



March 21, 2003

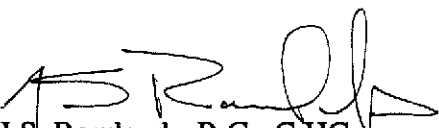
Mr. Don Wang  
Hazardous Materials Specialist  
Alameda County Environmental Health Services  
1131 Harbor Bay Parkway, Number 250  
Alameda, California 94502

RE: 2002 Fourth Quarter Groundwater Monitoring and Site Closure Summary  
Former Sears Retail Center #1058  
2633 Telegraph Avenue  
Oakland, California  
Case I.D. #STID 1082  
For Sears, Roebuck & Co.

Dear Mr. Wang,

Submitted with this letter is the 2002 Fourth Quarter Groundwater Monitoring Report and a Site Closure Summary. URS has prepared these documents on behalf of Sears, Roebuck & Co. Please feel free to contact me at 714 648-2793 if you have questions or comments.

Respectfully Submitted,  
URS CORPORATION



J.S. Rowlands, R.G., C.HG.  
Project Manager

cc: Mr. Scott DeMuth, Sears Roebuck and Co.  
Mr. Ryan Hartley, URS Corporation  
Mr. Tim Lester, Environmental Equalizers

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**REPORT  
2002 FOURTH QUARTER  
GROUNDWATER MONITORING  
HEATING OIL UST  
FORMER SEARS RETAIL CENTER #1058  
2633 TELEGRAPH AVENUE  
OAKLAND, CALIFORNIA  
CASE I.D. # STID 1082  
URS JOB NO. 25363708.02034  
FOR SEARS, ROEBUCK & CO.**

**1.0 INTRODUCTION**

This report has been prepared by URS Corporation (URS) on behalf of Sears, Roebuck & Co (Sears). It presents results of the 2002 Fourth Quarter Groundwater Monitoring conducted at the former Sears retail center (the Site) located at 2633 Telegraph Avenue in Oakland, California (Figure 1). The groundwater monitoring event consisted of "post purge" groundwater sample collection from two of five monitoring wells (FOMW-4 and FOMW-5) installed on the Site during May 2002. Due to recent Site construction activities, monitoring wells FOMW-2 and FOMW-3 are damaged and were not accessible for sampling during this quarterly event. The purpose of the groundwater monitoring was to assess groundwater conditions in the vicinity of a slurry-filled 10,000-gallon heating oil underground storage tank (UST) (Figure 2). The work is being performed under the regulatory oversight of the Alameda County Environmental Health Service (ACEHS) pursuant to quarterly monitoring and reporting requirements under Title 23, Division 3, Chapter 16 of the California Code of Regulations.

**2.0 SITE DESCRIPTION**

The Site is bounded by 27<sup>th</sup> Street to the north, Telegraph Avenue to the east, Sycamore Street to the south, and Northgate Avenue to the west (Figure 2). The property is occupied by a former Sears retail store (currently undergoing redevelopment) constructed in 1930, and an above-grade parking garage constructed in the 1960's. Prior to construction of the store, single and multi-family residences dating to the turn of the century occupied the Site. The Site elevation is approximately 30 feet above mean sea level (MSL) and slopes gently to the south towards San Francisco Bay.

The former Sears retail building is three stories tall (approximately 120,000 square feet) with a basement. The building is being converted from a commercial retail center into residential

apartments. Sears no longer owns the Site but maintains responsibility for environmental issues related to the slurry-filled 10,000 gallon heating oil UST.

The slurry-filled 10,000-gallon UST formerly used to store heating oil is located near the northwest corner of the building along 27<sup>th</sup> Street (Figure 2). It is constructed of single-walled steel with product piping that extends into the nearby basement (former boiler room) of the building. The top of the UST is located beneath the former loading dock of the building approximately 25 to 30 feet below ground surface (bgs). The loading dock was demolished during 2001, and the area has been repaved with asphalt. The UST is contained in a concrete vault estimated to be about 10 feet high and 30 feet long. The product piping was sealed and capped when the UST was taken out of commission sometime during the 1960's. The UST was filled with slurry in the fourth quarter of 1998 under the regulatory oversight of the City of Oakland Fire Prevention Bureau.

## **2.1 REGIONAL GEOLOGY AND HYDROGEOLOGY**

The Site is approximately 1.5 miles east of San Francisco Bay and three miles west of the Diablo Range in Oakland, California. It is located on the eastern flank of the San Francisco Basin, a broad Franciscan depression. The basement rock of the basin is respectively overlain by the Santa Clara Formation, the Alameda Formation, and the Temescal Formation. These formations consist of unconsolidated sediments ranging in total thickness from approximately 300 to 1,000 feet. The Pleistocene Santa Clara Formation consists primarily of alluvial fan deposits that are interspersed with lake, swamp, river channel, and flood plain deposits. The overlying Alameda Formation was deposited in an estuary environment and consists of organic clays and alluvial fan deposits of sands, gravels and silts. The uppermost Holocene Temescal Formation is an alluvial deposit ranging in thickness from 1 to 50 feet and consists primarily of silts and clays with a basal gravel unit. (California Regional Water Quality Control Board [RWQCB], San Francisco Bay Region, June 1999).

The Site is located within the Oakland sub-area of the East Bay Plain groundwater basin. The East Bay Plain groundwater basin encompasses approximately 115 square miles and is bounded by San Pablo Bay to the north, Alameda County to the south, the Hayward Fault to the east, and San Francisco Bay to the west. Existing beneficial use of groundwater within the East Bay Plain basin includes municipal and domestic water supply, industrial process water supply, industrial service water supply, and agricultural water supply (RWQCB, June 1995).

Groundwater flow direction in the basin typically follows surface topography. Historical high production wells in the Oakland sub-area were screened at depths greater than 200 feet bgs beneath the Yerba Buena Mud Member of the Alameda Formation. The Yerba Buena Mud is a black organic clay with an average thickness of 25 to 50 feet that forms an aquitard between upper and lower groundwater bearing units. From the 1860's until water importation programs were initiated in the 1930's, groundwater in the East Bay Plain was utilized as the primary municipal water source. Current beneficial uses of groundwater in the basin are minimal due to "readily available high quality imported surface water." Alameda County Well permit applications indicated that 91% of groundwater wells within the basin are used for "backyard" or commercial irrigation, 8.6% of the wells are used for industrial process water, and 0.4% are used for drinking water supply (RWQCB, June 1999).

### 3.0 BACKGROUND

Lowney Associates (Lowney) performed a "Phase I Environmental Site Assessment (ESA), a Soil and Groundwater Quality Evaluation" in April 1998, and a "Phase II Soil and Groundwater Evaluation," in July 1998. The first assessment included advancing five exploratory borings in three areas of recognized environmental concern for collection of soil samples and groundwater grab samples (Figure 2). Borings EB-1, EB-2, and EB-3 were driven in an area between the boiler room and a suspect pipe in the 27th Street sidewalk. Two borings were drilled within 10-feet of an adjacent dry cleaners (EB-4) and in the vicinity of a possible former tire and oil shop at the southwest corner of the retail store (EB-5). Detectable concentrations of total petroleum hydrocarbons (TPH) ranging from 79 milligrams per kilogram (mg/kg) to 9,500 mg/kg were present in soil samples collected from borings EB-1, EB-2, EB-3, and EB-5. Benzene was not detected (ND) in any of the soil samples submitted for chemical analysis.

During the second assessment conducted by Lowney, seven additional borings were advanced down gradient of the anticipated groundwater flow direction to collect selected soil and groundwater grab samples (Figure 2). The investigation also confirmed the location and existence of the 10,000-gallon UST beneath the loading dock of the retail center and identified the piping beneath the 27<sup>th</sup> Street sidewalk as the UST fill line. TPH and benzene, toluene, ethylbenzene, and total xylenes (BTEX) were ND in soil samples collected from borings EB-6 through EB-12.

Groundwater grab samples were collected by Lowney during the two assessments from borings EB-1 through EB-6, EB-10, EB-11, and EB-12. Groundwater grab samples collected from borings EB-1, EB-2, EB-3, and EB-5 contained detectable concentrations of TPH ranging from 38,000 micrograms

per liter ( $\mu\text{g/L}$ ) to 480,000  $\mu\text{g/L}$ . Groundwater grab samples collected from borings EB-2 and EB-4 contained detectable concentrations of benzene at 4.8  $\mu\text{g/L}$  and 4.3  $\mu\text{g/L}$ , respectively. TPH and BTEX were ND for the remaining groundwater grab samples.

SECOR International Incorporated (SECOR) subsequently performed an additional soil and groundwater investigation during November 1998 to further assess subsurface soils and groundwater near the southeastern corner of the property (Secor, Dec. 1998). The scope of work was approved by the ACEHS and included the advancement of nine soil borings (EB-13 through EB-21) for the collection of soil and groundwater grab samples (Figure 2). Soil samples collected from borings EB-19, EB-20, and EB-21 contained detectable concentrations of TPH ranging from 4 mg/kg to 160 mg/kg. BTEX were ND in all soil samples analyzed during the investigation, excluding EB-20-7. Soil sample EB-20-7 contained 0.044 mg/kg of ethylbenzene. Benzene, toluene, and total xylenes were ND.

A groundwater grab sample collected by SECOR from boring EB-14 contained 2,300  $\mu\text{g/L}$  of TPH, 3.2  $\mu\text{g/L}$  of ethylbenzene, and 6.1  $\mu\text{g/L}$  of total xylenes. TPH and BTEX were ND in the groundwater samples collected from borings EB-13, EB-15, and EB-18.

From October 19 to December 2, 1998, URS and subcontractor, Foss Environmental, conducted in-place closure activities for the heating-oil UST in accordance with the City of Oakland Fire Prevention Bureau, Closure Permit #94-98 (URS, Jan, 2001). The closure activities were conducted after obtaining a closure permit and preparing a site-specific health and safety plan. During the UST closure activities the UST was accessed, evacuated, cleaned, and filled with concrete slurry. URS submitted a letter report to the City of Oakland Fire Prevention Bureau dated February 22, 1999 that documents the in-place closure activities. Approximately 2 1/2 cubic yards of oily soil was removed from the access shaft, transported off site, and disposed at an approved facility. Approximately 500 gallons of oily water pumped from the access shaft and vault, and 10,000 gallons of oily water pumped from the UST was transported off site and disposed at an approved facility.

The City of Oakland Fire Prevention Bureau forwarded the UST closure report to the ACEHS. The ACEHS issued a letter on October 29, 1999 to Sears requesting a site assessment work plan and a list of responsible parties. In the letter, ACEHS requested the installation of three groundwater monitoring wells to assess subsurface conditions related to the former UST and dry cleaning facility. Resolution of property ownership issues resulted in Sears assuming the responsibility of assessing conditions solely related to the slurry-filled, heating oil UST.

URS installed three groundwater monitoring wells (FOMW-1, FOMW-2, FOMW-3) on the Site in May 2000 (URS, Jan. 2001). The monitoring wells were located adjacent to, and south of the slurry-filled UST (Figure 2). Soil samples collected from the borings contained concentrations of total extractable petroleum hydrocarbons (TEPH) as diesel fuel or bunker oil ranging from ND to 3,200 mg/kg. BTEX and methyl tertiary butyl ether (MTBE) were not detected in any of the soil samples analyzed.

