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

May 28, 1992

County of Alameda
Department of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, California 94621

Attention: Ms. Susan L. Hugo

Certified Mail

Reference: ARCO Service Station #4931
731 W. MacArthur Street
Oakland, California 94611

Ms. Hugo:

As requested of ARCO Products Company, we are forwarding the Vapor Extraction Test Report dated May 28, 1992 for the above referenced location. This report documents the installation of one vapor extraction well (AV-1) and presents the results the vapor extraction test performed on January 20, 1992.

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

Sincerely,

John F. Vargas
Senior Geologist

JFV:rcm

Enclosure

cc: Mr. Michael Whelan, ARCO Products Company
Mr. H. C. Winsor, ARCO Products Company
Mr. Eddy So, Regional Water Quality Control Board
(Certified Mail)

GeoStrategies Inc.

VAPOR EXTRACTION TEST REPORT

ARCO Service Station
731 West MacArthur
Oakland, California

790909-16

May 21, 1992

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

May 21, 1992

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

Attn: Mr. Michael Whelan

Re: VAPOR EXTRACTION TEST REPORT
ARCO Service Station No. 4931
731 West MacArthur
Oakland, California

Gentlemen:

This Vapor Extraction Test report has been prepared by GeoStrategies Inc. (GSI) for the above referenced location (Plates 1 and 2). The vapor extraction test was performed on January 20, 1992. The objective of the vapor extraction test was to evaluated the feasibility of vapor extraction as a remedial option to remove and combust hydrocarbons present in the soils above groundwater.

FIELD PROCEDURES

On January 17, 1992, GSI installed one Vapor Extraction Well (AV-1) to a depth of 15 feet below grade (fbg). The screened interval for Well AV-1 extends from 5-fbg to 15-fbg. Well AV-1 was positioned in the area reported to contain significant hydrocarbon concentrations in the soil. Three Vapor Extraction Monitoring Points (VEMPs) were installed to a depth of approximately 8 fbg to monitor vacuum pressure changes during the test. VEMPs are constructed of 3/4-inch metal pipe with an expendable point inserted in the leading end of the pipe. Once the pipe has been driven to the desired depth it is withdrawn approximately 6 to 8-inches, creating an opening. The VEMPs were positioned linearly east of Well AV-1 at approximately 4-foot intervals. Refer to Appendix A for the Boring Log and Well Construction Detail of AV-1. Plate 1 illustrates the locations of AV-1 and the three VEMPs. Soil samples collected at depths of 11 and 16 feet below grade during the drilling of boring AV-1 were transported to National Environmental Testing Inc. (NET), a State-certified laboratory located in Santa Rosa, California, and analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) and Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) according to EPA Methods 8015 (Modified) and 8020, respectively.

A Vapor Extraction test was performed utilizing Well AV-1 as the vapor extraction well, an Internal Combustion (IC) engine to create a vacuum on the extraction well and combust extracted vapors, and VEMPs equipped with manometers to monitor vacuum pressure changes during the test. The vapor extraction test ran for 4 hours. During the test, vacuum pressure changes in the VEMPs were monitored and recorded. Air stream concentrations before and after combustion (i.e. influent and effluent vapor readings) were also monitored utilizing a flame ionization detector (FID) and recorded. Influent and effluent air stream samples were collected near the end of the test and transported to Sequoia Analytical (Sequoia), a state-certified laboratory located in Redwood City, California. Air samples were analyzed for TPH-Gasoline, and BTEX according to EPA Methods 8015 (Modified) and 8020, respectively.

Vadose Zone Lithology

Available boring logs indicate that vadose zone lithology consists predominantly of a clay unit interspersed with sand and gravel. This lithology is indicative of an alluvial deposition. First observed groundwater has historically been reported at a depth of approximately 11-feet below grade.

RESULTS

Recorded vacuum pressure data in Well AV-1 ranged from 158.0 to 169.3 inches of water. Vacuum pressure in Well AV-1 appeared to equilibrate during the test. Vacuum pressure readings are summarized in Table 1. Recorded vacuum pressure data from the VEMPs indicates that there was insufficient vacuum pressure influence from Well AV-1 to cause any change in the VEMPs manometer readings during the test. Observed vapor pressure results indicate that the area of influence is less than 4-feet from Well AV-1.

Vapor concentration (in parts per million (ppm)) versus time were recorded for the extraction Well AV-1 during the 4-hour test. These data indicate a maximum measured concentration of 30,000 ppm. Vapor concentrations were initially recorded at 30,000 ppm, however, stabilized at 20,000 ppm after 113 minutes of the test had past. These concentrations were measured by a field screening instrument calibrated Methane, and should not be considered a quantitative measure of TPH-Gasoline of BTEX.

