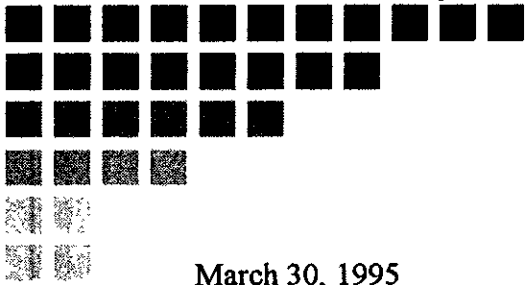


1045 - 1115 = 0.15



R. William Rudolph, Jr., PE  
Thomas E. Cundey, PE  
Jerriann N. Alexander, PE

ENVIRONMENTAL  
PROTECTION

95 APR -4 AM 8:15

March 30, 1995  
SCI 838.002

*Cont. AMR. to MW-6 show  
elevated levels of benzene then  
need add'l dg. MW.*

Ms. Eva Chu  
Alameda County Health Care Services Agency  
1131 Harbor Bay Parkway  
Alameda, California 94501

**Supplemental Soil and Groundwater Investigation  
Report Transmittal  
2801 MacArthur Boulevard  
Oakland, California**

Dear Ms. Chu:

On behalf of A.P.A. Fund, Subsurface Consultants, Inc. (SCI) is transmitting a copy of the Supplemental Soil and Groundwater Investigation report for your review. The next groundwater monitoring event will be performed within the next two weeks, weather permitting. If you have any questions, please call.

Yours very truly

Subsurface Consultants, Inc.

*Jerriann N. Alexander*  
Jerriann N. Alexander  
Civil Engineer 40469 (expires 3/31/99)  
Registered Environmental Assessor 03130 (expires 6/30/95)

- cc: Mr. Nicholas Molnar, A.P.A. Fund
- Ms. Aniko Molnar, Environmental Consultant
- Mr. Rich Heitt, RWQCB
- Mr. Raymond Yu
- Mr. Gil Jensen (w/o enclosure)

**Subsurface Consultants, Inc.**

ENVIRONMENTAL  
PROTECTION  
95 APR -4 AM 8:15

**SUPPLEMENTAL SOIL AND  
GROUNDWATER INVESTIGATION  
MONITORING WELLS M-5 AND M-6  
2801 MacARTHUR BOULEVARD  
OAKLAND, CALIFORNIA  
SCI 838.002**

MAR 1995

Prepared for:

A.P.A. Fund, Ltd.  
c/o Mr. Nicholas Molnar  
1940 Franklin Street, Suite 501  
Oakland, California 94612

By:

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Marianne F. Watada  
Project Engineer

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Jeriann N. Alexander  
Civil Engineer 40469 (expires 3/31/99)  
Registered Environmental Assessor 03130 (expires 6/30/95)

Subsurface Consultants, Inc.  
171 12th Street, Suite 201  
Oakland, California 94607  
(510) 268-0461

March 30, 1995

## TABLE OF CONTENTS

<b>I INTRODUCTION</b> .....	1
<b>II FIELD INVESTIGATION</b> .....	1
A. Test Borings .....	2
B. Groundwater Monitoring Wells and Sampling .....	3
C. Level Survey .....	4
<b>III ANALYTICAL TESTING</b> .....	5
<b>IV SITE CONDITIONS</b> .....	5
A. Regional Setting .....	5
B. Surface Conditions .....	6
C. Soil Conditions .....	6
D. Groundwater Conditions .....	6
E. Recommendations .....	8
<b>VI LIMITATIONS</b> .....	9

## I INTRODUCTION

This report presents the results of a supplemental soil and groundwater investigation conducted by Subsurface Consultants, Inc. (SCI) at 2801 MacArthur Boulevard in Oakland, California. The investigation was required by the Alameda County Health Care Services Agency (ACHCSA) to delineate the downgradient extent of groundwater contamination due to hydrocarbon releases at the referenced site. The scope of SCI's services, as outlined in a Work Plan, Work Plan Amendment, and Project Schedule letters dated April 27, 1994, May 31, 1994, and July 21, 1994 included 1) the installation of two monitoring wells (M-5 and M-6), 2) performing a groundwater monitoring event, and 3) performing additional research regarding previous site improvements. The site and well locations are shown on the Site Plan, Plate 1.

## II FIELD INVESTIGATION

Subsurface conditions were investigated by SCI on July 26 and 28, 1994 by drilling and sampling two test borings (M-5 and M-6) and completing the borings as groundwater monitoring wells. Boring/well locations are shown on Plate 1. For completeness, the location of test borings and wells installed previously by SCI and others are also shown on Plate 1. A discussion of procedures followed during drilling, soil sampling, monitoring well installation, well development and sampling is provided below.

A. Test Borings

Prior to drilling the test borings, SCI obtained encroachment and excavation permits from the City of Oakland Public Works Department. SCI also obtained a groundwater protection ordinance permit from the Alameda County Flood Control and Water Conservation District, Zone 7. Copies of the permits are included in Appendix A. Underground Service Alert was contacted to notify their members to clear drilling locations.

The test borings were drilled using a truck-mounted drill rig equipped with 8-inch-diameter hollow stem augers. An SCI field geologist observed drilling operations, prepared detailed logs of the test borings and obtained undisturbed samples of the materials encountered. Test boring logs are presented on Plates 2 and 3. Soils are classified in accordance with the Unified Soil Classification System described on Plate 4.

A California Drive Sampler (outside diameter: 2.5 inches, inside diameter: 2.0 inches), was used to obtain soil samples. The number of blows required to drive the sampler the final 12 inches of each 18-inch penetration were recorded and are presented on the boring logs. The drilling and sampling equipment was thoroughly cleaned prior to each use to reduce the likelihood of cross-contamination between samples and/or borings.

Soil samples were retained in brass liners. Samples obtained for analytical testing had Teflon sheeting placed over the ends of the liners prior to capping and sealing. The sealed liners were placed in ice-filled coolers and remained iced until delivery to the analytical laboratory. Chain-of-Custody records accompanied the samples to the laboratory.

The shoe sample from each drive was retained in a sealable plastic bag and screened in SCI's office laboratory at the end of the day for volatile organics using an Organic Vapor Meter (OVM). The bag samples were at room temperature when they were screened with the OVM. OVM measurements are recorded on the test boring logs.

The test borings were completed as groundwater monitoring wells as detailed in the following section. Soil cuttings generated during drilling were placed in sealed, 55-gallon steel drums and left on-site for later disposal.

**B. Groundwater Monitoring Wells and Sampling**

At the completion of drilling, monitoring wells were installed in the borings. Well schematics are shown on the test boring logs. In general, the wells consist of 2-inch diameter, Schedule 40 PVC pipe having flush-threaded joints. The pipe was steam-cleaned prior to being placed in the boreholes. The lower 20 feet of the wells consist of machine-slotted well screen having 0.02-inch slots. The remaining portion of the wells consist of blank pipe. The wells were provided with bottom caps and locking top caps. The well screen is encased in a filter composed of Lonestar No. 3 washed sand. The filter sand was placed by carefully pouring it through the annulus between the hollow stem of the auger and the well casing. Periodically, the augers were raised to allow the sand to fill the annulus between the casing and borehole. The filter extends from just below the bottom of the well to one foot above the top of the screened section. A one-foot thick bentonite pellet seal was placed above the sand filter. The annulus above the bentonite seal was backfilled with cement grout. The monitoring wells were completed below grade and are protected by traffic-rated valve boxes.

Initially, several attempts were made to develop and sample the new wells at the same time. However, 4 weeks after installation, the water level in M-6 was still rising. As a result, well M-5 was developed and sampled on August 23, 1994 along with the sampling event for existing wells M-2, M-3, M-4 and P-2. Well M-5 was developed by removing water with a bailer until the well went dry. Approximately 5 well volumes of water were removed. Wells M-2, M-3, M-4 and P-2 were purged of about 3 to 4 well casing volumes of water using a bailer. The wells were sampled after recovering to approximately 80 percent of their original water level. The water level in M-6 was measured on a weekly basis until it appeared to reach its maximum height. On October 11, 1994, M-6 was sampled. Well development and purge water was placed in 55 gallon drums and stored on-site. Well development and sampling forms are presented in Appendix B.

Groundwater samples were retained in pre-cleaned containers supplied by the laboratory. Water samples were placed in ice-filled coolers and remained iced until delivery to the analytical laboratory. Chain-of-Custody records accompanied the samples to the laboratory.

C. Level Survey

A level survey was performed to determine the elevation of the top of the well casings. The elevations were referenced to the west corner of the northernmost dispenser island. This point was previously assigned an elevation of 1000.00 feet by previous investigators. The top of casing elevations are presented in Table 1.

### III ANALYTICAL TESTING

Selected soil and groundwater samples were analyzed by Curtis & Tompkins, Ltd., a laboratory certified by the California Department of Health Services (DHS) for hazardous waste and water testing. The samples were analyzed for the following:

1. Total volatile hydrocarbons, as gasoline (TVH<sup>1</sup>, EPA 5030/8015 modified), and
2. Benzene, toluene, ethylbenzene, and xylene (BTEX, EPA 5030/8020).

The results of the soil analyses are presented in Table 2 and on Plate 5. Results of groundwater analyses are presented in Table 3 and on Plate 6. For completeness, analytical results from previous investigations are also presented. Analytical test reports and Chain-of-Custody documents are presented in Appendix C.

### IV SITE CONDITIONS

#### A. Regional Setting

The site is located within an upland area near the western flank of the Oakland Hills. The topography of the area is characterized by rolling terraces incised by narrow drainage channels. Locally, the site is situated on a southwest trending terrace comprised of varying gradations of sand and gravel in a clay matrix.

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<sup>1</sup> Previous laboratory reports refer to this test as Total Petroleum Hydrocarbons, as gasoline (TPH).



**B. Surface Conditions**

The project site occupies the western portion of a parcel bounded by MacArthur Boulevard to the north, Coolidge Avenue to the west, Georgia Street to the south and residential properties to the east. Remnants of a former gasoline service station, including the station building, canopy and former pump islands occupy the western portion of the parcel. Currently, the station building is being used by an auto repair business. The eastern portion of the parcel is occupied by a strip mall shopping center. The remainder of the property is covered by asphalt concrete parking areas.

**C. Soil Conditions**

The test borings drilled during SCI's investigations revealed that the site is underlain by alluvial soils consisting of interlayered stiff to very stiff sandy clays and dense clayey sands and gravels. Interpretation of soil conditions by SCI varies from other site investigators. However, noted field observations and comments on the boring logs are consistent in that the soils are predominately fine grained. Generalized cross-sections showing available data are presented on Plates 7 and 8.

**D. Groundwater Conditions**

The first water bearing zone appears to exist 25 to 32 feet below the ground surface. Based on the groundwater elevation data, it appears that groundwater flows toward the southwest at a gradient of about 10 percent and has fluctuated up to 5 feet seasonally. Groundwater surface contours for November 1994 are presented on Plate 6. A summary of groundwater elevation data is presented in Table 1.

As discussed previously, well M-6 was extremely slow to recharge. Groundwater levels appear to have stabilized approximately 8 weeks after the well was installed. Recharge data for well M-6 are graphically presented on Plate 9.

E. **Previous Site Improvements**

SCI reviewed a Sanborn Fire Insurance Company map dated 1928, which indicated that the site and adjacent parcels were residentially developed. Updates to the map showed that by 1932 MacArthur Boulevard, then referred to as Hopkins, was a completed thoroughfare extending to Coolidge Avenue. The 1932 updated map also showed that the site and the parcel now bounded by Hopkins Place, Coolidge Avenue and MacArthur Boulevard were occupied by service stations. The 1932 service station configuration on the 2801 MacArthur Boulevard site is different than the current configuration.

A copy of a site survey map dated 1953 obtained from the City of Oakland building department showed that the 2801 MacArthur Boulevard site was occupied by a service station with a similar configuration to the station improvements shown on the updated 1928 Sanborn map. No data exists regarding the removal of the former improvements. The circa 1932 thru 1953 improvements are shown on Plate 1.

These data are newly discovered. Hence, they have not been evaluated in past data interpretations.

