

**INTERIM REPORT ONE  
6707 BAY STREET  
EMERYVILLE, CALIFORNIA**

Prepared for:

Mr. Robert P. Gates  
Erskine and Tulley  
580 Market Street  
San Francisco, California 94104

Prepared by:

SCS Engineers  
6761 Sierra Court  
Suite D  
Dublin, California 94568

February 25, 1991

File Number 0389058.00

91 FEB 27 P11 4: 08

**SCS ENGINEERS**

February 25, 1991  
File No. 0389058.00

Mr. Robert P. Gates  
Erskine and Tulley  
580 Market Street  
San Francisco, California 94104

Subject: Interim Report One  
6707 Bay Street  
Emeryville, California

Dear Mr. Gates:

SCS Engineers is pleased to present this interim report discussing environmental work at 6707 Bay Street in Emeryville, California done since the work discussed in the report titled Environmental Assessment dated January 30, 1990. The January report was prepared for Mr. Gates and discussed environmental work done on the 6707 Bay Street site.

The attached report contains the following elements:

- Introduction
- Field Methods
- Chemical Methods
- Summary and Conclusions
- Recommendations

This report has been prepared specifically for Mr. Robert P. Gates with specific application to hazardous waste site investigations. The report has been prepared with the care and skill generally exercised by reputable professionals, under similar circumstances, in this or similar localities. No other warranty, either expressed or implied, is made as to the professional advice presented.

Mr. Robert P. Gates  
February 21, 1991  
Page Two

SCS is pleased to provide Mr. Gates with this environmental service. If you have any questions, please contact either of the undersigned at (415) 829-0661.

Sincerely,



J. Don McClenagan  
Project Geologist  
SCS Engineers



John P. Cummings, Ph.D., R.E.A., R.E.P.  
Office Director  
SCS Engineers

JDM/JPC/sar

Attachments

cc: Dennis Byrne, Alameda County Department of Health Services

## CONTENTS

<u>Section</u>		<u>Page</u>
1.	Introduction . . . . .	1
2.	Field Methods . . . . .	4
3.	Chemical Methods . . . . .	7
4.	Summary And Conclusions . . . . .	8
5.	Recommendations . . . . .	11

### FIGURES:

1. Vicinity Map
2. Site Plan
3. Groundwater Gradient Map

### APPENDIX:

- A - Chemical Analysis Results Tables
- B - Laboratory Reports, November and December 1990

## SECTION 1 INTRODUCTION

### BACKGROUND

Previous environmental work at 6707 Bay Street in Emeryville (subject site) was done by L & W Environmental Services, Incorporated (L & W) in 1989. The work done by L & W included an environmental site assessment and subsurface investigation of the subject site. Soil and groundwater samples were taken. Contamination of the soil and groundwater was detected.

A report discussing the subject site (see Figure 1) dated January 30, 1990 and titled Environmental Assessment was prepared by SCS Engineers (SCS). The report consisted of a preliminary site assessment and a discussion of results of a subsurface investigation by SCS. The subsurface investigation was carried out in January 1990 and consisted of soil borings, monitoring well constructions, and monitoring well sampling. Soil and groundwater samples were taken for analysis, and contamination by various compounds was detected in both the soil and the groundwater.

Some of the significant findings of the environmental work done in the two investigations were:

- The subject site was previously used, at least over part of its area, as a municipal landfill. This conclusion was indicated by aerial photographs and supported by the observation of landfill-type debris in samples taken during soil borings at the subject site. Prior to being used as a landfill, the site was apparently a tidal area or was completely inundated by the waters of the San Francisco Bay.

- Three underground storage tanks (USTs), previously used for the storage of chemicals and located near Bay Street at the front of the building, were removed from the site in the fall of 1989.
- The vadose zone (the zone above the water table) beneath the subject site is contaminated by, at various locations, high values of oil and grease, PCBs in low values, diesel, CAM metals, members of the BTEX group (benzene, toluene, ethylbenzene, and xylenes), semi-volatile organic compounds that are primarily coal tar derivatives, and methyl isobutyl ketone (MIBK) near the former tank pit. Low levels of soil contamination are found throughout most of the site, as would be expected in an old construction, soil, and debris landfill.
- The shallow groundwater beneath the site was also found to be contaminated, but, in both the lateral extent and degree of contamination, the contamination of the groundwater was found to be generally less than the vadose zone (soil) contamination. Six monitoring wells are located on-site and all were sampled by SCS. Compounds found in various of the wells included benzene, total petroleum hydrocarbons (TPH), and MIBK. For convenience, tables (Table 1 - Table 6) depicting the contaminants detected in the soil and water samples taken during the SCS investigation are included in Appendix A. Several typographic errors were found in the tables provided with the January 1990 SCS report. Also, some information was not available at the time that report was sent out. Those errors have been corrected and the omissions included in the tables provided with this report. These tables should be used for reference instead of the tables published with the January 1990 report.

High concentration of MIBK was found in Monitoring Well 8 (MW8), the monitoring well installed immediately to the northwest of the area which formerly contained the USTs. Total petroleum hydrocarbons were identified and hydrocarbon fatty acids were tentatively identified in water samples taken from MW7, a well installed in the southwestern part of the subject site (see Figure 2). These results were obtained from sampling done in January of 1990.

