



LEVINE•FRICKE

ENGINEERS, HYDROGEOLOGISTS & APPLIED SCIENTISTS

April 27, 1993

LF 2407.00-14

Mr. Brit Johnson
Hazardous Materials Division
Department of Environmental Health
Alameda County Health Care Services Agency
80 Swan Way
Oakland, California 94621

Subject: Quarterly Ground-Water Monitoring Report for
the Period from January 1 through March 31, 1993
5050 Coliseum Way and 750-50th Avenue
Oakland, California

Dear Mr. Chan:

On behalf of Volvo GM, and in accordance with our work plan dated January 6, 1993, and submitted to the Alameda County Health Care Services Agency (ACHCSA), we have prepared this quarterly monitoring report presenting results of recent ground-water sampling and analysis conducted at the properties located at 5050 Coliseum Way and 750-50th Avenue (collectively referenced as "the Site"; Figure 1).

Levine-Fricke collected water-level measurements and ground-water samples from 11 on-site wells on March 4 and 5, 1993. Ground-water samples were submitted to a state-certified analytical laboratory for analysis of CAM Title 22 metals.

If you have any questions or comments concerning the results presented in this report, please do not hesitate to contact me or Jenifer Beatty.

Sincerely,

Kathleen A. Isaacson, R.G.
Senior Hydrogeologist

Enclosure

cc: Lester Feldman, Regional Water Quality Control Board
Bob Whelen, Volvo GM Heavy Truck Corp.
Martha Boyd, Volvo GM Heavy Truck Corp.

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Quarterly Ground-Water Monitoring Report for the Period
January 1 through March 31, 1993
5050 Coliseum Way and 750-50th Avenue
Oakland, California

April 27, 1993
2407.00-14

Prepared for
Volvo GM Heavy Truck Corporation
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P.O. Box 26115
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CONTENTS

	<u>PAGE</u>
LIST OF TABLES	ii
LIST OF FIGURES	ii
1.0 INTRODUCTION	1
2.0 PREVIOUS INVESTIGATIONS CONDUCTED BY LEVINE·FRICKE .	1
3.0 GROUND-WATER ELEVATIONS AND FLOW DIRECTION	2
4.0 GROUND-WATER QUALITY	2
4.1 Sampling Procedures	2
4.2 Ground-Water Quality Results	3
5.0 PROJECT ACTIVITIES TO BE CONDUCTED DURING THE PERIOD FROM APRIL 1 THROUGH JUNE 30, 1993	4
6.0 REFERENCES	5
TABLES	
FIGURES	
APPENDICES	
A	WATER-QUALITY SAMPLING FORMS
B	LABORATORY CERTIFICATES

LIST OF TABLES

Number	Title
1	Shallow Ground-Water Elevation Data
2	Concentrations of Metals in Ground-Water Samples

LIST OF FIGURES

Number	Title
1	Site Location Map
2	Shallow Ground-Water Elevation Contour Map, March 4, 1993
3	Concentrations of Metals Detected in Shallow Ground-Water Samples, and pH, March 4 and 5, 1993

April 27, 1993

2407.00-14

**QUARTERLY GROUND-WATER MONITORING REPORT FOR
THE PERIOD FROM JANUARY 1 THROUGH MARCH 31, 1993
5050 COLISEUM WAY AND 750-50TH AVENUE
OAKLAND, CALIFORNIA**

1.0 INTRODUCTION

This report presents results of quarterly ground-water monitoring activities conducted during the period from January 1 through March 31, 1993, for the properties located at 5050 Coliseum Way and 750-50th Avenue (collectively referenced as "the Site"; Figure 1). This report was prepared on behalf of Volvo GM Heavy Truck Corporation (Volvo GM) in accordance with our work plan dated January 6, 1993, and submitted to the Alameda County Health Care Services Agency (ACHCSA). This report includes graphic illustrations of potentiometric head (water-level) data and presents historical summaries of ground-water elevation and ground-water quality data collected at the Site.

2.0 PREVIOUS INVESTIGATIONS CONDUCTED BY LEVINE-FRICKE

Levine-Fricke conducted soil and ground-water investigations for the Site on behalf of Volvo GM in response to a letter from the ACHCSA dated April 10, 1991. The letter requested a soil and ground-water investigation in the vicinity of the waste-oil tank to further assess the extent of oil and grease (O&G) and metals, and to assess the potential impact of previous activities conducted at the Site on soil and ground-water quality.

Results of the investigations indicated elevated concentrations of metals in soil and ground-water samples collected in portions of the Site. In general, elevated concentrations of metals in soils appear to be restricted to the upper 10 feet of material beneath the Site, except in the vicinity of well LF-1, where concentrations of zinc up to 16,000 parts per million (ppm) were detected to a depth of 20 feet below ground surface (bgs). Elevated concentrations of metals were detected in ground-water samples collected from several of the wells (Levine-Fricke 1992a).

Analytical results for semivolatile organic compounds, O&G, and hydrocarbons indicate that ground water in the vicinity of well LF-1, located approximately 50 feet downgradient from the

former waste-oil tank pit, has not been affected by these compounds (Levine-Fricke 1992b).

To monitor the concentrations of metals in shallow ground-water beneath the property, a quarterly monitoring program has been implemented at the Site. The following sections describe monitoring activities conducted at the Site in March 1993.

3.0 GROUND-WATER ELEVATIONS AND FLOW DIRECTION

The top of each well casing at the Site was surveyed relative to mean sea level by a state-licensed land surveyor in November 1991. Before sampling on March 4, 1993, water-level measurements were collected from all wells at the Site. Depth to water was measured using an electric water-level sounding probe to the nearest 0.01 foot, relative to the top of the well casing. Ground-water elevation contours for shallow ground water at the Site are presented in Figure 2. A historical summary of ground-water elevations for the Site is presented in Table 1.

Depth-to-water measurements collected at the Site in March 1993 indicate that ground-water elevations have increased relative to October 1992, apparently in response to recent rain. Ground-water elevation increases ranged from 0.75 foot in well LF-1 to 4.01 feet in well MW-1.

The general ground-water flow direction for the Site in March 1993 was toward the west. As indicated on Figure 2, ground-water elevation contours indicate apparent "mounding" of ground water in the vicinity of well MW-1, with ground-water generally flowing radially away from this well.

4.0 GROUND-WATER QUALITY

Ground-water samples were collected from 11 monitoring wells on March 4 and 5, 1993.

4.1 Sampling Procedures

Before ground-water samples were collected, approximately 3 to 5 well casing volumes of water were removed from each well using a Teflon bailer. Specific conductance, pH, and temperature of the purged water were measured during this purging process to aid in evaluating overall ground-water quality. These parameters were recorded in the field on

water-quality sampling forms. Copies of these forms are included in Appendix A. Ground-water samples were collected after these parameters stabilized to within 15 percent of the previous measurement.

Ground-water samples were collected using the same Teflon bailer used to purge the well. Ground-water samples for metals analysis were filtered in the field and preserved with nitric acid. Samples were placed in an ice-chilled cooler immediately after collection for transportation to the analytical laboratory.

Samples were submitted to American Environmental Network, Inc. (formerly Quanteg Laboratories) of Pleasant Hill, California, a state-certified laboratory, for analysis of Title 22 metals. The pH values for ground-water samples collected from each monitoring well were measured and recorded in the field during sampling activities.

For quality assurance/quality control measures, a duplicate sample and a field blank were collected for well LF-1. The duplicate sample was submitted for Title 22 metals analysis and the field blank was submitted to the laboratory on a hold basis, pending analytical results.

4.2 Ground-Water Quality Results

Analytical results for metals analysis are presented on Figure 3 and in Table 2. Laboratory certificates are contained in Appendix B. Analytical results for ground-water samples collected during the recent round of sampling generally were consistent with analytical results reported previously for the Site, except for those samples collected from wells MW-2 and MW-3.

No chromium, lead, mercury, selenium, or thallium was detected in ground-water samples collected from the Site. Concentrations of 0.5 ppm or less of antimony, barium, beryllium, copper, molybdenum, silver, and vanadium were detected in samples collected from various wells on the Site.

Nickel and zinc were detected in all of the 11 wells sampled at concentrations ranging from 0.02 ppm to 11.0 ppm and 0.01 ppm to 14,000 ppm, respectively. The highest concentrations of nickel and zinc, as well as of arsenic (4.9 ppm), cadmium (44.0 ppm), and cobalt (3.9 ppm), were detected in ground-water samples collected from well LF-1.

Analytical results indicate that during the period from October 1992 to March 1993, the concentration of zinc decreased from 6,000 ppm to 290 ppm in well MW-2, and increased from 730 ppm to 3,000 ppm in well MW-3. Labeling errors in the field or laboratory may account for the anomalous data reported for wells MW-2 and MW-3, although neither field nor laboratory documentation supports this idea. Concentrations of metals detected in these wells will be monitored closely during future monitoring events to determine if there was a labeling error.

Measurements of ground-water pH were consistent with values previously reported for the Site and indicate that pH values for shallow ground water beneath the Site are variable. Low values of pH (6.4 or less) were measured for ground-water samples collected from eight wells. The pH values recorded for the remaining three wells ranged from 6.5 to 6.9 (Figure 3).

