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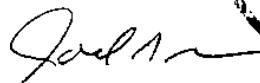
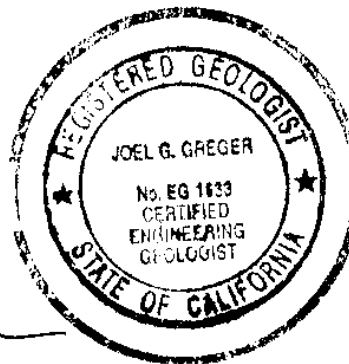
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Alameda County  
Environmental Health

**3<sup>rd</sup> QUARTER 2007  
GROUNDWATER  
MONITORING REPORT**

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

Prepared by  
**LRM Consulting, Inc.**  
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November 2007



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## 1.0 INTRODUCTION

At the request of the Strough Family Trust of 1983, LRM Consulting, Inc. (LRM) has prepared this 3<sup>rd</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 25 September 2007 groundwater monitoring event reflecting water quality reporting and water level gauging for all site wells per the existing ACHCSA-approved monitoring program for the site.

Per discussions with the ACHCSA and as outlined by LRM (2007), additional grab groundwater sampling is planned in the next two weeks to evaluate the vertical and lateral distribution of hydrocarbons within the residual source area (i.e, MW2 and MW3), the occurrence of MTBE in saturated soils in the immediate vicinity of MW4, and the potential for migration of dissolved hydrocarbons toward the downgradient site boundary. Correspondingly, the scope of groundwater monitoring for this quarter was increased from the ACHCSA-approved program to include all site wells in order to obtain a comprehensive assessment of groundwater conditions, and to supplement forthcoming grab groundwater sampling efforts.

Also worth noting is that this monitoring reflects groundwater conditions approximately one and one-half years 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

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## 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, but none since March 2004 in MW3 and June 2006 in MW2. These data suggest 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. This is corroborated by the dissolved groundwater data discussed below.

**Petroleum Hydrocarbon Distribution in Groundwater:** The highest concentrations of petroleum hydrocarbons have been detected in samples collected from wells MW2 and MW3. Generally significantly 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 (Tables 2 and 3). The extent of the downgradient portion of the dissolved plume remains a focus of the previously referenced grab groundwater sampling investigation planned for the next two weeks.

## 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. In the meantime, per discussions with ACHCSA, the original monitoring schedule previously approved by the ACHCSA will be followed as outlined in Table 4 herein.

### **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 25 September 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 all onsite wells. Three well casing volumes of water were purged from all wells and field parameters including temperature, pH, specific conductance, and dissolved oxygen were measured. Groundwater monitoring protocols are presented in Appendix A.

#### **3.3 Groundwater Sampling**

After purging, groundwater 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**

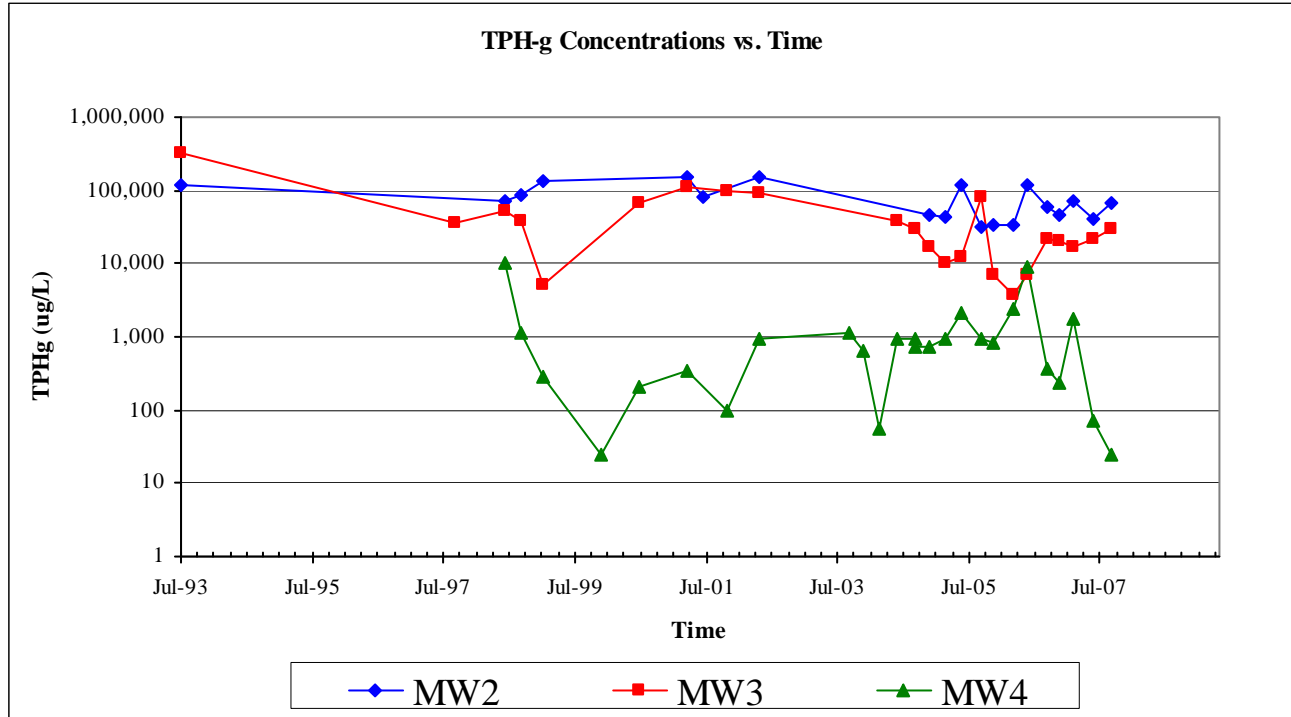
On 25 September 2007, the depth to water beneath the site ranged from 16.72 to 24.45 feet bgs (Table 2). Groundwater elevations in the site wells during this monitoring event ranged from 41.14 feet above msl in well MW5 to 43.40 feet above msl in well MW3 (Figure 2), reflecting an approximately 1.5-foot drop in levels from the previous quarter. The hydraulic gradient is approximately 0.019ft/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 25 September 2007, groundwater samples were collected from all site wells 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 68,000 µg/L and MW3 at 29,000 µg/L. TPH-g concentrations in all other wells remained below the detection limit of 50 ug/L.
- Benzene was detected in the samples collected from well MW2 at 1,400 µg/L and well MW3 at 2,400 µg/L. Benzene concentrations in all other wells remained below the detection limit of 0.5 ug/L.
- MTBE was detected in the samples collected from well MW1 at 1.8 ug/L, MW2 at 240 µg/L, MW3 at 220 µg/L, MW4 at 300 µg/L, MW5 at 0.64 ug/L, and MW6 at 89 ug/L. MTBE was not detected at above 0.50 ug/L at well MW7.
- 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 detected in groundwater samples from MW2 at 250 ug/L but remained undetected (<100 ug/L) in all other site wells.

