Oakland, CA

Well ID	Time	Well Size (in.)	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC	Notes
MW-1	1105	2					20.28	22.05	TOC	
MW-2	1101	2	Tubing removed for gauge				20.98	41.75	↓	
MW-3	1112	2				21.00	31.90			
MW-4	1110	2	Gauged w/ 1/2" tubing in well				19.70	27.50		
MW-5	1055	2	" " "	" "	" "	" "	22.78	26.38		
MW-6	1036	2					17.34	26.59		
MW-7	1030	2					16.20	34.50		

# WELLHEAD INSPECTION CHECKLIST

Date 6/12/07 Client LRM

Site Address 327 34th St. Oakland CA

Job Number 070612-PC2 Technician Tony Vega

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	A							
MW-2	K							
MW-3	K							
MW-4	K							
MW-5	A							
MW-6	K							
MW-7	K							

NOTES: <sup>Boyer + Longyear</sup> MW-6, MW-7 - Good boxes - below grade - under 10" metal covers



### WELL MONITORING DATA SHEET

Project #: 070612-PC2	Client: LRM
Sampler: Tony Vega	Date: 6/12/07
Well I.D.: MW-2	Well Diameter: 2 3 4 6 8
Total Well Depth: 41.75	Depth to Water Pre: 20.98 Post: 21.69
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: PVD Grade	Flow Cell Type: YSI 556

Purge Method: 2" Grundfos Pump      Peristaltic Pump      Bladder Pump      Disp. Baller  
 Sampling Method: Dedicated Tubing 3.3 gal CV x 3 = 9.9'      New Tubing      Other      Disp. Baller  
 Flow Rate: \_\_\_\_\_      Pump Depth: \_\_\_\_\_

Time	Temp. (°C or °F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Water Removed (gals or mL)	Observations
1220	18.36	6.70	600	—	0.95	-48.6	initial	grey odor
1230	18.45	6.64	758	—	0.96	-66.2	3.3	
1240	18.44	6.66	781	—	1.05	-66.1	6.6	
1250	18.48	6.67	796	—	1.12	-62.6	9.9	

Did well dewater? Yes  No

Amount actually evacuated: \_\_\_\_\_ gal

Sampling Time: 1256

Sampling Date: 6/12/07

Sample I.D.: MW-2

Laboratory: KIFF

Analyzed for: ~~TPH-G~~ ~~BTEX~~ ~~MTBE~~ ~~TPH-D~~ ~~mo~~ Other:

Equipment Blank I.D.: \_\_\_\_\_ @ \_\_\_\_\_ Time

Duplicate I.D.: \_\_\_\_\_

## WELL MONITORING DATA SHEET

Project #: 070612-PC2	Client: LRM
Sampler: Tony Veyn	Date: 6/12/07
Well I.D.: MW-3	Well Diameter: ② 3 4 6 8
Total Well Depth: 31.90	Depth to Water Pre: 21.00 Post: 21.10
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>ev0</u> Grade	Flow Cell Type: YSI 550

Purge Method: 2" Grundfos Pump  
 Sampling Method: Dedicated Tubing  
 Flow Rate: 1.7 gal/wk  $\times 3 \approx 5.1$

Peristaltic Pump  
New Tubing  
Bladder Pump Disp. Bailer  
Other: Disp. Bailer

Pump Depth: \_\_\_\_\_

Time	Temp. (C or °F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Water Removed (gals or mL)	Observations
1118	19.00	6.63	874	—	0.80	-75.7	initial	odor, grey
1122	18.35	6.64	886	—	0.81	-69.1	1.7	
1126	18.25	6.74	900	—	0.97	-75.0	3.4	
1130	18.34	6.71	908	—	0.89	-68.1	5.1	
							PID B.Z. = 0.0	
					DTW: 21.10			

Did well dewater? Yes <input checked="" type="checkbox"/>	Amount actually evacuated: 5.1 gal
Sampling Time: 1142	Sampling Date: 6/12/07
Sample I.D.: MW-3	Laboratory: KIFF
Analyzed for: <u>TPH-G</u> BTEX MTBE TPH-D <u>no</u> Other:	
Equipment Blank I.D.: @ <small>Time</small>	Duplicate I.D.:

