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GeoStrategies Inc.

QUARTERLY MONITORING WELL INSTALLATION REPORT

Fourth Quarter 1992

ARCO Service Station No. 5387
20200 Hesperian Boulevard
San Lorenzo, California

792603-8

January 29, 1993

GeoStrategies Inc.

January 29, 1993

ARCO Products Company
Post Office Box 5811
San Mateo, California

Attn: Mr. Michael Whelan

Re: **QUARTERLY MONITORING/WELL INSTALLATION REPORT**
Fourth Quarter 1992
ARCO Service Station No. 5387
20200 Hesperian Boulevard
~~San Lorenzo~~, California

Mr. Whelan:

This Quarterly Monitoring/Well Installation Report was prepared by GeoStrategies Inc. (GSI) and presents fourth quarter, 1992 ground-water sampling and field activities results performed for the above referenced location (Plate 1). **On November 18, 1992 one exploratory boring was drilled off-site and completed as ground-water monitoring well A-10 (Plate 2) as outlined in the GSI Work Plan dated July 14, 1992. Well A-10 was sampled on December 17, 1992. Quarterly monitoring and sampling of site wells were conducted by the ARCO contractor for the fourth quarter on November 12, 1992.** Field work was performed to comply with current State of California Water Resources Control Board (SWRCB) and local agency guidelines. GSI Field Methods and Procedures were presented in the GSI Work Plan dated April 26, 1991.

792603-8

SITE BACKGROUND

There are currently ten ground-water monitoring wells and one groundwater recovery well located at the site. Seven wells are located on-site (Wells MW-1 and MW-3, A-4 through A-6, and AR-1) and four wells are located off-site (Wells A-7 through A-10). These wells were installed by Groundwater Technology, Inc. (GTI) and GSI between 1986 and 1992 to evaluate the horizontal and vertical extent of petroleum hydrocarbons in soil and groundwater beneath the site.

On October 13 and 14, 1992, GSI performed step-drawdown and constant-rate aquifer tests on-site. These tests were performed utilizing recovery well AR-1 to evaluate groundwater flow characteristics beneath the site. Results are presented in a GSI Continuing Site Assessment/Quarterly Monitoring Report dated December 21, 1992.

Quarterly ground-water monitoring and sampling of site wells began in December, 1991. Ground-water samples are currently 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.

WELL INSTALLATION FIELD ACTIVITIES

One off-site exploratory soil boring was drilled on November 18, 1992, using a truck-mounted, hollow-stem auger drilling rig. Boring A-10 was drilled to a total depth of 35.0 feet below grade. Soil samples were collected at five-foot intervals using a modified California split-spoon sampler fitted with stainless steel sample tube liners. A GSI geologist observed the drilling, described the soil samples using the Unified Soil Classification System (ASTM D 2488-84) and Munsell Soil Color Chart, and prepared a lithologic log for each boring. Exploratory boring logs are presented in Appendix A.

Soil Sampling

An Organic Vapor Monitor (OVM) photoionization detector was used to perform head-space analysis on soils from sampled intervals above first encountered water, as a reconnaissance-level test for the presence of Volatile Organic Compounds (VOCs) in the soil. Head-space analysis results are presented on each boring log in Appendix A. Soil samples retained for chemical analyses were collected in clean stainless steel liners and sealed on both ends with aluminum foil and plastic end caps. Samples were labeled, entered onto a Chain-of-Custody form, and transported in a cooler with blue ice to Sequoia Analytical (Sequoia), a State-certified environmental laboratory located in Redwood City, California.

Monitoring Well Installation

Boring A-10 was drilled using 8-inch diameter hollow-stem augers to a depth of 35.0 feet below grade. Groundwater monitoring well A-10 was constructed using 2-inch diameter Schedule PVC blank well casing and 0.020-inch continuous wrap well screen to a depth of 35.0 feet. Well screen interval extends from 10.0 to 35.0 feet below grade in Well A-10. Lonestar #2/12 graded sand was placed across the entire screened interval and extends 1.0-foot above the top of the well screen. A 1.0-foot thick bentonite seal was placed above the sandpack and then hydrated with clean water. A neat cement seal was placed from the top of the bentonite to approximately one foot below ground surface. A waterproof underground vault box, set in concrete, was installed over the top of Well A-10. A waterproof locking well cap and lock were placed on the well casing. The well completion detail is presented with the Exploratory Boring Log in Appendix A.

Soil Chemical Analytical Results

Soil 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 in Redwood City, California.

Soil chemical analytical data are summarized in Table 1. Two soil samples from Boring A-10, collected at depths of 13.0 and 16.5 feet below grade, were selected for chemical analysis. TPH-Gasoline and BTEX were reported as none detected (ND) for each sample analyzed from Boring A-10. The Sequoia chemical analytical report and Chain-of-Custody form are presented in Appendix B.

Ground-water Chemical Analytical Results

A ground-water sample was collected from Well A-10 on December 7, 1992 by Gettler-Ryan Inc. (G-R). The sample was analyzed for TPH-Gasoline according to EPA Method 8015 (Modified) and BTEX according to EPA Method 8020. Chemical analyses were performed by Sequoia.

Ground-water chemical analytical data are summarized in Table 1. **TPH-Gasoline was detected in the sample from Well A-10 at a concentration of 660 parts per billion (ppb). Benzene was identified in this same sample at a concentration of 30 ppb.** The G-R field data sheet and Sequoia Analytical Report are presented in Appendix C.

HYDROGEOLOGIC CONDITIONS

Regional Setting

The site is located within the San Francisco Bay Plain approximately 2.5 miles east of San Francisco Bay and approximately 0.2 miles north of Sulpher Creek in San Lorenzo, California. The area is underlain by Holocene-age alluvial deposits consisting of unconsolidated, moderately sorted, fine grain sand and silt, with clayey silt and occasional thin beds of coarse sand (Helley, H. J. and others, 1972).

Local Setting

Based on exploratory boring data from current and previous investigations, the local subsurface lithology appears to consist of clay, silt, silty sand, sand, and minor gravel to the total depth explored of 35.0 feet below ground surface. Boring A-10 encountered silt and sandy-silt, with minor sand laminae at approximately 12 feet below grade, to the total depth explored (35.0 feet). **Groundwater was first encountered in Boring A-10 at a depth of 17.5 feet below grade. The water level stabilized after completion of the well at a depth of 16.93 feet below grade.** This close correlation between first encountered and stabilized water level suggests that unconfined aquifer conditions exist at this site.

CURRENT QUARTER SAMPLING RESULTS

Depth to water-level measurements were obtained, prior to sampling on November 12, 1992, from each monitoring and recovery well. Static ground-water levels were measured from the surveyed top of the well box and recorded to the nearest $\pm$0.01 foot. Water-level data were referenced to Mean Sea Level (MSL) datum and used to construct a potentiometric map (Plate 3). **Shallow ground-water beneath the site flows to the northwest at an approximate hydraulic gradient of 0.003.**

Each well was checked for the presence of floating product. **Floating product was not observed in any well this quarter.** Depth to groundwater and floating product measurements for the current quarter are summarized in Table 2. Current and historical water-level data and floating product measurements are summarized in Table 3.

Ground-water samples were collected on November 12, 1992 by EMCON Associates (EMCON). Samples were analyzed for TPH-Gasoline according to EPA Method 8015 (Modified) and BTEX according to EPA Method 8020. Ground-water samples were analyzed by Sequoia.

Current quarter chemical analytical data are presented in Table 2 and have also been added to the Historical Groundwater Quality Database presented in Table 4. TPH-Gasoline was detected in samples from Wells MW-1 through MW-3, A-4, A-5, A-7 and AR-1 at concentrations ranging between 140 ppb and 16,000 ppb. Benzene was identified in Wells MW-1 through MW-3, A-4, A-5, A-7, and AR-1 at concentrations ranging between 7.2 ppb and 3,800 ppb. TPH-Gasoline and benzene were reported as ND in Wells A-6, A-8 and A-9. The EMCON groundwater sampling report is presented in Appendix D. Chemical isoconcentration maps for TPH-Gasoline and benzene are presented on Plates 4 and 5, respectively.

SUMMARY

The results of this investigation are summarized below:

- One exploratory boring was drilled off-site on November 18, 1992 and completed as ground-water monitoring well A-10.

- The lithology of Boring A-10 consisted primarily of silt and sandy silt, with minor sand laminae at approximately 12 feet below grade, to the total depth explored of 35.0 feet. The water-level in Well A-10 was first encountered at 17.5 feet and appeared to stabilize at a depth of 16.93 feet below grade.

- Soil samples were collected from depths of 13.0 and 16.5 feet from Boring A-10 and analyzed for TPH-Gasoline and BTEX. TPH-Gasoline and BTEX were reported as ND for these samples.

- A ground-water sample was collected from Well A-10 on December 7, 1992 and analyzed for TPH-Gasoline and BTEX. TPH-Gasoline and benzene were detected in the sample from Well A-10 at concentrations of 660 ppb and 30 ppb, respectively.

- Water-level data collected during the fourth quarter, 1992 groundwater sampling indicate that groundwater flows to the northwest at a calculated hydraulic gradient of 0.003.

- Floating product was not observed in any wells this quarter.

- TPH-Gasoline was identified in Wells MW-1 through MW-3, A-4, A-5, A-7 and AR-1 at concentrations ranging between 140 ppb and 16,000 ppb. Benzene was detected in Wells MW-1 through MW-3, A-4, A-5, A-7 and AR-1 at concentrations ranging between 7.2 ppb and 3,800 ppb. TPH-Gasoline and BTEX were reported as ND in Wells A-6, A-8 and A-9.

CONCLUSIONS

Based on ND chemical analytical results from Wells A-8 and A-9, the dissolved hydrocarbon in groundwater beneath the site appears to be delineated in the cross-gradient directions. Petroleum hydrocarbons were detected in groundwater samples from newly installed Well A-10. Additional analytical data are needed to assess the distribution of petroleum hydrocarbons downgradient of the site. Detectable hydrocarbons in Well A-10 may be the result of underground storage tank (UST) leaks from gas stations in the immediate site vicinity (intersection of Hesperian Boulevard and A Street, located just northeast of the site).

If you have any questions, please call.

GeoStrategies Inc. by,

Robert C. Mallory
Geologist

John F. Vargas
Senior Geologist
R.G. 5046

REGISTERED GEOLOGIST
JOHN F. VARGAS
NO. 5046
STATE OF CALIFORNIA

RCM/JFV/rmt

Table 1. Soil Analyses Data
Table 2. Ground-water Analyses Data
Table 3. Historical Water-level Data
Table 4. Historical Ground-water Quality Database

Plate 1. Vicinity Map
Plate 2. Site Plan
Plate 3. Potentiometric Map
Plate 4. TPH-G Isoconcentration Map
Plate 5. Benzene Isoconcentration Map

Appendix A: Exploratory Boring Log and Well Construction Detail
Appendix B: Soil Chemical Analytical Report and Chain-of-Custody Form
Appendix C: G-R Field Data Sheets and Sequoia Chemical Analytical Report
Appendix D: EMCON Ground-water Sampling Report

QC Review: JFV

792603-8

References Cited

Helley, E.J., and others; 1979; Flatland Deposits - Their Geology and Engineering Properties and Their Importance to Comprehensive Planning, Selected Examples from the San Francisco Bay Region, California; U.S. Geological Survey Professional Paper 943, 88 p.

