



# Subsurface Consultants, Inc.

ENVIRONMENTAL  
PROTECTION

97 DEC 26 AM 3:42

R. William Rudolph, P.E.  
President

December 23, 1997  
SCI 447.055

STID 469

Ms. Susan Hugo  
Alameda County Health Care Services Agency  
1131 Harbor Bay Parkway  
Alameda, California 94502-6577

## Work Plan

**Ongoing and Additional Investigation Tasks  
Connell Oldsmobile Site  
3093 Broadway (STID# 469)  
Oakland, California**

Dear Ms. Hugo:

## INTRODUCTION

Subsurface Consultants, Inc. (SCI) has prepared this work plan to conduct ongoing activities at the subject site, as well as several additional investigation tasks that we believe are necessary prior to preparing the final Corrective Action Plan (CAP) for this site. This work plan presents relevant background information regarding the site, and describes the scope of the ongoing tasks and the recommended additional investigations.

## BACKGROUND

### UST Closures

On December 18, 1989, three underground fuel storage tanks (USTs) which previously contained gasoline, diesel, and waste oil were removed from the site (Plate 1). A fuel dispenser island located within the existing building was also removed. SCI understands that the pipelines connecting the fuel dispenser island with the USTs remained in-place. Results of leak testing conducted on the UST system and product lines in September 1985 by Comer Petroleum Equipment Company indicated that both the UST system and lines were apparently leaking. Separate-phase product associated with the in-place pipelines may be an ongoing source of hydrocarbon contamination at the site. The limits of free product in and around the former USTs and product pipeline area, including downgradient of the source area beneath the site building, have not been fully defined.

Ms. Susan Hugo  
Alameda County Health Care Services Agency  
December 23, 1997  
SCI 447.055  
Page 2

### Previous SCI Corrective Action Work Plan

SCI previously prepared a Corrective Action Work Plan dated November 6, 1995, for this site. The work plan included: (1) interim free product recovery, (2) groundwater monitoring, (3) development of site-specific cleanup levels, and (4) preparation of a feasibility study (FS) and CAP. The Alameda County Health Care Services Agency (ACHCSA) approved the work plan on November 29, 1995.

SCI's estimated costs to implement the work plan were submitted to the California Underground Storage Tank Cleanup Fund (Fund) for pre-approval. On April 17, 1996, the Fund pre-approved some of the estimated costs to implement the scope of work described in the work plan. Since that time, SCI has completed some of the tasks described in our November 1995 Corrective Action Work Plan, including subsurface investigations, free-product recovery, and groundwater monitoring. Efforts to recover free product and to monitor groundwater conditions are ongoing. Data indicate that soil and groundwater beneath the site have been impacted by releases of gasoline.

On March 18, 1997, SCI met with you to discuss the status of the Corrective Action Work Plan tasks, including free-product removal and groundwater monitoring results. On the basis of that meeting, ACHCSA issued a letter dated May 30, 1997, requiring that the following actions be performed at the site:

- ✓ • Continuation of free product recovery,
- ✓ • Continuation of groundwater monitoring, in accordance with the revised monitoring program stipulated by ACHCSA,
- ✓ • Removal and disposal of a soil stockpile left onsite from the 1989 UST closures, *→ 10-30 cu yds*
- Development of site-specific cleanup levels, and
- Preparation of an FS/CAP.

Since that meeting, SCI has reviewed available lithologic and chemical data for the site, including the historical distribution and varying thickness of free product in site wells. As described below, SCI believes that additional site investigation is necessary to better define the limits of separate-phase product beneath the site.

### Distribution of Separate-Phase Product

A review of cone penetration test and soil boring data indicate that the site is underlain by interbedded lenses of silt, sand, clay, and gravel. These randomly formed deposits have irregular thicknesses and are laterally discontinuous. The presence of separate-phase product beneath the site appears to coincide with the locations of permeable sand and gravel layers between 20 and 35 feet below ground surface. Data also indicate that the thickness of free product in wells MW-1, MW-4, MW-6, and/or MW-9 varies seasonally, with the greatest free-product thicknesses generally occurring when groundwater

Ms. Susan Hugo  
Alameda County Health Care Services Agency  
December 23, 1997  
SCI 447.055  
Page 3

levels are at their lowest, and the unsaturated thickness of the permeable sand and gravel layers are greatest. Because of the limited amount of investigation conducted to-date beneath the site building, the lateral and vertical extent of the sand and gravel layers and the presence of free product within those layers are not well defined downgradient of the UST/product line source area near well MW-1, and upgradient of wells MW-4, MW-6, and MW-9. To adequately evaluate remedial options for this site and recommend a preferred remedial alternative, SCI believes that some additional investigation tasks are necessary to better define the location and extent of permeable units and separate-phase product, as well as the hydraulic properties of the permeable units. These recommended additional tasks are described below, along with the scope of anticipated ongoing work.

