Ultramar

Ultramar Inc.
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209-583-3330 Administrative
209-583-3302 Information Services
209-583-3358 Accounting

March 25, 1993

Mr. Hugh Murphy
Hazardous Material Inspector
Hayward Fire Department
22300 Foothill Boulevard
Hayward, California 94541

SUBJECT: FORMER BEACON STATION NO. 546, 29705 MISSION BOULEVARD, HAYWARD, CALIFORNIA

Dear Mr. Murphy:

Enclosed is a copy of the Monitoring Well Installation Report for the above-referenced Ultramar facility. Please call if you have any question regarding this project.

Sincerely,

ULTRAMAR INC.

Terrence A. Fox

Terrence A. Fox
Senior Project Manager
Marketing Environmental Department

Enclosures

cc w/encls: Mr. Vijay B. Patel, San Francisco Region, RWQCB

April 5, 1993
Left message with Both Terry Fox & Douglas Sheeks on Voice mail. Message said that we need a specific plan for a recommendation. Current recommendations are not adequate. Also left note that RWQCB contact has change and that each should contact me.

AEGIS ENVIRONMENTAL, INC.

1050 Melody Lane, Suite 160, Roseville, CA 95678 ✦ 916 • 782-2110 / 916 • 969-2110 / FAX 916 • 786-7830

March 22, 1993

Mr. Terrence Fox
Senior Project Manager
Ultramar Inc.
525 West Third Street
Hanford, California 93230

Subject: **Monitoring Well Installation Results Report, January 1993**
Former Beacon Station #546
29705 Mission Boulevard, Hayward, California

Dear Mr. Fox:

INTRODUCTION

Aegis Environmental, Inc. (Aegis), is pleased to provide Ultramar Inc. (Ultramar) this report documenting the results of the monitoring well installation conducted by Aegis on January 4, 1993, at the subject site (Figure 1). This report is based, in part, on information obtained by Aegis from Ultramar, and is subject to modification as newly acquired information may warrant.

SITE DESCRIPTION

The site is located at 29705 Mission Boulevard in Hayward, California. The site is a former Beacon gasoline station that previously retailed regular-unleaded, regular-leaded, and premium-unleaded gasolines. Details of the site's former facilities, including underground storage tanks (UST) and on- and off-site monitoring wells, are shown on Figure 2.

BACKGROUND

Previous site investigations include the following:

- In March 1987, five soil borings were drilled around the UST. Hydrocarbons were detected in the soil and groundwater beneath the site.
- In April 1988, three UST and one waste-oil tank were removed.
- In June and July 1988, three monitoring wells (MW-1 through MW-3) were installed. Results indicated petroleum hydrocarbons were present in groundwater beneath the site.
- In June 1989 and February 1990, a total of five additional wells (MW-4 through MW-8) were installed. Varying concentrations of hydrocarbons have been detected in all nine wells through time.
- Groundwater monitoring at the site began in July 1988 and continues to date.

SCOPE OF WORK

The work completed at the site on January 4, 1993, included the following:

- Drilling one soil boring off site to a depth of 25 feet below grade.
- Collection of selected soil samples for analysis and classification.
- Soil samples were screened for total organic vapor content using a photoionization detector (PID).
- Completion of the boring as 2-inch-diameter groundwater monitoring well MW-9.
- Developing and surveying the well.
- Submittal of selected soil samples and a groundwater sample from MW-9 for chemical analysis to Resna Environmental Laboratories of Fremont, California, a state-certified analytical laboratory.

These tasks were performed according to the Aegis standard operating procedures (SOP) included as Attachment 1.

SOIL BORING

On January 4, 1993, one soil boring was drilled by Woodward Drilling Company at the location shown on Figure 2. The boring was terminated at a depth of 25 feet below grade. Soil samples were collected at a minimum spacing of 5 feet. Two selected soil samples were submitted for chemical analysis of benzene, toluene, ethylbenzene, total xylenes (BTEX), and total petroleum hydrocarbons (TPH), as gasoline. Soil descriptions, classifications, PID screening results, and other pertinent information were recorded on the soil boring logs included as Attachment 2.

The soils encountered in the boring consisted of silty clay from surface to total depth.

SOIL ANALYTICAL RESULTS

The soil samples were analyzed for BTEX by EPA Method 8020 and TPH, as gasoline, by modified EPA Method 8015. The results indicated TPH, as gasoline, ranged from 1.7 to 10 parts-per-million (ppm) and BTEX ranged from below detection limits to 0.045 ppm. The analytical results are summarized in Table 1. The laboratory reports and chain-of-custody form are included as Attachment 3.

MONITORING WELL INSTALLATION

The boring was completed with Schedule 40 PVC; the screened portion of the well consists of 0.020-inch-wide slots. The monitoring well construction details are included in Attachment 2. After installation, the well was surveyed and developed.

GROUNDWATER MONITORING

Groundwater Measurements

Aegis personnel collected measurements of the depth to groundwater in wells MW-1, MW-2, MW-3, MW-7, MW-8, and MW-9 on January 4, 1993. Monitoring wells MW-4, MW-5, and MW-6 were not accessible. Current groundwater level measurements and 1992 measurements for all wells are summarized in Table 2. All measurements of depth to groundwater were made to the nearest 0.01 foot from the referenced wellhead (top-of-casing) elevations. On the basis of the January 4, 1993, measurements, groundwater is estimated to flow to the southwest (Figure 3) at an average gradient of approximately 0.004 ft/ft. Groundwater levels have increased compared to measurements collected in the previous quarter; ranging from 1.44 to 2.02 feet, with an average of 1.61 feet.

Groundwater Sampling and Analysis

On January 4, 1993, Aegis personnel collected a groundwater sample only from the newly installed well MW-9. The sample was submitted under chain-of-custody to Resna. The sample was analyzed for concentrations of: a) TPH, as gasoline, by GC-FID/EPA Methods 5030/8015; and b) BTEX by GC-FID/EPA Methods 5030/602. The results indicated TPH, as gasoline, was 67,100 ppm and BTEX ranged from 67 to 2,900 ppm. Typically, initial sampling of the well is not representative of actual conditions. Current analytical results from monitoring well MW-9, and previous results from monitoring wells MW-1 through MW-8, are summarized in Table 3. The analytical laboratory reports and chain-of custody form are included in Attachment 3.

The next quarterly monitoring will be used to evaluate the concentration of hydrocarbons in the wells.

RECOMMENDATIONS

Aegis recommends a copy of this letter results report be forwarded to the following agencies:

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

Mr. Hugh Murphy
City of Hatward Fire Department
25151 Clawiter Road
Hayward, California 94545-2731

REMARKS/SIGNATURES

The interpretations and conclusions contained in this results report represent our professional opinions. These opinions are based on currently available information and were developed in accordance with currently accepted geologic, hydrogeologic, and engineering practices at this time and for this specific site. Other than this, no warranty is implied or intended.