## V CONCLUSIONS AND RECOMMENDATIONS

A. **Soil and Groundwater Contamination**

Studies to date indicate that soil and groundwater beneath the site have been impacted by previous petroleum releases. Shallow soil contamination is present near the circa 1932 thru 1953 station improvements and was also encountered beneath tanks which were removed in 1989. As a

result, it appears that releases from various site improvements are a source of vadoze zone contamination. Vadose zone contamination has been detected down to the groundwater surface in the area of Boring B-9 near the circa 1932 thru 1953 station improvements. Groundwater contains elevated levels of TVH and BTEX and concentrations are highest near the circa 1932 thru 1953 station improvements. Impacts to groundwater from off-site sources have not been evaluated to date.

In areas away from the current and previous station improvements, soils within the zone of groundwater fluctuation (25 to 35 feet below site grades) are impacted where they are coincident with the contaminated groundwater plume. The generalized cross-sections on Plates 7 and 8 show soil concentrations and the zone of groundwater fluctuation.

Data suggests that the groundwater plume has migrated downgradient (to the south) beyond the location of well M-6, although chemical concentrations decrease by an order of magnitude at well M-6 when compared to the next upgradient well, M-4, situated 50 feet to the north. Well recharge rates at well M-6 have been observed to be very slow, and as a result, indicate that the rate of groundwater movement and chemical migration is likely slow.

Separate phase hydrocarbons were not observed during this groundwater monitoring event. Although, groundwater levels are currently situated at or above the top of the screened interval, which inhibits observation of free product, free product was not observed during previous sampling events when groundwater levels were within the screened intervals. Hence, we conclude that a free product plume does not exist.

## **B. Recommendations**

Data generated to date has adequately defined the impacted soil conditions on-site in terms of source areas associated with the current station improvements. Given the limited transmissivity of the

underlying aquifer materials, the most appropriate remedial response may include implementing soil vapor extraction (SVE), sparging, and/or in-situ bioremediation technologies. SCI recommends that the remaining work plan items be implemented to further evaluate the feasibility of these remedial options. Specifically the following tasks are recommended:

Task 1 - Conduct slug tests in three wells

Task 2 - Perform a pilot SVE and sparging test

Task 3 - Investigate soil conditions in other potential source areas. The recently discovered circa 1932 thru 1953 improvements indicate that the additional potential sources may exist which have not been investigated to date.

Task 4 - Conduct microbiological and physical property tests

Task 5 - Evaluate the feasibility of remedial alternatives

Task 6 - Evaluate impacts from potential upgradient sources

In addition, groundwater monitoring should be performed on a quarterly basis.

## VI LIMITATIONS

This study was intended to preliminarily evaluate the extent of soil and groundwater contamination, based on limited subsurface investigation and analytical testing. If areas of contamination exist on other portions of the property, away from the areas investigated, it is possible that they would not have been detected during this study.

The conclusions drawn from this study are an expression of our professional opinion, and do not constitute a warranty or guaranty, either expressed or implied. Additional investigative work, if undertaken, may modify the conclusions presented herein, as additional information is generated.

SCI has performed this study in accordance with generally accepted standards of care which currently exist in Northern California. It should be recognized that the definition and evaluation of environmental conditions is difficult and inexact. Judgments leading to conclusions and recommendations are generally made with an incomplete knowledge of subsurface and/or historic conditions applicable to the site. In addition, the conclusions recorded herein reflect site conditions at the time of the investigation.

The conclusions and opinions expressed herein may be affected by future changes in the practice of environmental engineering and laws governing hazardous wastes.

**List of Tables:**

Table 1	-	Groundwater Elevation Data
Table 2	-	Hydrocarbon Concentrations in Soil
Table 3	-	Hydrocarbon Concentrations in Groundwater

**List of Attached Plates:**

Plate 1	Site Plan
Plates 2 and 3	Log of Test Borings M-5 and M-6
Plate 4	Unified Soil Classification System
Plate 5	Summary of Petroleum Hydrocarbons Concentrations in Soil
Plate 6	Summary of TVH and BTEX Concentrations in Groundwater
Plate 7	Cross Section A-A'
Plate 8	Cross Section B-B'
Plate 9	Well M-6 Recharge Rate

**Appendices:**

A	Permits
B	Well Development Forms/Well Sampling Forms
C	Analytical Test Reports/Chain-Of-Custody Documents

**Distribution:**

2 copies	Ms. Aniko Molnar Environmental Consultant 600 Anton Boulevard, Suite 1250 Costa Mesa, California 92626
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1 copy: Ms. Eva Chu  
Alameda County  
Environmental Health Care Services Agency  
1131 Harbor Bay Parkway  
Alameda, California 94501

1 copy: Mr. Rich Hiatt  
Regional Water Quality Control Board  
2101 Webster Street  
Oakland, California 94612

1 copy: Mr. Raymond W. Yu  
4098 Laguna Avenue  
Oakland, California 94602

MFW:JNA:RWR:sld

**Table 1**  
**Groundwater Elevation Data**

<u>Well</u>	<u>TOC<sup>1</sup> Elevation</u>	<u>Date</u>	<u>Groundwater Depth (feet)</u>	<u>Groundwater Elevation (feet)</u>
M1	1000.00	10/24/90	36.1	963.9
		10/25/90	36.1	963.9
		11/02/90 <sup>2</sup>	36.4	963.6
		11/06/90	36.8	963.2
		11/16/90	36.8	963.2
		11/23/90	36.9	963.1
		11/28/90	37.0	963.0
		12/05/90	37.2	963.0
		03/18/91	35.8	964.2
		03/29/91	32.4	967.6
		04/03/91	31.9	968.1
		04/09/91	31.6	968.4
		04/16/91	31.2	968.8
		01/23/92	35.5	964.5
		03/09/93	29.1	970.9
		06/01/93	27.5	972.9
		12/13/93	33.9	966.1
		03/07/94	32.3	967.7
		08/23/94	32.3	967.7
		10/11/94	34.1	965.9
M2	999.6	04/30/91	31.1 <sup>3</sup>	968.5 <sup>3</sup>
		05/07/91	31.3 <sup>3</sup>	968.3 <sup>3</sup>
		01/16/92	35.1 <sup>3</sup>	964.5 <sup>3</sup>
		03/09/93	33.6 <sup>3</sup>	966.0
		05/17/93	27.2 <sup>3</sup>	972.4
		06/01/93	27.6 <sup>3</sup>	972.0
		08/17/93	30.4 <sup>3</sup>	969.2
		12/13/93	34.0 <sup>3</sup>	965.6
		03/07/94	30.1 <sup>3</sup>	969.5
		08/23/94	32.3	967.3
		10/11/94	34.2	965.4
M3	992.8	05/17/93	22.2	970.6
		06/01/93	23.3	969.5
		08/17/93	25.0	967.8
		12/13/93	25.8	967.0
		03/07/94	23.1	969.7
		08/23/94	25.8	967.0
		10/11/94	27.4	965.4



**Table 1.**  
**Groundwater Elevation Data (Cont.)**

<u>Well</u>	<u>TOC<sup>1</sup> Elevation</u>	<u>Date</u>	<u>Groundwater Depth (feet)</u>	<u>Groundwater Elevation (feet)</u>
M4	999.6	05/17/93	33.8 <sup>3</sup>	965.8
		06/01/93	32.5 <sup>3</sup>	965.7
		12/13/93	36.8 <sup>3</sup>	962.8
		03/07/94	33.0 <sup>3</sup>	966.6
		08/23/94	35.4	964.2
		10/11/94	37.1	962.5
		M5	992.9	08/23/94
10/11/94	33.6			959.3
M6	997.7	08/23/94	41.2	956.6
		10/11/94	38.2	959.5
P1	999.6	10/24/90	37.9	961.7
		10/25/90	38.0	961.6
		11/02/90 <sup>2</sup>	38.4	961.2
		11/06/90	38.7	960.9
		11/16/90	38.3	961.3
		11/23/90	38.1	961.5
		11/28/90	38.3	961.3
		12/05/90	38.2	961.4
		03/18/91	37.8	961.8
		03/29/91	36.9	962.7
		04/03/91	36.8	962.8
		04/09/91	36.9	962.7
		04/16/91	36.7	962.9
		04/18/91	36.8	962.8
		04/30/91	36.3	963.3
		05/07/91	36.2	963.4
		01/16/92	36.6 <sup>3</sup>	963.0 <sup>3</sup>
		03/09/93	32.8	966.8
		06/01/93	30.0 <sup>3</sup>	969.6
		12/13/93	33.7 <sup>3</sup>	965.9
03/07/94	32.6	967.0		
08/23/94	32.7	966.9		
10/11/94	33.5	966.1		
P2	997.8	10/24/90	41.1	956.7
		10/25/90	40.6	957.2
		11/02/90 <sup>2</sup>	38.4	959.4
		11/06/90	37.0	960.8
		11/16/90	37.4	960.4
		11/23/90	35.9	961.9
		11/28/90	35.4 <sup>3</sup>	962.4 <sup>3</sup>

**Table 1.  
Groundwater Elevation Data (Cont.)**

<u>Well</u>	<u>TOC<sup>1</sup> Elevation</u>	<u>Date</u>	<u>Groundwater Depth (feet)</u>	<u>Groundwater Elevation (feet)</u>
		02/05/90	35.0 <sup>3</sup>	962.8 <sup>3</sup>
		03/18/91	31.4 <sup>3</sup>	966.4 <sup>3</sup>
		03/29/91	28.2 <sup>3</sup>	969.6 <sup>3</sup>
		04/03/91	26.8 <sup>3</sup>	971.0 <sup>3</sup>
		04/09/91	26.5 <sup>3</sup>	971.3 <sup>3</sup>
		04/16/91	26.5 <sup>3</sup>	971.3 <sup>3</sup>
		04/18/91	26.5 <sup>3</sup>	971.3 <sup>3</sup>
		04/30/91	26.7 <sup>3</sup>	971.1 <sup>3</sup>
		05/07/91	27.0 <sup>3</sup>	970.8 <sup>3</sup>
		01/16/92	33.7 <sup>3</sup>	964.1 <sup>3</sup>
		03/09/93	23.6 <sup>3</sup>	974.2
		05/17/93	23.7 <sup>3</sup>	974.1
		06/01/93	24.4 <sup>3</sup>	973.4
		08/17/93	28.3 <sup>3</sup>	969.5
		12/13/93	31.0 <sup>3</sup>	966.8
		03/07/94	25.4 <sup>3</sup>	972.4
		08/23/94	30.3	967.5
		10/11/94	32.3	965.5
P3	999.1	03/29/91	24.7	974.4
		04/03/91	25.1	974.0
		04/09/91	25.9	973.2
		04/16/91	26.2	972.9
		04/18/91	26.2	972.9
		04/30/91	26.8	972.3
		05/07/91	27.4	971.7
		01/23/92	32.5	966.6
		03/09/93	24.8	974.3
		06/04/93	23.9	975.2
		08/17/93	28.5 <sup>3</sup>	970.6
		12/13/93	29.3 <sup>3</sup>	969.8
		03/07/94	25.0 <sup>3</sup>	974.1
		08/23/94	30.1	969.0
		10/11/94	32.0	967.1

<sup>1</sup> Elevations relative to site-specific datum. Temporary Bench Mark No. 1, top of concrete at west corner of northernmost pump island. Assumed elevation = 1,000.00 feet.

<sup>2</sup> An interface probe was used to discern whether free product was present - free product was not detected with the probe.

<sup>3</sup> A petroleum odor and/or coating was observed on the water level probe.

