QUARTERLY GROUNDWATER REPORT

5800 CHRISTIE AVENUE, EMERYVILLE, CALIFORNIA

AUGUST 30, 1992

SUBMITTED TO:

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

376-3473

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
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ETS

ENVIRONMENT & TECHNOLOGY SERVICES

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

August 30, 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 July, 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 [redacted]arterly 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 those underlying a building because of safety concern. The removed soil was remediated on-site and properly disposed of with the approval of the regulatory agencies.

There is a vapor extraction system(VES) 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) [redacted] of about [redacted] at an average of [redacted]. A soil closure plan was [redacted] 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 and April 8, 1992 respectively. This quarterly monitoring event was conducted on July 15, 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-1including laboratory analytical results, groundwater movement analysis, summary of findings, and conclusions and discussions.

2.0 GROUNDWATER MOVEMENT ANALYSIS

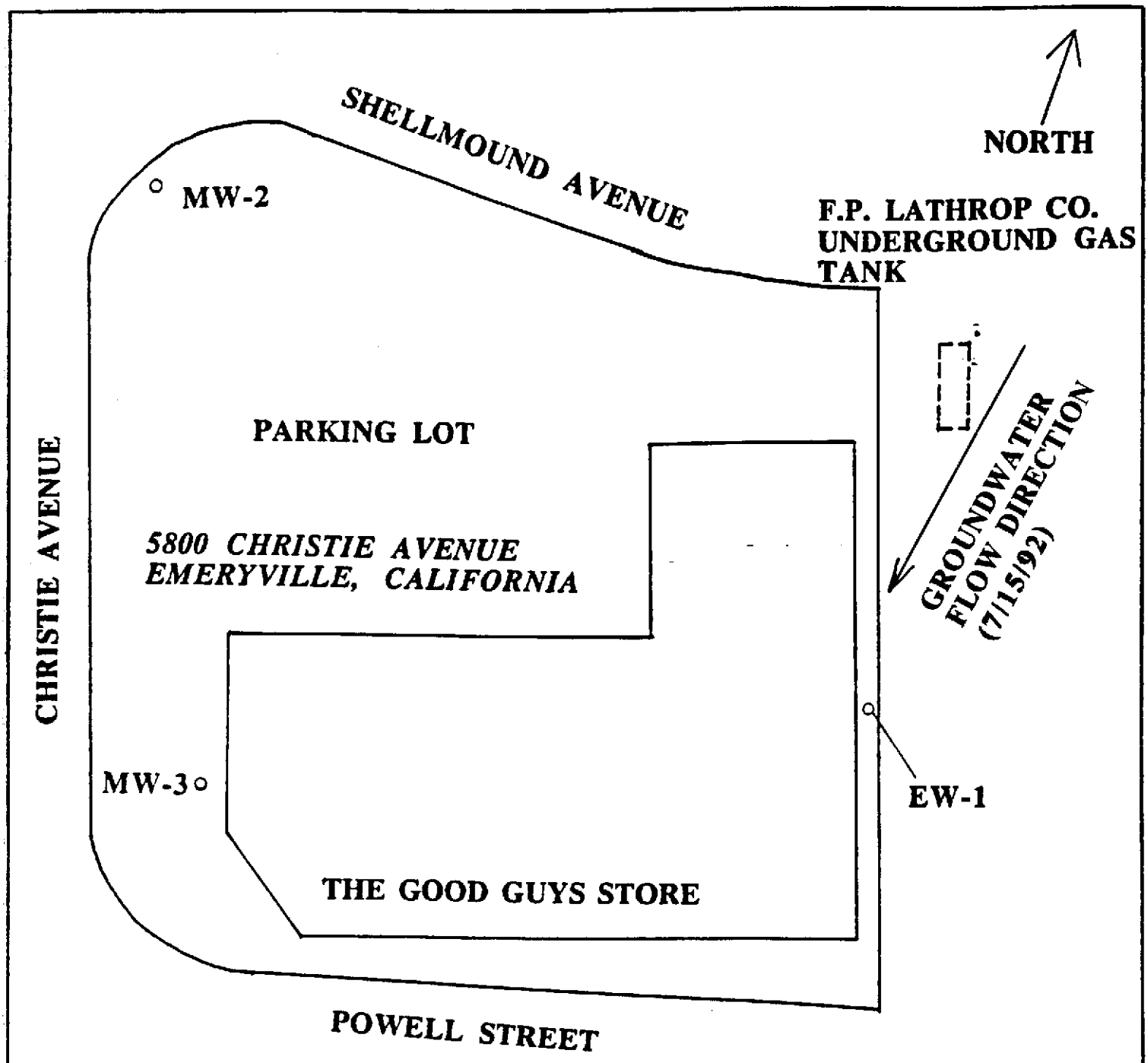
Prior to sample collection of this quarterly sampling, depth-to-water table in each of the three existing monitoring wells at the facility was measured for the analysis of groundwater movement. Table 1 presents a summary of the water levels in the three wells (EW-1, MW-2, and MW-3) from the groundwater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