The results of the laboratory chemical analysis on the soil samples submitted from 11 and 16 feet below grade were reported as none detected (ND) for both TPH-Gasoline and benzene. Soil analytical data are summarized in Table 2. The laboratory analytical report and Chain - of - Custody form are presented in Appendix B.

The result of the laboratory chemical analysis on the effluent air stream sample obtained at the end of the test was none detected (ND) for TPH-Gasoline and Benzene. TPH-Gasoline and benzene were detected in the influent sample at concentrations of 10,000 parts per million vapor (ppmv) and 2.3 ppmv, respectively. The laboratory analytical report and Chain-of-Custody Form are presented in Appendix C.

CONCLUSION

Based on the 4-hour Vapor Extraction Test results, vapor extraction did not create significant pressure influence at the closest VEMP locations (4 feet from the vapor extraction point). Vapor extraction does not appear to be a feasible remedial option.

If you have any questions, please call.

GeoStrategies Inc. by,

Cliff M. Garratt
Hydrogeologist

John F. Vargas
Senior Geologist
R.G. 5046

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

CMG/JFV/shl

Table 1. Vacuum Pressure Results for Well AV-1
Table 2. Soil Analyses Data
Table 3. Air Analyses Data

Plate 1. Vicinity Map
Plate 2. Site Plan
Plate 3. Vacuum Pressure Influence Map

Appendix A: Boring Logs and Well Construction Detail
Appendix B: Soil Laboratory Analytical Report and Chain-of-Custody Form
Appendix C: Air Laboratory Analytical Report and Chain-of-Custody Form

QC Review:
790909-16

TABLE 1

VACUUM PRESSURE RESULTS FOR WELL AV-1

TIME (minutes since start-up)	INFLUENT CONCENTRATION (ppm)	VACUUM PRESSURE AT WELL HEAD (inches of water)	FLOWRATE (cubic feet/min.)
83	30,000	169.3	5.5
113	30,000	168.2	5.7
173	20,000	158.0	4.8
234	20,000	161.9	4.9
294	20,000	169.3	6.4

PPM = Parts Per Million

Note = Influent concentrations were measured by a flame ionization detector calibrated to methane

TABLE 2

SOIL ANALYSES DATA

SAMPLE ID	SAMPLE DATE	ANALYZED DATE	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
AV-1-11	17-Jan-92	21-Jan-92	<1000	<2.5	<2.5	<2.5	<2.5
AV-1-16	17-Jan-92	22-Jan-92	<1000	<2.5	<2.5	<2.5	<2.5

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

Notes: 1. All data shown as <x are reported as ND (none detected).
2. The last number of sample I.D. corresponds to the approximate depth below existing grade that the sample was collected.