## WELL MONITORING DATA SHEET

Project #: 070612-PC2	Client: LRM
Sampler: Tony Vega	Date: 6/12/07
Well I.D.: MW-4	Well Diameter: <u>2</u> 3 4 6 8
Total Well Depth: 27.50	Depth to Water Pre: 19.70 Post: 20.82
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVD</u> Grade	Flow Cell Type: YSI 556

Purge Method: 2" Grundfos Pump 1.1 gal CV Peristaltic Pump Bladder Pump  
 Sampling Method: - Dedicated Tubing New Tubing Other Waterfall w/ dedicated tubing  
 Flow Rate: \_\_\_\_\_ Pump Depth: \_\_\_\_\_

Time	Temp. (C or F)	pH	Cond. (mS or $\mu$ S)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Water Removed (Gals. or mL)	Observations
1156/initial	18.9	6.90	832	—	1.06	-18.1	initial	gas odor
1158	18.62	6.80	812	—	1.00	-12.1	1.1	" "
1159	18.69	6.67	831	—	0.82	-5.9	2.2	" "
1201	18.66	6.64	840	—	0.91	-4.1	3.3	" "

Did well dewater? Yes <u>No</u>	Amount actually evacuated: 3.3
Sampling Time: 1205	Sampling Date: 6/12/07
Sample I.D.: MW-4	Laboratory: KIEFF
Analyzed for: <u>TPH-G</u> <u>BTEX</u> <u>MTBE</u> <u>TPH-D</u> <u>MO</u>	Other:
Equipment Blank I.D.: @	Duplicate I.D.:

## SPH or Purge Water Drum Log

Client: CRM @ Val Strough  
 Site Address: 327 34th St, Oakland

STATUS OF DRUM(S) UPON ARRIVAL					
Date	9/29/06	12-12-06	3/1/07	6/12/07	
Number of drum(s) empty:	0		2 <sup>new</sup>		
Number of drum(s) 1/4 full:			1		
Number of drum(s) 1/2 full:		1		1	
Number of drum(s) 3/4 full:					
Number of drum(s) full:			1	1	
Total drum(s) on site:	0	1	2	2	
Are the drum(s) properly labeled?		yes	Y	Y	
Drum ID & Contents:	-		Purge water →		
If any drum(s) are partially or totally filled, what is the first use date:			Sept 06	Full 9/06 1/2 Full 3/07	

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

STATUS OF DRUM(S) UPON DEPARTURE					
Date	9/29/06	12-12-06	3/1/07		
Number of drums empty:			2 <sup>new</sup>		
Number of drum(s) 1/4 full:		1			
Number of drum(s) 1/2 full:	1				
Number of drum(s) 3/4 full:			1		
Number of drum(s) full:		1	1	2	
Total drum(s) on site:	1	2	2	2	
Are the drum(s) properly labeled?	Y	yes	Y	Y	
Drum ID & Contents:	Purge H <sub>2</sub> O →		→	→	

**LOCATION OF DRUM(S)**  
 Describe location of drum(s): in compound (see map)

FINAL STATUS					
Number of new drum(s) left on site this event	1	1	0	0	
Date of inspection:	9/29/06	12-12-06	3/1/07	6/12/07	
Drum(s) labelled properly:	yes	yes	Y	Y	
Logged by BTS Field Tech:	we	BC	ood	TV	
Office reviewed by:	L	A		W	



**APPENDIX C**

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



Report Number : 56959

Date : 6/19/2007

Mehrdad Javaherian  
LRM Consulting, Inc.  
1534 Plaza Lane, #145  
Burlingame, CA 94010

Subject : 3 Water Samples  
Project Name : 327 34th Street  
Project Number : 070612-PC2

Dear Mr. Javaherian,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

A handwritten signature in black ink, appearing to read "Joel Kiff".