**Table 2**  
**Hydrocarbon Concentrations in Soil**

<u>Sample Location</u>	<u>Depth (feet)</u>	<u>Sample Date</u>	<u>Sampler</u>	<u>TVH-Gasoline (mg/kg)</u>	<u>Benzene (mg/kg)</u>	<u>Toluene (mg/kg)</u>	<u>Ethyl-Benzene (mg/kg)</u>	<u>Xylenes (mg/kg)</u>	<u>Oil &amp; Grease (mg/kg)</u>
B1	20.0	06/12/89	Riedel <sup>3</sup>	<1.0 <sup>6</sup>	<0.05	<0.1	<0.1	<0.1	--
B1	25.0	06/12/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B1	30.0	06/12/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B2	5.0	07/13/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B2	10.0	07/13/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B2	15.0	07/13/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B2	20.0	07/14/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B2	25.0	07/14/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B2	30.0	07/14/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B2	35.0	07/14/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B3	5.0	07/13/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B3	10.0	07/13/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B3	15.0	07/13/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B3	20.0	07/14/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B3	25.0	07/14/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B3	30.0	07/14/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B3	35.0	07/14/89	Riedel	72	<0.05	<0.1	<0.1	<0.1	--
B3	38.0	07/14/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B3	39.5	07/13/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B3	41.0	07/13/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B3	42.0	07/13/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B4	5.0	07/14/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B4	10.0	07/14/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B4	15.0	07/14/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B4	20.0	07/14/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B4	25.0	07/14/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B4	30.0	07/14/89	Riedel	150	<0.25	<0.5	<0.5	<0.5	--
B4	35.0	07/14/89	Riedel	5300	<5.0	<10.0	<10.0	<10.0	--
B4	36.5	07/14/89	Riedel	7.9	<0.05	<0.1	<0.1	<0.1	--
B4	38.0	07/14/89	Riedel	<1.0	<0.05	<0.1	<0.1	<0.1	--
B4	39.0	07/14/89	Riedel	71	<0.25	<0.5	<0.5	<0.5	--
B4	40.5	07/14/89	Riedel	15	<0.05	<0.1	<0.1	<0.1	--

**Table 2**  
**Hydrocarbon Concentrations in Soil (Cont.)**

<u>Sample Location</u>	<u>Depth (feet)</u>	<u>Sample Date</u>	<u>Sampler</u>	<u>TVH-Gasoline (mg/kg)</u>	<u>Benzene (mg/kg)</u>	<u>Toluene (mg/kg)</u>	<u>Ethyl-Benzene (mg/kg)</u>	<u>Xylenes (mg/kg)</u>	<u>Oil &amp; Grease (mg/kg)</u>
B5	20.0	08/24/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B5	25.0	08/24/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B5	30.0	08/24/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B5	35.0	08/24/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B5	40.0	08/24/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B5	45.0	08/24/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B6	20.0	08/24/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B6	25.0	08/24/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B6	30.0	08/24/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B6	35.0	08/24/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B6	40.0	08/24/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B7	15.0	08/24/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B7	20.0	08/25/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B7	25.0	08/25/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B7	30.0	08/25/89	Riedel	<10	<b>0.130</b>	<0.025	<0.075	<0.075	--
B7	33.0	08/25/89	Riedel	<b>380</b>	<0.025	<b>3.00</b>	<b>1.00</b>	<b>3.50</b>	--
B7	36.0	08/25/89	Riedel	65	<0.025	<b>0.120</b>	<b>0.190</b>	<b>0.440</b>	--
B7	41.0	08/25/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B7	45.5	08/25/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B7	51.0	08/28/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B8	15.0	08/28/89	Riedel	<10	<0.025	<b>0.097</b>	<0.075	<0.075	--
B8	20.0	08/28/89	Riedel	<b>21</b>	<0.025	<b>0.190</b>	<b>0.360</b>	<b>0.630</b>	--
B8	25.0	08/28/89	Riedel	<10	<0.025	<b>0.050</b>	<0.075	<0.075	--
B8	30.0	08/30/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B8	35.5	08/30/89	Riedel	<10	<0.025	<b>0.130</b>	<b>0.150</b>	<b>0.260</b>	--
B8	40.5	08/30/89	Riedel	<10	<0.025	<b>0.056</b>	<0.075	<0.075	--
B8	45.0	08/30/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B8	50.0	08/30/89	Riedel	<10	<0.025	<b>0.2220</b>	<0.075	<0.075	--

**Table 2**  
**Hydrocarbon Concentrations in Soil (Cont.)**

<u>Sample Location</u>	<u>Sample Depth<sup>2</sup> (feet)</u>	<u>Sample Date</u>	<u>Sample Sampler</u>	<u>TVH-Gasoline (mg/kg)<sup>1</sup></u>	<u>Benzene (mg/kg)</u>	<u>Toluene (mg/kg)</u>	<u>Ethyl-Benzene (mg/kg)</u>	<u>Xylenes (mg/kg)</u>	<u>Oil &amp; Grease (mg/kg)</u>
B9	6.5	08/30/89	Riedel	20	0.026	0.046	<0.075	0.200	--
B9	9.5	08/30/89	Riedel	<10	<0.025	<0.025	<0.075	<0.075	--
B9	16.5	08/30/89	Riedel	490	0.700	0.610	2.000	15.000	--
B9	21.0	08/30/89	Riedel	1500	4.1	3.4	14.0	62.0	--
B9	26.5	08/30/89	Riedel	1100	3.0	28.0	13.0	68.0	--
B9	31.5	08/30/89	Riedel	79	0.350	0.800	0.610	2.0	--
B9	35.0	08/30/89	Riedel	<10	0.390	0.130	<0.075	0.200	--
B9	40.5	08/30/89	Riedel	<10	<0.025	0.043	<0.075	<0.075	--
B9	45.5	08/30/89	Riedel	<10	<0.025	0.066	<0.075	<0.075	--
B9	51.0	08/30/89	Riedel	<10	0.310	0.046	<0.075	<0.075	--
B10	15.5	10/18/90	Stream <sup>4</sup>	<2.5	<0.005	<0.005	<0.005	<0.075	<10
B10	21	10/18/90	Stream	<2.5	<0.005	<0.005	<0.005	<0.005	<10
B10	30.5	10/18/90	Stream	<2.5	<0.005	<0.005	<0.005	<0.005	<10
B11	21	10/18/90	Stream	<2.5	<0.005	<0.005	<0.005	<0.005	<10
B11	31	10/18/90	Stream	230	0.15	0.47	0.88	1.60	<10
B11	36	10/18/90	Stream	<2.5	<0.005	<0.005	<0.005	<0.005	<10
B11	46	10/18/90	Stream	<2.5	<0.005	<0.005	<0.005	<0.005	<10
B12	28	04/28/93	SCI <sup>5</sup>	<1	<0.005	<0.005	<0.005	<0.005	--
B12	30	04/28/93	SCI	<1	<0.005	<0.005	<0.005	<0.005	--
B12	34.5	04/28/93	SCI	<1	<0.005	<0.005	<0.005	<0.005	--
P1	25.5	10/19/90	Stream	<2.5	<0.005	<0.005	<0.005	<0.005	--
P1	35	10/19/90	Stream	7.4	0.011	<0.005	<0.005	<0.005	--
P1	40.5	10/19/90	Stream	<2.5	<0.005	<0.005	<0.005	<0.005	--
P1	49.7	10/19/90	Stream	<2.5	<0.005	<0.005	<0.005	<0.005	--

**Table 2**  
**Hydrocarbon Concentrations in Soil (Cont.)**

<u>Sample Location</u>	<u>Sample Depth<sup>2</sup> (feet)</u>	<u>Sample Date</u>	<u>Sample Sampler</u>	<u>TVH-Gasoline (mg/kg)<sup>1</sup></u>	<u>Benzene (mg/kg)</u>	<u>Toluene (mg/kg)</u>	<u>Ethyl-Benzene (mg/kg)</u>	<u>Xylenes (mg/kg)</u>	<u>Oil &amp; Grease (mg/kg)</u>
P2	20.5	10/19/90	Stream	<2.5	<0.005	<0.005	<0.005	<0.005	<10
P2	30	10/19/90	Stream	20	0.018	<0.005	<0.005	0.013	<10
P2	35.5	10/19/90	Stream	95	0.21	0.20	14	0.33	<10
P2	55.5	10/19/90	Stream	<2.5	<0.005	<0.005	<0.005	<0.005	<10
P3	35.5	03/18/91	Stream	990	5.8	24	11	20	--
P3	40.5	03/18/91	Stream	<1	<0.005	<0.005	<0.005	<0.005	--
M1	20.5	10/20/90	Stream	<2.5	<0.005	<0.005	<0.005	<0.005	<10
M1	25.5	10/20/90	Stream	<2.5	<0.005	<0.005	<0.005	<0.005	<10
M1	35.5	10/20/90	Stream	82	<0.005	0.019	0.028	0.026	<10
M1	45.5	10/20/90	Stream	<2.5	<0.005	<0.005	<0.005	<0.005	<10
M2	26	04/18/91	Stream	1.3	0.32	<0.005	0.04	0.036	--
M2	31	04/18/91	Stream	490	<0.005	0.41	3.4	7.5	--
M2	36	04/18/91	Stream	33	<0.005	0.072	0.099	0.094	--
M2	41	04/18/91	Stream	<1	<0.005	<0.005	<0.005	<0.005	--
M3	22	04/28/93	SCI	<1	<0.005	<0.005	<0.005	<0.005	--
M3	27	04/28/93	SCI	<1	<0.005	<0.005	<0.005	<0.005	--
M3	30.5	04/28/93	SCI	<1	<0.005	<0.005	<0.005	<0.005	--
M4	31	04/27/93	SCI	<1	<0.005	<0.005	<0.005	<0.005	--
M4	33	04/27/93	SCI	130	0.43	0.49	2.0	4.5	--
M4	36	04/27/93	SCI	120	0.54	0.90	1.1	4.4	--
M4	39	04/27/93	SCI	<1	<0.005	<0.005	<0.005	<0.005	--
M5	29	07/26/94	SCI	<1	<0.005	<0.005	<0.005	<0.005	--
M6	36.5	07/28/94	SCI	330	<0.070	1.1	2.7	3.0	--
M6	39.5	07/28/94	SCI	300	0.660	0.780	4.0	5.8	--

<sup>1</sup> mg/kg = milligrams per kilogram

<sup>2</sup> Top of sample depth

<sup>3</sup> Riedel = Riedel Environmental Services, Inc.

<sup>4</sup> Stream = Streamborn

<sup>5</sup> SCI = Subsurface Consultants, Inc.

<sup>6</sup> <1.0 = Analyte not present at a concentration above the stated detection limits

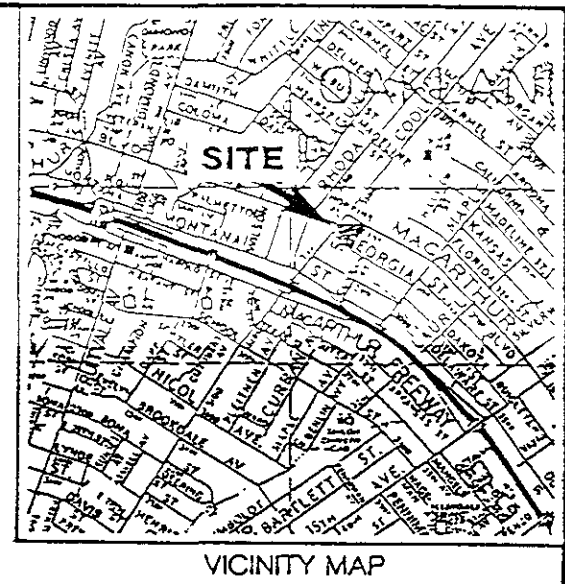
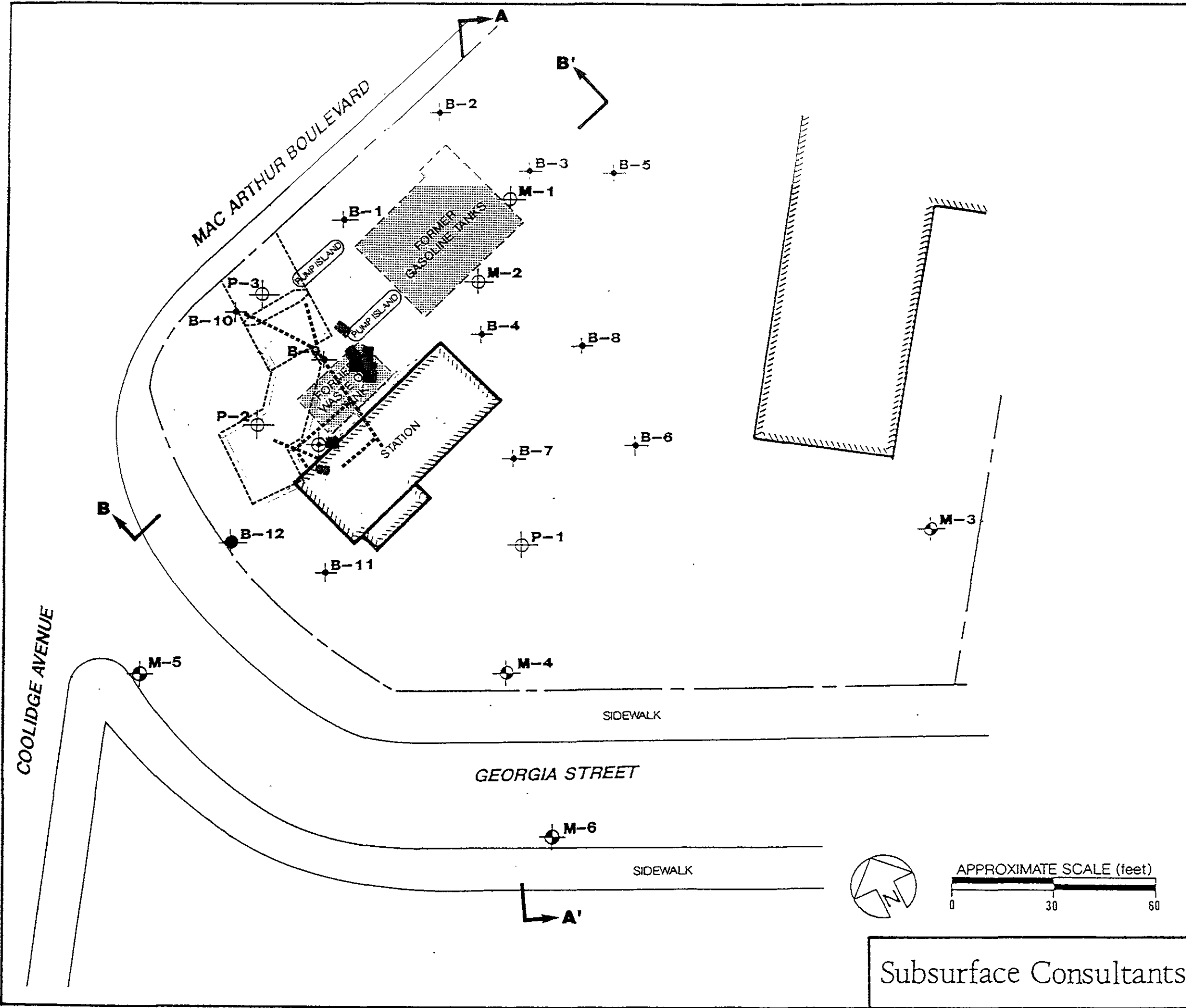
**Table 3**  
**Hydrocarbon Concentrations in Groundwater**