#### SUMMARY OF WORK DONE SINCE JANUARY 1990

A well survey to determine the groundwater gradient and direction beneath the site was performed in February of 1990.

Pump tests of MW7 and MW8 were conducted in July 1990.

Design of a vadose zone and groundwater remediation system for the site began in February 1990. Construction of the remediation systems took place from June through September 1990.

The vapor extraction and treatment system went on line in July 1990. The groundwater extraction and treatment system was put in operation in October of 1990.

The groundwater remediation effluent and influent were sampled November and December of 1990 to provide indication as to the effectiveness of the system. Also, the rate of flow from the system was measured to determine the amount of water being discharged to the landscaped area.

#### REPORT PURPOSE

The purpose of this interim report is to provide updated information regarding the subsurface conditions and contamination beneath the subject site and details of the construction and operation of the remediation systems in service on the subject site.

## SECTION 2

### FIELD METHODS

#### WELL SURVEY

Depths to water in the six on-site wells were measured February 8, 1990 by SCS personnel using an electronic water level indicator. Relative elevations of the well casings were measured February 12, 1990 using a Nikon automatic level. The elevations were tied into a benchmark just north of an East Bay Mud manhole located to the east of the Bay Street overpass over Ashby Avenue. The identification on the benchmark was NI 145 + 90.38 EBMud. For the purpose of obtaining relative elevations, the benchmark was given an arbitrary elevation of 100 feet.

#### WELL PUMP TEST

On July 13, 1990, SCS personnel conducted a pump test on MW7 and MW8. In each case, the procedure was as follows. A Grundfos submersible pump was inserted down the well. Approximately three well volumes were pumped out of the well into a 55-gallon drum. After the flow had stabilized, the discharge from the well was redirected into a 5-gallon container marked with 1-gallon gradations. A stop watch was used to record the time required to pump one gallon of water from the well. The time to pump one gallon of water was measured five times, and the values recorded. The rates were averaged to find a pump rate value.

This modified pump test was used as an indication of aquifer characteristics. The pumping rate for MW7 during the test was approximately 0.1 gallons per minute (gpm). The pump rate for MW8 was 0.2 gpm. This rate was later compared with the maximum obtainable flow rate from the remediation system (Section 4., Flow Rate).



## VAPOR SYSTEM CONSTRUCTION

A vapor extraction and treatment system was installed by SCS Engineers as part of a total remediation treatment designed to extract contaminants from both the soil and groundwater in the vicinity of the area formerly occupied by the three chemical USTs. The former tank pit had been backfilled with what appeared to be fine sand. Four 8-inch borings were drilled to a depth of approximately seven feet in a square pattern within the backfill area. Two-inch diameter, slotted PVC casing was wrapped with cheesecloth and inserted down each borehole. Number 3 sand was poured into the annular space up to a one foot depth below the surface. Bentonite was then placed in the annular space for the final foot of depth to act as a seal. Two of the vapor extraction wells were manifolded together. The other two wells served as air make-up wells.

After the two wells were manifolded together, the two inch piping was run through two carbon cannisters, connected in series, and hooked up to a Rotron blower. When the blower is turned on, a negative pressure is created in the two extraction wells. Vapor is pulled out of the ground and through the carbon cannisters. The organic vapors are adsorbed by the carbon pellets in the cannisters.

The vapor extraction system was analyzed periodically in accordance with guidelines set by the Bay Area Air Quality Management District. An Organic Vapor Meter Photo Ionization Detector was used to analyze three sampling ports (SP) on the system. SP1 is located before the two cannisters, SP2 is located between the cannisters, and SP3 serves to monitor the effluent from the system.

## GROUNDWATER TREATMENT SYSTEM CONSTRUCTION

Two groundwater extraction and treatment systems were installed at the site. One system was installed in the vicinity of the tank pit using MW8 as the extraction well. One system was installed to treat contamination found in the water beneath the southwest part of the property using MW7 as the extraction well.

The treatment systems consist of two-stage pneumatic pumps installed down the monitoring wells. The pumps are driven by an air compressor and controlled by a centrally located control panel. The extracted water is pumped through a series of, in the case of the MW7 system, two carbon cannisters connected in series, and, with the MW8 system, a series of three carbon cannisters. The contaminants are adsorbed by the carbon. The piping carrying the treated water is then joined together, and the combined effluent from both wells is used to irrigate the landscaped area on the subject site.

#### SAMPLING OF GROUNDWATER TREATMENT SYSTEM

The groundwater treatment system was sampled on November 12, 1990 and December 10, 1990. The effluent from the remediation system was sampled during the November sampling event. Both the influent and the effluent were analyzed during the December sampling event. Samples of the effluent were obtained from a sampling port (hose bib) located after the point where the treatment systems for MW7 and MW8 are piped together. The influent samples were obtained from sampling ports located in the water lines prior to the point where the water passes through the carbon cannisters.

#### GROUNDWATER REMEDIATION SYSTEM FLOW RATE

The flow rate of the groundwater remediation system was measured on November 2 and November 5, 1990. The flow rate data was obtained by recording the time required for water from the remediation system to fill a container of known volume (see Table 1 in Section 4).

---

### SECTION 3

### CHEMICAL METHODS

#### CHEMICAL ANALYSIS OF GROUNDWATER

The water sample taken December 1990 from MW7 was analyzed for total petroleum hydrocarbons (TPH) by EPA Method 418.1, and was analyzed for total oil and grease by EPA Method 503A. Method 503A analyzes for both petroleum hydrocarbons and animal and vegetable fats.

