July 10, 91

REPORT OF QUARTERLY ACTIVITIES

FOR

BROADWAY VOLKSWAGEN
2740 BROADWAY
OAKLAND, CALIFORNIA

Prepared For:

Alameda County Department of Environmental Health
Hazardous Materials Program
80 Swan Way, Room 200
Oakland, California 94621

and

Vorelco, Inc.
888 West Big Beaver Road
P.O. Box 7050
Troy, Michigan 48007-7050

Prepared by:

Environmental Science & Engineering, Inc. (ESE)
4090 Nelson Avenue, Suite J
Concord, CA 94520
(415) 685-4053

Project No. 6-91-5165
July 10, 1991

This report has been prepared by Environmental Science & Engineering, Inc. for the exclusive use of Broadway Volkswagen as it pertains to their site located at 2740 Broadway, in Oakland, California. Our professional services have been performed using that degree of care and skill ordinarily exercised under similar circumstances by other geologists and engineers practicing in this field. No other warranty, express or implied, is made as to professional advice in this report.

REPORT PREPARED BY:

Michael E. Miller FOR

Bart S. Miller
Senior Associate Geologist

JULY 10, 1991
Date

UNDER THE PRIMARY REVIEW OF:

Susan S. Wickham

Susan S. Wickham, R.G.
Staff Hydrogeologist
California Registered Geologist No. 3851

July 10, 1991
Date

Project No. 6-91-5165

TABLE OF CONTENTS

	Page
1.0 INTRODUCTION	1
1.1 Purpose	1
1.2 Background	1
1.3 Activities	2
2.0 METHODS AND PROCEDURES	4
2.1 Soil Sampling	4
2.2 Well Installation	4
2.3 Water Sampling	4
2.4 Analytical Methods Used	5
3.0 FINDINGS	6
3.1 Site Conditions	6
3.2 Ground-Water Flow Direction and Gradient	6
3.3 Results of Petroleum Hydrocarbons Analyses	7
3.4 Results of Metals and Halogenated Volatiles Analyses	7
4.0 CONCLUSIONS	8
5.0 RECOMMENDATIONS	9
6.0 REFERENCES	10

FIGURES (Tab A)

Figure

1 - Vicinity Map

2A - Site Plan

2B - Detail "B"

2C - Detail "A"

3 - Ground-Water Elevation Map - May, 1991

TABLES (Tab B)

Table

A - Ground-Water Information in Vicinity of Broadway Volkswagen

1 - Ground-Water and Product Level Measurements

2 - Analytical Results for Petroleum Hydrocarbons in Soil Samples

3 - Analytical Results for Halogenated Volatiles in Soil Samples

4 - Analytical Results for Petroleum Hydrocarbons in Water Samples

5 - Analytical Results for Halogenated Volatiles in Water Samples

6 - Analytical Results for Metals in Soil Sample SB-3 10'

APPENDICES (Tab C)

Appendix

A - Boring Log and Well Completion Summaries
B - Well Purging and Sampling Data
C - Analytical Results

1.0 INTRODUCTION

1.1 Purpose

Four underground fuel storage tanks were removed from three areas at the Broadway Volkswagen Facility located at 2740 Broadway, Oakland, Alameda County, California during August of 1988 (Figure 1 - Vicinity Map). Soil and ground-water samples collected at two of the three tank areas were found to contain detectable petroleum hydrocarbons. A recent site investigation, was conducted in combination with quarterly monitoring activities, to determine whether overexcavation was performed at the tank areas, determine the extent of contaminated soil at the tank areas, further identify ground-water contamination in the vicinity of the former tank sites and determine the ground-water flow direction at the site.

This report documents the findings of the abovementioned investigation and monitoring activities, as well as, provide recommendations for future work.

1.2 Background

In August of 1988, four underground fuel storage tanks (herein referred to as Tanks A, B, C and D) were removed from three areas at the Broadway Volkswagen Facility located at 2740 Broadway, Oakland, Alameda County, California (Figure 2A - Site Plan) which is owned by Vorelco, Inc. of Troy, Michigan. Engineering Science (ES) was the environmental consultant and SEMCO of Modesto, California acted as the tank removal contractor.

Environmental Science & Engineering, Inc. (ESE), formerly known as Hunter/Gregg, Inc. was retained by SEMCO in November of 1988 to install three ground-water monitoring wells (MW-1, MW-2 and MW-3) at the site. The purpose of these wells was to provide the Alameda County Department of Environmental Health (ACDEH) with a characterization of ground-water downgradient from the former underground tanks and information as to the local ground-water flow direction.

A tank removal report was issued to Vorelco by ES during January of 1990. Findings from the ES report and a Hunter/Gregg, Inc. (1989) report which documents the ground-water monitoring data collected at the three tank areas, are presented in the ESE workplan for Site Assessment dated March 27, 1991.

In summary:

- Tank A was a 1,000 gallon waste oil tank and samples collected at the tank area during removal were nondetectable for hydrocarbons.

- Tank B was a 550 gallon waste oil tank reported to have holes at the time of removal. Soil samples taken at the tank site contained detectable Total Petroleum Hydrocarbons (TPH) and Oil and Grease (O&G) concentrations.

Soil samples collected during the installation of monitoring well MW-2, located 15 feet southeast of the former tanks, were nondetectable for O&G and ground-water samples were nondetectable for TPH and Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX).

- Tanks C and D, located adjacent to each other, were reported to be a 3,000 gallon gasoline tank and a 550 gallon waste oil tank, respectively. Both tanks did have holes when removed and all ground-water samples (plus some soil samples) taken during tank removal contained detectable TPH and BTEX. Ground water collected at monitoring well MW-1, installed 15 feet east of the C/D tank area during 1989, contained detectable BTEX.

- Soil and ground-water samples collected during the installation of monitoring well MW-3, located 45 feet west of the C/D area contained detectable O&G in the soil and detectable TPH as gasoline and BTEX in the ground-water.

- Site ground-water levels may be skewed by perched water zones in clays found in the Bay Mud. January 1989, ground-water level measurements in the three site monitoring wells vary from the assumed regional ground-water gradient by approximately 90 degrees.

- Additional research has shown that several sites surrounding the subject area handle hazardous waste and have documented leaks. No data have been reported indicating a hazardous material release to the subsurface immediately north (up gradient) of the subject site. Ground-water levels at surrounding properties indicate a regional south-southeast ground-water flow direction toward Lake Merritt. Documentation of soil removal from the former tank areas has not been located.

1.3 Activities

All field activities reported were performed in accordance with Alameda County Department of Environmental Management (ACDEM) and Regional Water Quality Control Board guidelines. Field activities included a subsurface investigation, well monitoring, and well surveying.

Upon locating and permitting boring locations, ESE drilled five soil borings (including SB1, SB2A, SB2B, SB3 and SB4) and installed one monitoring well, MW4 (Figure 2A - Site Plan). A total of three soil borings were drilled and sampled at the Tank B area (Figure 2C - Detail "B") in order to determine if overexcavation was performed, whether soil containing hydrocarbons exists beneath the former tank site and the lateral extent of contamination if detected. Two soil borings were drilled and one ground-water monitoring well was installed at the Tank C/D area (Figure 2B - Detail "A") in order to, as for the Tank B area, determine if any overexcavation had been performed at this tank area, whether soil containing hydrocarbons exists beneath the former tanks and whether lateral

movement of contamination, if any, was occurring within the unsaturated soil. A ground-water monitoring well, MW-4, was installed to assist in further defining conditions downgradient.

Ground-water at two existing monitoring wells (MW-1 and MW-3) was measured, purged and sampled. One monitoring well, MW-2, was found to be abandoned, improperly destroyed, and impossible to sample. All recent measurements and sampling activities are considered to be the first quarter of site monitoring.

Monitoring wells MW1, MW3 and MW4 were surveyed to determine relative elevation and location. Measured ground-water levels at the three wells were corrected to the relative elevation and results are tabulated in the body of this report. Due to the effect of local perched ground-water zones and the small amount of data presently available, no ground-water contours have been plotted.

??

2.0 METHODS AND PROCEDURES

2.1 Soil Sampling

Soil borings were drilled with hollow stem auger drill rigs. A SIMCO 2400 rig, being compact in size and having the capability of drilling with a short mast, was used for installing monitoring well MW-4 located inside the building (Figure 2B - Detail "A") and drilling soil borings SB-2A and SB-2B located on the sidewalk area adjacent to the building on Broadway Avenue (Figure 2C - Detail "B"). The larger mobile B-61 was used for all other soil borings located outside of the building including SB-1, SB-3 and SB-4.

All soil borings were drilled to a depth of 15 feet and samples were collected at 5, 10 and 15-foot depth intervals in three two-inch diameter brass rings loaded within a split-spoon sampler. Upon retrieval each sample was logged in accordance with the Unified Soil Classification System (USCS), and each borehole was backfilled with grout (Appendix A).

2.2 Monitoring Well Installation

One ground-water monitoring well, MW-4, was installed under ACDEM and Regional Water Quality Control Board specifications within the Broadway Volkswagen building. This two-inch diameter well was emplaced to a depth of 25 feet with a 0.02 inch slot-sized screen portion extending from the 5 foot to 25 foot depth (Appendix A). Sand was used as a filter from 4 feet and downwards, and bentonite pellets overlain by grout acted as a seal from the ground surface to the top of the sand filter.

The well was developed by surveying with a surge block and evacuated until dry two times with a bailer. Evacuated water from the second well volume was consistently clear.

2.3 Water Sampling

As for monitoring well MW-4, both of the existing wells (MW-1 and MW-3) were also purged. Ground-water in all wells was allowed to return to a static level over a period of 48 hours before any free floating product and/or ground-water level measurements were taken with an electronic interface probe and sampling with a disposable polyethylene bailer was performed.

Six 40 ml vials and one 1-liter amber bottle of ground water were collected from each well. Each container was labeled and immediately placed in a cooler for cold transport to the laboratory under chain of custody.

2.4 Analytical Methods Used

All samples were submitted and analyzed by Curtis and Tompkins, Ltd. of Berkeley, California (a State certified laboratory). Four soil samples collected at the Tank B area were analyzed for Total Petroleum Hydrocarbons as diesel (TPH-d) using method EPA 3550/8015 modified which focuses on quantifying diesel and high boiling point hydrocarbons such as Kerosene and oil. Selected samples was further analyzed for Volatile Halocarbons using method 5030/8010, which identifies solvent constituents.