From the result of the water level measurements on July 15, 1992, elevation of water levels were decreased in the three wells, as compared to the data collected in January 1992. Nevertheless, the groundwater flow direction remained in the same direction, flowing towards south (Figure 1). The hydraulic gradient was 0.013 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
Flow Towards	S	S	S	SW	S
Gradient	0.014	0.013	0.011	0.0238	0.013



ETS

ENVIRONMENT & TECHNOLOGY SERVICES

FIGURE 1

LOCATION MAP

TABLE 1

SUMMARY OF WATER LEVEL DATA

WELL Name	Elev. of TOC (Ft-MSL)	11/6/89 DTW Ft.	11/6/89 SWL Ft.	2/20/90 DTW Ft.	2/20/90 SWL Ft.	5/31/90 DTW Ft.	5/31/90 SWL Ft.	9/7/90 DTW Ft.	9/7/90 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 Name	12/4/90 DTW Ft.	12/4/90 SWL Ft.	4/16/91 DTW Ft.	4/16/91 SWL Ft.	7/3/91 DTW Ft.	7/3/91 SWL Ft.	10/14/91 DTW Ft.	10/14/91 SWL Ft.	1/9/92 DTW Ft.	1/9/92 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 Name	7/15/90 DTW Ft.	7/15/90 SWL Ft.
EW-1	6.10	2.52
MW-2	4.42	3.00
MW-3	5.23	1.19

Note:

TOC top of casing
DTW [redacted]
SWL static water level above MSL
MSL mean sea level

3.0 GROUNDWATER QUALITY

On July 15, 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 laoratory 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 July 15, 1992 sampling episode are presented in Table 2.

4.0 SUMMARY OF FINDINGS

Table 2 presents a summary of analystical 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.

At present, an experiment is being 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. To date, the experiment showed successful control of the flow of groundwater in the area and the total volatile organic compounds(VOCs) at one time has 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 by the spreading of the upgradient gasoline plume.

Also, there were indications that there are strong biodegradation activities in the subsurface. Prescribed amount 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.

TABLE 2

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

CONCENTRATIONS IN [redacted]

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	[redacted]
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	[redacted]
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	[redacted]
TCE	0.64	0.74	1.1	0.83	0.49	1.5	1.3	0.13	0.73	1.7	[redacted]
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	[redacted]
1,2 DCA	ND	0.0048	0.034	0.033	0.053	ND	ND	ND	0.12	0.25	[redacted]
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
TPH as GASOLINE	100.0
BENZENE	[redacted]
TOLUENE	[redacted]
XYLENES	[redacted]
ETHYLBENZENE	[redacted]D
HALOCARBONS	[redacted]
TCE	[redacted]
1,1 DCE	ND
1,2 DCE	0.6
1,1,1 TCA	[redacted]2
1,1 DCA	0.6
1,2 DCA	0.[redacted]1
VINYL CHLORIDE	0.15
CHLOROETHANE	ND
MET. CHLORIDE	[redacted]
TOTAL VOCs	102.461

NA NOT ANALYSED
ND NOT DETECTED OR BELOW DETECTION LIMITS
VOCs VOLATILE ORGANIC COMPOUNDS (TPH PLUS TOX)

APPENDIX A

GROUNDWATER LABORATORY ANALYSIS REPORT

C K Y incorporated
Environmental Services

Date: 07/30/92
N9207-12

CHIC
448 Tharp Drive
Moraga, CA 94556

Attn: Mr. Walter Loo

Subject: Laboratory Report
Project:

Enclosed is the laboratory report for samples received on 07/15/92. The samples were received in coolers with ice and intact; the chain-of-custody forms were properly filled out. The data reported includes:

Method	No. of Analysis
M8015G	3 Water
EPA 8020	3 Water
EPA 8010	3 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

