GeoStrategies Inc.

CONTINUING SITE ASSESSMENT/QUARTERLY MONITORING REPORT - Third Quarter 1992

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

792605-7

December 21, 1992

GeoStrategies Inc.

December 21, 1992

ARCO Products Company
Post Office Box 5811
San Mateo, California

Attn: Mr. Michael Whelan

Re: **CONTINUING SITE ASSESSMENT/QUARTERLY MONITORING REPORT - Third Quarter 1992**
ARCO Service Station No. 5387
20200 Hesperian Boulevard
San Lorenzo, California

Mr. Whelan:

This Continuing Site Assessment/Quarterly Monitoring Report was prepared by GeoStrategies Inc. (GSI) and presents third quarter, 1992 field activities and ground-water sampling results for the above referenced location (Plate 1). On August 25 and 26, 1992 three exploratory soil borings were drilled and completed as recovery well AR-1 and monitoring wells A-8 and A-9 as outlined in the GSI Work Plan dated July 14, 1992. Well locations are shown on Plate 2. An additional proposed monitoring well (A-10) could not be installed during this phase of work due to utility obstructions. This well was completed on November 18, 1992 and will be described in a fourth quarter, 1992 Quarterly Monitoring/Well Installation Report. Quarterly monitoring and sampling of site wells were conducted by the ARCO contractor for the third quarter on September 14, 1992. Step-drawdown and constant-rate aquifer tests were performed on October 13 and 14, 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, 1992.

792605-7

SITE BACKGROUND

In August 1986, ARCO Products Company retained Groundwater Technology Inc. (GTI) to conduct and environmental investigation at the site. GTI drilled seven exploratory soil borings designated SB-1 through SB-4 and MW-1 through MW-3 (Plate 2). Borings MW-1 through MW-3 were completed as groundwater monitoring wells. Soil samples from the sample interval above first encountered water were analyzed for petroleum hydrocarbons. Soil samples from Borings SB-2, SB-3, and SB-4 were reported to contain petroleum hydrocarbons at concentrations of 49 parts per million (ppm), 42 ppm, and 20 ppm, respectively. Petroleum hydrocarbons were detected in groundwater samples from Wells MW-1 through MW-3 at concentrations ranging between 2.9 ppm and 14 ppm. Results of this investigation are presented in the GTI report dated August 21, 1986.

In October and December, 1991, GSI installed four additional groundwater monitoring wells designated A-4 through A-7. Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) were detected in the soil sample from Boring A-4 at a depth of 10 feet below grade at a concentration of 24 ppm. The remainder of the soil samples were reported as none detected (ND) for TPH-Gasoline. Groundwater samples collected from the entire monitoring network were analyzed for TPH-Gasoline and Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX). TPH-Gasoline was detected in six of the seven wells at concentrations ranging between 1,600 and 23,000 parts per billion (ppb).

There are currently nine groundwater 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 three wells are located off-site (Wells A-7 through A-9). These wells were installed to evaluate the horizontal and vertical extent of petroleum hydrocarbons in soil and groundwater beneath the site.

Quarterly ground-water monitoring and sampling of site wells began in December, 1991. Ground-water samples are currently analyzed for TPH-Gasoline according to EPA Method 8015 (Modified) and BTEX according to EPA Method 8020.

WELL INSTALLATION FIELD ACTIVITIES

Two off-site exploratory soil borings and one on-site exploratory soil boring were drilled on August 25 and 26, 1992, using a truck-mounted, hollow-stem auger drilling rig. Borings AR-1, A-8, and A-9 were drilled to total depths 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 each sampled interval, 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.

Recovery Well Installation

Boring AR-1 was drilled using 8-inch diameter and 12-inch diameter hollow-stem augers to a depth of 35.0 feet below existing ground surface. Recovery well AR-1 was constructed using 6-inch-diameter Schedule 40 PVC well casing and carbon steel 0.020-inch continuous wrap well screen to a depth of 35.0 feet. The well screen extends from 9.0 to 34.0 feet below grade. Lonestar #2/12 graded sand was placed in the annular space across the entire screened interval and extends 1.0-foot above the top of the well screen. A 10-foot thick bentonite seal was placed above the sandpack and was then hydrated with clean water. A neat cement seal was placed from the top of the bentonite to 1.0-foot below ground surface. A waterproof underground vault box, set in concrete, was installed over the top of the well and water locking well cap and lock were placed on the well casing. After the cement seal has cured for a minimum of 12 hours, the well was developed using methods outlined in GSI's Field Methods and Procedures.

Monitoring Well Installation

Borings A-8 through A-9 were installed using 8-inch diameter hollow-stem augers to a depth of 35.0 feet below grade. Bentonite was placed in the lower 1.0-foot of Boring A-9 as a bottom seal. Groundwater monitoring wells A-8 and A-9 were constructed using 2-inch diameter Schedule PVC blank well casing and 0.020-inch factory slotted well screen to depths of 35.0 and 34.0 feet, respectively. Well screens extend from 10.0 to 35.0 feet in Well A-8 and from 10.0 to 34.0 feet in Well A-9. 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. An underground vault box, set in concrete, was installed over the top of Well A-8 and a traffic-rated underground vault box, set in concrete, was installed over the top of Well

A-9. Waterproof locking well caps and locks were placed on the well casings. Well completion details are presented with the Exploratory Boring Logs 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. Five soil samples from Borings A-8, A-9, and AR-1, collected at depths ranging between 10 and 15 feet below grade, were selected for chemical analysis. TPH-Gasoline was detected in the soil samples from Boring AR-1 at depths of 10 and 14.5 feet, at concentrations of 1.0 parts per million (ppm) and 8.8 ppm, respectively. Benzene was identified in these soil samples at concentrations of 0.16 ppm and 0.030 ppm, respectively. TPH-Gasoline and BTEX were reported as ND for samples analyzed from Borings A-8 and A-9. The Sequoia chemical analytical report and Chain-of-Custody form are presented in Appendix B.

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 other, 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-8, A-9, and AR-1 encountered silt and clay to depths between 19 feet (A-8) and 26.5 feet (AR-1). The clay and silt are underlain by interbedded sand, silty sand and minor gravel to depth ranging between 31.5 feet and 34 feet below grade. Each boring was terminated in clay or silty clay at a depth of 35.0 feet. Geologic cross-sections have been prepared from site boring logs and are presented on Plates 3 and 4. Groundwater was first encountered in the borings at depths ranging between 13.5 and 16 feet below grade. Water-levels stabilized after completion of the wells at depths ranging between 14 and 16 feet below grade. This close correlation between first encountered and stabilized water-levels suggests unconfined aquifer conditions.

CURRENT QUARTER SAMPLING RESULTS

Depth to water-level measurements were obtained prior to sampling on September 14, 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 5). 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 September 14, 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 510 and 16,000 ppb. Benzene was identified in Wells MW-1 through MW-3, A-5, A-7, and AR-1 at concentrations ranging between 12 and 3,700 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 C. Chemical isoconcentration maps for TPH-Gasoline and benzene are presented on Plates 6 and 7, respectively.

Discharge Permit Sampling

Prior to the end of the constant-rate aquifer test, conducted on October 13 and 14, 1992, an effluent water sample was collected for chemical analysis. The sample was analyzed for Cyanide, Chemical Oxygen Demand, pH, Total Suspended Solids, and Phenols according to EPA Method 8040 by Sequoia. Results of these analyses are presented in the Sequoia Analytical Report in Appendix C.

These analyses were performed to satisfy permit requirements for water discharge to the Sanitary sewer of the Oro-Loma Sanitary District. This permit will be pursued after the proposed interim remedial system has been designed.

AQUIFER TEST FIELD ACTIVITIES

The 4-hour step-drawdown and 24-hour constant-rate aquifer tests were performed utilizing recover well AR-1 on October 13 and 14, 1992. The tests were performed to assess the feasibility of utilizing recovery well AR-1 to achieve hydrodynamic control of groundwater for extraction of

petroleum hydrocarbons from the first encountered water-bearing zone. Recovery well AR-1 was installed to extract groundwater from the shallow aquifer zone beneath the site and to assess aquifer parameters for a potential recovery system design.

Water-level measurements were obtained from recovery well AR-1 and monitoring wells MW-1 through MW-3 and A-4 through A-9 prior to conducting the test to establish baseline data (Plate 8). Pressure transducers connected to a Hermit SE2000 datalogger were installed in recovery well AR-1 and two selected observation wells (Wells MW-2 and MW-3) to monitor water-level changes during the tests. Water-level changes in wells MW-3, and A-4 through A-9 were measured with an electronic oil/water interface probe at various times throughout the duration of the tests.

AQUIFER TEST RESULTS

Data collected during the 4-hour step-drawdown and 24-hour constant-rate test were evaluated and used to calculate specific aquifer parameters; namely, Transmissivity (T) and Storativity (S). Additional aquifer characteristics evaluated include radius of influence and well efficiency.

Step-Drawdown Test

Well AR-1 was pumped at incrementally increased discharge rates to establish an optimum long-term discharge rate to effectively stress the aquifer during the 24-hour constant-rate test. The step-drawdown test consisted of four steps: for durations of 60, 20, 86, and 46 minutes, respectively. Discharge rates (Q) for steps one, two, and three were 2.0, 4.0, and 3.0 gallons per minute (gpm), respectively. Step four was the recovery step. An evaluation of the step-drawdown test data from a time versus drawdown plot (Appendix D) suggested that a pumping rate of 3 gpm would be the optimal discharge rate for the constant-rate test.

Step	Q (gpm)	Duration (min.)
1	2	60
2	4	20
3	3	86
4	N/A	46 (Recovery)

Constant-Rate Test

Recovery well AR-1 was pumped for a total of 1480 minutes at a constant discharge rate of 3.0 gpm. Maximum observed drawdown in the pumping well was 12.061 feet. Maximum observed drawdowns in the pumping well and observation wells, including distances to the respective observation wells are summarized in Table 5. Water-level data were collected and recorded as pumping well AR-1 recovered to greater than 90% of the initial recorded static water level.

Time versus drawdown data were plotted for observation Wells MW-1 through MW-3 and A-4 through A-9. Transmissivity (T) and Storativity (S) values were calculated from these field data plots using the Jacob Straight-line Method (Jacob, 1946). Calculated transmissivity values from the field plots using the Jacob Method ranged between 4147 gallons per day per foot (gpd/ft) to 11,000 gpd/ft. Storativity values ranged between 1.09×10^{-4} and 9.92×10^{-2}. Storativity values appear to represent an aquifer that is unconfined to semi-confined. These data results are summarized in Table 5. Field Data Plots are presented in Appendix E.

To further evaluate aquifer test data, GSI utilized the Graphical Well Analysis Package (GWAP) software to analyze test data using the Theis Method (Hantush and Jacob, 1955). Data plots generated utilizing GWAP are presented in Appendix F. Transmissivity values calculated using the Theis Method for Wells MW-1 through MW-3 and A-4 through A-9 ranged between 3769 gpd/ft and 9261 gpd/ft. Storativity values for these wells ranged between 2.13×10^{-4} and 1.35×10^{-1}. These results appear to be

relatively consistent with the Jacob method calculations performed in the field. GWAP transmissivity and storativity data are summarized in Table 5.

Approximately 5,000 gallons of groundwater were pumped during the aquifer tests. Groundwater was disposed of by Balch Petroleum.

Well Influence

Data collected from the pumping and observation wells at the end of the 1480 minute constant-rate aquifer test were used to construct a water-level drawdown map for the site (Plate 9). Drawdown was observed in each observation well and ranged between 0.08 and 0.47 feet below initial static water-levels.

The maximum observed radius of well influence was approximately 80 feet from pumping well AR-1 at a discharge rate of 3 gpm. The radius of influence most likely is greater in the downgradient direction as shown on Plate 9. The cone of depression created by pumping recovery well AR-1 appeared to equilibrate during the constant-rate test, indicating that a longer pumping duration may not produce a greater area of well influence.

Well Efficiency

The well efficiency was calculated using step drawdown test data as described by Todd (1980). A graph of the Specific Capacity (Q/Sw) vs. Well Discharge (Q) is included in Appendix G. Well efficiency was calculated to be approximately 16.5% at a flow rate of 3 gpm. Low well efficiency of Well AR-1 may result from fine grained soil conditions. Calculations of the well efficiency are presented in Appendix G.

Barometric Pressure Readings

Barometric pressure readings were recorded at various intervals throughout the constant rate test and recovery. Pressure readings ranged between 945 and 951 millibars (mb). These pressure changes did not appear to have affected water-level measurements or calculations. Barometric pressure readings are presented in Table 6.

SUMMARY

The results of this investigation are summarized below:

- Three exploratory soil borings were drilled on August 25 and 26, 1992 and completed as recovery well AR-1 and groundwater monitoring wells A-8 and A-9.

- Lithology of the borings consists primarily of clay and silt underlain by interbedded sand, silt, and minor gravel to the total depth explored of 35.0 feet.

- Ground water-levels were initially encountered at depths of between 13.5 and 16.0 feet below grade and stabilized in approximately the same range.

- TPH-Gasoline was detected in the soil samples from Boring AR-1 from the 10 and 14.5 depth interval at concentrations of 1.0 ppm and 8.8 ppm, respectively. TPH-Gasoline was reported as ND for soil sample from Borings A-8 and A-9.

- Potentiometric data collected during third quarter sampling indicate that groundwater flows to the northwest at a calculated hydraulic gradient of 0.003.

- Floating was not observed in any wells this quarter.

- TPH-Gasoline was identified in ground-water samples from Wells MW-1 through MW-3, A-4, A-5, A-7 , and AR-1 at concentrations ranging between 510 ppb and 16,000 ppb. TPH-Gasoline was reported as ND for Wells A-6, A-8, and A-9.

- The observed radius of influence from pumping well AR-1 at a sustained discharge rate of 3 gpm for 24 hours appeared to be approximately 80 feet.

- Based on aquifer test results it appears that a pump and treat system is a feasible option for remediating groundwater beneath the site.

CONCLUSIONS

Based on data from the current investigation, petroleum hydrocarbons were detected in soil samples analyzed from on-site Boring AR-1 and reported as ND in samples from off-site, cross-gradient Wells A-8 and A-9. Available soil chemical analytical data from on site borings indicate that concentrations of detectable hydrocarbons are limited to within the site property. Historical soil analysis data are presented in Table 7. Hydrocarbons were detected in the groundwater sample from recovery Well AR-1 and reported as ND in samples from Well A-8 and A-9. Based

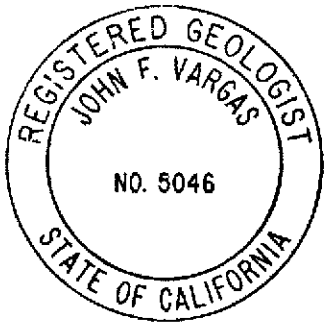
on ground-water sample results from Wells A-8 and A-9, the dissolved hydrocarbon plume appears to have been delineated in the cross-gradient direction. Down-gradient delineation of the hydrocarbon plume has not been characterized and will require the installation of proposed Well A-10. Aquifer tests results indicate that ground-water extraction and treatment is a feasible remedial option for this site.

If you have any questions, please call.

GeoStrategies Inc. by,

Robert C. Mallory
Geologist

John F. Vargas
Senior Geologist
R.G. 5046



RCM/JFV/rmt

Table 1. Soil Analyses Data
Table 2. Current quarter Ground-water Analyses Data
Table 3. Historical Water-level Data
Table 4. Historical Ground-water Quality Database
Table 5. Constant Rate Test Analytical Results
Table 6. Barometric Pressure Readings
Table 7. Historical Soil Analyses Data

Plate 1. Vicinity Map
Plate 2. Site Plan
Plate 3. Cross-section A - A'
Plate 4. Cross-section B - B'
Plate 5. Potentiometric Map
Plate 6. TPH-G Isoconcentration Map
Plate 7. Benzene Isoconcentration Map
Plate 8. Water Level Map Prior To Pumping Well AR-1
Plate 9. Water Level Map After Pumping Well AR-1

Appendix A: Exploratory Boring Logs and Well Construction Details
Appendix B: Soil Chemical Analytical Report and Chain-of-Custody Form
Appendix C: EMCON Ground-water Sampling Report
Appendix D: Time vs. Drawdown
Appendix E: Field Data Plots: Jacob Method
Appendix F: GWAP Data Plots: Theis Method
Appendix G: Well Efficiency Calculation

QC Review: RCM

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Newman, S.P., 1975, "Analysis of Pumping Test Data From an Anisotropic Unconfined Aquifer considering Delayed Gravity Response." Water Resources Res., 11 pp. 329-342.

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TABLE 1

SOIL ANALYSES DATA

SAMPLE I.D.	SAMPLE DATE	ANALYZED DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
A-8-10.0	25-Aug-92	01-Sep-92	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
A-9-10.0	25-Aug-92	01-Sep-92	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
A-9-15.0	25-Aug-92	01-Sep-92	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
AR-1-10.0	25-Aug-92	01-Sep-92	1.0	0.16	<0.0050	0.039	<0.0050
AR-1-14.5	25-Aug-92	01-Sep-92	8.8	0.030	<0.0050	0.060	0.070

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

Notes 1. All data shown as <x are reported as ND (none detected).
2. The last number of the sample I.D. corresponds to the depth of the sample.

TABLE 2

CURRENT QUARTER GROUND-WATER ANALYSIS DATA

WELL NO	SAMPLE DATE	ANALYSIS DATE	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)	DEPTH TO WATER (FT)	WELL ELEV (FT)	STATIC WATER ELEV (FT)	PRODUCT THICKNESS (FT)
MW-1	14-Sep-92	24-Sep-92	2,600	450	<5.0	45	21	15.34	38.36	23.02	0.00
MW-2	15-Sep-92	23-Sep-92	16,000	3,700	<100	470	1,000	15.78	38.58	22.80	0.00
MW-3	15-Sep-92	23-Sep-92	14,000	630	<50	1,500	2,400	14.78	37.77	22.99	0.00
A-4	15-Sep-92	24-Sep-92	1,300	<2.5	<2.5	61	6.8	16.83	39.86	22.03	0.00
A-5	14-Sep-92	24-Sep-92	770	34	<2.5	51	65	16.14	38.94	22.80	0.00
A-6	14-Sep-92	23-Sep-92	<50	<0.50	<0.50	<0.50	<0.50	16.20	39.07	22.87	0.00
A-7	14-Sep-92	24-Sep-92	510	12	<2.0	30	51	17.35	39.95	22.60	0.00
A-8	14-Sep-92	23-Sep-92	<50	<0.50	<0.50	<0.50	<0.50	14.19	37.23	23.04	0.00
A-9	14-Sep-92	23-Sep-92	<50	<0.50	<0.50	<0.50	<0.50	16.12	38.71	22.59	0.00
AR-1	15-Sep-92	24-Sep-92	820	67	<1.0	8.8	6.7	15.21	38.11	22.90	0.00
TB-1	14-Sep-92	23-Sep-92	<50	<0.50	<0.50	<0.50	<0.50	----	----	----	----

TABLE 2

CURRENT QUARTER GROUND-WATER ANALYSIS DATA

WELL NO	SAMPLE DATE	ANALYSIS DATE	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)	DEPTH TO WATER (FT)	WELL ELEV (FT)	STATIC WATER ELEV (FT)	PRODUCT THICKNESS (FT)

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

Note: 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 MCL are subject to change pending State review.

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

Note: 1. All data shown as <x are reported as ND (none detected).
2. Water level elevations referenced to Mean Seal Level (MSL).
3. DHS Action Levels and MCL are subject to change pending State review.

GeoStrategies Inc.
Environmental Consulting,
Engineering and Geologic Services

Letter of Transmittal

Date: 12/24/92

From: ROBERT MALLORY
Project No: 7926
To: MS. JULIET SHIN (CERTIFIED MAIL)
ACHCSA
80 SWAN WAY #200
OAKLAND, CA. 94621

Subject: CONT. SITE ASSESS./QUART. MON. REPORT
ARCO SERVICE STATION # 5387
20200 HESPERIAN BLVD.
SAN LORENZO, CA.

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Comments:

CC: MR. MICHAEL WHELAN, ARCO PRODUCTS CO.
MR. H.C. WINSOR, ARCO PRODUCTS CO.
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Robert C. Mallory
(Signed)

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-Aug-86	MW-1	11.25	38.36	27.11	0.00
24-Dec-91	MW-1	16.12	38.36	22.24	0.00
10-Mar-92	MW-1	13.34	38.36	25.02	0.00
09-Jun-92	MW-1	14.12	38.36	24.24	0.00
14-Sep-92	MW-1	15.34	38.36	23.02	0.00
08-Aug-92	MW-2	11.62	38.58	26.96	0.00
24-Dec-91	MW-2	16.50	38.58	22.08	0.00
10-Mar-92	MW-2	13.50	38.58	25.08	0.00
10-Jun-92	MW-2	14.52	38.58	24.06	0.00
14-Sep-92	MW-2	15.78	38.58	22.80	0.00
08-Aug-92	MW-3	10.61	37.77	27.16	0.00
24-Dec-91	MW-3	15.60	37.77	22.17	0.00
10-Mar-92	MW-3	12.90	37.77	24.87	0.00
10-Jun-92	MW-3	13.60	37.77	24.17	0.00
14-Sep-92	MW-3	14.78	37.77	22.99	0.00
24-Dec-91	A-4	17.60	39.86	22.26	0.00
10-Mar-92	A-4	14.76	39.86	25.10	0.00
09-Jun-92	A-4	15.63	39.86	24.23	0.00
14-Sep-92	A-4	16.83	39.86	23.03	0.00
24-Dec-91	A-5	16.85	38.94	22.09	0.00
10-Mar-92	A-5	13.83	38.94	25.11	0.00
09-Jun-92	A-5	14.91	38.94	24.03	0.00
14-Sep-92	A-5	16.14	38.94	22.80	0.00

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)
24-Dec-91	A-6	16.88	39.07	22.19	0.00
10-Mar-92	A-6	13.73	39.07	25.34	0.00
09-Jun-92	A-6	14.95	39.07	24.12	0.00
14-Sep-92	A-6	16.20	39.07	22.87	0.00
24-Dec-91	A-7	18.11	39.95	21.84	0.00
10-Mar-92	A-7	15.30	39.95	24.65	0.00
09-Jun-92	A-7	16.12	39.95	23.83	0.00
14-Sep-92	A-7	17.35	39.95	22.60	0.00
14-Sep-92	A-8	14.19	37.23	23.04	0.00
				22.59	
14-Sep-92	A-9	16.12	38.71	22.90	0.00
14-Sep-92	AR-1	15.21	38.11	<1.0	0.00

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

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
08-Aug-92	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
08-Aug-92	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
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
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

TABLE 4

HISTORICAL GROUND-WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
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
24-Dec-91	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	340.00	11	1.1	8.9	26
14-Sep-92	A-7	510.00	12	<2.0	30	51
14-Sep-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
14-Sep-92	AR-1	820	67	<1.0	8.8	6.7

Current Regional Water Quality Control Board Maximum Contaminant Level
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).

792603-7

TABLE 5

CONSTANT RATE TEST ANALYTICAL RESULTS

WELL NO.	PUMP RATE (GPM)	PUMPING DURATION (MIN)	MAXIMUM DRAWDOWN (FT)	DISTANCE FROM PUMPING WELL (FT)	THEIS T (gpd/ft)	THEIS S	JACOB T (gpd/ft)	JACOB S
MW-1	----	----	0.19	46	8,245	1.87E-02	9,900	1.07E-02
MW-2	----	----	0.224	28	3,769	1.35E-01	4,147	9.92E-02
MW-3	----	----	0.138	37	4,428	8.46E-02	7,471	7.05E-02
A-4	----	----	0.14	119	9,251	2.71E-03	11,000	2.50E-03
A-5	----	----	0.12	64	6,858	3.64E-02	8,800	2.68E-02
A-6	----	----	0.09	138	8,634	1.43E-02	10,421	1.12E-02
A-7	----	----	0.47	80	3,857	2.13E-04	5,176	1.09E-04
A-8	----	----	0.20	82	8,437	1.06E-03	8,250	2.25E-02
A-9	----	----	0.08	133	9,041	1.37E-02	6,387	2.03E-02
AR-1	3	1480	12.06	N/A	N/A	N/A	N/A	N/A

S = Storativity
T = Transmissivity
N/A = Not applicable

TABLE 6

BAROMETER PRESSURE READINGS

TIME (MINUTES SINCE START)	BAROMETRIC PRESSURE (MILLI BARS)
0	948
40	948
120	947
180	947
250	946
300	945
350	945
400	945
550	948
750	947
850	947
900	948
1058	948
1200	950
1320	951
1475	950
1565	950
1640	949

GeoStrategies Inc.
Environmental Consulting,
Engineering and Geologic Services

Letter of Transmittal

Date: 12/28/92

From: ROBERT MALLORY
To: MS. JULIET SHIN
A.C.H.C.S.A.
80 SWAN WAY #200
OAKLAND, CA. 94621

Project No: 7926
Subject: CONT SITE ASSESS./QUART MON. REPORT
ARCO SERVICE STATION #5387
20200 HESPERIAN BLVD.
SAN LORENZO, CA.

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

Date	Description	No. of Copies
12/28/92	TABLE 7 - HISTORICAL SOIL ANALYSES DATA	1

These are transmitted:

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

Comments:

TABLE 7 WAS INADVERTENTLY OMITTED FROM THE ABOVEY REFERENCED REPORT SUBMITTED ON 12/24/92. PLEASE INSERT THIS TABLE INTO THE APPROPIATE LOCATION IN THE REPORT.

