

**QUARTERLY GROUND WATER MONITORING**

**Harcros Pigments Plant  
4650 Shellmound Street  
Emeryville, California**

March 1, 1991

*Prepared for:*

**Harcros Pigments Plant  
Emeryville, California**

*Prepared by:*

**ROUX ASSOCIATES WEST, INC.  
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Martinez, CA 94553  
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## INTRODUCTION

This report presents the findings of the January 1991 quarterly ground water monitoring activities conducted by Roux Associates, Inc. (Roux) at the Harcros Pigments Plant located at 4650 Shellmound Street in Emeryville, California (Site; Figure 1).

The scope of work for this quarterly ground water monitoring event was to:

- Collect depth to water measurements in monitoring wells RW-2, RW-3, RW-22, RW-29, RW-30 and RW-31;
- Collect ground water samples from monitoring wells RW-2, RW-3, RW-22, RW-29, RW-30 and RW-31;
- Analyze the ground water samples from wells RW-2, RW-3 and RW-22 for total petroleum hydrocarbons as diesel (TPH-D) by United States Environmental Protection Agency (USEPA) Modified Method 8015, and analyze all ground water samples collected for halogenated hydrocarbons by USEPA Method 8240;
- Set up a database for ground water elevation data and ground water chemistry data; and
- Review all field and laboratory data and report on these activities.

## **SITE SETTING**

The Harcros Pigment Plant, formerly Pfizer pigments plant, is located in a predominantly industrial part of Emeryville (Figure 1). The plant produces iron oxide pigments and has been in operation since 1925. The Site is on the east side of San Francisco Bay at an elevation of about seven feet above mean sea level. The current bay shoreline is approximately 1,000 feet west of the Harcros property (USGS, 1980). A 1936 aerial photograph of the plant shows the former shoreline located along the eastern edge of present day Shellmound Street. The Site is underlain by estimated low permeability sandy clay to clay (Roux, 1990). The regional direction of ground water flow is westerly, towards San Francisco Bay (Roux, 1990).

## **BACKGROUND**

A total of 12 USTs have been removed from the Site since 1987. One 350-gallon capacity steel UST was used to contain waste oil and solvents, and was removed from the Site in December, 1987. The waste oil tank was located within the waste oil tank pit immediately east of Service Building No. 10 (Figure 2; Roux,1988). A total of nine 10,000-gallon diesel tanks and one 10,000 gallon Bunker C fuel oil tank were removed from the tank pit south of Service Building No. 10 in December, 1989 (Roux, 1990). A 1,000-gallon gasoline tank was removed from a tank pit south of Maintenance Shop Building No. 6 in December, 1989 (Roux, 1990).

Two double-walled fiberglass underground storage tanks (USTs) are currently in place and used at the Site. A 10,000-gallon diesel tank and one 1,000-gallon gasoline tank were installed east of Service Building No. 10 by Diablo Tank & Equipment of Martinez, California in September, 1989.

In January, 1990 diesel fuel was discovered, by Roux staff, floating on top of the water column in monitoring wells RW-4 and RW-11 (Roux, 1990). Wells RW-4 and RW-11 were located near the northeastern corner of Service Building No. 10 (Figure 2). The monitoring wells were within a former waste oil tank pit and are adjacent to two recently installed USTs and their associated pipelines.

In March and April 1990, Roux conducted an additional subsurface investigation to determine the extent of diesel fuel contamination surrounding the former waste oil tank pit.

The additional investigation included drilling seven soil borings, installing two monitoring wells (RW-22 and RW-23) in the area surrounding the former waste oil tank pit where free phase product was detected, and collecting ground water samples from the wells at the Site. The analytical results of the soil and ground water sampling analyzed indicated that the presence of diesel fuel was restricted to the soils and ground water around the former waste oil tank pit (Roux, 1990). In August 1990, the soils with concentrations of diesel fuel in the former tank pit area were excavated and transported to a Class II disposal facility (Harcros, 1990). At the request of the Alameda County Department of Health, two additional monitoring wells RW-30 and RW-31 were installed in December, 1990. These wells were installed for the purpose of monitoring ground water quality downgradient from the tank pit. Monitoring wells RW-4, RW-8 and RW-11 were abandoned due to soil excavation activity conducted in the former tank pit to remove hydrocarbon impacted soils.

## **GROUND WATER FLOW**

Figure 3 shows the direction of ground water flow at the Site on January 8, 1991. The ground water flow direction beneath the Site was determined from the depth to water measurements collected on January 8, 1991. The depth to water and water elevations are summarized on Table 1. Water elevations were calculated from the depth to water data. The water elevations were contoured to evaluate the flow conditions at the Site. Ground water flow beneath the Site on January 8, 1991 was in a southerly direction toward Temescal Creek.

## GROUND WATER SAMPLING

On January 8, 1991 depth to ground water measurements were collected from monitoring wells RW-2, RW-3, RW-22, RW-29, RW-30 and RW-31 (Figure 2). Prior to sampling, the depth to water and depth to free phase product was measured in each well. Floating free phase product was not encountered in any of the wells. From these data, the volume of water needed to purge prior to sampling was calculated. A minimum of three well casing volumes of water was removed from each well with the use of either a stainless steel or teflon bailer.

A water level measurement was not recorded for monitoring well RW-23 because the well has been damaged. A water sample was not collected from RW-23 due to the damage.

Subsequent to measuring the depth to water in monitoring wells RW-2, RW-3, RW-22, RW-29, RW-30 and RW-31, ground water samples were collected with the use of a bailer into 40 milliliter glass vials preserved with hydrochloric acid and one liter glass bottles for analysis for halogenated hydrocarbons and TPH-D, respectively. Visual observations of the ground water samples were recorded on well sampling forms. The pH, temperature and specific conductivity were measured at the time of sample collection. These data are provided in the Well Sampling Forms in Appendix A. The sample bottles were then labeled, placed on ice and transported to Curtis and Tompkins Limited Analytical Laboratory in Berkeley, California. A chain-of-custody document was maintained for the samples (Appendix B).

