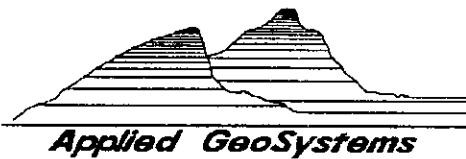


FED EX



91 JUL - 0 01 04 44

# TRANSMITTAL

3315 Almaden Expressway, Suite 34  
San Jose, California 95118  
(408) 264-7723 FAX (408) 264-2435

TO: MR. DENNIS BRYNE  
ACHCSA  
DEPARTMENT OF ENVIRONMENTAL HEALTH  
80 SWAN WAY, ROOM 200  
OAKLAND, CA. 94621

DATE: 7/1/91  
PROJECT NUMBER: 60026.03  
SUBJECT: WORK PLAN AND ADDENDUM ONE  
TO WORK PLAN

FROM: MR. JOEL COFFMAN  
TITLE: ASST. PROJECT GEOLOGIST

WE ARE SENDING YOU  Attached  Under separate cover via \_\_\_\_\_ the following items:  
 Shop drawings  Prints  Reports  Specifications  
 Letters  Change Orders  \_\_\_\_\_

COPIES	DATED	NO.	DESCRIPTION
1	6/27/91	60026.03	WORK PLAN FOR SUBSURFACE INVESTIGATIONS AND REMEDIATION AT ARCO STATION 276, 10600 MACARTHUR BOULEVARD, OAKLAND, CA.
1	6/27/91	60026.03	ADDENDUM ONE TO WORK PLAN AT ARCO STATION 276, 10600 MACARTHUR BOULEVARD, OAKLAND, CA.

THESE ARE TRANSMITTED as checked below:

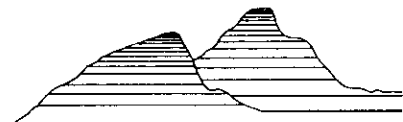
- For review and comment  Approved as submitted  Resubmit \_\_\_ copies for approval
- As requested  Approved as noted  Submit \_\_\_ copies for distribution
- For approval  Return for corrections  Return \_\_\_ corrected prints
- For your files  \_\_\_\_\_

REMARKS: PER ARCO'S AUTHORIZATION WORK PLAN AND ADDENDUM ONE TO WORK PLAN HAVE BEEN FORWARDED FOR YOUR REVIEW.

Copies: 1 to AGS project file no. 60026.03

SAN JOSE READER'S FILE

\*Revision Date: 10/15/90  
\*File Name: TRANSMT.PRJ



**Applied GeoSystems** 3315 Almaden Expressway, Suite 34, San Jose, CA 95118 (408) 264-7723

• FREMONT • IRVINE • HOUSTON • BOSTON • SACRAMENTO • CULVER CITY • SAN JOSE

ADDENDUM ONE TO WORK PLAN

at

ARCO Station 276  
10600 MacArthur Boulevard  
Oakland, California

01

AGS 60026.03

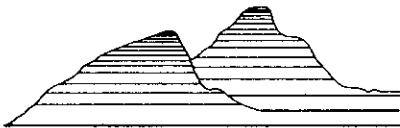
STID  
3756  
BL

Prepared for  
ARCO Products Company  
P.O. Box 5811  
San Mateo, California 94402

by

RESNA/Applied GeoSystems

June 27, 1991



**Applied GeoSystems**

3315 Almaden Expressway, Suite 34, San Jose, CA 95118 (408) 264-7723

• FREMONT • IRVINE • HOUSTON • BOSTON • SACRAMENTO • CULVER CITY • SAN JOSE

June 27, 1991  
AGS 60026.03

Mr. Chuck Carmel  
ARCO Products Company  
P.O. Box 5811  
San Mateo, California 94402

Subject: Addendum One to Work Plan 60026.03 for Subsurface Investigations and Remediation at ARCO Station 276, 10600 MacArthur Boulevard, Oakland, California.