TABLE 1

SOIL ANALYSES DATA

Sample No.	Sample Date	Analyzed Date	TPH-G (PPM)	Benzene (PPM)	Toluene (PPM)	Ethylbenzene (PPM)	Xylenes (PPM)
A-10-13.0	11/18/92	11/23/92	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
A-10-16.5	11/18/92	11/23/92	<1.0	<0.0050	<0.0050	<0.0050	<0.0050

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

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

TABLE 2

GROUND-WATER ANALYSES DATA

Well No.	Sample Date	Analyzed Date	TPH-G (PPB)	Benzene (PPB)	Toluene (PPB)	Ethylbenzene (PPB)	Xylenes (PPB)	Well Elev. (ft)	Static Water Elev. (ft)	Product Thickness (ft)	Depth to Water (ft)
MW-1	11/12/92	11/23/92	1600	310	7.2	22	8.9	38.36	22.90	0.00	15.46
MW-2	11/12/92	11/20/92	16000	3800	86	470	910	38.58	22.60	0.00	15.98
MW-3	11/12/92	11/20/92	7400	400	<25	860	330	37.77	22.85	0.00	14.92
A-4	11/12/92	11/20/92	810	7.2	0.98	34	0.97	39.86	22.89	0.00	16.97
A-5	11/12/92	11/20/92	520	12	0.96	29	36	38.94	22.59	0.00	16.35
A-6	11/12/92	11/19/92	<50	<0.50	<0.50	<0.50	<0.50	39.07	22.72	0.00	16.35
A-7	11/12/92	11/19/92	760	17	0.83	50	73	39.95	22.48	0.00	17.47
A-8	11/12/92	11/19/92	<50	<0.50	<0.50	<0.50	<0.50	37.23	22.88	0.00	14.35
A-9	11/12/92	11/19/92	<50	<0.50	<0.50	<0.50	<0.50	38.71	22.42	0.00	16.29
A-10	12/07/92	12/11/92	660	30	<2.5	<2.5	<2.5	38.94	22.13	0.00	16.81
AR-1	11/12/92	11/19/92	140	66	<0.50	4.3	3.7	38.11	22.75	0.00	15.36
TB	11/12/92	11/19/92	<50	<0.50	<0.50	<0.50	<0.50	----	----	----	----
TB	----	12/11/92	<50	<0.50	<0.50	<0.50	<0.50	----	----	----	----
XDUP-1	11/12/92	11/20/92	18000	3900	100	480	920	----	----	----	----

CURRENT REGIONAL WATER QUALITY CONTROL BOARD MAXIMUM CONTAMINANT LEVELS
Benzene 1.0 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. Water level elevations referenced to Mean Sea Level (MSL).
3. DHS Action Levels and MCLs are subject to change pending State review.

TABLE 3

HISTORICAL WATER-LEVEL DATA

Monitoring Date	Well Number	Depth to Water (ft)	Well Elevation (ft)	Static Water Elevation (ft)	Floating Product Thickness (ft)
08/08/86	MW-1	11.25	38.36	27.11	0.00
12/24/91	MW-1	16.12	38.36	22.24	0.00
03/10/92	MW-1	13.34	38.36	25.02	0.00
06/09/92	MW-1	14.12	38.36	24.24	0.00
09/14/92	MW-1	15.34	38.36	23.02	0.00
11/12/92	MW-1	15.46	38.36	22.90	0.00
08/08/86	MW-2	11.62	38.58	26.96	0.00
12/24/91	MW-2	16.50	38.58	22.08	0.00
03/10/92	MW-2	13.50	38.58	25.08	0.00
06/09/92	MW-2	14.52	38.58	24.06	0.00
09/14/92	MW-2	15.78	38.58	22.80	0.00
11/12/92	MW-2	15.98	38.58	22.60	0.00
08/08/86	MW-3	10.61	37.77	27.16	0.00
12/24/91	MW-3	15.60	37.77	22.17	0.00
03/10/92	MW-3	12.90	37.77	24.87	0.00
06/09/92	MW-3	13.60	37.77	24.17	0.00
09/14/92	MW-3	14.78	37.77	22.99	0.00
11/12/92	MW-3	14.92	37.77	22.85	0.00
12/24/91	A-4	17.60	39.86	22.26	0.00
03/10/92	A-4	14.76	39.86	25.10	0.00
06/09/92	A-4	15.63	39.86	24.23	0.00
09/14/92	A-4	16.83	39.86	23.03	0.00
11/12/92	A-4	16.94	39.86	22.89	0.00

Monitoring Date	Well Number	Depth to Water (ft)	Well Elevation (ft)	Static Water Elevation (ft)	Floating Product Thickness (ft)
12/24/91	A-5	16.85	38.94	22.09	0.00
03/10/92	A-5	13.83	38.94	25.11	0.00
06/09/92	A-5	14.91	38.94	24.03	0.00
09/14/92	A-5	16.14	38.94	22.80	0.00
11/12/92	A-5	16.35	38.94	22.59	0.00
12/24/91	A-6	16.88	39.07	22.19	0.00
03/10/92	A-6	13.73	39.07	25.34	0.00
06/09/92	A-6	14.95	39.07	24.12	0.00
09/14/92	A-6	16.20	39.07	22.87	0.00
11/12/92	A-6	16.35	39.07	22.72	0.00
12/24/91	A-7	18.11	39.95	21.84	0.00
03/10/92	A-7	15.30	39.95	24.65	0.00
06/09/92	A-7	16.12	39.95	23.83	0.00
09/14/92	A-7	17.35	39.95	22.60	0.00
11/12/92	A-7	17.47	39.95	22.48	0.00
09/14/92	A-8	14.19	37.23	23.04	0.00
11/12/92	A-8	14.35	37.23	22.88	0.00
09/14/92	A-9	16.12	38.71	22.59	0.00
11/12/92	A-9	16.29	38.71	22.42	0.00
12/07/92	A-10	16.81	38.94	22.13	0.00
09/14/92	AR-1	15.21	38.11	22.90	0.00
11/12/92	AR-1	15.36	38.11	22.75	0.00

Notes:

1. Static water elevations referenced to Mean Sea Level (MSL).
2. Well elevations and depth-to-water measurements are measured from the top of the well box.

TABLE 4

HISTORICAL GROUND-WATER QUALITY DATABASE

Sample Date	Sample Point	TPH-G (PPB)	Benzene (PPB)	Toluene (PPB)	Ethylbenzene (PPB)	Xylenes (PPB)
08-Aug-86	MW-1	7040	132	8.7	439	230
24-Dec-91	MW-1	2200	190	8.5	6.9	2.6
10-Mar-92	MW-1	2800	270	29	56	39
09-Jun-92	MW-1	2900	960	27	99	63
14-Sep-92	MW-1	2600	450	<5.0	45	21
12-Nov-92	MW-1	1600	310	7.2	22	8.9
08-Aug-86	MW-2	1910	20.1	2.8	1.8	----
24-Dec-91	MW-2	23000	1500	1,100	480	1400
10-Mar-92	MW-2	210000	44000	3,900	1700	5800
10-Jun-92	MW-2	33000	2300	370	780	2600
14-Sep-92	MW-2	16000	3700	100	470	1000
12-Nov-92	MW-2	16000	3800	86	470	910
08-Aug-86	MW-3	7450	510	549	409	1380
24-Dec-91	MW-3	6800	450	10	610	45
10-Mar-92	MW-3	11000	2500	75	400	560
10-Jun-92	MW-3	16000	2000	69	1,300	2600
14-Sep-92	MW-3	14000	630	<50	1,500	2400
12-Nov-92	MW-3	7400	400	<25	860	330
24-Dec-91	A-4	1900	29	1.9	25	29
10-Mar-92	A-4	7400	37	<0.60	11	73
09-Jun-92	A-4	4500	3.2	<1.5	37	16
14-Sep-92	A-4	1300	<2.5	2.5	61	6.8
12-Nov-92	A-4	610	7.2	0.98	34	0.97
24-Dec-91	A-5	1600	35	<0.30	32	52
10-Mar-92	A-5	1000	21	<1.5	43	100
09-Jun-92	A-5	680	1.6	<0.30	14	16
14-Sep-92	A-5	770	34	<2.5	51	65
12-Nov-92	A-5	520	12	0.96	29	36
24-Dec-91	A-6	<30	<0.30	<0.30	<0.30	<0.30
10-Mar-92	A-6	<30	<0.30	<0.30	<0.30	<0.30
09-Jun-92	A-6	<30	<0.30	<0.30	<0.30	<0.30
14-Sep-92	A-6	<50	<0.50	<0.50	<0.50	<0.50
12-Nov-92	A-6	<50	<0.50	<0.50	<0.50	<0.50

TABLE 4

HISTORICAL GROUND-WATER QUALITY DATABASE

Sample Date	Sample Point	TPH-G (PPB)	Benzene (PPB)	Toluene (PPB)	Ethylbenzene (PPB)	Xylenes (PPB)
24-Dec-92	A-7	10000	88	16	170	610
10-Mar-92	A-7	320	9.3	0.54	8.8	34
09-Jun-92	A-7	340	11	1.1	8.9	26
14-Sep-92	A-7	510	12	<2.0	30	51
12-Nov-92	A-7	760	17	0.83	50	73
14-Sep-92	A-8	<50	<0.50	<0.50	<0.50	<0.50
12-Nov-92	A-8	<50	<0.50	<0.50	<0.50	<0.50
14-Sep-92	A-9	<50	<0.50	<0.50	<0.50	<0.50
12-Nov-92	A-9	<50	<0.50	<0.50	<0.50	<0.50
07-Dec-92	A-10	660	30	<2.5	<2.5	<2.5
14-Sep-92	AR-1	820	67	<1.0	8.8	6.7
12-Nov-92	AR-1	140	66	<0.50	4.3	3.7

CURRENT REGIONAL WATER QUALITY CONTROL BOARD MAXIMUM CONTAMINANT LEVELS
Benzene 1. ppb Xylenes 1750. ppb Ethylbenzene 680. ppb

CURRENT DHS ACTION LEVELS
Toluene 100.0 ppb

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

Notes:

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

GeoStrategies Inc.
Environmental Consulting,
Engineering and Geologic Services

Letter of Transmittal

Date: 2/1/93

From: ROBERT MALLORY
Project No: 7926

To: MS. JULIET SHIN (CERTIFIED MAIL)
ACHCSA
80 SWAN WAY #200
OAKLAND, CA. 94621

Subject: QUART. MONIT./WELL INSTALL. - 4TH qtr. '92
ARCO SERVICE STATION # 5387
20200 HESPERIAN BLVD
SAN LORENZO, CA.