CC: MICHAEL WHELAN, ARCO PRODUCTS CO.
H.C. WINSON, ARCO PRODUCTS CO.
RICHARD HIETT, RWQCB - S.F. REGION

☑ 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)

TABLE 7

HISTORICAL SOIL ANALYSES DATA

SAMPLE NO.	SAMPLE DATE	ANALYZED DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
SB-1(9-9.5')	08-Aug-92	----	<10	N/A	N/A	N/A	N/A
SB-2(9-9.5')	08-Aug-92	----	49	N/A	N/A	N/A	N/A
SB-3(9-9.5')	08-Aug-92	----	42	N/A	N/A	N/A	N/A
SB-4(9-9.5')	08-Aug-92	----	20	N/A	N/A	N/A	N/A
MW-1(9-9.5')	08-Aug-92	----	<10	N/A	N/A	N/A	N/A
MW-2(9-9.5')	08-Aug-92	----	<10	N/A	N/A	N/A	N/A
MW-3(9-9.5')	08-Aug-92	----	<10	N/A	N/A	N/A	N/A
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
A-8-10.0	25-Aug-92	01-Sep-92	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
A-9-10.0	25-Aug-92	01-Sep-92	<1.0	<0.0050	<0.0050	<0.0050	<0.0050
A-9-15.0	25-Aug-92	01-Sep-92	<1.0	<0.0050	<0.0050	<0.0050	<0.0050

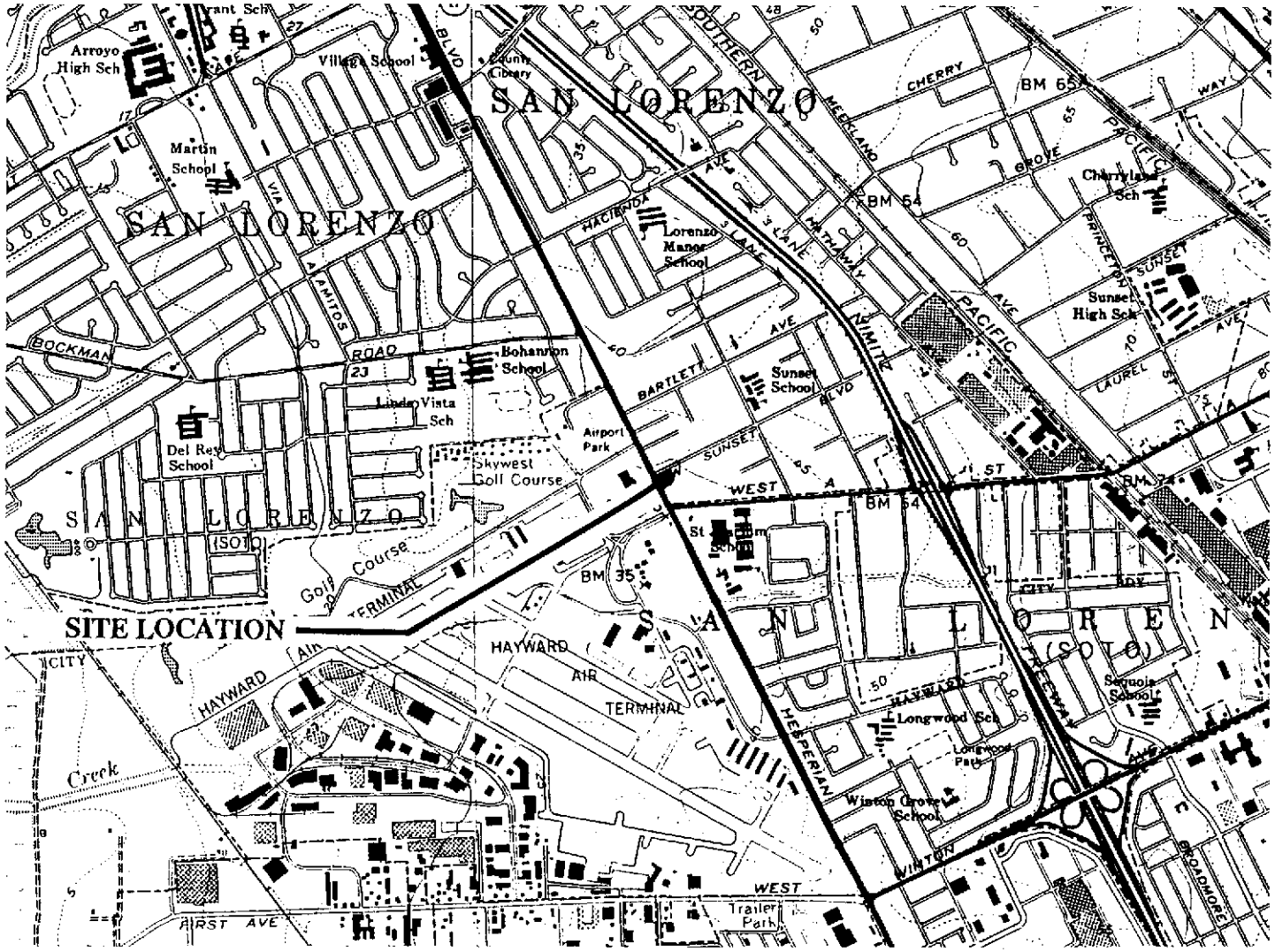
TABLE 7

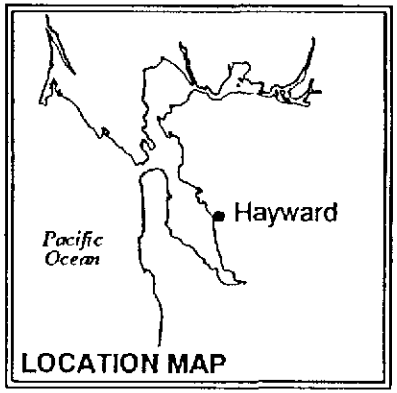
HISTORICAL SOIL ANALYSES DATA

SAMPLE NO.	SAMPLE DATE	ANALYZED DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
AR-1-10.0	25-Aug-92	01-Sep-92	1.0	0.16	<0.0050	0.039	<0.0050
AR-1-14.5	25-Aug-92	01-Sep-92	8.8	0.030	<0.0050	0.060	0.070

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPM = Parts Per Million
N/A = Not Analyzed

Notes 1. All data shown as <x are reported as ND (none detected).
2. The last number of the sample I.D. corresponds to the depth of the sample.
3. Soil from borings SB1 through SB4 and MW-1 through MW-3 was analyzed according to EPA Method 4181. Verbal results were received by GTS on 8/15/86.





N

0 2000

Scale in Feet

Base Map: USGS Topographic Map

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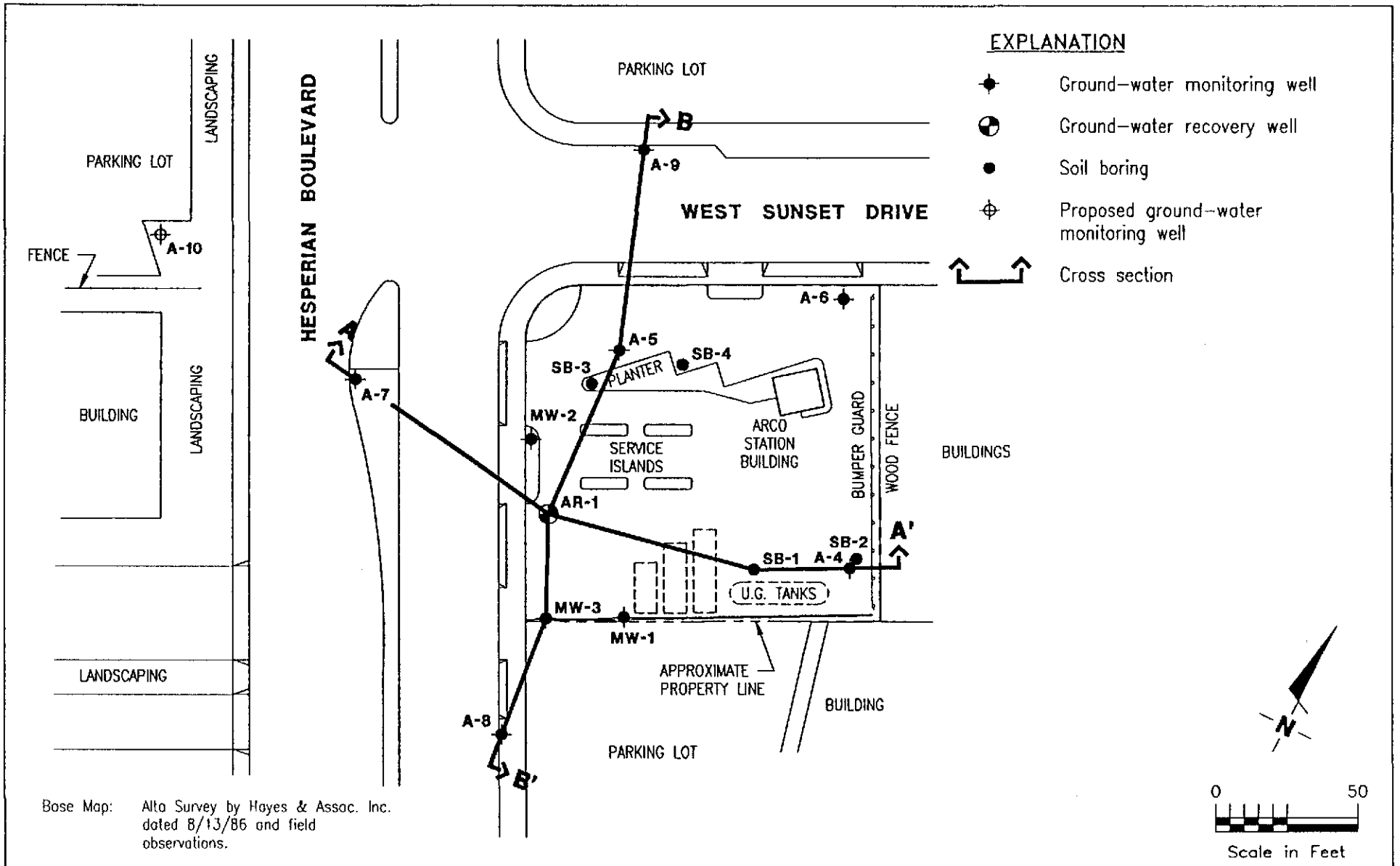
VICINITY MAP
ARCO Service Station #5387
20200 Hesperian Boulevard
Hayward, California

PLATE **1**

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7926		11/91	



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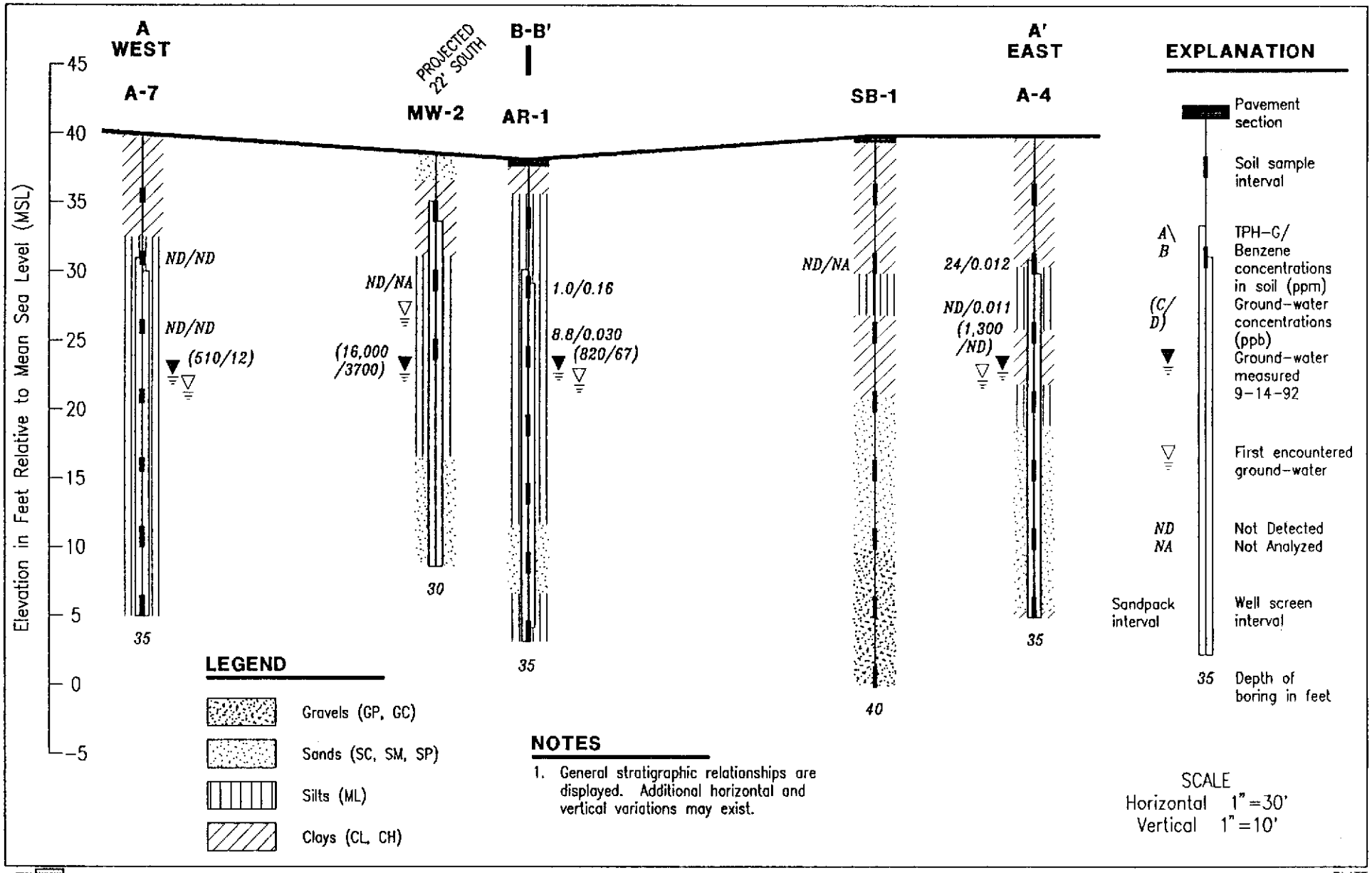
SITE PLAN
ARCO Service Station #5387
20200 Hesperian Boulevard
Hayward, California

PLATE
2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7926		11/92	



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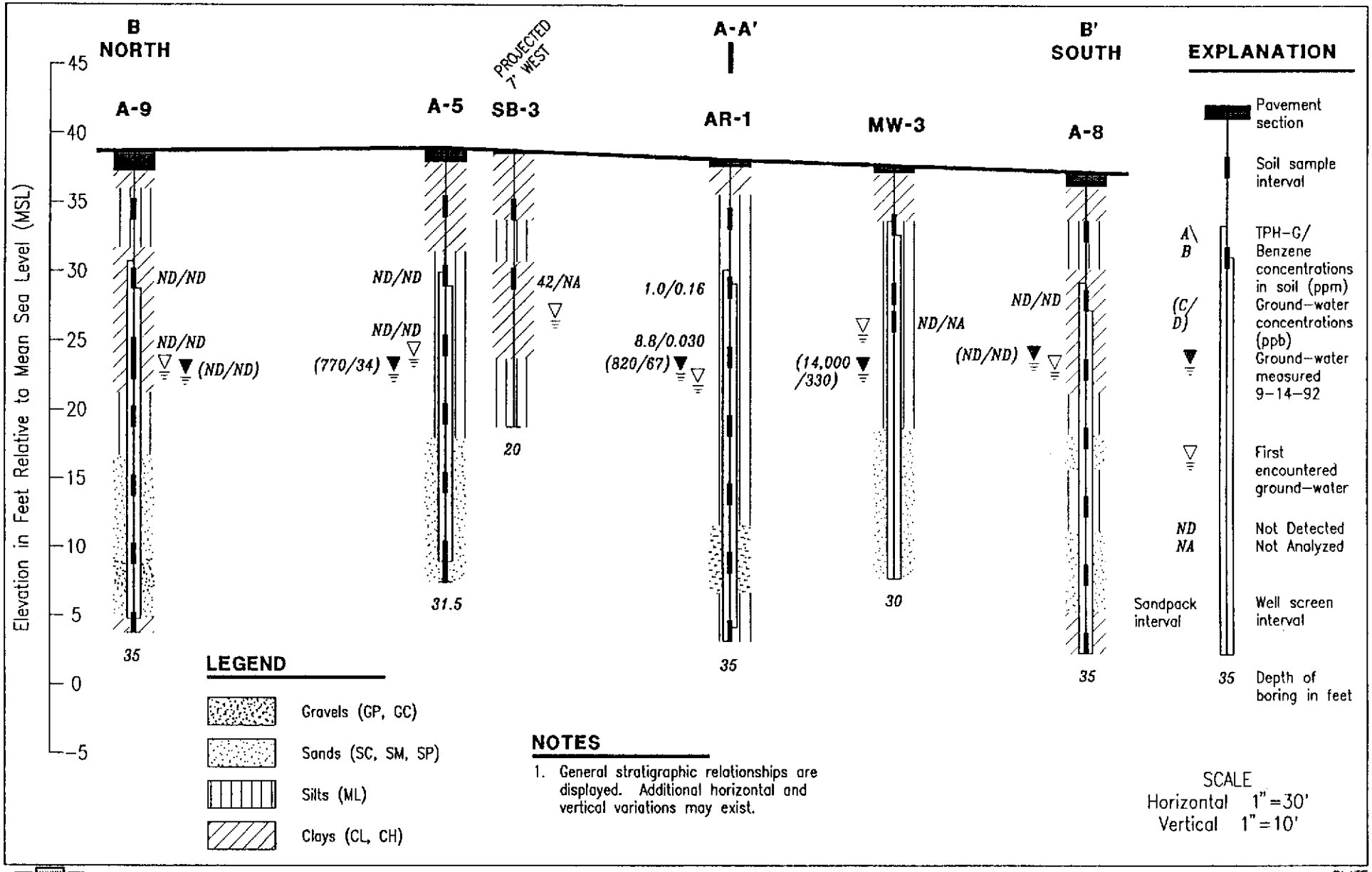
CROSS SECTION A-A'
ARCO Service Station #5387
20200 Hesperian Boulevard
Hayward, California

PLATE
3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792605-7	RCM	11/92	



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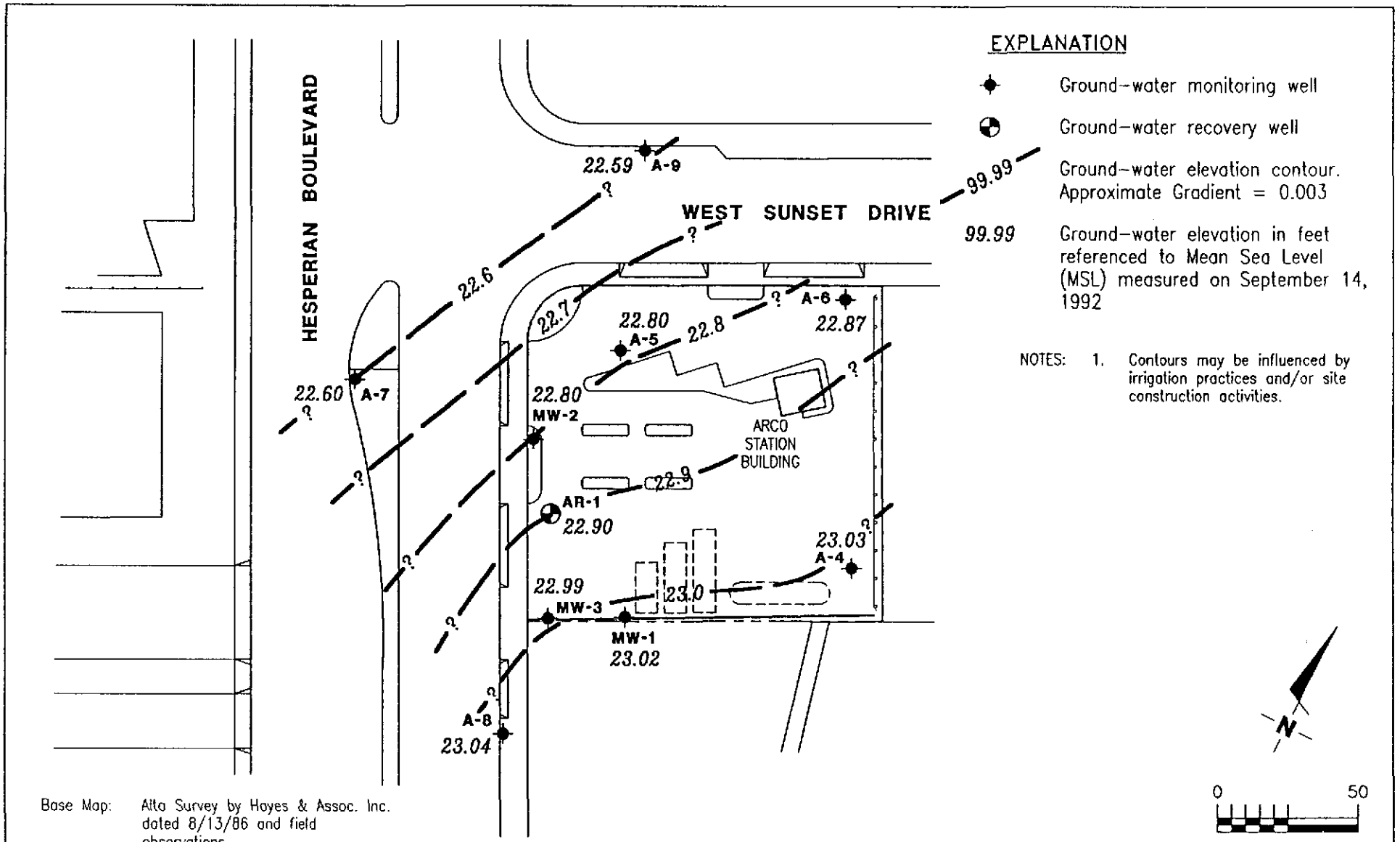
CROSS SECTION B-B'
ARCO Service Station #5387
20200 Hesperian Boulevard
Hayward, California

PLATE
4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792605-7		11/92	



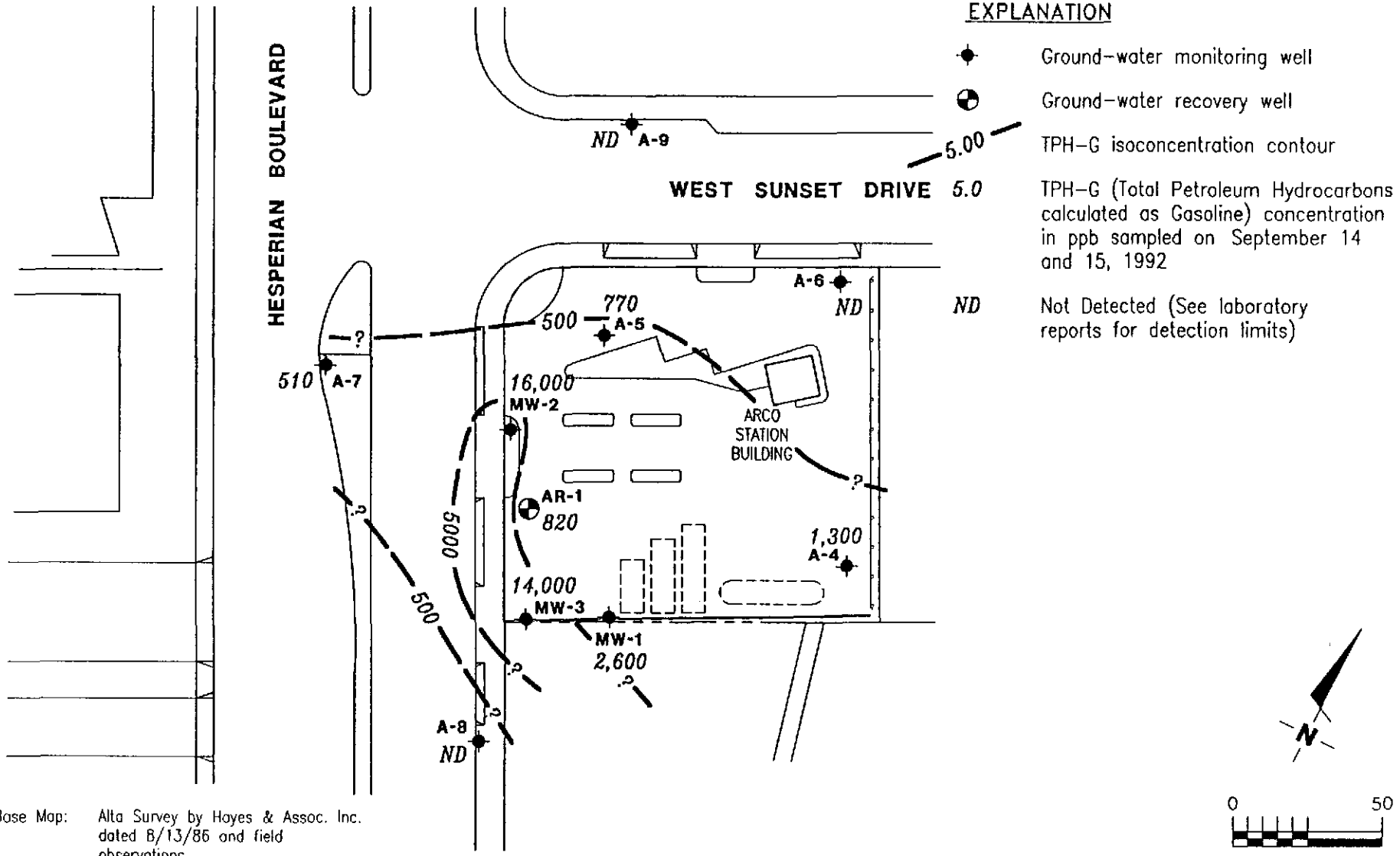
Base Map: Alta Survey by Hoyes & Assoc. Inc. dated 8/13/86 and field observations.