Seven soil samples collected at the Tank C/D area were analyzed for TPH-d, Total Volatile Hydrocarbons as gasoline (TVH-g) using method EPA 5030/8015 modified, and Benzene, Toluene, Ethylbenzene, and Total Xylenes (BTEX) using method EPA 5030/8020. One selected sample was then analyzed for pH using method EPA 9045, Volatile Halocarbons, Cadmium (Cd), Chromium (Cr), Nickel (Ni), Zinc (Zn) using method EPA 6010, Total and soluble lead (Pb) using method EPA 7420, Cyanide using method SW-846 Section 7.3.3.2, Sulfide using method SW-846 Section 7.3.4.1, and corrosivity using method EPA 1110. The purpose of these additional analyses was for waste characterization for soil disposal.

Five water samples, including one trip blank and one duplicate, were analyzed for TVH-g and BTEX. All of these samples, excluding the trip blank, were also analyzed for TPH-d and Volatile Halocarbons.

3.0 FINDINGS

3.1 Site Conditions

Based upon the results of drilling activities to date, the local sediments have been identified as unconsolidated, dark, plastic Bay Mud clays with lesser localized interlayers of sand.

Free floating product was found in soil boring SB-4 located at the former C and D tank area (Figure 2B - Detail "A"). Product was observed in the intergranular space of a pea gravel fill from three feet to twelve feet below the surface (Appendix A - Boring Log and Well Completion Summaries).

Three feet of poorly graded, angular gravel was intersected at soil boring SB-2B located to the immediate northeast of the former tank B area (Figure 2C - Detail "B"). This layer is most probably a fill. Well MW 2 was found destroyed with asphalt and no measurements could be collected.

3.2 Ground-Water Flow Direction and Gradient

In general, the ground-water flow direction at the area surrounding the subject facility follows the south to southeast trending topographic slope toward Lake Merritt. Based upon additional research conducted by ESE, eight sites in the vicinity of the subject facility which handle hazardous materials and have documented leaks and had available documentation concerning ground-water flow direction (Table A - Ground-Water Information). All sites, except the most distant, have documented ground-water flow towards the south and southeast (Figure 1 - Vicinity Map) and a reported ground-water depth range of 5 to 15 feet below surface.

Past ground-water level measurements in monitoring wells MW-1, MW-2 and MW-3 at the subject facility indicated an easterly ground-water flow direction and were considered to be skewed by perched water zones in the Bay Mud clays (Hunter/Gregg, 1989). It was reported that, upon well development, MW-1 ground-water levels increased by approximately 9 feet, whereas, other local wells (MW3 and MW4) have ground-water levels which have remained more-or-less static. MW-1 may be in a confined or perched ground-water zone thereby skewing the small amount of data presently available (Table 1 - Ground Water and Product Level Measurements). Ground-water levels in May 1991 were between 10 and 13 feet below surface. Measurements made during 1989 indicate that the ground-water level has decreased approximately 2 feet on average. The ground-water flow direction, based upon data collected at surrounding properties, is towards the southeast (Figure 3 - Ground Water Elevation).

3.3 Results of Petroleum Hydrocarbons Analyses

Two soil borings, SB-2A and SB-2B, were completed in the tank B area during this phase of field work (Figure 2C - Detail "B"). All samples were nondetectable for TPH-d (Table 2 - Analytical Results). An existing ground-water monitoring well, MW-2, in the tank B area was unable to be sampled.

Soil samples collected from the Tanks C/D area in boreholes SB-3, SB-4 and MW-4 contain detectable concentrations of TPH as oil, TVH-g and BTEX (Table 2 - Analytical Results). In general, the highest TVH-g and BTEX concentrations in soil occur between a depth of 10 to 15 feet below surface.

Detectable TVH-g and BTEX were found in ground-water samples collected in May 1991 from MW-1, MW-3 and MW-4 (Table 3 - Analytical Results). TPH as oil was also detected in ground-water in MW-1 and MW-3. Monitoring well MW-3 contained the highest ground-water concentrations of petroleum constituents and is located west of the former tanks C and D area.

3.4 Results of Metals and Volatile Halocarbons Analyses

Soil boring sample SB-3, collected at a depth of 10 feet in the tanks C and D area, was noted to contain the highest in-situ concentrations of TPH as oil, TPH-g and BTEX of all samples submitted for analyses. Follow-up analyses for metals (including Cd, Cr, Pb, Ni and Zn) indicate values (Table 4 - Analytical Methods) less than Soluble Threshold Limit Concentration (STLC) and Total Threshold Limit Concentration (TTLC) as defined by California Code of Regulations (CCR) Title 22.

Soil boring sample SB-2A, collected at a depth of 15 feet in the former Tank B area, was non-detectable for volatile halocarbons (Table 5 - Analytical Results). Sample SB-3 from a 10-foot depth at the Tanks C and D area was also nondetectable for volatile halocarbons.

Ground-water samples collected from monitoring wells MW-1, MW-3 and MW-4 in 1991 contained detectable trichloroethylene (TCE) with the highest concentrations found in MW-4 (Table 6 - Analytical Results). A ground-water sample from MW-3 contained the least TCE, as compared to the other samples, but was the only sample to have detectable 1,2 - dichloroethane (1,2 DCA).

4.0 CONCLUSIONS

The following conclusions are made from the findings of this subsurface investigation, in combination with quarterly monitoring observations:

- Soil and ground-water samples collected from and around the former tanks C and D area, including sample points MW-1, MW-3, MW-4, SB-3 and SB-4, contain detectable petroleum hydrocarbons in the oil and gasoline range.

- Ground-water flow in the surrounding vicinity is towards the southeast. Monitoring well MW-3 is thereby situated upgradient and is noted to contain detectable hydrocarbons. This suggests upgradient migration of petroleum constituents from the former tank area within the capillary zone or manmade conduit or downgradient migration from a source located off of the subject property. A plume of petroleum and organic volatile products may be migrating in a southeasterly direction from the former tanks C and D area and possibly from off-site sources toward monitoring well MW-4.

- Volatile halocarbons are present in ground water at the tanks C and D area as trichloroethylene (TCE). Ground water in MW-4 contains the highest concentration of TCE. Ground water in MW-3 contains both TCE and 1,2 DCA. 1,2 DCA is a known degradation product of TCE.

- The TCE and 1,2 DCA concentrations found in ground water from these wells are above State of California maximum contaminant levels of 5 μg/L.

5.0 RECOMMENDATIONS

Based upon the conclusions derived from the findings of a recent field investigation and monitoring program at the Broadway Volkswagen Facility, ESE recommends;

A. Two monitoring wells be installed upgradient from MW-3 and the former tanks C and D area in order to identify petroleum and organic volatile products sourcing beyond the subject facility.

B. Monitoring well MW-2 be permitted for destruction by Alameda County and the well be destroyed by drilling out.

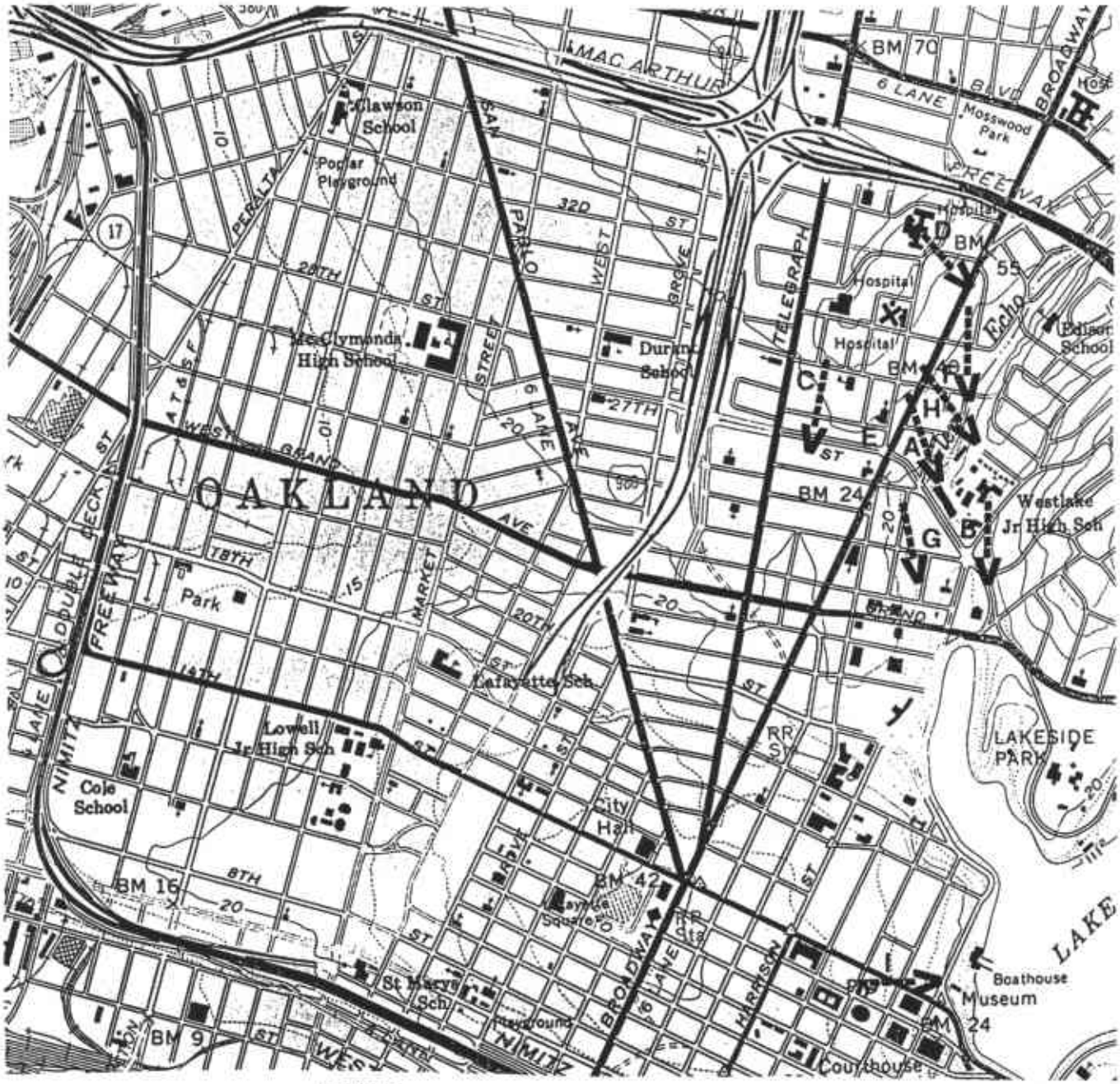
C. One monitoring well be installed downgradient from MW-4 in order to determine the extent of product migration. As well, three to four groundwater samples collected with a HYDROPUNCH at locations downgradient may be suitable for maximum coverage.