During the First Quarter 2002 URS conducted an additional assessment of the soil and groundwater at the Site, which consisted of installing two groundwater monitoring wells (FOMW-4 and FOMW-5) and two soil borings. The purpose of the additional assessment was to further characterize the nature and extent of petroleum hydrocarbon impacted soil and groundwater at the Site. Specifically, the extent of heating oil impacted soil to the north and west of the UST, the lateral extent of separate phase product, and the down gradient extent of impacted groundwater were assessed. Results of the additional assessment were used to evaluate the Site for closure under the City of Urban Land Redevelopment Program guidelines (URS Corporation, August 2002).

The highest concentration of TPH detected in soil during the additional assessment was 580 mg/kg of C-20 to C-30 range hydrocarbons. Benzene and ethylbenzene were ND in all soil samples. Toluene was detected in one soil sample at a concentration of 20 µg/kg. Total xylenes were detected in two soil samples at concentrations of 17 µg/kg and 71 µg/kg. The compounds detected were from soil samples collected at depths greater than 10 feet bgs.

The highest concentration of TPH detected in groundwater during the additional assessment was 4.6 mg/L in groundwater grab sample EB-22. TPH was also detected in the groundwater grab sample EB-23 at a concentration of 0.15 mg/L. BTEX were ND in both groundwater grab samples. TPH and BTEX were ND in groundwater samples collected from wells FOMW-3, FOMW-4, and FOMW-5. Groundwater samples were not collected from well FOMW-1 due to the presence of separate phase product, nor from well FOMW-2 due to access problems.

Groundwater samples have been collected from the wells on a quarterly basis since June 2000. Field parameter and chemical analytical results from previous quarterly sampling events are provided as Appendices A and B.

## **4.0 HEALTH AND SAFETY PLAN**

Prior to initiating the field activities, URS prepared a site-specific Health & Safety plan to:

- Identify and describe potentially hazardous substances which may be encountered during field operations;
- Specify protective equipment and clothing for on-site activities; and
- Outline measures to be implemented in the event of an emergency.

URS field personnel reviewed the Health & Safety plan prior to commencing the field procedures. Field monitoring activities were recorded in the Health and Safety Plan and were maintained in the project files at URS's Santa Ana office. A copy of the Health and Safety Plan remained onsite during field operations.

## **5.0 QUARTERLY GROUNDWATER MONITORING**

The Fourth Quarter Groundwater Sampling event was performed on December 11, 2002. Groundwater monitoring was performed on three of five groundwater wells (FOMW-1, FOMW-4, and FOMW-5). Monitoring wells FOMW-2 and FOMW-3 are damaged and were inaccessible due to recent construction activities onsite. Depth-to-water data was collected from wells FOMW-1, FOMW-4, and FOMW-5. Monitoring wells FOMW-4 and FOMW-5 were then purged and sampled. FOMW-1 contained separate phase product and was not sampled. A description of the monitoring procedures is presented below.

### **5.1 GROUNDWATER GAUGING**

Prior to sampling, accessible groundwater monitoring wells were checked for the presence of separate phase product using a Solinst™ product interface probe. Water levels were measured relative to the surveyed top of well casings using a Solinst™ water level meter. Water levels were recorded to the nearest 0.01 foot. Due to the high viscosity of the separate phase product an accurate free product thickness was not measurable in well FOMW-1. However, based on historic



observations of the well, separate phase product thickness is estimated to be less than 0.01 foot. Groundwater depths and elevations for the 2002 fourth quarter are listed in Table 1.

## 5.2 PURGING AND SAMPLING METHODS

Prior to sample collection, wells FOMW-4 and FOMW-5 were purged of approximately three well casing volumes at a purge rate of approximately 0.5 gallon per minute (gpm) using a Grundfos™ RediFlo 2 submersible well pump. Water purged from the well was monitored for field parameters including temperature, pH, electrical conductivity, turbidity, dissolved oxygen (D.O.), and oxygen reduction potential (O.R.P.) using a YSI™ multi-parameter meter equipped with a flow-through cell. Ferrrous iron ( $\text{Fe}^{++}$ ) was measured in the field using a Hach™ field testing kit. Measured field parameters are listed in Table 2.

The purging was terminated following the removal of approximately three well casing volumes and when temperature, pH, and conductivity measurements stabilized. Following purging and well recovery of at least 80% of the original static water levels (or after two hours of recovery), groundwater samples were collected for laboratory analysis from the discharge tubing of the well pump. A blind duplicate was also collected from well FOMW-4 and labeled BD-1. The down-hole pump was cleaned prior to use and between wells by washing in a solution of Alconox™, rinsing in tap water, final rinsing in de-ionized water, and air drying. Pre-cleaned, disposable, polyethylene discharge tubing was attached to the pump following each decontamination and was changed between each well purging event. An equipment blank, labeled EB-1, was collected by pumping de-ionized water from a clean container through the sampling pump and into sample containers following decontamination procedures.

Sample containers and handling procedures for groundwater samples conformed to the established protocols for each specific parameter as described in EPA SW-846. The sample bottles, once filled and preserved as required, were properly labeled and logged on a chain of custody form. The label included well identification number, sample number, date and time sampled, job number, site/client name and location, and sampling personnel's initials. The sealed and labeled samples were placed in ice chests maintained at a temperature of 4 to 7 degrees centigrade and transported to Southland Technical Services (STS), a California Department of Health Services (CDHS) accredited laboratory, located in Montebello, California for chemical analysis. A trip blank (TB) prepared by the laboratory with deionized water remained in the cooler during field sampling and sample transport. Additional samples from selected wells were submitted to CytoCulture Laboratories in Richmond, California for biological analysis. Chain-of-custody records were maintained throughout the sampling program.

### **5.3 LABORATORY ANALYSIS PROGRAM**

Groundwater samples, duplicates, equipment blanks, and trip blank were submitted to STS. All groundwater samples submitted to STS were analyzed for TPH as gasoline range organics (TPHg), diesel fuel range organics (TPHd), and oil range organics (TPHo) by modified EPA method 8015M; and for BTEX and the fuel oxygenate MTBE by EPA method 8021B, groundwater samples were also analyzed for attenuation parameters. Groundwater samples (FOMW-4 and FOMW-5) were analyzed for total alkalinity by EPA method 310.1, nitrate by EPA method 352.1, and sulfate by EPA method 375.4. Groundwater samples collected from wells FOMW-4 and FOMW-5 were submitted to CytoCulture Laboratory, and were analyzed for hydrocarbon degraders and heterotrophic plate count by SM 9215A (HPC).

### **5.4 WASTE MANAGEMENT**

Purge water was collected and stored in one 55-gallon DOT-approved drum. The container was numbered to identify the source of the waste. The container was stored onsite and properly disposed of by Sears following review of the chemical analysis data.

## **6.0 MONITORING RESULTS**

### **6.1 SHALLOW GROUNDWATER CONDITIONS**

Historical groundwater measurements collected since June 2000 indicate that the potentiometric surface beneath the Site has fluctuated from approximately 8 to 12 feet bgs (14 to 18 feet MSL). The water bearing zones are moderately confined, as water levels ascended within drill rods after penetration of the coarser-grained water bearing units during well installation. Groundwater elevations are presented in Table 1 and Appendix A.

Groundwater elevation contours for the Site were generated by Kriging (a geostatistical gridding method) using SURFER™, a graphical contouring software program. Resultant groundwater elevation contours and flow direction are shown on Figure 3. Water level contours generated from the December 11, 2002 water level measurements indicate shallow groundwater flow is to the south with an approximate gradient of 0.016. The groundwater flow direction and gradient are consistent with results from previous quarterly monitoring events.

## 6.2 LABORATORY ANALYTICAL RESULTS

TPHd, TPHg, TPHo, BTEX, and MTBE were ND in all groundwater samples and duplicate samples. Chemical analytical results for the groundwater samples collected during this monitoring event are presented in Table 2 and Figure 4. Results of historical chemical analyses are provided in Appendix B. The CDHS-accredited laboratory reports and chain-of-custody forms for the groundwater samples are provided in Appendix C.

URS conducted a check of data completeness for the analytical laboratory reports. Results indicate that "these data are usable, as qualified, for their intended purpose." URS's Data Validation Reports are included as Appendix D.

## 7.0 DISCUSSION

The additional assessment conducted during the First Quarter 2002 completed definition of the soil and groundwater affected with petroleum hydrocarbons onsite (URS, Aug. 2002). The highest concentration of TPH detected in soil during the additional assessment was 580 mg/kg of C-20 to C-30 range hydrocarbons. Residual separate phase product was not identified in any of the borings. BTEX and MTBE were ND in all soil samples analyzed during the additional assessment. Historically, benzene has not been detected in any soil samples collected from the Site.

Concentrations of toluene, ethylbenzene, and xylenes historically detected in soil samples collected from the Site are below Tier 1 Risk Based Screening Levels (RBSLs) published in the Oakland Urban Land Redevelopment (ULR) Program Guidance Document (January 2000), and also below RBSLs published by the RWQCB (December 2001). RBSLs for TPH are not provided in the Oakland ULR Guidance Document. A RBSL of 100 mg/kg for TPH in soil is listed in the RWQCB Tier 1 lookup tables for protection of drinking water. However, the 100 mg/kg RBSL "is considered to be overly conservative for heavy, residual fuels (fuel oil #6, motor oil, etc.) as well as for use at sites that do not pose a direct threat to drinking water or surface water resources" (RWQCB, December 2001).

Shallow groundwater flow is to the south with an approximate gradient of 0.016. The groundwater flow direction and gradient are consistent with results from previous quarterly monitoring events. TPHd, TPHg, TPHo, BTEX, and MTBE were ND in all groundwater samples collected during this quarterly monitoring event. Attenuation parameters monitored for the Site (DO, ORP, nitrate,

sulfate, and hydrocarbon degraders) indicate that any residual BTEX that might be present in shallow groundwater beneath the Site is likely undergoing biodegradation.

The closure analysis provided in the Additional Site Assessment and 2002 First Quarter Groundwater Monitoring Report (URS, August, 2002), indicates that the residual petroleum hydrocarbons present in soil and groundwater at the Site are not mobile and do not contain BTEX. Therefore, the residual petroleum hydrocarbons do not present a threat to drinking water resources, surface water resources, ecological receptors, or human health. In addition, according to the RWQCB (June 1999), shallow groundwater in the Merritt Sands west of Lake Merritt (Figure 1) is nonpotable and "could not be reasonably expected to serve a public water supply".

## 8.0 SCHEDULE

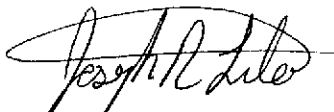
This report represents the eleventh submittal for quarterly groundwater monitoring at the Site. No further groundwater monitoring is scheduled to be conducted unless otherwise directed by the ACEHS. Proper destruction of the groundwater monitoring wells will be conducted following Site closure. URS will continue to notify ACEHS personnel of upcoming field activities.

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Should you have any questions or comments, please do not hesitate to contact us.