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



As indicated on the graph, TPH-g concentrations in MW2 continue to fluctuate within the 50,000 to 70,000 ug/L range over the past year, while levels in MW3 show a slight increase within the 20,000 to 30,000 ug/L range. TPH-g levels in MW4 continue to decline over the past several rounds of monitoring. As shown on Table 2, benzene levels depict a similar trend over the past year, with generally stable (but elevated) levels in MW2 (1,400 ug/L range), slightly increasing levels in MW-3 (1,300 to 2,400 ug/L range), and lower/declining levels in MW-4 (60 ug/L to <0.5 ug/L).

The hydrocarbon concentrations detected in this quarter remain within the past range of detections and reflect the generally stable trend where data are available away from the source area (i.e., MW-4 area). Within the source area (MW-2 and MW-3), measurable concentrations remain without evidence of significant natural attenuation; this area is accordingly the subject of the previously referenced investigation and will be addressed in the subsequent CAP for the site.

## **5.0 PLANNED ACTIVITIES**

### **5.1 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 formerly targeted by the DPE system (i.e., former residual source area in the vicinity of these wells) (see LRM (2006 and 2007)). Per the ACHCSA's request, this investigation also includes grab groundwater sampling along the downgradient site boundary. 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 addendum to the supplemental investigation work plan as soon as approval is provided by the ACHCSA.

Per the request of the ACHCSA, the results of the planned supplemental investigation will be used to prepare a Corrective Action Plan (CAP) to include, at a minimum, evaluation of three active remediation alternatives.

### **5.2 Planned Monitoring Activities**

Quarterly monitoring per the ACHCSA-approved plan will continue at the site until the results of the planned supplemental investigation are obtained and a CAP for the site has been developed.

## 6.0 REFERENCES

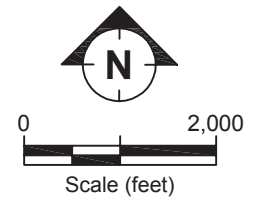
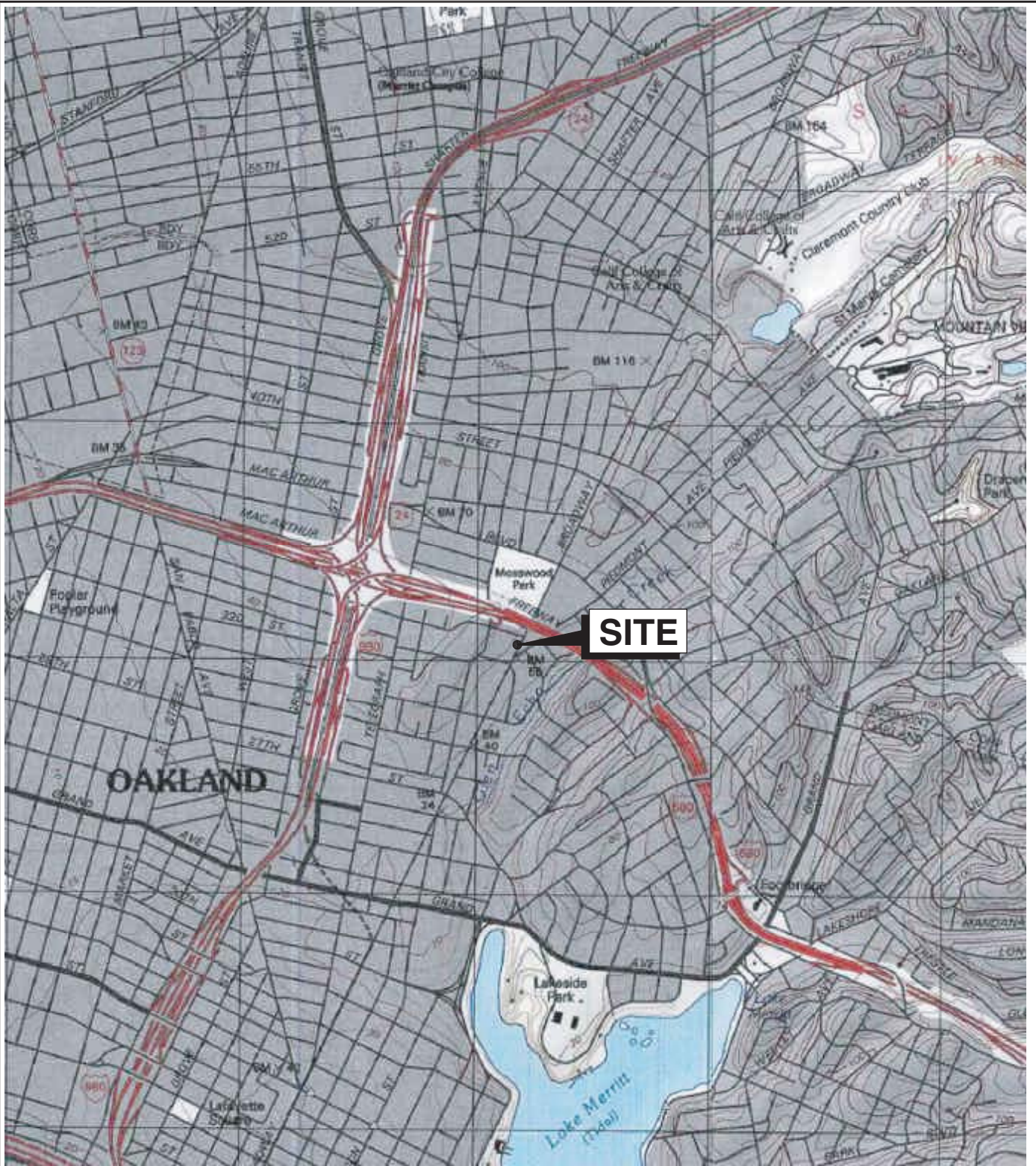
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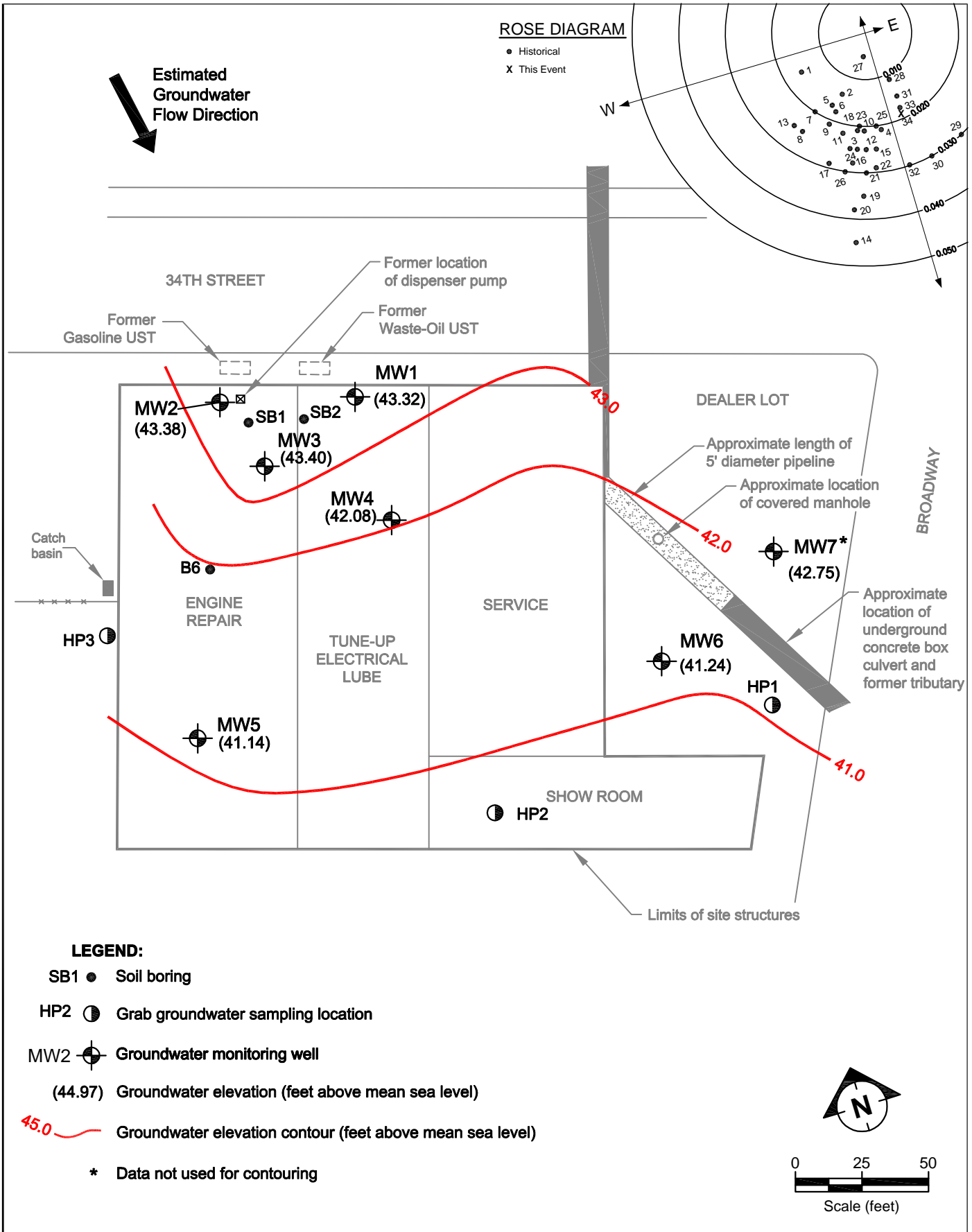


