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TRANSMITTAL

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

DATE: December 30, 1993
PROJECT NUMBER: 60026.13
SUBJECT: ARCO Station 276

FROM: Zbiginiew L. Ignatowicz

3756 12/30/93

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1	12/30/93	Letter Report, Quarterly Groundwater Monitoring and Remediation Performance Evaluation, Third 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

Zbigniew Ignatowicz

Zbigniew L. Ignatowicz, Staff Geologist

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

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LETTER REPORT
QUARTERLY GROUNDWATER MONITORING AND REMEDIATION PERFORMANCE EVALUATION

Third Quarter 1993
at
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

60026.13

RESNA
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December 30, 1993
1014MWHE
60026.13

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

Subject: Letter Report, Quarterly Groundwater Monitoring and Remediation Performance Evaluation, Third Quarter 1993 at ARCO Station 276, 10600 MacArthur Boulevard, Oakland, California.

Mr. Whelan:

As requested by ARCO Products Company (ARCO), RESNA Industries Inc. (RESNA) prepared this letter report summarizing the results of third quarter 1993 groundwater monitoring performed by ARCO's contractor, EMCON Associates (EMCON) of San Jose, California, at the above-referenced site. Included in this report is a remedial performance evaluation of an existing vapor extraction system (VES) which was restarted on July 19, 1993. The initial startup of the system was on August 25, 1992, but a rising groundwater level had prevented operation of the system from early January 1993 until restarting the system on July 19, 1993.

The objectives of this quarterly groundwater monitoring event are to evaluate changes in the groundwater levels, and changes in concentrations of gasoline hydrocarbons in the local groundwater associated with the former gasoline-storage tanks at the site. This monitoring event was also performed to evaluate changes in concentrations of volatile organic compounds (VOCs) in the local groundwater. The field work and laboratory analyses of groundwater samples during this quarter were performed under the direction of EMCON and included measuring depths to groundwater, subjectively analyzing groundwater for the presence of floating gasoline product, collecting groundwater samples from the wells for laboratory analyses, and directing a State-certified laboratory to analyze the groundwater samples. Field procedures and acquisition of field data were performed under the direction of EMCON; evaluation and warrant of their field data and field protocol is beyond RESNA's scope of work. RESNA's scope of work was limited to the following: inspecting wells MW-2 and MW-7 for the presence of floating gasoline product and, if present, removing the product; interpreting field and laboratory analytical data; evaluating trends in reported hydrocarbon and VOCs concentrations in the local groundwater; measuring

groundwater levels; and, evaluating direction of groundwater flow and gradient beneath the site. The operating ARCO Station 276 is located on the southeastern corner of the intersection of 106th Avenue and MacArthur Boulevard in Oakland, California, as shown on the Site Vicinity Map, Plate 1. The locations of the former and existing gasoline underground storage tanks (USTs), groundwater monitoring wells and vapor extraction wells are shown on the Generalized Site Plan, Plate 2.

Previous environmental work is discussed in prior subsurface investigation reports listed in the References section.

Groundwater Sampling and Gradient Evaluation

Depth to water (DTW) levels in wells MW-1 and MW-3 through MW-8, and RW-1 were measured and quarterly sampling was performed by EMCON field personnel on August 18, 1993. Monitoring well MW-2 was not monitored or sampled because EMCON field personnel was unable to access the well (a car was parked over the well). The results of EMCON's field work on the site, including DTW measurements and subjective analysis for the presence of product in the groundwater in MW-1 and MW-3 through MW-8, and RW-1, are presented on EMCON's Field Reports, Summary of Groundwater Monitoring Data, and Water Sample Field Data Sheets. Copies of these reports are included in Appendix A.

The DTW levels, wellhead elevations, groundwater elevations, and subjective observations for the presence of free product in the groundwater from MW-1 and MW-3 through MW-8, and RW-1 for this and previous quarters are summarized in Table 1, Cumulative Groundwater Monitoring Data. EMCON's DTW measurements were used to evaluate groundwater gradients for this quarter. The average groundwater gradient and flow direction for this quarter was 0.002 ft/ft to the northeast.

