

# CLEARWATER

G R O U P

Environmental Services

RC96

March 31, 2004

Mr. Amir Gholami  
Hazardous Materials Specialist  
Alameda County Environmental Health Services  
Environmental Protection Division  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502-6577

**Re: Groundwater Monitoring Report, First Quarter 2004**  
Eagle Gas Station  
4301 San Leandro Street  
Oakland, California 94601  
LOP Site ID# 2118  
**Clearwater Project No. ZP046B**  
USTCF Claim No. 014551

Dear Mr. Gholami:

The Clearwater Group (Clearwater) has prepared the following letter report of first quarter 2004 groundwater monitoring activities at the above referenced site. Groundwater monitoring was requested by the Alameda County Department of Environmental Health (ACDEH) in a letter dated October 18, 2001.

## Site Description

The site is located in the southern portion of Oakland, Alameda County, California at the south corner of San Leandro Street and High Street, approximately 1,000 feet east of Interstate Highway 880. The site is bounded by commercial property to the southeast, southwest and northwest and by the Bay Area Rapid Transit (BART) tracks to the northeast (**Figure 1**.) The site is underlain predominantly by clays with some clayey gravel and clayey sand at depths to approximately 10 feet below ground surface (bgs), and silty sand below 20 feet in some areas.

## Background

On April 21 and 22, 1999, Clearwater, (formerly Artesian Environmental), oversaw the removal from the site of five underground storage tanks (UST) consisting of two 6,000-gallon gasoline USTs, two 4,000-gallon diesel USTs and one 300-gallon used oil UST (Figure 2.) Field observations included detection of strong petroleum odors from soils near the former UST locations. A total of five-confirmation soil samples and three groundwater samples were collected from the UST excavations. Laboratory analysis confirmed an unauthorized release of petroleum had occurred.

In a letter dated May 10, 1999, the ACDEH recommended that soil be remediated by over-excavation and that "as much groundwater as possible" be pumped from the excavation. Approximately 800 tons of petroleum-impacted soil was excavated and disposed of as Class II non-hazardous waste. Less than 1,000 gallons of petroleum-impacted groundwater was pumped and removed from the excavation. Groundwater did not recharge after the initial pumping. Existing on- and off-site structures limited the amount of soil that could be safely excavated. Soil samples collected from the excavation walls and product piping trenches indicated some remaining petroleum and methyl tertiary butyl ether (MTBE) contamination.

On August 4 and 5, 1999, approximately 100 linear feet of product piping was removed. Vent piping from between the former USTs and the south corner of the on-site building was also removed. All piping was cut up and disposed of as scrap metal. On August 5, 1999, confirmation soil samples were collected along the piping trench. Six samples were collected from approximately three feet bgs. An additional four samples were collected, one for each of the four former fuel dispensers. Laboratory analytical results indicated the presence of hydrocarbon related contamination along the piping trenches.

On September 26, 2000 West Hazmat of Rancho Cordova, California, used a CME 75 drill rig to advance three borings to approximately 25 feet bgs (Figure 2), and collect soil samples. Each of the three borings was converted to a groundwater monitoring well using clean, flush-threaded, 2-inch diameter polyvinyl chloride (PVC) well materials (**Table 1**). Soil sample analytical results are included as **Table 2**. On October 3 and 10, 2000, Clearwater surveyed the top of the casing elevations for each of the wells relative to an arbitrary datum, and developed the wells for monitoring. Initial groundwater samples collected from these wells contained 83,000 micrograms per liter ( $\mu\text{g/L}$ ) to 250,000  $\mu\text{g/L}$  total petroleum hydrocarbons as gasoline, (TPHg), and 33,000  $\mu\text{g/L}$  to 400,000  $\mu\text{g/L}$  MTBE (**Table 3**.)

On August 3, 2001 Clearwater submitted its *Groundwater Monitoring Report, Second Quarter 2001, Sensitive Receptor Survey and Workplan for Continuing Investigation*. It was determined at that time that there are no major ecological receptors, permanent surface waters or domestic-use wells within a 2,000-foot radius of the site. The proposed scope of the workplan included the installation of eight groundwater-monitoring wells around the site to delineate the water-borne MTBE plume. In response to Clearwater's workplan, the ACDEH, in correspondence dated October 18, 2001, recommended that off-site monitoring wells not be installed for the time being. Instead, the ACDEH requested that further characterization of subsurface soils and groundwater on-site be completed prior to the installation of any off-site wells.

### **Groundwater Monitoring Activities**

#### Groundwater Gauging and Sampling

On February 13, 2004 all three wells were monitored. An electronic water level indicator accurate to within  $\pm 0.01$  feet was used to gauge depth to water. All wells were checked for the presence of Separate Phase Hydrocarbons (SPH) prior to purging. SPH were not found in any well. The wells were purged of groundwater until measurements of temperature, pH and conductivity stabilized, which occurred by approximately three



wetted casing volumes. Depth to water and well purging information was recorded on Gauging Data/Purge Calculations and Purging Data sheets (**Attachment 1.**) All work was performed in accordance with Clearwater's Groundwater Monitoring and Sampling Field Procedures (**Attachment 2.**)

Purging devices were decontaminated between wells in an Alconox® wash followed by double rinsing in clean tap water to prevent cross-contamination. Purge water and rinseate were contained in labeled 55-gallons drums and removed from the site for future disposal.

Following recovery of water levels to at least 80% of their static levels, groundwater samples were collected from the monitoring wells using disposable polyethylene bailers. Samples were labeled, documented on a chain-of-custody form, and placed on ice in a cooler for transport to the project laboratory.

#### Laboratory Analysis

Groundwater samples were analyzed by Kiff Analytical LLC, a California Department of Health Services certified laboratory, located in Davis, California. Analyses were conducted by EPA Method 8260B for TPHg, for benzene, toluene, ethylbenzene, and xylenes (BTEX), and for the oxygenates MTBE, di-isopropyl ether (DIPE), ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME), and tertiary butyl alcohol (TBA). Analyses for total petroleum hydrocarbons as diesel (TPHd) were conducted by EPA Method 8015M. Complete laboratory analytical reports including chain-of-custody forms are included in **Attachment 3.**

### **Groundwater Monitoring Results**

#### Groundwater Elevation and Flow

Depths to water ranged from approximately 8.80 (MW-1) to 13.88 (MW-2) feet bgs (Table 3.) Depth to water data combined with arbitrary well elevation data were used to

generate a groundwater elevation map (**Figure 3.**) During this monitoring event, groundwater flow was found to be toward the east at a gradient of 0.037. Groundwater flow direction and gradient are generally consistent with observations from the previous groundwater-monitoring event.