Mr. Carmel:

As requested by ARCO Products Company (ARCO), this letter has been prepared to serve as an Addendum to the Work Plan (RESNA/Applied GeoSystems [AGS] 60026.03, June 27, 1991) for the subject site and is in response to the results of the Subsurface Environmental Assessment Report (AGS 69034-2, December 14, 1990) and the letter request by Alameda County Health Care Services Agency (June 12, 1991) for a work plan specifying remedial measures to be employed at the site. This work will be performed in conjunction with an ongoing environmental investigation and involves treatment of gasoline-impacted soil beneath the subject site. Pacific Environmental Group, Inc. (Pacific) installed a vapor-extraction system offsite to the south to remediate gasoline-impacted soil and ground water in this area. An internal combustion engine was used to treat hydrocarbon concentrations in the off-gas removed from the soil beneath the area adjacent to the site. Pacific has recently permitted and installed a catalytic oxidizer onsite for the treatment of off-gas removed from both onsite and offsite areas of concern.

The location of the subject site is shown on the Site Vicinity Map, Plate 1. AGS' approach and project tasks recommended to perform subsurface investigations and remediation at this site include the following: drilling and sampling additional soil borings in the area of the former underground gasoline-storage tanks, installing soil vapor extraction wells in the borings, surveying the extraction wells for top-of-casing elevations, performing laboratory analyses of soil samples, field supervision of vapor extraction well connection to the existing vapor-extraction system, and preparing a report of the findings, interpretations, and conclusions.

A summary of previous work performed at the site by AGS and others is included in the Work Plan referenced above.

### PROPOSED WORK

AGS recommends the following work at the site based on previous investigations:

- Step 1        Submit this Addendum One to the Work Plan to Alameda County Health Care Services Agency (ACHCSA) describing proposed work for the subject site.
- Step 2        Update the site safety plan and drill and obtain soil samples for soil classification and laboratory analysis from eight onsite soil borings (B-6 through B-13) as shown on Plate 2, Proposed Vapor Extraction Well Locations. Install eight vapor extraction wells (VW-1 through VW-8) using 4-inch diameter well casing in borings B-6 through B-13, respectively. The purpose of these proposed borings/vapor extraction wells is to further delineate the extent of gasoline hydrocarbons previously encountered in soils near the former underground gasoline-storage tanks and to provide soil vapor extraction points to perform soil-vapor extraction as a means of remediating soils and shallow ground water at the site. The pilot soil borings will be reamed out to a minimum of 10-inches in diameter to accommodate the placement of the 4-inch diameter vapor extraction wells. The wells will be constructed with PVC blank casing and 0.020-inch machine slotted PVC screen. Blank casing will be used to construct the well from the ground surface to a depth of approximately 10 feet. Screened casing will complete the well from approximately 10 feet below ground surface to approximately 30 feet. The annulus of the well will be filled with # 3 Monterey sand from completion depth to approximately 9 feet below ground surface, bentonite from approximately 9 feet at depth up to 7 feet, and a sand-cement slurry from approximately 7 feet at depth up to ground surface. The well will be completed with the installation of a 3 by 5 foot traffic-rated utility box.
- Step 3        Submit selected soil samples from borings B-6 through B-13 for analysis to a State-certified laboratory for total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene, and total xylenes (BTEX) by Environmental Protection Agency (EPA) Method 5030/8015/8020. A Chain of Custody Record will be maintained.

Step 4      Contract a licensed surveyor to survey wellhead elevations to a U.S. Coast and Geodetic Survey Datum.

Step 5      Prepare and distribute a bid package to perform trenching and piping to connect vapor extraction wells VW-1 through VW-8 to the existing offsite vapor extraction system (VES). The purpose of the VES is to remediate the hydrocarbon concentrations in the soil to levels acceptable to the regulatory agencies involved in the closure of the site. It is estimated the vapor-extraction wells will allow the VES to act upon the onsite areas of concern. It is estimated that an extraction rate of approximately 25 cubic feet per minute from each vapor-extraction well will create a 20-foot radius of influence for each well based on a one-year operation period for the VES. It is also estimated that the VES will reduce the concentrations of gasoline hydrocarbons in vapor to below 50 parts per million (ppm) of TPHg, a typical detection limit for vapor samples, after one year of operation (telephone conversation between AGS engineer, Mike Hodges and Dan Landry from Pacific Environmental Group, May 28, 1991). The VES will continue to run if this threshold value is not reached in one year, or it may be shut down sooner if the threshold value is reached sooner and the catalytic oxidizer is not required for a ground-water treatment system.

