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SUBSURFACE ENVIRONMENTAL INVESTIGATION
at
ARCO Station No. 608
17601 Hesperian Boulevard
San Lorenzo, California

AGS Job No. 87131-1 3-9-88

Report prepared for

ARCO Petroleum Products Company
Post Office Box 5811
San Mateo, California 94403

by
Applied GeoSystems

John T. Lambert
Project Geologist

Gillian E. Holmes

Gillian Holmes
G.E. 2023

March 9, 1988

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SUBSURFACE ENVIRONMENTAL INVESTIGATION
at
ARCO Station No. 608
17601 Hesperian Boulevard
San Lorenzo, California

For: ARCO Petroleum Products Company

INTRODUCTION

This report describes an on-site subsurface environmental investigation at ARCO Station No. 608 located at 17601 Hesperian Boulevard in San Lorenzo, California. The investigation involved drilling four boreholes and installing two 4-inch-diameter ground-water monitoring wells. The work was conducted by Applied Geosystems at the request of ARCO to evaluate the extent of hydrocarbon contamination in the soil and ground water and to investigate suitable locations for a new tank pit at the site. This report describes the work elements performed during the investigation and summarizes the results obtained.

BACKGROUND

ARCO Station No. 608 is an operating service station located at 17601 Hesperian Boulevard in San Lorenzo, California. The station is located approximately 1 mile south of the intersection of Hesperian Boulevard and U.S. Highway 101, as shown on the Site Vicinity Map, Plate P-1. Five underground storage tanks are presently on the site at the approximate locations shown on the Generalized Site Plan, Plate P-2. We understand that three tanks, each of 6,000-gallon-capacity, are located in one pit (east pit) and are used to store regular leaded and unleaded gasoline. Another 6,000-gallon-capacity tank located in a separate tank pit (west pit) is used to store super-unleaded gasoline. A fifth tank, of 550-gallon-capacity is used to store waste oil.

ARCO is presently trying to arrange replacement of the underground storage tanks at the site. It is our understanding that the waste oil tank is to be replaced and the four 6,000-gallon-capacity gasoline tanks are to be replaced by three 12,000-gallon-capacity tanks. Two alternative locations have been proposed by ARCO for a new tank pit to hold these new gasoline tanks. Alternative 1 includes the existing east tank pit and extends to the north and east of it. Alternative 2 is

located to the west of the west pit and to the north of the station buildings. The approximate locations of the alternative tank pits are shown on Plate P-2.

PREVIOUS INVESTIGATIONS

The earliest known subsurface investigation undertaken at the site is documented in a report by EMCON Associates, dated November 12, 1985. The report describes sampling and laboratory analyses of soil collected from five exploratory boreholes and the installation of a 3-inch-diameter ground-water monitoring well in one of the boreholes at the site. The approximate locations of the boreholes and the monitoring well are shown on Plate P-3. The results of laboratory analyses of soil samples and of a ground-water sample collected from the monitoring well by EMCON are presented in Table 1.

TABLE 1
RESULTS OF LABORATORY ANALYSES
(from EMCON report dated November 12, 1985)
ARCO Station No. 608
17601 Hesperian Boulevard
San Lorenzo, California

SOIL SAMPLE

BORING	DEPTH (feet)	GASOLINE CONCENTRATION	WASTE OIL CONCENTRATION
A-A	7.0 to 8.5	N/A	10,000
	10.5 to 12.0	N/A	9,500
A-B	12.5 to 14.0	1,500	N/A
A-C	4.0 to 5.5	880	N/A
	7.0 to 8.5	1,900	N/A
	12.5 to 14.0	2,800	N/A
A-D	12.5 to 14.0	590	N/A

WATER SAMPLE Sampled July 10, 1985

A1	Benzene	1.000
	Toluene	0.690
	Xylene and Ethylbenzene	1.500
	Gasoline	32.000

Results in parts per million (ppm)

The laboratory results presented in EMCON's report indicated of hydrocarbon contamination levels of between 590 to 2,800 parts

per million in the soil samples collected near the gasoline tanks and 32 ppm of dissolved gasoline constituents in the ground-water sample. The soil samples collected near the waste oil tank showed levels of hydrocarbon contamination between 9,500 and 10,000 ppm. EMCON also indicated that the ground-water table was at a depth of approximately 12 feet and the inferred ground-water flow direction was toward the west. The borehole logs indicated that the soil at the site is predominantly sandy clay and silty clay interbedded with lenses of sand.

On October 20, 1987, the regular leaded underground storage tank at the site failed a Petro-Tite hydrostatic tank test. The same tank also failed a retest on November 2, 1987. At the request of ARCO, a geologist from Applied GeoSystems visited the site on November 6, 1987, to examine soil surrounding the subject tank for possible hydrocarbon contamination. Prior to the geologist's arrival at the site, Becker Industries, Incorporated, had excavated a trench and the upper portion of the east tank pit to expose vapor lines and the tops of the three gasoline tanks. Soil samples collected from the wall of the excavation at each end of the regular leaded gasoline tank were tested for total volatile hydrocarbons (TVH). The approximate extent of the excavation and locations where the samples were taken are shown on Plate P-4.

The laboratory results showed the sample collected from the north wall of the excavation contained a hydrocarbon contamination level of 420 parts per million (ppm) and the sample collected from the south wall contained a nondetectable level of hydrocarbon contamination. The results of the laboratory analyses and our recommendations were presented to ARCO in a letter report (reference number 87131-1) dated November 12, 1987. Based on these results, Applied GeoSystems recommended that ARCO undertake a limited subsurface environmental investigation to evaluate the soil and ground-water quality at the site.

On January 11, 1988, a geologist from Applied GeoSystems visited the site to perform subjective ground-water analyses of water from EMCON monitoring well A-1 (designation MW-2 in this report) for floating product, sheen, and emulsion and to collect a water sample for laboratory analyses. The depth of the water on this visit was 11.30 feet below the top of the well casing. Subjective analyses of the water showed a slight sheen, but no floating product, or emulsion were detected. The results of the laboratory analyses are summarized in Table 2.

During a visit to the site on January 18, 1988, a geologist from Applied GeoSystems discovered two additional wells. Each of

these wells is constructed of 8-inch-diameter corrugated casing. These wells have been designated MW-3 and MW-4 by Applied GeoSystems. Well MW-3 has a total depth of 14.0 feet and well MW-4 a total depth of 11.6 feet. No information is available regarding the history or construction of these wells. The locations of these wells are shown on Plate P-5. Subjective analyses of water samples collected from these two wells and from well MW-2, installed by EMCON, showed no floating product, sheen, or emulsion.

TABLE 2
RESULTS OF LABORATORY ANALYSIS ON WATER SAMPLE
ARCO Station No. 608
17601 Hesperian Boulevard
San Lorenzo, California

Sample	B	T	E	X	TVH
W-11-MW2	0.804	0.115	0.168	0.166	3.30

Results are presented in parts per million (ppm)
BTEX = benzene, toluene, ethylbenzene, and total xylene isomers
TVH = total volatile hydrocarbons
Detection limits: BETX = 0.005 ppm TVH = 0.05
Sample Designation: W-11-MW2
W = water
11 = depth of sample
MW2 = well number

HYDROGEOLOGY

Sediments in the vicinity of the site are alluvial gravels, sands and clays of Pliocene-Pleistocene to Late Pleistocene age, laid down by the San Lorenzo River during a period of rapid deposition. The sands and gravels are now aquifers which provide a source of ground water. Three confined aquifers are generally recognized in the area. The upper confined aquifer occurs between the ground surface and a depth of about 150 feet. A second aquifer occurs between about 150 feet and 200 feet and a third aquifer is located at about 300 feet in depth. In addition, there are also several shallow perched aquifers (less than 50 feet depth) of limited areal extent.

The shallow aquifers and the upper confined aquifer do not yield large volumes of water. These aquifers are mainly a source of water for domestic lawn and garden irrigation. The two deeper confined aquifers have much larger yields and are a source of water for nurseries, parks, and farms.

WELL INVENTORY

An inventory of known water wells within a radius of approximately 0.5-mile of the site was obtained to evaluate the

ground-water usage in the vicinity. Information regarding wells in the vicinity of the site was acquired from the Alameda County Water District Water Well Inventory. A summary of known wells and their use is presented in Table 3. Many of the wells were drilled prior to 1960 and records do not indicate if these wells still exist.

DRILLING AND SOIL SAMPLING

The drilling and soil sampling program was undertaken between January 19 and January 21, 1988, by Datum Exploration, Incorporated, of Pittsburg, California, using a Mobile B-57 truck-mounted drill rig with steam-cleaned, 8-inch-diameter and 10-inch-diameter, continuous flight, hollow-stem augers. A geologist from Applied GeoSystems was onsite to observe the drilling operation, log the boreholes, collect soil samples for laboratory analyses, and supervise the construction of two monitoring wells. The locations of the borings and monitoring wells are shown on Plate P-5.

