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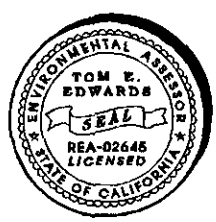
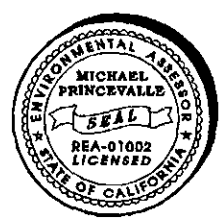
REMEDIATION WORKPLAN

1700 Park Street
Alameda, California

MANAGEMENT AND CONSULTING





California Registered Environmental Assessors
California Certified Engineering Geologist
Oregon Registered Engineering Geologist
Oregon Registered UST Soil Cleanup Supervisors

"An Environmental Management Company"

REMEDIATION WORKPLAN

Cavanaugh Motors Facility
1700 Park Street
Alameda, California

Project Number 109001
April 15, 1992

Prepared for

Mr. Dave Cavanaugh
Cavanaugh Motors
1700 Park Street
Alameda, California 94501

Prepared by

TMC Environmental Inc.
13908 San Pablo Avenue, Suite 101
San Pablo, California 94806

TRANSMITTAL LETTER FROM RESPONSIBLE PARTY

Project name: Remediation Workplan
Cavanaugh Motors
1700 Park Street
Alameda, California 94501
April 15, 1992

Tank Owner Commitment:- The enforcing agencies require the tank owner or responsible party to submit a statement of commitment with all reports and workplans.

The Responsible Party states the following:

___ I agree with the conclusions and recommendations in the workplan.

___ I disagree with the conclusions and recommendations in the workplan.

The facts and findings in the workplan are accurate. The preparation of the workplan followed the guidelines of the Regional Water Quality Control Board and Local Implementing Agency.
I **___do ___do not** request a meeting to discuss the options available to the Responsible Party for investigation or remediation.

_____ Date_____
Signature of Responsible Party

_____
Printed Name

_____
Company Name or Affiliation

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Remediation Workplan

1700 Park Street, Alameda California

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REMEDIATION WORKPLAN

1700 Park Street, Alameda California

1.0 GENERAL SITE INFORMATION

1.1 SITE LOCATION

The Cavanaugh Motors property, called the site in this workplan, is at the following address and description:

1700 Park Street, Alameda, California 94501
Alameda County
Appraisers parcel number: APN 70-192-21-1 and 24
Lots 1, 2, 3, portion of 4, 7 Block E of Alameda
Station Homestead Tract (Book 17 page 60)

The site is at the northeast corner of the intersection of Park Street and Buena Vista Avenue. The corner lot is approximately 150 feet by 200 feet.

1.2 TANK OWNER

The current property owner is:

Lee & Dave Cavanaugh
1700 Park Street
Alameda, California 94501

Mr. Dave Cavanaugh is the owner contact. He can be reached at (510) 523-5246.

1.3 CONSULTANT OF RECORD

The consultant of record for this project is:

TMC Environmental Inc. (TMC)
13908 San Pablo Avenue, Suite 101
San Pablo, California 94806

TMC Environmental, Inc. is the environmental consultant that wrote this workplan. The contact for TMC is Mr. Tom Edwards, President. Mr. Edwards can be reached at 510-232-8366.

1.4 SITE CONDITION

The site is presently being used for an automobile dealership. The site is in a commercial and retail neighborhood. Current activities include: a new car showroom, sales offices, parts storage and distribution, outside car storage, and vehicle repair shop with hydraulic hoists. Foot and vehicle traffic is heavy in this neighborhood and site. The site contains a large building with paved parking areas and driveways.

Access to the dealership is from both Park Street that borders the property on the northwest and Buena Vista Avenue that borders the property on the southwest. A gasoline station and automobile dealers occur across Park Street to the north. A motor vehicle repair shop bounds the site on the east. Adjacent to the site on the south is a residential neighborhood.

1.5 GEOLOGY

The site is less than one half mile west of the Oakland Estuary and Inner Harbor Waterway. San Francisco Bay is about one mile west of the site. The Inner Harbor Waterway connects San Leandro Bay and San Francisco Bay. As suggested by U.S. Geological Survey geological publications, the site is on the Alameda Bay Plain that has an alluvial fan environment. The Merritt Sand Formation is the main stratigraphic unit in the upper aquifer. This unit usually has unconsolidated beach sand and near shore deposits.

Borings on the site have encountered unconsolidated sands and clayey sands. Lenses of sandy clay occur in the sand. It appears that groundwater in the Merritt Sand Formation is unconfined. Ground water is about eight feet below surface grade (bsg) at the site. The average direction of ground water flow as measured in three ground water monitoring wells during four sampling episodes was approximately **North 75 degrees West** with a gradient of 0.0081 ft/ft.

1.6 LEAD IMPLEMENTING AGENCY

As stated in a letter to Mr. Dave Cavanaugh dated January 31, 1990 from the Alameda County Health Care Services Agency; the agency authorized by the Regional Water Quality Control Board (RWQCB) to oversee this site is:

> Alameda County Health Care Services Agency
> Department of Environmental Health
> Division of Hazardous Materials
> 80 Swan Way, Room 200, Oakland, California 94621

The officer overseeing this case is: Mr. Brian Oliva, Hazardous Materials Specialist. Mr. Oliva at can be called at 510-271-4320.

TMC followed the guidelines by the enforcing agency and the Bay Area Regional Water Quality Control Board (RWQCB) in preparing this workplan. The investigation, reclamation, and reporting guidelines applicable to leaking underground fuel tanks, available through these agencies, apply to this discharge.

The investigation and remediation work required at this site appears in the most recent guidelines published by the State Water Resources Control Board. The guidelines are:

> Leaking Underground Fuel Tank (LUFT) Field Manual
> State Water Resources Control Board
> P.O. Box 100, Sacramento, California 95801

The Regional Boards covering the North Coast, San Francisco Bay and the Central Valley have collaborated on a set of guidelines to ensure consistent site investigation in their regions. These guidelines supplement the LUFT Field Manual. The guidelines are:

> Regional Board Staff Recommendations For Initial
> Evaluation and Investigation of Underground Tanks
> July 6, 1990 (known as tri-regional recommendations)

These guidelines are available from the Alameda County Health Care Services Agency.