## **ANALYTICAL RESULTS**

The analytical reports for the ground water samples are included as Appendix C. Analytical results are presented in Table 2. All concentrations of TPH-D and volatile organic compounds are reported as below the detection limit.

## **CONCLUSIONS**

Previous investigations conducted at the Site by Roux Associates, indicated that the source of the hydrocarbons detected in ground water samples collected from the monitoring wells was limited to former UST complexes. This quarterly ground water sampling event supports the previous findings. TPH-D and volatile organic compounds were not detected in any of the samples collected from the wells. No floating free phase product was observed in any of the wells that were sampled.



## REFERENCES

Roux Associates West, Inc., Underground Storage Tank Site Investigation, Pfizer Pigments Plant, Emeryville, California, August 12, 1988.

Roux Associates West, Inc., Site Assessment, Petroleum Hydrocarbons in Soils, Pfizer Pigments Plant, Emeryville, California, July 11, 1989.

Roux Associates West, Inc., Work Plan, Site Investigation and Fuel Recovery, Pfizer Pigments Plant, Emeryville, California, March 8, 1990.

Roux Associates West, Inc., Diesel Fuel Site Investigation, Pfizer Pigments Plant, Emeryville, California, May 2, 1990.

United States Geologic Survey, Oakland West Quadrangle, California, Revised 1980.

**TABLES SECTION**

**TABLE 1**

**Elevation of Ground Water, Measured on January 8, 1991**

**Table 1. Elevation of Ground Water, Measured on January 8, 1991, Harcros Pigments Plant  
Emeryville, California**

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Monitoring Well Number	Date	DTW	TOC Elevation	GW Elevation
RW-2	1/08/91	4.93	6.84	1.91
RW-3	1/08/91	4.00	7.38	3.38
RW-22	1/08/91	4.04	7.42	3.38
RW-29	1/08/91	5.68	7.01	1.33
RW-30	1/08/91	4.23	7.51	3.28
RW-31	1/08/91	3.43	7.08	3.65

---

Notes:

DTW = Depth to Water  
TOC Elevation = Top of Casing Elevation, In Feet Above Mean Sea Level  
GW Elevation = Ground Water Elevation, In Feet Above Mean Sea Level

**TABLE 2**  
**Summary of Analytical Data**

**Table 2. Summary of Analytical Data, Harcros Pigments Plant, Emeryville, California**

Monitoring Well ID#	Date	TPH-D	TPH-K	Volatile Organic Compounds
RW-2	1/08/91	<5.0	<5.0	<5.0
RW-3	1/08/91	<5.0	<5.0	<5.0
RW-22	1/08/91	<5.0	<5.0	<5.0
RW-29	1/08/91	NA	NA	<5.0
RW-30	1/08/91	NA	NA	<5.0
RW-31	1/08/91	NA	NA	<5.0

Notes:

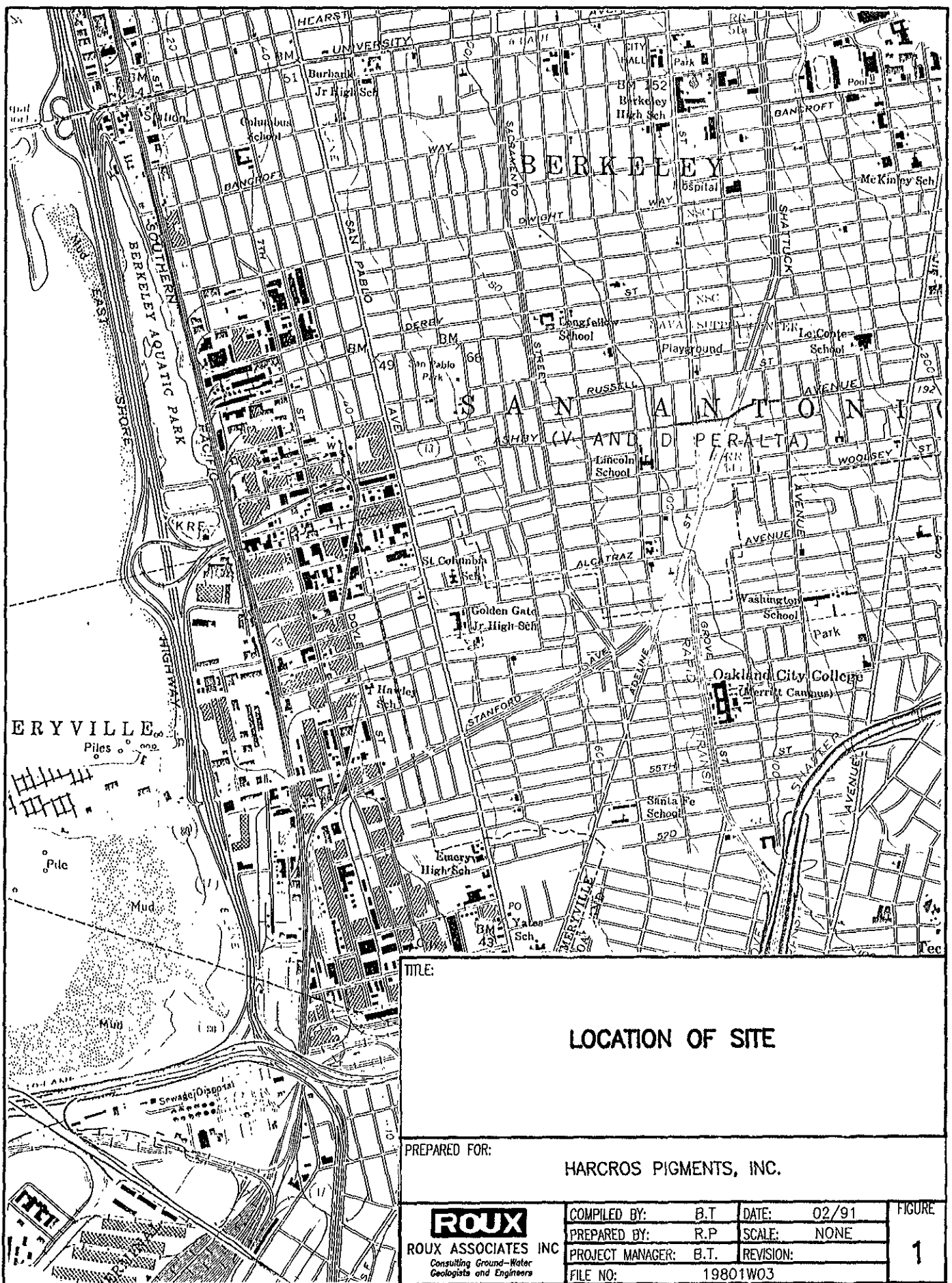
All concentrations are reported in parts per billion