The December 1990 water sample from MW8 was analyzed for TPH by Method 418.1 and for volatile organic compounds by EPA Method 624. Method 624 detects, along with other compounds, the presence of benzene and MIBK.

The effluent water samples taken in November and December 1990 were analyzed using Methods 624, 418.1, and 503A.

#### CAM METALS ANALYSIS

A water sample from MW1 was analyzed by L & W Environmental Services (L & W) according to their Environmental Site Assessment report to Mr. Robert Gates dated September 26, 1989. The sample was analyzed, along with other compounds, for the CAM Metals. L & W reported that "analytical results of CAM Metals indicated concentrations are well below the Soluble Threshold Limit Concentration (STLC) values" (page 23). The same report also stated that concentrations of lead (0.063 mg/l) and chromium (0.064 mg/l) in the water sample slightly exceeded the California Drinking Water Standards (0.05 mg/l). SCS was unable to find reference that any of the other on-site wells were analyzed for the CAM Metals.

**SECTION 4**  
**SUMMARY AND CONCLUSIONS**

**GROUNDWATER GRADIENT DIRECTION**

The results of the well survey data are depicted in the following table. Note that the benchmark used was assigned an arbitrary elevation of 100 feet.

**Table 1 - Well Survey Data**  
(measurements in feet)

<u>Well I.D.</u>	<u>Casing Elevation</u>	<u>Depth to Water</u>	<u>Water Elevations</u>
MW1	98.64	10.89	87.75
MW3	98.12	8.41	89.71
MW5	96.10	10.48	85.62
MW6	96.45	10.38	86.07
MW7	98.39	12.92	85.47
MW8	98.75	10.16	88.59

The data from the well survey was plotted on a site map and lines of equal elevation were drawn for the water table beneath the site. The direction of groundwater movement varies across the site. The report by L & W stated that the groundwater downgradient direction for the site was to the northwest. SCS concludes that further study is necessary to determine the direction of groundwater movement beneath the subject site. The proximity of the site to San Francisco Bay may cause the downgradient direction to vary over relatively small distances and also may cause variation of the groundwater gradient with time because of tidal fluxuations.

**VAPOR EXTRACTION SYSTEM**

The vapor system was run almost continuously from late July to late September. OVA readings of the influent dropped to 2 ppm, so the system was shut down to allow the buildup of contaminant vapors within the cylinder of influence of the extraction wells. The system was then operated intermittantly to the present. The level of vapor contamination as measured at the influent port (SP1) of the remediation system has not exceeded 10 ppm vapor since October 22, 1990. The vapor system has been largely successful.

## GROUNDWATER EXTRACTION AND TREATMENT SYSTEM

**Flow Rate** - The average measured flow rate from the remediation system was 0.03 gallons per minute (gpm) in November 1990. At this rate, 43.2 gallons per day of water are discharged from the system to the ground. SCS judges that the landscaped area and underlying soil can absorb much more than 45 gallons of water each day without becoming saturated and without endangering the foundation of the buildings in the vicinity. This flow rate value is one tenth the value of the combined pumping rates obtained in the pump test.

**Chemical Analysis of Groundwater** - The table below shows the results of the last two analyses performed on water samples taken from MW7, MW8, and the remediation system effluent (sample REMEFF). Laboratory reports are located in Appendix B.

**Table 2**  
(values in parts per million)

<u>Sample I.D.</u> <u>(sampling date)</u>	<u>Method 418.1</u>	<u>Method 503A</u>	<u>Method 624</u>
MW7 (12-10-90)	ND	2.0	-----
MW8 (12-10-90)	10.5	----	0.160 benzene 3.200 acetone 10.000 2-butanone 47.000 4-methyl 2- pentanone (MIBK) 130.000 4-methyl 2- pentanol
REMEFF (11-12-90)	ND	ND	ND
REMEFF (12-10-90)	0.6*	ND	ND

\* detection limit = 0.5

ND = not detected

Comparison of the above table with Table 6 in Appendix A indicates change in the contamination levels found in MW7 and MW8. That comparison is made for certain compounds in the table below. Note that, in the cases where the same compounds are listed in the analyses, the values prior to the operation of the remediation system (values from Table 6, Appendix A) are significantly higher than the values detected after the remediation system has been in operation for about two months (Table 2). This data comparison indicates the groundwater remediation efforts are proceeding in a positive direction.

**Table 3**  
(values in parts per million)

<u>Sample I.D.</u>	<u>Pre-remediation</u>	<u>After 2 Month's Remediation</u>
MW7 TPH (418.1)	.800	ND
MW8 TPH	103.000	10.500
MW8 benzene	2.100	.160
MW8 MIBK	160.000+	47.000

ND = not detected

## SECTION 5

### RECOMMENDATIONS

SCS recommends that additional sampling be done on the groundwater remediation system commencing in March 1991 and proceeding on a quarterly sampling schedule. The influent from MW7 and water from the sample port located after the first cannister in the MW7 cannister series should be sampled and the samples analyzed using EPA Methods 418.1 and 503A. The influent from MW8 and water from the sample port after the first cannister in the MW8 cannister series should be sampled and analyzed using EPA Methods 418.1 and 624. The effluent from the remediation system should be analyzed using Methods 418.1, 503A, and 624.