#### Groundwater Sample Analytical Results

Diesel-range hydrocarbons were detected in samples collected from all three groundwater-monitoring wells. Concentrations of TPHd ranged from 430 µg/L (MW-3) to 1,800 µg/L (MW-1). MTBE was detected in samples collected from all three monitoring wells in concentrations ranging from 85,000 µg/L (MW-1) to 710,000 µg/L (MW-2). Detections of TAME were reported this quarter in all three wells with concentrations ranging from 390 µg/L (MW-1) to 2,000 µg/L (MW-2). Laboratory detection limits were elevated in the all of the samples analyzed for TPHg, BTEX, ETBE, DIPE and TBA due to the interference from high concentrations of MTBE.. Though the reporting limit for TBA had been increased, samples collected from MW-1 contained reportable concentrations of TBA at a concentration of 79,000 µg/L. Samples collected from MW-2 contained reportable concentrations of benzene (860 µg/L) and ethylbenzene (260 µg/L). The samples collected from MW-3 contained a reportable concentration of benzene at 280 µg/L **Figure 4.** Laboratory analytical results are summarized in **Table 3**

#### **Conclusions and Recommendations**

The results of the recent groundwater-monitoring event confirm the presence of elevated concentrations of petroleum related hydrocarbons in the groundwater beneath the site. Concentrations of MTBE in the water samples collected from all wells have increased since the last monitoring event. Previous investigations have indicated that some contaminated soil may remain underneath existing structures. To date, the extent of the dissolved-phase contaminant plume remains undefined. Clearwater recommends that further subsurface investigations be conducted both on- and off-site in order to



characterize and delineate the extent of the water-borne contaminant plume. Monitoring of the existing wells should continue throughout the investigative process.

**Attachments**

- Figure 1: Site Location Map
- Figure 2: Site Plan
- Figure 3: Groundwater Elevation Map - 2/13/04
- Figure 4: Dissolved Hydrocarbon Map – 2/13/04
- Table 1: Well Construction Data
- Table 2: Soil Sample Analytical Data
- Table 3: Groundwater Elevation and Analytic Data
- Attachment 1: Well Gauging Data/Purge Calculations, Purging Data
- Attachment 2: Groundwater Monitoring and Sampling Field Procedures
- Attachment 3: Laboratory Analytical Reports and Chain-of-Custody Form

Cc: Mr. Muhammad Jamil  
40092 Davis Street  
Fremont, CA 94538

San Francisco Bay Regional  
Water Quality Control Board  
1515 Clay Street, Suite 1400  
Oakland, CA 94612

**Certification**

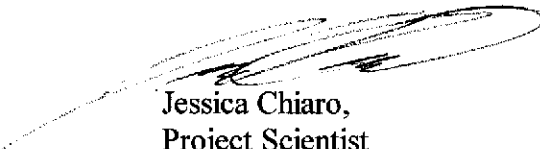
This report was prepared under the supervision of a professional Registered Geologist in the State of California. All statements, conclusions and recommendations are based solely upon published results from previous consultants, field observations by Clearwater and laboratory analyses performed by a State of California certified laboratory related to the work performed by Clearwater.

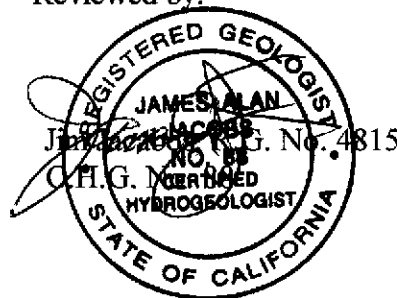
Information and interpretation presented herein are for the sole use of the client and regulating agency. The information and interpretation contained in this document should not be relied upon by a third party.

The service provided by Clearwater has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of this profession currently practicing under similar conditions in the area of the site. No other warranty, expressed or implied, is made.

Prepared by:

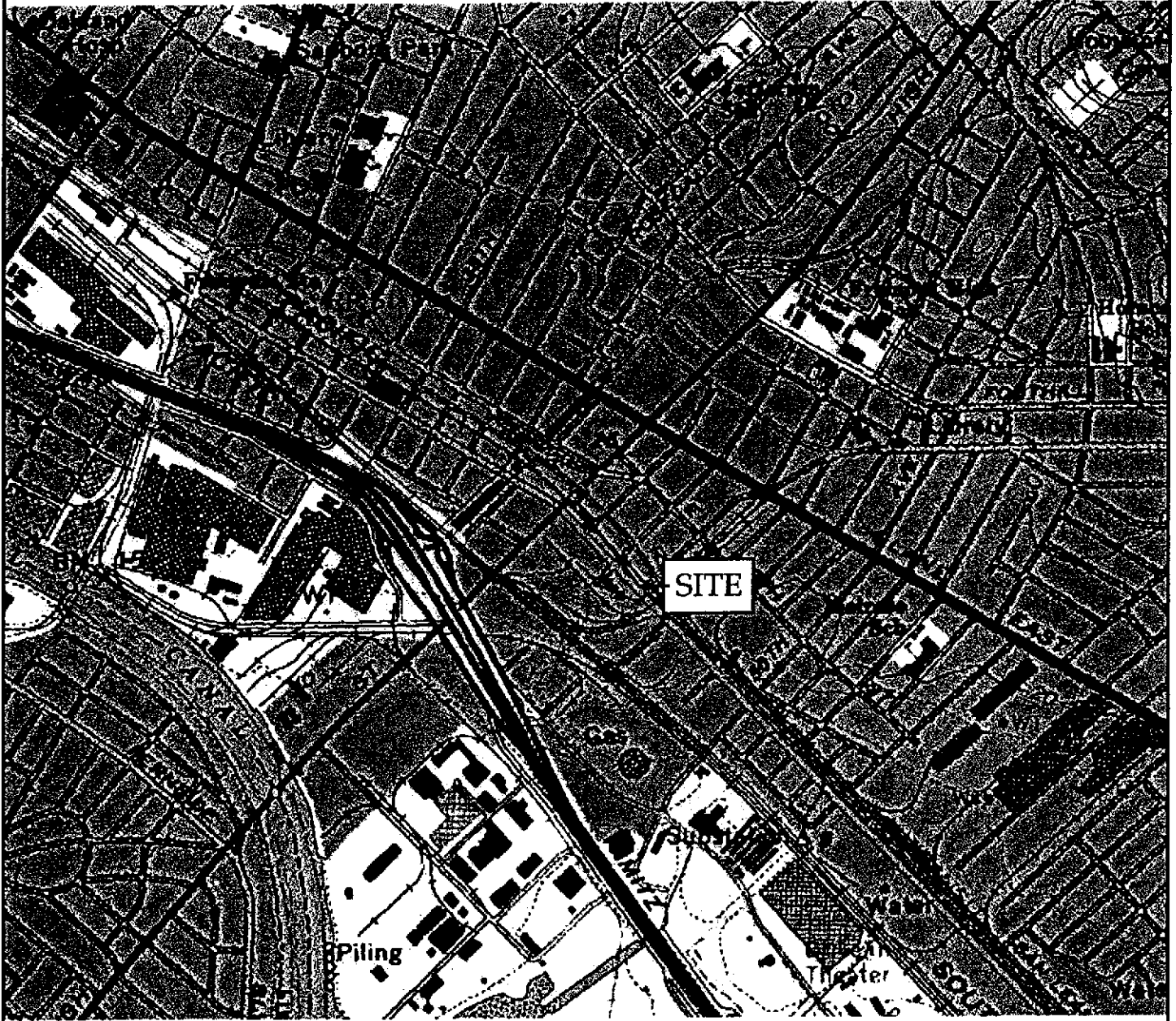
Reviewed by:

  
Jessica Chiaro,  
Project Scientist

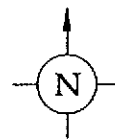


# FIGURES





NOT TO SCALE



**SITE LOCATION MAP**  
Eagle Gas  
4301 San Leandro Street  
Oakland, California

**CLEARWATER GROUP**

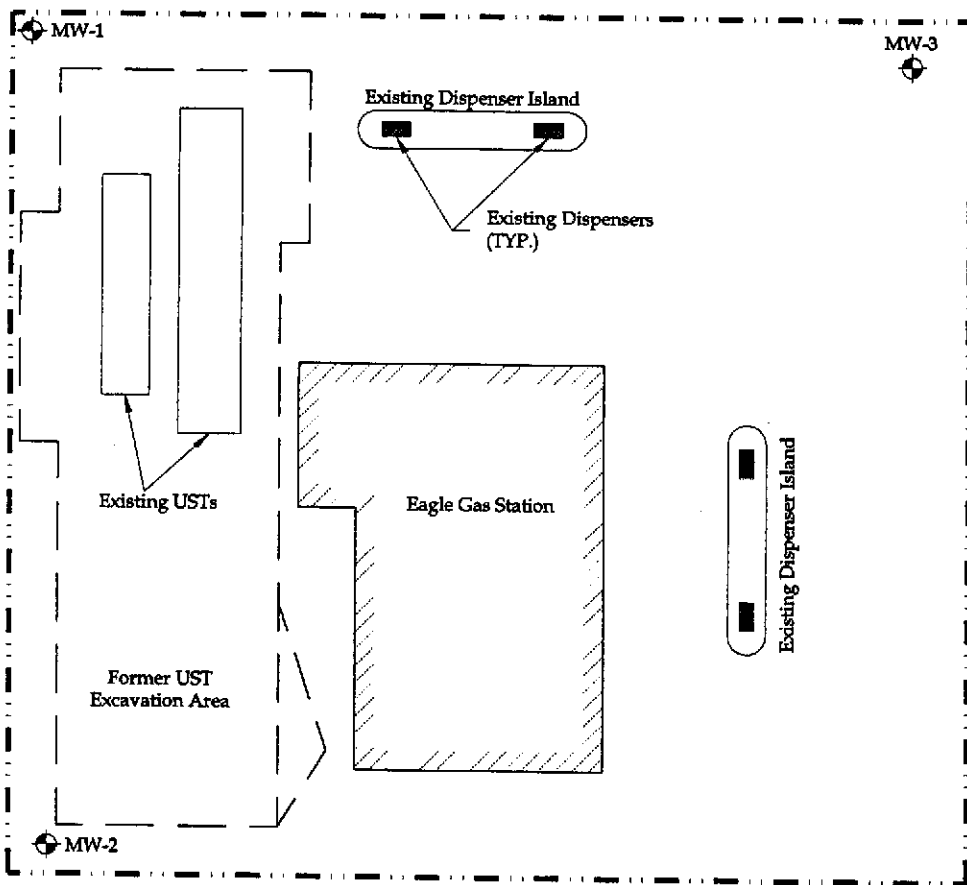
Project No.  
ZP046B

Figure Date  
1/04

Figure  
1

HIGH STREET

Public Sidewalk



Adjacent Commercial Structure

Existing USTs

Former UST Excavation Area

Eagle Gas Station

Existing Dispenser Island

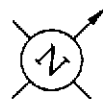
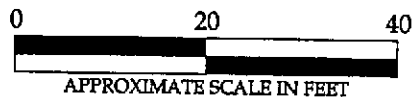
Existing Dispensers (TYP.)

Existing Dispenser Island

Public Sidewalk

SAN LEANDRO STREET

Adjacent Commercial Structure



**LEGEND**

- - - - - PROPERTY LINE
- ⊕ MW-1 MONITORING WELL

**SITE MAP**  
Eagle Gas  
4301 San Leandro Street  
Oakland, California

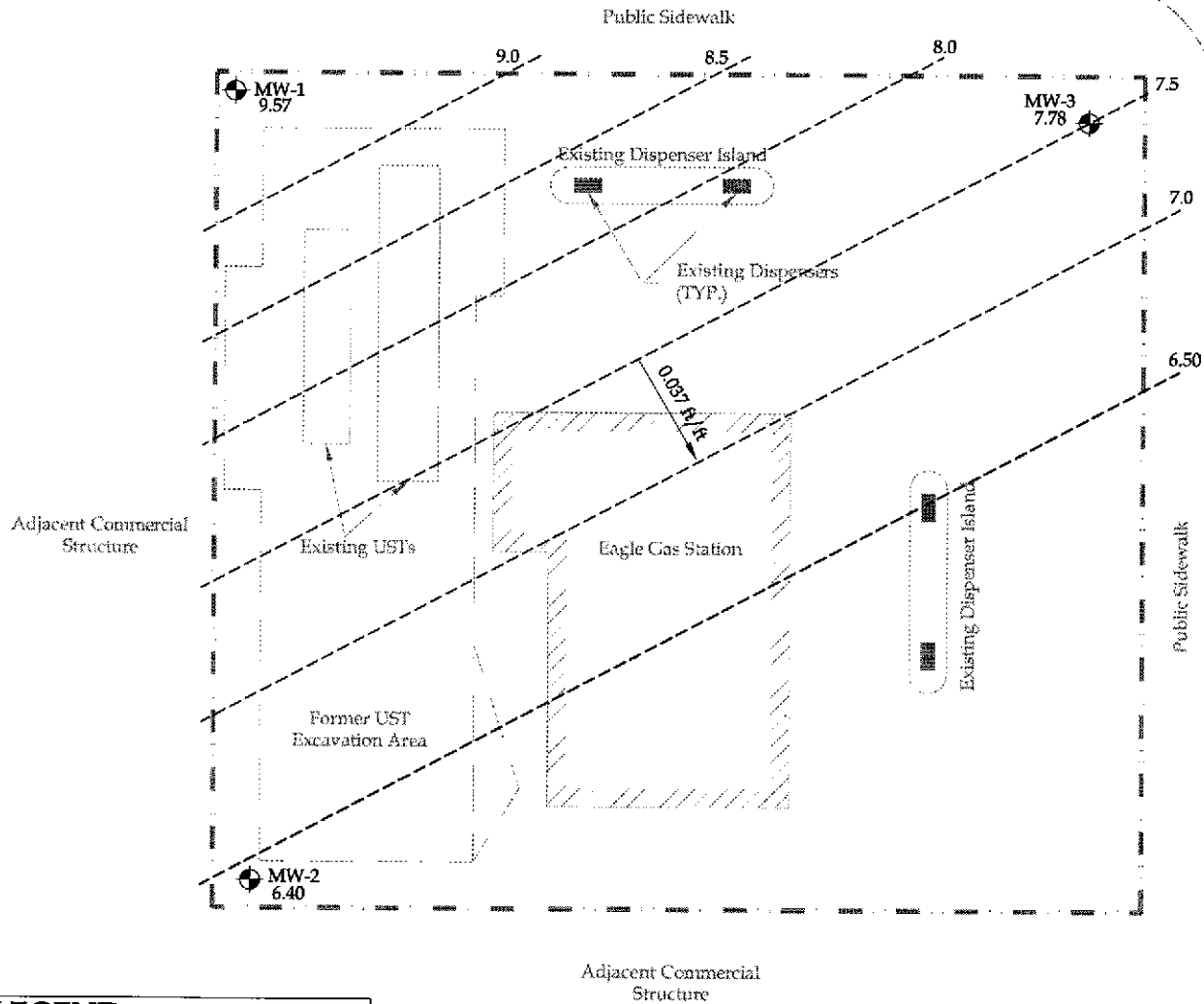
**CLEARWATER GROUP**

Project No.  
ZP046B

Figure Date  
4/01

Figure  
2

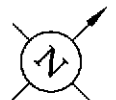
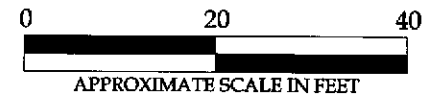
**HIGH STREET**



