

**QUARTERLY GROUNDWATER REPORT**

**5800 CHRISTIE AVENUE,  
EMERYVILLE, CALIFORNIA**

**NOVEMBER 8, 1992**

**SUBMITTED TO:**

**MR. BRIAN OLIVA  
ALAMEDA COUNTY HEALTH CARE SERVICES  
HAZARDOUS MATERIALS DIVISION  
80 SWAN WAY, ROOM 200  
OAKLAND, CALIFORNIA 94621**

**PREPARED FOR :**

**CROLEY & HERRING INVESTMENT COMPANY  
448 THARP DRIVE,  
MORAGA, CALIFORNIA 94556**

**PREPARED BY:**

***ETS***

**ENVIRONMENT & TECHNOLOGY SERVICES  
2081 15TH STREET,  
SAN FRANCISCO, CALIFORNIA 94114  
TELEPHONE: 415-861-0810  
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# *ETS*

## *ENVIRONMENT & TECHNOLOGY SERVICES*

*2081 15TH STREET, SAN FRANCISCO, CALIFORNIA 94114*  
*PHONE 415-861-0810 FAX 415-861-3269*

November 8, 1992

Mr. Dick Herring  
President  
Croley & Herring Investment Company  
448 Tharp Avenue,  
Moraga, California 94556

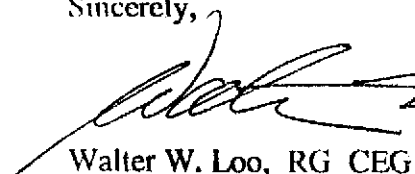
Subject: Quarterly Groundwater Report  
5800 Christie Avenue, Emeryville, California

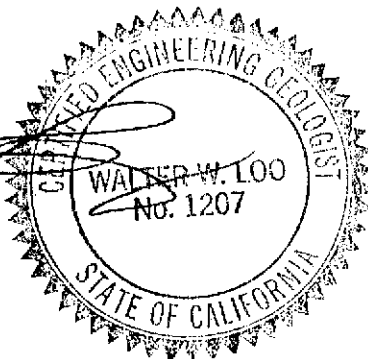
Dear Mr. Herring:

Enclosed please find a copy of the quarterly groundwater report for the October, 1992 water sampling period at the subject facility.

Please contact me if you have any question about this report.

Sincerely,

  
Walter W. Loo, RG CEG  
President



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## 1.0 INTRODUCTION

Environmental & Technology Services(ETS) was retained by Croley & Herring Investment Company to perform the 9th quarterly groundwater monitoring for the facility located at 5800 Christie Street in Emeryville, California. The subject facility is currently leased to an electronic merchandise retailer. Prior to leasing, soil contamination was identified at the subject facility. The contaminated soil was removed with the exception of that which was underlying the building because of safety concerns. The removed soil was remediated on-site and properly disposed of with the approval of the regulatory agencies.

A vapor extraction system(VES) was installed immediately adjacent to the northeastern side of the building to mitigate the residual volatile hydrocarbons contained in the soil. The residual volatile organic chemicals(VOCs) were remediated from an average VOCs concentration of about 660 ppm to a satisfactory level at an average of 0.82 ppm in soil. A soil closure plan was submitted(11/15/91) and approval of closure was received on 1/21/92 after submittal of confirmation soil sampling results. The soil vapor extraction system was decommissioned and the Bay Area Air Quality Management District was notified on 12/16/91. The final VES closure report was completed on August 29, 1992.

As part of the site activities, a quarterly groundwater monitoring program has been implemented. Previous quarterly monitoring events were conducted on November 6, 1989, February 20, 1990, May 31, 1990, September 7, 1990, December 4, 1990, April 16, 1991, July 3, 1991, October 12, 1991, January 26, 1992, April 8, 1992 and July 15, 1992 respectively. This quarterly monitoring event was conducted on October 19, 1992. Water samples were taken from the monitoring wells and sent to a State-certified laboratory for analysis under proper chain-of-custody procedures.

This report presents the results of this quarterly groundwater monitoring event on well EW-1 including laboratory analytical results, groundwater movement analysis, summary of findings, and conclusions and discussions.