3942 Valley Avenue, Suite F, Pleasanton, CA 94566 • Telephone 510-846-3188 • Fax: 510-846-1236

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

CLIENT:	CHIC	**DATE REC'D:**	07/15/92
PROJECT:		**DATE ANALYZED:**	07/17/92
CONTROL NO:	N9207-12	**MATRIX:**	Water

SAMPLE ID:	CONTROL NO:	RESULTS (mg/L)	DET. LIMIT (mg/L)	% SURRO RECOVERY
EW-1	N9207-12-1	100	10	93
EW-2	N9207-12-2	5	1	87
EW-3	N9207-12-3	5	1	85

EPA METHOD - 8020
BTEX

CLIENT:	CHIC	**DATE REC'D:**	07/15/92
PROJECT:		**DATE ANALYZED:**	07/17/92
CONTROL NO:	N9207-12	**MATRIX TYPE:**	Water

		RESULTS (ug/L)				% SURRO
SAMPLE ID:	CONTROL NO:	Benz	Tol	Et Benz	Xyls	RECOVERY
EW-1	N9207-12-1	ND	4700	ND	ND	80
EW-2	N9207-12-2	ND	1100	ND	ND	87
EW-3	N9207-12-3	ND	1400	ND	ND	86
DETECTION LIMIT		10	10	10	10	

EPA METHODS - 601

CLIENT: CHIC
PROJECT:
SAMPLE ID: EW-1
CONTROL NO: N9207-12-1

DATE REC'D: 07/15/92
DATE ANALYZED: 07/21/92
MATRIX TYPE: Water

PARAMETERS (601)	RESULTS (ug/L)	DETECTION LIMIT (ug/L)
Dichlorodifluoromethane	ND	5
Chloromethane	ND	5
Vinyl Chloride	150	5
Bromomethane	ND	5
Chloroethane	60	5
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Methylene Chloride	ND	1
1,2-Dichloroethene	600	1
cis 1,2 -dichloroethene	ND	1
1,1-Dichloroethane	600	1
Chloroform	ND	1
1,1,1-Trichloroethane	420	1
Carbon Tetrachloride	ND	1
1,2-Dichloroethane	110	1
Trichloroethene	680	1
1,2-Dichloropropane	ND	1
Bromodichloromethane	ND	1
2-Chloroethylvinylether	ND	1
Trans-1,3-Dichloropropene	ND	1
Cis-1,3-Dichloropropene	ND	1
1,1,2-Trichloroethane	ND	1
Tetrachloroethene	ND	1
Dibromochloromethane	ND	1
Chlorobenzene	ND	1
Bromoform	ND	1
1,1,2,2-Tetrachloroethane	ND	1
M-Dichlorobenzene	ND	1
P-Dichlorobenzene	ND	1
O-Dichlorobenzene	ND	1

EPA METHODS - 601

CLIENT: CHIC
PROJECT:
SAMPLE ID: EW-2
CONTROL NO: N9207-21-2

DATE REC'D: 07/15/92
DATE ANALYZED: 07/21/92
MATRIX TYPE: Water

PARAMETERS (601)	RESULTS (ug/L)	DETECTION LIMIT (ug/L)
Dichlorodifluoromethane	ND	5
Chloromethane	ND	5
Vinyl Chloride	ND	5
Bromomethane	ND	5
Chloroethane	ND	5
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	780	1
Methylene Chloride	ND	1
1,2-Dichloroethene	510	1
cis 1,2 -dichloroethene	ND	1
Chloroform	ND	1
1,1,1-Trichloroethane	ND	1
Carbon Tetrachloride	ND	1
1,2-Dichloroethane	50	1
Trichloroethene	370	1
1,2-Dichloropropane	ND	1
Bromodichloromethane	ND	1
2-Chloroethylvinylether	ND	1
Trans-1,3-Dichloropropene	ND	1
Cis-1,3-Dichloropropene	ND	1
1,1,2-Trichloroethane	ND	1
Tetrachloroethene	ND	1
Dibromochloromethane	ND	1
Chlorobenzene	ND	1
Bromoform	ND	1
1,1,2,2-Tetrachloroethane	ND	1
M-Dichlorobenzene	ND	1
P-Dichlorobenzene	ND	1
O-Dichlorobenzene	ND	1

EPA METHODS - 601

CLIENT:	CHIC	**DATE REC'D:**	07/15/92
PROJECT:		**DATE ANALYZED:**	07/21/92
SAMPLE ID:	EW-3	**MATRIX TYPE:**	Water
CONTROL NO:	N9207-12-3		

