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TRANSMITTAL

TO: Mr. Barney Chan
Alameda County Health
Health Care Services Agency
80 Swan Way, Room 200
Oakland, California 94621

DATE: March 31, 1994
PROJECT NUMBER: 69036.08
SUBJECT: ARCO Station 2035

FROM: Erin D. Krueger

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1	03/31/94	Letter Report, Quarterly Groundwater and Remediation System Monitoring Fourth Quarter 1993 at ARCO Station 2035, 1001 San Pablo Avenue, Albany, California.

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REMARKS:
Copies: 1 to RESNA project file no. 69036.08

Erin D. Krueger, Staff Geologist

cc: Mr. Michael Whelan, ARCO
Mr. Richard Hiett, RWQCB

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LETTER REPORT
QUARTERLY GROUNDWATER AND REMEDIATION SYSTEM MONITORING
Fourth Quarter 1993
at
ARCO Station 2035
1001 San Pablo Avenue
Albany, California

3-31-94

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March 31, 1994

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

Subject: Letter Report, Quarterly Groundwater and Remediation System Monitoring
Fourth Quarter 1993
ARCO Station 2035
1001 San Pablo Avenue, Albany, California.

Mr. Whelan:

As requested by ARCO Products Company (ARCO), RESNA Industries Inc. (RESNA) presents this letter report summarizing the results of Fourth Quarter 1993 Groundwater Monitoring and Remediation System Monitoring at the above-referenced site. The location of the site is shown on Plate 1, and site features such as groundwater monitoring wells, vapor extraction wells, and the remediation compound are shown on Plate 2.

Field work associated with groundwater monitoring was performed by EMCON Associates (EMCON) of San Jose, California. RESNA's scope of work for groundwater monitoring was to interpret field and laboratory analytical data, which included evaluating trends in hydrocarbon concentrations in the local groundwater, the groundwater gradient, and direction of groundwater flow beneath the site. Evaluation and warrant of EMCON's groundwater monitoring field procedures and protocols is beyond RESNA's scope of work.

Field work associated with remediation system monitoring was performed by RESNA and consists of; collection of field data, treatment unit influent and effluent sampling, and system adjustment to optimize system performance. Evaluation of remediation system operation was performed by RESNA using laboratory results of samples and collected field data. Previous environmental work at the site is summarized in RESNA reports cited in the Reference section.

GROUNDWATER MONITORING

Field Work

EMCON field personnel were onsite December 8, 1993, to measure depth-to-water (DTW) levels, perform subjective analysis for the presence of product, and perform quarterly sampling in groundwater in wells MW-1 through MW-6, and RW-1.

Laboratory Analyses

Water samples were analyzed by Columbia Analytical Services, Inc., located in San Jose, California (Hazardous Waste Testing Laboratory Certification #1426) for benzene, toluene, ethylbenzene, and total xylenes (BTEX), and total petroleum hydrocarbons as gasoline (TPHg) using Environmental Protection Agency (EPA) Methods 5030/8020/California DHS LUFT Method. In addition, the water sample from groundwater monitoring well MW-3, located next to the former waste-oil tank pit was analyzed for total oil and grease (TOG) using Standard Method 5520 C and F. The Chain of Custody Records and Laboratory Analysis Reports are included in Appendix A.

Results of Groundwater Monitoring

Groundwater elevations rose an average of about 0.16 foot in wells MW-1, MW-2, MW-4, MW-5, and RW-1; rose about 2.3 feet in MW-6; and fell about 0.05 foot in MW-3, since last quarter. Floating product was noted in well RW-1 (0.30 feet) by EMCON field personnel. No floating product or product sheen was noted in other wells during this quarter. Based on December 8, 1993, DTW data, groundwater was interpreted to flow toward the west with a gradient of approximately 0.01 ft/ft (Plate 3). Monitoring well MW-6 was not used in the gradient evaluation because of an anomalously high groundwater elevation. Groundwater monitoring data from this and previous quarters is presented in Table 1. The results of EMCON's field work on the site are presented in Appendix A.

The following trends in hydrocarbon concentrations have been identified since the last quarter: concentrations decreased in well MW-1 and remained nondetectable in MW-2 through MW-6 (Plate 4). Floating product or product sheen continued to be present in recovery well RW-1.

Product Removal

Floating product skimmer was removed from well RW-1 prior to system startup in December 1993. Quantities of floating product recovered prior to skimmer removal are presented in Table 4.

REMEDIATION SYSTEM MONITORING

Construction of the interim remediation system was completed in November 1993. The system consists of both a Groundwater Extraction System (GES) and a Vapor Extraction System (VES). The GES has not been started and therefore will not be discussed in this report. The VES uses 9 vapor extraction wells (VW-1 through VW-9), one groundwater extraction well (RW-1), and two air sparge wells (AS-1, and AS-2), to vapor extract from a total of 12 wells. The VES uses a 5 horsepower positive displacement blower, and a 100 standard cubic feet per minute (scfm) Therm-Tech VAC 10 combination thermal and catalytic oxidizer (oxidizer) for the combustion treatment of extracted gasoline vapors. The oxidizer can be operated in either the thermal or catalytic mode to minimize supplemental fuel costs as hydrocarbon concentrations in extracted soil gas decline. Oxidizer operation is authorized under the Bay Area Air Quality Management District (BAAQMD) Permit to Operate Application #10931.

VES Startup and Operation

Startup and testing of the VES began on December 7, 1993, with oxidizer operation initiated in the thermal mode and extraction occurring from 10 of the available 12 extraction wells. VES operational data for December 7 through December 31, 1993, is summarized in Table 5 and includes extraction well on/off status, flowrates, and TPHg vapor concentrations.

The system operated on wells VW-1 through VW-9, and RW-1 from startup until December 15, 1993, at which time RW-1 was closed due to no available well screen. The combined well flow rates for the extraction wells ranged from 5 standard cubic feet per minute (scfm) to 54 scfm at vacuums ranging from 38- to 65-inches of water column (WC). Dilution air flowrates ranged from 24 to 90 scfm during the quarter. The addition of dilution air is currently necessary to reduce the blower vacuum and prevent the oxidizer from shutting down due to a high vacuum condition. The oxidizer is designed to shutdown at a high vacuum of 80-inches of WC. The VES operated for a total of 330 hours of the available 585 hours during the fourth quarter 1993.

Air Sampling and Analysis

Initial oxidizer influent and effluent air samples were collected on December 7, 1993. On December 8, 1993, air samples could not be collected due to a mechanical failure of the air sampling pump and backup pump. Because the BAAQMD permit requires air samples be collected the first three days following startup, the VES was shutdown pending repair of the sampling pump. The VES was restarted on December 9, 1993, and air samples were collected on December 9 and December 10, 1993.

Air samples were collected in tedlar sample bags using polyvinyl chloride (PVC) tubing and an electric air vacuum sampling pump. Air samples were analyzed for TPHg and for gasoline constituents BTEX using modified EPA Methods 5030/8015/8020 by Sequoia Analytical Laboratories in Redwood City, California. The results of laboratory analyses of air samples collected from individual wells and from the oxidizer influent and effluent are summarized in Table 6. Copies of laboratory reports and individual chain of custody records for air samples are included in Appendix A.

TPHg vapor concentrations from individual wells ranged from 2,100 (VW-5) to 21,000 micrograms per cubic meter (mg/m^3 [VW-2]) while the oxidizer influent concentrations (with dilution air) ranged from 1,400 to 1,800 mg/m^3. Assuming a molecular weight of 95 grams/mole for TPHg, the oxidizer influent concentrations ranged from 354 to 375 parts per million (ppm) by volume. TPHg vapor concentrations in the oxidizer effluent ranged from 21 to 130 mg/m^3 while benzene concentrations ranged from less than the detection limit to 3.1 mg/m^3.

Mass Extraction and Emission Rates

Using the analytical results and system influent flowrates (measured after dilution air), the TPHg extraction rates from the wells and TPHg and benzene emissions rates to the atmosphere were calculated. TPHg extraction rates are summarized in Table 7 and TPHg and benzene emission rates are shown in Table 8. **TPHg mass extraction rates for the quarter ranged from 11.7 to 16.2 pounds per day (ppd). Total TPHg mass extracted by the VES is estimated at 94 pounds.**

The TPHg emission rates ranged from 0.68 to 1.17 ppd while the benzene emissions ranged from less than 0.0004 to 0.02 ppd. Based on the influent and effluent concentrations, the thermal destruction efficiency (DE) of the oxidizer varied from 90.7% to 98.6%. Pursuant to BAAQMD permit requirements, these reported DEs comply with the minimum required 90% DE for TPHg influent concentrations less than 1,000 parts per million (ppm). In addition, the mass emission rate for benzene were below the 0.05 ppd (benzene) emission limits applicable to this site.

Previous and Future Work

Fourth Quarter 1993

- Performed fourth quarter 1993 groundwater monitoring.
- Completed construction of interim remediation system.
- Started operation of Vapor Extraction portion of interim remediation system.

- Submitted third quarter groundwater monitoring report to ARCO and regulatory agencies.

First Quarter 1994

- Perform first quarter 1994 groundwater monitoring.
- Perform operation and maintenance of interim remediation system.
- Submit a report of findings for the air sparge pilot test to ARCO and regulatory agencies.
- Submit fourth quarter 1993 groundwater and remediation system monitoring report to ARCO and regulatory agencies.

REPORTING REQUIREMENTS

Copies of this report should be forwarded to:

Mr. Barney Chan
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Mr. Richard Hiett
Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, California 94612

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If you have any questions or comments, please call us at (408) 264-7723.

Sincerely,
RESNA Industries Inc.

Erin D. Krueger
Staff Geologist

David Peterson
Staff Engineer

James L. Nelson, C.E.G. 1463
Certified Engineering Geologist

REGISTERED GEOLOGIST
JAMES LEWIS NELSON
No. 1463
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

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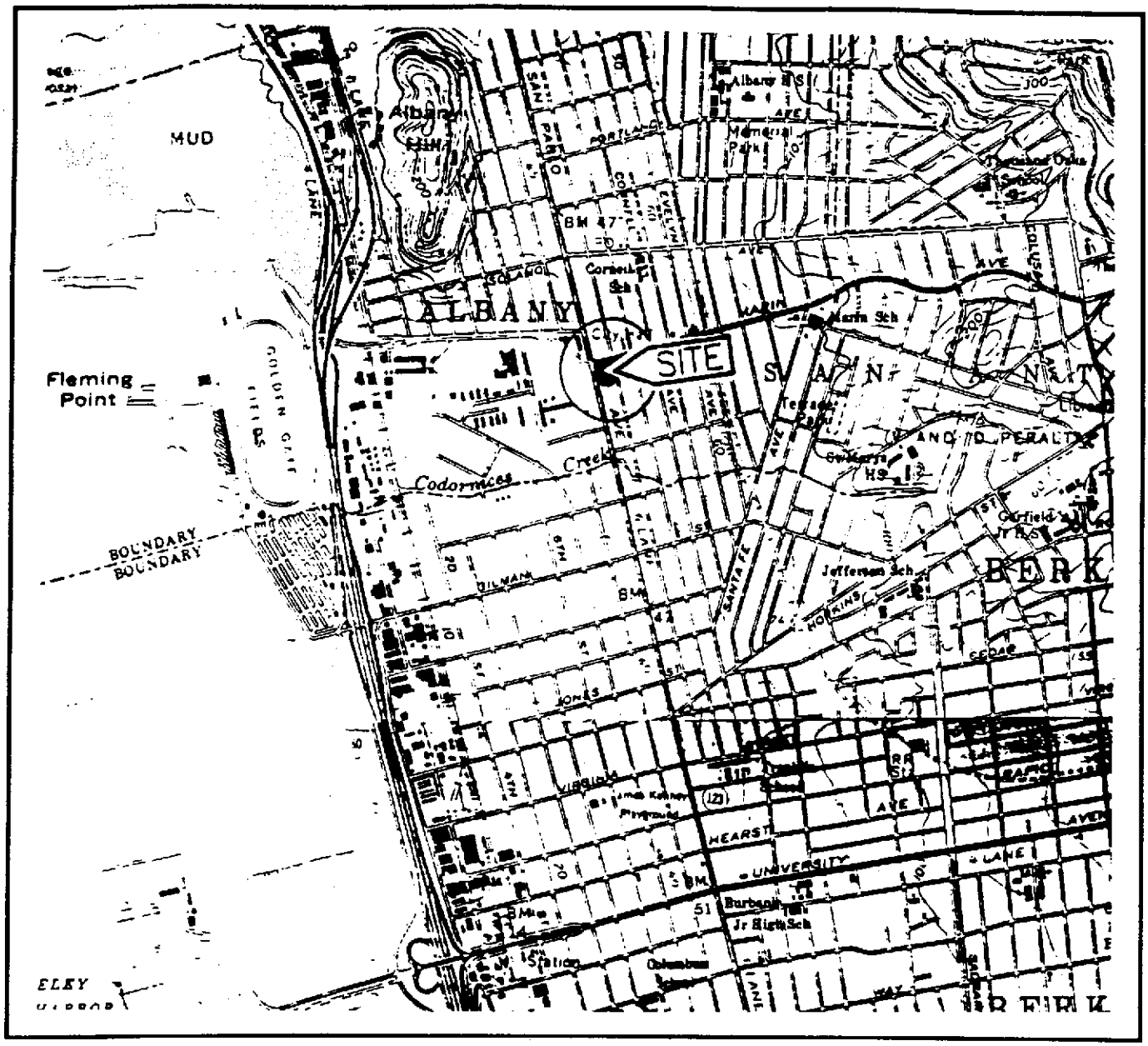
Enclosures: References

