GeoStrategies Inc.

MONITORING WELL INSTALLATION REPORT

ARCO Service Station No. 5387
20200 Hesperian Boulevard
Hayward, CA

792602-3

March 6, 1992

GeoStrategies Inc.
2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545
(510) 352-4800

March 6, 1992

Alemeda County Health Agency
Division of Hazardous Materials
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94521

Attention: Ms. Pamela Evans

Reference: ARCO Service Station 5387
20200 Hesperian Blvd.
Hayward, California 94541

Ms. Evans:

As requested by Mr. Charles Carmel of ARCO Products Co., we are forwarding a copy of the Well Installation Report for the above referenced location.

If you should have any questions or comments, please call.

Sincerely,

John F. Vargas
Senior Geologist

JFV/rsy

enlosure

cc: Mr. Charles Carmel, ARCO Products Company
Mr. H.C. Winsor, ARCO Products Company
Mr. Eddy So, RWQCB, San Francisco Bay Region

GeoStrategies Inc.
2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545
(510) 352-4800

March 6, 1992

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

Attn: Mr. Charles Carmel

Re: MONITORING WELL INSTALLATION REPORT
ARCO Service Station No. 5387
20200 Hesperian Boulevard
Hayward, California

Gentlemen:

This Monitoring Well Installation Report by GeoStrategies Inc. (GSI) presents monitoring well installation activities and ground-water monitoring/sampling results at the above referenced site (Plates 1 and 2). Four exploratory borings, completed as groundwater monitoring wells designated A-4 through A-7 were drilled on October 29 and 30, 1991 and December 20, 1991. Field work and laboratory analysis methods were performed to comply with current State of California Water Resources Control Board (SWRCB) guidelines.

SITE BACKGROUND

In August 1986, Groundwater Technology Inc. (GTI) drilled four exploratory soil borings (SB-1 through SB-4) and installed three ground-water monitoring wells (MW-1 through MW-3). Soil samples collected from these borings were analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-G) by EPA Method 418.1 (Modified). Laboratory analytical results for soil were verbally conveyed to GTI. TPH-G analytical results were verbally reported in the 9-9.5 foot soil samples from borings SB-2, SB-3 and SB-4 at concentrations of 49, 42 and 20 parts per million (ppm), respectively, and reported as none detected (ND) in soil samples collected from boring SB-1 and MW-1 through MW-3.

Initial groundwater samples collected from Wells MW-1 through MW-3 were analyzed for TPH-G and Benzene, Toluene, Ethylbenzene, Xylenes (BTEX) by EPA Method 602. TPH-G was detected in ground-water at concentrations of 14,300 parts per billion (ppb) (MW-1), 2,930 ppb (MW-2) and 14,100 ppb (MW-3). Additionally, benzene was detected at concentrations of 132 ppb (MW-1), 20.1 ppb (MW-2) and 510 ppb (MW-3).

FIELD PROCEDURES

Four exploratory borings were drilled using a truck-mounted hollow-stem auger rig. Borings A-4, A-6, and A-7 were drilled to a total depth of 35 feet below grade and boring A-5 was drilled to 31.5 feet below grade. A GSI geologist observed the drilling, described soil samples using the Unified Soil Classification System and Munsell Soil Color Chart, and prepared lithologic logs for each boring. The exploratory boring logs are presented in Appendix A.

Soil Sampling

Soil samples were collected at five-foot depth intervals using a modified California split spoon sampler fitted with precleaned stainless steel liners. One stainless steel liner from each soil sample interval was selected to perform head-space analysis in the field for volatile organic compounds. Test procedures involved removing the soil from the stainless steel liner into a clean glass jar and immediately covering the jar with aluminum foil secured under a ring-type threaded lid. After approximately twenty minutes, the foil was pierced and the head-space within the jar was tested for total organic vapor, measured in parts per million (ppm), using an Organic Vapor Monitor (OVM) photoionization detector. Head-space analyses are a standard GSI field screening procedure and are performed as a reconnaissance procedure only. They are not used to evaluate the actual levels of organic compounds in the sample or the extent of hydrocarbon contamination. Head-space analysis results are presented on each boring log in Appendix A.

Soil samples retained for chemical analysis were covered on both ends with aluminum foil and sealed with plastic end caps. The samples were labeled, entered on a Chain-of-Custody form, placed in a cooler with blue ice and transported to Sequoia Analytical (Sequoia), a State-certified environmental laboratory located in Redwood City, California.

Monitoring Well Installation

Well A-5 was installed to a depth of 30 feet below grade. Wells A-4, A-6, and A-7 were installed to a depth of 35 feet below grade. The wells were constructed using 3-inch-diameter Schedule 40 PVC casing and 0.020-inch factory slotted well screen. The well screen was placed from 10 feet to 30 feet below grade in Well A-5 and from 10 feet to 35 feet in Wells A-4, A-6, and A-7. Lonestar #2/12 graded sand was placed in the annular space across the entire screen interval to one foot above the top of the screen. A one to two-foot thick bentonite seal followed by a cement-sand grout seal was placed above the bentonite to approximately 1.5-feet below grade. The surface completion consisted of installing a water-proof well cap, lock, and a traffic-rated vault set in concrete. Well construction details are presented in Appendix A.

HYDROGEOLOGIC CONDITIONS AND SITE GEOLOGY

The site is located within the San Francisco bay plain approximately 2.5 miles east of the San Francisco Bay and approximately 0.2 miles north of Sulphur Creek. The area is underlain by Holocene-age alluvial/fluvial deposits consisting of unconsolidated, moderately sorted, fine sand and silt, with clayey silt and occasional thin beds of coarse sand (Helley, E. J. and others., 1972). Based on the exploratory boring logs, the lithology beneath the site consists of clay, silts, and sandy silts to approximately 21 feet below grade. These units graded into coarser grain units consisting of silty sand, sand, and gravelly sand in borings A-4 through A-6 to the total explored depth of 35 feet. Fine grain material consisting of silts and sandy silts were observed in Boring A-7 to the total explored depth of 35 feet. Saturated soil with "free-water" was first encountered in the exploratory borings between 17 and 18.5 feet below grade.

SOIL CHEMICAL ANALYTICAL RESULTS

Soil samples were retained for chemical analysis at the 10 and 15-foot sample intervals from borings A-4 through A-6 and from the 9.5-foot and 14.5-foot sample intervals from boring A-7. The samples were analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) according to EPA Method 8015 (Modified); and Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) according to EPA Method 8020.

TPH-Gasoline was detected only in boring A-4 at the 10 foot sample interval at a concentration of 24 parts per million (ppm). Benzene was detected in boring A-4 from the 10 and 15-foot sample intervals at concentrations of 0.012 ppm and 0.011 ppm, respectively. TPH-Gasoline and BTEX were reported as not detected (ND) for the remaining soil samples. Soil chemical data are summarized in Table 1 and the Sequoia soil chemical analytical report and Chain-of-Custody form are presented in Appendix B.

GROUND-WATER ANALYTICAL RESULTS

Groundwater samples were collected by G-R from the entire monitoring well network on December 24, 1991. Groundwater samples were analyzed for TPH-Gasoline according to EPA Method 8015 (Modified) and BTEX according to EPA Method 8020. Chemical analyses were performed by Sequoia.

Potentiometric Data

Depth to ground-water measurements were collected by G-R on December 24, 1991. Depth-to-water measurements were made in each well, prior to ground-water sampling with an electronic oil-water interface probe. Static water-level depths were measured from the surveyed top of the well box and recorded to the nearest $\pm$0.01 foot. Groundwater level data are summarized in Table 2. A potentiometric map prepared from ground-water level data (Plate 3) indicates groundwater in the upper water-bearing zone flows toward the southwest, at a calculated hydraulic gradient of 0.003.

Floating-Product Measurements

Monitoring wells were checked for the presence of floating product with an electric oil-water interface probe. Wells were also checked with a clear acrylic bailer to confirm interface probe results. Floating product was not observed in the monitoring wells.

Groundwater Chemical Analytical Data

Prior to collecting samples, monitoring wells were purged until ground-water parameters stabilized. Purged volumes and parameter values are presented in Table 2. Ground-water analyses detected TPH-Gasoline in all wells except A-6 at concentrations ranging from 1,600 parts per billion (ppb) in Well A-5 to 23,000 ppb in Well MW-2. Benzene was detected in all wells except A-6 at concentrations ranging between 29 ppb in Well A-4 to 1,500 ppb in Well MW-2. A TPH-Gasoline and Benzene Concentration Map (Plate 4) has been prepared using this data. A summary of ground-water chemical analytical data is presented in Table 3. The Sequoia chemical analytical report and Chain-of-Custody Form are presented in Appendix C. Field data sheets are presented in Appendix D.

Quality Control

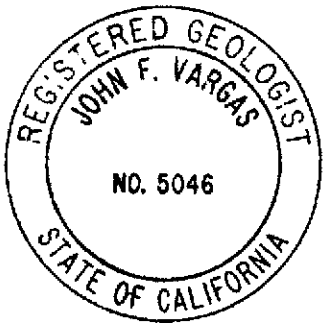
The quality control (QC) sample for this ground-water sampling was a trip blank. The trip blank was prepared in the Laboratory using organic-free water to evaluate laboratory handling and analytical procedures. The analysis performed on the trip blank did not detect any measurable concentrations of TPH-Gasoline or BTEX.

If you have any questions, please call.

GeoStrategies Inc. by,

Randall S. Young
Geologist

John F. Vargas
Senior Geologist
R.G. 5046



RSY/JFV/mlg

Plate 1. Vicinity Map
Plate 2. Site Plan
Plate 3. Potentiometric Map
Plate 4. TPH-Gasoline/Benzene Concentration Map

Appendix A: Exploratory Boring Logs and Well Construction Details
Appendix B: Soil Chemical Analytical Report and Chain-of-Custody Form
Appendix C: Ground-water Chemical Analytical Report and Chain-of-Custody Form
Appendix D: Field Data Sheets

QC Review:

792602-3

References Cited

Helley, E.J. and others, 1972, Geologic Map of late Cenozoic deposits, Alameda County, California: U.S. Geol. Survey Misc. Field Studies Map MF-429,1:62,500.