**SAN LEANDRO STREET**

**LEGEND**

- 0.037 ft/ft APPROX. GROUNDWATER FLOW DIRECTION & GRADIENT
- 6.5 GROUNDWATER ELEVATION CONTOUR (HEIGHT IN FEET ABOVE MSL)
- PROPERTY LINE
- MW-1 MONITORING WELL



**GROUNDWATER ELEVATION MAP**

Eagle Gas  
4301 San Leandro Street  
Oakland, California

**CLEARWATER GROUP**

Project No.  
**ZP046B**

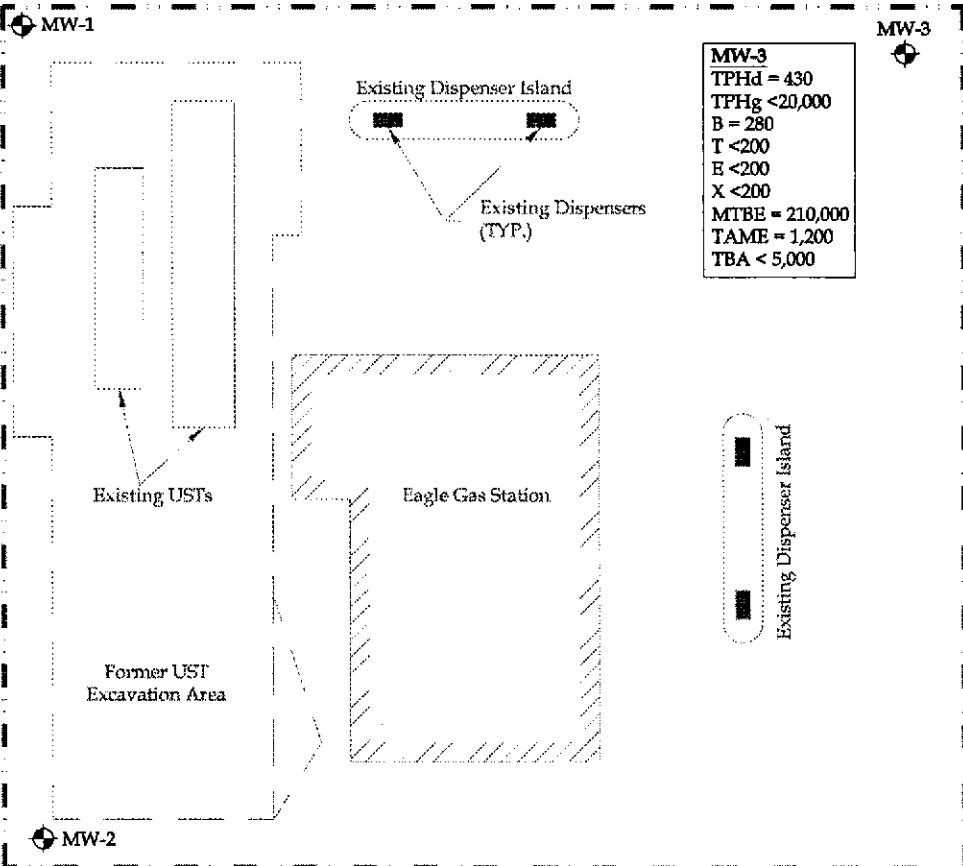
Figure Date  
**3/04**

Figure  
**3**

HIGH STREET

Public Sidewalk

**MW-1**  
 TPHd = 1,800  
 TPHg <10,000  
 B < 100  
 T <100  
 E <100  
 X <100  
 MTBE = 85,000  
 TAME = 390  
 TBA = 79,000



**MW-3**  
 TPHd = 430  
 TPHg <20,000  
 B = 280  
 T <200  
 E <200  
 X <200  
 MTBE = 210,000  
 TAME = 1,200  
 TBA < 5,000

Adjacent Commercial Structure

Existing USTs

Eagle Gas Station

Former UST Excavation Area

Existing Dispenser Island

Public Sidewalk

SAN LEANDRO STREET

**MW-2**  
 TPHd = 1,200  
 TPHg <20,000  
 B = 860  
 T <200  
 E = 260  
 X <200  
 MTBE = 710,000  
 TAME = 2,000  
 TBA < 25,000

MW-2

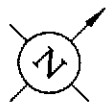
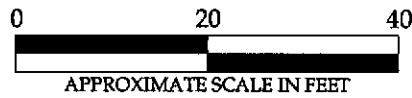
Adjacent Commercial Structure

**LEGEND**

**MW-1**  
 TPHd = 1,800  
 TPHg <10,000  
 B < 100  
 T <100  
 E <100  
 X <100  
 MTBE = 85,000  
 TAME = 390  
 TBA = 79,000

CONCENTRATIONS OF: TOTAL PETROLEUM HYDROCARBONS AS DESEL (TPHd), HYDROCARBONS AS GASOLINE (TPHg), BENZENE (B), TOULENE (T), ETHYLBENZENE (E), TOTAL XYLENES (X), AND METHYL TERT-BUTYL ETHER (MTBE), TERT AMYL METHYL ETHER (TAME), TERTIARY BUTYL ALCOHOL (TBA). ALL CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER (µg/L)

--- PROPERTY LINE  
 ⊕ MW-1 MONITORING WELL



**DISSOLVED HYDROCARBON MAP**

Eagle Gas  
 4301 San Leandro Street  
 Oakland, California

**CLEARWATER GROUP**

Project No.  
 ZP046B

Figure Date  
 3/04

Figure  
 4

# TABLES

**Table 1**  
**WELL CONSTRUCTION DATA**  
**Eagle Gas**  
 4301 San Leandro Street  
 Oakland, California  
 Clearwater Group Project No. ZP046A

Well I.D.	Date Intstalled	Borehole Diameter (inches)	Depth of Borehole (feet)	Casing Diameter (inches)	Screened Interval (feet)	Filter Pack (feet)	Bentonite Seal (feet)	Cement (feet)
MW-1	9/26/2000	8	25	2	10-25	6-25	3-6	0-3
MW-2	9/26/2000	8	25	2	10-25	6-25	3-6	0-3
MW-3	9/26/2000	8	25	2	10-25	6-25	3-6	0-3

TABLE 2  
 SOIL SAMPLE ANALYTICAL RESULTS  
 Eagle Gas  
 4301 San Leandro Street  
 Oakland, California  
 Clearwater Group Project No. ZP046B