Respectfully Submitted,

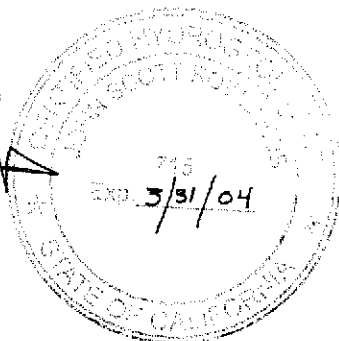
**URS CORPORATION**



Joseph Liles  
Senior Staff Geologist



J.S. Rowlands, R.G., C.H.G.  
Senior Project Geologist



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Table 1  
 2002 Fourth Quarter Groundwater Levels and Parameters  
 Sears Retail Store No. 1058  
 Oakland, California

Monitoring Well No.	Date Collected	Notes	GROUNDWATER LEVELS				GROUNDWATER SAMPLING FIELD PARAMETERS						
			Product Thickness (feet)	Depth to Groundwater (feet bgs)	Casing Elevation (MSL)	Groundwater Elevation (MSL)	Temp. (Celcius)	pH (Units)	Cond ( $\mu$ S/cm)	Turbidity (NTU)	O.R.P. (mV)	Dissolved Oxygen (mg/L)	Ferrous Iron (mg/L)
FOMW-1	12/11/02	SP,2	0.01	8.30	26.21	17.91	NA	NA	NA	NA	NA	NA	NA
FOMW-2	12/11/02	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FOMW-3	12/11/02	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FOMW-4	12/11/02	--	0.00	10.46	26.20	15.74	19.36	6.26	249	31.2	115.2	0.12	0.0
FOMW-5	12/11/02	--	0.00	12.65	26.23	13.58	18.87	6.21	179	127.8	58.6	0.31	0.0

Notes: MSL - Mean Sea Level  
 BGS - Below ground surface  
 Groundwater Elevation reference to MSL  
 Groundwater Elevation = Top of casing elevation - Depth to Water.  
 1: Well covered by recent construction. Could not be accessed.  
 2: Product too viscous to obtain accurate measurement

$\mu$ S/cm - microSiemens per centimeter  
 mV - millivolt  
 mg/L - milligrams per liter  
 NTU - nephelometric turbidity units  
 SP - Separate phase product in well  
 NA - Not analyzed/Not available.

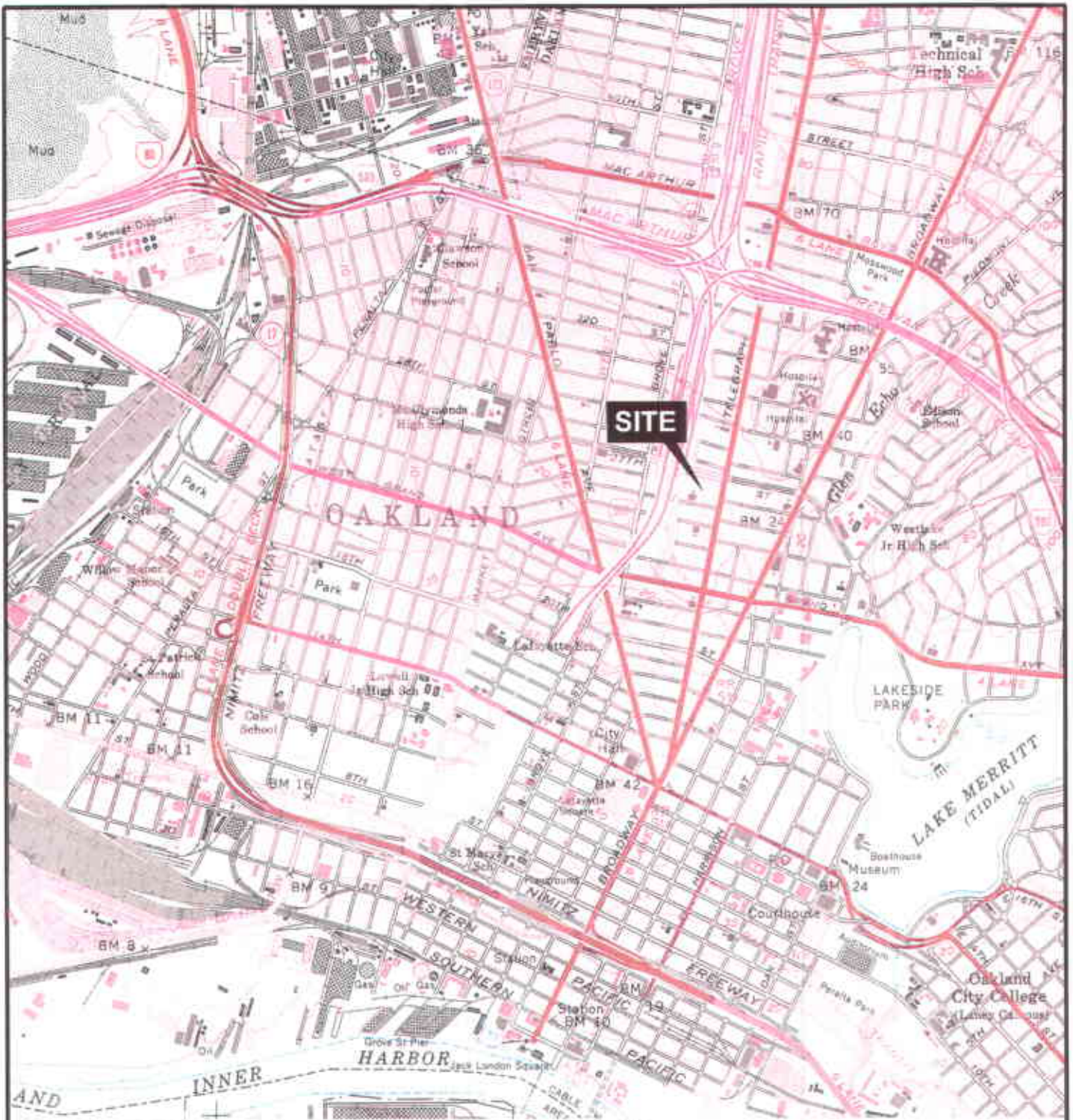


**Table 2**  
**2002 Fourth Quarter Groundwater Analytical Results**  
**Sears Retail Store No. 1058**  
**Oakland, California**

Monitoring Well No.	Sample Date	Notes	LABORATORY ANALYTICAL RESULTS								PHYSICAL PARAMETERS						
			TPH by 8015M			Volatile Organics by GC/MS 8021B					Nitrate (mg/L)	Sulfate (mg/L)	TDS (mg/L)	Total Alkalinity (mg/L)	Dissolved Methane (µg/ML)	Hydrocarbon Degraders (CFU/ML)	Heterotrophic Plate Count (CFU/ML)
			TPHg (µg/L)	TPHd (µg/L)	TPHo (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)							
FOMW-1	12/11/02	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FOMW-2	12/11/02	2,3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FOMW-3	12/11/02	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FOMW-4	12/11/02	--	< 50	< 500	< 2000	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	17.3	35.1	NA	125	NA	10	400
	12/11/02	1	< 50	< 500	< 2000	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	NA	NA	NA	NA	NA	NA	NA
FOMW-5	12/11/02	--	< 50	< 500	< 2000	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	14.4	29.6	NA	121	NA	10	600

Notes: 1: Duplicate sample  
2: Well blocked by demolition debris. Could not be accessed.  
3: Well casing is damaged  
< - Analyte not detected above indicated method detection limit  
NA: Not analyzed/Not available.  
SP: Separate Phase Product

TPHg = Total Petroleum Hydrocarbons as gasoline range organics by EPA Method 8015 (modified)  
TPHd = Total Petroleum Hydrocarbons as diesel range organics by EPA Method 8015 (modified).  
TRPo = Total Petroleum Hydrocarbons as oil range organics by EPA Method 8015 (modified)  
B T E X - Benzene, Toluene, Ethylbenzene, Total Xylenes  
MTBE - Methyl tertiary-butyl ether  
TDS = Total Dissolved Solids  
µg/L - micrograms per liter  
mg/L - milligrams per liter  
(CFU/ML)- colony forming unit per milliliter



REFERENCE: USGS 7.5 Minute Series Oakland West, CA Quad, 1959, Photorevised 1980

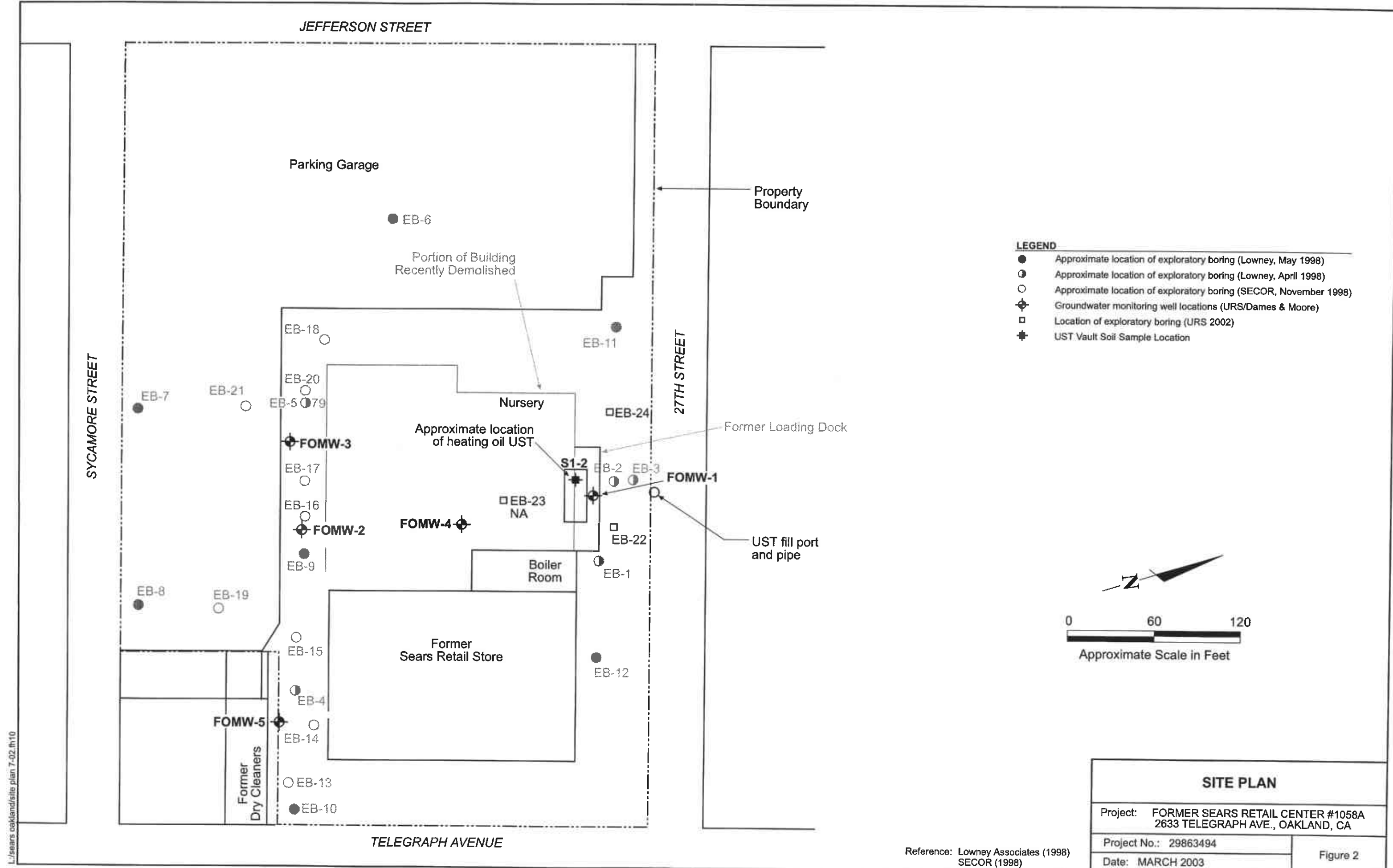
**FIGURE 1**  
**VICINITY MAP**  
 FORMER SEARS RETAIL CENTER #1058  
 2633 TELEGRAPH AVENUE  
 OAKLAND, CALIFORNIA  
 For Sears, Roebuck & Co.