TABLE 1

SOIL ANALYSES DATA

SAMPLE NO	SAMPLE DATE	ANALYZED DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
A-4-10	29-Oct-91	12-Nov-91	24	0.012	0.042	0.072	0.052
A-4-15	29-Oct-91	06-Nov-91	<1.0	0.011	<0.0050	0.028	0.0080
A-5-10	29-Oct-91	06-Nov-91	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
A-5-15	29-Oct-91	06-Nov-91	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
A-6-10	30-Oct-91	06-Nov-91	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
A-6-15	30-Oct-91	06-Nov-91	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
A-7-9.5	20-Dec-91	20-Dec-91	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
A-7-14.5	20-Dec-91	20-Dec-91	<1.0	<0.0050	<0.0050	<0.0050	<0.0050

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPM = Parts Per Million

Note 1. All data shown as <x are reported as ND (none detected).

TABLE 2

FIELD MONITORING DATA

WELL NO.	MONITORING DATE	CASING DIA. (IN)	TOTAL WELL DEPTH (FT)	WELL ELEV. (FT)	DEPTH TO WATER (FT)	PRODUCT THICKNESS (FT)	STATIC WATER ELEV. (FT)	PURGED WELL VOLUMES	pH	TEMPERATURE (F)	CONDUCTIVITY (u MHOS/CM)
MW-1	24-Dec-91	2	27.9	38.36	16.12	----	22.24	5	6.83	69.5	1208
MW-2	24-Dec-91	2	25.8	38.58	16.50	----	22.08	5	6.76	71.3	1249
MW-3	24-Dec-91	2	25.0	37.77	15.60	----	22.17	5	6.60	71.2	1175
A-4	24-Dec-91	3	35.0	39.86	17.60	----	22.26	5	6.80	67.0	1120
A-5	24-Dec-91	3	30.0	38.94	16.85	----	22.09	5	6.67	68.6	1159
A-6	24-Dec-91	3	34.8	39.07	16.88	----	22.19	5	6.83	67.0	963
A-7	24-Dec-91	3	35.6	39.95	18.11	----	21.84	5	6.92	69.7	1186

Notes: 1. Static water elevations referenced to Mean Sea Level (MSL).
2. Physical parameter measurements represent stabilized values.

TABLE 3

GROUND-WATER ANALYSES DATA

WELL NO	SAMPLE DATE	ANALYZED DATE	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
MW-1	24-Dec-91	02-Jan-92	2,200	190	8.5	6.9	2.6
MW-2	24-Dec-91	02-Jan-92	23,000	1,500	1,100	480	1,400
MW-3	24-Dec-91	02-Jan-92	6,800	450	10	610	45
A-4	24-Dec-91	02-Jan-92	1,900	29	1.9	25	29
A-5	24-Dec-91	02-Jan-92	1,600	35	<0.30	32	52
A-6	24-Dec-91	02-Jan-92	<30	<0.30	<0.30	<0.30	<0.30
A-7	24-Dec-91	02-Jan-92	10,000	88	16	170	610
TB	----	02-Jan-92	<30	<0.30	<0.30	<0.30	<0.30

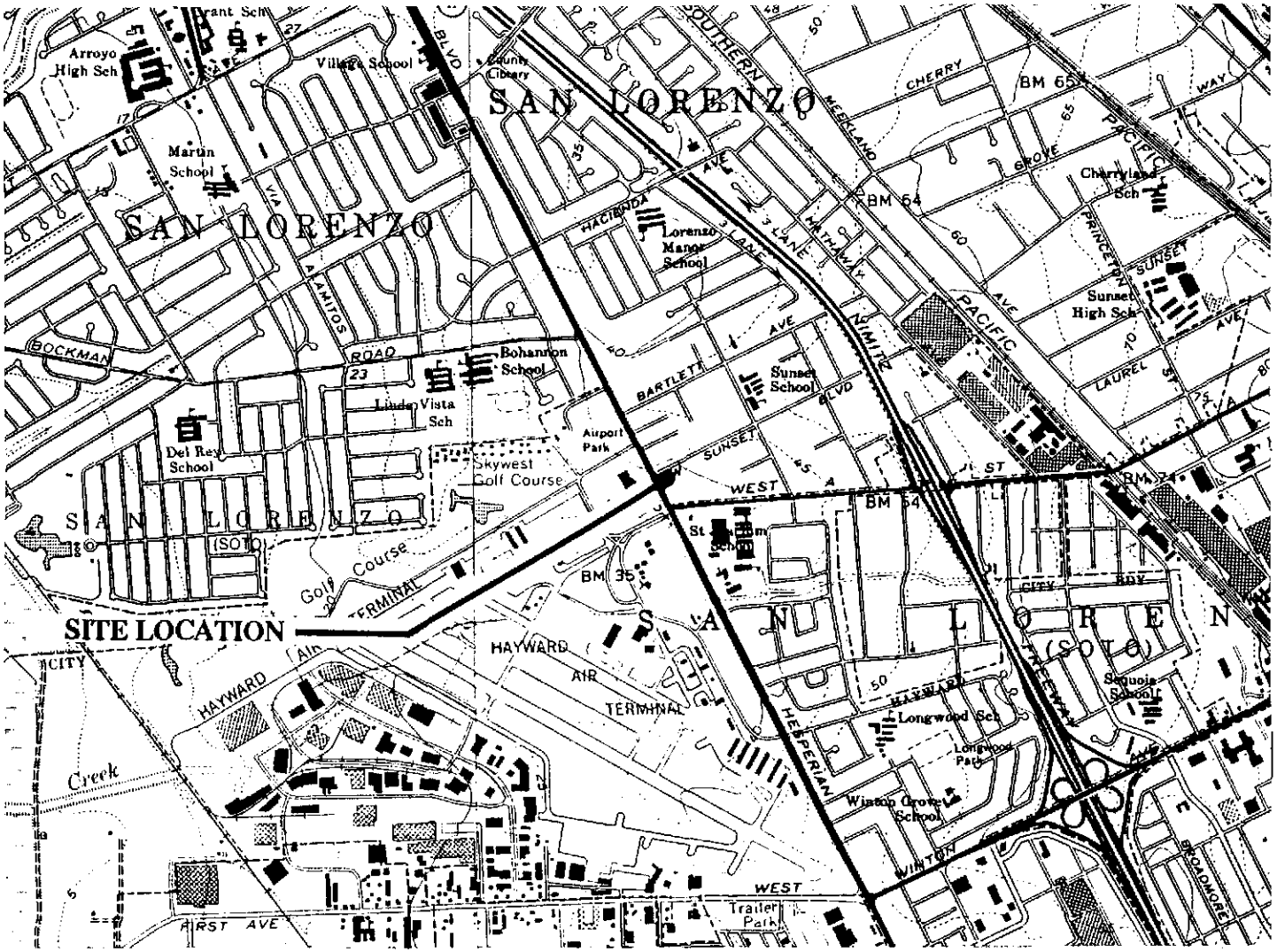
CURRENT REGIONAL WATER QUALITY CONTROL BOARD MAXIMUM CONTAMINANT LEVELS
Benzene 1. ppb Xylenes 1,750. ppb Ethylbenzene 680. ppb

CURRENT DHS ACTION LEVELS
Toluene 100.0 ppb

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPB = Parts Per Billion TB = Trip Blank

Notes: 1. All data shown as <x are reported as ND (none detected).
2. DHS Action Levels and MCLs are subject to change pending State review.