The below-grade portion of the VES consists of eight vapor-extraction wells and approximately 185 linear feet of vapor-extraction trenching. Each wellhead will be equipped with vacuum gauges, sample ports, and shut-off valves so that the flow out of each well can be adjusted to maximize the total pounds of petroleum hydrocarbons being removed from the soil.

AGS will be onsite to supervise trenching and piping activities.

Step 6      Prepare a report to include results of the investigation and our conclusions.

Field work proposed in this Addendum One to the Work Plan will be performed according to the Field Methods included in Appendix A of the above referenced Work Plan for Subsurface Investigations and Remediation for the subject site (AGS, June 27, 1991). Subsequent addenda to the Work Plan will be prepared and submitted to ARCO and regulatory agencies as necessary to describe future work proposed at the site.

Addendum One to Work Plan  
ARCO Station 276, Oakland, California

June 27, 1991  
AGS 60026.03


Copies of this Addendum should be forwarded to:

Mr. Don Dalke  
Water Quality Control Engineer  
California Regional Water Quality Control Board  
San Francisco Bay Region  
2101 Webster Street, Suite 500  
Oakland, California 94612

Mr. Dennis Byrne  
Alameda County Health Care Services Agency  
Department of Environmental Health  
80 Swan Way, Room 200  
Oakland, California 94621

If you have any questions or comments about this Addendum One to the Work Plan, please call us at (408) 264-7723.

Sincerely,  
RESNA \ Applied GeoSystems

  
Joel Coffman  
Assistant Project Geologist

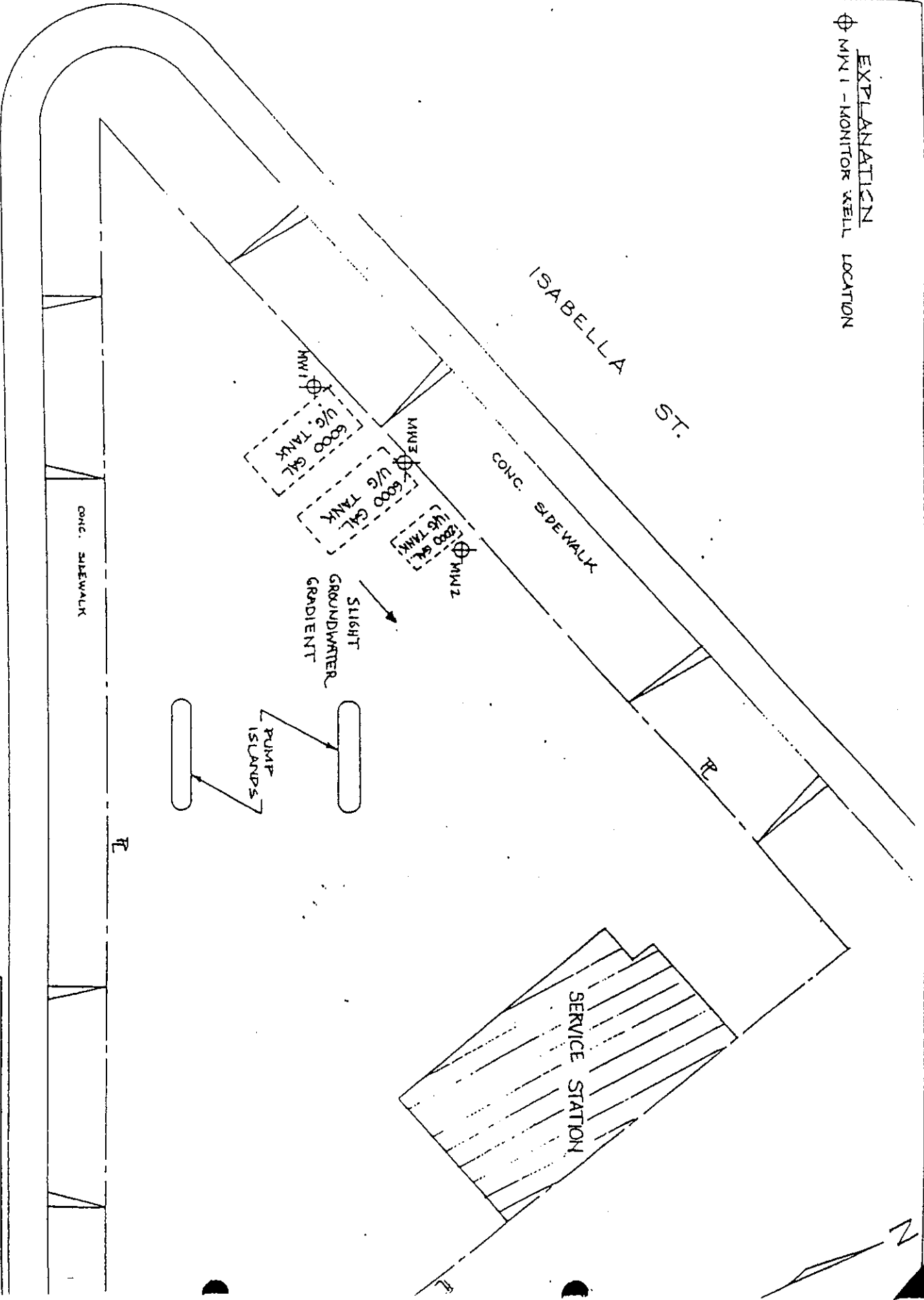
Enclosures: Plate 1, Site Vicinity Map  
Plate 2, Proposed Vapor Extraction Well Locations