Plate 1,	Site Vicinity Map
Plate 2,	Generalized Site Plan
Plate 3,	Groundwater Gradient Map, December 8, 1993
Plate 4,	TPHg/Benzene Concentrations in Groundwater, December 8, 1993
Table 1,	Cumulative Groundwater Monitoring Data
Table 2,	Cumulative Results of Laboratory Analyses of Water Samples - TPHg and BTEX
Table 3,	Cumulative Results of Laboratory Analyses of Water Samples - TPHd, TOG, VOCs, BNAs, PCBs and Metals
Table 4,	Approximate Cumulative Product Recovered
Table 5,	VES Operation Data
Table 6,	Cumulative Results of Laboratory Analysis of Air Samples
Table 7,	VES Estimated Gasoline Removal
Table 8,	VES Destruction Efficiencies and Removal Rates
Appendix A:	EMCON's Field Reports; Summary of Groundwater Monitoring Data, Certified Analytical Reports with Chain-of-Custody, and Water Sample Field Data Sheets
Appendix B:	Chain of Custody and Analytical Results of Air Samples

REFERENCES

RESNA November 30, 1992. Additional Subsurface Environmental Investigation and Vapor Extraction Test at ARCO Station 2035, 1001 San Pablo Avenue, Albany, California. 69036.05

RESNA December 29, 1993. Letter Report, Quarterly Groundwater Monitoring Third Quarter 1993 at ARCO Station 2035, 1001 San Pablo Avenue, Albany, California. 69036.08



Base: U.S. Geological Survey
7.5-Minute Quadrangles
Richmond/Oakland West, California.
Photorevised 1980

N

LEGEND

◉ = Site Location

Approximate Scale

2000 1000 0 2000 4000

feet

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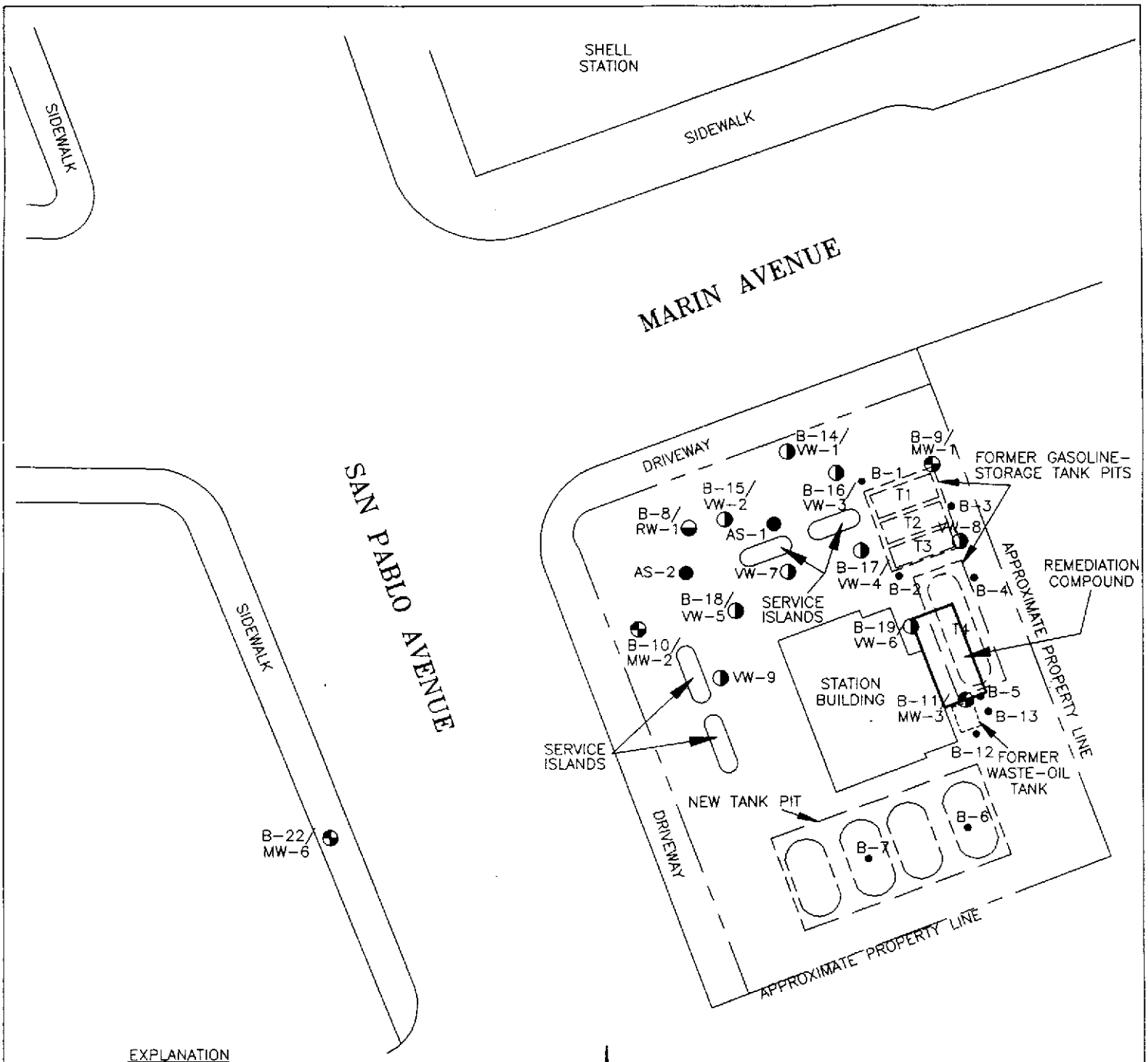
SITE VICINITY MAP
ARCO Station 2035
1001 San Pablo Avenue
Albany, California

PLATE
1



EXPLANATION

B-19/VW-6 = Boring/vapor extraction well (RESNA, August 1992 and June 1993)

B-8/RW-1 = Boring/recovery well (Exceltech, October 1991)

B-22/MW-6 = Boring/monitoring well (Exceltech, October 1991)

AS-2 = Air sparge well (RESNA, June 1993)

B-13 = Soil boring (RESNA, August 1989, June 1991, and August 1992)

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John E. Koch, Land Surveyor.

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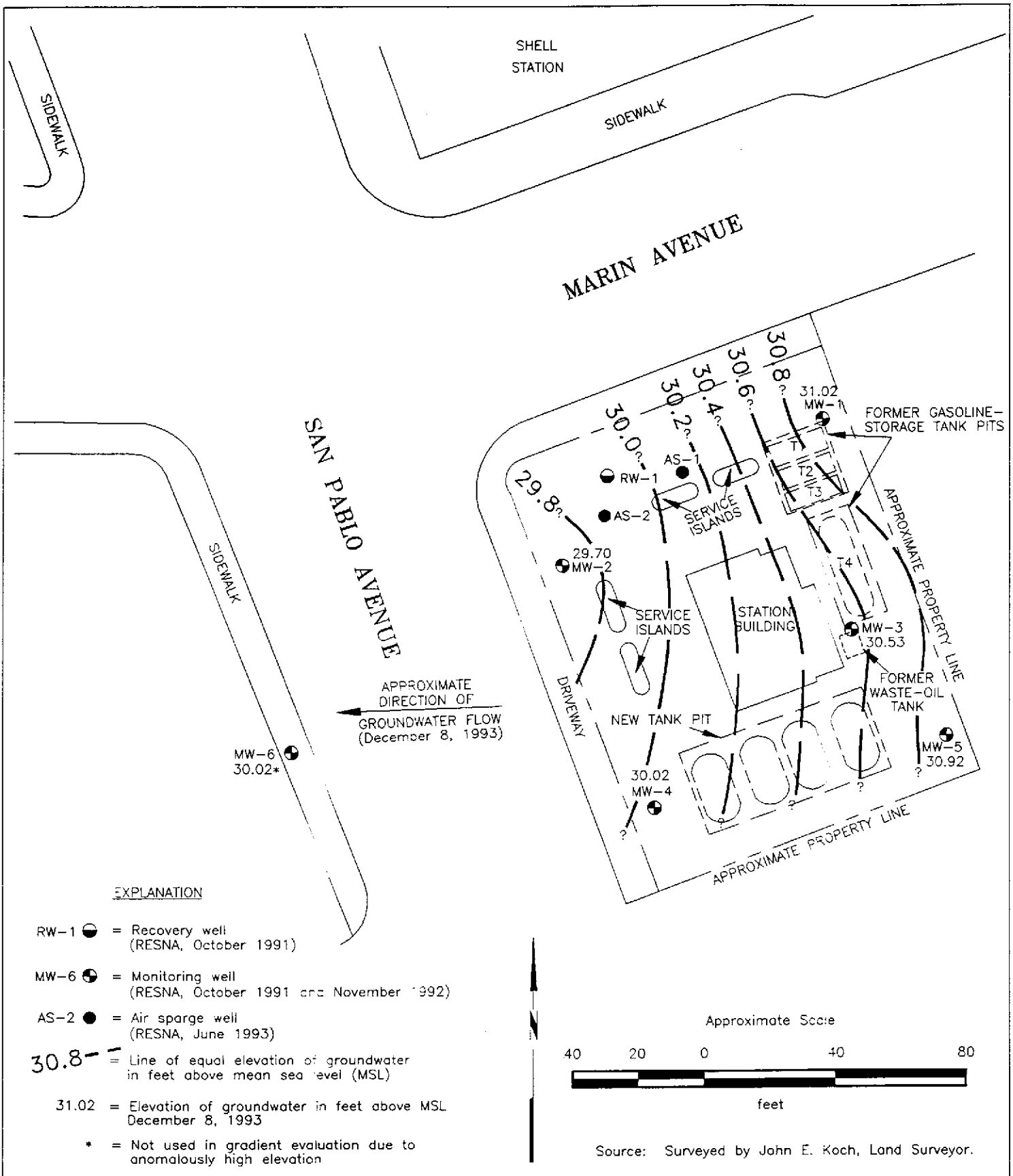
GENERALIZED SITE PLAN
ARCO Station 2035
1001 San Pablo Avenue
Albany, California

PLATE 2



EXPLANATION

RW-1 ◒ = Recovery well (RESNA, October 1991)

MW-6 ◒ = Monitoring well (RESNA, October 1991 and November 1992)

AS-2 ● = Air sparge well (RESNA, June 1993)

30.8- = Line of equal elevation of groundwater in feet above mean sea level (MSL)

31.02 = Elevation of groundwater in feet above MSL December 8, 1993

* = Not used in gradient evaluation due to anomalously high elevation

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John E. Koch, Land Surveyor.