- TPH-D = Total petroleum hydrocarbons as diesel fuel
- TPH-K = Total petroleum hydrocarbons as kerosene
- NA = Not Analyzed

**FIGURES SECTION**

**FIGURE 1**  
**Location of Site**





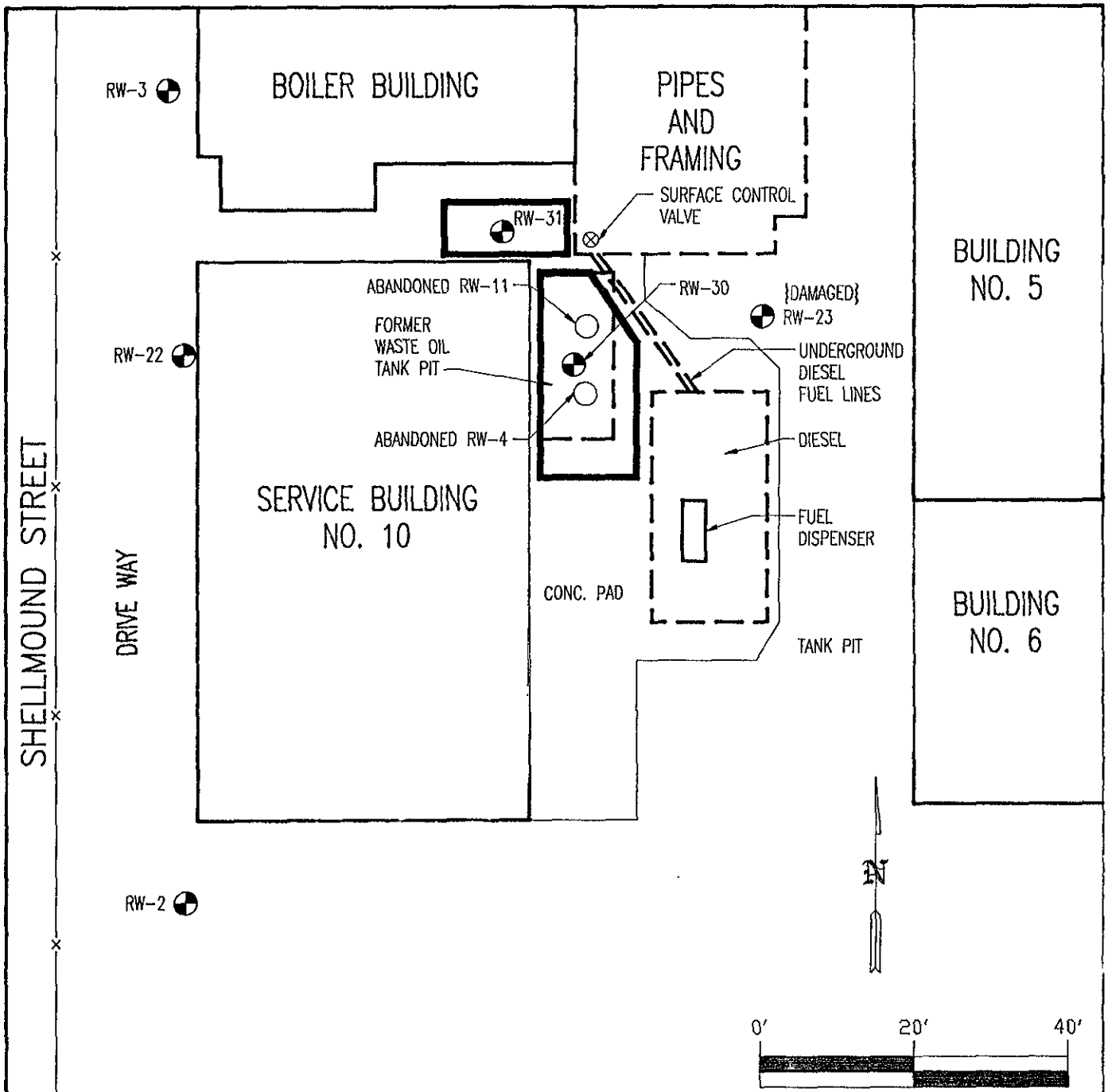
TITLE:

**LOCATION OF SITE**

PREPARED FOR:		HARCROS PIGMENTS, INC.	
<b>ROUX</b> ROUX ASSOCIATES INC Consulting Ground-Water Geologists and Engineers	COMPILED BY:	B.T.	DATE: 02/91
	PREPARED BY:	R.P.	SCALE: NONE
	PROJECT MANAGER:	B.T.	REVISION:
FILE NO:	19801W03		FIGURE <b>1</b>

