ARCO Petroleum Products Company
515 South Flower Street
Mailing Address: Box 2679 - T.A.
Los Angeles, California 90051
Telephone 213 486 3511

GZ

RC

February 5, 1988

Mr. Greg Zentner
Regional Water Quality Control Board
1111 Jackson Street, Room 6040
Oakland, CA. 94607

Re: ARCO Service Station #608, 17601 Hesperian Blvd.
San Lorenzo, California

Dear Mr. Zentner:

Please find enclosed an initial site assessment report performed by Emcon Associates and an additional site assessment work scope to be performed by Applied Geosystems.

The proposed work plan will be implemented immediately. Soil and groundwater data will be collected and results will be compiled in a final report which will be submitted to your office as soon as possible.

If you have any questions and/or comments please notify me at (213) 486-1824.

Sincerely

T. T. Potter
Environmental Engineering

TTP:kp

Enclosure

EMCON
ASSOCIATES
Consultants in Wastes
Management and
Environmental Control

November 12, 1985
Project 738-63.01

Gettler-Ryan, Incorporated
1992 National Avenue
Hayward, California 94545

Attention: Mr. Jeffrey M. Ryan

Re: Atlantic Richfield
Service Station,
Hesperian Boulevard and
Hacienda Avenue,
San Lorenzo, California

Gentlemen:

This letter presents the results of a soil and ground-water investigation conducted by EMCON Associates at the Atlantic Richfield service station located at Hesperian Boulevard and Hacienda Avenue in San Lorenzo, California. The purpose of this investigation was to examine soil and ground-water conditions adjacent to the subsurface product storage tanks located at the site.

FIELD INVESTIGATION PROCEDURES

Five exploratory borings (A-A through A-D and A-1) were drilled at the locations shown on Figure 1. The borings were drilled using continuous-flight solid-stem or hollow-stem auger drilling equipment and were logged by an EMCON geologist. Soil samples for logging were obtained from auger return materials and by advancing a modified California split-spoon sampler into undisturbed soil beyond the tip of the auger. Soil samples for chemical analysis were sealed in glass containers, packed on ice, and delivered directly to an independent laboratory as authorized by Gettler-Ryan.

Upon completion, Borings A-A through A-D were backfilled with soil cuttings to a depth of 1/2 foot and cement to the ground surface. Boring A-1 was converted to a ground-water monitoring well by the installation of 3-inch-diameter PVC casing. Well construction details accompany the attached Exploratory Boring Logs.

A ground-water sample was obtained from Well A-1 and was analyzed for the presence of gasoline, benzene, toluene, and xylene by gas chromatography followed by flame-ionization and photo-ionization detection. Complete laboratory results accompany this report.

SITE CONDITIONS

Boring A-A was placed downgradient of the subsurface waste oil tank. Borings A-B, A-C and A-D were placed adjacent to the subsurface gasoline storage tanks. Monitoring Well A-1 was placed downgradient of the subsurface gasoline storage tank complex. Subsurface conditions explored during drilling ranged in depth from 12-1/2 to 24 feet. Boring A-A encountered clayey sand to a depth of 3-1/2 feet, clay to a depth of approximately 10 feet, and silty sand to the total depth explored of 16-1/2 feet. Borings A-B and A-C encountered sand fill materials to depths of approximately 12-1/2 feet, underlain by clay to the total depths explored of 14 feet. Boring A-D encountered silt and gravel fill materials to the total depth explored of 12-1/2 feet. Boring A-1 encountered primarily clay to a depth of approximately 21 feet, underlain by silt to the total depth explored of 24 feet. Ground water was encountered in all borings at a depth of approximately 12-1/2 feet.

Soils from Boring A-A contained no petroleum product odor to a depth of approximately 15 feet. Gasoline odor was noted in soils from Borings A-B, A-C and A-D to the total depths explored and in Boring A-1 in the approximate depth interval of 12 to 15 feet.