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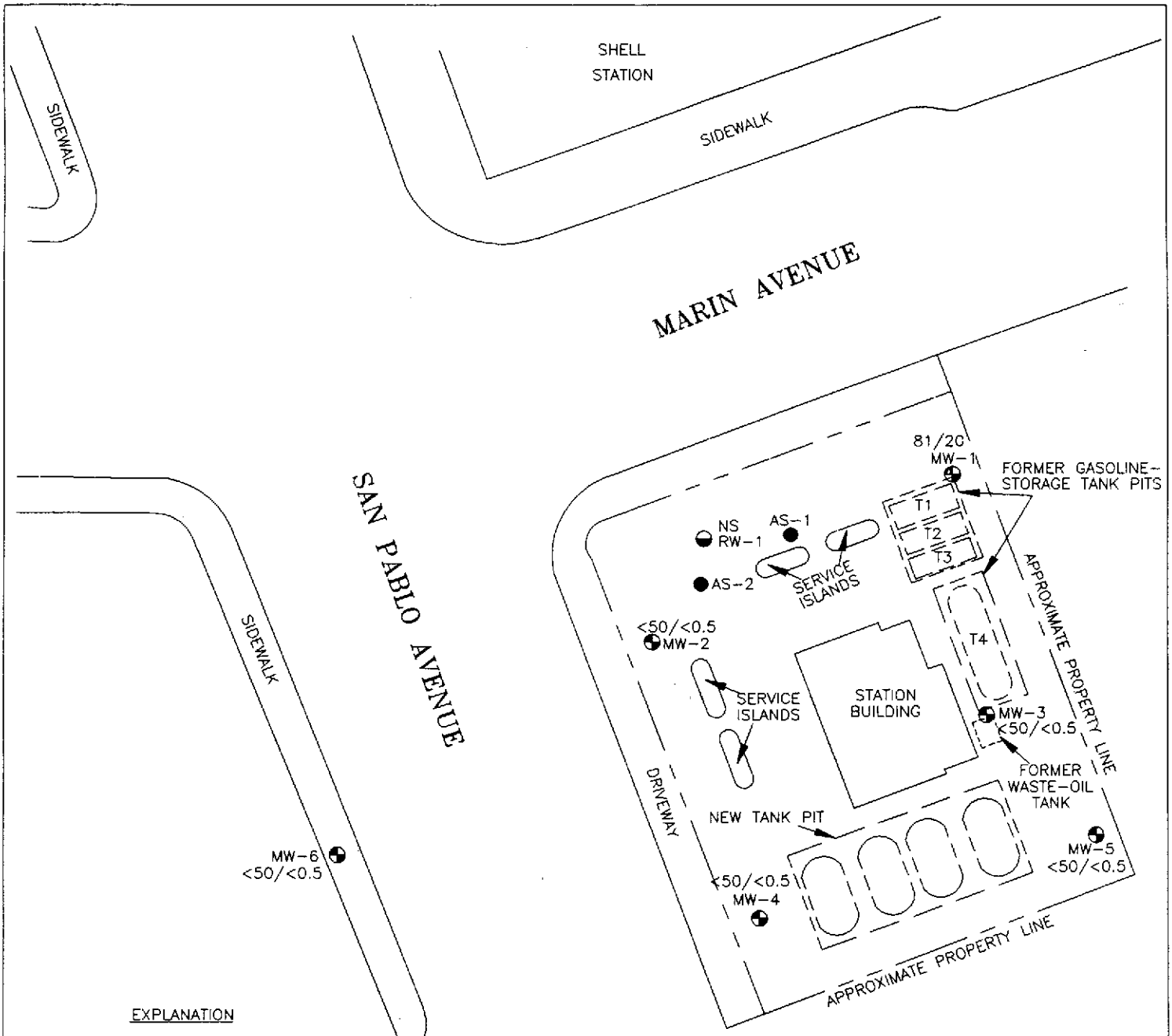
GROUNDWATER GRADIENT MAP

ARCO Station 2035
1001 San Pablo Avenue
Albany, California

PLATE 3



EXPLANATION

RW-1 = Recovery well (RESNA, October 1991)

MW-6 = Monitoring well (RESNA, October 1991 and November 1992)

AS-2 = Air sparge well (RESNA, June 1993)

81/20 = Concentration of TPHg/Benzene in groundwater, in parts per billion, December 8, 1993

NS = Not sampled due to floating product

N

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John E. Koch, Land Surveyor.

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TPHg/BENZENE CONCENTRATIONS IN GROUNDWATER
ARCO Station 2035
1001 San Pablo Avenue
Albany, California

PLATE 4

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 2035
Albany, California
(Page 1 of 4)

Well Date	Elevation of Wellhead	Depth to Water	Elevation of Groundwater	Evidence of Product
MW-1				
10/29/91	41.41	11.86	29.55	None
11/07/91		10.94	30.47	None
11/14/91		10.97	30.44	None
01/19/92		10.06	31.35	None
02/19/92		8.65	32.76	None
03/19/92		8.33	33.08	None
04/21/92		9.32	32.09	None
05/12/92		9.82	31.59	None
06/12/92		10.50	30.91	None
07/15/92		10.69	30.72	None
08/07/92		10.53	30.88	None
09/08/92		11.04	30.37	None
10/26/92		11.24	30.17	None
11/23/92		10.90	30.51	None
12/16/92		9.40	32.01	None
01/13/93		7.73	33.68	None
02/22/93		7.56	33.85	None
03/25/93		8.48	32.93	None
04/13/93		8.91	32.50	None
05/22/93		9.68	31.73	None
06/17/93		9.68	31.73	None
07/27/93		10.09	31.32	None
08/24/93		10.51	30.90	None
12/08/93		10.39	31.02	None
MW-2				
10/29/91	40.38	11.10	29.28	None
11/07/91		11.20	29.18	None
11/14/91		11.21	29.17	None
01/19/92		10.44	29.94	None
02/19/92		8.70	31.68	None
03/19/92		8.84	31.54	None
04/21/92		9.80	30.58	None
05/12/92		10.29	30.09	None
06/12/92		10.95	29.43	None
07/15/92		11.15	29.23	None
08/07/92		11.01	29.37	None
09/08/92		11.41	28.97	None
10/26/92		11.60	28.78	None
11/23/92		7.31	33.07	None
12/16/92		9.82	30.56	None

See notes on Page 4 of 4.

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 2035
Albany, California
(Page 2 of 4)

Well / Date	Elevation of Wellhead	Depth to Water	Elevation of Groundwater	Evidence of Product
MW-2 (cont.)				
01/13/93		8.25	32.13	None
02/22/93		8.25	32.13	None
03/25/93		8.82	31.56	None
04/13/93		9.30	31.08	None
05/22/93		10.57	29.81	None
06/17/93		10.25	30.13	None
07/27/93		10.48	29.90	None
08/24/93		10.82	29.56	None
12/08/93		10.68	29.70	None
MW-3				
10/29/91	41.44	11.62	29.82	None
11/07/91		11.52	29.92	None
11/14/91		11.50	29.94	None
01/19/92		10.56	30.88	None
02/19/92		9.52	31.92	None
03/19/92		9.01	32.43	None
04/21/92		9.70	31.74	None
05/12/92		10.29	31.15	None
06/12/92		11.26	30.18	None
07/15/92		11.28	30.16	None
08/07/92		11.15	30.29	None
09/08/92		11.70	29.74	None
10/26/92		12.15	29.29	None
11/23/92		12.55	28.89	None
12/16/92		10.15	31.29	None
01/13/93		9.12	32.32	None
02/22/93		8.18	33.26	None
03/25/93		8.57	32.87	None
04/13/93		9.55	31.89	None
05/22/93		10.56	30.88	None
06/17/93		10.41	30.70	None
07/27/93		10.53	30.91	None
08/24/93		10.86	30.58	None
12/08/93		10.91	30.53	None

See notes on Page 4 of 4.

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 2035
Albany, California
(Page 3 of 4)

Well Date	Elevation of Wellhead	Depth to Water	Elevation of Groundwater	Evidence of Product
MW-4				
01/13/93	40.33	8.05	32.28	None
02/22/93		7.58	32.75	None
03/25/93		8.27	32.06	None
04/13/93		8.54	31.79	None
05/22/93		9.52	30.81	None
06/17/93		9.53	30.80	None
07/27/93		10.14	30.19	None
08/24/93		10.42	29.91	None
12/08/93		10.31	30.02	None
MW-5				
01/13/93	41.84	8.22	33.62	None
02/22/93		7.92	33.92	None
03/25/93		8.67	33.17	None
04/13/93		9.18	32.66	None
05/22/93		10.12	31.72	None
06/17/93		10.03	31.81	None
07/27/93		10.74	31.10	None
08/24/93		11.02	30.82	None
12/08/93		10.92	30.92	None
MW-6				
01/13/93	40.13	9.84	30.29	None
02/22/93		9.94	30.19	None
03/25/93		10.68	29.45	None
04/13/93		11.12	29.01	None
05/22/93		11.74	28.39	None
06/17/93		11.75	28.38	None
07/27/93		12.20	27.93	None
08/24/93		12.41	27.72	None
12/08/93		10.11	30.02	None
RW-1				
10/29/91	40.33	10.85	29.48	Sheen
11/07/91		11.97	28.36	0.01
11/14/91		11.03	29.30	0.01
01/19/92		10.22*	30.11*	3.26
02/19/92		8.49*	31.84*	2.14
03/19/92		8.50*	31.83*	0.50
04/21/92		9.68*	30.65	0.03

See notes on Page 4 of 4.

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 2035
Albany, California
(Page 4 of 4)

Well Date	Elevation of Wellhead	Depth to Water	Elevation of Groundwater	Evidence of Product
RW-1 (cont.)				
05/12/92	40.33	10.47	29.86	Product not measured
06/12/92		11.41	28.92	Product not measured
07/15/92		11.35	28.98	None
08/07/92		10.80*	29.53*	0.02
09/08/92		10.80*	29.53*	0.62
10/26/92		11.42*	28.91*	0.04
11/23/92		10.94	29.39	Sheen
12/16/92		9.78*	30.55*	0.51
01/13/93		8.35	31.98	Product in skimmer
02/22/93		7.94*	32.39*	0.01
03/25/93		8.81	31.52	None
04/13/93		9.67**	NC**	Product not measured
05/22/93		10.04	30.29	Sheen
06/17/93		10.26*	30.07*	0.01 in bailer
07/27/93		10.58	29.75	Sheen
08/24/93		10.80*	29.53*	0.05
12/08/93		10.46*	29.87*	0.30
AS-1***				
08/24/93	41.03	10.97	30.06	None
AS-2***				
08/24/93	40.31	10.45	29.86	None

Depth-to-water measurements in feet below the top of the well casing.

*Adjusted water level due to product. The recorded thickness of the floating product was multiplied by 0.80 to obtain an approximate value for the displacement of water by the floating product. This approximate displacement value was then subtracted from the measured depth to water to obtain a calculated depth to water. These calculated groundwater depths were subtracted from surveyed wellhead elevations to obtain the adjusted groundwater elevations.

**Well contained product of unknown thickness. Groundwater elevation could not be corrected, therefore it was not used in gradient evaluation.

***Wells AS-1 and AS-2 were monitored during Third Quarter 1993 as a one-time event in conjunction with an air-sparge pilot test performed at the site.