TABLE 3
WELLS WITHIN APPROXIMATELY 0.5-MILE OF THE SITE
ARCO Station No. 608
17601 Hesperian Boulevard
San Lorenzo, California

WELL NO.	DATE	TOTAL WELL DEPTH (FT)	WELL DIAMETER	DEPTH TO WATER	USE
3S/2W 18B1	9/10	34	6	10	IRR
3S/2W 18B3	2/78	40	6	16	IRR
3S/2W 18B4	11/77	31	6	15	IRR
3S/2W 18C1	3/77	25	4	14	IRR
3S/2W 18D1	2/53	98	6	16	DOM
3S/2W 18E1	*/*	*	*	*	IRR
3S/2W 18F1	*/46	52	*	6	DOM
3S/2W 18F2	*/*	31	6	13	ABN
3S/2W 18F3	7/77	29	4	*	IRR
3S/2W 18G1	5/77	26	4	10	IRR
3S/2W 18G2	10/85	24	3	*	MON
3S/2W 18J1	*/53	202	8	55	DOM
3S/2W 18J2	*/41	91	6	*	IRR
3S/2W 18J3	*/*	100	8	*	DOM
3S/2W 18J4	*/18	90	8	*	IRR
3S/2W 18J5	*/39	55	6	*	DOM
3S/2W 18J6	*/46	95	6	*	IRR
3S/2W 18J7	*/29	65	8	*	IRR
3S/2W 18J8	5/51	75	6	18	DOM
3S/2W 18K1	*/50	108	10	*	DOM
3S/2W 18K3	3/78	155	8	16	IRR
3S/2W 18L1	*/*	*	*	*	IRR
3S/2W 7Q80	8/45	138	*	*	*

* Data not available
Well numbers are assigned accordingly to their locations in the rectangular system for the subdivision of public land. The first digit and the letter designation are the section and the 40-acre subdivision respectively, in which the well is located. Wells are numbered serially within each 40-acre tract, as indicated by the final digit of the well number.

Soil samples were collected from each borehole with a California-modified split-spoon sampler. Descriptions of the material encountered in each of the boreholes are presented on the Logs of Borings (Plate P-7 and P-10). Plate P-6 gives a summary of the Unified Soil Classification System used to describe the soils. The water table was encountered approximately 10 feet below ground level. The native material encountered consists predominantly of moderately stiff to stiff silty clay. Medium dense sand was encountered in borehole B-1/MW-1, B-2/MW-5, and B-3 between approximately 8 feet and 12 feet below ground level, and again below 25 feet and 20 feet in boreholes B-1/MW-1 and B2/MW5 respectively. A loose, poorly graded, clayey sand with gravel, believed to be fill material, was encountered to a depth of 12 feet in borehole B-4.

Soil samples and drill cuttings were analyzed onsite using an Organic Vapor Analyzer (OVA). Organic vapor concentrations of 1000 ppm and greater were detected in soil cuttings from the upper few feet of boring B-1/MW-1; in the proximity of the ground water table in borings B-3, B-4 and B-2/MW-5; and between 5 feet and 13 feet in B-4.

While drilling, a yellow-amber product was encountered at a depth of approximately 12 feet in borehole B-2. A bailed sample of water collected from the borehole showed approximately 1/8-inch of floating product. ARCO was informed about the presence of free product, and, with their authorization, a monitoring well was constructed in this borehole.

The drill cuttings excavated from the boreholes were piled at the site and remain the responsibility of ARCO. Applied GeoSystems will arrange to have this material hauled to an appropriate landfill facility at the request of ARCO. After boreholes B-3 and B-4 were completed, they were backfilled with drill cuttings and sealed with neat cement.

PROCEDURE FOR SAMPLING SOIL

Soil samples were collected from each borehole and described on site as drilling progressed. These samples, labeled as indicated as the Boring Logs, were collected at 2.5-foot intervals from ground level to a depth of 15 feet and then at 5-foot intervals to the total depth of each borehole. In borehole B-1/MW-1, soil samples were collected at 5-foot intervals from ground level to the total depth of the borehole. The 2.5-foot sampling interval was used in boreholes B-2, B-3, and B-4 to obtain a detailed

lithology log at the two alternative locations for a proposed new tank pit. Soil samples were collected by advancing the boring to a point immediately above the sampling depth and then driving a California-modified, split-spoon sampler (2-1/2-inch inside diameter) into the soil through the hollow center of the auger. The sampler was driven with a standard 140-pound hammer repeatedly dropped 30 inches. The number of blows to drive the sampler for each 6-inch increment, to a total advancement of 18 inches, was counted and recorded to evaluate the relative consistency of soil materials.

The samples were removed from the sampler and were immediately sealed in their brass sleeves with aluminum foil, plastic caps, and airtight tape. They were then labeled and placed in iced storage. Selected samples were delivered to Anametrix, Inc. in San Jose, California, for analytical testing. Chain-of Custody protocol was observed during handling and transporting of the soil samples.

CONSTRUCTION OF MONITORING WELLS

Ground-water monitoring wells were installed in boreholes B-1 and B-2. Each well was constructed with 4-inch-diameter polyvinyl chloride (PVC) casing. The screened portions of the wells were

constructed of factory-perforated slotted casing with 0.020-inch-wide slots. Borehole B-2 extended through a competent clay horizon and into a coarse sand at a depth of approximately 20 feet. To protect the ground water below the horizon of clay, the borehole was tremie backfilled with concrete from the base of the hole to a depth of 15.5 feet and then sealed with a layer of approximately 1 foot of bentonite. The concrete and bentonite raised the bottom of the borehole to a depth approximately 14.5 feet below the ground surface. Well screen was set from the bottom of each borehole to approximately 6 feet above the water table. Blank PVC casing was set from the top of the screened casing to the ground surface. All casing joints are threaded; and no glues, chemical cements, or solvents were used in well construction. The top of the casing is covered with a slip cap and the bottom has a threaded cap. The annular space of each well was backfilled with No. 3 Monterey sand from the bottom of the borehole to approximately 1 foot above the screened casing. A bentonite plug, approximately 1 foot thick, was placed above the sand as a seal against cement entering the sand pack, and the remaining annular space was backfilled with neat cement to grade. Graphic representations of the well constructions are shown on the right margin of Boring Logs B-1/MW-1 and B-2/MW-5 (Plates P-7 and P-10).

An aluminum utility box with a PVC apron was placed over each well head and concreted into place flush with the surrounding ground surface. The utility box has a watertight seal to protect the ground-water monitoring well against surface-water infiltration and requires a specially designed spanner wrench to open. This reduces the possibility of vandalism to or accidental disturbance of the well.

PROCEDURE FOR SAMPLING WATER

Subjective water samples were collected from monitoring wells MW-1 through MW-5 by gently lowering about half of the length of a Teflon bailer past the air/water interface and collecting a sample from the surface of the water in the well. Monitoring wells MW-1 through MW-4 showed no floating product, sheen, or emulsion. A sheen was observed on the water sample taken from MW-5.

After performing the subjective analyses, the wells were purged of approximately four well volumes of water and were allowed time to recover to static water level. Samples for laboratory analyses were then collected with a laboratory-cleaned Teflon bailer. A sample from each well was collected from below the static water level. The samples were transferred to laboratory-

cleaned 40-milliliter glass volatile organic analysis (VOA) or 1-liter laboratory-cleaned glass bottles, as appropriate for the method of analysis. Hydrochloric acid was added to the containers to minimize bacteria degradation of the samples. Each sample container was immediately sealed with a Teflon-lined cap, labeled, and placed in iced storage. Selected samples were delivered to the Applied GeoSystems Laboratory in Fremont, California, and to the Anametrix, Inc. Laboratory in San Jose, California for analytical testing. These laboratories are certified to perform the analyses requested. Chain of custody protocol was observed throughout at the process of handling the samples.

LABORATORY ANALYSES

One soil sample collected from just above the approximate top of the saturated zone was selected from each borehole for laboratory analyses. A soil sample was also selected from an area of suspected high contamination at a depth of approximately 5 feet in borehole B-4.

Soil samples were analyzed for total volatile hydrocarbons (TVH) by modified Environmental Protection Agency (EPA) method 8015 and for the hydrocarbon constituents, benzene, toluene, ethylbenzene,

and total xylene isomers (BTEX) by modified EPA method 8020. The soil sample collected from B-1 was analyzed for BTEX, total extractable hydrocarbons (TEH) by modified EPA method 8015, and total oil and grease (TOG) by EPA method 503E. The soil samples were analyzed by Anametrix, Inc.'s State certified-laboratory in San Jose, California.

The ground-water samples were analyzed for total volatile hydrocarbons by modified EPA method 8015 and for BTEX by EPA method 8020/602. The water sample collected from monitoring well MW-1, located near the waste oil tank, was also analyzed for TOG and TEH by EPA method 503E and 8015 respectively. The water samples were analyzed at Anametrix, Inc., laboratory and at Applied GeoSystems' State certified-laboratory in Fremont, California.

Chain of Custody Records that were initiated by the sampler and Analysis Data Sheets and Records of Analysis are presented in the Appendix to this report. The results are summarized in Table 4.

TABLE 4
RESULTS OF ANALYSES OF SOIL AND WATER SAMPLES
ARCO Station No. 608
17601 Hesperian Boulevard
San Lorenzo, California

	B	T	E	X	TVH	TEH	TOG
SOIL							
	(0.200)	(0.200)	(0.200)	(0.200)	(5)	(10)	(30)
S-11-B1	<0.200	<0.200	<0.200	<0.200	<5	<10	<30
S-10-B2	0.600	<0.200	<0.200	<0.200	<5		
S-10-B3	0.400	<0.200	<0.200	<0.200	<5		
S-5-B4	0.800	0.500	4.100	1.200	10		
S-10-B4	0.400	0.200	1.000	1.000	5		
WATER							
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.05)	(10)
W-11-MW1	0.020	0.050	0.010	0.080	0.300	0.20	<10
W-11-MW2	0.804	0.115	0.168	0.166	3.300		
W-11-MW3	0.020	0.020	0.080	0.060	1.800		
W-11-MW4	2.700	7.900	0.850	5.200	62.000		
W-11-MW5	4.00*	2.70*	3.80*	5.50*	31.000		

Results are in parts per million (ppm)
BTEX = benzene, toluene, ethylbenzene, and total xylene isomers
TVH = total volatile hydrocarbons
TEH = total extractable hydrocarbons
TOG = total oil and grease
(0.001) = detection limit in ppm
* = detection limit of 0.05 ppm
Sample Designation = S-10-B1
- S-10-B1: Borehole or well number
- S-10-B1: Sample depth in feet
- S-10-B1: Soil sample
- W = water sample

< = Result below detection limit for the selected method of analysis.