2.0 SITE HISTORY

2.1 BACKGROUND

Mr. William S. Bean, the first landholder, owned the property from 1948 until 1981. The property, developed in 1948 as a new automobile dealership, has remained an automobile dealership. In 1981, Mr. Bean sold the property to Lee & Dave Cavanaugh, the present owners. The two underground tanks installed on the site by Mr. Bean in 1948 were a 550 gallon gasoline storage tank and a 300 gallon waste oil storage tank. Scott Corporation removed the 550 gallon gasoline tank, dispenser, and piping on December 15, 1989.

A six inch thick concrete floor overlaid the 300 gallon waste oil storage tank inside the vehicle repair shop. Next to the tank was a hydraulic lift and the north wall of the building. A fill pipe of approximately four feet in length connected the south end of the tank to a fill hole in the concrete floor. On August 14, 1990, TMC and Gene L. Failing Company removed the 300 gallon waste oil tank and related lines. TMC summarized the tank removal methods and results in an April 8, 1991 report submitted to Cavanaugh Motors called, Tank Removal and Soil Excavation Report.

2.2 TANK INFORMATION

Mr. Cavanaugh reports that only two underground storage tanks have existed on the site as follows:

Tank 1:

550 gallon metal gasoline tank
Installation date 1948
Removed December 15, 1989
One dispenser on top of the tank

Tank 2:

300 gallon metal waste oil tank
Installation date 1948
Removed August 14, 1990
No remote fills

2.3 KNOWN OFF SITE FUEL LEAKS

There are four known sites with fuel leaks around Cavanaugh Motors. Because two of the four sites are next to Cavanaugh Motors, pollution from off site is possible. We have summarized the fuel leak problems associated with each site (as reported in the files of the RWQCB) as follows:

1. Alameda Collision, 1911 Park Street-
Removal of the gasoline tank occurred on June, 1988. Gasoline contamination effects the soil and ground water. The maximum amount of gasoline in ground water was 1.7 ppm. The site may be down gradient of Cavanaugh Motors.

2. Mobil Service Station, 1541 Park Street-
Closure of the underground gasoline tanks occurred during October of 1987. Gasoline effects the soil and ground water. The maximum TPH as gasoline concentration in tank removal soil samples was 3200 ppm. Resulting ground water sampling shows a gasoline concentration of up to 2000 ppb. This property may be up gradient of Cavanaugh Motors.

3. Good Chevrolet, 1630 Park Street-
Closure of two tanks occurred during October of 1986. The maximum soil TPH as gasoline concentration collected beneath the tanks was 2500 ppm. Ground water contains as much as 7600 ppb of gasoline. This site is less than one block west of Cavanaugh Motors and may be up gradient.

4. Regal Exxon Service Station, 1725 Park Street-
Removal and replacement of the tanks occurred in June 1988. Discovery of soil and ground water contamination happened during the installation of new tanks. Subse-

quent ground water sampling has shown gasoline concentrations as high as 110,000 ppb. There is no report of free product on the ground water. This site is directly across Park street from Cavanaugh Motors.

3.0 CHRONOLOGY OF PAST INVESTIGATIONS

3.1 PRELIMINARY ASSESSMENT REPORT

TMC prepared the Preliminary Assessment Report, dated July 11, 1990. The investigation concerned the former 550 gallon gasoline tank. The waste oil tank had not become an active case at this time. The report used the results of sampling the gasoline tank excavation, four soil borings, and four ground water monitoring wells.

3.2 SOIL EXCAVATION AND TANK REMOVAL REPORT

TMC prepared the Soil Excavation and Tank Removal Report, dated April 8, 1991 and submitted to Cavanaugh Motors. The report presents the procedures and results of the 300 gallon waste oil tank removal. We inspected for evidence of soil contamination by drilling six borings around the waste oil tank excavation. TMC excavated approximately 120 cubic yards of waste oil contaminated soil surrounding the tank. We based the limits of the excavation on the results of the exploratory borings. Gene Failing Company, engineering contractor, of Campbell, California excavated then back filled the excavation with clean imported fill.

3.3 STATUS REPORT BY TMC ENVIRONMENTAL

TMC prepared the Status Report dated January 15, 1992. We installed two more monitoring wells called MW-5 and MW-6. The total number of monitoring wells on site is six. Water sampling, groundwater measurements, and laboratory analysis were part of the study. TMC also drilled one hand augured boring, B6, north of the waste oil tank excavation.

4.0 CONTAMINATION INFORMATION

This section provides a quick reference to the information in the previously submitted reports and certified analytical reports.

4.1 550 GALLON GASOLINE TANK

The dealership recorded daily inventory records from 1948 until August 10, 1989 when the gasoline tank retired from service. A certified underground tank testing company tested the gasoline tank in August 1986, June 1988, and August 1989. The August 4, 1989 tank test suggested the filler tube was leaking. The period of product loss is less than one year, between tank testing episodes. Cavanaugh Motors believes the product loss was small. The tank, dispenser, and piping appeared in good condition with no holes when removed on December 15, 1989 by the Scott Corporation. The Scott Corporation excavated approximately 10-15 cubic yards of soil during the tank removal.

TMC removed most of the accessible gasoline contaminated soil in a controlled excavation on April 26, 1990. Cavanaugh Motors aerated the excavated soil on site, then disposed of the treated soil at Durham Landfill. The adjacent building and driveway prevented the complete excavation of the gasoline contaminated soil. Soil borings, drilled by TMC, found no detectable gasoline. These soil borings defined the extent of soil contamination.

TMC installed and sampled four ground water monitoring wells. Cavanaugh Motors aerated the excavated soil on-site until there no detectable gasoline remained. TMC reported the results of the 550 gallon gasoline tank investigation in a report dated July 11, 1990, titled "Preliminary Assessment Report" submitted to Cavanaugh Motors.