All of the six monitoring wells on-site, including MW7 and MW8, should be sampled and analyzed for CAM metals. SCS does not anticipate high values of metals in the water; however, such analysis is deemed necessary by Mr. Dennis Byrne of Alameda County Department of Health Services.

SCS recommends that the groundwater downgradient direction beneath the site be verified. After the March sampling event, the groundwater remediation system should be shut down for one week to allow the recharge of the aquifer so that a re-evaluation of the groundwater gradient direction beneath the site can be obtained. Depths to water in all of the wells can be obtained after the one week "rest period" is completed, and the results used to plot the groundwater downgradient direction beneath the site.

SCS recommends that, even though the vapor extraction system appears to have been successful, that system should remain in place until the site has been remediated successfully. The vapor system should be checked quarterly, at the time of the water sampling event. Should the air sampled from the influent port indicate a level higher than 10 ppm organic vapors, then the vapor system should be turned on until the influent values decrease below 5 ppm.

**TABLE 1**

Results of Soil Sample Analyses for Gasoline, Diesel, Oil and Grease

<u>Sample I.D.</u>	<u>EPA 8015 gasoline</u>	<u>EPA 8015 diesel</u>	<u>EPA 503D oil and grease</u>
	--mg/kg (parts per million)--		
MW7-1	ND	ND	9,000
MW7-2	ND	788	8,800
MW8-1	ND	ND	2,000
MW8-2	ND	ND	20,000
B9-1	ND	ND	23,000
B9-2	ND	5,050	15,000
B10-1	ND	380	9,500
B10-2	ND	ND	6,300
B11-1	ND	ND	45,000
B11-2	ND	ND	30,400
B12-1	ND	ND	12,000
B12-2	ND	ND	38,800
B13-1	ND	ND	9,400
B13-2	ND	ND	3,000
Sump	ND	ND	10,500

ND = not detected

Detection Limit for EPA Method 8015 = 10 ppm



TABLE 2

Results of Soil Sample Analyses for EPA Method 8080  
Organochlorine Pesticides and PCBs

<u>Sample I.D.</u>	<u>Compound</u>	<u>Results</u>	<u>Detection Limit</u> mg/kg (ppm)
MW7-1	----	ND	----
MW7-2	----	ND	----
MW8-1	----	ND	----
MW8-2	PCB-1260	2.3	1.0
B9-1	----	ND	----
B9-2	----	ND	----
B10-1	----	ND	----
B10-2	----	ND	----
B11-1	PCB-1260	2.2	1.0
B11-2	----	ND	----
B12-1	----	ND	----
B12-2	----	ND	----
B13-1	PCB-1260	3.1	1.0
B13-2	----	ND	----
Sump	PCB-1260	4.2	1.0

ND = not detected

TABLE 3

## Results of Soil Sample Analyses for CAM Metals

	antimony (10)	arsenic (16)	barium (0.1)	beryllium (0.02)	cadmium (0.7)	chromium (0.5)	cobalt (2)	copper (0.2)
	---mg/kg (ppm)---							
MW7-1	ND	ND	140	0.48	ND	32	8.6	27
MW7-2	ND	ND	24	0.13	ND	21	ND	3.6
MW8-1	ND	ND	42	0.16	ND	27	2.8	18
MW8-2	ND	ND	85	0.15	ND	9.6	ND	41
B9-1	ND	ND	140	0.41	ND	33	7.4	55
B9-2	ND	ND	610	0.31	44	180	15	2300
B10-1	ND	ND	33	0.05	ND	23	ND	39
B10-2	ND	21	590	0.33	1.3	34	6.9	140
B11-1	ND	ND	240	0.36	1.0	22	5.4	44
B11-2	ND	ND	160	0.31	ND	21	3.6	>4500
B12-1	ND	ND	89	0.23	ND	36	3.4	170
B12-2	ND	38	540	0.26	7.7	190	28	2200
B13-1	ND	ND	160	0.36	ND	62	6.5	120
B13-2	ND	ND	37	0.15	ND	29	2.9	4.9
Sump	ND	ND	180	0.48	ND	95	10	49

ND=not detected

d.l.=detection limit (ppm)

TABLE 3 (Continued)

	lead (12)	mercury (0.009)	molyb- benum (1.0)	nickel (1.0)	selenium (0.2)	silver (0.4)	thallium (10)	vana- dium (0.3)	zinc (0.4)
	---mg/kg (ppm)---								
MW7-1	ND	ND	ND	28	ND	ND	ND	36	79
MW7-2	ND	0.088	ND	16	ND	ND	ND	12	310
MW8-1	ND	ND	ND	18	ND	ND	ND	15	75
MW8-2	24	0.36	ND	6.8	ND	ND	ND	8.5	120
B9-1	41	0.45	ND	32	ND	ND	ND	31	120
B9-2	980	0.66	27	350	ND	ND	ND	26	6200
B10-1	42	0.10	ND	10	ND	ND	ND	5	95
B10-2	1500	0.62	ND	24	ND	ND	ND	28	410
B11-1	72	0.092	ND	25	ND	ND	ND	21	940
B11-2	55	0.12	ND	24	ND	ND	ND	17	160
B12-1	120	ND	ND	29	ND	ND	ND	21	150
B12-2	3000	ND	20	110	ND	ND	ND	23	3600
B13-1	520	ND	ND	42	ND	ND	ND	27	300
B13-2	12	ND	ND	18	ND	ND	ND	15	210
Sump	62	0.022	ND	135	ND	ND	ND	39	150

ND=not detected

d.l.=detection limit (ppm)

TABLE 4.