Joel Kiff



Report Number : 56959

Date : 6/19/2007

Subject : 3 Water Samples  
Project Name : 327 34th Street  
Project Number : 070612-PC2

## Case Narrative

The Method Reporting Limit for TPH as Diesel is increased due to interference from Gasoline-Range Hydrocarbons for samples MW-2 and MW-3.

Approved By: \_\_\_\_\_

A handwritten signature in black ink, appearing to read "Joel Kiff", is written over a horizontal line. Below the line, the name "Joel Kiff" is printed in a black sans-serif font.

Project Name : **327 34th Street**

Project Number : **070612-PC2**

Sample : **MW-2**

Matrix : Water

Lab Number : 56959-01

Sample Date :6/12/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	<b>1300</b>	20	ug/L	EPA 8260B	6/14/2007
<b>Toluene</b>	<b>4900</b>	20	ug/L	EPA 8260B	6/14/2007
<b>Ethylbenzene</b>	<b>1200</b>	20	ug/L	EPA 8260B	6/14/2007
<b>Total Xylenes</b>	<b>8900</b>	20	ug/L	EPA 8260B	6/14/2007
<b>Methyl-t-butyl ether (MTBE)</b>	<b>130</b>	20	ug/L	EPA 8260B	6/14/2007
<b>TPH as Gasoline</b>	<b>40000</b>	2000	ug/L	EPA 8260B	6/14/2007
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	6/14/2007
4-Bromofluorobenzene (Surr)	100		% Recovery	EPA 8260B	6/14/2007
<b>TPH as Diesel (w/ Silica Gel)</b>	<b>&lt; 3000</b>	3000	ug/L	M EPA 8015	6/14/2007
<b>TPH as Motor Oil (w/ Silica Gel)</b>	<b>&lt; 100</b>	100	ug/L	M EPA 8015	6/14/2007
Octacosane (Diesel Silica Gel Surr)	124		% Recovery	M EPA 8015	6/14/2007

Sample : **MW-3**

Matrix : Water

Lab Number : 56959-02

Sample Date :6/12/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	<b>1800</b>	5.0	ug/L	EPA 8260B	6/14/2007
<b>Toluene</b>	<b>4000</b>	6.0	ug/L	EPA 8260B	6/14/2007
<b>Ethylbenzene</b>	<b>800</b>	5.0	ug/L	EPA 8260B	6/14/2007
<b>Total Xylenes</b>	<b>3300</b>	5.0	ug/L	EPA 8260B	6/14/2007
<b>Methyl-t-butyl ether (MTBE)</b>	<b>150</b>	5.0	ug/L	EPA 8260B	6/14/2007
<b>TPH as Gasoline</b>	<b>22000</b>	500	ug/L	EPA 8260B	6/14/2007
Toluene - d8 (Surr)	98.8		% Recovery	EPA 8260B	6/14/2007
4-Bromofluorobenzene (Surr)	99.1		% Recovery	EPA 8260B	6/14/2007
<b>TPH as Diesel (w/ Silica Gel)</b>	<b>&lt; 1500</b>	1500	ug/L	M EPA 8015	6/14/2007
<b>TPH as Motor Oil (w/ Silica Gel)</b>	<b>&lt; 100</b>	100	ug/L	M EPA 8015	6/14/2007
Octacosane (Diesel Silica Gel Surr)	114		% Recovery	M EPA 8015	6/14/2007

Approved By:

Joel Kiff



Report Number : 56959

Date : 6/19/2007

Project Name : 327 34th Street

Project Number : 070612-PC2

Sample : MW-4

Matrix : Water

Lab Number : 56959-03

Sample Date :6/12/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	<b>9.3</b>	0.50	ug/L	EPA 8260B	6/14/2007
<b>Toluene</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	6/14/2007
<b>Ethylbenzene</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	6/14/2007
<b>Total Xylenes</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	6/14/2007
<b>Methyl-t-butyl ether (MTBE)</b>	<b>150</b>	0.50	ug/L	EPA 8260B	6/14/2007
<b>TPH as Gasoline</b>	<b>70</b>	50	ug/L	EPA 8260B	6/14/2007
Toluene - d8 (Surr)	98.6		% Recovery	EPA 8260B	6/14/2007
4-Bromofluorobenzene (Surr)	97.0		% Recovery	EPA 8260B	6/14/2007
<b>TPH as Diesel (w/ Silica Gel)</b>	<b>&lt; 50</b>	50	ug/L	M EPA 8015	6/14/2007
<b>TPH as Motor Oil (w/ Silica Gel)</b>	<b>&lt; 100</b>	100	ug/L	M EPA 8015	6/14/2007
Octacosane (Diesel Silica Gel Surr)	122		% Recovery	M EPA 8015	6/14/2007