Scale in Miles

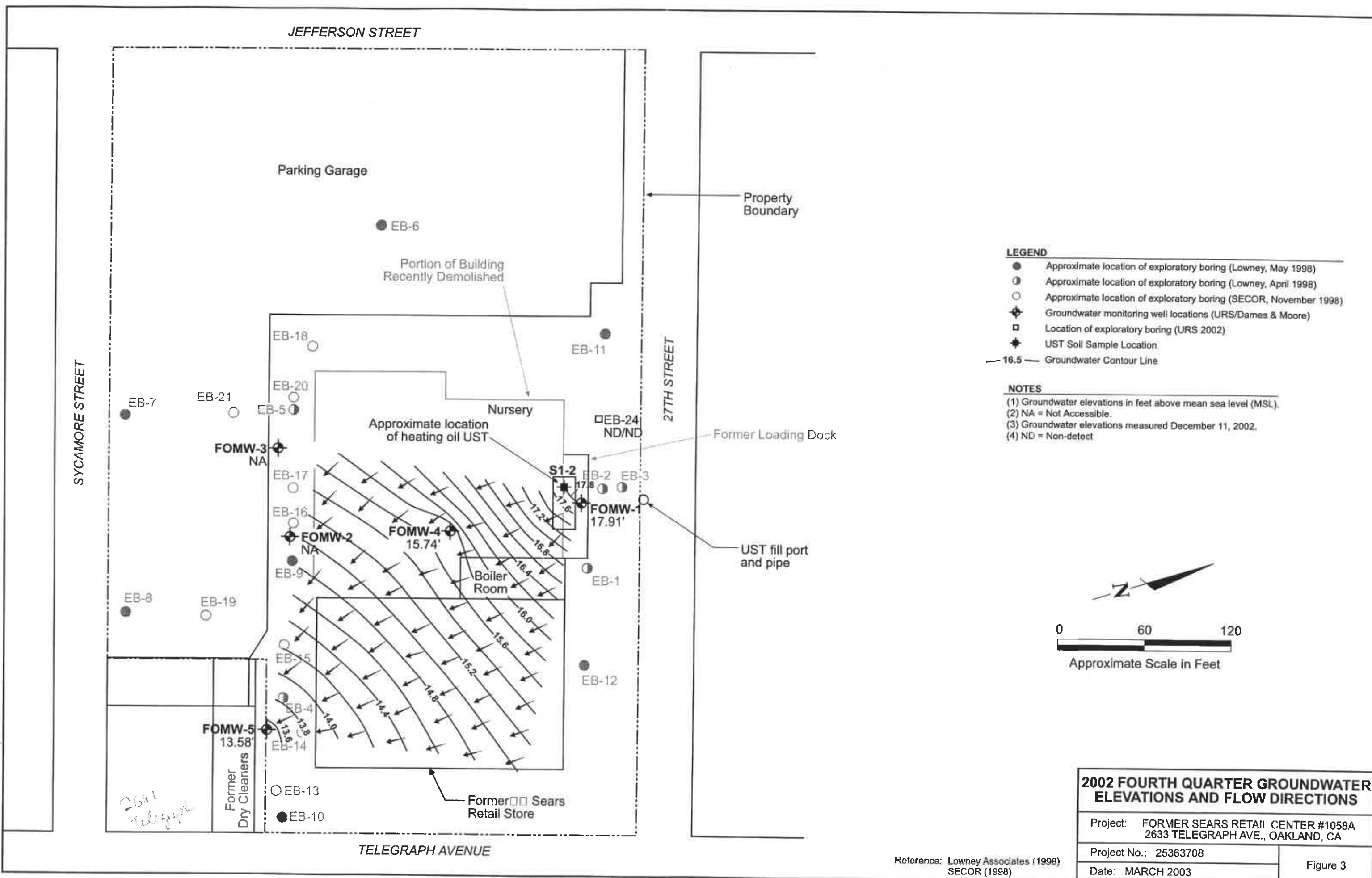


L:\sears\topo #1058a fh10 4/02



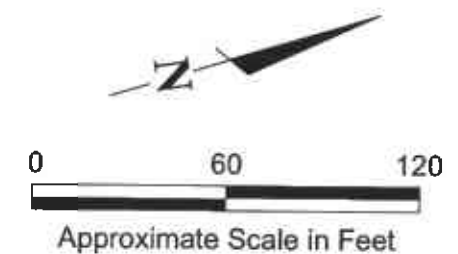
L:\sears oakland\site plan 7-02 fh10

L:\sears/oakland/GW contour 4th art 02 oakl 1058A.rh10 103



- LEGEND**
- Approximate location of exploratory boring (Lowney, May 1998)
  - ⊙ Approximate location of exploratory boring (Lowney, April 1998)
  - Approximate location of exploratory boring (SECOR, November 1998)
  - ⊕ Groundwater monitoring well locations (URS/Dames & Moore)
  - Location of exploratory boring (URS 2002)
  - ★ UST Soil Sample Location
  - 16.5 — Groundwater Contour Line

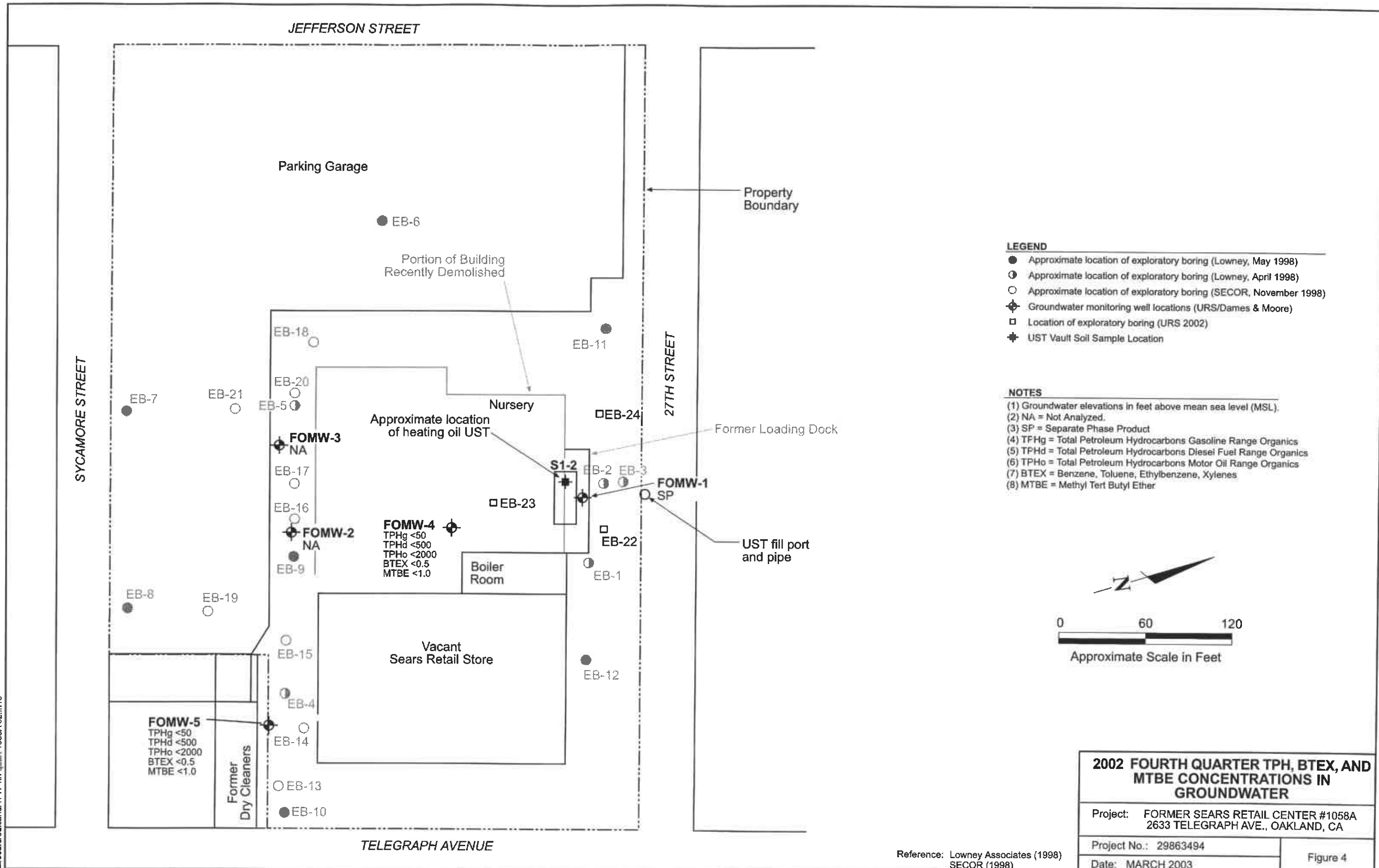
- NOTES**
- (1) Groundwater elevations in feet above mean sea level (MSL).
  - (2) NA = Not Accessible.
  - (3) Groundwater elevations measured December 11, 2002.
  - (4) ND = Non-detect



<b>2002 FOURTH QUARTER GROUNDWATER ELEVATIONS AND FLOW DIRECTIONS</b>	
Project: FORMER SEARS RETAIL CENTER #1058A 2633 TELEGRAPH AVE., OAKLAND, CA	
Project No.: 25363708	Figure 3
Date: MARCH 2003	

Reference: Lowney Associates (1998)  
SECOR (1998)

L:\sears/oakland/TPH 4th quart 1058A 02.fh10

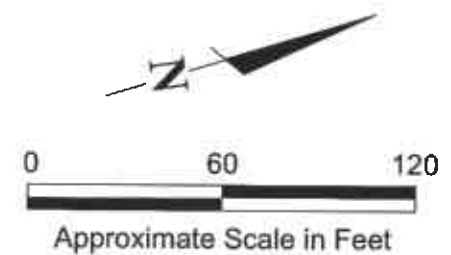


**LEGEND**

- Approximate location of exploratory boring (Lowney, May 1998)
- Approximate location of exploratory boring (Lowney, April 1998)
- Approximate location of exploratory boring (SECOR, November 1998)
- ⊕ Groundwater monitoring well locations (URS/Dames & Moore)
- Location of exploratory boring (URS 2002)
- ⊕ UST Vault Soil Sample Location

**NOTES**

- (1) Groundwater elevations in feet above mean sea level (MSL).
- (2) NA = Not Analyzed.
- (3) SP = Separate Phase Product
- (4) TPHg = Total Petroleum Hydrocarbons Gasoline Range Organics
- (5) TPHd = Total Petroleum Hydrocarbons Diesel Fuel Range Organics
- (6) TPHo = Total Petroleum Hydrocarbons Motor Oil Range Organics
- (7) BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
- (8) MTBE = Methyl Tert Butyl Ether



<b>2002 FOURTH QUARTER TPH, BTEX, AND MTBE CONCENTRATIONS IN GROUNDWATER</b>	
Project: FORMER SEARS RETAIL CENTER #1058A 2633 TELEGRAPH AVE., OAKLAND, CA	
Project No.: 29863494	Figure 4
Date: MARCH 2003	