LABORATORY INVESTIGATIONS AND RESULTS

Soil samples collected from Boring A-A were analyzed for the presence of waste oil. Soil from Boring A-A contained 10,000 parts per million (ppm) waste oil at the depth interval of 7 to 8-1/2 feet and 9,500 ppm waste oil at the depth interval of 10-1/2 to 12 feet. Selected soil samples from Borings A-B, A-C and A-D were analyzed for the presence of gasoline. Soil collected from the depth interval of 12-1/2 to 14 feet in Boring A-B contained 1,500 ppm gasoline. Soil collected from Boring A-C contained gasoline concentrations of 880 ppm at the depth interval of 4 to 5-1/2 feet, 1,900 ppm at the depth interval of 7 to 8-1/2 feet, and 2,800 ppm at the depth interval of 12-1/2 to 14 feet. Soil collected from Boring A-D contained 590 ppm gasoline at the depth interval of 12-1/2 to 14 feet.

A ground-water sample obtained from Monitoring Well A-1 contained a dissolved gasoline concentration of 32,000 micrograms per liter (ug/l) or parts per billion.

If you have any questions regarding the contents of this letter, please do not hesitate to call.

Very truly yours,

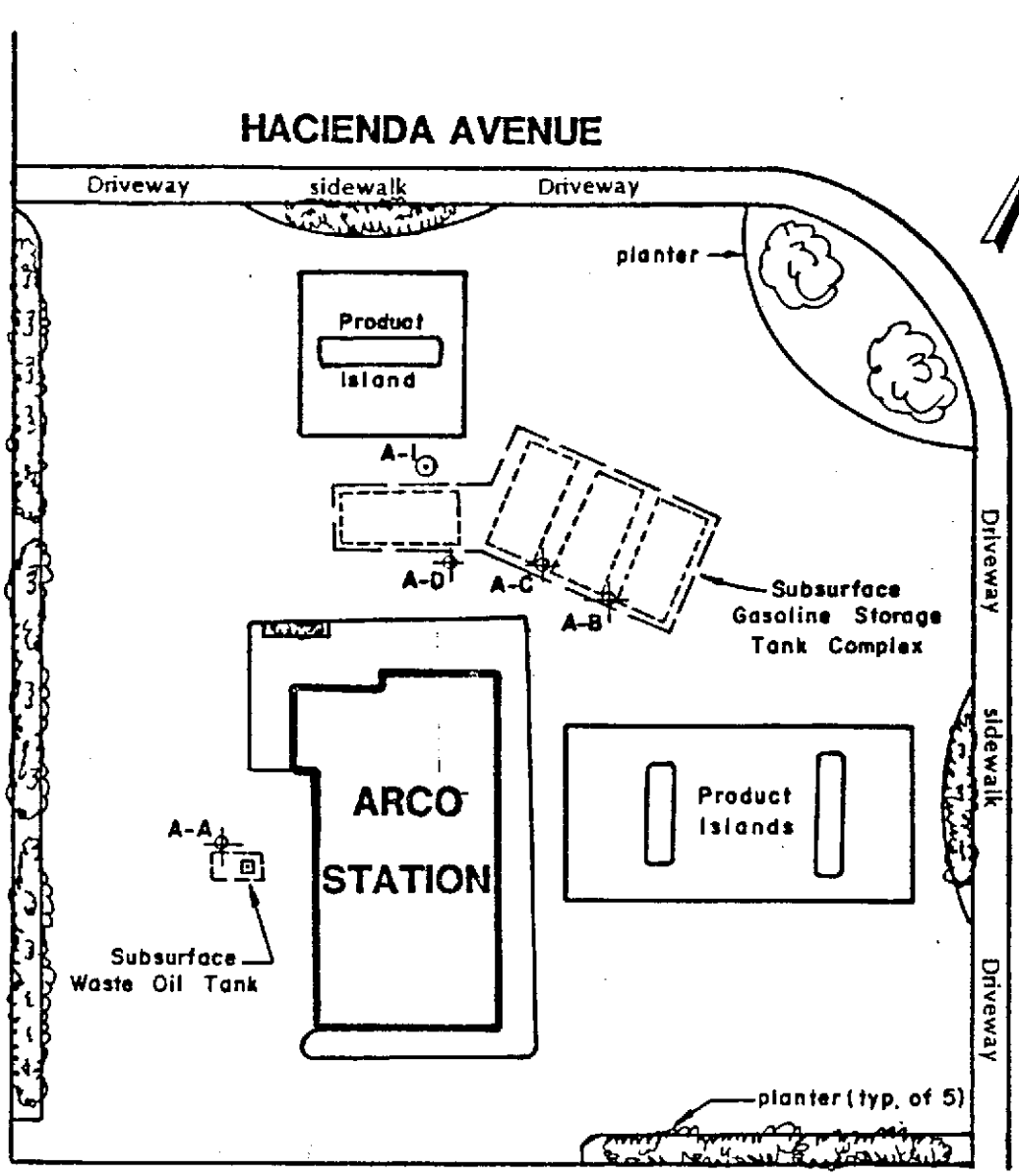
EMCON Associates

Michael G. Burns
Staff Geologist

Susan M. Willhite
Project Geologist

MGB/SMW:mtg

Enclosures



Approximate Direction of Ground-water Flow

LEGEND

A-A — Soil boring location and designation

A-1 — Ground-water monitoring well location and designation

Approx. Scale: 1" = 30'

EMCON Associates
San Jose, California

GETTLER-RYAN, INC.
SUBSURFACE HYDROGEOLOGIC INVESTIGATION
ARCO STATION, HESPERIAN BLVD. AND HACIENDA AVE.
SAN LORENZO, CALIFORNIA

SOIL BORING AND MONITORING WELL LOCATION MAP

FIGURE 1

PROJECT NO. 736-63.01

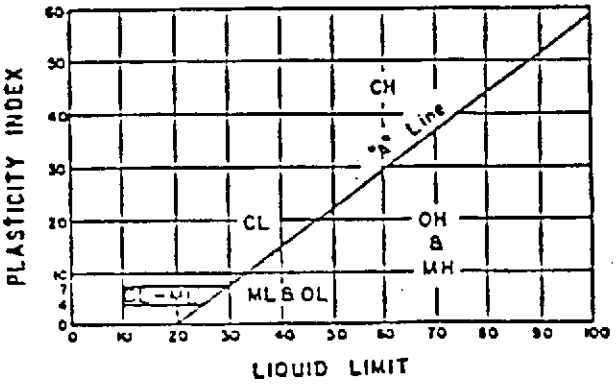
MAJOR DIVISIONS		SYMBOLS		TYPICAL SOIL DESCRIPTIONS