TABLE 3

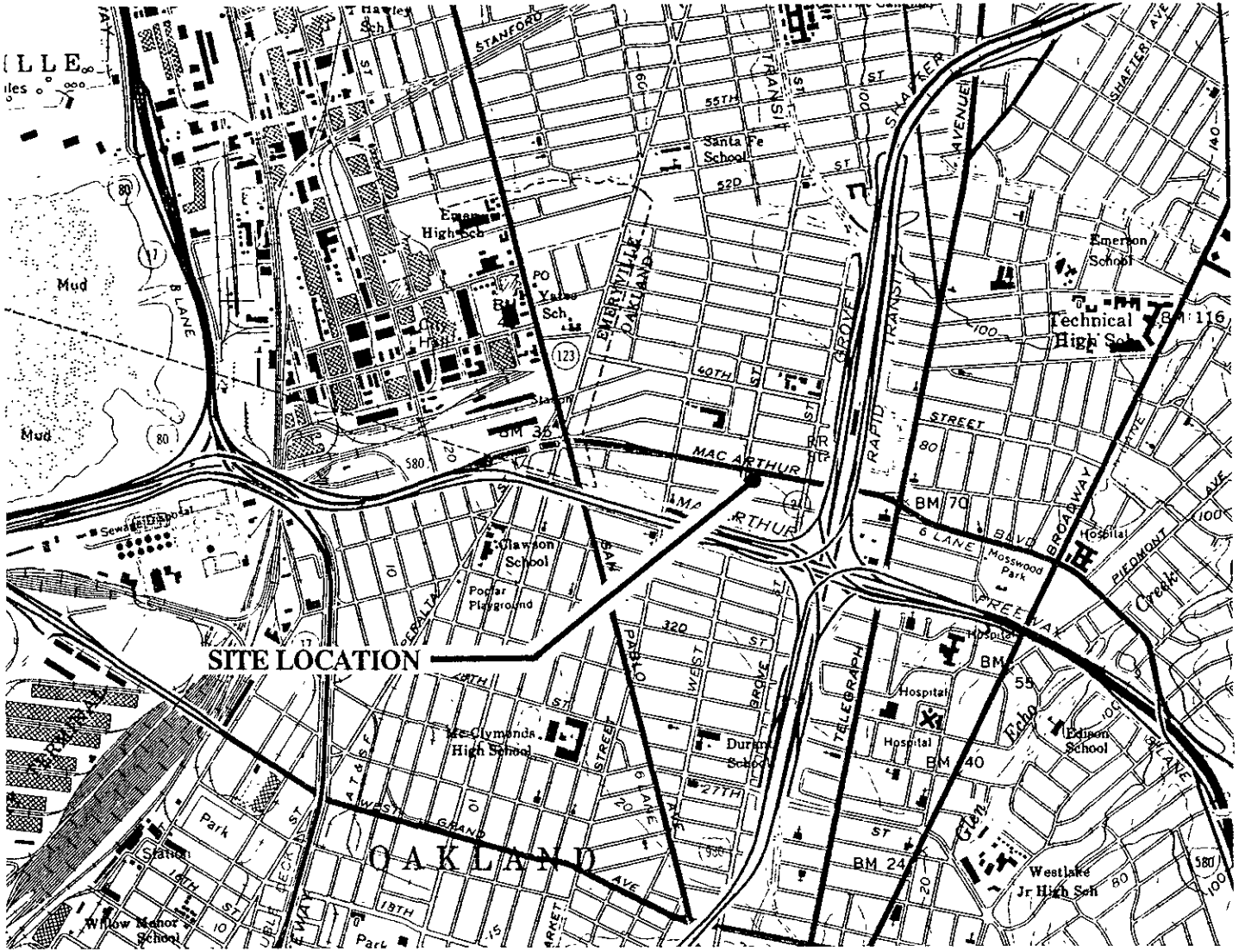
AIR ANALYSES DATA

SAMPLE NO	SAMPLE DATE	ANALYZED DATE	TPH-G (PPMV)	BENZENE (PPMV)	TOLUENE (PPMV)	ETHYLBENZENE (PPMV)	XYLENES (PPMV)
INFLUENT	20-Jan-92	23-Jan-92	10,000	2.3	16	20	23
EFFLUENT	20-Jan-92	22-Jan-92	<2.3	<0.019	<0.016	<0.014	<0.014