GeoStrategies Inc.

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

PLATE
5

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792605-7		11/92	



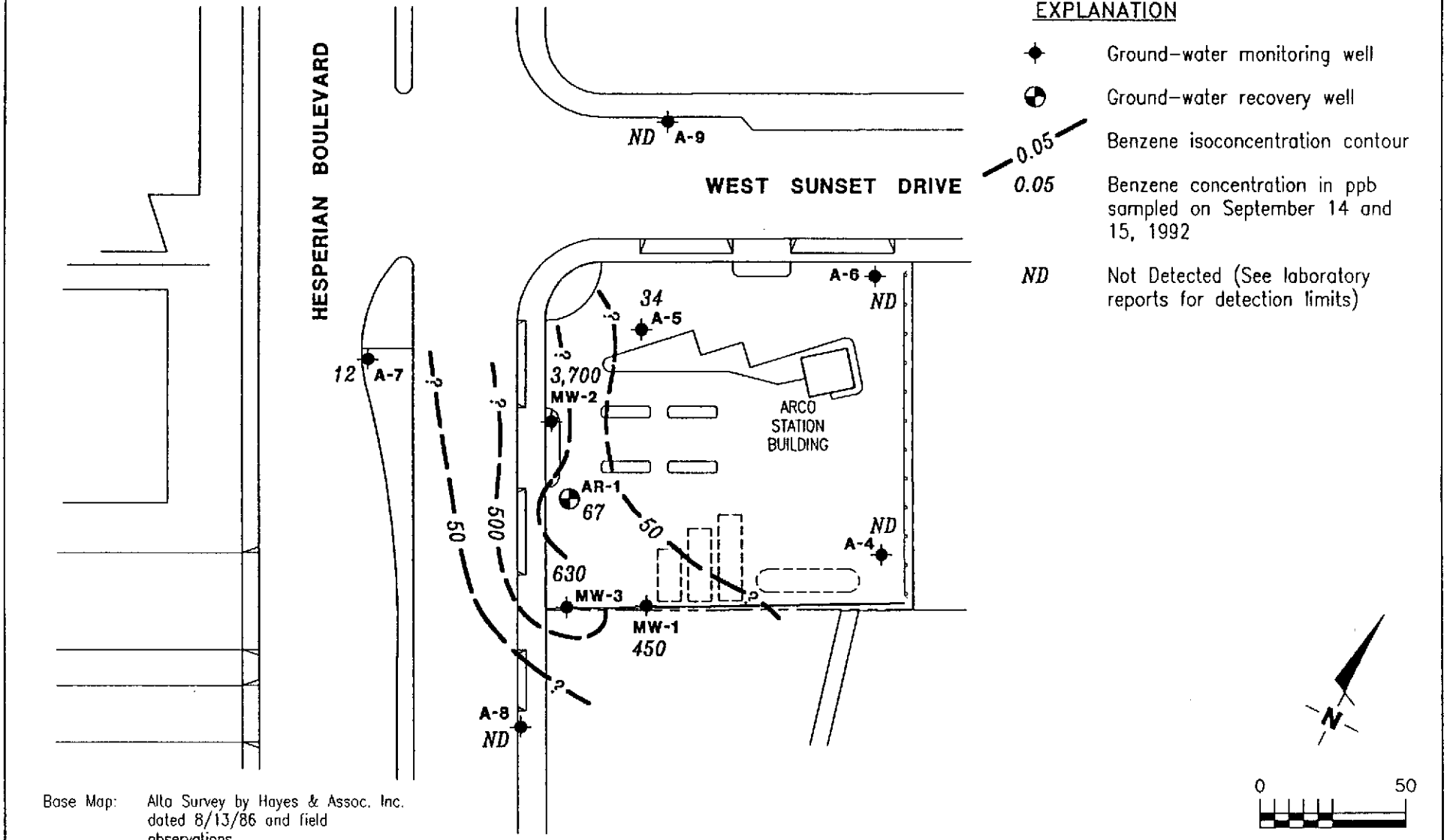
Base Map: Alta Survey by Hoyes & Assoc. Inc. dated 8/13/86 and field observations.

GeoStrategies Inc.

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

PLATE 6

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792605-7	RCM	11/92	



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

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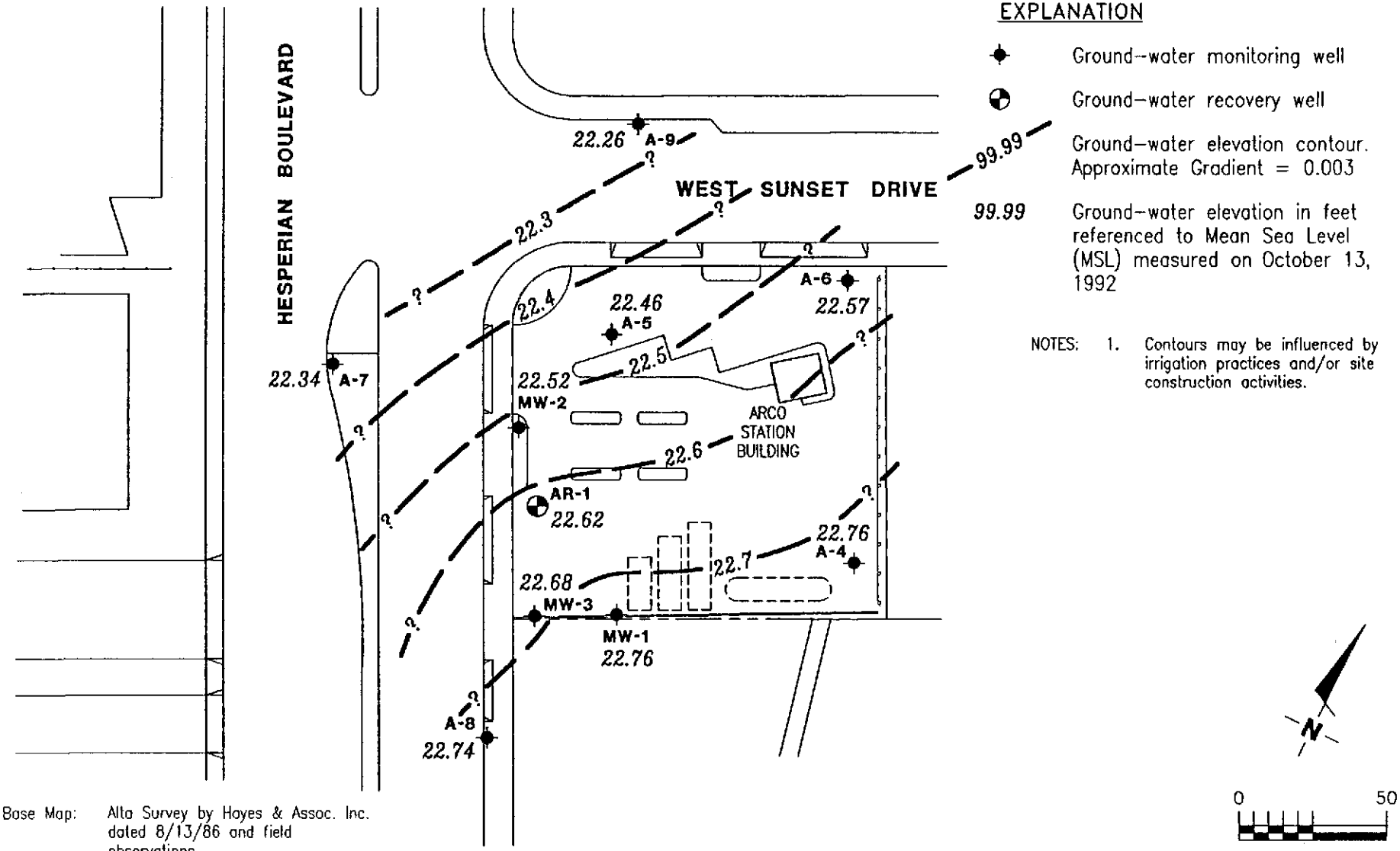
BENZENE ISOCONCENTRATION MAP

ARCO Service Station #5387
20200 Hesperian Boulevard
Hayward, California

PLATE 7

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792605-7	RCM	11/92	



EXPLANATION

- Ground–water monitoring well
- Ground–water recovery well
- 99.99 Ground–water elevation contour. Approximate Gradient = 0.003
- 99.99 Ground–water elevation in feet referenced to Mean Sea Level (MSL) measured on October 13, 1992

NOTES: 1. Contours may be influenced by irrigation practices and/or site construction activities.

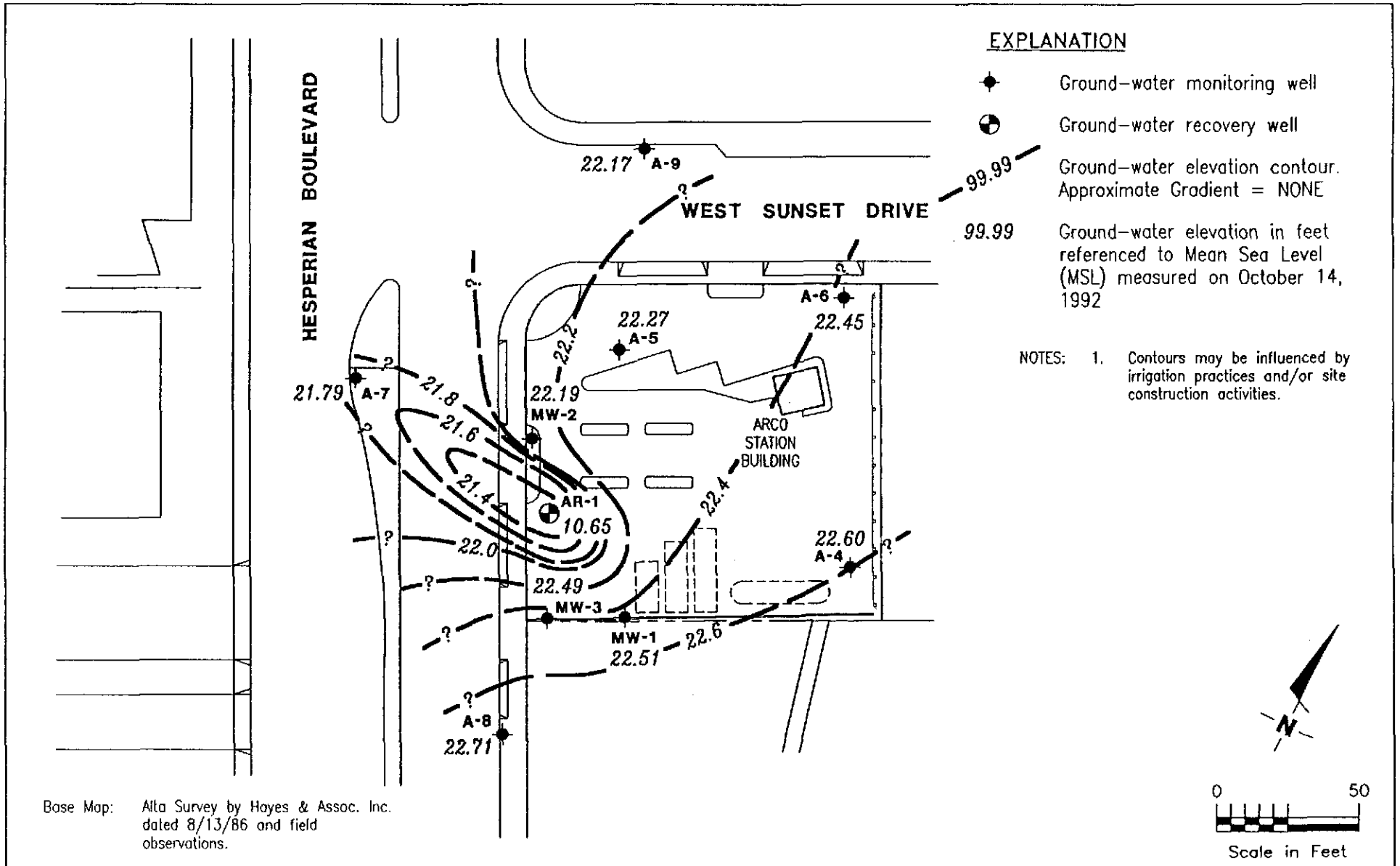
Base Map: Alta Survey by Hoyes & Assoc. Inc. dated 8/13/86 and field observations.

GeoStrategies Inc.

WATER LEVEL MAP PRIOR TO PUMPING
ARCO Service Station #5387
20200 Hesperian Boulevard
Hayward, California

PLATE
8

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792605–7	rcm	11/92	



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WATER LEVEL MAP AFTER PUMPING
ARCO Service Station #5387
20200 Hesperian Boulevard
Hayward, California

PLATE
9

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
792605-7		11/92	

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: (See Plate 2)	Project No.: 792605	Date: 8/25/92	Boring No: A-8
	Client: Arco Products Company SS# 5387		
	Location: 20200 Hesperian Blvd.		
	City: Hayward		Sheet 1 of 2
	Logged by: RCM	Driller: W. Hazmat	
Drilling method: Hollow Stem Auger	Casing installation data:		
Hole diameter: 8-inches	Top of Box Elevation:	Datum:	

Water Level	13.5	14.0	
Time	10:15	17:08	
Date	8/25/92	8/26/92	

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				1				PAVEMENT SECTION - 1.0 ft.
				2				CLAY (CL), very dark grayish brown (10YR 2/2), medium stiff, damp; 90% clay, 10% fine sand.
				3				
	300	S&H		4				
	300	(Push)		5				
0	300		A-8-5.0					SILT (ML), dark yellowish brown (10YR 4/4), medium stiff, moist; 65% silt, 30% clay, 5% fine sand.
				6				
				7				
				8				
		S&H		9				
2.3	10		A-8-10.0	10				CLAY (CL), dark greenish gray (5GY 4/1), stiff, moist; 90% clay, 10% silt.
				11				
				12				
				13				
				14		▽		
		S&H	A-8-14.5	15		▼		Color Change to olive brown (2.5Y 4/4), increase fine sand to 10%, increase silt to 20%, saturated at 13.5 ft.
0								
	12			16				
				17				
				18				
		S&H		19				SILT (ML), light olive brown (2.5Y 5/6), stiff, saturated; 65% filt, 30% fine sand, 5% clay.
0	13		A-8-20.0	20				SILTY SAND (SM), light olive brown (2.5Y 5/6), medium dense, saturated; 80% fine sand, 20% silt.

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

GeoStrategies Inc.

Log of Boring

BORING NO. A-8

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792605		8/25/92		

Field location of boring: (See Plate 2)	Project No.: 792605	Date: 8/6/92	Boring No: A-8
	Client: Arco Products Company SS# 5387		
	Location: 20200 Hesperian Blvd.		
	City: Hayward		Sheet 2 of 2
	Logged by: RCM	Driller: W. Hazmat	
Drilling method: Hollow Stem Auger	Casing installation data:		
Hole diameter: 8-inches	Top of Box Elevation:	Datum:	

									Water Level				
PID (ppm)	Blows/ft*. or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)		Time				
									Date				
								Description					
				21									
				22									
				23									
		S&H						CLAYEY SILT (ML/CL), light olive brown (2.5Y 5/6), stiff,					
0				24				saturated; 70% silt, 25% clay, 5% fine sand.					
	10		A-8-24.5										
				25									
				26									
				27									
				28				SAND (SP), olive brown (2.5Y 4/4), medium dense,					
								saturated; 95% fine sand, 5% silt.					
		S&H		29				SAND with GRAVEL (SW), olive brown (2.5Y 4/4),					
								medium dense, saturated; 85% fine to coarse sand, 15%					
0	14		A-8-30.0	30				fine subrounded gravel.					
								SAND (SP), brown (10YR 4/3), medium dense, saturated;					
				31				95% fine sand, 5% silt.					
				32									
				33									
		S&H		34				CALY (CL), light olive brown (2.5Y 5/4), stiff, moist; 85%					
								clay, 15% fine sand.					
0	12		A-8-35.0	35									
								Bottom of boring 35.0 ft.					
				36				8/25/92					
				37									
				38									
				39									
				40									

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

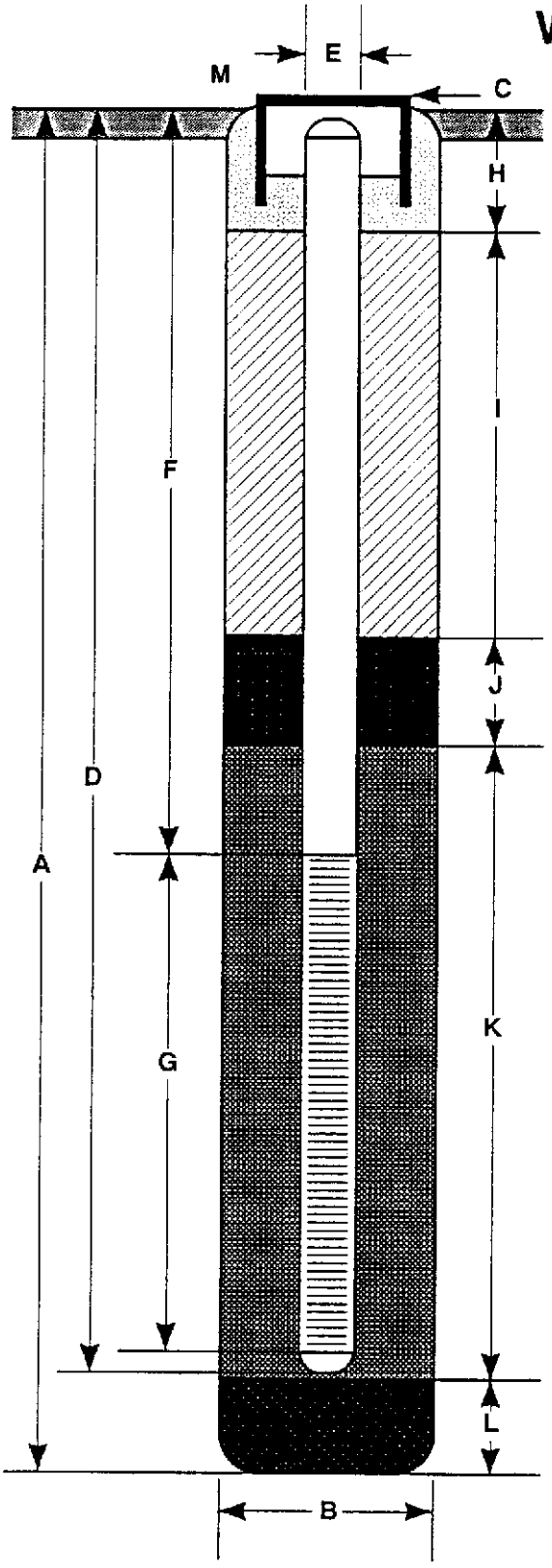
GeoStrategies Inc.

Log of Boring

BORING NO. A-8

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792605		8/25/92		

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 37.23 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 machine slotted
Perforation Size 0.020 in.

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

I Backfill from 1.0 to 7.0 ft.
Backfill Material Neat Cement

J Seal from 7.0 to 8.0 ft.
Seal Material Bentonite

K Gravel Pack from 8.0 to 35.0 ft.
Pack Material Lonestar #2/12 Graded Sand

L Bottom Seal ft.
Seal Material

M Underground vault box with waterproof locking cap and lock.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO.
A-8

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792605		8/92		

Field location of boring: (See Plate 2)	Project No.: 792605	Date: 8/25/92	Boring No: A-9
	Client: Arco Products Company SS# 5387		
	Location: 20200 Hesperian Blvd.		
	City: Hayward		Sheet 1 of 2
	Logged by: RCM	Driller: W. Hazmat	
Drilling method: Hollow Stem Auger	Casing installation data:		
Hole diameter: 8-inches	Top of Box Elevation:		Datum:

	Water Level	15.75	15.9		
	Time	14:02	17:25		
	Date	8/25/92	8/26/92		

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				1				PAVEMENT SECTION 1.5 FT.
	300	S&H		4				CLAY (CL), very dark grayish brown (10YR 3/2), medium stiff, damp; 90% clay 10% fine sand.
	300	(Push)						
0	300		A-9-5.0	5				SILT (ML), dark yellowish brown (10YR 3/6), medium stiff, damp; 80% silt, 10% fine sand.
		S&H		9				
0	9		A-9-10.0	10				CLAY (CL), olive brown (2.5Y 4/4), stiff, very moist; 90% clay, 10% silt, large 1-2 mm. diameter, voids (tube like) rootholes?
		S&H		14				GREY (5Y 6/1), discoloration in voids at 13.5 ft.
0	11		A-915.0	15				
		S&H						SATURATED at 15.75 ft.
0	11		A-9-16.5	16		▽ ▼		
		S&H		19				SILT (ML), olive brown (2.5Y 4/4), stiff, saturated; 85% silt, 15% clay, trace fine sand, minor small voids.
0	9		A-9-20.0	20				

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

GeoStrategies Inc.

Log of Boring

BORING NO. A-9

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792605		8/25/92		

Field location of boring: (See Plate 2)	Project No.: 792605	Date: 8/25/92	Boring No.: A-9
	Client: Arco Products Company SS#5387		
	Location: 20200 Hesperian Blvd.		
	City: Hayward		Sheet 2 of 2
	Logged by: RCM	Driller: W. Hazmat	
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				
		S&H		24				
0	9		A-9-25.0	25				SAND with SILT (SP-SM), dark grayish brown (10YR 4/2), loose, saturated; 90% fine sand, 10% silt.
				26				
				27				
				28				
		S&H		29				
0	55		A-9-30.0	30				GRAVEL with SAND (GP), very dark grayish brown (10YR 4/2), very dense, saturated; 75% fine gravel, 25% fine to coarse sand.
				31				
				32				SILTY SAND (SM), light olive brown (2.5Y 5/4), medium dense, saturated; 65% fine sand, 35% silt.
				33				SANDY CLAY (CL), light olive brown (2.5Y 5/4), very stiff, moist; 85% clay, 15% fine sand.
		S&H		34				
0	23		A-9-35.0	35				Bottom of boring at 35.0 ft. 8/25/92
				36				
				37				
				38				
				39				
				40				

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

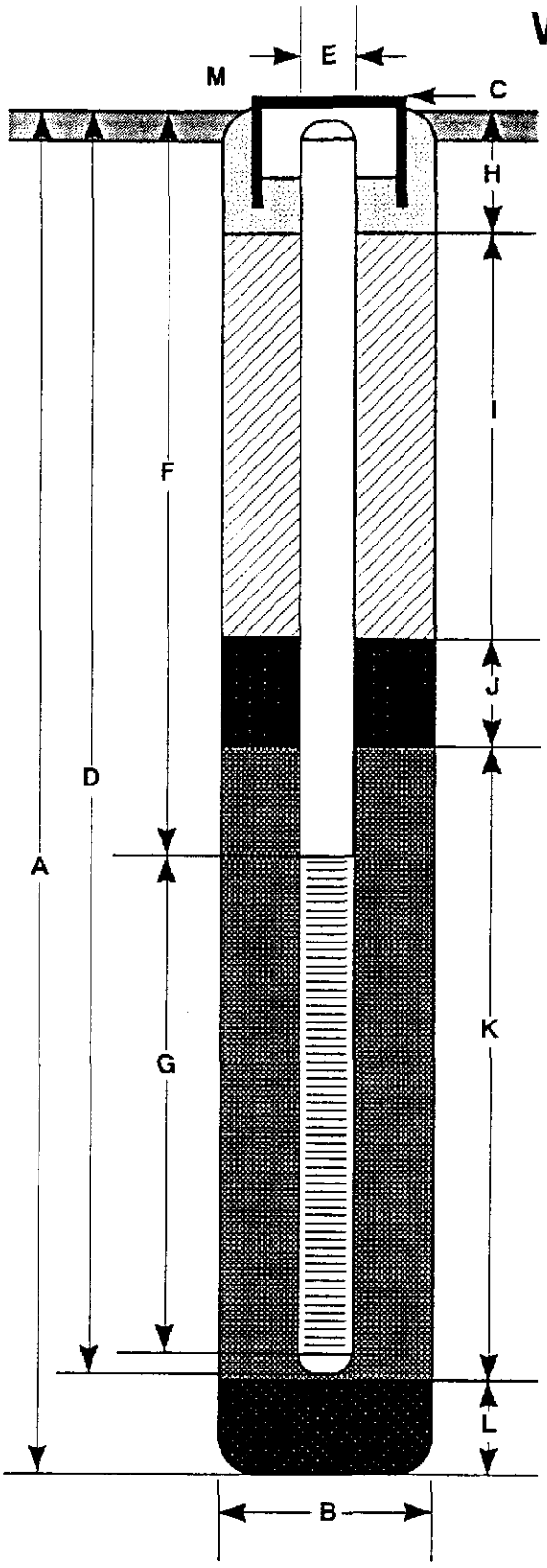
GSI GeoStrategies Inc.

Log of Boring

BORING NO. A-9

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792605		8/25/92		

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	38.71 ft.
	[x] Referenced to Mean Sea Level	
	[ ] Referenced to Project Datum	
D	Casing Length	34.0 ft.
	Material	Schedule 40 PVC
E	Casing Diameter	2 in.
F	Depth to Top Perforations	10.0 ft.
G	Perforated Length	24.0 ft.
	Perforated Interval from 10.0 to	34.0 ft.
	Perforation Type	Machine Slotted
	Perforation Size	0.020 in.
H	Surface Seal from 0 to	1.0 ft.
	Seal Material	Concrete
I	Backfill from 1.0 to	7.0 ft.
	Backfill Material	Neat Cement
J	Seal from 7.0 to	8.0 ft.
	Seal Material	Bentonite
K	Gravel Pack from 8.0 to	34.0 ft.
	Pack Material	Lonestar #2/12 Graded Sand
L	Bottom Seal	1.0 ft.
	Seal Material	Bentonite
M	Underground, traffic rated vault box with waterproof locking cap and lock.	