### SCOPE OF WORK

As required by ACHCSA and/or recommended by SCI, the following tasks are proposed:

1. Ongoing groundwater monitoring and free-product removal activities, including connection of an additional existing monitoring well to the vapor extraction system (VES) currently being operated,
- ✓ 2. Offsite disposal of the onsite soil stockpile,
3. Drilling and sampling of additional soil borings primarily beneath the site building, and construction of several additional wells, as necessary, and
- ✓ 4. Conducting a groundwater pumping test concurrent with the previously approved vapor extraction pilot test.

These tasks are further described below.

### Groundwater Monitoring

SCI will continue to perform quarterly groundwater monitoring activities as required by ACHCSA in their letter dated May 30, 1997. ACHCSA modified the required monitoring program to include quarterly sampling of wells MW-1, MW-4, and MW-9, whenever free product is absent. ACHCSA also requires that groundwater samples from these wells be sampled for methyl tertiary butyl ether (MTBE). SCI anticipates no other changes to the original groundwater monitoring program.

### Free Product Removal

A total of approximately 395 gallons of free product have been removed by hand bailing from the wells and by SVE at well MW-6. Of the 395 gallons, about 145 gallons of free product has been removed from the wells by hand bailing. The balance (approximately 250 gallons) has been extracted by SVE at well MW-6. Between August and November 1997, the SVE system extracted approximately 133 gallons of free product at well MW-6.

Ms. Susan Hugo  
Alameda County Health Care Services Agency  
December 23, 1997  
SCI 447.055  
Page 4

SCI will continue to check site wells monthly for free product. We will continue to remove product from well MW-1 by bailing. SCI will also continue to operate the VES system for removal and recovery of product from well MW-6. To enhance the effectiveness of the free-product recovery and operation of the VES unit, SCI plans to connect well MW-4 to the VES unit. This well also contains free product and is located approximately 25 feet southwest of the VES compound. This well can easily be connected to the VES unit via aboveground piping. SCI will continue to operate the VES unit until notified by ACHCSA to cease operation.

### **Offsite Disposal of Soil Stockpile**

Approximately 225 cubic yards of stockpiled soil remain onsite from the former UST excavation. As directed by ACHCSA, the soil will be disposed offsite at a permitted landfill facility. For waste characterization purposes, SCI will collect one four-point composite soil sample from the stockpile, and submit the sample to a state-certified chemical testing laboratory for the following analyses:

- Total volatile hydrocarbons (TVH), EPA Method 8015, modified,
- Total extractable hydrocarbons (TEH), EPA Method 8015, modified,
- Benzene, toluene, ethylbenzene, and xylenes (BTEX), EPA Method 8020,
- Volatile organic compounds, EPA Method 8260,
- Semivolatile organic compounds, EPA Method 8270, and
- 17 Title 22 metals, EPA Method 6010.

Upon receipt of the analytical results and approval of the waste profile at a local permitted landfill, SCI will oversee the loading and off-haul of the soil by a licensed transportation subcontractor.

### **Additional Subsurface Investigation**

SCI proposes to conduct a soil and groundwater investigation to further delineate the extent of free product within permeable sand and gravel layers beneath the site building and near the UST/product line source area. The field investigation will include drilling test borings, collecting soil and grab groundwater samples, installing wells at selected locations, and abandoning test borings that are not converted to wells. We anticipate that the field investigation activities may be performed in two phases: (1) drilling soil borings and collecting samples for chemical analyses and (2) installing wells at selected locations.

Prior to drilling, SCI will obtain a drilling permit from Alameda County Public Works Agency. In addition, SCI will retain the services of an underground utility locator to clear soil borings prior to drilling. SCI will drill seven soil borings to depths of approximately 35 to 40 feet below ground surface using a limited access drill rig equipped with hollow stem auger equipment. Proposed test boring locations are shown on Plate 1. Most of the soil borings are within the existing building footprint and

Ms. Susan Hugo  
Alameda County Health Care Services Agency  
December 23, 1997  
SCI 447.055  
Page 5

will therefore require concrete coring. Because the facility is an active automobile dealership and repair facility, field work will be conducted on the weekend.