Results of Soil Sample Analyses for EPA Method 8240 Volatile Organics

<u>Sample ID</u>	<u>Compound</u>	<u>Results</u>	<u>detection limit</u>
MW7-1	-----	ND	---
MW7-2	ethylbenzene	0.25	---
	toluene	0.061	0.010
	m- and p-xylenes	0.56	0.010
	o-xylene	0.46	0.010
MW8-1	-----	ND	---
MW8-2	methyl isobutyl ketone	8.3	0.30
B9-1	toluene	0.012	0.010
B9-2	benzene	0.054	0.010
	ethylbenzene	0.140	0.010
	toluene	0.026	0.010
	m- and p-xylenes	0.250	0.010
	o-xylene	0.130	0.010
B10-1	m- and p-xylenes	0.043	0.010
B10-2	-----	ND	---
B11-1	toluene	0.015	0.010
B11-2	-----	ND	---
B12-1	-----	ND	---
B12-2	-----	ND	---
B13-1	-----	ND	---
B13-2	-----	ND	---
Sump	-----	ND	---

ND = not detected

**TABLE 6.**

Results of Water Sample Analyses

Sample ID	EPA 8015 modified ---mg/l---	EPA 418.1	EPA 624 ---mg/l---	EPA 625
MW1-1W	ND	0.5*	ND	ND
MW3-1W	ND	0.6*	ND	ND
MW5-1W	ND	0.7*	benzene 0.012**	ND
MW6-1W	ND	1.2*	ND	ND
MW7-1W	ND	0.8*	ND	ND
MW8-1W	ND	103.0*	see table below	ND

ND=not detected

\* detection limit 0.5 ppm

\*\* detection limit 0.005 ppm

MW8-1W EPA 624 ANALYSIS RESULTS

concentrations in parts per million (mg/kg)

benzene 2.100

Tentatively Identified Compounds - Approximate Concentrations

MIBK	>160.000
Ethyl Acetate	>20.000
Butyl Acetate	5.800
Propyl Acetate	>32.000
Propyl Ester of Proponoic Acid	2.500
Ethyl Butyl Ether	>12.000
C6 Alcohol	34.000

**TABLE 5**

Results of Soil Sample Analyses for EPA Method 8270 Semi-Volatile Organics

<u>Sample ID</u>	<u>Compound</u>	<u>Results</u> mg/kg (ppm)	<u>Detection Limit</u>
MW7-1	-----	ND	---
MW7-2	chrysene	0.39	0.30
	fluoranthene	0.32	0.30
	2-methylnaphthalene	1.5	0.30
	naphthalene	7.5	0.30
	phenanthrene	0.53	0.30
	pyrene	0.36	0.30
MW8-1	-----	ND	---
MW8-2	pyrene	0.41	0.30
B9-1	chrysene	0.39	0.30
B9-2	chrysene	0.63	0.30
	fluoranthene	0.34	0.30
	2-methylnaphthalene	1.10	0.30
	naphthalene	6.80	0.30
	phenanthrene	0.59	0.30
	pyrene	0.55	0.30
B10-1	-----	ND	---
B10-2	-----	ND	---
B11-1	pyrene	0.32	0.30
B11-2	benzo (a) anthracene	0.58	0.30
	chrysene	0.82	0.30
	fluoranthene	1.10	0.30
	phenanthrene	0.56	0.30
	pyrene	1.80	0.30
B12-1	pyrene	0.37	0.30
B12-2	-----	ND	---
B13-1	benzo (a) pyrene	0.47	0.30
	chrysene	0.39	0.30
	pyrene	0.32	0.30
B13-2	-----	ND	---
Sump	-----	ND	---

ND = not detected

NOV 21 1990



2660 WALNUT AVENUE  
LONG BEACH, CALIFORNIA 90806  
(213) 595-9324  
FAX (213) 595-6709

MEMO

To: Don McClenagen

From: Lam V. Ho

November 16, 1990

Job Number: 0389058.00

Page 1 of 1

LABORATORY REPORT

Sample: Two (2) water samples from MRCP effluent, MW1 and MW8 remediation system. Received 11/13/90 and analyzed 11/15/90.

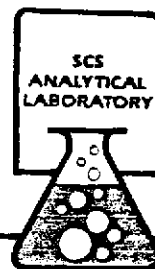
Sample ID	418.1	503A
REMEFF	ND	ND
Detection Limit	0.5	0.5

ND - Not Detected

*Loree Kenyon*  
Loree Kenyon  
Chemist

*Lam V. Ho*  
Lam V. Ho PhD, REP  
Laboratory Director

NOV 28 1990



2860 WALNUT AVENUE  
LONG BEACH, CALIFORNIA 90806  
(213) 595-9324  
FAX (213) 595-6709

MEMO

To: Don McClenagan

From: Lam V. Ho

November 26, 1990

Job Number: 0389058.00

Page 1 of 2

---

LABORATORY REPORT

---

Sample: Two (2) water samples from MRCP effluent, MW7 and MW8 remediation system. Received 11/13/90 and analyzed 11/19/90. One (1) sample archived.