5.0 PROJECT ACTIVITIES TO BE CONDUCTED DURING THE PERIOD FROM APRIL 1 THROUGH JUNE 30, 1993

The following activities will be conducted during the period from April 1 through June 30, 1993:

- . Water-level measurements will be collected from all on-site monitoring wells on a monthly basis.
- . Ground-water samples will be collected from all monitoring wells in accordance to our work plan dated January 6, 1993.
- . Ground-water samples will be submitted to American Environmental Network, Inc., of Pleasant Hill, California, for analysis of Title 22 metals.

6.0 REFERENCES

Levine-Fricke, Inc. 1992a. Report of Soil and Ground-Water Investigation, White GMC Truck Corporation Facility, 5050 Coliseum Way, Oakland, California. June 25.

———. 1992b. Results of Ground-Water Sampling and Analysis, 5050 Coliseum Way and 750-50th Avenue, Oakland, California. November 12.

TABLE 1
 SHALLOW GROUND-WATER ELEVATION DATA
 5050 COLISEUM WAY AND 750-50TH AVENUE
 OAKLAND, CALIFORNIA

Well Number	Top of PVC Casing Elevation (feet msl)	Date Measured	Depth to Water (feet msl)	Ground-Water Elevation (feet msl)
LF-1	7.56	07-Nov-91	6.79	0.77
		26-Oct-92	4.69	2.87
		04-Mar-93	3.94	3.62
LF-2	9.84	07-Nov-91	7.26	2.58
		26-Oct-92	6.28	3.56
		04-Mar-93	5.14	4.70
LF-3	10.98	07-Nov-91	7.55	3.43
		26-Oct-92	7.05	3.93
		04-Mar-93	5.83	5.15
LF-4	10.36	07-Nov-91	11.63	-1.27
		26-Oct-92	7.31	3.05
		04-Mar-93	5.58	4.78
LF-5	8.03	07-Nov-91	7.34	0.69
		26-Oct-92	7.05	0.98
		04-Mar-93	6.05	1.98
LF-6	11.59	07-Nov-91	8.59	3.00
		26-Oct-92	8.82	2.77
		04-Mar-93	5.79	5.80
LF-7	10.65	07-Nov-91	8.54	2.11
		26-Oct-92	7.98	2.67
		04-Mar-93	4.92	5.73
MW-1	10.21	07-Nov-91	6.13	4.24
		26-Oct-92	7.58	2.63
		04-Mar-93	3.57	6.64
MW-2	8.86	07-Nov-91	5.93	2.93
		26-Oct-92	5.41	3.45
		04-Mar-93	4.26	4.60
MW-3	9.01	07-Nov-91	6.94	2.07
		26-Oct-92	7.29	1.72
		04-Mar-93	5.07	3.94
MW-4	10.75	07-Nov-91	10.26	0.49
		26-Oct-92	9.04	1.71
		04-Mar-93	5.77	4.98

Data entered by MEK/16 Mar 93 Data proofed by MEK 3/16/93

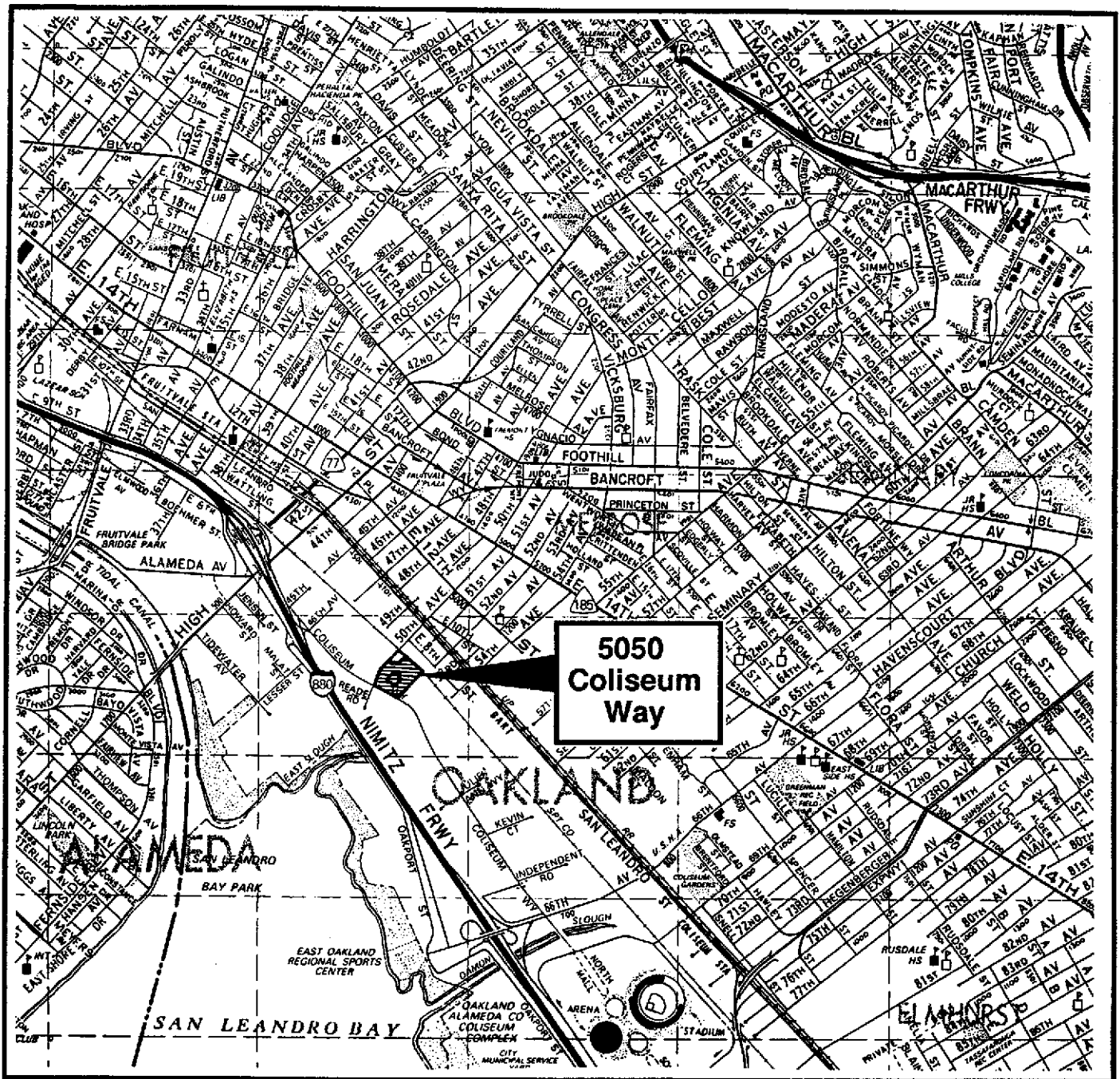
NOTES
 All elevations are measured to the mean-sea-level (msl) datum.
 The elevations shown here were measured from the north side of
 each PVC casing.

TABLE 2
 CONCENTRATIONS OF METALS IN GROUND-WATER SAMPLES
 5050 COLISEUM WAY AND 750-50TH AVENUE
 (All results in milligrams per liter [mg/L]*)