Reference: Lowney Associates (1998)  
SECOR (1998)

**APPENDIX A**

**HISTORICAL GROUNDWATER LEVELS AND FIELD PARAMETERS**

APPENDIX A  
HISTORICAL GROUNDWATER LEVELS AND FIELD PARAMETERS  
SEARS RETAIL STORE NO. 1058  
OAKLAND, CALIFORNIA

Monitoring Well No.	Date Collected	Notes	GROUNDWATER LEVELS				GROUNDWATER SAMPLING FIELD PARAMETERS						
			Product Thickness (feet)	Depth to Groundwater (feet bgs)	Casing Elevation (MSL)	Groundwater Elevation (MSL)	Temp. (Celcius)	pH (Units)	Cond (µS/cm)	Turbidity (NTU)	O.R.P. (mV)	Dissolved Oxygen (mg/L)	Ferrous Iron (mg/L)
FOMW-1	6/8/00	1,2	0.00	9.59	27.81	18.22	18.3	6.72	659	NA	13.0	0.28	NA
	10/10/00	SP	0.01	9.91	27.81	17.90	NA	NA	NA	NA	NA	NA	NA
	12/15/00	SP	0.01	9.44	27.81	18.37	NA	NA	NA	NA	NA	NA	NA
	3/27/01	SP	0.01	9.00	27.81	18.81	NA	NA	NA	NA	NA	NA	NA
	6/22/01	SP	NA	NA	27.81	NA	NA	NA	NA	NA	NA	NA	NA
	9/26/01	SP	0.01	10.85	27.81	16.96	NA	NA	NA	NA	NA	NA	NA
	12/7/01	3	NA	NA	27.81	NA	NA	NA	NA	NA	NA	NA	NA
	3/6/02	SP,6	0.01	8.70	26.21	17.51	NA	NA	NA	NA	NA	NA	NA
	6/6/02	SP,6,7	--	8.10	26.21	18.11	NA	NA	NA	NA	NA	NA	NA
	9/6/02	SP,6,7	NA	9.00	26.21	17.21	NA	NA	NA	NA	NA	NA	NA
	12/11/02	SP,6,7	0.01	8.30	26.21	17.91	NA	NA	NA	NA	NA	NA	NA
FOMW-2	6/8/00	--	0.00	11.14	26.65	15.51	14.7	7.00	673	NA	10.0	2.92	NA
	10/10/00	--	0.00	12.34	26.65	14.31	15.8	7.58	420	NA	0.0	NA	NA
	12/15/00	--	0.00	11.05	26.65	15.60	14.0	7.09	1210	NA	NA	0.15	NA
	3/27/01	--	0.00	10.91	26.65	15.74	15.4	7.62	305	NA	92.0	0.61	NA
	6/22/01	--	0.00	11.30	26.65	15.35	15.3	5.33	340	NA	0.2	0.25	NA
	9/26/01	3	NA	NA	26.65	NA	NA	NA	NA	NA	NA	NA	NA
	12/7/01	4	NA	NA	26.65	NA	NA	NA	NA	NA	NA	NA	NA
	3/6/02	4,5	NA	11.25	26.65	15.40	NA	NA	NA	NA	NA	NA	NA
	6/6/02	4,5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/6/02	4,5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/11/02	3,4,5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FOMW-3	6/8/00	2	0.00	10.48	26.80	16.32	15.0	6.87	689	NA	23.0	0.22	NA
	10/10/00	--	0.00	11.15	26.80	15.65	15.6	7.66	430	NA	39.0	NA	NA
	12/15/00	--	0.00	10.36	26.80	16.44	14.1	7.31	1400	NA	45.0	0.15	NA
	3/27/01	--	0.00	10.12	26.80	16.68	NA	NA	NA	NA	NA	NA	NA
	6/22/01	--	0.00	10.65	26.80	16.15	15.7	5.11	330	NA	0.1	0.50	NA
	9/26/01	--	0.00	11.74	26.80	15.06	17.5	6.81	528	NA	23.8	0.78	NA
	12/7/01	--	0.00	9.59	26.80	17.21	16.8	6.71	432	228.9	34.2	0.18	0.32
	3/6/02	6	0.00	10.59	26.70	16.11	16.3	6.76	471	NA	45.6	0.3	0.11
	6/6/02	6	0.00	10.78	26.70	15.92	15.91	6.63	538	2.1	NA	NA	NA
	9/6/02	--	0.00	11.19	26.70	15.51	18.75	6.56	495	77.7	NA	NA	0.0
	12/11/02	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX A  
**HISTORICAL GROUNDWATER LEVELS AND FIELD PARAMETERS**  
**SEARS RETAIL STORE NO. 1058**  
**OAKLAND, CALIFORNIA**

Monitoring Well No.	Date Collected	Notes	GROUNDWATER LEVELS				GROUNDWATER SAMPLING FIELD PARAMETERS						
			Product Thickness (feet)	Depth to Groundwater (feet bgs)	Casing Elevation (MSL)	Groundwater Elevation (MSL)	Temp. (Celcius)	pH (Units)	Cond (µS/cm)	Turbidity (NTU)	O.R.P. (mV)	Dissolved Oxygen (mg/L)	Ferrous Iron (mg/L)
FOMW-4	3/6/02	5,6	0.00	10.08	26.20	16.12	15.90	6.75	376	NA	78.2	0.18	0.47
	6/6/02	6	0.00	10.23	26.20	15.97	15.91	6.63	538	18.1	NA	NA	NA
	9/6/02	--	0.00	10.58	26.20	15.62	19.88	6.47	454	1099.9	NA	NA	0.0
	12/11/02	--	0.00	10.46	26.20	15.74	19.36	6.26	249	31.2	115.2	0.12	0.0
FOMW-5	3/6/02	5,6	0.00	12.91	26.23	13.32	16.63	6.62	386	NA	77.9	0.09	0.3
	6/6/02	6	0.00	12.60	26.23	13.63	16.54	6.02	464	43.5	NA	NA	NA
	9/6/02	--	0.00	12.55	26.23	13.68	18.62	6.38	409	71.4	NA	NA	0.0
	12/11/02	--	0.00	12.65	26.23	13.58	18.87	6.21	179	127.8	58.6	0.31	0.0

Notes: MSL - Mean Sea Level  
 BGS - Below ground surface  
 Groundwater Elevation reference to MSL  
 Groundwater Elevation = Top of casing elevation - Depth to Water.  
 1 Sheen observed on water surface.  
 2 Petroleum odor in groundwater  
 3 Well covered by recent construction. Could not be accessed.  
 4 Well casing damaged  
 5 Reference point for DTW measurement has not been surveyed  
 6 Well resurveyed by Mariscal and Associates on May 13, 2002  
 7 Product too viscous to obtain accurate measurement  
 SP - Separate phase product in well  
 NA - Not analyzed/Not available.

µS/cm - microSiemens per centimeter  
 mV - millivolt  
 mg/L - milligrams per liter



**APPENDIX B**

**HISTORICAL SUMMARY OF GROUNDWATER ANALYSES RESULTS**

APPENDIX B  
HISTORICAL SUMMARY OF GROUNDWATER MONITORING RESULTS  
SEARS RETAIL STORE NO. 1058  
OAKLAND, CALIFORNIA

Monitoring Well No.	Sample Date	Notes	LABORATORY ANALYTICAL RESULTS								PHYSICAL PARAMETERS						
			TPH by 8015M			Volatile Organics by GC/MS 8021A/8260A					Nitrate (mg/L)	Sulfate (mg/L)	TDS (mg/L)	Total Alkalinity (mg/L)	Dissolved Methane (µg/ML)	Hydrocarbon Degraders (CFU/ML)	Heterotrophic Plate Count (CFU/ML)
			TPHg (µg/L)	TPHd (µg/L)	TPHo (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)							
FOMW-1	6/8/00	--	NA	< 50	J 1200	< 0.5	< 0.5	< 0.5	< 1	< 5	NA	NA	360	230	< 0.01	390	4000
	10/10/00	SP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/15/00	SP	NA	260	< 50	< 0.5	< 0.5	< 0.5	< 1	< 5	NA	NA	NA	NA	NA	NA	NA
	12/15/00	1	NA	370	< 50	< 0.5	< 0.5	< 0.5	< 1	< 5	NA	NA	NA	NA	NA	NA	NA
	3/27/01	SP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/22/01	SP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/26/01	SP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/7/01	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/6/02	SP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/6/02	SP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/6/02	SP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/11/02	SP	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FOMW-2	6/8/00	--	NA	< 50	< 50	< 0.5	< 0.5	< 0.5	< 1	< 5.0	NA	NA	250	150	< 0.01	1	110
	10/10/00	--	NA	< 50	< 50	< 0.5	< 0.5	< 0.5	< 1	< 5.0	NA	NA	260	140	< 0.01	170	1600
	12/15/00	--	NA	< 50	< 50	< 0.5	< 0.5	< 0.5	< 1	< 5.0	7.8	30	210	190	< 0.01	550	1000
	3/27/01	--	NA	< 50	NA	< 0.5	< 0.5	< 0.5	< 1	< 5.0	8.4	47	290	130	< 0.01	30	170
	3/27/01	1	NA	< 50	NA	< 0.5	< 0.5	< 0.5	< 1	< 5.0	9.1	47	320	130	< 0.01	40	70
	6/22/01	--	NA	< 250	< 250	< 1	< 1	< 1	< 1	< 5.0	NA	NA	220	110	< 0.01	4000	400000
	9/26/01	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/7/01	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	3/6/02	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	6/6/02	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	9/6/02	3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	12/11/02	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FOMW-3	6/8/00	--	NA	< 50	J 1200	< 0.5	< 0.5	< 0.5	< 1	< 5.0	NA	NA	330	190	< 0.01	440	110000
	6/8/00	1	NA	< 50	J 1100	< 0.5	< 0.5	< 0.5	< 1	< 5.0	NA	NA	330	180	< 0.01	50	8000
	10/10/00	--	NA	230	< 50	< 0.5	< 0.5	< 0.5	< 1	< 5.0	NA	NA	300	170	< 0.01	800	4000
	12/15/00	--	NA	100	< 50	< 0.5	< 0.5	< 0.5	< 1	< 5.0	3.2	30	290	190	< 0.01	1200	1800
	3/27/01	--	NA	170	NA	< 0.5	< 0.5	< 0.5	< 1	< 5.0	3.3	51	420	130	< 0.01	400	300
	6/22/01	--	NA	260	< 250	< 1	< 1	< 1	< 1	< 5.0	NA	NA	250	150	< 0.01	4000	350000
	9/26/01	--	NA	95	< 500	0.72	1	< 0.5	< 0.5	< 5.0	5.0	55	NA	150	0.011	30	170
	12/7/01	--	NA	110	< 500	< 0.5	< 0.5	< 0.5	< 0.5	< 5.0	7.1	66	NA	130	NA	260	1000
	3/6/02	--	< 50	53	< 500	< 0.5	< 0.5	< 0.5	< 0.5	< 5.0	6.8	84	NA	140	NA	--	--
	6/6/02	--	< 50	302 J	< 500	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	9.08	39.3	NA	160	NA	200	400
	9/6/02	--	< 50	< 500	< 500	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	1.54	26.9	NA	165	NA	20	100
	12/11/02	2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