6.0 REFERENCES

Hunter/Gregg, Inc., (1989). Letter Report on Findings at Broadway Volkswagen, 2740 Broadway Avenue, Oakland, California

Engineering Science (ES) Report, (1989). Removal of Underground Storage Tanks at Broadway Volkswagen, Oakland, California.

Environmental Science & Engineering, Inc., (1991). Workplan for Site Assessment for Broadway Volkswagen, 2740 Broadway Avenue, Oakland, California



SCALE

0 1/2 MILE 1 mile

LEGEND

A Site Designation on table 1 with ground-water flow direction

N

SOURCE:

USGS Oakland East and Oakland West Quadrangles

ESE A CH2M HILL COMPANY	Environmental Science & Engineering, Inc.
VORELCO #4286 BROADWAY/VOLKSWAGEN OAKLAND, CALIFORNIA	
FIGURE 1 VICINITY MAP	

DRAWN BY	APPROVED BY	REVISED
DWR		CVS 6/91
DATE	FILE NAME	PROJ. NO.
3/91	F1VM30	6-91-5165

benzene = .610 at 15'

3000 gal gas, 550 gal w.o.

DETAIL "A"

28th STREET

SIDEWALK

MW3

SB4 C&D

SB3

MW1

1.2 ppm at 5'
benzene = .805 at 10'
0.81 ppm at 15'

GARAGE DOOR

MW4

boring 3 benzene = .2100 at 10'

RAMP TO SECOND FLOOR

TREE

TREE

SHOW ROOM

OFFICES

PARKING GARAGE

WASHROOM

DETAIL "B"

550 gal W.O.

TREE

SB2B

B

ENTRANCE

SB2A

SB1

BROADWAY

MW2

Abandoned well

TREE

HALLWAY

HALLWAY

OFFICES

OFFICES

ASPHALT PARKING AREA

PROPERTY LINE

UTILITIES

SIDEWALK

TREE

AUTO SHOP

ELEVATED PARKING AREA

1500 gal W.O.

A

FENCE

SIDEWALK

27th STREET

LEGEND

- ⊗ MONITORING WELL
- ⊕ ABANDONED MONITORING WELL
- ⌖ SOIL BORING

TANKS

- A WASTE OIL (1,000 GAL.); TANK REMOVED, SITE CLEAN
- B WASTE OIL (550 GAL.); TANK REMOVED
- C&D WASTE OIL (550 GAL.) AND UNLEADED GASOLINE (3,000 GAL.); TANKS REMOVED

SCALE
0 30 FEET

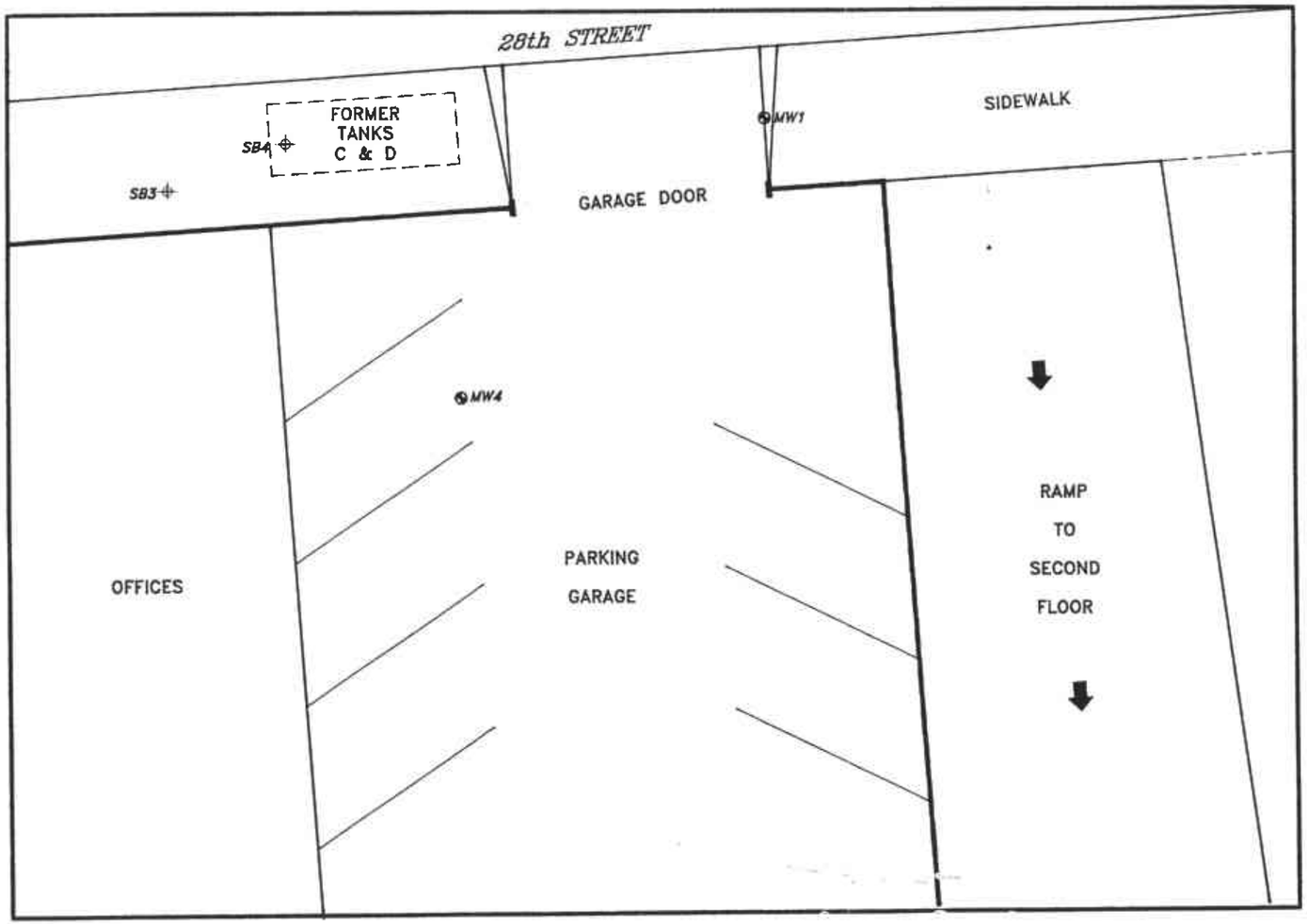
ESE A CH2M HILL COMPANY
Environmental Science & Engineering, Inc.

VORELCO #4286
BROADWAY VOLKSWAGEN
OAKLAND, CALIFORNIA

FIGURE 2A
SITE PLAN

DRAWN BY	APPROVED BY	REVISED
CVS		

DATE	FILE NAME	PROJ. NO.
6/91	F1SP30	6-91-5165



LEGEND

- MONITORING WELL
- SOIL BORING

SCALE
0 10 FEET

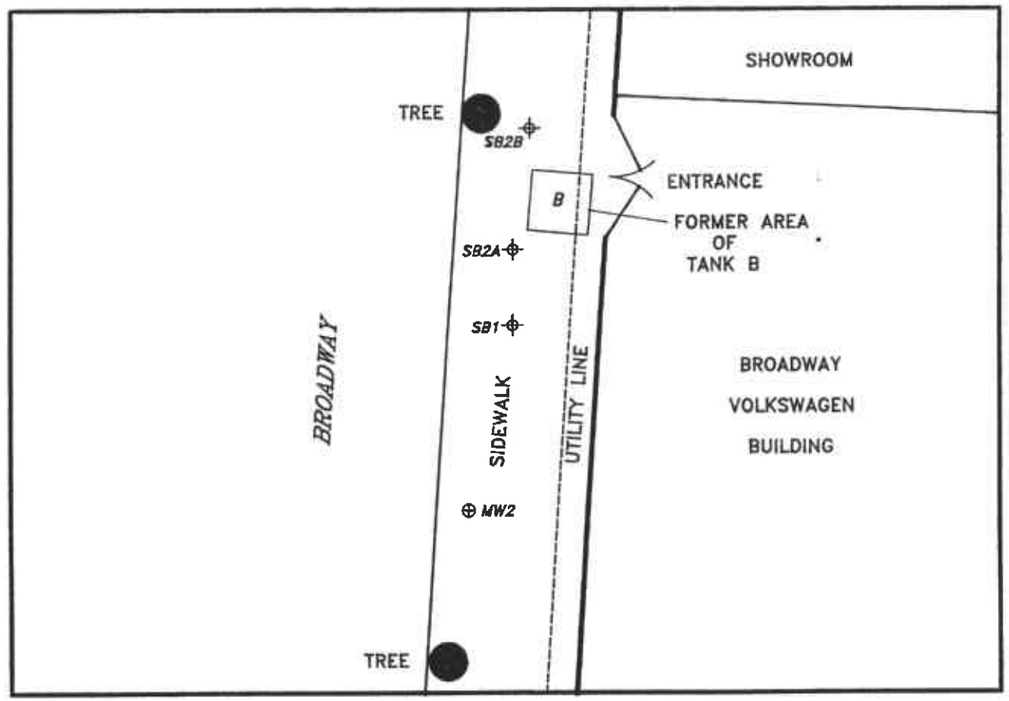
ESE A CH2MHILL COMPANY
Environmental Science & Engineering, Inc.