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TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF WATER SAMPLES - TPHg and BTEX
ARCO Station 2035
Albany, California
(Page 1 of 2)

Well Date	TPHg	B	T	E	X
MW-1					
10/29/91	620	76	69	15	60
03/19/92	6,500	2,600	89	42	290
06/12/92	2,900	1,100	2.5	21	15
09/08/92	820	350	<5*	<5*	<5*
10/26/92	190	68	<0.5	0.6	<0.5
01/13/93	430	130	5.3	5.0	9.0
04/13/93	5,300	2,100	<20*	63	36
08/24/93	630	230	<2.5*	3.1	3.3
12/08/93	81	20	<0.5	0.9	<0.5
MW-2					
10/29/91	<60	2.4	4.6	0.48	2.3
03/19/92	<50	6.8	0.9	<0.5	1.1
06/12/92	<50	<0.5	<0.5	<0.5	<0.5
09/08/92	<50	<0.5	<0.5	<0.5	<0.5
10/26/92	<50	<0.5	<0.5	<0.5	<0.5
01/13/93	<50	<0.5	<0.5	<0.5	<0.5
04/13/93	<50	<0.5	<0.5	<0.5	<0.5
08/24/93	<50	<0.5	<0.5	<0.5	<0.5
12/08/93	<50	<0.5	<0.5	<0.5	<0.5
MW-3					
10/29/91	32	2.1	2.8	0.35	1.8
03/19/92	2,100	780	8.8	16	58
06/12/92	720	210	<2.5*	23	4.0
09/08/92	<50	5.3	<0.5	<0.5	<0.5
10/26/92	<50	0.6	<0.5	<0.5	<0.5
01/13/93	<50	1.1	<0.5	<0.5	<0.5
04/13/93	68	13	<0.5	1.6	1.1
08/24/93	<50	<0.5	<0.5	<0.5	<0.5
12/08/93	<50	<0.5	<0.5	<0.5	<0.5
MW-4					
01/13/93	<50	<0.5	1.3	<0.5	1.6
04/13/93	<50	<0.5	<0.5	<0.5	<0.5
08/24/93	<50	<0.5	<0.5	<0.5	<0.5
12/08/93	<50	<0.5	<0.5	<0.5	<0.5

See notes on Page 2 of 2

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TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF WATER SAMPLES - TPHg and BTEX
ARCO Station 2035
Albany, California
(Page 2 of 2)

Well Date	TPHg	B	T	E	X
MW-5					
01/13/93	<50	<0.5	<0.5	<0.5	<0.5
04/13/93	<50	<0.5	<0.5	<0.5	<0.5
08/24/93	<50	<0.5	<0.5	<0.5	<0.5
12/08/93	<50	<0.5	<0.5	<0.5	<0.5
MW-6					
01/13/93	<50	<0.5	<0.5	<0.5	<0.5
04/13/93	<50	<0.5	<0.5	<0.5	<0.5
08/24/93	<50	<0.5	<0.5	<0.5	<0.5
12/08/93	<50	<0.5	<0.5	<0.5	<0.5
RW-1					
10/29/91	Not sampled–sheen				
03/19/92	Not sampled–floating product				
06/12/92	Not sampled–floating product				
09/08/92	Not sampled–floating product				
10/23/92	Not sampled–floating product				
01/13/93	Not sampled–floating product in skimmer				
04/13/93	Not sampled–floating product				
08/24/93	Not sampled–floating product				
12/08/93	Not sampled–floating product				
AS-1**					
08/24/93	2,400	78	87	52	370
AS-2**					
08/24/93	30,000	1,300	2,800	980	5,900
MCL:	—	1	—	680	1,750
DWAL:	—	—	100	—	—

Results in parts per billion (ppb).
TPHg: Total petroleum hydrocarbons as gasoline using EPA Method 5030/8015/8020.
B: benzene, T: toluene, E: ethylbenzene, X: total xylenes isomers
BTEX: Analyzed using EPA Method 5030/8015/8020.
<: Results reported below the laboratory detection limit.
*: Laboratory Raised Methods Reporting Limit (MRL) due to high analyte concentration requiring sample dilution.
**: Wells AS-1 and AS-2 were monitored during Third Quarter 1993 as a one-time event in conjunction with an air-sparge pilot test performed at the site.
MCL: State Maximum Contaminant Level (October 1990).
DWAL: State Drinking Water Action Level (October 1990).

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TABLE 3
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF WATER SAMPLES
- TPHd, TOG, VOC, BNAs, PCB and Metals
ARCO Station 2035
Albany, California

Well Date	TPHd	TOG	VOC	BNAs	PCB	Cd	Cr	Pb	Ni	Zn
MW-3										
10/29/91	NA	<5,000	ND[a]	NA	NA	<10	<10	<5	<50	45
03/19/92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
06/12/92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
09/08/92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
10/26/92	<50	(600)[600]	ND[b]	NA	NA	NA	NA	NA	NA	NA
12/01/92	NA	NA	NA	ND[c]	ND[d]	NA	NA	NA	NA	NA
01/13/93	NA	(780)[1,100]	NA	NA	NA	NA	NA	NA	NA	NA
04/13/93	NA	(<0.5)[<0.5]	NA	NA	NA	NA	NA	NA	NA	NA
08/24/93	NA	(<0.5)[<0.5]	NA	NA	NA	NA	NA	NA	NA	NA
12/08/93	NA	(900)[500]	NA	NA	NA	NA	NA	NA	NA	NA
MCL:	—	—	—	—	—	10	50	50	—	—

Results in parts per billion (ppb).

TPHd: Total petroleum hydrocarbons as diesel by EPA Method 3510/California DHS LUFT Method.
TOG: Total oil and grease by Standard Method 5520B&F or 5520C (780) and 5520F [1.100].
VOCs: Volatile organic compounds by EPA Method 624.
BNAs: Semivolatile organic compounds by EPA Method 3510/8270.
PCBs: Polychlorinated biphenyls by EPA Method 3510/8080.
Cd: Cadmium by EPA Method 200.7.
Cr: Chromium by EPA Method 200.7.
Ni: Nickel by EPA Method 200.7.
Zn: Zinc by EPA Method 200.7.
Pb: Lead by EPA Method 3010.
NA: Not analyzed.
<: Results reported below the laboratory detection limit.
ND: Not detected; detection limit varied according to analyte.
[a]: All 37 compounds were nondetectable except for toluene (3.0 ppb).
[b]: All 41 compounds analyzed were nondetectable.
[c]: All 34 compounds analyzed were nondetectable.
[d]: All 7 compounds analyzed were nondetectable.
MCL: State Maximum Contaminant Level (October 1990).

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TABLE 4
APPROXIMATE CUMULATIVE PRODUCT RECOVERED
ARCO Station 2035
Albany, California

Well Date	Product Thickness (feet)	Product Recovered (gallons)
YEAR: 1992		
RW-1		
01/29/92	3.35	5.0
02/28/92	2.58	3.8
03/12/92	1.28	2.0
03/25/92	0.91	0.5
05/29/92	0.23	0.3
06/08/92	0.60	0.5
06/30/92	0.15	0.25
07/23/92	0.27	0.5
08/05/92	0.45	0.25
08/17/92	0.50	0.5
09/10/92	0.75	0.5
09/22/92	0.80	1.2
10/06/92	0.65	1.0
10/21/92	0.50	1.0
11/04/92	0.48	1.5
11/17/92	0.40	0.75
12/02/92	0.41	0.75
12/17/92	0.39	1.0
12/29/92	0.53	1.0
	1992 TOTAL:	22.30
YEAR: 1993		
RW-1		
01/19/92	0.01	0.5
01/29/93	0.01	0.5
02/11/93	sheen	0
03/03/93	sheen	0
03/11/93	sheen	0
03/23/93	sheen	0
04/07/93	sheen	0
04/22/93	sheen	0
05/06/93	sheen	0
06/21/93	sheen	0
07/27/93*	sheen	0
08/24/93*	0.5	0
09/30/93	0.2	0
12/08/93*#	0.3	0
	1993 TOTAL:	1.0
	TOTAL 1992 and 1993:	23.30

Product measured and bailed by RESNA personnel.
* = Product measured by EMCON personnel.
# = Product skimmer removed due to system startup.

TABLE 5
VAPOR EXTRACTION SYSTEM OPERATIONAL DATA
ARCO Station 2035, Albany, California
(Page 1 of 2)

DATE OF OPER	VAPOR EXTRACTION WELLS ON LINE										COMB WELL FLOW (scfm)	DIL AIR FLOW (scfm)	INF FLOW (scfm)	INF VAC ("WC)	TPHg WELL CONC (mg/m^3)	TPHg INF CONC (mg/m^3)	TPHg EFF CONC (mg/m^3)
	VW 1	VW 2	VW 3	VW 4	VW 5	VW 6	VW 7	VW 8	VW 9	RW 1							
12/07/93	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	90	100	NM	10,000	1,400	76
12/08/93	SYSTEM SHUTDOWN AND NOT SAMPLED DUE TO A FAILED SAMPLING PUMP																
12/09/93	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	10	90	100	40	NS	1,400	130
12/10/93	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	5	82	87	38	NS	1,500	21
12/15/93	✓	✓	✓	✓	✓	✓	✓	✓	✓		45	55	100	65	NS	1,800	NS
12/16/93	SYSTEM SHUTDOWN 12/16/93 TO 12/21/93 DUE TO FAILURE OF THE PROCESS BLOWER																
12/21/93	✓	✓	✓	✓	✓	✓	✓	✓	✓		20	80	100	48	NS	NS	NS
12/25/93	SYSTEM SHUTDOWN 12/25/93 TO 12/29/93 DUE TO A CONTROL FAULT OF THE OXIDIZER																
12/29/93	✓	✓	✓	✓	✓	✓	✓	✓	✓		54	24	78	60	NS	NS	NS
12/31/93	SYSTEM SHUTDOWN 12/31/93 DUE TO HIGH LIQUID LEVEL IN THE KNOCKOUT DRUM																

SEE NOTES ON PAGE 2 OF 2.

TABLE 5
VAPOR EXTRACTION SYSTEM OPERATIONAL DATA
ARCO Station 2035, Albany, California
(Page 2 of 2)

NOTES:
COMB WELL FLOW = Combined Well Flow Rates
DIL AIR FLOW = Dilution Air Flow Rate
INF FLOW = Influent Flow Rate to therm-ox (well plus dilution flows)
scfm = standard cubic feet per minute
INF VAC = Influent Vacuum
"WC = inches of water column vacuum
TPHg = Total petroleum hydrocarbons as gasoline
WELL TPHg CONC = Concentration of TPHg vapor in combined well flow
TPHg INF CONC = Concentration of TPHg vapor in therm-ox influent flow
TPHg EFF CONC = Concentration of TPHg vapor in therm-ox effluent flow
mg/m^3 = milligrams per cubic meter
✓ = Vapor Extraction Well Online
NS = Not Sampled
NM = Not Measured

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TABLE 6
CUMULATIVE RESULTS OF LABORATORY ANALYSES
OF AIR SAMPLES
ARCO Station 2035, Albany, California
(Page 1 of 2)

Sample Location & Date	Sample ID	TPHg	Benzene	Toluene	Ethylbenzene	Total Xylenes
VW-1 12/09/93	AS-HV-1	9,700	990	430	<0.05	38
VW-2 12/09/93	AS-HV-2	21,000	1,200	630	79	240
VW-3 12/09/93	AS-HV-3	8,000	270	400	57	200
VW-4 12/09/93	AS-HV-4	9,000	250	320	44	140
VW-5 12/09/93	AS-HV-5	2,100	11	280	32	110
VW-6 12/09/93	AS-HV-6	9,600	450	330	46	140
VW-7 12/09/93	AS-HV-7	12,000	1,300	480	32	91
VW-8 12/09/93	AS-HV-8	4,900	89	38	<0.05	18
VW-9 12/09/93	AS-HV-9	6,600	130	74	58	120
RW-1 12/09/93	AS-HV-10	6,800	130	82	36	77
ALL WELLS* 12/07/93	AS-COMBINE WELLS	10,000	540	300	31	100

See Notes on page 2 of 2.