Well ID	Sample Date	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Lead (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Nickel (mg/L)	Selenium (mg/L)	Silver (mg/L)	Thallium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)
LF-1	04-Nov-91	<0.2	0.004	0.046	0.11	130	<0.01	5.7	1.9	0.5	<0.0003	0.11	20	<0.004	0.054	<1	<0.005	4000
	27-Oct-92	<2	0.007	<0.5	<0.2	57	<1	4.1	1	<4	<0.0003	<1	19	0.027	<0.5	<10	<0.5	16000
	05-Mar-93	<2	0.22	<0.05	<0.2	43	<1	3.6	0.47	<4	<0.0003	<1	11	<0.01	<0.5	<10	<0.5	14000
	Duplicate 05-Mar-93	<2	0.26	<0.05	<0.2	44	<1	3.9	0.50	<4	<0.0003	<1	11	<0.01	<0.5	<10	<0.5	14000
LF-2	04-Nov-91	<0.02	0.028	0.026	<0.001	0.009	<0.01	0.18	0.008	<0.005	<0.0003	<0.01	0.52	<0.004	<0.002	<0.1	<0.005	4.2
	27-Oct-92	<0.02	0.007	<0.05	<0.002	0.006	<0.01	0.12	0.02	<0.04	<0.0003	<0.01	0.22	0.005	0.006	<0.1	<0.005	3.3
	04-Mar-93	<0.02	0.003	<0.05	<0.002	<0.005	<0.01	0.10	<0.01	<0.04	<0.0003	<0.01	0.12	<0.004	<0.005	<0.1	<0.005	1.9
LF-3	04-Nov-91	<0.02	3.1	0.077	0.001	<0.005	<0.01	0.016	<0.004	<0.005	<0.0003	0.16	0.012	<0.004	<0.002	<0.1	0.006	3.1
	27-Oct-92	<0.02	3.6	0.11	0.004	0.013	<0.01	0.029	<0.01	<0.04	<0.0003	0.22	0.02	0.018	<0.005	<0.1	<0.005	12
	04-Mar-93	<0.02	4.9	0.07	0.003	0.012	<0.01	0.023	<0.01	<0.04	<0.0003	0.18	0.04	<0.02	<0.005	<0.1	<0.005	15
LF-4	04-Nov-91	0.03	0.026	0.082	<0.001	<0.005	<0.01	<0.005	<0.004	<0.005	<0.0003	<0.01	0.013	<0.004	<0.002	<0.1	0.01	0.034
	27-Oct-92	<0.02	0.034	<0.05	<0.002	<0.005	<0.01	<0.005	<0.01	<0.04	<0.0003	<0.01	0.03	<0.004	<0.005	<0.1	<0.005	0.012
	04-Mar-93	0.02	0.017	0.11	<0.002	<0.005	<0.01	<0.005	<0.01	<0.04	<0.0003	<0.01	0.05	<0.004	<0.005	<0.1	0.008	0.04
LF-5	04-Nov-91	<0.02	<0.002	0.018	<0.001	0.049	<0.01	0.03	<0.005	<0.005	0.0004	<0.01	0.23	<0.004	0.004	<0.1	<0.005	11
	27-Oct-92	<0.02	0.005	<0.05	<0.002	0.24	<0.01	1.4	<0.01	<0.04	<0.0003	<0.01	5.4	0.017	0.022	<0.1	<0.005	35
	04-Mar-93	<0.02	<0.005	<0.05	<0.002	0.21	<0.01	1.1	<0.01	<0.04	<0.0003	<0.01	5.0	<0.010	0.021	<0.1	<0.005	36
LF-6	05-Nov-91	<0.02	0.008	0.019	<0.001	0.079	<0.01	0.58	<0.005	0.009	0.0009	<0.01	2.1	<0.004	0.011	<0.1	<0.005	8.1
	27-Oct-92	<0.02	0.022	<0.05	<0.002	0.17	<0.01	1.6	<0.01	<0.04	<0.0003	<0.01	5.5	0.012	0.020	<0.1	<0.005	23
	04-Mar-93	<0.02	0.007	<0.05	0.003	0.13	<0.01	1.2	<0.01	<0.04	<0.0003	<0.01	4.2	<0.004	0.013	<0.1	<0.005	17
LF-7	05-Nov-91	<0.02	0.004	0.13	<0.001	<0.005	<0.01	<0.005	0.006	<0.005	0.0011	<0.01	0.01	<0.004	<0.002	<0.1	0.006	<0.005
	27-Oct-92	<0.02	0.03	0.11	<0.002	<0.005	<0.01	<0.005	<0.01	<0.04	<0.0003	0.01	0.01	<0.004	<0.005	<0.1	0.008	0.021
	04-Mar-93	<0.02	0.025	0.08	<0.002	<0.005	<0.01	<0.005	<0.01	<0.04	<0.0003	0.01	0.01	<0.010	<0.005	<0.1	0.009	0.01
MW-1	05-Nov-91	<0.02	0.073	0.085	<0.001	<0.005	<0.01	0.008	<0.005	<0.005	<0.0003	0.02	0.032	<0.004	<0.002	<0.1	<0.005	2.7
	27-Oct-92	<0.02	0.084	0.09	<0.002	0.031	<0.01	0.052	<0.01	<0.04	<0.0003	<0.01	0.3	<0.004	<0.005	<0.1	0.007	42
	05-Mar-93	<0.02	0.024	0.05	<0.002	0.008	<0.01	0.015	<0.01	<0.04	<0.0003	<0.01	0.11	<0.004	<0.005	<0.1	0.006	16
MW-2	05-Nov-92	<0.2	2.1	0.013	0.002	7	<0.01	0.42	0.093	<0.2	0.0055	0.01	1.2	<0.004	0.008	<0.1	<0.005	4200
	27-Oct-92	<0.2	1.5	<0.5	<0.02	10	<0.1	1.5	0.2	<0.4	<0.0003	<0.1	4.9	0.014	<0.05	<1	<0.05	6000
	05-Mar-93	<0.02	0.011	<0.05	<0.002	0.28	<0.01	0.24	0.14	<0.04	<0.0003	<0.1	1.0	<0.01	<0.005	<0.1	<0.005	290
MW-3	05-Nov-92	<0.02	<0.002	0.017	0.001	0.57	<0.01	0.42	0.28	0.005	0.0028	<0.01	1.2	<0.004	0.005	<0.1	<0.005	600
	27-Oct-92	<0.02	0.004	<0.05	0.003	0.73	<0.01	0.74	0.3	<0.4	<0.0003	<0.01	2.6	0.011	0.009	<0.1	<0.005	730
	05-Mar-93	<0.2	1.6	<0.05	<0.02	5.8	<0.1	1.0	0.07	<0.4	<0.0003	<0.1	3.1	<0.02	<0.05	<1	<0.05	3000
MW-4	05-Nov-92	<0.02	0.007	0.017	<0.001	<0.005	<0.01	<0.005	<0.005	<0.005	0.0027	<0.01	0.012	<0.004	<0.002	<0.1	<0.005	<0.005
	27-Oct-92	<0.02	<0.002	<0.05	<0.002	0.006	<0.01	<0.005	0.02	<0.04	<0.0003	<0.01	0.02	0.004	<0.005	<0.1	0.011	0.047
	04-Mar-93	<0.02	<0.002	<0.05	<0.002	<0.005	<0.01	<0.005	<0.01	<0.04	<0.0003	<0.01	0.02	<0.004	<0.005	<0.1	0.010	0.03

Data entered by MEK/19 Mar 93 Data proofed by MEK 3/19/93 QA/QC by JJB 3/25/93

* mg/L - milligrams per liter, equivalent to parts per million.
 All metals analyzed using Method 6010 except: Arsenic analyzed using Method 7060, Mercury analyzed using Method 7470, Selenium analyzed using Method 7740.



SOURCE: Thomas Bros. map
Alameda and Contra Costa
1990

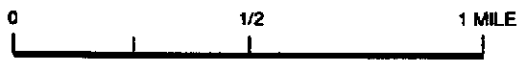
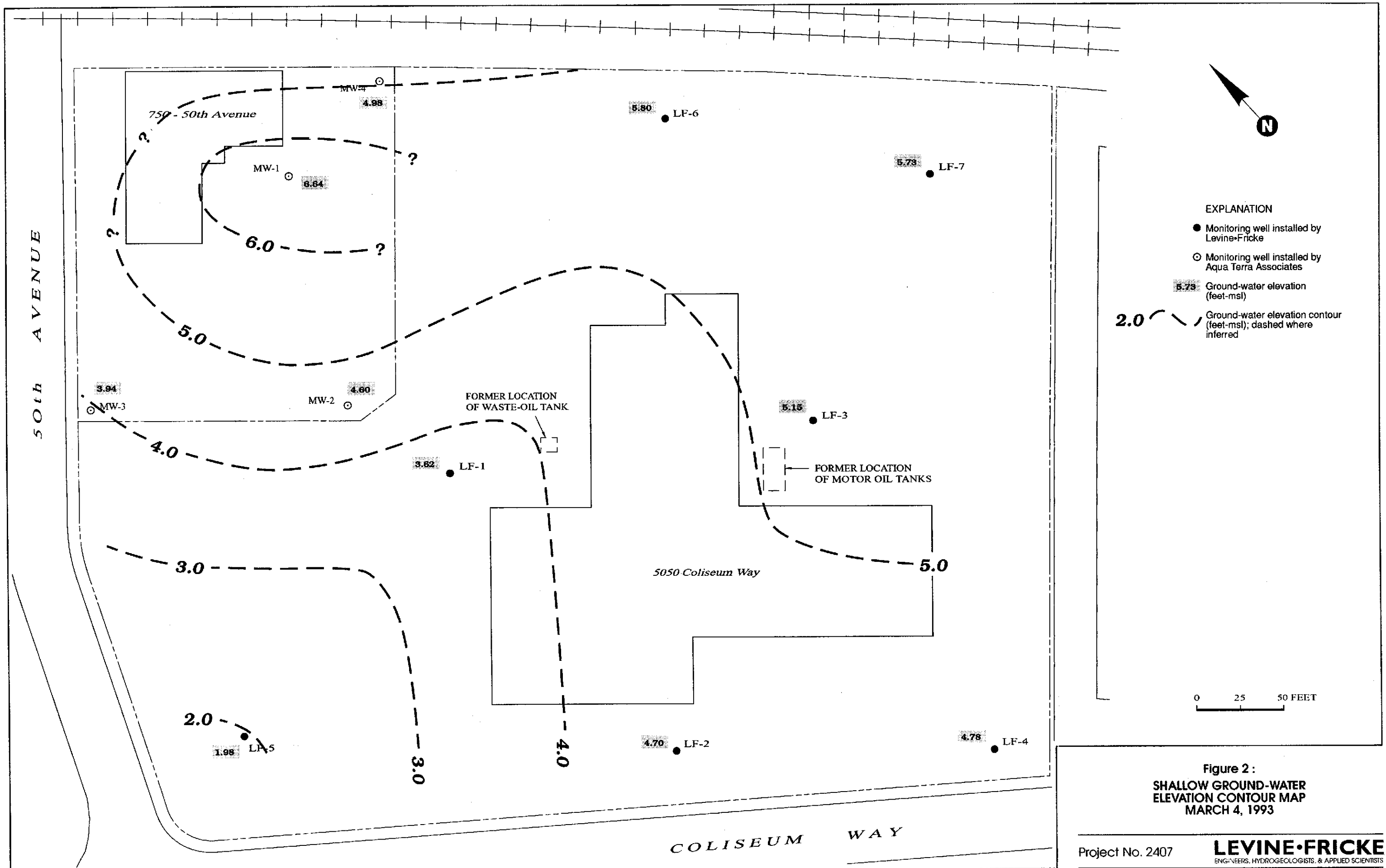