792602-3



N

0 2000

Scale in Feet

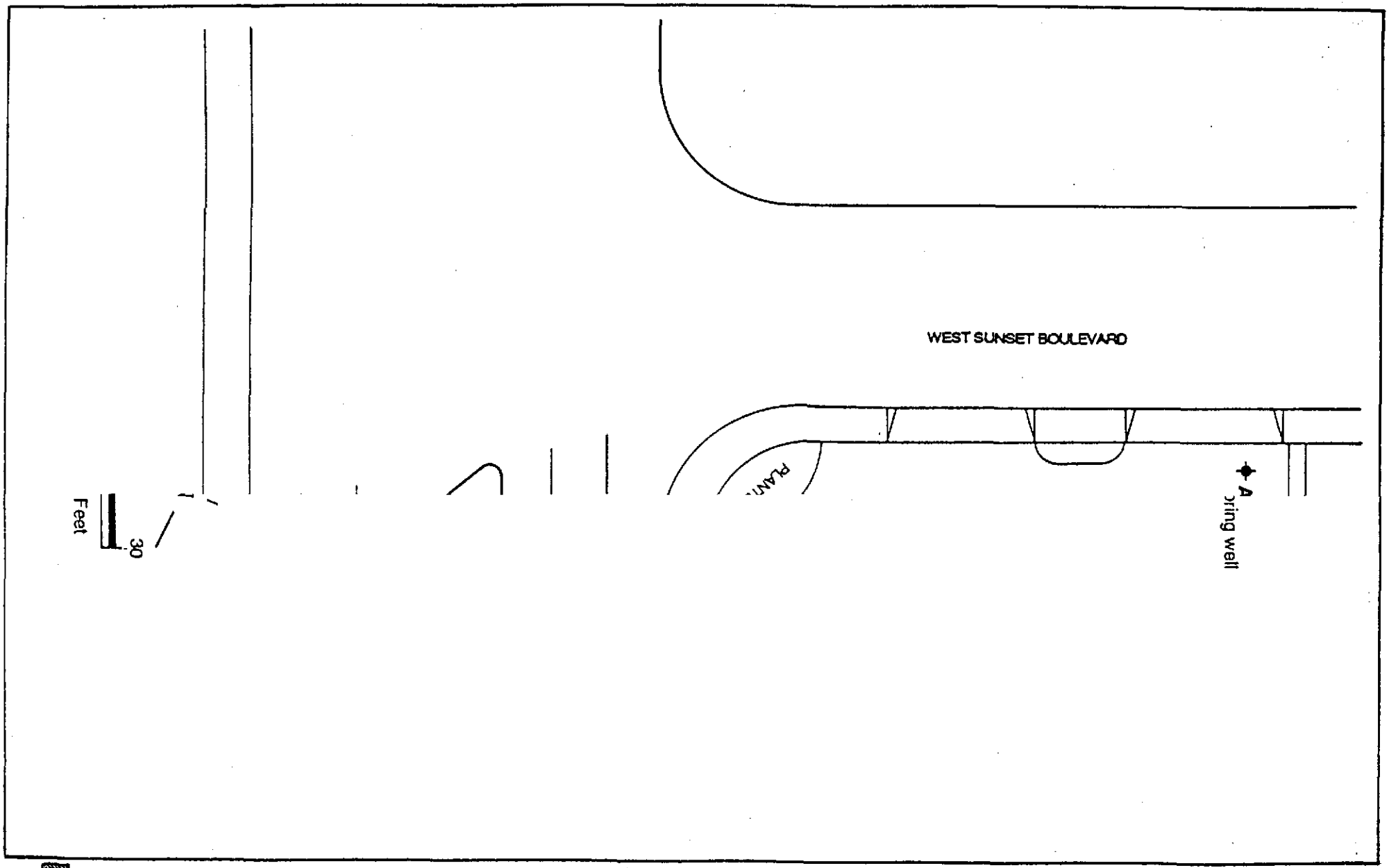
Base Map: USGS Topographic Map

GeoStrategies Inc.

VICINITY MAP
ARCO Service Station #5387
20200 Hesperian Boulevard
Hayward, California

PLATE 1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7926		11/91	

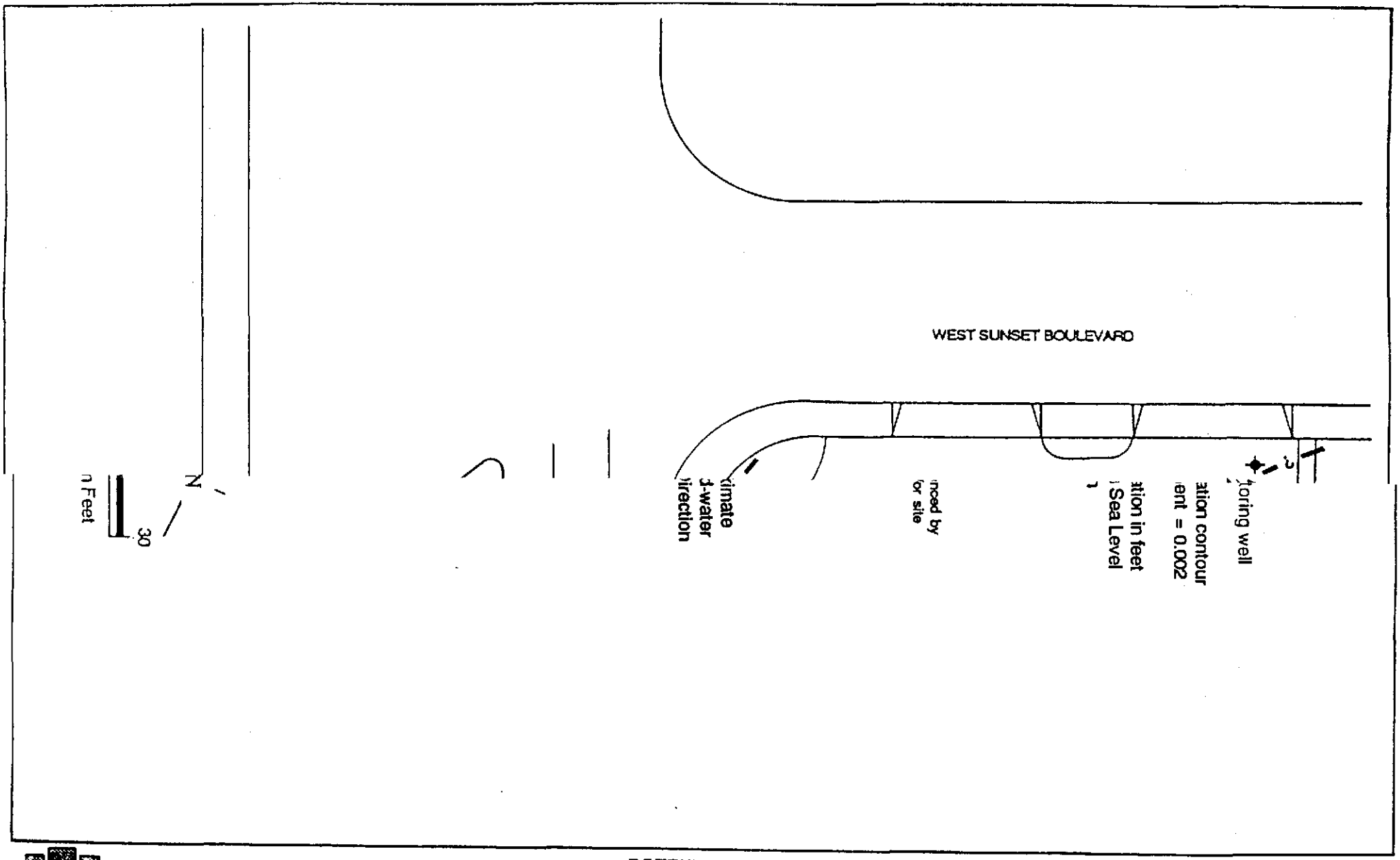


GeoStrategies Inc.

SITE PLAN
ARCO Service Station #5387
20200 Hesperian Boulevard
Hayward, California

PLATE
2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
792602-3	RSY	1/92		

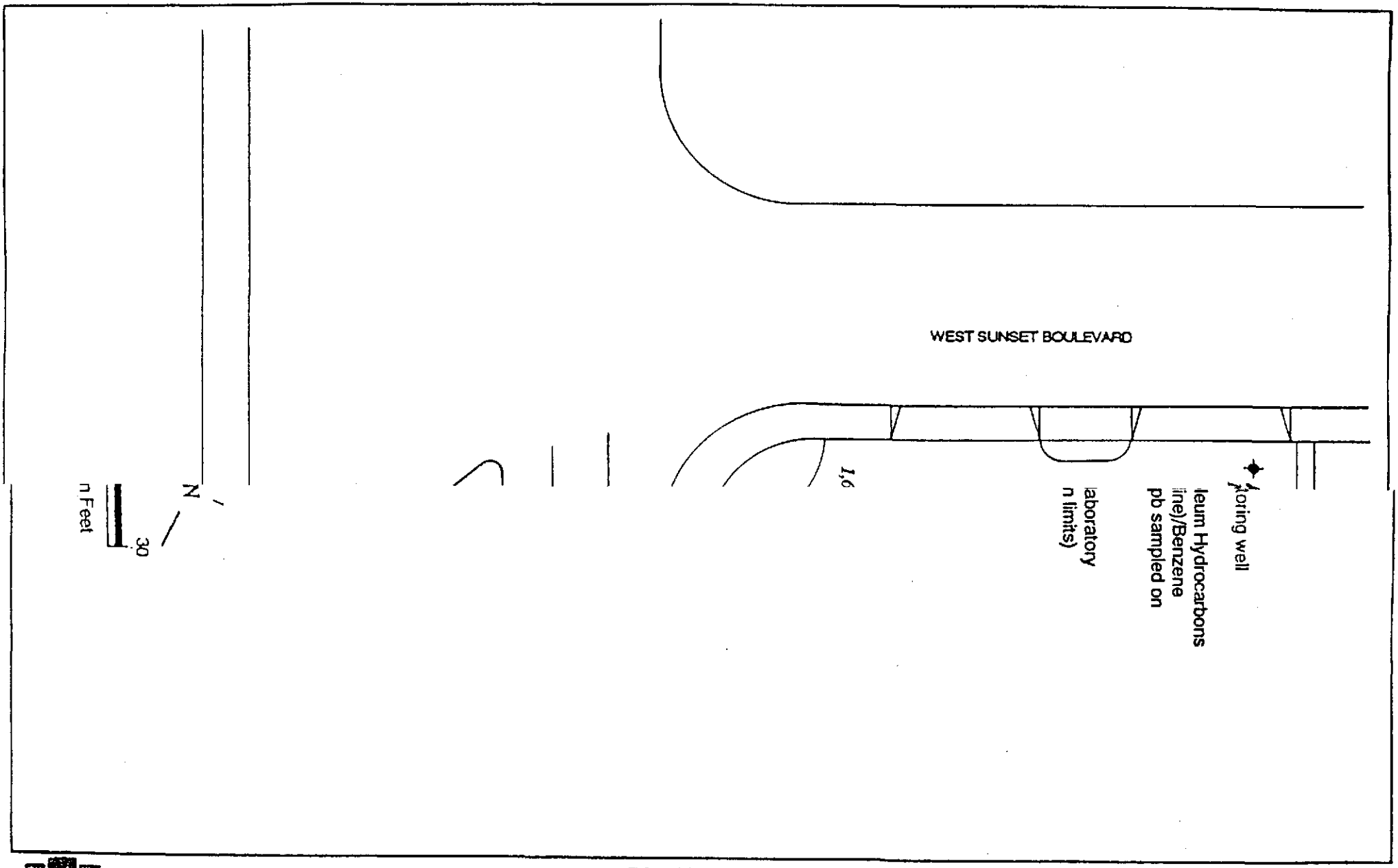


GeoStrategies Inc.