The following items are: ☑ Enclosed ☐ Sent Separately via _____

Date	Description	No. of Copies
1/29/93	QUARTERLY MONITORING / WELL INSTALLATION REPORT - 4TH qtr. '92	1

These are transmitted:

- ☐ At you request
- ☐ For your action
- ☐ For your approval
- ☑ For your files
- ☐ For your review
- ☐ For your information
- ☐ Preliminary
- ☐ _____

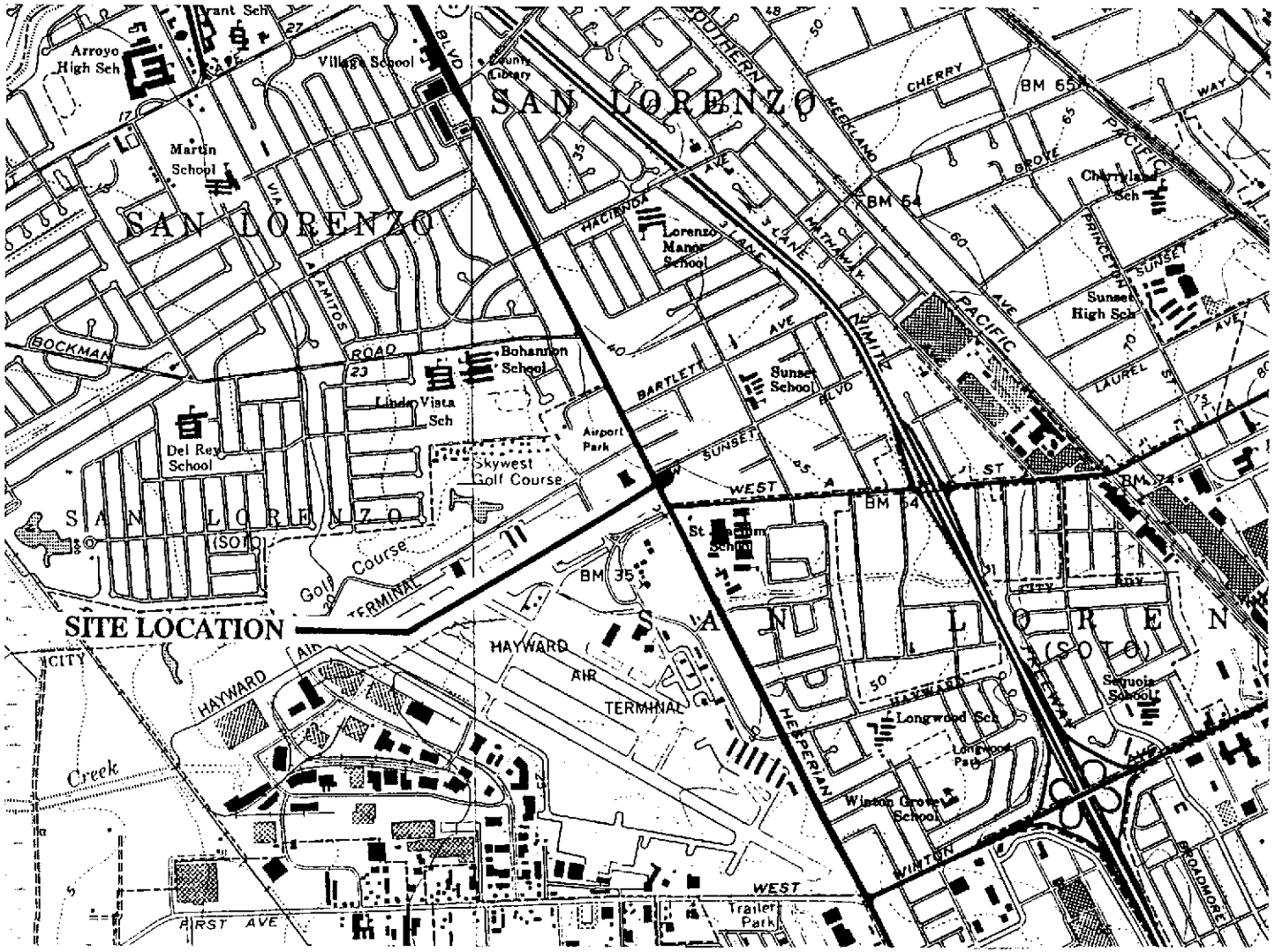
Comments:

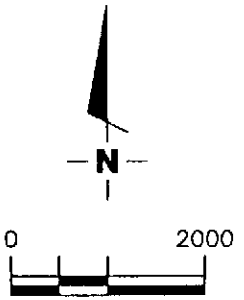
CC: MR. MICHAEL WHELAN, ARCO PRODUCTS CO.
MR. H. C. WINSOR, ARCO PRODUCTS CO.
MR. RICHARD HIETT, RWQCB - SF REGION (CERTIFIED MAIL)

☑ 2140 W. Winton Avenue, Hayward, CA 94545
(510) 352-4800 - Fax (510) 783-1089

☐ 601 University Avenue, Sacramento, CA 95825
(916) 568-7500 - Fax (916) 568-7504

Robert C. Mallory
(Signed)





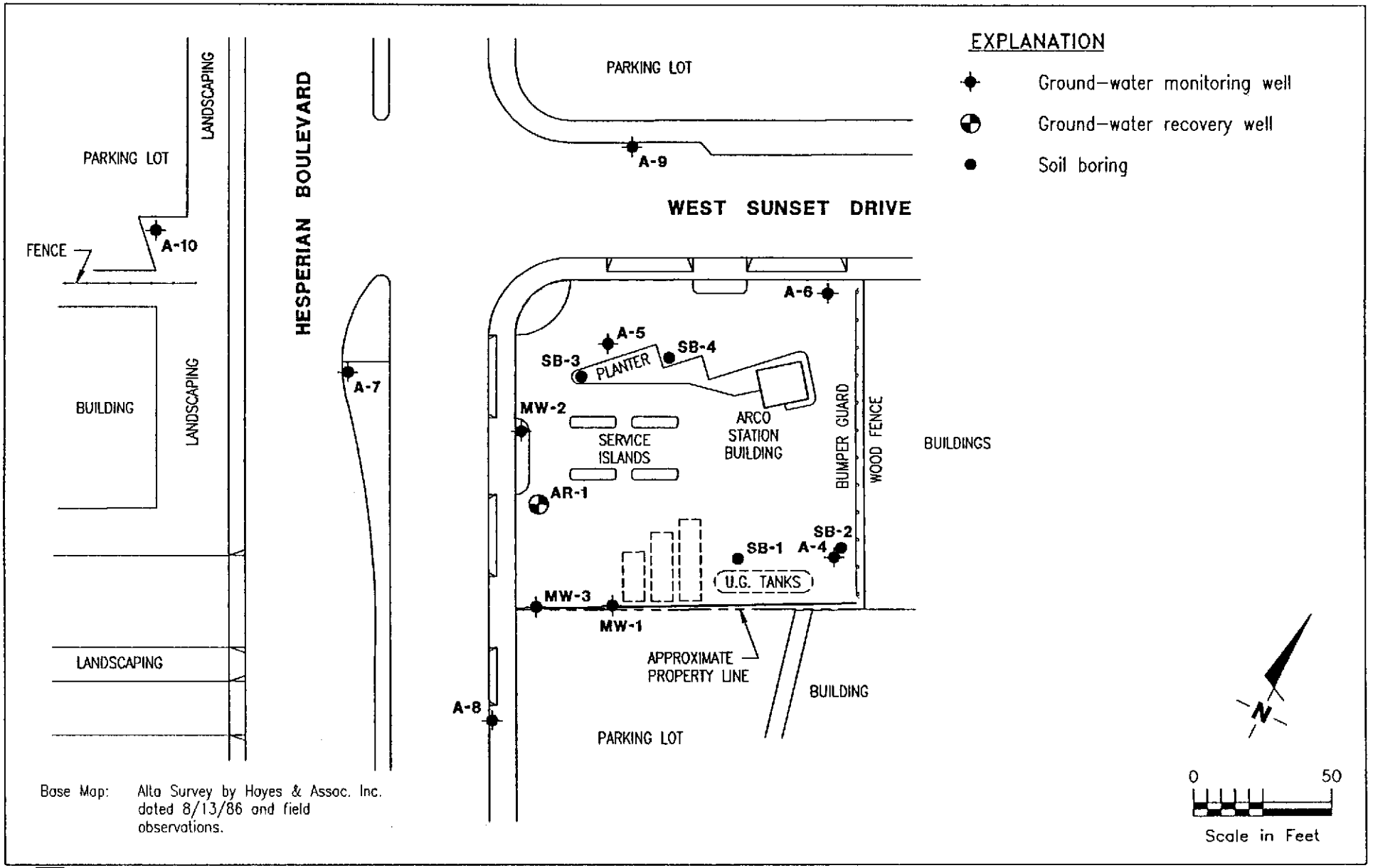
Base Map: USGS Topographic Map

GeoStrategies Inc.

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

PLATE
1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7926		11/91	



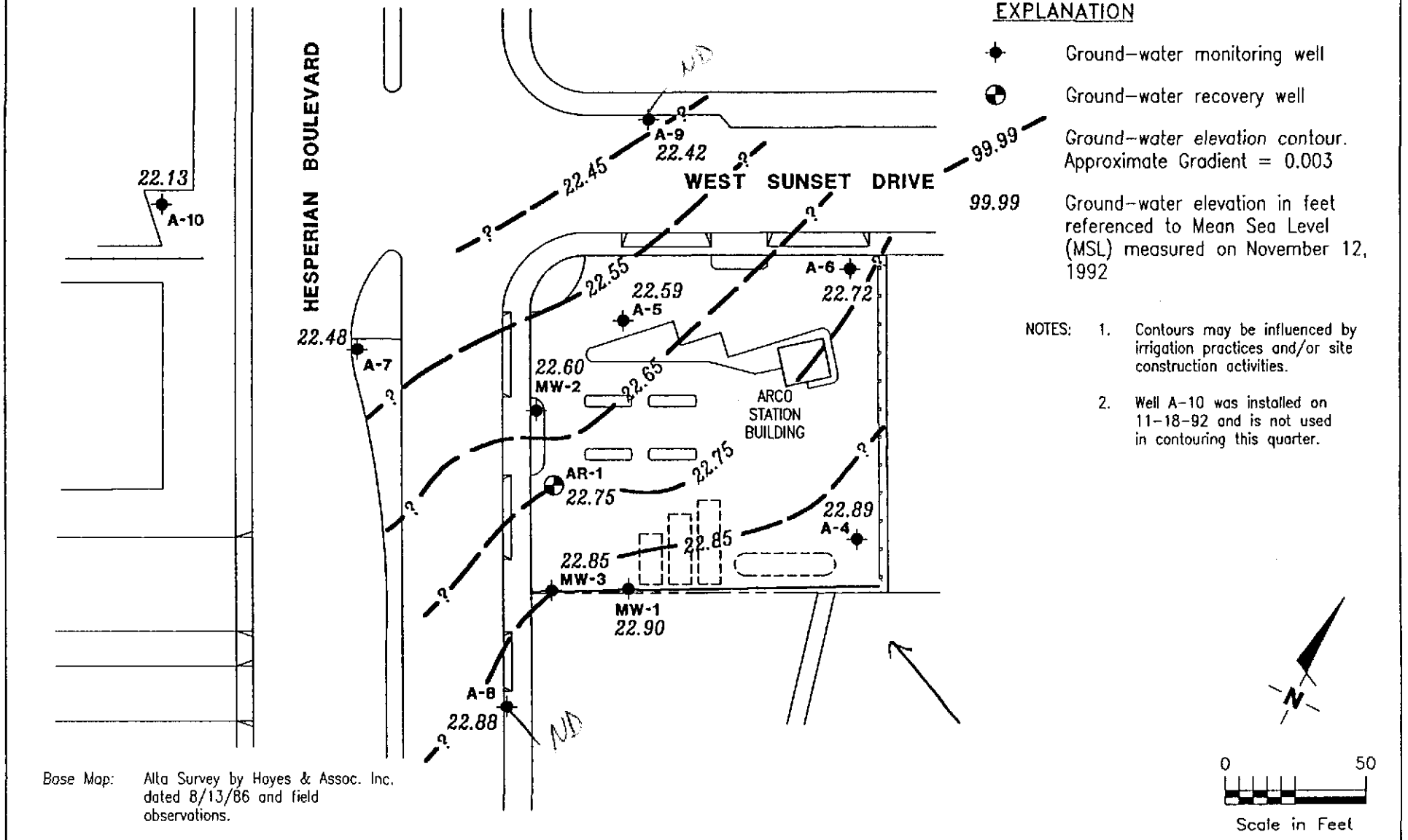
Base Map: Alta Survey by Hoyes & Assoc. Inc. dated 8/13/86 and field observations.