**FIGURE 2**

**Location of Monitoring Wells and Former Tank Pits**



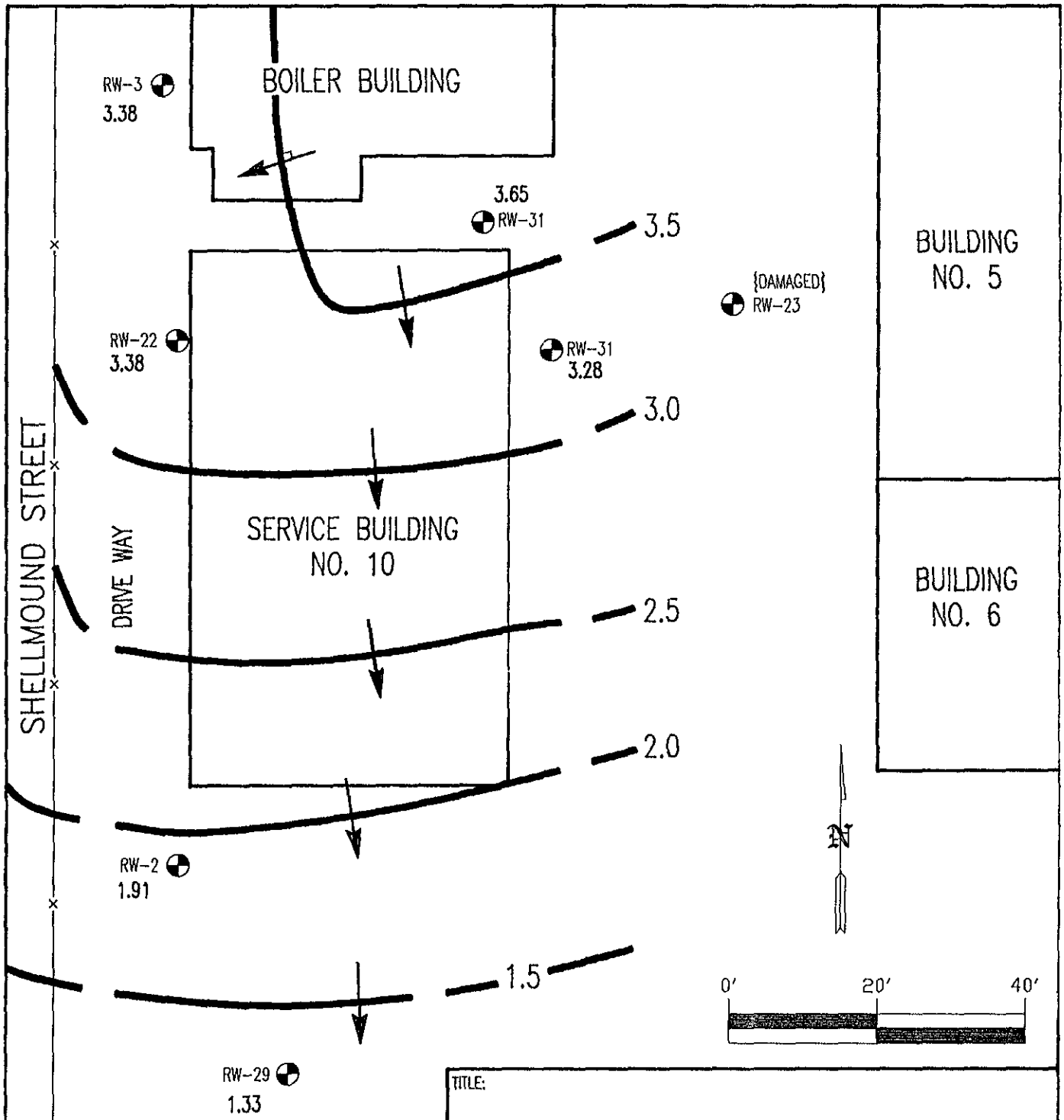
**EXPLANATION**

- RW-2 MONITORING WELL LOCATION AND DESIGNATION
- RW-11 FORMER MONITORING WELL LOCATION AND DESIGNATION
- APPROXIMATE AREA OF EXCAVATION



TITLE: <b>LOCATION OF MONITORING WELLS AND FORMER TANK PITS</b>			
PREPARED FOR: <b>HARCROS PIGMENTS, INC.</b>			
<b>ROUX</b>	COMPILED BY: B.T.	DATE: 01/91	<b>FIGURE</b>  <b>2</b>
ROUX ASSOCIATES INC <small>Consulting Ground-Water Geologists and Engineers</small>	PREPARED BY: RLP	SCALE: SHOWN	
	PROJECT MANAGER: B.T.	REVISION:	
	FILE NO: 19801W01		

**FIGURE 3**

**Elevation of Ground Water, January 8, 1991**



**EXPLANATION**

- RW-2  MONITORING WELL LOCATION AND DESIGNATION
- 3.28 GROUND-WATER ELEVATION (FEET)
- 3.0- LINE OF EQUAL GROUND-WATER ELEVATION (FEET) RELATIVE TO EMERYVILLE DATUM DASHED WHERE INFERRED
-  DIRECTION OF GROUND-WATER FLOW

TITLE:

**ELEVATION OF GROUND-WATER  
JANUARY 8, 1991**

PREPARED FOR:

HARCROS PIGMENTS, INC.

**ROUX**  
ROUX ASSOCIATES INC  
Consulting Ground-Water  
Geologists and Engineers

COMPILED BY: B.T.	DATE: 02/91
PREPARED BY: RLP	SCALE: SHOWN
PROJECT MANAGER: B.T.	REVISION:
FILE NO: 19801W02	

FIGURE

**3**

**APPENDIX A**  
**Well Sampling Forms**

WELL SAMPLING DATA FORM

CLIENT: Harcros

PROJECT NO.: 19801W

LOCATION: Emeryville CA

WELL NUMBER: Rw-2

TYPE OF WELL: 2" Monitoring well

DATE: 1/8/91

STORAGE TANK: \_\_\_\_\_

WEATHER: Clear 50's

TIME OF START: \_\_\_\_\_

SAMPLED BY: B. Thomas

TIME OF FINISH: \_\_\_\_\_

DEPTH TO BOTTOM OF WELL:	<u>17.26</u>	FT.
DEPTH TO WATER:	<u>4.93</u>	FT.
WATER COLUMN:	<u>12.33</u>	FT.
VOLUME OF WATER IN WELL:	<u>1.97</u>	GAL.
VOLUME OF WATER TO REMOVE:	<u>5.92</u>	GAL.
VOLUME REMOVED:	<u>6.25</u>	GAL.