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO.

A-9

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792605		8/92		

Field location of boring:	Project No.: 792605	Date: 8/25/92	Boring No:
(See Plate 2)	Client: Arco Products Company SS#5387		AR-1
	Location: 20200 Hesperian Blvd.		
	City: Hayward		Sheet 1
	Logged by: RCM	Driller: W. Hazmat	of 2
	Casing installation data:		
Drilling method: Hollow Stem Auger			
Hole diameter: 12-inches	Top of Box Elevation:		Datum:

Water Level	16.0	15.1	
Time	16:30	17:15	
Date	8/25/92	8/26/92	

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				0				PAVEMENT SECTION - 0.5 FT.
				1				
				2				CLAY (CL), very dark grayish brown (10YR 2/2), medium stiff, damp; 95% clay, 5% fine sand.
				3				
	300	S&H		4				SILT (ML), dark grayish brown (2.5Y 4/2), medium stiff,
	300	(Push)	AR-1					damp; 80% fine sand, moderate dark greenish gray (5B6
4	300		5.0	5				4/1) , discoloration.
				6				
				7				
				8				
		S&H		9				COLOR CHANGE to greenish gray (5GY 5/1), increase
			AR-1					clay to 35%, very moist at 8.5 ft.
151	10		10.0	10				
				11				
				12				
				13				
484		S&H	AR-1	14				
	16		14.5					
				15		▼		
				16		▽		Saturated at 16.0 ft.
				17				
				18				
		S&H		19				COLOR CHANGE to dark yellowish brown (10YR 4/6),
			AR-1					saturated, minor greenish gray (5GY 5/1), discoloration
0	23		20.0	20				in voids (rootholes?).

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

GeoStrategies Inc.

Log of Boring

BORING NO.

AR-1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792605		8/25/92		

Field location of boring:	Project No.: 792605	Date: 8/26/92	Boring No:
(See Plate 2)	Client: Arco Products Company SS# 5387		AR-1
	Location: 20200 Hesperian Blvd.		
	City: Hayward		Sheet 2
	Logged by: RCM	Driller: W. Hazmat	of 2
	Casing installation data:		
Drilling method: Hollow Stem Auger			
Hole diameter: 12-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				
		S&H		24				SANDY SILT (ML), dark yellowish brown (10YR 4/4), very
			AR-1					stiff, saturated; 70% silt, 30% fine sand, rootholes, voids
2	18		25.0	25				with greenish gray disocloration (5GY 5/1).
				26				
				27				
				28				
		S&H		29				SILTY SAND (SM), olive brown (2.54 4/4), medium dense
			AR-1					saturated; 70% fine sand, 30% silt.
0	22		30.0	30				
				31				
				32				
				33				
		S&H		34				CLAYEY SILT (ML/CL), light oliuve brown (2.5Y 5/4), stiff,
			AR-1					saturated; 55% silt, 30% clay, 15% fine sand.
0	14		35.0	35				Bottom of boring at 35.0 ft.
				36				
				37				
				38				
				39				
				40				

Remarks:

GeoStrategies Inc.

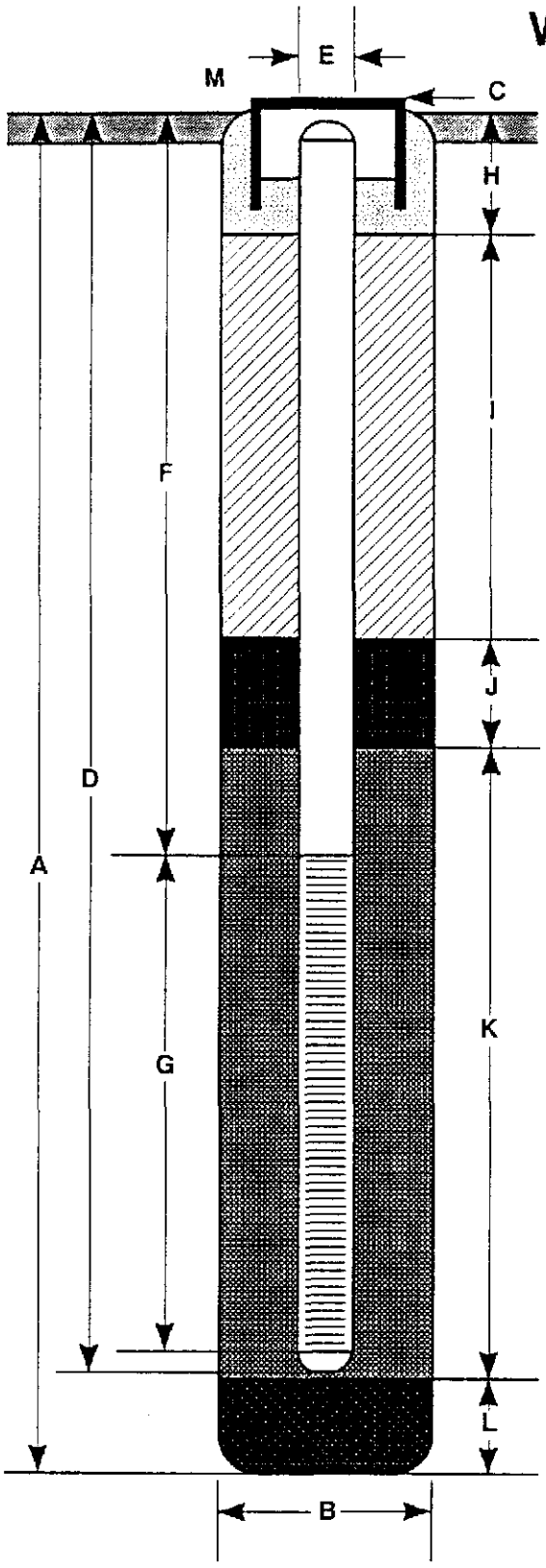
Log of Boring

BORING NO.

AR-1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792605		8/25/92		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 35.0 ft.

B Diameter of Boring 12 in.
Drilling Method Hollow Stem Auger

C Top of Box Elevation 38.11 ft.
[x] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length 35 ft.
Material Sch. 40 PVC & Carbon Steel

E Casing Diameter 6 in.

F Depth to Top Perforations 9.0 ft.

G Perforated Length 25.0 ft.
Perforated Interval from 9.0 to 34.0 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 7.0 ft.
Backfill Material Neat Cement

J Seal from 7.0 to 8.0 ft.
Seal Material Bentonite

K Gravel Pack from 8.0 to 35.0 ft.
Pack Material Lonestar #2/12 Graded Sand

L Bottom Seal ft.
Seal Material

M Underground vault box with waterproof locking cap and lock.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO.
AR-1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
792605		8/92		

SEQUOIA ANALYTICAL

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

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

Project: 5387-92-2A, Arco 5387, Hayward

Enclosed are the results from 5 soil samples received at Sequoia Analytical on August 27,1992. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
2085091	Soil, A-8-10.0	8/25/92	EPA 5030/8015/8020
2085092	Soil, A-9-10.0	8/25/92	EPA 5030/8015/8020
2085093	Soil, A-9-15.0	8/25/92	EPA 5030/8015/8020
2085094	Soil, AR-1-10.0	8/25/92	EPA 5030/8015/8020
2085095	Soil, AR-1-14.5	8/25/92	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

SEQUOIA ANALYTICAL

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

Gettler Ryan/Geostrategies	Client Project ID:	5387-92-2A, Arco 5387, Hayward	Sampled:	Aug 25, 1992
2150 W. Winton Avenue	Sample Matrix:	Soil	Received:	Aug 27, 1992
Hayward, CA 94545	Analysis Method:	EPA 5030/8015/8020	Reported:	Sep 9, 1992
Attention: John Vargas	First Sample #:	208-5091		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit mg/kg	Sample I.D. 208-5091 A-8-10.0	Sample I.D. 208-5092 A-9-10.0	Sample I.D. 208-5093 A-9-15.0	Sample I.D. 208-5094 AR-1-10.0	Sample I.D. 208-5095 AR-1-14.5	Sample I.D.
Purgeable Hydrocarbons	1.0	N.D.	N.D.	N.D.	1.0	8.8	
Benzene	0.0050	N.D.	N.D.	N.D.	0.16	0.030	
Toluene	0.0050	N.D.	N.D.	N.D.	N.D.	N.D.	
Ethyl Benzene	0.0050	N.D.	N.D.	N.D.	0.039	0.060	
Total Xylenes	0.0050	N.D.	N.D.	N.D.	N.D.	0.070	
Chromatogram Pattern:		--	--	--	C4-C12 Non-Gas	C4-C12 Non-Gas	

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0
Date Analyzed:	9/1/92	9/1/92	9/1/92	9/1/92	9/1/92
Instrument Identification:	GCHP-7	GCHP-7	GCHP-7	GCHP-7	GCHP-7
Surrogate Recovery, %: (QC Limits = 70-130%)	101	104	100	111	105

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/Geostrategies
2150 W. Winton Avenue
Hayward, CA 94545
Attention: John Vargas

Client Project ID: 5387-92-2A, Arco 5387, Hayward

QC Sample Group: 2085091 - 95

Reported: Sep 9, 1992

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:	Sep 1, 1992	Sep 1, 1992	Sep 1, 1992	Sep 1, 1992
QC Sample #:	GBLK090192	GBLK090192	GBLK090192	GBLK090192
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.20	0.20	0.20	0.60
Conc. Matrix Spike:	0.19	0.19	0.19	0.55
Matrix Spike % Recovery:	95	95	95	92
Conc. Matrix Spike Dup.:	0.19	0.19	0.20	0.57
Matrix Spike Duplicate % Recovery:	95	95	100	95
Relative % Difference:	0.0	0.0	5.1	3.6

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

COPY

Chain of Custody

ARCO Facility no. 5387	City (Facility) HAYWARD	Project manager (Consultant) TOM VERGAS	Laboratory name SEQUOIA
ARCO engineer MICHAEL WHELAN	Telephone no. (ARCO) (415) 511-2434	Telephone no. (Consultant) (510)-732-4800	Fax no. (Consultant) (510)-783-1089
Consultant name GeoSTRATEGIES INC.	Address (Consultant) 2140 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 ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
A-8-10.0		1	X					8/25/92	10:15		X			2050		91						
A-9-10.0		1	X					8/25/92	13:40		X			1		92						
A-9-15.0		1	X					8/25/92	12:55		X					93						
AB-1-10.0		1	X					8/25/92	16:05		X					94						
AB-1-14.5		1	X					8/25/92	16:20		X			V		95						

Special detection Limit/reporting: * LOWEST POSSIBLE

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 (X)

Condition of sample: GOOD

Temperature received: COOL

	Date	Time		Date	Time
Relinquished by sampler	8/27/92	14:45	Received by		
Relinquished by	8/27/92	15:15	Received by		
Relinquished by			Received by laboratory	8/27/92	15:15

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

APPC-3292 (2-91)

EMCON ASSOCIATES
Consultants in Wastes Management and Environmental Control

RECEIVED
OCT 1 3 1992
GeoStrategies Inc.

Date September 26, 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 third 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: 4084 Exp. 6/30/96 INDUSTRIAL STATE OF CALIFORNIA

Robert Porter, Senior Project Engineer.

1935 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 : 9-14-92

ARCO STATION # : 5387 FIELD TECHNICIAN : B. Stafford DAY : Monday

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	~~Yes~~ ok	yes	None	~~2268~~	Yes	19.19	19.19	ND	ND	34.8	-
2	A-9	ok	yes	None	2268	yes	16.12	16.13	ND	ND	32.8	-
3	A-6	ok	yes	ok	~~3268~~ 2268	yes	16.20	16.20	ND	ND	34.8	-
4	A-7	ok	yes	none	2268	yes	17.35	17.35	ND	ND	35.5	-
5	A-5	ok	yes	ok	2268	yes	16.14	16.14	ND	ND	30.0	slight odor.
6	MW-1	ok	yes	None	2268	yes	15.34	15.32	ND	ND	29.9	Moderate Odor.
7	A-4	~~ok~~ OK	~~yes~~	~~ok~~	~~2268~~	~~yes~~	~~16.83~~	~~16.85~~	~~ND~~	~~ND~~ 35.0		~~illegible~~
8	MW-3	~~Yes~~ OK	yes	None	2268	yes	14.78	14.78	ND	ND	27.3	slight odor.
9	MW-2	ok	yes	None	2268	yes	15.78	15.78	ND	ND	27.3	slight odor.
10	AR-1	ok	yes	ok	2268	yes	15.24	15.21	ND	ND	34.8	-

SURVEY POINTS ARE TOP OF WELL BOXES

Summary of Groundwater Monitoring Data
Third 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)	09/14/92	15.34	ND.[2]	2,600.	450.	<5.0	45.	21.
MW-2(26)	09/15/92	15.78	ND.	16,000.	3,700.	<100.	470.	1,000.
MW-3(26)	09/15/92	14.78	ND.	14,000	630.	<20.	1,500.	2,400.
A-4(34)	09/15/92	16.83	ND.	1,300.	<2.5	<2.5	61.	6.8
A-5(29)	09/14/92	16.14	ND.	770.	34.	<2.5	51.	65.
A-6(33)	09/14/92	16.20	ND.	<50.	<0.5	<0.5	<0.5	<0.5
A-7(34)	09/14/92	17.35	ND.	510.	12.	<2.0	30.	51.
A-8(33)	09/14/92	14.19	ND.	<50.	<0.5	<0.5	<0.5	<0.5
A-9(31)	09/14/92	16.12	ND.	<50.	<0.5	<0.5	<0.5	<0.5
AR-1(33)	09/15/92	15.21	ND.	820.	67.	<1.0	8.8	6.7
TB-1[3]	09/14/92	NA.[4]	NA.	<50.	<0.5	<0.5	<0.5	<0.5

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

Summary of Analytical Results
EPA[1] Priority Pollutant Metals
Third 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	Copper (ppb)	Zinc (ppb)
AR-1(33)	09/15/92	13.	220.

1. EPA = United States Environmental Protection Agency

Summary of Analytical Results
Volatile Organic Compounds by EPA[1] Method 624
Third 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	Benzene (ppb)	Ethylbenzene (ppb)	Tetrachloroethene (ppb)	Total Xylenes (ppb)
AR-1(33)	09/15/92	110.	13.	3.3	8.7

1. EPA = United States Environmental Protection Agency.

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: Arco 5387

Enclosed are the results from 11 water samples received at Sequoia Analytical on September 16,1992. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
2092710	Water, MW-1(28)	9/14-15/92	EPA 5030/8015/8020
2092711	Water, MW-2(26)	9/14-15/92	EPA 5030/8015/8020
2092712	Water, MW-3(26)	9/14-15/92	EPA 5030/8015/8020
2092713	Water, A-4(34)	9/14-15/92	EPA 5030/8015/8020
2092714	Water, A-5(29)	9/14-15/92	EPA 5030/8015/8020
2092715	Water, A-6(33)	9/14-15/92	EPA 5030/8015/8020
2092716	Water, A-7(34)	9/14-15/92	EPA 5030/8015/8020
2092717	Water, A-8(33)	9/14-15/92	EPA 5030/8015/8020
2092718	Water, A-9(31)	9/14-15/92	EPA 5030/8015/8020
2092719	Water, AR-1(33)	9/14-15/92	EPA 5030/8015/8020
2092720	Water, TB-1	9/14-15/92	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

Maile A. Springer
Project Manager

SEQUOIA ANALYTICAL

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

Emcon Associates	Client Project ID:	Arco 5387	Sampled:	9/14-15/92
1938 Junction Avenue	Sample Matrix:	Water	Received:	Sep 16, 1992
San Jose, CA 95131	Analysis Method:	EPA 5030/8015/8020	Reported:	Sep 29, 1992
Attention: Jim Butera	First Sample #:	209-2710		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 209-2710 MW-1(28)	Sample I.D. 209-2711 MW-2(26)	Sample I.D. 209-2712 MW-3(26)	Sample I.D. 209-2713 A-4(34)	Sample I.D. 209-2714 A-5(29)	Sample I.D. 209-2715 A-6(33)
Purgeable Hydrocarbons	50	2,600	16,000	14,000	1,300	770	N.D.
Benzene	0.50	450	3,700	630	N.D.	34	N.D.
Toluene	0.50	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Ethyl Benzene	0.50	45	470	1,500	61	51	N.D.
Total Xylenes	0.50	21	1,000	2,400	6.8	65	N.D.
Chromatogram Pattern:		Gas	Gas	Gas	Weathered Gas	Weathered Gas	--

Quality Control Data

Report Limit Multiplication Factor:	10	200	40	5.0	5.0	1.0
Date Analyzed:	9/24/92	9/23/92	9/23/92	9/24/92	9/24/92	9/23/92
Instrument Identification:	GCHP-6	GCHP-6	GCHP-6	GCHP-6	GCHP-6	GCHP-6
Surrogate Recovery, %: (QC Limits = 70-130%)	98	92	121	106	117	93

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

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

SEQUOIA ANALYTICAL

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

Emcon Associates	Client Project ID:	Arco 5387	Sampled:	9/14-15/92
1938 Junction Avenue	Sample Matrix:	Water	Received:	Sep 16, 1992
San Jose, CA 95131	Analysis Method:	EPA 5030/8015/8020	Reported:	Sep 29, 1992
Attention: Jim Butera	First Sample #:	209-2716		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 209-2716 A-7(34)	Sample I.D. 209-2717 A-8(33)	Sample I.D. 209-2718 A-9(31)	Sample I.D. 209-2719 AR-1(33)	Sample I.D. 209-2720 TB-1	Sample I.D.
Purgeable Hydrocarbons	50	510	N.D.	N.D.	820	N.D.	
Benzene	0.50	12	N.D.	N.D.	67	N.D.	
Toluene	0.50	N.D.	N.D.	N.D.	N.D.	N.D.	
Ethyl Benzene	0.50	30	N.D.	N.D.	8.8	N.D.	
Total Xylenes	0.50	51	N.D.	N.D.	6.7	N.D.	
Chromatogram Pattern:		Weathered Gas	–	–	Gas	–	

Quality Control Data

Report Limit Multiplication Factor:	4.0	1.0	1.0	2.0	1.0
Date Analyzed:	9/24/92	9/23/92	9/23/92	9/24/92	9/23/92
Instrument Identification:	GCHP-6	GCHP-6	GCHP-6	GCHP-6	GCHP-6
Surrogate Recovery, %: (QC Limits = 70-130%)	108	100	105	98	100

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

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

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

Client Project ID: Arco 5387

QC Sample Group: 2092710, 13-14, 16, 19

Reported: Sep 29, 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:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Sep 24, 1992	Sep 24, 1992	Sep 24, 1992	Sep 24, 1992
QC Sample #:	GBLK092492	GBLK092492	GBLK092492	GBLK092492
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	10
Conc. Matrix Spike:	9.8	9.9	9.9	30
Matrix Spike % Recovery:	98	99	99	100
Conc. Matrix Spike Dup.:	9.2	9.3	9.3	28
Matrix Spike Duplicate % Recovery:	92	93	93	93
Relative % Difference:	6.3	6.3	6.3	6.9

SEQUOIA ANALYTICAL

Maile A. Springer
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

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

Client Project ID: Arco 5387

QC Sample Group: 2092711 - 12, 15, 17-18, 20

Reported: Sep 29, 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:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Sep 23, 1992	Sep 23, 1992	Sep 23, 1992	Sep 23, 1992
QC Sample #:	GBLK092392	GBLK092392	GBLK092392	GBLK092392
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	10
Conc. Matrix Spike:	9.4	9.2	9.3	27
Matrix Spike % Recovery:	94	92	93	90
Conc. Matrix Spike Dup.:	10	10	9.6	29
Matrix Spike Duplicate % Recovery:	100	100	96	97
Relative % Difference:	6.2	8.3	3.2	7.1

SEQUOIA ANALYTICAL

Maile A. Springer
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. EMCGC-92-1

ARCO Facility no. 5387	City (Facility) Hayward	Project manager (Consultant) Jim Butera	Laboratory name SEQUOIA
ARCO engineer Kyle Christie	Telephone no. (ARCO) 415 571-2434	Telephone no. (Consultant) 408 453-0719	Fax no. (Consultant) 453-0452
Consultant name EMCON Associates	Address (Consultant) 1938 Junction Ave San Jose		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 G&T 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 ☐		
MW-1(28)		2		X		X	HCl	9-14-92	1620		X						209	27	10			
MW-2(26)		2		X		X	HCl	9-15-92	1214		X								11			
MW-3(26)		2		X		X	HCl	9-15-92	1112		X								12			
A-4(34)		2		X		X	HCl	9-15-92	1315		X								13			
A-5(29)		2		X		X	HCl	9-14-92	1454		X								14			
A-6(33)		2		X		X	HCl	9-14-92	1330		X								15			
A-7(34)		2		X		X	HCl	9-14-92	1414		X								16			
A-8(33)		2		X		X	HCl	9-14-92	1715		X								17			
A-9(31)		2		X		X	HCl	9-14-92	1257		X								18			
MW-1(33)		2		X		X	HCl	9-15-92	1450		X								19			
TB-1		2		X		X	HCl	9-15-92			X								20			

Special detection Limit/reporting: Lowest Possible

Special QA/QC: AS Normal

Remarks: 2-40ml HCl VOA's

Method of shipment: Courier will deliver

COPY

Lab number

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

	Date	Time		Date	Time
Relinquished by sampler: Brent Stanton	9-15-92	1650	Received by: J Butera		
Relinquished by: J Butera	9/16/92	925	Received by: Rebekah A. Harper		
Relinquished by: Rebekah A. Harper	9/16/92	11:50	Received by laboratory: [illegible]	9-16-92	1120

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

Emcon Associates
1938 Junction Avenue
San Jose, CA 95131
Attention: Dave Larson

Project: Arco 5387

Enclosed are the results from 1 water sample received at Sequoia Analytical on September 16,1992. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
2092398	Water, AR-1, (33)	9/15/92	EPA 624 Priority Metals Hazardous Waste Bioassay

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

Maile A. Springer
Project Manager

SEQUOIA ANALYTICAL

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

Emcon Associates	Client Project ID:	Arco 5387	Sampled:	Sep 15, 1992
1938 Junction Avenue	Sample Descript:	Water, AR-1 (33)	Received:	Sep 16, 1992
San Jose, CA 95131	Analysis Method:	EPA 624	Analyzed:	Sep 16, 1992
Attention: Dave Larson	Lab Number:	209-2398	Reported:	Sep 24, 1992

PURGEABLES by GC/MS (EPA 624)

Analyte	Detection Limit µg/L	Sample Results µg/L
Acetone	10	N.D.
Benzene	**2.0**	**110**
Bromodichloromethane	2.0	N.D.
Bromoform	2.0	N.D.
Bromomethane	2.0	N.D.
2-Butanone	10	N.D.
Carbon disulfide	2.0	N.D.
Carbon tetrachloride	2.0	N.D.
Chlorobenzene	2.0	N.D.
Chloroethane	2.0	N.D.
2-Chloroethyl vinyl ether	10	N.D.
Chloroform	2.0	N.D.
Chloromethane	2.0	N.D.
Dibromochloromethane	2.0	N.D.
1,1-Dichloroethane	2.0	N.D.
1,2-Dichloroethane	2.0	N.D.
1,1-Dichloroethene	2.0	N.D.
cis-1,2-Dichloroethene	2.0	N.D.
trans-1,2-Dichloroethene	2.0	N.D.
1,2-Dichloropropane	2.0	N.D.
cis-1,3-Dichloropropene	2.0	N.D.
trans-1,3-Dichloropropene	2.0	N.D.
Ethylbenzene	**2.0**	**13**
2-Hexanone	10	N.D.
Methylene chloride	5.0	N.D.
4-Methyl-2-pentanone	10	N.D.
Styrene	2.0	N.D.
1,1,2,2-Tetrachloroethane	2.0	N.D.
Tetrachloroethene	**2.0**	**3.3**
Toluene	2.0	N.D.
1,1,1-Trichloroethane	2.0	N.D.
1,1,2-Trichloroethane	2.0	N.D.
Trichloroethene	2.0	N.D.
Trichlorofluoromethane	2.0	N.D.
Vinyl acetate	2.0	N.D.
Vinyl chloride	2.0	N.D.
Total Xylenes	**2.0**	**8.7**

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

SEQUOIA ANALYTICAL

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

Emcon Associates	Client Project ID:	Arco 5387	Sampled:	Sep 15, 1992
1938 Junction Avenue	Sample Descript:	Water, AR-1, (33)	Received:	Sep 16, 1992
San Jose, CA 95131			Analyzed:	9/17-22/92
Attention: Dave Larson	Lab Number:	209-2398	Reported:	Sep 24, 1992

E.P.A. PRIORITY POLLUTANTS: METALS

Analyte	Detection Limit µg/L (ppb)	Sample Results µg/L (ppb)
Antimony	5.0	N.D.
Arsenic	5.0	N.D.
Beryllium	10	N.D.
Cadmium	10	N.D.
Chromium	10	N.D.
Copper	**10**	**13**
Lead	5.0	N.D.
Mercury	0.20	N.D.
Nickel	50	N.D.
Selenium	5.0	N.D.
Silver	10	N.D.
Thallium	5.0	N.D.
Zinc	**10**	**220**