## **FIGURES**



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

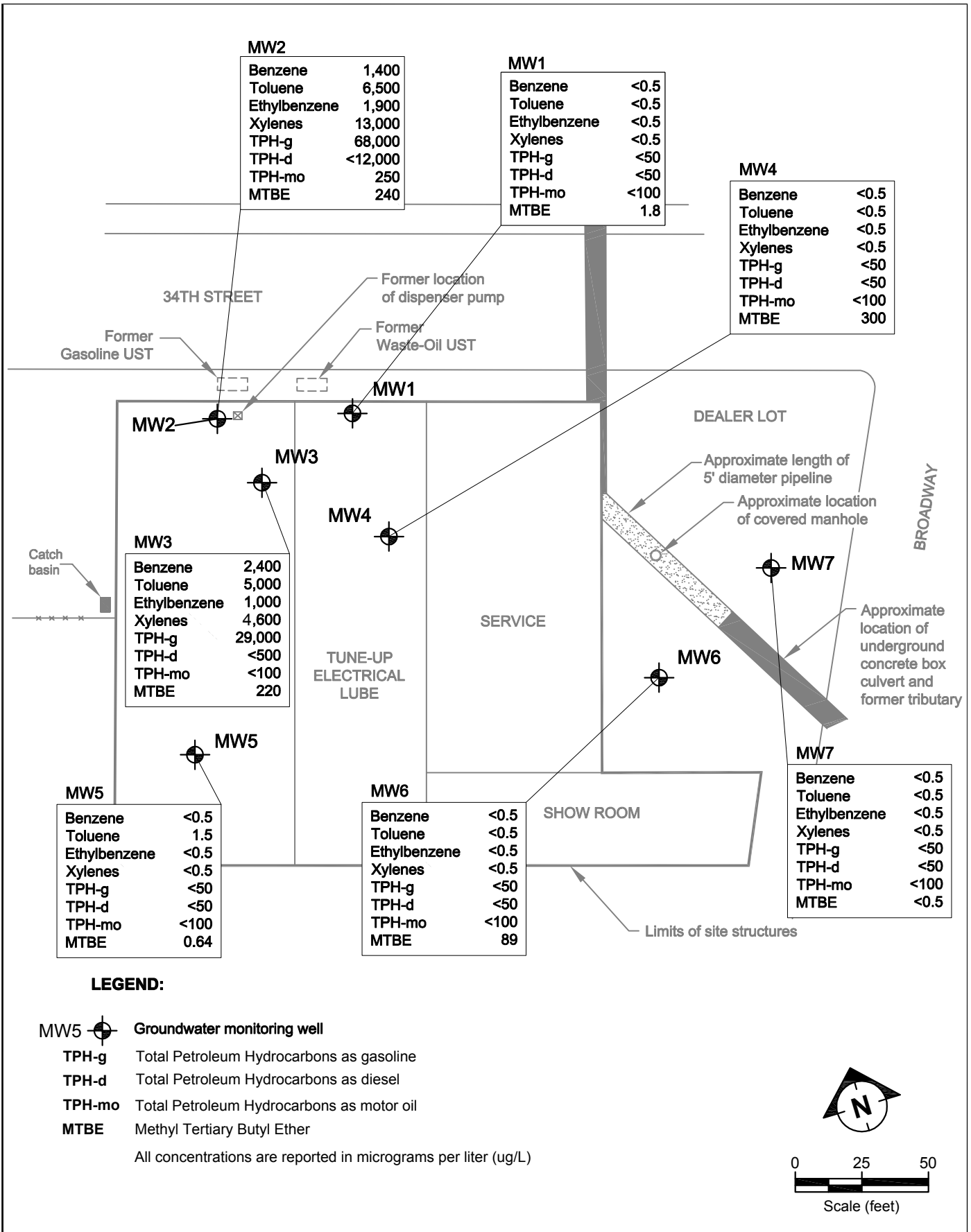
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**1**



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

FIGURE:

**2**



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

FIGURE:

**3**

## **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	Xylenes	TPH-g	TPH-d	TPH-mo	MTBE	CO <sub>2</sub> (lab)	DO (field)	Eh (mv) (field)	pH (field)	Fe(II)	Mn

- 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	Q	S	S	S
MW2	Q	Q	Q	Q
MW3	Q	Q	Q	Q
MW4	Q	Q	Q	Q
MW5	Q	A	A	A
MW6	Q	S	S	S
MW7	Q	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.