RATE OF PURGE: \_\_\_\_\_

METHOD OF PURGE: Bailer

PHYSICAL APPEARANCE/COMMENTS:

Clear color, slightly turbid, no odor

FIELD MEASUREMENTS:

TIME: 12:45

pH: 6.94

COND: 1850 uMHO<sub>s</sub>

TEMP: 19°C

TURB: -

Eh: -

O<sub>2</sub>: -

TYPES OF SAMPLES COLLECTED:

EPA Method 624 Volatile Organic Compounds

TPH-D Method 2015

LABORATORY NAME & LOCATION:

Curtist Tompkins Ltd, Berkeley, CA

WELL SAMPLING DATA FORM

CLIENT: Harcros

PROJECT NO.: 19801W

LOCATION: Emeryville

WELL NUMBER: RW-3

DATE: 1/8/90 91

WEATHER: Clear 50's

SAMPLED BY: B. Thomas

TYPE OF WELL: 2" Monitoring well

STORAGE TANK: \_\_\_\_\_

TIME OF START: \_\_\_\_\_

TIME OF FINISH: \_\_\_\_\_

DEPTH TO BOTTOM OF WELL: 17.62 FT.

DEPTH TO WATER: 4.00 FT.

WATER COLUMN: 13.62 FT.

VOLUME OF WATER IN WELL: 2.18 GAL.

VOLUME OF WATER TO REMOVE: 6.54 GAL.

VOLUME REMOVED: 7.00 GAL.

RATE OF PURGE: \_\_\_\_\_

METHOD OF PURGE: Bailer

PHYSICAL APPEARANCE/COMMENTS:

Slightly turbid, clear color, no odor

FIELD MEASUREMENTS:

TIME: 13:20

pH: 6.82

COND: 2180 uMHO

TEMP: 20°C

TURB: -

Eh: -

O<sub>2</sub>: -

TYPES OF SAMPLES COLLECTED:

volatile Organic Compounds Method 624

TPH-D Method 8015

LABORATORY NAME & LOCATION:

Curtis + Tompkins, LTD, Berkeley, CA



WELL SAMPLING DATA FORM

CLIENT: Harcros

PROJECT NO.: 19801W

LOCATION: Emeryville

WELL NUMBER: RW-22

TYPE OF WELL: 4" Monitoringwell

DATE: 1/8/91

STORAGE TANK: \_\_\_\_\_

WEATHER: Clear 50's

TIME OF START: \_\_\_\_\_

SAMPLED BY: B. Thomas

TIME OF FINISH: \_\_\_\_\_

DEPTH TO BOTTOM OF WELL:	<u>13.50</u>	FT.
DEPTH TO WATER:	<u>4.04</u>	FT.
WATER COLUMN:	<u>9.46</u>	FT.
VOLUME OF WATER IN WELL:	<u>6.15</u>	GAL.
VOLUME OF WATER TO REMOVE:	<u>18.45</u>	GAL.
VOLUME REMOVED:	<u>18.75</u>	GAL.

RATE OF PURGE: \_\_\_\_\_

METHOD OF PURGE: Bailer

PHYSICAL APPEARANCE/COMMENTS:

Moderately turbid, grey-brown color, no odor

FIELD MEASUREMENTS:

TIME: 13:00

pH: 6.87

COND: 2030  $\mu$ MHO

TEMP: 19°C

TURB: Moderate

Eh: -

O<sup>2</sup>: -

TYPES OF SAMPLES COLLECTED:

USEPA Method 624 Volatile Organic Compounds

USEPA Method 8015 TPH-D

LABORATORY NAME & LOCATION:

Curtis + Tompkins Ltd, Berkeley, CA

WELL SAMPLING DATA FORM

CLIENT: Harcros

PROJECT NO.: 19801W

LOCATION: Emeryville

WELL NUMBER: RW-29

TYPE OF WELL: 2" monitoring well

DATE: 1/8/91

STORAGE TANK: \_\_\_\_\_

WEATHER: Clear 50's

TIME OF START: \_\_\_\_\_

SAMPLED BY: B. Thomas

TIME OF FINISH: \_\_\_\_\_

DEPTH TO BOTTOM OF WELL: 13.05 FT.  
DEPTH TO WATER: 5.68 FT.  
WATER COLUMN: 7.37 FT.  
VOLUME OF WATER IN WELL: 1.18 GAL.  
VOLUME OF WATER TO REMOVE: 3.54 GAL.  
VOLUME REMOVED: 4.0 GAL.

RATE OF PURGE: \_\_\_\_\_  
METHOD OF PURGE: Bailer

PHYSICAL APPEARANCE/COMMENTS:  
Clear, not turbid, no odor

FIELD MEASUREMENTS:  
TIME: 12:35  
pH: 6.74  
COND: 1630  $\mu$ MHO  
TEMP: 19°C  
TURB: \_\_\_\_\_  
Eh: \_\_\_\_\_  
O<sub>2</sub>: \_\_\_\_\_

TYPES OF SAMPLES COLLECTED:  
Volatile Organic Compounds USEPA Method 624

LABORATORY NAME & LOCATION:  
Curtis + Tompkins Ltd, Berkeley, CA

WELL SAMPLING DATA FORM

CLIENT: Harcros

PROJECT NO.: 19801

LOCATION: Emeryville

WELL NUMBER: RW-30

TYPE OF WELL: 4" monitoring well

DATE: 1/8/91

STORAGE TANK: \_\_\_\_\_

WEATHER: Clear 50<sup>°</sup>S

TIME OF START: \_\_\_\_\_

SAMPLED BY: B. Thomas

TIME OF FINISH: \_\_\_\_\_

DEPTH TO BOTTOM OF WELL:	<u>13.50</u>	FT.
DEPTH TO WATER:	<u>4.23</u>	FT.
WATER COLUMN:	<u>9.27</u>	FT.
VOLUME OF WATER IN WELL:	<u>6.03</u>	GAL.
VOLUME OF WATER TO REMOVE:	<u>18.07</u>	GAL.
VOLUME REMOVED:	<u>18.00</u>	GAL.