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

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: Dave Larson

Client Project ID: Arco 5387

QC Sample Group: 209-2398

Reported: Sep 24, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Mercury	Lead	Antimony	Thallium	Arsenic	Selenium
Method:	EPA 245.1	EPA 239.2	EPA 204.2	EPA 279.2	EPA 206.2	EPA 270.2
Analyst:	J.Martinez	S.Chin	F.Contreras	F.Contreras	F.Contreras	F.Contreras
Reporting Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Sep 17, 1992	Sep 18, 1992	Sep 18, 1992	Sep 18, 1992	Sep 18, 1992	Sep 18, 1992
QC Sample #:	209-2398	209-2652	209-2563	209-2563	209-2563	209-2563
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	2.0	50	250	250	250	250
Conc. Matrix Spike:	2.0	47	220	240	230	230
Matrix Spike % Recovery:	100	94	88	96	92	92
Conc. Matrix Spike Dup.:	2.0	49	240	230	230	260
Matrix Spike Duplicate % Recovery:	100	98	96	92	92	104
Relative % Difference:	0.0	4.2	8.7	4.3	0.0	12

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

SEQUOIA ANALYTICAL

Maile A. Springer
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: Dave Larson

Client Project ID: Arco 5387

QC Sample Group: 209-2398

Reported: Sep 24, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Silver	Nickel	Beryllium	Cadmium	Chromium	Zinc	Copper
Method:	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7	EPA 200.7
Analyst:	C.Medefesser	C.Medefesser	C.Medefesser	C.Medefesser	C.Medefesser	C.Medefesser	C.Medefesser
Reporting Units:	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Sep 22, 1992	Sep 22, 1992	Sep 22, 1992	Sep 22, 1992	Sep 22, 1992	Sep 22, 1992	Sep 22, 1992
QC Sample #:	209-3204	209-3204	209-3204	209-3204	209-3204	209-3204	209-3204
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	22
Spike Conc. Added:	1000	1000	1000	1000	1000	1000	1000
Conc. Matrix Spike:	760	910	960	880	910	860	950
Matrix Spike % Recovery:	76	91	96	88	91	86	93
Conc. Matrix Spike Dup.:	800	840	870	800	830	770	870
Matrix Spike Duplicate % Recovery:	80	84	87	80	83	77	85
Relative % Difference:	5.1	8.0	9.8	9.5	9.2	11	8.8

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

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

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

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

SEQUOIA ANALYTICAL

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

Emcon Associates	Client Project ID:	Arco 5387	
1938 Junction Avenue	Method (units):	EPA 8240 (µg/L purged)	Q.C. Sample Dates
San Jose, CA 95131	Analyst(s):	M.Williams	
Attention: Dave Larson	QC Sample #:	BLK091692	Analyzed: Sep 16, 1992
			Reported: Sep 24, 1992

QUALITY CONTROL DATA REPORT

Analyte	Sample Conc.	Spike Conc. Added	Conc. Matrix Spike	Matrix Spike % Recovery	Conc. Matrix Spike Duplicate	Matrix Spike Duplicate % Recovery	Relative % Difference
1,1-Dichloro-ethene	N.D.	50	55	110	55	110	0.0
Trichloroethene	N.D.	50	50	100	50	100	0.0
Benzene	N.D.	50	53	106	52	104	1.9
Toluene	N.D.	50	50	100	50	100	0.0
Chlorobenzene	N.D.	50	51	102	50	100	2.0

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

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

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

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

SEQUOIA ANALYTICAL

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

Emcon Associates	Client Project ID: Arco 5387	Sampled: 9/15/92
1938 Junction Avenue	Sample Descript: Water, AR-1	Received: 9/16/92
San Jose, CA 95131	Analysis Method: See below	
Attention: Jim Butera	Lab Number: 209-2398	Reported: 9/24/92

STATIC ACUTE HAZARDOUS WASTE BIOASSAY

Static [X]
Cont. Flow [ ]

Screening [ ]
Definitive [X]

Species: Pimephales promelas
Common Name: Fathead Minnow
Mean length: 37 mm
Mean weight: 0.55 g
Supplier: Sticklebacks Unlimited
Acclimation Temp.: 20 degrees C
Dilution Water: Synthetic Saltwater

Organisms/Tank: 10
Replicates: 2
Organisms/Conc.: 20
Tank Depth: 13 cm
Tank Volume: 10 L

	Alkalinity, mg/L		Hardness, mg/L	
	Initial	Final	Initial	Final
Control	32	34	44	45
1000 ppm	31	33	48	50
Duplicate 1000 ppm	32	34	47	49

	Initial	24 Hr	48 Hr	72 Hr	96 Hr
DATE	9/16/92	9/17/92	9/18/92	9/19/92	9/20/92

	DO mg/L	C Temp	pH Units	DO mg/L	C Temp	pH Units	# M Dead	DO mg/L	C Temp	pH Units	# M Dead	DO mg/L	C Temp	pH Units	# M Dead	DO mg/L	C Temp	pH Units	# M Dead	Total Dead
Control	9.5	20	7.2	6.9	20	7.0	0	6.5	20	6.9	0	6.4	20	6.9	0	6.0	20	7.0	0	0
100 ppm	9.0	20	7.4	7.7	20	7.2	0	7.2	20	7.0	0	6.8	20	7.0	0	6.4	20	6.9	0	0
180 ppm	8.9	20	7.4	7.5	20	7.1	0	7.3	20	7.0	0	7.0	20	7.0	0	6.9	20	7.0	0	0
320 ppm	9.1	20	7.4	7.7	20	7.1	0	7.7	20	7.1	0	7.3	20	7.0	0	7.0	20	6.9	1	1
560 ppm	9.0	20	7.4	7.4	20	7.1	0	7.2	20	7.0	1	7.0	20	6.9	0	6.7	20	6.9	0	1
1000 ppm	9.0	20	7.4	7.3	20	7.1	0	7.2	20	7.0	0	6.8	20	7.0	0	6.5	20	6.9	0	0

Duplicate	DO mg/L	C Temp	pH Units	DO mg/L	C Temp	pH Units	# M Dead	DO mg/L	C Temp	pH Units	# M Dead	DO mg/L	C Temp	pH Units	# M Dead	DO mg/L	C Temp	pH Units	# M Dead	Total Dead
Control	9.5	20	7.2	6.9	20	7.0	0	6.5	20	6.9	0	6.4	20	6.9	0	6.0	20	7.0	0	0
100 ppm	9.1	20	7.4	8.0	20	7.2	0	7.6	20	7.0	0	7.2	20	6.9	0	7.0	20	6.9	0	0
180 ppm	9.1	20	7.4	8.1	20	7.2	0	7.9	20	7.1	0	7.2	20	7.0	0	7.0	20	7.0	0	0
320 ppm	9.0	20	7.4	7.9	20	7.3	0	7.7	20	7.1	0	7.2	20	7.0	0	6.9	20	7.0	0	0
560 ppm	9.0	20	7.3	7.4	20	7.1	0	7.1	20	7.0	1	6.8	20	7.0	0	6.0	20	6.9	0	1
1000 ppm	8.9	20	7.4	6.6	20	7.0	0	6.5	20	7.0	0	6.0	20	6.9	0	5.4	20	6.8	0	0

LC-50: > 1,000 ppm
LC-50 Dup: ~~> 1,000 ppm~~

LC-50 Calculation Method: Moving average angle

Remarks:

Analyst: D. George/N. Northey Method Reference: Static Acute Bioassay Procedures for Hazardous Waste Samples, September 1987, California Department of Fish and Game WPCL.

SEQUOIA ANALYTICAL

Maile A. Springer
Project Manager

ARCO Products Company
Division of AtlanticRichfieldCompany

Chain of Custody

Task Order No. EMCGC-92-1

ARCO Facility no. 5387	City (Facility) HAYWARD	Project manager (Consultant) JILL BUREKA	Laboratory name SEQUOIA
ARCO engineer Kyle Christie	Telephone no. (ARCO) (415) 571-2034	Telephone no. (Consultant) 408 453-7719	Fax no. (Consultant) 408 453 0857	Contract number 07-073
Consultant name EMCON ASSOCIATES	Address (Consultant) 1938 JUNCTION Ave San Jose		Method of shipment Courier will Pick up

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 ☐	Priority pollutant metals	Hold/Save
AR-1(33)	2098 2398	2		X		X	HCl	9-15-92	1450							X						
AR-1(33)		1		X		X	HNO_3														*	
AR-1(33)	↓	1		X		X	NP	↓	↓												X	X

* PLEASE FAX RESULTS ASAP TO JOHN VARLEAS
FAX # (510) 783-1089

COPY

Special detection Limit/reporting: Lowest Possible

Special QA/QC: AS Normal

Remarks: 2-40ml HCl VOA's; 1-Liter HNO_3 plastic; 1-Liter NP plastic

Lab number

Turnaround time
- Priority Rush 1 Business Day [ ]
- Rush 2 Business Days [ ]
- Expedited 5 Business Days [X]
- Standard 10 Business Days [ ]

Condition of sample: good

Temperature received: cool

	Date	Time		Date	Time
Relinquished by sampler: Brent Stanfa	9-15-92	1650	Received by: Rebekah J. Hayson	9/16/92	925
Relinquished by: Rebekah J. Hayson	9/16/92	11:50	Received by:		
Relinquished by:			Received by laboratory:	9-16-92	1110

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

ARPC-3292 (2-91)

Rev. 2, 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: DG70-034-01 SAMPLE ID: MW-1 (28)

PURGED BY: B. Stafford CLIENT NAME: Arco 5387

SAMPLED BY: B. Stafford 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.): 2.37

DEPTH TO WATER (feet): 15.34 CALCULATED PURGE (gal.): 11.87

1456 DEPTH OF WELL (feet): 29.9 ACTUAL PURGE VOL (gal.): 12.0

DATE PURGED: 9-14-92 Start (2400 Hr) 1551 End (2400 Hr) 1616

DATE SAMPLED: 9-14-92 Start (2400 Hr) 1620 End (2400 Hr) 1624

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1556	2.50	6.66	1305.	63.9	Gray	V. Hvy
1600	5.00	6.73	1249.	62.7	"	"
1606	7.50	6.71	1273.	62.2	"	"
1611	10.0	6.70	1270.	62.9	"	Hvy
1615	12.0	6.72	1264.	61.9	"	"

D. O. (ppm): NA ODOR: Slight

COLOR (visual): NA (COBALT 0 - 100)

TURBIDITY (visual): NA (NTU 0 - 200)

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

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: 9-14-92 Time: 12:14 Meter Serial #: 8912 Temperature °F: ___

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

Location of previous calibration: A-9

Reviewed By: JP

Rev. 2, 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-034-01 | SAMPLE ID: MW-2 (26)

PURGED BY: B. Stafford | CLIENT NAME: Arco 5387

SAMPLED BY: B. Stafford | 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.): 1.95

DEPTH TO WATER (feet): 15.80 | CALCULATED PURGE (gal.): 9.75

12.00 DEPTH OF WELL (feet): 27.8 | ACTUAL PURGE VOL (gal.): 10.00

DATE PURGED: 9-15-92 | Start (2400 Hr) 1138 | End (2400 Hr) 1211

DATE SAMPLED: 9-15-92 | Start (2400 Hr) 1214 | End (2400 Hr) 1217

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1143	2.0	6.57	1345.	66.1	Gray	High
1149	4.0	6.63	1343.	65.8	"	"
1159	6.0	6.62	1343.	65.7	"	"
1204	8.0	6.63	1338.	65.4	"	"
1209	10.0	6.63	1333.	65.5	"	"

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

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

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: Sheen occured on purge water in buckets & Jar. Readim

Meter Calibration: Date: 9-15-92 Time: 1018 Meter Serial #: 8912 Temperature °F: ___

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

Location of previous calibration: MW-3

S. L. Sch.

Reviewed By: JB

Rev. 2, 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: DG70-034-01 SAMPLE ID: MW-3 (2k)

PURGED BY: B. Stafford CLIENT NAME: Arco 5387

SAMPLED BY: B. Stafford 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.): 2.04

DEPTH TO WATER (feet): 14.79 CALCULATED PURGE (gal.): 10.20

DEPTH OF WELL (feet): ~~Z 27.3~~ 12.51 ACTUAL PURGE VOL (gal.): 10.50

DATE PURGED: 9-15-92 Start (2400 Hr) 10:52 End (2400 Hr) 1108

DATE SAMPLED: 9-15-92 Start (2400 Hr) 1112 End (2400 Hr) 1115

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1036	2.0	6.24	1202.	65.0	Brown	High
1045	4.0	6.51	1200.	64.0	↓	↓
1054	6.0	6.51	1199.	64.5	↓	↓
1101	8.0	6.51	1196.	63.9	↓	↓
1106	10.50	6.49	1187.	63.3	↓	↓

D. O. (ppm): NA ODOR: Moderate to Strong NA (COBALT 0 - 100) NA (NTU 0 - 200)

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

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: 9-15-92 Time: 1018 Meter Serial #: 8912 Temperature °F: 66.1

(EC 1000 994 / 1001) (DI 3.35) (pH 7 7.01 / 7.00) (pH 10 9.98 / 10.01) (pH 4 4.03 / ___)

Location of previous calibration: NA

Reviewed By: JB Page 3 of 10

Rev. 2, 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-034-01 SAMPLE ID: A-4 (34)

PURGED BY: B. Stafford CLIENT NAME: Arco 5387

SAMPLED BY: B. Stafford 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.): 6.67

DEPTH TO WATER (feet): 16.83 CALCULATED PURGE (gal.): 33.34

DEPTH OF WELL (feet): 35.00 (1817) ACTUAL PURGE VOL. (gal.): 34.0

DATE PURGED: 9-15-92 Start (2400 Hr) 12:50 End (2400 Hr) 1310

DATE SAMPLED: 9-15-92 Start (2400 Hr) 13:15 End (2400 Hr) 1317

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1252	7.0	6.61	1176.	66.6	Brown	High
1257	14.0	6.53	1111.	64.2	↓	↓
1302	21.0	6.58	1126.	64.3	Cloudy	Moderate
1305	28.0	6.58	1125.	63.6	↓	low
1309	34.0	6.59	1127.	63.6	↓	↓

D. O. (ppm): NA ODOR: Moderate

NA (COBALT 0 - 100) NA (NTU 0 - 200)

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

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: 9-15-92 Time: 1018 Meter Serial #: 3912 Temperature °F: ____

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

Location of previous calibration: MW-3

2 + Fitting JB 4.10

Rev. 2, 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-034-01 SAMPLE ID: A-5(29)

PURGED BY: B. Stafford CLIENT NAME: Arco 5387

SAMPLED BY: B. Stafford 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.): 5.09

DEPTH TO WATER (feet): 16.13 CALCULATED PURGE (gal.): 25.45

13.37 DEPTH OF WELL (feet): 30.00 ACTUAL PURGE VOL (gal.): 25.50

DATE PURGED: 9-14-92 Start (2400 Hr) 1435 End (2400 Hr) 1448

DATE SAMPLED: 9-14-92 Start (2400 Hr) 1454 End (2400 Hr) 1457

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1436	5.0	6.60	1273.	65.3	Brown	High
1440	10.0	6.59	1251.	65.2	↓	↓
1443	15.0	6.58	1253.	64.8	↓	↓
1445	20.0	6.58	1255.	64.8	↓	↓
1447	25.5	6.59	1231	64.8	↓	↓

D. O. (ppm): NA ODOR: Strong

COLOR (visual): NA (COBALT 0 - 100)

TURBIDITY (visual): NA (NTU 0 - 200)

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

PURGING EQUIPMENT

___ 2" Bladder Pump
X Centrifugal Pump
___ Submersible Pump
___ Well Wizard™
___ Bailer (Teflon®)
___ Bailer (PVC)
___ Bailer (Stainless Steel)
___ Dedicated
Other: ___

SAMPLING EQUIPMENT

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

WELL INTEGRITY: OK LOCK #: 2268

REMARKS: ___

Meter Calibration: Date: 9-14-92 Time: 12:14 Meter Serial #: 8912 Temperature °F: ___

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

Location of previous calibration: A-9

Brent Stafford

Reviewed By: JB

Rev. 2, 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-034-01 SAMPLE ID: A-6 (33)

PURGED BY: B. Stafford CLIENT NAME: Arco 5387

SAMPLED BY: B. Stafford LOCATION: 20200 Hesperian Blvd Hayward, CA

TYPE: Ground Water Y 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.): 6.83

DEPTH TO WATER (feet): 16.20 CALCULATED PURGE (gal.): 34.2

18.6 DEPTH OF WELL (feet): 34.8 ACTUAL PURGE VOL (gal.): 35.0

DATE PURGED: 9-14-92 Start (2400 Hr) 1315 End (2400 Hr) 1328

DATE SAMPLED: 9-14-92 Start (2400 Hr) 1330 End (2400 Hr) 1336

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1316	7.0	6.77	1024.	64.6	Brown	High
1319	14.0	6.68	1056.	63.3	↓	↓
1321	21.0	6.70	1109	63.0	Cloudy	low
1324	28.0	6.71	1108.	62.7	cloudy	low
1327	35.0	6.72	1115.	62.7	↓	↓

D. O. (ppm): NA ODOR: None COLOR: NA (COBALT 0 - 100) TURBIDITY: NA (NTU 0 - 200)

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

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: 9-14-92 Time: 12:14 Meter Serial #: 8912 Temperature °F: ___

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

Location of previous calibration: A-9

B. Stafford

Reviewed By: JB Page 6 of 10

Rev. 2, 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: DG70-034.01 SAMPLE ID: A-7(34)

PURGED BY: B. Stafford CLIENT NAME: Arco 5387

SAMPLED BY: B. Stafford 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.): 6.66

DEPTH TO WATER (feet): 17.35 CALCULATED PURGE (gal.): 33 3

18.15 DEPTH OF WELL (feet): 35.5 ACTUAL PURGE VOL (gal.): 33.5

DATE PURGED: 9-14-92 Start (2400 Hr) 13:59 End (2400 Hr) 1410

DATE SAMPLED: 9-14-92 Start (2400 Hr) 1414 End (2400 Hr) 1417

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1400	6.50	6.73	1275.	65.3	Brown	High
1403	13.0	6.75	1275.	65.1	Tan	Moderate
1405	19.5	6.75	1267.	64.2	↓	↓
1407	26.0	6.74	1268.	64.2	↓	↓
1409	33.5	6.75	1265.	63.9	↓	↓

D. O. (ppm): NA ODOR: None

COLOR (visual): NA (COBALT 0 - 100)

TURBIDITY (visual): NA (NTU 0 - 200)

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

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: 9-14-92 Time: 12:14 Meter Serial #: 8912 Temperature °F: ___

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

Location of previous calibration: A-9

B. Stafford

Reviewed By: JB

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/9

EMCON ASSOCIATES

PROJECT NO: 0670-034-01 SAMPLE ID: A-8 (33)

PURGED BY: B. Stafford CLIENT NAME: Arco 5387

SAMPLED BY: B. Stafford 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.): 3.36

DEPTH TO WATER (feet): 14.19 CALCULATED PURGE (gal.): 16.8

20.61 DEPTH OF WELL (feet): 34.8 ACTUAL PURGE VOL. (gal.): 17.0

DATE PURGED: 9-14-92 Start (2400 Hr) 1638 End (2400 Hr) 1711

DATE SAMPLED: 9-14-92 Start (2400 Hr) 1715 End (2400 Hr) 1718

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1643	3.50	6.70	1200.	64.4	Brown	High
1651	7.00	6.61	1222.	63.7	"	"
1657	10.50	6.63	1267.	64.8	"	"
1705	14.0	6.65	1204.	63.6	"	"
1710	17.0	6.64	1200.	62.6	"	"

D. O. (ppm): NA ODOR: None

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

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

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: 9-14-92 Time: 1214 Meter Serial #: 8912 Temperature °F: ___

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

Location of previous calibration: A-9

Signature: [signature] Reviewed By: JD Page 8 of 10

Rev. 2, 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-034-01 SAMPLE ID: A-9 (31)

PURGED BY: B. Stafford CLIENT NAME: Arco 5387

SAMPLED BY: B. Stafford 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.): 2.72

DEPTH TO WATER (feet): 16.12 CALCULATED PURGE (gal.): 13.60

16.08 DEPTH OF WELL (feet): 32.8 ACTUAL PURGE VOL (gal.): 14.0

DATE PURGED: 9-14-92 Start (2400 Hr) 12:25 End (2400 Hr) 1252

DATE SAMPLED: 9-14-92 Start (2400 Hr) 1257 End (2400 Hr) 1301

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1229	3.0	6.56	~~660.~~ 1265. 88	66.8	Brown	High
1235	6.0	6.67	1205.	65.3	↓	↓
1241	9.0	6.69	1191.	64.8	↓	↓
1247	12.0	6.76	1155.	64.0	↓	↓
1251	14.0	6.73	1152.	64.2	↓	↓

D. O. (ppm): NA ODOR: None

NA (COBALT 0 - 100) NA (NTU 0 - 200)

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

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: 9-14-92 Time: 1214 Meter Serial #: 8917 Temperature °F: 74.6

(EC 1000 1087 / 1001) (DI 3.22) (pH 7 6.95 / 7.00) (pH 10 10.04 / 10.00) (pH 4 4.03 / ___)

Location of previous calibration: NA

Reviewed By: JB Page 9 of 10

Rev. 2 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-034-01 SAMPLE ID: AR-1 (33)

PURGED BY: B. Stafford CLIENT NAME: Arco 5387

SAMPLED BY: B. Stafford 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.): 28.83

DEPTH TO WATER (feet): 15.26 CALCULATED PURGE (gal.): 144.2

19.VA DEPTH OF WELL (feet): 34.9 ACTUAL PURGE VOL. (gal.): 150.0

DATE PURGED: 9-15-92 Start (2400 Hr) 14:01 End (2400 Hr) 1439

DATE SAMPLED: 9-15-92 Start (2400 Hr) 1450 End (2400 Hr) 1455

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1404	30.0	6.72	1173.	70.3	Cloudy	Moderate
1413	60.0	6.92	1161.	66.8	↓	↓
1421	90.0	6.85	1171.	66.7	↓	↓
1430	120.	6.80	1166.	67.3	↓	↓
1438	150.0	6.75	1155.	66.7	↓	↓

D. O. (ppm): NA ODOR: None

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

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

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: 9-15-92 Time: 1048 Meter Serial #: 8912 Temperature °F: ___

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

Location of previous calibration: MW-3

B. Stafford JB

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 1 water sample received at Sequoia Analytical on October 14,1992. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
2102018	Water, Effluent	10/14/92	Cyanide Chemical Oxygen Demand pH Total Suspended Solids EPA 8040

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

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:	Oct 14, 1992
2150 W. Winton Avenue	Sample Descript:	Water, Effluent	Received:	Oct 14, 1992
Hayward, CA 94545	Analysis Method:	EPA 8040	Extracted:	Oct 21, 1992
Attention: John Vargas	Lab Number:	210-2018	Analyzed:	Oct 26, 1992
			Reported:	Oct 28, 1992

PHENOLS (EPA 8040)

Analyte	Detection Limit µg/L	Sample Results µg/L
4-Chloro-3-methylphenol	2.0	N.D.
2-Chlorophenol	2.0	N.D.
2,4-Dichlorophenol	2.0	N.D.
2,4-Dimethylphenol	2.0	N.D.
2,4-Dinitrophenol	10	N.D.
2-Methyl-4,6-dinitrophenol	10	N.D.
2-Nitrophenol	2.0	N.D.
4-Nitrophenol	2.0	N.D.
Pentachlorophenol	10	N.D.
Phenol	**2.0**	**54**
2,4,6-Trichlorophenol	2.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

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	Client Project ID:	5387-92-2A, Arco 5387, San Lorenzo	Sampled:	Oct 14, 1992
2150 W. Winton Avenue	Sample Descript:	Water, Effluent	Received:	Oct 14, 1992
Hayward, CA 94545			Analyzed:	see below
Attention: John Vargas	Lab Number:	210-2018	Reported:	Oct 28, 1992

LABORATORY ANALYSIS

Analyte	Date Analyzed	Detection Limit	Sample Result
Cyanide, mg/L	10/20/92	0.010	N.D.
Chemical Oxygen Demand, mg/L	10/19/92	20	N.D.
pH	**10/15/92**	**N.A.**	**6.8**
Total Suspended Solids, mg/L	**10/15/92**	**1.0**	**2.0**

Analytes reported as N.D. were not present above the stated limit of detection.

