

# CLEARWATER GROUP

Environmental Services

August 4, 2003

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, Third Quarter 2003**  
Eagle Gas Station  
4301 San Leandro Street  
Oakland, California 94601  
LOP StID# 2118  
Clearwater Group Project # ZP046B  
USTCF Claim No. 014551

Alameda County  
AUG 13 2003  
Environmental Health

Dear Mr. Gholami,

The Clearwater Group (Clearwater) has recently been obtained by Mr. Muhammad Jamil on behalf of Ms. Farah Naz, to conduct groundwater monitoring activities at the above-referenced site. The following is a letter report summarizing previous investigative activities as well as presenting current data collected during the first month of the third quarter of 2003.

## Site Description

The subject 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 predominantly underlain by clays with some clayey gravel and clayey sand in shallower 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, Artesian Environmental, Pt. Richmond California, oversaw the removal of five underground storage tanks (UST) at the subject site. The USTs included two 6,000-gallon gasoline USTs, two 4,000-gallon diesel USTs and one 300-gallon used oil UST (Figure 2). Field observations included 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 Alameda County Department of Environmental Health (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. The groundwater did not recharge after the initial pumping. Existing 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<sup>th</sup> and 5<sup>th</sup>, 1999, approximately 100 linear feet of product piping was removed. Vent piping from between the former USTs and the south corner of the onsite building was also removed. All piping was cut and disposed of as scrap metal. On August 5, 1999, conformation 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 ground water monitoring well using clean, flush-threaded, 2-inch diameter polyvinyl chloride (PVC) well materials (Table 1). On October 3<sup>rd</sup> and 10<sup>th</sup>, 2000, Clearwater surveyed the top of the casing elevations for each of the well relative to an arbitrary benchmark, and developed the wells for monitoring. Initial ground samples collected from these wells contained 83,000 micrograms per liter ( $\mu\text{g/L}$ ) to 250,000  $\mu\text{g/L}$  TPHg and 33,000  $\mu\text{g/L}$  to 400,000  $\mu\text{g/L}$  MTBE (Table 2).

August 3, 2001 Clearwater presented *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 project location. The proposed scope of the workplan involved the installation of eight groundwater-monitoring wells around the project site to delineate the 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 July 1, 2003, all three groundwater-monitoring wells, were monitored. An electronic water level indicator was used to gauge depth to water accurate to within  $\pm 0.01$ -feet. All wells were checked for the presence of Separate Phase Hydrocarbons (SPH). All work was performed in accordance with Clearwater's Field Protocols (Appendix A).

The wells were purged of groundwater until sampling parameters (e.g. temperature, pH and conductivity) stabilized, which occurred by approximately three wet casing volumes.



Groundwater monitoring and well purging information was recorded on Gauge Data/Purge Calculations and Purge Data sheets (Appendix B).

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.

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 stored on-site in labeled 55-gallons drums pending future removal and disposal.

#### Laboratory Analysis

Groundwater samples were analyzed by Kiff Analytical, a California Department of Health Services (DHS) certified laboratory, located in Davis California for concentrations of benzene, toluene, ethylbenzene, and xylenes (BTEX), 5 oxygenates (MTBE, diisopropyl ether (DIPE), ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME), and tertiary butyl alcohol(TBA) ), and TPHg by EPA Method 8260B, and total petroleum hydrocarbons as diesel (TPHd) by EPA Method 8015M. (Appendix C)

#### **Groundwater Monitoring Results**

##### Groundwater Elevation and Flow

The depth to water ranged from approximately 7.59 (MW-1) to 14.98 (MW-2) feet bgs (Table 3). Depth to water data combined with arbitrary well elevation data were use to generate a groundwater elevation map (Figure 3). During this monitoring event, groundwater flow was toward the east-northeast at a gradient of 0.045 ft/ft. Groundwater

flow direction and gradient are generally consistent with observations from the previous groundwater-monitoring event performed August 3, 2001. To comply with California law AB 2886, effective January 1, 2002, the top of the casing elevations for each of the existing groundwater-monitoring wells should be surveyed relative to a recognized benchmark in the vicinity of the project location. Latitude and longitude coordinates of each groundwater-monitoring well must also be documented.

### Groundwater Sample Analytical Results

Diesel range hydrocarbons were detected at elevated levels in samples collected from all three groundwater-monitoring wells. Concentrations of TPHd ranged from 620 µg/L (MW-3) to 3,000 µg/L (MW-1). TAME was detected in concentrations ranging from 3,400 µg/L (MW-2) to 980 µg/L (MW-1). TBA was detected above the laboratory-reporting limit in samples collected from MW-1 at a concentration of 8,700 µg/L. MTBE was detected in samples collected from all three monitoring wells in concentrations ranging from 170,000 µg/L (MW-1) to 790,000 µg/L (MW-2). Laboratory detection limits were elevated in the samples analyzed for TPHg, BTEX, MTBE, ETBE, DIPE, TAME, and TBA due to the interference from high concentrations of MTBE. The laboratory analyzed the samples numerous times using a variety of dilution factors until results became consistent. 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 project site. Though laboratory reporting limits have been increased throughout the history of the project, this is the first sampling event where reportable concentrations of TAME and TBA have been detected. Concentrations of MTBE in the water samples collected from MW-1 have increased since the last monitoring event, while decreasing in samples