EPA 624 - see attached page

---

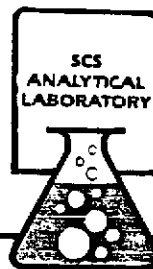
*Loree Kenyon*  
Loree Kenyon  
Chemist

*Don Smarbeck for*  
Lam V. Ho PhD, REP  
Laboratory Director

---

MRCP7.rep





2860 WALNUT AVENUE  
 LONG BEACH, CALIFORNIA 90806  
 (213) 595-9324  
 FAX (213) 595-6709

Addendum Report, EPA 624  
 Page 2 of 2

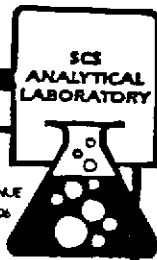
Sample I.D.: REMEFF  
 Date Received: 11/13/90  
 Date Analyzed: 11/19/90  
 Matrix: Water  
 Project #: 0389058.00  
 File #: mrcp7.rep

CAS #	Compound	Result	D.L.
		-----ug/L(ppb)-----	
71-43-2	Benzene	ND	5
75-27-4	Bromodichloromethane	ND	5
75-25-2	Bromoform	ND	5
74-83-9	Bromomethane	ND	30
56-23-5	Carbon Tetrachloride	ND	5
108-90-7	Chlorobenzene	ND	5
75-00-3	Chloroethane	ND	30
110-75-8	2-Chloroethyl Vinyl Ether	ND	50
67-66-3	Chloroform	ND	5
74-87-3	Chloromethane	ND	30
124-48-1	Dibromochloromethane	ND	5
95-50-1	1,2-Dichlorobenzene	ND	5
541-73-1	1,3-Dichlorobenzene	ND	5
106-46-7	1,4-Dichlorobenzene	ND	5
75-34-3	1,1-Dichloroethane	ND	5
107-06-2	1,2-Dichloroethane	ND	5
75-35-4	1,1-Dichloroethene	ND	5
156-60-5	trans-1,2-Dichloroethene	ND	5
78-87-5	1,2-Dichloropropane	ND	5
10061-01-5	cis-1,3-Dichloropropene	ND	5
10061-02-6	trans-1,3-Dichloropropene	ND	5
100-41-4	Ethylbenzene	ND	5
75-09-2	Methylene Chloride	ND	50
79-34-5	1,1,2,2-Tetrachloroethane	ND	5
127-18-4	Tetrachloroethene	ND	5
108-88-3	Toluene	ND	5
71-55-6	1,1,1-Trichloroethane	ND	5
79-00-5	1,1,2-Trichloroethane	ND	5
79-01-6	Trichloroethene	ND	5
75-69-4	Trichlorofluoromethane	ND	5
75-01-4	Vinyl Chloride	ND	30
1330-20-7	m- and p-Xylenes	ND	5
95-47-6	o-Xylene	ND	5

D.L. = Detection Limit  
 ND = Not Detected

# CHAIN OF CUSTODY RECORD

469



**PERSONNEL**

**SITE INFORMATION**

2860 WALNUT AVENUE  
LONG BEACH, CALIFORNIA 90806  
(714) 595-9324

Sampler (Signature) Candia M. Cowan Nov 12, 1990  
Phone 415-829-0661

Job Name MRCP  
Job Number 0389058.00  
Sample Location Effluent, MW7 & MW8  
REMEDIATION SYSTEM

Field Crew Supervisor \_\_\_\_\_  
Field Company \_\_\_\_\_  
Project Geologist/Engineer Don McCleneghan

P.O. Number \_\_\_\_\_

Relinquished by (Signature) <u>Candia M. Cowan</u> <span style="margin-left: 20px;">Nov 12</span>	Received by (Signature) <u>Nancy Hotel</u>	Date <u>12/13/90</u>	Time <u>10:45 AM</u>
Relinquished by (Signature) _____	Received by (Signature) _____	Date _____	Time _____

Analysis laboratory should complete "sample cond. upon receipt" section below, sign, and return copy to Shipper

Sample Number	Sample Type	No. of Cont.	Site Identification	Date Sampled	Analysis Requested	Sample Cond. Upon Receipt
<del>REMEFF</del>	<u>VOA</u>	<u>2</u>	<u>MRCP</u> <u>water system</u>	<u>11/12</u>	<u>624</u>	<u>cool</u>

Remarks: Normal 10 day turn Around - Thanks

# CHAIN OF CUSTODY RECORD

468

SCS ANALYTICAL LABORATORY



2860 WALNUT AVENUE  
LONG BEACH, CALIFORNIA 90806  
(714) 515-9324

### PERSONNEL

### SITE INFORMATION

Sampler (Signature) Candice M. Cowan <sup>Nov 13, 1990</sup>  
 Phone 415-829-0661  
 Field Crew Supervisor \_\_\_\_\_  
 Field Company \_\_\_\_\_  
 Project Geologist/Engineer Don McClung

Job Name MRCP  
 Job Number 0389058.00  
 Sample Location Effluent, MW1 & MW8  
Remediation System  
 P.O. Number \_\_\_\_\_

Relinquished by (Signature) <u>Candice M. Cowan</u> <sup>Nov 12</sup>	Received by (Signature) _____	Date _____	Time _____
Relinquished by (Signature) _____	Received by (Signature) _____	Date _____	Time _____