POTENTIOMETRIC MAP
ARCO Service Station #5387
20200 Hesperian Boulevard
Hayward, California

PLATE
3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
792602-3	RJY	1/92		



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TPH-G/BENZENE CONCENTRATION MAP
ARCO Service Station #5387
20200 Hesperian Boulevard
Hayward, California

PLATE
4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE	REVISED DATE
7926023	RSY	1/92		

Field location of boring:	Project No.: 792602	Date: 10/29/91	Boring No:
(See Plate 2)	Client: ARCO Service Station No. 5387		A-4
	Location: 20200 Hesperian Boulevard		
	City: Hayward, California		Sheet 1
	Logged by: R.S.Y.	Driller: Bayland	of 2
	Casing installation data:		
Drilling method: Hollow Stem Auger			
Hole diameter: 8-inches	Top of Box Elevation: 39.86		Datum: MSL

Water Level	17.5'	17'	17.3'
Time	09:50	11:00	09:50
Date	10/29/91	10/29/91	10/30/91

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
								PAVEMENT SECTION - 2-inches
				1				
				2				CLAY (CL) - black (7.5YR 2/0), medium stiff, moist; small roots; medium plasticity; small voids; minor silt content.
				3				
	50			4				
	50		A-4-					
1.0	50	S&H	5	5				
	psi							
				6				
				7				
				8				
				9				
			A-4-					
1.0	8	S&H	10	10				
				11				CLAYEY SILT (ML) - gray (5Y 5/1), medium stiff, moist; voids; organic matter; low plasticity.
			A-4-	12				
1.5	5	S&H	12.5					
				13				
				14				
			A-4-					SILTY CLAY (CL) - brown (10YR 4/3), medium stiff,
7.9	5	S&H	15	15				moist; voids; medium plasticity.
				16				
				17		▽		soft at 17.5 ft.
				18		▽		
				19				SILT (ML) - yellow brown (10YR 5/4), medium stiff,
			A-4-					saturated; low plasticity; trace fine sand at 20 ft.
0	6	S&H	20	20				

Remarks:

* Converted to equivalent Standard Penetration blow/ft.

GeoStrategies Inc.

Log of Boring

BORING NO. A-4

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792602		10/91		

Field location of boring: (See Plate 2)	Project No.: 792602	Date: 10/29/91	Boring No.: A-4
	Client: ARCO Service Station No. 5387		
	Location: 20200 Hesperian Boulevard		
	City: Hayward, California		Sheet 2 of 2
	Logged by: R.S.Y.	Driller: Bayland	
Drilling method: Hollow Stem Auger	Casing installation data:		
Hole diameter: 8-inches	Top of Box Elevation:	Datum:	

	Water Level			
	Time			
	Date			

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				21				
				22				
				23				SILTY SAND (SM) - dark yellowish brown (10YR 4/4), medium dense, saturated, 60% fine sand.
				24				
			A-4-					
0	11	S&H	25	25				
				26				
				27				
				28				GRAVELLY SAND (SP) - dark yellow brown (10YR 4/4), dense, saturated; 30% fine subround gravel 1-inch maximum size; 60-70% medium to coarse sand; 5-10% fines.
				29				
			A-4-					
0	33	S&H	30	30				
				31				
				32				
				33				
				34				
			A-4-					SANDY CLAY (CL) - olive (5Y 5/3), very stiff, saturated; medium plasticity; fine sand.
0	26	S&H	35	35				
				36				Bottom of Boring at 35 ft. 10/29/91
				37				
				38				
				39				
				40				

Remarks:

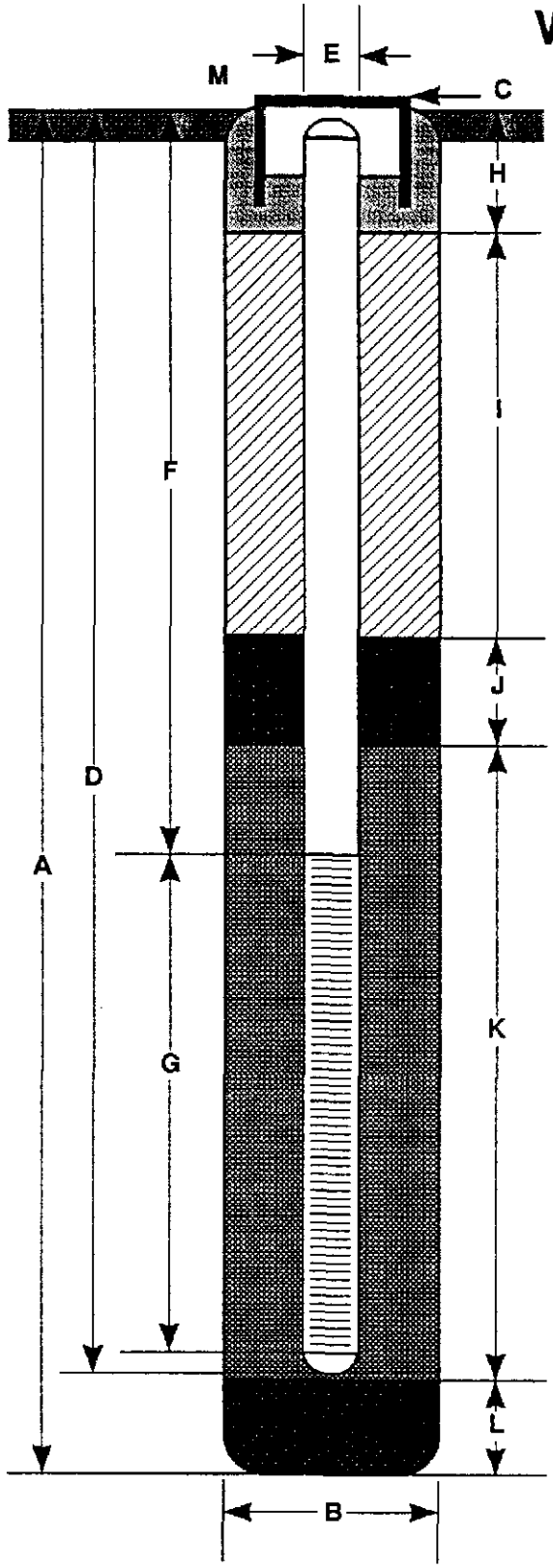
GeoStrategies Inc.

Log of Boring

BORING NO. A-4

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792602		10/91		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring: 35 ft.

B Diameter of Boring: 10 in.
Drilling Method: Hollow Stem Auger

C Top of Box Elevation: 39.86 ft.
[X] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length: 35 ft.
Material: Schedule 40 PVC

E Casing Diameter: 3 in.

F Depth to Top Perforations: 10 ft.

G *Perforated Length*: 25 ft.
Perforated Interval from 10 to 35 ft.
Perforation Type: Factory slot
Perforation Size: 0.020 in.

H Surface Seal from 0.0 to 1.5 ft.
Seal Material: Concrete grout

I Backfill from 0.0 to 1.5 ft.
Backfill Material: Cement grout

J Seal from 8 to 9 ft.
Seal Material: Bentonite pellets

K Gravel Pack from 9 to 35 ft.
Pack Material: Lonestar #2/12 sand

L Bottom Seal: ft.
Seal Material:

M Traffic-rated box with locking well cap and lock.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO. **A-4**

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792602		1/92		

Field location of boring:

(See Plate 2)

Project No.:	792602	Date: 10/29/91	Boring No: A-5
Client:	ARCO Service Station No. 5387		
Location:	20200 Hesperian Boulevard		
City:	Hayward, California		Sheet 1 of 2
Logged by:	R.S.Y.	Driller: Bayland	

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 8-inches

Top of Box Elevation: 38.94 Datum: MSL

Water Level	18'				
Time	15:00				
Date	10/29/91				

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
								PAVEMENT SECTION - 1 ft.
				1				
				2				
				3				CLAY (CL) - black (7.5YR 2/0), medium stiff, moist, roots, organics; minor silt content.
	50			4				
	50		A-5-					
0	350	S&H	5	5				COLOR CHANGE to dark yellowish brown (10YR 4/4) at 4.5 ft.; 20% fine sand.
				6				
				7				
				8				
				9				SILT (ML) - olive gray (5Y 5/2), soft, moist, minor clay; low plasticity, voids.
			A-5-					
0	5	S&H	10	10				
				11				lenses of silty sand <1/4-inch thick
				12				
				13				
				14				
			A-5-					
0	4	S&H	15	15				
				16				
				17				
				18		▽		
				19				COLOR CHANGE to yellow brown (10YR 5/4), saturated
			A-5-					
0	5	S&H	20	20				

Remarks:

* Converted to equivalent Standard Penetration blows/ft

GeoStrategies Inc.