EVALUATION OF GROUND-WATER FLOW DIRECTION

An evaluation of the ground-water flow direction across the site was made using a Wild NA-24 Auto Level. The leveling instrument was used to measure the difference in elevation between the instrument and the top of the casing for each of the monitoring wells. Measurements were recorded to the nearest 0.001-foot, although accuracy of the instrument is limited to about 0.005-foot over the maximum distance measured (approximately 114 feet). The static water level in each well was measured to the nearest 0.01-foot using an electric Solinst Water Level Sounder. The well head and ground-water depth differences were combined to calculate the water-level elevation difference. Table 5 presents the tabulated results of the survey using ground-water elevation measurements taken on January 28, 1988. Plate P-11 presents a graphical interpretation of the ground-water table at the time of measurement. The ground water may be assumed to flow at right angles to and in a direction downgradient from the equipotential lines. The ground-water gradient calculated from the above measurements is 0.0033 (approximately 1 foot per 300 feet). The measured differences in ground-water elevations indicate that the ground-water flow direction is approximately toward the southwest.

TABLE 5
GROUND-WATER ELEVATION DIFFERENCES
ARCO Service Station No. 608
17601 Hesperian Boulevard, San Lorenzo, California
(measured on January 28, 1988)

Monitoring Well Number	Top of Casing (C)	Static Water Depth (W)	Ground Water Elevation (C-W)
MW-1	102.936	12.26	90.68
MW-2	101.758	10.99	90.77
MW-3	101.250	10.64	90.61
MW-4	100.000	9.30	90.70
MW-5	101.985	11.32	90.67

All measurements are in feet.
Static water level measured in feet below top of casing.
Datum is an arbitrary elevation corresponding to 100 feet below the top of the lowest well casing, which is at MW-4.
This datum corresponds approximately to the National Geodetic Vertical Datum.

CONCLUSIONS

- The native material at the site consists predominantly of moderately stiff to stiff silty clay. Between approximately 8 feet and 12 feet below ground level, medium dense sand was encountered overlying silty clay in boreholes B-1, B-2 and B-3.

- Subjective analyses of soil sampled during the drilling program detected vapor concentrations of 1000 ppm and greater in the soil collected in the proximity of the ground-water table.

- Laboratory analyses of soil samples collected from just above the ground-water table showed very low (5 ppm and less) levels of hydrocarbon contamination in the native soil.

- Very low (10 ppm and less) levels of hydrocarbon contamination were detected in possible tank pit fill material encountered in borehole B-3.

- Results of laboratory analyses of soil and water samples collected from within 4 feet of and in the down gradient direction from the waste oil tank pit showed no detectable levels of total oil and grease or total extractable hydrocarbons.

- The depth to ground water is approximately 11 feet below the existing ground surface.

- The ground-water flow is towards the southwest.

- Floating product was encountered at a depth of approximately 12 feet while drilling borehole B-2; however, no floating product was found in monitoring well MW-5 installed at this location.

- Dissolved hydrocarbon constituents were detected in ground-water samples collected from all the monitoring wells. Total volatile hydrocarbon concentrations ranged between 0.3 and 62.0 ppm, and benzene levels of between 0.02 and 4.0 ppm were detected. Benzene levels in all samples analyzed exceeded the action levels for drinking water established by the Department of Health Services.

- Shallow water wells in the vicinity of the site are predominantly used for lawn and garden irrigation. Many of the wells listed in the Alameda County well inventory were built prior to 1953, and it is not known if these wells are still in operation.

LIMITATIONS

This study has been conducted in accordance with generally accepted standards of environmental geological practice in

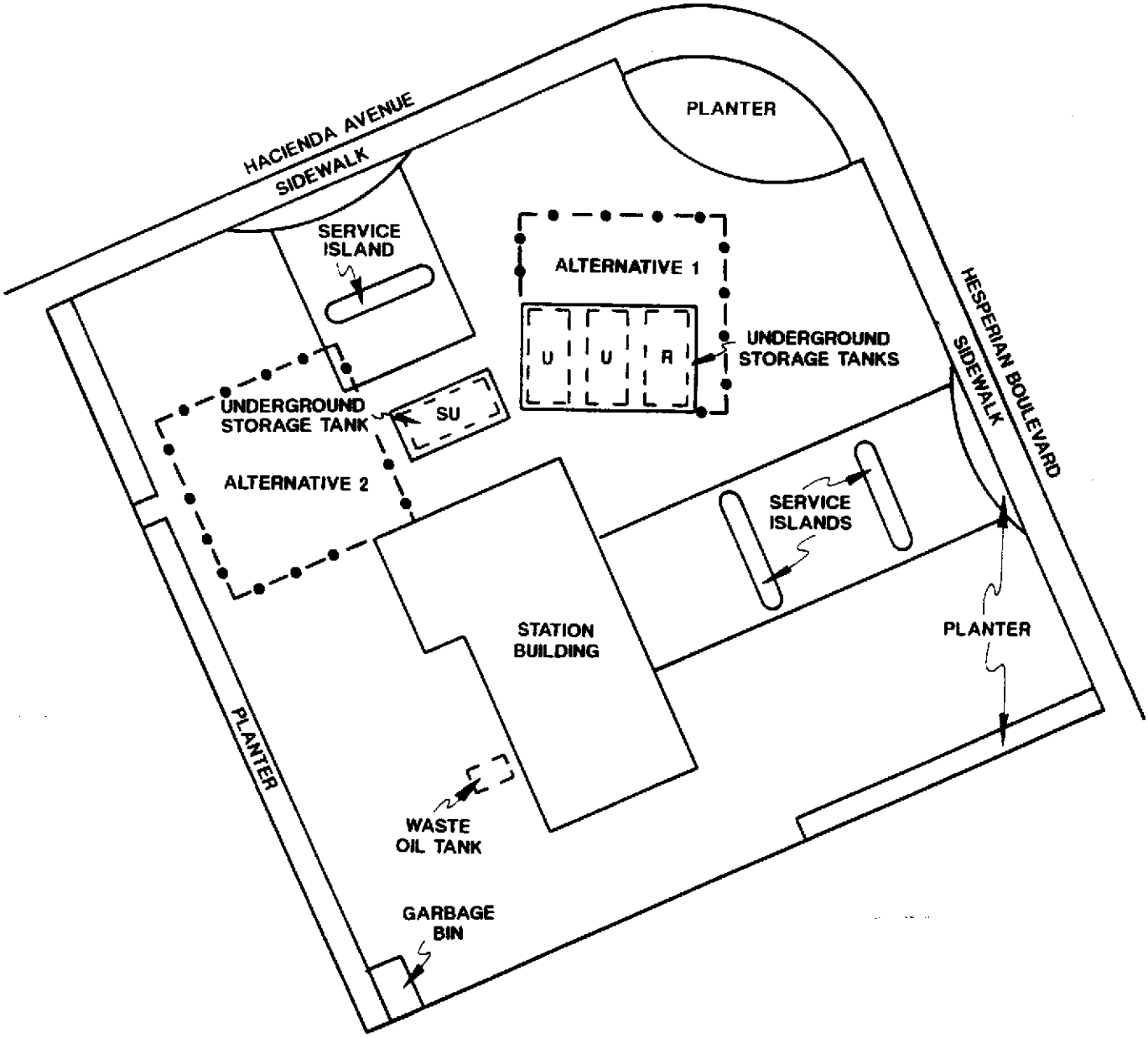
California at the time this report was prepared. This investigation was conducted solely for the purpose of evaluating environmental conditions of the soil and ground water with respect to hydrocarbon product contamination in the vicinity of the subject property. No soil engineering or geotechnical recommendations are implied or inferred. Evaluation of geologic conditions at the site for the purpose of this investigation is made from a limited number of observation points. Subsurface conditions may vary away from the data points available. Additional work, including further subsurface investigation, can reduce the inherent uncertainties associated with this type of investigation.

Applied GeoSystems

PROJECT NO. 87131-1

SITE VICINITY MAP
Arco Service Station
17601 Hesperian Boulevard
San Lorenzo, California