Analysis laboratory should complete "sample cond. upon receipt" section below, sign, and return copy to Shipper

Sample Number	Sample Type	No. of Cont.	Site Identification	Date Sampled	Analysis Requested	Sample Cond. Upon Receipt
REMEFF	<u>H<sub>2</sub>O</u>	<u>1</u>	<u>MRCP</u>	<u>11/12</u>	<u>418.1</u>	_____
REMEFF	<u>H<sub>2</sub>O</u>	<u>1</u>	<u>MRCP</u>	<u>11/12</u>	<u>50.3A</u>	_____

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

JAN 2 1991



2860 WALNUT AVENUE  
LONG BEACH, CALIFORNIA 90806  
(714) 595-9324  
FAX (714) 595-6709

MEMO

To: Don McClenagan

From: Lam V. Ho

December 24, 1990

Job Number: 0389058.00

Page 1 of 3

LABORATORY REPORT

Sample: Five (5) water samples from MRCP, MW7 and MW8, received 12/11/90 and analyzed 12/21/90. One (1) sample was received broken.

Sample ID	EPA 418.1	SM 503A
	-----mg/L-----	
MW7	ND	2.0
MW8	10.5	-----
Detection Limit	0.5	0.5

ND - Not Detected

EPA 624 - see attached page

*Loree Kenyon*  
Loree Kenyon  
Chemist

*Lam V. Ho*  
Lam V. Ho PhD, REP  
Laboratory Director



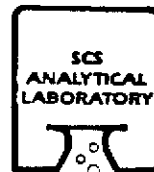
2860 WALNUT AVENUE  
LONG BEACH, CALIFORNIA 90806  
(213) 595-9324  
FAX (213) 595-6709

Addendum Report, EPA 624  
Page 2 of 3

Sample I.D.: MW8  
Date Received: 12/11/90  
Date Analyzed: 12/21/90  
Matrix: Water  
Project #: 0389058.00  
File #: mrcp8.rep

CAS #	Compound	Result -----ug/L(ppb)-----	D.L.
71-43-2	Benzene	160	25
75-27-4	Bromodichloromethane	ND	25
75-25-2	Bromoform	ND	25
74-83-9	Bromomethane	ND	150
56-23-5	Carbon Tetrachloride	ND	25
108-90-7	Chlorobenzene	ND	25
75-00-3	Chloroethane	ND	150
110-75-8	2-Chloroethyl Vinyl Ether	ND	250
67-66-3	Chloroform	ND	25
74-87-3	Chloromethane	ND	150
124-48-1	Dibromochloromethane	ND	25
95-50-1	1,2-Dichlorobenzene	ND	25
541-73-1	1,3-Dichlorobenzene	ND	25
106-46-7	1,4-Dichlorobenzene	ND	25
75-34-3	1,1-Dichloroethane	ND	25
107-06-2	1,2-Dichloroethane	ND	25
75-35-4	1,1-Dichloroethene	ND	25
156-60-5	trans-1,2-Dichloroethene	ND	25
78-87-5	1,2-Dichloropropane	ND	25
10061-01-5	cis-1,3-Dichloropropene	ND	25
10061-02-6	trans-1,3-Dichloropropene	ND	25
100-41-4	Ethylbenzene	ND	25
75-09-2	Methylene Chloride	ND	250
79-34-5	1,1,2,2-Tetrachloroethane	ND	25
127-18-4	Tetrachloroethene	ND	25
108-88-3	Toluene	ND	25
71-55-6	1,1,1-Trichloroethane	ND	25
79-00-5	1,1,2-Trichloroethane	ND	25
79-01-6	Trichloroethene	ND	25
75-69-4	Trichlorofluoromethane	ND	25
75-01-4	Vinyl Chloride	ND	150
1330-20-7	m- and p-Xylenes	ND	25
95-47-6	o-Xylene	ND	25

D.L. = Detection Limit  
ND = Not Detected



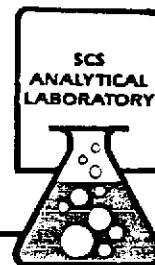
2860 WALNUT AVENUE  
LONG BEACH, CALIFORNIA 90806  
(213) 595-9324  
FAX (213) 595-6709

Addendum Report,  
Page 3 of 3

Sample I.D.: MW8  
Date Received: 12/11/90  
Date Analyzed: 12/21/90  
Matrix: Water  
Project #: 0389058.00  
File #: mrcp8.rep

COMPOUND NAME	TENTATIVELY IDENTIFIED COMPOUNDS	APPROXIMATE CONCENTRATION
Acetone		3,200 ug/L
2-Butanone		10,000 ug/L
4-Methyl-2-Pentanone		47,000 ug/L
4-Methyl-2-Pentanol		130,000 ug/L

DEC 28 1990



2860 WALNUT AVENUE  
LONG BEACH, CALIFORNIA 90806  
(213) 595-9324  
FAX (213) 595-6709

MEMO

To: Don McClenagan

From: Lam V. Ho

December 24, 1990

Job Number: 0389058.00

Page 1 of 2

LABORATORY REPORT

Sample: Four (4) water samples from MRCP, effluent from remediation system MW7 and MW8, received 12/11/90 and analyzed 12/21/90. One (1) sample to be archived and the remainder to be analyzed.