**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**

## WELLHEAD INSPECTION CHECKLIST

Date 9/25/07 Client LRM  
 Site Address 327 34<sup>th</sup> St. Oakland, CA  
 Job Number 070925-SW1 Technician S. Chase

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-7	X							
MW-6	X							
MW-1	X							
MW-4	X							

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

## WELL GAUGING DATA

Project # 070925-5C-1 Date 9/25/07 Client LRM

Site 327 34<sup>th</sup> 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-7	0930	2	NO / NO				16.72	34.22	↓	
MW-6	0935	2	NO / NO				18.38	25.98		
MW-1	0945	2	NO / NO				21.37	28.92		
MW-4	0950	2	NO / NO				21.27	27.30		
MW-2	0957	2	NO / YES				22.57	31.47		
MW-3	1005	2	NO / YES				22.59	31.50		
MW-5	1010	2	NO / NO				24.45	26.24		



## WELL MONITORING DATA SHEET

Project #: <u>070925-SC-1</u>	Client: <u>LRM</u>
Sampler: <u>S. Chase</u>	Date: <u>9/25/07</u>
Well I.D.: <u>MW-1</u>	Well Diameter: <u>(2)</u> 3 4 6 8
Total Well Depth: <u>28.92</u>	Depth to Water Pre: <u>21.37</u> Post: <u>22.85</u>
Depth to Free Product:	Thickness of Free Product (feet): <u>Recharge: 22.85</u>
Referenced to: <u>(PVC)</u> Grade	Flow Cell Type: <u>YSI 556</u>

Purge Method: 2" Grundfos Pump Water Peristaltic Pump Bladder Pump  
 Sampling Method: Dedicated Tubing 4' dedicated tubing New Tubing Other Dedicated tubing  
 Flow Rate: 1/4 gallon per min. Pump Depth: 25'

Time	Temp. (C or °F)	pH	Cond (mS or µS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Water Removed (gals. or mL)	Observations
1235	18.84	6.40	1276	76	16.87	150.4	1.2	clear
1240	18.71	6.39	1299	55	14.80	159.3	2.4	clear
1245	18.68	6.40	1289	31	15.11	165.2	3.6	clear

Did well dewater? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Amount actually evacuated: <u>3.6 gallons</u>
Sampling Time: <u>1250</u>	Sampling Date: <u>9/25/07</u>
Sample I.D.: <u>MW-1</u>	Laboratory: <u>Kiff</u>
Analyzed for: TPH-G BTEX MTBE TPH-D	Other: <u>see LOC</u>
Equipment Blank I.D.: @	Duplicate I.D.:

## WELL MONITORING DATA SHEET

Project #: 070925-50-1	Client: LRM
Sampler: S. Chase	Date: 9/25/07
Well I.D.: MW-2	Well Diameter: (2) 3 4 6 8
Total Well Depth: 31.47	Depth to Water Pre: 22.57 Post: 23.86
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	Flow Cell Type: YS: 556 <span style="float: right;">Recharge: 24.35</span>

Purge Method: 2" Grundfos Pump \*Disp. Bailer      Peristaltic Pump      Bladder Pump  
 Sampling Method: Dedicated Tubing      New Tubing      Other: Disp. Bailer  
 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
1413	18.75	6.36	848	989	1.80	-10.5	1.4	cloudy/gray/odor
1417	18.36	6.53	751	>1,000	2.13	-75.6	2.8	"
1421	18.28	6.57	747	>1,000	2.52	-74.5	4.2	"

Did well dewater? Yes <input type="radio"/> No <input checked="" type="radio"/>	Amount actually evacuated: 4.2 gallons
Sampling Time: 1425	Sampling Date: 9/25/07
Sample I.D.: MW-2	Laboratory: Kiff
Analyzed for: TPH-G BTEX MTBE TPH-D	Other: See COC
Equipment Blank I.D.: @	Duplicate I.D.:

## WELL MONITORING DATA SHEET

Project #: 070925-SC-1	Client: LRM
Sampler: G. Chase	Date: 9/25/07
Well I.D.: MW-3	Well Diameter: (2) 3 4 6 8
Total Well Depth: 31.50	Depth to Water Pre: 22.59 Post: 23.41
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	Flow Cell Type: ysi 556 <span style="float: right;">Recirc: 24.37</span>

Purge Method: 2" Grundfos Pump \*Disp. Bailers      Peristaltic Pump      Bladder Pump  
 Sampling Method: Dedicated Tubing      New Tubing      Other: Disp. Bailers

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
1450	18.73	6.42	910	>1,000	1.62	26.5	1.4	cloudy/brown odor
1454	18.61	6.54	904	>1,000	1.58	-10.5	2.8	"
1500	18.44	6.63	895	>1,000	1.49	-54.8	4.2	"

Did well dewater? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Amount actually evacuated: 4.2 gallons
Sampling Time: 1505	Sampling Date: 9/25/07
Sample I.D.: MW-3	Laboratory: KIAP
Analyzed for: TPH-G BTEX MTBE TPH-D	Other: see COC
Equipment Blank I.D.: @ _____	Duplicate I.D.: _____

## WELL MONITORING DATA SHEET

Project #: 070925-51-1	Client: LRM
Sampler: S. Chase	Date: 9/25/07
Well I.D.: MW-4	Well Diameter: (2) 3 4 6 8
Total Well Depth: 27.30	Depth to Water Pre: 21.27 Post: 21.75
Depth to Free Product:	Thickness of Free Product (feet): Recharge: 22.48
Referenced to: (PVC) Grade	Flow Cell Type: YSI 556

Purge Method: 2" Grundfos Pump *Water* Peristaltic Pump Bladder Pump  
 Sampling Method: Dedicated Tubing *w/ dedicated tubing* New Tubing Other: *Dedicated tubing*  
 Flow Rate: *1/4 gallon/min.* Pump Depth: *24'*

Time	Temp. (°C or °F)	pH	Cond. (mS or µS)	Turbidity (NTUs)	D.O. (mg/L)	ORP (mV)	Water Removed (gals or mL)	Observations
1311	19.01	6.52	769	296	6.67	98.5	1	cloudy
1315	18.90	6.58	764	214	6.29	84.3	2	cloudy
1319	18.93	6.59	772	184	6.03	78.4	3	little cloudy