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

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

ILLUSTRATIONS



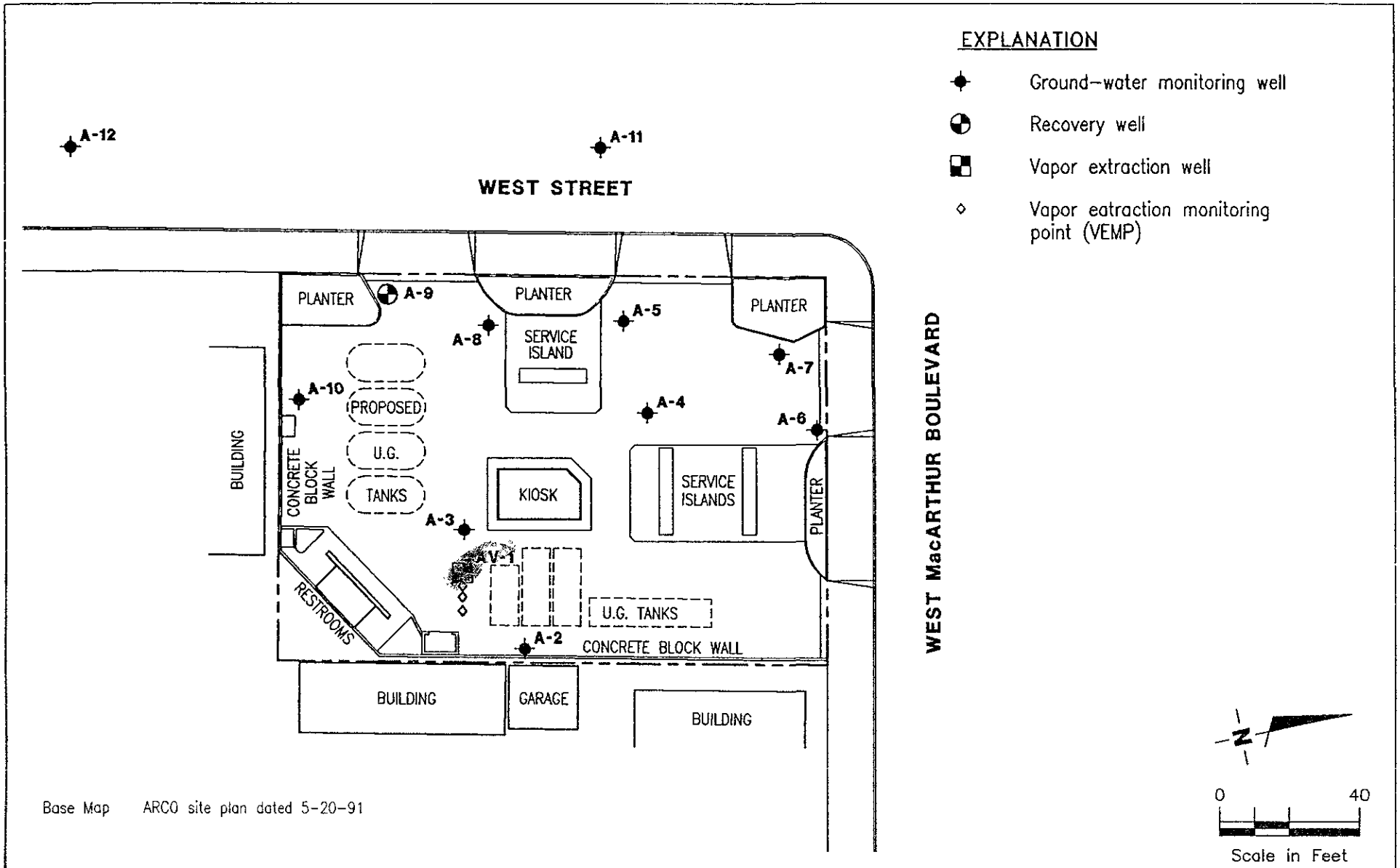
Base Map: USGS Topographic Map

GeoStrategies Inc.

VICINITY MAP
ARCO Service Station #4931
731 West MacArthur Boulevard
Oakland, California