cc: H.C. Winsor, ARCO Products Company

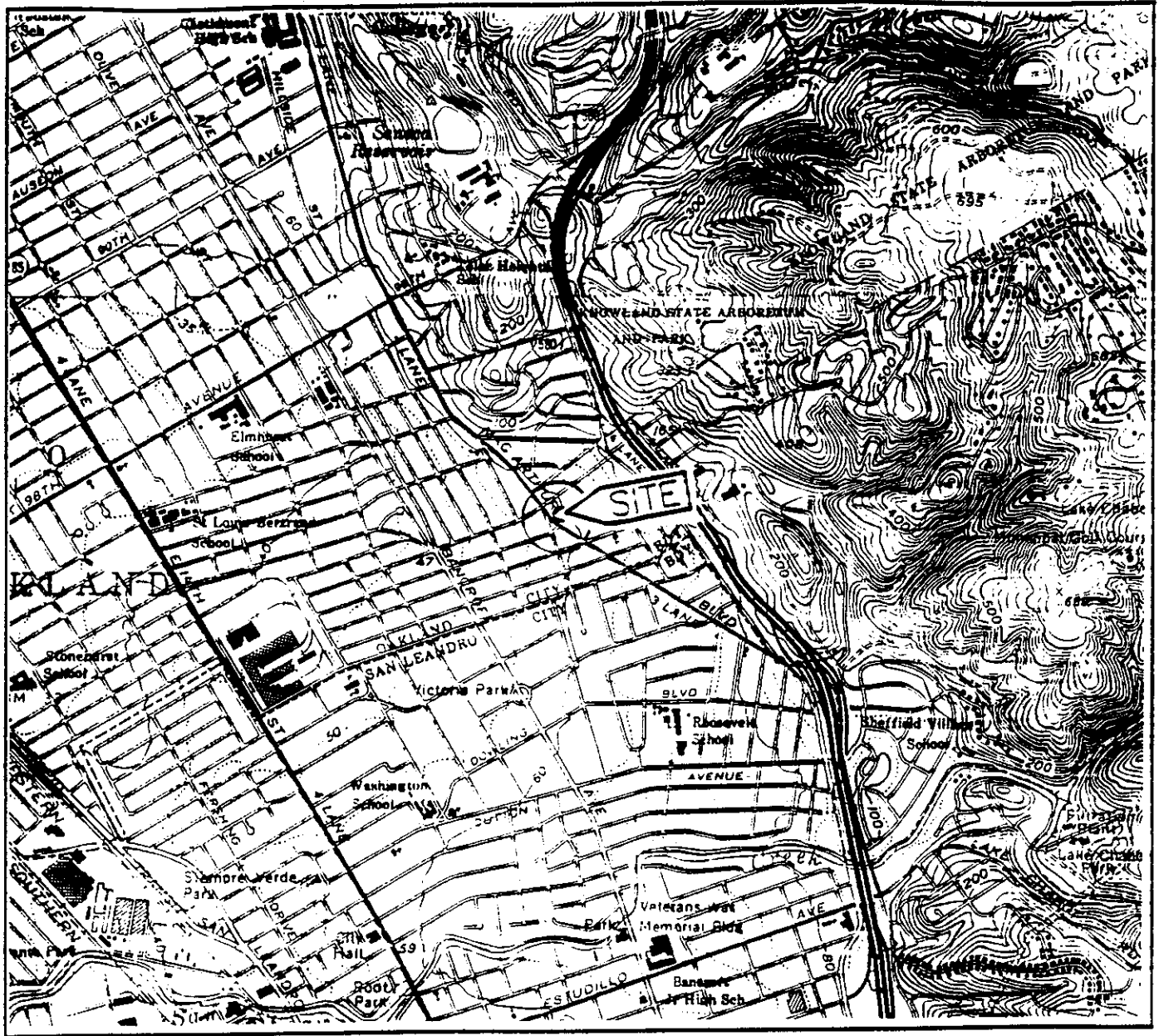
EXPLANATION  
 ⊕ MW1 - MONITOR WELL LOCATION

SCALE  
 0 10 20 FEET

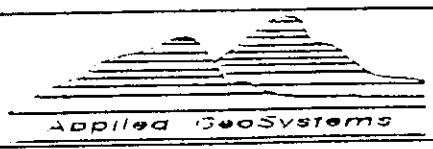
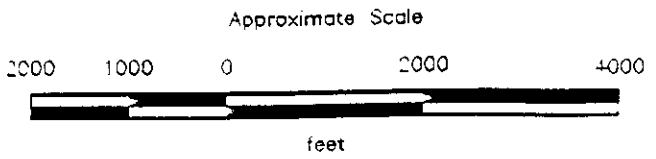
WEST GRAND AVE.



CHEVRON SERVICE STATION PLAN	
OAKLAND, CALIFORNIA	
DATE: 10/22/84	PROJECT NO. F-1



Source: U.S. Geological Survey  
 7.5-Minute Quadrangles  
 Oakland East/San Leandro  
 California.  
 Photorevised 1980