Did well dewater? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Amount actually evacuated: 3 gallons
Sampling Time: 1325	Sampling Date: 9/25/07
Sample I.D.: MW-4	Laboratory: Kiff
Analyzed for: TPH-G BTEX MTBE TPH-D	Other: See col
Equipment Blank I.D.: @	Duplicate I.D.:



## WELL MONITORING DATA SHEET

Project #: 070925-SC-1	Client: LRM
Sampler: S. Chase	Date: 9/25/07
Well I.D.: MW-5	Well Diameter: (2) 3 4 6 8
Total Well Depth: 26.24	Depth to Water Pre: 24.45 Post: 24.75
Depth to Free Product:	Thickness of Free Product (feet): Recharge: 24.81
Referenced to: (PVC) Grade	Flow Cell Type: YSI 556

Purge Method: 2" Grundfos Pump *\*Water* Peristaltic Pump Bladder Pump  
 Sampling Method: Dedicated Tubing *4" dedicated tubing* New Tubing Other: *Dedicated tubing*  
 Flow Rate: *1/4 gallon/min.* Pump Depth: *25'*

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
1524	20.20	6.24	398	107	18.71	148.2	.3	little cloudy
1526	20.23	6.25	396	92	19.13	148.5	.6	"
1528	20.27	6.26	395	73	19.68	148.9	.9	clear

Did well dewater? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Amount actually evacuated: <i>.9 gallons</i>
Sampling Time: <i>1535</i>	Sampling Date: <i>9/25/07</i>
Sample I.D.: <i>MW-5</i>	Laboratory: <i>Kiff</i>
Analyzed for: TPH-G BTEX MTBE TPH-D	Other: <i>see COC</i>
Equipment Blank I.D.: @ Time	Duplicate I.D.:

## WELL MONITORING DATA SHEET

Project #: 070925-SC-1	Client: LRM
Sampler: S. Choo	Date: 9/25/07
Well I.D.: MW-6	Well Diameter: (2) 3 4 6 8
Total Well Depth: 25.98	Depth to Water Pre: 18.38 Post: 19.71
Depth to Free Product:	Thickness of Free Product (feet): Recharge: 19.90
Referenced to: (PVC) Grade	Flow Cell Type: YSI 656

Purge Method: 2" Grundfos Pump ~~Water~~ Peristaltic Pump Bladder Pump  
 Sampling Method: Dedicated Tubing w/ dedicated tubing New Tubing Other: dedicated tubing  
 Flow Rate: 1/2 gallon/min. Pump Depth: 21'

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
1116	19.35	6.78	686	112	8.50	-124.2	1.2	little cloudy
1119	19.04	6.75	670	96	4.82	-124.8	2.4	"
1122	18.94	6.76	667	78	5.10	-125.4	3.6	"

Did well dewater? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Amount actually evacuated: 3.6
Sampling Time: 1130	Sampling Date: 9/25/07
Sample I.D.: MW-6	Laboratory: KIFF
Analyzed for: TPH-G BTEX MTBE TPH-D	Other: See COC
Equipment Blank I.D.: @ Time	Duplicate I.D.:

## WELL MONITORING DATA SHEET

Project #: <u>070925-5L-1</u>	Client: <u>LRM</u>
Sampler: <u>S. Chase</u>	Date: <u>9/25/07</u>
Well I.D.: <u>MW-7</u>	Well Diameter: <u>(2)</u> 3 4 6 8
Total Well Depth: <u>34.22</u>	Depth to Water Pre: <u>16.72</u> Post: <u>20.13</u>
Depth to Free Product:	Thickness of Free Product (feet): <u>Recharge: 20.22</u>
Referenced to: <u>PVC</u> Grade	Flow Cell Type: <u>YSI 556</u>

Purge Method: 2" Grundfos Pump \* Watera Peristaltic Pump Bladder Pump  
 Sampling Method: Dedicated Tubing w/ dedicated tubing New Tubing Other: \* Dedicated tubing  
 Flow Rate: 1/2 gallon/min. Pump Depth: 30'

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
1030	20.01	6.78	872	258	4.26	141.2	2.8	cloudy
1035	19.71	6.58	782	236	5.93	147.5	5.6	cloudy
1040	19.90	6.63	761	173	8.11	178.8	8.4	cloudy

Did well dewater? Yes <input type="radio"/> No <input checked="" type="radio"/>	Amount actually evacuated: <u>8.4 gallons</u>
Sampling Time: <u>1045</u>	Sampling Date: <u>9/25/07</u>
Sample I.D.: <u>MW-7</u>	Laboratory: <u>Kiff</u>
Analyzed for: TPH-G BTEX MTBE TPH-D	Other: <u>see COC</u>
Equipment Blank I.D.: @ _____ Time	Duplicate I.D.:

## SPH or Purge Water Drum Log

Client: CRM @ Val Stough

Site Address: 327 34<sup>th</sup> St., Oakland

STATUS OF DRUM(S) UPON ARRIVAL						
Date	9/29/06	12-12-06	3/1/07	6/12/07	9/25/07	
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	2	
Total drum(s) on site:	0	1	2	2	2	
Are the drum(s) properly labeled?		yes	Y	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	N/A	

- 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		9/25/07	
Number of drums empty:			2 <sup>new</sup>			
Number of drum(s) 1/4 full:		1				
Number of drum(s) 1/2 full:	1				1	
Number of drum(s) 3/4 full:			1			
Number of drum(s) full:		1	1	2	2	
Total drum(s) on site:	1	2	2	2	3	
Are the drum(s) properly labeled?	Y	yes	Y	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	1	
Date of inspection:	9/29/06	12-12-06	3/1/07	6/12/07	9/25/07	
Drum(s) labelled properly:	yes	yes	Y	Y	Y	
Logged by BTS Field Tech:	we	BC	ood	TV	SC	
Office reviewed by:	L	A		W	H	

**APPENDIX C**

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



Report Number : 58791

Date : 10/8/2007

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

Subject : 7 Water Samples  
Project Name : 327 34th Street  
Project Number : 070925-SC-1

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 : 58791

Date : 10/8/2007

Project Name : 327 34th Street

Project Number : 070925-SC-1

Sample : MW-1

Matrix : Water

Lab Number : 58791-01

Sample Date :9/25/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
<b>Toluene</b>	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
<b>Ethylbenzene</b>	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
<b>Total Xylenes</b>	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
<b>Methyl-t-butyl ether (MTBE)</b>	1.8	0.50	ug/L	EPA 8260B	10/2/2007
<b>TPH as Gasoline</b>	< 50	50	ug/L	EPA 8260B	10/2/2007
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	10/2/2007
4-Bromofluorobenzene (Surr)	96.6		% Recovery	EPA 8260B	10/2/2007
<b>TPH as Diesel (w/ Silica Gel)</b>	< 50	50	ug/L	M EPA 8015	10/4/2007
<b>TPH as Motor Oil (w/ Silica Gel)</b>	< 100	100	ug/L	M EPA 8015	10/4/2007
Octacosane (Diesel Silica Gel Surr)	97.7		% Recovery	M EPA 8015	10/4/2007