<u>Sample Location</u>	<u>Sample Date</u>	<u>TVH (ug/l)</u>	<u>Benzene (ug/l)</u>	<u>Toluene (ug/l)</u>	<u>Ethyl-benzene (ug/l)</u>	<u>Xylenes (ug/l)</u>
P-1	01/16/92	6,700	500	4.4	80	40
	03/09/93	5,600	1,100	29	63	120
P-2	11/06/90	33,000	4,700	2,100	380	630
	01/16/92	99,000	6,500	12,000	2,000	16,000
	03/09/93	70,000	5,900	11,000	2,100	12,000
	05/17/93	87,000	6,600	13,000	2,200	13,000
	08/17/93	80,000	5,800	12,000	2,000	12,000
	12/13/93	100,000	5,600	12,000	2,200	14,000
	03/07/94	77,000	5,100	11,000	2,000	12,000
	08/23/94	70,000	3,800	8,700	1,500	9,900
P-3	08/17/93	900	180	65	10	93
M-2	05/07/91	16,000	1,300	950	170	890
	01/16/92	22,000	960	570	370	1,800
	03/09/93	27,000	1,100	970	490	1,400
	05/17/93	17,000	1,200	770	480	1,300
	08/17/93	20,000	1,700	910	540	1,400
	12/13/93	51,000	2,200	1,400	700	2,600
	03/07/94	28,000	1,400	900	640	1,800
	08/23/94	21,000	1,600	34.0	520	1,100
M-3	05/17/93	<50	<0.5	<0.5	<0.5	<0.5
	08/17/93	<50	<0.5	<0.5	<0.5	<0.5
	12/13/93	<50	<0.5	<0.5	<0.5	<0.5
	03/07/94	<50	<0.5	<0.5	<0.5	<0.5
	08/23/94	<50	<0.5	<0.5	<0.5	<0.5
M-4	05/17/93	7,500	1,200	230	11	350
	08/17/93	13,000	3,000	330	130	700
	12/13/93	11,000	2,700	190	90	360
	03/07/94	3,800	980	33	49	140
	08/23/94	19,000	5,800	200	460	630
M-5	08/23/94	<50	<0.5	<0.5	<0.5	<0.5
M-6	10/11/94	3,600	340	27	65	240

TVH = Total volatile hydrocarbons, as gasoline

ug/l = Micrograms per liter = parts per billion

<50 = Analyte not present at a concentration above the stated detection limit.



	TEST BORING BY SCI
	MONITORING WELL BY SCI
	TEST BORING BY OTHERS
	MONITORING WELL BY OTHERS
	FORMER TANK EXCAVATION (1989)
	PROPERTY BOUNDARY
	EXISTING BUILDING
	PIPELINES REMOVED IN 1989
	CIRCA 1953 STATION IMPROVEMENTS
	CIRCA 1953 TANKS
	CROSS SECTION



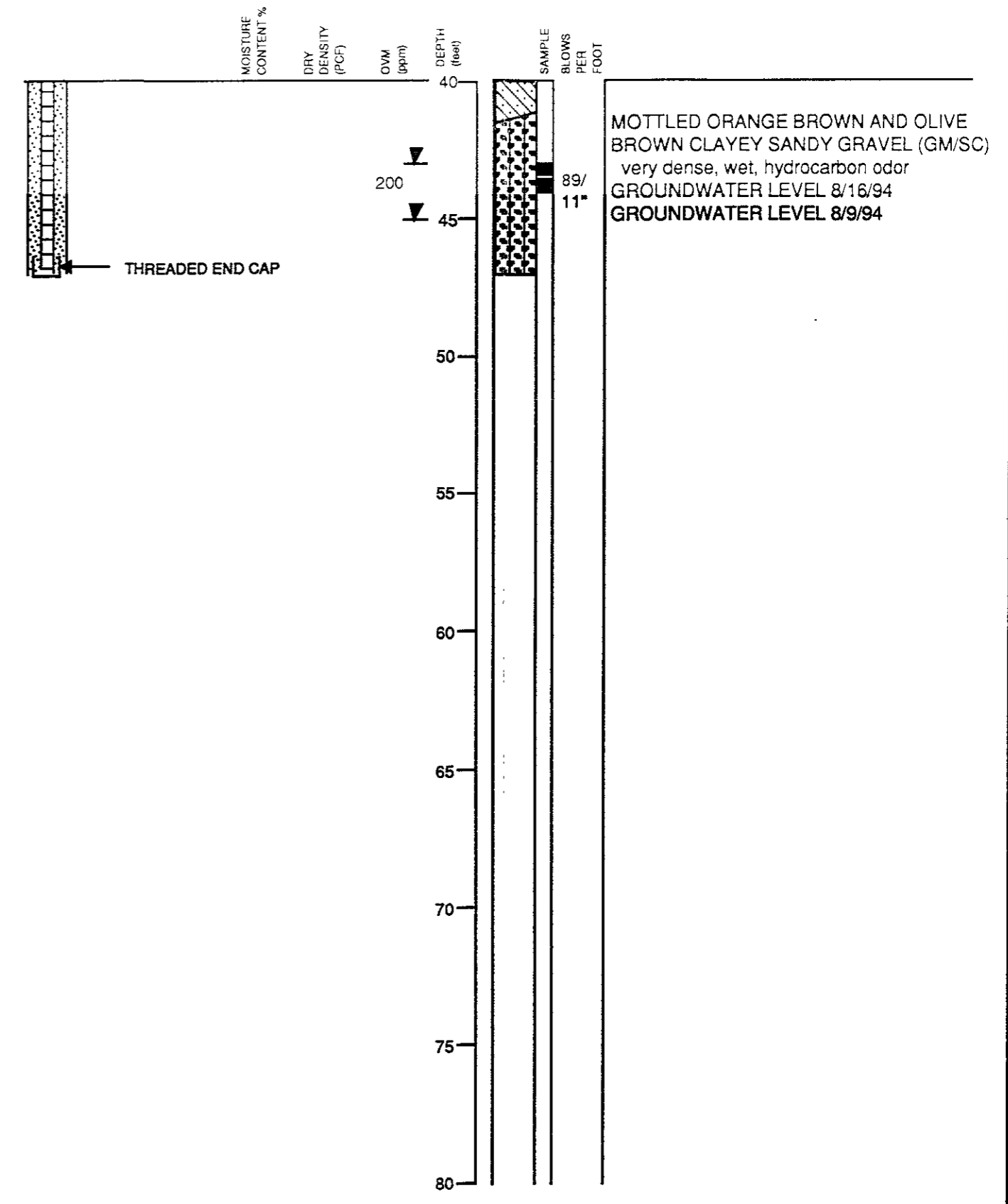
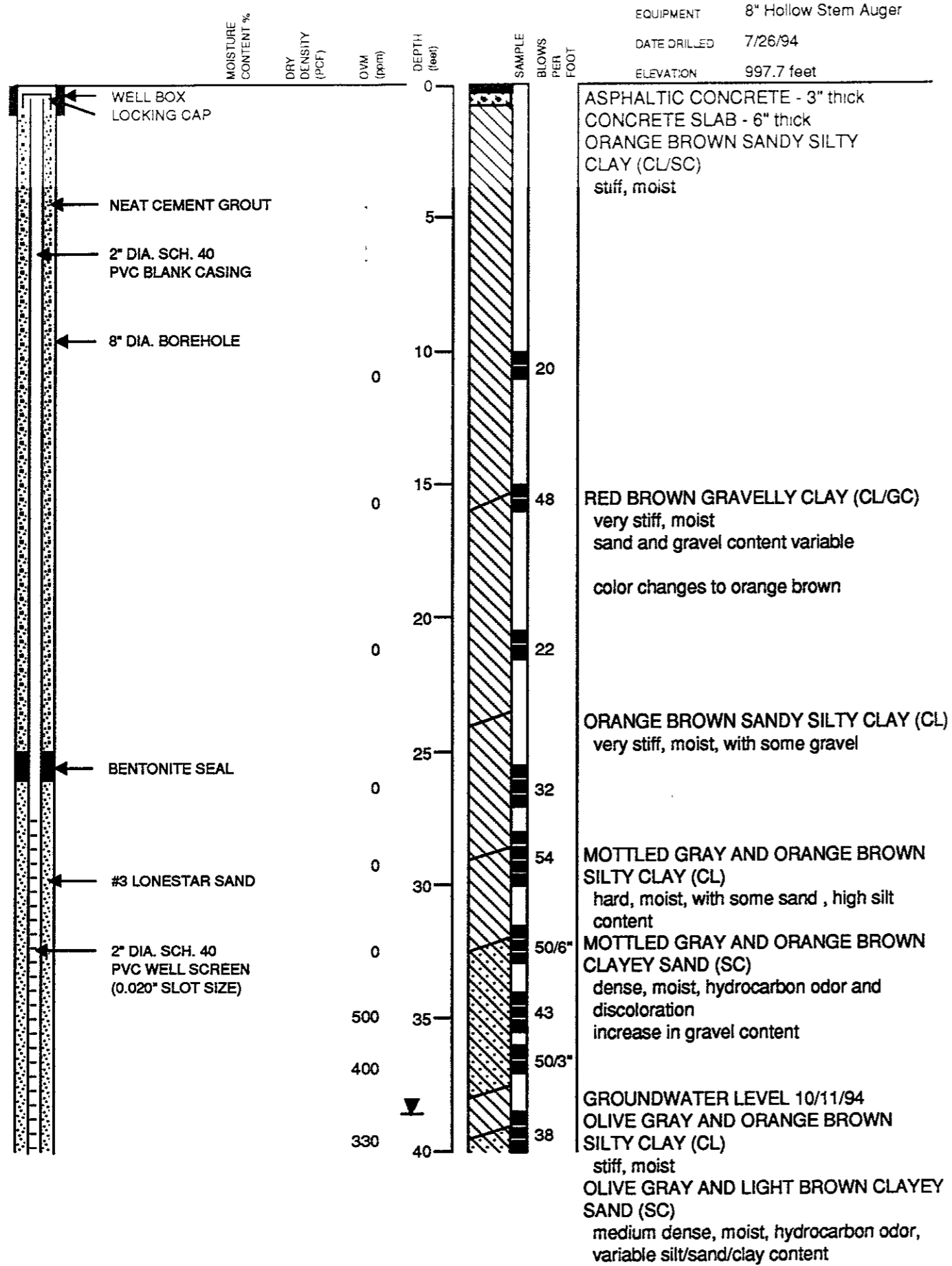
SITE PLAN		
2801 MAC ARTHUR BLVD. - OAKLAND, CA		PLATE
JOB NUMBER	DATE	APPROVED
838.002	1/31/95	MW
		<b>1</b>