The following tables summarize the results of soil and water sampling and analyses in the report:

TABLE 1. GASOLINE RESULTS FOR SOIL SAMPLES

Date Sampled	*Sample & depth*	*TPH gas mg/Kg*	*Benzene mg/kg*	*Toluene mg/kg*	*Ethyl benzene mg/Kg*	*Xylenes mg/Kg*
4-26-90	SOUTH-1	ND<0.5	ND<0.005	ND<0.005	ND<0.005	ND<0.005
4-26-90	WEST-1	ND<0.5	ND<0.005	ND<0.005	ND<0.005	ND<0.005
5-19-90	EB-1,5'	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
5-19-90	EB-2,5'	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
5-19-90	EB-3,5'	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
5-19-90	EB-4,5'	ND<1.0	ND<0.005	ND<0.005	ND<0.005	0.034
5-17-90	MW-1,5'	3,500	ND<0.005	190	76	510
5-17-90	MW-2,5'	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
5-17-90	MW-3,5'	ND<1.0	ND<0.005	ND<0.005	ND<0.005	ND<0.005
5-17-90	MW-4,5'	ND<1.0	ND<0.005	ND<0.005	ND<0.005	0.034
6-26-91	B-6, 8'	ND<1.0	ND<0.005	0.011	ND<0.005	0.029
6-26-91	MW-5, 5'	ND<1.0	ND<0.005	ND<0.005	ND<0.005	0.021
6-26-91	MW-6, 15'	ND<1.0	ND<0.005	0.0072	0.0052	0.028
6-26-91	MW-6, 20'	ND<1.0	ND<0.005	ND<0.005	ND<0.005	0.015

ND- Not detected below reporting limits

4.2 300 GALLON WASTE OIL TANK

During removal of the 300 gallon waste oil tank on August 4, 1990 by TMC, many holes were observed in the metal tank. Stained soil surrounded the tank. There is no estimate of the quantity of released waste oil. Soil borings and a controlled excavation removed 120 cubic yards of waste oil contaminated soil. TMC reported the results of the 300 gallon waste oil tank removal in a report dated April 8, 1991 titled "Tank Removal and Soil Excavation Report" submitted to Cavanaugh Motors.

The following tables summarize the results of soil sampling and laboratory tests in this report:

TABLE 2. OIL AND DIESEL RESULTS FOR SOIL SAMPLES

Date Sampled	*Sample & depth*	*Oil & Grease mg/Kg*	*Kerosene mg/kg*	*Diesel mg/kg*	*Motor Oil mg/kg*
8-31-90	SS-1 18" below tank	20,000	NA	6,400	NA
10-10-90	B-1, 7'	ND<30	NA	ND<10	NA
10-10-90	B-3, 8'	ND<30	NA	ND<10	NA
10-10-90	B-4, 8'	710	NA	680	NA
10-10-90	B-5, 8'	ND<30	NA	ND<10	NA
6-26-91	B-6, 8'	ND<50.0	ND<1.0	ND<1.0	ND<100
6-26-912	MW-5, 5'	ND<50.0	ND<1.0	ND<1.0	ND<100
6-26-91	MW-6, 15'	ND<50.0	ND<1.0	ND<1.0	ND<100
6-26-91	MW-6, 20'	ND<50.0	ND<1.0	ND<1.0	ND<100

ND- Not detected below reporting limits
NA- Not analyzed for this constituent

4.3 GROUNDWATER SAMPLING

TMC had the ground water from monitoring wells MW-1, MW-2, MW-3 and MW-4 tested for the target fuel chemicals: total volatile hydrocarbons (TVH) as gasoline and benzene, toluene, ethylbenzene, and total xylene (BTEX). The groundwater from wells MW-3, MW-5, and MW-6 was tested for the fuel chemicals TVH as gasoline with BTEX, diesel, oil & grease and purgeable halocarbons. The certified analytical reports in the original reports contain quality assurance and quality control (QA/QC) data. The following Tables summarize the chemical compounds detected. The first table lists the gasoline results for groundwater samples:

TABLE 3. GASOLINE RESULTS FOR GROUNDWATER SAMPLES

Date Sampled	*Monitoring Well*	*TPH gas ug/L*	*Benzene ug/L*	*Toluene ug/L*	*Ethyl benzene ug/L*	*Xylenes ug/L*
6-08-90	MW-1	28,000.	6200.	7000.	630.	6100.
6-08-90	MW-2	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
6-08-90	MW-3	ND<50	ND<0.5	ND<0.5	ND<0.5	0.9
6-08-90	MW-4	ND<50	ND<0.5	ND<0.5	ND<0.5	0.9
12-17-90	MW-1	7,200.	620.	250.	1200.	1400.
12-17-90	MW-2	ND<50	1.1	ND<0.5	2.3	2.1
12-17-90	MW-3	140	ND<0.5	1.3	1.3	9.1
12-17-90	MW-4	ND<50	ND<0.5	ND<0.5	ND<0.5	0.9
7-30-91	MW-1	21,000.	890.	1900.	320.	1700.
7-30-91	MW-2	ND<50	ND<0.5	ND<0.5	ND<0.5	0.9
7-18-91	MW-3	ND<50	ND<0.5	ND<0.5	ND<0.5	0.9
7-30-91	MW-4	ND<50	ND<0.5	ND<0.5	ND<0.5	0.9
7-18-91	MW-5	ND<50	ND<0.5	ND<0.5	ND<0.5	0.9
7-18-91	MW-6	ND<50	1.3	ND<0.5	ND<0.5	1.6
12-4-91	MW-1	4,300.	3.2	1.3	88.	630.
12-4-91	MW-2	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
12-4-91	MW-3	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
12-4-91	MW-4	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
12-4-91	MW-5	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
12-4-91	MW-6	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5

ND- Not detected below reporting limits

The following table presents the results of laboratory analyses for extractable petroleum hydrocarbons and purgeable halocarbons in water:

TABLE 4. DIESEL AND OIL RESULTS FOR WATER SAMPLES

Date Sampled	*Monitoring Well*	*Diesel ug/L*	*Kerosene ug/L*	*Oil & Grease mg/L*	*Chlorobenzene ug/L*
7-18-91	MW-3	NA	NA	ND<5	NA
7-18-91	MW-5	NA	NA	ND<5	NA
7-18-91	MW-6	NA	NA	ND<5	NA
12-4-91	MW-3	ND<50	ND<50	ND<5	ND<1.0
12-4-91	MW-5*	ND<50	ND<50	ND<5	4.6
12-4-91	MW-6*	1,400	ND<50	ND<5	33

ND- NOT DETECTED BELOW REPORTING LIMITS
NA- NOT ANALYZED BY LABORATORY

5.0 ASSESSMENT AND OBJECTIVES

5.1 ESTIMATE OF SPILLED OR LEAKED PRODUCTS

No precise estimate of spilled or leaked product is available. Inventory records for the gasoline tank suggest leakage of less than one years duration. The area of gasoline contamination is small. No gasoline product is on the water surface.

No inventory records for the waste oil tank are available. The area of oil contamination is small. No oil layer is present on the water surface.

5.2 SITE HYDROGEOLOGY

The first water containing layer consists mostly of fine to medium grained, clayey sand. The clayey sand contains scattered sand and clay lenses. The shallow water-bearing sand beneath the site is unconfined. By measuring the water levels at three groundwater monitoring wells, we estimated the direction of groundwater flow. The following table summarizes the groundwater measurements recorded for selected monitoring wells.