Soil samples will be collected from each boring at 5-foot intervals. An SCI field geologist will observe drilling operations, prepare detailed logs, and screen soil samples using a photoionization detector (PID). Soil samples will be retained in brass sample liners. Teflon sheeting will be placed on the ends of the liners prior to capping and sealing with tape. Upon sealing and labeling, the samples will be placed in an ice filled cooler and delivered to a state-certified chemical testing laboratory under chain-of-custody documentation. SCI will select soil samples for chemical analyses on the basis of visual observations and/or PID readings.

Using a disposable bailer, SCI will check for the presence of free product and will collect grab groundwater samples from temporary well casings inserted into the soil borings. All augers, drill rods, and sampling equipment that will be placed in the test borings will be cleaned prior to their initial use and prior to each subsequent use to reduce the likelihood of cross-contamination between borings and/or samples.

Depending on our field observations and the results of drilling and sampling of the seven borings, SCI may install new wells in several selected borings. The purpose of the new wells will be to better define the presence and extent of permeable geologic units and free product beneath the site building, and to evaluate the effect of water level fluctuations on the thickness of free product in those areas.

We estimate that up to three additional groundwater monitoring wells will be installed. The wells will extend about 35 feet below the ground surface, and will be constructed of 2-inch-diameter, Schedule 40 PVC pipe having flush threaded joints. The upper 10 to 15 feet of each well will consist of solid PVC well casing to ensure that an adequate surface seal is present in the event that the wells are used in the future for vapor-extraction purposes. The remainder of the wells (approximately 20 to 25 feet) will consist of machine-slotted well screen having 0.020-inch slots. This length of well screen will allow the well to be used both as a groundwater monitoring and vapor-extraction point, if necessary. The annular space around the screened section will be backfilled with sand. A bentonite seal, approximately 12 inches thick, will be placed above the sand. The annular space above the bentonite seal will be backfilled with cement/bentonite grout. Each well will be finished below grade in a traffic-rated utility box and will be secured by a locking cap.

Groundwater levels will be measured in the wells prior to development/purging. The new wells will be developed by bailing or pumping, until the water becomes relatively free of turbidity, and temperature, conductivity, and pH have stabilized. When the wells have recharged to at least 80 percent of their original volume, a groundwater sample will be obtained using a disposable, pre-cleaned sampler. The water samples will be placed in pre-cleaned containers and refrigerated until delivery to the analytical laboratory. The water samples will be accompanied by chain-of-custody records.

Ms. Susan Hugo  
Alameda County Health Care Services Agency  
December 23, 1997  
SCI 447.055  
Page 6

Soil and groundwater samples will be analyzed for the following:

- TVH, EPA Method 8015, Modified,
- TEH, EPA Method 8015, Modified,
- BTEX/MTBE, EPA Method 8020, and
- 1,2-Dichloroethane, EPA Method 8240 (selected samples only).

Results of the field investigation will be summarized in a quarterly technical report.

### **Groundwater Pumping Test**

SCI's November 1995 Corrective Action Work Plan included a vapor extraction pilot test to evaluate vapor extraction as a possible remedial action at this site. SCI's evaluation of the current vapor-extraction data for well MW-6 indicates that the effectiveness of vapor extraction is greatly reduced when the groundwater level saturates the permeable sand and gravel layers. We therefore recommend that a limited 8-hour groundwater pumping test be performed concurrent with the vapor extraction test. The purpose of the groundwater pumping test is to draw down the water table near the test location, and dewater the permeable sand and gravel layers to evaluate the potential enhancement of vapor extraction and product-recovery rates.

SCI plans to conduct the vapor-extraction test on either an existing monitoring well or a newly installed well. SCI will select the test well after completing the additional investigation activities described above. Groundwater will be pumped from the closest monitoring or extraction well to the vapor extraction point. Subsurface differential pressure will be monitored at different radial distances from the vapor extraction well using a combination of driven monitoring probes and existing monitoring wells temporarily capped and attached to pressure gauges. SCI will utilize the existing VES unit to destroy the extracted vapors. During the groundwater pumping test, SCI will monitor draw-down and recovery in the extraction well, as well as in surrounding wells. SCI will utilize a data logger and pressure transducers to measure the water levels in the pumping well and closest surrounding wells. In addition, SCI will conduct measurements using an electronic water level meter in other site wells.