VORELCO #4286
BROADWAY VOLKSWAGEN
OAKLAND, CALIFORNIA

FIGURE 2B
DETAIL "A"

DRAWN BY	APPROVED BY	REVISED
CVS		

DATE	FILE NAME	PROJ. NO.
6/91	F1A10	6-91-5165



LEGEND

⊕ ABANDONED MONITORING WELL

⌖ SOIL BORING

SCALE

0 10 FEET

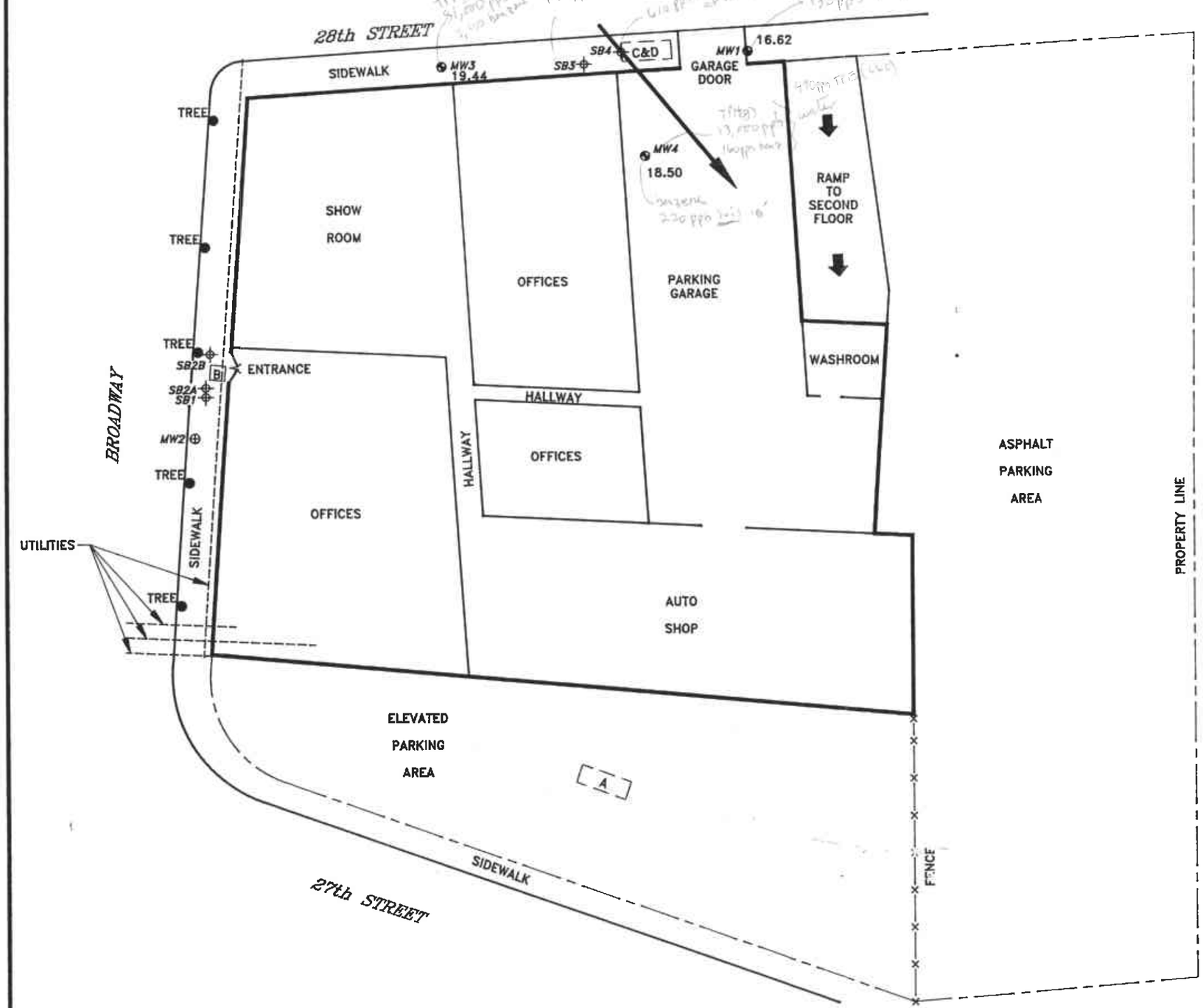
ESE A CILCORP COMPANY

Environmental Science & Engineering, Inc.

VORELCO #4286
BROADWAY VOLKSWAGEN
OAKLAND, CALIFORNIA

FIGURE 2C
DETAIL "B"

DRAWN BY	APPROVED BY	REVISED
CVS		
DATE	FILE NAME	PROJ. NO.
5/91	F1B10	6-91-5165



LEGEND

- MONITORING WELL
- ABANDONED MONITORING WELL
- SOIL BORING
- GROUND-WATER ELEVATION CONTOUR (5-23-91)
- REGIONAL GROUND-WATER FLOW DIRECTION

WELL ELEVATIONS (RELATIVE)
(MW3 ASSIGNED - 30.00 FEET)

CONTOUR INTERVAL: 0.5 FEET

TANKS

- A — WASTE OIL (1,000 GAL.); TANK REMOVED, SITE CLEAN
- B — WASTE OIL (550 GAL.); TANK REMOVED
- C&D — WASTE OIL (550 GAL.) AND UNLEADED GASOLINE (3,000 GAL.); TANKS REMOVED

SCALE
0 30 FEET

ESE A CECORP COMPANY
Environmental Science & Engineering, Inc.

VORELCO #4286
BROADWAY VOLKSWAGEN
OAKLAND, CALIFORNIA

FIGURE 3
GROUND-WATER ELEVATION
MAY 1991

DRAWN BY	APPROVED BY	REVISED
CVS		CVS 6/91
DATE	FILE NAME	PROJ. NO.
5/91	F2GWE30	6-91-5165

Table A.

Ground-Water Information In Vicinity
Of Broadway Volkswagen, 2740 Broadway, Oakland, California

Site	Description Address	Distance to Broadway VW	Reported Contamination and Date	Ground-Water Depth	Ground-Water Flow Direction
A	Vorelco 2740 Broadway	-	Waste oil, - 1988, 1989	9-11'	south-southeast
B	Oakland Acura 255 27th	1050' south	Gasoline? ground water	5'	south
C	Shell 2800 Telegraph	1200' west	Gasoline? ground water	10-11.5'	south
D	Broadway Medical 3300 Webster	2110' north	ground water (low conc.) 1990	10-15'	southwest
E	Tracy Buick 2735 Broadway	450' west	waste oil - soil 1989	NA	NA
F	Connel Auto 3093 Broadway	750' north	gasoline, soil 1989	NA	south
G	Oakland Tribune 2302 Valdez	1050' south	gasoline - soil, ground water 1989	14-16'	south
H	European Motors 2915 Broadway	450' north	waste oil, diesel ground water	10-12'	southeast
I	Alameda County Alcopark	4828' south	gasoline ground water	20.5'	east

NA = Information not available

VORELCO.gm 06/18/91 ssw-d

TABLE 1 - GROUND WATER AND PRODUCT LEVEL MEASUREMENTS

VORELCO

2740 BROADWAY, OAKLAND, CALIFORNIA 94612

WELL #	DEPTH TO WATER (feet)	WELL DEPTH (feet)	PRODUCT THICKNESS (feet)	WELL ELEVATION (feet)	WATER ELEVATION (feet amsl)
	5/13/91				5/13/91
MW-1	12.60	20	0	29.22	16.62
MW-3	10.56	20	0	30.00	19.44
MW-4	11.20	25	0	29.70	18.50

amsl = above mean sea level

Note: Well #2 is abandoned.

5165-1A.gm 6/25/91 obc-d

TABLE 2 - ANALYTICAL RESULTS
PETROLEUM HYDROCARBONS (METHOD 8015 AND 8020) FOR SOIL SAMPLES

VORELCO

2740 BROADWAY, OAKLAND, CALIFORNIA 94612

SAMPLE ID	KEROSENE (mg/Kg)	DIESEL (mg/Kg)	MOTOR OIL (mg/Kg)	TVH AS GASOLINE (mg/Kg)	BENZENE (ug/Kg)	TOLUENE (ug/Kg)	ETHYL-BENZENE (ug/Kg)	TOTAL XYLENES (ug/Kg)
SB-2A at 10'	ND	ND	--	--	--	--	--	--
SB-2A at 15'	ND	ND	--	--	--	--	--	--
SB-2B at 10'	ND	ND	--	--	--	--	--	--
SB-2B at 15'	ND	ND	--	--	--	--	--	--
SB-3 at 5'	ND	ND	ND	2.3	5.2	6.0	ND	21
SB-3 at 10'	ND	ND	91	740	1,200	30,000	9,400	42,000
SB-3 at 15'	ND	ND	ND	5.9	810	480	99	380
SB-4 at 5'	ND	ND	ND	ND	ND	ND	ND	ND
SB-4 at 15'	ND	ND	14	13	610	1,100	170	840
MW-4 at 5'	ND	ND	ND	ND	ND	ND	ND	ND
MW-4 at 10'	ND	ND	ND	21	220	700	260	1,300

ND = Not detectable at analysis detection limit.
mg/Kg = 1 milligram per Kilogram or parts per million (ppm).
ug/Kg = 1 microgram per Kilogram or parts per billion (ppb).
-- = Not analyzed

All samples were collected by Environmental Science & Engineering, Inc. (ESE) on May 14 and 15, 1991.

5165-2.gm 06/18/91 obc-d

TABLE 3 - ANALYTICAL RESULTS
PETROLEUM HYDROCARBONS (METHOD 8015 AND 8020) FOR WATER SAMPLES

VORELCO

2740 BROADWAY, OAKLAND, CALIFORNIA 94612

SAMPLE ID	KEROSENE (ug/L)	DIESEL (ug/L)	MOTOR OIL (ug/L)	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL-BENZENE (ug/L)	TOTAL XYLENES (ug/L)
TRIP	--	--	--	ND	ND	ND	ND	ND
MW-1	ND	ND	ND	130	ND	ND	ND	1.1
MW-3	ND	ND	155	91,000	7,800	12,000	1,200	4,000
MW-4	ND	ND	ND	13,000	160	690	250	1,100
MW-4D	ND	ND	610	14,000	170	730	260	1,200

ND = Not detectable at detection limit value shown.
ug/L = 1 microgram per liter or parts per billion (ppb).
-- = Not analyzed

All samples were collected by Environmental Science & Engineering, Inc. (ESE) on May 14 and 15, 1991.

TABLE 4 - ANALYTICAL RESULTS
HEAVY METALS (EPA METHODS 6010, 7420, 1110 AND SW-846 SECTIONS 7.3.3.2 AND 7.3.4.1) FOR SOIL SAMPLE SB-3 10'

VORELCO

2740 BROADWAY, OAKLAND, CALIFORNIA 94612

SAMPLE	CADMIUM (mg/Kg)	CHROMIUM (mg/Kg)	TOTAL LEAD (mg/Kg)	SOLUBLE LEAD (mg/L)	NICKEL (mg/Kg)	ZINC (mg/Kg)	CYANIDE (mg/Kg)	SULFIDE (mg/Kg)
SB-3 10'	0.27	27.4	5.0	0.24	42.5	42.5	ND	ND

* Corrosivity was analyzed as < 6.35 mm/year.

ND = Not detectable at analysis detection limit.
mg/Kg = 1 milligram per Kilogram or parts per million (ppm).
mg/L = 1 milligram per Liter or parts per billion (ppb).

All samples were collected by Environmental Science & Engineering, Inc. (ESE) on May 14, 1991.