Approved By:

Joel Kiff



Report Number : 58791

Date : 10/8/2007

Project Name : **327 34th Street**

Project Number : **070925-SC-1**

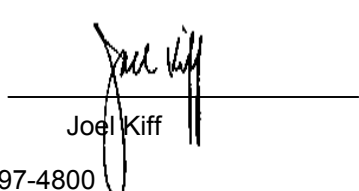
Sample : **MW-2**

Matrix : Water

Lab Number : 58791-02

Sample Date :9/25/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	<b>1400</b>	25	ug/L	EPA 8260B	10/2/2007
<b>Toluene</b>	<b>6500</b>	25	ug/L	EPA 8260B	10/2/2007
<b>Ethylbenzene</b>	<b>1900</b>	25	ug/L	EPA 8260B	10/2/2007
<b>Total Xylenes</b>	<b>13000</b>	25	ug/L	EPA 8260B	10/2/2007
<b>Methyl-t-butyl ether (MTBE)</b>	<b>240</b>	25	ug/L	EPA 8260B	10/2/2007
<b>TPH as Gasoline</b>	<b>68000</b>	2500	ug/L	EPA 8260B	10/2/2007
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	10/2/2007
4-Bromofluorobenzene (Surr)	100		% Recovery	EPA 8260B	10/2/2007
<b>TPH as Diesel (w/ Silica Gel)</b>	<b>&lt; 12000</b>	12000	ug/L	M EPA 8015	10/6/2007
(Note: MRL increased due to interference from Gasoline-range hydrocarbons.)					
<b>TPH as Motor Oil (w/ Silica Gel)</b>	<b>250</b>	100	ug/L	M EPA 8015	10/6/2007
Octacosane (Diesel Silica Gel Surr)	104		% Recovery	M EPA 8015	10/6/2007

Approved By:  Joel Kiff





Report Number : 58791

Date : 10/8/2007

Project Name : 327 34th Street

Project Number : 070925-SC-1


Sample : MW-3

Matrix : Water

Lab Number : 58791-03

Sample Date :9/25/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	<b>2400</b>	15	ug/L	EPA 8260B	10/2/2007
<b>Toluene</b>	<b>5000</b>	15	ug/L	EPA 8260B	10/2/2007
<b>Ethylbenzene</b>	<b>1000</b>	15	ug/L	EPA 8260B	10/2/2007
<b>Total Xylenes</b>	<b>4600</b>	15	ug/L	EPA 8260B	10/2/2007
<b>Methyl-t-butyl ether (MTBE)</b>	<b>220</b>	15	ug/L	EPA 8260B	10/2/2007
<b>TPH as Gasoline</b>	<b>29000</b>	1500	ug/L	EPA 8260B	10/2/2007
Toluene - d8 (Surr)	98.3		% Recovery	EPA 8260B	10/2/2007
4-Bromofluorobenzene (Surr)	98.4		% Recovery	EPA 8260B	10/2/2007
<b>TPH as Diesel (w/ Silica Gel)</b>	<b>&lt; 500</b>	500	ug/L	M EPA 8015	10/5/2007
(Note: MRL increased due to interference from Gasoline-range hydrocarbons.)					
<b>TPH as Motor Oil (w/ Silica Gel)</b>	<b>&lt; 100</b>	100	ug/L	M EPA 8015	10/5/2007
Octacosane (Diesel Silica Gel Surr)	102		% Recovery	M EPA 8015	10/5/2007

Approved By:  Joel Kiff



Report Number : 58791

Date : 10/8/2007

Project Name : **327 34th Street**

Project Number : **070925-SC-1**


Sample : **MW-4**

Matrix : Water

Lab Number : 58791-04

Sample Date :9/25/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	< <b>0.50</b>	0.50	ug/L	EPA 8260B	10/2/2007
<b>Toluene</b>	< <b>0.50</b>	0.50	ug/L	EPA 8260B	10/2/2007
<b>Ethylbenzene</b>	< <b>0.50</b>	0.50	ug/L	EPA 8260B	10/2/2007
<b>Total Xylenes</b>	< <b>0.50</b>	0.50	ug/L	EPA 8260B	10/2/2007
<b>Methyl-t-butyl ether (MTBE)</b>	<b>300</b>	0.50	ug/L	EPA 8260B	10/2/2007
<b>TPH as Gasoline</b>	< <b>50</b>	50	ug/L	EPA 8260B	10/2/2007
Toluene - d8 (Surr)	100		% Recovery	EPA 8260B	10/2/2007
4-Bromofluorobenzene (Surr)	97.6		% Recovery	EPA 8260B	10/2/2007
<b>TPH as Diesel (w/ Silica Gel)</b>	< <b>50</b>	50	ug/L	M EPA 8015	10/5/2007
<b>TPH as Motor Oil (w/ Silica Gel)</b>	< <b>100</b>	100	ug/L	M EPA 8015	10/5/2007
Octacosane (Diesel Silica Gel Surr)	99.8		% Recovery	M EPA 8015	10/5/2007

Approved By:  Joel Kiff



Report Number : 58791

Date : 10/8/2007

Project Name : 327 34th Street

Project Number : 070925-SC-1

Sample : MW-5

Matrix : Water

Lab Number : 58791-05

Sample Date :9/25/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	10/4/2007
<b>Toluene</b>	<b>1.5</b>	0.50	ug/L	EPA 8260B	10/4/2007
<b>Ethylbenzene</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	10/4/2007
<b>Total Xylenes</b>	<b>&lt; 0.50</b>	0.50	ug/L	EPA 8260B	10/4/2007
<b>Methyl-t-butyl ether (MTBE)</b>	<b>0.64</b>	0.50	ug/L	EPA 8260B	10/4/2007
<b>TPH as Gasoline</b>	<b>&lt; 50</b>	50	ug/L	EPA 8260B	10/4/2007
Toluene - d8 (Surr)	99.0		% Recovery	EPA 8260B	10/4/2007
4-Bromofluorobenzene (Surr)	104		% Recovery	EPA 8260B	10/4/2007
<b>TPH as Diesel (w/ Silica Gel)</b>	<b>&lt; 50</b>	50	ug/L	M EPA 8015	10/4/2007
<b>TPH as Motor Oil (w/ Silica Gel)</b>	<b>&lt; 100</b>	100	ug/L	M EPA 8015	10/4/2007
Octacosane (Diesel Silica Gel Surr)	95.4		% Recovery	M EPA 8015	10/4/2007