PLATE
1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7909		9/91	



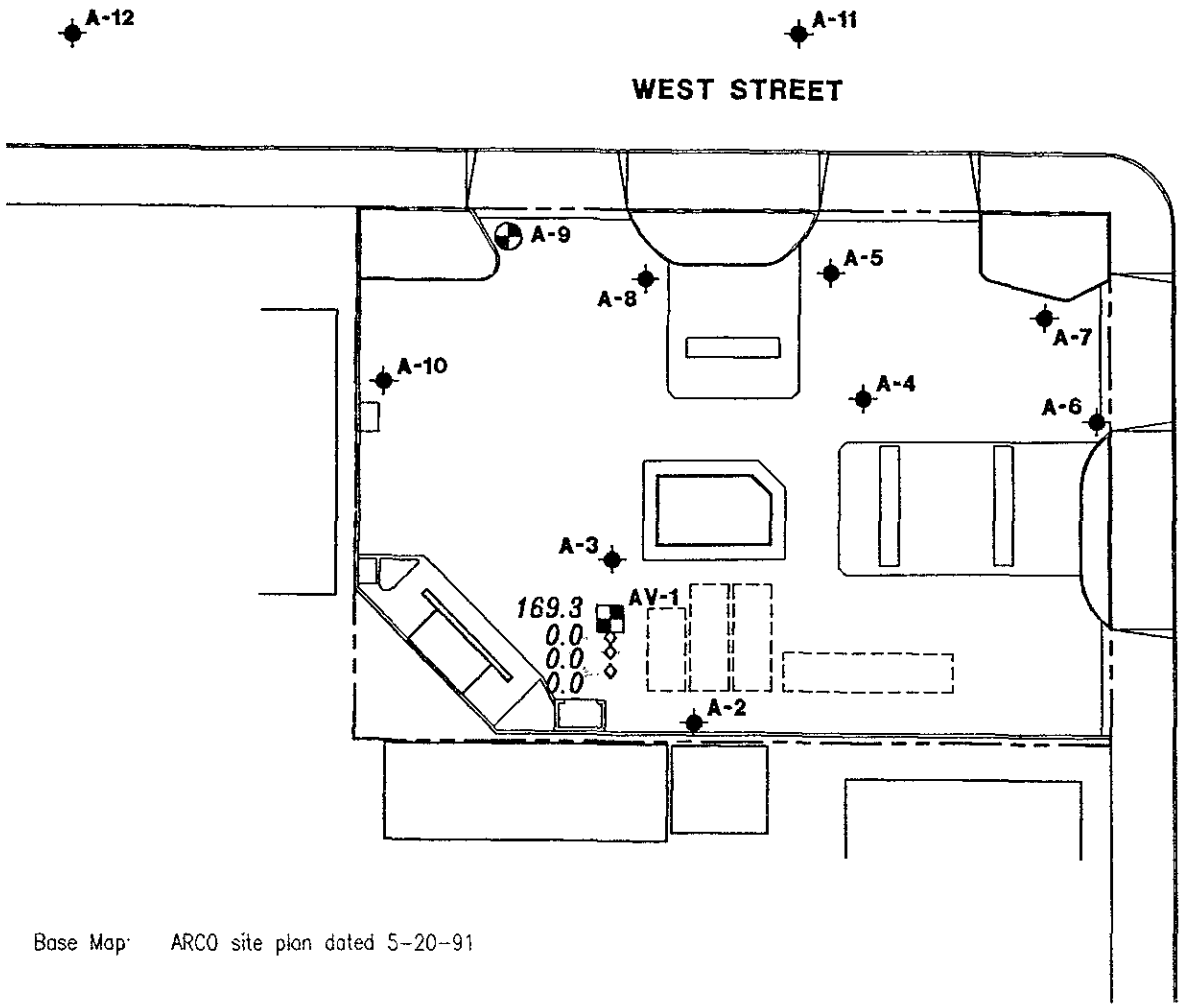
Base Map ARCO site plan dated 5-20-91

GeoStrategies Inc.

SITE PLAN
ARCO Service Station #4931
731 West MacArthur Boulevard
Oakland, California

PLATE 2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
790909-16		2/92	



EXPLANATION

- Ground-water monitoring well
- Recovery well
- Vapor extraction well
- Vapor eatraction monitoring point (VEMP)
- *0.1* Vacuum pressure, in inches of water, relative to atmospheric pressure measured on January 20, 1992

Base Map: ARCO site plan dated 5-20-91

N

0 40

Scale in Feet

GeoStrategies Inc.

VACUUM PRESSURE INFLUENCE MAP
ARCO Service Station #4931
731 West MacArthur Boulevard
Oakland, California

PLATE 3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
790909-16	CMG	2/92	

APPENDIX A

BORING LOGS AND WELL CONSTRUCTION DETAIL

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.: 790909	Date: 1/17/92	Boring No: AV-1
	Client: ARCO Service Station No. 4931		
	Location: 731 W. MacArthur		
	City: Oakland, California		Sheet 1 of 1
	Logged by: R.S.Y.	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
				1				PAVEMENT SECTION - 1 ft.
				2				
				3				SANDY CLAY (CL) - yellowish brown (10YR 5/3), medium stiff, moist; 35%-40% medium to coarse sand; trace angular gravel; medium plasticity.
				4				
				5				
			AV-1-	6				CLAYEY SAND (SC) - dark yellow brown (10YR 4/3), very dense, moist; 70% medium to coarse sand; 20% clay; 10% angular fine gravel.
0	64	S&H	6.5	7				
				8				
				9				
				10				CLAYEY GRAVEL with SAND (GC) - dark yellow brown (10YR 4/3), medium dense, moist; 60% fine to coarse subround gravel; 25% clay; 15% sand.
			AV-1-	11				
0	26	S&H	11	12				
				13				CLAYEY SAND (SC) - dark yellow brown (10YR 4/6), medium dense, moist, voids with moisture; 60% medium to coarse sand; 30% clay; 10% fine gravel.
				14				
				15				
			AV-1-	16				
0	17	S&H	16	17				Bottom of Boring at 16 ft. 1/17/92
				18				
				19				
				20				

Remarks:

*Converted to equivalent Standard Penetration blows/ft.