collected from both MW-2 and MW-3. Previous investigations have indicated that some contaminated soil may remain underneath existing structures. To date the extent of the contaminant plume remains undefined. **Clearwater recommends that further subsurface investigations be conducted onsite in order to characterize and delineate the extent of the 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 7/01/03
- Table 1 Well Construction Detail
- Table 2 Soil sample Analytical Results
- Table 3 Groundwater Elevation and Analytical Results
- Appendix A Clearwater Field Protocols
- Appendix B Clearwater Daily Field Form, Clearwater Well Gauging Data/Purge Calculations, Well Purging Data
- Appendix C Laboratory Report and Chain-of-Custody Form


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




## Certification

This report was prepared at Clearwater Group under the supervision of a professional Registered Geologist in the State of California. All statements, conclusions, and recommendations are based solely upon field observations by Clearwater Group, and analyses performed by a state-certified laboratory related to the work performed by Clearwater Group. 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 performed by Clearwater Group has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area of the site. No other warranty, expressed or implied, is made.



Jessica Chiaro  
Project Scientist

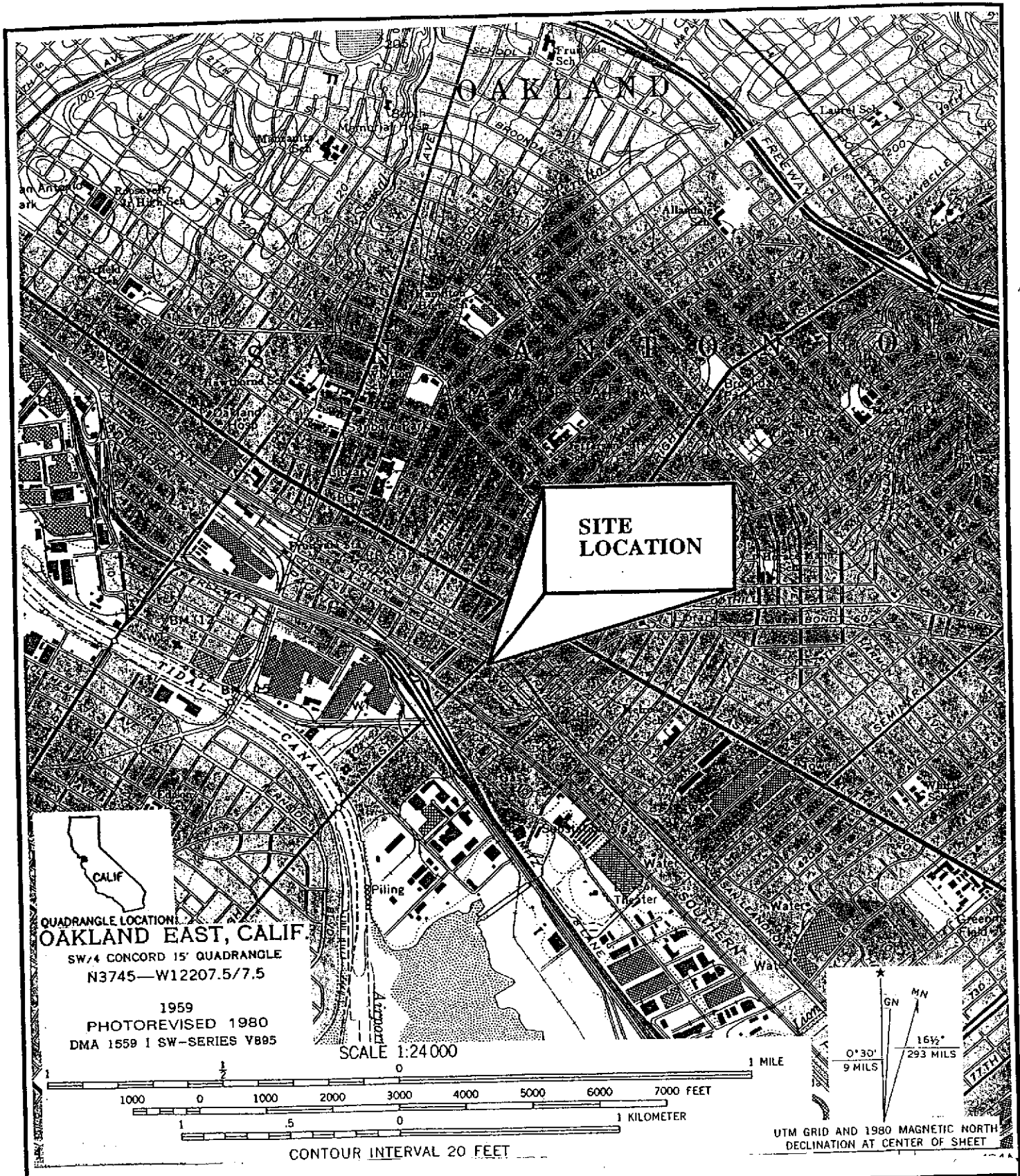


Barney P. Popkin, R.G #5585  
Principal Geologist



## FIGURES





**SITE LOCATION MAP**  
**EAGLE GAS**

4301 SAN LEANDRO STREET  
 OAKLAND, CALIFORNIA

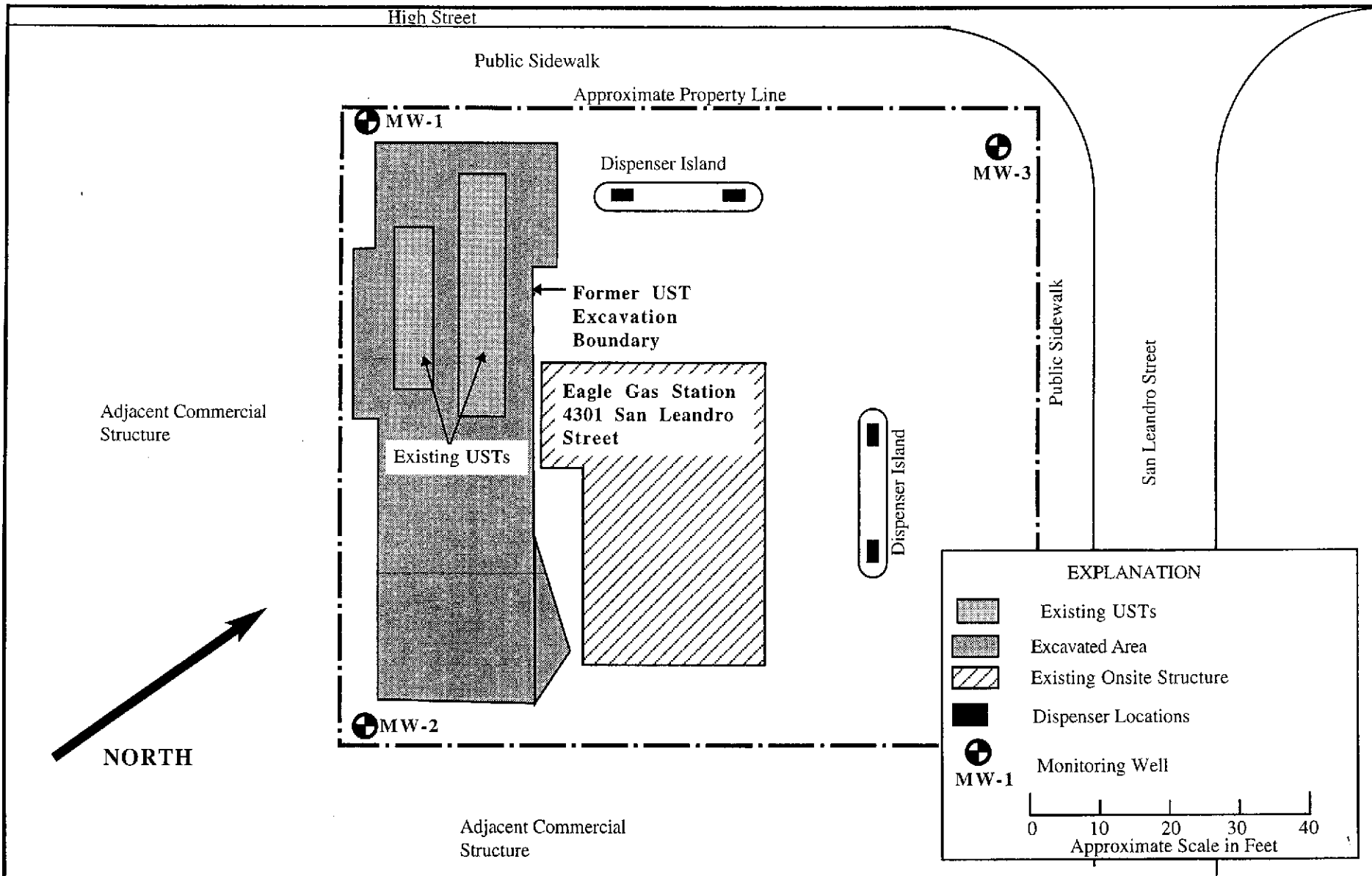
**CLEARWATER GROUP**

229 TEWKSBURY AVE. PT. RICHMOND

PROJECT NUMBER  
 ZP046B

REPORT DATE  
 AUGUST 2003

FIGURE  
 1



## SITE PLAN

EAGLE GAS

4301 SAN LEANDRO STREET

OAKLAND, CALIFORNIA

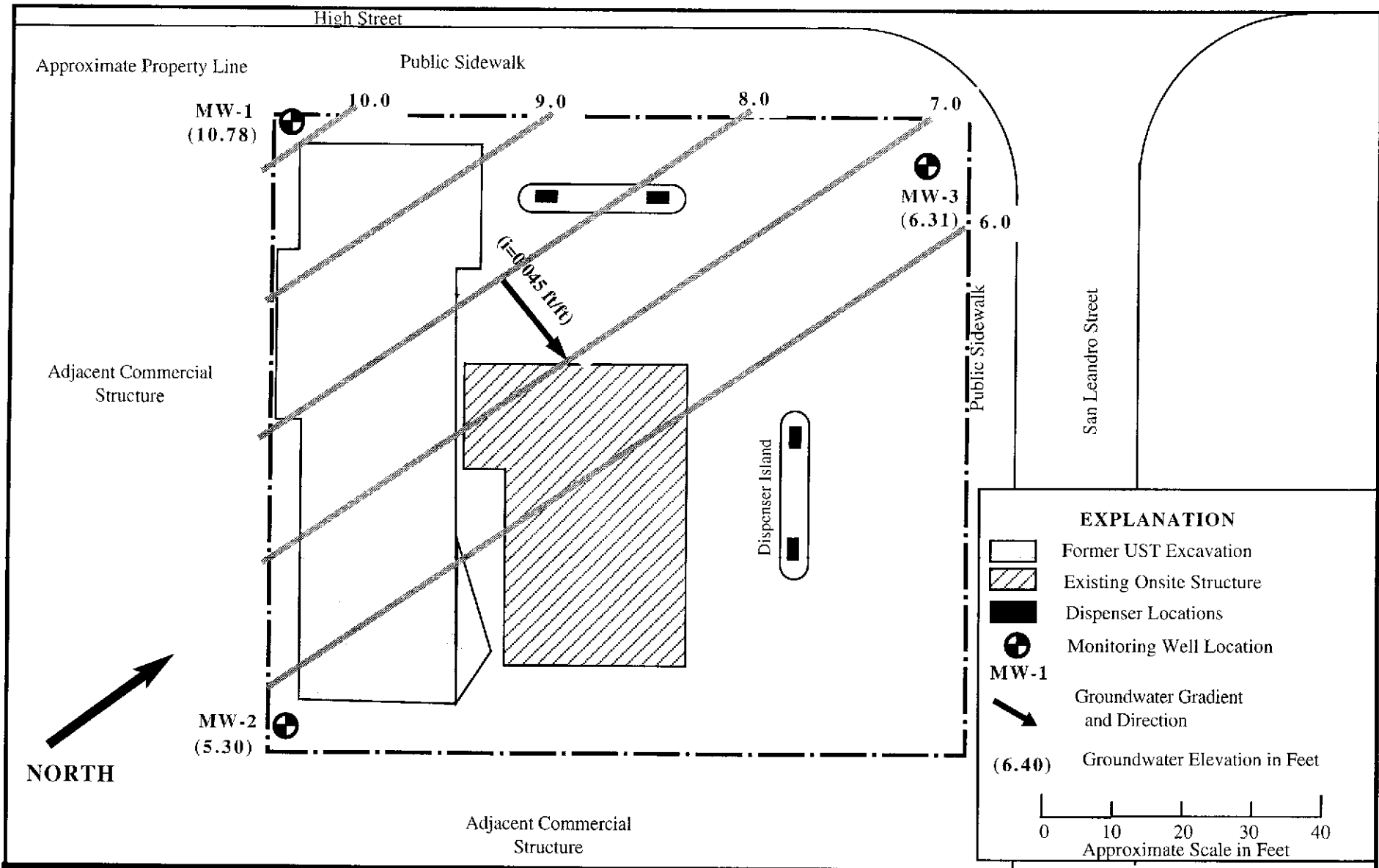
## CLEARWATER GROUP

229 TEWKSBURY AVE. PT. RICHMOND

PROJECT NUMBER  
ZP046B

REPORT DATE  
AUGUST 2003

FIGURE  
2



**GROUNDWATER ELEVATION MAP 7/01/03**  
**EAGLE GAS**  
**4301 SAN LEANDRO STREET**  
**OAKLAND, CA**

**CLEARWATER GROUP**  
 229 TEWKSBURY AVE. PT. RICHMOND

<b>PROJECT NUMBER</b> ZP046B	<b>REPORT DATE</b> AUGUST 2003	<b>FIGURE</b> 3
---------------------------------	-----------------------------------	--------------------

## TABLES

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

<b>Well I.D.</b>	<b>Date Installed</b>	<b>Borehole Diameter (inches)</b>	<b>Depth of Borehole (feet)</b>	<b>Casing Diameter (inches)</b>	<b>Screened Interval (feet)</b>	<b>Filter Pack (feet)</b>	<b>Bentonite Seal (feet)</b>	<b>Cement (feet)</b>
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
-----------	-------------	------------	------------	---------	---------	---------	---------	------------	-----------	---------------	------------	------------	------------	-----------