TABLE 5 - ANALYTICAL RESULTS
HALOGENATED VOLATILES EPA METHOD 8010 FOR SOIL SAMPLES
VORELCO
2740 BROADWAY, OAKLAND, CALIFORNIA. 94612

(All results reported in ug/L)

COMPOUND	SB-2A 15'	SB-3 10'
Chloromethane	ND	ND
Bromomethane	ND	ND
Vinyl chloride	ND	ND
Chloroethane	ND	ND
Methylene chloride	ND	ND
Trichlorofluoromethane	ND	ND
1,1-Dichloroethene	ND	ND
1,1-Dichloroethane	ND	ND
cis-1,2-Dichloroethane	ND	ND
trans-1,2-Dichloroethane	ND	ND
Chloroform	ND	ND
Freon 113	ND	ND
1,2-Dichloroethane	ND	ND
1,1,1-Trichloroethane	ND	ND
Carbon tetrachloride	ND	ND
Bromodichloromethane	ND	ND
1,2-Dichloropropane	ND	ND
cis-1,3-Dichloropropene	ND	ND
Trichloroethylene	ND	ND
1,1,2-Trichloroethane	ND	ND
trans-1,3-Dichloropropene	ND	ND
Dibromochloromethane	ND	ND
2-Chloroethyl vinyl ether	ND	ND
Bromoform	ND	ND
Tetrachloroethene / 1,1,2,2-Tetrachloroethane	ND	ND
Chlorobenzene	ND	ND
1,3-Dichlorobenzene	ND	ND
1,2-Dichlorobenzene	ND	ND
1,4-Dichlorobenzene	ND	ND

ug/Kg = 1 microgram per Kilogram or parts per billion (ppb).
ND = Not detectable at analysis detection limit.

All samples were collected by Environmental Science & Engineering, Inc. (ESE) on May 14 and 15, 1991.

5165-3.gm 6/18/91 obc-d

TABLE 6 - ANALYTICAL RESULTS
HALOGENATED VOLATILES EPA METHOD 8010 FOR WATER SAMPLES - 130. nal.
VORELCO 8240 225.
2740 BROADWAY, OAKLAND, CALIFORNIA.94612

B+C
428-2300
Rich Bower

(All results reported in ug/L)

COMPOUND	MW-1	MW-3	MW-4	MW-4D
Chloromethane	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND
cis-1,2-Dichloroethane	ND	ND	ND	ND
trans-1,2-Dichloroethane	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND
Freon 113	ND	ND	ND	ND
1,2-Dichloroethane	ND	**380**	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND
Carbon tetrachloride	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND
Trichloroethylene	58	14	**490**	**660**
1,1,2-Trichloroethane	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND
Dibromochloromethane	ND	ND	ND	ND
2-Chloroethyl vinyl ether	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND
Tetrachloroethene / 1,1,2,2-Tetrachloroethane	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND
1,3-Dichlorobenzene	ND	ND	ND	ND
1,2-Dichlorobenzene	ND	ND	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND

ug/L = 1 microgram per liter or parts per billion (ppb).
ND = Not detectable at analysis detection limit.

All samples were collected by Environmental Science & Engineering, Inc. (ESE) on May 14 and 15, 1991.

5165-5.gm 6/26/91 obc-d

Environmental Science & Engineering, Inc.
A CILCORP Company

BORING LOG AND WELL COMPLETION SUMMARY

SB1

Page 1 of 1

WELL COMPLETION

Completion Depth: **N/A**

	Size/Type	From	To
Casing:			
Screen:			
Filter:	BACKFILLED WITH GROUT		
Seal:			

Well Cap or Box:

Project Name: Vorelco Project No: 6-91-5165
Location: Broadway Volkswagen
2740 Broadway Ave.
Oakland, CA

Driller: Gregg Drilling and Testing
Method: Hollow Stem Auger
Hole Diameter: 8 In. Total Depth: 15 Feet
Ref. Elevations: NA
Logged By: Bart Miller

Dates:
Start: 5-13-91
Finish: 5-13-91

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor	Remarks: Water, drilling/completion, summary, sample type	TIME:
0	CEMENT - 4 In. GRAVEL FILL - 2 In. FORMATIONAL SEDIMENTS	GP						
5	CLAY, dark brown, moderate to low plasticity, slightly moist, no odor.	CL	10 13 15			0	RING @ 5 FEET (*)	8:40
10	CLAY, grey with some visible reddish brown mottling, low plasticity, slightly moist, no odor.	CL				1	RING @ 10 FEET (*)	8:45
15	CLAY, grey with some reddish brown mottling, silty, low plasticity, slightly moist, no odor.	CL	15 20 25			1	RING @ 15 FEET (*)	8:55
20							(*) - Sample submitted for analysis	
25								
30								
35								

REVIEWED AND APPROVED BY:

Environmental Science & Engineering, Inc.
A CILCORP Company

BORING LOG AND WELL COMPLETION SUMMARY

SB-2A

Page 1 of 1

WELL COMPLETION

Completion Depth: N/A

	Size/Type	From	To
Casing:			
Screen:			
Filter:	BACKFILLED WITH GROUT		
Seal:			

Well Cap or Box:

Project Name: Vorelco Project No: 6-91-5165
Location: Broadway Volkswagen
2740 Broadway Ave.
Oakland, CA

Driller: Gregg Drilling and Testing
Method: SIMCO Rig
Hole Diameter: 8 in. Total Depth: 15 Feet
Ref. Elevations: NA
Logged By: Oliver Christen

Dates:
Start: 5-15-91
Finish: 5-15-91

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor	Remarks: Water, drilling/completion, summary, sample type
							TIME: 13:30
0	CEMENT - 4 in. GRAVEL FILL - 1 in. FORMATIONAL SEDIMENTS	GP					
5	CLAY with trace silt and gravel, tan brown, slightly grey mottled, dry, no odor, trace root stains.	CL				2	RING @ 5 FEET
10	AS ABOVE, but slightly damp.	CL				3	RING @ 10 FEET
15	AS ABOVE	CL				0	RING @ 15 FEET 14:15
20							
25							
30							
35							

REVIEWED AND APPROVED BY:
Susan W Wickham
SUSAN S. WICKHAM
REGISTERED CALIFORNIA
GEOLOGIST #3961

Environmental Science & Engineering, Inc.
A GILCORP Company

BORING LOG AND WELL COMPLETION SUMMARY

SB-2B

Page 1 of 1

WELL COMPLETION

Completion Depth: **N/A**

Size/Type	From	To
Casing:		
Screen:		
Filter:	BACKFILLED WITH GROUT	
Seal:		
Well Cap or Box:		

Project Name: Voreico Project No: 6-91-5165
Location: Broadway Volkswagen
2740 Broadway Ave.
Oakland, CA

Driller: Gregg Drilling and Testing
Method: SIMCO Rig
Hole Diameter: 8 In. Total Depth: 15 Feet
Ref. Elevations: NA
Logged By: Oliver Christen

Dates:
Start: 5-15-91
Finish: 5-15-91

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor	Remarks: Water, drilling/completion, summary, sample type
							TIME: 14:20
0	CEMENT - 4 In. GRAVEL FILL - 2 In. FORMATIONAL SEDIMENTS	GP					
5	CLAY with trace gravel, brown, soft, dry, no odor.	CL				3	RING @ 5 FEET
10	GRAVEL, approximately 1 inch diameter, poorly graded, trace Clay, brown, moist, no odor (possible fill).	GP				1	RING @ 10 FEET
15	CLAY, tan brown, soft, moist, no odor.	CL				0	RING @ 15 FEET 15:00
20							
25							
30							
35							

REVIEWED AND APPROVED BY:
Susan Wickham
SUSAN S. WICKHAM
REGISTERED CALIFORNIA
GEOLOGIST #3951

Environmental Science & Engineering, Inc.
A GILCORP Company

BORING LOG AND WELL COMPLETION SUMMARY

SB3

Page 1 of 1

WELL COMPLETION

Completion Depth: **N/A**

Size/Type	From	To
Casing:		
Screen:		
Filter:	BACKFILLED WITH GROUT	
Seal:		

Well Cap or Box:

Project Name: Vorelco Project No: 6-91-5165
Location: Broadway Volkswagen
2740 Broadway Ave.
Oakland, CA

Driller: Gregg Drilling and Testing
Method: Hollow Stem Auger
Hole Diameter: 8 In. Total Depth: 15 Feet
Ref. Elevations: NA
Logged By: Bart Miller

Dates:
Start: 5-13-91
Finish: 5-13-91

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor	Remarks: Water, drilling/completion, summary, sample type	TIME:
0	CEMENT - 4 In. GRAVEL FILL - 2 In. FORMATIONAL SEDIMENTS	GP						
5	CLAY, light brown, silty to sandy, minor mottling, low to moderate plasticity, slightly moist, no odor.	CL	15 12 20			1	RING @ 5 FEET (*)	10:01
10	CLAY, light brown, silty low plasticity, moist, strong fuel odor (i.e. gasoline).	CL	8 10 20			8	RING @ 10 FEET (*)	10:10
							▼ Water Saturation	
15	CLAY, light brown with grey mottling, low to medium plasticity, moist, strong fuel odor (i.e. gasoline).	CL	10 20 30			5	RING @ 15 FEET (*)	10:16
20							(*) - Sample submitted for analysis	
25								
30								
35								

REVIEWED AND APPROVED BY:
SUSAN S. WICKHAM
REGISTERED CALIFORNIA
GEOLOGIST #3951

Environmental Science & Engineering, Inc.
A CILCORP Company

BORING LOG AND WELL COMPLETION SUMMARY

SB4

Page 1 of 1

WELL COMPLETION

Completion Depth: **N/A**

Size/Type	From	To
Casing:		
Screen:		
Filter:	BACKFILLED WITH GROUT	
Seal:		
Well Cap or Box:		

Project Name: Vorelco Project No: 6-91-5165
Location: Broadway Volkswagen
2740 Broadway Ave.
Oakland, CA

Driller: Gregg Drilling and Testing
Method: Hollow Stem Auger
Hole Diameter: 8 in. Total Depth: 15 Feet
Ref. Elevations: NA
Logged By: Bart Miller

Dates:
Start: 5-13-91
Finish: 5-13-91

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor	Remarks: Water, drilling/completion, summary, sample type
							TIME:
0	CEMENT - 4 in. GRAVEL FILL - 2 in.	GP					
5	PEA GRAVEL FILL, abundant gasoline product, impossible to sample	GP	10 8 9			1	RING @ 5 FEET (*) 10:49
10						8	Lost all sample @ 10 Feet
15	FORMATIONAL SEDIMENTS CLAY, light brown with grey mottling, low to medium plasticity, moist, ~~strong fuel odor~~ (i.e. gasoline).	CL	30 40			5	RING @ 15 FEET (*) 11:00
20							(*) - Sample submitted for analysis
25							
30							
35							