This results report has been prepared solely for the use of Ultramar Inc. Any reliance on this report by third parties shall be at such parties sole risk. The work described herein was performed under the direct supervision of the professional geologist, registered with the State of California, whose signature appears below.

Sincerely,

AEGIS ENVIRONMENTAL, INC.

John Giorgi

John Giorgi
Staff Geologist

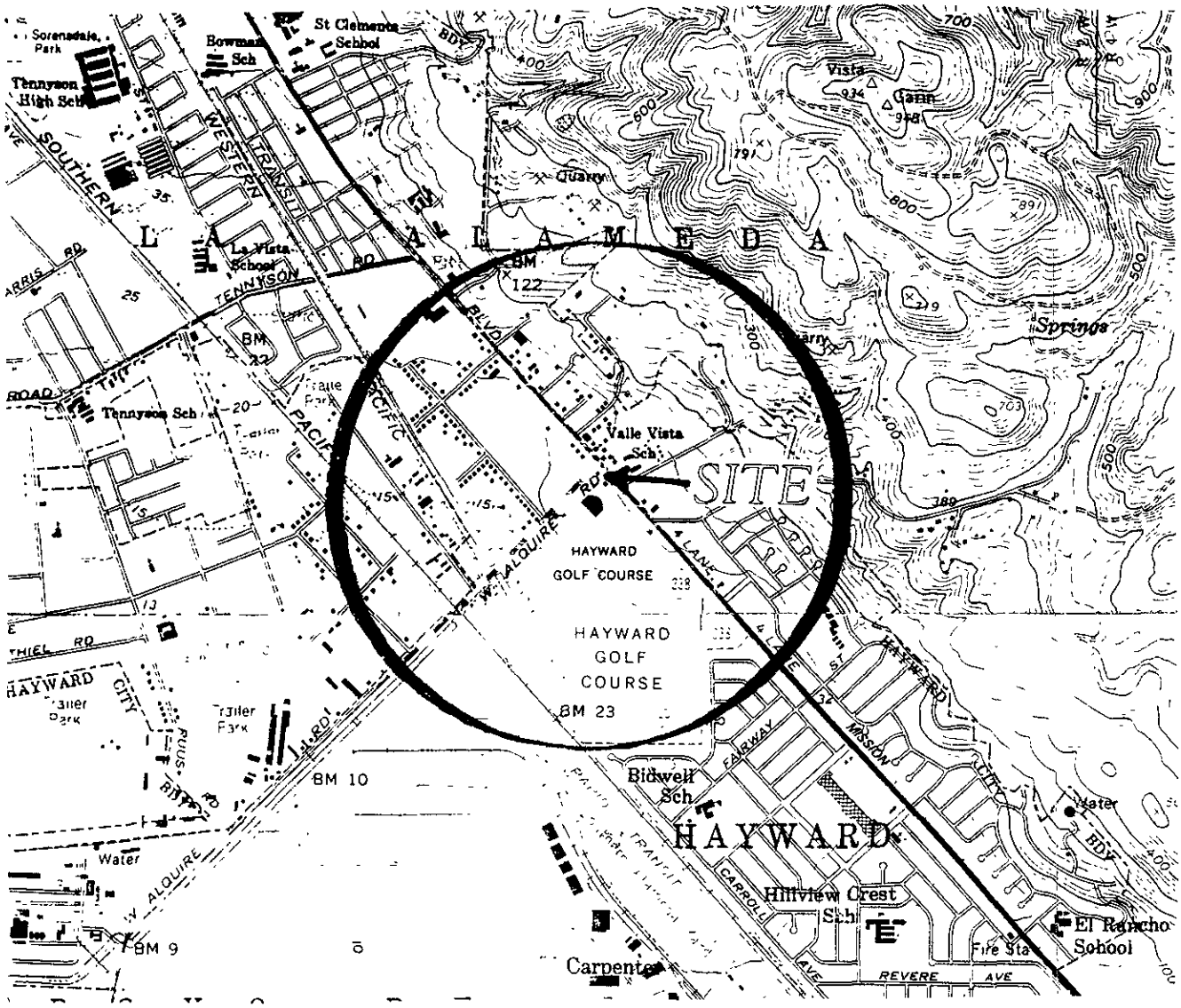
Douglas I. Sheeks
Senior Geologist
CRG No. 5211

3-22-93
Date

JG/DIS/law

Attachments

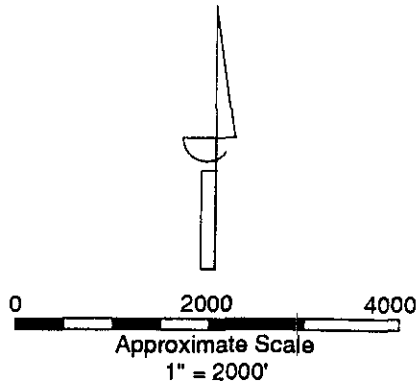
FIGURES



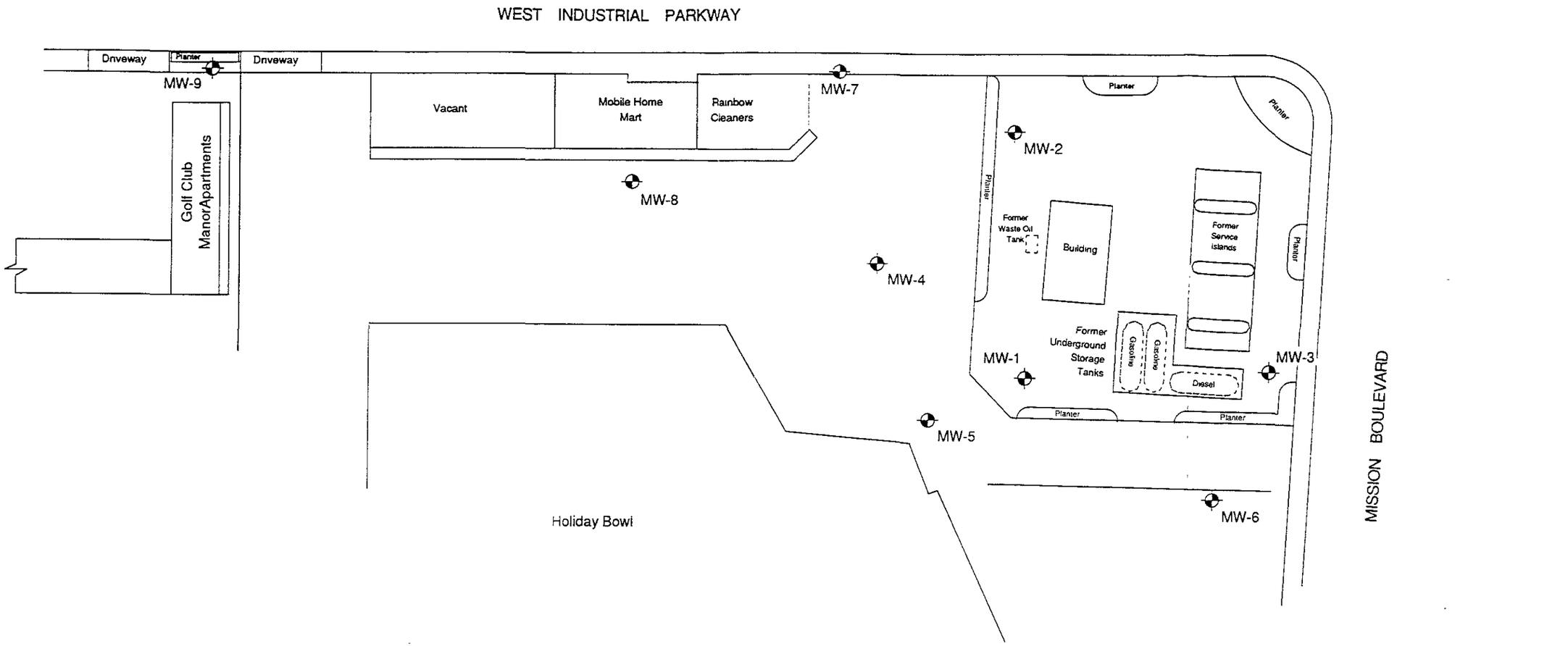
GENERAL NOTES:

BASE MAP FROM USGS
7.5 MINUTE TOPOGRAPHIC
HAYWARD & NEWARK, CA.
1959, PHOTOREVISED 1980.

WEST ALQUIRE ROAD HAS BEEN
CHANGED TO
WEST INDUSTRIAL PARKWAY



AEGIS ENVIRONMENTAL, INC.		SITE LOCATION MAP	FIGURE 1
DRAWN BY: Ed Bernard	DATE: September 29, 1992	Beacon Station # 546 29705 Mission Boulevard Hayward, CA	PROJECT NUMBER: 10-92067
REVISED BY: Ed Bernard	DATE: February 11, 1993		
REVIEWED BY: John Giorgi	DATE: 2-12-93		



LEGEND

⊕ Monitoring Well

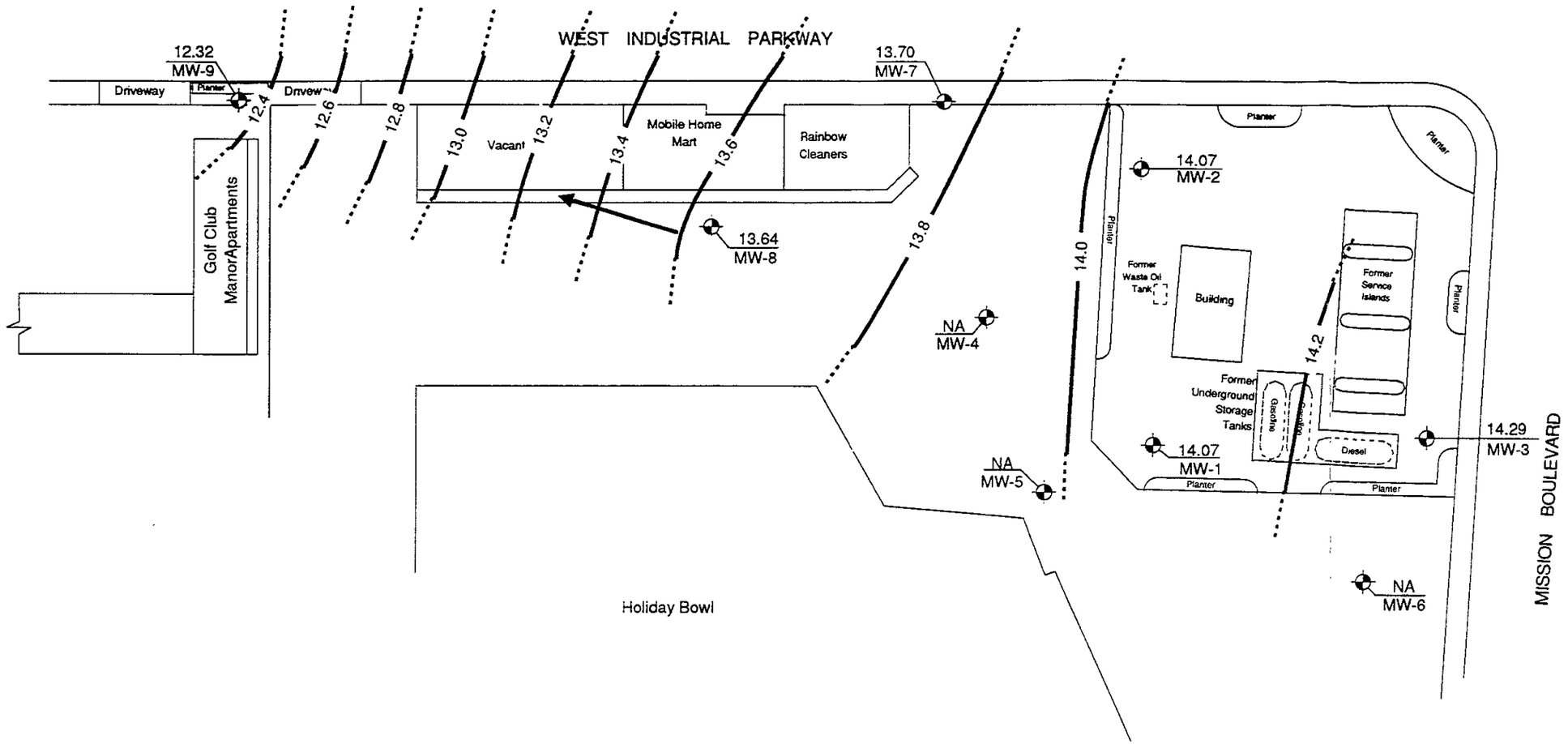
NOTES

Site Sketch After
Site Map By Ultramar
August 5, 1992

All Locations Are Approximate

0 50 100
Approximate Scale
1" = 50'

DRAWN BY: D Hada	DATE: November 16 1992	SITE VICINITY MAP	FIGURE 2
REVISED BY	DATE	Beacon Station # 546 29705 Mission Boulevard Hayward, CA	PROJECT NUMBER 10-92067
REVIEWED BY: John Gorgi	DATE: 2-11-93		



LEGEND

- Monitoring Well
- 14.07 — Groundwater Elevation
- Potentiometric Surface Contour (Dashed Where Inferred)
- Estimated Direction Of Groundwater Flow
- NA — Not Accessible

NOTES

Site Sketch After
Site Map By Ultramar
August 5, 1992

All locations Are Approximate

Average Hydraulic Gradient = 0.004 ft/ft
Contour Interval = 0.2 ft.

