RESNA
Working to Restore Nature

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TRANSMITTAL

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

DATE: April 5, 1994
PROJECT NUMBER: 60026.13
SUBJECT: ARCO Station 276

FROM: Erin D. Krueger

94 APR -7 PM 1:26
ALCO HAZMAT

WE ARE SENDING YOU:

COPIES	DATED	DESCRIPTION
1	03/31/94	Letter Report, Quarterly Groundwater Monitoring and Remediation System Operation, Fourth Quarter 1993 at ARCO Station 276, 10600 MacArthur Boulevard, Oakland, California.

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REMARKS:

Copies: 1 to RESNA project file no. 60026.13

Erin D. Krueger, Staff Geologist

cc: Mr. Michael Whelan, ARCO
Mr. Richard Hiett, CRWQCB
Mr. Richard Gilcrease, Drake Builders

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QUARTERLY GROUNDWATER MONITORING AND REMEDIATION SYSTEM OPERATION

Fourth Quarter 1993

at

ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

60026.13

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March 31, 1994

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

Subject: Quarterly Groundwater Monitoring and Remediation System Operation
Fourth Quarter 1993
ARCO Station 276
10600 MacArthur Boulevard, Oakland, 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 Operation 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 operation was performed by RESNA and consists of collecting field data, collecting treatment unit influent and effluent samples, and adjusting the system to optimize 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 References section.

GROUNDWATER MONITORING

Field Work

EMCON field personnel were onsite November 10, 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-8, and RW-1. Wells MW-2 and MW-7 are constructed in a shallow water-bearing zone, and wells MW-1, MW-3 through MW-6, MW-8, and RW-1 are constructed in a deeper water-bearing zone.

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, and for Volatile Organic Compounds (VOCs) using EPA Method 8240. In addition, the sample from well MW-4 was analyzed for total oil and grease (TOG) using Standard Methods 5520C/F. The chain of custody records and laboratory analysis reports are included in Appendix A.

Results of Groundwater Monitoring

Groundwater elevations fell an average of about 1.92 feet in wells MW-1, MW-3 through MW-6, MW-8, and RW-1 since last quarter. Floating product was noted in wells MW-2 and MW-7 during the purging of the wells. No floating product or product sheen was noted in other wells during this or previous quarters. Based on November 10, 1993, DTW data, groundwater in the deeper water-bearing unit appears to be mounding around wells MW-3 and MW-5 (Plate 5). 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.

Since the last quarter, product has continued to be detected in wells MW-2 and MW-7 during purging. Laboratory analytical results of groundwater samples from wells MW-1, MW-3 through MW-6, MW-8, and RW-1 indicated nondetectable concentrations of TPHg and BTEX. Detection limits for TPHg and BTEX were less than 50 parts per billion (ppb) and less than 0.5 ppb, respectively, with the exception of samples collected from wells MW-3, MW-4, MW-6, and RW-1, where detection limits were raised due to matrix interference (single peaks, possibly PCE) in the sample (Plate 4). TOG in well MW-4 continued to be not detected at the detection limit of 0.5 parts per million (ppm).

Concentrations of Tetrachloroethene continued to be detected in wells MW-1, MW-3, MW-4, MW-5, MW-6, and RW-1.

Floating Product Removal

No floating product was recovered during this quarter. The total product removed to date is presented in Table 2.

REMEDIATION SYSTEM OPERATION

The major components of the Vapor Extraction System (VES) include eight vapor extraction wells (VW-1 through VW-7, and monitoring well MW-2), a 1.5 horsepower Rotron vacuum blower, and a 500 standard cubic feet per minute (scfm) natural gas fired Anguil Catalytic Oxidizer (cat-ox) for the combustion treatment of extracted gasoline vapors. Cat-ox operation is authorized under the Bay Area Air Quality Management District (BAAQMD) Permit to Operate #5998.

VES Operation

The cat-ox operated with extraction occurring from two to seven of the available eight extraction wells during fourth quarter 1993. Cumulative VES operational data is summarized in Table 5 and includes extraction well on/off status, flowrates and TPHg vapor concentrations. The VES was shutdown on December 30, 1994, due to low concentrations of TPHg vapor in the soil gas. The VES will be pulsed during the first and second quarter 1994 based on rates of diffusion of gasoline into soil gas.

The VES operated on wells VW-2 and VW-4 in October and all extraction wells except VW-6 during the remainder of the quarter. The combined well flowrates for the extraction wells ranged from 45 to 70 standard cubic feet per minute (scfm) at vacuums of 18 to 54 inches of water column. The site conditions limit the combined well flowrates to these values. As a result, large amounts of dilution air (430 to 455 scfm) are currently needed for the oxidizer to operate at its 500 scfm flowrate. The VES operated for a total of 1,152 hours of the available 2,208 hours during the fourth quarter 1993. Downtime during fourth quarter 1993 was due to the following reasons; replacement of a failed flame rod, repair of a clogged flame arrestor, and low TPHg vapor concentrations in soil gas.

Air Sampling and Analysis

Air samples were collected in mylar 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 the certified analytical reports with chain-of-custody for air samples are included in Appendix B.

TPHg vapor concentration from the combined well flow was 209 milligrams per cubic meter (mg/m^3) on November 11, 1993. During the fourth quarter 1993 influent TPHg vapor concentrations (with dilution air) ranged from not detected at the MDL to 57 mg/m^3. Assuming a molecular weight of 95 grams per mole for TPHg the cat-ox influent concentrations ranged from less than 1.1 to 11.8 parts per million (ppm) by volume. TPHg vapor concentrations in the cat-ox effluent ranged from not detected at the MDL to 64 mg/m^3 while benzene concentrations ranged from not detected at the MDL to 1.2 mg/m^3.

Mass Extraction and Emission Rates

Using the analytical results and system influent flowrates, the TPHg extraction rates from the wells and TPHg and benzene emissions rates to the atmosphere were calculated and TPHg extraction rates are summarized in Table 7. TPHg mass extraction rates for the quarter ranged from 0.4 to 2.6 pounds per day (ppd) and the total TPHg mass extracted this quarter by the VES is estimated at 77 pounds. The benzene emission rates ranged from less than 0.002 to 0.05 ppd, well below the BAAQMD limit of 0.11 ppd (benzene) emission rate applicable to this site.

PREVIOUS AND FUTURE WORK

Fourth Quarter 1993

- Performed fourth quarter 1993 groundwater monitoring.
- Performed operation and maintenance of interim remediation system.
- Submitted third quarter groundwater monitoring report to ARCO and regulatory agencies.
- Sent out Requests for Bids for the enhancement of offsite wells.

First Quarter 1994

- Perform first quarter 1994 groundwater monitoring.
- Monitor TPHg vapor concentrations and depth to water in vapor extraction wells to access possibility of restarting the remediation system.
- Perform operation and maintenance of interim remediation system upon restarting of system.
- Submit fourth quarter 1993 groundwater and remediation system monitoring report to ARCO and regulatory agencies.
- Receive bids for the enhancement of offsite wells.

Distribution

It is recommended that copies of this report 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
California Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster, Suite 500
Oakland, California 94612

Mr. Richard Gilcrease
Drake Builders
5201 Sacramento Avenue
Richmond, California 94804

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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 Engineer 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, November 10, 1993
Plate 4:	TPHg/Benzene Concentrations in Groundwater, November 10, 1993
Plate 5:	PCE Concentrations in Groundwater, November 10, 1993
Table 1:	Cumulative Groundwater Monitoring Data
Table 2:	Approximate Cumulative Product Removed
Table 3:	Cumulative Results of Laboratory Analyses of Groundwater Samples--TPHg, TPHd, BTEX, and TOG
Table 4:	Cumulative Results of Laboratory Analyses of Groundwater Samples--VOCs and Metals
Table 5:	VES Operation Data
Table 6:	Cumulative Results of Laboratory Analysis of Air Samples
Table 7:	Summary of Extraction Rates and Mass Recovery
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:	Certified Analytical Reports with Chain-of-Custody for Air Samples

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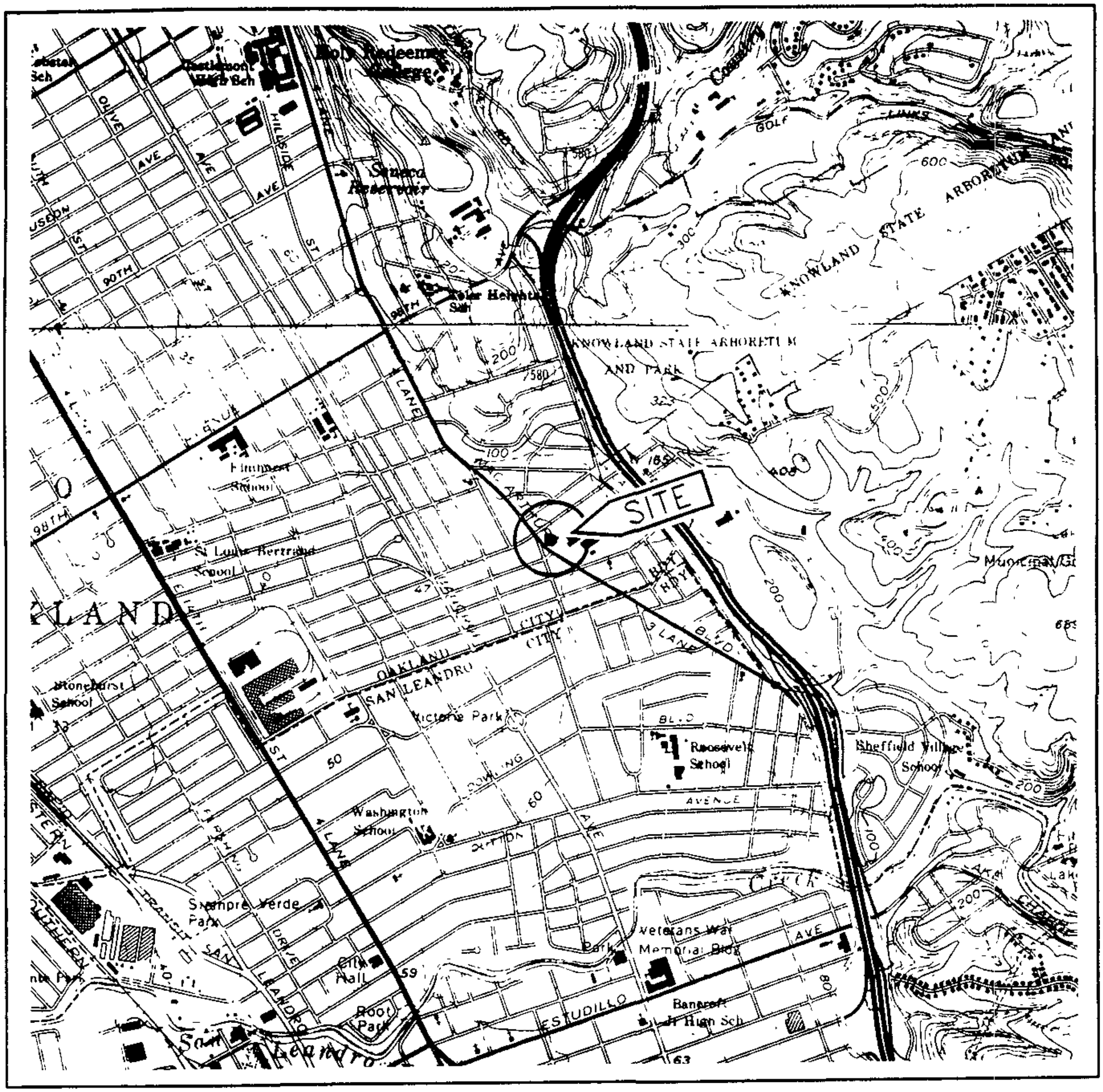
REFERENCES

RESNA. February 1, 1993. Additional Subsurface Investigation and Interim Remediation at ARCO Station 276, 10600 MacArthur Boulevard in Oakland, California. RESNA Report 60026.05.

RESNA. December 30, 1993. Letter Report Quarterly Groundwater Monitoring and Remedial Performance Evaluation Third Quarter 1993 at ARCO Station 276, 10600 MacArthur Boulevard in Oakland, California. RESNA Report 60026.13.



N

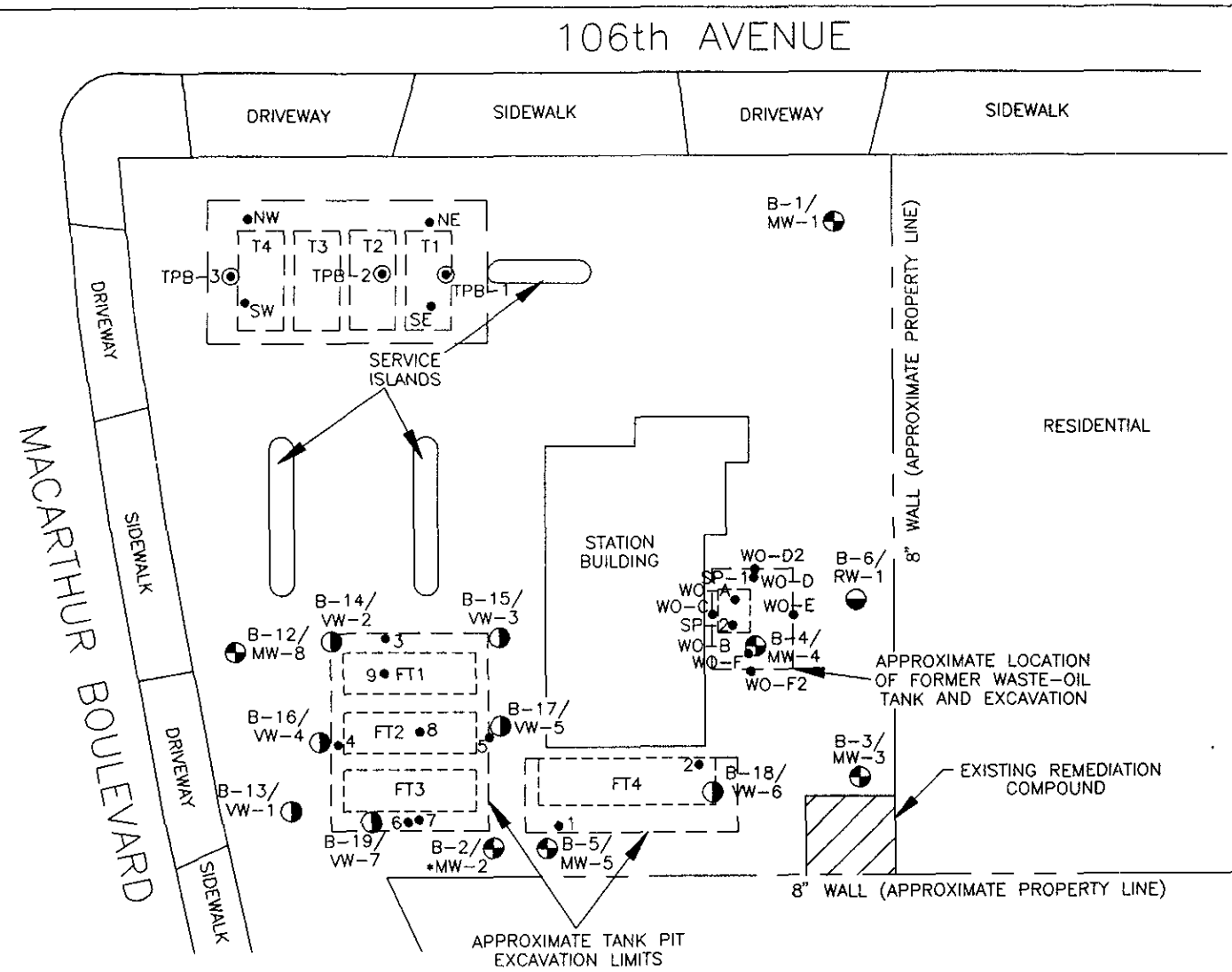
Source U.S. Geological Survey
7.5-Minute Quadrangles
Oakland East/San Leandro, California
Photorevised 1980

Approximate Scale

2000 1000 0 2000

feet

RESNA *Working to Restore Nature*	SITE VICINITY MAP ARCO Station 276 10600 MacArthur Boulevard Oakland, California	PLATE 1
PROJECT 60026.13		



EXPLANATION

TPB-3 ◉ = Boring in proposed new tank pit (RESNA, 1990)

B-19/ VW-7 ◑ = Vapor well (RESNA, 1992)

B-12/ MW-8 ◔ = Groundwater monitoring well (RESNA, 1989 and 1992)

B-7/ RW-1 ◒ = Recovery well (RESNA, 1991)

MW-3 (WGR) ⊗ = Groundwater monitoring well (WGR, 1988)

* = Well screened in shallow water-bearing zone

NW ● = New tank pit excavation bottom sample (RESNA, 1990)

9 ● = Former tank pit sample (S7-TP1SW-1 through -9; RESNA, 1990)

SP-2 WO-F ● WO-F2 = Former waste-oil tank pit excavation bottom and sidewall sample (PEG, 1988)

T4 = Existing underground storage tanks

FT4 = Former underground storage tanks

B-10/ MW-6

B-11/ *MW-7

MW-3 (WGR)

Approximate Scale

30 15 0 30 60

feet

Source: Modified from plan supplied by ARCO and surveyed by Ron Archer, Civil Engineer, Inc. and John Koch, Land Surveyor.