REVIEWED AND APPROVED BY:
SUSAN S. WORTHAM
REGISTERED CALIFORNIA
GEOLOGIST #2551

Environmental Science & Engineering, Inc.
A CILCORP Company

BORING LOG AND WELL COMPLETION SUMMARY

MW4

WELL COMPLETION

Completion Depth: 25 Feet

	Size/Type	From	To
Casing:	2 In. Blank PVC	0 Feet	5 Feet
Screen:	2 In. (0.02 In. Slotted) PVC	5 Feet	25 Feet
Filter:	#2 Sand	4 Feet	25 Feet
Seal:	Bentonite Pellets	3 Feet	4 Feet
	Grout	0 Feet	3 Feet

Well Cap or Box:

Project Name: Vorelco Project No: 6-91-5165
Location: Broadway Volkswagen
2740 Broadway Ave.
Oakland, CA
Inside Building
Driller: Gregg Drilling and Testing
Method: Simco Rig
Hole Diameter: 8 In. Total Depth: 25 Feet
Ref. Elevations: NA
Logged By: Oliver Christen

Dates:
Start: 5-13-91
Finish: 5-15-91

Depth (ft)	Lithologic Description	USC	Graphic Log: Sample/Blows	Graphic Log: Lithology	Graphic Log: Well Installation	Vapor	Remarks: Water, drilling/completion, summary, sample type
							TIME: 11:15
0	CEMENT - 8 In. GRAVEL FILL at 1 Ft	GP					
5	SAND FILL, tan brown, moderately graded, loose, dry, no odor.	SP				0	RING @ 5 FEET 11:40
10	FORMATIONAL SEDIMENTS CLAY with layers of fine grained sand, brown, moist, no odor.	CL				0	RING @ 10 FEET 12:25
							▼ Ground Water @ 11.2 feet (after drilling.
15	AS ABOVE	CL					
20	AS ABOVE	CL					
25	AS ABOVE	CL					Base of boring @ 25 feet.
30							
35							

REVIEWED AND APPROVED BY:
Susan Workman
SUSAN S. WORKMAN
REGISTERED GEOLOGIST
CERTIFIED HYDROGEOLOGIST

WELL PURGING AND SAMPLING DATA

Date: 5-13-91 Project Number: 6-91-5165 Project Name: VORELCO

Well Number: MW 1 Boring Diameter: 10 INCH Casing Diameter: 2 INCH

Column of Fluid in Well

depth to product NIL

depth to water 12.60'

total depth of well 20'

column of product NIL

column of water 7.4'

Volume to be Removed

gal per ft Annular Space =
column of water X
volume of annular space =
gal per ft of casing =
column of water X
volume of casing =
total volume =
number of vol to remove X
total vol to remove =

method of measuring fluid Electric Tape

method of purging well Bailer rate

method of decon Alconox/Water

Physical appearance of water (clarity, color, particulates, odor)

Initial

During

Final

Field Analysis	Initial		During		Final
time					
conductivity					
pH					
temperature					

method of measurement

Total volume purged 3 gallons Comments

Sample Number MW 1 Amount of Sample 6 x 40ml VOA vials and 1 x 1 liter

Signed/Sampler OLIVER CHRISTEN Date 5-13-91

Signed/Reviewer Date

WELL PURGING AND SAMPLING DATA

Date: 5-13-91 Project Number: 6-91-5165 Project Name: VORELCO

Well Number: MW3 Boring Diameter: 8 INCH Casing Diameter: 2 INCH

Column of Fluid in Well

depth to product NIL

depth to water 10.56'

total depth of well 20'

column of product NIL

column of water 9.44'

Volume to be Removed

gal per ft Annular Space =
column of water X
volume of annular space =
gal per ft of casing =
column of water X
volume of casing =
total volume =
number of vol to remove X
total vol to remove =

method of measuring fluid Electric Tape

method of purging well Bailer rate

method of decon

Physical appearance of water (clarity, color, particulates, odor)

Initial

During

Final

Field Analysis	Initial		During	Final
time				
conductivity				
pH				
temperature				

method of measurement

Total volume purged 3. gallons Comments

Sample Number MW 3· Amount of Sample 6x40ml VOA vials and 1x1 liter

Signed/Sampler OLIVER CHRISTEN Date 5-13-91

Signed/Reviewer Date

WELL PURGING AND SAMPLING DATA

Date: 5-13-91 Project Number: 6-91-5165 Project Name: VORELCO

Well Number: MW 4 Boring Diameter: 10 INCH Casing Diameter: 4 INCH

Column of Fluid in Well

depth to product N/L

depth to water 11.20'

total depth of well 25'

column of product N/L

column of water 14.4'

Volume to be Removed

gal per ft Annular Space =
column of water X
volume of annular space =
gal per ft of casing =
column of water X
volume of casing =
total volume =
number of vol to remove X
total vol to remove =

method of measuring fluid Electric Tape

method of purging well Bailer rate

method of decon

Physical appearance of water (clarity, color, particulates, odor)

Initial

During

Final

Field Analysis	Initial		During		Final	
time						
conductivity						
pH						
temperature						

method of measurement

Total volume purged 25 gallons Comments Bailed dry twice. Slow recharge.

Sample Number MW 4. Amount of Sample 6 x 40ml VOA vials and 1 x 1 liter

Signed/Sampler OLIVER CHRISTEN Date 5-13-91

Signed/Reviewer Date

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 05/14/91
DATE REQUESTED: 05/20/91
DATE REPORTED: 06/05/91

LAB NUMBER: 103982

CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING

PROJECT ID: 6-91-5165

LOCATION: VORELCO

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103982-1
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING
PROJECT ID: 6-91-5165
LOCATION: VORELCO
SAMPLE ID: SB-2A@15'

DATE RECEIVED: 05/14/91
DATE REQUESTED: 05/30/91
DATE ANALYZED: 06/03/91
DATE REPORTED: 06/05/91

EPA 8010: Volatile Halocarbons in Soil & Wastes
Extraction Method: EPA 5030 - Purge & Trap

Compound	RESULT ug/Kg	REPORTING LIMIT ug/Kg
chloromethane	ND	10
bromomethane	ND	10
vinyl chloride	ND	10
chloroethane	ND	10
methylene chloride	ND	5.0
trichlorofluoromethane	ND	5.0
1,1-dichloroethene	ND	5.0
1,1-dichloroethane	ND	5.0
cis-1,2-dichloroethene	ND	5.0
trans-1,2-dichloroethene	ND	5.0
chloroform	ND	5.0
freon 113	ND	5.0
1,2-dichloroethane	ND	5.0
1,1,1-trichloroethane	ND	5.0
carbon tetrachloride	ND	5.0
bromodichloromethane	ND	5.0
1,2-dichloropropane	ND	5.0
cis-1,3-dichloropropene	ND	5.0
trichloroethylene	ND	5.0
1,1,2-trichloroethane	ND	5.0
trans-1,3-dichloropropene	ND	5.0
dibromochloromethane	ND	5.0
2-chloroethylvinyl ether	ND	10
bromoform	ND	5.0
tetrachloroethylene	ND	5.0
1,1,2,2-tetrachloroethane	ND	5.0
chlorobenzene	ND	5.0
1,3-dichlorobenzene	ND	5.0
1,2-dichlorobenzene	ND	5.0
1,4-dichlorobenzene	ND	5.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

Duplicate: Relative % Difference	10
Spike: Average % Recovery	105

103982 103025

CHAIN OF CUSTODY RECORD

DATE 5-15-91 PAGE 1 OF 1

PROJECT NAME VORELCO

ADDRESS 2740 Broadway
Oakland, CA

PROJECT NO. 6-91-5165

SAMPLED BY Oliver Christen

LAB NAME Curtis & Tompkins

SAMPLE #	DATE	TIME	LOCATION	ANALYSES TO BE PERFORMED: TPH-gas (8015) & BTEX (8020)	TPH-diesel (8015) Oil Scan	Halogenated Volatiles (8010)	MATRIX	NUMBER OF CONTAINERS	REMARKS (CONTAINER, SIZE, ETC.)
MW-4	5-15-91	13:30	Oakland	X	X	X	Water	7	6 VOAs & 1 Liter
MW-4D	5-15-91	13:30	Oakland	X	X	X	Water	7	6 VOAs & 1 Liter
B-2A	5-15-91	14:15	Oakland				Soil	1	HOLD
B-2A @ 5'	5-15-91	14:25	Oakland				Soil	1	
B-2A @ 10'	5-15-91	14:35	Oakland			103982-1 requested on 5/20/91 for 8010.	Soil	1	
B-2A @ 15'	5-15-91	15:00	Oakland				Soil	1	HOLD
B-2B @ 10'	5-15-91	15:10	Oakland				Soil	1	
B-2B @ 15'	5-15-91	15:15	Oakland				Soil	1	

RELINQUISHED BY: (signature)
Oliver Christen

RECEIVED BY: (signature) date time
O'Keane 5/14/91

TOTAL NUMBER OF CONTAINERS

REPORT RESULTS TO: Sue Wickham

SPECIAL SHIPMENT REQUIREMENTS

INSTRUCTIONS TO LABORATORY (handling, analyses, storage, etc.):
CALL SUE FOR QUESTIONS
10 Day TA for Water Samples

SAMPLE RECEIPT

CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	
CONFORMS TO RECORD	

ESE Environmental Science & Engineering, Inc.
A GILCORP Company
4090 Nelson Avenue
Suite J
Concord, CA 94520
(415) 685-4053
Fax (415) 685-5323

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710. Phone (415) 486-0900

DATE RECEIVED: 05/14/91
DATE REPORTED: 05/29/91

LAB NUMBER: 103828

CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING

PROJECT ID: 6-91-5165

LOCATION: VORELCO

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103828
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING
PROJECT ID: 6-91-5165
LOCATION: VORELCO

DATE RECEIVED: 05/14/91
DATE ANALYZED: 05/23/91
DATE REPORTED: 05/29/91

Total Volatile Hydrocarbons with BTXE in Aqueous Solutions
TVH by California DOHS Method/LUFT Manual October 1989
BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
103828-1	MW-4	13,000	160	690	250	1,100
103828-2	MW-4D	14,000	170	730	260	1,200

QA/QC SUMMARY

RPD, %	<1
RECOVERY, %	100

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103828
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING
PROJECT ID: 6-91-5165
LOCATION: VORELCO

DATE RECEIVED: 05/14/91
DATE EXTRACTED: 05/21/91
DATE ANALYZED: 05/22/91
DATE REPORTED: 05/29/91

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)	MOTOR OIL RANGE (ug/L)	REPORTING LIMIT* (ug/L)
103828-1	MW-4	ND	ND	ND	50
103828-2	MW-4D	ND	ND	610	50

ND = Not detected at or above reporting limit.