Log of Boring

BORING NO. A-5

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792602		10/91		

Field location of boring:	Project No.: 792602	Date: 10/29/91	Boring No:
(See Plate 2)	Client: ARCO Service Station No. 5387		A-5
	Location: 20200 Hesperian Boulevard		
	City: Hayward, California		Sheet 2
	Logged by: R.S.Y.	Driller: Bayland	of 2
Drilling method: Hollow Stem Auger	Casing installation data:		
Hole diameter: 8-inches	Top of Box Elevation:		Datum:

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Water Level / Time / Date	Description
				21					SILTY SAND (SM) - dark brown (10YR 4/4), loose, ~~saturated~~; 70% fine sand; 30% fines.
				22					
				23					
				24					
			A-5-						SAND (SP) - dark yellow brown (10YR 5/4), medium
0	11	S&H	25	25					dense, ~~saturated~~; fine to medium sand; trace gravel.
				26					
				27					
				28					
				29					
			A-5-						
0	11	S&H	30	30					
				31					interbedded silt and sand between 30 and 31.5 ft.
	20	S&H							
				32					Bottom of Boring at 31.5 ft.
									10/29/91
				33					
				34					
				35					
				36					
				37					
				38					
				39					
				40					

Remarks:

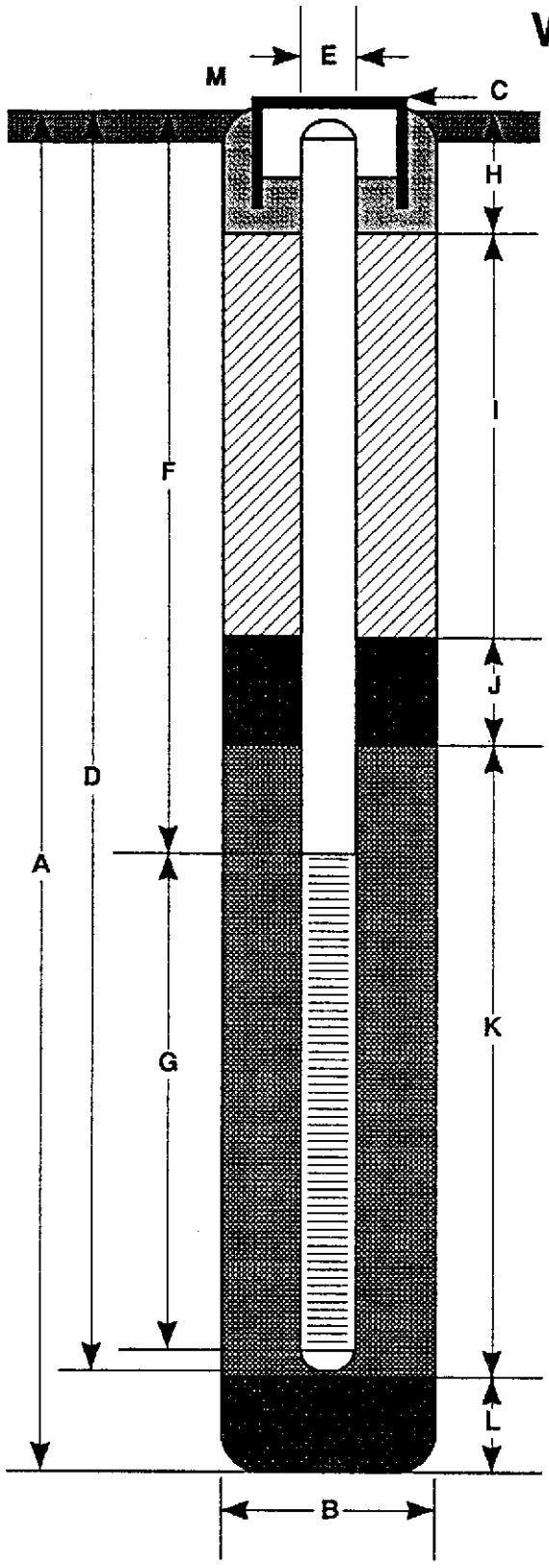
GeoStrategies Inc.

Log of Boring

BORING NO. A-5

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792602	JPW	10/91		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring: 31.5 ft.

B Diameter of Boring: 10 in.
Drilling Method: Hollow Stem Auger

C Top of Box Elevation: 38.94 ft.
[X] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length: 30 ft.
Material: Schedule 40 PVC

E Casing Diameter: 3 in.

F Depth to Top Perforations: 10 ft.

G Perforated Length: 20 ft.
Perforated Interval from 10 to 30 ft.
Perforation Type: Factory slot
Perforation Size: 0.020 in.

H Surface Seal from 0.0 to 1.5 ft.
Seal Material: Concrete grout

I Backfill from 1.5 to 7 ft.
Backfill Material: Cement grout

J Seal from 7 to 9 ft.
Seal Material: Bentonite pellets

K Gravel Pack from 9 to 30 ft.
Pack Material: Lonestar #2/12 sand

L Bottom Seal: 1.5 ft.
Seal Material: Native

M Traffic-rated box with locking well cap and lock.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO. A-5

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792602		1/92		

Field location of boring:

(See Plate 2)

Project No.:	792602	Date: 10/30/91	Boring No: A-6
Client:	ARCO Service Station No. 5387		
Location:	20200 Hesperian Boulevard		
City:	Hayward, California		Sheet 1 of 2
Logged by:	R.S.Y.	Driller: Bayland	

Casing installation data:

Drilling method: Hollow Stem Auger

Hole diameter: 8-inches

Top of Box Elevation: 39.07 Datum: MSL

Water Level	18'			
Time	11:20			
Date	10/30/91			

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
								PAVEMENT SECTION - 3-inches
				1				
				2				CLAY (CL) - black (7.5YR 2/0), medium stiff, moist; voids; organic fragments; trace sand.
				3				
	50			4				
	350		A-6-					
0	350	S&H	5	5				COLOR CHANGE to dark brown (10YR 4/3) at 4 ft.
				6				
				7				
				8				SILTY SAND (SM) - olive (5Y 4/3), loose, moist; 70% fine sand; 30% silt; voids.
				9				
			A-6-					
0	6	S&H	10	10				
				11				
				12				
				13				
				14				SANDY SILT (ML) - olive gray (5Y 4/2), medium stiff, moist; low plasticity; voids; fine sand.
			A-6-					
0	6	S&H	15	15				
				16				
				17				
				18		▽		saturated at 18 ft.
				19				
			A-6-					
0	7	S&H	20	20				

Remarks:

* Converted to equivalent Standard Penetration blows/ft.

GeoStrategies Inc.

Log of Boring

BORING NO. A-6

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792602		10/91		

Field location of boring:	Project No.: 792602	Date: 10/30/91	Boring No:
(See Plate 2)	Client: ARCO Service Station No. 5387		A-6
	Location: 20200 Hesperian Boulevard		
	City: Hayward, California		Sheet 2
	Logged by: R.S.Y.	Driller: Bayland	of 2
Drilling method: Hollow Stem Auger	Casing installation data:		
Hole diameter: 8-inches	Top of Box Elevation:	Datum:	

	Water Level			
	Time			
	Date			

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				21				
				22				SILTY SAND (SM) - olive (5Y 5/3), loose, ~~saturated~~; 80% fine sand; 20% fines.
				23				
				24				interbedded with 100% fine to medium sand.
			A-6-					
0	9	S&H	25	25				
				26				
				27				
				28				SAND (SW) - dark yellowish brown (10YR 4/4), medium dense, ~~saturated~~; fine to medium grain.
				29				
			A-6-					sand coarsening downward
0	17	S&H	30	30				
				31				
				32				gravels at 33 ft.
				33				
				34				
			A-6-					
0	10	S&H	35	35				SANDY CLAY (CL) - olive (5Y 4/3), medium stiff, saturated; 15% fine sand; black organic nodules, some silt.
				36				
				37				Bottom of Boring at 35 ft.
				38				
				39				
				40				

Remarks:

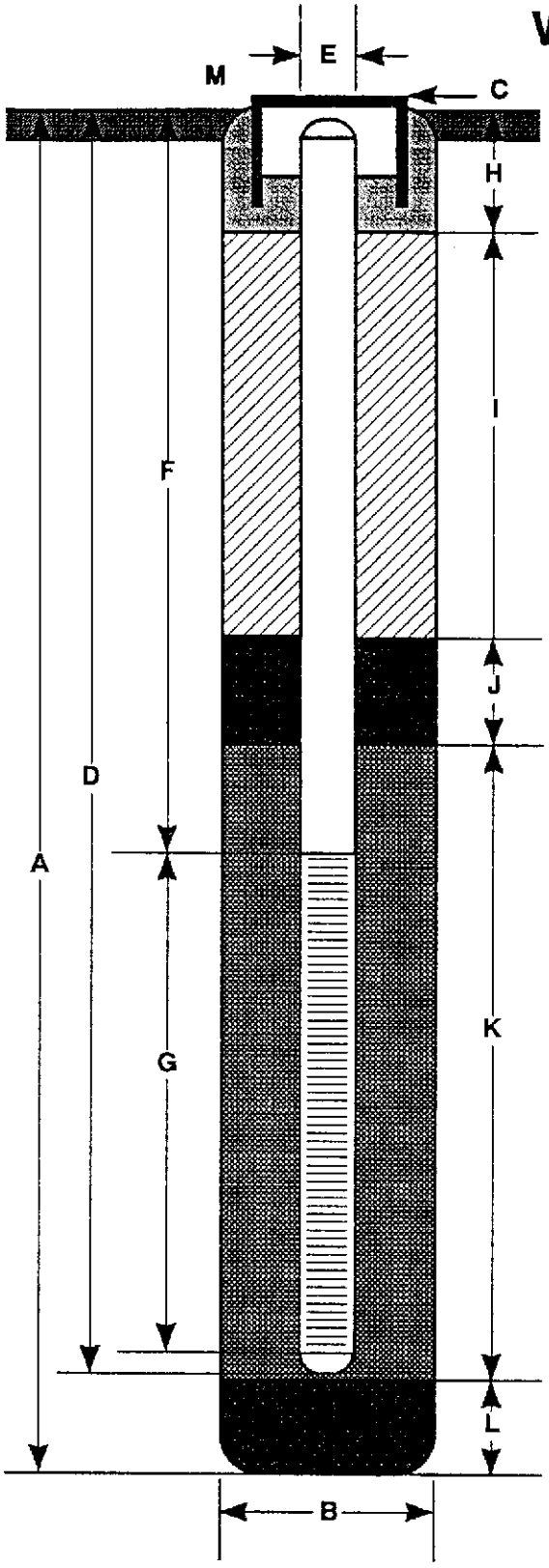
GeoStrategies Inc.