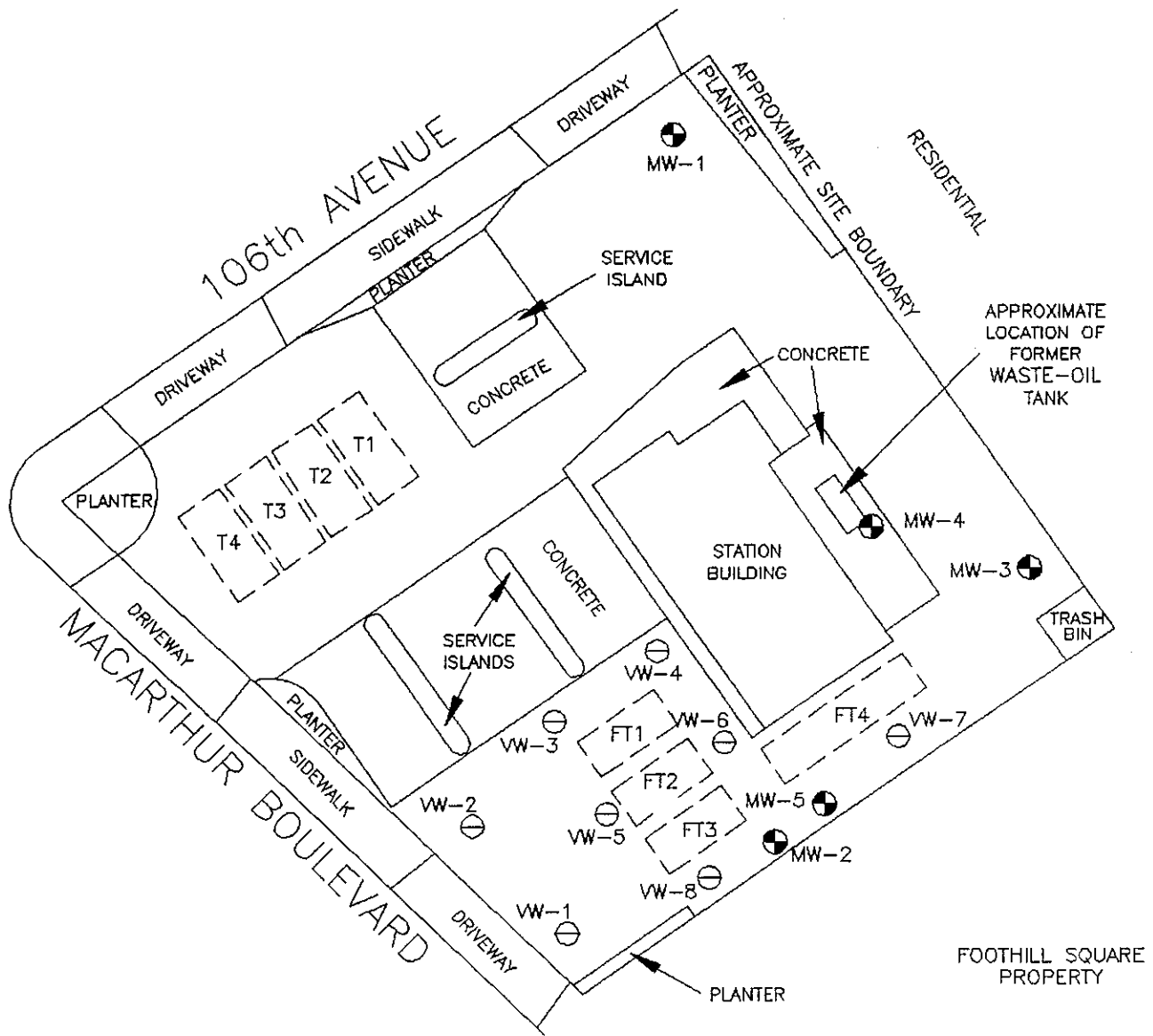


**SITE VICINITY MAP**  
**ARCO Station 276**  
**10600 MacArthur Boulevard**  
**Oakland, California**

**PLATE**  
**1**

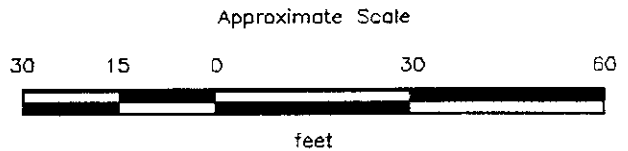
**PROJECT 60026-4**





**EXPLANATION**

- VW-8 ⊖ = Proposed vapor extraction well
- MW-5 ⊕ = Approximate location of monitoring well (Applied GeoSystems, 1989)
- T4 = Existing underground storage tanks
- FT4 = Former underground storage tanks



Source: Modified from plan supplied by ARCO and surveyed by Ron Archer, Civil Engineer, Inc.



**PROPOSED VAPOR  
EXTRACTION WELL LOCATIONS**  
**ARCO Station 276**  
**10600 MacArthur Boulevard**  
**Oakland, California**

**PLATE**

**2**

**PROJECT 60026-4**