PLATE
P - 1



= Proposed location for new tank pit

R = Regular gasoline

U = Unleaded gasoline

SU = Super Unleaded gasoline

N

Approximate Scale

30 15 0 30 60

feet

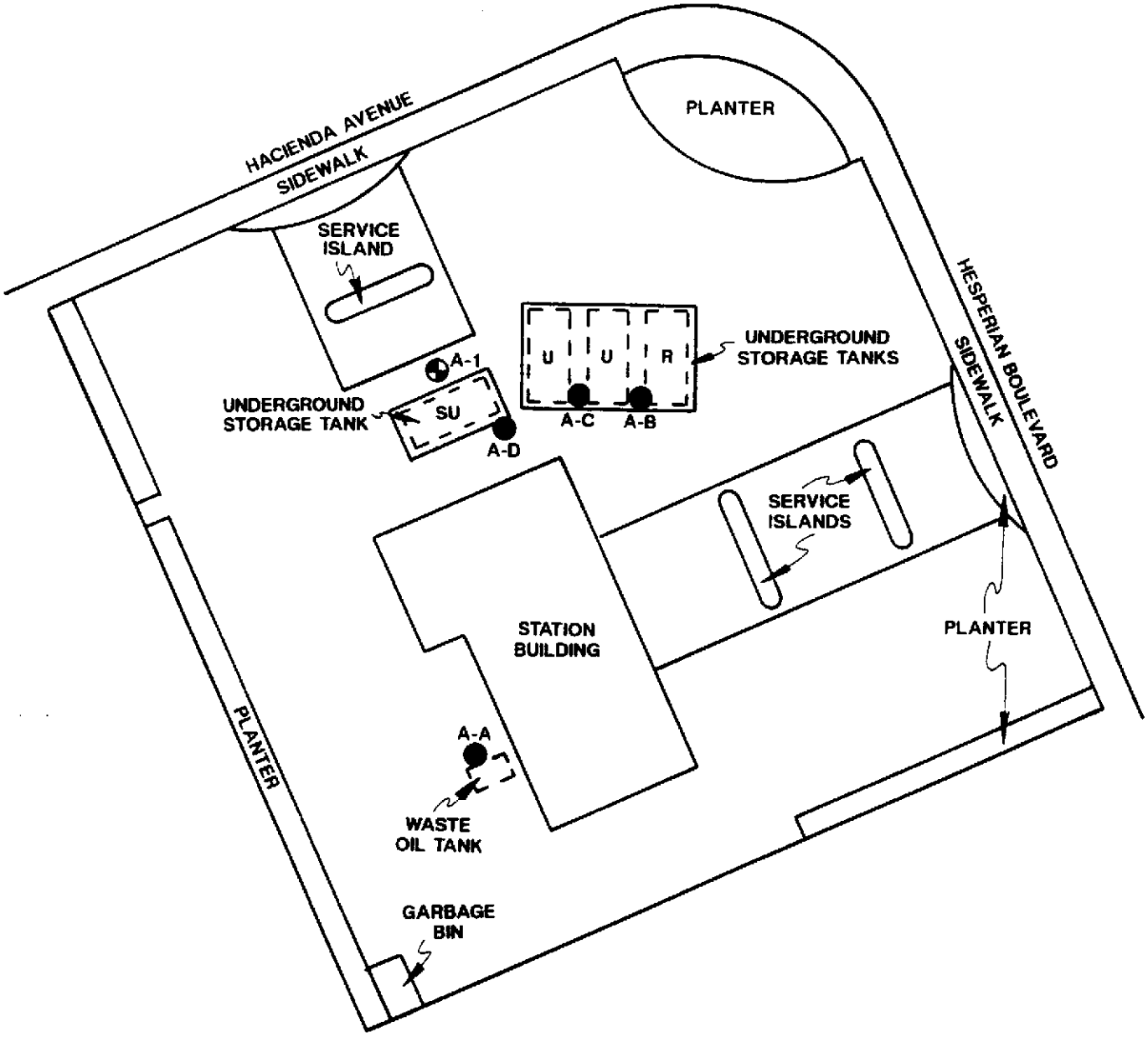
Source: Modified from plan supplied by ARCO

Applied GeoSystems

PROJECT NO. 87131-1

GENERALIZED SITE PLAN
ARCO Service Station
17601 Hesperian Boulevard
San Lorenzo, California

PLATE
P - 2



◐ = Monitoring well location

● = Soil boring location

R = Regular gasoline

U = Unleaded gasoline

SU = Super Unleaded gasoline

N

Approximate Scale

30 15 0 30 60

feet

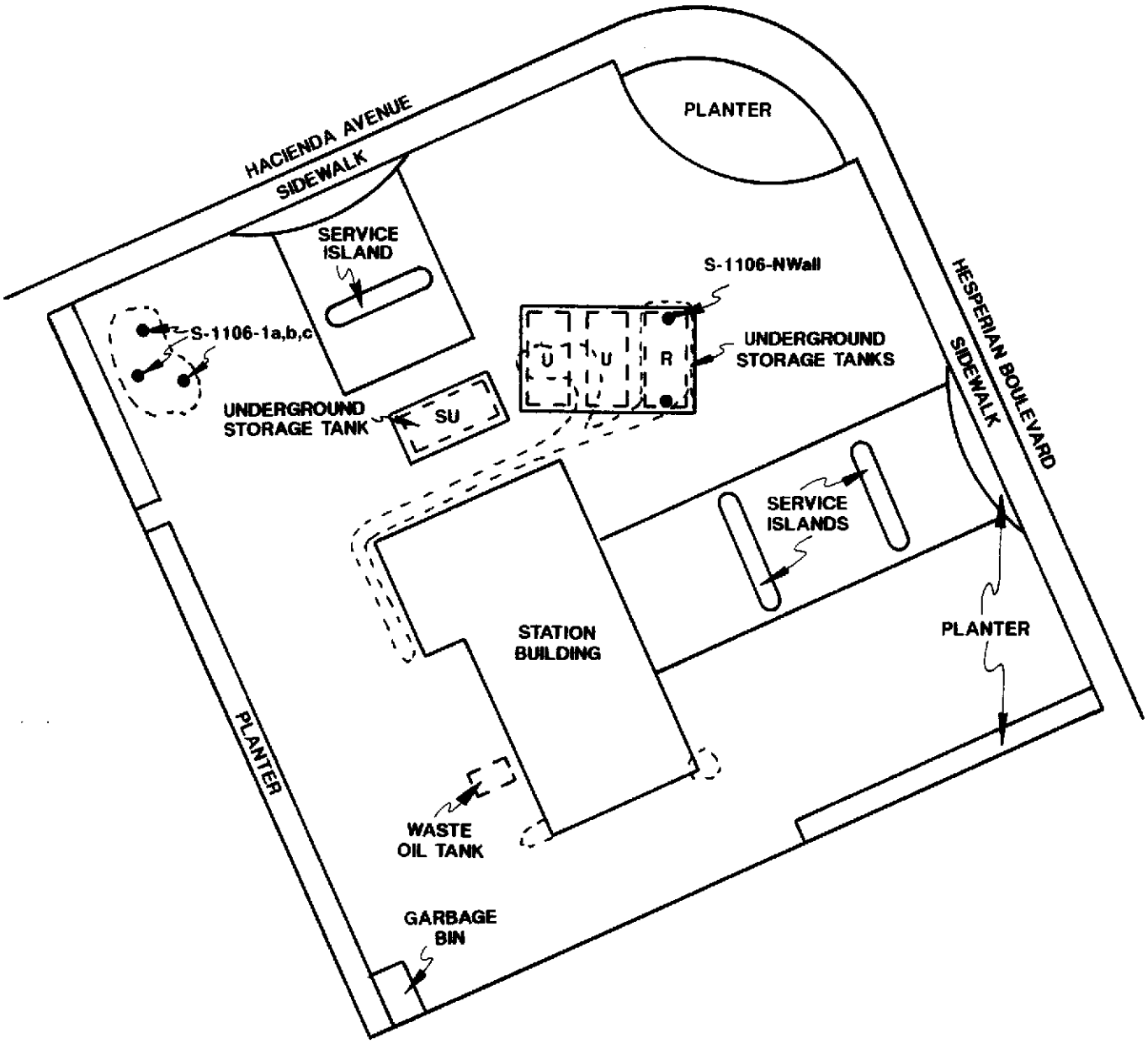
Source: Modified from plan supplied by ARCO

Applied GeoSystems

PROJECT NO. 87131-1

SOIL BORING AND MONITORING WELL LOCATIONS
(from Emcon report, November 1985)
ARCO Service Station
San Lorenzo, California

PLATE
P - 3



● = Soil sample location

(dashed) = Extent of excavation

R = Regular gasoline

U = Unleaded gasoline

SU = Super Unleaded gasoline

N

Approximate Scale

30 15 0 30 60

feet

Source: Modified from plan supplied by ARCO

Applied GeoSystems

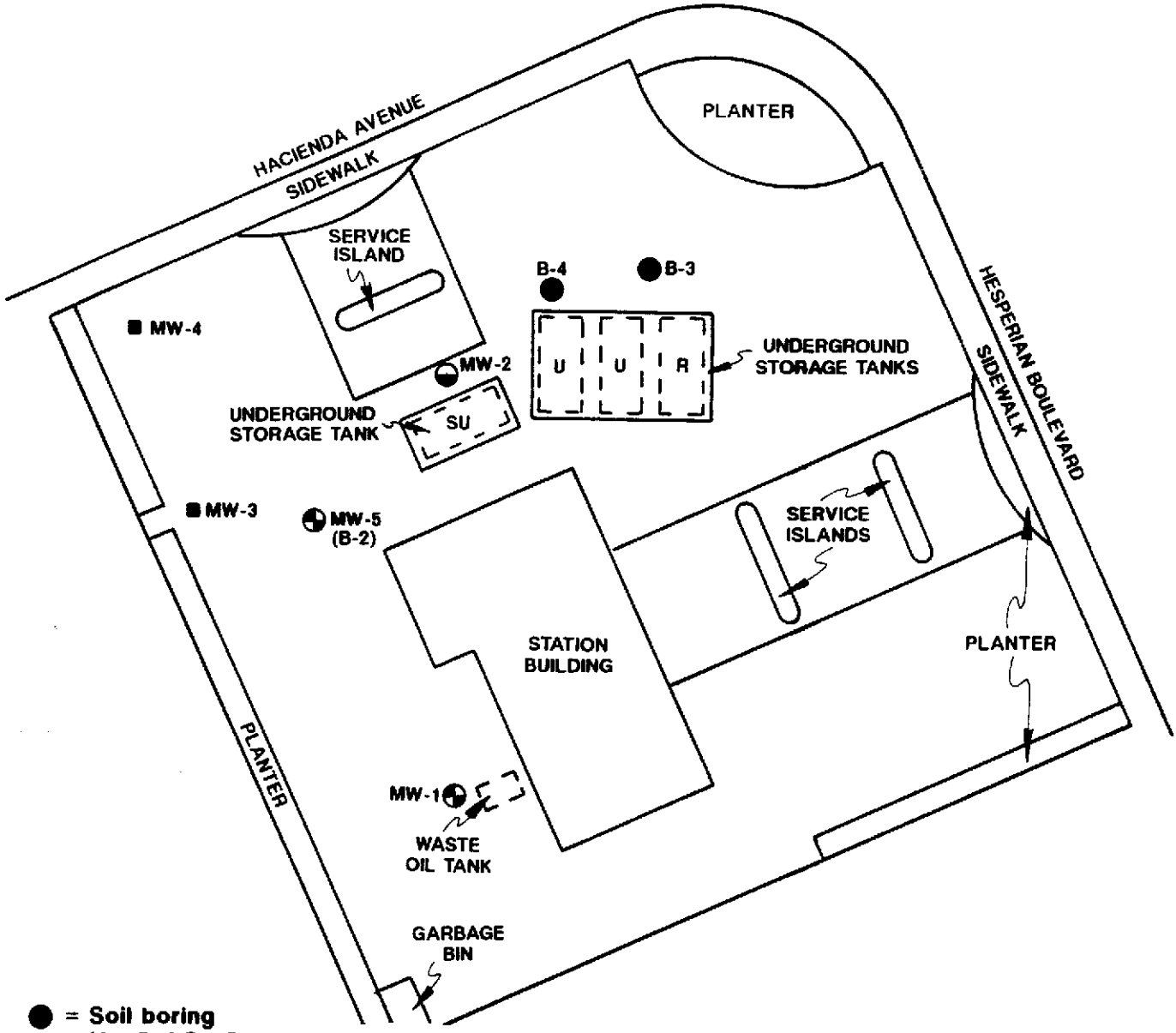
41255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