Log of Boring

BORING NO. A-6

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792602		10/91		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring: 35 ft.

B Diameter of Boring: 10 in.
Drilling Method: Hollow Stem Auger

C Top of Box Elevation: 39.07 ft.
[X] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length: 35 ft.
Material: Schedule 40 PVC

E Casing Diameter: 3 in.

F Depth to Top Perforations: 10 ft.

G Perforated Length: 25 ft.
Perforated Interval from 10 to 35 ft.
Perforation Type: Factory slot
Perforation Size: 0.020 in.

H Surface Seal from 0.0 to 1.5 ft.
Seal Material: Concrete grout

I Backfill from 1.5 to 7 ft.
Backfill Material: Cement grout

J Seal from 7 to 9 ft.
Seal Material: Bentonite pellets

K Gravel Pack from 9 to 35 ft.
Pack Material: Lonestar #2/12 sand

L Bottom Seal: ft.
Seal Material:

M Traffic-rated box with locking well cap and lock.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO. A-6

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792602		1/92		

Field location of boring: (See Plate 2)	Project No.: 792602	Date: 12/20/91	Boring No.: A-7
	Client: ARCO Service Station No. 5387		
	Location: 20200 Hesperian Boulevard		
	City: Hayward, California		Sheet 1 of 2
	Logged by: T.D.L	Driller: Bayland	
Drilling method: Hollow Stem Auger	Casing installation data:		
Hole diameter: 8-10-inches	Top of Box Elevation: 39.95		Datum: MSL

Water Level	18.5'	
Time	11:00	
Date	12/29/91	

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				1				CLAY (CL) very dark brown (10YR 2/2), medium stiff, damp; trace coarse sand.
				2				
				3				CLAY with SAND (CH) - black (10YR 2/1), very stiff, damp; trace silt; 20% fine sand; 80% fines.
	250	S&H	A-7-	4				
0	250	push	4.5					
	psi			5				
				6				
				7				
				8				
	150	S&H	A-7-	9				SILT (ML) - brown (10YR 5/3), medium stiff, damp; 100% fines; trace clay.
0	150	push	9.5					
	250			10				
	psi							
				11				
				12				
				13				
			A-7-	14				COLOR CHANGE to dark grayish brown (2.5Y 4/2), trace clay; 10% sand.
25	7	S&H	14.5					
				15				
				16				
				17				
				18				
			A-7-	19				COLOR CHANGE to very dark grayish brown (2.5Y 3/2), [illegible] mottling.
26	9	S&H	19.5					
				20				

Remarks:

* Converted to equivalent Standard Penetration blows/ft.

GeoStrategies Inc.

Log of Boring

BORING NO. A-7

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792602		12/91		

Field location of boring:

(See Plate 2)

Project No.:	792602	Date: 12/20/91	Boring No: A-7
Client:	ARCO Service Station No. 5387		
Location:	20200 Hesperian Boulevard		
City:	Hayward, California		Sheet 2 of 2
Logged by:	T.D.L.	Driller: Bayland	

Drilling method: Hollow Stem Auger

Hole diameter: 8-10-inches

Casing installation data:

Top of Box Elevation: Datum:

Water Level				
Time				
Date				

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				21				
				22				
				23				
			A-7-	24				COLOR CHANGE to light olive brown (7.5Y 5/4).
3	5	S&H	24.5	25				
				26				
				27				
				28				
				29				SANDY SILT (ML) - olive brown (10YR 4/4), soft, saturated; 65% fines; 35% very fine sand; mottling.
			A-7-					
3.5	7	S&H	30	30				
				31				
				32				
				33				
				34				COLOR CHANGE to light olive brown (2.5Y 5/4), increase sand to 45%.
			A-7-					
1	7	S&H	35	35				
				36				Bottom of Boring at 35 ft. 12/20/91
				37				
				38				
				39				
				40				

Remarks:

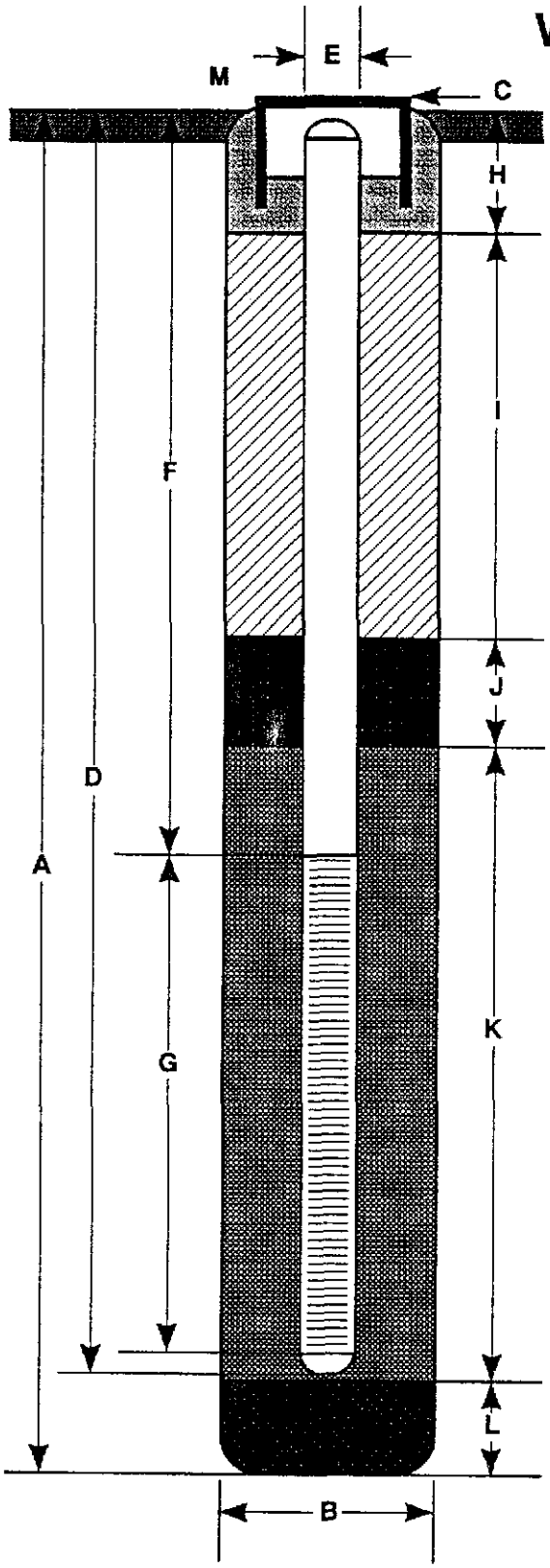
GeoStrategies Inc.

Log of Boring

BORING NO. A-7

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792602		12/91		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 35 ft.

B Diameter of Boring 10 in.
Drilling Method Hollow Stem Auger

C Top of Box Elevation 39.95 ft.
[X] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length 35 ft.
Material Schedule 40 PVC

E Casing Diameter 3 in.

F Depth to Top Perforations 10 ft.

G Perforated Length 25 ft.
Perforated Interval from 10 to 35 ft.
Perforation Type Factory slot
Perforation Size 0.020 in.

H Surface Seal from 0.0 to 1.5 ft.
Seal Material Concrete grout

I Backfill from 1.5 to 8 ft.
Backfill Material Cement grout

J Seal from 8 to 9 ft.
Seal Material Bentonite pellets

K Gravel Pack from 9 to 35 ft.
Pack Material Lonestar #2/12 sand

L Bottom Seal ft.
Seal Material

M Traffic-rated box with locking well cap and lock.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO. A-7

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792602		1/92		

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: Dave Vossler

Project: Arco 5387, Hayward

Enclosed are the results from 6 soil samples received at Sequoia Analytical on October 31,1991. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
1105854	Soil, A-4-10	Oct 29-30, 1991	EPA 5030/8015/8020
1105855	Soil, A-4-15	Oct 29-30, 1991	EPA 5030/8015/8020
1105856	Soil, A-5-10	Oct 29-30, 1991	EPA 5030/8015/8020
1105857	Soil, A-5-15	Oct 29-30, 1991	EPA 5030/8015/8020
1105858	Soil, A-6-10	Oct 29-30, 1991	EPA 5030/8015/8020
1105859	Soil, A-6-15	Oct 29-30, 1991	EPA 5030/8015/8020

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL
680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan	Client Project ID:	Arco 5387, San Lorenzo	Sampled: Oct 29-30, 1991
2150 W. Winton Avenue	Matrix Descript:	Soil	Received: Oct 31, 1991
Hayward, CA 94545	Analysis Method:	EPA 5030/8015/8020	Analyzed: Nov 6-12, 1991
Attention: Dave Vossler	First Sample #:	110-5854	Reported: Nov 14, 1991

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
110-5854	A-4-10	24	0.012	0.042	0.072	0.052
110-5855	A-4-15	N.D.	0.011	N.D.	0.028	0.0080
110-5856	A-5-10	N.D.	N.D.	N.D.	N.D.	N.D.
110-5857	A-5-15	N.D.	N.D.	N.D.	N.D.	N.D.
110-5858	A-6-10	N.D.	N.D.	N.D.	N.D.	N.D.
110-5859	A-6-15	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**1.0**	**0.0050**	**0.0050**	**0.0050**	**0.0050**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

1105854.GET <1>

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: Dave Vossler

Client Project ID: Arco 5387, San Lorenzo

QC Sample Group: 110-5854

Reported: Nov 14, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	C. Donohue	C. Donohue	C. Donohue	C. Donohue
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	Nov 12, 1991	Nov 12, 1991	Nov 12, 1991	Nov 12, 1991
QC Sample #:	GBLK111191	GBLK111191	GBLK111191	GBLK111191
Sample Conc.:	N.D.	N.D.	N.D.	ND..
Spike Conc. Added:	0.20	0.20	0.20	0.60
Conc. Matrix Spike:	0.17	0.17	0.17	0.51
Matrix Spike % Recovery:	85	85	85	85
Conc. Matrix Spike Dup.:	0.19	0.18	0.18	0.55
Matrix Spike Duplicate % Recovery:	92	90	90	92
Relative % Difference:	11	5.7	5.7	7.5