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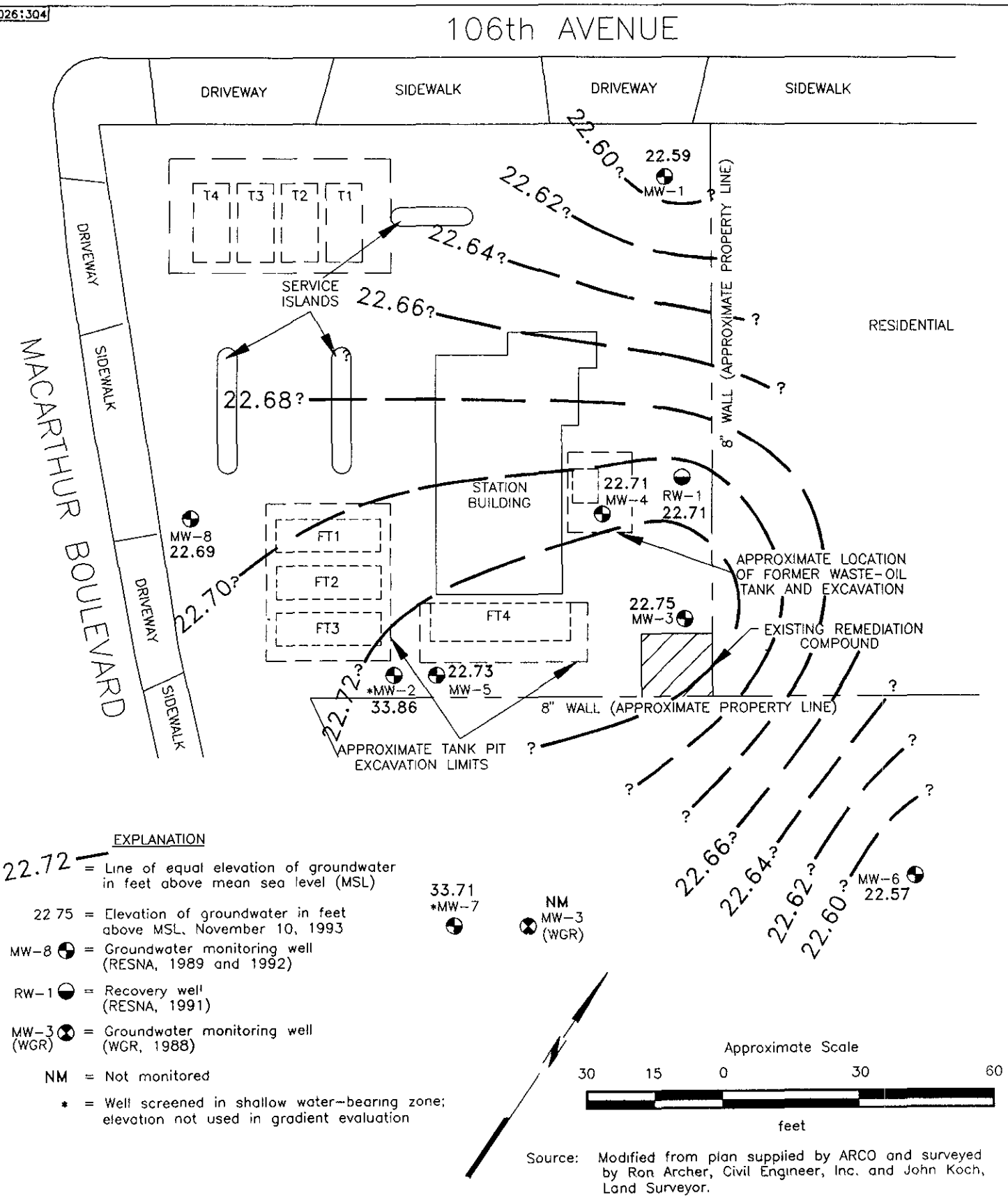
GENERALIZED SITE PLAN
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

PLATE 2

0026:304



EXPLANATION

22.72 — = Line of equal elevation of groundwater in feet above mean sea level (MSL)

22.75 = Elevation of groundwater in feet above MSL, November 10, 1993

MW-8 = Groundwater monitoring well (RESNA, 1989 and 1992)

RW-1 = Recovery well (RESNA, 1991)

MW-3 (WGR) = Groundwater monitoring well (WGR, 1988)

NM = Not monitored

* = Well screened in shallow water-bearing zone; elevation not used in gradient evaluation

Approximate Scale

30 15 0 30 60

feet

Source: Modified from plan supplied by ARCO and surveyed by Ron Archer, Civil Engineer, Inc. and John Koch, Land Surveyor.

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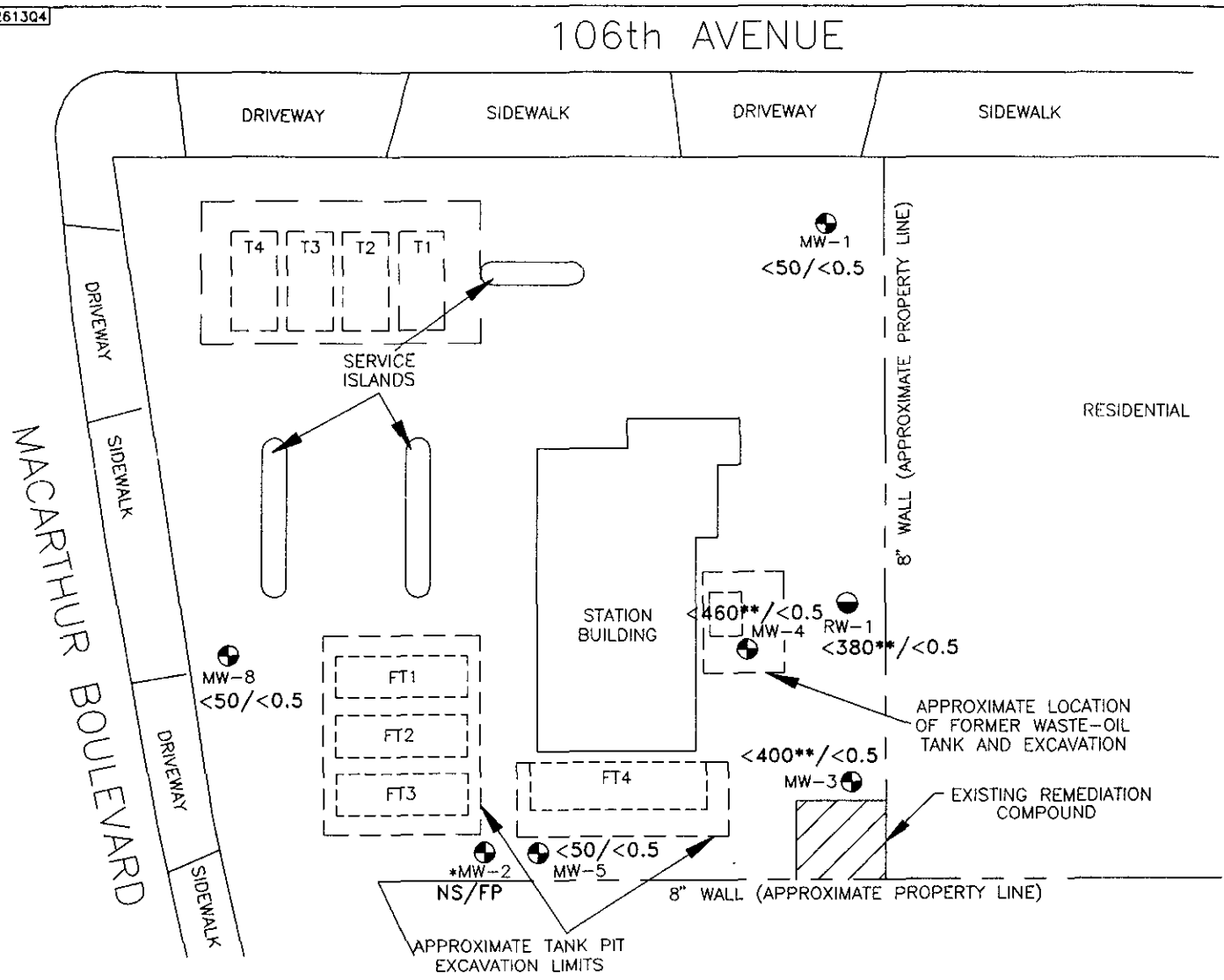
PROJECT 60026.13

GROUNDWATER GRADIENT MAP

ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

PLATE 3

00261304



EXPLANATION

<50/<0.5 = Concentrations of total petroleum hydrocarbons as gasoline (TPHg) and benzene in groundwater in parts per billion, November 10, 1993

MW-8 = Groundwater monitoring well (RESNA, 1989 and 1992)

RW-1 = Recovery well (RESNA, 1991)

MW-3 (WGR) = Groundwater monitoring well (WGR, 1988)

* = Well screened in shallow water-bearing zone

** = Detection limit reportedly raised by laboratory because of matrix interference or high analyte concentration requiring dilution or does not match gas fingerprint

NS/FP = Not sampled Floating product noticed during well purging

NS/FP
*MW-7

NS
MW-3
(WGR)

MW-6
<1,000**/<2.5**

Approximate Scale
30 15 0 30 60
feet

Source: Modified from plan supplied by ARCO and surveyed by Ron Archer, Civil Engineer, Inc. and John Koch, Land Surveyor.

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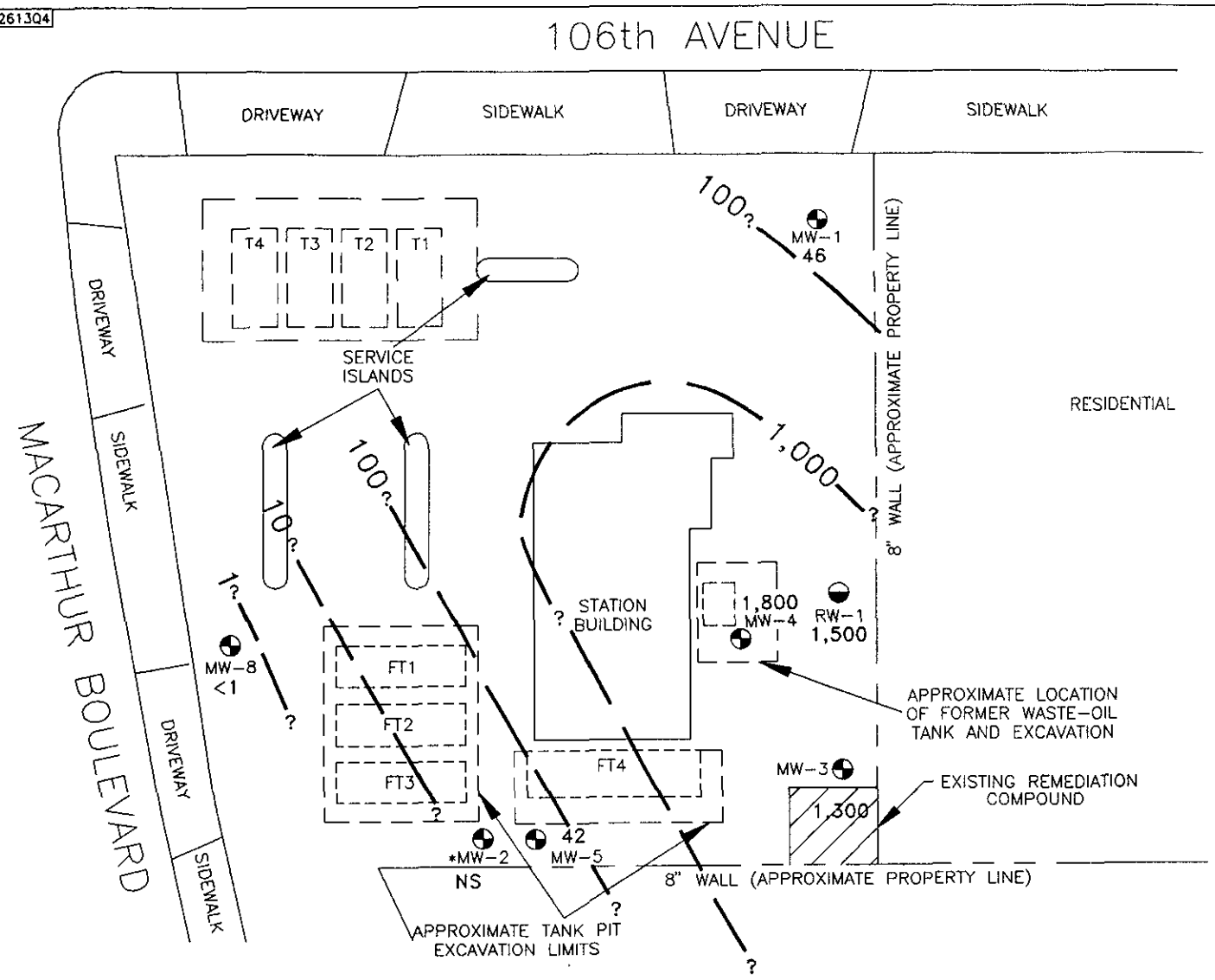
TPHg/BENZENE CONCENTRATIONS IN GROUNDWATER
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

PLATE 4

00261304



EXPLANATION

1,000 = Line of equal concentration of Tetrachloroethene (PCE) in groundwater in parts per billion (ppb)

3,900 = Concentration of PCE in ppb, November 10, 1993

MW-8 = Groundwater monitoring well (RESNA, 1989 and 1992)

RW-1 = Recovery well (RESNA, 1991)

MW-3 (WGR) = Groundwater monitoring well (WGR, 1988)

NS = Not sampled

FP = Floating product in well, not sampled

< = Less than laboratory detection limit

* = Well screened in shallow water-bearing zone

3,900 MW-6

*MW-7 NS

NS MW-3 (WGR)

Approximate Scale

30 15 0 30 60

feet

Source. Modified from plan supplied by ARCO and surveyed by Ron Archer, Civil Engineer, Inc and John Koch, Land Surveyor.