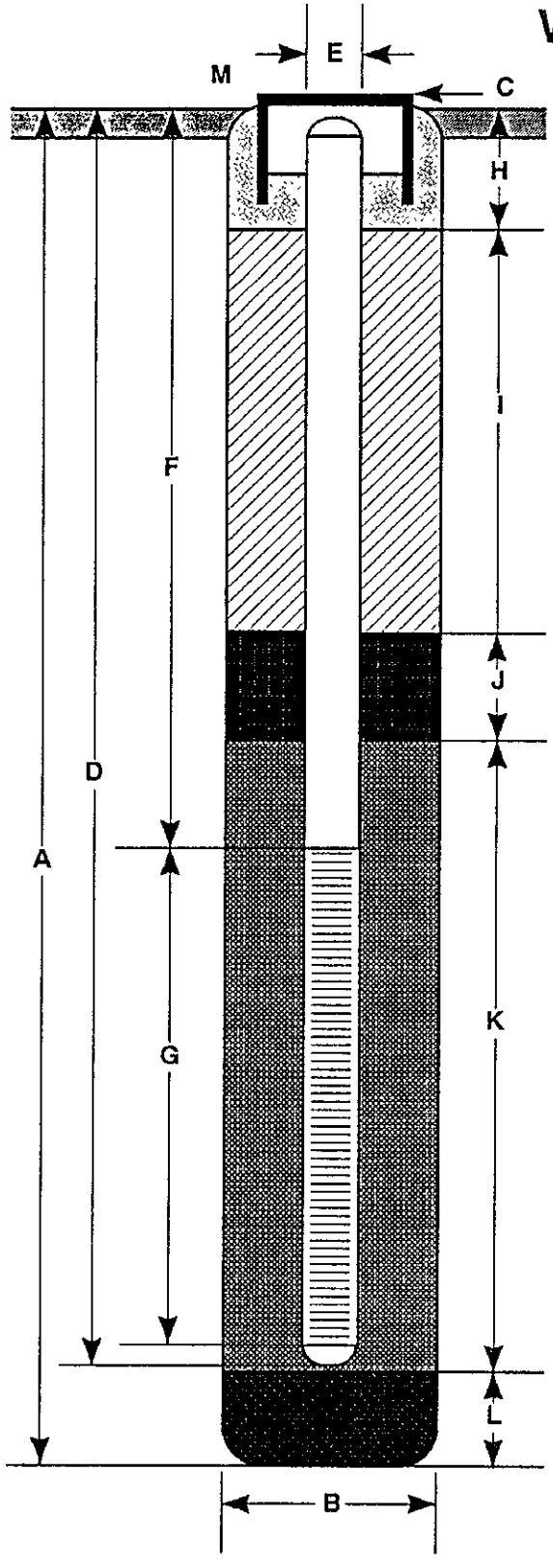
GeoStrategies Inc.

Log of Boring

BORING NO. **AV-1**

JOB NUMBER	REVIEWED BY/RG/CEG	DATE	REVISED DATE	REVISED DATE
790909		1/92		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 16.0 ft.

B Diameter of Boring 8 in.
Drilling Method Hollow Stem Auger

C Top of Box Elevation N/A ft.
☐ Referenced to Mean Sea Level
☐ Referenced to Project Datum

D Casing Length 15 ft.
Material Schedule 40 PVC

E Casing Diameter 2 in.

F Depth to Top Perforations 5 ft.

G Perforated Length 10 ft.
Perforated Interval from 5 to 15 ft.
Perforation Type Factory slot
Perforation Size 0.020 in.

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

I Backfill from 1.5 to 3.5 ft.
Backfill Material Cement grout

J Seal from 3.5 to 4.5 ft.
Seal Material Bentonite powder

K Gravel Pack from 4.5 to 15 ft.
Pack Material Lonestar #2/12 sand

L Bottom Seal 1.0 ft.
Seal Material Native

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

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO.
AV-1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
790909		1/92		

APPENDIX B

SOIL LABORATORY ANALYTICAL REPORT AND CHAIN-OF-CUSTODY FORM

NATIONAL
ENVIRONMENTAL
TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

John Vargas
Gettler-Ryan, Inc.
2150 West Winton
Hayward, CA 94545

Date: 02/07/1992
NET Client Acct No: 413
NET Pacific Log No: 92.0216
Received: 01/21/1992

Client Reference Information

Arco 4931, Oakland, 4931-92-4A

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

Jules Skamarack
Laboratory Manager

Enclosure(s)

NET Pacific, Inc.