Figure 1 : SITE LOCATION MAP



- EXPLANATION**
- Monitoring well installed by Levine-Fricke
 - Monitoring well installed by Aqua Terra Associates
 - 5.73 Ground-water elevation (feet-msl)
 - 2.0 Ground-water elevation contour (feet-msl); dashed where inferred

Figure 2 :
SHALLOW GROUND-WATER
ELEVATION CONTOUR MAP
MARCH 4, 1993

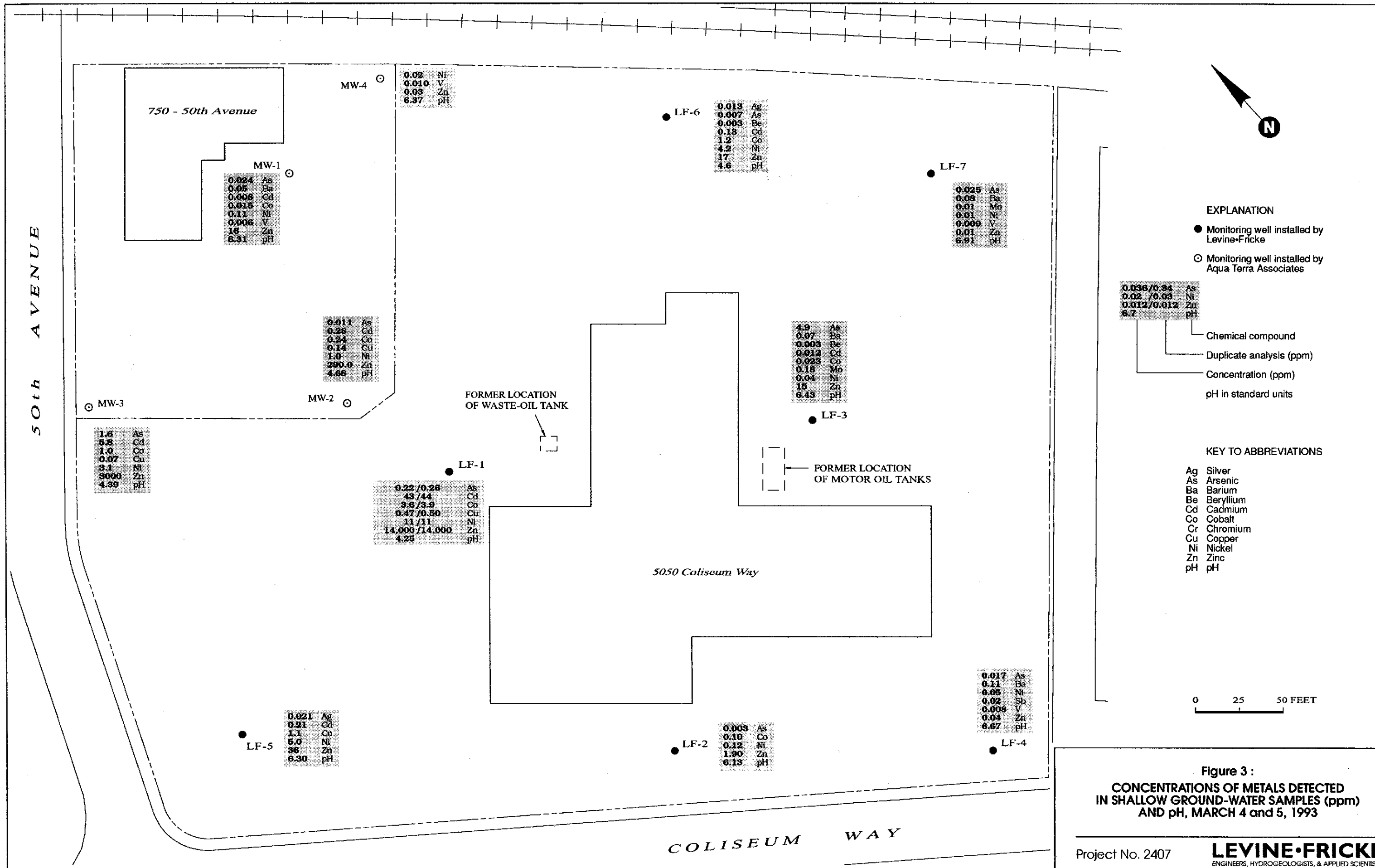


Figure 3:
**CONCENTRATIONS OF METALS DETECTED
 IN SHALLOW GROUND-WATER SAMPLES (ppm)
 AND pH, MARCH 4 and 5, 1993**

APPENDIX A
WATER-QUALITY SAMPLING FORMS

WATER-QUALITY SAMPLING INFORMATION

Project Name Volvo GM Project No. 2407.14
 Date 3/5/93 Sample No. LF-1-FB
 Samplers Name NPD LF-1
 Sampling Location Oakland; LF-1
 Sampling Method hand bail w/ Teflon bailer
 Analyses Requested T. Fe 22 Metals
 Number and Types of Sample Bottles used 1 x 32 oz plastic
 Method of Shipment Carrier 3/5/93 Shed (Hald)

LF-101

19.91	
20.00	
3.91	
<hr/>	
16.09	
.16	
<hr/>	
9654	
16090	
<hr/>	
2.5744	

14900	
1490	
<hr/>	
16390	

GROUND WATER	SURFACE WATER
Well No. <u>LF-1</u>	Stream Width _____
Well Diameter (in.) <u>2"</u>	Stream Depth _____
Depth to Water, Static (ft) <u>3.91</u>	Stream Velocity _____
Water in Well Box _____	Rained recently? _____
Well Depth (ft) <u>20-0</u>	Other _____
Height of Water Column in Well <u>16.09</u>	2-inch casing = 0.16 gal/ft
Water Volume in Well <u>2.5 gal (2.57)</u>	4-inch casing = 0.65 gal/ft
	5-inch casing = 1.02 gal/ft
	6-inch casing = 1.47 gal/ft

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
1106								start bailing
1108		2.5	19.7	4.26	12880			orange color, turbid
1110		5.0	19.7	4.35	14900			less " " "
1113		7.5	19.9	4.25	16470			less color, turbid
1117	14.75							after sampling
1115								sample LF-1
1110								sample LF-1-1/2
1215								sample LF-101

Suggested Method for Purging Well _____

WATER-QUALITY SAMPLING INFORMATION

Project Name Volvo GM Project No. 2407.14

Date 3/4/93 Sample No. LF-2

Samplers Name NPD

Sampling Location Oakland; LF-2

Sampling Method hand bail w/ Teflon bailer

Analyses Requested T.H.e 22 Metals

Number and Types of Sample Bottles used 1 X 32 oz plastic (HNO₃)

Method of Shipment Carrier 3/5/93 shed

14.75
5.14

9.61
.16

5766
9610

15376

GROUND WATER

SURFACE WATER

Well No. LF-2 Stream Width _____

Well Diameter (in.) 2" Stream Depth _____

Depth to Water, Static (ft) 5.14 Stream Velocity _____

Water in Well Box _____ Rained recently? _____

Well Depth (ft) 14.75 Other _____

Height of Water Column in Well 9.61

Water Volume in Well 1.5 gal (1.53)

- ②-inch casing = 0.16 gal/ft
- 4-inch casing = 0.65 gal/ft
- 5-inch casing = 1.02 gal/ft
- 6-inch casing = 1.47 gal/ft

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
1105								start bailing
1107		1.5	19.6	6.24	4110			orange color, turbid
1109		3.0	19.5	6.14	4040			" " " "
1112		4.5	19.8	6.13	4060			less orange sl. turbid stop
1120								sample LF-2
1115	12.15					←		after sampling
								--

Suggested Method for Purging Well

H.B.