*Reporting limit applies to all analytes.

QA/QC SUMMARY

RPD, %	2
RECOVERY, %	104

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103828-1
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING
PROJECT ID: 6-91-5165
LOCATION: VORELCO
SAMPLE ID: MW-4

DATE RECEIVED: 05/14/91
DATE ANALYZED: 05/24/91
DATE REPORTED: 05/29/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	20
bromomethane	ND	20
vinyl chloride	ND	20
chloroethane	ND	20
methylene chloride	ND	20
trichlorofluoromethane	ND	10
1,1-dichloroethene	ND	10
1,1-dichloroethane	ND	10
cis-1,2-dichloroethene	ND	10
trans-1,2-dichloroethene	ND	10
chloroform	ND	10
freon 113	ND	10
1,2-dichloroethane	ND	10
1,1,1-trichloroethane	ND	10
carbon tetrachloride	ND	10
bromodichloromethane	ND	10
1,2-dichloropropane	ND	10
cis-1,3-dichloropropene	ND	10
trichloroethylene	490	10
1,1,2-trichloroethane	ND	10
trans-1,3-dichloropropene	ND	10
dibromochloromethane	ND	10
2-chloroethyl vinyl ether	ND	20
bromoform	ND	10
tetrachloroethene	ND	10
1,1,2,2-tetrachloroethane	ND	10
chlorobenzene	ND	10
1,3-dichlorobenzene	ND	10
1,2-dichlorobenzene	ND	10
1,4-dichlorobenzene	ND	10

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	109

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103828-2
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING
PROJECT ID: 6-91-5165
LOCATION: VORELCO
SAMPLE ID: MW-4D

DATE RECEIVED: 05/14/91
DATE ANALYZED: 05/24/91
DATE REPORTED: 05/29/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	20
bromomethane	ND	20
vinyl chloride	ND	20
chloroethane	ND	20
methylene chloride	ND	20
trichlorofluoromethane	ND	10
1,1-dichloroethene	ND	10
1,1-dichloroethane	ND	10
cis-1,2-dichloroethene	ND	10
trans-1,2-dichloroethene	ND	10
chloroform	ND	10
freon 113	ND	10
1,2-dichloroethane	ND	10
1,1,1-trichloroethane	ND	10
carbon tetrachloride	ND	10
bromodichloromethane	ND	10
1,2-dichloropropane	ND	10
cis-1,3-dichloropropene	ND	10
trichloroethylene	660	10
1,1,2-trichloroethane	ND	10
trans-1,3-dichloropropene	ND	10
dibromochloromethane	ND	10
2-chloroethyl vinyl ether	ND	20
bromoform	ND	10
tetrachloroethene	ND	10
1,1,2,2-tetrachloroethane	ND	10
chlorobenzene	ND	10
1,3-dichlorobenzene	ND	10
1,2-dichlorobenzene	ND	10
1,4-dichlorobenzene	ND	10

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	109

103828

CHAIN OF CUSTODY RECORD

DATE 5-15-91 PAGE 1 OF 1

PROJECT NAME VORELCO

ADDRESS 2740 Broadway
Oakland, CA

PROJECT NO. 6-91-2765

SAMPLED BY Oliver Christen

LAB NAME Curtis & Tompkins

ESE Environmental Science & Engineering, Inc.
A GILCORP Company
4090 Nelson Avenue
Suite J
Concord, CA 94520
(415) 685-4053
Fax (415) 685-5123

SAMPLE #	DATE	TIME	LOCATION	TPH-gas (8015) & BTEX (8020)	TPH-diesel (8015) Oil Scan	Halogenated Volatiles (8010)	MATRIX	NUMBER OF CONTAINERS	REMARKS (CONTAINER, SIZE, ETC.)
1 MW-4	5-15-91	13:30	Oakland	X	X	X	Water	7	6 VOAS & 1 Liter
2 MW-4D	5-15-91	13:30	Oakland	X	X	X	Water	7	6 VOAS & 1 Liter
3 SB-2A	5-15-91	14:15	Oakland				Soil	1	HOLD
4 SB-2A 9+	5-15-91	14:25	Oakland				Soil	1	
5 SB-2A 10	5-15-91	14:35	Oakland				Soil	1	
6 SB-2B 15	5-15-91	15:00	Oakland				Soil	1	HOLD
7 SB-2B +10	5-15-91	15:10	Oakland				Soil	1	
8 SB-2B +15	5-15-91	15:15	Oakland				Soil	1	

RELINQUISHED BY: (signature)	RECEIVED BY: (signature)	date	time
1. Oliver Christen	JKeane	5/14/91	
2.			
3.			
4.			
5.			

TOTAL NUMBER OF CONTAINERS

REPORT RESULTS TO: Sue Wickham

SPECIAL SHIPMENT REQUIREMENTS

SAMPLE RECEIPT

CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	
CONFORMS TO RECORD	

INSTRUCTIONS TO LABORATORY (handling, analyses, storage, etc.):
CALL SUE FOR QUESTIONS
10 Day TA for Water Samples

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 05/14/91
DATE REPORTED: 05/31/91

LAB NUMBER: 103800

CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING

PROJECT ID: 6-91-5165

LOCATION: VORELCO

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103800-1
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING
PROJECT ID: 6-91-5165
LOCATION: VORELCO
SAMPLE ID: MW-1

DATE RECEIVED: 05/14/91
DATE ANALYZED: 05/24/91
DATE REPORTED: 05/31/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	58	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	109

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103800-2
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING
PROJECT ID: 6-91-5165
LOCATION: VORELCO
SAMPLE ID: MW-3

DATE RECEIVED: 05/14/91
DATE ANALYZED: 05/24/91
DATE REPORTED: 05/31/91

EPA 8010
Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	20
bromomethane	ND	20
vinyl chloride	ND	20
chloroethane	ND	20
methylene chloride	ND	20
trichlorofluoromethane	ND	10
1,1-dichloroethene	ND	10
1,1-dichloroethane	ND	10
cis-1,2-dichloroethene	ND	10
trans-1,2-dichloroethene	ND	10
chloroform	ND	10
freon 113	ND	10
1,2-dichloroethane	380	10
1,1,1-trichloroethane	ND	10
carbon tetrachloride	ND	10
bromodichloromethane	ND	10
1,2-dichloropropane	ND	10
cis-1,3-dichloropropene	ND	10
trichloroethylene	14	10
1,1,2-trichloroethane	ND	10
trans-1,3-dichloropropene	ND	10
dibromochloromethane	ND	10
2-chloroethyl vinyl ether	ND	20
bromoform	ND	10
tetrachloroethene	ND	10
1,1,2,2-tetrachloroethane	ND	10
chlorobenzene	ND	10
1,3-dichlorobenzene	ND	10
1,2-dichlorobenzene	ND	10
1,4-dichlorobenzene	ND	10

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	109

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103800
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING
PROJECT ID: 6-91-5165
LOCATION: VORELCO

DATE RECEIVED: 05/14/91
DATE ANALYZED: 05/22,25/91
DATE REPORTED: 05/31/91

Total Volatile Hydrocarbons with BTXE in Aqueous Solutions
TVH by California DOHS Method/LUFT Manual October 1989
BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
103800-1	MW-1	130	ND(0.5)	ND(0.5)	ND(0.5)	1.1
103800-2	MW-3	81,000	7,800	12,000	1,200	4,000
103800-3	TRIP	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

ND = Not detected at or above reporting limit; Reporting limit indicated in parentheses.

QA/QC SUMMARY

RPD, %	<1
RECOVERY, %	100

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103800
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING
PROJECT ID: 6-91-5165
LOCATION: VORELCO

DATE RECEIVED: 05/14/91
DATE EXTRACTED: 05/21/91
DATE ANALYZED: 05/22/91
DATE REPORTED: 05/31/91

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)	MOTOR OIL RANGE (ug/L)	REPORTING LIMIT* (ug/L)
103800-1	MW-1	ND	ND	ND	50
103800-2	MW-3	ND	ND	155	50

ND = Not detected at or above reporting limit.

*Reporting limit applies to all analytes.

QA/QC SUMMARY

RPD, %	2
RECOVERY, %	104

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103800
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING
PROJECT ID: 6-91-5165
LOCATION: VORELCO

DATE RECEIVED: 05/14/91
DATE EXTRACTED: 05/22/91
DATE ANALYZED: 05/23/91
DATE REPORTED: 05/31/91

Extractable Petroleum Hydrocarbons in Soils & Wastes
California DOHS Method
LUFT Manual October 1989

LAB ID	SAMPLE ID	KEROSENE RANGE (mg/Kg)	DIESEL RANGE (mg/Kg)	MOTOR OIL RANGE (mg/Kg)	REPORTING LIMIT* (mg/Kg)
103800-5	SB-3@5'	ND	ND	ND	1.0
103800-6	SB-3@10'	ND	ND	91	1.0
103800-7	SB-3@15'	ND	ND	ND	1.0
103800-8	SB-4@5'	ND	ND	ND	1.0
103800-9	SB-4@15'	ND	ND	14	1.0
103800-10	MW-4@5'	ND	ND	ND	1.0
103800-11	MW-4@10'	ND	ND	ND	1.0

ND = Not Detected at or above reporting limit.

*Reporting limit applies to all analytes.

QA/QC SUMMARY

RPD, %	16
RECOVERY, %	99

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103800
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING
PROJECT ID: 6-91-5165
LOCATION: VORELCO

DATE RECEIVED: 05/14/91
DATE ANALYZED: 05/23/91
DATE REPORTED: 05/31/91

Total Volatile Hydrocarbons with BTXE in Soils & Wastes
TVH by California DOHS Method/LUFT Manual October 1989
BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (mg/Kg)	BENZENE (ug/Kg)	TOLUENE (ug/Kg)	ETHYL BENZENE (ug/Kg)	TOTAL XYLENES (ug/Kg)
103800-5	SB-3@5'	2.3	5.2	6.0	ND(5.0)	21
103800-6	SB-3@10'	740	1,200	30,000	9,400	42,000
103800-7	SB-3@15'	5.9	810	480	99	380
103800-8	SB-4@5'	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
103800-9	SB-4@15'	13	610	1,100	170	840
103800-10	MW-4@5'	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
103800-11	MW-4@10'	21	220	700	260	1,300

ND = Not detected at or above reporting limit; Reporting limit indicated in parentheses.