Sample ID	Sample Date	TPHd mg/Kg	TPHg mg/Kg	B mg/Kg	T mg/Kg	E mg/Kg	X mg/Kg	MTBE mg/Kg	EDB mg/Kg	1,2-DCA mg/Kg	DIPE mg/Kg	ETBE mg/Kg	TAME mg/Kg	TBA mg/Kg
CS1-7	4/21/1999	840	770	8.9	4.8	5.8	16	86	---	---	---	---	---	---
CS2-7	4/21/1999	1900	880	3.3	5.7	15	45	16	---	---	---	---	---	---
CS3-7	4/22/1999	780	1600	4.3	110	42	220	92	---	---	---	---	---	---
CS5-6.5	4/22/1999	33	20	0.22	1.8	0.54	3	52	---	---	---	---	---	---
Stockpile 1	4/22/1999	770	610	0.28	4.7	6.9	36	ND	---	---	---	---	---	---
stockpile 2	4/22/1999	670	480	0.23	2.3	3.9	18	ND	---	---	---	---	---	---
CS4-13	4/22/2000	ND	ND	ND	ND	ND	ND	0.08	---	---	---	---	---	---
CS6-3	8/5/1999	1300	4300	11	130	82	420	70	---	---	---	---	---	---
CS7-3	8/5/1999	200	50	ND	2.4	0.85	4	14	---	---	---	---	---	---
CS8-3	8/5/1999	3400	250	0.32	0.72	0.81	1	3.8	---	---	---	---	---	---
CS9-3	8/5/1999	1900	380	ND	ND	ND	ND	9.5	---	---	---	---	---	---
CS10-3	8/5/1999	350	930	ND	78	17	99	310	---	---	---	---	---	---
CS11-3	8/5/1999	5200	1400	3.2	13	25	90	62	---	---	---	---	---	---
MW1-10'bgs	9/26/2000	87	310	0.062	0.022	1.3	3.4	6.9	ND	ND	ND	ND	0.019	2.9
MW2-10'bgs	9/26/2000	210	630	0.053	0.052	2	14	1.00	ND	ND	ND	ND	ND	3.5
MW3-10'bgs	9/26/2000	ND	32	ND	ND	ND	ND	4.5	ND	ND	ND	ND	0.043	0.58

TABLE 2  
 SOIL SAMPLE ANALYTICAL RESULTS  
 Eagle Gas  
 4301 San Leandro Street  
 Oakland, California  
 Clearwater Group Project No. ZP046B

Sample ID	Sample Date	TPHd mg/Kg	TPHg mg/Kg	B mg/Kg	T mg/Kg	E mg/Kg	X mg/Kg	MTBE mg/Kg	EDB mg/Kg	1,2-DCA mg/Kg	DIPE mg/Kg	ETBE mg/Kg	TAME mg/Kg	TBA mg/Kg
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**NOTES:**

- TPHd Total petroleum hydrocarbons as diesel by EPA Method 8015 (modified)
- TPHg Total petroleum hydrocarbons as gasoline by EPA Method 8260B
- BTEX Benzene, toluene, ethylbenzene, total xylenes by EPA Method 8260B
- MTBE Methyl tertiary butyl ether by EPA Method 8260B
- DIPE Di-isopropyl ether by EPA Method 8260B
- ETBE Ethyl tertiary butyl ether by EPA Method 8260B
- TAME Tertiary amyl methyl ether by EPA Method 8260B
- 1,2-DCA 1,2-Dichloroethane by EPA Method 8260B
- EDB Ethylene dibromide by EPA Method 8260B
- TBA Tertiary butyl alcohol by EPA Method 8260B
- mg/Kg milligrams per kilogram
- no samples collected, no data available
- ND Not detected in concentrations above laboratory reporting limit



TABLE 3  
GROUNDWATER ELEVATIONS AND SAMPLE ANALYTICAL RESULTS  
Eagle Gas  
4301 San Leandro Street  
Oakland, California  
Clearwater Group Project No. ZP046B

Sample ID	Sample Date	TOC (feet)	DTW (feet)	GWE (feet)	TPHd (µg/L)	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	TBA (µg/L)
MW-1	10/3/2000	18.37	8.96	9.41	460	93,000	<500	<500	<500	<500	130,000	<10,000	<10,000	<10,000	<2,000
	10/27/2000	18.37	7.27	11.1	---	---	---	---	---	---	---	---	---	---	---
	1/26/2001	18.37	7.60	10.77	1,600*	51,000	270	<100	<100	<100	77,000	<5,000	<5,000	<5,000	<20,000
	5/8/2001	18.37	7.50	10.87	470*	36,000*	<100	<100	<100	<100	15,000	<5,000	<5,000	<5,000	<20,000
	8/3/2001	18.37	7.09	11.28	2,200*	19,000*	<50	59	<50	<50	96,000	<5,000	<5,000	<5,000	<20,000
	7/1/2003	18.37	7.59	10.78	3,000	<25,000	<250	<250	<250	<250	170,000	<250	<250	980	8700
	10/1/2003	18.37	8.36	10.01	2,600	<20,000	<200	<200	<200	<200	69,000	<200	<200	270	15,000
	2/13/2004	18.37	8.80	9.57	1,800	<10,000	<100	<100	<100	<100	85,000	<100	<100	390	79,000
MW-2	10/3/2000	20.28	20.26	0.02	210	250,000	<1,250	<1,250	<1,250	<1,250	400,000	<25,000	<25,000	<25,000	<100,000
	10/27/2000	20.28	13.88	6.40	---	---	---	---	---	---	---	---	---	---	---
	1/26/2001	20.28	12.10	8.18	6,000*	740,000	3,800	<500	940	1,600	1,000,000	<50,000	<50,000	<50,000	<200,000
	5/8/2001	20.28	12.05	8.23	2,100*	140,000	2,800	<250	780	640	840,000	<50,000	<50,000	<50,000	<200,000
	8/3/2001	20.28	13.30	6.98	2,600*	42,000*	1,100	63	230	130	880,000	<25,000	<25,000	<25,000	<100,000
	7/1/2003	20.28	14.98	5.30	2,200	<200,000	<2,000	<2,000	<2,000	<2,000	790,000	<2,000	<2,000	3,400	<20,000
	10/1/2003	20.28	15.99	4.29	870	<100,000	<1,000	<1,000	<1,000	<1,000	620,000	<1,000	<1,000	2,700	<20,000
	2/13/2004	20.28	13.88	6.40	1200	<20,000	860	<200	260	<200	710,000	<200	<200	2,000	<25,000
MW-3	10/3/2000	18.98	---	---	120	8,300	<500	<500	<500	<500	33,000	<2,500	<2,500	<2,500	<10,000
	10/27/2000	18.98	18.75	0.23	---	---	---	---	---	---	---	---	---	---	---
	1/26/2001	18.98	13.38	5.60	900*	230,000	930	<500	<500	<500	330,000	<25,000	<25,000	<25,000	<100,000
	5/8/2001	18.98	11.82	7.16	1,100*	95,000	840	<250	<250	<250	390,000	<12,500	<12,500	<12,500	<50,000
	8/3/2001	18.98	13.44	5.54	290*	30,000*	<50	51	<50	<50	270,000	<12,500	<12,500	<12,500	<50,000
	7/1/2003	18.98	12.67	6.31	620	<50,000	<500	<500	<500	<500	230,000	<500	<500	1,800	<5,000
	10/1/2003	18.98	14.04	4.94	370	<20,000	<200	<200	<200	<200	120,000	<200	<200	1,200	<5,000
	2/13/2004	19.98	12.20	7.78	430	<20,000	280	<200	<200	<200	210,000	<200	<200	1,200	<5000