Approved By: Joel Kiff



Report Number : 58791

Date : 10/8/2007

Project Name : **327 34th Street**

Project Number : **070925-SC-1**

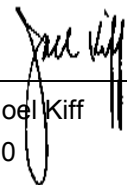
Sample : **MW-6**

Matrix : Water

Lab Number : 58791-06

Sample Date :9/25/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
<b>Toluene</b>	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
<b>Ethylbenzene</b>	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
<b>Total Xylenes</b>	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
<b>Methyl-t-butyl ether (MTBE)</b>	<b>89</b>	0.50	ug/L	EPA 8260B	10/2/2007
<b>TPH as Gasoline</b>	< 50	50	ug/L	EPA 8260B	10/2/2007
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	10/2/2007
4-Bromofluorobenzene (Surr)	97.2		% Recovery	EPA 8260B	10/2/2007
<b>TPH as Diesel (w/ Silica Gel)</b>	< 50	50	ug/L	M EPA 8015	10/4/2007
<b>TPH as Motor Oil (w/ Silica Gel)</b>	< 100	100	ug/L	M EPA 8015	10/4/2007
Octacosane (Diesel Silica Gel Surr)	101		% Recovery	M EPA 8015	10/4/2007

Approved By:  Joel Kiff



Report Number : 58791

Date : 10/8/2007

Project Name : 327 34th Street

Project Number : 070925-SC-1

Sample : MW-7

Matrix : Water

Lab Number : 58791-07

Sample Date :9/25/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
<b>Toluene</b>	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
<b>Ethylbenzene</b>	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
<b>Total Xylenes</b>	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
<b>Methyl-t-butyl ether (MTBE)</b>	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
<b>TPH as Gasoline</b>	< 50	50	ug/L	EPA 8260B	10/2/2007
Toluene - d8 (Surr)	99.8		% Recovery	EPA 8260B	10/2/2007
4-Bromofluorobenzene (Surr)	98.3		% Recovery	EPA 8260B	10/2/2007
<b>TPH as Diesel (w/ Silica Gel)</b>	< 50	50	ug/L	M EPA 8015	10/4/2007
<b>TPH as Motor Oil (w/ Silica Gel)</b>	< 100	100	ug/L	M EPA 8015	10/4/2007
Octacosane (Diesel Silica Gel Surr)	96.8		% Recovery	M EPA 8015	10/4/2007

Approved By:

Joel Kiff

Report Number : 58791

Date : 10/8/2007

**QC Report : Method Blank Data**

Project Name : **327 34th Street**

Project Number : **070925-SC-1**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
TPH as Diesel (w/ Silica Gel)	< 50	50	ug/L	M EPA 8015	10/2/2007
TPH as Motor Oil (w/ Silica Gel)	< 100	100	ug/L	M EPA 8015	10/2/2007
Octacosane (Diesel Silica Gel Surr)	86.8		%	M EPA 8015	10/2/2007
TPH as Diesel (w/ Silica Gel)	< 50	50	ug/L	M EPA 8015	10/5/2007
TPH as Motor Oil (w/ Silica Gel)	< 100	100	ug/L	M EPA 8015	10/5/2007
Octacosane (Diesel Silica Gel Surr)	102		%	M EPA 8015	10/5/2007
Benzene	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
Toluene	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	10/2/2007
Toluene - d8 (Surr)	98.5		%	EPA 8260B	10/2/2007
4-Bromofluorobenzene (Surr)	86.1		%	EPA 8260B	10/2/2007
Benzene	< 0.50	0.50	ug/L	EPA 8260B	10/1/2007
Toluene	< 0.50	0.50	ug/L	EPA 8260B	10/1/2007
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	10/1/2007
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	10/1/2007
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	10/1/2007
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	10/1/2007
Toluene - d8 (Surr)	101		%	EPA 8260B	10/1/2007
4-Bromofluorobenzene (Surr)	96.9		%	EPA 8260B	10/1/2007

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	10/4/2007
Toluene	< 0.50	0.50	ug/L	EPA 8260B	10/4/2007
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	10/4/2007
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	10/4/2007
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	10/4/2007
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	10/4/2007
Toluene - d8 (Surr)	98.6		%	EPA 8260B	10/4/2007
4-Bromofluorobenzene (Surr)	105		%	EPA 8260B	10/4/2007
Benzene	< 0.50	0.50	ug/L	EPA 8260B	10/1/2007
Toluene	< 0.50	0.50	ug/L	EPA 8260B	10/1/2007
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	10/1/2007
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	10/1/2007
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	10/1/2007
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	10/1/2007
Toluene - d8 (Surr)	100		%	EPA 8260B	10/1/2007
4-Bromofluorobenzene (Surr)	98.8		%	EPA 8260B	10/1/2007
Benzene	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
Toluene	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	10/2/2007
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	10/2/2007
Toluene - d8 (Surr)	99.8		%	EPA 8260B	10/2/2007
4-Bromofluorobenzene (Surr)	96.9		%	EPA 8260B	10/2/2007

Approved By:  Joel Kiff

KIFF ANALYTICAL, LLC

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

## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : 327 34th Street

Project Number : 070925-SC-1

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	845	799	ug/L	M EPA 8015	10/2/07	84.5	79.9	5.61	70-130	25
Benzene	58809-03	<0.50	39.9	39.8	41.7	41.0	ug/L	EPA 8260B	10/2/07	104	103	1.44	70-130	25
Toluene	58809-03	<0.50	39.9	39.8	40.9	39.9	ug/L	EPA 8260B	10/2/07	102	100	2.04	70-130	25
Tert-Butanol	58809-03	400	200	199	607	598	ug/L	EPA 8260B	10/2/07	105	100	4.40	70-130	25
Methyl-t-Butyl Ether	58809-03	39	39.9	39.8	74.7	74.6	ug/L	EPA 8260B	10/2/07	89.6	89.7	0.0882	70-130	25
Benzene	58803-02	<0.50	40.0	40.0	40.5	39.3	ug/L	EPA 8260B	10/1/07	101	98.4	2.99	70-130	25
Toluene	58803-02	<0.50	40.0	40.0	40.1	39.4	ug/L	EPA 8260B	10/1/07	100	98.6	1.73	70-130	25
Tert-Butanol	58803-02	26	200	200	236	237	ug/L	EPA 8260B	10/1/07	105	106	0.561	70-130	25
Methyl-t-Butyl Ether	58803-02	<0.50	40.0	40.0	37.1	36.6	ug/L	EPA 8260B	10/1/07	92.8	91.4	1.51	70-130	25
Benzene	58886-01	<0.50	40.0	40.0	41.1	40.2	ug/L	EPA 8260B	10/4/07	103	100	2.26	70-130	25
Toluene	58886-01	<0.50	40.0	40.0	41.2	40.2	ug/L	EPA 8260B	10/4/07	103	101	2.28	70-130	25
Tert-Butanol	58886-01	<5.0	200	200	203	205	ug/L	EPA 8260B	10/4/07	102	102	0.745	70-130	25
Methyl-t-Butyl Ether	58886-01	<0.50	40.0	40.0	39.1	38.9	ug/L	EPA 8260B	10/4/07	97.7	97.2	0.503	70-130	25
Benzene	58803-06	<0.50	40.0	40.0	40.2	37.9	ug/L	EPA 8260B	10/1/07	100	94.7	5.97	70-130	25
Toluene	58803-06	<0.50	40.0	40.0	39.2	36.8	ug/L	EPA 8260B	10/1/07	98.1	91.9	6.48	70-130	25
Tert-Butanol	58803-06	<5.0	200	200	205	208	ug/L	EPA 8260B	10/1/07	102	104	1.25	70-130	25
Methyl-t-Butyl Ether	58803-06	<0.50	40.0	40.0	41.7	38.6	ug/L	EPA 8260B	10/1/07	104	96.5	7.86	70-130	25