WATER-QUALITY SAMPLING INFORMATION

Project Name Volvo GM Project No. 2407.14

Date 3/4/93 Sample No. LF-3

Samplers Name NPD

Sampling Location Oakland, LF-3

Sampling Method hand bail w/ Teflon bailer

Analyses Requested Title 28 Metals

Number and Types of Sample Bottles used 1 x 32oz. plastic (HNO₃)

Method of Shipment Carrier 3/5/93 shd

14.93
5.83
9.10
.16
546
9.10
1456

LOCATION MAP

GROUND WATER

SURFACE WATER

Well No. LF-3 Stream Width _____

Well Diameter (in.) 2" Stream Depth _____

Depth to Water, Static (ft) 5.83 Stream Velocity _____

Water in Well Box _____ Rained recently? _____

Well Depth (ft) 14.93 Other _____

Height of Water Column in Well 9.10
 2-inch casing = 0.16 gal/ft
 4-inch casing = 0.65 gal/ft

Water Volume in Well 1.5 gal (1.45)
 5-inch casing = 1.02 gal/ft
 6-inch casing = 1.47 gal/ft

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
1205								start bailing
1206		1.5	21.0	6.41	4340			turbid
1207		3.0	20.0	6.33	4460			turbid
1209		4.5	20.2	6.43	4210			turbid (stop)
1215								sample LF-3
1212	6.50							← after sampling

WATER-QUALITY SAMPLING INFORMATION

Project Name 66100 GM Project No. 2407.14

Date 3/4/93 Sample No. LF-4

Samplers Name NPD

Sampling Location Oakland; LF-4

Sampling Method hand bail w/ Teflon bailer

Analyses Requested Title 22 Metals

Number and Types of Sample Bottles used 1 x 32 oz. plastic (HNO₃)

Method of Shipment Carrier 3/5/93 shed

18.25
5.58

12.67
.16

3150
261

2889 7602
12670

20272

LOCATION MAP

GROUND WATER

SURFACE WATER

Well No. LF-4

Stream Width _____

Well Diameter (in.) 2"

Stream Depth _____

Depth to Water, Static (ft) 5.58

Stream Velocity _____

Water in Well Box _____

Rained recently? _____

Well Depth (ft) 18.25

Other _____

Height of Water Column in Well 12.67

2-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

Water Volume in Well 2.0 gal (2.02)

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
1134								Start boring
1135		2.0	12.7	6.62	2540			sl. turbid
1137		4.0	19.0	6.63	2610			" "
1140		6.0	19.7	6.69	3170			less turbid (conduct.)
1144		8.0	20.2	6.67	3010			mod. clear / stop
1150								sample LF-4
1147	16.78							← after sampling

WATER-QUALITY SAMPLING INFORMATION

Project Name Volvo GM Project No. 2407.14

Date 3/4/93 Sample No. LF-5

Samplers Name NPD

Sampling Location Oakland; LF-5

Sampling Method hand bail w/ Teflon bailer

Analyses Requested Title 22 Metals

Number and Types of Sample Bottles used 1 X 32oz. plastic

Method of Shipment Carrier 3/5/93 Shed (HNO₃)

21.10
6.05

15.05
.16

9.030
1.5050

2.4080

GROUND WATER

SURFACE WATER

Well No. LF-5 Stream Width _____

Well Diameter (in.) 2" Stream Depth _____

Depth to Water, Static (ft) 6.05 Stream Velocity _____

Water in Well Box _____ Rained recently? _____

Well Depth (ft) 21.10 Other _____

Height of Water Column in Well 15.05
 2-inch casing = 0.16 gal/ft
 4-inch casing = 0.65 gal/ft

Water Volume in Well 2.5 gal (2.40)
 5-inch casing = 1.02 gal/ft
 6-inch casing = 1.47 gal/ft

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
1351								start bailing
1354		2.5	18.6	6.47	14360			turbid
1356		5.0	18.6	6.55	12190			turbid.
1359		7.5	19.1	6.27	18130			turbid
1402		10.0	19.2	6.30	17220			turbid / stop
1405	13.68							sample LF-5

WATER-QUALITY SAMPLING INFORMATION

Project Name Volvo GM Project No. 2407-14

Date 3/4/93 Sample No. LF-6

Samplers Name NPD

Sampling Location Oakland; LF-6

Sampling Method hand bail w/ Teflon bailer

Analyses Requested Title 22 Metals

Number and Types of Sample Bottles used 1 x 32 oz plastic

Method of Shipment Carrier 3/5/93 8:00 AM (HNO₃)

23.86
5.79

14.21
.16

8.526
14.210

2.2736

GROUND WATER

SURFACE WATER

Well No. LF-6 Stream Width _____

Well Diameter (in.) 2" Stream Depth _____

Depth to Water, Static (ft) 5.79 Stream Velocity _____

Water in Well Box _____ Rained recently? _____

Well Depth (ft) 20.00 Other _____

Height of Water Column in Well 14.21 2-inch casing = 0.16 gal/ft

Water Volume in Well 2.25 gal (2.27) 4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft
6-inch casing = 1.47 gal/ft

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
1322								start pouring
1325		2.25	19.5	4.91	4780			turbid
1327		4.5	19.0	4.76	4760			turbid
1329		6.75	19.1	4.63	4780			turbid
1332		9.0	19.0	4.60	4780			turbid / stop
1340								sample LF-6
1335	11.11							← after sampling

Suggested Method for Purging Well _____

WATER-QUALITY SAMPLING INFORMATION

Project Name Volvo GM Project No. 2407.14

Date 3/4/93 Sample No. LF-7

Samplers Name NPD

Sampling Location Oakland; LF-7

Sampling Method hand bail w/ Toflon bailer

Analyses Requested Title 22 Metals

Number and Types of Sample Bottles used 1 x 32oz plastic

Method of Shipment Courier 3/5/93 sled (HNO₃)

21.50
4.92

16.58
.16

9948
16580

2.6528

GROUND WATER

SURFACE WATER

Well No. LF-7 Stream Width _____

Well Diameter (in.) 2" Stream Depth _____

Depth to Water, Static (ft) 4.92 Stream Velocity _____

Water in Well Box _____ Rained recently? _____

Well Depth (ft) 21.50 Other _____

Height of Water Column in Well 16.58
 2-inch casing = 0.16 gal/ft
 4-inch casing = 0.65 gal/ft

Water Volume in Well 2.75 gal
(2.65)
 5-inch casing = 1.02 gal/ft
 6-inch casing = 1.47 gal/ft

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
1229								start bailing
1232		2.75	21.4	7.01	1679			turbid
1234		5.5	20.9	6.94	1625			turbid
1237		8.25	20.9	6.91	1609			turbid / stop
1245								sample LF-7
1240	13.15							← after sampling

WATER-QUALITY SAMPLING INFORMATION

Project Name Volvo GM Project No. 2407-14

Date 3/5/93 Sample No. MW-1

Samplers Name NPD

Sampling Location Oakland; MW-1

Sampling Method hand bail w/ Teflon bucket

Analyses Requested Title 22 Metals

Number and Types of Sample Bottles used 1x 32oz plastic

Method of Shipment Cowier 3/5/93 Shed (HNO₃)

28.5
3.47

25.03
.16

150.18
25030

4.0048

GROUND WATER

SURFACE WATER

Well No. MW-1 Stream Width _____

Well Diameter (in.) 2" Stream Depth _____

Depth to Water, Static (ft) 3.47 Stream Velocity _____

Water in Well Box _____ Rained recently? _____

Well Depth (ft) 28.5 Other _____

Height of Water Column in Well 25.03
 2-inch casing = 0.16 gal/ft
 4-inch casing = 0.65 gal/ft

Water Volume in Well 4.0 gal
 5-inch casing = 1.02 gal/ft
 6-inch casing = 1.47 gal/ft

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
0920								Start bailing
0924		4.0	20.0	6.02	1051			turbid
0927		8.0	19.7	5.97	1124			turbid
0932		12.0	19.9	6.21	1088			turbid
0937		16.0	20.0	6.31	1075			turbid / stop
0940	24.1							sample MW-1

WATER-QUALITY SAMPLING INFORMATION

Project Name Volvo GM Project No. 2407.14

Date 3/5/93 Sample No. MW-2

Samplers Name NPD

Sampling Location Oakland, MW-2

Sampling Method hand bail w/ Teflon bailer

Analyses Requested Title 22 Metals

Number and Types of Sample Bottles used (x32oz. plastic)

Method of Shipment Carrier 3/5/93 Shed (TWA)

27.00
5.05
21.95
.16
13170
21950
35120

GROUND WATER

SURFACE WATER

Well No. MW-2

Stream Width _____

Well Diameter (in.) 2"

Stream Depth _____

Depth to Water, Static (ft) 5.05

Stream Velocity _____

Water in Well Box _____

Rained recently? _____

Well Depth (ft) 27.0

Other _____

Height of Water Column in Well 21.95

(2)-inch casing = 0.16 gal/ft

4-inch casing = 0.65 gal/ft

Water Volume in Well 3.5 gal
(3.51)

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
0956								start bailing
1000		3.5	16.8	4.73	2260			turbid, orange col
1003		7.0	16.7	4.63	3120			" " "
1008		10.5	17.0	4.68	3880			" less orange
								stop
1015								sample MW-2
1011	12.65							← after 9 min