Subsurface Consultants





# LOG OF TEST BORING M-6



<b>Subsurface Consultants</b>	2801 MAC ARTHUR BLVD. - OAKLAND, CA		PLATE
	JOB NUMBER 838.002	DATE 3/24/95	APPROVED <i>nmw</i>

3

GENERAL SOIL CATEGORIES			SYMBOLS	TYPICAL SOIL TYPES
<b>COARSE GRAINED SOILS</b> More than half is larger than No. 200 sieve	<b>GRAVEL</b> More than half coarse fraction is larger than No. 4 sieve size	Clean Gravel with little or no fines	GW	Well Graded Gravel, Gravel-Sand Mixtures
			GP	Poorly Graded Gravel, Gravel-Sand Mixtures
		Gravel with more than 12% fines	GM	Silty Gravel, Poorly Graded Gravel-Sand-Silt Mixtures
			GC	Clayey Gravel, Poorly Graded Gravel-Sand-Clay Mixtures
	<b>SAND</b> More than half coarse fraction is smaller than No. 4 sieve size	Clean Sand with little or no fines	SW	Well Graded Sand, Gravelly Sand
			SP	Poorly Graded Sand, Gravelly Sand
		Sand with more than 12% fines	SM	Silty Sand, Poorly Graded Sand-Silt Mixtures
			SC	Clayey Sand, Poorly Graded Sand-Clay Mixtures
<b>FINE GRAINED SOILS</b> More than half is smaller than No. 200 sieve	<b>SILT AND CLAY</b> Liquid Limit Less than 50%	ML	Inorganic Silt and Very Fine Sand, Rock Flour, Silty or Clayey Fine Sand, or Clayey Silt with Slight Plasticity	
		CL	Inorganic Clay of Low to Medium Plasticity, Gravelly Clay, Sandy Clay, Silty Clay, Lean Clay	
		OL	Organic Clay and Organic Silty Clay of Low Plasticity	
	<b>SILT AND CLAY</b> Liquid Limit Greater than 50%	MH	Inorganic Silt, Micaceous or Diatomaceous Fine Sandy or Silty Soils, Elastic Silt	
		CH	Inorganic Clay of High Plasticity, Fat Clay	
		OH	Organic Clay of Medium to High Plasticity, Organic Silt	
<b>HIGHLY ORGANIC SOILS</b>			PT	Peat and Other Highly Organic Soils

UNIFIED SOIL CLASSIFICATION SYSTEM

Subsurface Consultants

2801 MacARTHUR BLVD. - OAKLAND, CA

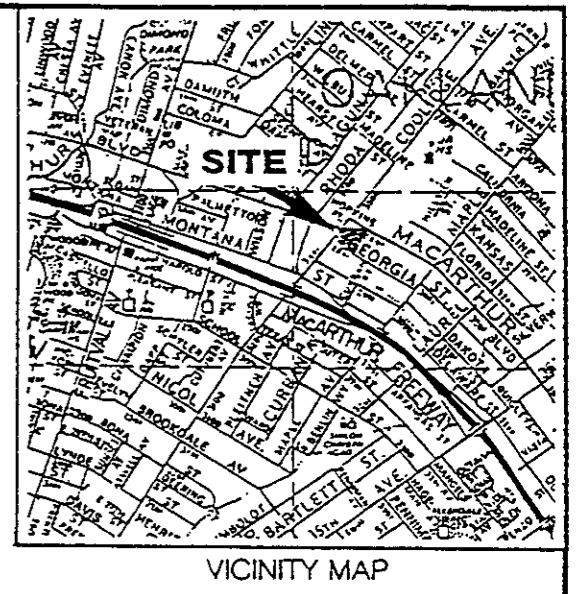
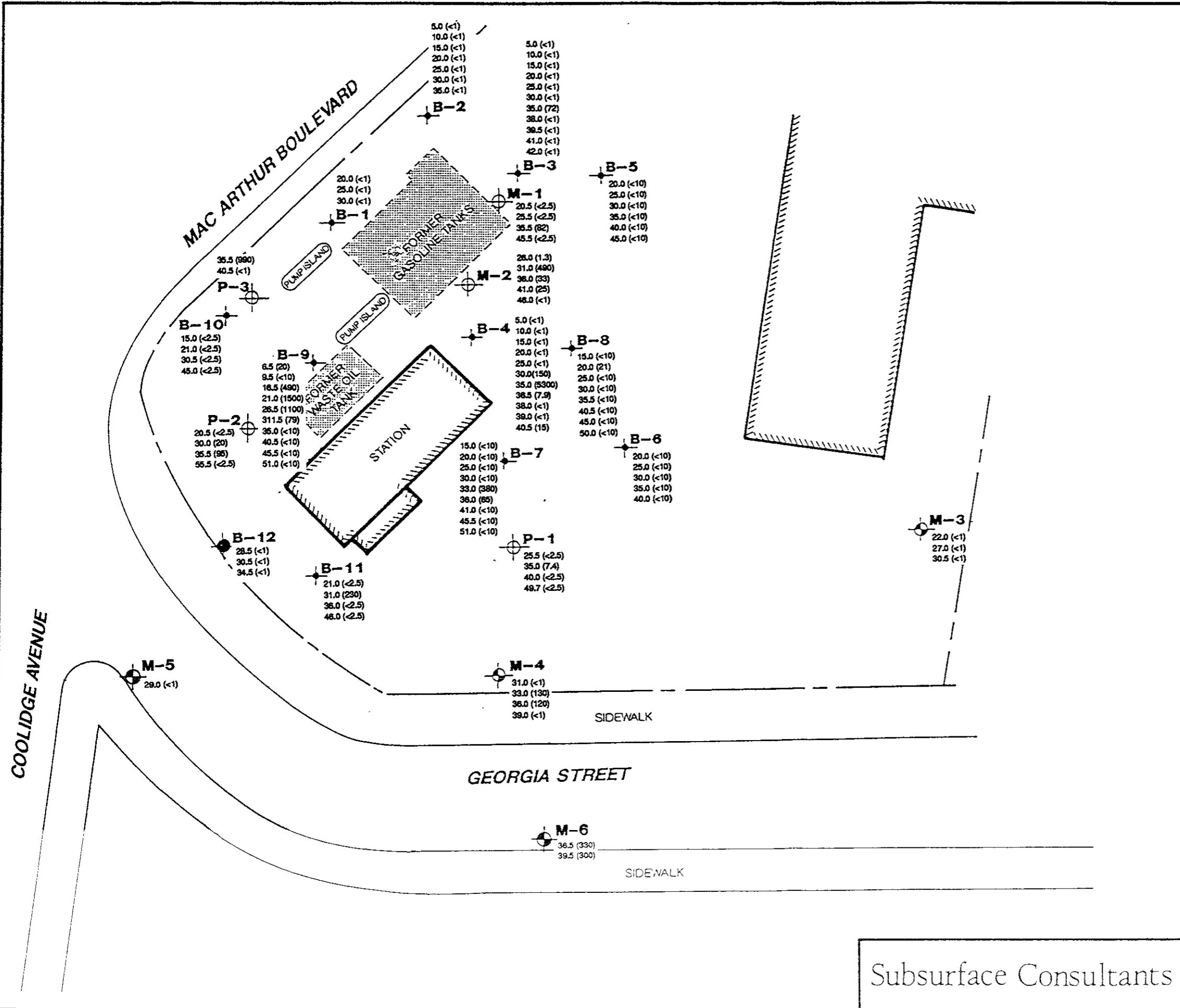
JOB NUMBER  
838.002

DATE  
11/7/94

APPROVED  
*nmw*

PLATE

4



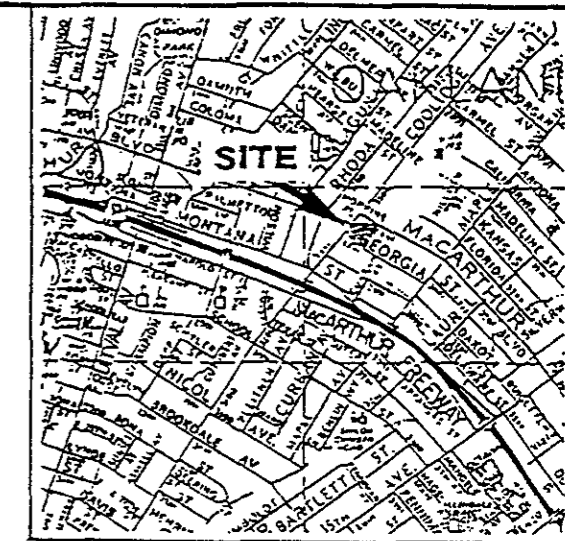
**LEGEND**

- TEST BORING BY SCI
- MONITORING WELL BY SCI
- ⊙ TEST BORING BY OTHERS
- ⊕ MONITORING WELL BY OTHERS
- ▨ FORMER EXCAVATION
- - - PROPERTY BOUNDARY
- ▬ EXISTING BUILDING
- 6.5 (20) VOLATILE PETROLEUM HYDROCARBON CONCENTRATION (mg/kg)
- SAMPLE DEPTH (FEET)

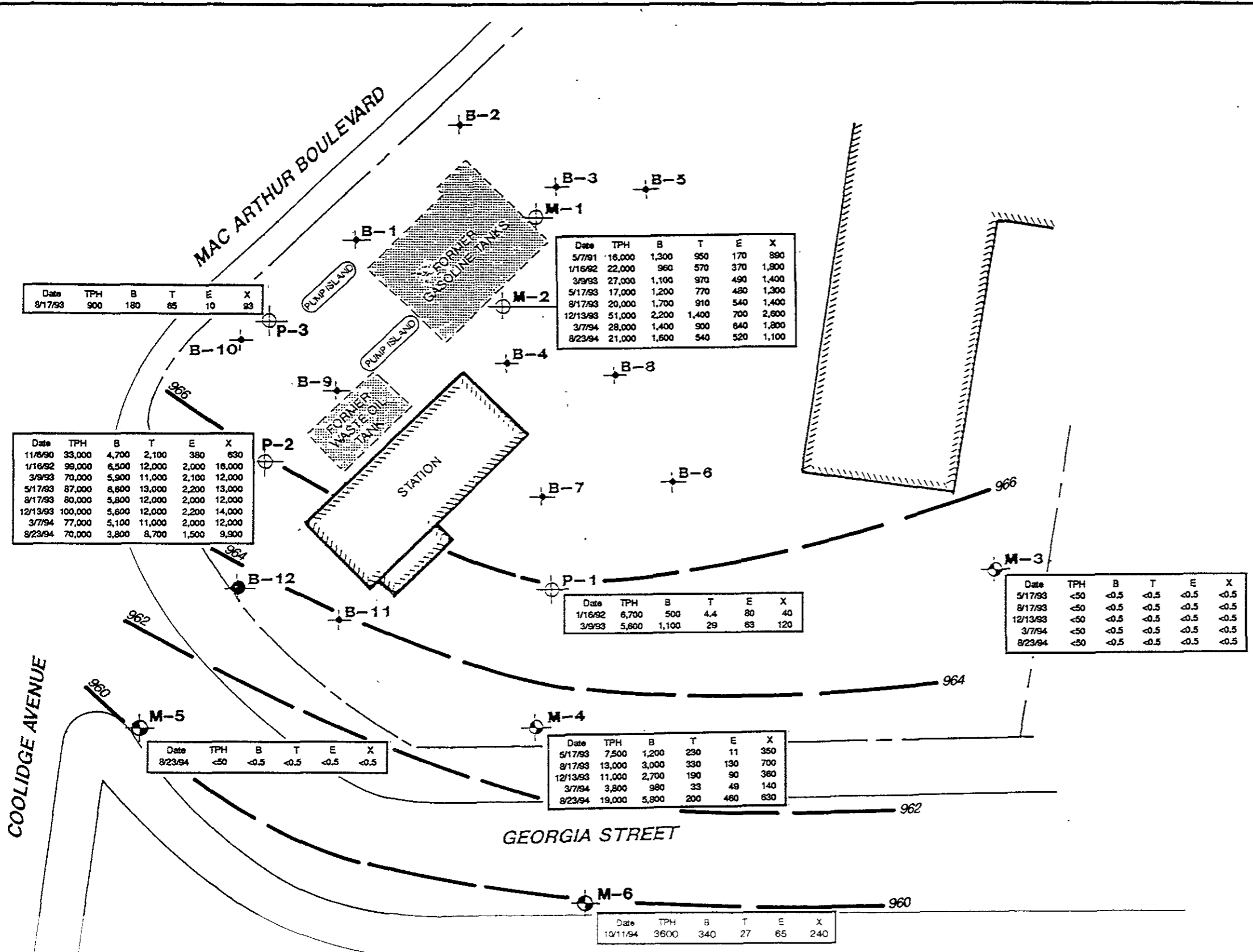


<b>SUMMARY OF PETROLEUM HYDROCARBON CONCENTRATIONS IN SOIL</b>			
2801 MAC ARTHUR BLVD - OAKLAND, CA			
JOB NUMBER	DATE	APPROVED	<b>5</b>
838 002	11/7/94	<i>mw</i>	