COARSE GRAINED SOILS (More than 1/2 of soil > no. 200 sieve size)	GRAVELS (More than 1/2 of coarse fraction > no. 4 sieve size)	GW		Well graded gravels or gravel-sand mixtures, little or no fines
		GP		Poorly graded gravels or gravel-sand mixtures, little or no fines
		GM		Silty gravels, gravel-sand-silt mixtures
		GC		Clayey gravels, gravel-sand-clay mixtures
	SANDS (More than 1/2 of coarse fraction < no. 4 sieve size)	SW		Well graded sands or gravelly sands, little or no fines
		SP		Poorly graded sands or gravelly sands, little or no fines
		SM		Silty sands, sand-silt mixtures
		SC		Clayey sands, sand-clay mixtures
FINE GRAINED SOILS (More than 1/2 of soil < no. 200 sieve size)	SILTS & CLAYS LL < 50	ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
		CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL		Organic silts and organic silty clays of low plasticity
	SILTS & CLAYS LL > 50	MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH		Inorganic clays of high plasticity, fat clays
		OH		Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOILS		Pt		Peat and other highly organic soils

CLASSIFICATION CHART

(Unified Soil Classification System)

CLASSIFICATION	RANGE OF GRAIN SIZES	
	U.S. Standard Sieve Size	Grain Size in Millimeters
BOULDERS	Above 12"	Above 305
COBBLES	12" to 3"	305 to 76.2
GRAVEL	3" to No. 4	76.2 to 4.76
coarse	3" to 3/4"	76.2 to 19.1
fine	3/4" to No. 4	19.1 to 4.76
SAND	No. 4 to No. 200	4.76 to 0.074
coarse	No. 4 to No. 10	4.76 to 2.00
medium	No. 10 to No. 40	2.00 to 0.420
fine	No. 40 to No. 200	0.420 to 0.074
SILT & CLAY	Below No. 200	Below 0.074

GRAIN SIZE CHART



PLASTICITY CHART

METHOD OF SOIL CLASSIFICATION

NOTES: Logs of Exploratory Borings

2.5 YR 6/2 — Denotes color as field checked to Munsell Soil Color Charts (1975 Edition)

 Denotes undisturbed sample taken in 2-inch split-spoon sampler.

