PACIFIC
ENVIRONMENTAL
GROUP INC.

June 29, 1995
Project 330-048.1B

Mr. Scott Seary
Alameda County Health Care Services Agency
Division of Hazardous Materials
1131 Harbor Bay Parkway, Room 250
Alameda, California 94502

Re: Soil Assessment and Site Closure Report
ARCO Service Station 2152
22141 Center Street at Grove Way
Castro Valley, California

Dear Mr. Seary:

This letter, prepared by Pacific Environmental Group, Inc. (PACIFIC) for ARCO Products Company (ARCO), presents the results of a soil investigation performed at the site referenced above (Figure 1 and 2). The purpose of this investigation was to address the concerns of hydrocarbons in the area of the former product line vapor recovery sump. Additionally, the soil analytical data collected during the investigation would facilitate approval for closure of soil and groundwater at the site. The work was conducted in response to the February 3, 1995, meeting with Alameda County Health Care Services Agency (ACHCSA), ARCO, and PACIFIC. The work was performed as described in PACIFIC's February 7, 1995 *Meeting Minutes/Limited Work Plan,* and April 11, 1995 *Work Plan Modification.* This letter includes a brief discussion of the scope of work, findings, and conclusions and recommendations.

SCOPE OF WORK

The scope of work completed for this investigation included the drilling of one angled boring (B-21) and one vertical soil boring (B-22), collection and submittal of selected soil samples for laboratory analysis, and preparation of this letter. Field and laboratory procedures and boring logs are presented as Attachment A. Certified analytical reports and chain-of-custody documentation are presented as Attachment B.

PACIFIC drilled Borings B-21 and B-22 on April 28, 1995. Boring B-21 was drilled at a angle of 55 degrees from horizontal approximately 10 feet west of Well MW-1 to a

maximum vertical depth of 42 feet below ground surface (bgs). Boring B-22 was drilled in the conductor casing located in the present underground storage tank (UST) complex to a maximum vertical depth of 49 feet bgs. Soil samples were collected for laboratory analysis during drilling. The locations of Borings B-21 and B-22 are shown on Figure 2.

Soil samples were collected at 5-foot depth intervals during drilling for field and chemical analysis. Field analysis on soil samples was performed using an HNU photo-ionization detector (PID). All soil samples collected were submitted to a California State-certified laboratory and analyzed for the presence of total petroleum hydrocarbons calculated as gasoline (TPH-g), benzene, toluene, ethylbenzene, and xylenes (BTEX compounds).

FINDINGS

Subsurface Conditions

Soils encountered during drilling consisted primarily of fine-grained deposits of silts and clays interbedded with coarser-grained deposits, both underlain by a clayey gravel to a maximum depth explored of 49 feet bgs.

Groundwater was not encountered during drilling, but measurements from nearby groundwater monitoring wells show water to be at approximately 52 feet bgs.

Organic Vapor Analysis

The concentration of organic vapors, measured with the PID in the field during drilling, were all non-detectable. PID measurements of petroleum hydrocarbon levels are useful for indicating relative levels of hydrocarbon impact, but cannot be used to evaluate petroleum hydrocarbon levels with the confidence of laboratory analysis. The results of PID field analyses are noted on the attached boring logs.

Soil Analytical Results

All soil samples collected were submitted for laboratory analysis. TPH-g and BTEX compounds were below the detection limits for all soil samples. Soil analytical data are presented in Table 1.

Summary of Findings

A summary of the findings of this investigation follows.

- Soils encountered during drilling consisted primarily of fine-grained deposits of silts and clays interbedded with coarser-grained deposits, underlain by a clayey gravel to maximum vertical depth explored of 49 feet bgs.

- TPH-g and BTEX compounds were below the detection limits for all soil samples analyzed.

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this investigation was to assess soil conditions beneath the former product line vapor recovery sump and determine whether the area was currently impacted by petroleum hydrocarbons. Based on the results of this investigation, soils beneath the TPH-g concentrations of 2,300 and 37,000 parts per million previously detected during UST and former product line vapor recovery sump excavation are not impacted by petroleum hydrocarbons. As shown on Figure 3, the soils previously noted to be impacted with TPH-g are defined to below the detection limits for TPH-g and BTEX compounds by Borings B-21 and B-22. Additionally, analytical results from soil samples collected from Wells MW-1, VW-1, VW-3, and VW-4, and Borings B-2, B-14, and B-19 indicate TPH-g and benzene are below the detection limits for all soil sample analyzed, with the exception of Well VW-4. TPH-g and benzene were detected only in the 22-foot soil sample at 680 and 126 ppm, respectively. Therefore, PACIFIC requests that the ACHCSA grant approval for closure for soil and groundwater at the site.