PROJECT NO. 87131-1

EXCAVATION AND SOIL SAMPLING
(November 6, 1987)
ARCO Service Station
17601 Hesperian Boulevard
San Lorenzo, California

PLATE

P - 4



● = Soil boring (Applied GeoSystems, January 1988)

◔ = Monitoring well (Applied GeoSystems, January 1988)

◒ = Monitoring well (Emcon Associates, November 1985)

■ = Monitoring well (unknown origin)

R = Regular gasoline

U = Unleaded gasoline

SU = Super Unleaded gasoline

Approximate Scale

30 15 0 30 60

feet

Source: Modified from plan supplied by ARCO

Applied GeoSystems

43551 Mission Blvd Suite B Fremont CA 94539 (415) 651-3906

PROJECT NO. 87131-1

BORING AND MONITORING WELL LOCATONS
ARCO Service Station
17601 Hesperian Boulevard
San Lorenzo, California

PLATE
P - 5

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		LTR	DESCRIPTION	MAJOR DIVISIONS		LTR	DESCRIPTION
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW	Well-graded gravels or gravel sand mixtures, little or no fines.	FINE GRAINED SOILS	SILTS AND CLAYS LL<50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
		GP	Poorly-graded gravels or gravel sand mixture, little or no fines			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		GM	Silty gravels, gravel-sand-clay mixtures.			OL	Organic silts and organic silt-clays of low plasticity.
		GC	Clayey gravels, gravel-sand-clay mixtures.		SILTS AND CLAYS LL<50	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
	SAND AND SANDY SOILS	SW	Well-graded sands or gravelly sands, little or no fines.			CH	Inorganic clays of high plasticity, fat clays.
		SP	Poorly-graded sands or gravelly sands, little or no fines.			OH	Organic clays of medium to high plasticity.
		SM	Silty sands, sand-silt mixtures.	HIGHLY ORGANIC SOILS		Pt	Peat and other highly organic soils.
		SC	Clayey sands, sand-clay mixtures.				


Depth through which sampler is driven


Relatively undisturbed sample


Missed sample


Ground water level observed in boring

S-10 Sample number


Sand pack


Bentonite annular seal


Neat cement annular seal


Blank PVC


Machine-slotted PVC

BLOW/FT. REPRESENTS THE NUMBER OF BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES TO DRIVE THE SAMPLER THROUGH THE LAST 12 INCHES OF AN 18 INCH PENETRATION.

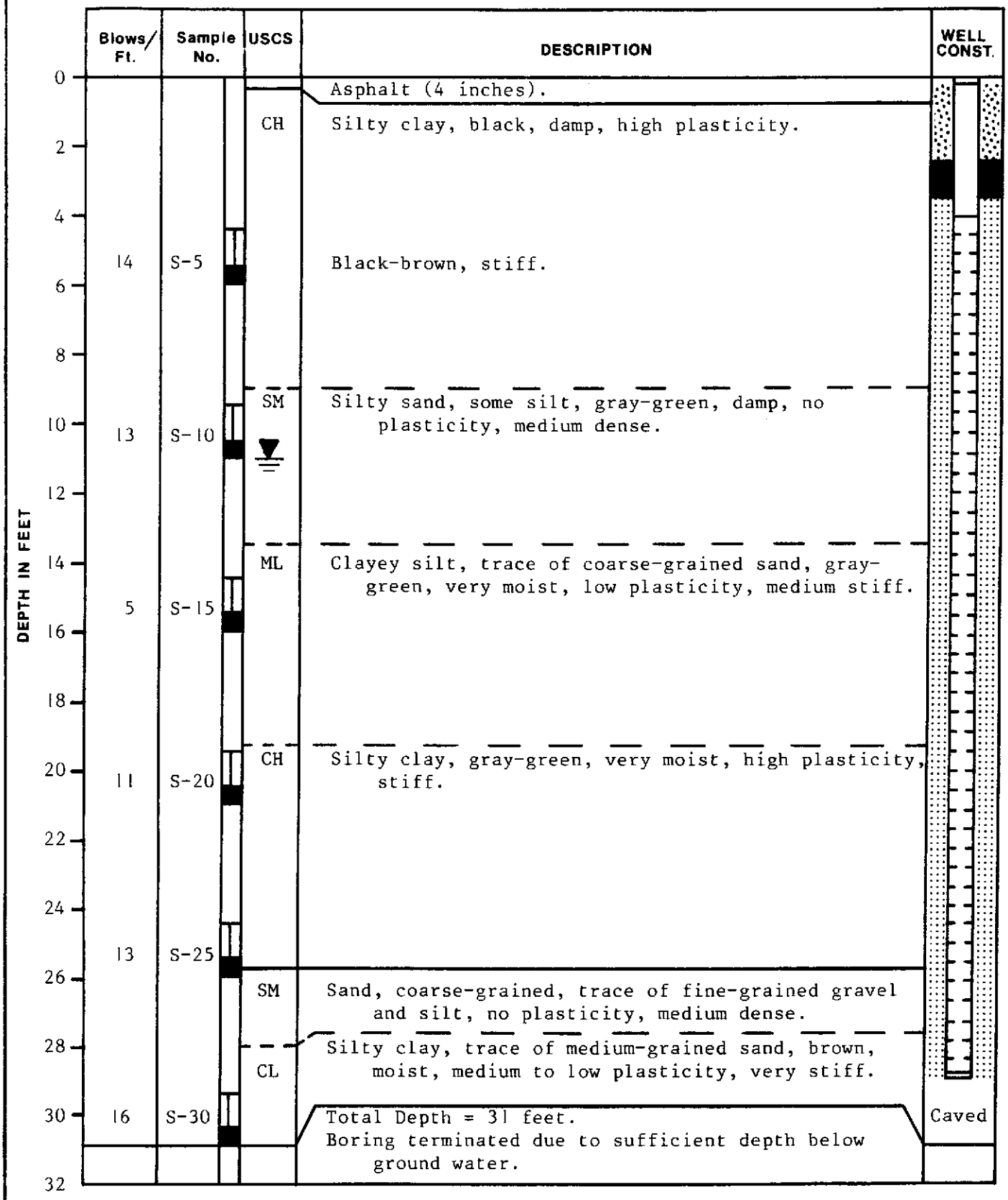
DASHED LINES SEPARATING UNITS ON THE LOG REPRESENT APPROXIMATE BOUNDARIES ONLY. ACTUAL BOUNDARIES MAY BE GRADUAL. LOGS REPRESENT SUBSURFACE CONDITIONS AT THE BORING LOCATION AT THE TIME OF DRILLING ONLY.

Applied GeoSystems

PROJECT NO. 87131-1

UNIFIED SOIL CLASSIFICATION SYSTEM AND SYMBOL KEY
ARCO Station No. 608
17601 Hesperian Boulevard
San Lorenzo, California