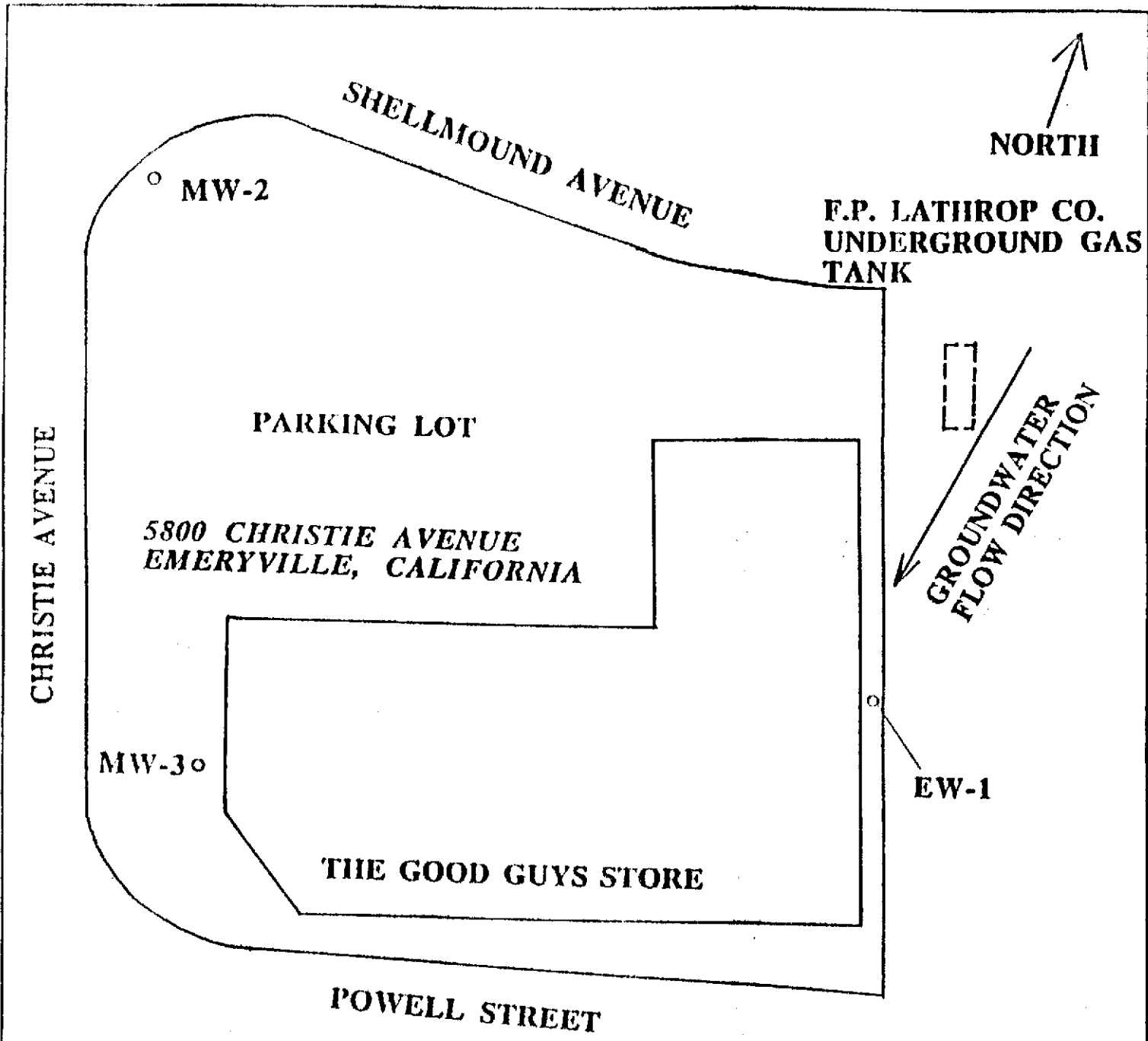
## 2.0 GROUNDWATER MOVEMENT ANALYSIS

Prior to sample collection of this quarterly sampling, depth-to-water table in each of the three existing monitoring wells at the facility was measured for the analysis of groundwater movement. Table 1 presents a summary of the water levels in the three wells (LW-1, MW-2, and MW-3) from the groundwater monitoring events prepared by ETS.

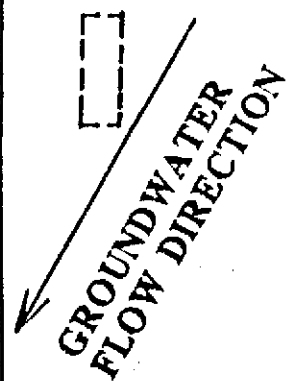
From the result of the water level measurements on October 19, 1992, elevation of water levels were decreased in the three wells, as compared to the data collected in July 1992. Nevertheless, the groundwater flow direction remained in the same direction, flowing towards south (Figure 1). The hydraulic gradient was 0.0127 feet per horizontal foot.