TABLE 3  
GROUNDWATER ELEVATIONS AND SAMPLE ANALYTICAL RESULTS  
Eagle Gas  
4301 San Leandro Street  
Oakland, California  
Clearwater Group Project No. ZP046B

Sample ID	Sample Date	TOC (feet)	DTW (feet)	GWE (feet)	TPHd (µg/L)	TPHg (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)	DIPE (µg/L)	ETBE (µg/L)	TAME (µg/L)	TBA (µg/L)
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**NOTES:**

- TOC Top of well casing referenced to arbitrary datum
- DTW Depth to water
- GWE Groundwater elevation
- TPHd Total petroleum hydrocarbons as diesel by EPA Method 8015 (modified)
- TPHg Total petroleum hydrocarbons as gasoline by EPA Method 8260B
- BTEX Benzene, toluene, ethylbenzene, total xylenes by EPA Method 8260B
- MTBE Methyl tertiary butyl ether by EPA Method 8260B
- DIPE Di-isopropyl ether by EPA Method 8260B
- ETBE Ethyl tertiary butyl ether by EPA Method 8260B
- TAME Tertiary amyl methyl ether by EPA Method 8260B
- TBA Tertiary butyl alcohol by EPA Method 8260B
- (µg/L) Micrograms per liter
- <# Not detected in concentrations above laboratory reporting limit
- no samples collected, no data available
- \* Laboratory note: "Results within quantitation range; chromatographic pattern not typical of fuel"

**ATTACHMENT 1**



PURGING DATA

SHEET 1 OF 1

Job No: ZP0468 Location: Oakland, CA Date: 2-13-04 Tech: EA

WELL No.	TIME	VOLUME (gal.)	COND. (mS/cm)	TEMP. (deg. F.)	pH	
MW-1	10:25	3	1106	62.7	6.83	Sample for: 11:30
Calc. purge volume 7.53	10:30	3	1114	62.4	6.99	TPHg <input checked="" type="checkbox"/> TPHd <input checked="" type="checkbox"/> 8010
	10:36	1.53	1135	62.4	7.27	BTEX <input checked="" type="checkbox"/> Other <u>Sax</u>
						Purging Method: <u>PVC bailer / Pump</u>
COMMENTS: color, turbidity, recharge, sheen						Sampling Method:
<u>gray, low, OK - sheen/odor</u>						Dedicated <input checked="" type="checkbox"/> Disposable bailer

WELL No.	TIME	VOLUME (gal.)	COND. (mS/cm)	TEMP. (deg. F.)	pH	
MW-3	10:42	2	871	65.4	7.33	Sample for: 11:45
Calc. purge volume 5.19	10:47	2	884	66.1	7.08	TPHg <input checked="" type="checkbox"/> TPHd <input checked="" type="checkbox"/> 8010
	10:55	1.19	890	65.8	7.13	BTEX <input checked="" type="checkbox"/> Other <u>Sax</u>
						Purging Method: <u>PVC bailer / Pump</u>
COMMENTS: color, turbidity, recharge, sheen						Sampling Method:
<u>grayish, low, OK odor</u>						Dedicated <input checked="" type="checkbox"/> Disposable bailer

WELL No.	TIME	VOLUME (gal.)	COND. (mS/cm)	TEMP. (deg. F.)	pH	
MW-2	11:03	2	1153	61.3	7.18	Sample for: 12:00
Calc. purge volume 5.19	11:08	2	1169	62.4	7.01	TPHg <input checked="" type="checkbox"/> TPHd <input checked="" type="checkbox"/> 8010
	11:13	1.19	1167	63.2	6.98	BTEX <input checked="" type="checkbox"/> Other <u>Sax</u>
						Purging Method: <u>PVC bailer / Pump</u>
COMMENTS: color, turbidity, recharge, sheen						Sampling Method:
<u>gray, mild, poor, slight sheen odor</u>						Dedicated <input checked="" type="checkbox"/> Disposable bailer

**ATTACHMENT 2**

## CLEARWATER GROUP

### Groundwater Monitoring and Sampling Field Procedures

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#### Groundwater Monitoring

Prior to beginning, a decontamination area is established. Decontamination procedures consist of scrubbing downhole equipment in an Alconox® solution wash (wash solution is pumped through any purging pumps used), and rinsing in a first rinse of potable water and a second rinse of potable water or deionized water if the latter is required. Any non-dedicated downhole equipment is decontaminated prior to use.

Prior to purging and sampling a well, the static water level is measured to the nearest 0.01 feet with an electronic water sounder. Depth to bottom is typically measured once per year, at the request of the project manager, and during Clearwater's first visit to a site. If historical analytical data are not available, with which to establish a reliable order of increasing well contamination, the water sounder and tape will be decontaminated between each well. If floating separate-phase hydrocarbons (SPH) are suspected or observed, SPH is collected using a clear, open-ended product bailer, and the thickness is measured to the nearest 0.01 feet in the bailer. SPH may alternatively be measured with an electronic interface probe. Any monitoring well containing a measurable thickness of SPH before or during purging is not additionally purged and no sample is collected from that well. Wells containing hydrocarbon sheen are sampled unless otherwise specified by the project manager. Field observations such as well integrity as well as water level measurements and floating product thicknesses are noted on the Gauging Data/Purge Calculations form.

#### Well Purging

Each monitoring well to be sampled is purged using either a PVC bailer or a submersible pump. Physical parameters (pH, temperature and conductivity) of the purge water are monitored during purging activities to assess if the water sample collected is representative of the aquifer. If required, parameters such as dissolved oxygen, turbidity, salinity etc. are also measured. Samples are considered representative if parameter stability is achieved. Stability is defined as a change of less than 0.25 pH units, less than 10% change in conductivity in micro mhos, and less than 1.0 degree centigrade (1.8 degrees Fahrenheit) change in temperature. Parameters are measured in a discreet sample decanted from the bailer separately from the rest of the purge water. Parameters are measured at least four times during purging; initially, and at volume intervals of one well volume. Purging continues until three well casing volumes have been removed or until the well completely dewater. Wells which dewater or demonstrate a slow recharge may be sampled after fewer than three well volumes have been removed. Well purging information is recorded on the Purge Data sheet. All meters used to measure parameters are calibrated daily. Purge water is sealed, labeled, and stored on site in D.O.T.-approved 55-gallon drums. After being chemically profiled, the water is removed to an appropriate disposal facility by a licensed waste hauler.