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: 210-2018

Reported: Oct 28, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Phenols	4-chloro-3-methyiph	4-nitrophenol	Ttl. Suspended Solids	pH	Chem. Oxy. Demand	Cyanide
Method:	EPA 8040	EPA 8040	EPA 8040	EPA 160.2	EPA 9040	EPA 410.4	EPA 335.3
Analyst:	D.Dreblow	D.Dreblow	D.Dreblow	Y.Arteaga	Y.Arteaga	Y.Arteaga	A.Savva
Reporting Units:	µg/L	µg/L	µg/L	mg/L	N.A.	mg/L	mg/L
Date Analyzed:	Oct 26, 1992	Oct 26, 1992	Oct 26, 1992	Oct 15, 1992	Oct 15, 1992	Oct 19, 1992	Oct 20, 1992
QC Sample #:	SBLK101992	SBLK101992	SBLK101992	210-2024	210-2003	210-2476	210-2615
Sample Conc.:	N.D.	N.D.	N.D.	40	7.1	N.D.	N.D.
Spike Conc. Added:	50	50	50	N.A.	N.A.	75	0.18
Conc. Matrix Spike:	54	42	43	N.A.	N.A.	63	0.18
Matrix Spike % Recovery:	108	84	86	N.A.	N.A.	84	100
Conc. Matrix Spike Dup.:	53	44	40	41	7.1	69	0.18
Matrix Spike Duplicate % Recovery:	106	88	80	N.A.	N.A.	92	100
Relative % Difference:	1.9	4.7	7.2	2.5	0.0	9.1	0.0

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 AtlanticRichfieldCompany

Task Order No. 5387-92-2A

COPY

Chain of Custody

ARCO Facility no	5387
City (Facility)	San Lorenco
Project manager (Consultant)	John Vargas
Laboratory name	SEQ
ARCO engineer	Lyle Christie
Telephone no. (ARCO)	
Telephone no. (Consultant)	510 783-7500
Fax no. (Consultant)	783-1089
Contract number	07-073
Consultant name	Geo Strategies Ryan Inc
Address (Consultant)	2150 W. Winton Ave. Hayward
Method of shipment	GR

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 (Cyanide)	EPA 601/8010 (COD)	EPA 624/8240 (Total Suspended Solids)	EPA 625/8270 (Phenols Organic)	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	
Effluent		4		✓		✓	✓	10-14-92	13:20					X	X	X	X		2	02	018

Special detection Limit/reporting: Standard

Special QA/QC: Standard

Remarks: GR 442904

Lab number:

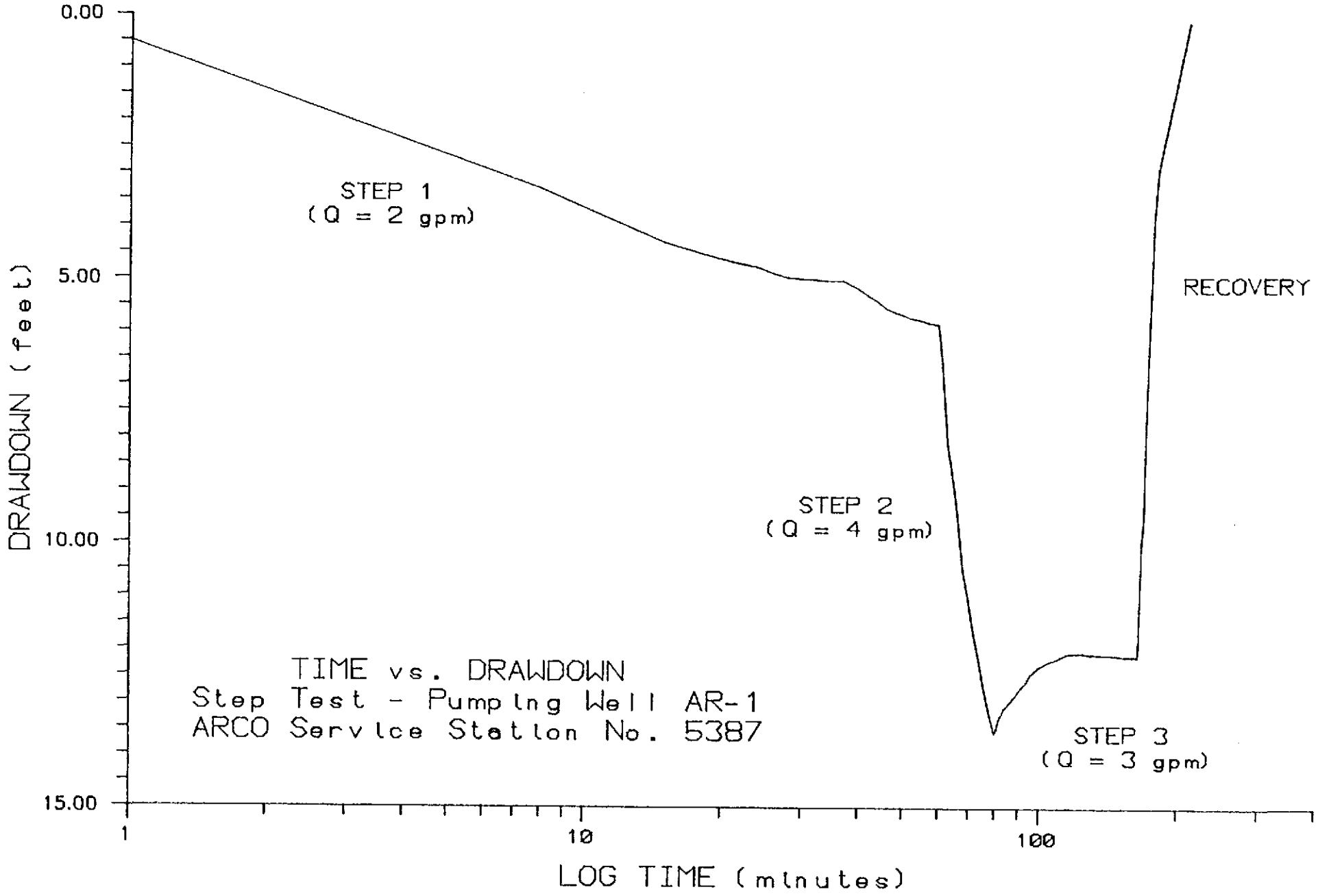
Turnaround time:
- Priority Rush 1 Business Day [ ]
- Rush 2 Business Days [ ]
- Expedited 5 Business Days [ ]
- Standard 10 Business Days [✓]

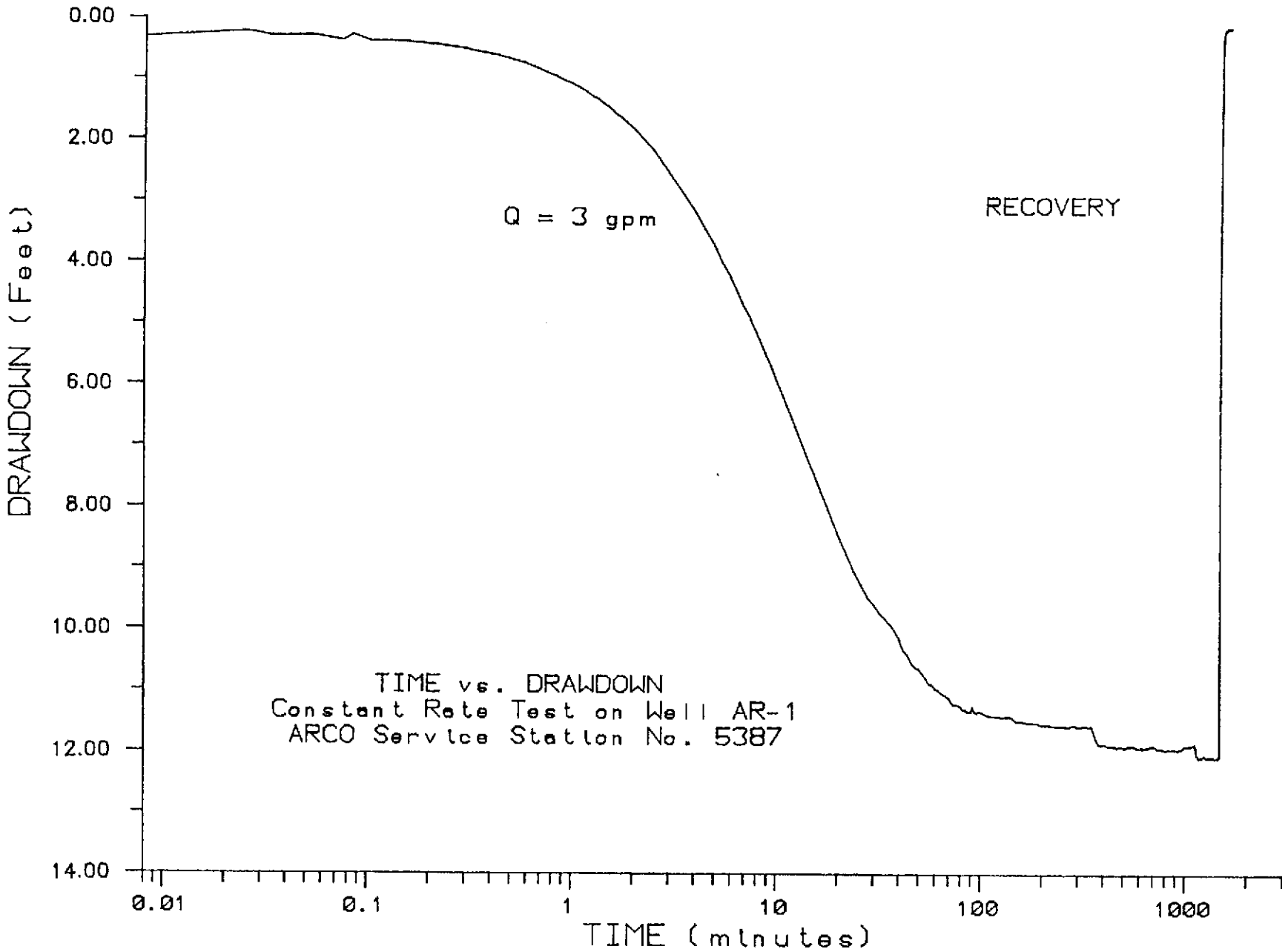
Condition of sample: GOOD

Temperature received: COOL

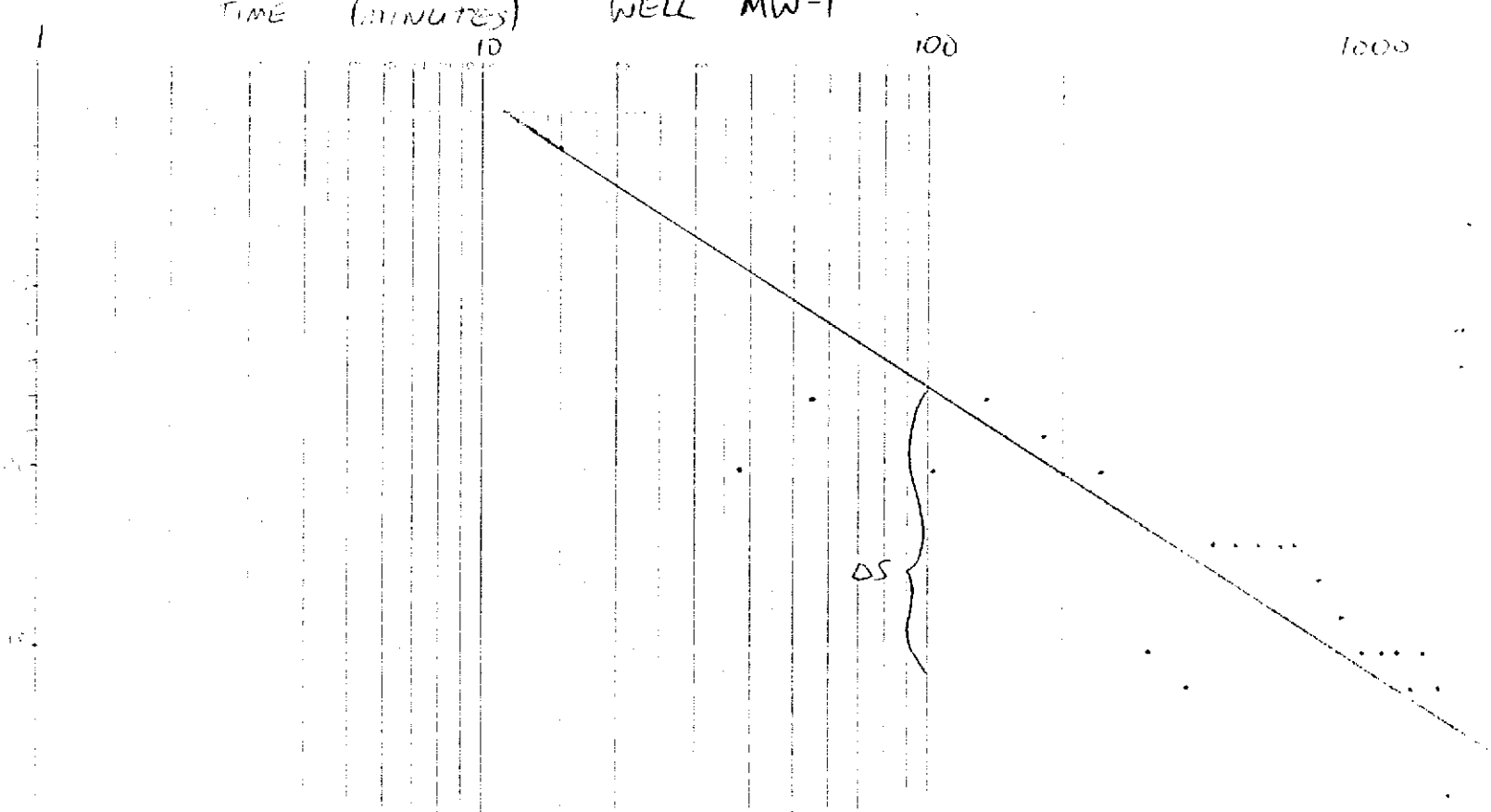
Relinquished by	Date	Time	Received by	Date	Time
Relinquished by sampler: [illegible]	10-14-92	16:50	Received by		
Relinquished by			Received by		
Relinquished by			Received by laboratory: [illegible]	10-14-92	1650

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant
APPC-3292 (2-91)


0.00
5.00
10.00
15.00
DRAWDOWN (feet)
STEP 1
(Q = 2 gpm)
STEP 2
(Q = 4 gpm)
STEP 3
(Q = 3 gpm)
RECOVERY
TIME vs. DRAWDOWN
Step Test - Pumping Well AR-1
ARCO Service Station No. 5387
1
10
100
LOG TIME (minutes)


0.00
2.00
4.00
6.00
8.00
10.00
12.00
14.00
DRAWDOWN (Feet)
Q = 3 gpm
RECOVERY
TIME vs. DRAWDOWN
Constant Rate Test on Well AR-1
ARCO Service Station No. 5387
0.01
0.1
1
10
100
1000
TIME (minutes)

7926 PUMPING WELL AR-1



$T = \frac{264(Q)}{\Delta s}$ $Q = 3$ gpm

$= \frac{264(3)}{0.08}$ $\Delta s = 0.08'$

$= 9.9 \times 10^3$ gpd/ft.

$S_y = \frac{0.3(T)(t_o)}{r^2}$ $t_o = 11/1440 = 0.00764$

$r = 46'$

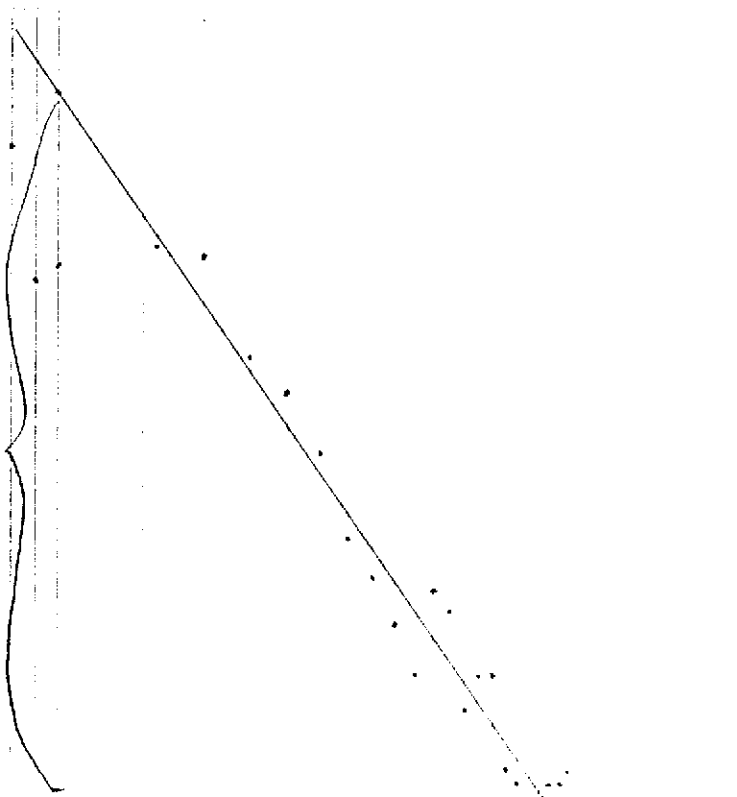
$= \frac{0.3\,(9900)(0.00764)}{(46)^2}$

$= 0.0107$

[illegible]	ARCO
[illegible] NO.	7926
DATE	10/14/92
TEST NO.	CONSTANT RATE
ANALYSIS	JACOB
PUMP. WELL	AR-1
[illegible] WELL	MW-1
Q =	3 gpm
r =	46'

7926 PUMPING WELL AR-1

TIME (MINUTES) WELL MW-2



ARCO
7926
10/14/92
CONSTANT RATE
JACOB
AR-1
MW-2
3 gpm
28'

$T = \frac{264Q}{DS}$ $Q = 3$ gpm, $DS = 0.191'$

$= \frac{264(3)}{0.191}$

$= 4,147$ gpd/ft

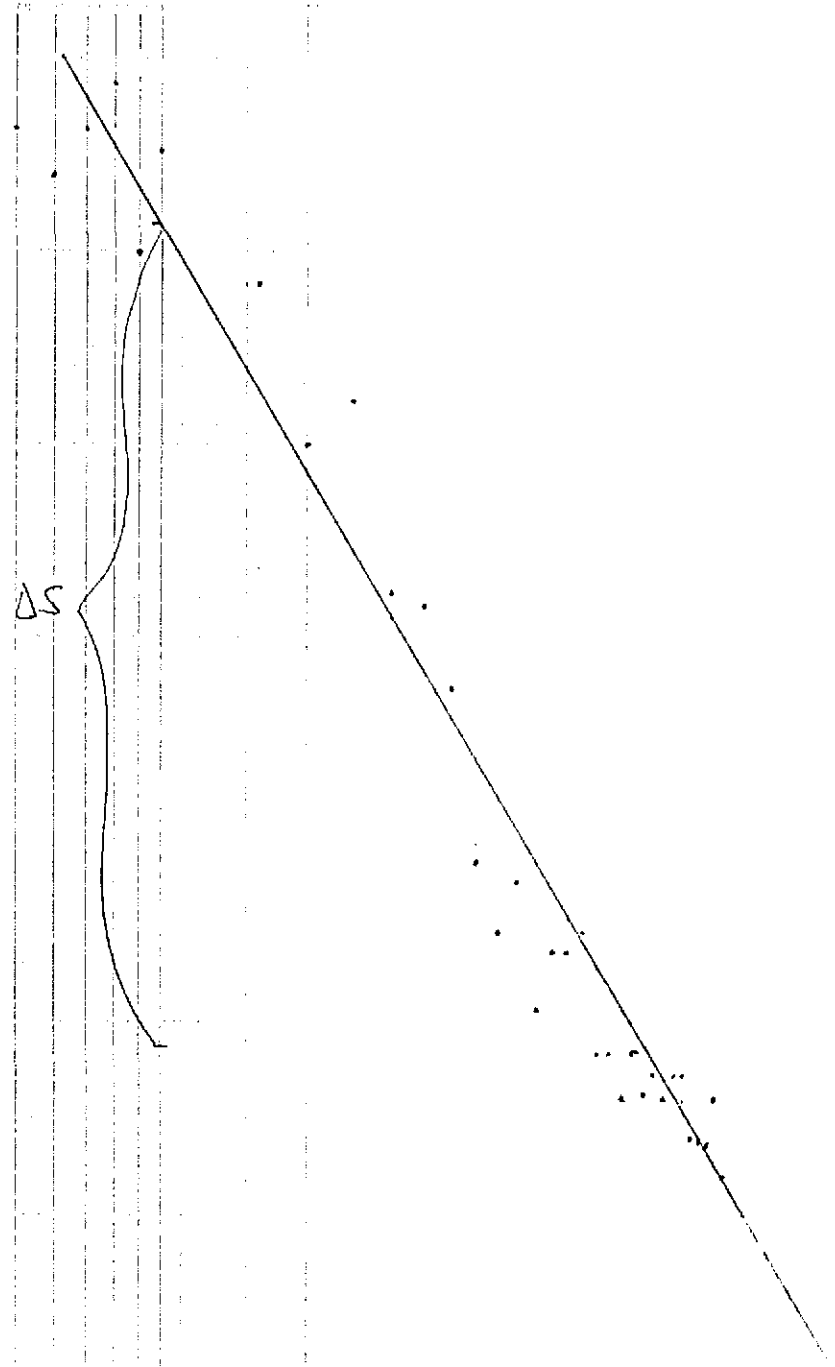
$S_y = \frac{0.3(T)(t_o)}{r^2}$ $t_o = 90/1440 = 0.0625$, $r = 28'$

$= \frac{0.3(4,147)(0.0625)}{(28)^2}$

$= 0.09917$

1 7926 PUMPING WELL AR-1

TIME (MINUTES) WELL MW-3



ARCO
7926
10/14/92
CONSTANT RATE,
JACOB
AR-1
MW-3
3 gpm
37'

$T = \frac{7.64\,Q}{\Delta S}$ $Q = 3$ gpm, $\Delta S = 0.106$

$= \frac{264\,(3)}{0.106}$

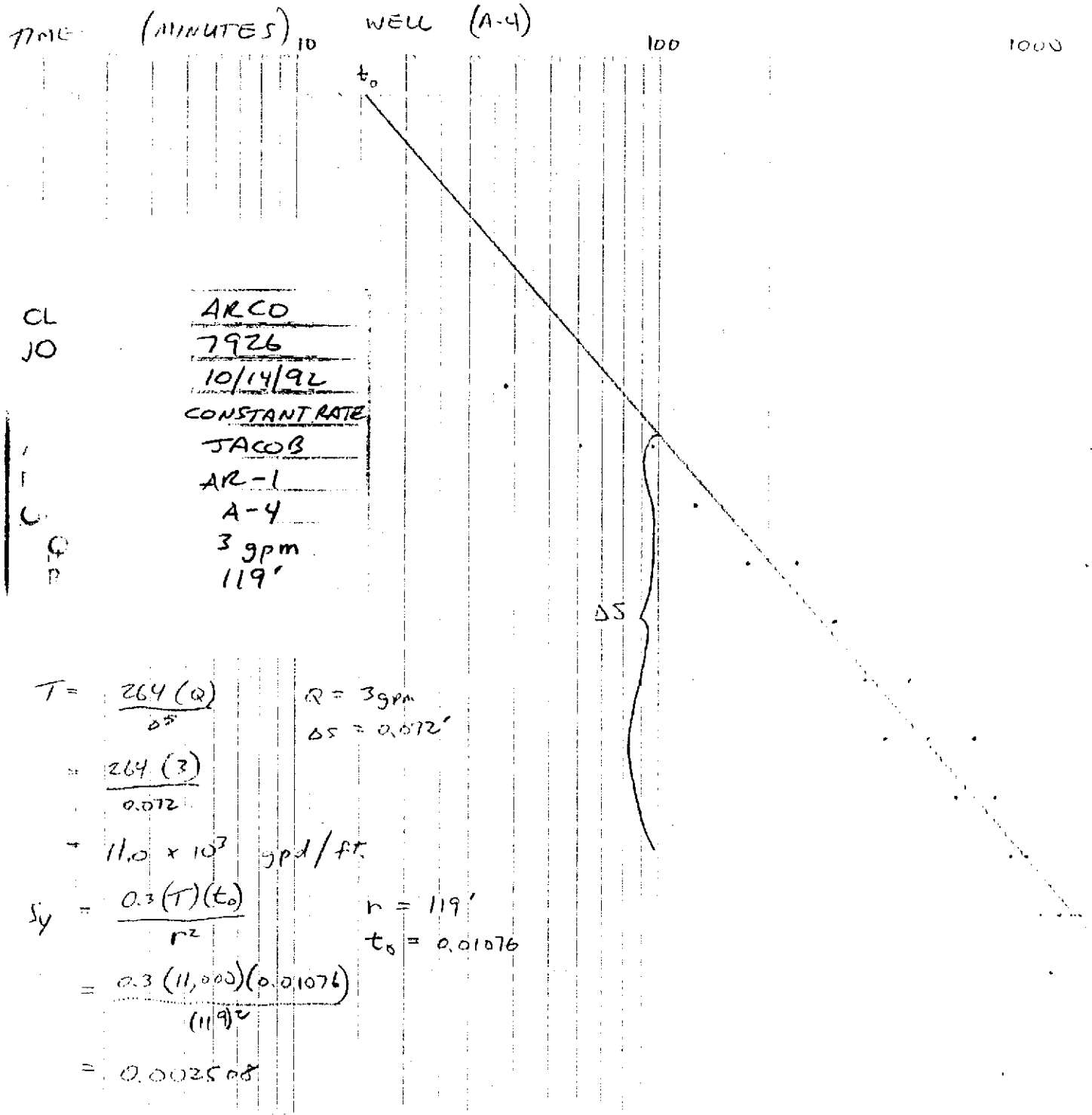
$= 7,471$

$S_y = \frac{0.3\,(T)\,(t_o)}{r^2}$ $t_o = 0.0430555$, $r = 37'$

$= \frac{0.3\,(7471)\,(0.0430555)}{(37)^2}$

$= 0.07049$

7926 PUMPING WELL AR-1



CL ARCO
JO 7926
10/14/92
CONSTANT RATE
JACOB
AR-1
A-4
Q 3 gpm
r 119'

$T = \frac{264(Q)}{\Delta s}$ $Q = 3$ gpm
$\Delta s = 0.072'$

$= \frac{264(3)}{0.072}$

$= 11.0 \times 10^3$ gpd/ft.