 Denotes disturbed sample (bag sample).

 Denotes first observation of ground water.

 Denotes static ground-water level.

Penetration — Sample drive hammer weight - 140 pounds, drop - 30 inches. Blows required to drive sampler 1 foot are indicated on the logs.

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-63.01 BORING NO. A-A

PROJECT NAME Gettler-Ryan, Arco, Hesperian Blvd. & Hacienda Ave. PAGE 1 OF 1.
San Lorenzo

BY MGB DATE 10/1/85 SURFACE ELEV. 34'±

TORVANE (TSF)	POCKET PENETROMETER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION
				0		SC	ASPHALT CLAYEY SAND; dark olive gray (5Y, 3/2); fine to coarse grained; very clayey; loose; moist; moderate product odor.
						CL	CLAY; black (5Y, 2.5/1); trace silt; stiff; moist; faint product odor. @5': silty; trace fine sand; faint product odor. @6': dark olive gray (5Y, 3/2)
	1.75	23		5	1		@7': olive (5Y, 4/4); to very dark gray (5Y, 3/1); slightly silty; trace fine to coarse sand; stiff; damp; no product odor.
		11	▽	10	2	SM	SILTY SAND; dark olive gray (5Y, 3/2); fine grained; very silty; medium dense; moist; moderate product odor.
		7		15	3		@15': wet; loose; moderate product odor.
				20			BOTTOM OF BORING AT 16½ FEET.

REMARKS Drilled by 5-inch continuous flight augers; samples collected with 2-inch Calfiornia modified split-spoon sampler; borehole backfilled with soil cuttings to ½ foot; concrete to surface.

EMCON ASSOCIATES

PLATE A

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-63.01 BORING NO. A-B

PROJECT NAME Gettler-Ryan, Arco, Hesperian Blvd. & Hacienda Ave. PAGE 1 OF 1
San Lorenzo

BY MGB DATE 10/1/85 SURFACE ELEV. 34'±

TORVANE (TSF)	POCKET PENETROMETER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION
				0			CONCRETE
						SC	CLAYEY SAND - Fill; olive brown (2.5Y, 4/4); to dark gray (5Y, 4/5); fine to coarse grained; clayey; 15% fine gravel; loose; damp; faint gasoline odor.
		Push		5	1		@4': moist; moderate gasoline odor.
		5			2	SW	SAND - Fill; dark olive gray (5Y, 3/2); fine to coarse grained; 15% clay; loose; moist; moderate gasoline odor.
				10			
			▽				
	1.2	14			3	CL	CLAY; black (5Y, 2.5/2) to dark olive gray (5Y, 3/2); silty; stiff; wet; moderate gasoline odor.
				15			BOTTOM OF BORING AT 14 FEET.
				20			

REMARKS Drilled by 8-inch continuous flight, hollow-stem auger; samples collected with 2-inch California modified split-spoon sampler; borehole backfilled with soil cuttings to ½foot ; concrete to surface.

EMCON ASSOCIATES

PLATE B

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-63.01 BORING NO. A-C

PROJECT NAME Gettler-Ryan, Arco, Hesperian Blvd. & Hacienda Ave, San Lorenzo PAGE 1 OF 1

BY MGB DATE 10/1/85 SURFACE ELEV. 34'±

TORVANE (TSF)	POCKET PENETROMETER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION
				0			CONCRETE.
					SC		CLAYEY SAND - Fill; olive brown (2.5Y, 4/4) to dark gray (5Y, 4/1); fine to coarse grained; clayey; 15% fine gravel; loose; damp; faint gasoline odor.
		Push		5	1		@4': moderate gasoline odor.
	—	4			2		@6': 30% fine to coarse gravel; strong gasoline odor. @7': greenish gray; no gravel; 20% clay; loose; strong gasoline odor.
			▽	10			
	1.25	9			3 CL		CLAY; black (5Y, 2.5/2); slightly silty; stiff; wet; moderate gasoline odor.
				15			BOTTOM OF BORING AT 14 FEET
				20			

REMARKS Drilled by 8-inch continuous-flight, hollow-stem auger ; samples collected with 2-inch California modified split-spoon sampler; borehole backfilled with soil cuttings to-½ foot ; concrete to surface.