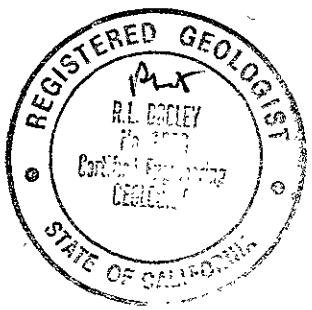
If you have any questions regarding the contents of this letter, please call.

Sincerely,

Pacific Environmental Group, Inc.

Kelly C. Brown
Project Manager

R. Lee Dooley
Senior Geologist
CEG 1006



Attachments:
- Table 1 - Soil Analytical Data - Total Petroleum Hydrocarbons (TPH as Gasoline and BTEX Compounds)
- Figure 1 - Site Location Map
- Figure 2 - Site Map
- Figure 3 - Soil Analytical Map/Angle Boring Schematic
- Attachment A - Field and Laboratory Procedures, and Boring Logs
- Attachment B - Certified Analytical Reports and Chain-of-Custody Documentation

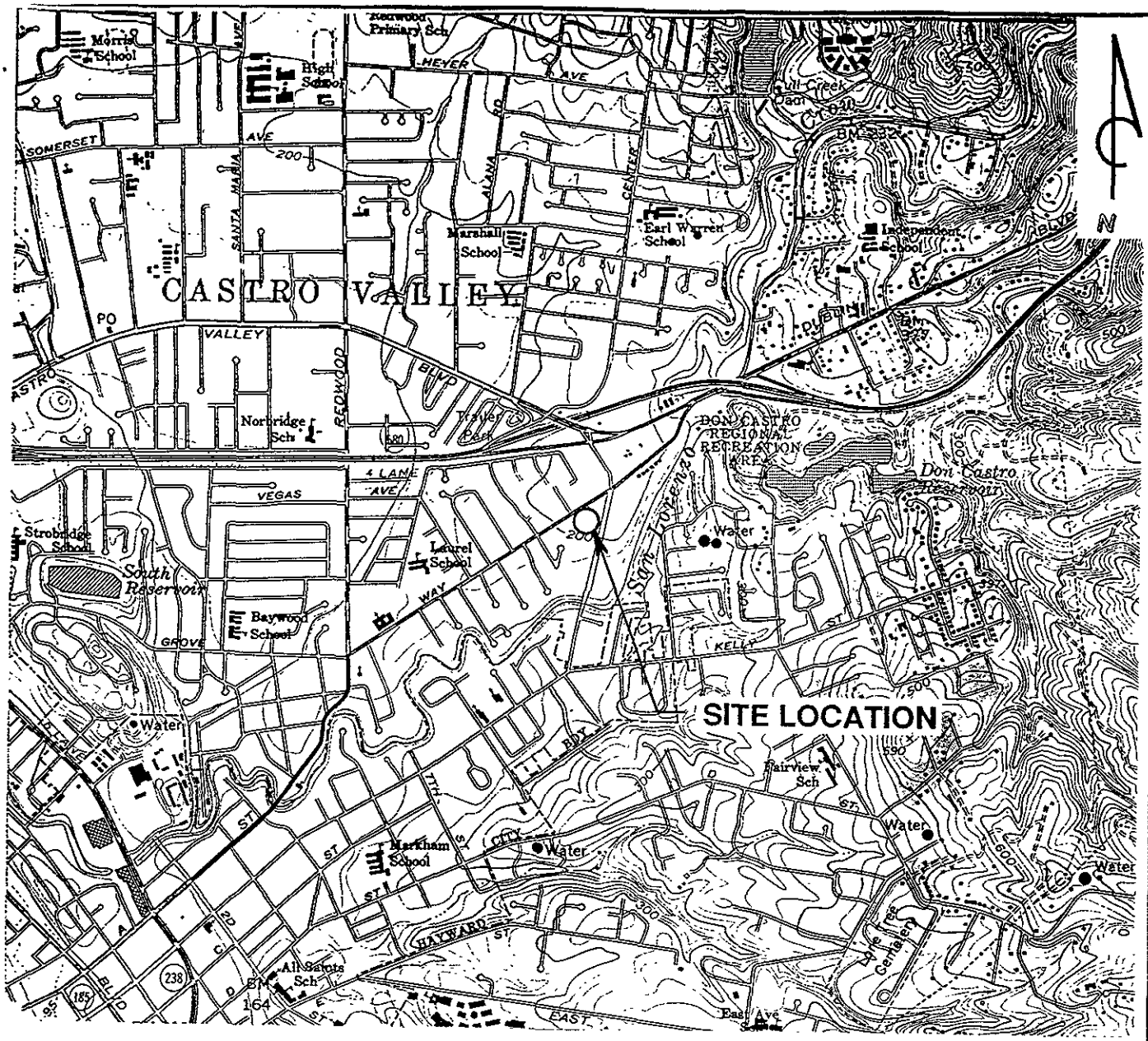
cc: Mr. Michael Whelan, ARCO Products Company
Mr. Kevin Graves, Regional Water Quality Control Board