APPENDIX B  
HISTORICAL SUMMARY OF GROUNDWATER MONITORING RESULTS  
SEARS RETAIL STORE NO. 1058  
OAKLAND, CALIFORNIA

Monitoring Well No.	Sample Date	Notes	LABORATORY ANALYTICAL RESULTS								PHYSICAL PARAMETERS						
			TPH by 8015M			Volatile Organics by GC/MS 8021A/8260A					Nitrate (mg/L)	Sulfate (mg/L)	TDS (mg/L)	Total Alkalinity (mg/L)	Dissolved Methane (µg/ML)	Hydrocarbon Degraders (CFU/ML)	Heterotrophic Plate Count (CFU/ML)
			TPHg (µg/L)	TPHd (µg/L)	TPHo (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)	MTBE (µg/L)							
FOMW-4	3/6/02	--	< 50	< 50	< 500	< 0.5	< 0.5	< 0.5	< 0.5	< 5.0	9.7	53	--	100	--	--	--
	3/6/02	1	< 50	52	< 500	< 0.5	< 0.5	< 0.5	< 0.5	< 5.0	9.7	53	--	110	--	--	--
	6/6/02	--	< 50	120 J	< 500	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	12.7	25.6	NA	146	NA	1000	4000
	6/6/02	1	< 50	< 500	< 500	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	--	--	NA	--	NA	--	--
	9/6/02	--	< 50	< 500	< 500	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	7.64	21.2	NA	144	NA	40	5000
	9/6/02	1	< 50	< 500	< 500	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	7.48	11.8	NA	126	NA	--	--
	12/11/02	--	< 50	< 500	< 2000	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	17.3	35.1	NA	125	NA	10	400
	12/11/02	1	< 50	< 500	< 2000	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	NA	NA	NA	NA	NA	NA	NA
FOMW-5	3/6/02	--	< 50	< 50	< 500	< 0.5	< 0.5	< 0.5	< 0.5	< 5.0	15	41	--	120	--	--	--
	6/6/02	--	< 50	< 500	< 500	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	11.4	25.9	NA	130	NA	200	1600
	9/6/02	--	< 50	< 500	< 500	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	7.48	11.8	NA	124	NA	30	100
	12/11/02	--	< 50	< 500	< 2000	< 0.5	< 0.5	< 0.5	< 0.5	< 1.0	14.4	29.6	NA	121	NA	10	600

Notes: TPH - Total petroleum hydrocarbons  
B T E X - Benzene, Toluene, Ethylbenzene, Total Xylenes  
MTBE - Methyl tertiary-butyl ether  
TDS = Total Dissolved Solids  
1: Duplicate sample  
2: Well covered by recent construction. Could not be accessed.  
3: Well casing is damaged  
J - Bunker-C detections were quantitated against the diesel standard and flagged as estimated concentrations  
< - Analyte not detected above indicated method detection limit  
NA: Not analyzed/Not available.  
SP: Separate Phase Product

TPHg = Total Petroleum Hydrocarbons as gasoline range hydrocarbons by EPA Method 8015 (modified)  
TPHd = Total Petroleum Hydrocarbons as diesel range hydrocarbons by EPA Method 8015 (modified).  
TRPo = Total Petroleum Hydrocarbons as oil range by EPA Method 8015 (modified)  
µg/L - micrograms per liter  
mg/L - milligrams per liter  
(CFU/ML)- colony forming unit per milliliter

**APPENDIX C**

**LABORATORY REPORTS AND CHAIN OF CUSTODY DOCUMENTS FOR  
GROUNDWATER**



**Southland Technical Services, Inc.**  
Environmental Laboratories

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12-19-2002

Mr. Scott Rowlands  
URS Corporation  
2020 E. First Street, Suit 400  
Santa Ana, CA 92705

Project: 25363708.02034/Sears Oakland 1058A  
Project Site: 2633 Telegraph Ave., Oakland, CA  
Sample Date: 12-11-2002  
Lab Job No.: UR212092

Dear Mr. Rowlands:

Enclosed please find the analytical report for the sample(s) received by STS Environmental Laboratories on 12-12-2002 and analyzed by the following EPA methods:

EPA 8015M (Gasoline)  
EPA 8015M (Diesel & Oil)  
EPA 8021B (BTEX & MTBE)  
EPA 352.1 (Nitrate)  
EPA 375.4 (Sulfate)  
EPA 310.1 (Alkalinity)

EPA 310.1 analysis was subcontracted to AmeriChem Testing Laboratory, ELAP No. 1758.

The sample(s) arrived in good conditions (i.e., chilled at 4°C, intact) and with a chain of custody record attached.

STS Environmental Laboratory is certified by CA DHS (Certificate Number 1986). Thank you for giving us the opportunity to serve you. Please feel free to call me at (323) 888-0728 if our laboratory can be of further service to you.

Sincerely,

Roger Wang, Ph. D.  
Laboratory Director

Enclosures

This cover letter is an integral part of this analytical report.



# Southland Technical Services, Inc.

## Environmental Laboratories

12-19-2002

Client: URS Corporation  
 Project: 25363708.02034/Sears Oakland 1058A  
 Project Site: 2633 Telegraph Ave., Oakland, CA  
 Matrix: Water  
 Batch No.: AL14-GW1/for Gasoline  
 Batch No.: EL12-DW1/for Diesel & Oil

Lab Job No.: UR212092  
 Date Sampled: 12-11-2002  
 Date Received: 12-12-2002  
 Date Analyzed: 12-14-2002  
 Date Analyzed: 12-12-2002

**EPA 8015M (Gasoline, Diesel & Oil)**  
 Reporting Unit:  $\mu\text{g/L}$  (ppb)

Date of Analysis for TPH (Gasoline)		12-14-02	12-14-02	12-14-02	12-14-02	12-14-02	12-14-02
Preparation Method for TPH (Gasoline)		5030	5030	5030	5030	5030	5030
Date of Analysis for TPH (D & O)		12-12-02	12-12-02	12-12-02	12-12-02	12-12-02	
Date of Extraction for TPH (D & O)		12-12-02	12-12-02	12-12-02	12-12-02	12-12-02	
Preparation Method for TPH (D & O)		3510C	3510C	3510C	3510C	3510C	
LAB SAMPLE LD.			UR212092-1	UR212092-2	UR212092-3	UR212092-4	UR212092-5
CLIENT SAMPLE LD.			FOMW-4	FOMW-5	BD-1	EB-1	TRIP
Analyte	MDL	MB					
TPH-Gasoline (C4 - C10)	50	ND	ND	ND	ND	ND	ND
TPH-Diesel (C11 - C23)	500	ND	ND	ND	ND	ND	NA
TPH-Oil (C24 - C40)	2000	ND	ND	ND	ND	ND	NA
Surrogate	Spk Conc.	ACP%	MB %RC	%RC	%RC	%RC	%RC
BFB (for TPH-Gasoline)	20 ppb	70-130	103	88	106	104	102
Dioctyl Phthalate (for TPH-Diesel)	5 ppm	70-130	124	126	122	120	NA

SPK Conc.=Spiking Concentration; ACP%=Acceptable Range of Percent; %RC=% Recovery MDL=Method Detection Limit; MB=Method Blank; ND=Not Detected(Below MDL); NA=Not Analyzed

J=Trace level, below reporting limit.

Checked & approved by:

Roger Wang, Ph.D.  
 Laboratory Director.



**Southland Technical Services, Inc.**  
Environmental Laboratories

12-19-2002

Client: URS Corporation  
Project: 25363708.02034/Sears Oakland 1058A  
Project Site: 2633 Telegraph Ave., Oakland, CA  
Matrix: Water  
Batch No.: AL14-G/BW1

Lab Job No.: UR212092  
Date Sampled: 12-11-2002  
Date Received: 12-12-2002  
Date Analyzed: 12-14-2002

**EPA 8015M (Gasoline ) & 8021B (BTEX, MTBE by GC/PID)**  
Reporting Units: µg/L (ppb)

Lab ID	Method Blank	UR212092-1	UR212092-2	UR212092-3	UR212092-4	UR212092-5		MDL
Sample ID		FOMW-4	FOMW-5	BD-1	EB-1	TRIP		
DF	1	1	1	1	1	1		
Benzene	ND	ND	ND	ND	ND	ND		0.5
Toluene	ND	ND	ND	ND	ND	ND		0.5
Ethylbenzene	ND	ND	ND	ND	ND	ND		0.5
Total Xylenes	ND	ND	ND	ND	ND	ND		0.5
MTBE	ND	ND	ND	ND	ND	ND		1.0
Gasoline	ND	ND	ND	ND	ND	ND		50
SURRO-GATE	MB %RC	%RC	%RC	%RC	%RC	%RC		Accept Limit%
Bromofluoro-benzene	103	88	106	104	102	90		71-131

Note: Surrogate spike concentrations are 20 µg/L for Bromofluoro-benzene

MDL=Method Detection Limit, DF=Dilution Factor ( $DF \times MDL = \text{Reporting Limit for the sample}$ ),  
ND=Not Detected (at the specified limit),%RC=Percent Recovery, MB=Method Blank.

Checked & approved by:

Roger Wang, Ph.D.  
Laboratory Director.



**Southland Technical Services, Inc.**  
Environmental Laboratories

12-19-2002

Client: URS Corporation  
Project: 25363708.02034/Sears Oakland 1058A  
Project Site: 2633 Telegraph Ave., Oakland, CA  
Matrix: Water

Lab Job No.: UR212092  
Date Sampled: 12-11-2002  
Date Received: 12-12-2002

**Analytical Test Results**

Analyte	Method	Date Analyzed	Reporting Unit	Sample Results					Reporting Limit
				MB	FOMW-4	FOMW-5			
Total Alkalinity	310.1	12-13-02	mg/L	ND	125	121			1 mg/L
Nitrate	352.1	12-12-02	mg/L	ND	17.3	14.4			0.05 ppm
Sulfate	375.4	12-12-02	mg/L	ND	35.1	29.6			1.0 ppm

MB: Method Blank.

Note: EPA 310.1 analysis was subcontracted to AmeriChem Testing Laboratory, ELAP No. 1758.

Checked & approved by:

Roger Wang, Ph.D.  
Laboratory Director.





**Southland Technical Services, Inc.**  
Environmental Laboratories

12-19-2002

**EPA 8015M (TPH)  
Batch QA/QC Report**

Client: URS Corporation  
Project: 25363708.02034/Sears Oakland 1058A  
Matrix: Water  
Batch No.: EL12-DW1

Lab Job No.: UR212092  
Lab Sample ID: UR212092-4  
Date Analyzed: 12-12-2002

**I. MS/MSD Report**  
Unit: ppm

Analyte	Sample Conc.	Spike Conc.	MS	MSD	MS %Rec.	MSD %Rec.	% RPD	%RPD Accept. Limit	%Rec Accept. Limit
TPH-d	ND	20	23.0	22.9	115.0	114.5	0.4	30	70-130

**II. LCS Result**  
Unit: ppm

Analyte	LCS Report Value	True Value	Rec.%	%Rec Accept. Limit
TPH-d	23.5	20	117.5	80-120

ND: Not Detected (at the specified limit).



**Southland Technical Services, Inc.**  
Environmental Laboratories

12-19-2002

**EPA 8015M (TPH)  
Batch QA/QC Report**

Client: URS Corporation  
Project: 25363708.02034/Sears Oakland 1058A  
Matrix: Water  
Batch No.: AL14-GW1

Lab Job No.: UR212092  
Lab Sample ID: UR212083-10  
Date Analyzed: 12-14-2002

**I. MS/MSD Report  
Unit: ppb**

Analyte	Sample Conc.	Spike Conc.	MS	MSD	MS %Rec.	MSD %Rec.	% RPD	%RPD Accept. Limit	%Rec Accept. Limit
TPH-G	ND	1000	810	781	81.0	78.1	3.6	30	70-130

**II. LCS Result  
Unit: ppb**

Analyte	LCS Report Value	True Value	Rec.%	%Rec Accept. Limit
TPH-G	955	1000	95.0	80-120

ND: Not Detected (at the specified limit).