Subsurface Consultants



VICINITY MAP

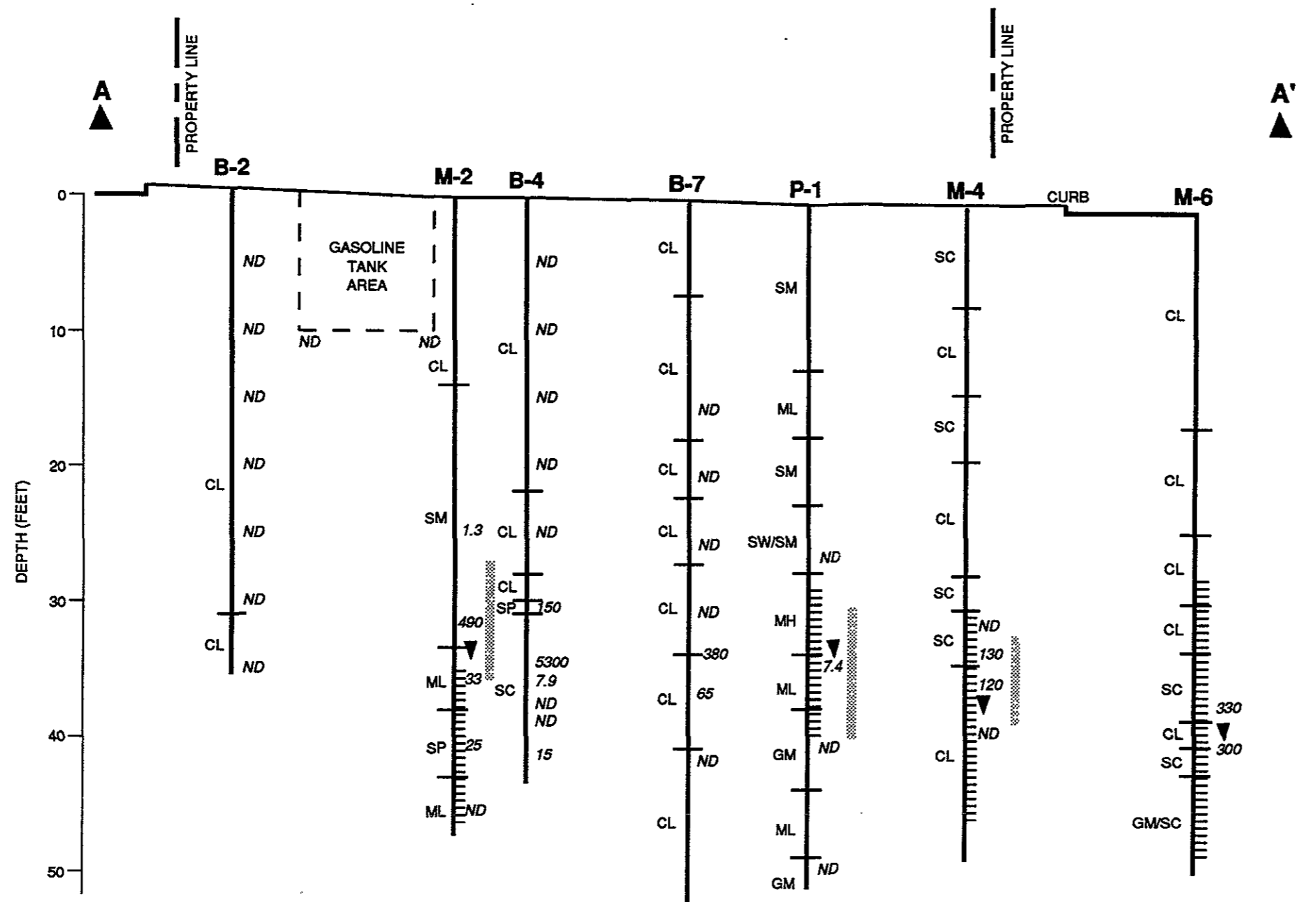


- TEST BORING BY SCI
- MONITORING WELL BY SCI
- TEST BORING BY OTHERS
- MONITORING WELL BY OTHERS
- FORMER EXCAVATION
- PROPERTY BOUNDARY
- EXISTING BUILDING
- GROUNDWATER CONTOUR ELEVATIONS (FEET)
- CONCENTRATIONS IN ug/l



SUMMARY OF TPH AND BTEX CONCENTRATIONS IN GROUNDWATER

Subsurface Consultants	2901 MAC ARTHUR BLVD - OAKLAND, CA		PLATE
	JOB NUMBER	DATE	APPROVED
	838.002	11/7/94	<i>mm</i>
			<b>6</b>

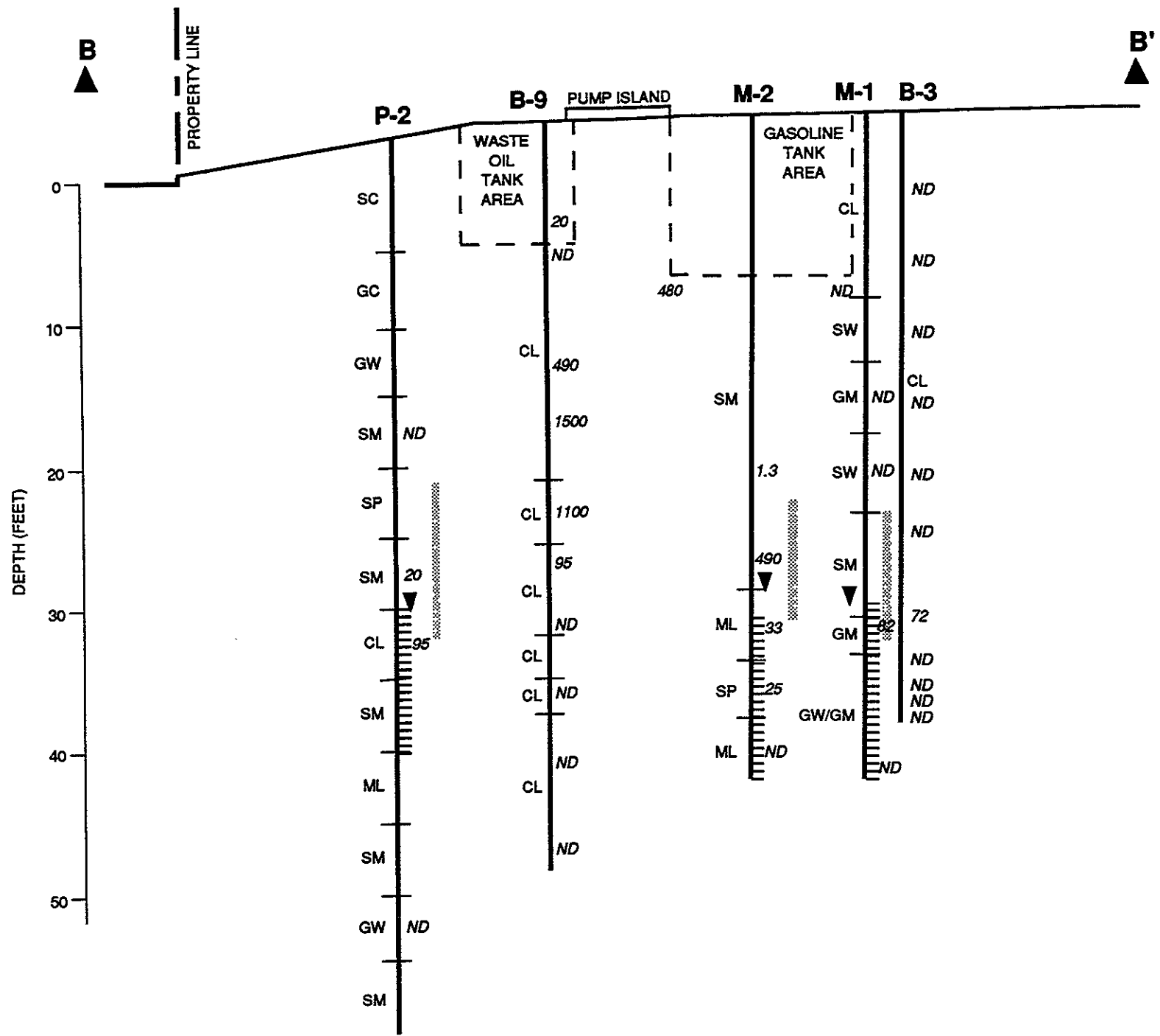


▼	GROUNDWATER LEVEL NOV. 1994
▨	HISTORICAL GROUNDWATER ZONE
▨	WELL SCREEN INTERVAL
130	TVH CONCENTRATION IN SOIL (mg/kg)
ND	NONE DETECTED
SC	USCS CLASSIFICATION (See Plate 4)

APPROXIMATE HORIZONTAL SCALE: 1" = 30'  
 APPROXIMATE VERTICAL SCALE: 1" = 10'

<b>CROSS SECTION A - A'</b>		
2801 MacARTHUR BLVD. - OAKLAND, CA		PLATE
JOB NUMBER	DATE	APPROVED
838 002	11/10/94	<i>nmw</i>
		<b>7</b>