TABLE 5. GROUNDWATER MEASUREMENTS FROM MONITORING WELLS

Date	*Well Number*	*Water Level*	*Casing Elevation*	*Water Elevation*
6-20-90	MW2	7.16	16.73	9.57
6-20-90	MW3	7.37	16.89	8.52
6-20-90	MW4	7.60	16.39	8.79
12-17-90	MW2	8.78	16.73	7.95
12-17-90	MW3	8.42	16.89	8.47
12-17-90	MW4	8.61	16.39	7.78
9-13-90	MW2	8.78	16.73	7.95
9-13-90	MW3	8.70	16.89	8.19
9-13-90	MW4	8.80	16.39	7.59
12-4-90	MW2	7.99	16.73	8.74
12-4-90	MW3	8.18	16.89	8.71
12-4-90	MW4	8.26	16.39	8.13

The following table summarizes the estimated groundwater flow direction and gradient. We used a three point solution to estimate the flow direction and gradient. We avoided using well MW1 in the estimate because it is in the back fill of the tank excavation.

TABLE 6. GROUNDWATER FLOW DIRECTIONS AND GRADIENTS

Date	*Direction of Flow*	*Horizontal Gradient*
June 20, 1990	North 26 degrees West	0.0088 ft/ft
September 13, 1990	North 91 degrees West	0.0073 ft/ft
December 17, 1990	North 106 degrees West	0.0069 ft/ft
December 4, 1991	North 77 degrees West	0.0093 ft/ft

The groundwater flow direction and the horizontal gradient vary between measurements. The changing groundwater flow direction may suggest the shallow water layer is sensitive to seasonal changes in rainfall. The average of the above data is a North 75 degrees West flow direction at an average horizontal gradient of 0.0081 ft/ft.

5.3 SOIL CONTAMINATION

Cavanaugh Motors dug out the accessible contaminated soil at both tank locations. An area of gasoline contaminated soil remains under the excavation and foundation wall next to the former gasoline tank. A small area of waste oil contaminated soil remains under the foundation wall next to the former waste oil tank. The extent of soil contamination is defined by soil borings.

Cavanaugh Motors is proposing to remove the remaining gasoline contamination by soil venting. Cavanaugh Motors is proposing to leave the remaining oil & grease contamination under the foundation wall. Cavanaugh Motors believes the small quantity of nonvolatile contamination is not an environmental or public health concern. The contamination is capped and inaccessible. Cavanaugh Motors agrees to disclose the presence of the contamination to any future developer upon sale of the property with conditions for the removal of the contaminated soil.

5.4 GROUNDWATER CONTAMINATION

Groundwater sampling occurred on an sporadic schedule during the last two years. Wells MW-2, MW-3, MW-4, MW-5, and MW-6 have shown no detectable gasoline. Well MW-1, located in the pit of the former gasoline tank, shows levels of gasoline and BTEX above action limits. The groundwater contamination in the gasoline pit does not appear to be migrating and appears confined to the pit.

Sampling of wells MW-3, MW-5, and MW-6 for gasoline, BTEX, and oil & grease has shown no detectable results in two sampling intervals. Analysis for extractable hydrocarbons (diesel) and purgeable halocarbons occurred for the first time on December 4, 1991. Well MW-6, in the waste oil tank excavation, had a concentration of diesel at 1600 ppb. The laboratory reported chlorobenzene in well MW-6 at a concentration of 33 ppb and in well MW-5 at a concentration of 3 ppb. The laboratory reported no diesel or chlorobenzene in well MW-3 that is down gradient from the waste oil tank.

6.0 PROPOSED WORK AND SCHEDULE

6.1 OBJECTIVES

TMC Environmental Inc. is presenting the work proposed for the continued cleanup (remediation) of Cavanaugh Motors. The Alameda County Health Care Services Agency required "interim remediation" in a letter dated January 29, 1992, to Cavanaugh Motors. The purpose of this work is to:

1) reduce the amount of gasoline in the soils around the former gasoline tank using a soil venting system

2) monitor the presence of gasoline and waste oil in the ground water to establish a one year period of regular sampling results

6.2 SCOPE OF WORK

The scope of work for the remediation includes the following tasks:

1) the permitting and operation of a soil venting system

2) the drilling of four borings at the finish of soil venting

3) the sampling of the six ground water monitoring wells on a quarter year schedule for gasoline and waste oil

4) the preparation of a report with the results of the remediation and ground water monitoring

5) the aeration and disposal of stockpiled soil to an appropriate landfill

6.3 RATIONAL FOR GROUND WATER MONITORING

Ground water measurements suggest the water beneath the site is flowing westward toward Park Street. The average direction of ground water flow is **North 75 degrees West** with an average gradient of 0.0081 ft/ft. None of the ground water monitoring wells contain floating gasoline product or floating waste oil. The down gradient wells from both former tank locations, show no detectable petroleum fuel or waste oil.

Dissolved gasoline is present within the ground water at monitoring well MW-1. Well MW-1 is in the back fill of the tank excavation. The results of soil sampling suggest the gasoline remains in the sand at a depth of 5-7 feet below grade. The soil venting system will remove the threat of further ground water contamination.

The laboratory reported detectable concentrations of diesel in well MW-6 in the waste oil tank pit. The laboratory reported low concentrations of chlorobenzene in wells MW-6 and MW-5. The down gradient well shows no detectable diesel or chlorobenzene. The majority of soil contamination was dug out. It is likely that the water contamination is residual and may degrade naturally now that the generator is removed.

We propose a quarterly ground water monitoring program of one years duration. The purpose of the monitoring program is to obtain a minimum one year sampling data base. Water samples will be recovered from each well for the laboratory analysis of total petroleum hydrocarbons as gasoline and BTEX distinction. Wells MW-3, MW-5, and MW-6 will also be sampled for hydrocarbon oil & grease, diesel, and halogenated volatile compounds. A State licensed environmental laboratory will do the chemical testing. Water samples will be collected from the well following development, purging, and surveying as outlined in the project workplan.

6.4 RATIONAL FOR SOIL VAPOR EXTRACTION

Cavanaugh Motors is proposing to install and operate a soil venting system to conclude the clean up of gasoline at the former underground gasoline tank location. TMC will install vapor extraction wells surrounding the remaining area of gasoline

contamination. The location of the soil vapor borings is displayed on Plate 3, Remediation Map.