PLATE
P - 6



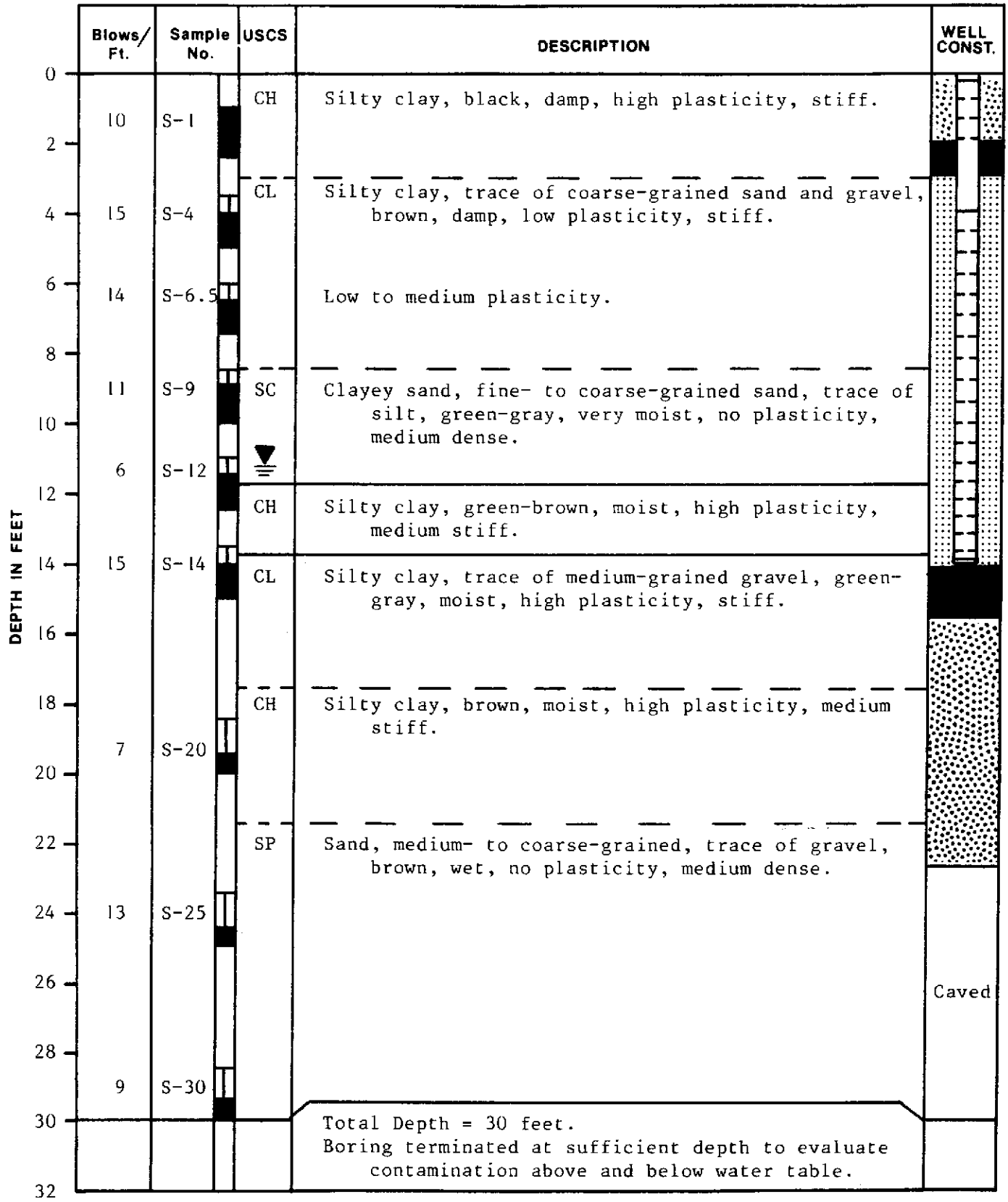
Applied GeoSystems
43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

PROJECT NO. 87131-1

LOG OF BORING B-1/MW-1

ARCO Station No. 608
17601 Hesperian Boulevard
San Lorenzo, California

PLATE
P - 7



Applied GeoSystems
43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

PROJECT NO. 87131-1

LOG OF BORING B-2/MW-5

ARCO Station No. 608

17601 Hesperian Boulevard

San Lorenzo, California

PLATE

P - 8

DEPTH IN FEET	Blows/ Ft.	Sample No.	USCS	DESCRIPTION	WELL CONST.
0	11	S-2	CH	Silty clay, black, damp, high plasticity, stiff.	
2					
4	16	S-4	CL	Silty clay, trace of coarse-grained sand, brown, damp, low plasticity, stiff.	
6	14	S-7		Silty clay, medium plasticity.	
8	6	S-9	SM	Clayey silty sand, fine- to coarse-grained sand, green, very moist, no plasticity, loose.	
10	8	S-11	CH	Silty clay, gray-brown, moist, high plasticity, medium stiff.	
12					
14	10	S-14		Green-gray, stiff.	
16				Total depth = 15 feet.	

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PROJECT NO. 87131-1

LOG OF BORING B - 3

ARCO Station No. 608
17601 Hesperian Boulevard
San Lorenzo, California

PLATE
P - 9

DEPTH IN FEET	Blows/ Ft.	Sample No.	USCS	DESCRIPTION	WELL CONST.
0					
2	6	S-2	SM	Sand, medium- to coarse-grained, green, dry, no plasticity, loose. (possibly fill).	
4	5	S-4			
6	6	S-7	SC	Sandy clay, some gravel, green with red mottling, damp, low plasticity, medium stiff. (possibly fill).	
8	5	S-9		Silty sandy clay, gray, moist, slight plasticity.	
10	8	S-12			
12			CH	Silty clay, gray-green, moist, high plasticity, medium stiff.	
14	9	S-14		Stiff.	
16				Total Depth = 15 feet.	

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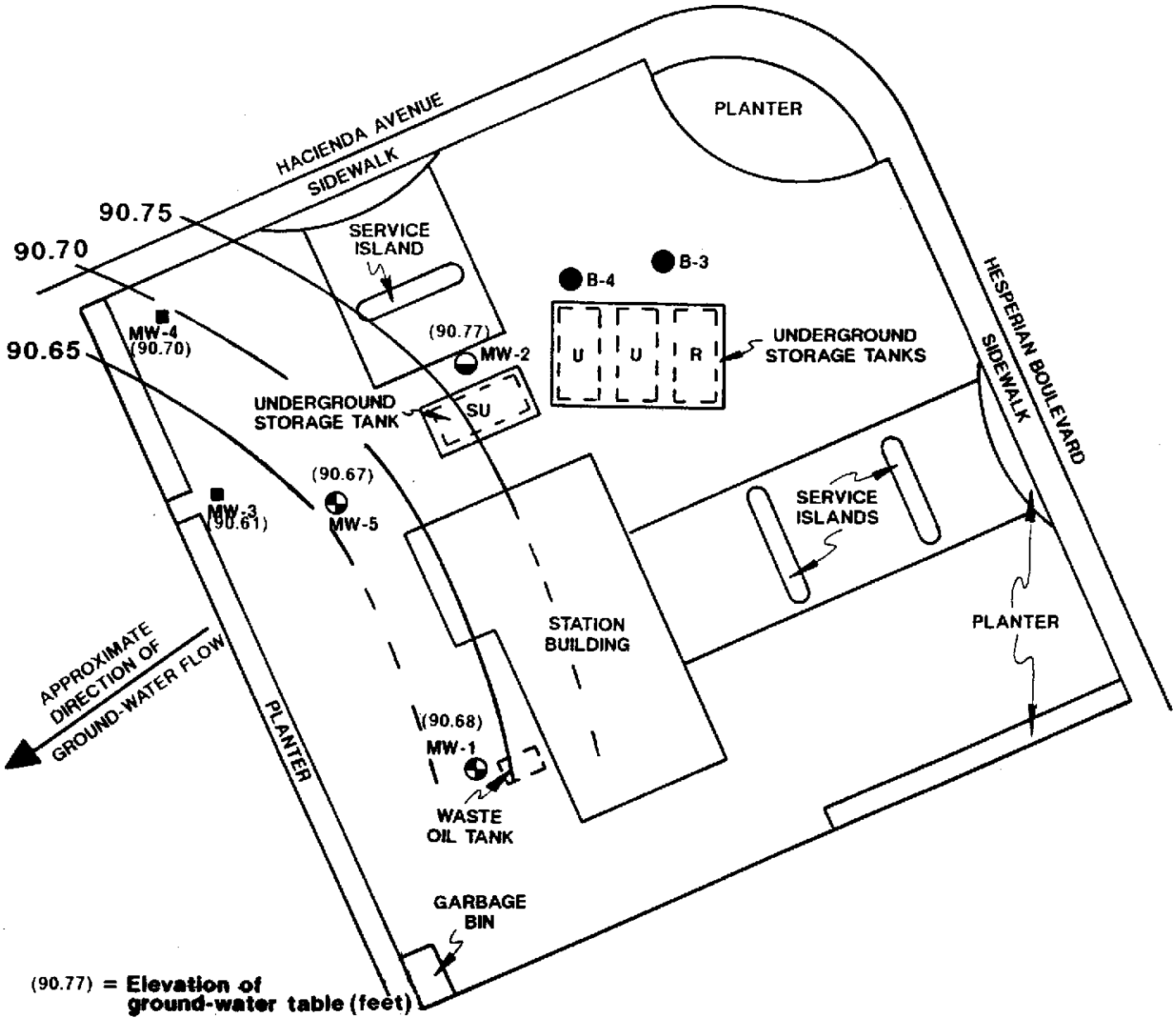
LOG OF BORING B - 4

ARCO Station No. 608
17601 Hesperian Boulevard
San Lorenzo, California

PLATE
P - 10

PROJECT NO. 87131-1



(90.77) = Elevation of ground-water table (feet)

● = Soil boring (Applied GeoSystems, January 1988)

⊕ = Monitoring well (Applied GeoSystems, January 1988)

⊖ = Monitoring well (Emcon Associates, November 1985)

■ = Monitoring well (unknown origin)

90.75 = Line of equal ground-water elevation (feet)

R = Regular gasoline

U = Unleaded gasoline

SU = Super Unleaded gasoline

N

Approximate Scale

30 15 0 30 60

feet

Source: Modified from plan supplied by ARCO

Applied GeoSystems

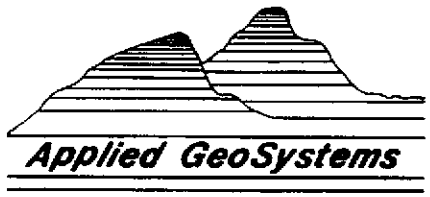
PROJECT NO. 87131-1

GROUND-WATER POTENTIOMETRIC SURFACE MAP
ARCO Service Station
17601 Hesperian Boulevard
San Lorenzo, California

PLATE

P - 11

CHAIN OF CUSTODY RECORD



43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

SAMPLER (signature): Dan Kirkman

Phone: 651-1906

LABORATORY: Applied Geosystems

TURNAROUND TIME: 1 week

Project Leader: John Lambert

Phone No. 651-1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Time
Dan Kirkman			
	Received for laboratory by: [illegible]	1-13-88	11:00AM

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-12-MW1	87131-1	1-11-88	BETX	Iced

Applied GeoSystems 43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

RECORD OF ANALYSIS

Date 2-1-88

Applied GeoSystems
43255 Mission Blvd.
Fremont, CA. 94539

Attention: John T. Lambert

Date Received: 1-13-88 Laboratory# 8801W034
Date Analyzed: 1-19-88

Procedure:

The water sample referenced on the attached Chain-of-Custody was analyzed for the presence and concentration of Benzene, Ethyl-Benzene, Toluene, and Xylenes (BETX) by EPA method 602. The sample was concentrated on a Tekmar LSC-2 and ALS automatic sampler prior to injection into a 5890 Hewlett Packard gas chromatograph fitted with a Photo-Ionization detector (PID) and a Flame Ionization detector (FID). The limit of detection for this sample is 0.005 milligrams/liter (parts per million = ppm).