WATER-QUALITY SAMPLING INFORMATION

Project Name Volvo GM Project No. 2407.14

Date 3/5/93 Sample No. MW-3

Samplers Name WPD

Sampling Location Oakland, MW-3

Sampling Method hand bail w/ Teflon bailer

Analyses Requested 1.7K 22 Metals

Number and Types of Sample Bottles used 1 x 32oz plastic

Method of Shipment Courier 3/5/93 shed (HNO₃)

27.86
4.15
<hr/>
22.85
.16
<hr/>
137.0
22850
<hr/>
36560

GROUND WATER

SURFACE WATER

Well No. MW-3 Stream Width _____

Well Diameter (in.) 2" Stream Depth _____

Depth to Water, Static (ft) 4.15 Stream Velocity _____

Water in Well Box _____ Rained recently? _____

Well Depth (ft) 27.0 Other _____

Height of Water Column in Well 22.85 2-inch casing = 0.16 gal/ft

Water Volume in Well 3.75 gal (3.65) 4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
1028								start bailing
1031		3.75	18.2	4.48	7340			turbid
1034		7.5	19.1	4.40	7530			turbid
1038		11.25	19.5	4.39	7770			turbid / stop
1045								Sample MW-3
1042	12.77							← after sampling

WATER-QUALITY SAMPLING INFORMATION

Project Name Volvo GM Project No. 2407.14

Date 3/4/93 Sample No. MW-4

Samplers Name NPD

Sampling Location Oakland; MW-4

Sampling Method hand bail w/ Teflon bailer

Analyses Requested Title 22 Metals

Number and Types of Sample Bottles used 1 x 32oz plastic

Method of Shipment Carrier 3/5/93 Shed (HNO₃)

29.50
5.77

23.73
.16

14.238
23730

3.7968

GROUND WATER

SURFACE WATER

Well No. MW-4 Stream Width _____

Well Diameter (in.) 2" Stream Depth _____

Depth to Water. Static (ft) 5.77 Stream Velocity _____

Water in Well Box _____ Rained recently? _____

Well Depth (ft) 29.5 Other _____

Height of Water Column in Well 23.73 2-inch casing = 0.16 gal/ft

Water Volume in Well 3.75 gal (3.79) 4-inch casing = 0.65 gal/ft

5-inch casing = 1.02 gal/ft

6-inch casing = 1.47 gal/ft

LOCATION MAP

TIME	DEPTH TO WATER (feet)	VOLUME WITHDRAWN (gallons)	TEMP (deg. C)	pH (S.U.)	COND (mhos/cm)	OTHER		REMARKS
1426								start bailing
1430		3.75	20.3	6.28	2680			turbid
1433		7.5	20.0	6.30	2460			turbid +
1438		11.25	20.0	6.36	2860			turbid /
1442		15.0	20.3	6.37	3010			turbid / stop
1445								sample MW-4
1446	22.34							

APPENDIX B
LABORATORY CERTIFICATES

Quanteq Laboratories

An Ecologics Company

Certificate of Analysis

PAGE 1 OF 15

DOHS CERTIFICATION NO. E772

AIHA ACCREDITATION NO. 332

LEVINE-FRICKE
1900 POWELL STREET
12TH FLOOR
EMERYVILLE, CA 94608
ATTN: JENIFER BEATTY

REPORT DATE: 03/18/93
DATE SAMPLED: 03/04-05/93
DATE RECEIVED: 03/05/93
QUANTEQ JOB NO: 9303045

CLIENT PROJECT ID: 2407.14
C.O.C. SERIAL NO: 9983
PROJ. NAME: VOLVO GM

PROJECT SUMMARY:

On March 5, 1993, this laboratory received thirteen (13) water samples.

Client requested twelve (12) samples be analyzed for CCR 17 Metals. One (1) sample was placed on hold. Sample identification, methodologies, results and dates analyzed are summarized on the following pages.

Analysis of samples LF-3, LF-7, LF-5, MW-2, MW-3, LF-1 and LF-101 (9303045-03A, 04A, 06A, 09A, 10A, 11A and 12A) have elevated reporting limits due to matrix interference. Zinc was analyzed by EPA Method 7950, Atomic Absorption Spectroscopy for all samples except LF-2 (9303045-01A) due to a malfunction of the ICP.

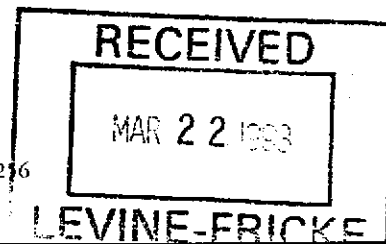
All laboratory quality control parameters were found to be within established limits. Batch QC data is included at the end of this report.

If you have any questions, please contact Client Services at (510) 930-9090.


Larry Klein
Laboratory Manager

Results FAXed 03/15/93

COPY



LEVINE-FRICKE

SAMPLE ID: LF-2
 CLIENT PROJ. ID: 2407.14
 DATE RECEIVED: 03/05/93
 REPORT DATE: 03/18/93

QUANTEQ LAB NO: 9303045-01A
 QUANTEQ JOB NO: 9303045
 DATE ANALYZED: 03/09-15/93

CCR 17 METALS
 (WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	REPORTING LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	ND	0.005	6010	ICP
As	Arsenic	0.003	0.002	7060	4000
Ba	Barium	ND	0.05	6010	ICP
Be	Beryllium	ND	0.002	6010	ICP
Cd	Cadmium	ND	0.005	6010	ICP
Co	Cobalt	0.10	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	ND	0.01	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Mo	Molybdenum	ND	0.01	6010	ICP
Ni	Nickel	0.12	0.01	6010	ICP
Pb	Lead	ND	0.04	6010	ICP
Sb	Antimony	ND	0.02	6010	ICP
Se	Selenium	ND	0.004	7740	4000
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	ND	0.005	6010	ICP
Zn	Zinc	1.9	0.005	6010	ICP

Digestion Date: 03/08/93

ND = Not Detected

INST. = Instrument Number

LEVINE-FRICKE

SAMPLE ID: LF-4
 CLIENT PROJ. ID: 2407.14
 DATE RECEIVED: 03/05/93
 REPORT DATE: 03/18/93

QUANTEQ LAB NO: 9303045-02A
 QUANTEQ JOB NO: 9303045
 DATE ANALYZED: 03/09-15/93

CCR 17 METALS
 (WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	REPORTING LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	ND	0.005	6010	ICP
As	Arsenic	0.017	0.002	7060	4000
Ba	Barium	0.11	0.05	6010	ICP
Be	Beryllium	ND	0.002	6010	ICP
Cd	Cadmium	ND	0.005	6010	ICP
Co	Cobalt	ND	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	ND	0.01	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Mo	Molybdenum	ND	0.01	6010	ICP
Ni	Nickel	0.05	0.01	6010	ICP
Pb	Lead	ND	0.04	6010	ICP
Sb	Antimony	0.02	0.02	6010	ICP
Se	Selenium	ND	0.004	7740	4000
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	0.008	0.005	6010	ICP
Zn	Zinc	0.04	0.01	7950	V12

Digestion Date: 03/08/93

ND = Not Detected

INST. = Instrument Number

LEVINE-FRICKE

SAMPLE ID: LF-3
 CLIENT PROJ. ID: 2407.14
 DATE RECEIVED: 03/05/93
 REPORT DATE: 03/18/93

QUANTEQ LAB NO: 9303045-03A
 QUANTEQ JOB NO: 9303045
 DATE ANALYZED: 03/09-15/93

CCR 17 METALS
 (WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	REPORTING LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	ND	0.005	6010	ICP
As	Arsenic	4.9	0.002	7060	4000
Ba	Barium	0.07	0.05	6010	ICP
Be	Beryllium	0.003	0.002	6010	ICP
Cd	Cadmium	0.012	0.005	6010	ICP
Co	Cobalt	0.023	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	ND	0.01	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Mo	Molybdenum	0.18	0.01	6010	ICP
Ni	Nickel	0.04	0.01	6010	ICP
Pb	Lead	ND	0.04	6010	ICP
Sb	Antimony	ND	0.02	6010	ICP
Se	Selenium	ND	0.02*	7740	4000
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	ND	0.005	6010	ICP
Zn	Zinc	15	0.01	7950	V12

Digestion Date: 03/08/93

ND = Not Detected

INST. = Instrument Number

* Reporting limit elevated due to matrix interference.

LEVINE-FRICKE

SAMPLE ID: LF-7
 CLIENT PROJ. ID: 2407.14
 DATE RECEIVED: 03/05/93
 REPORT DATE: 03/18/93

QUANTEQ LAB NO: 9303045-04A
 QUANTEQ JOB NO: 9303045
 DATE ANALYZED: 03/09-15/93

CCR 17 METALS
 (WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	REPORTING LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	ND	0.005	6010	ICP
As	Arsenic	0.025	0.002	7060	4000
Ba	Barium	0.08	0.05	6010	ICP
Be	Beryllium	ND	0.002	6010	ICP
Cd	Cadmium	ND	0.005	6010	ICP
Co	Cobalt	ND	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	ND	0.01	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Mo	Molybdenum	0.01	0.01	6010	ICP
Ni	Nickel	0.01	0.01	6010	ICP
Pb	Lead	ND	0.04	6010	ICP
Sb	Antimony	ND	0.02	6010	ICP
Se	Selenium	ND	0.01*	7740	4000
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	0.009	0.005	6010	ICP
Zn	Zinc	0.01	0.01	7950	V12

Digestion Date: 03/08/93

ND = Not Detected

INST. = Instrument Number

* Reporting limit elevated due to matrix interference.