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TABLE 6
CUMULATIVE RESULTS OF LABORATORY ANALYSES
OF AIR SAMPLES
ARCO Station 2035, Albany, California
(Page 2 of 2)

Sample Location & Date	Sample ID	TPHg	Benzene	Toluene	Ethylbenzene	Total Xylenes
INFLUENT**						
12/07/93	AS-INFLUENT	1,400	38	22	3.5	11
12/09/93	AS-INFLUENT	1,400	60	67	17	55
12/10/93	AS-INFLUENT	1,500	100	39	6.1	19
12/15/93	AS-INFLUENT	1,800	79	73	13	42
EFFLUENT***						
12/07/93	AS-EFFLUENT	76	2.3	4.8	2.1	7.2
12/09/93	AS-EFFLUENT	130	3.1	21	4.6	15
12/10/93	AS-EFFLUENT	21	<0.05	1.7	1.4	5.0

Notes: Results in milligrams per cubic meter (mg/m^3), equivalent to micrograms per liter ($\mu g/l$).
TPHg: Total petroleum hydrocarbons as gasoline
BTEX and TPHg using EPA method 5030/8015/8020.
* ALL WELLS Sample taken before fresh air dilution.
** INFLUENT Samples taken after fresh air dilution before entering Therm-Ox.
*** EFFLUENT Samples taken from exhaust stack of Therm-Ox.

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TABLE 7
VES ESTIMATED GASOLINE REMOVAL
ARCO Station 2035
Albany, California
(Page 1 of 1)

OPERATING PERIOD		OPERATING HRS THIS PERIOD	INSTANTANEOUS EXTRACTION RATE (ppd)	ESTIMATED TOTAL POUNDS REMOVED	ESTIMATED TOTAL GALLONS REMOVED
FROM	TO				
12/07/93	12/08/93	21	12.5	11	1.8
12/08/93	12/09/93	SYSTEM SHUTDOWN ON 12/08/93			
12/09/93	12/10/93	23	12.5	12	1.9
12/10/93	12/15/93	121	11.7	59	9.5
12/15/93	12/16/93	18	16.2	12	1.9
12/16/93	12/21/93	SYSTEM SHUTDOWN			
12/21/93	12/25/93	104	NA	--	--
12/25/93	12/29/93	SYSTEM SHUTDOWN			
12/29/93	12/31/93	43	NA	--	--
TOTAL THIS QUARTER		330	--	94	15
TOTAL SINCE STARTUP		330	--	94	15

NOTES:
ppd = Pounds per day
Estimated gallons removed based upon a density of 6.2 Pounds per gallon gasoline.

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TABLE 8
VES DESTRUCTION EFFICIENCIES AND EMISSION RATES
ARCO Station 2035
Albany, California
(Page 1 of 1)

SAMPLING DATE	TPHg DESTRUCTION EFFICIENCY	TPHg EMISSION RATE (ppd)	BENZENE EMISSION RATE (ppd)
12/07/93	94.6 %	0.682	0.0206
12/09/93	90.7 %	1.17	0.0278
12/10/93	98.6 %	0.164	<0.00039

NOTES:
TPHg = Total purgeable hydrocarbons as gasoline
ppd = Pounds per day

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APPENDIX A

EMCON'S FIELD REPORTS; SUMMARY OF GROUNDWATER MONITORING DATA, CERTIFIED ANALYTICAL REPORTS WITH CHAIN-OF-CUSTODY, AND WATER SAMPLE FIELD DATA SHEETS

EMCON Associates
1921 Ringwood Avenue • San Jose, California 95131-1721 • **(408) 453-7300** • Fax (408) 437-9526

Date December 30, 1993
Project 0G70-017.01

To:
Mr. John Young
RESNA
3315 Almaden Expressway, Suite 34
San Jose, California 95118

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
7	Water Sample Field Data Sheets

For your: X Information Sent by: X Mail

Comments:

Enclosed are the data from the fourth quarter 1993 monitoring event at ARCO service station 2035, 1001 San Pablo Avenue, Albany, California. Groundwater monitoring is conducted consistent with applicable regulatory guidelines. Please call if you have any questions: (408) 453-7300.

Reviewed by:

Jim Butera

Robert Porter, Senior Project Engineer.

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-017.01 STATION ADDRESS : 1001 San Pablo Ave. Albany, CA DATE : December 5, 1993

ARCO STATION # : 2035 FIELD TECHNICIAN : Sean Connors/Steve Horton DAY : Wednesday

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	MW-2	Bad	15/16	Good	3259	Yes	10.68	10.68	ND	ND	28.7	water in box. needs grout around casing
2	MW-4	Good	15/16	Good	3259	Yes	10.31	10.31	ND	ND	25.1	water in box
3	MW-5	Good	15/16	Good	3259	Yes	10.92	10.92	ND	ND	24.3	—
4	MW-6	Good	15/16	Good	3259	Yes	10.11	10.11	ND	ND	24.3	—
5	MW-3	Good	15/16	Good	3259	Yes	10.91	10.91	ND	ND	33.0	replaced 4" well cap that was damaged
6	MW-1	Good	15/16	Good	3259	Yes	10.39	10.91	ND	ND	29.6	water in box
7	RW-1	Good	15/16	Good	none	Slip	10.70	10.70	10.40	10.40	25.4	

SURVEY POINTS ARE TOP OF WELL CASINGS

Summary of Groundwater Monitoring Data
Fourth Quarter 1993
ARCO Service Station 2035
1001 San Pablo Avenue, Albany, 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)	Hydro-carbons IR (ppm)*	Total Oil and Grease (ppm)*
MW-1(29)	12/08/93	10.39	ND.[2]	81.	20.	<0.5	0.9	<0.5	NR.[3]	NR.
MW-2(28)	12/08/93	10.68	ND.	<50.	<0.5	<0.5	<0.5	<0.5	NR.	NR.
MW-3(33)	12/08/93	10.91	ND.	<50.	<0.5	<0.5	<0.5	<0.5	0.5	0.9
MW-4(25)	12/08/93	10.31	ND.	<50.	<0.5	<0.5	<0.5	<0.5	NR.	NR.
MW-5(24)	12/08/93	10.92	ND.	<50.	<0.5	<0.5	<0.5	<0.5	NR.	NR.
MW-6(24)	12/08/93	10.11	ND.	<50.	<0.5	<0.5	<0.5	<0.5	NR.	NR.
RW-1	12/08/93	10.70	0.05	FP.[4]	FP.	FP.	FP.	FP.	NR.	NR.
FB-1[5]	12/08/93	NA.[6]	NA.	<50.	<0.5	<0.5	<0.5	<0.5	NR.	NR.

1. TPH. = Total petroleum hydrocarbons
2. ND. = Not detected
3. NR. = Not required, well was not analized for the above listed parameter
4. FP. = Floating product was detected in well, not sampled
5. FB. = Field blank
6. NA. = Not applicable
   * = Reported as parts-per-million

Columbia Analytical Services, Inc.

December 27, 1993

Service Request No. SJ93-1507

Jim Butera
EMCON Associates
1921 Ringwood Avenue
San Jose, CA 95131

Re: **EMCON Project No. 0G70-017.01**
ARCO Facility No. 2035

Dear Mr. Butera:

Attached are the results of the water samples submitted to our lab on December 9, 1993. For your reference, these analyses have been assigned our service request number SJ93-1507.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and CAS is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted:

COLUMBIA ANALYTICAL SERVICES, INC.

Keoni A. Murphy
Laboratory Manager

Annelise J. Bazar
Regional QA Coordinator

KAM/kmh

1921 Ringwood Avenue • San Jose California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

Acronyms

ASTM	American Society for Testing and Materials
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MRL	Method Reporting Limit
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected at or above the MRL
NR	Not Requested
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
VPH	Volatile Petroleum Hydrocarbons

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	12/09/93
Project:	EMCON Project No. 0G70-017.01	**Service Request No.:**	SJ93-1507
	ARCO Facility No. 2035	**Sample Matrix:**	Water

Inorganic Parameters[1]
mg/L (ppm)

Sample Name:	MW-3 (33)	Method Blank
Date Sampled:	12/08/93	

Analyte	EPA Method	MRL		
Total Oil and Grease, IR	SM 5520C	0.5	0.9	ND
Hydrocarbons, IR	SM 5520F	0.5	0.5	ND

SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989

[1] Unless otherwise noted, all analyses were performed within EPA recommended maximum holding times specified in *Test Methods for Evaluating Solid Waste*, (SW-846, 3rd Edition) and *Methods for Chemical Analysis of Water and Waste* (EPA-600/4-79-020, Revised March 1983).

Approved by: Kenneth Murphy Date: December 27, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	Date Received:	12/09/93
Project:	EMCON Project No. 0G70-017.01	Service Request No.:	SJ93-1507
	ARCO Facility No. 2035	Sample Matrix:	Water

BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
µg/L (ppb)

Sample Name:		MW-1 (29)	MW-2 (28)	MW-3 (33)
Date Analyzed:		12/16/93	12/14/93	12/14/93
Analyte	**MRL**			
Benzene	0.5	20.	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	0.9	ND	ND
Total Xylenes	0.5	ND	ND	ND
TPH as Gasoline	50	81.	ND	ND

Sample Name:		MW-4 (25)	MW-5 (24)	MW-6 (24)
Date Analyzed:		12/14/93	12/14/93	12/14/93 *
Analyte	**MRL**			
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	0.5	ND	ND	ND
TPH as Gasoline	50	ND	ND	ND

* This sample was part of the analytical batch started on December 14, 1993. However, it was analyzed after midnight so the actual date analyzed is December 15, 1993.

Approved by: Leon A. Murphy Date: December 27, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	12/09/93
Project:	EMCON Project No. 0G70-017.01	**Service Request No.:**	SJ93-1507
	ARCO Facility No. 2035	**Sample Matrix:**	Water

BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
µg/L (ppb)

Sample Name:		FB-1	Method Blank	Method Blank
Date Analyzed:		12/14/93 *	12/14/93	12/16/93
Analyte	**MRL**			
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	0.5	ND	ND	ND
TPH as Gasoline	50	ND	ND	ND

* This sample was part of the analytical batch started on December 14, 1993. However, it was analyzed after midnight so the actual date analyzed is December 15, 1993.

Approved by: Reviewed Murphy Date: December 27, 1993

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APPENDIX A

LABORATORY QC RESULTS

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	12/09/93
Project:	EMCON Project No. 0G70-017.01	**Service Request No.:**	SJ93-1507
	ARCO Facility No. 2035	**Sample Matrix:**	Water

Continuing Calibration Summary
Inorganics
EPA Method SM 5520 F
mg/L

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Hydrocarbon Mix	40.	38.2	95.	90-110

Approved by: Kevin A Murphy Date: December 27, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	Date Received:	12/09/93
Project:	EMCON Project No. 0G70-017.01	Service Request No.:	SJ93-1507
	ARCO Facility No. 2035	Sample Matrix:	Water

Matrix Spike/Duplicate Matrix Spike Summary
Petroleum Hydrocarbons, IR
EPA Method SM 5520 F
mg/L (ppm)

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria
Hydrocarbon Mix	8.0	ND	6.6	6.2	82.	78.	56-151

Approved by: Kevin A. Murphy Date: December 27, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-017.01
ARCO Facility No. 2035

Date Received: 12/09/93
Service Request No.: SJ93-1507
Sample Matrix: Water

Surrogate Recovery Summary
BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method

Sample Name	Date Analyzed	Percent Recovery *a,a,a*-Trifluorotoluene
MW-1 (29)	12/16/93	88.
MW-2 (28)	12/14/93	92.
MW-3 (33)	12/14/93	82.
MW-4 (25)	12/14/93	89.
MW-5 (24)	12/14/93	85.
MW-6 (24)	12/14/93	88.
FB-1	12/14/93	91.
MS	12/14/93	93.
DMS	12/14/93	96.
Method Blank	12/14/93	90.
Method Blank	12/16/93	93.
CAS Acceptance Criteria		70-130

Approved by: Kenn A Murphy Date: December 27, 1993

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-017.01
ARCO Facility No. 2035