Floating gasoline product 0.01 foot thick was detected in offsite well MW-7 on August 18, 1993. Evidence of product or sheen was not observed in the other monitoring wells during this quarter. Quantities of floating product and water removed are presented in Table 2, Approximate Cumulative Product Removed. There was no product recovered at the site for this quarter; the total product removed at this site to date by hand bailing is approximately 19 gallons.

Wells MW-1, MW-3, through MW-6, MW-8, and RW-1 were constructed in a deeper water-bearing zone, and offsite well MW-7 and onsite well MW-2 were constructed in a shallow groundwater bearing zone.

Groundwater elevations of the shallow and deep water-bearing zone for this quarter are shown on the Groundwater Gradient Map, Plate 3. The contours and flow directions depicted on Plate 3 are those interpreted for the deeper water-bearing zone.

Groundwater monitoring wells MW-1, MW-3 through MW-6, MW-8, and RW-1 were purged and sampled by EMCON field personnel on August 18, 1993. Samples were not collected from monitoring well MW-2, since well was inaccessible, and monitoring well MW-7 due to floating product in the well. Purge water generated during purging and sampling of the monitoring wells was transported to Gibson Environmental in Redwood City, California for recycling.

VAPOR EXTRACTION SYSTEM OPERATION

Description of the VES

The system began operation on August 25, 1992. The VES consists of eight vapor extraction wells (VW-1 through VW-7, and monitoring well MW-2) with their locations shown on Plate 6. A 1.5 horsepower Rotron vacuum blower extracts petroleum hydrocarbon vapor from the subsurface soils associated with the former USTs at the site. Extracted vapor is directed through piping to a 500 standard cubic feet per minute (scfm at 70 degrees Fahrenheit) gas fired Anguil Catalytic Oxidizer (CatOx) for abatement prior to discharge to the atmosphere. System operation is regulated under the Bay Area Air Quality Management District (BAAQMD) Permit to Operate No. 5998.

VES Operation

The data presented in this section covers the period from July 1, 1993 to September 30, 1993. The system has been shutdown the previous two quarters because the available well screen was submerged by rising groundwater. The system was restarted on July 19, 1993 and ran continuously through September 9, 1993. Between September 9 and September 22, 1993 the system shut itself down due to a failed flame rod. The system remained shutdown for the remainder of the third quarter, and was restarted during the fourth quarter 1993. A chronological list of on-line wells is located in Table 6, Operation and Performance Data.

System Monitoring

The onsite VES is monitored twice a month to evaluate the treatment system performance, at which time the following measurements are recorded: applied vacuum of the on-line wells; average extracted air flow rates influent to the blower (prior to fresh-air dilution); and

extracted hydrocarbon vapor concentrations from the well field, influent to the CatOx, and effluent to the CatOx as measured by a flame-ionization detector (FID). In addition to these measurements, several other parameters such as the process temperature, stack temperature, and flame voltage are also recorded during every site visit for maintenance purposes.

LABORATORY METHODS AND RESULTS

Groundwater Samples

Under the direction of EMCON, groundwater samples collected from the wells were analyzed by Columbia Analytical Services, Inc., located in San Jose, California (Hazardous Waste Testing Laboratory Certification No. 1426). The groundwater samples from MW-1, MW-3 through MW-6, MW-8, and RW-1 were analyzed for total petroleum hydrocarbons as gasoline (TPHg), and benzene, toluene, ethylbenzene, and total xylenes (BTEX) using modified Environmental Protection Agency (EPA) Methods 5030/8020/California DHS LUFT Method. Concentrations of TPHg and benzene in groundwater are shown on Plate 5, TPHg/Benzene Concentrations in Groundwater. Groundwater samples from wells MW-1, MW-3 through MW-6, MW-8, and RW-1 were also analyzed for VOCs using EPA Method 624. Concentrations of VOCs in the groundwater are shown on Plate 6, Tetrachlorethlene (PCE) Concentrations in Groundwater. In addition, the sample from well MW-4 was analyzed for total oil and grease (TOG) using Standard Method 5520C/F. The Chain-of-Custody Records and Laboratory Analysis Reports are included in Appendix A. Results of these and previous groundwater analyses are summarized in Table 3, Cumulative Results of Laboratory Analyses of Groundwater Samples--TPHg, TPHd, BTEX, and TOG and Table 4, Cumulative Results of Laboratory Analyses of Groundwater Samples--VOCs and Metals.