**Southland Technical Services, Inc.**  
Environmental Laboratories

07-12-2002

**EPA 8021B (BTEX)  
Batch QA/QC Report**

Client: URS Corporation  
Project: 25363708.02034/Sears Oakland 1058A  
Matrix: Water  
Batch No.: AL14-BW1

Lab Job No.: UR212092  
Lab Sample ID: UR212092-1  
Date Analyzed: 12-14-2002

**I. MS/MSD Report  
Unit: ppb**

Compound	Sample Conc.	Spike Conc.	MS	MSD	MS %Rec.	MSD %Rec.	% RPD	%RPD Accept. Limit	%Rec Accept. Limit
Benzene	ND	20	19.4	20.4	97.0	102.0	5.0	30	70-130
Toluene	ND	20	18.4	19.9	92.0	99.5	7.8	30	70-130

**II. LCS Result  
Unit: ppb**

Compound	LCS Report Value	True Value	Rec.%	Accept. Limit
Benzene	20.3	20	101.5	80-120
Toluene	19.4	20	97.0	80-120

ND:Not Detected (at the specified limit).



**Southland Technical Services, Inc.**  
Environmental Laboratories

12-19-2002

**EPA 300 Series(SO4, NO3)  
Batch QA/QC Report**

Client: URS Corporation  
Project: 25363708.02034/Sears Oakland 1058A  
Matrix: Water  
Batch No: 1212-WET1

Lab Job No.: UR212092  
Sample ID: LCS  
Date Analyzed: 12-12-2002

**LCS/LCSD Report**  
Unit: ppm

Compound	Sample Conc.	Spike Conc.	LCS	LCSD	MS %Rec.	MSD %Rec.	% RPD	%RPD Accept. Limit	%Rec Accept. Limit
SO4	ND	30	26.1	26.2	87.0	87.3	0.3	30	70-130
NO3	ND	20	19.4	19.5	97.0	97.5	0.5	30	70-130

ND: Not Detected.



**Southland Technical Services, Inc.**  
Environmental Laboratories

12-19-2002

**EPA 300 Series(SO4, NO3)  
Batch QA/QC Report**

Client: URS Corporation  
Project: 25363708.02034/Sears Oakland 1058A  
Matrix: Water  
Batch No: 1212-WET1

Lab Job No.: UR212092  
Sample ID: LCS  
Date Analyzed: 12-12-2002

**LCS/LCSD Report**  
Unit: ppm

Compound	Blank Conc.	Spike Conc.	LCS	LCSD	LCS %Rec.	LCSD %Rec.	% RPD	%RPD Accept. Limit	%Rec Accept. Limit
SO4	ND	30	26.1	26.2	87.0	87.3	0.3	30	70-130
NO3	ND	20	19.4	19.5	97.0	97.5	0.5	30	70-130

ND: Not Detected.

# Cyto Culture

ENVIRONMENTAL  
BIOTECHNOLOGY

**CytoCulture International, Inc.**  
249 Tewksbury Avenue  
Pt. Richmond, CA 94801 USA

## URS Corporation

Project Name: Sears-Hayward

Project Manager: Scott Rowlands

Address: 2020 East First Street, Suite 400  
Santa Ana, CA 92705

Reporting Date: December 23, 2002

CytoCulture Lab Login: 02-107

Project Number: 25363708.02034

Tel: 714-835-6886 Fax: 714-667-7147

**Samples:** Two water samples on ice were received 12/12/02. They were stored at 4°C and assayed on 12/13/03. Please see attached chain of custody.

## AEROBIC

### Hydrocarbon-Degrading and Total Heterotrophic Bacteria Enumeration Assays

**Analysis Request:** Enumeration of aerobic petroleum hydrocarbon-degrading bacteria (broad range petroleum derived from gasoline and diesel) and total heterotrophic bacteria by method 9215A (HPC)/ Standard Methods 9215B modified.

**Carbon Source for Hydrocarbon-Degrading Bacteria:** Pasteurized Chevron gasoline and diesel were dissolved into agar plates as the sole carbon and energy source for the growth of aerobic hydrocarbon-degrading bacteria.

**Protocol for Hydrocarbon-Degrading Bacteria:** Sterile agar plates (100 x 15 mm) were prepared with minimal salts medium at pH 6.8 with agar and hydrocarbons, without any other carbon sources or nutrients added. Triplicate plates were inoculated with 1.0 ml of each sample (log dilution  $10^0$ ) or log dilutions of each sample: at  $10^{-1}$ ,  $10^{-2}$ , and  $10^{-3}$ . Hydrocarbon plates were counted after 10 days incubation at 30 degrees Celsius. The plate count data is reported as colony forming units (cfu) per milliliter (ml). Each enumeration value represents a statistical average of plate count data obtained from two of the four inoculating log dilutions assayed.

**Protocol for Total Heterotrophic Bacteria:** Sterile agar plates (100 x 15 mm) were prepared with minimal salts and 2.35% Difco heterotrophic plate count agar at pH 6.8 without any other carbon source or nutrients added. Triplicate plates were inoculated with 1.0 ml of sample at log dilutions  $10^{-1}$ ,  $10^{-2}$ ,  $10^{-3}$  and  $10^{-4}$ . The heterotrophic plates were counted after 4 days of incubation at 30 Deg. C. The plate count data is reported as colony forming units (cfu) per milliliter (ml) of sample. Each enumeration value represents a statistical average of plate count data obtained from two of the four inoculating log dilutions assayed.


**AEROBIC  
Hydrocarbon-Degrading and Total Heterotrophic Bacteria  
Enumeration Assay Results**

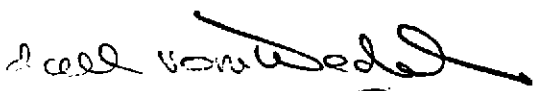
Client Sample Number	Sample Date	Hydrocarbon Degraders (cfu/ml)	Target Hydrocarbons Tested	Total Heterotrophs (cfu/ml)
FOMW-4	12/11/02	$1 \times 10^1$	Gasoline/Diesel	$4 \times 10^2$
FOMW-5	12/11/02	$1 \times 10^1$	Gasoline/Diesel	$6 \times 10^2$
Sterile Water	12/13/02	$<1 \times 10^1$	Gasoline/Diesel	$<1 \times 10^1$
Air control	12/13/02	$<1 \times 10^1$	Gasoline/Diesel	$<1 \times 10^1$
Positive Control	12/13/02	$4 \times 10^6$	Gasoline/Diesel	$2 \times 10^8$

Reporting Limit for enumeration data is  $1.0 \times 10^1$  cfu/ml.

A positive control sample of hydrocarbon-degrading bacteria was run concurrently with these samples using a mixed flask culture of bacteria isolated from contaminated groundwater sites in Northern California.

CytoCulture is available on a consulting basis to assist in the interpretation of these data and their application to field bioremediation protocols.

  
Tia Shimada  
Laboratory Technician

  
Randall von Wedel  
Randall von Wedel  
Randall von Wedel, Ph.D.  
Principal Biochemist

# URS Corporation

Subcontracted Microbiology Assays  
performed by

## CytoCulture Environmental Biotechnology

### CHAIN OF CUSTODY FORM

Project Name: <i>Sequ. Auto Center #1058A</i>	URS Project No. <i>2536370802034</i>	URS Purchase Order / LOG IN #:
URS Client Organization: <i>Sequ</i>		CytoCulture LOG IN #:
Address to Send Results: <i>2020 E. 1st St., Suite 400 Santa Ana, CA 92705</i>		Billing Address:
URS Email for Sending Data:		URS Project Manager: <i>Scott Rowlands</i>
URS Tel for Follow-up: <i>(714/227-1492 Nashua cell) OFF:ce 714/85-6886</i>		URS Sampler / Recorder: <i>Nashua Sam</i>

Sample I.D. <small>Indicate target Hydrocarbon range</small>	Sampling		Matrix		Aerobic Analyses Requested							Other Tests or Comments	
	Date	Time	Soil	Water	Hydrocarbon Degrading Bacteria Plate Count	Total Heterotrophic Bacteria Plate Count	pH	DO	NH <sub>3</sub>	PO <sub>4</sub>	NO <sub>3</sub>		SO <sub>4</sub>
<i>FUMW-4</i>	<i>12-11-02</i>	<i>1435</i>		<i>X</i>	<i>X</i>	<i>X</i>							
<i>FUMW-5</i>	<i>12-11-02</i>	<i>1340</i>		<i>X</i>	<i>X</i>	<i>X</i>							

<b>Chain of Custody Record</b>	Signature of this form constitutes	a firm Purchase Order for services.	Payment DUE on Reporting Date.
Relinquished by: <i>[Signature]</i>	Date/Hr: <i>12/11/02 1800</i>	Please call CytoCulture to notify our lab of samples being shipped.	<b>Deliver samples on ice to:</b> <b>CytoCulture Environmental</b>
Received for CytoCulture Lab by: <i>[Signature]</i>	Date/Hr: <i>12-12-02 11:00AM</i>	CytoCulture Tel: 510-233-0102 Lab Services Fax: 510-233-3777	<b>249 Tewksbury Avenue</b> <b>Point Richmond, CA 94801</b>





**AmeriChem  
Testing  
Laboratory**

1700 N. Batavia St.  
Orange, CA 92865

(714) 921-1550  
FAX: (714) 921-4770

# Analytical Report

**REPORT NUMBER: AL-4079-C**

**CLIENT:**

**STS Environmental Lab.  
7801 Telegraph Rd. suite J  
Montebello, CA 90640**

**REPORT ON:**

**Water sample, UR212092  
Sears/Oakland**

**DATE RECEIVED: 12/13/02**

**DATE REPORTED: 12/14/02**

ANALYSIS	TEST RESULT, mg/l		DET. LIMIT	METHOD
	FOMW-4 UR212092-1	FOMW-5 UR212092-2		
Total Alkalinity	125	121	1.0	EPA 310.1