Approved By:

Joel Kiff

Report Number : 56959

Date : 6/19/2007

**QC Report : Method Blank Data**

Project Name : **327 34th Street**

Project Number : **070612-PC2**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
TPH as Diesel (w/ Silica Gel)	< 50	50	ug/L	M EPA 8015	6/14/2007
TPH as Motor Oil (w/ Silica Gel)	< 100	100	ug/L	M EPA 8015	6/14/2007
Octacosane (Diesel Silica Gel Surr)	110		%	M EPA 8015	6/14/2007
Benzene	< 0.50	0.50	ug/L	EPA 8260B	6/13/2007
Toluene	< 0.50	0.50	ug/L	EPA 8260B	6/13/2007
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	6/13/2007
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	6/13/2007
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	6/13/2007
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	6/13/2007
Toluene - d8 (Surr)	99.2		%	EPA 8260B	6/13/2007
4-Bromofluorobenzene (Surr)	101		%	EPA 8260B	6/13/2007
Benzene	< 0.50	0.50	ug/L	EPA 8260B	6/14/2007
Toluene	< 0.50	0.50	ug/L	EPA 8260B	6/14/2007
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	6/14/2007
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	6/14/2007
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	6/14/2007
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	6/14/2007
Toluene - d8 (Surr)	99.3		%	EPA 8260B	6/14/2007
4-Bromofluorobenzene (Surr)	101		%	EPA 8260B	6/14/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Toluene	< 0.50	0.50	ug/L	EPA 8260B	6/14/2007

Approved By:  Joel Kiff

KIFF ANALYTICAL, LLC

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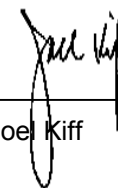
## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : 327 34th Street

Project Number : 070612-PC2

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
TPH-D (Si Gel)	Blank	<50	1000	1000	742	758	ug/L	M EPA 8015	6/14/07	74.2	75.8	2.12	70-130	25
Benzene	56885-01	8.0	39.9	39.8	48.1	48.2	ug/L	EPA 8260B	6/13/07	100	101	0.424	70-130	25
Toluene	56885-01	<0.50	39.9	39.8	42.0	42.2	ug/L	EPA 8260B	6/13/07	105	106	0.745	70-130	25
Tert-Butanol	56885-01	<5.0	200	199	205	207	ug/L	EPA 8260B	6/13/07	103	104	1.31	70-130	25
Methyl-t-Butyl Ether	56885-01	<0.50	39.9	39.8	34.9	33.6	ug/L	EPA 8260B	6/13/07	87.4	84.3	3.65	70-130	25
Benzene	56959-03	9.3	39.8	39.9	48.6	49.1	ug/L	EPA 8260B	6/14/07	98.9	99.7	0.844	70-130	25
Toluene	56959-03	<0.50	39.8	39.9	40.7	40.4	ug/L	EPA 8260B	6/14/07	102	101	0.972	70-130	25
Tert-Butanol	56959-03	7.0	199	200	193	196	ug/L	EPA 8260B	6/14/07	93.8	94.5	0.791	70-130	25
Methyl-t-Butyl Ether	56959-03	150	39.8	39.9	181	185	ug/L	EPA 8260B	6/14/07	70.4	79.6	12.3	70-130	25
Benzene	56927-03	<0.50	39.9	40.0	39.6	40.0	ug/L	EPA 8260B	6/14/07	99.2	100	0.895	70-130	25
Toluene	56927-03	<0.50	39.9	40.0	40.2	40.7	ug/L	EPA 8260B	6/14/07	101	102	1.03	70-130	25
Tert-Butanol	56927-03	10	200	200	216	219	ug/L	EPA 8260B	6/14/07	103	104	1.48	70-130	25
Methyl-t-Butyl Ether	56927-03	<0.50	39.9	40.0	37.5	37.8	ug/L	EPA 8260B	6/14/07	93.9	94.4	0.542	70-130	25