$S_y = \frac{0.3(T)(t_0)}{r^2}$ $r = 119'$
$t_0 = 0.01076$

$= \frac{0.3(11,000)(0.01076)}{(119)^2}$

$= 0.00250$

7926 PUMPING WELL AR-1

TIME (MINUTES) WELL A-6

1 10 100 1000

CLIENT ARCO
JOB NO. 7926
DATE 10/14/92
TEST NO. CONSTANT RATE
ANALYSIS JACOB
PUMP. WELL AR-1
OBS. WELL A-6
Q = 3 gpm
R = 138'

$T = \frac{264(Q)}{\Delta s}$ Q = 3 gpm
Δs = 0.076'

$= \frac{264(3)}{0.076}$

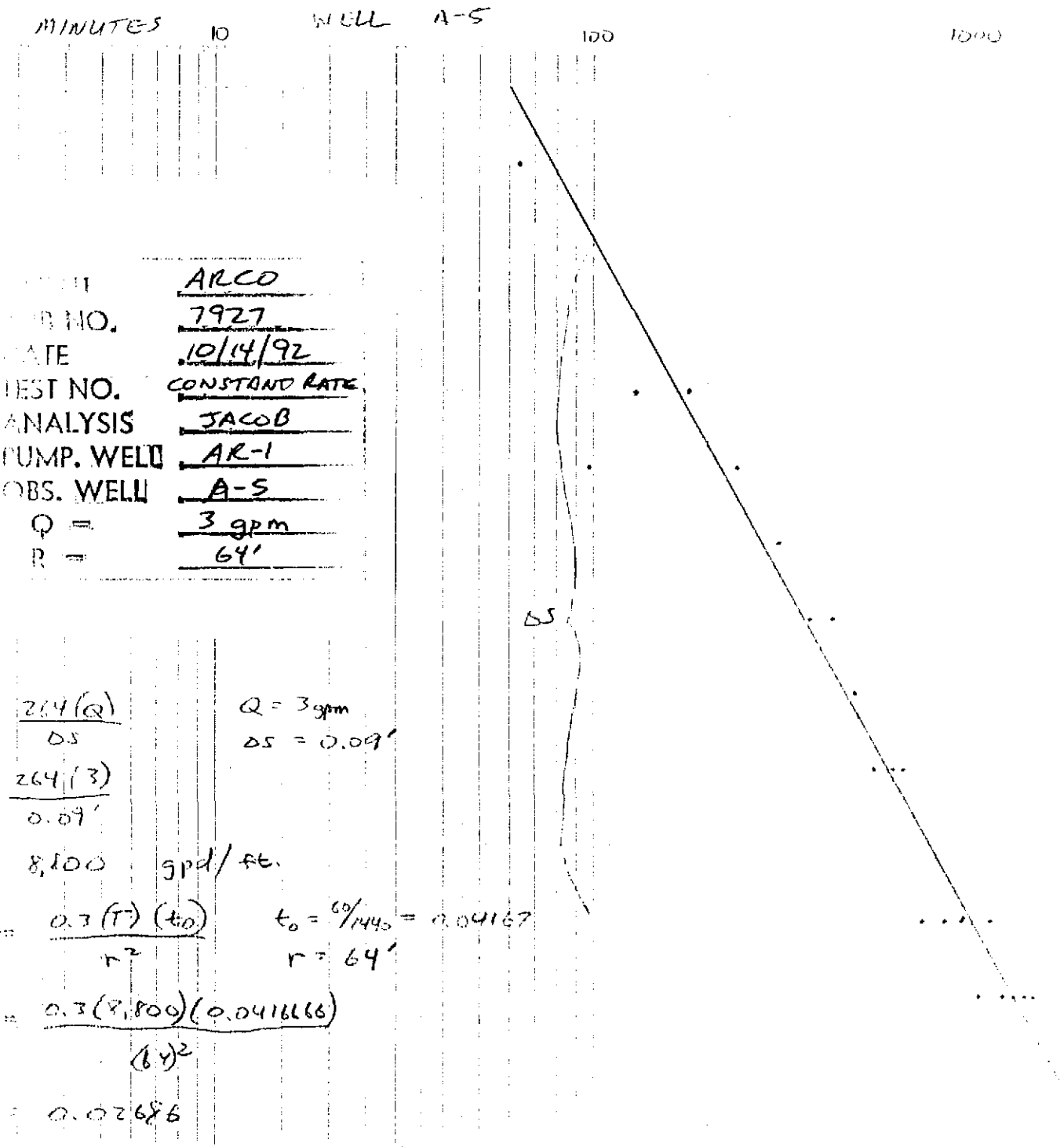
$= 10,421$ gpd/ft.

$S_y = \frac{0.3(T)(t_o)}{r^2}$ $t_o = 98/1440 = 0.068055$
r = 138'

$= \frac{0.3(10,421)(0.068055)}{(138)^2}$

$= 0.01118$

7926 PUMPING WELL AR-1



[illegible]	ARCO
[illegible] NO.	7927
[illegible]TE	10/14/92
TEST NO.	CONSTAND RATE
ANALYSIS	JACOB
PUMP. WELL	AR-1
OBS. WELL	A-5
Q =	3 gpm
R =	64'

$T = \frac{264(Q)}{\Delta s}$ $Q = 3$ gpm $\Delta s = 0.09'$

$= \frac{264(3)}{0.09'}$

$= 8{,}100$ gpd/ft.

$S_y = \frac{0.3(T)(t_0)}{r^2}$ $t_0 = 60/1440 = 0.04167$ $r = 64'$

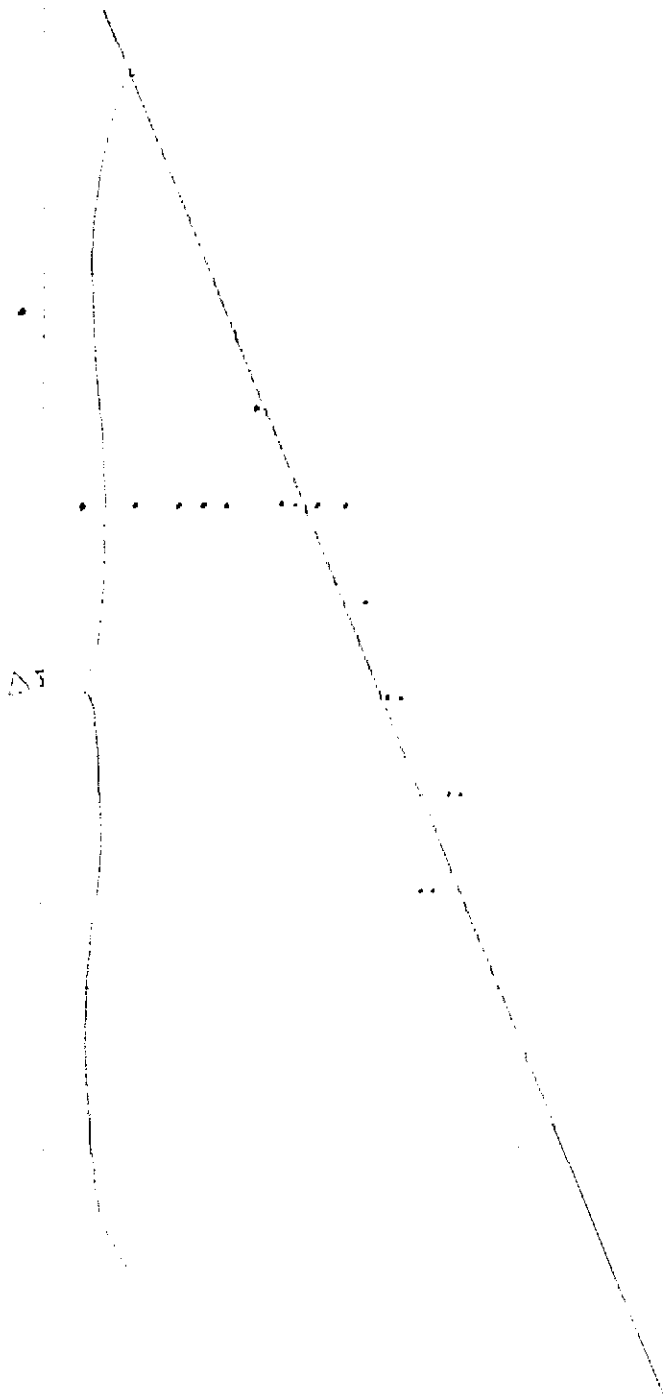
$= \frac{0.3(8{,}100)(0.041666)}{(64)^2}$

$= 0.02686$

7926 PUMPING WELL AR-1

WELL A-9

TIME (MINUTES) 1 10 100 1000



CLIENT ARCO
JOB NO. 7926
DATE 10/14/92
TEST NO. CONSTANT RATE
ANALYSIS JACOB
PUMP. WELL AR-1
OBS. WELL A-9
Q = 3 gpm
r = 133'

$$T = \frac{264(Q)}{\Delta s} \qquad Q = 3 \text{ gpm}, \quad \Delta s = 0.124'$$

$$= \frac{264(3)}{0.124}$$

$$= 6{,}387 \text{ gpd/ft.}$$

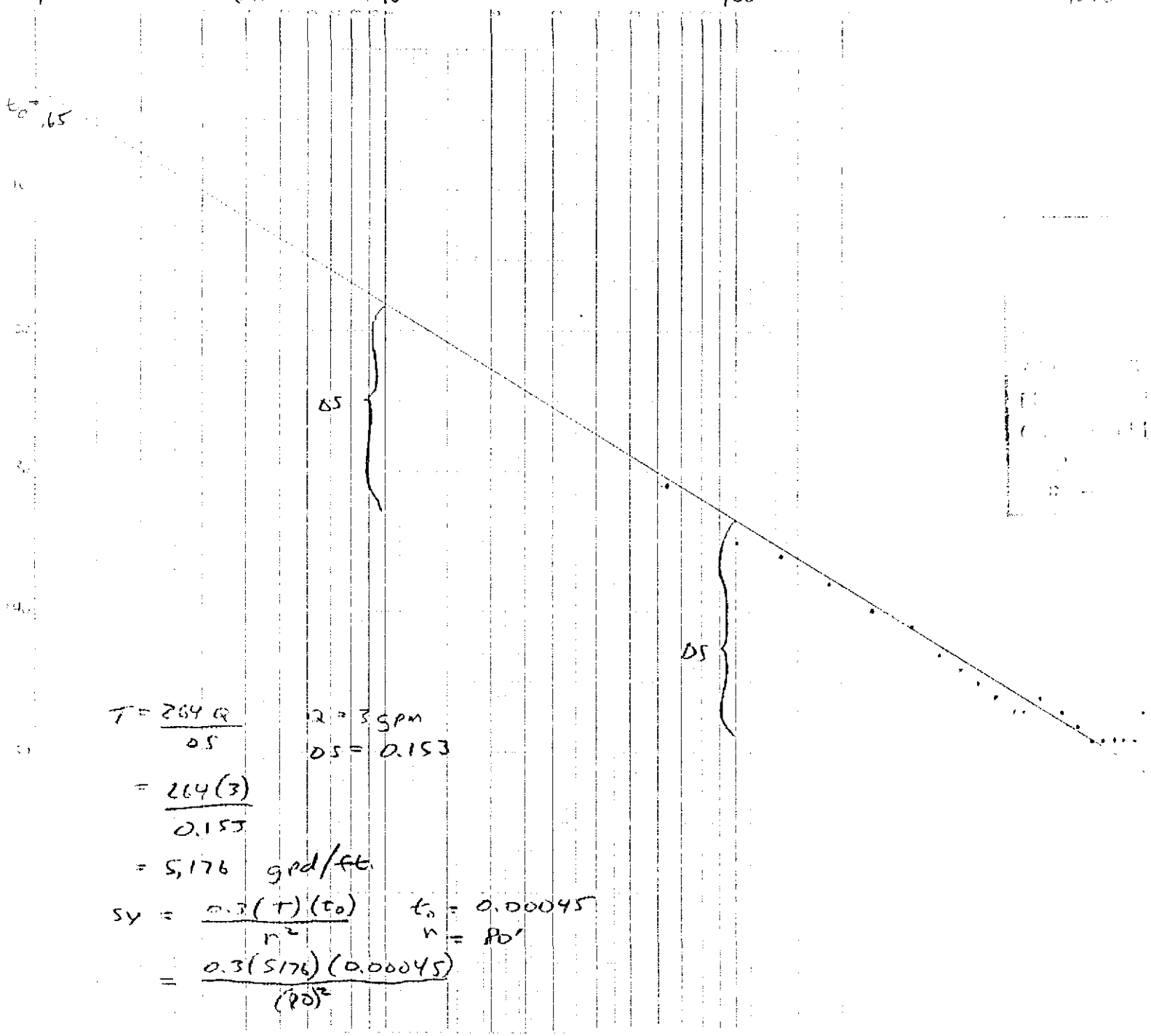
$$S_y = \frac{0.3(T)(t_o)}{r^2} \qquad t_o = 0.1875, \quad r = 133$$

$$= \frac{0.3(6387)(0.1875)}{(133)^2}$$

$$= 0.0203$$

7926 PUMPING WELL AR-1

WELL A-7



ARCO
7926
10/14/92
CONSTANT RATE
JACOB
AR-1
A-7
3 gpm
80'

$T = \frac{264\,Q}{\Delta s}$ $\quad Q = 3$ gpm, $\Delta s = 0.153$

$= \frac{264(3)}{0.153}$

$= 5{,}176$ gpd/ft

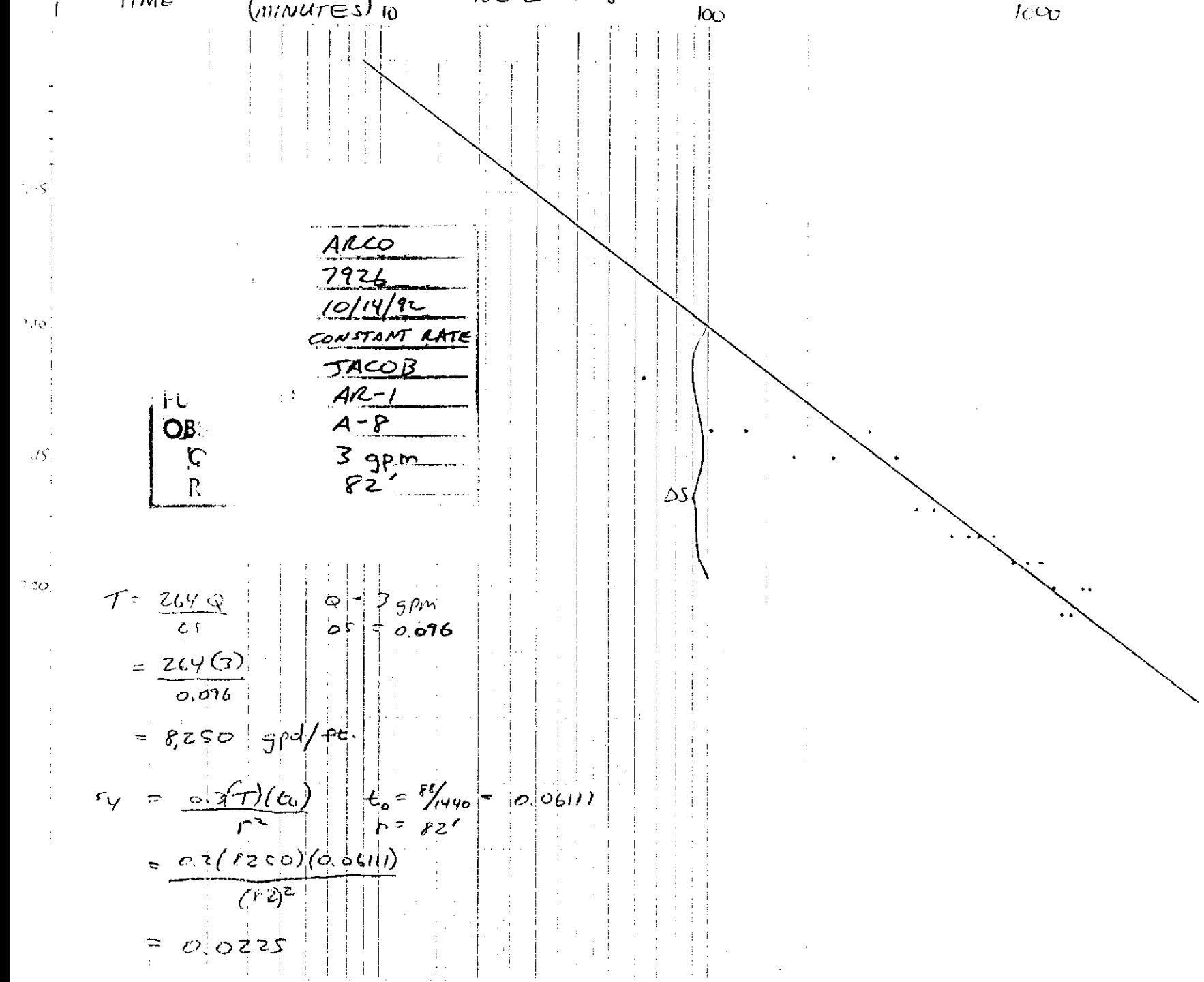
$S_y = \frac{0.3(T)(t_o)}{r^2}$ $\quad t_o = 0.00045$, $r = 80'$

$= \frac{0.3(5176)(0.00045)}{(80)^2}$

$= 0.[illegible]1095$

7926 PUMPING WELL AR-1

WELL A-8



	ARCO
	7926
	10/14/92
	CONSTANT RATE
	JACOB
PW	AR-1
OB	A-8
Q	3 gpm
R	82'

$T = \frac{264\,Q}{\Delta s}$ $\quad Q = 3$ gpm, $\Delta s = 0.096$

$= \frac{264(3)}{0.096}$

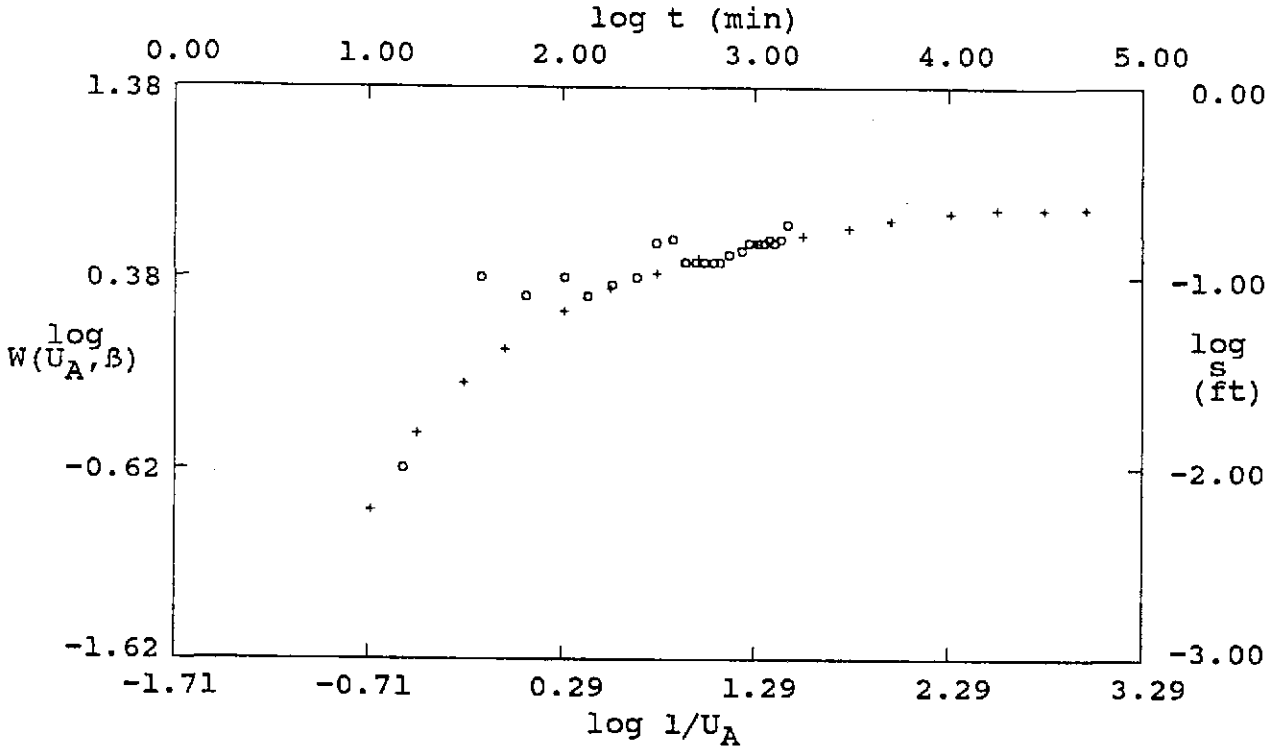
$= 8{,}250$ gpd/ft.

$S_y = \frac{0.3(T)(t_0)}{r^2}$ $\quad t_0 = 88/1440 = 0.06111$, $r = 82'$

$= \frac{0.3(8250)(0.06111)}{(82)^2}$

$= 0.0225$

7926 - Well MW-1



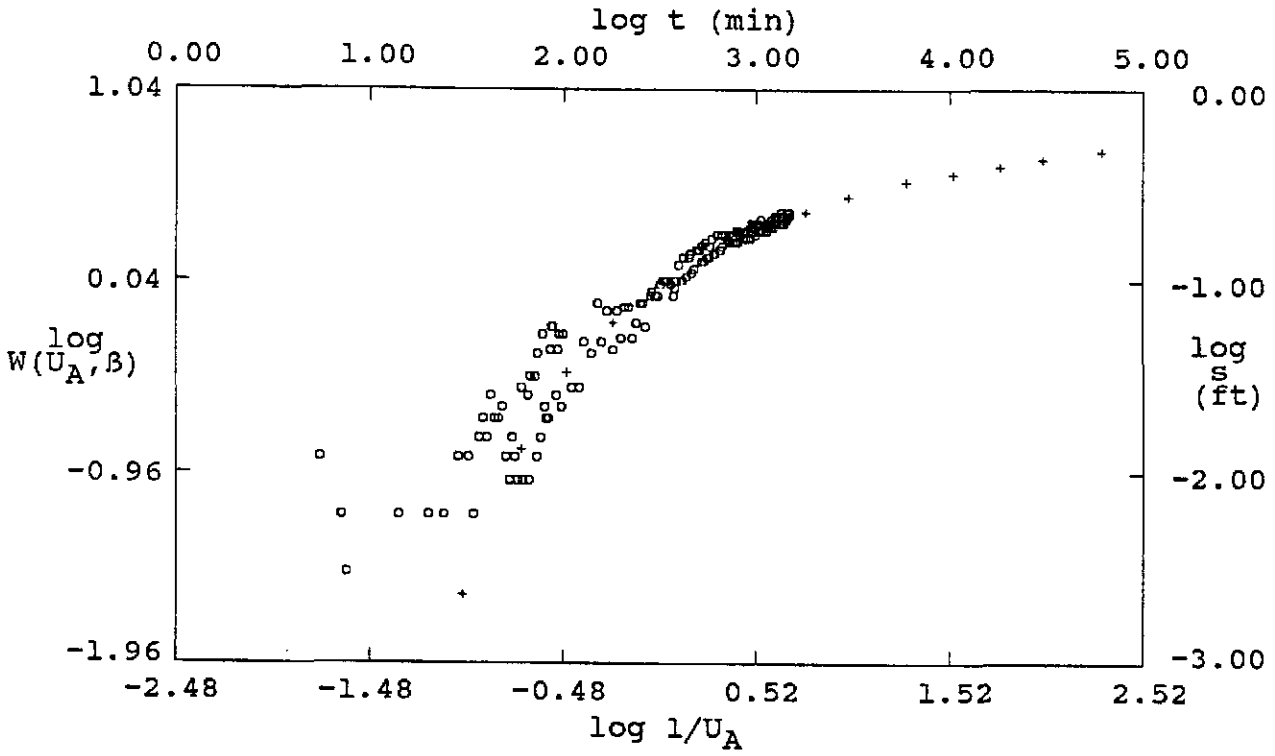
o - Data

\+ - Type Curve
Unconfined Elastic: beta = 0.001

SOLUTION

Transmissivity	=	8.245E+0003 gpd/ft
Aquifer Thick.	=	2.000E+0001 ft
Hydraulic Cond.	=	4.123E+0002 gpd/sq ft
Storativity	=	1.856E-0002

7926 - Well MW-2



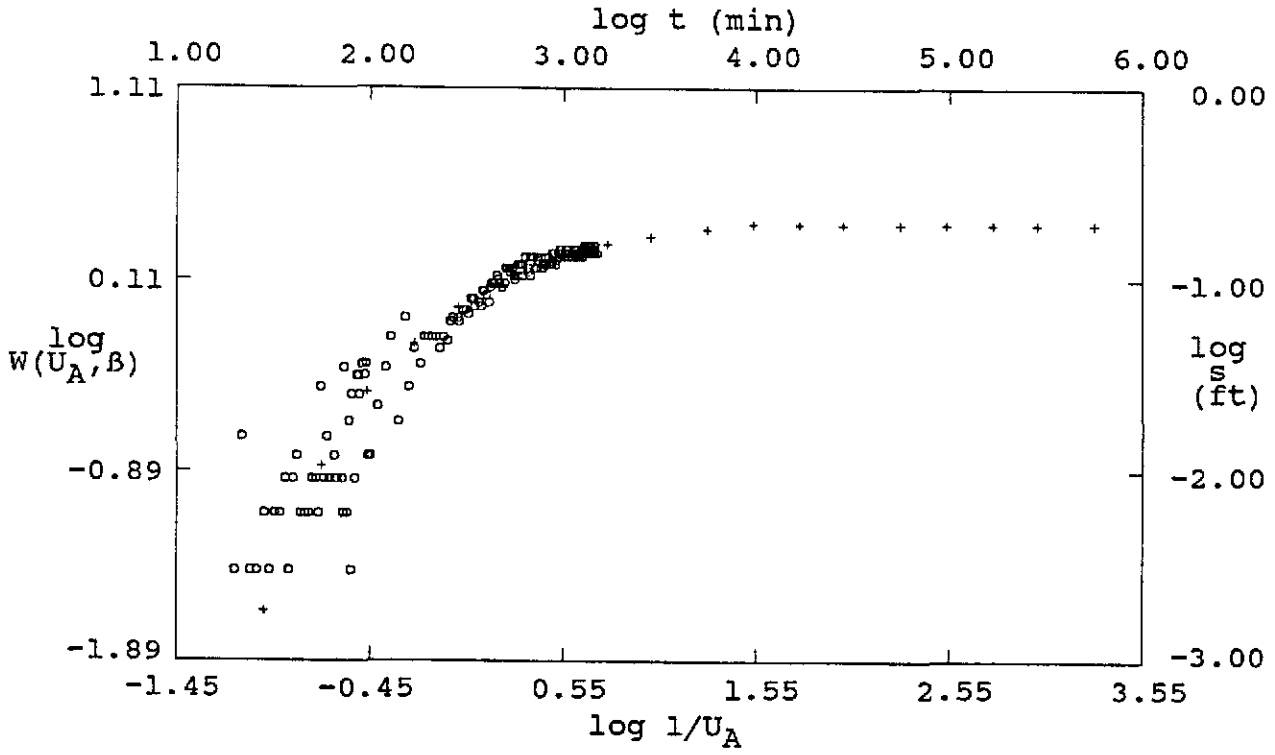
o - Data

\+ - Type Curve
Unconfined Elastic: beta = 0.001

SOLUTION

Transmissivity	=	3.769E+0003 gpd/ft
Aquifer Thick.	=	2.000E+0001 ft
Hydraulic Cond.	=	1.884E+0002 gpd/sq ft
Storativity	=	1.348E-0001