The results are presented in the table below:

SAMPLE	SITE	BENZENE	ETHYL BENZENE	TOLUENE	TOTAL XYLENES
W-12-MW1	87131-1	0.804	0.168	0.115	0.166

Results in milligrams/liter (parts per million = ppm).

Tia Tran, Chemist

Applied GeoSystems is a State of California, Department of Health Services Certified Hazardous Waste Testing Laboratory (No. 153).

CHAIN OF CUSTODY RECORD

Applied GeoSystems
43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

SAMPLER (signature): Dan Kirkman

Phone: (415) 651-1906

LABORATORY: Anametrix

TURNAROUND TIME: 1 week

Project Leader: John Lambert

Phone No: (415) 651-1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Time
Dan Kirkman			
1/15/88 9:25	Received for laboratory by: DPG	1/15/88	9:25 AM

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-12-MW1	87131-1	1-11-88	TPH (Gasoline 8015)	Iced

ANAMETRIX, INC.
LABORATORY SERVICES
ENVIRONMENTAL • ANALYTICAL CHEMISTRY
2754 AIELLO DRIVE • SAN JOSE, CA 95111 • (408) 629-1132

January 22, 1988
Work Order Number 8801098
Date Received 01/15/88
Project NO. 87131-1

John Lambert
Applied GeoSystems
43255 Mission Blvd.
Suite B
Fremont, CA 94539

One water sample was received for analysis of total volatile hydrocarbons as gasoline by gas chromatography, using the following EPA method(s):

ANAMETRIX I.D.	SAMPLE I.D.	METHOD(S)
8801098-01	87131-1 W-12-MW1	8015

RESULTS

See enclosed data sheet, Page 2.

If there is any more that we can do, please give us a call. Thank you for using ANAMETRIX, INC.

Sincerely,

Sarah Schoen, Ph.D.
GC Supervisor

SRS/km

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 629-1132

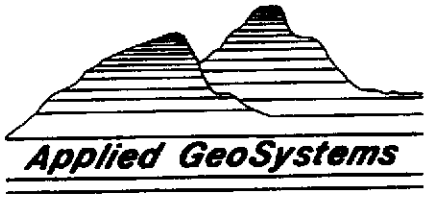
Sample I.D.	: 87131-1 W-12-MW1	Anametrix I.D.	: 8801098-01
Matrix	: WATER	Analyst	: JC
Date sampled	: 01-11-88	Supervisor	: SJ
Date anl. TVH	: 01-20-88	Date released	: 01-22-88
Date ext. TEH	: NA	Date ext. TOG	: NA
Date anl. TEH	: NA	Date anl. TOG	: NA

CAS #	Compound Name	Reporting Limit (ug/l)	Amount Found (ug/l)
	TVH as Gasoline	50	3300

BRL - Below reporting limit.
TVH - Total Volatile Hydrocarbons is determined by modified EPA 8015 with either headspace or purge and trap.
TEH - Total Extractable Hydrocarbons is determined by modified EPA 8015 with direct injection.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX- Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow CRWQCB Region 2 guidelines.

CHAIN OF CUSTODY RECORD



43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

SAMPLER (signature): William C Rivers

Phone: (415) 651-1906

LABORATORY: ANAMETRIX

TURNAROUND TIME: 24 Hours

Project Leader: John Lambert

Phone No. (415) 651-1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Time
William C Rivers			
dropped off overnight 1-20-88 9:31	Received for laboratory by: BURT SUTHERLAND	1-20-88	09:30

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
S-11-B1	87131-1	1/19/88	Tot. Oil & Grease	ICE
			BETX	
			TEH	

ANAMETRIX, INC.
LABORATORY SERVICES
ENVIRONMENTAL • ANALYTICAL CHEMISTRY
2754 AIELLO DRIVE • SAN JOSE, CA 95111 • (408) 629-1132

January 21, 1988
Work Order Number 8801123
Date Received 01/20/88
Project No. 37131-1

John Lambert
Applied GeoSystems
43255 Mission Blvd., Ste. B
Fremont, CA 94539

One soil sample was received for analysis of BTEX plus total hydrocarbons as gasoline and diesel by gas chromatography, and total oil and grease by gravimetric analysis, using the following EPA method(s):

ANAMETRIX I.D.	SAMPLE I.D.	METHOD(S)
8801123-01	37131-1 S-11-B1	8015/8020/503E

RESULTS

See enclosed data sheet, Page 2.

If there is any more that we can do, please give us a call. Thank you for using ANAMETRIX, INC.

Sincerely,

Sarah Schoen

Sarah Schoen, Ph.D.
QC Supervisor

SRS/da

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 629-1132

Sample I.D.	: 87131-1 S-11-B1	Anametrix I.D.	: 8801123-01
Matrix	: SOIL	Analyst	: [illegible]
Date sampled	: 01-19-88	Supervisor	: [illegible]
Date anl. TVH	: 01-20-88	Date released	: 01-21-88
Date ext. TEH	: 01-20-88	Date ext. TOG	: 01-20-88
Date anl. TEH	: 01-20-88	Date anl. TOG	: 01-21-88

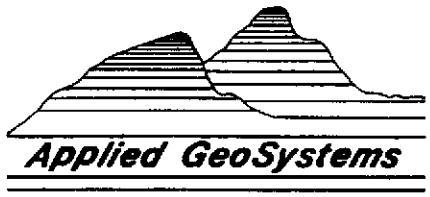
CAS #	Compound Name	Reporting Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	200	BRL
108-88-3	Toluene	200	BRL
100-41-4	Ethylbenzene	200	BRL
1330-20-7	Total Xylenes	200	BRL
	TVH as Gasoline	5000	BRL
	TEH as Diesel	10,000	BRL
	Total Oil & Grease	30,000	BRL

BRL - Below reporting limit.
TVH - Total Volatile Hydrocarbons is determined by modified EPA 8015 with either headspace or purge and trap.
TEH - Total Extractable Hydrocarbons is determined by modified EPA 8015 with direct injection.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX- Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow CRWQCB Region 2 guidelines.

8801134

CHAIN OF CUSTODY RECORD



43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

SAMPLER (signature): William Rivera

Phone: (415) 651-1906

LABORATORY: ANAMETRIX

TURNAROUND TIME: 24 Hours

Project Leader: John Lambert

Phone No. (415) 651-1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Time
William Rivera			
Dan Kirkman 1-21 9:33	Received for laboratory by: Darine Lyle	1-21-88	9:30

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
S-10-B2	87131-1	1/20/88	TVH, BETX (8015/G)	ICE brass liner ok
S-10-B3	"	"	"	"
S-10-B4	"	"	"	"
S-5-B4	"	"	"	"

8801134

CHAIN OF CUSTODY RECORD

Applied GeoSystems

43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

SAMPLER (signature): William C. [signature]

Phone:

LABORATORY: ANAMETRIX

TURNAROUND TIME: 24 HR

Project Leader: John Lambert

Phone No. (415) 651-1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Time
William C. [signature]			
Dan Kirkman 9:30 1-21-88	Received for laboratory by: Darin [signature]	1-21-88	9:30

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-11-MW3	87131-1	1/20/88	TVH, BETX 8015(G)	ICE 2x40ml
W-11-MW4	87131-1	1/20/88	"	" 2x40ml
W-11-MW1	87131-1	1/20/88	TEH, TVH, TOG, BETX 8015(D) 8015(G) 503E BTEX	" 2x1liter ok 2x40ml

ANAMETRIX, INC.
LABORATORY SERVICES
ENVIRONMENTAL • ANALYTICAL CHEMISTRY
2754 AIELLO DRIVE • SAN JOSE, CA 95111 • (408) 629-1132

January 26, 1988
Work Order Number 8801134
Date Received 01/21/88
Project No. 87131-1

John Lambert
Applied GeoSystems
43255 Mission Blvd., Ste. B
Fremont, CA 94539

Three water samples and four soil samples were received for analysis of total hydrocarbons as gasoline and diesel by gas chromatography, and total oil and grease by gravimetric analysis, using the following method(s):

ANAMETRIX I.D.	SAMPLE I.D.	METHOD(S)
8801134-01	87131-1 W-11-MW3	8015/8020
-02	" W-11-MW4	"
-03	" W-11-MW1	8015/8020/503E
-04	" S-10-B2	8015/8020
-05	" S-10-B3	"
-06	" S-10-B4	"
-07	" S-5-B4	"

RESULTS

See enclosed data sheets, Pages 2-8.

If there is any more that we can do, please give us a call. Thank you for using ANAMETRIX, INC.