EMCON ASSOCIATES

PLATE C

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-63.01 BORING NO. A-D

PROJECT NAME Gettler-Ryan, Arco, Hesperian Blvd. & Hacienda Ave. San Lorenzo PAGE 1 OF 1.

BY MGB DATE 10/1/85 SURFACE ELEV. 34'±

TORVANE (TSF)	POCKET PENETROMETER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION
				0		ML	ASPHALT. GRAVELLY SILT;-Fill; brown (10YR,4/3); 40% fine gravel; 10% fine to coarse sand; soft; damp; no gasoline odor.
						GW	
		Push		5	1		GRAVEL - Fill; multi-colored;fine grained; 30%fine to coarse sand; 10% clay; loose; damp; faint gasoline odor.
	—	5			2		@7': faint gasoline odor.
				10			
		Grab	▽		⊠		@12': faint gasoline odor. BOTTOM OF BORING AT 12½ FEET.
				15			
				20			

REMARKS Drilled by 5-inch continuous-flight auger; samples collected with 2-inch California modified split-spoon sampler; borehole backfilled with soil cuttings to ½ foot ; concrete to surface.

EMCON ASSOCIATES

PLATE D

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-63.01 BORING NO. A-1

PROJECT NAME Gettler-Ryan, Arco, Hesperian Blvd. & Hacienda Ave. PAGE 1 OF 2
San Lorenzo

BY MGB DATE 10/1/85 SURFACE ELEV. 34'±

TORVANE (TSF)	POCKET PENETROMETER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION
				0		ML	ASPHALT GRAVELLY SILT - Fill; brown (10YR, 4/3); 40% fine gravel; 10% fine to coarse sand; loose; damp; no gasoline odor.
						CL	CLAY: black (5Y, 2.5/2); 25% fine to coarse sand; firm; damp; faint gasoline odor.
				5			@4': very dark grayish brown (2.5Y, 3/2); silty; trace fine sand; damp; no gasoline odor.
				10			@9'; olive brown (2.5Y, 4/4); no sand; moist; no gasoline odor.
	1.6	12	▽		1		@12½': very dark gray (2.5Y, 3/0); no silt; stiff; wet; moderate gasoline odor.
	0.75	8		15	2		@17½': very silty; firm; no gasoline odor.
				20			

REMARKS Drilled by 8-inch continuous-flight, hollow-stem auger; samples collected with 2-inch California modified split-spoon sampler; borehole converted to 3-inch monitoring well as detailed on Plate G.

EMCON ASSOCIATES

PLATE E

LOG OF EXPLORATORY BORING

PROJECT NUMBER 738-63.01

BORING NO. A-1

PROJECT NAME Gettler-Ryan, Arco, Hesperian Blvd. & Hacienda Ave. San Lorenzo

PAGE 2 OF 2

BY MGB DATE 10/1/85

SURFACE ELEV. 34'±

TORVANE (TSF)	POCKET PENETROMETER (TSF)	PENETRATION (Blows/Ft.)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHOGRAPHIC COLUMN	DESCRIPTION
	0	8		20	3	ML	CLAY; continued SANDY SILT; olive brown (2.5Y, 4/4); 40% fine sand; clayey; very soft; wet; no gasoline odor. BOTTOM OF BORING AT 24 FEET.
				25			
				30			
				35			
				40			