Wells MW-4, MW-5 And MW-6 Were Not Used To Determine Potentiometric Surface As They Were Not Accessible

0 50 100
Approximate Scale
1" = 50'

AEGIS ENVIRONMENTAL, INC

POTENTIOMETRIC SURFACE MAP
January 4, 1993

FIGURE
3

DRAWN BY: Ed Bernard — DATE: February 3, 1992
REVISED BY: — DATE:
REVIEWED BY: John Giorgi — DATE: 2-11-93

Beacon Station # 546
29705 Mission Boulevard
Hayward, CA

PROJECT NUMBER
10-92067

TABLES

TABLE 1

ANALYTICAL RESULTS: SOIL

FORMER BEACON STATION #546
29705 MISSION BOULEVARD, HAYWARD, CALIFORNIA
JANUARY 4, 1993
(All results in parts-per-million)

Sample ID	Sample Depth (Feet)	Total Petroleum Hydrocarbons	Aromatic Volatile Organics			
		Gasoline	Benzene	Toluene	Ethyl-benzene	Total Xylenes
S-0104-MW9-10.5'	10.5	10	0.045	0.009	0.007	0.026
S-0104-MW9-15.5'	15.5	1.7	0.036	<	0.011	0.012

NOTE: < = Below Practical Quantitation Reporting Limits (PQL) per "Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites" (August 10, 1990). (PQL for BTEX = 0.005 ppm, TPH, as gasoline and diesel = 1.0 ppm.)

TABLE 2

LIQUID LEVEL DATA

FORMER BEACON STATION #546
29705 MISSION BOULEVARD, HAYWARD, CALIFORNIA
(Measurements in feet)

Monitoring Well	Date	Reference Elevation (top of casing)[1]	Depth to Groundwater[1]	Depth to Product	Groundwater Elevation[2]	Product Thickness
MW-1	04/15/92	37.46	22.10	---	15.36	---
	07/07/92		23.40	---	14.06	---
	09/23/92*		24.61	---	12.85	---
	11/12/92		24.87	24.86	12.60**	0.01
	01/04/93		23.39	---	14.07	---
MW-2	04/15/92	35.95	20.88	---	15.07	---
	07/07/92		21.95	---	14.00	---
	09/23/92*		23.15	---	12.80	---
	11/12/92		23.43	---	12.52	---
	01/04/93		21.88	---	14.07	---
MW-3	04/15/92	40.28	24.59	---	15.69	---
	07/07/92		25.90	---	14.38	---
	09/23/92*		27.09	---	13.19	---
	11/12/92		27.43	---	12.85	---
	01/04/93		25.99	---	14.29	---

NOTES:
[1] = Measurement and reference elevation taken from notch/mark on top north side of well casing.
[2] = Elevation referenced to (mean sea level or arbitrary bench mark).
* = Data collected prior to 09/23/92 are from a previous consultant.
** = Corrected groundwater elevation - CDTW = DTW - (SP.G x LHT).
CDTW = Corrected depth to water.
DTW = Measured depth to water.
SP.G. = Specific gravity: unweathered gasoline = 0.75, diesel = 0.80.
LHT = Measured liquid hydrocarbon thickness.
--- = Not measured/observed/calculated.

TABLE 2 (CONTINUED)

LIQUID LEVEL DATA

FORMER BEACON STATION #546
29705 MISSION BOULEVARD, HAYWARD, CALIFORNIA
(Measurements in feet)

Monitoring Well	Date	Reference Elevation (top of casing)[1]	Depth to Groundwater[1]	Depth to Product	Groundwater Elevation[2]	Product Thickness
MW-4	04/15/92	34.94	NA	---	NA	---
	07/07/92		NA	---	NA	---
	09/23/92*		NA	---	NA	---
	11/12/92		NA	---	NA	---
	01/04/93		NA	---	NA	---
MW-5	04/15/92	36.37	NA	---	NA	---
	07/07/92		NA	---	NA	---
	09/23/92*		NA	---	NA	---
	11/12/92		NA	---	NA	---
	01/04/93		NA	---	NA	---

NOTES:
[1] = Measurement and reference elevation taken from notch/mark on top north side of well casing.
[2] = Elevation referenced to (mean sea level or arbitrary bench mark).
* = Data collected prior to 09/23/92 are from a previous consultant.
NA = Not accessible.
--- = Not measured/observed/calculated.

TABLE 2 (CONTINUED)

LIQUID LEVEL DATA

FORMER BEACON STATION #546
29705 MISSION BOULEVARD, HAYWARD, CALIFORNIA
(Measurements in feet)

Monitoring Well	Date	Reference Elevation (top of casing)[1]	Depth to Groundwater[1]	Depth to Product	Groundwater Elevation[2]	Product Thickness
MW-6	04/15/92	37.43	NA	---	NA	---
	07/07/92		NA	---	NA	---
	09/23/92*		NA	---	NA	---
	11/12/92		NA	---	NA	---
	01/04/93		NA	---	NA	---
MW-7	04/15/92	30.50	16.00	---	14.50	---
	07/07/92		17.10	---	13.40	---
	09/23/92*		18.21	---	12.29	---
	11/12/92		18.37	---	12.13	---
	01/04/93		16.80	---	13.70	---
MW-8	04/15/92	28.48	14.30	---	14.18	---
	07/07/92		15.60	---	12.88	---
	09/23/92*		16.66	---	11.82	---
	11/12/92		16.86	---	11.62	---
	01/04/93		14.84	---	13.64	---
MW-9	01/04/93	21.99[3]	9.67	---	12.32	---

NOTES:
[1] = Measurement and reference elevation taken from notch/mark on top north side of well casing.
[2] = Elevation referenced to (mean sea level or arbitrary bench mark).
[3] = Surveyed by Aegis Environmental, Inc., on January 4, 1993.
* = Data collected prior to 09/23/92 are from a previous consultant.
NA = Not accessible.
--- = Not measured/observed/calculated.