**Subsurface Consultants**

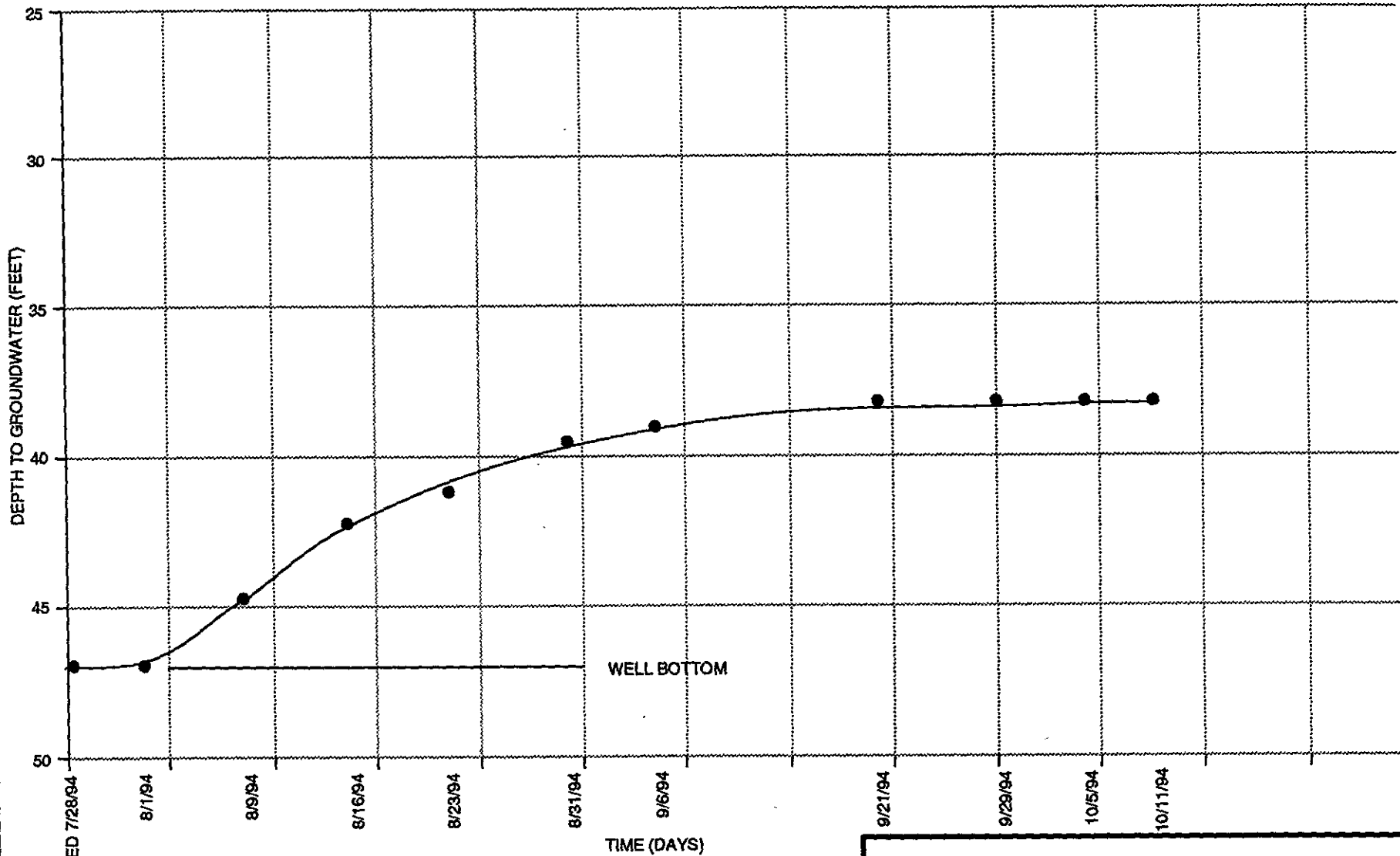


- ▼ GROUNDWATER LEVEL NOV. 1994
- ▨ HISTORICAL GROUNDWATER ZONE
- ▨▨▨ WELL SCREEN INTERVAL
- 130 TVH CONCENTRATION IN SOIL (mg/kg)
- ND NONE DETECTED
- SC USCS CLASSIFICATION (See Plate 4)

APPROXIMATE HORIZONTAL SCALE: 1" = 30'  
 APPROXIMATE VERTICAL SCALE: 1" = 10'

**CROSS SECTION B - B'**

<b>Subsurface Consultants</b>	2801 MacARTHUR BLVD. - OAKLAND, CA		PLATE
	JOB NUMBER 838 002	DATE 11/10/94	APPROVED <i>mu</i>



**WELL M-6 RECHARGE RATE  
(Depth 48 Feet)**

**Subsurface Consultants**

2801 MacARTHUR BLVD. - OAKLAND, CA  
 JOB NUMBER: 838.002      DATE: 11/7/94      APPROVED: *mm*

PLATE  
**9**





# ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE

PLEASANTON, CALIFORNIA 94588

VOICE (510) 484-2800

FAX (510) 462-3914

## DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT 2801 MacArthur  
Oakland, Cal

PERMIT NUMBER 94465

LOCATION NUMBER \_\_\_\_\_

### CLIENT

Name ADA Fund Ltd c/o Anika Marina  
Address 1420 Main, Ste 400 Voice 714-476-6121  
City Irving Zip 92714

### PERMIT CONDITIONS

Circled Permit Requirements Apply

### APPLICANT

Name Subsurface Consultants, Inc  
Address 171-12th St, Ste 201 Fax 510-268-0137  
City Oakland Voice 510-268-0560  
Zip 94607

### TYPE OF PROJECT

Well Construction	_____	Geotechnical Investigation	_____
Cathodic Protection	_____	General	_____
Water Supply	_____	Contamination	_____
Monitoring	<input checked="" type="checkbox"/>	Wall Destruction	_____

### PROPOSED WATER SUPPLY WELL USE

Domestic	_____	Industrial	_____	Other	_____
Municipal	_____	Irrigation	_____		

### DRILLING METHOD:

Mud Rotary \_\_\_\_\_ Air Rotary \_\_\_\_\_ Auger

Cable \_\_\_\_\_ Other \_\_\_\_\_

DRILLER'S LICENSE NO. C-57 682696

### WELL PROJECTS

Drill Hole Diameter	<u>8</u> in.	Maximum	
Casing Diameter	<u>2</u> in.	Depth	<u>40</u> ft.
Surface Seal Depth	<u>25</u> ft.	Number	<u>2</u>

### GEOTECHNICAL PROJECTS

Number of Borings	_____	Maximum	
Hole Diameter	_____ in.	Depth	_____ ft.

ESTIMATED STARTING DATE 7/26/94  
ESTIMATED COMPLETION DATE 7/27/94

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-88.

Approved \_\_\_\_\_

*Wayman Hong*  
Wayman Hong

Date 10 Aug 94

### APPLICANT'S

SIGNATURE Maximilian Watada Date 7/25/94



WELL SAMPLING FORM

Water level Only

Project Name: 2801 MACARTHUR BOULEVARD

Well Number: MW-1

Job No.: 838.002

Well Casing Diameter: 2 inch

Sampled By:

Date: 8/23/94

TOC Elevation: 1000.0

Weather: foggy

Depth to Casing Bottom (below TOC) 44.50 feet

Depth to Groundwater (below TOC) 32.27 feet

Feet of Water in Well 2.23 feet

Depth to Groundwater When 80% Recovered

Casing Volume (feet of water x Casing DIA<sup>2</sup> x 0.0408)

Depth Measurement Method Electronic Sounder

Free Product

Purge Method BAILER

FIELD MEASUREMENTS

Table with 6 columns: Gallons Removed, pH, Temp (°c), Conductivity (micromhos/cm), Salinity S%, Comments. Multiple rows for data entry.

Total Gallons Purged

Depth to Groundwater Before Sampling (below TOC)

Sampling Method BAILER

Containers Used 3 40 ml liter pint

Subsurface Consultants

2801 MACARTHUR BLVD - OAKLAND, CA

JOB NUMBER 838.002 DATE APPROVED

PLATE

*Sampling*  
WELL DEVELOPMENT FORM

Project Name: 2801 MACARTHUR BLVD Well Number: MW-2  
 Job No.: 838.002 Well Casing Diameter: 2 inches  
 Developed By: DWA Date: ~~8/24~~ 8/23/94  
 TOC Elevation: 999.6 Weather: Sunny

Depth to Casing Bottom (below TOC) 45.00 feet  
 Depth to Groundwater (below TOC) ~~31.4~~ 32.32 (38.66 @ 50%) feet  
 Feet of Water in Well ~~13.53~~ 12.68 feet  
 Casing Volume (feet of water x Casing DIA<sup>2</sup> x 0.0408) 2.1 gallons  
 Depth Measurement Method Tape & Paste Electronic Sounder / Other  
 Development Method disposable bailer

*Recharge rate:  
~ 6" every 5-7 min.*

**FIELD MEASUREMENTS**

Gallons Removed	pH	Temp (°C)	Conductivity (micromhos/cm)	Salinity S%	Comments
<u>1</u>	<u>7.14</u>	<u>24.0</u>	<u>875</u>		<u>Clean / slight odor / sheen</u>
<u>3</u>	<u>7.09</u>	<u>23.5</u>	<u>925</u>		
<u>5</u>	<u>7.08</u>	<u>24.5</u>	<u>925</u>		<u>Semi-clean</u>
<u>7</u>	<u>7.07</u>	<u>24.0</u>	<u>950</u>		<u>mucky / stronger odor</u>

Total Gallons Removed 7 gallons  
 Depth to Groundwater After Development (below TOC) 38.64' feet

<b>Subsurface Consultants</b>	2801 MacArthur Boulevard		PLATE
	JOB NUMBER 838.002	DATE	APPROVED

## WELL SAMPLING FORM

Project Name: 2801 MacArthur Blvd Well Number: MW-3  
 Job No.: 838.001 Well Casing Diameter: 2 inch  
 Sampled By: DWA Date: 8/23/94  
 TOC Elevation: 992.8 Weather: Cloudy / Sunny

Depth to Casing Bottom (below TOC) ~~39~~ 40.00 feet  
 Depth to Groundwater (below TOC) 25.78 feet  
 Feet of Water in Well 14.22 feet  
 Depth to Groundwater When 80% Recovered 28.62 (32.89 @ 50%) feet  
 Casing Volume (feet of water x Casing DIA<sup>2</sup> x 0.0408) 2.3 gallons  
 Depth Measurement Method Tape & Paste / Electronic Sounder / Other  
 Free Product none  
 Purge Method disposable bailer

### FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°C)	Conductivity (micromhos/cm)	Salinity S%	Comments
<u>2</u>	<u>7.35</u>	<u>24.5</u>	<u>240</u>		<u>lt. turbidity / no odor</u>
<u>4</u>	<u>7.23</u>	<u>24.0</u>	<u>230</u>		
<u>6</u>	<u>7.14</u>	<u>24.0</u>	<u>235</u>		<u>increasing turbidity</u>
<u>8</u>	<u>7.14</u>	<u>25.0</u>	<u>230</u>		

Total Gallons Purged 8 gallons  
 Depth to Groundwater Before Sampling (below TOC) 30.68' feet  
 Sampling Method fellow bailer  
 Containers Used 3 40 ml liter pint

**Subsurface Consultants**

2801 MacArthur Blvd., Oakland, California

PLATE

JOB NUMBER

DATE

APPROVED

838.001

## WELL SAMPLING FORM

Project Name: 2801 MacArthur Blvd Well Number: MW-4  
 Job No.: 838.001 Well Casing Diameter: 2 inch  
 Sampled By: DWA Date: ~~8/19~~ 8/22/94  
 TOC Elevation: 999.6 Weather: Foggy/Sunny

Depth to Casing Bottom (below TOC) 45.00 feet  
 Depth to Groundwater (below TOC) ~~34.4~~ ~~34.5~~ 35.43 feet  
 Feet of Water in Well ~~10.43~~ 9.57 feet  
 Depth to Groundwater When 80% Recovered 37.34 (40.2 @ 50%) feet  
 Casing Volume (feet of water x Casing DIA<sup>2</sup> x 0.0408) 1.56 gallons  
 Depth Measurement Method Tape & Paste / Electronic Sounder / Other  
 Free Product none  
 Purge Method disposable bailer

### FIELD MEASUREMENTS

Recharge rate:  
 ~ 1" every 5 min.