Prior to the vapor extraction and groundwater pumping tests, SCI will obtain a permit from the East Bay Municipal Utilities District to discharge extracted water to the sanitary sewer system. Extracted groundwater will be routed to an oil-water separator prior to discharge into portable holding tanks. Water in these tanks will be pumped through liquid carbon adsorption units for treatment prior to discharge into the sanitary sewer system. The groundwater treatment compound will be placed in a location to minimize disruption to onsite business operations.

Ms. Susan Hugo  
Alameda County Health Care Services Agency  
December 23, 1997  
SCI 447.055  
Page 7

Results of the vapor extraction and groundwater pumping test will be used in the FS/CAP to evaluate remedial options, including soil vapor extraction (SVE), groundwater pump and treat, combination of both SVE and groundwater extraction (co-extraction), or other technologies for free product removal, contaminant capture, and contaminant reduction.

### **SCHEDULE**

SCI's proposed schedule is presented in Table 1. Depending on receiving pre-approval of these tasks from the Fund, SCI proposes to complete the additional investigation activities and the vapor extraction and groundwater pumping tests by April 1998. Preparation of the FS/CAP is scheduled for July/August 1998.

### **COST PRE-APPROVAL**

We request your written approval of this work plan. A copy of the work plan, ACHCSA's approval, and a pre-approval request will then be submitted to the Fund.

To achieve our planned schedule, we respectfully request your prompt review of this work plan. If you have any questions, please call.

Yours very truly,

Subsurface Consultants, Inc.