Groundwater movement across the facility remains in a similar pattern, as compared to the result from the previous sampling event. Data of flow direction and hydraulic gradient are summarized below:

Date	4/25/89	11/6/89	2/20/90	5/31/90	9/7/90	12/4/90	
Flow Towards	SW	S	S	S	S	S	
Gradient	0.0014		0.012	0.016	0.0125	0.0115	0.045
Date	4/16/91	7/3/91	10/14/91	1/9/92	7/15/92	10/19/92	
Flow Towards	S	S	S	SW	S	S	
Gradient	0.014	0.013	0.011	0.0238	0.013	0.0127	

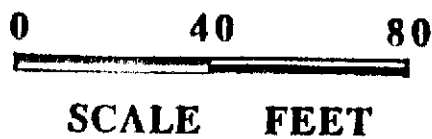


F.P. LATHROP CO.  
UNDERGROUND GAS  
TANK



**LEGEND**

○ MONITORING WELLS



**ETS**

ENVIRONMENT & TECHNOLOGY SERVICES

**FIGURE 1  
LOCATION MAP**

**TABLE 1**  
**SUMMARY OF WATER LEVEL DATA**

WELL	Elev. of	11/6/89		2/20/90		5/31/90		9/7/90	
Name	TOC (Ft-MSL)	DTW Ft.	SWL Ft.	DTW Ft.	SWL Ft.	DTW Ft.	SWL Ft.	DTW Ft.	SWL Ft.
EW-1	8.62	6.15	2.47	5.93	2.69	5.86	2.76	6.30	2.32
MW-2	7.42	4.37	3.05	4.26	3.16	4.26	3.16	4.60	2.82
MW-3	6.42	5.10	1.32	5.42	1.00	4.93	1.49	5.15	1.17

WELL	12/4/90		4/16/91		7/3/91		10/14/91		1/9/92	
Name	DTW Ft.	SWL Ft.	DTW Ft.	SWL Ft.	DTW Ft.	SWL Ft.	DTW Ft.	SWL Ft.	DTW Ft.	SWL Ft.
EW-1	7.39	2.23	6.02	2.60	6.20	2.42	6.5	2.12	6.20	2.42
MW-2	4.67	2.75	4.31	3.11	4.52	2.9	3.92	3.5	4.43	3.10
MW-3	5.96	1.35	5.25	1.17	5.33	1.09	4.63	1.79	6.50	-0.08

WELL	7/15/92		10/19/92	
Name	DTW Ft.	SWL Ft.	DTW Ft.	SWL Ft.
EW-1	6.10	2.52	6.1	2.52
MW-2	4.42	3.00	4.77	2.65
MW-3	5.23	1.19	5.37	1.05

Note:

TOC top of casing  
 DTW depth to water table  
 SWL static water level above MSL  
 MSL mean sea level

### 3.0 GROUNDWATER QUALITY

On October 19, 1992, ETS field personnel visited the facility and collected water samples from monitoring well EW-1 for laboratory analysis. These groundwater samples were sent to a state-certified laboratory for analyses of halocarbons using EPA method 601, total petroleum hydrocarbons (TPH) as gasoline and gasoline constituents benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA method 602.

From the results of the laboratory analysis (Appendix A), water sample taken from well EW-1 contained some volatile organic compounds. The VOCs detected in well EW-1 from the October 19, 1992 sampling episode are presented in Table 2.