Since the last quarter, floating product has continued to be detected in MW-7 by EMCON and RESNA field personnel. 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 MW-1, 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.

Concentrations of TOG decreased in well MW-4 to nondetectable level. Concentrations of PCE increased in wells MW-4 and MW-5, decreased in MW-1, MW-3, MW-6 and RW-1, and continued to be nondetectable in well MW-8.

Air Samples

Air samples are collected from the combined well field prior to fresh-air dilution at the remediation compound once a month and when a new well is brought on line. Influent and effluent air samples to the CatOx are also collected monthly to evaluate system performance. Air samples collected were analyzed for TPHg and BTEX using modified EPA Methods 5030/8015/8020 by GTEL Environmental Laboratories (GTEL) in Concord, California and by Sequoia Analytical Laboratories in Redwood City, California. The results of laboratory analysis of air samples are summarized in Table 5, Cumulative Results of Laboratory Analysis of Air Samples. Copies of laboratory reports and individual chain-of-custody records for air samples are included in Appendix B.

RESULTS OF REMEDIAL PERFORMANCE EVALUATION

VES System Performance

Table 6, Operation and Performance Data, contains a summary of the VES monitoring data and a chronological listing of the wells used during each period of operation. TPHg concentrations decreased for three of the wells used during the third quarter of 1993. System shutdown due to the failed flame rod prevented the collection of accurate data after September 9, 1993; therefore performance with MW-2 on-line could not be analyzed. For more detailed information regarding TPHg concentration decreases see Table 6.

Estimated Hydrocarbon Removal Rates

Table 6 shows instantaneous hydrocarbon removal rates pounds per day estimated from analytical results of air samples collected from the influent stream of the CatOx (after fresh-air dilution). Table 7, Estimated Quantity of Gasoline Removed, contains estimated instantaneous removal rates, as well as, total pounds removed for a give period. An estimated total of 32 pounds (5.2 gallons) was recovered in the third quarter of 1993, this brings the total amount of gasoline recovered by this VES since its initial startup June 12, 1991 to 3,647 pounds (582 gallons). These estimated totals can be found in Table 7.

CONCLUSIONS

The shallow water-bearing zone at the site has been impacted by gasoline hydrocarbons. The deeper water-bearing zone has been impacted by VOCs, but does not appear to have been impacted by gasoline hydrocarbons. Floating gasoline product was observed by EMCON

field personnel in shallow offsite well MW-7 this quarter. Analytical results of groundwater samples from deeper wells MW-1, MW-3, MW-4, MW-5, MW-6, MW-8 and RW-1 indicated nondetectable TPHg and BTEX. In wells MW-1, MW-3, MW-4, MW-6, and RW-1 the samples reportedly contained a discrete, non-fuel component. This discrete non-fuel component is confirmed by the presence of PCE which is the predominant VOC in the deeper groundwater zone. Based on the distribution of PCE in groundwater it appears that PCE originated from an offsite and upgradient source (near offsite deeper well MW-6). The possibility of an offsite source was discussed in greater detail in RESNA's Additional Subsurface Investigation and Interim Remediation report (RESNA, February 1, 1993).

The high groundwater level present in the vapor extraction wells during the two previous quarters decreased to allow startup of the VES on July 19, 1993. The performance results of the operation of the onsite VES during the third quarter 1993 indicated that extracted vapor concentrations from VW-3 and VW-2 decreased significantly; by 92 percent and 73 percent, respectively. An estimated total of 32 pounds (5.2 gallons) of hydrocarbons were recovered this quarter, with the total since startup on June 16, 1991 being 3,647 pounds (582 gallons).

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

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

Sincerely,
RESNA Industries Inc.