REMARKS

EMCON ASSOCIATES

PLATE F

WELL DETAILS

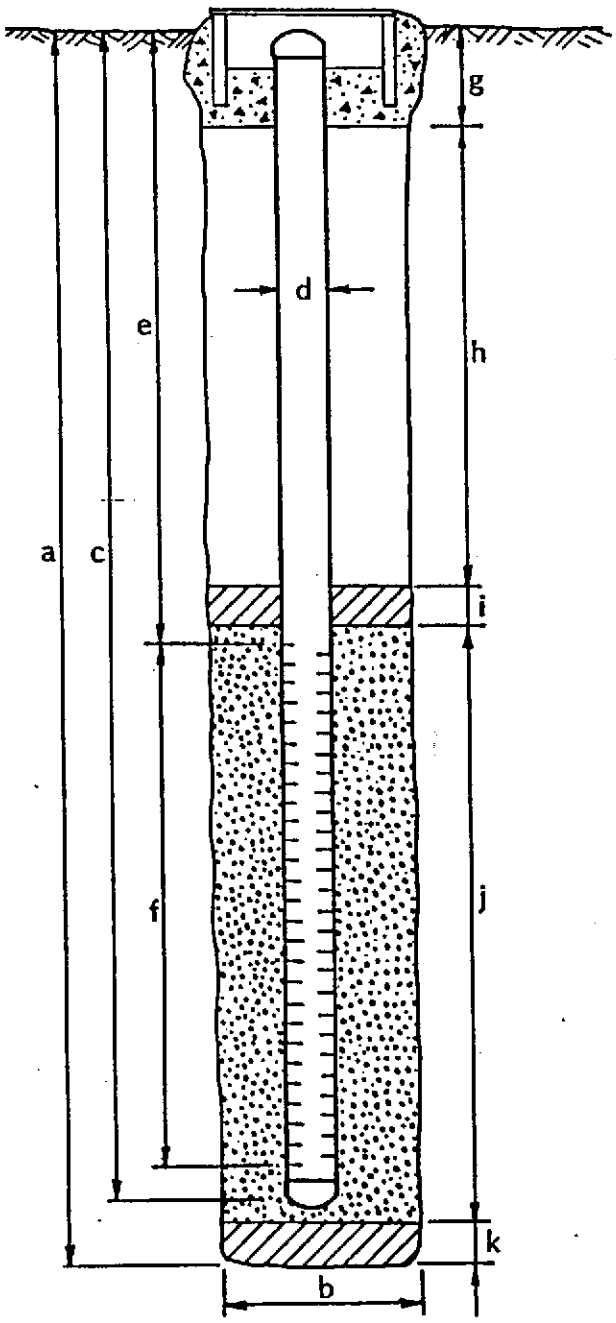
PROJECT NUMBER 738-63.01 BORING / WELL NO. A-1

PROJECT NAME Gettler-Ryan, Arco, San Lorenzo TOP OF CASING ELEV. _____

COUNTY Alameda GROUND SURFACE ELEV. 34'±

WELL PERMIT NO. _____ DATUM MSL

G-5 vault box (Std.)



EXPLORATORY BORING

a. Total depth 24 ft.

b. Diameter 8 in.

Drilling method Hollow-Stem Auger

WELL CONSTRUCTION

c. Casing length 24 ft.

Material Schedule 40 PVC

d. Diameter 3 in.

e. Depth to top perforations 11 ft.

f. Perforated length 13 ft.

Perforated interval from 11 to 24 ft.

Perforation type Machined Slot

Perforation size 0.020 inch

g. Surface seal 1 ft.

Seal material Concrete

h. Backfill 8 ft.

Backfill material Concrete

i. Seal 1 ft.

Seal material Bentonite

j. Gravel pack (10'-24') 14 ft.

Pack material Coarse Aquarium Sand

k. Bottom seal - ft.

Seal material -

PLATE G

November 11, 1985
Project 738-63.01

VERBAL RESULTS

IT STONER LABORATORIES

Boring	Depth	Gasoline Concentration (ppm)	Waste Oil Concentration (ppm)
A-A	7.0 to 8.5	---	10,000
	10.5 to 12.0	---	9,500
A-B	12.5 to 14.0	1,500	
A-C	4.0 to 5.5	880	
	7.0 to 8.5	1,900	
	12.5 to 14.0	2,800	
A-D	12.5 to 14.0	590	

EMCON ASSOCIATES • CHEMICAL LABORATORIES

Analysis • Consultation • Research • Environmental Studies

State Approved Water Laboratory

CERTIFIED ANALYTICAL REPORT

Report to:

Gettler-Ryan
1992 National Ave
Hayward, CA 94545

Project Number: 738-63

Location: ARCO

Sample Type: WATER
Units: ug/l

Sample Designation:	A1
Field Date:	10/07/85
Laboratory Number:	E85-0813
Benzene	1000
Toluene	690
Xylenes and Ethylbenzene	1500
Gasoline	32000