Gasoline contaminated soil with a concentration of 3500 mg/Kg remains beneath the excavation at a depth of 5 to 7 feet. We estimate about 400 cubic yards of gasoline contaminated soil, above 100 mg/Kg total petroleum hydrocarbons as gasoline, could remain. Sandy soils are present to a depth of about 15 feet below grade. The ground water surface is about 7 feet below grade. The small areal extent of volatile contamination and sandy soil conditions favor the soil venting method of remediation.

6.5 SCHEDULE OF WORK

Permitting of the soil venting system through the Bay Area Air Quality Management District is the most time consuming procedure. Permitting delays of 3 months are not uncommon. Verbal laboratory results are available 10 working days after sampling. We have not included provisions in this workplan for rush service on laboratory testing. The final report will be available when all documentation is in our office. Quarterly progress reports will be provided to the lead agency.

TMC Environmental Inc. is available to begin work upon receipt of authorization to proceed from the Client and the Alameda County Department of Environmental Health. An estimated schedule for doing the soil venting work is as follows:

TASK	WEEKS
Authorization to Proceed	1
Agency Permitting	5-16
Soil Pile Aeration	12
Installation of Soil Venting	4
Conduct Vapor Extraction	12
Final Borings and Samples	2
Final Report	4

We estimate a total of 24 weeks to do this project. TMC Environmental Inc. is confident that we can complete this project in an efficient and cost effective manner.

7.0 SOIL VENTING

7.1 SOIL VENTING CLEAN UP GOALS

Cavanaugh Motors proposes to install a soil venting system to reduce gasoline surrounding the former location of the underground gasoline tank. By withdrawing vapor from the contaminated soil, the volatile hydrocarbons are released into the air stream. Providing a continual flow through the soil can reduce volatile hydrocarbon concentrations significantly. Activated carbon canisters remove the hydrocarbon vapor from the air. Our objective is to reduce soil gasoline concentrations to the following:

Total Volatile Hydrocarbons as Gasoline	100 mg/Kg
Benzene	10 mg/Kg
Toluene	40 mg/Kg
Ethylbenzene	100 mg/Kg
Total Xylenes	100 mg/Kg

These clean up goals would be confirmed by soil samples and laboratory testing.

7.2 SOIL VENTING SYSTEM DESIGN

Soil gasoline concentrations will be reduced using a conventional soil venting system. A soil venting system using carbon canisters needs no health risk analysis.

The soil venting borings use the same sealing guidelines as for ground water monitoring wells. The eight inch boring contains 2 feet of blank 2 inch PVC casing and 5 feet of 2 inch screen with a 0.020 slot and 2/16 sand. The vapor boring well screen is from 2 to 7 feet below grade. The sand pack extends from a depth of 3 to 7 feet. One and ½ foot of bentonite pellet seal is on top of the sand. One and ½ feet of neat portland cement surface seal is on top of the bentonite.

The soil venting system has a Rotron blower that can extract vapor at a rate of 100 cubic feet per minute (cfm). The enclosed unit is protected against adverse weather conditions. Extracted vapors flow through the blower to two vapor phase carbon

canisters joined in series. The vapor phase canisters will be used to meet Bay Area Air Quality Management District release requirements of less than 10 ppm hydrocarbon vapor.

The testing of air from three sample ports determines when the carbon canisters need to be replaced. The sampling port located at the well head is used to measure the amount of gasoline vapor coming from the ground. The sampling port located between the canisters will be used to monitor the condition of the first carbon canister. The sampling port at the system's effluent will be used to monitor the air released to the atmosphere and last carbon canister condition.

A quick estimate of the minimum flow rates can be made by dividing the total void volume in the target area by a standard turnover time. We estimate the volume of contaminated soil at less than 10,800 cubic feet. Soil in the contaminated area is mostly sand. Using a void space in sand of 30%, the void space in the contaminated area is 3,240 cubic feet. Using a turnover time of 45 minutes, a minimum flow rate of about 75 cfm is appropriate. The Rotron blower has a flow rate of 100 cfm. We estimate that the small Rotron blower unit is satisfactory for this application.

7.3 SOIL VENTING SYSTEM CONDITIONS AND MONITORING

The following conditions conform to the requirements of the Bay Area Air Quality Management District conditional Authority to Construct/ Permit to Operate.

The soil venting borings will be piped directly into the single blower of the soil venting system. The blower, called S-1, is the source of hydrocarbon emissions. The two carbon canisters are abatement devices called A-1 and A-2, with A-1 closest to the source S-1. The stack pipe connected to the last carbon canister is the emission point, called P-1. The following system conditions apply to source S-1:

1. The source S-1 will be vented to at least two 150 pound (55 gallon) activated carbon vessels (or canisters) arranged in series.

2. The second to last carbon bed A-1 will be changed out with unspent carbon upon the detection at the carbon vessel outlet of 10% of the inlet stream

hydrocarbon concentration to the carbon vessel as measured by a flame ionization detector (OVA-FID).

3. The last carbon bed A-2 will be changed out with unspent carbon upon the detection at the vessel outlet of initial hydrocarbon breakthrough as measured with an organic vapor analyzer-flame ionization detector (OVA-FID).

4. The limits set forth in Conditions number 2 and 3 will apply to non-methane hydrocarbon emissions. To find the presence of methane in the exhaust stream, a reading will be taken with and without a carbon filter tip fitted on the OVA-FID probe. Concentrations measured with the carbon filter tip in place will be considered methane for these conditions.

5. The source S-1 will be monitored by collecting and analyzing an air sample with a portable field instrument using a flame ionization detector (FID). No air bag samples will be collected for laboratory analysis. Monitoring will occur at the following locations:

   a) At the exhaust of S-1; the inlet to carbon bed A-1

   b) At the exhaust of A-1; the inlet to carbon bed A-2

   c) At the outlet of carbon bed A-2; the carbon bed that is last in series before venting to the atmosphere.

   The air sample readings will be recorded in a monitoring log when taken. The monitoring results will be used to:

   a) Calculate the time of predicted breakthrough of organic compounds as carbon on a dry basis after carbon adsorption to maintain compliance with condition number 3

   b) Determine the frequency of carbon change out necessary to maintain compliance with condition number 2

c) To maintain compliance with conditions number 2 and 3, the monitoring will be conducted daily. Based on actual measurements taken at the site during operation of the source S-1, a proposal will be made to change the monitoring schedule, based on the decline in organic emissions and/or the demonstrated breakthrough rates of the carbon vessels. Written approval by the Bay Area Air Quality Management District will be received before a change to the monitoring schedule.