Date Received: 12/09/93
Service Request No.: SJ93-1507

Initial Calibration Verification
BTEX and TPH as Gasoline
EPA Methods 5030/8020/DHS LUFT Method
µg/L (ppb)

Date Analyzed: 12/14/93

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Benzene	25.	24.9	100.	85-115
Toluene	25.	25.1	100.	85-115
Ethylbenzene	25.	25.6	102.	85-115
Total Xylenes	75.	80.1	107.	85-115
TPH as Gasoline	250.	258.	103.	90-110

Approved by: _____ Date: December 27, 1993

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	12/09/93
Project:	EMCON Project No. 0G70-017.01	**Service Request No.:**	SJ93-1507
	ARCO Facility No. 2035	**Sample Matrix:**	Water

Matrix Spike/Duplicate Matrix Spike Summary
BTE
EPA Methods 5030/8020
µg/L (ppb)

Date Analyzed: 12/14/93

			Spike Result		Percent Recovery		CAS Acceptance
Analyte	Spike Level	Sample Result	MS	DMS	MS	DMS	Criteria
Benzene	25.	ND	27.7	27.6	111.	110.	76-122
Toluene	25.	ND	27.7	27.6	111.	110.	75-127
Ethylbenzene	25.	ND	28.2	27.9	113.	112.	70-135

Approved by: K. Connolly Date: December 27, 1993

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

APPENDIX B

CHAIN OF CUSTODY

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

ARCO Products Company
Division of AtlanticRichfieldCompany

Chain of Custody

Task Order No. EMC-93-5

ARCO Facility no. 2035	City (Facility) Albany	Project manager (Consultant) Jim Butera	Laboratory name CAS
ARCO engineer Kyle Christie	Telephone no. (ARCO) 571-2434	Telephone no. (Consultant) 453-7300	Fax no. (Consultant) 453-0452
Consultant name EMCON Associates	Address (Consultant) 1921 Ringwood Avenue San Jose		Contract number 07077

Method of shipment: Sampler will deliver

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH 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(29)	1-2	2						12/8/93	15:25		X									
MW-2(28)	3-4	2							12:54		X									
MW-3(33)	5-10	6							14:42		X									
MW-4(28)	11-12	2							12:41		X									
MW-5(24)	13-14	2							13:21		X									
MW-6(24)	15-16	2							13:42		X									
RW-1( )		2									X									
FB-1	17-18	2									X									

Special detection Limit/reporting: Lowest Possible

Special QA/QC: AS Normal

Remarks: 2-40 ml HCl VOA's; 4-Liter HCl 5520 C&F (IR)

No Sample, Well Contained Product

Lab number: 5J93-1507

Turnaround time

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

Condition of sample: Ok		Temperature received: cool	
Relinquished by sampler	Date 12/9/93 Time 8:15	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory	Date 12-9-93 Time 8:15

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

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0870-017.01 SAMPLE ID: mw-1 (29.6)

PURGED BY: S. Connors / S. Horton CLIENT NAME: Arco #275

SAMPLED BY: S. Horton LOCATION: San Pablo, Albany

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

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 12.55

DEPTH TO WATER (feet): 10.39 CALCULATED PURGE (gal.): 37.65

DEPTH OF WELL (feet): 29.6 / 19.21 ACTUAL PURGE VOL. (gal.): 38.0

DATE PURGED: 12/8/93 Start (2400 Hr) 1517 End (2400 Hr) 1523

DATE SAMPLED: 12/8/93 Start (2400 Hr) 1525 End (2400 Hr) 1528

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1519	13.0	6.95	754	54.9	Grey	light
1521	26.0	6.26	804	55.8	Grey	light
1523	38.0	6.25	830	56.2	[illegible]	Heavy

D. O. (ppm): NR ODOR: none

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

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

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: Good LOCK #: 3259

REMARKS: ___

Meter Calibration: Date: 12/8/93 Time: 11:45 Meter Serial #: 8912 Temperature °F: ___

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

Location of previous calibration: mw-2

Signature: [signature] Reviewed By: JB Page 1 of 7

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0870-017.01 SAMPLE ID: mw-2 (28.7)

PURGED BY: S. Connors / S Horton CLIENT NAME: Arco 2035

SAMPLED BY: S Horton LOCATION: San Pablo, Albany

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	11.77
DEPTH TO WATER (feet):	10.68	CALCULATED PURGE (gal.):	35.31
DEPTH OF WELL (feet):	28.70 ft. o.a.	ACTUAL PURGE VOL. (gal.):	36.0

DATE PURGED: 12/8/93 Start (2400 Hr) 1245 End (2400 Hr) 1253

DATE SAMPLED: 12/8/93 Start (2400 Hr) 1254 End (2400 Hr) 1257

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1248	12.0	6.52	832	59.7	Brown	moderate
1251	24.0	6.59	860	56.6	Brown	moderate
1253	36.0	6.60	813	57.3	clear	light

D. O. (ppm): NR ODOR: none

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

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

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: Good LOCK #: 3259

REMARKS: water in box, needs grout around casing. well seal not good

Meter Calibration: Date: 12/8/93 Time: 11:45 Meter Serial #: 8912 Temperature °F: 59.0

(EC 1000 995 / 1000) (DI —) (pH 7 688 / 700) (pH 10 972 / 1000) (pH 4 4.44 / 4.00)

Location of previous calibration: m

Signature: [signature] Reviewed By: [signature] Page 2 of 7

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 06-70-0170.01 SAMPLE ID: MW-33C

PURGED BY: S. Gamos / S. Horton CLIENT NAME: Arco 2035

SAMPLED BY: S. Horton LOCATION: San Pablo, Albany

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	14.43
DEPTH TO WATER (feet):	10.41	CALCULATED PURGE (gal.):	43.29
DEPTH OF WELL (feet):	33.0	ACTUAL PURGE VOL (gal.):	43.5

DATE PURGED: 12/8/93 Start (2400 Hr) 1430 End (2400 Hr) 1436

DATE SAMPLED: 12/8/93 Start (2400 Hr) 1442 End (2400 Hr) 1447

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1431	14.5	6.41	737	54.4	Brown	Heavy
1434	29.0	6.56	778	56.2	Brown	Heavy
1436	43.5	6.55	725	57.2	Brown	Heavy

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

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
C 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: replaced 4" lwc LOCK #: 3259

REMARKS: lid was partially cemented over well is now located inside treatment system lock # 2357

Meter Calibration: Date: 12/8/93 Time: 1145 Meter Serial #: 8912 Temperature °F: ___

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

Location of previous calibration: ___

Signature: Sean Melburn Reviewed By: ___ Page 3 of 7

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0820-017.01 SAMPLE ID: MW-4 (25.1)

PURGED BY: S. Connors / S. Horton CLIENT NAME: Arco 2035

SAMPLED BY: S. Horton LOCATION: San Pablo, Albany

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	1.62
DEPTH TO WATER (feet):	10.31	CALCULATED PURGE (gal.):	28.87
DEPTH OF WELL (feet):	25.10	ACTUAL PURGE VOL. (gal.):	~~22.5~~ 22.5

DATE PURGED: 12/8/93 Start (2400 Hr) 1227 End (2400 Hr) 1239

DATE SAMPLED: 12/8/93 Start (2400 Hr) 1241 End (2400 Hr) 1243

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
12.30	10.0	6.95	528	59.2	Brown	Heavy
12.32	19.5	6.51	626	59.3	"	"
~~12.34~~ 12.39	Recharge	6.79	637	57.5	"	"

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

COLOR (COBALT 0 - 100): NR

TURBIDITY (NTU 0 - 200): NR

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

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	✓ Bailer (Teflon®)
___ 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: Good LOCK #: 3259

REMARKS: well dried at 22.5

Meter Calibration: Date: 12/8/93 Time: ~~1145~~ 1145 Meter Serial #: 8912 Temperature °F: ___

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

Location of previous calibration: MW-2

Signature: [signature] Reviewed By: JB Page 4 of 7

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0870-017.01 SAMPLE ID: MW-5 (248)

PURGED BY: S. Connors/S. Horton CLIENT NAME: Arco 2035

SAMPLED BY: S. Horton LOCATION: San Pablo, Albany

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

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 8.74

DEPTH TO WATER (feet): 10.92 CALCULATED PURGE (gal.): 26.22

DEPTH OF WELL (feet): 24.3 1338 ACTUAL PURGE VOL. (gal.): 27.0

DATE PURGED: 12/8/93 Start (2400 Hr) 1309 End (2400 Hr) 1320

DATE SAMPLED: 12/8/93 Start (2400 Hr) 1721 End (2400 Hr) 1322

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1312	9.0	6.55	612	53.3	Grey	moderate
1314	18.0	6.28	630	55.2	Brown	Heavy
1320	recharge	6.39	641	55.0	Brown	Heavy

D. O. (ppm): NR ODOR: none NR (COBALT 0 - 100) NR (NTU 0 - 200)

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

PURGING EQUIPMENT

___ 2" Bladder Pump ___ Bailer (Teflon®)

X Centrifugal Pump ___ Bailer (PVC)

___ Submersible Pump ___ Bailer (Stainless Steel)

___ Well Wizard™ ___ Dedicated

Other: ___

SAMPLING EQUIPMENT

___ 2" Bladder Pump X Bailer (Teflon®)

___ DDL Sampler ___ Bailer (Stainless Steel)

___ Dipper ___ Submersible Pump

___ Well Wizard™ ___ Dedicated

Other: ___

WELL INTEGRITY: Good LOCK #: 3259

REMARKS: well dried at 21 gallons

Meter Calibration: Date: 12/8/93 Time: 11:45 Meter Serial #: 8912 Temperature °F: ___

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

Location of previous calibration: MW-2

Signature: Sean McLaurin Reviewed By: JB Page 5 of 7

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: OG70-017.01 SAMPLE ID: MW-6 (24-3)

PURGED BY: S. Connors / S. Horton CLIENT NAME: Arco 2035

SAMPLED BY: S. Horton LOCATION: San Pablo, Albany

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.): 3.08

DEPTH TO WATER (feet): 10.11 CALCULATED PURGE (gal.): 9.26

DEPTH OF WELL (feet): 24.3 / 14.79 ACTUAL PURGE VOL (gal.): 9.5

DATE PURGED: 12/8/93 Start (2400 Hr) 1335 End (2400 Hr) 1341

DATE SAMPLED: 12/8/93 Start (2400 Hr) 1342 End (2400 Hr) 1344

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1337	3.5	6.73	830	54.3	Brown	Heavy
1339	6.0	6.72	840	56.5	"	"
1341	9.0	6.73	852	57.0	"	"

D. O. (ppm): NR ODOR: none

COLOR (COBALT 0 - 100): NR

TURBIDITY (NTU 0 - 200): NR

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

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: Good LOCK #: 3259

REMARKS: ___

Meter Calibration: Date: 12/8/93 Time: 11:95 Meter Serial #: 8912 Temperature °F: ___

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

Location of previous calibration: MW-2

Signature: Sean M Lawn Reviewed By: JB Page 6 of 7

Rev. 2, 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0610-017.01 SAMPLE ID: RW-1

PURGED BY: S. Horton CLIENT NAME: ARCO #2035

SAMPLED BY: S. Horton LOCATION: Albany, 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.): ___

DEPTH TO WATER (feet): ___ CALCULATED PURGE (gal.): ___

DEPTH OF WELL (feet): ___ ACTUAL PURGE VOL. (gal.): ___

DATE PURGED: ___ Start (2400 Hr) ___ End (2400 Hr) ___

DATE SAMPLED: ___ Start (2400 Hr) ___ End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
			No Sample Well Contained Product			