Zbigniew L. Ignatowicz
Staff Geologist

David Peterson
Staff Engineer

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

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

Enclosures: References

Plate 1:	Site Vicinity Map
Plate 2:	Generalized Site Plan
Plate 3:	Groundwater Gradient Map, August 18, 1993
Plate 4:	VES Schematic
Plate 5:	TPHg/Benzene Concentrations in Groundwater, August 18, 1993
Plate 6:	PCE Concentrations in Groundwater, August 18, 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:	Cumulative Results of Laboratory Analysis of Air Samples
Table 6:	Operation and Performance Data
Table 7:	Estimated Quantity of Gasoline Removed
Appendix A:	EMCON's Field Reports, Summary of Groundwater Monitoring Data, Certified Analytical Reports with Chain-of-Custody, Water Sample Field Data Sheets
Appendix B:	Certified Analytical Reports with Chain-of-Custody for Air Samples

REFERENCES

Alameda County Health Care Services Agency. March 23, 1993. Letter to Drake Builders informing them of perchloroethylene on their property and requesting a work plan to address the problem.

Applied GeoSystems. August 8, 1989. Report Limited Subsurface Environmental Investigation. AGS Job No. 19014-1.

Applied GeoSystems. January 17, 1991. Report Limited Offsite Subsurface Environmental Investigation, ARCO Station 276, 10600 MacArthur Boulevard,Oakland, California. AGS Job 19014.01.

Applied GeoSystems, February 11, 1991. Report Underground Gasoline Storage Tank Removal and Replacement at ARCO Station 276, 10600 MacArthur Boulevard,Oakland, California. AGS Job 19014-5.

Department of Health Services, State of California. October 24, 1990. Summary of California Drinking Water Standards.

Kaldveer Associates. October 3, 1988. Preliminary Environmental Assessment Proposed Foothill Square Oakland, California. Job No. KE812-3, 12056.

Kaldveer Associates. October 7, 1988. Preliminary Soil And Groundwater Quality Testing Program Foothill Square Oakland, California. Job No. KE812-3A, 12302.

Pacific Environmental Group, Inc., February 6, 1989. Former Waste-Oil Tank Pit Analytical Results and Site Plan of ARCO Station No. 276. Copy of letter sent to Ms. Mary Meirs, Alameda County Environmental Health Department Hazardous Material Division.

Pacific Environmental Group, Inc., April 25, 1989. Letter Report-Removal of Waste-Oil Tank and Soil Sampling at ARCO Station 276, 10600 MacArthur Boulevard, Oakland, California. Job No. 330-40.01

Pacific Environmental Group, Inc., July 17, 1989. Soil Gas Investigation at ARCO Station No. 276.

RESNA. December 28, 1992. Letter Report on Quarterly Groundwater Monitoring Third Quarter 1992 at ARCO Station 276, 10600 MacArthur Boulevard in Oakland, California. RESNA Report 60026.06.

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(Continued)