6. The following information will be maintained in a log format for each month of operation of the source:

a) The hours of operation
b) Each monitoring reading or analysis result for the day of operation they are taken
c) The calculation of organic breakthrough from the carbon beds
d) The number of carbon beds removed from service.

Any variation from condition number 2 or 3 will be reported in a separate letter with the log also the corrective action taken. In addition, a variation of condition number 2 or 3 will be submitted to the Bay Area Air Quality Management District at the time it occurs. The submittal will detail the corrective action taken and will include the data showing the variation as well at the time of occurrence.

A file will be maintained containing all measurements, records and other data that are collected pursuant to the various provisions of this conditional Authority to Construct/Permit to Operate. All measurements, records and data will be maintained for at least two years following the date the data is recorded.

7.4 EMERGENCY SYSTEM SHUT DOWN

If the monitoring vapor readings at the outlet of carbon bed A-2 shows detectable results, the source blower S-1 will be shut down and both vapor canisters in series will be replaced before restarting the system.

7.5 FINAL SYSTEM SHUT DOWN

When the vapor concentration of the extracted vapor is less than 100 ppm the verifying borings will be drilled. The system will continue to run until the laboratory analysis confirms the removal of gasoline from the soil. We propose to abandon the vent wells with pressurized grout.

7.6 SOILS BORING VERIFICATION PROGRAM

TMC Environmental Inc. proposes to drill four exploratory soil borings in the vicinity of the former location of the underground gasoline tank. The borings would be sampled at five to seven feet below grade within the area of soil venting.

Four soil samples would be submitted to a State certified Environmental Laboratory for laboratory chemical analysis of TPH as gasoline with benzene, toluene, ethylbenzene, and total xylenes (BTEX) distinction. The borings will verify that gasoline concentrations are below vapor extraction goals. The drilling of the borings and soil sampling would be done according to the standard operating field procedures, located in the project work plan already submitted and approved by the lead agencies.

7.7 SOIL PILE REMEDIATION AND DISPOSAL

About 120 cubic yards of diesel and oil & grease contaminated soil is on site in a stockpile. Sampling of the soil pile occurred on December 5, 1991. We collected two composite soil samples from eight random locations within the soil pile. The laboratory reported the following concentrations: diesel fuel at 44 and 54 mg/Kg; hydrocarbon oil & grease at 3600 and 5000 mg/Kg; tetrachloroethylene at 10 and 58 ug/Kg (tetrachloroethylene was the only volatile hydrocarbon detected); barium at 61.1 and 64.2 mg/Kg; chromium at 36.2 and 33.6 mg/Kg; lead at 84 and 150 mg/Kg. The laboratory reported no detectable arsenic, cadmium, mercury, selenium, or silver.

Cavanaugh Motors is proposing to land farm the soil pile for additional 3 months to aerate out the remaining tetrachloroethylene. The pile will be turned over every week using tractor equipment. The pile will then be sampled according to the requirements

of the designated landfill. The soil will be transported for disposal by a licensed hazardous waste hauler to an appropriate landfill.

8.0 PREPARATION OF A REPORT

A technical report will be prepared following the guidelines of the Regional Water Quality Control Board and the Alameda County Environmental Health Services Agency. The report will be signed by a State-Certified Engineering Geologist. Recommendations will be presented for further ground water investigation or remediation if warranted. The report will present the results of the ground water monitoring program and soil venting remediation. Copies of the report would be distributed to the Alameda County Environmental Health Services Agency and Regional Water Quality Control Board for agency review.

9.0 STANDARD OPERATING PROCEDURES

The protocol of standard operating field procedures contained in the April 15, 1991 "Site Contamination Workplan" applies to all work done under this remediation workplan.

10.0 SITE SPECIFIC SAFETY PLAN

The site specific safety plan contained in the April 15, 1991 "Site Contamination Workplan" applies to all work done under this remediation workplan.

11.0 QUALITY ASSURANCE AND QUALITY CONTROL

The quality assurance and quality control plan contained in the April 15, 1991 "Site Contamination Workplan" applies to all work done under this remediation workplan.

12.0 LIMITATIONS

The procedures and opinions in this workplan follow professional practice as recommended by the guidelines of the California Regional Water Quality Control Board for addressing fuel leaks from underground tanks. This workplan is only part of the ongoing work required by the lead implementing agency at this site. The lab test results rely on limited data collected at the sampling location only. Budget constraints restrict the amount of testing allowed. The lab test results do not apply to the general site as a whole. Therefore, TMC Environmental Inc. cannot have complete knowledge of the underlying conditions.

We provide the information in the resulting report to our client so he may make a more informed decision about site conditions. The professional opinion and judgement in the reports is subject to revisions in light of new information. We do not state or imply any guarantees or warranties that the subject property is or is not free of environmental impairment. Monitoring wells and soil venting wells are temporary sampling and remediation wells that eventually must be permitted and destroyed by a licensed driller at client expense. The owner/responsible party assumes sole responsibility for contamination that is not cleaned up, and for complying with future more stringent requirements and clean-up levels.

13.0 CERTIFICATION

I supervised the preparation of the Remediation Workplan dated April 15, 1992 for the Cavanaugh Motors facility in the City of Alameda, Alameda County, California. The investigation used techniques and standards of care common to the consulting geologic profession in California. My certification as an engineering geologist by the State of California, Board of Registration for Geologists and Geophysicists, license number EG-1380, expires on June 30, 1992. This license is active and currently in good standing with the Board of Registration.