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

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

PURGING EQUIPMENT

___ 2" Bladder Pump ___ Bailer (Teflon®)

___ Centrifugal Pump ___ Bailer (PVC)

___ Submersible Pump ___ Bailer (Stainless Steel)

___ Well Wizard™ ___ Dedicated

Other: ___

SAMPLING EQUIPMENT

___ 2" Bladder Pump ___ Bailer (Teflon®)

___ DDL Sampler ___ Bailer (Stainless Steel)

___ Dipper ___ Submersible Pump

___ Well Wizard™ ___ Dedicated

Other: ___

WELL INTEGRITY: Good LOCK #: none

REMARKS: ___

Meter Calibration: Date: 12/8/93 Time: 11:45 Meter Serial #: 8912 Temperature °F: ___

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

Location of previous calibration: MW-2

Signature: S. Horton Reviewed By: JB Page 7 of 7

RESNA
Working to Restore Nature

APPENDIX B

CHAIN OF CUSTODY
AND
ANALYTICAL RESULTS OF AIR SAMPLES

SEQUOIA ANALYTICAL

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

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Bruce Maeda

Project: Arco 2035 Albany

Enclosed are the results from 3 air samples received at Sequoia Analytical on December 8,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3L35801	Air, AS-Combine Wells	12/7/93	EPA 5030/8015/8020
3L35802	Air, AS-Influent	12/7/93	EPA 5030/8015/8020
3L35803	Air, AS-Effluent	12/7/93	EPA 5030/8015/8020

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

Very truly yours,

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

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

RESNA	Client Project ID:	Arco 2035 Albany	Sampled:	Dec 7, 1993
3315 Almaden Expwy., Suite 34	Sample Matrix:	Air	Received:	Dec 8, 1993
San Jose, CA 95118	Analysis Method:	EPA 5030/8015/8020	Reported:	Dec 9, 1993
Attention: Bruce Maeda	First Sample #:	3L35801		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3L35801 AS-Combine Wells	Sample I.D. 3L35802 AS-Influent	Sample I.D. 3L35803 AS-Effluent
Purgeable Hydrocarbons	5.0	10,000	1,400	76
Benzene	0.050	540	38	2.3
Toluene	0.050	300	22	4.8
Ethyl Benzene	0.050	31	3.5	2.1
Total Xylenes	0.050	100	11	7.2
Chromatogram Pattern:		Gas + Non-Gas Mix <C8	Gas + Non-Gas Mix <C8	Gas + Non-Gas Mix <C8

Quality Control Data

Report Limit Multiplication Factor:	100	50	5.0
Date Analyzed:	12/8/93	12/8/93	12/8/93
Instrument Identification:	GCHP-17	GCHP-3	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	213*	114	120

*Coelution confirmed.

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

RECEIVED
DEC 15 1993
RESNA
SAN JOSE

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Bruce Maeda

Client Project ID: Arco 2035 Albany

QC Sample Group: 3L35801-02

Reported: Dec 9, 1993

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
MS/MSD Batch#:	3L10804	3L10804	3L10804	3L10804
Date Prepared:	-	-	-	-
Date Analyzed:	12/8/93	12/8/93	12/8/93	12/8/93
Instrument I.D.#:	GCHP-17	GCHP-17	GCHP-17	GCHP-17
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Matrix Spike % Recovery:	100	100	100	100
Matrix Spike Duplicate % Recovery:	100	100	100	103
Relative % Difference:	0.0	0.0	0.0	3.0
LCS Batch#:	-	-	-	-
Date Prepared:	-	-	-	-
Date Analyzed:	-	-	-	-
Instrument I.D.#:	-	-	-	-
LCS % Recovery:	-	-	-	-
% Recovery Control Limits:	71-133	72-128	72-130	71-120

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

RECEIVED
DEC 15 1993
RESNA
SAN JOSE

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Bruce Maeda

Client Project ID: Arco 2035 Albany
QC Sample Group: 3L35803

Reported: Dec 9, 1993

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
MS/MSD Batch#:	3L10804	3L10804	3L10804	3L10804
Date Prepared:	-	-	-	-
Date Analyzed:	12/8/93	12/8/93	12/8/93	12/8/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Matrix Spike % Recovery:	100	100	100	100
Matrix Spike Duplicate % Recovery:	95	95	96	97
Relative % Difference:	5.1	5.1	4.1	3.0
LCS Batch#:	-	-	-	-
Date Prepared:	-	-	-	-
Date Analyzed:	-	-	-	-
Instrument I.D.#:	-	-	-	-
LCS % Recovery:	-	-	-	-
% Recovery Control Limits:	71-133	72-128	72-130	71-120

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

ARCO Products Company
Division of AtlanticRichfieldCompany

Chain of Custody

RECEIVED DEC 10 1993 FRESNO

Task Order No. 2035-93-4D

ARCO Facility no. 2035	City (Facility) ALBANY	Project manager (Consultant) BRUCE MAEDA, RESNA	Laboratory name
ARCO engineer MIKE WHELAN	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 264-7723	Fax no. (Consultant) (408) 264-2435	Contract number
Consultant name RESNA INDUSTRIES	Address (Consultant) 3315 ALMADEN EXPY, SUITE 34, SAN JOSE, CA 95118		Method of shipment

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 ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	
AS-1		Sine Wave						12-7-93	15:00	—	—							93/2358			-01
								→	15:10	—	—										-02
								→	15:12	—	—										-03
AS-Influent																					
AS-Effluent																					

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number

Turnaround time

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

Condition of sample:

Temperature received:

	Date	Time	
Relinquished by sampler	12/8/93	4:10 P.M.	Received by Johnson Eugene
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory: Date 12/8/93, Time 17:22

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

SEQUOIA ANALYTICAL

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

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Bruce Maeda

Project: Arco 2035-93-4D

Enclosed are the results from 10 air samples received at Sequoia Analytical on December 9,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3L40801	Air, AS-HV-1	12/9/93	EPA 5030/8015/8020
3L40802	Air, AS-HV-2	12/9/93	EPA 5030/8015/8020
3L40803	Air, AS-HV-3	12/9/93	EPA 5030/8015/8020
3L40804	Air, AS-HV-4	12/9/93	EPA 5030/8015/8020
3L40805	Air, AS-HV-5	12/9/93	EPA 5030/8015/8020
3L40806	Air, AS-HV-6	12/9/93	EPA 5030/8015/8020
3L40807	Air, AS-HV-7	12/9/93	EPA 5030/8015/8020
3L40808	Air, AS-HV-8	12/9/93	EPA 5030/8015/8020
3L40809	Air, AS-HV-9	12/9/93	EPA 5030/8015/8020
3L40810	Air, AS-HV-10	12/9/93	EPA 5030/8015/8020

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

Very truly yours,

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

RESNA	Client Project ID:	Arco 2035-93-4D	Sampled:	Dec 9, 1993
3315 Almaden Expwy., Suite 34	Sample Matrix:	Air	Received:	Dec 9, 1993
San Jose, CA 95118	Analysis Method:	EPA 5030/8015/8020	Reported:	Dec 20, 1993
Attention: Bruce Maeda	First Sample #:	3L40801		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3L40801 AS-HV-1	Sample I.D. 3L40802 AS-HV-2	Sample I.D. 3L40803 AS-HV-3	Sample I.D. 3L40804 AS-HV-4	Sample I.D. 3L40805 AS-HV-5	Sample I.D. 3L40806 AS-HV-6
Purgeable Hydrocarbons	5.0	9,700	21,000	8,000	9,000	2,100	9,600
Benzene	0.050	990	1,200	270	250	11	450
Toluene	0.050	430	630	400	320	280	330
Ethyl Benzene	0.050	N.D.	79	57	44	32	46
Total Xylenes	0.050	38	240	200	140	110	140
Chromatogram Pattern:		Gas + Non-Gas Mix <C8	Gas + Non-Gas Mix <C8	Gas + Non-Gas Mix <C8	Gas + Non-Gas Mix <C8	Gas + Non-Gas Mix <C8	Gas + Non-Gas Mix <C8

Quality Control Data

Report Limit Multiplication Factor:	250	200	250	200	100	250
Date Analyzed:	12/9/93	12/9/93	12/9/93	12/9/93	12/10/93	12/9/93
Instrument Identification:	GCHP-17	GCHP-17	GCHP-17	GCHP-17	GCHP-3	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	121	165	119	127	100	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

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

RESNA	Client Project ID:	Arco 2035-93-4D	Sampled:	Dec 9, 1993
3315 Almaden Expwy., Suite 34	Sample Matrix:	Air	Received:	Dec 9, 1993
San Jose, CA 95118	Analysis Method:	EPA 5030/8015/8020	Reported:	Dec 20, 1993
Attention: Bruce Maeda	First Sample #:	3L40807		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3L40807 AS-HV-7	Sample I.D. 3L40808 AS-HV-8	Sample I.D. 3L40809 AS-HV-9	Sample I.D. 3L40810 AS-HV-10
Purgeable Hydrocarbons	5.0	12,000	4,900	6,600	6,800
Benzene	0.050	1,300	89	130	130
Toluene	0.050	480	38	74	82
Ethyl Benzene	0.050	32	N.D.	58	36
Total Xylenes	0.050	91	18	120	77
Chromatogram Pattern:		Gas + Non-Gas Mix < C8	Gas + Non-Gas Mix < C8	Gas + Non-Gas Mix < C8	Gas + Non-Gas Mix < C8

Quality Control Data

Report Limit Multiplication Factor:	100	200	200	50
Date Analyzed:	12/9/93	12/9/93	12/9/93	12/9/93
Instrument Identification:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	136	105	100	71

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

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

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Bruce Maeda

Client Project ID: Arco 2035-93-4D
Matrix: Liquid

QC Sample Group: 3L40805-10

Reported: Dec 20, 1993

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
MS/MSD Batch#:	3L30002	3L30002	3L30002	3L30002
Date Prepared:	-	-	-	-
Date Analyzed:	12/9/93	12/9/93	12/9/93	12/9/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Matrix Spike % Recovery:	93	93	93	90
Matrix Spike Duplicate % Recovery:	91	91	91	90
Relative % Difference:	2.2	2.2	2.2	0.0
LCS Batch#:	-	-	-	-
Date Prepared:	-	-	-	-
Date Analyzed:	-	-	-	-
Instrument I.D.#:	-	-	-	-
LCS % Recovery:	-	-	-	-
% Recovery Control Limits:	71-133	72-128	72-130	71-120

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

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

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Bruce Maeda

Client Project ID: Arco 2035-93-4D
Matrix: Liquid

QC Sample Group: 3L40801-4

Reported: Dec 20, 1993

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
MS/MSD Batch#:	3L30001	3L30001	3L30001	3L30001
Date Prepared:	-	-	-	-
Date Analyzed:	12/9/93	12/9/93	12/9/93	12/9/93
Instrument I.D.#:	GCHP-17	GCHP-17	GCHP-17	GCHP-17
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Matrix Spike % Recovery:	100	110	110	103
Matrix Spike Duplicate % Recovery:	100	100	100	103
Relative % Difference:	0.0	9.5	9.5	0.0
LCS Batch#:	-	-	-	-
Date Prepared:	-	-	-	-
Date Analyzed:	-	-	-	-
Instrument I.D.#:	-	-	-	-
LCS % Recovery:	-	-	-	-
% Recovery Control Limits:	71-133	72-128	72-130	71-120

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
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SEQUOIA ANALYTICAL

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

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Bruce Maeda

Client Project ID: Arco 2035-93-4D
Matrix: Liquid

QC Sample Group: 3L40805-10

Reported: Dec 20, 1993

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
MS/MSD Batch#:	3L41102	3L41102	3L41102	3L41102
Date Prepared:	-	-	-	-
Date Analyzed:	12/10/93	12/10/93	12/10/93	12/10/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Matrix Spike % Recovery:	93	93	94	93
Matrix Spike Duplicate % Recovery:	95	95	95	93
Relative % Difference:	2.1	2.1	1.0	0.0
LCS Batch#:	-	-	-	-
Date Prepared:	-	-	-	-
Date Analyzed:	-	-	-	-
Instrument I.D.#:	-	-	-	-
LCS % Recovery:	-	-	-	-
% Recovery Control Limits:	71-133	72-128	72-130	71-120