Client No: 413
Client Name: Gettler-Ryan, Inc.
NET Log No: 92.0216

Date: 02/07/1992
Page: 2

Ref: Arco 4931, Oakland, 4931-92-4A

SAMPLE DESCRIPTION: AV-1-11
SAMPLE RECEIVED: 01/21/1992
LAB JOB NO: (-111493)

SAMPLE TAKEN: 01/17/1992
TIME TAKEN: 10:15

Parameter	Method	Reporting Limit	Results	Units	Date Received	Date Extracted	Date Analyzed	QC Batch I
TPH (Gas/BTXE,Solid)					01/21/1992			
METHOD 5030 (GC,FID)			--		01/21/1992		01/21/1992	G59716S
DATE ANALYZED			01-21-92		01/21/1992		01/21/1992	G59716S
DILUTION FACTOR*			1		01/21/1992		01/21/1992	G59716S
as Gasoline	5030	1000	ND	ug/Kg	01/21/1992		01/21/1992	G59716S
METHOD 8020 (GC,Solid)			--		01/21/1992		01/21/1992	G59716S1
DATE ANALYZED			01-21-92		01/21/1992		01/21/1992	G59716S1
DILUTION FACTOR*			1		01/21/1992		01/21/1992	G59716S1
Benzene	8020	2.5	ND	ug/Kg	01/21/1992		01/21/1992	G59716S1
Ethylbenzene	8020	2.5	ND	ug/Kg	01/21/1992		01/21/1992	G59716S1
Toluene	8020	2.5	ND	ug/Kg	01/21/1992		01/21/1992	G59716S1
Xylenes (Total)	8020	2.5	ND	ug/Kg	01/21/1992		01/21/1992	G59716S1

NET Pacific, Inc

Client No: 413
Client Name: Gettler-Ryan, Inc.
NET Log No: 92.0216

Date: 02/07/1992
Page: 3

Ref: Arco 4931, Oakland, 4931-92-4A

SAMPLE DESCRIPTION: AV-1-16
SAMPLE RECEIVED: 01/21/1992
LAB JOB NO: (-111494)

SAMPLE TAKEN: 01/17/1992
TIME TAKEN: 10:30

Parameter	Method	Reporting Limit	Results	Units	Date Received	Date Extracted	Date Analyzed	QC Batch I:
TPH (Gas/BTXE,Solid)					01/21/1992			
METHOD 5030 (GC,FID)			--		01/21/1992		01/22/1992	G59717S'
DATE ANALYZED			01-22-92		01/21/1992		01/22/1992	G59717S
DILUTION FACTOR*			1		01/21/1992		01/22/1992	G59717S'
as Gasoline	5030	1000	ND	ug/Kg	01/21/1992		01/22/1992	G59717S'
METHOD 8020 (GC,Solid)			--		01/21/1992		01/22/1992	G59717S'
DATE ANALYZED			01-22-92		01/21/1992		01/22/1992	G59717S'
DILUTION FACTOR*			1		01/21/1992		01/22/1992	G59717S'
Benzene	8020	2.5	ND	ug/Kg	01/21/1992		01/22/1992	G59717S'
Ethylbenzene	8020	2.5	ND	ug/Kg	01/21/1992		01/22/1992	G59717S'
Toluene	8020	2.5	ND	ug/Kg	01/21/1992		01/22/1992	G59717S'
Xylenes (Total)	8020	2.5	ND	ug/Kg	01/21/1992		01/22/1992	G59717S'

NET Pacific, Inc.

Client No: 413
Client Name: Gettler-Ryan, Inc.
NET Log No: 92.0216

Date: 02/07/1992
Page: 4

Ref: Arco 4931, Oakland, 4931-92-4A

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Gasoline	1000	ug/Kg	95	ND	84	86	1.2
Benzene	2.5	ug/Kg	110	ND	88	97	9.7
Toluene	2.5	ug/Kg	118	ND	88	85	3.5
Gasoline	1000	ug/Kg	95	ND	61	68	6.1
Benzene	2.5	ug/Kg	107	ND	82	82	<1
Toluene	2.5	ug/Kg	107	ND	82	82	<1

COMMENT: Blank Results were ND on other analytes tested.

NET Pacific, Inc

KEY TO ABBREVIATIONS and METHOD REFERENCES

<	:	Less than; When appearing in results column indicates analyte not detected at the value following. This datum supercedes the listed Reporting Limit.
*	:	Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated Reporting Limits by the dilution factor (but do not multiply reported values).
ICVS	:	Initial Calibration Verification Standard (External Standard).
mean	:	Average; sum of measurements divided by number of measurements.
mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
mg/L	:	Concentration in units of milligrams of analyte per liter of sample.
mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
N/A	:	Not applicable.
NA	:	Not analyzed.
ND	:	Not detected; the analyte concentration is less than applicable listed reporting limit.
NTU	:	Nephelometric turbidity units.
RPD	:	Relative percent difference, 100 [Value 1 - Value 2]/mean value.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
ug/L	:	Concentration in units of micrograms of analyte per liter of sample.
umhos/cm	:	Micromhos per centimeter.