Reported by: Philip Murphy Date: 10-22-85

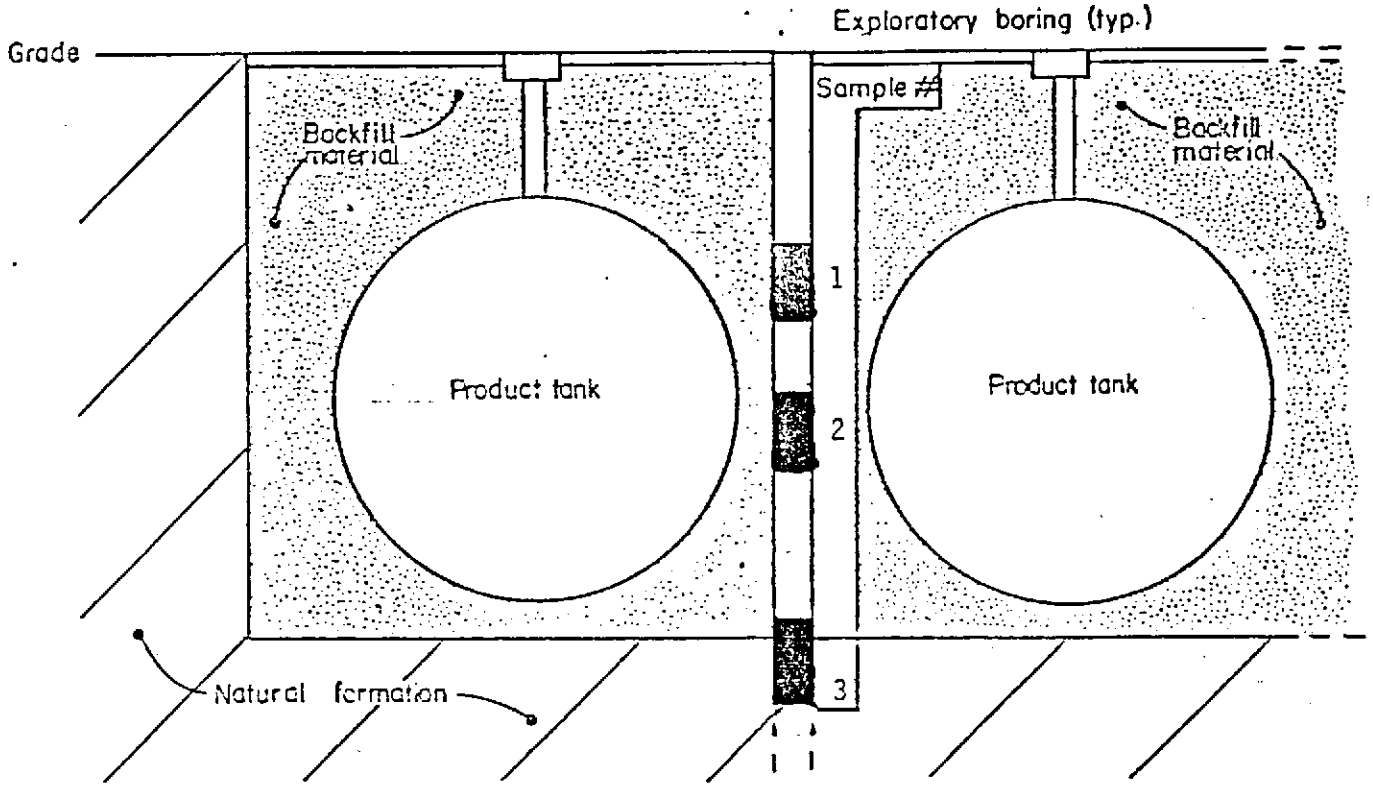
80 ARCHER STREET, SAN JOSE, CALIFORNIA 95112 TELEPHONE (408) 275-1444

GETTLER-RYAN, IN

GENERALIZED PROFILE OF SUBSURFACE TANK COMPLEX AND GASOLINE CONCENTRATIONS WITHIN BACKFILL MATERIAL

PROJECT NUMBER 738-63.01
PROJECT NAME ARCO, Hesperian & Hacienda
NUMBER OF TANKS IN COMPLEX 4

MAPVIEW DIMENSIONS 35' x 20'
APPROXIMATE DEPTH 12½'



SAMPLE #	BORING	DEPTH INTERVAL	GASOLINE CONCENTRATION (parts per million)
1	A-C	4' - 5½'	880
2	A-C	7' - 8½'	1,900
3	A-C	12½' - 14'	2,800
		Detection Limit	2