Table 1
Soil Analytical Data
Total Petroleum Hydrocarbons
(TPH as Gasoline and BTEX Compounds)

ARCO Service Station 2152
22141 Center Street at Grove Way
Castro Valley, California

Sample ID	Sample Depth (feet)	Date Sampled	TPH as Gasoline (ppm)	Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylenes (ppm)
B-21*	26	04/28/95	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	31		<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	36		<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	41		<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	46		<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	51		<1.0	<0.0050	<0.0050	<0.0050	<0.0050
B-22	16	04/28/95	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	21		<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	26		<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	31		<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	36		<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	41		<1.0	<0.0050	<0.0050	<0.0050	<0.0050
	46		<1.0	<0.0050	<0.0050	<0.0050	<0.0050

ppm = Parts per million
* = Below laboratory detection limit.
< = Boring B-21 is an angle boring drilled at 55 degrees from horizontal. Sample depths are along line of drilling and not vertical sample depths.



QUADRANGLE LOCATION

REFERENCES:
USGS 7.5 MIN. TOPOGRAPHIC MAP
TITLED: HAYWARD, CALIFORNIA
DATED: 1959 REVISED: 1980

SCALE IN FEET
2000 0 2000

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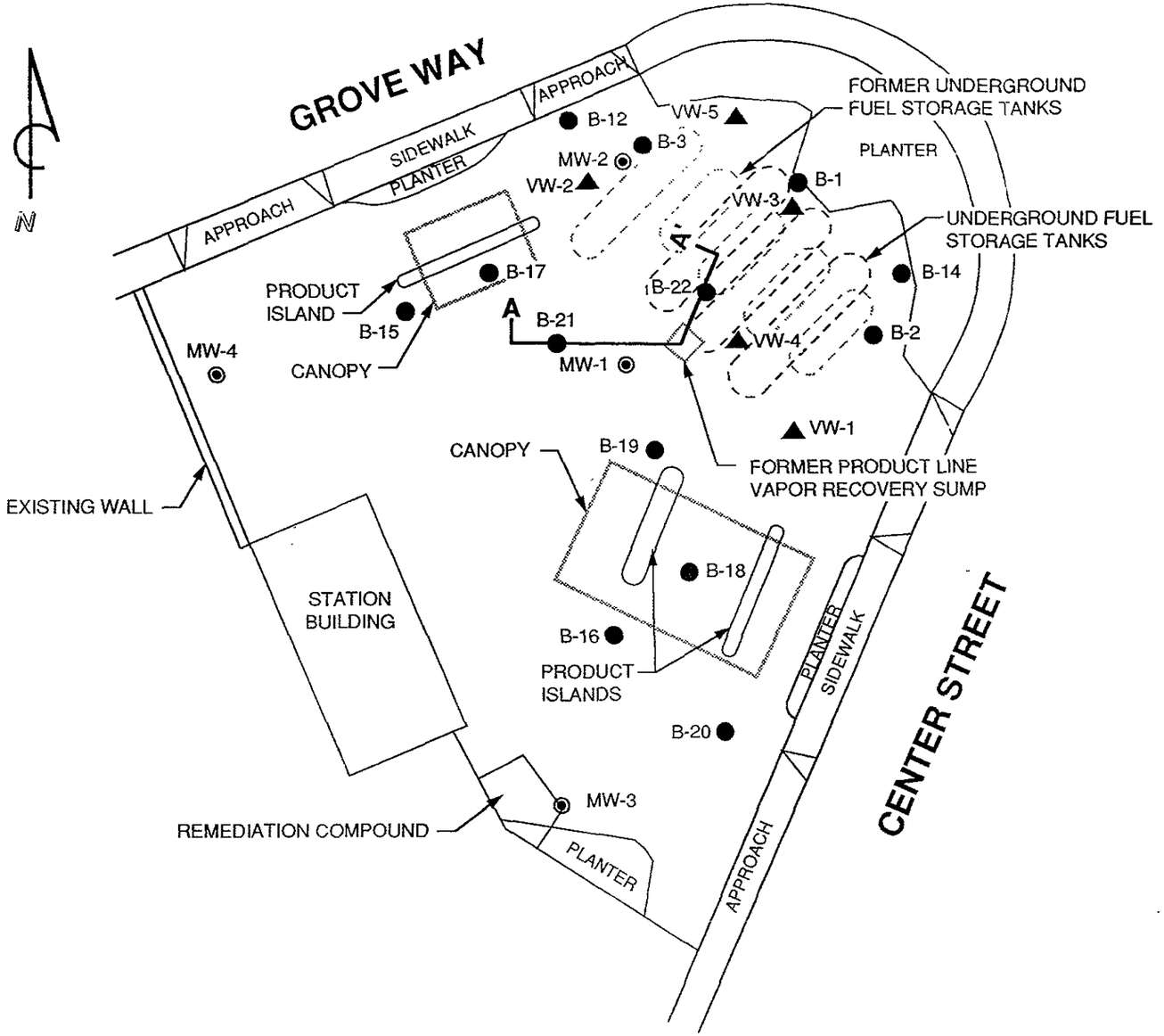
ARCO SERVICE STATION 2152
22141 Center Street at Grove Way
Castro VAlley, California

SITE LOCATION MAP

FIGURE: 1
PROJECT: 330-048.1B



LEGEND

MW-4 ◉ GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION

VW-1 ▲ SOIL VAPOR EXTRACTION WELL LOCATION AND DESIGNATION

B-2 ● SOIL BORING LOCATION AND DESIGNATION

A A' LINE OF CROSS-SECTION (SEE FIGURE 3)