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TETRACHLOROETHENE (PCE) CONCENTRATIONS IN GROUNDWATER
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

PLATE 5

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 276
Oakland, California
(Page 1 of 7)

Well Date	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-1	55.91			
04/17/89		33.04	22.87	None
04/24/89		33.84	22.07	None
10/13/89		37.19	18.72	None
02/01/90		36.73	19.18	None
07/31/90		36 42	19 49	None
08/01/90		36 41	19 50	None
08/28/90		36 88	19 03	None
10/30/90		37.73	18.18	None
11/20/90		37 92	18 37	None
12/19/90		37.90	18.01	None
01/30/91		38 06	17.85	None
02/27/91		37.66	18 25	None
03/20/91		36.77	19 14	None
04/30/91		34.63	21.28	None
05/31/91		34.83	21.08	None
07/24/91		35.96	19.95	None
08/06/91		36.21	19.70	None
09/03/91		36 74	19 17	None
10/17/91		37 57	18.34	None
11/05/91		37 65	18 26	None
12/24/91		38.14	17 77	None
01/19/92		37.62	18 29	None
02/20/92		36.23	19 68	None
03/10/92		34.58	21.33	None
04/20/92		32.82	23.09	None
05/15/92		33.17	22 74	None
06/30/92		34 55	21.36	None
07/15/92		34 90	21 01	None
08/25/92	55 92	35 34	20.58	None
09/09/92		35 71	20.21	None
10/31/92		36.62	19.30	None
11/20/92		36 90	19 02	None
12/16/92		36.18	19 74	None
01/22/93		32 24	23.68	None
02/12/93		30.65	25.27	None
03/26/93		28 36	27.56	None
04/30/93		28 45	27.47	None
05/12/93		28 88	27 04	None
06/17/93		29.67	26.25	None
08/18/93		31 44	24.48	None
11/10/93		33.33	22.59	None

See notes on page 7 of 7

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 276
Oakland, California
(Page 2 of 7)

Well Date	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-2				
04/17/89		17.20	38.15	None
04/24/89		17.83	37.52	None
10/13/89	55.35	20.15*	35.20*	0 03
02/01/90		NM	NM	NM
07/31/90		18.90	36.45	None
08/01/90		18.23*	37.03*	1.04
08/28/90		21.25*	34.10*	0.83
10/30/90		24.21*	31.14*	1.04
11/20/90		25.08*	30.27*	0.60
12/19/90		18.23*	37.12*	None
01/30/91		19.47*	35.88*	0 03
02/27/91		18.84*	36.51*	0.02
03/20/91		16.02*	39.33*	0.01
04/30/91		16 55	38.80	Sheen
05/31/91		18 41*	36.94*	0.01
07/24/91		19.81	35 54	Sheen
08/06/91		20 59*	34.76*	0.14
09/03/91		23 23*	32 12*	0 54
10/17/91		24.81*	30 54*	0 20
11/05/91		18.88*	36.47*	0 01
12/24/91		19.34*	36.01*	0 09
01/19/92		18 00	37 35	Sheen
02/20/92		14.81**	40.54	Skimmer
03/10/92		14 95**	40.40	Skimmer
04/20/92		16.13	39.22	None
05/15/92		17.66	37.69	None
06/30/92		19.11	36.24	Sheen
07/15/92		19 50	35.85	None
08/25/92	55.10	21.35*	33 73*	0.05
09/09/92		22.70*	32.40*	0 05
10/31/92		22.34	32.76	None
11/20/92		19.85*	32.25*	0 02[1]
12/16/92		NM	NM	NM
01/22/93		13.10	42.00	None
02/12/93		14.71	40 39	0.05[1]
03/26/93		Well	Inaccessible	
04/30/93		15.48	39.62	None
05/12/93		15 81*	39.29*	0.01
06/17/93		18.45	36 65	None
08/18/93		NM	NM	Nm
11/10/93		21.24	33 86	None[1]

See notes on page 7 of 7

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 276
Oakland, California
(Page 3 of 7)

Well Date	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-3				
04/24/89		34.47	22.08	None
10/13/89	56.55	37 60	18 95	None
02/01/90		37 20	19.35	None
07/31/90		36.90	19.65	None
08/01/90		36.87	19.68	None
08/28/90		37 33	19.22	None
10/30/90		38 15	18 40	None
11/20/90		38 33	18.58	None
12/19/90		38 30	18.25	None
01/30/91			Well Dry	
02/27/91		38.11	18.44	None
03/20/91		37.26	19 29	None
04/30/91		35.02	21.53	None
05/31/91		35 26	21.29	None
07/24/91		36 40	20.15	None
08/06/91		36 66	19.89	None
09/03/91		37.20	19 35	None
10/17/91		38.04	18 51	None
11/05/91		38.08	18 47	None
12/24/91			Well Dry	
01/19/92		38.07	18 48	None
02/20/92		36.71	19.84	None
03/10/92		34.96	21.59	None
04/20/92		33 20	23.35	None
05/15/92		33.70	22.85	None
06/30/92		34.97	21 58	None
07/15/92		35.35	21.20	None
08/25/92	56 55	35.94	20 61	None
09/09/92		36 19	20.36	None
10/31/92		36 13	20.42	None
11/20/92		37 40	19 15	None
12/16/92		36.68	19.87	None
01/22/93		32 58	23.97	None
02/12/93		30 86	25 69	None
03/26/93		28 60	27.95	None
04/30/93		28.79	27.76	None
05/12/93		29.17	27.38	None
06/17/93		30.11	26.44	None
08/18/93		31.91	24.64	None
11/10/93		33.80	22.75	None

See notes on page 7 of 7

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 276
Oakland, California
(Page 4 of 7)

Well Date	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-4				
04/17/89		33.87	22.07	None
04/24/89		33.76	22.18	None
10/13/89	55.94	37.03	18.91	None
02/01/90		36.57	19.37	None
07/31/90		36 39	19.55	None
08/01/90		36.32	19.62	None
08/28/90		36.79	19 15	None
10/30/90		37.62	18.32	None
11/20/90		37.82	18.52	None
12/19/90		37.74	18.20	None
01/30/91		37 97	17 97	None
02/27/91		37.52	18 42	None
03/20/91		36.69	19.25	None
04/30/91		34.48	21.46	None
05/31/91		34.73	21.21	None
07/24/91		35.86	20.08	None
08/06/91		36.15	19.79	None
09/03/91		36.66	19.28	None
10/17/91		37 49	18.45	None
11/05/91		37.54	18.40	None
12/24/91		38 01	17 93	None
01/19/92		37 48	18 46	None
02/20/92		36 11	19.83	None
03/10/92		34 96	21.54	None
04/20/92		32 60	23 34	None
05/15/92		33.12	22 82	None
06/30/92		34.06	21.88	None
07/15/92		NR	NR	NR
08/25/92	55.98	35.22	20 76	None
09/09/92		35.63	20.35	None
10/31/92		33 84	22.14	None
11/20/92		36.87	19 11	None
12/16/92		36.09	19.89	None
01/22/93		31.98	24.00	None
02/12/93		30.31	25.67	None
03/26/93		27 97	28 01	None
04/30/93		28.24	27.74	None
05/12/93		28.60	27.38	None
06/17/93		29 54	26.44	None
08/18/93		31 37	24.61	None
11/10/93		33.27	22.71	None

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 276
Oakland, California
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Well Date	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-5				
04/17/89		33.17	22.26	None
04/24/89		33.06	22.37	None
10/13/89	55 43	36.33	19.10	None
02/01/90		35.96	19.47	None
07/31/90		35 70	19 73	None
08/01/90		35.69	19.74	None
08/28/90		36 14	19.29	None
10/30/90		36.94	18.49	None
11/20/90		37.09	18.64	None
12/19/90		37 05	18.38	None
01/30/91		37.26	18 17	None
02/27/91		36.81	18.62	None
03/20/91		36 04	19.39	None
04/30/91		33.75	21.68	None
05/31/91		34.01	21.42	None
07/24/91		35.20	20 23	None
08/06/91		35 48	19.95	None
09/03/91		36 00	19.43	None
10/17/91		36.84	18.59	None
11/05/91		36.86	18.57	None
12/24/91		37 31	18.12	None
01/19/92		36 95	18.48	None
02/20/92		35.39	20.04	None
03/10/92		33.67	21.76	None
04/20/92		31.80	23.63	None
05/15/92		32.37	23.06	None
06/30/92		34.00	21.43	None
07/15/92		34 32	21.11	None
08/25/92	55.43	35.76	19.67	None
09/09/92		34.97	20 46	None
10/31/92		35 97	19 46	None
11/20/92		36 26	19 17	None
12/16/92		35 45	19.98	None
01/22/93		31 05	24.38	None
02/12/93		29 42	26.01	None
03/26/93		27.07	28 36	None
04/30/93		27 40	28.03	None
05/12/93		27 83	27.60	None
06/17/93		28.84	26.59	None
08/18/93		30.75	24.68	None
11/10/93		32 70	22.73	None

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 276
Oakland, California
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Well / Date	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-6	61.21			
06/30/92		35.50	25 71	None
07/15/92		39.89	21.32	None
08/25/92		34.90	26.31	None
09/09/92		NM	NM	NM
10/31/92		NM	NM	NM
11/20/92		NM	NM	NM
12/16/92		NM	NM	NM
01/22/93		36.52	24.69	None
02/12/93		35 65	25.56	None
03/28/93		33.33	27.88	None
04/30/93		33 56	27.65	None
05/12/93		33 95	27 26	None
06/17/93		34.90	26.31	None
08/18/93		36.72	24 49	None
11/10/93		38.64	22.57	None
MW-7	58.22			
06/30/92		23.70	34.52	None
07/15/92		23.10	35.12	None
08/25/92		34.23	23.99	None
09/09/92		26.30*	31.92*	1.31
10/31/92		35 44	22.78	None
11/20/92		23.47*	34.75*	0.02
12/16/92		19.07*	39.15*	0.04
01/22/93		16.56*	41.66*	0.02
02/12/93		18 22*	40.00*	0.04
03/26/93		18 04	40.18	None
04/30/93		19 34	38 88	NM
05/12/93		19.80*	38.42*	0.01
06/17/93		22.63*	35.59*	0.01
08/18/93		22 44*	35 78	0.01
11/10/93		24.51	33 71	None[1]
MW-8	53 65			
08/25/92		NR	NR	NR
09/09/92		33.20	20.45	None
10/31/92		37 12	16.53	None
11/24/92		34 45	19.20	None
12/16/92		NM	NM	NM
01/22/93		28 59	25.06	None
02/12/93		27 57	26.08	None
03/26/93		25 16	28.49	None

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 276
Oakland, California
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Well Date	Well Elevation	Depth to Water	Water Elevation	Floating Product
MW-8 (cont.)				
04/30/93		25.50	28.15	None
05/12/93		25.95	27.70	None
06/17/93		NM	NM	NM
08/18/93		28.97	24.68	None
11/10/93		30 96	22.69	None
RW-1				
11/05/91	56.32	37.89	18.43	None
12/24/91		38.35	17.97	None
01/19/92		37.82	18.50	None
02/20/92		36 42	19.90	None
03/10/92		34.74	21 58	None
04/20/92		32.90	23 42	None
05/15/92		33.43	22 89	None
06/30/92		34.74	21.58	None
07/15/92		35 12	21 20	None
08/25/92		36 75	19 57	None
09/09/92		35 99	20 33	None
10/31/92		34 32	22.00	None
11/20/92		37 11	19 21	None
12/16/92		36 40	19 92	None
01/22/93		32.30	24.02	None
02/12/93		30 64	25.68	None
03/26/93		28 32	28.00	None
04/30/93		28.55	27.77	None
05/12/93		28.94	27.38	None
06/17/93		29.89	26.43	None
08/18/93		31 74	24.58	None
11/10/93		33 61	22.71	None

Notes
Depths are in feet below top of each well casing
Elevations are referenced in feet above mean sea level.
Floating product thickness reported in feet.

* = Depth to water and water elevation adjusted as followed The thickness of the floating product and the ground-water depths were recorded. The recorded thickness of the floating product was then 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 (potentiometric surface).

1 = Floating product was detected during purging of the groundwater from the well

NM = Not monitored

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TABLE 2
APPROXIMATE CUMULATIVE PRODUCT REMOVED
ARCO Station 276
Oakland, California
(page 1 of 1)

Year Date	Floating Product Removed (gallons)
1991	18.15
1992	0.39
1993	
MW-2	
01-29-93	Sheen - Not Removed
02-26-93	Sheen - Not Removed
03-24-93	Sheen - Not Removed
05-12-93	Sheen - Not Removed
08/18/93	Not Measured
11/10/93	None
MW-7	
01-29-93	Sheen - Not Removed
02-26-93	Sheen - Not Removed
03-24-93	Sheen - Not Removed
05-12-93	Sheen - Not Removed
08/18/93	Sheen - Not Removed
11/10/93	None
1993 Total:	0.00 Gallons
Product Removed to Date:	18.54 gallons

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TABLE 3
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER SAMPLES--TPHg, TPHd, BTEX, and TOG
ARCO Station 276
Oakland, California
(Page 1 of 4)

Well Date	TPHg (ppb)	TPHd (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	TOG (ppb)
MW-1							
04/24/89	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
10/13/89	<20	NA	<0.50	<0.50	<0.50	<0.50	NA
02/01/90#	91	NA	<0.30	<0.30	<0.30	0.36	NA
07/31/90	<20	NA	<0.50	<0.50	<0.50	<0.50	NA
10/30/90	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
01/30/91	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
04/30/91	<30	NA	<0.30	<0.30	<0.30	<0.30	NA
08/06/91	<30	NA	<0.30	<0.30	<0.30	<0.30	NA
11/05/91	<30	NA	<0.30	<0.30	<0.30	<0.30	NA
03/10/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
06/30/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
09/09/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
11/20/92	<50	<0.5	<0.5	<0.5	<0.5	<0.5	NA
02/12/93	<50	<0.5	<0.5	<0.5	<0.5	<0.5	NA
05/12/93	<100*	NA	<0.5	<0.5	<0.5	<0.5	NA
08/18/93	<51*	NA	<0.5	<0.5	<0.5	<0.5	NA
11/10/93	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
MW-2							
04/24/89	165,000	NA	13,000	21,000	2,100	12,700	NA
10/13/89	Not sampled--floating product						
02/01/90	Not sampled--sheen						
07/31/90	240,000	NA	14,000	24,000	3,000	17,000	NA
10/30/90	Not sampled--floating product						
01/30/91	Not sampled--floating product						
04/30/91	Not sampled--sheen						
08/06/91	Not sampled--floating product						
11/05/91	Not sampled--floating product						
03/10/92	220,000	NA	8,200	13,000	4,500	22,000	NA
06/30/92	130,000	NA	10,000(9,300)	16,000(18,000)	4,700(4,200)	24,000(27,000)	NA
09/09/92	Not sampled--floating product						
11/20/92	Not sampled--floating product						
02/12/93	Not sampled--floating product						
05/12/93	Not sampled--floating product						
08/18/93	Not sampled						
11/10/93	Not sampled-floating product entered during purging						
MW-3							
04/24/89#	560	NA	0.54	0.75	<0.50	<0.50	NA
10/13/89#	450	NA	<0.50	<0.50	<0.50	<0.50	NA
02/01/90#	360	NA	<0.30	<0.30	<0.30	0.85	NA
08/01/90#	440	NA	<0.50	<0.50	<0.50	<0.50	NA
10/30/90#	340	NA	<0.5	<0.5	<0.5	<0.5	NA

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TABLE 3
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER SAMPLES--TPHg TPHd BTEX and TOG
ARCO Station 276
Oakland, California
(Page 2 of 4)