**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 Diisopropyl 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
- mg/Kg miligrams 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	10/3/00	18.37	8.96	9.41	460	93,000	<500	<500	<500	<500	130,000	<10,000	<10,000	<10,000	<2,000
	10/27/00	18.37	7.27	11.1	---	---	---	---	---	---	---	---	---	---	---
	1/26/01	18.37	7.60	10.77	1,600*	51,000	270	<100	<100	<100	77,000	<5,000	<5,000	<5,000	<20,000
	5/8/01	18.37	7.50	10.87	470*	36,000*	<100	<100	<100	<100	15,000	<5,000	<5,000	<5,000	<20,000
	8/3/01	18.37	7.09	11.28	2,200*	19,000*	<50	59	<50	<50	96,000	<5,000	<5,000	<5,000	<20,000
	7/1/03	18.37	7.59	10.78	3000	<25000	<250	<250	<250	<250	170,000	<250	<250	980	8700
MW-2	10/3/00	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
	10/27/00	20.28	13.88	6.40	---	---	---	---	---	---	---	---	---	---	---
	1/26/01	20.28	12.10	8.18	6,000*	740,000	3800	<500	940	1600	1,000,000	<50,000	<50,000	<50,000	<200,000
	5/8/01	20.28	12.05	8.23	2,100*	140,000	2800	<250	780	640	840,000	<50,000	<50,000	<50,000	<200,000
	8/3/01	20.28	13.30	6.98	2,600*	42,000*	1100	63	230	130	880,000	<25,000	<25,000	<25,000	<100,000
	7/1/03	20.28	14.98	5.30	2200	<200,000	<2000	<2000	<2000	<2000	790,000	<2000	<2000	3400	<20,000
MW-3	10/3/00	18.98	---	---	120	83,00	<500	<500	<500	<500	33,000	<2,500	<2,500	<2,500	<10,000
	10/27/00	18.98	18.75	0.23	---	---	---	---	---	---	---	---	---	---	---
	1/26/01	18.98	13.38	5.60	900*	230,000	930	<500	<500	<500	330,000	<25,000	<25,000	<25,000	<100,000
	5/8/01	18.98	11.82	7.16	1,100*	95,000	840	<250	<250	<250	390,000	<12,500	<12,500	<12,500	<50,000
	8/3/01	18.98	13.44	5.54	290*	30,000*	<50	51	<50	<50	270,000	<12,500	<12,500	<12,500	<50,000
	7/1/03	18.98	12.67	6.31	620	<50,000	<500	<500	<500	<500	230,000	<500	<500	1800	<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)
-----------	-------------	------------	------------	------------	-------------	-------------	----------	----------	----------	----------	-------------	-------------	-------------	-------------	------------

**NOTES:**

- TOC Top of well casing referenced to mean sea level
- 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 Diisopropyl 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, approximately equal to parts per billion
- <# 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"

## APPENDIX A

## CLEARWATER GROUP, INC.

### Groundwater Monitoring and Sampling Field Procedures

---

#### 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 down hole equipment is decontaminated prior to use. When using a peristaltic pump, new or dedicated silicon head tube and polyethylene tubing is used.

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 a 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, submersible pump or a peristaltic 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 or in a in-line flowthrough cell. 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 dewateres. 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 may also be collected from the peristaltic pump tubing. 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, CGI personnel adhere to the following procedures in the field:

- A new, clean pair of latex gloves are 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 purgable 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 CGI depending on site conditions and regulatory requirements.

## APPENDIX B

**DAILY FIELD REPORT**

Date: 7-11-03  
Field Engineer/  
Technician: Scott Robertson

Company/ Firm: TAG Inc. dba Clearwater Group

Project Name: 29046C Eagle Gas

Project Manager: Jessica Chiao

Project Number: 29046C

Site Contact: \_\_\_\_\_

**EVENTS/COMMENTS/REMARKS**

TIME

0950 on site in Oakland  
 introduce myself to tenant  
 tenant requested I take the drum back with me  
 proceed to open wells  
 MW-2 has water in well box  
 and a dedicated bailer attached to well cap  
 MW-1 has water in well box and dedicated bailer attached to  
 cap and is missing one 9/16 bolt in well lid  
 MW-3 has water and is missing an bolt as well  
 All dedicated bailers were removed and new  
 disposable bailers were used for sampling.  
 Tenant came out and asked me questions several  
 times during the sample event.  
 Nice sunny day  
 1225 Leave site

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Attachments: \_\_\_\_\_

Figures Included: \_\_\_\_\_



# PURGING DATA

SHEET 1 OF 1

Job No.: ZP0468      Location: 4301 San Leandro street      Date: 7-1-03      Tech: SR

WELL No.	TIME	VOLUME (gal.)	COND. (mS/cm)	TEMP. (deg. F.)	pH	
MW-1	1047	2	195	71.6	6.54	Sample for: (TPH <sub>g</sub> )    (TPH <sub>d</sub> )    8010 (BTEX)    Other    5 oxyS
Calc. purge volume	1051	4	214	70.0	6.75	
	1055	6	227	69.5	6.74	
<u>8.28</u>	1059	<u>8.28</u>	<u>233</u>	<u>68.8</u>	<u>6.74</u>	
COMMENTS: color, turbidity, recharge, sheen <u>gray, low, poor</u>						Sampling Method: Dedicated / Disposable bailer