LEVINE-FRICKE

SAMPLE ID: LF-6
 CLIENT PROJ. ID: 2407.14
 DATE RECEIVED: 03/05/93
 REPORT DATE: 03/18/93

QUANTEQ LAB NO: 9303045-05A
 QUANTEQ JOB NO: 9303045
 DATE ANALYZED: 03/09-15/93

CCR 17 METALS
 (WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	REPORTING LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	0.013	0.005	6010	ICP
As	Arsenic	0.007	0.002	7060	4000
Ba	Barium	ND	0.05	6010	ICP
Be	Beryllium	0.003	0.002	6010	ICP
Cd	Cadmium	0.13	0.005	6010	ICP
Co	Cobalt	1.2	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	ND	0.01	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Mo	Molybdenum	ND	0.01	6010	ICP
Ni	Nickel	4.2	0.01	6010	ICP
Pb	Lead	ND	0.04	6010	ICP
Sb	Antimony	ND	0.02	6010	ICP
Se	Selenium	ND	0.004	7740	4000
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	ND	0.005	6010	ICP
Zn	Zinc	17	0.01	7950	V12

Digestion Date: 03/08/93

ND = Not Detected

INST. = Instrument Number

LEVINE-FRICKE

SAMPLE ID: LF-5
 CLIENT PROJ. ID: 2407.14
 DATE RECEIVED: 03/05/93
 REPORT DATE: 03/18/93

QUANTEQ LAB NO: 9303045-06A
 QUANTEQ JOB NO: 9303045
 DATE ANALYZED: 03/09-15/93

CCR 17 METALS
 (WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	REPORTING LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	0.021	0.005	6010	ICP
As	Arsenic	ND	0.005*	7060	4000
Ba	Barium	ND	0.05	6010	ICP
Be	Beryllium	ND	0.002	6010	ICP
Cd	Cadmium	0.21	0.005	6010	ICP
Co	Cobalt	1.1	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	ND	0.01	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Mo	Molybdenum	ND	0.01	6010	ICP
Ni	Nickel	5.0	0.01	6010	ICP
Pb	Lead	ND	0.04	6010	ICP
Sb	Antimony	ND	0.02	6010	ICP
Se	Selenium	ND	0.01*	7740	4000
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	ND	0.005	6010	ICP
Zn	Zinc	36	0.01	7950	V12

Digestion Date: 03/08/93

ND = Not Detected

INST. = Instrument Number

* Reporting limit elevated due to matrix interference.

LEVINE-FRICKE

SAMPLE ID: MW-4
 CLIENT PROJ. ID: 2407.14
 DATE RECEIVED: 03/05/93
 REPORT DATE: 03/18/93

QUANTEQ LAB NO: 9303045-07A
 QUANTEQ JOB NO: 9303045
 DATE ANALYZED: 03/09-15/93

CCR 17 METALS
 (WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	REPORTING LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	ND	0.005	6010	ICP
As	Arsenic	ND	0.002	7060	4000
Ba	Barium	ND	0.05	6010	ICP
Be	Beryllium	ND	0.002	6010	ICP
Cd	Cadmium	ND	0.005	6010	ICP
Co	Cobalt	ND	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	ND	0.01	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Mo	Molybdenum	ND	0.01	6010	ICP
Ni	Nickel	0.02	0.01	6010	ICP
Pb	Lead	ND	0.04	6010	ICP
Sb	Antimony	ND	0.02	6010	ICP
Se	Selenium	ND	0.004	7740	4000
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	0.010	0.005	6010	ICP
Zn	Zinc	0.03	0.01	7950	V12

Digestion Date: 03/08/93

ND = Not Detected

INST. = Instrument Number

LEVINE-FRICKE

SAMPLE ID: MW-1
 CLIENT PROJ. ID: 2407.14
 DATE RECEIVED: 03/05/93
 REPORT DATE: 03/18/93

QUANTEQ LAB NO: 9303045-08A
 QUANTEQ JOB NO: 9303045
 DATE ANALYZED: 03/09-15/93

CCR 17 METALS
 (WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	REPORTING LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	ND	0.005	6010	ICP
As	Arsenic	0.024	0.002	7060	4000
Ba	Barium	0.05	0.05	6010	ICP
Be	Beryllium	ND	0.002	6010	ICP
Cd	Cadmium	0.008	0.005	6010	ICP
Co	Cobalt	0.015	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	ND	0.01	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Mo	Molybdenum	ND	0.01	6010	ICP
Ni	Nickel	0.11	0.01	6010	ICP
Pb	Lead	ND	0.04	6010	ICP
Sb	Antimony	ND	0.02	6010	ICP
Se	Selenium	ND	0.004	7740	4000
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	0.006	0.005	6010	ICP
Zn	Zinc	16	0.01	7950	V12

Digestion Date: 03/08/93

ND = Not Detected

INST. = Instrument Number

LEVINE-FRICKE

SAMPLE ID: MW-2
 CLIENT PROJ. ID: 2407.14
 DATE RECEIVED: 03/05/93
 REPORT DATE: 03/18/93

QUANTEQ LAB NO: 9303045-09A
 QUANTEQ JOB NO: 9303045
 DATE ANALYZED: 03/09-15/93

CCR 17 METALS
 (WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	REPORTING LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	ND	0.005	6010	ICP
As	Arsenic	0.011	0.002	7060	4000
Ba	Barium	ND	0.05	6010	ICP
Be	Beryllium	ND	0.002	6010	ICP
Cd	Cadmium	0.28	0.005	6010	ICP
Co	Cobalt	0.24	0.005	6010	ICP
Cr	Chromium	ND	0.01	6010	ICP
Cu	Copper	0.14	0.01	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Mo	Molybdenum	ND	0.01	6010	ICP
Ni	Nickel	1.0	0.01	6010	ICP
Pb	Lead	ND	0.04	6010	ICP
Sb	Antimony	ND	0.02	6010	ICP
Se	Selenium	ND	0.01*	7740	4000
Tl	Thallium	ND	0.1	6010	ICP
V	Vanadium	ND	0.005	6010	ICP
Zn	Zinc	290	0.01	7950	V12

Digestion Date: 03/08/93

ND = Not Detected

INST. = Instrument Number

* Reporting limit elevated due to matrix interference.

LEVINE-FRICKE

SAMPLE ID: MW-3
 CLIENT PROJ. ID: 2407.14
 DATE RECEIVED: 03/05/93
 REPORT DATE: 03/18/93

QUANTEQ LAB NO: 9303045-10A
 QUANTEQ JOB NO: 9303045
 DATE ANALYZED: 03/09-15/93

CCR 17 METALS
 (WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	REPORTING LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	ND	0.05*	6010	ICP
As	Arsenic	1.6	0.002	7060	4000
Ba	Barium	ND	0.05	6010	ICP
Be	Beryllium	ND	0.02*	6010	ICP
Cd	Cadmium	5.8	0.05*	6010	ICP
Co	Cobalt	1.0	0.05*	6010	ICP
Cr	Chromium	ND	0.1*	6010	ICP
Cu	Copper	0.07	0.01	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Mo	Molybdenum	ND	0.1*	6010	ICP
Ni	Nickel	3.1	0.01	6010	ICP
Pb	Lead	ND	0.4*	6010	ICP
Sb	Antimony	ND	0.2*	6010	ICP
Se	Selenium	ND	0.02*	7740	4000
Tl	Thallium	ND	1*	6010	ICP
V	Vanadium	ND	0.05*	6010	ICP
Zn	Zinc	3,000	0.01	7950	V12

Digestion Date: 03/08/93

ND = Not Detected

INST. = Instrument Number

* Reporting limit elevated due to matrix interference.

LEVINE-FRICKE

SAMPLE ID: LF-1
 CLIENT PROJ. ID: 2407.14
 DATE RECEIVED: 03/05/93
 REPORT DATE: 03/18/93

QUANTEQ LAB NO: 9303045-11A
 QUANTEQ JOB NO: 9303045
 DATE ANALYZED: 03/09-15/93

CCR 17 METALS
 (WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	REPORTING LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	ND	0.5*	6010	ICP
As	Arsenic	0.22	0.002	7060	4000
Ba	Barium	ND	0.05	6010	ICP
Be	Beryllium	ND	0.2*	6010	ICP
Cd	Cadmium	43	0.5*	6010	ICP
Co	Cobalt	3.6	0.5*	6010	ICP
Cr	Chromium	ND	1*	6010	ICP
Cu	Copper	0.47	0.01	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Mo	Molybdenum	ND	1*	6010	ICP
Ni	Nickel	11	0.01	6010	ICP
Pb	Lead	ND	4*	6010	ICP
Sb	Antimony	ND	2*	6010	ICP
Se	Selenium	ND	0.01*	7740	4000
Tl	Thallium	ND	10*	6010	ICP
V	Vanadium	ND	0.5*	6010	ICP
Zn	Zinc	14,000	0.01	7950	V12

Digestion Date: 03/08/93

ND = Not Detected

INST. = Instrument Number

* Reporting limit elevated due to matrix interference.