Well Date	TPHg (ppb)	TPHd (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	TOG (ppb)
MW-3 Cont.							
01/30/91		Not sampled--well dry					
04/30/91		Not sampled--well inaccessible due to construction					
08/06/91#	430	NA	<0.30	<0.30	<0.30	<0.30	NA
11/05/91#	290	NA	<1.5	<1.5	<1.5	<1.5	NA
03/10/92	<360*	NA	<0.5	<0.5	<0.5	<0.5	NA
06/30/92	<530*	NA	<0.5	<0.5	<0.5	<0.5	NA
09/09/92	<290*	NA	<0.5	<0.5	<0.5	<0.5	NA
11/20/92	<270*	NA	<0.5	<0.5	<2.4*	<1.8*	NA
02/12/93	<500*	NA	<0.5	<0.5	<0.5	<0.5	NA
05/12/93	<670*	NA	<0.5	<0.5	<0.5	<0.5	NA
08/18/93	<590*	NA	<0.5	<0.5	<0.5	<0.5	NA
11/10/93	<400*	NA	<0.5	<0.5	<0.5	<0.9*	NA
MW-4							
04/24/89#	2,500	NA	270	1.4	<0.50	85	NA
10/13/89#	760	NA	0.86	<0.50	1.2	<0.50	NA
02/01/90#	680	NA	<0.30	<0.30	<0.30	1.6	NA
07/31/90#	470	240	<0.50	<0.50	<0.50	<0.50	<500
10/30/90#	430	<100	<0.5	<0.5	<0.5	<0.5	<500
01/30/91	<50	<100	<0.5	<0.5	1.2	<0.5	<500
04/30/91#	600	NA	<0.30	0.30	<0.30	0.43	NA
08/06/91#	520	NA	<0.30	<0.30	<0.30	<0.30	NA
11/05/91#	900	NA	<3.0	<3.0	<3.0	<3.0	NA
03/10/92	<730*	NA	<0.5	<0.5	<0.5	<0.5	<2,500
06/30/92	<670*	NA	<0.5	<0.5	<2.3*	500	500
09/09/92	<470*	NA	<0.5	<0.5	<0.5	<0.5	3,600
11/20/92	<680*	NA	<0.5	<0.5	<6.3*	<3.2*	800
02/12/93	<860*	NA	<0.5	<0.5	<0.5	<0.5	25,000
05/12/93	<670*	NA	<0.5	<0.5	<1.4*	<1.3*	120,000
08/18/93	<700*	NA	<0.5	<0.5	<0.5	<0.5	<500
11/10/93	<460*	NA	<0.5	<0.5	<0.5	<1.3*	<500
MW-5							
04/24/89#	130	NA	0.67	<0.50	<0.50	<0.50	NA
10/13/89#	75	NA	<0.50	<0.50	<0.50	<0.50	NA
02/01/90#	81	NA	0.94	0.88	<0.30	1.8	NA
07/31/90#	110	NA	<0.50	<0.50	<0.50	<0.50	NA
10/30/90	<50	NA	<0.5	<0.5	<0.5	<0.5	NA

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TABLE 3
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER SAMPLES--TPHg, TPHd, BTEX, and TOG
ARCO Station 276
Oakland, California
(Page 3 of 4)

Well Date	TPHg (ppb)	TPHd (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	TOG (ppb)
MW-5 Cont.							
01/30/91	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
04/30/91#	120	NA	<0.30	<0.30	<0.30	<0.30	NA
08/06/91	<30	NA	<0.30	<0.30	<0.30	<0.30	NA
11/05/91#	77	NA	1.0	3.6	0.60	2.6	NA
03/10/92	<110*	NA	<0.5	<0.5	<0.5	<0.6*	NA
06/30/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
09/09/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
11/24/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
02/12/93	<150*	NA	<0.5	<0.5	<0.5	<0.5	NA
05/12/93	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
08/18/93	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
11/10/93	<50	NA	<0.5	<0.5	<0.5	<1.4*	NA
MW-6							
06/30/92	<850*	NA	<0.5	<0.5	<0.5	<0.5	NA
09/09/92	NS	NS	NS	NS	NS	NS	NS
11/20/92	NS	NS	NS	NS	NS	NS	NS
02/12/93	<1,900*	NA	<2.5*	<2.5*	<2.5*	<2.5*	NA
05/12/93	<1,600*	NA	<2.5*	<2.5*	<2.5*	<2.5*	NA
08/18/93	<1,500*	NA	<2.5*	<2.5*	<2.5*	<2.5*	NA
11/10/93	<1,000*	NA	<2.5*	<2.5*	<2.5*	<2.5*	NA
MW-7							
06/30/92	71,000	NA	5,100(5,100)	6,600(6,800)	2,300(2,300)	14,000(16,000)	NA
09/09/92	Not sampled--floating product						
11/20/92	Not sampled--floating product						
02/12/93	Not sampled--floating product						
05/12/93	Not sampled--floating product						
08/18/93	Not sampled--floating product						
11/10/93	Not sampled-floating product entered during purging						
MW-8							
09/09/92	<50	NA	3.4(4)	<0.5	<0.5	0.7	NA
11/24/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
02/12/93	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
05/12/93	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
08/18/93	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
11/10/93	<50	NA	<0.5	<0.5	<0.5	1.1	NA

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TABLE 3
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER SAMPLES--TPHg, TPHd, BTEX, and TOG
ARCO Station 276
Oakland, California
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Well Date	TPHg (ppb)	TPHd (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	TOG (ppb)
RW-1							
11/05/91#	750	NA	4 8	3.7	<3.0	<3.0	NA
03/10/92	<140*	NA	<0 5	<0.5	<0.5	<0.6*	NA
06/30/92	<400*	NA	<0.5	<0 5	<0.5	<0.5	NA
09/09/92	<520*	NA	<0.5	<0 5	<0.5	<0.5	NA
11/24/92	<650*	NA	<0 5	<0.5	<8.6*	<7.2*	NA
02/12/93	<260*	NA	<0.5	<0.5	<0.5	<0.5	NA
05/12/93	<240*	NA	<0 5	<0.5	<0.5	<0.5	NA
08/18/93	<230*	NA	<0 5	<0 5	<0.5	<0.5	NA
11/10/93	<380*	NA	<0.5	<0.5	<0.5	<0.8*	NA
January 1990							
MCLs	---	---	1.0	---	680	1,750	---
DWAL	---	---	---	100	---	---	---

Results in parts per billion (ppb)
TPHg and BTEX: Total petroleum hydrocarbons as gasoline and benzene, toluene, ethylbenzene, and total xylenes using EPA method 5030/8020/California DHS LUFT Method.
TPHd: Total petroleum hydrocarbons as diesel using EPA method 3550/3510
B: Benzene, T: Toluene, E: Ethylbenzene, T: Total Xylene isomers
BTEX: Measured using EPA method 8020/602.
TOG: Total oil and grease using Standard Methods 5520 C&F
NA. Not analyzed
NS Not sampled
< Results reported as less than detection limit
Based on new results, the chromatograph peaks previously interpreted to be TPHg and BTEX have been reinterpreted to be a single peak hydrocarbon possibly (PCE).
* Laboratory note indicated Raised MRL due to matrix interference The sample contains a single non-fuel component eluting in the gasoline range, and quantitated as gasoline The chromatogram does not match the typical gasoline fingerprint or Raised MRL due to high analyte concentration requiring sample dilution.
( ) BTEX as measured using EPA Method 624
1· Anality concentration is an estimate because this anality was also found in the method blank.
MCL Maximum contaminant level
DWAL: Drinking water action level

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TABLE 4
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER SAMPLES--VOCs and Metals
ARCO Station 276
Oakland, California
(Page 1 of 3)

Well / Date	Compound	VOCs (ppb)	Cd (ppm)	Cr (ppm)	Pb (ppm)	Zn (ppm)	Ni (ppm)
MW-1							
09/03/91	Tetrachloroethene	4.5	NA	NA	NA	NA	NA
11/06/91	All Compounds	< 2.0	NA	NA	NA	NA	NA
03/10/92	Tetrachloroethene	8.2	NA	NA	NA	NA	NA
06/30/92	Tetrachloroethene	15	NA	NA	NA	NA	NA
09/09/92	Tetrachloroethene	6	NA	NA	NA	NA	NA
11/20/92	Tetrachloroethene	2	NA	NA	NA	NA	NA
02/12/93	Tetrachloroethene	92	NA	NA	NA	NA	NA
05/12/93	Tetrachloroethene	280	NA	NA	NA	NA	NA
08/18/93	Tetrachloroethene	120	NA	NA	NA	NA	NA
11/10/93	Tetrachloroethene	46	NA	NA	NA	NA	NA
MW-2							
09/03/91	----------	Not sampled--floating product					
11/06/91	----------	Not sampled--floating product					
03/10/92	Tetrachloroethene	0 9	NA	NA	NA	NA	NA
	1,2-Dichloroethene	5 4					
06/30/92**	All Compounds	< 2,000	NA	NA	NA	NA	NA
09/09/92	----------	Not sampled--floating product					
11/20/92	----------	Not sampled--floating product					
02/12/93	----------	Not sampled--floating product					
05/12/93		Not sampled--floating product					
08/18/93		Not sampled					
11/10/93		Not sampled-floating product entered the well during purging					
MW-3							
09/03/91	Tetrachloroethene	1,600	NA	NA	NA	NA	NA
11/06/91	Tetrachloroethene	400	NA	NA	NA	NA	NA
03/10/92	Freon 12	3.4	NA	NA	NA	NA	NA
	cis-1,2-Dichloroethene	1.0					
	Trichloroethene	5.6					
	Tetrachloroethene	980					
06/30/92**	Tetrachloroethene	1,500	NA	NA	NA	NA	NA
09/09/92	Tetrachloroethene	800	NA	NA	NA	NA	NA
11/20/92	Tetrachloroethene	690	NA	NA	NA	NA	NA
02/12/93	Tetrachloroethene	1,200	NA	NA	NA	NA	NA
05/12/93	Tetrachloroethene	1,600	NA	NA	NA	NA	NA
08/18/93	Tetrachloroethene	1,300	NA	NA	NA	NA	NA
11/10/93	Tetrachloroethene	1,300	NA	NA	NA	NA	NA
MW-4							
07/31/90	Trichloroethene	7 5	NA	NA	NA	NA	NA
	Tetrachloroethene	1600	NA	NA	NA	NA	NA
	1,2 Dichloroethene	0 7	NA	NA	NA	NA	NA

See notes on Page 3 of 3

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TABLE 4
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER SAMPLES--VOCs and Metals
ARCO Station 276
Oakland, California
(Page 2 of 3)

Well / Date	Compound	VOCs (ppb)	Cd (ppm)	Cr (ppm)	Pb (ppm)	Zn (ppm)	Ni (ppm)
MW-4 Cont							
10/30/90	Trichloroethene	8 1	NA	NA	NA	NA	NA
	Tetrachloroethene	3600	NA	NA	NA	NA	NA
	1,2 Dichloroethene	0.7	NA	NA	NA	NA	NA
01/30/91	Trichloroethene	12	NA	NA	NA	NA	NA
	Tetrachloroethene	4,900	NA	NA	NA	NA	NA
04/30/91	Tetrachloroethene	2,200	NA	NA	NA	NA	NA
08/06/91	Tetrachloroethene	1,700	<0.010	0.065	0 0067	0 14	0 096
09/03/91	Tetrachloroethene	2,000	NA	NA	NA	NA	NA
11/06/91	Tetrachloroethene	1,000	NA	NA	NA	NA	NA
	Trichloroethene	6 3	NA	NA	NA	NA	NA
03/10/92	cis-1,2-Dichloroethene	4 0	NA	NA	NA	NA	NA
	Trichloroethene	13					
	Tetrachloroethene	2,300					
06/30/92**	Tetrachloroethene	1,800	NA	NA	NA	NA	NA
09/09/92	Tetrachloroethene	1,300	NA	NA	NA	NA	NA
11/20/92	Tetrachloroethene	1,700	NA	NA	NA	NA	NA
02/12/93	Tetrachloroethene	1,800	NA	NA	NA	NA	NA
05/12/93	Tetrachloroethene	1,500	NA	NA	NA	NA	NA
08/18/93	Tetrachloroethene	1,800	NA	NA	NA	NA	NA
11/10/93	Tetrachloroethene	1,800	NA	NA	NA	NA	NA
MW-5							
08/06/91	Tetrachloroethene	7.3	NA	NA	NA	NA	NA
09/03/91	Tetrachloroethene	25	NA	NA	NA	NA	NA
11/06/91	Tetrachloroethene	12	NA	NA	NA	NA	NA
03/10/92	Trichloroethene	1 3	NA	NA	NA	NA	NA
	Tetrachloroethene	300					
06/30/92	Tetrachloroethene	30	NA	NA	NA	NA	NA
09/09/92	Tetrachloroethene	120	NA	NA	NA	NA	NA
11/24/92	Tetrachloroethene	93	NA	NA	NA	NA	NA
02/12/93	Tetrachloroethene	210	NA	NA	NA	NA	NA
05/12/93	Tetrachloroethene	50	NA	NA	NA	NA	NA
08/18/93	Tetrachloroethene	80	NA	NA	NA	NA	NA
11/10/93	Tetrachloroethene	42	NA	NA	NA	NA	NA
MW-6							
06/30/92**	Tetrachloroethene	2,400	NA	NA	NA	NA	NA
09/09/92	----------		Inaccessible well--paved over				
11/20/92	----------		Inaccessible well--paved over				
02/12/93	Tetrachloroethene	4,200	NA	NA	NA	NA	NA
05/12/93	Tetrachloroethene	3,500	NA	NA	NA	NA	NA
08/18/93	Tetrachloroethene	3,000	NA	NA	NA	NA	NA
11/10/93	Tetrachloroethene	3,900	NA	NA	NA	NA	NA

See notes on Page 3 of 3

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TABLE 4
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER SAMPLES--VOCs and Metals
ARCO Station 276
Oakland, California
(Page 3 of 3)

Well / Date	Compound	VOCs (ppb)	Cd (ppm)	Cr (ppm)	Pb (ppm)	Zn (ppm)	Ni (ppm)
MW-7							
06/30/92**	All Compounds	< 1000	NA	NA	NA	NA	NA
09/09/92	----------	Not sampled--floating product					
11/20/92	----------	Not sampled--floating product					
02/12/93	----------	Not sampled--floating product					
05/12/93	----------	Not sampled--floating product					
08/18/93	----------	Not sampled--floating product					
11/10/93	----------	Not sampled-floating product entered the well during purging					
MW-8							
09/09/92	Tetrachloroethene	37	NA	NA	NA	NA	NA
11/24/92	Tetrachloroethene	2					
02/12/93	Tetrachloroethene	< 1	NA	NA	NA	NA	NA
05/12/93	Tetrachloroethene	< 1	NA	NA	NA	NA	NA
08/18/93	Tetrachloroethene	< 1	NA	NA	NA	NA	NA
11/10/93	Tetrachloroethene	< 1	NA	NA	NA	NA	NA
RW-1							
11/06/91	Tetrachloroethene	980	NA	NA	NA	NA	NA
03/10/92	Trichloroethene	1 7	NA	NA	NA	NA	NA
	Tetrachloroethene	400					
06/30/92**	Tetrachloroethene	1,100	NA	NA	NA	NA	NA
09/09/92	Tetrachloroethene	1,500	NA	NA	NA	NA	NA
11/24/92	Tetrachloroethene	1,500	NA	NA	NA	NA	NA
02/12/93	Tetrachloroethene	620	NA	NA	NA	NA	NA
05/12/93	Tetrachloroethene	500	NA	NA	NA	NA	NA
08/18/93	Tetrachloroethene	470	NA	NA	NA	NA	NA
11/10/93	Tetrachloroethene	1,500	NA	NA	NA	NA	NA
MCLs		5	0 010	0.05	0.05	5.0	

Results in parts per billion (ppb), except heavy metals which are in parts per million (ppm)
VOCs Halogenated Volatile Organic Compounds using EPA method 601/8010 and 624 Compounds not shown were not detected
Cd Cadmium using EPA method 200.7
Cr Chromium using EPA method 200.7
Pb Lead using EPA method 239.7
Zn. Zinc using EPA method 200.7
Ni. Nickel using EPA method 200 7
< Results reported as less than the detection limit.
NA Not analyzed. Compounds not shown not detected.
*. Exceeds the MCL of 5 ppb concentration of tetrachloroethane.
MCLs: Maximum Contaminant Levels as reported by the California Department of Health Services 10/24/90.
** Raised Method Reporting Limit (MRL) due to high anality concentration requiring sample dilution.