PARAMETERS (601)	RESULTS (ug/L)	DETECTION LIMIT (ug/L)
Dichlorodifluoromethane	ND	5
Chloromethane	ND	5
Vinyl Chloride	ND	5
Bromomethane	ND	5
Chloroethane	ND	5
Trichlorofluoromethane	ND	1
1,1-Dichloroethene	ND	1
Methylene Chloride	ND	1
1,2-Dichloroethene	[redacted]	1
cis 1,2 -dichloroethene	[redacted]	1
1,1-Dichloroethane	[redacted]	1
Chloroform	[redacted]	1
1,1,1-Trichloroethane	[redacted]	1
Carbon Tetrachloride	[redacted]	1
1,2-Dichloroethane	100	1
Trichloroethene	[redacted]	1
1,2-Dichloropropane	ND	1
Bromodichloromethane	ND	1
2-Chloroethylvinylether	ND	1
Trans-1,3-Dichloropropene	ND	1
Cis-1,3-Dichloropropene	ND	1
1,1,2-Trichloroethane	ND	1
Tetrachloroethene	ND	1
Dibromochloromethane	ND	1
Chlorobenzene	ND	1
Bromoform	ND	1
1,1,2,2-Tetrachloroethane	ND	1
M-Dichlorobenzene	ND	1
P-Dichlorobenzene	ND	1
O-Dichlorobenzene	ND	1

QUALITY CONTROL DATA

CLIENT: CHIC
PROJECT:
CONTROL NO: N9207-12

METHOD EPA M8015G
MATRIX: Water

SAMPLE ID: Blank

COMPOUND	SAMPLE RESULTS (mg/L)	AMOUNT SPIKED (mg/L)	% REC.	DUP. % REC.	RPD
Gasoline	ND	1	120	110	9

QUALITY CONTROL DATA

CLIENT: CHIC
PROJECT:
CONTROL NO: N9207-12

METHOD EPA 8020
MATRIX: Water

SAMPLE ID: Blank

COMPOUND	SAMPLE RESULTS (ug/L)	AMOUNT SPIKED (ug/L)	% REC.	DUP. % REC.	RPD
Benzene	ND	20	95	100	5
Toluene	ND	20	90	100	11
Ethyl Benzene	ND	20	95	105	10
Xylene	ND	40	98	105	7

QUALITY CONTROL DATA

CLIENT: CHIC
PROJECT:
CONTROL NO: N9207-12

METHOD EPA 601
MATRIX: Water

SAMPLE ID: Blank

COMPOUND	SAMPLE RESULTS (ug/L)	AMOUNT SPIKED (ug/L)	DUP. % REC.	RPD
1,2 DCE	ND	78	74	4
TCE	ND	86	80	6

N9207-12

CHAIN OF CUSTODY RECORD
REQUEST FOR ANALYSIS

CLIENT NAME: CHIC
ADDRESS: 448 THARP DRIVE
MORAGA, CA 94556
PHONE NO. _____ FAX NO. _____
PROJECT NAME: _____
SEND REPORT TO: WALTER LOO
415-861-0816 FAX 415-861-3269

DATE: _____
PAGE ____ OF ____

2081 15TH ST.
S.F. CA 94114

C K Y Incorporated
Environmental Services
3942 Valley Avenue, Suite F
Pleasanton, CA 94566
Tel: 510-846-3188
Fax: 510-846-1236

SAMPLER NAME/SIGNATURE

TURN AROUND TIME
NORMAL ☐
RUSH ☐

SAMPLE NUMBER	SAMPLING DATE/TIME		PRESER-VATIVE	CONTAINER SIZE/TYPE	SAMPLE DESCRIPTION WATER	SOIL	OTHER	ANALYSES REQUIRED 418.1	M8015 (AS GASOLINE)	8010/601	8020/602	8080/608	8240/624	8270/625	CAM Metals	TOTAL NITROGEN (KJELDHAL) NH
1 EW-1	7/15/92	3:00p		1 LITER	✓											✓ ✓
"	"	"		40ML (2)					✓	✓	✓					
2 ~~MW-5~~ #2	7/15/92	3:00p		40ML (3)	✓				✓	✓	✓					✓
3 #3	7/15/92	3:00p		40ML (~~2~~)	✓				✓	✓	✓					✓

COMMENTS: KEEP ORGANIC AND INORGANIC REPORTS SEPARATE

Relinquished by: (Signature)	Date:	Received by: (Signature)	Date:	Relinquished by: (Signature)	Date:	Received by: (Signature)	Date:
Company: ETS	Time: 4:00PM	Company: CKY	Time: 16:2[illegible]	Company:	Time:	Company:	Time:

Storage/Disposal of Samples: Sample will be stored at CKY for 30 days at no charge and at $10/sample/month thereafter. Disposal of sample by the Laboratory will be charged at $10/sample.