7926 - Well MW-3



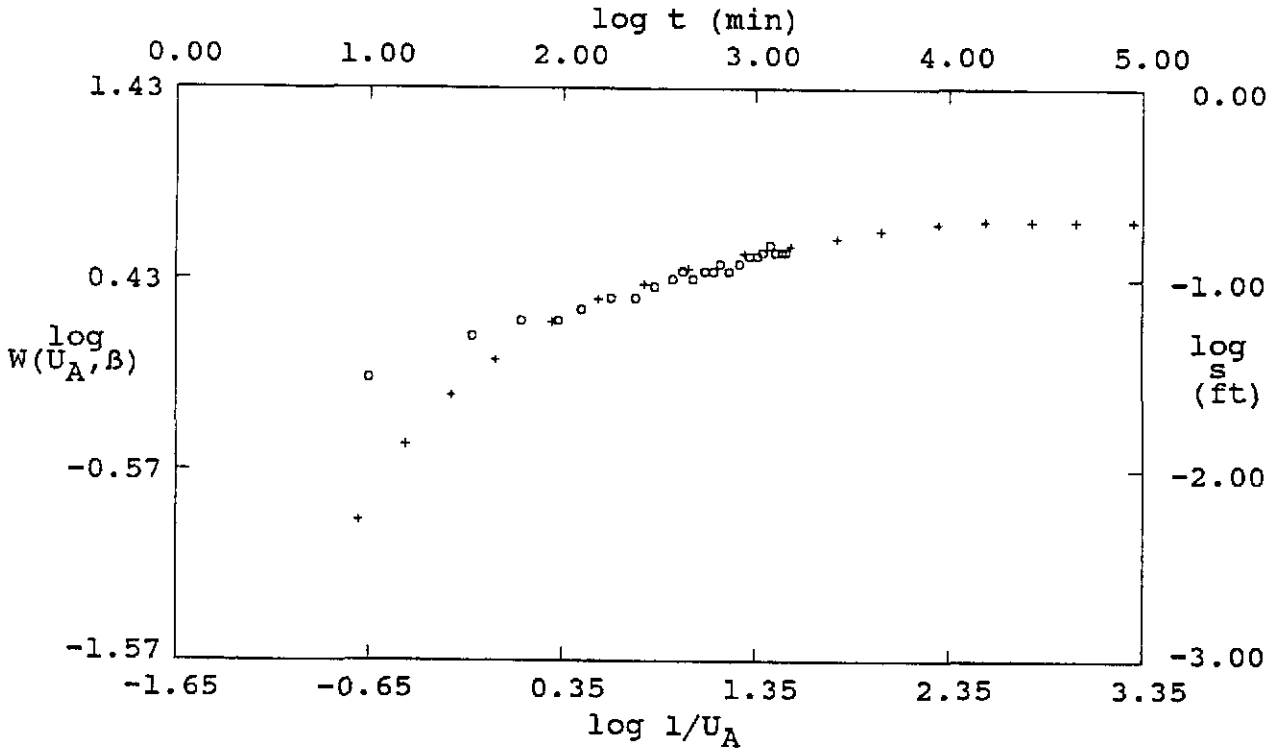
o - Data

\+ - Type Curve
Unconfined Elastic: beta = 0.03

SOLUTION

Transmissivity = 4.428E+0003 gpd/ft
Aquifer Thick. = 2.000E+0001 ft
Hydraulic Cond.= 2.214E+0002 gpd/sq ft
Storativity = 8.464E-0002

7926 - Well A-4



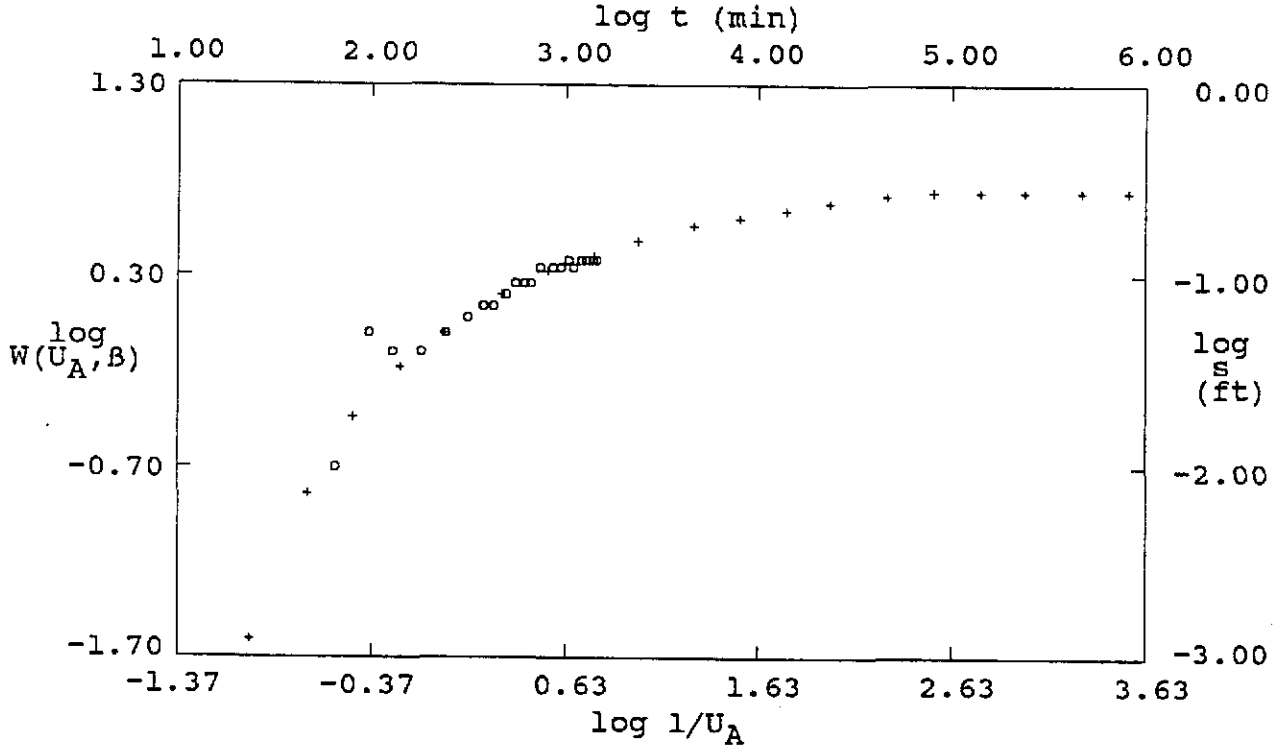
o - Data

\+ - Type Curve
Unconfined Elastic: beta = 0.001

SOLUTION

Transmissivity = 9.251E+0003 gpd/ft
Aquifer Thick. = 2.000E+0001 ft
Hydraulic Cond.= 4.626E+0002 gpd/sq ft
Storativity = 2.709E-0003

7926 - Well A-5



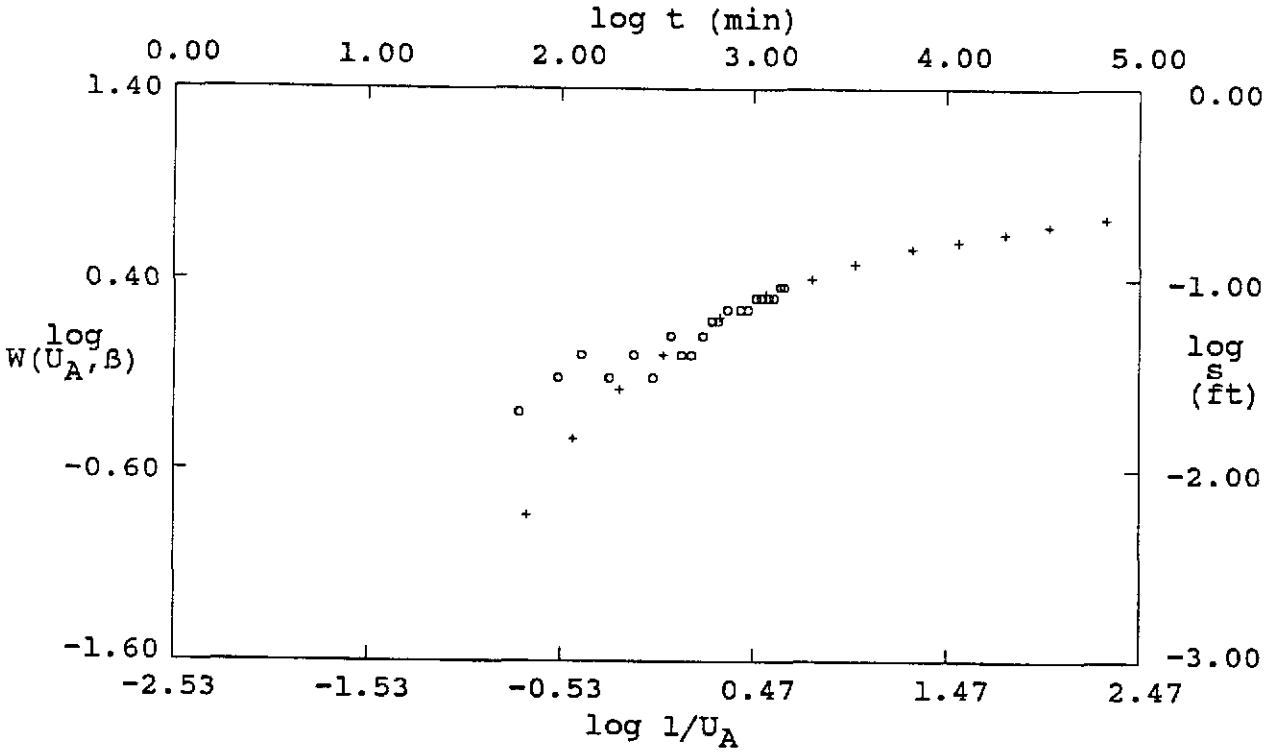
o - Data

\+ - Type Curve
Unconfined Elastic: beta = 0.001

SOLUTION

Transmissivity	=	6.858E+0003 gpd/ft
Aquifer Thick.	=	2.000E+0001 ft
Hydraulic Cond.	=	3.429E+0002 gpd/sq ft
Storativity	=	3.644E-0002

7926 - Well A-6



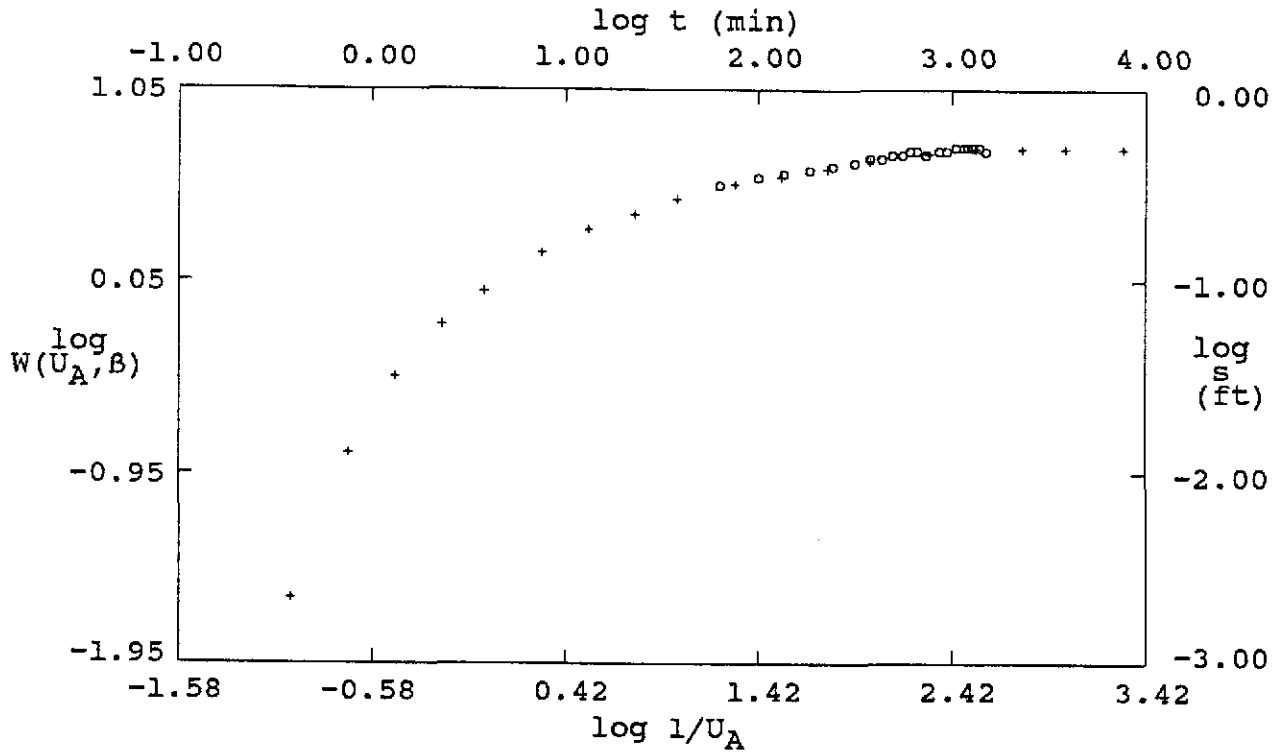
o - Data

\+ - Type Curve
Unconfined Elastic: beta = 0.001

SOLUTION

Transmissivity	=	8.634E+0003 gpd/ft
Aquifer Thick.	=	2.000E+0001 ft
Hydraulic Cond.	=	4.317E+0002 gpd/sq ft
Storativity	=	1.426E-0002

7926 - Well A-7



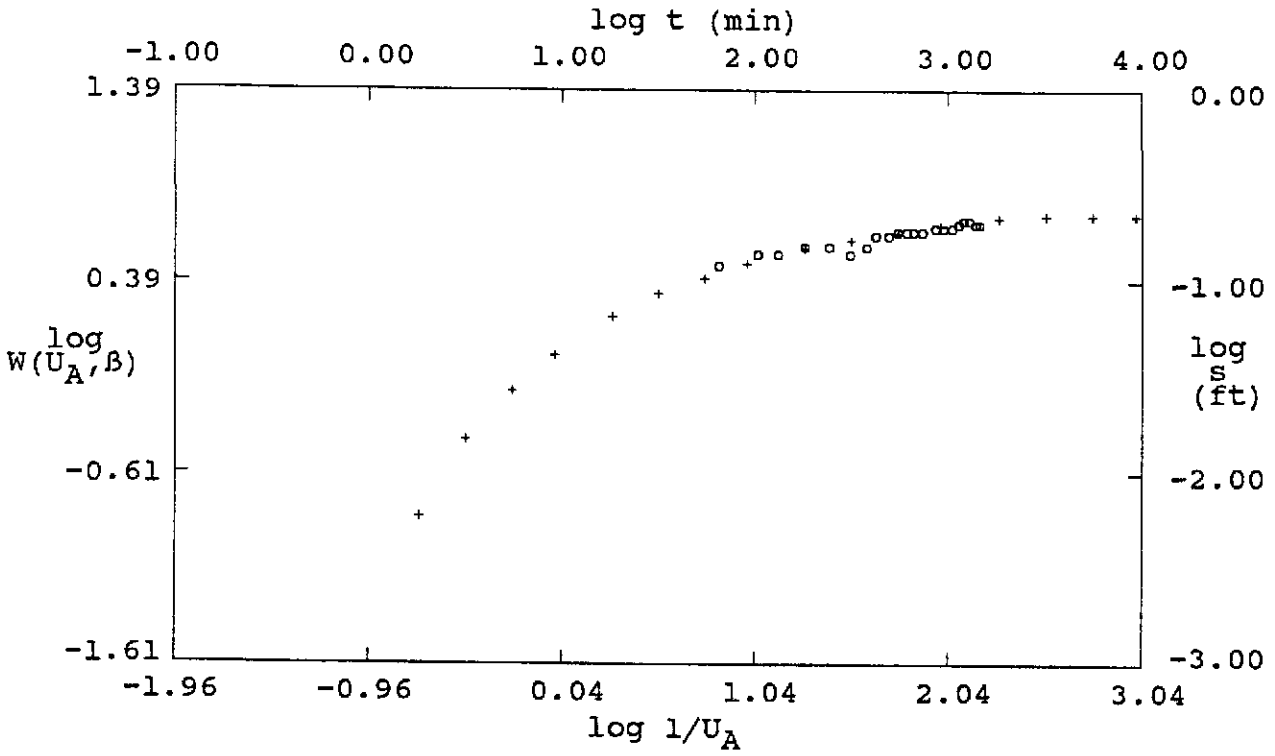
o - Data

\+ - Type Curve
Unconfined Elastic: beta = 0.001

SOLUTION

Transmissivity = 3.857E+0003 gpd/ft
Aquifer Thick. = 2.000E+0001 ft
Hydraulic Cond.= 1.928E+0002 gpd/sq ft
Storativity = 2.127E-0004

7926 - Well A-8



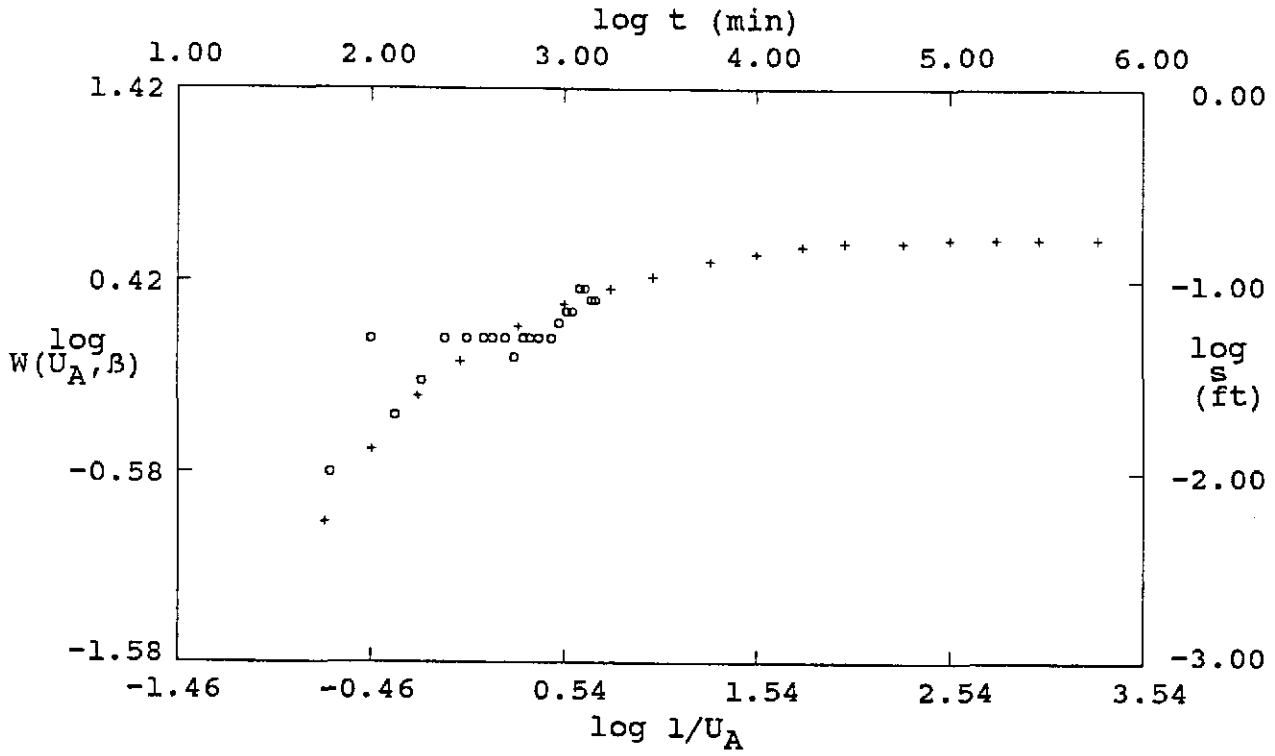
o - Data

\+ - Type Curve
Unconfined Elastic: beta = 0.001

SOLUTION

Transmissivity	=	8.437E+0003 gpd/ft
Aquifer Thick.	=	2.000E+0001 ft
Hydraulic Cond.	=	4.219E+0002 gpd/sq ft
Storativity	=	1.063E-0003

7926 - Well A-9

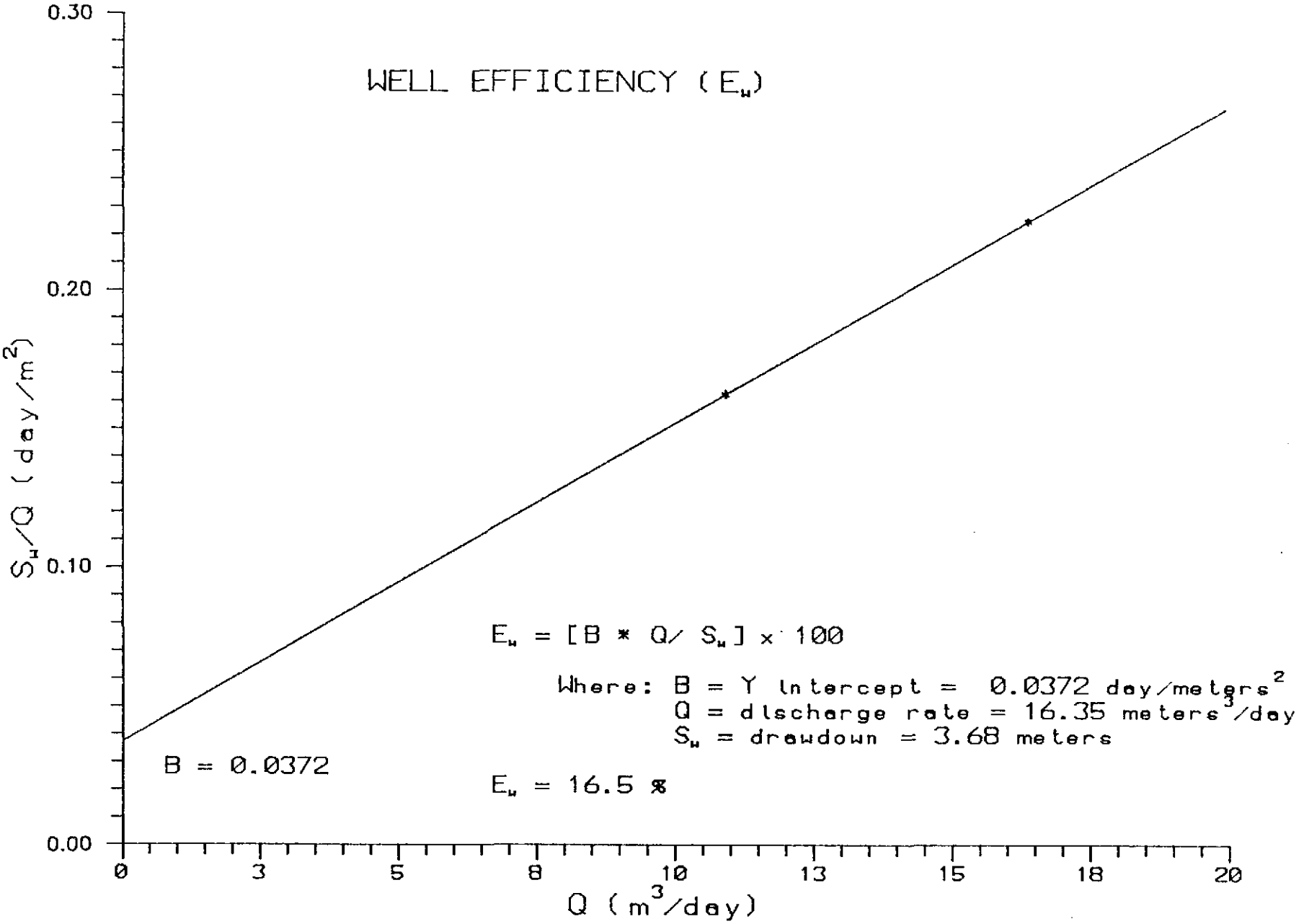


o - Data

\+ - Type Curve
Unconfined Elastic: beta = 0.004

SOLUTION

Transmissivity	=	9.041E+0003 gpd/ft
Aquifer Thick.	=	2.000E+0001 ft
Hydraulic Cond.	=	4.520E+0002 gpd/sq ft
Storativity	=	1.369E-0002


WELL EFFICIENCY (E_w)
0.30
0.20
0.10
0.00
S_w/Q (day/m^2)
0
3
5
8
10
13
15
18
20
Q (m^3/day)
E_w = [B * Q/ S_w] x 100
Where: B = Y Intercept = 0.0372 day/meters^2
Q = discharge rate = 16.35 meters^3/day
S_w = drawdown = 3.68 meters
B = 0.0372
E_w = 16.5 %