TABLE 5
VES OPERATION DATA
ARCO STATION 276
Oakland, California
(Page 1 of 2)

DATE	VAPOR EXTRACTION WELLS ON LINE STATUS								COMB WELL FLOW (scfm)	DILUT 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	MW-2							
8/25/92			✓	✓					80	420	500	NM	NS	NS	NS
9/09/92			✓	✓					80	420	500	NM	9,500	NS	NS
10/05/92			✓	✓					80	420	500	22	1,200	578	18
10/23/92			✓	✓					54	446	500	22	990	240	12
11/03/92		✓			✓				45	455	500	29	350	64	< 10
11/17/92	✓								73	427	500	22	200	NS	NS
12/07/92			✓	✓					60	440	500	41	< 10	10	< 10
12/21/92		✓							44	456	500	40	37	NS	NS
1/05/93		✓							30	470	500	45	34	53	17
1/05/93	SYSTEM SHUTDOWN FROM 1/05/93 TO 7/19/93 (HIGH GROUNDWATER LEVEL).														
7/19/93			✓						35	465	500	25	250	20	25
8/10/93		✓							80	420	500	40	110	8 7	10
8/25/93					✓				50	450	500	35	19	NS	NS
9/09/93								✓	47	453	500	NM	330	87	18
9/22/93	SYSTEM SHUTDOWN 9/09/93 TO 10/06/93 FOR REPAIR OF FAILED FLAME ROD.														
10/06/93		✓		✓					47	453	500	18	NS	51	5 6
10/18/93	SYSTEM SHUTDOWN 10/18/93 TO 11/23/93 FOR REPAIR OF A CLOGGED FLAME ARRESTOR.														

SEE NOTES PAGE 2 OF 2

TABLE 5
VES OPERATION DATA
ARCO STATION 276
Oakland, California
(Page 2 of 2)

DATE	VAPOR EXTRACTION WELLS ON LINE STATUS								COMB WELL FLOW (scfm)	DILUT 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	MW-2							
11/23/93	✓	✓	✓	✓	✓		✓	✓	70	430	500	27	209	57	12
12/09/93	✓	✓	✓	✓	✓		✓	✓	70	430	500	54	NS	9.7	6.4
12/29/93	✓	✓	✓	✓	✓		✓	✓	45	455	500	34	NS	<5.0	<5.0
12/29/93	SYSTEM SHUTDOWN ON 12/29/93 DUE TO LOW TPHg VAPOR CONCENTRATIONS IN SOIL GAS.														

NOTES
COMB WELL FLOW = Combined well flow rates
DIL AIR FLOW = Dilution air flow rates
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 276
Oakland, California
(Page 1 of 3)

Sample Location (Date)	Sample ID	TPHg	B	T	E	X
VW-1						
11/17/92	AS-VW1	200	2	3	0.6	4
VW-2						
8/10/93	AS-VW2	110	0.95	0.48	0.56	1.8
8/25/93	AS-VW2	30	0.31	0.23	0.46	1.9
VW-3						
7/19/93	AS-VW3-14:00	250	1	2	1	2
8/10/93	AS-VW3	20	< 0 05	0 20	0.73	2 2
VW-4						
8/10/93	AS-VW4	1900	7	3	3	7
9/22/93	AS-VW4	110	2.5	0.92	0.43	1 6
VW-5						
8/25/93	AS-VW5	19	0 46	0.22	0.43	1.5
9/09/93	AS-VW5	22	0 26	3 2	0.53	2 0
VW-6						
12/21/92	A-VW6	37	< 0.5	5	< 0.5	1
MW-2						
9/09/93	AS-MW2	330	2 9	4.5	0.47	10
9/22/93	AS-VW2#	130	0.94	1 7	0.84	2 7
VW-3 & VW-4						
7/19/93	AS-VW3-14 45#	1000	3	2	2	3
COMBINED WELLS						
6/19/91	WELLS	810	22	7 6	1 2	6.6
7/11/91	WELL	960	18	8.1	< 3.0	12
8/22/91	WELLS	920	27	6.5	1 2	9 6
4/27/92	WELL FIELD	< 6.0	< 0.06	0.085	< 0 06	0.21
5/27/92	WELL FIELD	33	< 0 06	0.28	0.14	0.42
6/26/92	WELL FIELD	110	0.35	0.64	0.23	1.4
7/06/92	WELL INFL	85	1.5	0.81	0.21	1.2
8/03/92	WELL FIELD	160	2.6	0 77	0.21	1.0
9/09/92	WELL FIELD	540	7.7	18	5.5	36
10/05/92	AS-WELLSNFL	990	17	17	4	22
11/03/92	A3-AEUFEO	350	6	7	1	12
12/16/92	COMB WELLS	< 10	< 0.5	2	< 0.5	2
1/05/93	WELL INFL	34	< 0 5	0.8	,0.5	3
11/23/93	AS-COMBINE WELLS	290	2 2	1 2	0 86	5 1

SEE NOTES ON PAGE 3 OF 3

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TABLE 6
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF AIR SAMPLES
ARCO Station 276
Oakland, California
(Page 2 of 3)

Sample Location (Date)	Sample ID	TPHg	B	T	E	X
INFLUENT						
6/12/91	INFLUENT	<6.0	0.081	<0.06	<0.06	<0.06
6/19/91	INFLUENT	140	2.8	1.8	0.24	5.2
7/11/91	INFLUENT	140	4.0	1.4	0.62	4.5
8/22/91	INFLUENT	130	3.4	1 2	0.27	3.0
9/05/91	INFLUENT	86	3 2	1.0	<0.30	1 7
12/20/91	INFLUENT	32	0 40	0.20	<0.06	0.43
1/03/92	INFLUENT	7 5	0.12	<0 06	<0 06	<0.06
1/17/92	INFLUENT	<6 0	<0.06	<0.06	<0.06	<0.06
2/18/92	INFLUENT	<6.0	<0 06	<0.06	<0.06	<0 06
3/02/92	INFLUENT	9.7	0 095	0.22	0.13	1.1
3/17/92	INFLUENT	<6 0	<0.06	<0.06	<0.06	<0.06
3/31/92	INFLUENT	<6.0	<0 06	<0.06	<0.06	<0.06
4/27/92	INFLUENT	<6.0	<0.06	<0 06	<0.06	0.078
5/11/92	INFLUENT	8.2	0.068	0.23	0.064	0 44
5/27/92	INFLUENT	<6 0	<0 06	0.13	<0.06	0.097
6/08/92	INFLUENT	7.8	0.17	0.10	<0.06	<0.06
6/24/92	INFL	6.5	<0.06	0.10	0.11	0.44
7/06/92	INFL	<5 0	<0 05	<0.05	<0.05	<0.05
7/20/92	INFL	<5.0	0 13	0.078	<0.05	<0.05
8/03/92	INFL	12	0 17	0 17	<0 05	<0 05
8/18/92	INFL	<5.0	<0.05	0 37	<0.05	0 15
9/09/92	INFL	1,200	13	36	14	95
9/21/92	INFL	610	6 5	20	9 4	53
10/05/92	AS-SYSSNFL	240	3	3	0.6	5
11/04/92	A2-INF	64	1	2	<0 5	6
12/16/92	INFL	<10	<0 5	<0 5	<0.5	1
1/05/93	INFL	53	<0.5	1	<0.5	3
7/19/93	AS-SYSINF	20	<0.5	2	<0.5	<0.5
8/10/93	AS-INF	8 7	<0 05	0.061	0.33	0 79
9/09/93	AS-INFL	82	<0.125	14	0.79	3.6
10/06/93	AS-COMBINE INFLUENT	51	1.5	2.0	0.38	1.3
11/23/93	AS-INFLUENT	57	0.89	5 1	0.50	2.0
12/09/93	AS-INFLUENT	9 7	<0 050	0.73	0.73	2.2
12/29/93	AS-INFLUENT	<5.0	<0.050	<0 050	<0.050	<0.050
EFFLUENT						
6/12/91	EFFLUENT	<6.0	<0.06	<0 06	<0.06	<0.06
6/19/91	EFFLUENT	28	0 33	0 57	0.14	2.4
7/11/91	EFFLUENT	<6 0	0.063	0.077	<0.06	0.25
8/22/91	EFFLUENT	20	0.29	0 39	0.069	1.0
12/20/91	EFFLUENT	<6.0	<0 06	<0.06	<0.06	<0.06
1/17/92	EFFLUENT	<6.0	<0 06	<0.06	<0.06	<0.06
4/27/92	EFFLUENT	<6 0	<0 06	<0.06	<0.06	0.089
5/27/92	EFFLUENT	<6 0	<0.06	0.097	<0.06	0.060
6/24/92	EFFL	<6.0	<0 06	<0.06	<0.06	0.34
7/06/92	EFFL	<5.0	<0 05	0.073	<0.05	<0 05
8/03/92	EFFL	<5.0	<0.05	0 11	0.065	0.34
9/09/92	EFFL	18	0 24	0.64	0.23	1.6

SEE NOTES ON PAGE 3 OF 3

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TABLE 6
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF AIR SAMPLES
ARCO Station 276
Oakland, California
(Page 3 of 3)

Sample Location (Date)	Sample ID	TPHg	B	T	E	X
EFFLUENT						
10/05/92	AS-SYSEFFL	12	0.8	1	<0.5	2
11/03/92	A1-EFF	<10	<0.5	<0.5	<0.5	<0.5
12/16/92	EFFL	<10	<0.5	3	<0.5	1
1/05/93	EFFL	17	<0.5	8	<0.5	1
7/19/93	AS-SYSEFF	25	<0 5	8	<0.5	1
8/10/93	AS-EFF	10	<0.05	0.09	0.46	1.5
9/09/93	AS-EFFL	18	0.13	<0.05	0.72	2.3
10/06/93	AS-EFFLUENT 1	5.6	0.061	0.44	0.29	0.90
11/23/93	AS-EFFLUENT	12	<0 050	1.3	0.42	1.3
12/09/93	AS-EFFLUENT	64	1.2	6 1	2.9	10
12/29/93	AS-EFFLUENT	<5.0	<0.050	0 69	<0.050	0.33

NOTES.
Results in milligrams per cubic meter (mg/m^3).
BTEX and TPHg analyzed using EPA Methods 5030/8015/8020.
TPHg = Total petroleum hydrocarbons as gasoline
COMBINED WELLS = Combined well flow prior to fresh air dilution.
INFLUENT = Influent to oxidizer after fresh air dilution
EFFLUENT = Effluent from oxidizer to atmosphere
# = Sample labeled improperly by lab

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TABLE 7
SUMMARY OF EXTRACTION RATES AND MASS RECOVERY
ARCO STATION 276
Oakland, California
(Page 1 of 1)

OPERATING PERIOD		OPERATING HOURS	BENZENE EMISSION RATE (ppd)	MASS EXTRACTION RATE (ppd)	ESTIMATED TOTAL POUNDS REMOVED	ESTIMATED TOTAL GALLONS REMOVED
FROM	TO					
10/01/93	10/06/93	SYSTEM SHUTDOWN				
10/06/93	10/18/93	288	0.003	2 3	27	4 3
10/18/93	11/23/93	SYSTEM SHUTDOWN				
11/23/93	12/09/93	384	< 0 002	2 6	42	6.8
12/09/93	12/29/93	480	0.05	0.4	8	1.3
TOTAL THIS QUARTER		1,152	--	--	77	12
TOTAL SINCE STARTUP		5,928	--	--	3,724	600

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

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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 November 30, 1993
Project 0G70-002.01

6 0026.13

ARCHIVE COPY

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
9	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 276, 10600 MacArthur Boulevard, Oakland, CA. Groundwater monitoring is conducted consistent with applicable regulatory guidelines. Please call if you have any questions: (408) 453-7300.

Jim Butera JB

Reviewed by:

REGISTERED ... INDUSTRIAL ... STATE OF CALIFORNIA
No: 4039
Exp. 6/30/96

Robert Porter
Robert Porter, Senior Project Engineer.

Summary of Analytical Results
Volatile Organic Compounds by EPA[1] Methods 624
Fourth Quarter 1993
ARCO Service Station 276
10600 MacArthur Boulevard, Oakland, California
micrograms per liter (µg/l) or parts per billion (ppb)

Well ID and Sample Depth	Sampling Date	PCE[2] (ppb)
MW-1(38)	11/10/93	46.
MW-2	11/10/93	FP.[3]
MW-3(38)	11/10/93	1,300.
MW-4(48)	11/10/93	1,800.
MW-5(47)	11/10/93	42.
MW-6(53)	11/10/93	3,900.
MW-7	11/10/93	FP.
MW-8(37)	11/10/93	<1.
RW-1(49)	11/10/93	1,500.
FB-1[4]	11/10/93	<1.

1. EPA = United States Environmental Protection Agency
2. PCE = Tetrachloroethene
3. FP. = Floating product detected in well, no samples were taken
4. FB = Field blank

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-002.01 STATION ADDRESS : 10600 MacArthur Blvd. Oakland DATE : 11-10-93

ARCO STATION # : 276 FIELD TECHNICIAN : M. Gallegos / J. Williams 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	VW-1	Good	VAULT	Good	NONE	GAGE	15.63	15.63	ND	NA	16.4	—
2	VW-2	Good	VAULT	Good	NONE	GAGE	Dry	Dry	ND	NA	13.0	—
3	VW-3	Good	VAULT	Good	NONE	GAGE	Dry	Dry	ND	NA	15.2	hinges are Broken
4	VW-4	Good	VAULT	Good	NONE	GAGE	16.78	16.78	ND	NA	17.6	hinges are Broken
5	VW-5	Good	VAULT	Good	NONE	GAGE	Dry	Dry	ND	NA	15.5	—
6	VW-6	Good	VAULT	Good	NONE	GAGE	~~8.50~~	Dry	ND	NA	8.50	—
7	VW-7	Good	VAULT	Good	NONE	GAGE	16.98	16.98	ND	NA	17.6	missing Bolt
8	MW-5	Good	Hex	Good	3499	LWC	32.70	32.70	ND	NA	47.0	hinges are Broken
9	MW-8	Good	VAULT	Good	NONE	VA SLIP	30.96	30.96	ND	NA	37.8	hinges are Broken
10	MW-1	Good	Hex	Good	3259	LWC	33.33	33.33	ND	NA	38.8	—
11	RW-1	Good	VAULT	Good	NONE	VAULT SLIP	33.61	33.61	ND	NA	49.0	—
12	MW-3	Good	9/16	Good	3259	LWC	33.80	33.80	ND	NA	38.60	—
13	MW-4	Good	9/16	Good	3259	LWC	33.27	33.27	ND	NA	48.30	—
14	MW-6	Good	15/16	Good	3616	LWC	38.64	38.64	ND	NA	53.9	—

SURVEY POINTS ARE TOP OF WELL CASINGS

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-002.01 STATION ADDRESS : 10600 MacArthur Blvd. Oakland DATE : 11-10-93

ARCO STATION # : 276 FIELD TECHNICIAN : M. Gallegos / ~~J.W.Bill~~ J. Williams 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
15	**MW-2**	Good	Good	Good	NONE	Slip	21.24	21.24	ND*	NA	25.5	—
16	**MW-7**	Good	Good	Good	3259	good	24.51	24.51	ND*	NA	37.0	—
												*product came in during purge

SURVEY POINTS ARE TOP OF WELL CASINGS

Summary of Groundwater Monitoring Data
Fourth Quarter 1993
ARCO Service Station 276
10600 MacArthur Boulevard, Oakland, 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)	TOG[2] Grease 5520C/F (ppm)
MW-1(38)	11/10/93	33.33	ND.[3]	<50.	<0.5	<0.5	<0.5	<0.5	NR.[4]
MW-2	11/10/93	21.24	0.01.	FP.[5]	FP.	FP.	FP.	FP.	FP.
MW-3(38)	11/10/93	33.80	ND.	<400.	<0.5	<0.5	<0.5	<0.9	NR.
MW-4(48)	11/10/93	33.27	ND.	<460.	<0.5	<0.5	<0.5	<1.3	<0.5
MW-5(47)	11/10/93	32.70	ND.	<50.	<0.5	<0.5	<0.5	<1.4	NR.
MW-6(53)	11/10/93	38.64	ND.	<1,000.	<2.5	<2.5	<2.5	<2.5	NR.
MW-7	11/10/93	24.51	0.01	FP.	FP.	FP.	FP.	FP.	FP.
MW-8(37)	11/10/93	30.96	ND.	<50.	<0.5	<0.5	<0.5	1.1	NR.
RW-1(49)	11/10/93	33.61	ND.	<380.	<0.5	<0.5	<0.5	<0.8	NR.
FB-1[6]	11/10/93	NA.[7]	NA.	<50	<0.5	<0.5	<0.5	<0.5	NR.