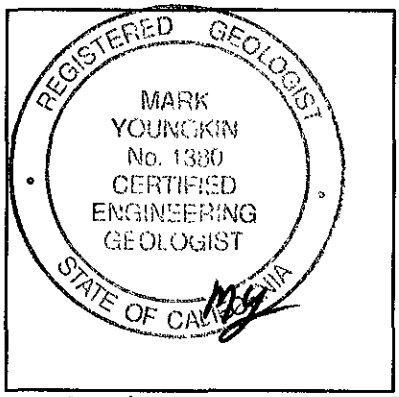
Certifying Professional:

TMC Environmental, Inc.
Vice President

Mark T. Youngkin

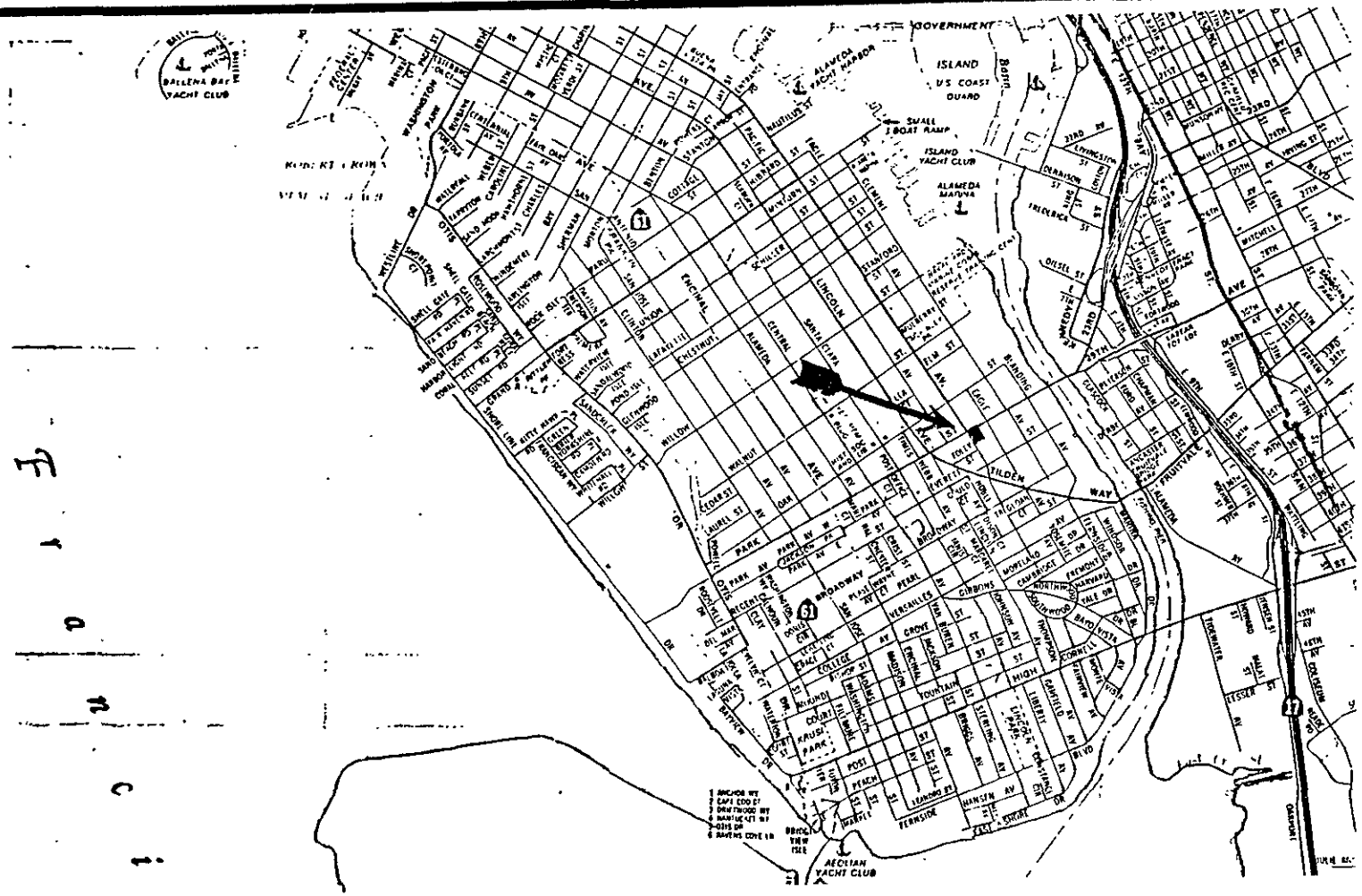
Mark T. Youngkin
Certified Engineering Geologist No. EG-1380

Dated April 23, 1992



Geologist Seal

This document, signed and stamped with seal, follows section 7835 of the Geologist and Geophysicists Act, Business and Professionals Code, State of California and the requirements of the California Regional Water Quality Control Board, San Francisco Bay Region.