Peter T. Wu  
Lab Director

# URS CORPORATION

2020 East First Street, Suite 400  
 Santa Ana, CA 92705  
 (714) 835-6886  
 FAX (714) 667-7147

Date: 12/11/02

Page 1 of 2

## CHAIN OF CUSTODY RECORD

UR212092

Data Requested in GISKey Format

Lab Name: STS		URS Project/PO Number: 25363708.02034		Requested Analyses:										Special Instructions:	
Client Name/Project Name/Location: Seas/2633 Telegraph Ave. Oakland		GeoTracker Information:													
URS Project Manager: Crest Rowlands		EDF Reporting: Y N Global ID:													
Sampler Name and Signature: Nathan Stern		COELT Log Number:													
Sample Name:	Sample Date:	Sample Time:	Preserved:	Matrix:	Container Type:	# of Cont.:	TPHs / 8015M	TPHs TPHs / 8015M	BTX, MIBL, 8021, 8202B	NO <sub>3</sub> /SO <sub>4</sub> /9056	Alk. 310.1	Dechlor/ASTM 677	HPC / SM915A	Lab ID	HOLD
FOMW-5	12-11-02	1340	Y N HCl	S G	Acetate SS. Brass Jar Encore ml Amb. Plas. Glass VOA	3	X	X						UR212092-2	
FOMW-5	12-11-02	1340	Y N	S G	Acetate SS. Brass Jar Encore ml Amb. Plas. Glass VOA	2			X						-2
FOMW-5	12-11-02	1340	Y N	S G	Acetate SS. Brass Jar Encore 100ml Amb. Plas. Glass VOA	1				X					-2
FOMW-5	12-11-02	1340	Y N	S G	Acetate SS. Brass Jar Encore ml Amb. Plas. Glass VOA IL	1		X							-2
EB-1	12-11-02	1255	Y N HCl	S G	Acetate SS. Brass Jar Encore ml Amb. Plas. Glass VOA	3	X	X							-4
EB-1	12-11-02	1255	Y N	S G	Acetate SS. Brass Jar Encore ml Amb. Plas. Glass VOA	1		X							-4
FOMW-4	12-11-02	1435	Y N HCl	S G	Acetate SS. Brass Jar Encore ml Amb. Plas. Glass VOA	3	X	X							-1
FOMW-4	12-11-02	1435	Y N	S G	Acetate SS. Brass Jar Encore ml Amb. Plas. Glass VOA	2			X						-1
FOMW-4	12-11-02	1435	Y N	S G	Acetate SS. Brass Jar Encore ml Amb. Plas. Glass VOA IL	1		X							-1
FOMW-4	12-11-02	1435	Y N	S G	Acetate SS. Brass Jar Encore 100ml Amb. Plas. Glass VOA	1				X					-1

Relinquished by: <i>[Signature]</i>	Date: 12/11/02	Received By: <i>[Signature]</i>	Date/Time: 12/12/02	Turnaround Time: (Check)	
Relinquished by:	Date:	Received By:	Date/Time:	Same Day: _____	72 Hour: _____
Relinquished by:	Date:	Received By:	Date/Time:	24 Hour: _____	5 Day: _____
Relinquished by:	Date:	Received By:	Date/Time:	48 Hour: _____	Standard: _____

**Lab Use Only**

Cooler Temperature\*: 4°C  
 \*Record upon arrival

**URS**

# URS CORPORATION

2020 East First Street, Suite 400  
 Santa Ana, CA 92705  
 (714) 835-6886  
 FAX (714) 667-7147

Date: 12/11/02

## CHAIN OF CUSTODY RECORD

Page 2 of 2

UR212092

Data Requested in GISKey Format

Lab Name: <u>STS</u>		URS Project/PO Number: <u>25363708.02034</u>				Requested Analyses:										Special Instructions:				
Client Name/Project Name/Location: <u>Sears / 2633 Telegraph Ave <sup>04142</sup></u>		GeoTracker Information:				<div style="display: flex; justify-content: space-around;"> <div>TPH<sub>5</sub>/8015N</div> <div>TPH<sub>40</sub>/8015M</div> <div>TPH<sub>15</sub>/8015E</div> <div>NO<sub>3</sub>/8504/9056</div> <div>AKI<sub>3</sub>/10.1</div> </div>										HOLD				
URS Project Manager: <u>Scott Rowlands</u>		EDF Reporting: Y N Global ID:														UR212092				
Sampler Name and Signature: <u>N. S. G. S. G. S. G.</u>		COELT Log Number:																		
Sample Name:	Sample Date:	Sample Time:	Preserved:	Matrix:	Container Type:	# of Cont.:														
BD-1	12-11-02	1410	Y N	HCl	Acetate SS. Brass Jar Encore ____ml Amb. Plas. Glass VOA	3	X	X												-3
BD-1	12-11-02	1410	Y N		Acetate SS. Brass Jar Encore ____ml Amb. Plas. Glass VOA	1		X												-3
TRIP			Y N		Acetate SS. Brass Jar Encore ____ml Amb. Plas. Glass VOA		X	X												-5
			Y N		Acetate SS. Brass Jar Encore ____ml Amb. Plas. Glass VOA															
			Y N		Acetate SS. Brass Jar Encore ____ml Amb. Plas. Glass VOA															
			Y N		Acetate SS. Brass Jar Encore ____ml Amb. Plas. Glass VOA															
			Y N		Acetate SS. Brass Jar Encore ____ml Amb. Plas. Glass VOA															
			Y N		Acetate SS. Brass Jar Encore ____ml Amb. Plas. Glass VOA															
			Y N		Acetate SS. Brass Jar Encore ____ml Amb. Plas. Glass VOA															
			Y N		Acetate SS. Brass Jar Encore ____ml Amb. Plas. Glass VOA															

Relinquished by: <u>[Signature]</u>	Date: <u>12/11/02</u>	Received By: <u>[Signature]</u>	Date/Time: <u>12/12/02</u>	Turnaround Time: (Check)		Lab Use Only	
Relinquished by:	Date:	Received By:	Date/Time:	Same Day: _____	72 Hour: _____	Cooler Temperature: <u>4°C</u>	
Relinquished by:	Date:	Received By:	Date/Time:	24 Hour: _____	5 Day: _____	*Record upon arrival	
Relinquished by:	Date:	Received By:	Date/Time:	48 Hour: _____	<u>Standard</u>	<b>URS</b>	

CHAIN OF CUSTODY RECORD

Lab Job Number \_\_\_\_\_

Client: <i>Southland Technical Services, Inc.</i>						Analyses Requested										T.A.T. Requested <input type="checkbox"/> Rush 8 12 24 hours <input type="checkbox"/> 2-3 days <input type="checkbox"/> Normal									
Address: <i>7801 Telegraph Rd. #L. Montebello. CA 90640</i>						602/8021 (BTEX, MTBE)	8015M (Gasoline)	8015M (Diesel)	8260B (VOCs)	8260B (Oxygenates, BTEX)	8260B (MTBE Confirm.)	Alkalinity (380.1)	Sample Condition <input type="checkbox"/> Chilled <input type="checkbox"/> Intact <input type="checkbox"/> Sample seals		Remarks										
Report Attention <i>Roger Wang</i>	Phone 323 <i>888-0728</i>	Fax 323 <i>888-1509</i>	Sampled by										Project Name/No. <i>UR212092</i>			Project Site <i>Sears/Oakland</i>									
Client Sample ID	Lab Sample ID	Sample Collect		Matrix Type	Sample Preserve								No., type* & size of container												
		Date	Time																						
<i>FOMW-4</i>	<i>LD2 212092-1</i>	<i>12/11/02</i>		<i>H<sub>2</sub>O</i>		<i>1</i>																			
<i>FOMW-5</i>	<i>-2</i>	<i>12/11</i>		<i>"</i>		<i>1</i>																			
<i>Dup-1</i>		<i>12/11</i>		<i>"</i>		<i>1</i>																			
Relinquished by <i>Roger Wang</i>		Company <i>STS</i>	Date <i>12/11/02</i>	Time <i>10:00</i>	Received by <i>[Signature]</i>		Company <i>Southland Tech Serv</i>											Container types: M=Metal Tube A=Air Bag P=Plastic bottle G=Glass bottle V=VOA vial							
Relinquished by		Company	Date	Time	Received by		Company																		

Southland Tech. Services, Inc.  
7801 Telegraph Road, Suite L & K  
Montebello, CA 90640

Tel: (323) 888-0728  
Fax: (323) 888-1509

Note: Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client's expense.  
Distribution: WHITE with report, PINK to courier.

**APPENDIX D**

**URS DATA VALIDATION REPORTS**

## Level III Data Validation Summary

**PROJECT:** Sears Oakland 1058A  
**LABORATORY:** Southland Technical Services, Inc. (STS)  
**MATRIX:** Groundwater  
**LAB PROJECT #:** UR212092  
**SAMPLES:** See table below

Field ID	QC Designations	Lab ID	BTEX, MTBE	TPH-Gasoline	TPH-Diesel, TPH-Oil	Nitrate, Sulfate	Alkalinity	H-Degrader and HPC
FOMW-5		UR212092-2	X	X	X	X	X	X
EB-1	Equipment blank	UR212092-4	X	X	X			
FOMW-4		UR212092-1	X	X	X	X	X	X
BD-1	Field duplicate of FOMW-4	UR212092-3	X	X	X			
TRIP	Trip blank	UR212092-5	X	X				

Date Sampled: 12/11/02

TPH-Gasoline = Total petroleum hydrocarbons, gasoline range (C4-C10).

TPH-Diesel = Total petroleum hydrocarbons, diesel range (C11-C23).

TPH-Oil = Total petroleum hydrocarbons, oil range (C24-C40).

BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes.

MTBE = Methyl t-butyl ether.

STS is certified by California Department of Health Services, Environmental Laboratory Accreditation Program (ELAP Certificate Number 1986).

## DATA REVIEW MATRIX

QC Parameter	BTEX, MTBE EPA 8021B	TPH-Gasoline EPA 5030/8015M	TPH-Diesel, TPH-Oil EPA 3510C/8015M	Nitrate, Sulfate EPA352.1/375.4	Alkalinity EPA 310.1	H-Degrader and HPC SM9215A/ SM9215B
Chain-of-custody (COC)	✓	✓	✓	✓	✓(4)	✓(5)
Sample Receipt	✓	✓	✓	✓	✓	✓
Holding Times	✓	✓	✓	✓	✓	✓
Method Blank	✓	✓	✓	✓	✓	✓
Surrogate Recovery	✓	✓	✓	NA	NA	NA
Laboratory Control Sample	✓	✓	✓	✓	NP	✓
Matrix Spike	✓(1)	(2)	(3)	NP	NP	NA
Duplicate, or Spike Duplicate	✓(1)	(2)	(3)	NP	NP	NA
Field Duplicate	✓	✓	✓	NC	NC	NC
Trip Blank	✓	✓	NC	NC	NC	NC
Equipment Blank	✓	✓	✓	NC	NC	NC

✓ = Quality control evaluation criteria met.

NA = Not Applicable or Not Analyzed

NP = Not Provided

NC = Not Collected or Analysis Not Requested

### Notes:

- MS/MSD was conducted on sample FOMW-4. The results were within acceptance criterion.
- MS/MSD was conducted on a non-site related sample; therefore, the MS/MSD results obtained may not be fully representative of the accuracy and precision of the analysis on the site-specific sample matrix.
- MS/MSD was conducted on sample EB-1, the equipment blank sample; therefore, the MS/MSD results obtained may not be fully representative of the accuracy and precision of the analysis on the site-specific sample matrix.
- Analyses subcontracted to Americhem Testing Laboratories, ELAP certificate number 1758.
- Analyses performed at CytoCulture Environmental Biotechnology Laboratories.

Summary: Based on this Level III validation covering the QC parameters listed in the table above, these data are considered to be useable for meeting project objectives without qualification. However, the data user must evaluate the ultimate usability of the data based on the reporting limits obtained. The table below lists the detection limits obtained for undiluted samples.

Analyte	Detection Limits Obtained
TPH-Gasoline	50
TPH-Diesel	500
TPH-Oil	2000
Benzene	0.5
Toluene	0.5
Ethylbenzene	0.5
Total Xylenes	0.5
MTBE	1.0
Total Alkalinity	1000
Nitrate	50
Sulfate	1000

Aqueous units are microgram per Liter ( $\mu\text{g/L}$ ).

Samples did not require dilution for the EPA 8021B, and EPA 8015M analyses.