TABLE 3

ANALYTICAL RESULTS: GROUNDWATER

BEACON STATION #546
29705 MISSION BOULEVARD, HAYWARD, CALIFORNIA
(All results in parts-per-billion)

Monitoring Well	Date Collected	Total Petroleum Hydrocarbons	Aromatic Volatile Organics			
		Gasoline	Benzene	Toluene	Ethyl-benzene	Total Xylenes
MW-1	04/15/92	8,900	710	11	150	440
	07/07/92	<50	<0.5	<0.5	<0.5	<0.5
	09/23/92*	<50	<0.5	<0.5	<0.5	<0.5
	11/12/92	---	---	---	---	---
MW-2	04/15/92	1,200	21	4.8	56	26
	07/07/92	<50	<0.5	<0.5	<0.5	<0.5
	09/23/92*	<50	<50	<0.5	<0.5	<0.5
	11/12/92	<50	<0.5	<0.5	1.7	0.9
MW-3	04/15/92	69	2.8	<0.5	<0.5	<0.5
	07/07/92	<50	<0.5	<0.5	<0.5	<0.5
	09/23/92*	<50	<0.5	<0.5	<0.5	<0.5
	11/12/92	<50	<0.5	<0.5	<0.5	<0.5
MW-4	04/15/92	---	---	---	---	---
	07/07/92	---	---	---	---	---
	09/23/92*	---	---	---	---	---
	11/12/92	---	---	---	---	---

NOTES: < = Below indicated detection limit as labeled on laboratory results report.
--- = Not analyzed.
* = Analytical results prior to 09/23/92 are from a previous consultant.

TABLE 3 (CONTINUED)

ANALYTICAL RESULTS: GROUNDWATER

BEACON STATION #546
29705 MISSION BOULEVARD, HAYWARD, CALIFORNIA
(All results in parts-per-billion)

Monitoring Well	Date Collected	Total Petroleum Hydrocarbons	Aromatic Volatile Organics			
		Gasoline	Benzene	Toluene	Ethyl-benzene	Total Xylenes
MW-5	04/15/92	---	---	---	---	---
	07/07/92	---	---	---	---	---
	09/23/92*	---	---	---	---	---
	11/12/92	---	---	---	---	---
MW-6	04/15/92	---	---	---	---	---
	07/07/92	---	---	---	---	---
	09/23/92*	---	---	---	---	---
	11/12/92	---	---	---	---	---
MW-7	04/15/92	1,600	21	1.2	2.0	1.2
	07/07/92	320	<0.5	<0.5	<0.5	<0.5
	09/23/92*	90	<0.5	<0.5	<0.5	<0.5
	11/12/92	<50	<0.5	<0.5	<0.5	<0.5
MW-8	04/15/92	40,000	1,900	34	1,200	1,800
	07/07/92	19,000	560	14	32	630
	09/23/92*	4,200	370	<5.0	<5.0	150
	11/12/92	5,100	75	<2.5	<2.5	110
MW-9	01/04/93	67,000	990	67	1,000	2,900

NOTES: < = Below indicated detection limit as labeled on laboratory results report.
--- = Not analyzed.
* = Analytical results prior to 09/23/92 are from a previous consultant.

ATTACHMENT 1

STANDARD OPERATING PROCEDURES

AEGIS ENVIRONMENTAL, INC.
STANDARD OPERATING PROCEDURES
RE: SOIL BORING SAMPLING
SOP-1

During drilling, soil samples for chemical analysis are collected in thin-walled brass tubes, of varying diameters and lengths (e.g., 4 or 6 inches long by 2 inches outside diameter). Three or four of the selected tubes, plus a spacer tube, are set in an 18-inch long split-barrel sampler of the appropriate inside-diameter.

Where possible, the split-barrel sampler is driven its entire length either hydraulically or using a 140-pound drop hammer. The sampler is extracted from the borehole and the brass tubes, containing the soil samples, are removed. Upon removal from the sampler, the selected brass tubes are either immediately trimmed and capped with aluminum foil or "Teflon" sheets and plastic caps or the samples are extruded from the tubes and sealed within other appropriate cleaned sample containers. The samples are then hermetically sealed, labeled, and refrigerated for delivery, under strict chain-of-custody, to the analytical laboratory. These procedures minimize the potential for cross-contamination and volatilization of volatile organic compounds (VOC) prior to chemical analysis.

One soil sample collected at each sampling interval is analyzed in the field using either a portable photoionization detector (PID), flame ionization detector, organic vapor analyzer, catalytic gas detector, or an explosimeter. The purpose of this field analysis is to qualitatively determine the presence or absence of hydrocarbons, and the samples to be analyzed at the laboratory. The soil sample is sealed in either a brass tube, glass jar, or plastic bag to allow for some volatilization of VOC. The PID is then used to measure the concentrations of hydrocarbons within the containers's headspace. The data is recorded on both field notes and the boring logs at the depth corresponding to the sampling point.

Other soil samples are collected to document the soil and/or stratigraphic profile beneath the project site, and estimate the relative permeability of the subsurface materials. All drilling and sampling equipment are either steam cleaned or washed in solution and doubly rinsed in deionized water prior to use at each site and between boreholes to minimize the potential for cross-contamination.

In the event the soil samples cannot be submitted to the analytical laboratory on the same day they are collected (e.g., due to weekends or holidays), the samples are temporarily stored until the first opportunity for submittal either on ice in a cooler, such as when in the field, or in a refrigerator at Aegis' office.

AEGIS ENVIRONMENTAL, INC.
STANDARD OPERATING PROCEDURES
RE: SOIL CLASSIFICATION
SOP-3

Soil samples are classified according to the Unified Soil Classification System. Representative portions of the samples may be submitted under strict chain-of-custody to an analytical laboratory for further examination and verification of the in-field classification, and analysis of soil mechanical and/or petrophysical properties. The soil types are indicated on logs of either excavations or borings together with depths corresponding to the sampling points, and other pertinent information.

AEGIS ENVIRONMENTAL, INC.
STANDARD OPERATING PROCEDURES
RE: SAMPLE IDENTIFICATION AND CHAIN-OF-CUSTODY PROCEDURES
SOP-4

Sample identification and chain-of-custody procedures ensure sample integrity, and document sample possession from the time of collection to its ultimate disposal. Each sample container submitted for analysis is labeled to identify the job number, date, time of sample collection, a sample number unique to the sample, any in-field measurements made, sampling methodology, name(s) of on-site personnel and any other pertinent field observations also recorded on the field excavation or boring log.

Chain-of-custody forms are used to record possession of the sample from time of collection to its arrival at the laboratory. During shipment, the person with custody of the samples will relinquish them to the next person by signing the chain-of-custody form(s) and noting the date and time. The sample-control officer at the laboratory will verify sample integrity, correct preservation, confirm collection in the proper container(s), and ensure adequate volume for analysis.

If these conditions are met, the samples will be assigned unique laboratory log numbers for identification throughout analysis and reporting. The log numbers will be recorded on the chain-of-custody forms and in the legally-required log book maintained in the laboratory. The sample description, date received, client's name, and any other relevant information will also be recorded.