#### Groundwater Sample Collection

Groundwater samples are collected immediately after purging or, if purging rate exceeds well recharge rate, when the well has recharged to at least 80% of its static water level. If recharge is extremely slow, the well is allowed to recharge for at least two hours, if practicable, or until sufficient volume has accumulated for sampling. The well is sampled within 24 hours of purging or repurged. Samples are collected using polyethylene bailers, either disposable or dedicated to the well. Samples being analyzed for compounds most sensitive to volatilization are collected first. Water samples are placed in appropriate laboratory-supplied containers, labeled, documented on a chain of custody form and placed on ice in a cooler for transport to a state-certified analytical laboratory. Analytical detection limits match or surpass standards required by relevant local or regional guidelines.

#### Quality Assurance Procedures

To prevent contamination of the samples, Clearwater personnel adhere to the following procedures in the field:

- A new, clean pair of latex gloves is put on prior to sampling each well.
- Wells are gauged, purged and groundwater samples are collected in the expected order of increasing degree of contamination based on historical analytical results.

- All purging equipment will be thoroughly decontaminated between each well, using the procedures previously described at the beginning of this section.
- During sample collection for volatile organic analysis, the amount of air passing through the sample is minimized. This helps prevent the air from stripping the volatiles from the water. Sample bottles are filled by slowly running the sample down the side of the bottle until there is a convex meniscus over the mouth of the bottle. The lid is carefully screwed onto the bottle such that no air bubbles are present within the bottle. If a bubble is present, the cap is removed and additional water is added to the sample container. After resealing the sample container, if bubbles still are present inside, the sample container is discarded and the procedure is repeated with a new container.

Laboratory and field handling procedures may be monitored, if required by the client or regulators, by including quality control (QC) samples for analysis with the groundwater samples. Examples of different types of QC samples are as follows:

- Trip blanks are prepared at the analytical laboratory by laboratory personnel to check field handling procedures. Trip blanks are transported to the project site in the same manner as the laboratory-supplied sample containers to be filled. They are not opened, and are returned to the laboratory with the samples collected. Trip blanks are analyzed for purgeable organic compounds.
- Equipment blanks are prepared in the field to determine if decontamination of field sampling equipment has been effective. The sampling equipment used to collect the groundwater samples is rinsed with distilled water which is then decanted into laboratory-supplied containers. The equipment blanks are transported to the laboratory, and are analyzed for the same chemical constituents as the samples collected at the site.
- Duplicates are collected at the same time that the standard groundwater samples are being collected and are analyzed for the same compounds in order to check the reproducibility of laboratory data. They are typically only collected from one well per sampling event. The duplicate is assigned an identification number that will not associate it with the source well.

Generally, trip blanks and field blanks check field handling and transportation procedures. Duplicates check laboratory procedures. The configuration of QC samples is determined by Clearwater depending on site conditions and regulatory requirements.



**ATTACHMENT 3**



Report Number : 37051

Date : 3/4/2004

Jessica Chiaro  
Clearwater Group, Inc  
229 Tewksbury Avenue  
Point Richmond, CA 94801

Subject : 3 Water Samples  
Project Name : NAZ EAGLE - GAS  
Project Number : ZP046B

Dear Ms. Chiaro,

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 "Jeff Dahl", is written over the typed name.

Jeff Dahl



Report Number : 37051

Date : 3/4/2004

Project Name : NAZ EAGLE - GAS

Project Number : ZP046B

Sample : MW-1

Matrix : Water

Lab Number : 37051-01

Sample Date :2/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 100	100	ug/L	EPA 8260B	2/18/2004
Toluene	< 100	100	ug/L	EPA 8260B	2/18/2004
Ethylbenzene	< 100	100	ug/L	EPA 8260B	2/18/2004
Total Xylenes	< 100	100	ug/L	EPA 8260B	2/18/2004
Methyl-t-butyl ether (MTBE)	85000	250	ug/L	EPA 8260B	2/19/2004
Diisopropyl ether (DIPE)	< 100	100	ug/L	EPA 8260B	2/18/2004
Ethyl-t-butyl ether (ETBE)	< 100	100	ug/L	EPA 8260B	2/18/2004
Tert-amyl methyl ether (TAME)	390	100	ug/L	EPA 8260B	2/18/2004
Tert-Butanol	79000	2500	ug/L	EPA 8260B	2/19/2004
TPH as Gasoline	< 10000	10000	ug/L	EPA 8260B	2/18/2004
Toluene - d8 (Surr)	95.4		% Recovery	EPA 8260B	2/18/2004
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	2/18/2004
TPH as Diesel	1800	50	ug/L	M EPA 8015	2/27/2004
Octacosane (Diesel Surrogate)	90.3		% Recovery	M EPA 8015	2/27/2004

Approved By:  Jeff Dahl



Report Number : 37051

Date : 3/4/2004

Project Name : NAZ EAGLE - GAS

Project Number : ZP046B

Sample : MW-3

Matrix : Water

Lab Number : 37051-02

Sample Date : 2/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	280	200	ug/L	EPA 8260B	2/19/2004
Toluene	< 200	200	ug/L	EPA 8260B	2/19/2004
Ethylbenzene	< 200	200	ug/L	EPA 8260B	2/19/2004
Total Xylenes	< 200	200	ug/L	EPA 8260B	2/19/2004
Methyl-t-butyl ether (MTBE)	210000	500	ug/L	EPA 8260B	2/20/2004
Diisopropyl ether (DIPE)	< 200	200	ug/L	EPA 8260B	2/19/2004
Ethyl-t-butyl ether (ETBE)	< 200	200	ug/L	EPA 8260B	2/19/2004
Tert-amyl methyl ether (TAME)	1200	200	ug/L	EPA 8260B	2/19/2004
Tert-Butanol	< 5000	5000	ug/L	EPA 8260B	2/20/2004
TPH as Gasoline	< 20000	20000	ug/L	EPA 8260B	2/19/2004
Toluene - d8 (Surr)	90.6		% Recovery	EPA 8260B	2/19/2004
4-Bromofluorobenzene (Surr)	97.4		% Recovery	EPA 8260B	2/19/2004
TPH as Diesel	430	50	ug/L	M EPA 8015	2/27/2004
Octacosane (Diesel Surrogate)	102		% Recovery	M EPA 8015	2/27/2004

Approved By:  Jeff Dahl



Report Number : 37051

Date : 3/4/2004

Project Name : NAZ EAGLE - GAS

Project Number : ZP046B

Sample : MW-2

Matrix : Water

Lab Number : 37051-03

Sample Date :2/13/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	860	200	ug/L	EPA 8260B	2/19/2004
Toluene	< 200	200	ug/L	EPA 8260B	2/19/2004
Ethylbenzene	260	200	ug/L	EPA 8260B	2/19/2004
Total Xylenes	< 200	200	ug/L	EPA 8260B	2/19/2004
Methyl-t-butyl ether (MTBE)	710000	2500	ug/L	EPA 8260B	2/19/2004
Diisopropyl ether (DIPE)	< 200	200	ug/L	EPA 8260B	2/19/2004
Ethyl-t-butyl ether (ETBE)	< 200	200	ug/L	EPA 8260B	2/19/2004
Tert-amyl methyl ether (TAME)	2000	200	ug/L	EPA 8260B	2/19/2004
Tert-Butanol	< 25000	25000	ug/L	EPA 8260B	2/19/2004
TPH as Gasoline	< 20000	20000	ug/L	EPA 8260B	2/19/2004
Toluene - d8 (Surr)	85.9		% Recovery	EPA 8260B	2/19/2004
4-Bromofluorobenzene (Surr)	96.7		% Recovery	EPA 8260B	2/19/2004
TPH as Diesel	1200	50	ug/L	M EPA 8015	2/27/2004
Octacosane (Diesel Surrogate)	111		% Recovery	M EPA 8015	2/27/2004