Gallons Removed	pH	Temp (°C)	Conductivity (micromhos/cm)	Salinity S%	Comments
<u>0</u>	<u>7.53</u>	<u><del>23.0</del></u>	<u><del>500</del> 590</u>		<u>clear/mod. odor</u>
<u>1</u>	<u>7.43</u>	<u>23.0</u>	<u>600</u>		↓
<u>3</u>	<u>7.38</u>	<u>23.0</u>	<u>700</u>		↓
<u>5</u>	<u>7.39</u>	<u>23.0</u>	<u>700</u>		<u>Decreasing odor</u>

Total Gallons Purged 5 gallons  
 Depth to Groundwater Before Sampling (below TOC) 40.20' feet  
 Sampling Method tellan bailer  
 Containers Used 3 40 ml \_\_\_\_\_ liter \_\_\_\_\_ pint

Subsurface Consultants

2801 MacArthur Blvd., Oakland, California

JOB NUMBER  
838.001

DATE

APPROVED

PLATE

**WELL SAMPLING FORM**

*Development*

Project Name: 2801 MacArthur Blvd Well Number: MW-5  
 Job No.: 838.001 Well Casing Diameter: 2 inch  
 Sampled By: DWA Date: ~~8/24~~ 8/23/94  
 TOC Elevation: 992.9 Weather: Sunny

Depth to Casing Bottom (below TOC) 37.50 feet  
 Depth to Groundwater (below TOC) ~~30.87~~ 31.80 feet  
 Feet of Water in Well ~~6.63~~ 5.70 feet  
 Depth to Groundwater When 80% Recovered 32.94 (34.65 @ 50%) feet  
 Casing Volume (feet of water x Casing DIA<sup>2</sup> x 0.0408) .93 gallons  
 Depth Measurement Method Tape & Paste / Electronic Sounder / Other  
 Free Product None  
 Purge Method disposable bailer

*recharge rate:  
2-3" per 5 min.*

**FIELD MEASUREMENTS**

Gallons Removed	pH	Temp (°C)	Conductivity (micromhos/cm)	Salinity S%	Comments
<u>0</u>	<u>7.56</u>	<u>24.5</u>	<u>950</u>		<u>clear/no odor</u>
<u>3</u>	<u>7.56</u>	<u>24.0</u>	<u>950</u>		<u>Lt. turbidity</u>
<u>5</u>	<u>7.48</u>	<u>24.0</u>	<u>900</u>		<u>went dry @ 5 gals.</u>

Total Gallons Purged 5 gallons  
 Depth to Groundwater Before Sampling (below TOC) 34.65' feet  
 Sampling Method open bailer  
 Containers Used 3 40 ml 1 liter   pint

**Subsurface Consultants**

2801 MacArthur Blvd., Oakland, California		PLATE
JOB NUMBER 838.001	DATE	
APPROVED		

**WELL SAMPLING FORM**

*Water level only*

Project Name: 2801 MacArthur Blvd Well Number: MW-6  
 Job No.: 838.001 Well Casing Diameter: 2 inch  
 Sampled By: N/A Date: ~~8/1/94~~ 8/23/94  
 TOC Elevation: 997.7 Weather:  foggy

Depth to Casing Bottom (below TOC) 47.00' feet  
 Depth to Groundwater (below TOC) no water 41.17 feet  
 Feet of Water in Well 5.83 feet  
 Depth to Groundwater When 80% Recovered \_\_\_\_\_ feet  
 Casing Volume (feet of water x Casing DIA<sup>2</sup> x 0.0408) \_\_\_\_\_ gallons  
 Depth Measurement Method Tape & Paste Electronic Sounder / Other \_\_\_\_\_  
 Free Product \_\_\_\_\_  
 Purge Method \_\_\_\_\_

**FIELD MEASUREMENTS**

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Total Gallons Purged \_\_\_\_\_ gallons  
 Depth to Groundwater Before Sampling (below TOC) \_\_\_\_\_ feet  
 Sampling Method \_\_\_\_\_  
 Containers Used 3 40 ml liter pint

<b>Subsurface Consultants</b>	2801 MacArthur Blvd., Oakland, California		PLATE
	JOB NUMBER	DATE	
	838.001		



**WELL DEVELOPMENT FORM** — *Water Level Only*

Project Name: 2801 MACARTHUR BLVD Well Number: P-1  
 Job No.: 838.002 Well Casing Diameter: 2 inches  
 Developed By: DWA Date: 8/23/94  
 TOC Elevation: \_\_\_\_\_ Weather: loopy

Depth to Casing Bottom (below TOC) 39.00 feet  
 Depth to Groundwater (below TOC) ~~32.45~~ 32.72 feet  
 Feet of Water in Well 6.28 feet  
 Casing Volume (feet of water x Casing DIA <sup>2</sup> x 0.0408) \_\_\_\_\_ gallons  
 Depth Measurement Method Tape & Paste / Electronic Sounder / Other \_\_\_\_\_  
 Development Method \_\_\_\_\_

**FIELD MEASUREMENTS**

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Total Gallons Removed \_\_\_\_\_ gallons  
 Depth to Groundwater After Development (below TOC) \_\_\_\_\_ feet

<b>Subsurface Consultants</b>	2801 MacArthur Boulevard		PLATE
	JOB NUMBER 838.002	DATE APPROVED	



WELL SAMPLING FORM

Water Level Only

Project Name: 2801 MACARTHUR BOULEVARD

Well Number: P-3

Job No.: 838.002

Well Casing Diameter: 2 inch

Sampled By:

Date: ~~8/24~~ 8/23/94

TOC Elevation:

Weather:

Depth to Casing Bottom (below TOC) 45.00 feet

Depth to Groundwater (below TOC) ~~28.5~~ 30.09 feet

Feet of Water in Well ~~76.43~~ 4.91 feet

Depth to Groundwater When 80% Recovered

Casing Volume (feet of water x Casing DIA<sup>2</sup> x 0.0408)

Depth Measurement Method Tape & Paste / Electronic Sounder / Other

Free Product

Purge Method BAILER

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Total Gallons Purged \_\_\_\_\_ gallons

Depth to Groundwater Before Sampling (below TOC) \_\_\_\_\_ feet

Sampling Method BAILER

Containers Used 3 40 ml liter pint

Subsurface Consultants

2801 MACARTHUR BLVD - OAKLAND, CA

PLATE

JOB NUMBER 838.002

DATE

APPROVED

# Subsurface Consultants

## FIELD REPORT

Sheet \_\_\_ of \_\_\_

PROJECT: APA Fund JOB NO: 838.002 REPORT NO.

PERSONNEL PRESENT: D.A (scv) DATE: 10/11/94

HOURS - From: 10:30 To: 12:00 From: 1:00 To: 2:30 TOTAL HRS: 3

*Travel Time Included*  
EQUIPMENT IN USE: \_\_\_\_\_

TYPE OF SERVICES PROVIDED:  Exploration  Field Density Testing  
 Site Meeting  Construction Observation  WELL SAMPLING

Arrived on site at 10:45 am.

Measured all wells for water levels except MW-6 due to car parked over well. See Below for levels

well #	Water level	TOC ELEV	WATER ELEV
P-1	33.46	999.60	966.14
P-2	32.32	997.80	965.48
P-3	32.00	999.10	967.10
M-1	34.12	1000.00	965.88
M-2	34.23	999.60	965.37
M-3	27.36	992.80	965.44
M-4	37.07	999.60	962.53
M-5	33.61	992.90	959.79
M-6	38.20	997.70	959.50

Returned on site at 1:15 pm. to measure water level in M-6. Took grab sample of M-6.

Purged M-6 dry. Approx. 5 gallons were removed. 1st 2 gallons were clear with remaining 3 murky. Water had slight gas odor. Water level was 46.36' @ 1:45 pm. and had risen to 45.74' @ 2:00 pm. Left site at 2:10 pm. to take sample to lab.

Prepared by: \_\_\_\_\_ Reviewed by: \_\_\_\_\_

*APA0894.*



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

A N A L Y T I C A L   R E P O R T

Prepared for:

Subsurface Consultants  
171 12th Street  
Suite 201  
Oakland, CA 94608

Date: 11-AUG-94  
Lab Job Number: 116635  
Project ID: 838.002  
Location: A.P.A. Fund

Reviewed by:

Teresa K Morris

Reviewed by:

Mary Pless

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LABORATORY NUMBER: 116635  
CLIENT: SUBSURFACE CONSULTANTS  
PROJECT ID: 838.002  
LOCATION: A.P.A. FUND

DATE SAMPLED: 07/26/94  
DATE RECEIVED: 08/01/94  
DATE ANALYZED: 08/02/94  
DATE REPORTED: 08/11/94

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)
116635-001	M-5 @ 29'	ND(1)	ND(5)	ND(5)	ND(5)	ND(5)
METHOD BLANK		ND(1)	ND(5)	ND(5)	ND(5)	ND(5)

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

QA/QC SUMMARY

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=====
RPD, %                               3
RECOVERY, %                           114
=====

```



LABORATORY NUMBER: 116635  
CLIENT: SUBSURFACE CONSULTANTS  
PROJECT ID: 838.002  
LOCATION: A.P.A. FUND

DATE SAMPLED: 07/28/94  
DATE RECEIVED: 08/01/94  
DATE ANALYZED: 08/08/94  
DATE REPORTED: 08/11/94

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)
116635-002	M-6 @ 36.5'	330	ND(70)	1100	2700	3000
116635-003	M-6 @ 39.5'	300	660*	780*	4000	5800
METHOD BLANK		ND(5)	ND(30)	ND(30)	ND(30)	ND(30)

\* Presence of this compound confirmed by second column; however, the confirmation concentration differed from the reported result by more than a factor of two.

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

QA/QC SUMMARY

```

=====
RPD, %                               <1
RECOVERY, %                           109
=====

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A N A L Y T I C A L R E P O R T

Prepared for:

Subsurface Consultants  
171 12th Street  
Suite 201  
Oakland, CA 94608

Date: 14-SEP-94  
Lab Job Number: 117039  
Project ID: 838.001  
Location: A.P.A. Fund

Reviewed by:

*Mary Plessee*

Reviewed by:

*Kelby OB*

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LABORATORY NUMBER: 117039  
CLIENT: SUBSURFACE CONSULTANTS  
PROJECT ID: 838.001  
LOCATION: A.P.A. FUND

DATE SAMPLED: 08/23/94  
DATE RECEIVED: 08/23/94  
DATE ANALYZED: 09/04/94  
DATE REPORTED: 09/14/94  
DATE REVISED: 09/15/94

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)
117039-1	P-2	70,000	3,800	8,700	1,500	9,900
117039-2	M-2	21,000	1,600	540	520	1,100
117039-4	M-4	19,000	5,800	200	460	630
117039-METHOD BLANK		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, %                                20
RECOVERY, %                            104
=====

```



LABORATORY NUMBER: 117039  
CLIENT: SUBSURFACE CONSULTANTS  
PROJECT ID: 838.001  
LOCATION: A.P.A. FUND

DATE SAMPLED: 08/23/94  
DATE RECEIVED: 08/23/94  
DATE ANALYZED: 08/31/94  
DATE REPORTED: 09/14/94

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)
117039-3	M-3	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
117039-5	M-5	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
117039-METHOD BLANK		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, %	19
RECOVERY, %	96

CHAIN OF CUSTODY FORM

11-5037

PAGE OF

PROJECT NAME: APA Fund

JOB NUMBER: 838.001

PROJECT CONTACT: Marianne Watada

SAMPLED BY: \_\_\_\_\_

LAB: Curtis + Tompkins

TURNAROUND: normal

REQUESTED BY: M. Watada

ANALYSIS REQUESTED

LABORATORY I.D. NUMBER	SCI SAMPLE NUMBER	MATRIX				CONTAINERS				METHOD PRESERVED					SAMPLING DATE				NOTES	
		WATER	SOIL	WASTE	AIR	VOA	LITER	PINT	TUBE	HCL	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	ICE	NONE	MONTH	DAY	YEAR	TIME		
																		HR		MIN
-1	P-2	X								X					08	23	94	11	45	TVH/STX
-2	M-2	X								X								13	35	
-3	M-3	X								X								14	30	
-4	M-4	X								X								12	55	
-5	M-5	X								X								15	45	
	<del>M-6</del>	<del>X</del>								<del>X</del>					<del>08</del>	<del>23</del>	<del>94</del>	<del>15</del>	<del>45</del>	

CHAIN OF CUSTODY RECORD

RELEASED BY: (Signature) <u>Devin Alexander</u>	DATE / TIME <u>8/23/94 4:15 p.m.</u>	RECEIVED BY: (Signature) <u>Nancy Plessner</u>	DATE / TIME <u>8/23/94 4:15 p.m.</u>
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME
RELEASED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)	DATE / TIME

COMMENTS & NOTES:

Subsurface Consultants, Inc.  
171 12TH STREET, SUITE 201, OAKLAND, CALIFORNIA 94607  
(510) 268-0461 • FAX: 510-268-0137



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A N A L Y T I C A L   R E P O R T

Prepared for:

Subsurface Consultants  
171 12th Street  
Suite 201  
Oakland, CA 94608

Date: 04-NOV-94  
Lab Job Number: 117927  
Project ID: 838.002  
Location: A.P.A. Fund

Reviewed by:

*Teresa K Morris*

Reviewed by:

*Christine E. Schley*

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LABORATORY NUMBER: 117927  
CLIENT: SUBSURFACE CONSULTANTS, INC.  
PROJECT ID: 838.002  
LOCATION: A.P.A FUND

DATE SAMPLED: 10/11/94  
DATE RECEIVED: 10/11/94  
DATE ANALYZED: 10/19/94  
DATE REPORTED: 11/04/94

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)
117927-1	MW-6	3600	340	27	65	240
	METHOD BLANK	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, %	9
RECOVERY, %	92