WELL No.	TIME	VOLUME (gal.)	COND. (mS/cm)	TEMP. (deg. F.)	pH	
MW-3	1102	1.25	224	72.2	6.75	Sample for: (TPH <sub>g</sub> )    (TPH <sub>d</sub> )    8010 (BTEX)    Other    5 oxyS
Calc. purge volume	1105	2.5	208	72.1	6.75	
	1109	4	186	84.3	6.75	
<u>8.15</u>	1112	<u>5.15</u>	<u>212</u>	<u>70.3</u>	<u>6.74</u>	
COMMENTS: color, turbidity, recharge, sheen <u>gray, high</u>						Sampling Method: Dedicated / Disposable bailer

WELL No.	TIME	VOLUME (gal.)	COND. (mS/cm)	TEMP. (deg. F.)	pH	
MW-2	1115	1.25	211	67.2	6.75	Sample for: (TPH <sub>g</sub> )    (TPH <sub>d</sub> )    8010 (BTEX)    Other    5 oxyS
Calc. purge volume	1117	2.5	197	65.4	6.74	
	1120	3.75	182	65.5	6.74	
<u>4.85</u>	1122	<u>5</u>	<u>180</u>	<u>67.2</u>	<u>6.74</u>	
COMMENTS: color, turbidity, recharge, sheen <u>gray, low, good</u>						Sampling Method: Dedicated / Disposable bailer





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

Lab No. \_\_\_\_\_ Page 1 of 1

Project Contact (Hardcopy or PDF To): Jessica Chiaro  
 California EDF Report?  Yes  No

**Chain-of-Custody Record and Analysis Request**

Company/Address: Cleanwater Group  
 Recommended but not mandatory to complete this section:  
 Sampling Company Log Code: C.W.O.C.

Phone No.: 510-317-9003 FAX No.: 510-252-2623  
 Global ID: Pending

Project Number: 29046B P.O. No.: 8807  
 EDF Deliverable To (Email Address): jchiaro@cleanwatergroup.com

Project Name: NAZ Eagle Gas  
 Sampler Signature: Scott Robertson

Project Address: 4000 San Leandro Ave  
Oakland, CA

**Analysis Request**

Sampling Container Preservative Matrix

Date Time 40 ml VOA SLEEVE HCl HNO<sub>3</sub> ICE NONE WATER SOIL

Sample Designation

MW-1 7/1/03 1130 ✓ X ✓

MW-2 ✓ 1155 ✓ X ✓

MW-3 ✓ 1140 ✓ X ✓

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 (7421/239.2)	TOTAL (X) W.E.T. (X)	TAT	For Lab Use Only
														12 hr/24 hr/48 hr/72 hr/1 wk	

Relinquished by: Scott Robertson Date: 7.1.03 Time: 1400 Received by: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received by: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Date: 07/23/03 Time: 12:15 Received by Laboratory: John [Signature]

Remarks:

Bill to:

## APPENDIX C



Report Number : 33964

Date : 7/11/2003

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

Subject : 3 Water Samples  
Project Name : NAZ Eagle Gas  
Project Number : ZP046B  
P.O. Number : 8807

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 that reads "Joel Kiff". The signature is written in a cursive style with a large initial "J".

Joel Kiff



Report Number : 33964

Date : 7/11/2003

Project Name : **NAZ Eagle Gas**

Project Number : **ZP046B**

Sample : **MW-1**

Matrix : **Water**

Lab Number : **33964-01**

Sample Date : **7/1/2003**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	<b>&lt; 250</b>	250	ug/L	EPA 8260B	7/8/2003
<b>Toluene</b>	<b>&lt; 250</b>	250	ug/L	EPA 8260B	7/8/2003
<b>Ethylbenzene</b>	<b>&lt; 250</b>	250	ug/L	EPA 8260B	7/8/2003
<b>Total Xylenes</b>	<b>&lt; 250</b>	250	ug/L	EPA 8260B	7/8/2003
<b>Methyl-t-butyl ether (MTBE)</b>	<b>170000</b>	250	ug/L	EPA 8260B	7/8/2003
<b>Diisopropyl ether (DIPE)</b>	<b>&lt; 250</b>	250	ug/L	EPA 8260B	7/8/2003
<b>Ethyl-t-butyl ether (ETBE)</b>	<b>&lt; 250</b>	250	ug/L	EPA 8260B	7/8/2003
<b>Tert-amyl methyl ether (TAME)</b>	<b>980</b>	250	ug/L	EPA 8260B	7/8/2003
<b>Tert-Butanol</b>	<b>8700</b>	2500	ug/L	EPA 8260B	7/8/2003
<b>TPH as Gasoline</b>	<b>&lt; 25000</b>	25000	ug/L	EPA 8260B	7/8/2003
<b>Toluene - d8 (Surr)</b>	99.6		% Recovery	EPA 8260B	7/8/2003
<b>4-Bromofluorobenzene (Surr)</b>	102		% Recovery	EPA 8260B	7/8/2003
<b>TPH as Diesel</b>	<b>3000</b>	50	ug/L	M EPA 8015	7/10/2003