TABLE 2

SUMMARY OF QUARTERLY GROUNDWATER QUALITY RESULTS OF WELL EW-1  
5800 CHRISTIE AVENUE,  
EMERYVILLE, CALIFORNIA

## CONCENTRATIONS IN MG/L

COMPOUNDS	5/8/89	11/6/89	2/20/90	5/31/90	9/7/90	12/4/90	4/6/91	7/3/91	10/12/91	1/8/92	4/8/92
TPH as GASOLINE	NA	0.74	12.0	24.0	25.0	7.4	51.0	23.0	39.0	<5.0	12.0
BENZENE	ND	0.18	1.3	0.056	1.1	0.18	3.0	0.65	ND	ND	4.0
TOLUENE	0.19	0.039	3.6	6.1	0.8	3.5	12.0	8.7	1.1	0.58	ND
XYLENES	0.17	0.067	0.047	0.14	0.042	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	ND	0.0008	0.0071	0.017	ND	ND	ND	ND	ND	ND	ND
HALOCARBONS	0.718	1.1861	4.701	6.876	6.661	3.762	10.6	6.49	2.794	4.459	6.8
TCE	0.64	0.74	1.1	0.83	0.49	1.5	1.3	0.13	0.73	1.7	2.8
1,1 DCE	0.078	0.0023	0.014	0.069	0.036	ND	ND	ND	ND	ND	ND
1,2 DCE	ND	0.35	2.5	0.11	2.4	1.5	3.7	2.0	0.62	1.52	ND
1,1,1 TCA	ND	0.026	0.55	1.2	0.51	0.072	2.9	0.2	0.47	0.089	ND
1,1 DCA	ND	0.034	0.46	1.9	1.3	0.46	1.8	2.0	0.63	0.42	1.3
1,2 DCA	ND	0.0048	0.034	0.033	0.053	ND	ND	ND	0.12	0.25	2.7
VINYL CHLORIDE	ND	0.029	ND	2.6	1.7	0.23	0.9	1.99	0.17	0.48	ND
CHLOROETHANE	ND	ND	0.029	0.094	0.15	ND	ND	0.17	0.054	ND	ND
MET. CHLORIDE	ND	ND	0.014	0.04	0.022	ND	ND	ND	ND	ND	ND
TOTAL VOCs	1.078	1.9261	16.701	30.876	31.661	11.162	61.6	29.49	41.794	<9.459	18.8

NA NOT ANALYSED

ND NOT DETECTED OR BELOW DETECTION LIMITS

VOCs VOLATILE ORGANIC COMPOUNDS (TPH PLUS TOX)

TABLE 2 (CONTINUE)

SUMMARY OF QUARTERLY GROUNDWATER QUALITY RESULTS OF WELL EW-1  
 5800 CHRISTIE AVENUE,  
 EMERYVILLE, CALIFORNIA

CONCENTRATIONS IN MG/L

COMPOUNDS	7/15/92	10/19/92
TPH as GASOLINE	100.0	26.0
BENZENE	ND	ND
TOLUENE	4.7	12.5
XYLENES	ND	ND
ETHYLBENZENE	ND	ND
HALOCARBONS	2.461	5.07
TCE	0.68	0.270
1,1 DCE	ND	4.8
1,2 DCE	0.6	ND
1,1,1 TCA	0.42	ND
1,1 DCA	0.6	ND
1,2 DCA	0.11	ND
VINYL CHLORIDE	0.15	ND
CHLOROETHANE	ND	ND
MET. CHLORIDE	ND	ND
TOTAL VOCs	102.461	31.07

NA NOT ANALYSED

ND NOT DETECTED OR BELOW DETECTION LIMITS

VOCs VOLATILE ORGANIC COMPOUNDS (TPH PLUS TOX)

#### 4.0 SUMMARY OF FINDINGS

Table 2 presents a summary of analytical results of well EW-1 in time series. There are several factors that affect the changes in the hydrocarbon concentration. These factors are variations in water table, chemical breakdown due to natural degradation, and unidentified off-site sources.

An experiment was tried to desorb the organic chemicals from the clayey material and oxidize them in places near well EW-1 by the application of direct electrical current flow in the subsurface without pumping the groundwater. The experiment showed successful control of the flow of groundwater in the area and the total volatile organic compounds (VOCs) at one time reached below 4 ppm due to the induced electrochemical reactions between electrodes. The degree of the effectiveness and success cannot be assessed at this time because the readings were interfered with by the spreading of the upgradient gasoline plume.

Also, there are indications that strong biodegradation activities are taking place in the subsurface. Prescribed amounts of glucose was added to the groundwater underlying the area to stimulate cometabolic biodegradation of the chlorinated solvents. The results of groundwater analysis showed reduction of the chlorinated solvents since the addition of the glucose.

*APPENDIX A*

*GROUNDWATER LABORATORY ANALYSIS REPORT*



**CKY incorporated**  
**Environmental Services**

Date: 10/21/92  
N9210-04

CHIC  
448 Tharp Drive  
Moraga, CA 95666

Attn: Mr. Walter Loo

Subject: Laboratory Report  
Project:

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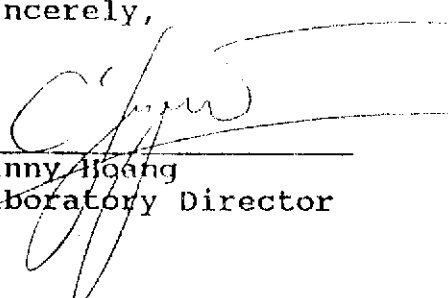
Enclosed is the laboratory report for samples received on 10/19/92. The samples were received in coolers with ice and intact; the chain-of-custody forms were properly filled out. The data reported includes:

<u>Method</u>	<u>No. of Analysis</u>
EPA M8015 (Gas)	1 Water
EPA 8020	1 Water
EPA 8010	1 Water

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely,

  
\_\_\_\_\_  
Danny Hoang  
Laboratory Director

EPA METHOD - 8020  
BTEX

=====

CLIENT:	CHIC	DATE REC'D:	10/19/92
PROJECT:		DATE ANALYZED:	10/20/92
CONTROL NO:	N9210-04	MATRIX TYPE:	Water

=====

<u>SAMPLE ID:</u>	<u>CONTROL NO:</u>	<u>RESULTS (ug/L)</u>				<u>% SURRO</u>
		<u>Benz</u>	<u>Tol</u>	<u>Et Benz</u>	<u>Xyls</u>	<u>RECOVERY</u>
EW-1	N9210-04-1	ND	12500	ND	ND	122
<u>DETECTION LIMIT</u>		100	100	100	100	

=====

## EPA METHODS - 601

=====

CLIENT:	CHIC	DATE REC'D:	10/19/92
PROJECT:		DATE ANALYZED:	10/20/92
SAMPLE ID:	EW-1	MATRIX TYPE:	Water
CONTROL NO:	N9210-04-1		

=====

<u>PARAMETERS (601)</u>	<u>RESULTS</u> <u>(ug/L)</u>	<u>DETECTION LIMIT</u> <u>(ug/L)</u>
Dichlorodifluoromethane	ND	500
Chloromethane	ND	500
Vinyl Chloride	ND	500
Bromomethane	ND	500
Chloroethane	ND	500
Trichlorofluoromethane	ND	100
1,1-Dichloroethene	4800	100
Methylene Chloride	ND	100
Trans-1,2-Dichloroethene	ND	100
cis 1,2 -dichloroethene	ND	100
1,1-Dichloroethane	ND	100
Chloroform	ND	100
1,1,1-Trichloroethane	ND	100
Carbon Tetrachloride	ND	100
1,2-Dichloroethane	ND	100
Trichloroethene	270	100
1,2-Dichloropropane	ND	100
Bromodichloromethane	ND	100
2-Chloroethylvinylether	ND	100
Trans-1,3-Dichloropropene	ND	100
Cis-1,3-Dichloropropene	ND	100
1,1,2-Trichloroethane	ND	100
Tetrachloroethene	ND	100
Dibromochloromethane	ND	100
Chlorobenzene	ND	100
Bromoform	ND	100
1,1,2,2-Tetrachloroethane	ND	100
M-Dichlorobenzene	ND	100
P-Dichlorobenzene	ND	100
O-Dichlorobenzene	ND	100

=====

EPA METHOD 5030/Mod. 8015  
TOTAL PETROLEUM HYDROCARBONS BY PURGE & TRAP

=====

CLIENT:	CHIC	DATE REC'D:	10/19/92
PROJECT:		DATE ANALYZED:	10/20/92
CONTROL NO:	N9210-04	MATRIX:	Water

=====

<u>SAMPLE ID:</u>	<u>CONTROL NO:</u>	<u>RESULTS</u> <u>(mg/L)</u>	<u>DET. LIMIT</u> <u>(mg/L)</u>	<u>% SURRO</u> <u>RECOVERY</u>
EW-1	N9210-04-1	26	10	121

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QUALITY CONTROL DATA

CLIENT: CHIC  
 PROJECT:  
 CONTROL NO: N9210-04

METHOD EPA 8020  
 MATRIX: Water

SAMPLE ID: N9210-04-1

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (ug/L)	<u>AMOUNT SPIKED</u> (ug/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
Benzene	ND	10	90	90	0
Toluene	ND	10	80	80	0
Ethyl Benzene	ND	10	90	80	12
Xylene	ND	20	95	85	11

QUALITY CONTROL DATA

CLIENT: CHIC  
 PROJECT:  
 CONTROL NO: N9210-04

METHOD EPA 8010  
 MATRIX: Soil

SAMPLE ID: N9210-04-1

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (ug/L)	<u>AMOUNT SPIKED</u> (ug/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
1,1 DCE	ND	50	118	96	21
TCE	ND	50	114	96	17
Chlorobenzene	ND	50	92	76	19

QUALITY CONTROL DATA

CLIENT: CHIC  
PROJECT:  
CONTROL NO: N9210-04

=====  
-----  
METHOD EPA M8015G  
MATRIX: Water

SAMPLE ID: N9210-04

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (mg/L)	<u>AMOUNT SPIKED</u> (mg/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
Gas	ND	1	82	87	6