Samuel C. Won, PE, REA  
Project Engineer

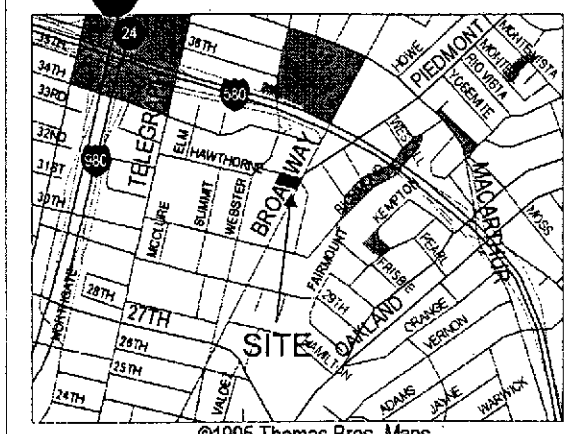


Terence J. McManus, REA  
Associate Environmental Scientist

SCW:TJM:ly 447.055\wp1297.doc

Attachments: Plate 1, Site Plan  
Table 1, Proposed Schedule

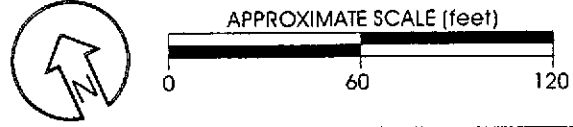
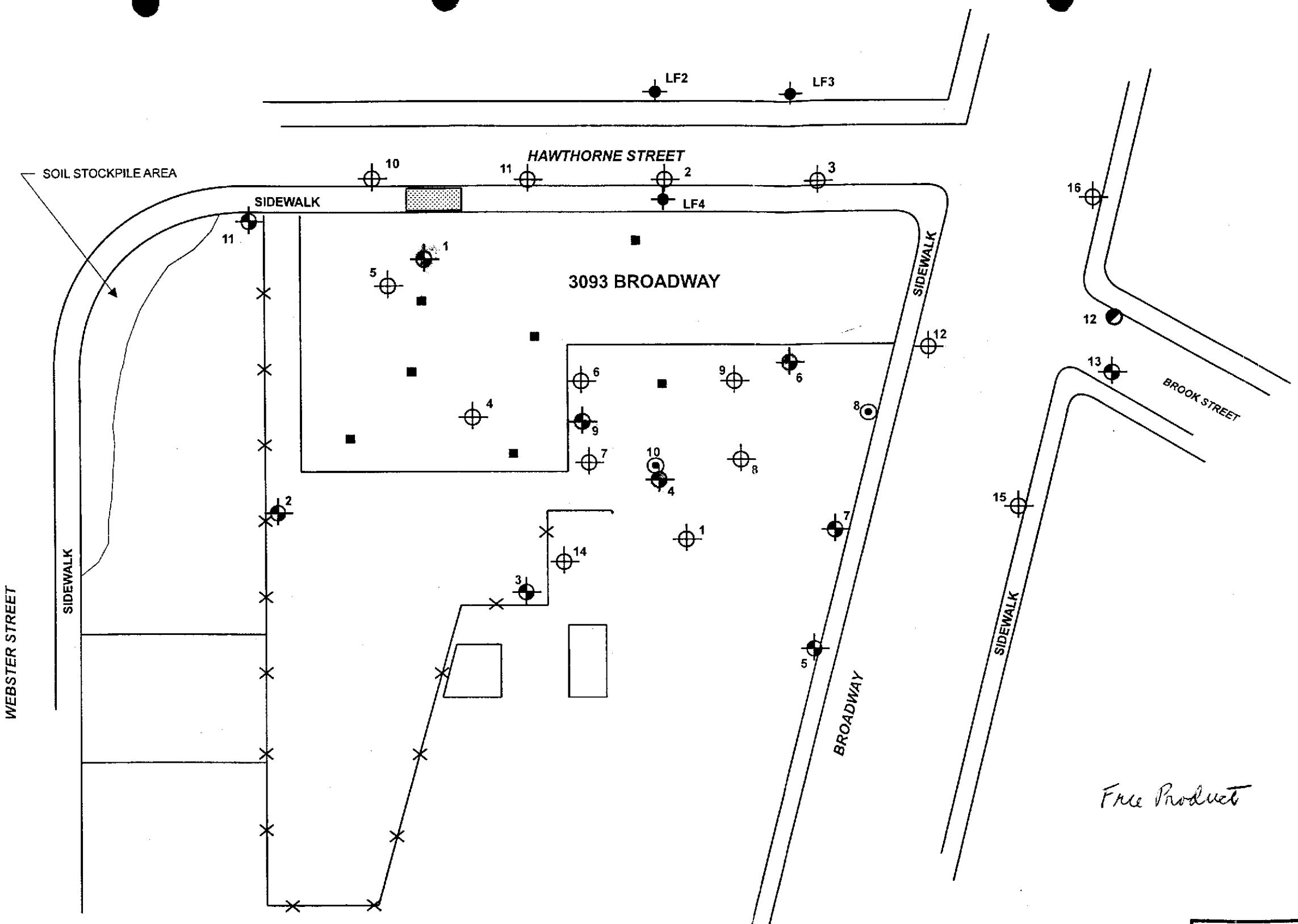
cc: Mr. Jonathan Redding - Fitzgerald Abbott & Beardsley, LLP



©1995 Thomas Bros. Maps

VICINITY MAP

EXPLANATION	
	SCI TEST BORING
	SCI MONITORING WELL
	EXTRACTION WELL
	LEVINE FRICKE MONITORING WELL
	CONE PENETRATION TEST (CPT)
	FENCE
	RETAINING WALL
	FORMER TANK LOCATION
	PROPOSED TEST BORING



<b>SITE PLAN</b>		
CONNELL OLDSMOBILE - OAKLAND, CA		
JOB NUMBER 447.055	DATE 8/5/97	APPROVED <i>SW</i>
		<b>1</b>

**SCI** Subsurface Consultants, Inc.  
Geotechnical & Environmental Engineers



TABLE 1  
PROPOSED SCHEDULE

Task Name	Dec '97	Jan '98	Feb '98	Mar '98	Apr '98	May '98	Jun '98	Jul '98	Aug '98	Sep '98	Oct '98	Nov '98	Dec '98	Jan '99	Feb '99
Pre-approval Period		█													
1.2 VES Operations and Maintenance		█	█	█	█	█	█	█	█	█	█	█	█	█	█
1.3 Free Product Recovery		█	█	█	█	█	█	█	█	█	█	█	█	█	█
2.1 Water Level Measurements		█	█	█	█	█	█	█	█	█	█	█	█	█	█
2.2 Product Characterization			█												
2.3/2.6 3-Well Event (Quarterly Event)			█												
2.3/2.6 3-Well Event (Quarterly Event)									█						
2.4/2.6 7-Well Event (Semi-annual Event)												█			
2.5/2.6 12-Well Event (Annual Event)							█								
2A.1 Soil Profile				█											
2A.2 Soil Transportation and Disposal				█											
2B.1 Additional Investigation				█	█										
3.1 VES Pilot Test					█										
3.2 Analytical						█									
3.3 Data Evaluation							█								
3.4 Groundwater Pump Test								█							
4 Biotreatability									█						
5 RBCA Tier 1										█					
6 Feasibility Study/Corrective Action Plan											█				
Consultation		█	█	█	█	█	█	█	█	█	█	█	█	█	█
Pre-approval for 1998													█		

Project: Connell Oldsmobile,  
3093 Broadway, Oakland, CA  
Date: December 23, 1997

Task █