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	94

103800

CHAIN OF CUSTODY RECORD

DATE 5-14-91 PAGE 1 OF 1

PROJECT NAME VORELCO

ADDRESS 2740 Broadway
Oakland, CA

PROJECT NO. 6-91-5765

SAMPLED BY Oliver Christen

LAB NAME Curtis & Tompkins

ESE Environmental Science & Engineering, Inc.
A CILCORP Company
4090 Nelson Avenue
Suite J
Concord, CA 94520
(415) 685-4053
Fax (415) 685-5323

SAMPLE #	DATE	TIME	LOCATION	TPH-gas (8015) and BTEX (8020)	TPH-diesel (8015) & oil scan	Halogenated Volatiles (8010)	MATRIX	NUMBER OF CONTAINERS	REMARKS (CONTAINER, SIZE, ETC.)
MW-1	5/13/91	10:25	Oakland	X	X	X	Water	7	6 VOAs and 1 Liter
MW-3	5/13/91	10:45	Oakland	X	X	X	Water	7	6 VOAs and 1 Liter
TRIP	5/13/91	6:45	Oakland	X			Water	3	3 VOAs
SB-1	5/13/91	8:40, 8:45, 8:55	Oakland				Soil	3	→ HOLD SAMPLES
SB-3 9'	5/13/91	10:01	Oakland	X	X		Soil	1	
SB-3 9'	5/13/91	10:10	Oakland	X	X		Soil	1	
SB-3 15'	5/13/91	10:16	Oakland	X	X		Soil	1	All in Brass Rings
SB-4 5'	5/13/91	10:49	Oakland	X	X		Soil	1	
SB-4 15'	5/13/91	11:00	Oakland	X	X		Soil	1	
MW-4 5'	5/13/91	11:40	Oakland	X	X		Soil	1	
MW-4 10'	5/13/91	13:30	Oakland	X	X		Soil	1	

RELINQUISHED BY: (signature)	RECEIVED BY: (signature)	date	time
1. Oliver Christen		5/14/91	2:35
2.			
3.			
4.			
5.			

27 TOTAL NUMBER OF CONTAINERS

REPORT RESULTS TO: Sue Wickham

SPECIAL SHIPMENT REQUIREMENTS

SAMPLE RECEIPT

CHAIN OF CUSTODY SEALS	
REC'D GOOD CONDTN/COLD	
CONFORMS TO RECORD	

INSTRUCTIONS TO LABORATORY (handling, analyses, storage, etc.):
CALL SUE WICKHAM FOR INSTRUCTIONS
10 v TA

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 05/14/91
DATE REQUESTED: 06/04/91
DATE REPORTED: 06/11/91

LAB NUMBER: 104012

CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING

PROJECT ID: 6-91-5165

LOCATION: VORELCO

RESULTS: SEE ATTACHED

Alice for NCL
QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

Client: Environmental Science & Engineering Laboratory **Login Number: 104012**

Project Name: Vorelco **Report Date:** 11 June 91
Project Number: 6-91-5165

ANALYSIS: pH

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	Method	Analyst	QC Batch
104012-001	SB-3@10'	Soil	13-MAY-91	14-MAY-91	06-JUN-91	7.6	SU *	EPA 9045	TR	1625

* Soil pH measured as water

Curtis & Tompkins, Ltd.

Q C B a t c h R e p o r t

Client: Environmental Science & Engineering
Project Name: Vorelco
Project Number: 6-91-5165

Laboratory Login Number: 104012
Report Date: 11 June 91

ANALYSIS: pH

QC Batch Number: 1625

Calibration Verification Results

Sample	Result	TV	Difference	Limit	Analyzed
ICV	10.00	10.00	.00	< 0.10	06-JUN-91
CCV	10.04	10.00	.04	< 0.10	06-JUN-91

Sample Duplicate Results

Sample	Duplicate	RPD	Analyzed
7.60	7.59	.1%	06-JUN-91

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 104012-1
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING
PROJECT ID: 6-91-5165
LOCATION: VORELCO
SAMPLE ID: SB-3@10'

DATE RECEIVED: 05/14/91
DATE REQUESTED: 06/04/91
DATE ANALYZED: 06/06/91
DATE REPORTED: 06/11/91

EPA 8010: Volatile Halocarbons in Soil & Wastes
Extraction Method: EPA 5030 - Purge & Trap

Compound	RESULT ug/Kg	REPORTING LIMIT ug/Kg
chloromethane	ND	10
bromomethane	ND	10
vinyl chloride	ND	10
chloroethane	ND	10
methylene chloride	ND	5.0
trichlorofluoromethane	ND	5.0
1,1-dichloroethene	ND	5.0
1,1-dichloroethane	ND	5.0
cis-1,2-dichloroethene	ND	5.0
trans-1,2-dichloroethene	ND	5.0
chloroform	ND	5.0
freon 113	ND	5.0
1,2-dichloroethane	ND	5.0
1,1,1-trichloroethane	ND	5.0
carbon tetrachloride	ND	5.0
bromodichloromethane	ND	5.0
1,2-dichloropropane	ND	5.0
cis-1,3-dichloropropene	ND	5.0
trichloroethylene	ND	5.0
1,1,2-trichloroethane	ND	5.0
trans-1,3-dichloropropene	ND	5.0
dibromochloromethane	ND	5.0
2-chloroethylvinyl ether	ND	10
bromoform	ND	5.0
tetrachloroethylene	ND	5.0
1,1,2,2-tetrachloroethane	ND	5.0
chlorobenzene	ND	5.0
1,3-dichlorobenzene	ND	5.0
1,2-dichlorobenzene	ND	5.0
1,4-dichlorobenzene	ND	5.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

Duplicate: Relative % Difference	13
Spike: Average % Recovery	97

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 104012-1
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING
PROJECT ID: 6-91-5165
LOCATION: VORELCO
SAMPLE ID: SB-3@10'

DATE RECEIVED: 05/14/91
DATE REQUESTED: 06/04/91
DATE ANALYZED: 06/06/91
DATE REPORTED: 06/11/91

PARAMETER	RESULT	UNITS	REPORTING LIMIT	METHOD
CADMIUM	0.27	mg/Kg	0.25	EPA 6010
CHROMIUM	27.4	mg/Kg	0.5	EPA 6010
LEAD	5.0	mg/Kg	3.0	EPA 7420
NICKEL	42.5	mg/Kg	1.6	EPA 6010
ZINC	45.5	mg/Kg	0.5	EPA 6010

QA/QC SUMMARY

	RPD, %	Recovery, %
CADMIUM	1	92
CHROMIUM	<1	99
LEAD	5	108
NICKEL	<1	100
ZINC	<1	92

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 104012-1
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING
PROJECT ID: 6-91-5165
LOCATION: VORELCO
SAMPLE ID: SB-3@10'

DATE RECEIVED: 05/14/91
DATE REQUESTED: 06/05/91
DATE ANALYZED: 06/06,10/91
DATE REPORTED: 06/11/91

PARAMETER	RESULT	UNITS	REPORTING LIMIT	METHOD
CYANIDE	ND	mg/Kg	1.0	SW-846 SECTION 7.3.3.2
SULFIDE	ND	mg/Kg	1.0	SW-846 SECTION 7.3.4.1
CORROSIVITY	<6.35	mm/year	--	EPA 1110

QA/QC SUMMARY

	RPD, %	RECOVERY, %
SULFIDE	<1	--
CYANIDE	<1	105
CORROSIVITY	4	--

Curtis & Tompkins, Ltd.

VERBAL ADDITIONS / CANCELLATIONS TO ANALYSIS REQUEST SHEET

CLIENT: ESE DATE: 6/5/91

REQUESTED BY: Oliver Christen TIME: 09:30 am pm

RECORDED BY: Lori L Bruno

Current Lab ID (Previous Lab ID)	Client ID	Circle matrix	Specify add'l or cancel	Analysis	Due date
104012-001 (103800-006)	SB-3@10'	soil water other	ADD	Wet Pb	June 10, 1991
104012-009 (103800-004)	~~SB-3@10'~~ SB-3@10'	soil water other	ADD	RCI: ~~Reactivity~~ Cyanide, Sulfides pH, flash point, corrosivity	6/10/91
(-)		soil water other			
(-)		soil water other			
(-)		soil water other			
(-)		soil water other			
(-)		soil water other			
(-)		soil water other			

Original in job jacket. Copies to analytical departments.

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 05/15/91
DATE REQUESTED: 05/21/91
DATE REPORTED: 05/28/91

LAB NUMBER: 103871

CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING

PROJECT ID: 6-91-5165

LOCATION: VORELCO

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 103871
CLIENT: ENVIRONMENTAL SCIENCE & ENGINEERING
PROJECT ID: 6-91-5165
LOCATION: VORELCO

DATE RECEIVED: 05/15/91
DATE REQUESTED: 05/21/91
DATE EXTRACTED: 05/22/91
DATE ANALYZED: 05/23/91
DATE REPORTED: 05/28/91

Extractable Petroleum Hydrocarbons in Soils & Wastes
California DOHS Method
LUFT Manual October 1989

LAB ID	SAMPLE ID	KEROSENE RANGE (mg/Kg)	DIESEL RANGE (mg/Kg)	REPORTING LIMIT* (mg/Kg)
103871-1	SB-2A @ +10'	ND	ND	1.0
103871-2	SB-2A @ +15'	ND	ND	1.0
103871-3	SB-2B @ +10'	ND	ND	1.0
103871-4	SB-2B @ +15'	ND	ND	1.0

ND = Not Detected at or above reporting limit.

*Reporting limit applies to all analytes.

QA/QC SUMMARY

RPD, %	16
RECOVERY, %	99

Logn 103871

Curtis & Tompkins, Ltd.

VERBAL ADDITIONS / CANCELLATIONS TO ANALYSIS REQUEST SHEET

CLIENT: ESE DATE: 5/21

REQUESTED BY: Sue Wickham TIME: 12:50 am (pm)

RECORDED BY: Joanne Heath Vorelco Proj.

Current Lab ID (Previous Lab ID)	Client ID	Circle matrix	Specify add or cancel	Analysis	Due date
103828-4 (-)	2A@10'	(soil) water other	~~DAS~~	TEH-diesel	5/28
103828-5 (-)	2A@15'	(soil) water other	~~DAS~~	TEH-diesel	5/28
103828-7 (-)	2B@10'	(soil) water other	~~DAS~~	TEH-diesel	5/28
103828-8 (-)	2B@15'	(soil) water other	~~DAS~~	TEH-D	5/28
* On the high (-)		soil ~~water~~ (other)	hit	run 8010 Cd	
(-)		soil water other		Cr Pb	
(-)		soil water other		Zn Ni	
(-)		soil water other			

Original in job jacket. Copies to analytical departments.