Approved By:  Joel Kiff

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



Report Number : 33964

Date : 7/11/2003

Project Name : **NAZ Eagle Gas**

Project Number : **ZP046B**

Sample : **MW-2**

Matrix : **Water**

Lab Number : **33964-02**

Sample Date : **7/1/2003**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	<b>&lt; 2000</b>	<b>2000</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/8/2003</b>
<b>Toluene</b>	<b>&lt; 2000</b>	<b>2000</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/8/2003</b>
<b>Ethylbenzene</b>	<b>&lt; 2000</b>	<b>2000</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/8/2003</b>
<b>Total Xylenes</b>	<b>&lt; 2000</b>	<b>2000</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/8/2003</b>
<b>Methyl-t-butyl ether (MTBE)</b>	<b>790000</b>	<b>2000</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/8/2003</b>
<b>Diisopropyl ether (DIPE)</b>	<b>&lt; 2000</b>	<b>2000</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/8/2003</b>
<b>Ethyl-t-butyl ether (ETBE)</b>	<b>&lt; 2000</b>	<b>2000</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/8/2003</b>
<b>Tert-amyl methyl ether (TAME)</b>	<b>3400</b>	<b>2000</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/8/2003</b>
<b>Tert-Butanol</b>	<b>&lt; 20000</b>	<b>20000</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/8/2003</b>
<b>TPH as Gasoline</b>	<b>&lt; 200000</b>	<b>200000</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/8/2003</b>
<b>Toluene - d8 (Surr)</b>	<b>98.6</b>		<b>% Recovery</b>	<b>EPA 8260B</b>	<b>7/8/2003</b>
<b>4-Bromofluorobenzene (Surr)</b>	<b>106</b>		<b>% Recovery</b>	<b>EPA 8260B</b>	<b>7/8/2003</b>
<b>TPH as Diesel</b>	<b>2200</b>	<b>50</b>	<b>ug/L</b>	<b>M EPA 8015</b>	<b>7/10/2003</b>

Approved By:  Joel Kiff

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



Report Number : 33964

Date : 7/11/2003

Project Name : **NAZ Eagle Gas**

Project Number : **ZP046B**

Sample : **MW-3**

Matrix : **Water**

Lab Number : **33964-03**

Sample Date : **7/1/2003**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
<b>Benzene</b>	<b>&lt; 500</b>	<b>500</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/10/2003</b>
<b>Toluene</b>	<b>&lt; 500</b>	<b>500</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/10/2003</b>
<b>Ethylbenzene</b>	<b>&lt; 500</b>	<b>500</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/10/2003</b>
<b>Total Xylenes</b>	<b>&lt; 500</b>	<b>500</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/10/2003</b>
<b>Methyl-t-butyl ether (MTBE)</b>	<b>230000</b>	<b>500</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/10/2003</b>
<b>Diisopropyl ether (DIPE)</b>	<b>&lt; 500</b>	<b>500</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/10/2003</b>
<b>Ethyl-t-butyl ether (ETBE)</b>	<b>&lt; 500</b>	<b>500</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/10/2003</b>
<b>Tert-amyl methyl ether (TAME)</b>	<b>1800</b>	<b>500</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/10/2003</b>
<b>Tert-Butanol</b>	<b>&lt; 5000</b>	<b>5000</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/10/2003</b>
<b>TPH as Gasoline</b>	<b>&lt; 50000</b>	<b>50000</b>	<b>ug/L</b>	<b>EPA 8260B</b>	<b>7/10/2003</b>
<b>Toluene - d8 (Surr)</b>	<b>100</b>		<b>% Recovery</b>	<b>EPA 8260B</b>	<b>7/10/2003</b>
<b>4-Bromofluorobenzene (Surr)</b>	<b>101</b>		<b>% Recovery</b>	<b>EPA 8260B</b>	<b>7/10/2003</b>
<b>TPH as Diesel</b>	<b>620</b>	<b>50</b>	<b>ug/L</b>	<b>M EPA 8015</b>	<b>7/10/2003</b>

Approved By:  Joel Kiff

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

Report Number : 33964

Date : 7/11/2003

**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	7/9/2003
TPH as Diesel	< 50	50	ug/L	M EPA 8015	7/9/2003
Benzene	< 0.50	0.50	ug/L	EPA 8260B	7/8/2003
Toluene	< 0.50	0.50	ug/L	EPA 8260B	7/8/2003
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	7/8/2003
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	7/8/2003
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	7/8/2003
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	7/8/2003
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	7/8/2003
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	7/8/2003
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	7/8/2003
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	7/8/2003
Toluene - dB (Surr)	98.3		%	EPA 8260B	7/8/2003
4-Bromofluorobenzene (Surr)	101		%	EPA 8260B	7/8/2003
Benzene	< 0.50	0.50	ug/L	EPA 8260B	7/10/2003
Toluene	< 0.50	0.50	ug/L	EPA 8260B	7/10/2003
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	7/10/2003
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	7/10/2003
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	7/10/2003
Diisopropyl ether (DIPE)	< 0.50	0.50	ug/L	EPA 8260B	7/10/2003
Ethyl-t-butyl ether (ETBE)	< 0.50	0.50	ug/L	EPA 8260B	7/10/2003
Tert-amyl methyl ether (TAME)	< 0.50	0.50	ug/L	EPA 8260B	7/10/2003
Tert-Butanol	< 5.0	5.0	ug/L	EPA 8260B	7/10/2003
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	7/10/2003
Toluene - dB (Surr)	101		%	EPA 8260B	7/10/2003
4-Bromofluorobenzene (Surr)	101		%	EPA 8260B	7/10/2003