AEGIS ENVIRONMENTAL, INC.
STANDARD OPERATING PROCEDURES
RE: LABORATORY ANALYTICAL QUALITY ASSURANCE AND CONTROL
SOP-5

In addition to routine instrument calibration, replicates, spikes, blanks, spiked blanks, and certified reference materials are routinely analyzed at method-specific frequencies to monitor precision and bias. Additional components of the laboratory Quality Assurance/Quality Control program include:

1. Participation in state and federal laboratory accreditation/certification programs;

2. Participation in both U.S. EPA Performance Evaluation studies (WS and WP studies) and inter-laboratory performance evaluation programs;

3. Standard operating procedures describing routine and periodic instrument maintenance;

4. "Out-of-Control"/Corrective Action documentation procedures; and,

5. Multi-level review of raw data and client reports.

AEGIS ENVIRONMENTAL, INC.
STANDARD OPERATING PROCEDURE
RE: HOLLOW-STEM AUGER MONITORING WELL INSTALLATION AND DEVELOPMENT
SOP-6

Boreholes for monitoring wells are drilled using a truck-mounted, hollow-stem auger drill rig. The borehole diameter will be a minimum of 4 inches larger than the outside diameter of the casing when installing well screen. The hollow-stem auger provides minimal interruption of drilling while permitting soil sampling at desired intervals. Soil samples are collected by either hammering or hydraulically pushing a conventional split-barrel sampler containing pre-cleaned 2-inch-diameter brass tubes. A geologist or engineer from Aegis Environmental, Inc., continuously logs each borehole during drilling and constantly checks drill cuttings for indications of both the first recognizable occurrence of groundwater and volatile hydrocarbons using either a portable photoionization detector, flame ionization detector, or an explosimeter. The sampler is rinsed between samples and either steam cleaned or washed with all other drilling equipment between borings to minimize the potential for cross-contamination.

Monitoring wells are cased with threaded, factory-perforated and blank Schedule 40 PVC. The perforated interval consists of slotted casing, generally with 0.020-inch wide by 1.5-inch long slots, with 42 slots per foot. A PVC cap may be secured to the bottom of the casing with stainless steel screws; no solvents or cements are used. Centering devices may be fastened to the casing to ensure even distribution of filter material and grout within the borehole annulus. The well casing is thoroughly washed and/or steam cleaned, or may be purchased as pre-cleaned, prior to installation.

After setting the casing inside the hollow-stem auger, sand or gravel filter material is poured into the annular space to fill from boring bottom to generally 1 foot above the perforated interval. A 1- to 2-foot thick bentonite plug is set above this filter material to prevent grout from infiltrating into the filter pack. Either neat cement, containing about 5 percent bentonite, or sand-cement grout is then tremmied into the annular space from the top of the bentonite plug to near surface. A traffic-rated vault is installed around each wellhead for wells located in parking lots or driveways, while steel "stovepipes" are usually set over wellheads in landscaped areas.

After installation, the wells are thoroughly developed to remove residual drilling materials from the wellbore, and to improve well performance by removing fine material from the filter pack that may pass into the well. Well development techniques used may include pumping, surging, bailing, swabbing, jetting, flushing, and air-lifting. All development water is collected either in drums or tanks for temporary storage, and properly disposed of depending on laboratory analytical results. To minimize the potential for cross-contamination between wells, all development equipment are either steam cleaned or properly washed prior to use.

AEGIS ENVIRONMENTAL, INC.
STANDARD OPERATING PROCEDURE
RE: GROUNDWATER PURGING AND SAMPLING
SOP-7

Prior to water sampling, each well is purged by evacuating a minimum of three wetted well-casing volumes of groundwater. When required, purging will continue until either the discharge water temperature, conductivity, or pH stabilize, a maximum of ten well-bore volumes of groundwater have been recovered, or the well is bailed dry. When practical, the groundwater sample should be collected when the water level in the well recovers to at least 80 percent of its static level.

The sampling equipment consists of either a "Teflon" bailer, PVC bailer, or stainless steel bladder pump with a "Teflon" bladder. If the sampling system is dedicated to the well, then the bailer is usually "Teflon," but the bladder pump is PVC with a polypropylene bladder. In general and depending on the intended laboratory analysis, 40-milliliter glass, volatile organic analysis (VOA) vials, with "Teflon" septa, are used as sample containers.

The groundwater sample is decanted into each VOA vial in such a manner that there is no meniscus at the top of the vial. A cap is quickly secured to the top of the vial. The vial is then inverted and gently tapped to see if air bubbles are present. If none are present, the vial is labeled and refrigerated for delivery, under strict chain-of-custody, to the analytical laboratory. Label information should include a unique sample identification number, job identification number, date, time, type of analysis requested, and the sampler's name.

For quality control purposes, a duplicate water sample is collected from each well. This sample is put on hold at the laboratory. When required, a trip blank is prepared at the laboratory and placed in the transport cooler. It is labeled similar to the well samples, remains in the cooler during transport, and is analyzed by the laboratory along with the groundwater samples. In addition, a field blank may be prepared in the field when sampling equipment is not dedicated. The field blank is prepared after a pump or bailer has been either steam cleaned or properly washed, prior to use in the next well, and is analyzed along with the other samples. The field blank analysis demonstrates the effectiveness of the in-field cleaning procedures to prevent cross-contamination.

To minimize the potential for cross-contamination between wells, all well development and water sampling equipment not dedicated to a well is either steam cleaned or properly washed between use. As a second precautionary measure, wells are sampled in order of least to highest concentrations as established by available previous analytical data.

In the event the water samples cannot be submitted to the analytical laboratory on the same day they are collected (e.g., due to weekends or holidays), the samples are temporarily stored until the first opportunity for submittal either on ice in a cooler, such as when in the field, or in a refrigerator at Aegis' office.

AEGIS ENVIRONMENTAL, INC.
STANDARD OPERATING PROCEDURE
RE: MEASURING LIQUID LEVELS USING WATER LEVEL OR INTERFACE PROBE
SOP-12

Field equipment used for liquid-level gauging typically includes the measuring probe (water-level or interface) and product bailer(s). The field kit also includes cleaning supplies (buckets, TSP, spray bottles, and deionized water) to be used in cleaning the equipment between wells.

Prior to measurement, the probe tip is lowered into the well until it touches bottom. Using the previously established top-of-casing or top-of-box (i.e., wellhead vault) point, the probe cord (or halyard) is marked and a measuring tape (graduated in hundredths of a foot) is used to determine the distance between the probe end and the marking on the cord. This measurement is then recorded on the liquid-level data sheet as the "Measured Total Depth" of the well.

When necessary in using the interface probe to measure liquid levels, the probe is first electrically grounded to either the metal stove pipe or another metal object nearby. When no ground is available, reproducible measurements can be obtained by clipping the ground lead to the handle of the interface probe case.