Base Map from Thomas Bros. Maps, California Road Atlas, 1988

LEGEND

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Scale: 1 inch = 2200 feet

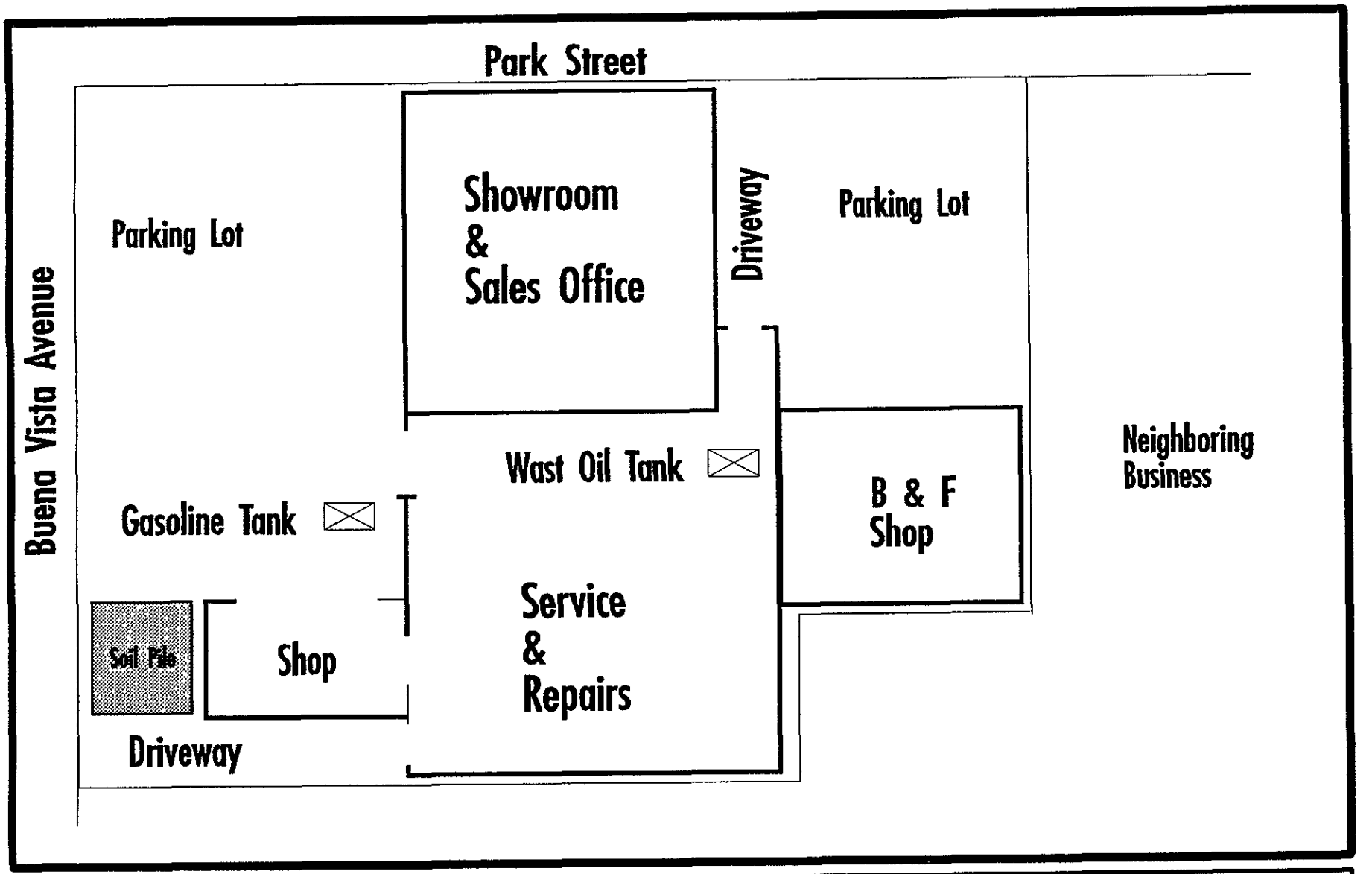
SITE VICINITY MAP

Cavanaugh Motors

1700 Park Street, Alameda, California

TMC ENVIRONMENTAL INC, SAN PABLO, CALIFORNIA

PLATE 1



LEGEND

Scale: 1 inch = 30 feet
Project No. 109001
April 15, 1992

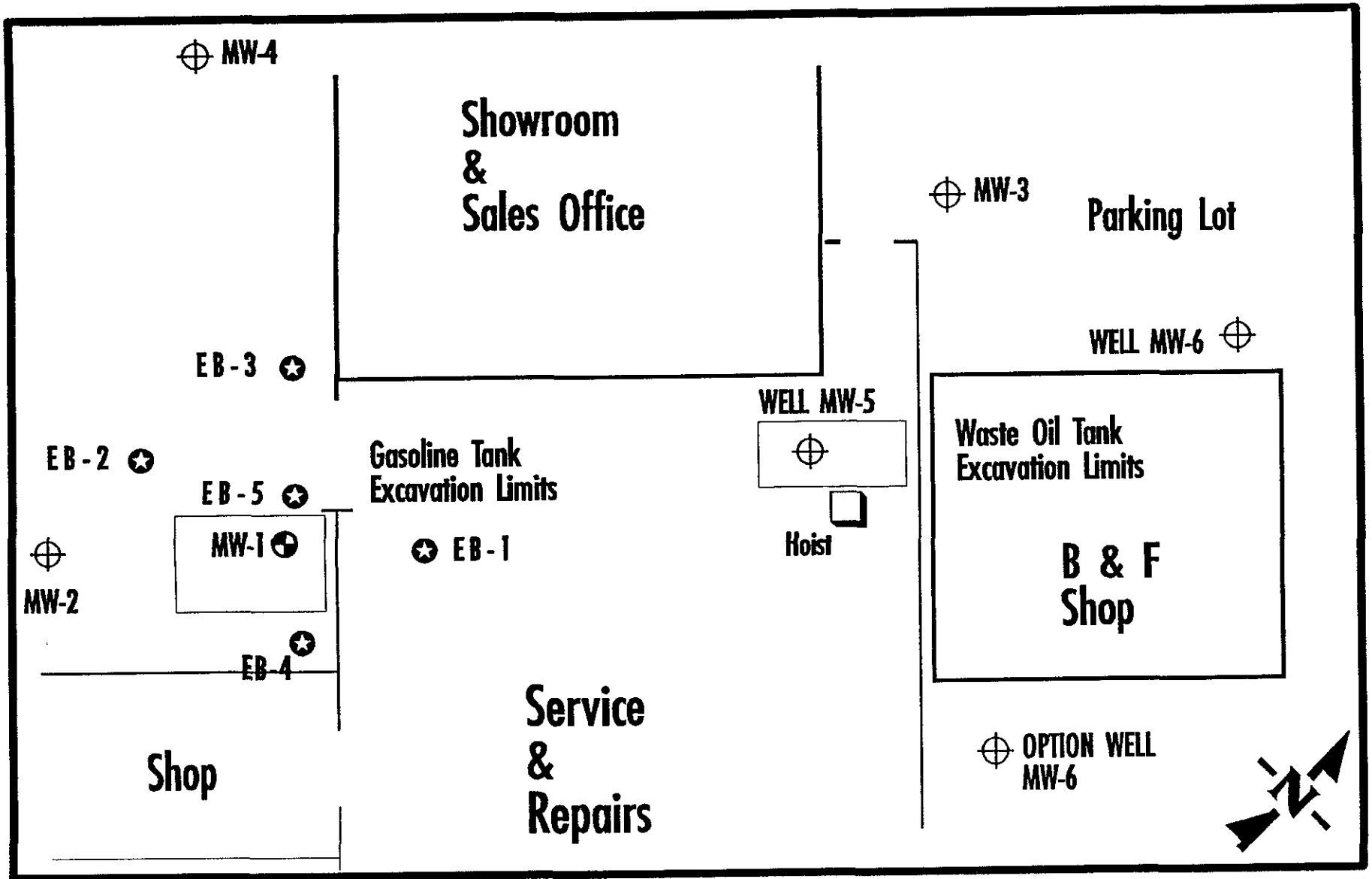
SITE MAP

Cavanaugh Motors

1700 Park Street, Alameda California

TMC ENVIRONMENTAL INC. SAN PABLO, CALIFORNIA

PLATE 2



LEGEND

- Monitoring Well
- Soil Venting Boring

Project No. 109001
April 15, 1992
Scale 1 inch = 20 feet

REMEDIATION MAP

Cavanaugh Motors

1700 Park Street, Alameda California

TMC ENVIRONMENTAL INC. SAN PABLO, CALIFORNIA

PLATE 3