Reference: Basemap taken from RESNA

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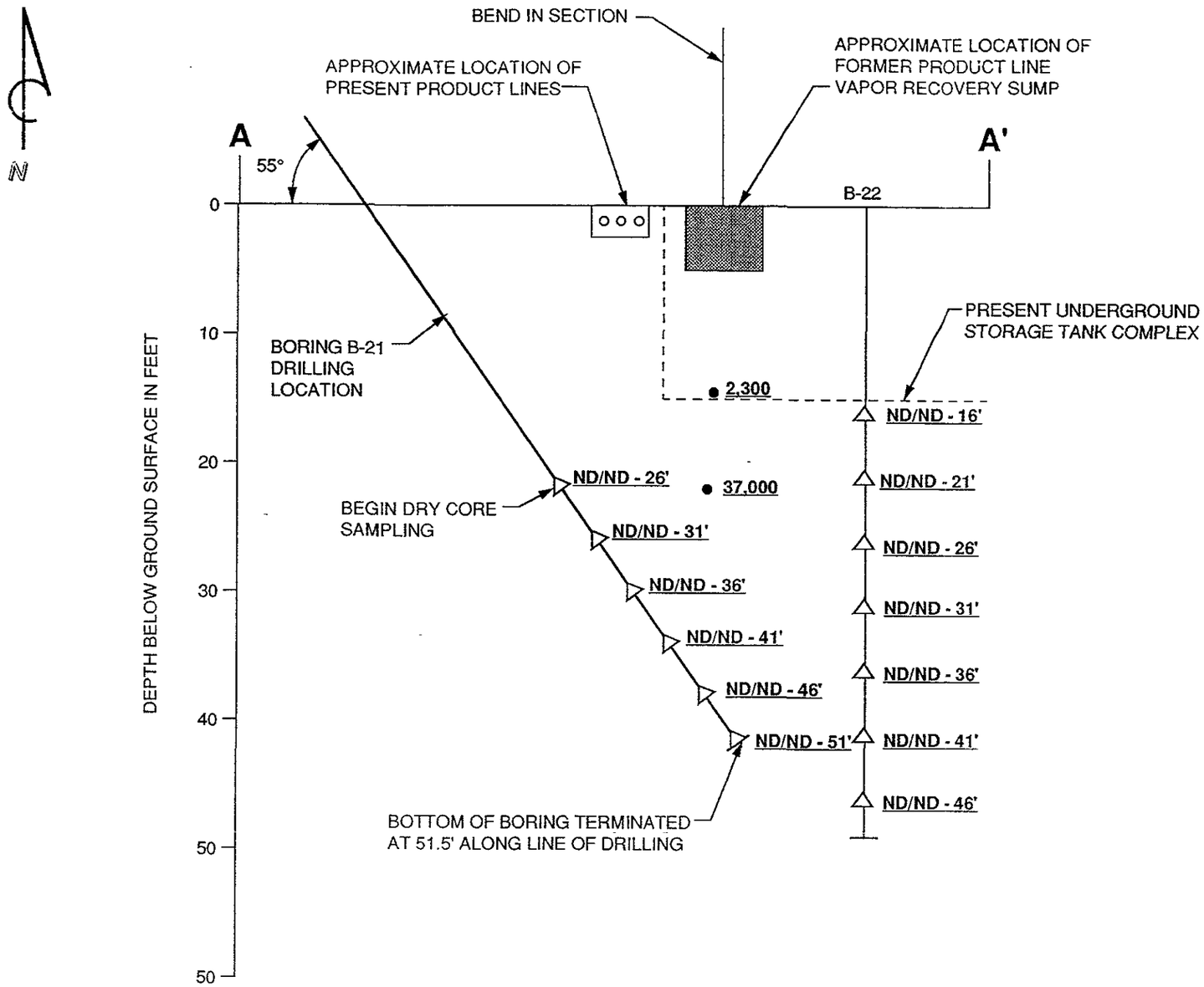
SCALE
0 30 60 FEET

ARCO SERVICE STATION 2152
22141 Center Street at Grove Way
Castro Valley, California

SITE MAP

FIGURE:
2
PROJECT:
330-048.1B

10/30/95



LEGEND

2,300 ●	SOIL SAMPLE LOCATION WITH TPH-g CONCENTRATION IN SOIL, IN PARTS PER MILLION, FROM UNDERGROUND STORAGE TANK EXCAVATION
△	SOIL SAMPLE LOCATION
proj	PROJECTED ONTO LINE OF SECTION IN FEET
ND/ND - 21'	TPH-g/BENZENE CONCENTRATION IN SOIL, IN PARTS PER MILLION, AT DEPTH INDICATED IN FEET, 4-28-95
ND	NOT DETECTED

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SCALE

HORIZONTAL : 1" = 10'
VERTICAL : 1" = 10'

ARCO SERVICE STATION 2152
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SOIL ANALYTICAL MAP/ANGLE BORING SCHEMATIC

FIGURE: **3**
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06/09/95

LETTER OF RECOMMENDATION FOR UST CASE CLOSURE

INTRODUCTION
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INVESTIGATIVE METHODS
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- Soil Sampling
- Construction of Monitoring Wells
- Well Development
- Groundwater Sampling
- Analytical Methods
  - Soil Samples
  - Groundwater Samples

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- Hydrocarbons in Groundwater
  - Floating Product
  - Dissolved Hydrocarbons

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- Local Hydrology
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- Seasonal Variations of Groundwater
- Aquifer Characteristics

BENEFICIAL USES OF GROUNDWATER
- Well Inventory
- Contaminant Fate Transport
- Sources of Drinking Water Policy Determination

REMEDIATION ACTIVITIES AND EFFECTIVENESS
- Soil Remediation
- Groundwater Remediation
- Impact of Residual Hydrocarbons on Beneficial Uses

SUMMARY AND CONCLUSIONS
RECOMMENDATIONS
TABLES ATTACHED
- Results of Analysis of Soil Samples
- Cumulative Results of Groundwater Elevation and Flow Direction
- Cumulative Results of Analyses of Water Samples
- Wells within 1/2-Mile Radius of the Site