RATE OF PURGE: \_\_\_\_\_

METHOD OF PURGE: Bailer

PHYSICAL APPEARANCE/COMMENTS:

Turbid, grey color

FIELD MEASUREMENTS:

TIME: 13:45

pH: 6.87

COND: 2250  $\mu$ MHO

TEMP: 19<sup>°</sup>C

TURB: Slightly

Eh: -

O<sup>2</sup>: \_\_\_\_\_

TYPES OF SAMPLES COLLECTED:

USEPA method 624 volatile organic compounds.

LABORATORY NAME & LOCATION:

Cortist Tompkins Ltd, Berkeley CA

WELL SAMPLING DATA FORM

CLIENT: Harcros

PROJECT NO.: 19801W

LOCATION: Emeryville

WELL NUMBER: RW-31

TYPE OF WELL: 4" Monitoring well

DATE: 1/8/91

STORAGE TANK: \_\_\_\_\_

WEATHER: Clear 50<sup>SS</sup>

TIME OF START: \_\_\_\_\_

SAMPLED BY: B. Thomas

TIME OF FINISH: \_\_\_\_\_

DEPTH TO BOTTOM OF WELL:	<u>13.00</u>	FT.
DEPTH TO WATER:	<u>3.43</u>	FT.
WATER COLUMN:	<u>9.57</u>	FT.
VOLUME OF WATER IN WELL:	<u>6.22</u>	GAL.
VOLUME OF WATER TO REMOVE:	<u>18.66</u>	GAL.
VOLUME REMOVED:	<u>19.50</u>	GAL.

RATE OF PURGE: \_\_\_\_\_

METHOD OF PURGE: Boiler

PHYSICAL APPEARANCE/COMMENTS:  
turbid, grey color, no odor

FIELD MEASUREMENTS:

TIME: 14:00  
pH: 7.14  
COND: 2180 uMHOs  
TEMP: 19°C  
TURB: moderate  
Eh: —  
O<sup>2</sup>: —

TYPES OF SAMPLES COLLECTED:  
USEPA method 624 Volatile Organic Compounds

LABORATORY NAME & LOCATION:  
Curtis + Tompkins

**APPENDIX B**  
**Chain of Custody Documentation**

**APPENDIX B**  
**Chain of Custody Documentation**

Consulting Ground-Water  
Geologists & Engineers  
**ROUX ASSOCIATES**

1340 ARNOLD DRIVE, SUITE 231  
MARTINEZ, CALIFORNIA 94553  
(415) 370-2275 FAX. (415) 370-2235

ANALYSES

PAGE OF

PROJECT NAME

Harcros

PROJECT NUMBER

19801W

PROJECT LOCATION

Emeryville CA

SAMPLER(S):

B. Thomas

EPA METHOD 624 (Pb)  
 40ml glass vial  
 preserved with HCl  
 EPA METHOD 815  
 10ml Diesel  
 ultraclean bottle  
 organic lead

TOTAL BOTTLES

1  
2  
3  
4  
5  
6  
7  
8  
9  
10

SAMPLE DESIGNATION/LOCATION	DATE COLLECTED	TIME COLLECTED							NOTES
Rw-2 ✓	1/8/91	12:45	✓	✓				3	
Rw-3 ✓	1/8/91	13:20	✓	✓				3	
Rw-22 ✓	1/8/91	13:00	✓	✓				3	
Rw-29 ✓	1/8/91	12:35	✓					2	
Rw-30 ✓	1/8/91	13:45	✓					2	
Rw-31 ✓	1/8/91	14:00	✓					2	
CS-3A ✓	1/8/91	14:15		X	X			1	
CS-3B } composite	1/8/91	14:15		X	X			1	Total 16 Samples in cooler
CS-3C } 1 sample	1/8/91	14:15		X	X			1	
CS-3D }	1/8/91	14:15		X	X			1	

RELINQUISHED BY: (SIGNATURE) FOR	DATE	TIME	RELINQUISHED BY: (SIGNATURE) FOR	DATE	TIME
<i>Bruce Thomas</i> ROUX ASSOCIATES	1/8/91	15:26	<i>Mary Shriver</i> C&T	1/8/91	15:26
RELINQUISHED BY: (SIGNATURE) FOR	DATE	TIME	RELINQUISHED BY: (SIGNATURE) FOR	DATE	TIME
RELINQUISHED BY: (SIGNATURE) FOR	DATE	TIME	RELINQUISHED BY: (SIGNATURE) FOR	DATE	TIME

DELIVERY METHOD: *Hand delivered* COMMENTS: *Kept cool since*

**APPENDIX C**  
**Laboratory Analytical Reports**



LABORATORY NUMBER: 102701  
 CLIENT: ROUX ASSOCIATES  
 PROJECT ID: 19801W  
 LOCATION: HARCROS

DATE RECEIVED: 01/08/91  
 DATE EXTRACTED: 01/11/91  
 DATE ANALYZED: 01/12/91  
 DATE REPORTED: 01/21/91

Extractable Petroleum Hydrocarbons in Aqueous Solutions  
 California DOHS Method  
 LUFT Manual October 1989

LAB ID	CLIENT ID	KEROSENE RANGE (ug/L)	DIESEL RANGE (ug/L)	REPORTING LIMIT* (ug/L)
102701-1	RW-2	ND	ND	50
102701-2	RW-3	ND	ND	50
102701-3	RW-22	ND	ND	50

ND = Not detected at or above reporting limit.

\*Reporting limit applies to all analytes.