GeoStrategies Inc.

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

PLATE
2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7926		1/93	



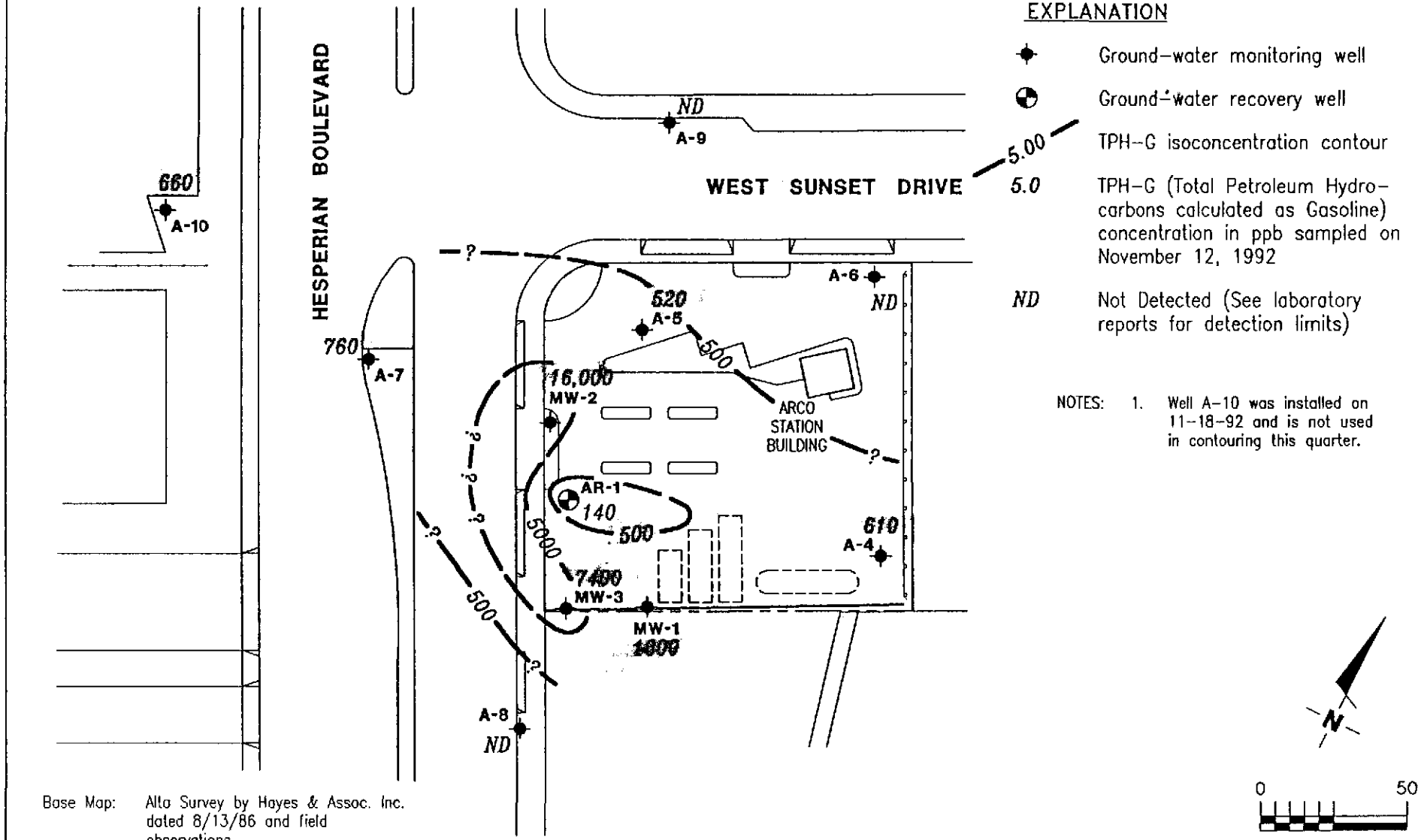
Base Map: Alta Survey by Hoyes & Assoc. Inc. dated 8/13/86 and field observations.

GeoStrategies Inc.

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

PLATE
3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792603-8	RCM	1/93	



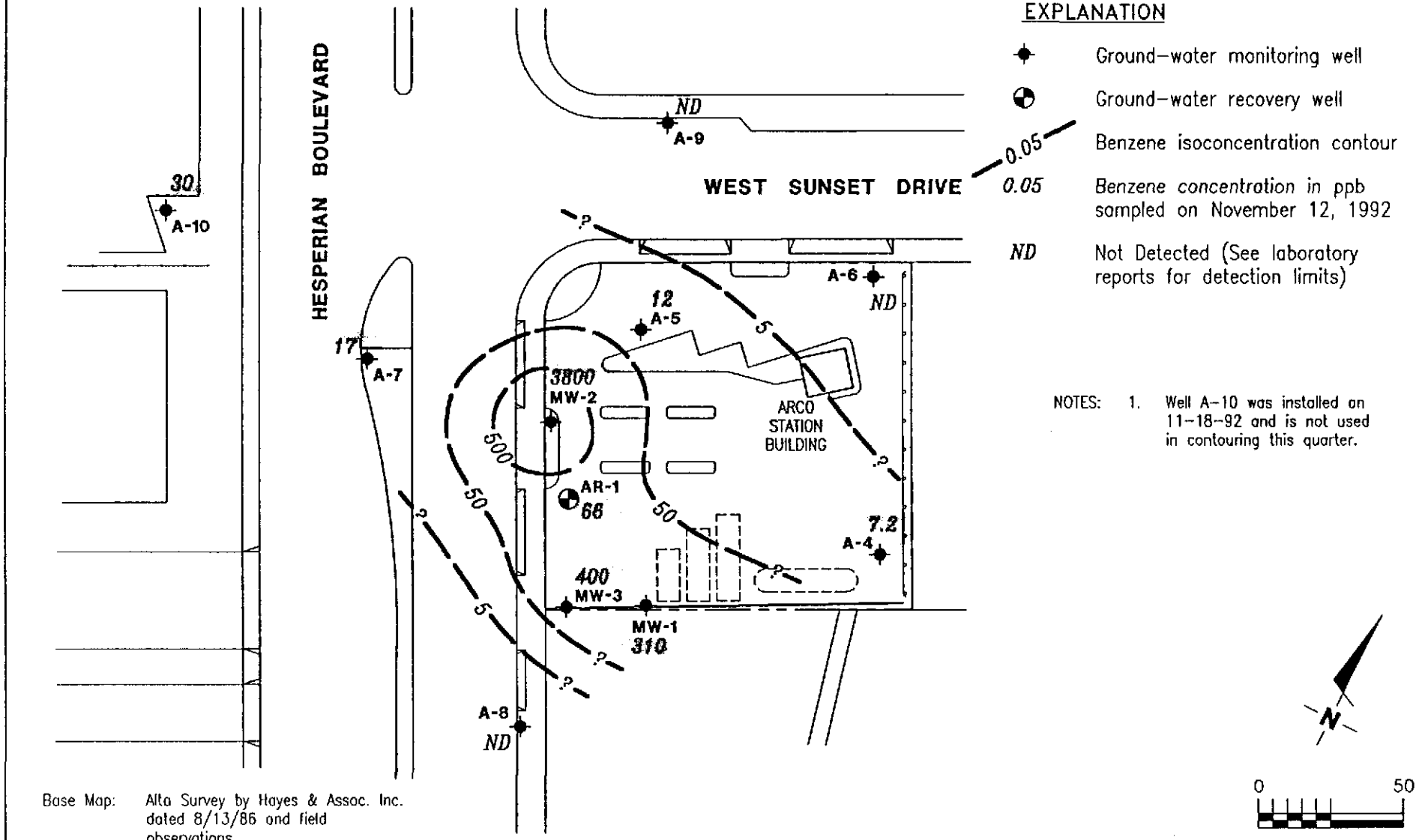
Base Map: Alta Survey by Hayes & Assoc. Inc. dated 8/13/86 and field observations.

GeoStrategies Inc.

TPH-G ISOCONCENTRATION MAP
ARCO Service Station #5387
20200 Hesperian Boulevard
San Lorenzo, California

PLATE
4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792603-8	nem	1/93	



EXPLANATION

- Ground-water monitoring well
- Ground-water recovery well
- 0.05 — Benzene isoconcentration contour
- 0.05 — *Benzene concentration in ppb sampled on November 12, 1992*
- ND — Not Detected (See laboratory reports for detection limits)

NOTES: 1. Well A-10 was installed on 11-18-92 and is not used in contouring this quarter.

Base Map: Alta Survey by Hayes & Assoc. Inc. dated 8/13/86 and field observations.

N

0 50

Scale in Feet

GeoStrategies Inc.

BENZENE ISOCONCENTRATION MAP
ARCO Service Station #5387
20200 Hesperian Boulevard
San Lorenzo, California

PLATE 5

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792603-8	nom	1/93	

MAJOR DIVISIONS					TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
			GP		POORLY GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
		GRAVELS WITH OVER 15% FINES	GM		SILTY GRAVELS, SILTY GRAVELS WITH SAND
			GC		CLAYEY GRAVELS, CLAYEY GRAVELS WITH SAND
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
			SP		POORLY GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
		SANDS WITH OVER 15% FINES	SM		SILTY SANDS WITH OR WITHOUT GRAVEL
			SC		CLAYEY SANDS WITH OR WITHOUT GRAVEL
FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTS WITH SANDS AND GRAVELS
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY CLAYS WITH SANDS AND GRAVELS, LEAN CLAYS
			OL		ORGANIC SILTS OR CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACIOUS, FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH		ORGANIC SILTS OR CLAYS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS			PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

LL - Liquid Limit (%)

PI - Plastic Index (%)

PID - Volatile Vapors in ppm

MA - Particle Size Analysis

2.5 YR 6/2 - Soil Color according to Munsell Soil Color Charts (1975 Edition)

5 GY 5/2 - GSA Rock Color Chart

☒ - No Soil Sample Recovered

■ - "Undisturbed" Sample

⊠ - Bulk or Classification Sample

▽ - First Encountered Ground Water Level

▼ - Piezometric Ground Water Level

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

GeoStrategies Inc.