1. TPH. = Total petroleum hydrocarbons
2. TOG. = Total Oil and Grease
3. ND. = Not detected
4. NR. = Not reported; sample was not scheduled for analysis of the selected parameter
5. FP. = Floating product detected in well, no samples were taken
6. FB. = Field blank
7. NA. = Not applicable

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:**	11/11/93
Project:	ARCO Project No. 0G70-002.01	**Service Request No.:**	SJ93-1386
	ARCO Facility No. 276	**Sample Matrix:**	Water

Inorganic Parameters[1]
mg/L (ppm)

Sample Name:			MW-4 (48)	Method Blank
Date Sampled:			11/10/93	
Analyte	**EPA Method**	**MRL**		
Total Oil and Grease, IR	SM 5520C	0.5	ND	ND
Hydrocarbons, IR	SM 5520F	0.5	ND	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: Kevin Murphy Date: November 29, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	11/11/93
Project:	EMCON Project No. 0G70-002.01	**Service Request No.:**	SJ93-1386
	ARCO Facility No. 276	**Sample Matrix:**	Water

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

Sample Name:		MW-1 (38)	MW-3 (38)	MW-4 (48)
Date Analyzed:		11/19/93	11/19/93	11/19/93
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	<0.9 *	<1.3 *
TPH as Gasoline	50	ND	<400. **	<460. **

Sample Name:		MW-5 (47)	MW-6 (53)	MW-8 (37)
Date Analyzed:		11/19/93	11/19/93 ***	11/19/93 ***
Analyte	**MRL**			
Benzene	0.5	ND	<2.5 ****	ND
Toluene	0.5	ND	<2.5 ****	ND
Ethylbenzene	0.5	ND	<2.5 ****	ND
Total Xylenes	0.5	<1.4 *	<2.5 ****	1.1
TPH as Gasoline	50	ND	<1000. **	ND

* Raised MRL due to matrix interference.

** Raised MRL due to matrix interference. The sample contains a single non-fuel component eluting in the gasoline range, and quantitated as gasoline. The chromatogram does not match the typical gasoline fingerprint.

*** This sample was part of the analytical batch started on November 19, 1993. However, it was analyzed after midnight so the actual date analyzed is November 20, 1993.

**** Raised MRL due to high analyte concentration requiring sample dilution.

Approved by: Kevin Murphy Date: November 29, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	11/11/93
Project:	EMCON Project No. 0G70-002.01	**Service Request No.:**	SJ93-1386
	ARCO Facility No. 276	**Sample Matrix:**	Water

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

Sample Name:		RW-1 (49)	FB-1	Method Blank
Date Analyzed:		11/19/93 *	11/19/93 *	11/19/93
Analyte	**MRL**			
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	0.5	<0.8 **	ND	ND
TPH as Gasoline	50	<380. ***	ND	ND

* This sample was part of the analytical batch started on November 19, 1993. However, it was analyzed after midnight so the actual date analyzed is November 20, 1993.

** Raised MRL due to matrix interference.

*** Raised MRL due to matrix interference. The sample contains a single non-fuel component eluting in the gasoline range, and quantitated as gasoline. The chromatogram does not match the typical gasoline fingerprint.

Approved by: Kevin Murphy Date: November 29, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-002.01
ARCO Facility No. 276

Date Received: 11/11/93
Service Request No.: SJ93-1386
Sample Matrix: Water

Volatile Organic Compounds
EPA Method 8240
µg/L (ppb)

Sample Name:		MW-1 (38)	MW-3 (38) *	MW-4 (48) *
Date Analyzed:		11/18/93	11/18/93	11/22/93
Analyte	**MRL**			
Chloromethane	10	ND	<200.	<200.
Vinyl Chloride	10	ND	<200.	<200.
Bromomethane	10	ND	<200.	<200.
Chloroethane	10	ND	<200.	<200.
Trichlorofluoromethane (Freon 11)	1	ND	<20.	<20.
Trichlorotrifluoroethane (Freon 113)	10	ND	<200.	<200.
1,1-Dichloroethene	1	ND	<20.	<20.
Acetone	20	ND	<400.	<400.
Carbon Disulfide	1	ND	<20.	<20.
Methylene Chloride	10	ND	<200.	<200.
trans-1,2-Dichloroethene	1	ND	<20.	<20.
cis-1,2-Dichloroethene	1	ND	<20.	<20.
2-Butanone (MEK)	10	ND	<200.	<200.
1,1-Dichloroethane	1	ND	<20.	<20.
Chloroform	1	ND	<20.	<20.
1,1,1-Trichloroethane (TCA)	1	ND	<20.	<20.
Carbon Tetrachloride	1	ND	<20.	<20.
Benzene	1	ND	<20.	<20.
1,2-Dichloroethane	1	ND	<20.	<20.
Vinyl Acetate	10	ND	<200.	<200.
Trichloroethene (TCE)	1	ND	<20.	<20.
1,2-Dichloropropane	1	ND	<20.	<20.
Bromodichloromethane	1	ND	<20.	<20.
2-Chloroethyl Vinyl Ether	10	ND	<200.	<200.
trans-1,3-Dichloropropene	1	ND	<20.	<20.
2-Hexanone	10	ND	<200.	<200.
4-Methyl-2-pentanone (MIBK)	10	ND	<200.	<200.
Toluene	1	ND	<20.	<20.
cis-1,3-Dichloropropene	1	ND	<20.	<20.
1,1,2-Trichloroethane	1	ND	<20.	<20.
Tetrachloroethene (PCE)	1	46.	1,300.	1,800.
Dibromochloromethane	1	ND	<20.	<20.
Chlorobenzene	1	ND	<20.	<20.
Ethylbenzene	1	ND	<20.	<20.
Styrene	1	ND	<20.	<20.
Total Xylenes	5	ND	<100.	<100.
Bromoform	1	ND	<20.	<20.
1,1,2,2-Tetrachloroethane	1	ND	<20.	<20.
1,3-Dichlorobenzene	1	ND	<20.	<20.
1,4-Dichlorobenzene	1	ND	<20.	<20.
1,2-Dichlorobenzene	1	ND	<20.	<20.

* Raised MRL due to high analyte concentration requiring sample dilution.

Approved by: Kevin Murphy Date: November 29, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	11/11/93
Project:	EMCON Project No. 0G70-002.01	**Service Request No.:**	SJ93-1386
	ARCO Facility No. 276	**Sample Matrix:**	Water

Volatile Organic Compounds
EPA Method 8240
µg/L (ppb)

Sample Name:		MW-5 (47)	MW-6 (53) *	MW-8 (37)
Date Analyzed:		11/22/93	11/22/93	11/18/93
Analyte	**MRL**			
Chloromethane	10	ND	<500.	ND
Vinyl Chloride	10	ND	<500.	ND
Bromomethane	10	ND	<500.	ND
Chloroethane	10	ND	<500.	ND
Trichlorofluoromethane (Freon 11)	1	ND	<50.	ND
Trichlorotrifluoroethane (Freon 113)	10	ND	<500.	ND
1,1-Dichloroethene	1	ND	<50.	ND
Acetone	20	ND	<1,000.	ND
Carbon Disulfide	1	ND	<50.	ND
Methylene Chloride	10	ND	<500.	ND
trans-1,2-Dichloroethene	1	ND	<50.	ND
cis-1,2-Dichloroethene	1	ND	<50.	ND
2-Butanone (MEK)	10	ND	<500.	ND
1,1-Dichloroethane	1	ND	<50.	ND
Chloroform	1	ND	<50.	ND
1,1,1-Trichloroethane (TCA)	1	ND	<50.	ND
Carbon Tetrachloride	1	ND	<50.	ND
Benzene	1	ND	<50.	ND
1,2-Dichloroethane	1	ND	<50.	ND
Vinyl Acetate	10	ND	<500.	ND
Trichloroethene (TCE)	1	ND	<50.	ND
1,2-Dichloropropane	1	ND	<50.	ND
Bromodichloromethane	1	ND	<50.	ND
2-Chloroethyl Vinyl Ether	10	ND	<500.	ND
trans-1,3-Dichloropropene	1	ND	<50.	ND
2-Hexanone	10	ND	<500.	ND
4-Methyl-2-pentanone (MIBK)	10	ND	<500.	ND
Toluene	1	ND	<50.	ND
cis-1,3-Dichloropropene	1	ND	<50.	ND
1,1,2-Trichloroethane	1	ND	<50.	ND
Tetrachloroethene (PCE)	1	42.	3,900.	ND
Dibromochloromethane	1	ND	<50.	ND
Chlorobenzene	1	ND	<50.	ND
Ethylbenzene	1	ND	<50.	ND
Styrene	1	ND	<50.	ND
Total Xylenes	5	ND	<250.	ND
Bromoform	1	ND	<50.	ND
1,1,2,2-Tetrachloroethane	1	ND	<50.	ND
1,3-Dichlorobenzene	1	ND	<50.	ND
1,4-Dichlorobenzene	1	ND	<50.	ND
1,2-Dichlorobenzene	1	ND	<50.	ND

* Raised MRL due to high analyte concentration requiring sample dilution.

Approved by: Kevin A Murphy Date: November 29, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates		**Date Received:**	11/11/93
Project:	EMCON Project No.	0G70-002.01	**Service Request No.:**	SJ93-1386
	ARCO Facility No.	276	**Sample Matrix:**	Water

Volatile Organic Compounds
EPA Method 8240
µg/L (ppb)

Sample Name:		RW-1 (49) *	FB-1	Method Blank
Date Analyzed:		11/22/93	11/18/93	11/18/93
Analyte	**MRL**			
Chloromethane	10	<200.	ND	ND
Vinyl Chloride	10	<200.	ND	ND
Bromomethane	10	<200.	ND	ND
Chloroethane	10	<200.	ND	ND
Trichlorofluoromethane (Freon 11)	1	<20.	ND	ND
Trichlorotrifluoroethane (Freon 113)	10	<200.	ND	ND
1,1-Dichloroethene	1	<20.	ND	ND
Acetone	20	<400.	ND	ND
Carbon Disulfide	1	<20.	ND	ND
Methylene Chloride	10	<200.	ND	ND
trans-1,2-Dichloroethene	1	<20.	ND	ND
cis-1,2-Dichloroethene	1	<20.	ND	ND
2-Butanone (MEK)	10	<200.	ND	ND
1,1-Dichloroethane	1	<20.	ND	ND
Chloroform	1	<20.	ND	ND
1,1,1-Trichloroethane (TCA)	1	<20.	ND	ND
Carbon Tetrachloride	1	<20.	ND	ND
Benzene	1	<20.	ND	ND
1,2-Dichloroethane	1	<20.	ND	ND
Vinyl Acetate	10	<200.	ND	ND
Trichloroethene (TCE)	1	<20.	ND	ND
1,2-Dichloropropane	1	<20.	ND	ND
Bromodichloromethane	1	<20.	ND	ND
2-Chloroethyl Vinyl Ether	10	<200.	ND	ND
trans-1,3-Dichloropropene	1	<20.	ND	ND
2-Hexanone	10	<200.	ND	ND
4-Methyl-2-pentanone (MIBK)	10	<200.	ND	ND
Toluene	1	<20.	ND	ND
cis-1 3-Dichloropropene	1	<20.	ND	ND
1,1,2-Trichloroethane	1	<20.	ND	ND
Tetrachloroethene (PCE)	1	1,500.	ND	ND
Dibromochloromethane	1	<20.	ND	ND
Chlorobenzene	1	<20.	ND	ND
Ethylbenzene	1	<20.	ND	ND
Styrene	1	<20.	ND	ND
Total Xylenes	5	<100.	ND	ND
Bromoform	1	<20.	ND	ND
1,1,2,2-Tetrachloroethane	1	<20.	ND	ND
1,3-Dichlorobenzene	1	<20.	ND	ND
1,4-Dichlorobenzene	1	<20.	ND	ND
1,2-Dichlorobenzene	1	<20.	ND	ND

* Raised MRL due to high analyte concentration requiring sample dilution.

Approved by: Kenneth Murphy Date: November 29, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	11/11/93
Project:	EMCON Project No. 0G70-002.01	**Service Request No.:**	SJ93-1386
	ARCO Facility No. 276	**Sample Matrix:**	Water

Volatile Organic Compounds
EPA Method 8240
µg/L (ppb)

Sample Name:		Method Blank
Date Analyzed:		11/22/93
Analyte	**MRL**	
Chloromethane	10	ND
Vinyl Chloride	10	ND
Bromomethane	10	ND
Chloroethane	10	ND
Trichlorofluoromethane (Freon 11)	1	ND
Trichlorotrifluoroethane (Freon 113)	10	ND
1,1-Dichloroethene	1	ND
Acetone	20	ND
Carbon Disulfide	1	ND
Methylene Chloride	10	ND
trans-1,2-Dichloroethene	1	ND
cis-1,2-Dichloroethene	1	ND
2-Butanone (MEK)	10	ND
1,1-Dichloroethane	1	ND
Chloroform	1	ND
1,1,1-Trichloroethane (TCA)	1	ND
Carbon Tetrachloride	1	ND
Benzene	1	ND
1,2-Dichloroethane	1	ND
Vinyl Acetate	10	ND
Trichloroethene (TCE)	1	ND
1,2-Dichloropropane	1	ND
Bromodichloromethane	1	ND
2-Chloroethyl Vinyl Ether	10	ND
trans-1,3-Dichloropropene	1	ND
2-Hexanone	10	ND
4-Methyl-2-pentanone (MIBK)	10	ND
Toluene	1	ND
cis-1,3-Dichloropropene	1	ND
1,1,2-Trichloroethane	1	ND
Tetrachloroethene (PCE)	1	ND
Dibromochloromethane	1	ND
Chlorobenzene	1	ND
Ethylbenzene	1	ND
Styrene	1	ND
Total Xylenes	5	ND
Bromoform	1	ND
1,1,2,2-Tetrachloroethane	1	ND
1,3-Dichlorobenzene	1	ND
1,4-Dichlorobenzene	1	ND
1,2-Dichlorobenzene	1	ND

Approved by: Kevin Murphy Date: November 29, 1993

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APPENDIX A

LABORATORY QC RESULTS

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates		**Date Received:**	11/11/93
Project:	EMCON Project No.	0G70-002.01	**Service Request No.:**	SJ93-1386
	Arco Facility No.	276	**Sample Matrix:**	Water