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

1105854.GET <2>

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: Dave Vossler

Client Project ID: Arco 5387, San Lorenzo

QC Sample Group: 1105855-59

Reported: Nov 14, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A. Maralit	A. Maralit	A. Maralit	A. Maralit
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	Nov 6, 1991	Nov 6, 1991	Nov 6, 1991	Nov 6, 1991
QC Sample #:	GBLK110591	GBLK110591	GBLK110591	GBLK110591
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.20	0.20	0.20	0.60
Conc. Matrix Spike:	0.18	0.18	0.18	0.53
Matrix Spike % Recovery:	90	90	90	88
Conc. Matrix Spike Dup.:	0.18	0.18	0.18	0.54
Matrix Spike Duplicate % Recovery:	90	90	90	90
Relative % Difference:	0.0	0.0	0.0	1.9

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

ARCO Products Company
Division of AtlanticRichfieldCompany

Chain of Custody

Task Order No: 5387-91-2S

ARCO Facility no. 5387	City (Facility) San Lorenzo	Project manager (Consultant) Dave Vossler	Laboratory name Sequoia Analytical
ARCO engineer Chuck Carmel	Telephone no. (ARCO)	Telephone no. (Consultant) 510-352-4800	Fax no. (Consultant) 783-1089
Consultant name Geo Strategies Inc.	Address (Consultant)		Contract number 07-073
			Method of shipment Sequoia courier

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
A-4-10	1	1	✓		1105854			10/29/91			✓											
A-4-15	2	1	✓		5855			10/29/91			✓											
A-5-10	3	1	✓		5856			10/29/91			✓											
A-5-15	4	1	✓		5857			10/29/91			✓											
A-6-10	5	1	✓		5858			10/30/91			✓											
A-6-15	6	1	✓		5859			10/30/91			✓											
																					X	
											1105854											
																					T	

Condition of sample: good

Temperature received: cool

Relinquished by sampler	Date 10/31/91	Time 1400	Received by Jim Dougl
Relinquished by Jim Dougl	Date 10-31-91	Time 2:40	Received by
Relinquished by	Date	Time	Received by laboratory K. Wallace

Date 10/31 Time 5:00pm

Lab number 1105854

Turnaround time

- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☑

Special detection Limit/reporting

Special QA/QC

Remarks

White: Laboratory copy — ARCO Environmental Engineering; Pink copy — Consultant

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Project: Arco 5387, Hayward

Enclosed are the results from 2 soil samples received at Sequoia Analytical on Dec 23. 1991. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
1124256	Soil, A-4-9.5	12/20/91	EPA 5030/8015/8020
1124257	Soil, A-4-14.5	12/20/91	EPA 5030/8015/8020

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan	Client Project ID:	Arco 5387, Hayward	Sampled:	Dec 20, 1991
2150 W. Winton Avenue	Matrix Descript:	Soil	Received:	Dec 23. 1991
Hayward, CA 94545	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Dec 30, 1991
Attention: John Vargas	First Sample #:	112-4256	Reported:	Jan 7, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
112-4256	A-4-9.5	N.D.	N.D.	N.D.	N.D.	N.D.
112-4257	A-4-14.5	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		1.0	0.0050	0.0050	0.0050	0.0050

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

VM Tague

Vickie Tague
Project Manager

1124256.GET <1>

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Client Project ID: Arco 5387, Hayward

QC Sample Group: 1124256-7

Reported: Jan 7, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A. Maralit	A. Maralit	A. Maralit	A. Maralit
Reporting Units:	µg/kg	µg/kg	µg/kg	µg/kg
Date Analyzed:	Dec 30, 1991	Dec 30, 1991	Dec 30, 1991	Dec 30, 1991
QC Sample #:	GBLK123091	GBLK123091	GBLK123091	GBLK123091
Sample Conc.:	N.D.	ND..	N.D.	N.D.
Spike Conc. Added:	0.20	0.20	0.20	0.60
Conc. Matrix Spike:	0.20	0.20	0.20	0.59
Matrix Spike % Recovery:	100	100	100	98
Conc. Matrix Spike Dup.:	0.19	0.20	0.20	0.59
Matrix Spike Duplicate % Recovery:	95	100	100	98
Relative % Difference:	5.1	0.0	0.0	0.0

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 5387-91-25

Chain of Custody

ARCO facility no. 5387	City (Facility) Hayward	Project manager (Consultant) John Vargas	Laboratory name [illegible]
ARCO engineer C. Carmel	Telephone no. (ARCO)	Telephone no. (Consultant) (510) 352-4800	Fax no. (Consultant) (510) 783-1089
Consultant name GSI	Address (Consultant) 1240 W. Winton Ave, Hayward		Contract number 07-073

Method of shipment: Sea. T [illegible] h

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
11-4-2.5			✓					12-20			✓				11	4	57					
11-4-14.5			✓					12-20			✓					1	57					

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number 1124256

Turnaround time

- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☑

Condition of sample: good		Temperature received: cool	
Relinquished by sampler: [illegible]	Date/Time: 12/23/91 1050pm	Received by: [illegible]	
Relinquished by: [illegible]	Date/Time: 12/23/91 235	Received by:	
Relinquished by:	Date/Time:	Received by laboratory: MLW	Date: 12/23 Time: 1445

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant

APPC-3292 (2-91)

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Zwierzycki

Project: 3926.02, Arco 5387, Hayward

Enclosed are the results from 8 water samples received at Sequoia Analytical on December 27,1991. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
1124825	Water, MW-1	12/24/91	EPA 5030/8015/8020
1124826	Water, MW-2	12/24/91	EPA 5030/8015/8020
1124827	Water, MW-3	12/24/91	EPA 5030/8015/8020
1124828	Water, A-4	12/24/91	EPA 5030/8015/8020
1124829	Water, A-5	12/24/91	EPA 5030/8015/8020
1124830	Water, A-6	12/24/91	EPA 5030/8015/8020
1124831	Water, A-7	12/24/91	EPA 5030/8015/8020
1124832	Water, Trip Blank	12/24/91	EPA 5030/8015/8020

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan	Client Project ID:	3926.02, Arco 5387, Hayward	Sampled:	Dec 24, 1991
2150 W. Winton Avenue	Matrix Descript:	Water	Received:	Dec 27, 1991
Hayward, CA 94545	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jan 2-3, 1992
Attention: John Zwierzycki	First Sample #:	112-4825	Reported:	Jan 7, 1992

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)
112-4825	MW-1	2,200	190	8.5	6.9	2.6
112-4826	MW-2	23,000	1,500	1,100	480	1,400
112-4827	MW-3	6,800	450	10	610	45
112-4828	A-4	1,900	29	1.9	25	29
112-4829	A-5	1,600	35	N.D.	32	52
112-4830	A-6	N.D.	N.D.	N.D.	N.D.	N.D.
112-4831	A-7	10,000	88	16	170	610
112-4832	Trip Blank	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		30	0.30	0.30	0.30	0.30

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

1124825.GET <1>

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Zwierzycki

Client Project ID: 3926.02, Arco 5387, Hayward

QC Sample Group: 1124825-26

Reported: Jan 7, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	L. Laikhtman	L. Laikhtman	L. Laikhtman	L. Laikhtman
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Jan 3, 1992	Jan 3, 1992	Jan 3, 1992	Jan 3, 1992
QC Sample #:	GBLK010392	GBLK010392	GBLK010392	GBLK010392
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	10	10	10	30
Matrix Spike % Recovery:	100	100	100	100
Conc. Matrix Spike Dup.:	10	10	10	30
Matrix Spike Duplicate % Recovery:	100	100	100	100
Relative % Difference:	0.0	0.0	0.0	0.0

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

$$\%\ \text{Recovery:} = \frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$$

$$\text{Relative \% Difference:} = \frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}} \times 100$$

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Zwierzycki

Client Project ID: 3926.02, Arco 5387, Hayward

QC Sample Group: 1124827-28, 31

Reported: Jan 7, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	L. Laikhtman	L. Laikhtman	L. Laikhtman	L. Laikhtman
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Jan 3, 1992	Jan 3, 1992	Jan 3, 1992	Jan 3, 1992
QC Sample #:	BLK010392	BLK010392	BLK010392	BLK010392
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	11	11	10	32
Matrix Spike % Recovery:	110	110	100	107
Conc. Matrix Spike Dup.:	11	11	11	32
Matrix Spike Duplicate % Recovery:	110	110	110	107
Relative % Difference:	0.0	0.0	9.5	0.0

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Zwierzycki

Client Project ID: 3926.02, Arco 5387, Hayward

QC Sample Group: 1124829-30, 32

Reported: Jan 7, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	J. Villar	J. Villar	J. Villar	J. Villar
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Jan 2, 1992	Jan 2, 1992	Jan 2, 1992	Jan 2, 1992
QC Sample #:	GBLK010292	GBLK010292	GBLK010292	GBLK010292
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	9.5	9.5	9.5	28
Matrix Spike % Recovery:	95	95	95	93
Conc. Matrix Spike Dup.:	9.7	9.5	9.6	29
Matrix Spike Duplicate % Recovery:	97	95	96	97
Relative % Difference:	2.1	0.0	1.0	3.5

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery:	Conc. of M.S. - Conc. of Sample / Spike Conc. Added	x 100
Relative % Difference:	Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2	x 100