Unified Soil Classification - ASTM D 2488-85 and Key to Test Data

Field location of boring:	Project No.: 792605	Date: 11/18/92	Boring No:
(See Plate 2)	Client: ARCO Products Co. #5387		A-10
	Location: 20200 Hesperian Boulevard		
	City: San Lorenzo		Sheet 1
	Logged by: RCM	Driller: Bayland	of 2
Drilling method: Hollow Stem Auger	Casing installation data:		
Hole diameter: 8-inches	Top of Box Elevation: 38.94		Datum: MSL

								Water Level	17.5	16.93		
								Time	10:58	12:05		
								Date	11/18/92	11/19/92		
PID (ppm)	Blows/ft., or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description				
				1				SILT (ML) - very dark grayish brown (10YR 3/2); medium stiff, damp; 85% silt, 15% fine sand.				
				2								
				3								
	700	S&H	A-10	4				SANDY SILT (ML) - dark yellowish brown (10YR 4/4);				
0	900	(push)	4.5					stiff, damp; 60% silt, 40% fine to coarse sand; trace				
	1300			5				organic matter.				
				6								
				7								
				8								
	5	S&H		9								
	8		A-10					SILT (ML) - light olive brown (2.5Y 5/6); stiff, damp; 95%				
0	9		10.0	10				silt, 5% fine sand;				
	3	S&H										
	6		A-10	11				moist, 2 mm. thick laminae of fine sand; rootholes at 11.0				
0	7		11.5					ft.				
	3	S&H		12								
	6		A-10					Light yellowish brown mottling at 12.0 ft., 4 mm. thick				
0	9		13.0	13				sand laminae at 12.5 ft.				
	4	S&H		14				Color change to olive brown (2.5Y 4/4); rootholes at 14.5				
	6		A-10					ft.				
0	12		15.0	15								
	9	S&H						Increase clay to 25% at 15.0 ft				
	7		A-10	16								
0	12		16.5					Gray (5Y 5/1) discoloration in rootholes; at 16.0 ft.				
	6	S&H	A-10	17		▼						
0	6		17.5			▽						
				18								
	0	S&H		19				COLOR CHANGE to greenish gray (5GY 5/1); medium				
	3		A-10					stiff at 20.0.				
	5		20.0	20								

Remarks: * Converted to equivalent Standard Penetration blows/ft.

GeoStrategies Inc.

Log of Boring

BORING NO. **A-10**

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792605		11/92		

Field location of boring:	Project No.: 792605	Date: 11/18/92	Boring No:
(See Plate 2)	Client: ARCO Products Company		A-10
	Location: 20200 Hesperian Boulevard		
	City: San Lorenzo		Sheet 2
	Logged by: RCM	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				
				23				Increase clay to 35%, soft at 23.5 ft.
	1	S&H	A-10	24				
	1		24.5					
	3			25				
				26				
				27				
				28				
	2	S&H		29				COLOR CHANGE to yellowish brown (10YR 5/4) with greenish gray (5GY-5/1) and black (10YR 2/1)
	3		A-10					
	4		30.0	30				discoloration/mottling.
				31				
				32				
				33				
	2	S&H		34				Increase fine sand to 10%, decrease clay to 20% at 33.5
	3		A-10					ft.
	4		35.0	35				
				36				
				37				Bottom of boring at 35.0 ft.
								11/18/92
				38				
				39				
				40				

Remarks:

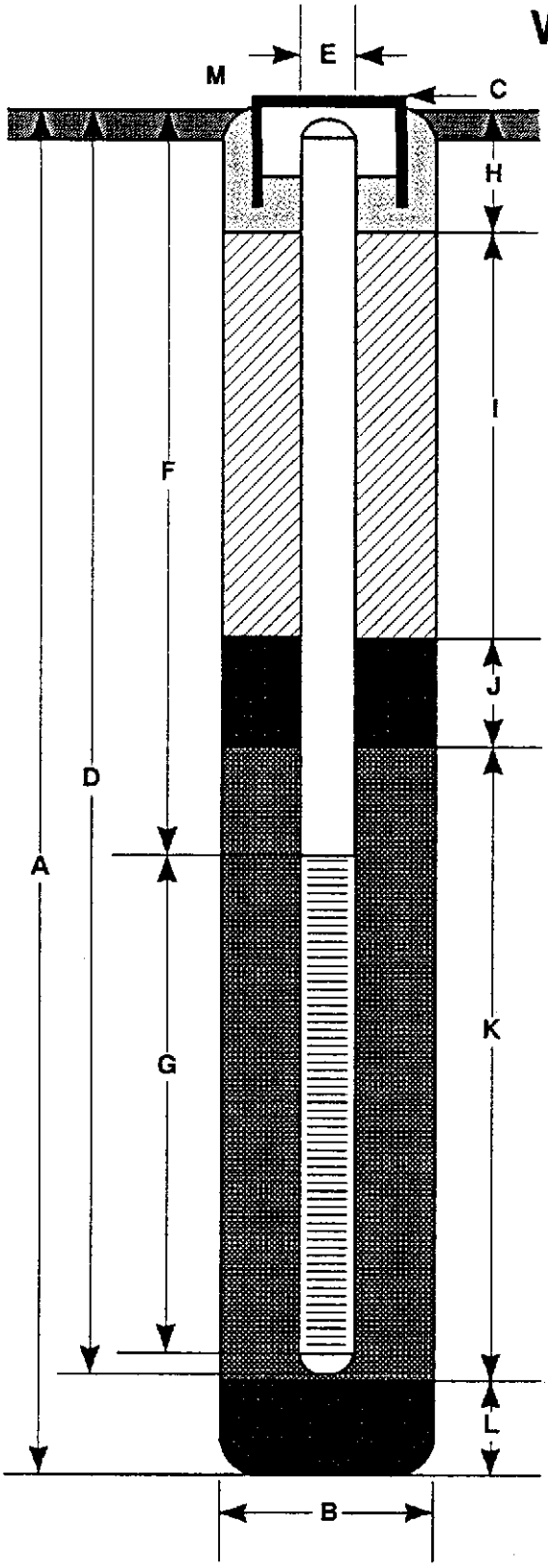
GeoStrategies Inc.

Log of Boring

BORING NO. A-10

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792605		11/92		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 35.0 ft.

B Diameter of Boring 8 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 35.0 ft.
Material Schedule 40 PVC

E Casing Diameter 2 in.

F Depth to Top Perforations 10.0 ft.

G Perforated Length 25.0 ft.
Perforated Interval from 10.0 to 35.0 ft.
Perforation Type Continuous Wrap
Perforation Size 0.020 in.

H Surface Seal from 0 to 1.0 ft.
Seal Material Concrete

I Backfill from 1.0 to 8.0 ft.
Backfill Material Neat Cement

J Seal from 8.0 to 9.0 ft.
Seal Material Bentonite

K Gravel Pack from 9.0 to 35.0 ft.
Pack Material Lonestar #2/12 Graded Sand

L Bottom Seal ft.
Seal Material

M Waterproof vault box with waterproof locking cap and lock.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO.
A-10

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792605		11/92		

SEQUOIA ANALYTICAL

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

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

Project: 5387-92-1A/ARCO 5387-San Lorenzo

Enclosed are the results from 2 soil samples received at Sequoia Analytical on November 19,1992. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
2113450	Soil, A-10 @ 13.0'	11/18/92	EPA 5030/8015/8020
2113451	Soil, A-10 @ 16.5'	11/18/92	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

Nokowhat D. Herrera
Project Manager

926-A

SEQUOIA ANALYTICAL

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

Gettler Ryan/Geo Strageties	Client Project ID:	5387-92-1A/ARCO 5387-San Lorenzo	Sampled:	Nov 18, 1992
2150 W. Winton Avenue	Sample Matrix:	Soil	Received:	Nov 19, 1992
Hayward, CA 94545	Analysis Method:	EPA 5030/8015/8020	Reported:	Dec 3, 1992
Attention: John Vargas	First Sample #:	211-3450		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit mg/kg	Sample I.D. 211-3450 A-10 @ 13.0'	Sample I.D. 211-3451 A-10 @ 16.5'
Purgeable Hydrocarbons	1.0	N.D.	N.D.
Benzene	0.0050	N.D.	N.D.
Toluene	0.0050	N.D.	N.D.
Ethyl Benzene	0.0050	N.D.	N.D.
Total Xylenes	0.0050	N.D.	N.D.
Chromatogram Pattern:		--	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0
Date Analyzed:	11/23/92	11/23/92
Instrument Identification:	GCHP-1	GCHP-1
Surrogate Recovery, %: (QC Limits = 70-130%)	106	104

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

SEQUOIA ANALYTICAL

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

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

Client Project ID: 5387-92-1A/ARCO 5387-San Lorenzo

QC Sample Group: 2113450-1

Reported: Dec 3, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	R. Geckler	R. Geckler	R. Geckler	R. Geckler
Reporting Units:	mg/kg	mg/kg	mg/kg	mg/kg
Date Analyzed:	Nov 23, 1992	Nov 23, 1992	Nov 23, 1992	Nov 23, 1992
QC Sample #:	GBLK112392	GBLK112392	GBLK112392	GBLK112392
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.20	0.20	0.20	0.60
Conc. Matrix Spike:	0.21	0.20	0.20	0.60
Matrix Spike % Recovery:	105	100	100	100
Conc. Matrix Spike Dup.:	0.23	0.22	0.22	0.65
Matrix Spike Duplicate % Recovery:	115	110	110	108
Relative % Difference:	9.1	9.5	9.5	8.0

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

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
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 Atlantic Richfield Company

Task Order No. 5387-92-2A

Chain of Custody

ARCO Facility no. 5387	City (Facility) SAN LORENZO	Project manager (Consultant) JOHN VARGAS	Laboratory name SEQUOIA
ARCO engineer MICHAEL WHELAN	Telephone no. (ARCO) (415)-571-2434	Telephone no. (Consultant) (510)-352-4800	Fax no. (Consultant) (510)-782-1029
Consultant name GeoSTRATEGIES INC.	Address (Consultant) 2140 W. WINTON AVE., HAYWARD, CA.		Contract number 07.072

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 Volatile ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
A-10-13.0		1	X			X		11/18/92	10:18		X						Z11	345.0				
A-10-K5		1	X			X		11/18/92	10:39		X						↓	51				