Sample ID	EPA 418.1	SM 503A
-----	-----	-----
	-----mg/L-----	
REMEFF	0.6	ND
Detection Limit	0.5	0.5

ND - Not Detected

EPA 624 - see attached page

*Loree Kenyon*  
Loree Kenyon  
Chemist

*Lam V. Ho*  
Lam V. Ho PhD, REP  
Laboratory Director



2860 WALNUT AVENUE  
LONG BEACH, CALIFORNIA 90806  
(714) 595-9324  
FAX (714) 595-6709

Addendum Report, EPA 624

Page 2 of 2

Sample I.D.: REMEFF  
Date Received: 12/11/90  
Date Analyzed: 12/21/90  
Matrix: Water  
Project #: 0389058.00  
File #: mrcp9.rep

CAS #	Compound	Result	D.L.
		-----ug/L(ppb)-----	
71-43-2	Benzene	ND	5
75-27-4	Bromodichloromethane	ND	5
75-25-2	Bromoform	ND	5
74-83-9	Bromomethane	ND	5
56-23-5	Carbon Tetrachloride	ND	30
108-90-7	Chlorobenzene	ND	5
75-00-3	Chloroethane	ND	5
110-75-8	2-Chloroethyl Vinyl Ether	ND	30
67-66-3	Chloroform	ND	50
74-87-3	Chloromethane	ND	5
124-48-1	Dibromochloromethane	ND	30
95-50-1	1,2-Dichlorobenzene	ND	5
541-73-1	1,3-Dichlorobenzene	ND	5
106-46-7	1,4-Dichlorobenzene	ND	5
75-34-3	1,1-Dichloroethane	ND	5
107-06-2	1,2-Dichloroethane	ND	5
75-35-4	1,1-Dichloroethene	ND	5
156-60-5	trans-1,2-Dichloroethene	ND	5
78-87-5	1,2-Dichloropropane	ND	5
10061-01-5	cis-1,3-Dichloropropene	ND	5
10061-02-6	trans-1,3-Dichloropropene	ND	5
100-41-4	Ethylbenzene	ND	5
75-09-2	Methylene Chloride	ND	50
79-34-5	1,1,2,2-Tetrachloroethane	ND	5
127-18-4	Tetrachloroethene	ND	5
108-88-3	Toluene	ND	5
71-55-6	1,1,1-Trichloroethane	ND	5
79-00-5	1,1,2-Trichloroethane	ND	5
79-01-6	Trichloroethene	ND	5
75-69-4	Trichlorofluoromethane	ND	5
75-01-4	Vinyl Chloride	ND	5
1330-20-7	m- and p-Xylenes	ND	30
95-47-6	o-Xylene	ND	5

D.L. = Detection Limit

ND = Not Detected



# CHAIN OF CUSTODY RECORD

475



**PERSONNEL**

**SITE INFORMATION**

2860 WALNUT AVENUE  
LONG BEACH, CALIFORNIA 90805  
(213) 575-9324

Sampler (Signature) Don Mc Cleary  
Phone 415 827 0661  
Field Crew Supervisor Don Mc  
Field Company \_\_\_\_\_  
Project Geologist/Engineer J. Cummings

Job Name MRCF  
Job Number 0389058.00  
Sample Location MW7 + MW8  
P.O. Number \_\_\_\_\_

Relinquished by (Signature) <u>Don Mc Cleary</u>	<u>12-10-90</u>	Received by (Signature) <u>Nancy Abel</u>	Date <u>12-11-90</u>	Time <u>9:30 AM</u>
Relinquished by (Signature) _____	_____	Received by (Signature) _____	Date _____	Time _____

Analysis laboratory should complete "sample cond. upon receipt" section below, sign, and return copy to Shipper

Sample Number	Sample Type	No. of Cont.	Site Identification	Date Sampled	Analysis Requested	Sample Cond. Upon Receipt
MW7	water	1	MRCF	12-10-90	418.1	cond
MW7	"	1	"	"	503A	↓
MW8	"	1	"	"	418.1	↓
MW8	"	2	"	"	624	1-was broken

Remarks: BEWARE!! MW8 concentrations of MIBK are probably > 186,000 ppb.

# CHAIN OF CUSTODY RECORD

474



## PERSONNEL

Sampler (Signature) Don McMenagan  
Phone 415 829 0661  
Field Crew Supervisor Don Mc  
Field Company \_\_\_\_\_  
Project Geologist/Engineer J. Cummings

## SITE INFORMATION

2860 WALNUT AVENUE  
LONG BEACH, CALIFORNIA 90806  
(714) 595-9324

Job Name MRC P  
Job Number 0389058.00  
Sample Location Effluent from remediation system MW7 & MW8  
P.O. Number \_\_\_\_\_

Relinquished by (Signature) <u>Don McMenagan</u> <u>12-10-90</u>	Received by (Signature) <u>Mary Hotel</u>	Date <u>12-11-90</u>	Time <u>10:00 AM</u>
Relinquished by (Signature) _____	Received by (Signature) _____	Date _____	Time _____

Analysis laboratory should complete "sample cond. upon receipt" section below, sign, and return copy to Shipper

Sample Number	Sample Type	No. of Cont.	Site Identification	Date Sampled	Analysis Requested	Sample Cond. Upon Receipt
REMEFF	water	1	MRC P	12-10	418.1	uid
REMEFF	"	1	"	"	503A	↓
REMEFF	"	2	"	"	624	↓

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