LEVINE-FRICKE

SAMPLE ID: LF-101
 CLIENT PROJ. ID: 2407.14
 DATE RECEIVED: 03/05/93
 REPORT DATE: 03/18/93

QUANTEQ LAB NO: 9303045-12A
 QUANTEQ JOB NO: 9303045
 DATE ANALYZED: 03/09-15/93

CCR 17 METALS
 (WATER MATRIX)

CODE	METAL	CONCENTRATION (mg/L)	REPORTING LIMIT (mg/L)	METHOD REFERENCE	INST.
Ag	Silver	ND	0.5*	6010	ICP
As	Arsenic	0.26	0.002	7060	4000
Ba	Barium	ND	0.05	6010	ICP
Be	Beryllium	ND	0.2*	6010	ICP
Cd	Cadmium	44	0.5*	6010	ICP
Co	Cobalt	3.9	0.5*	6010	ICP
Cr	Chromium	ND	1*	6010	ICP
Cu	Copper	0.50	0.01	6010	ICP
Hg	Mercury	ND	0.0003	7470	Hg
Mo	Molybdenum	ND	1*	6010	ICP
Ni	Nickel	11	0.01	6010	ICP
Pb	Lead	ND	4*	6010	ICP
Sb	Antimony	ND	2*	6010	ICP
Se	Selenium	ND	0.01	7740	4000
Tl	Thallium	ND	10*	6010	ICP
V	Vanadium	ND	0.5*	6010	ICP
Zn	Zinc	14,000	0.01	7950	V12

Digestion Date: 03/08/93

ND = Not Detected

INST. = Instrument Number

* Reporting limit elevated due to matrix interference.

QUALITY CONTROL DATA

MATRIX: WATER

QUANTEQ JOB NO: 9303045

CLIENT PROJ. ID: 2407.14

DIGESTION DATE: 03/08/93

MATRIX SPIKE RECOVERY SUMMARY

COMPOUND	INST./METHOD	SAMPLE SPIKED	SAMPLE RESULT	SPIKE ADDED	OBSERVED RECOVERIES (mg/L)		% REC.	RPD	QC CONTROL LIMITS	
					MS	MSD			% REC. LIMIT	RPD LIMIT
Ag, Silver	ICP/6010	9303045-02A	ND	0.10	0.095	0.098	97	3	75-125	20
As, Arsenic	V22/7060	9303045-01A	0.0035	0.04	0.0368	0.0385	85	5	56-147	13
Ba, Barium	ICP/6010	9303045-02A	0.105	2.00	1.98	2.06	96	4	82-111	5
Be, Beryllium	ICP/6010	9303045-02A	ND	0.05	0.0438	0.0456	89	4	75-125	20
Cd, Cadmium	ICP/6010	9303045-02A	ND	0.05	0.0501	0.0497	100	<1	71-122	8
Co, Cobalt	ICP/6010	9303045-02A	ND	0.50	0.507	0.526	103	4	75-125	20
Cr, Chromium	ICP/6010	9303045-02A	ND	0.20	0.192	0.200	98	4	77-115	5
Cu, Copper	ICP/6010	9303045-02A	ND	0.25	0.244	0.254	100	4	85-113	5
Hg, Mercury	Hg/7470	9303045-01A	ND	2.0 ug/L	1.79	1.81	90	1	80-120	15
Mo, Molybdenum	ICP/6010	9303045-02A	ND	0.25	0.253	0.256	102	1	75-125	20
Ni, Nickel	ICP/6010	9303045-02A	0.047	0.50	0.537	0.554	100	3	82-112	5
Pb, Lead	ICP/6010	9303045-02A	ND	0.50	0.488	0.493	98	<1	76-111	5
Se, Selenium	V22/7740	9303045-01A	ND	0.08	0.0234	0.0235	29	<1	24-141	21
Sb, Antimony	ICP/6010	9303045-02A	0.02	0.50	0.498	0.491	95	1	75-125	20
Tl, Thallium	ICP/6010	9303045-02A	ND	2.0	2.16	2.25	110	4	75-125	20
V, Vanadium	ICP/6010	9303045-02A	0.008	0.50	0.497	0.518	100	4	75-125	20
Zn, Zinc	V12/7950	9303045-02A	0.035	0.50	0.517	0.536	98	4	75-125	20

MS = Matrix Spike
 MSD = Matrix Spike Duplicate
 RPD = Relative Percent Difference
 ND = Not Detected
 < = Less Than

QUALITY CONTROL DATA

MATRIX: WATER

QUANTEQ JOB NO: 9303045

CLIENT PROJ. ID: 2407.14

DIGESTION DATE: 03/08/93

METHOD BLANK AND STANDARD RECOVERY SUMMARY

COMPOUND	INST./METHOD	BLANK RESULT	TRUE VALUE	OBSERVED RECOVERIES (mg/L)			QC CONTROL LIMITS		
				MS	MSD	% REC.	RPD	% REC. LIMIT	RPD LIMIT
Ag, Silver	ICP/6010	ND	0.10	0.0935	0.0966	95	3	75-125	20
As, Arsenic	V22/7060	ND	0.04	0.0355	0.0361	90	2	79-126	12
Ba, Barium	ICP/6010	ND	2.00	1.91	1.91	96	<1	81-113	5
Be, Beryllium	ICP/6010	ND	0.05	0.0443	0.0441	88	<1	75-125	20
Cd, Cadmium	ICP/6010	ND	0.05	0.0496	0.0501	100	1	73-125	8
Co, Cobalt	ICP/6010	ND	0.50	0.514	0.517	103	1	75-125	20
Cr, Chromium	ICP/6010	ND	0.20	0.201	0.194	99	3	87-114	5
Cu, Copper	ICP/6010	ND	0.25	0.242	0.244	97	<1	86-112	5
Hg, Mercury	Hg/7470	ND	5.0 ug/L	4.97	4.97	99	<1	80-120	15
Mo, Molybdenum	ICP/6010	ND	0.25	0.25	0.25	100	<1	75-125	20
Ni, Nickel	ICP/6010	ND	0.50	0.518	0.517	103	<1	85-109	5
Pb, Lead	V22/7421	ND	0.50	0.489	0.489	98	<1	88-112	6
Se, Selenium	V22/7740	ND	0.08	0.0693	0.0743	90	7	76-131	14
Sb, Antimony	ICP/6010	ND	0.50	0.501	0.506	101	1	75-125	20
Tl, Thallium	ICP/6010	ND	2.00	2.16	2.22	110	3	75-125	20
V, Vanadium	ICP/6010	ND	0.50	0.499	0.501	100	<1	75-125	20
Zn, Zinc	V12/7950	ND	0.50	0.472	0.477	95	1	75-125	20

MS = Matrix Spike
MSD = Matrix Spike Duplicate
RPD = Relative Percent Difference
ND = Not Detected
< = Less Than

CHAIN OF CUSTODY / ANALYSES REQUEST FORM

R-15-D

9303045

Project No.: 2407.14 Field Logbook No.: Date: 3/4/93 Serial No.: 9983
 Project Name: Volvo GM Project Location: Oakland

Sampler (Signature): *[Signature]* ANALYSES Samplers: NPD
 SAMPLES

SAMPLE NO.	DATE	TIME	LAB SAMPLE NO.	NO. OF CONTAINERS	SAMPLE TYPE	ANALYSES				HOLD	RUSH	REMARKS
						EPA 601	EPA 624	Trace Metals				
LF-2	3/4	1120	01A	ONE	H ₂ O		X					- Normal turnaround
LF-4		1150	02A									
LF-3		1215	03A									- Results to:
LF-7		1245	04A									Jenifer Beatty
LF-6		1340	05A									
LF-5		1405	06A									
MW-4	↓	1445	07A									
MW-1	3/5	0940	08A									
MW-2		1015	09A									
MW-3		1045	10A									
LF-1		1115	11A									
LF-101		1215	12A									
LF-1FB	↓	1110	13A	↓	↓					X		

RELINQUISHED BY: <i>[Signature]</i>	DATE: 3-5-93	TIME: 16:25	RECEIVED BY: <i>[Signature]</i>	DATE: 3-5-93	TIME: 16:25
RELINQUISHED BY: <i>[Signature]</i>	DATE: 3-5-93	TIME: 18:00	RECEIVED BY: <i>[Signature]</i>	DATE: 3-5-93	TIME: 18:00
RELINQUISHED BY: <i>[Signature]</i>	DATE:	TIME:	RECEIVED BY: <i>[Signature]</i>	DATE:	TIME:
METHOD OF SHIPMENT:	DATE:	TIME:	LAB COMMENTS:		

Sample Collector: LEVINE-FRICKE
 1900 Powell Street, 12th Floor
 Emeryville, Ca 94608
 (415) 652-4500

Analytical Laboratory:
 QUANTER