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number

Turnaround time

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

Method of shipment: COURIER

Condition of sample: Good

Temperature received: Cool

	Date	Time
Relinquished by sampler: [signature]	11/19/92	14:10
Received by: [signature]		
Relinquished by: [signature]	11/19/92	1555
Received by: [signature]		
Received by laboratory: [signature]	11.19.92	15:55

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 Vargas

Project: 5387-92-2A, Arco 5387-San Lorenzo

Enclosed are the results from 2 water samples received at Sequoia Analytical on December 7,1992. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
2121657	Water, A-10	12/7/92	EPA 5030/8015/8020
2121658	Water, Trip Blank	12/7/92	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

Nokowhat D. Herrera
Project Manager

92-A

SEQUOIA ANALYTICAL

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

Gettler Ryan	Client Project ID:	5387-92-2A, Arco 5387-San Lorenzo	Sampled:	Dec 7, 1992
2150 W. Winton Avenue	Sample Matrix:	Water	Received:	Dec 7, 1992
Hayward, CA 94545	Analysis Method:	EPA 5030/8015/8020	Reported:	Dec 21, 1992
Attention: John Vargas	First Sample #:	212-1657		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 212-1657 A-10	Sample I.D. 212-1658 Trip Blank	Sample I.D.	Sample I.D.	Sample I.D.	Sample I.D.
Purgeable Hydrocarbons	50	660	N.D.				
Benzene	0.50	30	N.D.				
Toluene	0.50	N.D.	N.D.				
Ethyl Benzene	0.50	N.D.	N.D.				
Total Xylenes	0.50	N.D.	N.D.				
Chromatogram Pattern:		Gas	Gas				

Quality Control Data

Report Limit Multiplication Factor:	5.0	1.0
Date Analyzed:	12/11/92	12/11/92
Instrument Identification:	GCHP-2	GCHP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	107	102

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
Project Manager

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: 5387-92-2A, Arco 5387-San Lorenzo

QC Sample Group: 2121657 - 58

Reported: Dec 21, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	M.Nipp	M.Nipp	M.Nipp	M.Nipp
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Dec 11, 1992	Dec 11, 1992	Dec 11, 1992	Dec 11, 1992
QC Sample #:	GBLK121192	GBLK121192	GBLK121192	GBLK121192
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	10	10	10	31
Matrix Spike % Recovery:	100	100	100	103
Conc. Matrix Spike Dup.:	10	10	10	30
Matrix Spike Duplicate % Recovery:	100	100	100	100
Relative % Difference:	0.0	0.0	0.0	3.3

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

SEQUOIA ANALYTICAL

Nokowhat D. Herrera
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. 5387-92-2A

Chain of Custody

ARCO Facility no. 5387	City (Facility) San Lorenzo	Project manager (Consultant) John Vargar	Laboratory name SEQ
ARCO engineer Mike Wheeler	Telephone no. (ARCO)	Telephone no. (Consultant) 510-783-7500	Fax no. (Consultant) 510-783-7089
Consultant name Geotech Ryan Inc	Address (Consultant) 2150 W. Winton Hayward CA		Contract number 07-073

Method of shipment: 61R

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	EPA 610	EPA 625/8270	TCLP Metals ☐ Semi ☐ VOA ☐	CAM 6010/7000 Metals ☐ TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	
A-10		2		X		X	X	12-7-92	13:35		X			2	1	2	1	6	5	7	
Trip Blank		1		X		X	X	—	—		X			2	1	2	1	6	5	8	

Special detection Limit/reporting: Standard

Special QA/QC: Standard

Remarks: GR# 3926.05

Lab number:

Turnaround time

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

Condition of sample:

Temperature received:

	Date	Time		Date	Time
Relinquished by sampler	12-7-92	19:55	Received by		
Relinquished by			Received by		
Relinquished by			Received by laboratory	12/7/92	1955

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 # 37-6...

LOCATION Sunset / Hesperian DATE 12-...-92

CITY San Lorenzo CA TIME

Well ID. A-10 Well Condition Shut

Well Diameter 2" in. Hydrocarbon Thickness — ft.

Total Depth 34.03 ft.

Depth to Liquid- 16.01 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) 3 x 17.62 x(VF) 0.17 = (Estimated Purge Volume) 3.0 (15) gal.

Purging Equipment ~~Bailer~~ Suction

Sampling Equipment Bailer

Starting Time 13:25 Purging Flow Rate — gpm.

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

Time	pH	Conductivity	Temperature	Volume
13:26	7.45	1465	19.3	3
13:27	7.42	1328	19.1	6
13:28	7.04	1332	19.2	9
13:29	7.02	1337	19.1	12
13:30	7.03	1336	19.1	15

Did well dewater? No If yes, time Volume

Sampling Time 13:35 Weather Conditions

Analysis Bottles Used

Chain of Custody Number

COMMENTS D.T.W. 0.35

FOREMAN [signature] ASSISTANT

12-11-92

926

EMCON ASSOCIATES
Consultants in Wastes Management and Environmental Control

Date December 3, 1992
Project 0G70-034.01

To:
Mr. John Vargas
GeoStrategies Inc.
2140 West Winton Avenue
Hayward, California 94545

We are enclosing:

Copies	Description
1	Depth To Water / Floating Product Survey Results
1	Summary of Groundwater Monitoring Data
1	Certified Analytical Reports with Chain-of-Custody
10	Water Sample Field Data Sheets

For your: X Information Sent by: X Mail

Comments:

Enclosed are the data from the fourth quarter 1992 monitoring event at ARCO service station 5387, 20200 Hesperian Boulevard, San Lorenzo, CA. Groundwater monitoring is conducted consistent with applicable regulatory guidelines. Please call if you have any questions: (408) 453-2266.

Jim Butera JB

Reviewed by:

REGISTERED PROFESSIONAL ENGINEER ROBERT CURTIS PORTER No: 4094 Exp. 6/30/96 INDUSTRIAL STATE OF CALIFORNIA

Robert Porter, Senior Project Engineer.

1938 Junction Avenue, San Jose, California 95131-2102, (408) 453-0719, Fax (408) 453-0452

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-034.01 STATION ADDRESS : 20200 Hesperian Blvd., Hayward DATE : 11-12-92

ARCO STATION # : 5387 FIELD TECHNICIAN : T.G / M.G. DAY : THURSDAY

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	A-8	OK	YES	NO	2268	OK	14.35	14.35	ND	NR	34.5	WATER IN BOX LOSE CAP
2	A-9	OK	YES	NO	2268	OK	16.29	16.29	ND	NR	32.2	WATER IN BOX
3	A-6	OK	YES	YES	2268	OK	16.35	16.35	ND	NR	34.8	WATER IN BOX NEEDS NEW CAP
4	A-7	OK	YES	NO	2268	OK	17.47	17.47	ND	NR	35.5	NEEDS NEW CAP
5	A-5	OK	YES	YES	2268	OK	16.35	16.35	ND	NR	30.0	WATER IN BOX
6	AR-1	OK	YES	YES	2268	OK	15.36	15.36	ND	NR	34.8	—
7	A-4	OK	YES	YES	2268	OK	16.97	16.97	ND	NR	35.0	—
8	MW-1	OK	YES	NO	2268	OK	15.46	15.46	ND	NR	29.1	STRONG ODOR WATER IN BOX
9	MW-2	OK	YES	NO	2268	OK	15.98	15.98	ND	NR	27.2	WATER IN BOX
10	MW-3	OK	YES	NO	2268	OK	14.92	14.93	ND	NR	27.3	WATER IN BOX NEXT TO PROPERTY
												RUN OFF DRAIN (CAP SEMI-LOSE)

SURVEY POINTS ARE TOP OF WELL BOXES

Summary of Groundwater Monitoring Data
Fourth Quarter 1992
ARCO Service Station 5387
20200 Hesperian Boulevard, San Lorenzo, California
micrograms per liter (µg/l) or parts per billion (ppb)

Well ID and Sample Depth	Sampling Date	Depth To Water (feet)	Floating Product Thickness (feet)	TPH[1] as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Total Xylenes (ppb)
MW-1(28)	11/12/92	15.46	ND.[2]	1,600.	310.	7.2	22.	8.9
MW-2(26)	11/12/92	15.98	ND.	16,000.	3,800.	86.	470.	910.
MW-3(26)	11/12/92	14.92	ND.	7,400.	400.	<25	860.	330.
A-4(34)	11/12/92	16.97	ND.	610.	7.2	0.98	34.	0.97
A-5(29)	11/12/92	16.35	ND.	520.	12.	0.96	29.	36.
A-6(33)	11/12/92	16.35	ND.	<50.	<0.5	<0.5	<0.5	<0.5
A-7(34)	11/12/92	17.47	ND.	760.	17.	0.83	50.	73.
A-8(33)	11/12/92	14.35	ND.	<50.	<0.5	<0.5	<0.5	<0.5
A-9(31)	11/12/92	16.29	ND.	<50.	<0.5	<0.5	<0.5	<0.5
AR-1(33)	11/12/92	15.36	ND.	140.	66.	<0.5	4.3	3.7
X-Dup-1	11/12/92	NA.[3]	NA.	18,000.	3,900.	100.	480.	920.
TB-1[4]	9/3/92	NA.	NA.	<50.	<0.5	<0.5	<0.5	<0.5

1. TPH. = Total petroleum hydrocarbons
2. ND. = Not detected
3. NA. = Not applicable
4. TB. = Trip blank

SEQUOIA ANALYTICAL

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

Emcon Associates
1938 Junction Avenue
San Jose, CA 95131
Attention: Jim Butera

Project: EMCGC-92-1/Arco 5387, Hayward

Enclosed are the results from 12 water samples received at Sequoia Analytical on November 13,1992. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
2112549	Water, A-4 (34)	11/12/92	EPA 5030/8015/8020
2112550	Water, A-5 (29)	11/12/92	EPA 5030/8015/8020
2112551	Water, A-6 (33)	11/12/92	EPA 5030/8015/8020
2112552	Water, A-7 (34)	11/12/92	EPA 5030/8015/8020
2112553	Water, A-8 (33)	11/12/92	EPA 5030/8015/8020
2112554	Water, MW-1 (28)	11/12/92	EPA 5030/8015/8020
2112555	Water, MW-2 (26)	11/12/92	EPA 5030/8015/8020
2112556	Water, MW-3 (26)	11/12/92	EPA 5030/8015/8020
2112557	Water, AR-1 (33)	11/12/92	EPA 5030/8015/8020
2112558	Water, X-Dup-1	11/12/92	EPA 5030/8015/8020
2112559	Water, A-9 (31)	11/12/92	EPA 5030/8015/8020
2112560	Water, TB-1	9/3/92	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