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
-----------	----------------	------------------------	-------	-----------------	---------------

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

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

Report Number : 33964

Date : 7/11/2003

**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	1060	863	ug/L	M EPA 8015	7/9/03	106	86.3	21.0	70-130	25
TPH as Diesel	Blank	<50	1000	1000	1020	1000	ug/L	M EPA 8015	7/9/03	102	100	1.18	70-130	25
Benzene	34000-08	<0.50	40.0	40.0	39.4	38.2	ug/L	EPA 8260B	7/8/03	98.6	95.4	3.30	70-130	25
Toluene	34000-08	<0.50	40.0	40.0	39.4	38.1	ug/L	EPA 8260B	7/8/03	98.6	95.3	3.38	70-130	25
Tert-Butanol	34000-08	<5.0	200	200	193	192	ug/L	EPA 8260B	7/8/03	96.4	96.0	0.432	70-130	25
Methyl-t-Butyl Ether	34000-08	<0.50	40.0	40.0	34.0	35.3	ug/L	EPA 8260B	7/8/03	85.0	88.3	3.78	70-130	25
Benzene	34023-01	0.61	40.0	40.0	42.2	40.6	ug/L	EPA 8260B	7/10/03	104	100	4.04	70-130	25
Toluene	34023-01	<0.50	40.0	40.0	42.3	41.0	ug/L	EPA 8260B	7/10/03	106	102	3.19	70-130	25
Tert-Butanol	34023-01	<5.0	200	200	201	199	ug/L	EPA 8260B	7/10/03	100	99.3	0.977	70-130	25
Methyl-t-Butyl Ether	34023-01	1.5	40.0	40.0	43.1	42.2	ug/L	EPA 8260B	7/10/03	104	102	2.23	70-130	25

KIFF ANALYTICAL, LLC

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

Approved By:  Joel Kiff



Report Number : 33964

Date : 7/11/2003

**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	7/8/03	98.5	70-130
Toluene	40.0	ug/L	EPA 8260B	7/8/03	100	70-130
Tert-Butanol	200	ug/L	EPA 8260B	7/8/03	96.2	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	7/8/03	86.4	70-130
Benzene	40.0	ug/L	EPA 8260B	7/10/03	99.1	70-130
Toluene	40.0	ug/L	EPA 8260B	7/10/03	102	70-130
Tert-Butanol	200	ug/L	EPA 8260B	7/10/03	97.9	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	7/10/03	98.8	70-130

KIFF ANALYTICAL, LLC

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

Approved By: Joel Kiff





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

Lab No. 33964

Page 1 of 1

Project Contact (Hardcopy or PDF To): Jessica Chiara  
 Company/Address: Clearwater Group  
229 Taskbury Ave Pt. Richmond CA  
 Phone No.: 510-207-9988 FAX No.: 510-232-2823  
 Project Number: 29046R P.O. No: 8807  
 Project Name: NAZ Eagle Gas  
 Project Address: 4301 San Leandro Street  
Oakland, CA  
 California EDF Report?  Yes  No  
 Recommended but not mandatory to complete this section:  
 Sampling Company Log Code: CWGO  
 Global ID: Pending  
 EDF Deliverable To (Email Address): jchiara@clearwatergroup.com  
 Sampler Signature: Scott Robertson

**Chain-of-Custody Record and Analysis Request**

Analysis Request														TAT																
Sample Designation	Date	Time	40 ml VOA	SLEEVE	Container	Preservative				Matrix		BTEX (8021B)	BTEX/TPH Gas/MTBE (8021B/88015)	TPH as Diesel (88015)	TPH as Motor Oil (88016)	TPH Gas/BTEX/MTBE (82609)	5 Oxygenates/TPH Gas/BTEX (82608)	7 Oxygenates/TPH Gas/BTEX (82608)	5 Oxygenates (82608)	7 Oxygenates (82608)	Lead Scav. (1,2 DCA & 1,2 EDB - 82608)	EPA 8260B (Full List)	Volatile Halocarbons (EPA 8260B)	Lead (7421/238.2)	TOTAL (X) W.E.T. (X)	12 hr/24 hr/48 hr/72 hr (X)	For Lab Use Only			
MW-1	7-1-03	1130	X			HCl	HNO <sub>3</sub>	ICE	NONE					X		X													X	01
MW-2	↓	1155												X		X													X	02
MW-3	↓	1140												X		X												X	03	

Relinquished by: <u>Scott Robert</u>	Date: <u>7-1-03</u>	Time: <u>1400</u>	Received by: _____
Relinquished by: _____	Date: _____	Time: _____	Received by: _____
Relinquished by: _____	Date: <u>07-20-03</u>	Time: <u>12:45</u>	Received by Laboratory: <u>John Cutler Kiff Analytical</u>

Remarks: \_\_\_\_\_

Billed to: \_\_\_\_\_