QA/QC SUMMARY

RPD, %	<1
RECOVERY, %	130



LABORATORY NUMBER: 102701-1  
 CLIENT: ROUX ASSOCIATES  
 PROJECT ID: 19801W - HARCROS  
 SAMPLE ID: RW-2

DATE RECEIVED: 01/08/91  
 DATE ANALYZED: 01/15/91  
 DATE REPORTED: 01/21/91

EPA METHOD 8240: VOLATILE ORGANICS IN WATER  
 Extraction Method: EPA 5030 - Purge & Trap

COMPOUND	Result ug/L	Reporting Limit (ug/L)
chloromethane	ND	10
bromomethane	ND	10
vinyl chloride	ND	10
chloroethane	ND	10
methylene chloride	ND	5.0
acetone	ND	10
carbon disulfide	ND	5.0
trichlorofluoromethane	ND	5.0
1,1-dichloroethene	ND	5.0
1,1-dichloroethane	ND	5.0
1,2-dichloroethene (total)	ND	5.0
chloroform	ND	5.0
freon 113	ND	5.0
1,2-dichloroethane	ND	5.0
2-butanone	ND	10
1,1,1-trichloroethane	ND	5.0
carbon tetrachloride	ND	5.0
vinyl acetate	ND	10
bromodichloromethane	ND	5.0
1,2-dichloropropane	ND	5.0
cis-1,3-dichloropropene	ND	5.0
trichloroethylene	ND	5.0
dibromochloromethane	ND	5.0
1,1,2-trichloroethane	ND	5.0
benzene	ND	5.0
trans-1,3-dichloropropene	ND	5.0
2-chloroethylvinyl ether	ND	10
bromoform	ND	5.0
2-hexanone	ND	10
4-methyl-2-pentanone	ND	10
1,1,2,2-tetrachloroethane	ND	5.0
tetrachloroethylene	ND	5.0
toluene	ND	5.0
chlorobenzene	ND	5.0
ethyl benzene	ND	5.0
styrene	ND	5.0
total xylenes	ND	5.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	103, %
Toluene-d8	100 %
Bromofluorobenzene	102 %



LABORATORY NUMBER: 102701-2  
 CLIENT: ROUX ASSOCIATES  
 PROJECT ID: 19801W - HARCROS  
 SAMPLE ID: RW-3

DATE RECEIVED: 01/08/91  
 DATE ANALYZED: 01/15/91  
 DATE REPORTED: 01/21/91  
 DATE REVISED: 02/19/91

EPA METHOD 8240: VOLATILE ORGANICS IN WATER  
 Extraction Method: EPA 5030 - Purge & Trap

COMPOUND	Result ug/L	Reporting Limit (ug/L)
chloromethane	ND	10
bromomethane	ND	10
vinyl chloride	ND	10
chloroethane	ND	10
methylene chloride	ND	5.0
acetone	ND	10
carbon disulfide	ND	5.0
trichlorofluoromethane	ND	5.0
1,1-dichloroethene	ND	5.0
1,1-dichloroethane	ND	5.0
1,2-dichloroethene (total)	ND	5.0
chloroform	ND	5.0
freon 113	ND	5.0
1,2-dichloroethane	ND	5.0
2-butanone	ND	10
1,1,1-trichloroethane	ND	5.0
carbon tetrachloride	ND	5.0
vinyl acetate	ND	10
bromodichloromethane	ND	5.0
1,2-dichloropropane	ND	5.0
cis-1,3-dichloropropene	ND	5.0
trichloroethylene	ND	5.0
dibromochloromethane	ND	5.0
1,1,2-trichloroethane	ND	5.0
benzene	ND	5.0
trans-1,3-dichloropropene	ND	5.0
2-chloroethylvinyl ether	ND	10
bromoform	ND	5.0
2-hexanone	ND	10
4-methyl-2-pentanone	ND	10
1,1,2,2-tetrachloroethane	ND	5.0
tetrachloroethylene	ND	5.0
toluene	ND	5.0
chlorobenzene	ND	5.0
ethyl benzene	ND	5.0
styrene	ND	5.0
total xylenes	ND	5.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	84 %
Toluene-d8	101 %
Bromofluorobenzene	97 %

LABORATORY NUMBER: 102701-4  
 CLIENT: ROUX ASSOCIATES  
 PROJECT ID: 19801W - HARCROS  
 SAMPLE ID: RW-29

DATE RECEIVED: 01/08/91  
 DATE ANALYZED: 01/16/91  
 DATE REPORTED: 01/21/91

EPA METHOD 8240: VOLATILE ORGANICS IN WATER  
 Extraction Method: EPA 5030 - Purge & Trap

COMPOUND	Result ug/L	Reporting Limit (ug/L)
chloromethane	ND	10
bromomethane	ND	10
vinyl chloride	ND	10
chloroethane	ND	10
methylene chloride	ND	5.0
acetone	ND	10
carbon disulfide	ND	5.0
trichlorofluoromethane	ND	5.0
1,1-dichloroethene	ND	5.0
1,1-dichloroethane	ND	5.0
1,2-dichloroethene (total)	ND	5.0
chloroform	ND	5.0
freon 113	ND	5.0
1,2-dichloroethane	ND	5.0
2-butanone	ND	10
1,1,1-trichloroethane	ND	5.0
carbon tetrachloride	ND	5.0
vinyl acetate	ND	10
bromodichloromethane	ND	5.0
1,2-dichloropropane	ND	5.0
cis-1,3-dichloropropene	ND	5.0
trichloroethylene	ND	5.0
dibromochloromethane	ND	5.0
1,1,2-trichloroethane	ND	5.0
benzene	ND	5.0
trans-1,3-dichloropropene	ND	5.0
2-chloroethylvinyl ether	ND	10
bromoform	ND	5.0
2-hexanone	ND	10
4-methyl-2-pentanone	ND	10
1,1,2,2-tetrachloroethane	ND	5.0
tetrachloroethylene	ND	5.0
toluene	ND	5.0
chlorobenzene	ND	5.0
ethyl benzene	ND	5.0
styrene	ND	5.0
total xylenes	ND	5.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	99 %
Toluene-d8	102 %
Bromofluorobenzene	102 %