Eileen A. Manning
Project Manager

SEQUOIA ANALYTICAL

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

Emcon Associates	Client Project ID:	EMCGC-92-1/Arco 5387, Hayward	Sampled:	Nov 12, 1992
1938 Junction Avenue	Sample Matrix:	Water	Received:	Nov 13, 1992
San Jose, CA 95131	Analysis Method:	EPA 5030/8015/8020	Reported:	Dec 1, 1992
Attention: Jim Butera	First Sample #:	211-2549		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 211-2549 A-4 (34)	Sample I.D. 211-2550 A-5 (29)	Sample I.D. 211-2551 A-6 (33)	Sample I.D. 211-2552 A-7 (34)	Sample I.D. 211-2553 A-8 (33)	Sample I.D. 211-2554 MW-1 (28)
Purgeable Hydrocarbons	50	610	520	N.D.	760	N.D.	1,600
Benzene	0.50	7.2	12	N.D.	17	N.D.	310
Toluene	0.50	0.98	0.96	N.D.	0.83	N.D.	7.2
Ethyl Benzene	0.50	34	29	N.D.	50	N.D.	22
Total Xylenes	0.50	0.97	36	N.D.	73	N.D.	8.9
Chromatogram Pattern:		Gas	Gas	--	Gas	--	Gas

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0	5,.0
Date Analyzed:	11/20/92	11/20/92	11/19/92	11/19/92	11/19/92	11/23/92
Instrument Identification:	GCHP-3	GCHP-3	GCHP-2	GCHP-2	GCHP-2	GCHP-6
Surrogate Recovery, %: (QC Limits = 70-130%)	112	105	105	114	101	116

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Eileen A. Manning
Project Manager

SEQUOIA ANALYTICAL

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Emcon Associates	Client Project ID:	EMCGC-92-1/Arco 5387, Hayward	Sampled:	Nov 12, 1992
1938 Junction Avenue	Sample Matrix:	Water	Received:	Nov 13, 1992
San Jose, CA 95131	Analysis Method:	EPA 5030/8015/8020	Reported:	Dec 1, 1992
Attention: Jim Butera	First Sample #:	211-2555		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 211-2555 MW-2 (26)	Sample I.D. 211-2556 MW-3 (26)	Sample I.D. 211-2557 AR-1 (33)	Sample I.D. 211-2558 X-Dup-1	Sample I.D. 211-2559 A-9 (31)	Sample I.D. 211-2560 TB-1
Purgeable Hydrocarbons	50	16,000	7,400	140	18,000	N.D.	N.D.
Benzene	0.50	3,800	400	66	3,900	N.D.	N.D.
Toluene	0.50	86	N.D.	N.D.	100	N.D.	N.D.
Ethyl Benzene	0.50	470	860	4.3	480	N.D.	N.D.
Total Xylenes	0.50	910	330	3.7	920	N.D.	N.D.
Chromatogram Pattern:		Gas	Gas	Gas	Gas	--	--

Quality Control Data

Report Limit Multiplication Factor:	100	50.0	1.0	100	1.0	1.0
Date Analyzed:	11/20/92	11/20/92	11/19/92	11/20/92	11/19/92	11/19/92
Instrument Identification:	GCHP-3	GCHP-3	GCHP-2	GCHP-3	GCHP-2	GCHP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	114	98	103	103	119	103

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

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Eileen A. Manning
Project Manager

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Emcon Associates	Client Project ID:	EMCGC-92-1/Arco 5387, Hayward	Sampled:	Nov 12, 1992
1938 Junction Avenue	Sample Matrix:	Water	Received:	Nov 13, 1992
San Jose, CA 95131	Analysis Method:	EPA 5030/8015/8020	Reported:	Dec 1, 1992
Attention: Jim Butera	First Sample #:	211-2555		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 211-2555 MW-2 (26)	Sample I.D. 211-2556 MW-3 (26)	Sample I.D. 211-2557 AR-1 (33)	Sample I.D. 211-2558 X-Dup-1	Sample I.D. 211-2559 A-9 (31)	Sample I.D. 211-2560 TB-1
Purgeable Hydrocarbons	50	16,000	7,400	140	18,000	N.D.	N.D.
Benzene	0.50	3,800	400	66	3,900	N.D.	N.D.
Toluene	0.50	86	N.D.	N.D.	100	N.D.	N.D.
Ethyl Benzene	0.50	470	860	4.3	480	N.D.	N.D.
Total Xylenes	0.50	910	330	3.7	920	N.D.	N.D.
Chromatogram Pattern:		Gas	Gas	Gas	Gas	--	--

Quality Control Data

Report Limit Multiplication Factor:	100	50.0	1.0	100	1.0	1.0
Date Analyzed:	11/20/92	11/20/92	11/19/92	11/20/92	11/19/92	11/19/92
Instrument Identification:	GCHP-3	GCHP-3	GCHP-2	GCHP-3	GCHP-2	GCHP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	114	98	103	103	119	103

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard.
Analytes reported as N.D. were not detected above the stated reporting limit.

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Eileen A. Manning
Project Manager

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Emcon Associates
1938 Junction Avenue
San Jose, CA 95131
Attention: Jim Butera

Client Project ID: EMCGC-92-1/Arco 5387, Hayward

QC Sample Group: 2112549-60

Reported: Dec 1, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	M. Nipp	M. Nipp	M. Nipp	M. Nipp
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Nov 20, 1992	Nov 20, 1992	Nov 20, 1992	Nov 20, 1992
QC Sample #:	GBLK112092	GBLK112092	GBLK112092	GBLK112092
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	31
Matrix Spike Duplicate % Recovery:	100	100	100	103
Relative % Difference:	0.0	0.0	0.0	3.3

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

SEQUOIA ANALYTICAL

Eileen A. Manning
Project Manager

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

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

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Attention: Jim Butera

Client Project ID: EMCGC-92-1/Arco 5387, Hayward

QC Sample Group: 2112549-60

Reported: Dec 1, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	M. Nipp	M. Nipp	M. Nipp	M. Nipp
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Nov 19, 1992	Nov 19, 1992	Nov 19, 1992	Nov 19, 1992
QC Sample #:	GBLK111992	GBLK111992	GBLK111992	GBLK111992
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

Eileen A. Manning
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

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Emcon Associates
1938 Junction Avenue
San Jose, CA 95131
Attention: Jim Butera

Client Project ID: EMCGC-92-1/Arco 5387, Hayward

QC Sample Group: 2112549-60

Reported: Dec 1, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	R. Lee	R. Lee	R. Lee	R. Lee
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Nov 23, 1992	Nov 23, 1992	Nov 23, 1992	Nov 23, 1992
QC Sample #:	GBLK112392	GBLK112392	GBLK112392	GBLK112392
Sample Conc.:	N.D.	N.D.	N.D.	ND..
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	10	10	11	32
Matrix Spike % Recovery:	100	100	110	107
Conc. Matrix Spike Dup.:	10	10	10	32
Matrix Spike Duplicate % Recovery:	100	100	100	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

Eileen A. Manning
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. EMCGC-92-1

Chain of Custody

ARCO Facility no. 5387	City (Facility) HAYWARD	Project manager (Consultant) JIM BUTERA	Laboratory name SEQUOIA
ARCO engineer KYLE CHRISTIE	Telephone no. (ARCO) 571-2434	Telephone no. (Consultant) 453-0719	Fax no. (Consultant) 453-0452
Consultant name EMCON ASSOCIATES	Address (Consultant) 1938 JUNCTION AVE. SAN JOSE, CA.		Contract number

Method of shipment: CARRIER WILL DELIVER

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 ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	
A-4 (34)		2		X		X	HCL	11-12-92	1430		X								2112549		
A-5 (29)									1222		X									50	
A-6 (33)									1110		X									51	
A-7 (34)									1145		X									52	
A-8 (33)									1008		X									53	
MW-1 (28)									1455		X									54	
MW-2 (26)									1545		X									55	
MW-3 (26)									1515		X									56	
AR-1 (33)									1318		X									57	
X-DUP-1									—		X									58	
TB-1								9-3-92	0800		X								2112560		
A-9 (31)									1030		X								2112559		

COPY

Special detection Limit/reporting: LOWEST POSSIBLE

Special QA/QC: AS NORMAL

Remarks: 2 - 40 ML. VOA 's

Lab number

Turnaround time

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

Condition of sample:

Temperature received:

	Date	Time		Date	Time
Relinquished by Sampler	11/13/92	2:45	Received by	11-13-92	2:45
Relinquished by	11-13-92	3:22	Received by		
Relinquished by	Date	Time	Received by laboratory	13 NOV 92	1522

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

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-034.01 SAMPLE ID: MW-1 (28)

PURGED BY: IAN GRAHAM CLIENT NAME: ARCO # 5387

SAMPLED BY: IAN GRAHAM LOCATION: 20200 HESPERIAN BLVD. HAYWARD, CA.

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 X 3 ___ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 2.23

DEPTH TO WATER (feet): 15.46 CALCULATED PURGE (gal.): 11.18

DEPTH OF WELL (feet): 29.1 13.64 ACTUAL PURGE VOL. (gal.): 12.0

DATE PURGED: 11-12-92 Start (2400 Hr) 1438 End (2400 Hr) 1453

DATE SAMPLED: 11-12-92 Start (2400 Hr) 1455 End (2400 Hr) 1455

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1441	2.5	6.55	1346	67.4	GRY / GRN	HEAVY
1444	5.0	6.57	1310	67.9	"	"
1448	7.5	6.55	1231	67.6	"	"
1450	10.0	6.56	1285	67.5	"	"
1453	12.0	6.55	1269	67.3	"	"

D. O. (ppm): NR ODOR: STRONG

COLOR: NR (COBALT 0 - 100) TURBIDITY: NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NONE

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: 2268

REMARKS: ___

Meter Calibration: Date: 11-12-92 Time: 1400 Meter Serial #: 9105 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-4

Signature: [signature] Reviewed By: JB Page 1 of 10

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-034.01 SAMPLE ID: MW-2 (26)

PURGED BY: IAN GRAHAM CLIENT NAME: ARCO # 5387

SAMPLED BY: IAN GRAHAM LOCATION: 20200 HESPERIAN BLVD. HAYWARD, CA.

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 X 3 ___ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	1.84
DEPTH TO WATER (feet):	15.98	CALCULATED PURGE (gal.):	9.20
DEPTH OF WELL (feet):	27.2 / 11.22	ACTUAL PURGE VOL (gal.):	10.0

DATE PURGED: 11-12-92 Start (2400 Hr) 1530 End (2400 Hr) 1543

DATE SAMPLED: 11-12-92 Start (2400 Hr) 1545 End (2400 Hr) 1545

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1532	2.0	6.41	1413	69.2	GRY/GRN	HEAVY
1535	4.0	6.47	1410	69.5	"	"
1538	6.0	6.53	1404	69.2	"	"
1541	8.0	6.50	1405	69.2	"	"
1543	10.0	6.50	1413	69.5	"	"

D. O. (ppm): NR ODOR: STRONG

COLOR: NR (COBALT 0 - 100) TURBIDITY: NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): X-DUP-1 / FB-1

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: 2268

REMARKS: ___

Meter Calibration: Date: 11-12-92 Time: 1400 Meter Serial #: 9105 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-4

Signature: [signature] Reviewed By: JB Page 2 of 10

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-034.01 SAMPLE ID: MW-3 (26)

PURGED BY: IAN GRAHAM CLIENT NAME: ARCO # 5387

SAMPLED BY: IAN GRAHAM LOCATION: 20200 HESPERIAN BLVD, HAYWARD, CA.