ARCO Products Company ◆ Division of AtlanticRichfieldCompany

Task Order No. 5387-91-2

Chain of Custody

ARCO Facility no. 5387	City (Facility) Hayward	Project manager (Consultant) Tom Paulson	Laboratory name: SEQ
ARCO engineer ~~Kyle Christie~~	Telephone no. (ARCO) CHUCK CURTIS	Telephone no. (Consultant) (510) 783-7500	Fax no. (Consultant)
Consultant name Getler-Ryan Inc.	Address (Consultant) 2150 W. Winton Ave - Hayward		Contract number 07-073

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH (Gas) EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐
MW-1		2		✓		✓	HCl	12-24-91	1145	✓	✓			11	24	825				
MW-2		↓		↓		↓	↓	↓	1113	↓	↓			↓	↓	26				
MW-3									1200							27				
A-4									0946							28				
A-5	1								1037							29				
A-6									1014					1	1	30				
A-7									1236							31				
trip		1		↓		↓	↓	-	-	↓	↓			↓	↓	32				
							IN													
										X										
											1	1								
							N/A													

Special detection Limit/reporting: Standard

Special QA/QC: Standard

Remarks: 392602

Lab number: 1124825

Turnaround time

- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☒

Condition of sample: good		Temperature received: cool	
Relinquished by sampler: Guadalupe Sanchez	Date 12-24-91 Time 13:54	Received by: Refrigerator #1	12-24-91 13:54
Relinquished by: [signature]	Date 12-27-91 Time 11:~~08~~45	Received by:	
Relinquished by:	Date Time	Received by laboratory: [signature]	Date 12/27 Time 11:45AM

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant

APPC-3292 (2-91)

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY ARCO JOB # 3926.02

LOCATION 20200 Hesperian Blvd DATE 12-24-91

CITY Hayward TIME

Well ID. MW-1 Well Condition OK

Well Diameter 2 in. Hydrocarbon Thickness — ft.

Total Depth 27.9 ft.

Depth to Liquid- 16.12 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 11.78 x(VF) .17 = (Estimated Purge Volume) 10.0 gal. (2-0)

Purging Equipment Bailer

Sampling Equipment "

Starting Time 1135 Purging Flow Rate — gpm.

(Estimated Purge Volume) 10 gal. / (Purging Flow Rate) — gpm. = (Anticipated Purging Time) — min.

Time	pH	Conductivity	Temperature	Volume
1136	6.80	1304	70.5	1 gal
1140	6.82	1215	69.6	4 gal
1141	6.85	1233	69.7	7 gal
1145	6.83	1208	69.5	10 gal

Did well dewater? NO If yes, time Volume

Sampling Time 1145 Weather Conditions Sun

Analysis DH (gas) BTXE Bottles Used 2-40 ml

Chain of Custody Number

COMMENTS Installed new locking cap & lock # 2268 ~~2268~~

FOREMAN G. Sanchez ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY ARCO JOB # 3926.02

LOCATION 20200 Hesperian Blvd DATE 12-24-91

CITY Hayward TIME

Well ID. MW-2 Well Condition OK

Well Diameter 2 in. Hydrocarbon Thickness — ft.

Total Depth 25.8 ft.

Depth to Liquid- 16.50 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 9.30 x(VF) .17 = (Estimated Purge Volume) 8.0 gal. (1.6)

Purging Equipment Bailer

Sampling Equipment "

Starting Time 1101 Purging Flow Rate — gpm.

(Estimated Purge Volume) 8.0 gal. / (Purging Flow Rate) — gpm. = (Anticipated Purging Time) — min.

Time	pH	Conductivity	Temperature	Volume
1102	6.72	1237	71.8	1 gal
1107	6.73	1241	71.8	4 ↑
1113	6.76	1249	71.3	8 ↓

Did well dewater? NO If yes, time Volume

Sampling Time 1113 Weather Conditions Sun

Analysis THC (gas) BTXE Bottles Used 2-40 ml

Chain of Custody Number

COMMENTS Installed new locking cap & lock # 2268 ~~2068~~

FOREMAN G. Sanchez ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY ARCO JOB # 7926.02

LOCATION 20200 Hesperian Blvd DATE 12-24-91

CITY Hayward TIME

Well ID. MW-3 Well Condition OK

Well Diameter 2 in. Hydrocarbon Thickness — ft.

Total Depth 25.0 ft.

Depth to Liquid- 15.60 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 9.40 x(VF) .17 = (Estimated Purge Volume) 8.0 (1.6) gal.

Purging Equipment Bailer

Sampling Equipment "

Starting Time 1121 Purging Flow Rate — gpm.

(Estimated Purge Volume) 8.0 gal. / (Purging Flow Rate) — gpm. = (Anticipated Purging Time) — min.

Time	pH	Conductivity	Temperature	Volume
1122	6.60	1203	71.6	1 gal
1126	6.65	1204	70.8	4 gal
1130	6.71	1193	70.0	6½ gal
1200	6.60	1175	71.2	7½ gal

Did well dewater? Yes If yes, time 1130 Volume 6½ gal

Sampling Time 1200 Weather Conditions Sun

Analysis THC (gas) BTXE Bottles Used 2-40 ml

Chain of Custody Number

COMMENTS Installed new locking cap & lock # 2260 2060

FOREMAN G. Sanchez ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY ARCO JOB # 3926.02

LOCATION 20200 Hesperian Blvd DATE 12-24-91

CITY Hayward TIME

Well ID. A-4 Well Condition OK

Well Diameter 3 in. Hydrocarbon Thickness - ft.

Total Depth 35.0 ft.

Depth to Liquid- 17.60 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 17.40 x(VF) .38 = (Estimated Purge Volume) 33.0 gal. (6.6)

Purging Equipment D.D.

Sampling Equipment Bailer

Starting Time 0930 Purging Flow Rate 3 gpm.

(Estimated Purge Volume) 33.0 gal. / (Purging Flow Rate) 3 gpm. = (Anticipated Purging Time) 11 min.

Time	pH	Conductivity	Temperature	Volume
0931	6.74	1088	66.6	3 gal
0934	6.81	1100	66.7	12
0938	6.83	1117	67.3	24
0941	6.82	1118	67.3	33
0946	6.80	1120	67.0	34

Did well dewater? NO If yes, time Volume

Sampling Time 0946 Weather Conditions sun

Analysis THC (gas) BTXE Bottles Used 2-40 ml

Chain of Custody Number

COMMENTS

FOREMAN G. Sanchez ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY ARCO JOB # 3926.02

LOCATION 20200 Hesperian Blvd DATE 12-24-91

CITY Hayward TIME

Well ID. A-5 Well Condition OK

Well Diameter 3 in. Hydrocarbon Thickness - ft.

Total Depth 30.0 ft.

Depth to Liquid- 16.85 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 13.15 x(VF) .38 = (Estimated Purge Volume) 25.0 gal. (5.0)

Purging Equipment D.D.

Sampling Equipment Bailer

Starting Time 1024 Purging Flow Rate 3 gpm.

(Estimated Purge Volume) 25 gal. / (Purging Flow Rate) 3 gpm. = (Anticipated Purging Time) 8.3 min.

Time	pH	Conductivity	Temperature	Volume
1025	6.64	1135	68.5	7 gal
1029	6.66	1158	68.9	15 gal
1032	6.65	1166	68.6	24 gal
1037	6.67	1159	68.6	25 gal

Did well dewater? NO If yes, time Volume

Sampling Time 1037 Weather Conditions sm

Analysis THC (gas) BTXE Bottles Used 2-40 ml

Chain of Custody Number

COMMENTS

FOREMAN G. Sanchez ASSISTANT

GETTLER–RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY ARCO JOB # 3926.02

LOCATION 20200 Hesperian Blvd DATE 12-24-91

CITY Hayward TIME

Well ID. A-6 Well Condition OK

Well Diameter 3 in. Hydrocarbon Thickness – ft.

Total Depth 34.8 ft.

Depth to Liquid- 16.88 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 17.92 x(VF) .38 = (Estimated Purge Volume) 34.0 (6.8) gal.

Purging Equipment D.D.

Sampling Equipment Bailer

Starting Time 0958 Purging Flow Rate 3 gpm.

(Estimated Purge Volume) 34.0 gal. / (Purging Flow Rate) 3 gpm. = (Anticipated Purging Time) 11.3 min.

Time	pH	Conductivity	Temperature	Volume
0959	6.79	947	65.7	3 gal
1002	6.80	984	66.1	12
1006	6.79	1003	66.3	24
1009	6.78	1002	66.4	33
1014	6.83	963	67.0	34

Did well dewater? NO If yes, time Volume

Sampling Time 1014 Weather Conditions sun

Analysis THC (gas) BTXE Bottles Used 2-40 ml

Chain of Custody Number

COMMENTS

FOREMAN G. Sanchez ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY ARCO JOB # 3926.02

LOCATION 20200 Hesperian Blvd DATE 12-24-91

CITY Hayward TIME

Well ID. A-7 Well Condition OK

Well Diameter 3 in. Hydrocarbon Thickness - ft.

Total Depth 35.6 ft.

Depth to Liquid- 18.11 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 17.49 x(VF) .38 = (Estimated Purge Volume) 33.0 (6.6) gal.

Purging Equipment D.D.

Sampling Equipment Bailer

Starting Time 1220 Purging Flow Rate 3 gpm.

(Estimated Purge Volume) 33.0 gal. / (Purging Flow Rate) 3 gpm. = (Anticipated Purging Time) 11 min.

Time	pH	Conductivity	Temperature	Volume
1221	6.92	1151	69.6	3 gal
1224	6.92	1166	69.2	12
1228	6.93	1187	69.7	24
1231	6.91	1189	69.8	33
1236	6.92	1186	69.7	34 ✓

Did well dewater? No If yes, time Volume

Sampling Time 1236 Weather Conditions sun

Analysis THC (gas) BTXE Bottles Used 2-40 ml

Chain of Custody Number

COMMENTS

FOREMAN G. Sanchez ASSISTANT