Sincerely,

Sarah Schoen

Sarah Schoen, Ph.D.
GC Supervisor

SRS/da

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 629-1132

Sample I.D.	: 87131-1 W-11-MW3	Anametrix I.D.	: 8801134-01
Matrix	: WATER	Analyst	:
Date sampled	: 01-20-88	Supervisor	:
Date anl. TVH	: 01-21-88	Date released	: 01-26-88
Date ext. TEH	: NA	Date ext. TOG	: NA
Date anl. TEH	: NA	Date anl. TOG	: NA

CAS #	Compound Name	Reporting Limit (ug/l)	Amount Found (ug/l)
71-43-2	Benzene	1	200
108-88-3	Toluene	1	200
100-41-4	Ethylbenzene	1	80
1330-20-7	Total Xylenes	1	60
	TVH as Gasoline	50	1800

BRL - Below reporting limit.
TVH - Total Volatile Hydrocarbons is determined by modified EPA 8015 with either headspace or purge and trap.
TEH - Total Extractable Hydrocarbons is determined by modified EPA 8015 with direct injection.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX- Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow CRWQCB Region 2 guidelines.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 629-1132

Sample I.D.	: 87131-1 W-11-MW4	Anametrix I.D.	: 8801134-02
Matrix	: WATER	Analyst	: BS
Date sampled	: 01-20-88	Supervisor	: SW
Date anl. TVH	: 01-21-88	Date released	: 01-26-88
Date ext. TEH	: NA	Date ext. TOG	: NA
Date anl. TEH	: NA	Date anl. TOG	: NA

CAS #	Compound Name	Reporting Limit (ug/l)	Amount Found (ug/l)
71-43-2	Benzene	1	2700
108-88-3	Toluene	1	7900
100-41-4	Ethylbenzene	1	850
1330-20-7	Total Xylenes	1	5200
	TVH as Gasoline	50	62000

BRL - Below reporting limit.
TVH - Total Volatile Hydrocarbons is determined by modified EPA 8015 with either headspace or purge and trap.
TEH - Total Extractable Hydrocarbons is determined by modified EPA 8015 with direct injection.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX- Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow CRWQCB Region 2 guidelines.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 629-1132

Sample I.D.	: 87131-1 W-11-MW1	Anametrix I.D.	: 880134-03
Matrix	: WATER	Analyst	:
Date sampled	: 01-20-88	Supervisor	:
Date anl. TVH	: 01-21-88	Date released	: 01-26-88
Date ext. TEH	: 01-21-88	Date ext. TOG	: 01-21-88
Date anl. TEH	: 01-21-88	Date anl. TOG	: 01-22-88

CAS #	Compound Name	Reporting Limit (ug/l)	Amount Found (ug/l)
71-43-2	Benzene	1	20
108-88-3	Toluene	1	50
100-41-4	Ethylbenzene	1	10
1330-20-7	Total Xylenes	1	80
	TVH as Gasoline	50	300
	TEH as Diesel	50	200
	Total Oil & Grease	10,000	BRL

BRL - Below reporting limit.
TVH - Total Volatile Hydrocarbons is determined by modified EPA 8015 with either headspace or purge and trap.
TEH - Total Extractable Hydrocarbons is determined by modified EPA 8015 with direct injection.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX- Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow CRWQCB Region 2 guidelines.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 629-1132

Sample I.D.	: 87131-1 S-10-B2	Anametrix I.D.	: 8801134-04
Matrix	: SOIL	Analyst	:
Date sampled	: 01-20-88	Supervisor	:
Date anl. TVH	: 01-21-88	Date released	: 01-26-88
Date ext. TEH	: NA	Date ext. TOG	: NA
Date anl. TEH	: NA	Date anl. TOG	: NA

CAS #	Compound Name	Reporting Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	200	600
108-88-3	Toluene	200	BRL
100-41-4	Ethylbenzene	200	BRL
1330-20-7	Total Xylenes	200	BRL
	TVH as Gasoline	5000	BRL

BRL - Below reporting limit.
TVH - Total Volatile Hydrocarbons is determined by modified EPA 8015 with either headspace or purge and trap.
TEH - Total Extractable Hydrocarbons is determined by modified EPA 8015 with direct injection.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX- Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow CRWQCB Region 2 guidelines.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 629-1132

Sample I.D.	: 87131-1 S-10-B3	Anametrix I.D.	: 8801134-05
Matrix	: SOIL	Analyst	:
Date sampled	: 01-20-88	Supervisor	:
Date anl. TVH	: 01-21-88	Date released	: 01-26-88
Date ext. TEH	: NA	Date ext. TOG	: NA
Date anl. TEH	: NA	Date anl. TOG	: NA

CAS #	Compound Name	Reporting Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	200	400
108-88-3	Toluene	200	BRL
100-41-4	Ethylbenzene	200	BRL
1330-20-7	Total Xylenes	200	BRL
	TVH as Gasoline	5000	BRL

BRL - Below reporting limit.
TVH - Total Volatile Hydrocarbons is determined by modified EPA 8015 with either headspace or purge and trap.
TEH - Total Extractable Hydrocarbons is determined by modified EPA 8015 with direct injection.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX- Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow CRWQCB Region 2 guidelines.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 629-1132

Sample I.D.	: 87131-1 S-10-B4	Anametrix I.D.	: 8801134-06
Matrix	: SOIL	Analyst	: [illegible]
Date sampled	: 01-20-88	Supervisor	: [illegible]
Date anl. TVH	: 01-21-88	Date released	: 01-26-88
Date ext. TEH	: NA	Date ext. TOG	: NA
Date anl. TEH	: NA	Date anl. TOG	: NA

CAS #	Compound Name	Reporting Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	200	400
108-88-3	Toluene	200	200
100-41-4	Ethylbenzene	200	1000
1330-20-7	Total Xylenes	200	1000
	TVH as Gasoline	5000	5000

BRL - Below reporting limit.
TVH - Total Volatile Hydrocarbons is determined by modified EPA 8015 with either headspace or purge and trap.
TEH - Total Extractable Hydrocarbons is determined by modified EPA 8015 with direct injection.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX- Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow CRWQCB Region 2 guidelines.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 629-1132

Sample I.D.	: 87131-1 S-5-B4	Anametrix I.D.	: 8801134-07
Matrix	: SOIL	Analyst	:
Date sampled	: 01-20-88	Supervisor	:
Date anl. TVH	: 01-21-88	Date released	: 01-26-88
Date ext. TEH	: NA	Date ext. TOG	: NA
Date anl. TEH	: NA	Date anl. TOG	: NA

CAS #	Compound Name	Reporting Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	200	800
108-88-3	Toluene	200	500
100-41-4	Ethylbenzene	200	4100
1330-20-7	Total Xylenes	200	1200
	TVH as Gasoline	5000	10000

BRL - Below reporting limit.
TVH - Total Volatile Hydrocarbons is determined by modified EPA 8015 with either headspace or purge and trap.
TEH - Total Extractable Hydrocarbons is determined by modified EPA 8015 with direct injection.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX- Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow CRWQCB Region 2 guidelines.

CHAIN OF CUSTODY RECORD

Applied GeoSystems
43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

SAMPLER (signature): [signature]

Phone:

LABORATORY: ANAMETRIX

TURNAROUND TIME: 24 Hour

Project Leader: John Lambert

Phone No. (415) 651-1906

SHIPPING INFORMATION:

Shipper

Address

Date Shipped

Service Used

Airbill No. Cooler No.

Relinquished by: (signatures)	Received by: (signatures)	Date	Time
[signature]			
[signature] 1-25/88 / 11:30	Received for laboratory by: [signature]	1-25-88	11:30

LABORATORY SHOULD SIGN UPON RECEIPT AND RETURN A COPY OF THIS FORM WITH THE LABORATORY RESULTS

Sample No.	Site Identification	Date Sampled	Analyses Requested	Sample Condition Upon Receipt
W-13-MW5	87131-1	1-22-88	TVH, BETX 8015 Gas	ICED 2x40ml

ANAMETRIX, INC.
LABORATORY SERVICES
ENVIRONMENTAL • ANALYTICAL CHEMISTRY
2754 AIELLO DRIVE • SAN JOSE, CA 95111 • (408) 629-1132

January 27, 1988
Work Order Number 8801146
Date Received 01/25/88
Project 87131-1

John Lambert
Applied GeoSystems
43255 Mission Blvd.
Suite B
Fremont, CA 94539

One water sample was received for analysis of BTEX plus total volatile hydrocarbons as gasoline by gas chromatography, using the following EPA method(s):

ANAMETRIX I.D.	SAMPLE I.D.	METHOD(S)
8801146-01	87131-1 W-13-MW5	8015/8020

RESULTS

See enclosed data sheet, page 2.

If there is any more that we can do, please give us a call. Thank you for using ANAMETRIX, INC.

Sincerely,

Sarah Schoen

Sarah Schoen, Ph.D.
GC Supervisor

SRS/km

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 629-1132

Sample I.D.	: 87131-1 W-13-MW5	Anametrix I.D.	: 8801146-01
Matrix	: WATER	Analyst	: mh
Date sampled	: 01-22-88	Supervisor	: [illegible]
Date anl. TVH	: 01-25-88	Date released	: 01-27-88
Date ext. TEH	: NA	Date ext. TOG	: NA
Date anl. TEH	: NA	Date anl. TOG	: NA

CAS #	Compound Name	Reporting Limit (ug/l)	Amount Found (ug/l)
71-43-2	Benzene	1	4800
108-88-3	Toluene	1	2700
100-41-4	Ethylbenzene	1	3800
1330-20-7	Total Xylenes	1	5500
	TVH as Gasoline	50	31000

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TEH - Total Extractable Hydrocarbons is determined by modified EPA 8015 with direct injection.
TOG - Total Oil & Grease is determined by Standard Method 503E.
BTEX- Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

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