Method References

Methods 100 through 493: see "Methods for Chemical Analysis of Water & Wastes", U.S. EPA, 600/4-79-020, rev. 1983.

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

SM: see "Standard Methods for the Examination of Water & Wastewater, 16th Edition, APHA, 1985.

ARCO Products Company
Division of AtlanticRichfieldCompany

Chain of Custody

Task Order No. 4931-92-4A

ARCO Facility no. 4931	City (Facility) Oakland	Project manager (Consultant) John Vargas	Laboratory name NET
ARCO engineer Chuck Carmel	Telephone no. (ARCO)	Telephone no. (Consultant) 352-4800	Fax no. (Consultant) 783-1089
Consultant name Geo Strategies / Gettler-Ryan	Address (Consultant) 2150 West Winton Ave Hayward		Contract number

Method of shipment: VCJ

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 ☐
AV-1-11			✓					1/17/92	10:15		✓									
AV-1-16			✓					1/17/92	10:30		✓									
			CUSTODY SEALED 1/20/92																	
			1400																	

Special detection Limit/reporting:

Special QA/QC:

Remarks: seal intact

Lab number: 3395

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

Condition of sample: Intact

Temperature received: cold

	Date	Time
Relinquished by sampler: Randall Young	1/21/92	15:00
Relinquished by: Micky Tarpini	1/20/92	1400
Relinquished by:	Date	Time

Received by: Micky Tarpini	1/20/92	
Received by:		
Received by laboratory: [signature]	Date: 1/21/92	Time: 0800

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

ARCO 3303 (3-91)

APPENDIX C

AIR LABORATORY ANALYTICAL REPORT AND CHAIN-OF-CUSTODY FORM

SEQUOIA ANALYTICAL

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

Gettler Ryan	Client Project ID:	9909.09, Arco 4931, Oakland	Sampled: Jan 20, 1992
2150 W. Winton Avenue	Matrix Descript:	Air	Received: Jan 22, 1992
Hayward, CA 94545	Analysis Method:	EPA 5030/8015/8020	Analyzed: Jan 22, 1992
Attention: John Zwierzycki	First Sample #:	201-2864	Reported: Jan 24, 1992

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons ppmv	Benzene ppmv	Toluene ppmv	Ethyl Benzene ppmv	Xylenes ppmv
201-2864	Effluent	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		2.3	0.019	0.016	0.014	0.014

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
A molecular weight of 65 was used to calculate ppmv for TPHG.

SEQUOIA ANALYTICAL

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

Gettler Ryan	Client Project ID:	9909.09, Arco 4931, Oakland	Sampled:	Jan 20, 1992
2150 W. Winton Avenue	Matrix Descript:	Air	Received:	Jan 22, 1992
Hayward, CA 94545	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jan 23, 1992
Attention: John Zwierzycki	First Sample #:	201-2865	Reported:	Jan 24, 1992

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons ppmv	Benzene ppmv	Toluene ppmv	Ethyl Benzene ppmv	Xylenes ppmv
201-2865	Influent	10,000	2.3	16	20	23
Detection Limits:		120	0.95	0.80	0.70	0.70

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
A molecular weight of 65 was used to calculate ppmv for TPHG.

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

Client Project ID: 9909.09, Arco 4931, Oakland

QC Sample Group: 201-2864

Reported: Jan 24, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	M. Nipp	M. Nipp	M. Nipp	M. Nipp
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Jan 22, 1992	Jan 22, 1992	Jan 22, 1992	Jan 22, 1992
QC Sample #:	GBLK012292	GBLK012292	GBLK012292	GBLK012292
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	9.0	9.3	9.3	28
Matrix Spike % Recovery:	90	93	93	93
Conc. Matrix Spike Dup.:	9.1	9.5	9.4	29
Matrix Spike Duplicate % Recovery:	91	95	94	97
Relative % Difference:	1.1	2.1	1.1	3.5

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

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

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Attention: John Zwierzycki

Client Project ID: 9909.09, Arco 4931, Oakland

QC Sample Group: 201-2865

Reported: Jan 24, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	M. Nipp	M. Nipp	M. Nipp	M. Nipp
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Jan 23, 1992	Jan 23, 1992	Jan 23, 1992	Jan 23, 1992
QC Sample #:	GBLK012392	GBLK012392	GBLK012392	GBLK012392
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	10	10	10	30
Matrix Spike % Recovery:	100	100	100	100
Conc. Matrix Spike Dup.:	10	10	10	30
Matrix Spike Duplicate % Recovery:	100	100	100	100
Relative % Difference:	0.0	0.0	0.0	0.0

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% 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