Continuing Calibration Summary
Inorganics
SM 5520F
mg/L (ppm)

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Hydrocarbons Mix	40.	36.6	92.	90-110

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

Approved by: Kevin A Murphy Date: November 29, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	11/11/93
Project:	EMCON Project No. 0G70-002.01	**Service Request No.:**	SJ93-1386
	ARCO Facility No. 276	***Sample Matrix:***	*Water*

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

Sample Name	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria
Hydrocarbon Mix	8.0	ND	7.74	8.70	97.	109.	56-151

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-002.01
ARCO Facility No. 276

Date Received: 11/11/93
Service Request No.: SJ93-1386
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 α,α,α-Trifluorotoluene
MW-1 (38)	11/19/93	74.
MW-3 (38)	11/19/93	84.
MW-4 (48)	11/19/93	80.
MW-5 (47)	11/19/93	81.
MW-6 (53)	11/19/93	84.
MW-8 (37)	11/19/93	80.
RW-1 (49)	11/19/93	79.
FB-1	11/19/93	82.
MS	11/19/93	89.
DMS	11/19/93	89.
Method Blank	11/19/93	76.
	CAS Acceptance Criteria	70-130

Approved by: Kevin Murphy Date: November 29, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-002.01
ARCO Facility No. 276

Date Received: 11/11/93
Service Request No.: SJ93-1386

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

Date Analyzed: 11/19/93

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Benzene	25.	27.0	108.	85-115
Toluene	25.	26.8	107.	85-115
Ethylbenzene	25.	26.9	108.	85-115
Total Xylenes	75.	82.5	110.	85-115
TPH as Gasoline	250.	225.	90.	90-110

Approved by: Kevin Murphy Date: November 29, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-002.01
ARCO Facility No. 276

Date Received: 11/11/93
Service Request No.: SJ93-1386
Sample Matrix: Water

Matrix Spike/Duplicate Matrix Spike Summary
TPH as Gasoline
EPA Methods 5030/California DHS LUFT Method
µg/L (ppb)

Date Analyzed: 11/19/93

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria
TPH as Gasoline	250.	ND	199.	209.	80.	84.	76-130

Approved by: Kevin Murphy Date: November 29, 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:**	11/11/93
Project:	EMCON Project No. 0G70-002.01	**Service Request No.:**	SJ93-1386
	ARCO Facility No. 276	**Sample Matrix:**	Water

Surrogate Recovery Summary
Volatile Organic Compounds
EPA Method 8240

Sample Name	Date Analyzed	Percent Recovery		
		1,2-Dichloroethane - D_4	Toluene - D_8	4-Bromofluorobenzene
MW-1 (28)	11/18/93	104.	94.	96.
MW-3 (38)	11/18/93	105.	96.	95.
MW-4 (48)	11/22/93	101.	97.	97.
MW-5 (47)	11/22/93	102.	95.	96.
MW-6 (53)	11/22/93	102.	96.	96.
MW-8 (37)	11/18/93	112.	97.	96.
RW-1 (49)	11/22/93	103.	96.	96.
FB-1	11/18/93	104.	95.	95.
MW-5 (47) MS	11/18/93	102.	95.	94.
MW-5 (47) DMS	11/18/93	103.	96.	94.
Method Blank	11/18/93	103.	96.	98.
Method Blank	11/22/93	100.	96.	96.
EPA Acceptance Criteria		76-114	88-110	86-115

Approved by: Kevin A Murphy Date: November 29, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-002.01
ARCO Facility No. 276

Date Received: 11/11/93
Service Request No.: SJ93-1386

Initial Calibration Verification
Volatile Organic Compounds
EPA Method 8240
µg/L (ppb)

Date Analyzed: 10/21/93

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Chloromethane *	50	58.9	118.	70-130
Vinyl Chloride *	50	44.7	89.	70-130
Bromomethane *	50	39.3	79.	70-130
Chloroethane *	50	56.0	112.	70-130
Acetone *	50	68.0	136. **	70-130
1,1-Dichloroethene	50	48.0	96.	70-130
Carbon Disulfide	50	46.8	94.	70-130
Methylene Chloride	50	45.1	90.	70-130
trans-1,2-Dichloroethene	50	42.5	85.	70-130
cis-1,2-Dichloroethene	50	50.4	101.	70-130
1,1-Dichloroethane	50	46.3	93.	70-130
Vinyl Acetate *	50	34.0	68. **	70-130
2-Butanone *	50	53.9	108.	70-130
Chloroform	50	47.1	94.	70-130
1,1,1-Trichloroethane (TCA)	50	46.4	93.	70-130
Carbon Tetrachloride	50	48.0	96.	70-130
Benzene	50	45.9	92.	70-130
1,2-Dichloroethane	50	45.3	91.	70-130
Trichloroethene (TCE)	50	48.2	96.	70-130
1,2-Dichloropropane	50	44.1	88.	70-130
Bromodichloromethane	50	43.6	87.	70-130
2-Chloroethyl Vinyl Ether	50	40.6	81.	70-130
2-Hexanone *	50	53.4	107.	70-130
trans-1,3-Dichloropropene	50	46.7	93.	70-130
Toluene	50	46.3	93.	70-130
cis-1,3-Dichloropropene	50	44.6	89.	70-130
1,1,2-Trichloroethane	50	46.3	93.	70-130
Tetrachloroethene (PCE)	50	50.2	100.	70-130
Dibromochloromethane	50	45.4	91.	70-130
Chlorobenzene	50	48.0	96.	70-130
Ethylbenzene	50	48.7	97.	70-130
o-Xylene	50	49.6	99.	70-130
Styrene	50	49.0	98.	70-130
Bromoform	50	45.5	91.	70-130
1,1,2,2-Tetrachloroethane	50	47.8	96.	70-130

* These recoveries are from an analysis on October 29, 1993.
** These two compounds were out of the CAS Acceptance Criteria. The data was accepted since the compounds were not present in any of the samples.

Approved by: Kevin A. Murphy Date: November 29, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	11/11/93
Project:	EMCON Project No. 0G70-002.01	**Service Request No.:**	SJ93-1386
	ARCO Facility No. 276	**Sample Matrix:**	Water

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds
EPA Method 8240
µg/L (ppb)

Sample Name: MW-5 (47)
Date Analyzed: 11/18/93

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	EPA Acceptance Criteria	Relative Percent Difference
1,1-Dichloroethene	250.	ND	271.	282.	108.	109.	61-145	4.
Trichloroethene	250.	ND	246.	258.	98.	103.	71-120	5.
Chlorobenzene	250.	ND	247.	253.	99.	101.	75-130	2.
Toluene	250.	ND	233.	242.	93.	97.	76-125	4.
Benzene	250.	ND	246.	258.	98.	103.	76-127	5.

Approved by: Kevin A Murphy Date: November 29, 1993

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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

Task Order No. EMC-93-5

Chain of Custody

ARCO Facility no.	276	City (Facility)	OAKLAND	Project manager (Consultant)	JIM BUTERA
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

Laboratory name: CAS

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 GAS EPA M602/8020/8015	TPH Modified 8015 Gas / Diesel	Oil and Grease 413.1 / 413.2	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals / VOA / Semi VOA	CAM Metals EPA 6010/7000 TTLC / STLC	Lead Org/DHS / Lead EPA 7420/7421		
MW-1(38)	1-4	4		X		X	HCl	11-10-93	1355		X					X						
MW-2( )	~~5-8~~	4						NO sample			X					X						
5-8 MW-3(38)	~~9-12~~	4						11-10-93	1435		X					X						
9-12 MW-4(48)	~~13-16~~	4						11-10-93	1514		X					X						
13-16 MW-5(47)	~~17-20~~	4						11-10-93	1415		X					X						
17-20 MW-6(53)	~~21~~-20	4						11-10-93	1653		X					X						
MW-7( )		4						NO sample			X					X						
21-24 MW-8(37)	21-24	4						11-10-93	1459		X					X						
25-28 RW-1(49)	25-28	4						11-10-93	1404		X					X						
273 B-1	29-30	3	SW	↓		↓	↓	11-10-93			X					X						
MW-4(48)	35-38	4		X		X	HCl		1514				X									

Special detection Limit/reporting

Special QA/QC

Remarks: 4-40 ml HCl VOA's
4-LITER HCl

Lab number: SJ93-1386

Turnaround time

Priority Rush 1 Business Day ☐

Rush 2 Business Days ☐

Expedited 5 Business Days ☐

Standard 10 Business Days ☐

Condition of sample: Okay

Temperature received: COOL

Relinquished by sampler: [signature]	Date 11-11-93	Time 9:10	Received by
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory: [signature] CAS — Date 11/11/93 — Time 0910

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

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-002-01 SAMPLE ID: MW-1 (38)

PURGED BY: J Williams CLIENT NAME: ARCO 276

SAMPLED BY: J Williams LOCATION: 1100 MacArthur Blvd Oakland Ca.

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

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

CASING ELEVATION (feet/MSL): N/R VOLUME IN CASING (gal.): .89

DEPTH TO WATER (feet): 33.33 CALCULATED PURGE (gal.): 2.68

DEPTH OF WELL (feet): 38.8 ACTUAL PURGE VOL. (gal.): 3

DATE PURGED: 11-10-93 Start (2400 Hr) 1336 End (2400 Hr) 1349

DATE SAMPLED: 11-10-93 Start (2400 Hr) 1352 End (2400 Hr) 1355

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1341	1	6.43	2520	66.1	BROWN	HEAVY
1345	2	6.43	2570	65.9	"	"
1349	3	6.42	2630	66.0	"	"

D. O. (ppm): N/R ODOR: None N/R (COBALT 0 - 100) N/R (NTU 0 - 200)

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

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: OK LOCK #: 3259

REMARKS: ___

Meter Calibration: Date: 11-10-93 Time: 1313 Meter Serial #: 9610 Temperature °F: 68.5

(EC 1000 1020 / 1000) (DI ___) (pH 7 6.98 / 7.00) (pH 10 9.98 / 10.00) (pH 4 3.93 / —)

Location of previous calibration: ___

Signature: [signature] Reviewed By: JB Page 1 of 9

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-002.01 | SAMPLE ID: MW-2
PURGED BY: S. Williams | CLIENT NAME: ARCO 276
SAMPLED BY: S. Williams | LOCATION: 10600 MacArthur Oakland

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.): 2.13
DEPTH TO WATER (feet): 21.24 | CALCULATED PURGE (gal.): 6.46
DEPTH OF WELL (feet): 24.51 | ACTUAL PURGE VOL. (gal.): 1.5

DATE PURGED: 11-10-93 | Start (2400 Hr) 1547 | End (2400 Hr) 15:49
DATE SAMPLED: 11-10-93 | Start (2400 Hr) NA | End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
		NO READING				

D. O. (ppm): NR | ODOR: Strong | 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

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

SAMPLING EQUIPMENT

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

WELL INTEGRITY: OK | LOCK #: 3259

REMARKS: NO READING @ Purge 1.5 GALLONS Product during purging

Meter Calibration: Date: 11-10-93 Time: 1313 Meter Serial #: 9010 Temperature °F: 68.5

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

Location of previous calibration: MW-1

Signature: [signature] | Reviewed By: JB | Page 2 of 9

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-007-01 SAMPLE ID: MW-3 (38')

PURGED BY: J Williams CLIENT NAME: ARCO 276

SAMPLED BY: J Williams LOCATION: 1660 MacArthur Blvd Oakland Ca

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.): .78

DEPTH TO WATER (feet): 33.80 CALCULATED PURGE (gal.): 2.35

DEPTH OF WELL (feet): 38.6 ACTUAL PURGE VOL. (gal.): 3

DATE PURGED: 11-10-93 Start (2400 Hr) 1414 End (2400 Hr) 1427

DATE SAMPLED: 11-10-93 Start (2400 Hr) 1433 End (2400 Hr) 1435

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1420	1	6.54	1163	64.6	BROWN	HEAVY
1424	2	6.51	1229	64.9	"	"
1427	3	6.51	1237	65.1	"	"

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

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: OK LOCK #: 3259

REMARKS: ___

Meter Calibration: Date: 11-10-93 Time: 1213 Meter Serial #: 9010 Temperature °F: 68.5

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

Location of previous calibration: MW-1

Signature: Jon Williams Reviewed By: JB Page 3 of 9

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-002-01 SAMPLE ID: MW-4(48)

PURGED BY: J. Williams CLIENT NAME: ARCO 276

SAMPLED BY: J. Williams LOCATION: 10600 MacArthur Blvd Oakland Ca

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

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

CASING ELEVATION (feet/MSL): 101.2 VOLUME IN CASING (gal.): 2.36

DEPTH TO WATER (feet): 33.27 CALCULATED PURGE (gal.): 7.36

DEPTH OF WELL (feet): 48.3 ACTUAL PURGE VOL. (gal.): 7.5

DATE PURGED: 11-10-93 Start (2400 Hr) 1455 End (2400 Hr) 1508

DATE SAMPLED: 11-10-93 Start (2400 Hr) 1510 End (2400 Hr) 1514

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1500	2.5	6.87	1575	63.5	BROWN	HEAVY
1503	5.	6.84	1518	66.1	"	"
1508	7.5	6.88	1509	65.7	"	"

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	✓ 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: OK LOCK #: 3259

REMARKS: ___

Meter Calibration: Date: 11-10-93 Time: 1313 Meter Serial #: 9010 Temperature °F: 68.5

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

Location of previous calibration: MW-1

Signature: [signature] Reviewed By: [signature] Page 4 of 9

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-002.01 SAMPLE ID: MW-5

PURGED BY: M. Gallegos CLIENT NAME: ARCO #276

SAMPLED BY: M. Gallegos LOCATION: Oakland, CA

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.):	9.34
DEPTH TO WATER (feet):	32.70	CALCULATED PURGE (gal.):	28.02
DEPTH OF WELL (feet):	47.0	ACTUAL PURGE VOL. (gal.):	28.5

DATE PURGED: 11-10-93 Start (2400 Hr) 1390 End (2400 Hr) 1402

DATE SAMPLED: 11-10-93 Start (2400 Hr) 1415 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1355	9.5	6.78	521	69.6	Clear	~~heavy~~ Light
1358	19.0	6.75	529	69.2	"	trace
1402	28.5	6.72	523	68.8	"	"

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

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

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

SAMPLING EQUIPMENT

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

WELL INTEGRITY: Good. LOCK #: ~~Locked~~ 3455

REMARKS: All Samples taken

Meter Calibration: Date: 11-10-93 Time: 1345 Meter Serial #: 9204 Temperature °F: 67.0

(EC 1000 1116 / 1000) (DI ___) (pH 7 702 / 700) (pH 10 977 / 1000) (pH 4 400 / 400)

Location of previous calibration: ___

Signature: M. Gallegos Reviewed By: JB Page 5 of 9

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-002.01 SAMPLE ID: MW-6

PURGED BY: M. Gallegos CLIENT NAME: ARCO #276

SAMPLED BY: M. Gallegos LOCATION: Oakland, CA

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

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 2.49

DEPTH TO WATER (feet): 38.64 CALCULATED PURGE (gal.): 7.47

DEPTH OF WELL (feet): 53.9 ACTUAL PURGE VOL. (gal.): 7.5

DATE PURGED: 11-10-93 Start (2400 Hr) 1635 End (2400 Hr) 1645

DATE SAMPLED: 11-10-93 Start (2400 Hr) 1653 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1638	2.5	7.15	2460	63.6	Brn	Heavy
1642	5.0	6.88	2470	64.4	"	"
1645	7.5	6.95	2460	64.6	"	"

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): ~~None~~ FB-1

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

WELL INTEGRITY: Good LOCK #: 3616

REMARKS: All Samples taken

Meter Calibration: Date: 11-10-93 Time: ___ Meter Serial #: 9204 Temperature °F: ___

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

Location of previous calibration: MW-5

Signature: M. J. Gallegos Reviewed By: JB Page 6 of 9

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-002-01 | SAMPLE ID: MW-7

PURGED BY: S. Williams | CLIENT NAME: ARCO 2711

SAMPLED BY: S. Williams | LOCATION: 10600 MacArth...