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 X 3 ___ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 2.02

DEPTH TO WATER (feet): 14.93 CALCULATED PURGE (gal.): 10.14

DEPTH OF WELL (feet): 27.3 (12.37) ACTUAL PURGE VOL (gal.): 10.5

DATE PURGED: 11-2-92 Start (2400 Hr) 1500 End (2400 Hr) 1513

DATE SAMPLED: 11-2-92 Start (2400 Hr) 1515 End (2400 Hr) 1515

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1502	2.0	6.16	1243	68.3	GRY/GRN	HEAVY
1505	4.0	6.41	1239	68.8	"	"
1509	6.0	6.43	1241	68.7	"	"
1511	8.0	6.58	1235	68.2	"	"
1513	10.5	6.61	1228	68.1	"	"

D. O. (ppm): NR ODOR: STRONG COLOR: NR (COBALT 0 - 100) TURBIDITY: NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NONE

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: 2268

REMARKS: WATER WAS SILTY

Meter Calibration: Date: 11-12-92 Time: 1400 Meter Serial #: 9105 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-4

Signature: [signature] Reviewed By: JB Page 3 of 10

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-034.01 SAMPLE ID: A-5(29)

PURGED BY: M. GALLEGOS CLIENT NAME: ARCO # 5387

SAMPLED BY: M. GALLEGOS LOCATION: 20200 HESPERIAN BLVD, HAYWARD, CA.

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 X 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	5.07
DEPTH TO WATER (feet):	16.35	CALCULATED PURGE (gal.):	25.39
DEPTH OF WELL (feet):	30.0 / 13.65	ACTUAL PURGE VOL. (gal.):	27.0

DATE PURGED: 11-12-92 Start (2400 Hr) 1205 End (2400 Hr) 1221

DATE SAMPLED: 11-12-92 Start (2400 Hr) 1222 End (2400 Hr) 1222

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1207	5.5	6.53	1140	66.8	BROWN	HEAVY
1210	11.0	6.55	1147	67.5	"	"
1213	16.5	6.50	1134	67.2	"	"
1217	22.0	6.53	1125	66.7	GREY	"
1221	27.0	6.55	1121	66.5	"	"

D. O. (ppm): NR ODOR: STRONG NR (COBALT 0 - 100) NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NONE

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: 2268

REMARKS: ___

Meter Calibration: Date: 11-12-92 Time: 0945 Meter Serial #: 9105 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-8

Signature: ___ Reviewed By: JB Page 5 of 10

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: DG70-034.01 | SAMPLE ID: A-6 (33)

PURGED BY: M. GALLEGOS | CLIENT NAME: ARCO # 5387

SAMPLED BY: M. GALLEGOS | LOCATION: 20200 HESPERIAN BLVD, HAYWARD, CA.

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 X 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR | VOLUME IN CASING (gal.): 6.86

DEPTH TO WATER (feet): 16.35 | CALCULATED PURGE (gal.): 34.31

DEPTH OF WELL (feet): 34.8 / 18.45 | ACTUAL PURGE VOL. (gal.): 35.0

DATE PURGED: 11-12-92 | Start (2400 Hr) 1050 | End (2400 Hr) 1107

DATE SAMPLED: 11-12-92 | Start (2400 Hr) 1110 | End (2400 Hr) 1110

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1052	7.0	6.71	944	65.2	BROWN	HEAVY
1055	14.0	6.68	975	65.1	"	"
1059	21.0	6.67	1027	64.7	GREY (LT.)	"
1103	28.0	6.65	1023	64.2	"	"
1107	35.0	6.74	1011	64.5	"	"

D. O. (ppm): NR | ODOR: ND | COLOR: NR (COBALT 0 - 100) | TURBIDITY: NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NONE

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK | LOCK #: 2265

REMARKS: NEEDS NEW LOCKING WELL CAP

Meter Calibration: Date: 11-12-92 Time: 0945 Meter Serial #: 9105 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-8

Signature: ___ Reviewed By: JB

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: OG70-034.01 SAMPLE ID: A-7 (34)

PURGED BY: M. GALLEGOS CLIENT NAME: ARCO # 5387

SAMPLED BY: M. GALLEGOS LOCATION: 20200 HESPERIAN BLVD, HAYWARD, CA.

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 X 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	6.71
DEPTH TO WATER (feet):	17.46	CALCULATED PURGE (gal.):	33.55
DEPTH OF WELL (feet):	35.5 / 18.04	ACTUAL PURGE VOL. (gal.):	35.0

DATE PURGED: 11-12-92 Start (2400 Hr) 1125 End (2400 Hr) 1143

DATE SAMPLED: 11-12-92 Start (2400 Hr) 1145 End (2400 Hr) 1145

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1128	7.0	6.73	1149	65.7	BROWN	HEAVY
1132	14.0	6.71	1113	67.4	"	"
1135	21.0	6.67	1144	67.6	"	"
1139	28.0	6.69	1123	66.4	GREY	"
1143	35.0	6.74	1144	67.2	"	"

D. O. (ppm): NR ODOR: NO NR (COBALT 0 - 100) NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NONE

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: 2268

REMARKS: NEEDS NEW LOCKING CAP

Meter Calibration: Date: 11-12-92 Time: 0945 Meter Serial #: 9105 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-8

Signature: ___ Reviewed By: ___ Page 7 of 10

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: DG70-034.01 | SAMPLE ID: A-8 (33)

PURGED BY: M. GALLEGOS | CLIENT NAME: ARCO # 5387

SAMPLED BY: M. GALLEGOS | LOCATION: 20200 HESPERIAN BLVD, HAYWARD, CA.

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 X 3 ___ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR | VOLUME IN CASING (gal.): 3.30

DEPTH TO WATER (feet): 14.35 | CALCULATED PURGE (gal.): 16.52

DEPTH OF WELL (feet): 34.5 20.15 | ACTUAL PURGE VOL. (gal.): 18.0

DATE PURGED: 11-12-92 | Start (2400 Hr) 0950 | End (2400 Hr) 1006

DATE SAMPLED: 11-12-92 | Start (2400 Hr) 1008 | End (2400 Hr) 1009

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
0952	3.5	6.53	1153	64.4	BROWN	HEAVY
0955	7.0	6.52	1097	66.4	"	"
0958	10.5	6.59	1053	67.1	"	"
1002	14.0	6.59	1050	67.0	"	"
1006	18.0	6.61	1065	66.7	"	"

D. O. (ppm): NR | ODOR: ND | COLOR: NR (COBALT 0 - 100) | TURBIDITY: NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NONE

PURGING EQUIPMENT			SAMPLING EQUIPMENT		
___ 2" Bladder Pump	___ Bailer (Teflon®)		___ 2" Bladder Pump	X Bailer (Teflon®)	
X Centrifugal Pump	___ Bailer (PVC)		___ DDL Sampler	___ Bailer (Stainless Steel)	
___ Submersible Pump	___ Bailer (Stainless Steel)		___ Dipper	___ Submersible Pump	
___ Well Wizard™	___ Dedicated		___ Well Wizard™	___ Dedicated	
Other: ___			Other: ___		

WELL INTEGRITY: OK | LOCK #: 2268

REMARKS: PURGE AT LOW SPEED, NO PROBLEMS W/ WATER LEVELS OR DRYING

Meter Calibration: Date: 11-12-92 Time: 0945 Meter Serial #: 9105 Temperature °F: 60.5

(EC 1000 1069 / 1000) (DI 9.80) (pH 7 6.88 / 7.00) (pH 10 10.10 / 10.00) (pH 4 3.92 / ___)

Location of previous calibration: ___

Signature: ___ Reviewed By: JB Page 8 of 11

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: DG70-034.01 SAMPLE ID: A-9 (31)

PURGED BY: M. GALLEGOS CLIENT NAME: ARCO # 5387

SAMPLED BY: M. GALLEGOS LOCATION: 20200 HESPERIAN BLVD, HAYWARD, CA.

TYPE: Ground Water X Surface Water ____ Treatment Effluent ____ Other ____

CASING DIAMETER (inches): 2 X 3 ____ 4 ____ 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	2.61
DEPTH TO WATER (feet):	16.28	CALCULATED PURGE (gal.):	13.05
DEPTH OF WELL (feet):	32.2 / 15.92	ACTUAL PURGE VOL. (gal.):	14.0

DATE PURGED: 11-12-92 Start (2400 Hr) 1015 End (2400 Hr) 1029

DATE SAMPLED: 11-12-92 Start (2400 Hr) 1030 End (2400 Hr) 1030

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1017	3.0	6.72	1085	66.7	BROWN	HEAVY
1019	6.0	6.77	1087	67.2	"	"
1022	9.0	6.76	1083	67.0	"	"
1025	12.0	6.75	1076	66.7	"	"
1029	14.0	6.72	1079	66.7	"	"

D. O. (ppm): NR ODOR: ND NR (COBALT 0 - 100) NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NONE

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
____ 2" Bladder Pump	____ Bailer (Teflon®)	____ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	____ Bailer (PVC)	____ DDL Sampler	____ Bailer (Stainless Steel)
____ Submersible Pump	____ Bailer (Stainless Steel)	____ Dipper	____ Submersible Pump
____ Well Wizard™	____ Dedicated	____ Well Wizard™	____ Dedicated
Other: ____		Other: ____	

WELL INTEGRITY: OK LOCK #: 2269

REMARKS: ____

Meter Calibration: Date: 11-12-92 Time: 0945 Meter Serial #: 9105 Temperature °F: ____

(EC 1000 ____ / ____) (DI ____) (pH 7 ____ / ____) (pH 10 ____ / ____) (pH 4 ____ / ____)

Location of previous calibration: A-8

Signature: ____ Reviewed By: JB Page 9 of 10

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-034.01 SAMPLE ID: AR-1 (33)

PURGED BY: IAN GRAHAM CLIENT NAME: ARCO # 5387

SAMPLED BY: IAN GRAHAM LOCATION: 20200 HESPERIAN BLVD. HAYWARD, CA.

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 ___ 4.5 ___ 6 X Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 28.55

DEPTH TO WATER (feet): 15.35 CALCULATED PURGE (gal.): 142.76

DEPTH OF WELL (feet): 34.8 / 11.45 ACTUAL PURGE VOL. (gal.): 145.0

DATE PURGED: 11-12-92 Start (2400 Hr) 1240 End (2400 Hr) 1314

DATE SAMPLED: 11-12-92 Start (2400 Hr) 1318 End (2400 Hr) 1318

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1245	29.0	6.81	1131	68.3	LT. YELLOW	MODERATE
1250	58.0	6.75	1113	69.4	CLEAR	LIGHT
1259	87.0	6.69	1116	69.7	"	"
1308	116.0	6.61	1101	70.6	"	"
1314	145.0	6.69	1105	71.2	"	"

D. O. (ppm): NR ODOR: STRONG NR (COBALT 0 - 100) NR (NTU 0 - 200)

FIELD QC SAMPLES COLLECTED AT THIS WELL (i.e. FB-1, XDUP-1): NONE

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
X Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: 2268

REMARKS: ___

Meter Calibration: Date: 11-12-92 Time: 0945 Meter Serial #: 9105 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: A-8

Signature: [signature] Reviewed By: JB Page 10 of 10