Approved By: Joel Kiff



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**QC Report : Laboratory Control Sample (LCS)**Project Name : **327 34th Street**Project Number : **070612-PC2**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	40.0	ug/L	EPA 8260B	6/13/07	102	70-130
Toluene	40.0	ug/L	EPA 8260B	6/13/07	103	70-130
Tert-Butanol	200	ug/L	EPA 8260B	6/13/07	106	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	6/13/07	95.1	70-130
Benzene	40.0	ug/L	EPA 8260B	6/14/07	104	70-130
Toluene	40.0	ug/L	EPA 8260B	6/14/07	105	70-130
Tert-Butanol	200	ug/L	EPA 8260B	6/14/07	96.3	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	6/14/07	93.7	70-130
Benzene	40.0	ug/L	EPA 8260B	6/14/07	99.9	70-130
Toluene	40.0	ug/L	EPA 8260B	6/14/07	101	70-130
Tert-Butanol	200	ug/L	EPA 8260B	6/14/07	102	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	6/14/07	96.6	70-130

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2795 2nd Street, Suite 300 Davis, CA 95618 530-297-4800

Approved By:


  
 \_\_\_\_\_  
 Joel Kiff



56959

# BLAINE

TECH SERVICES, INC.

1680 ROGERS AVENUE  
SAN JOSE, CALIFORNIA 95112-1105  
FAX (408) 573-7771  
PHONE (408) 573-0555

## CONDUCT ANALYSIS TO DETECT

LAB

KIFF

DHS #

ALL ANALYSES MUST MEET SPECIFICATIONS AND DETECTION LIMITS SET BY CALIFORNIA DHS AND

- EPA
- LIA
- OTHER
- RWQCB REGION

### CHAIN OF CUSTODY

BTS # 07062-PC2

#### CLIENT

LRM Consulting, Inc.

#### SITE

327 34th Street  
Oakland, CA

C = COMPOSITE ALL CONTAINERS

TPH-Gas / BTEX (8260)

MTBE (8260)

TEPH (Diesel & Motor Oil) \* 8015M

#### SPECIAL INSTRUCTIONS

Invoice to: LRM Consulting, Inc.  
Attn: Mehrdad Javaherian  
Report to: Mehrdad Javaherian

\* Silica Gel Cleanup Required

SAMPLE I.D.	DATE	TIME	MATRIX	CONTAINERS		C	TPH-Gas / BTEX (8260)	MTBE (8260)	TEPH (Diesel & Motor Oil) * 8015M									
			S= SOIL W=H <sub>2</sub> O	TOTAL	6x4oz/Ven													

SAMPLE I.D.	DATE	TIME	MATRIX	TOTAL	6x4oz/Ven	C	TPH-Gas / BTEX (8260)	MTBE (8260)	TEPH (Diesel & Motor Oil) * 8015M											
MU-2	6/12/07	1256	W	6	✓		✓	✓	✓											01
MU-3	↓	1142	↓	6	✓		✓	✓	✓											02
MU-4	↓	1205		6	✓		✓	✓	✓											03

SAMPLING COMPLETED	DATE	TIME	SAMPLING PERFORMED BY	RESULTS NEEDED NO LATER THAN
	6/12/07	1300	P. Cornish	Standard TAT

RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
Attin	6/12/07	1505	Tony Vega	6/12/07	1500

RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
<del>Attin</del>	6/12/07	1115	<del>Tony Vega</del>		

RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
<del>Attin</del>			KIFF Analytical	06/30/07	1128

SHIPPED VIA	DATE SENT	TIME SENT	COOLER #	SAMPLE RECEIPT
				Temp °C 12.8 Therm. ID# 1R-5

Initial RM Date 06/30/07  
Time 1529 Coolant present:  Yes  No