The probe tip is then lowered into the well and submerged in the groundwater. An oscillating (beeping) tone indicates the probe is in water. The probe is slowly raised until either the oscillating tone ceases or becomes a steady tone. In either case, this is the depth-to-water (DTW) indicator and the DTW measurement is made accordingly. The steady tone indicates floating hydrocarbons. In this case, the probe is slowly raised until the steady tone ceases. This is the depth-to-product (DTP) indicator and the DTP measurement is made accordingly.

The process of lowering and raising the probe must be repeated several times to ensure accurate measurements. The DTW and DTP measurements are recorded on the liquid-level data sheet. When floating product is indicated by the probe's response, a product bailer is lowered partially through the product-water interface to confirm the product on the water surface, and as further indication of product thickness, particularly in cases where the product layer is quite thin. This measurement is recorded on the data sheet as "product thickness."

In order to avoid cross-contamination of wells during the liquid-level measurement process, wells are measured in the order of "clean" to "dirty" (where such information is available). In addition, all measurement equipment is cleaned with TSP or similar solution and thoroughly rinsed with deionized water before use, between measurements in respective wells, and at the completion of the day's use.

ATTACHMENT 2

BORING LOGS AND MONITORING WELL CONSTRUCTION DETAILS

FIELD BORING/MONITORING WELL LOG

AEGIS ENVIRONMENTAL, INC.

Boring #	MW# 9 Sheet 1 Of 2
Project Name:	Beacon Station ID # 546
Address:	29705 Mission Blvd, Hayward Job # 92-067
Logged By:	J. Giorgi Pro. Mgr: J. Giorgi Edited By:
Drilling Contractor:	Woodward Drilling Company
Drill Rig Type/Method:	Mobile B-57 / HSA
Drillers Name:	Erik Forsstrom
Borehole Dia./Drill Bit Type	Total Depth: 25
	8 1/4 inches / Clay Bit
Hammer Wt:	140 lbs Drop: 30 inches
Start Time:	9:15 Date: 1-4-93
Completion Time:	13:00 Date: 1-4-93
Backfilled Time:	Date:

Sketch Map Of Site Area With Boring Locations

	1st Water			
Boring Depth in Feet				
Casing Depth in Feet				
Water Depth in Feet				
Time				
Date				

Sampler Type Length	Sample Condition	Casing Type & Size	Driven (in.)	Recovered (in.)	Annulus Filler	Blow Count (6 in.)	PID/OVA (ppmv)	Depth Sample Recovery	Depth Feet (Below Surface)	USCS	
									0		
											Concrete (sidewalk) and fill material
									1		0 - 1.0
GS											Clay with silt, brownish black, moist,
									2		no product odor
									3		
									4		
									5		
CMSS	E		6	6		7					Same as above (SAA) and hard
	E		6	6		17			6		
	E		6	6		29	0				
									7		
									8		
									9		
									10		
CMSS	E		6	6		5	50				SAA except, light olive gray to some
	E		6	6		6		■	11		bluish gray and moderate yellowish
	E		6	6		15					brown, slight product odor
									12		

■ Sample sent to Laboratory for chemical analysis

E = Excellent
P = Poor

FIELD BORING/MONITORING WELL LOG

AEGIS ENVIRONMENTAL, INC.