Approved By:  Jeff Dahl

Report Number : 37051

Date : 3/4/2004

**QC Report : Method Blank Data**

Project Name : **NAZ EAGLE - GAS**

Project Number : **ZP046B**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
TPH as Diesel	< 50	50	ug/L	M EPA 8015	2/26/2004
Octacosane (Diesel Surrogate)	101		%	M EPA 8015	2/26/2004
Benzene	< 0.50	0.50	ug/L	EPA 8260B	2/18/2004
Toluene	< 0.50	0.50	ug/L	EPA 8260B	2/18/2004
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	2/18/2004
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	2/18/2004
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	2/18/2004
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	2/18/2004
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	2/18/2004
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	2/18/2004
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	2/18/2004
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	2/18/2004
Toluene - d8 (Surr)	94.9		%	EPA 8260B	2/18/2004
4-Bromofluorobenzene (Surr)	99.8		%	EPA 8260B	2/18/2004
Benzene	< 0.50	0.50	ug/L	EPA 8260B	2/18/2004
Toluene	< 0.50	0.50	ug/L	EPA 8260B	2/18/2004
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	2/18/2004
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	2/18/2004
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	2/18/2004
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	2/18/2004
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	2/18/2004
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	2/18/2004
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	2/18/2004
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	2/18/2004
Toluene - d8 (Surr)	106		%	EPA 8260B	2/18/2004
4-Bromofluorobenzene (Surr)	89.1		%	EPA 8260B	2/18/2004

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
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Approved By:  Jeff Dahl

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 37051

Date : 3/4/2004

QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **NAZ EAGLE - GAS**

Project Number : **ZP046B**

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 as Diesel	Blank	<50	1000	1000	1160	1120	ug/L	M EPA 8015	2/26/04	116	112	3.42	70-130	25
Benzene	37058-01	0.52	39.9	39.8	40.1	39.4	ug/L	EPA 8260B	2/18/04	99.1	97.9	1.22	70-130	25
Toluene	37058-01	1.6	39.9	39.8	40.5	40.1	ug/L	EPA 8260B	2/18/04	97.5	96.8	0.788	70-130	25
Tert-Butanol	37058-01	47	200	199	256	250	ug/L	EPA 8260B	2/18/04	105	102	2.48	70-130	25
Methyl-t-Butyl Ether	37058-01	14	39.9	39.8	56.6	57.2	ug/L	EPA 8260B	2/18/04	107	109	1.70	70-130	25
Benzene	37056-07	<0.50	40.0	40.0	39.7	39.4	ug/L	EPA 8260B	2/18/04	99.4	98.4	0.939	70-130	25
Toluene	37056-07	<0.50	40.0	40.0	44.9	45.1	ug/L	EPA 8260B	2/18/04	112	113	0.355	70-130	25
Tert-Butanol	37056-07	<5.0	200	200	193	203	ug/L	EPA 8260B	2/18/04	96.6	101	4.98	70-130	25
Methyl-t-Butyl Ether	37056-07	<0.50	40.0	40.0	37.9	40.0	ug/L	EPA 8260B	2/18/04	94.7	99.9	5.38	70-130	25

Approved By:  Jeff Dahl

KIFF ANALYTICAL, LLC

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800

Report Number : 37051

Date : 3/4/2004

QC Report : Laboratory Control Sample (LCS)

Project Name : **NAZ EAGLE - GAS**

Project Number : **ZP046B**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	40.0	ug/L	EPA 8260B	2/18/04	96.9	70-130
Toluene	40.0	ug/L	EPA 8260B	2/18/04	96.2	70-130
Tert-Butanol	200	ug/L	EPA 8260B	2/18/04	106	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	2/18/04	110	70-130
Benzene	40.0	ug/L	EPA 8260B	2/18/04	103	70-130
Toluene	40.0	ug/L	EPA 8260B	2/18/04	104	70-130
Tert-Butanol	200	ug/L	EPA 8260B	2/18/04	98.8	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	2/18/04	94.8	70-130

KIFF ANALYTICAL, LLC

Approved By:  Jeff Darr

2795 2nd St, Suite 300 Davis, CA 95616 530-297-4800





2795 2nd Street, Suite 300  
 Davis, CA 95616  
 Lab: 530.297.4800  
 Fax: 530.297.4808

Lab No. 37051 Page      of     

Project Contact (Hardcopy or PDF To): <u>J. Chiaro</u>			California EDF Report? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<b>Chain-of-Custody Record and Analysis Request</b>														
Company/Address: <u>229 Towhyway, Pt. Richmond, CA</u>			Recommended but not mandatory to complete this section: Sampling Company Log Code: <u>GWGO</u>	<b>Analysis Request</b>														
Phone No.: <u>510-307-9447</u>	FAX No.: <u>510-292-2823</u>	Global ID: <u>pending</u>	EDF Deliverable To (Email Address): <u>J.Chiaro@clarvalab.com</u>	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421239.2) TOTAL (X) W.E.T. (X)	TAT	For Lab Use Only
Project Number: <u>ZP046B</u>			P.O. No:	Project Name: <u>NAZ Eagle - GAS</u>	Project Address: <u>4301 San Leandro St. Oakland, CA.</u>	Date	Time	40 ml VOA	SLEEVE	HCl	HNO <sub>3</sub>	ICE	NONE	WATER	SOIL	12 hr/24 hr/48 hr/72 hr/1 wk		
Sample Designation	Date	Time	40 ml VOA	SLEEVE	HCl	HNO <sub>3</sub>	ICE	NONE	WATER	SOIL	12 hr/24 hr/48 hr/72 hr/1 wk							
Container	Preservative	Matrix	BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/M8015)	TPH as Diesel (M8015)	TPH as Motor Oil (M8015)	TPH Gas/BTEX/MTBE (8260B)	5 Oxygenates/TPH Gas/BTEX (8260B)	7 Oxygenates/TPH Gas/BTEX (8260B)	5 Oxygenates (8260B)	7 Oxygenates (8260B)	Lead Scav. (1,2 DCA & 1,2 EDB - 8260B)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421239.2) TOTAL (X) W.E.T. (X)	TAT		
Sample Designation	Date	Time	40 ml VOA	SLEEVE	HCl	HNO <sub>3</sub>	ICE	NONE	WATER	SOIL	12 hr/24 hr/48 hr/72 hr/1 wk							
MW-1	2/13/04	1130	6		X				X									
MW-3	2/13/04	1145	✓															
MW-2	2/13/04	1200	✓		✓				✓									
Relinquished by: <u>Eric V. Austin</u>			Date <u>2/13/04</u>	Time <u>1350</u>	Received by:				Remarks:									
Relinquished by:			Date	Time	Received by:													
Relinquished by:			Date	Time	Received by Laboratory:													
			<u>021704</u>	<u>1045</u>	<u>Nichelle Woodworth / Kiff Analytical</u>													