LABORATORY NUMBER: 102701-3  
 CLIENT: ROUX ASSOCIATES  
 PROJECT ID: 19801W - HARCROS  
 SAMPLE ID: RW-22

DATE RECEIVED: 01/08/91  
 DATE ANALYZED: 01/15/91  
 DATE REPORTED: 01/21/91  
 DATE REVISED: 02/19/91

EPA METHOD 8240: VOLATILE ORGANICS IN WATER  
 Extraction Method: EPA 5030 - Purge & Trap

COMPOUND	Result ug/L	Reporting Limit (ug/L)
chloromethane	ND	10
bromomethane	ND	10
vinyl chloride	ND	10
chloroethane	ND	10
methylene chloride	ND	5.0
acetone	ND	10
carbon disulfide	ND	5.0
trichlorofluoromethane	ND	5.0
1,1-dichloroethene	ND	5.0
1,1-dichloroethane	ND	5.0
1,2-dichloroethene (total)	ND	5.0
chloroform	ND	5.0
freon 113	ND	5.0
1,2-dichloroethane	ND	5.0
2-butanone	ND	10
1,1,1-trichloroethane	ND	5.0
carbon tetrachloride	ND	5.0
vinyl acetate	ND	10
bromodichloromethane	ND	5.0
1,2-dichloropropane	ND	5.0
cis-1,3-dichloropropene	ND	5.0
trichloroethylene	ND	5.0
dibromochloromethane	ND	5.0
1,1,2-trichloroethane	ND	5.0
benzene	ND	5.0
trans-1,3-dichloropropene	ND	5.0
2-chloroethylvinyl ether	ND	10
bromoform	ND	5.0
2-hexanone	ND	10
4-methyl-2-pentanone	ND	10
1,1,2,2-tetrachloroethane	ND	5.0
tetrachloroethylene	ND	5.0
toluene	ND	5.0
chlorobenzene	ND	5.0
ethyl benzene	ND	5.0
styrene	ND	5.0
total xylenes	ND	5.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	104 %
Toluene-d8	100 %
Bromofluorobenzene	101 %

LABORATORY NUMBER: 102701-5  
 CLIENT: ROUX ASSOCIATES  
 PROJECT ID: 19801W - HARCROS  
 SAMPLE ID: RW-30

DATE RECEIVED: 01/08/91  
 DATE ANALYZED: 01/15/91  
 DATE REPORTED: 01/21/91

EPA METHOD 8240: VOLATILE ORGANICS IN WATER  
 Extraction Method: EPA 5030 - Purge & Trap

COMPOUND	Result ug/L	Reporting Limit (ug/L)
chloromethane	ND	10
bromomethane	ND	10
vinyl chloride	ND	10
chloroethane	ND	10
methylene chloride	ND	5.0
acetone	ND	10
carbon disulfide	ND	5.0
trichlorofluoromethane	ND	5.0
1,1-dichloroethene	ND	5.0
1,1-dichloroethane	ND	5.0
1,2-dichloroethene (total)	ND	5.0
chloroform	ND	5.0
freon 113	ND	5.0
1,2-dichloroethane	ND	5.0
2-butanone	ND	10
1,1,1-trichloroethane	ND	5.0
carbon tetrachloride	ND	5.0
vinyl acetate	ND	10
bromodichloromethane	ND	5.0
1,2-dichloropropane	ND	5.0
cis-1,3-dichloropropene	ND	5.0
trichloroethylene	ND	5.0
dibromochloromethane	ND	5.0
1,1,2-trichloroethane	ND	5.0
benzene	ND	5.0
trans-1,3-dichloropropene	ND	5.0
2-chloroethylvinyl ether	ND	10
bromoform	ND	5.0
2-hexanone	ND	10
4-methyl-2-pentanone	ND	10
1,1,2,2-tetrachloroethane	ND	5.0
tetrachloroethylene	ND	5.0
toluene	ND	5.0
chlorobenzene	ND	5.0
ethyl benzene	ND	5.0
styrene	ND	5.0
total xylenes	ND	5.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	94 %
Toluene-d8	101 %
Bromofluorobenzene	97 %



LABORATORY NUMBER: 102701-6  
CLIENT: ROUX ASSOCIATES  
PROJECT ID: 19801W - HARCROS  
SAMPLE ID: RW-31

DATE RECEIVED: 01/08/91  
DATE ANALYZED: 01/15/91  
DATE REPORTED: 01/21/91

EPA METHOD 8240: VOLATILE ORGANICS IN WATER  
Extraction Method: EPA 5030 - Purge & Trap

COMPOUND	Result ug/L	Reporting Limit (ug/L)
chloromethane	ND	10
bromomethane	ND	10
vinyl chloride	ND	10
chloroethane	ND	10
methylene chloride	ND	5.0
acetone	ND	10
carbon disulfide	ND	5.0
trichlorofluoromethane	ND	5.0
1,1-dichloroethene	ND	5.0
1,1-dichloroethane	ND	5.0
1,2-dichloroethene (total)	ND	5.0
chloroform	ND	5.0
freon 113	ND	5.0
1,2-dichloroethane	ND	5.0
2-butanone	ND	10
1,1,1-trichloroethane	ND	5.0
carbon tetrachloride	ND	5.0
vinyl acetate	ND	10
bromodichloromethane	ND	5.0
1,2-dichloropropane	ND	5.0
cis-1,3-dichloropropene	ND	5.0
trichloroethylene	ND	5.0
dibromochloromethane	ND	5.0
1,1,2-trichloroethane	ND	5.0
benzene	ND	5.0
trans-1,3-dichloropropene	ND	5.0
2-chloroethylvinyl ether	ND	10
bromoform	ND	5.0
2-hexanone	ND	10
4-methyl-2-pentanone	ND	10
1,1,2,2-tetrachloroethane	ND	5.0
tetrachloroethylene	ND	5.0
toluene	ND	5.0
chlorobenzene	ND	5.0
ethyl benzene	ND	5.0
styrene	ND	5.0
total xylenes	ND	5.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	98 %
Toluene-d8	98 %
Bromofluorobenzene	92 %