Boring # MW# 9 | Sheet 2 Of 2

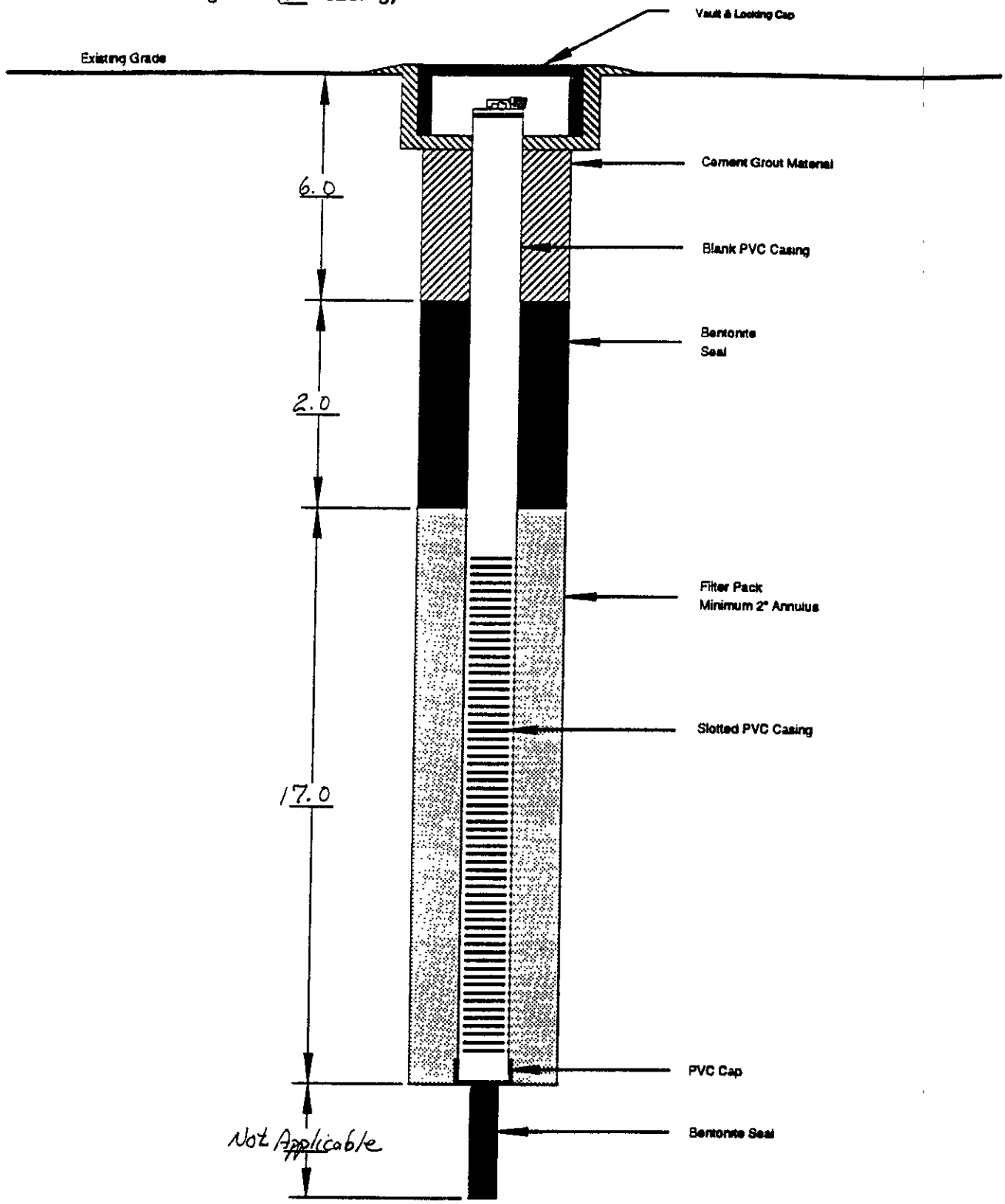
Project Name: Beacon Station #546

Address: 29705 Mission Blvd, Hayward, CA

Job # 92-067

Sampler Type Length	Sample Condition	Casing Type & Size	Driven (in.)	Recovered (in.)	Annulus Filler	Blow Count (6 in.)	PID/OVA (ppmv)	Depth: Sample Recovery	Depth: Feet (Below Surface)	Depth: USCS	
									13		
									14		First water at 14.5 feet below grade
								▼	15		
CMSS	E		6	6		6	50				SAA except more silt, less olive gray,
	E		6	6		14			16		more moderate yellowish brown, and
	E		6	6		16					no bluish green
									17		
									18		
									19		
									20		
CMSS	E		6	6		5	5				SAA except dark yellowish orange to
	E		6	6		8			21		moderate brown, no product odor
	P		6	2		13					
									22		
									23		
									24		
									25		Total Depth = 25 feet below grade
CMSS	E		6	6		9	0				SAA
	E		6	6		12			26		
	P		6	1		13					
									27		
									28		
									29		
									30		

Groundwater Monitoring Well (2" casing)



(NOT TO SCALE)

AEGIS ENVIRONMENTAL, INC.

Typical Groundwater Monitoring Well Construction Details (2" Casing)

Client Name Ultramar Inc
Street 29705 Mission Blvd., Hayward, CA
City, State Hayward, CA

JOB NUMBER 92-067

FIGURE MW-9

ATTACHMENT 3

LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY FORM

92-067

RECEIVED

JAN 2 1 1993

Ans'd. CF/AIG

Environmental Laboratories

RESNA

Working To Restore Nature

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. John Giorgi	Date Sampled:	01-04-93
	Aegis	Date Received:	01-06-93
	1050 Melody Lane, Ste 160	BTEX Analyzed:	01-06-93
	Roseville, CA 95678	TPHg Analyzed:	01-06-93
Project:	90-067, Station 546	TPHd Analyzed:	NR
	Hayward	Matrix:	Soil

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	0.005	0.005	0.005	0.005	1.0	10
SAMPLE Laboratory Identification						
S-0104-MW9-10.5' S1301028	0.045	0.009	0.007	0.026	10	NR
S-0104-MW9-15.5' S1301029	0.036	ND	0.011	0.012	1.7	NR

ppm = parts per million = mg/kg = milligrams per kilogram.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX-- Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg--Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd--Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

January 7, 1993
Date Reported

RESNA ENVIRONMENTAL LABORATORY IS CERTIFIED BY THE STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. E1211)
42501 Albrae Street • Fremont, CA 94538 • Phone: (510) 623-0775 • (800) 247-5223 • FAX: (510) 651-8754

ANALYSIS REPORT

1020lab.frm

Attention:	Mr. John Giorgi	Date Sampled:	01-04-93
	Aegis	Date Received:	01-06-93
	1050 Melody Lane, Ste 160	BTEX Analyzed:	01-06-93
	Roseville, CA 95678	TPHg Analyzed:	01-06-93
Project:	90-067, Station 546	TPHd Analyzed:	NR
	Hayward	Matrix:	Soil

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppm	ppm	ppm	ppm	ppm	ppm
Detection Limit:	0.005	0.005	0.005	0.005	1.0	10
SAMPLE Laboratory Identification						
S-0104-SP1(COMPOSITE) S1301030	ND	0.006	0.012	0.040	2.2	NR

ppm = parts per million = mg/kg = milligrams per kilogram.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX– Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg–Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd–Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

J.M Tague
Laboratory Representative

January 7, 1993
Date Reported

ANALYSIS REPORT

1020lab.frm

Attention:	Ms. Sheila Richgels	Date Sampled:	01-04-93
	Aegis Environmental	Date Received:	01-06-93
	1050 Melody Ln., Ste 160	BTEX Analyzed:	01-06-93
	Roseville, CA 95678	TPHg Analyzed:	01-06-93
Project:	12110.0L, Project 92-067	TPHd Analyzed:	NR
	Station #546, Hayward	Matrix:	Water

	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPHg	TPHd
	ppb	ppb	ppb	ppb	ppb	ppb
Detection Limit:	0.5	0.5	0.5	0.5	50	50
SAMPLE Laboratory Identification						
MW-9 W1301031	990	67	1000	2900	67000	NR

ppb = parts per billion = µg/L = micrograms per liter.
ND = Not detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

ANALYTICAL PROCEDURES

BTEX-- Benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) are measured by extraction using EPA Method 5030 followed by analysis using EPA Method 8020/602, which utilizes a gas chromatograph (GC) equipped with a photoionization detector (PID) and a flame-ionization detector (FID) in series.

TPHg--Total petroleum hydrocarbons as gasoline (low-to-medium boiling points) are measured by extraction using EPA Method 5030, followed by analysis using modified EPA Method 8015, which utilizes a GC equipped with an FID.

TPHd--Total petroleum hydrocarbons as diesel (high boiling points) are measured by extraction using EPA Method 3550 for soils and EPA Method 3510 for water, followed by modified EPA Method 8015 with direct sample injection into a GC equipped with an FID.

Laboratory Representative

January 11, 1993
Date Reported

AEGIS

Ultramar Inc.

CHAIN OF CUSTODY REPORT

AEGIS 10804

BEACON

Beacon Station No.	Sampler (Print Name)			ANALYSES									Date	Form No.
546	John Giorgi												1-4-93	1 of 1
Project No. 92-067	Sampler (Signature) John Giorgi													
Project Location Mission Blvd Hayward, CA	Affiliation Aegis Environmental													
Sample No./Identification	Date	Time	Lab No.	BTEX	TPH (gasoline)	TPH (diesel)	Organic Lead					No. of Containers	REMARKS	
S-0104-MW-9-10.5'	1-4-92		S130/028	X	X							1	5-day Standard TAT except for Soil Composite - 24hr TAT	
S-0104-MW-9-15.5'			029	X	X							1		
S-0104-SP1			030	X	X		X					3	Composite 3 into 1	
MW-9		14:00	W130/031	X	X							2	40ml VOA's	

Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
John Giorgi	1/5/93	9:50	H. Stefanski	1/5/93	9:50
H. Stefanski	1/5/93	1:45	C. Chan 319	1/5/93	1:45
C. Chan 319	1/5	4:10	E. Fox	1/5	4:10

Report To: John Giorgi 1/5 - 5:30

Bill to: ULTRAMAR INC.
525 West Third Street
Hanford, CA 93230
Attention: Jerry/Peggy Fox

Composite to Carolyn Nunez

WHITE. Return to Client with Report YELLOW: Laboratory Copy PINK: Originator Copy

32 8003 1/90