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.): 20

DEPTH TO WATER (feet): 24.51 | CALCULATED PURGE (gal.): 6

DEPTH OF WELL (feet): 37.0 | ACTUAL PURGE VOL. (gal.): 2

DATE PURGED: 11-10-93 | Start (2400 Hr) 1635 | End (2400 Hr) —

DATE SAMPLED: 11-10-93 | Start (2400 Hr) NA | End (2400 Hr) NA

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
		NO SAMPLE				

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

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

SAMPLING EQUIPMENT

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

WELL INTEGRITY: OK | LOCK #: 3259

REMARKS: Product during purging .01 - Two Gallons

Meter Calibration: Date: 11-10-93 Time: 1315 Meter Serial #: 9010 Temperature °F: 68.5

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

Location of previous calibration: MW-1

Signature: [signature] Reviewed By: JS Page 7 of 9

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-002.01 SAMPLE ID: MW-8

PURGED BY: M. Gallegos CLIENT NAME: ARCO #276

SAMPLED BY: M. Gallegos LOCATION: OAKLAND, CA

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.):	4.44
DEPTH TO WATER (feet):	30.96	CALCULATED PURGE (gal.):	13.40
DEPTH OF WELL (feet):	37.8	ACTUAL PURGE VOL. (gal.):	13.5

DATE PURGED: 11-10-93 Start (2400 Hr) 1445 End (2400 Hr) 1453

DATE SAMPLED: 11-10-93 Start (2400 Hr) 1459 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1448	4.5	7.13	617	68.5	cloudy	moderate
1450	9.0	6.91	615	68.8	"	"
1453	13.5	6.88	618	69.0	"	"

D. O. (ppm): NR ODOR: Slight 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®)
___ Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
X Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: Vault

REMARKS: All Samples taken

Meter Calibration: Date: 11-10-93 Time: ___ Meter Serial #: 9204 Temperature °F: ___

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

Location of previous calibration: MW-5

Signature: [signature] Reviewed By: JB Page 8 of 9

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-002.01 SAMPLE ID: RW-1

PURGED BY: M. Gallegos CLIENT NAME: ARCO # 274

SAMPLED BY: M. Gallegos LOCATION: OAKLAND, 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.): 22.62

DEPTH TO WATER (feet): 33.61 CALCULATED PURGE (gal.): 67.86

DEPTH OF WELL (feet): 49.0 ACTUAL PURGE VOL. (gal.): ___

DATE PURGED: 11-10-93 Start (2400 Hr) 1531 End (2400 Hr) 1551

DATE SAMPLED: 11-10-93 Start (2400 Hr) 1404 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1538	23.0	6.98	1870	67.2	Clear	trace
1544	46.0	7.15	1844	66.8	"	"
1551	68.0	7.04	1844	66.6	"	"

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

___ 2" Bladder Pump ___ Bailer (Teflon®)

___ Centrifugal Pump ___ Bailer (PVC)

X 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 #: VAULT

REMARKS: All Samples taken

Meter Calibration: Date: 11-10-93 Time: ___ Meter Serial #: 9204 Temperature °F: ___

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

Location of previous calibration: MW-5

Signature: [signature] Reviewed By: [signature] Page 9 of 9

RESNA
Working to Restore Nature

APPENDIX B

CERTIFIED ANALYTICAL REPORTS WITH CHAIN-OF-CUSTODY FOR AIR SAMPLES

SEQUOIA ANALYTICAL

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

le 6002615

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Valli Voruganti

Project: Arco 276, Oakland

Enclosed are the results from 2 air samples received at Sequoia Analytical on October 7,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3J22901	Air, AS-Effluent 1	10/6/93	EPA 5030/8015/8020
3J22902	Air, AS-Combine Influent	10/6/93	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 276, Oakland	Sampled:	Oct 6, 1993
3315 Almaden Expwy., Suite 34	Sample Matrix:	Air	Received:	Oct 7, 1993
San Jose, CA 95118	Analysis Method:	EPA 5030/8015/8020	Reported:	Oct 11, 1993
Attention: Valli Voruganti	First Sample #:	3J22901		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit mg/m³	Sample I.D. 3J22901 AS-Effluent 1	Sample I.D. 3J22902 AS-Combine Influent
Purgeable Hydrocarbons	5.0	5.6	51
Benzene	0.050	0.061	1.5
Toluene	0.050	0.44	2.0
Ethyl Benzene	0.050	0.29	0.38
Total Xylenes	0.050	0.90	1.3
Chromatogram Pattern:		Gas	Gas

Quality Control Data

Report Limit Multiplication Factor:	1.0	2.5
Date Analyzed:	10/7/93	10/7/93
Instrument Identification:	GCHP-3	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	103	126

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: Valli Voruganti

Client Project ID: Arco 276, Oakland
Matrix: Liquid

QC Sample Group: 3J22901-2

Reported: Oct 11, 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
Conc. Spiked:	10	10	10	30
Units:	µg/L	µg/L	µg/L	µg/L
LCS Batch#:	BLK100793	BLK100793	BLK100793	BLK100793
Date Prepared:	-	-	-	-
Date Analyzed:	10/7/93	10/7/93	10/7/93	10/7/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
LCS % Recovery:	100	100	100	100
Control Limits:	80-120	80-120	80-120	80-120
MS/MSD Batch #:	3J15301	3J15301	3J15301	3J15301
Date Prepared:	-	-	-	-
Date Analyzed:	10/7/93	10/7/93	10/7/93	10/7/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Matrix Spike % Recovery:	110	110	110	107
Matrix Spike Duplicate % Recovery:	94	95	95	97
Relative % Difference:	16	15	15	9.8

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 LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 276-93-5A

Chain of Custody

ARCO Facility no 276	City (Facility) Oakland	Project manager (Consultant) Vali Voruganti	Laboratory name Jes
ARCO engineer Michael Whelan	Telephone no (ARCO)	Telephone no (Consultant) (408) 264 7723	Fax no (Consultant) 264-2431
Consultant name Resna	Address (Consultant) 335 Almaden Exp Suit 34 San Jose CA 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 Semi Metals ☐ VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
AS-EFFLUENT 1					/			10-6-93	17:50		X											01
AS-Combine INFLUENT					/			"	17:55		X											02

Special detection Limit/reporting: mg/m³

Special QA/QC

Remarks

Lab number 9310229

Turnaround time

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

Condition of sample:

Relinquished by sampler — Date 10-7-93 — Time 10:26

Relinquished by — Date 10/7/93 — Time 12:31

Relinquished by — Date — Time

Temperature received

Received by

Received by

Received by laboratory — Date 10-7-93 — Time 12:30

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: John Young

Project: Arco 276, Oakland

Enclosed are the results from 3 air samples received at Sequoia Analytical on November 24,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3KE9501	Air, As-Combine Wells	11/23/93	EPA 5030/8015/8020
3KE9502	Air, As-Influent	11/23/93	EPA 5030/8015/8020
3KE9503	Air, As-Effluent	11/23/93	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
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: John Young

Client Project ID: Arco 276, Oakland
Sample Matrix: Air
Analysis Method: EPA 5030/8015/8020
First Sample #: 3KE9501

Sampled: Nov 23, 1993
Received: Nov 24, 1993
Reported: Dec 1, 1993

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3KE9501 As-Combine Wells	Sample I.D. 3KE9502 As-Influent	Sample I.D. 3KE9503 As-Effluent
Purgeable Hydrocarbons	5.0	290	57	12
Benzene	0.050	2.2	0.89	N.D.
Toluene	0.050	1.2	5.1	1.3
Ethyl Benzene	0.050	0.86	0.50	0.42
Total Xylenes	0.050	5.1	2.0	1.3
Chromatogram Pattern:		Gas & Non-Gas Mix <C8	Gas & Non-Gas Mix <C8	Gas

Quality Control Data

Report Limit Multiplication Factor:	5.0	1.0	1.0
Date Analyzed:	11/24/93	11/24/93	11/24/93
Instrument Identification:	GCHP-3	GCHP-3	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	89	108	95

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: John Young

Client Project ID: Arco 276, Oakland
Matrix: Liquid

QC Sample Group: 3KE9501-3

Reported: Dec 1, 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#:	3KC6502	3KC6502	3KC6502	3KC6502
Date Prepared:	-	-	-	-
Date Analyzed:	11/24/93	11/24/93	11/24/93	11/24/93
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:	95	96	97	93
Matrix Spike Duplicate % Recovery:	86	86	87	87
Relative % Difference:	9.9	11	11	6.7
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.

Chain of Custody

ARCO Facility no. 276	City (Facility) Oakland	Project manager (Consultant) John Young	Laboratory name Sequoia
ARCO engineer Michael Whelan	Telephone no (ARCO)	Telephone no. (Consultant) (408) 264-7723	Fax no. (Consultant) (408) 264-2435
Consultant name Resna Ind	Address (Consultant) 3315 Almaden Expy Suite 34 San Jose 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 EPA M602/8020/8015 Eng	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 - Combine Wells		✓						11/23/93	16:45		X		01									
AS - INFLUENT		✓						11	16:50		X		02									
AS - EFFLUENT		✓						11	16:55		X		03									

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number 9311E95

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	11/24/93	14:15	Received by
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory: Date 11/24 Time 1415

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

APPC-3292 (2-91)

SEQUOIA ANALYTICAL

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

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

Project: Arco 276, Oakland

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
3L40901	Air, AS-Influent	12/9/93	EPA 5030/8015/8020
3L40902	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 276, Oakland	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 13, 1993
Attention: Bruce Maeda	First Sample #:	3L40901		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3L40901 AS-Influent	Sample I.D. 3L40902 AS-Effluent
Purgeable Hydrocarbons	5.0	9.7	64
Benzene	0.050	N.D.	1.2
Toluene	0.050	0.73	6.1
Ethyl Benzene	0.050	0.73	2.9
Total Xylenes	0.050	2.2	10
Chromatogram Pattern:		Gas	Gas

Quality Control Data

Report Limit Multiplication Factor:	1.0	2.5
Date Analyzed:	12/9/93	12/9/93
Instrument Identification:	GCHP-17	GCHP-17
Surrogate Recovery, %: (QC Limits = 70-130%)	94	101

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 276
Matrix: Liquid

QC Sample Group: 3L40901 - 02

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#:	3L30001	3L30001	3L30001	3L30001
Date Prepared:	12/9/93	12/9/93	12/9/93	12/9/93
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.

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
For Project Manager

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No.

Chain of Custody

ARCO Facility no. 276	City (Facility) Oakland	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 Kesna Ind.	Address (Consultant) 335 Almaden Exp Suit 34 San Jose CA 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 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					—			12-9-93	14:35		✓										9312409	-01
AS-Effluent					—				14:35		✓											-02

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:		
Relinquished by sampler	Date 12-9-93	Time 15:23	Received by		
Relinquished by	Date	Time	Received by		
Relinquished by	Date	Time	Received by laboratory	Date 12-9-93	Time 15:23

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

APPC-3292 (2-91)

SEQUOIA ANALYTICAL

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

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: John Young

ARCHIVE COPY

Project: Arco 276, Oakland

Enclosed are the results from 2 air samples received at Sequoia Analytical on December 30,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3LE5901	Air, AS-Influent	12/29/93	EPA 5030/8015/8020
3LE5902	Air, AS-Effluent	12/29/93	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

V M Tague

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 276, Oakland	Sampled:	Dec 29, 1993
3315 Almaden Expwy., Suite 34	Sample Matrix:	Air	Received:	Dec 30, 1993
San Jose, CA 95118	Analysis Method:	EPA 5030/8015/8020	Reported:	Jan 10, 1994
Attention: John Young	First Sample #:	3LE5901		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3LE5901 AS-Influent	Sample I.D. 3LE5902 AS-Effluent
Purgeable Hydrocarbons	5.0	N.D.	N.D.
Benzene	0.050	N.D.	N.D.
Toluene	0.050	N.D.	0.69
Ethyl Benzene	0.050	N.D.	N.D.
Total Xylenes	0.050	N.D.	0.33
Chromatogram Pattern:		--	Gas

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0
Date Analyzed:	12/30/93	12/30/93
Instrument Identification:	GCHP-3	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	108	106

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: John Young

Client Project ID: Arco 276, Oakland
Matrix: Liquid

QC Sample Group: 3LE5901-2

Reported: Jan 10, 1994

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#:	3LC5602	3LC5602	3LC5602	3LC5602
Date Prepared:	-	-	-	-
Date Analyzed:	12/30/93	12/30/93	12/30/93	12/30/93
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:	85	98	85	87
Matrix Spike Duplicate % Recovery:	100	100	100	100
Relative % Difference:	16	2.0	16	14
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. ~~[illegible]~~ 276-93-5A

Chain of Custody

ARCO Facility no. 276	City (Facility) Oakland	Project manager (Consultant) John Young	Laboratory name Sequoia
ARCO engineer Michael Whelan	Telephone no (ARCO)	Telephone no. (Consultant) 408 264-7723	Fax no. (Consultant) 408 264 2435
Consultant name Resna Ind.	Address (Consultant) 2315 Almaden Exp Suit 34 S.J. CA 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 ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
AS-INFLUENT		1			/			12-29-93	13:15		X											
AS-EFFLUENT		1			/			"	13:20		X											

SEE ALSO ATTACHED SEQUOIA COC

Method of shipment

Special detection Limit/reporting

Special QA/QC

Remarks
Vickie Tague

Lab number 9312E59

Condition of sample:

Temperature received:

Relinquished by sampler [signature]	Date 12/30/93	Time 12:25	Received by SPO 1/4/94 10:45	
Relinquished by	Date	Time	Received by	
Relinquished by	Date	Time	Received by laboratory	Date / Time

Turnaround time

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

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

SEQUOIA ANALYTICAL
CHAIN OF CUSTODY

❑ 680 Chesapeake Drive • Redwood City, CA 94063 • (415) 364-9600 FAX (415) 364-9233
❑ 819 West Striker Ave. • Sacramento, CA 95834 • (916) 921-9600 FAX (916) 921-0100
❑ 1900 Bates Ave., Suite LM • Concord, CA 94520 • (510) 686-9600 FAX (510) 686-9689

Company Name: Resna Industries	Project Name: Arco 2780
Address: 3315 Almaden Exp Suit 34	Billing Address (if different):
City: San Jose State: CA Zip Code: 95118	
Telephone: 408 264-7723 FAX #: 264-2435	P.O. #:
Report To: John Young Sampler: [illegible]	QC Data: ❑ Level A (Standard) ❑ Level B ❑ Level C ❑ Level D

Turnaround Time: ☑ 10 Working Days ❑ 3 Working Days ❑ 2 - 8 Hours ❑ 7 Working Days ❑ 2 Working Days ❑ 5 Working Days ❑ 24 Hours

❑ Drinking Water ❑ Waste Water ☑ Other

Analyses Requested: BTEX TPH-G

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Sequoia's Sample #	Comments
1 AS-INFLUENT	12-29-93 13:15				X	9312E59-01
2 AS-EFFLUENT	12-29-93 13:20				X	-02
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

Relinquished By: [signature]	Date: 12/30	Time: 12:25	Received By: [signature]	Date: 12/30 Time: 12:25
Relinquished By:	Date:	Time:	Received By:	Date: Time:
Relinquished By:	Date:	Time:	Received By Lab:	Date: Time:

Were Samples Received in Good Condition? ❑ Yes ❑ No Samples on Ice? ❑ Yes ❑ No Method of Shipment_____ Page __ of __

Pink - Client
Yellow - Sequoia
White - Sequoia