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. RWS-93-40

Chain Custody

ARCO Facility no. 2035	City (Facility) Albany	Project manager (Consultant) Bruce Maeda	Laboratory name Sequoia
ARCO engineer Michael Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 264-7723	Fax no. (Consultant) 264-2435
Consultant name Resna Ind	Address (Consultant) 335 Almaden Exp. Suit 34 S.J.		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 Semi ☐ Metals ☐ VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	
AS-HV-1								12-9-93	11:20		—							93	12408	-01
AS-HV-2									11:22		/										-02
AS-HV-3									11:24		/										-03
AS-HV-4									11:26		/										-04
AS-HV-5									11:28		/										-05
AS-HV-6									11:49		/										-06
AS-HV-7									11:40		/										-07
AS-HV-8									11:40		/										-08
AS-HV-9									11:43		/										-09
AS-HV-10								↓	11:45		/										-10

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number 9312408

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

Condition of sample:		Temperature received:	
Relinquished by sampler	Date 12-9-93 Time 15:30	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory	Date 12-9-93 Time 15:30

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

SEQUOIA ANALYTICAL

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

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Bruce Maeda

Project: Arco 2035, Albany

Enclosed are the results from 2 air samples received at Sequoia Analytical on December 9,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3L40701	Air, AS-Influent	12/9/93	EPA 5030/8015/8020
3L40702	Air, AS-Effluent	12/9/93	EPA 5030/8015/8020

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

Very truly yours,

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

RESNA	Client Project ID:	Arco 2035, Albany	Sampled:	Dec 9, 1993
3315 Almaden Expwy., Suite 34	Sample Matrix:	Air	Received:	Dec 9, 1993
San Jose, CA 95118	Analysis Method:	EPA 5030/8015/8020	Reported:	Dec 10, 1993
Attention: Bruce Maeda	First Sample #:	3L40701		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3L40701 AS-Influent	Sample I.D. 3L40702 AS-Effluent
Purgeable Hydrocarbons	5.0	1,400	130
Benzene	0.050	60	3.1
Toluene	0.050	67	21
Ethyl Benzene	0.050	17	4.6
Total Xylenes	0.050	55	15
Chromatogram Pattern:		Gas + Non-Gas Mix < C8	Gas

Quality Control Data

Report Limit Multiplication Factor:	10	5.0
Date Analyzed:	12/9/93	12/9/93
Instrument Identification:	GCHP-17	GCHP-17
Surrogate Recovery, %: (QC Limits = 70-130%)	178*	105

*Coelution confirmed.

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

3L40701.RES

SEQUOIA ANALYTICAL

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

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Bruce Maeda

Client Project ID: Arco 2035, Albany

QC Sample Group: 3L40701-02

Reported: Dec 10, 1993

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
MS/MSD Batch#:	3L30001	3L30001	3L30001	3L30001
Date Prepared:	-	-	-	-
Date Analyzed:	12/9/93	12/9/93	12/9/93	12/9/93
Instrument I.D.#:	GCHP-17	GCHP-17	GCHP-17	GCHP-17
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Matrix Spike % Recovery:	100	110	110	103
Matrix Spike Duplicate % Recovery:	100	100	100	103
Relative % Difference:	0.0	9.5	9.5	0.0
LCS Batch#:	-	-	-	-
Date Prepared:	-	-	-	-
Date Analyzed:	-	-	-	-
Instrument I.D.#:	-	-	-	-
LCS % Recovery:	-	-	-	-
% Recovery Control Limits:	71-133	72-128	72-130	71-120

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

ARCO Products Company — Division of AtlanticRichfieldCompany

Chain Custody

Task Order No. 2035-93-4D

ARCO Facility no. 2035	City (Facility) Albany	Project manager (Consultant) Bruce Maeda	Laboratory name Sequoia
ARCO engineer Michael Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 264-7723	Fax no. (Consultant) 264-2435
Consultant name Resin Ind	Address (Consultant) 33N Almaden Exp Suit 34 S.J.		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 EPA M602/8020/8015 GAS	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 ☐		
AS-Influent								12-9-93	12:00		✓											
AS-Effluent								12-9-93	12:01		✓											

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number 9312407

Turnaround time

Priority Rush 1 Business Day — 24

Rush 2 Business Days [ ]

Expedited 5 Business Days [ ]

Standard 10 Business Days [ ]

Condition of sample:

Temperature received:

	Date	Time
Relinquished by sampler	12-9-93	15:26
Relinquished by		
Relinquished by		

	Date	Time
Received by		
Received by		
Received by laboratory	12-9-93	15:26

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

SEQUOIA ANALYTICAL

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

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Bruce Maeda

Project: Arco 2035

Enclosed are the results from 2 air samples received at Sequoia Analytical on December 10,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3L46101	Air, AS-Influent	12/10/93	EPA 5030/8015/8020
3L46102	Air, AS-Effluent	12/10/93	EPA 5030/8015/8020

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

Very truly yours,

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

RESNA	Client Project ID:	Arco 2035	Sampled:	Dec 10, 1993
3315 Almaden Expwy., Suite 34	Sample Matrix:	Air	Received:	Dec 10, 1993
San Jose, CA 95118	Analysis Method:	EPA 5030/8015/8020	Reported:	Dec 13, 1993
Attention: Bruce Maeda	First Sample #:	3L46101		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3L46101 AS-Influent	Sample I.D. 3L46102 AS-Effluent
Purgeable Hydrocarbons	5.0	1,500	21
Benzene	0.050	100	N.D.
Toluene	0.050	39	1.7
Ethyl Benzene	0.050	6.1	1.4
Total Xylenes	0.050	19	5.0
Chromatogram Pattern:		Gas & Non-Gas Mix < C8	Gas

Quality Control Data

Report Limit Multiplication Factor:	50	2.5
Date Analyzed:	12/10/93	12/10/93
Instrument Identification:	GCHP-3	GCHP-17
Surrogate Recovery, %: (QC Limits = 70-130%)	87	85

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

3L46101.RES

SEQUOIA ANALYTICAL

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

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Bruce Maeda

Client Project ID: Arco 2035
Matrix: Liquid

QC Sample Group: 3L46101

Reported: Dec 13, 1993

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
MS/MSD Batch#:	G3L41102	G3L41102	G3L41102	G3L41102
Date Prepared:	12/10/93	12/10/93	12/10/93	12/10/93
Date Analyzed:	12/10/93	12/10/93	12/10/93	12/10/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Matrix Spike % Recovery:	93	93	94	93
Matrix Spike Duplicate % Recovery:	95	95	95	93
Relative % Difference:	2.1	2.1	1.1	0.0
LCS Batch#:	-	-	-	-
Date Prepared:	-	-	-	-
Date Analyzed:	-	-	-	-
Instrument I.D.#:	-	-	-	-
LCS % Recovery:	-	-	-	-
% Recovery Control Limits:	71-133	72-128	72-130	71-120

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL

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

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Bruce Maeda

Client Project ID: Arco 2035
Matrix: Liquid

QC Sample Group: 3L46102

Reported: Dec 13, 1993

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
MS/MSD Batch#:	G3L41104	G3L41104	G3L41104	G3L41104
Date Prepared:	12/10/93	12/10/93	12/10/93	12/10/93
Date Analyzed:	12/10/93	12/10/93	12/10/93	12/10/93
Instrument I.D.#:	GCHP-17	GCHP-17	GCHP-17	GCHP-17
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Matrix Spike % Recovery:	95	98	95	93
Matrix Spike Duplicate % Recovery:	97	100	97	97
Relative % Difference:	2.1	2.0	1.1	4.2
LCS Batch#:	-	-	-	-
Date Prepared:	-	-	-	-
Date Analyzed:	-	-	-	-
Instrument I.D.#:	-	-	-	-
LCS % Recovery:	-	-	-	-
% Recovery Control Limits:	71-133	72-128	72-130	71-120

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

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

ARCO Products Company — Division of AtlanticRichfieldCompany

Task Order No. 35-93-4D

Chain of Custody

ARCO Facility no. 2035	City (Facility)	Project manager (Consultant) Bruce Maeda	Laboratory name Sequoia
ARCO engineer Michael Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) 408 264-7723	Fax no. (Consultant) 264-2435
Consultant name Resna Ind.		Address (Consultant) 3315 Almaden Expy Suite 34 S.J.	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 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 ☐		
AS -	INFLUENT			—				12/10/93	11:15		X							93	12461	-01		
AS -	EFFLUENT			—				11	11:17		X									-02		

Lab number: 93-12-461

Special detection Limit/reporting:

Special QA/QC:

Remarks:

Turnaround time

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

Condition of sample:

Temperature received:

	Date	Time	
Relinquished by sampler	12-10-93	12:21	Received by
Relinquished by			Received by
Relinquished by			Received by laboratory: Date 12/10/93 Time 12:21

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

SEQUOIA ANALYTICAL

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

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Bruce Maeda

Project: Arco, 2035 Albany

Enclosed are the results from 1 air sample received at Sequoia Analytical on December 16,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3L83401	Air, AS-Influent	12/15/93	EPA 5030/8015/8020

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

Very truly yours,

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

RESNA	Client Project ID:	Arco, 2035 Albany	Sampled:	Dec 15, 1993
3315 Almaden Expwy., Suite 34	Sample Matrix:	Air	Received:	Dec 16, 1993
San Jose, CA 95118	Analysis Method:	EPA 5030/8015/8020	Reported:	Dec 21, 1993
Attention: Bruce Maeda	First Sample #:	3L83401		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3L83401 AS-Influent
Purgeable Hydrocarbons	5.0	1,800
Benzene	0.050	79
Toluene	0.050	73
Ethyl Benzene	0.050	13
Total Xylenes	0.050	42
Chromatogram Pattern:		Gas + Non-Gas Mix < C8

Quality Control Data

Report Limit Multiplication Factor:	25
Date Analyzed:	12/17/93
Instrument Identification:	GCHP-17
Surrogate Recovery, %: (QC Limits = 70-130%)	133*

* Coelution confirmed.

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Bruce Maeda

Client Project ID: Arco, 2035 Albany
Matrix: Liquid

QC Sample Group: 3L83401

Reported: Dec 21, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	V. Harabajahian	V. Harabajahian	V. H.	V. H.
MS/MSD Batch#:	3L88208	3L88208	3L88208	3L88208
Date Prepared:	-	-	-	-
Date Analyzed:	12/17/93	12/17/93	12/17/93	12/17/93
Instrument I.D.#:	GCHP-17	GCHP-17	GCHP-17	GCHP-17
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Matrix Spike % Recovery:	73	76	77	77
Matrix Spike Duplicate % Recovery:	84	88	89	90
Relative % Difference:	14	15	14	16
LCS Batch#:	-	-	-	-
Date Prepared:	-	-	-	-
Date Analyzed:	-	-	-	-
Instrument I.D.#:	-	-	-	-
LCS % Recovery:	-	-	-	-
% Recovery Control Limits:	71-133	72-128	72-130	71-120

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

ARCO Products Company Division: AtlanticRichfieldCompany

Task Order No. 2[illegible]5-93-4D

Chain of Custody

ARCO Facility no. 2035	City (Facility) Albany	Project manager (Consultant) Bruce Maeda	Laboratory name Sequoia
ARCO engineer Michael Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) 408 264-7723	Fax no. (Consultant) 264-2435
Consultant name RESNA	Address (Consultant) 3257 Almaden Expy Suite 34 J. J. 95118		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 ☐	
MS-INFLUENT		1			—			12-15-93	16:46		X							9312834-01			

Special detection Limit/reporting

Special QA/QC

Remarks DEC ≤ 10 S

Lab number 9312834

Turnaround time

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

Condition of sample:

Temperature received:

	Date	Time
Relinquished by sampler	12-16-93	9:08
Relinquished by: Claudia Hurtado	12-16-93	1050
Relinquished by		

Received by: Claudia Hurtado

Received by

Received by laboratory: [signature] Date 12-16-93 Time 1056

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

APPC 3292 (2-91)