Approved By: Joel Kiff



KIFF ANALYTICAL, LLC

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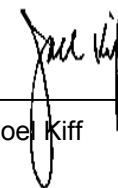
## QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : 327 34th Street

Project Number : 070925-SC-1

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
Benzene	58814-02	33	40.0	40.0	72.1	70.6	ug/L	EPA 8260B	10/2/07	98.2	94.3	4.04	70-130	25
Toluene	58814-02	0.64	40.0	40.0	39.6	39.0	ug/L	EPA 8260B	10/2/07	97.3	95.9	1.49	70-130	25
Tert-Butanol	58814-02	5.2	200	200	207	210	ug/L	EPA 8260B	10/2/07	101	102	1.19	70-130	25
Methyl-t-Butyl Ether	58814-02	<0.50	40.0	40.0	42.2	42.2	ug/L	EPA 8260B	10/2/07	106	105	0.0189	70-130	25
TPH-D (Si Gel)	Blank	<50	1000	1000	755	800	ug/L	M EPA 8015	10/5/07	75.5	80.0	5.71	70-130	25

Approved By: Joel Kiff



KIFF ANALYTICAL, LLC

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



**QC Report : Laboratory Control Sample (LCS)**Project Name : **327 34th Street**Project Number : **070925-SC-1**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	40.0	ug/L	EPA 8260B	10/2/07	103	70-130
Toluene	40.0	ug/L	EPA 8260B	10/2/07	101	70-130
Tert-Butanol	200	ug/L	EPA 8260B	10/2/07	104	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	10/2/07	91.6	70-130
Benzene	40.0	ug/L	EPA 8260B	10/1/07	98.9	70-130
Toluene	40.0	ug/L	EPA 8260B	10/1/07	99.5	70-130
Tert-Butanol	200	ug/L	EPA 8260B	10/1/07	98.4	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	10/1/07	90.1	70-130
Benzene	40.0	ug/L	EPA 8260B	10/4/07	104	70-130
Toluene	40.0	ug/L	EPA 8260B	10/4/07	106	70-130
Tert-Butanol	200	ug/L	EPA 8260B	10/4/07	104	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	10/4/07	103	70-130
Benzene	40.0	ug/L	EPA 8260B	10/1/07	99.5	70-130
Toluene	40.0	ug/L	EPA 8260B	10/1/07	97.3	70-130
Tert-Butanol	200	ug/L	EPA 8260B	10/1/07	103	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	10/1/07	97.7	70-130
Benzene	40.0	ug/L	EPA 8260B	10/2/07	99.8	70-130

KIFF ANALYTICAL, LLC

Approved By:


  
 Joel Kiff

Report Number : 58791

Date : 10/8/2007

**QC Report : Laboratory Control Sample (LCS)**

Project Name : **327 34th Street**

Project Number : **070925-SC-1**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Toluene	40.0	ug/L	EPA 8260B	10/2/07	97.6	70-130
Tert-Butanol	200	ug/L	EPA 8260B	10/2/07	101	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	10/2/07	102	70-130

KIFF ANALYTICAL, LLC

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

Approved By:

Joel Kiff



# BLAINE

TECH SERVICES, INC.

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

58791

## CONDUCT ANALYSIS TO DETECT

LAB KIFF DHS #  
 ALL ANALYSES MUST MEET SPECIFICATIONS AND DETECTION LIMITS SET BY CALIFORNIA DHS AND  
 EPA  RWQCB REGION  
 LIA  
 OTHER

CHAIN OF CUSTODY  
 BTS # 070925-SC-1

CLIENT LRM Consulting, Inc.  
 SITE 327 34th Street  
 Oakland, CA

C = COMPOSITE ALL CONTAINERS

SAMPLE I.D.	DATE	TIME	MATRIX	CONTAINERS
			S=SOIL W=H <sub>2</sub> O	TOTAL

SAMPLE I.D.	DATE	TIME	S=SOIL W=H <sub>2</sub> O	TOTAL	C = COMPOSITE ALL CONTAINERS	TPH-Gas / BTEX (8260)	MTBE (8260)	TEPH (Diesel & Motor Oil) * 8015M									ADD'L INFORMATION	STATUS	CONDITION	LAB SAMPLE #
M4-1	9/25/07	1250	W	6		X	X	X												01
M4-2		1425		1		X	X	X												02
M4-3		1505				X	X	X												03
M4-4		1325				X	X	X												04
M4-5		1535				X	X	X												05
M4-6		1130				X	X	X												06
M4-7	9/25/07	1045	W	1		X	X	X												07

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

\* Silica Gel Cleanup Required

ADD'L INFORMATION	STATUS	CONDITION	LAB SAMPLE #
			01
			02
			03
			04
			05
			06
			07

**SAMPLE RECEIPT**  
 Temp °C 32.0 Therm. ID# 12-5  
 Initial RM Date 092807  
 Time 1700 Coolant present?  Yes /  No

SAMPLING COMPLETED	DATE	TIME	SAMPLING PERFORMED BY	RESULTS NEEDED	
	9/25/07	1630	S. Chase	NO LATER THAN Standard TAT	
RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
<i>[Signature]</i>	9/25/07	1745	<i>[Signature] (Sample Custodian)</i>	9/25/07	1745
RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
<i>[Signature]</i>	9/28/07	1045	<i>[Signature]</i>		
RELEASED BY	DATE	TIME	RECEIVED BY	DATE	TIME
			Rozmese Kiff Analytical	092807	1045
SHIPPED VIA	DATE SENT	TIME SENT	COOLER #		