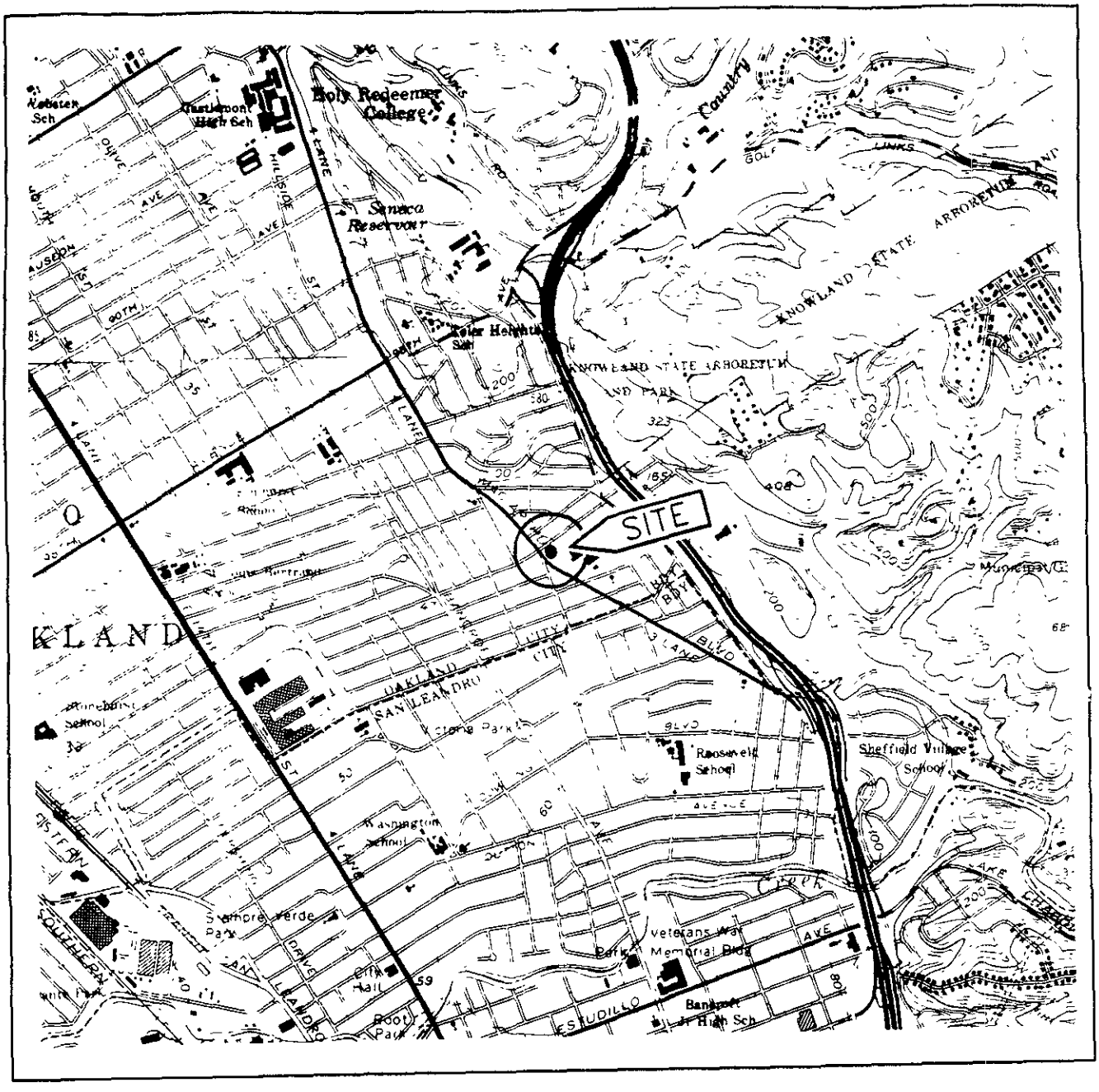
RESNA. February 1, 1993. Additional Subsurface Investigation and Interim Remediation at ARCO Station 276, 10600 MacArthur Boulevard in Oakland, California. RESNA Report 60026.05.

RESNA. March 11, 1993. Letter Report Quarterly Groundwater Monitoring and Remedial Performance Evaluation Fourth Quarter 1992 at ARCO Station 276, 10600 MacArthur Boulevard in Oakland, California. RESNA Report 60026.13.

RESNA. April 29, 1993. Letter Report Quarterly Groundwater Monitoring and Remedial Performance Evaluation First Quarter 1993 at ARCO Station 276, 10600 MacArthur Boulevard in Oakland, California. RESNA Report 60026.13.

RESNA. July 28, 1993. Letter Report Quarterly Groundwater Monitoring and Remedial Performance Evaluation Second Quarter 1993 at ARCO Station 276, 10600 MacArthur Boulevard in Oakland, California. RESNA Report 60026.13.

Western Geologic Resources, Inc. January 17, 1989. Soil Sampling and Monitoring Well Installation Foothill Square Shopping Center Oakland, California. Job No. 8-088.01.



Source: U.S Geological Survey
7 5-Minute Quadrangles
Oakland East/San Leandro, California
Photorevised 1980

N

Approximate Scale
2000 1000 0 2000
feet

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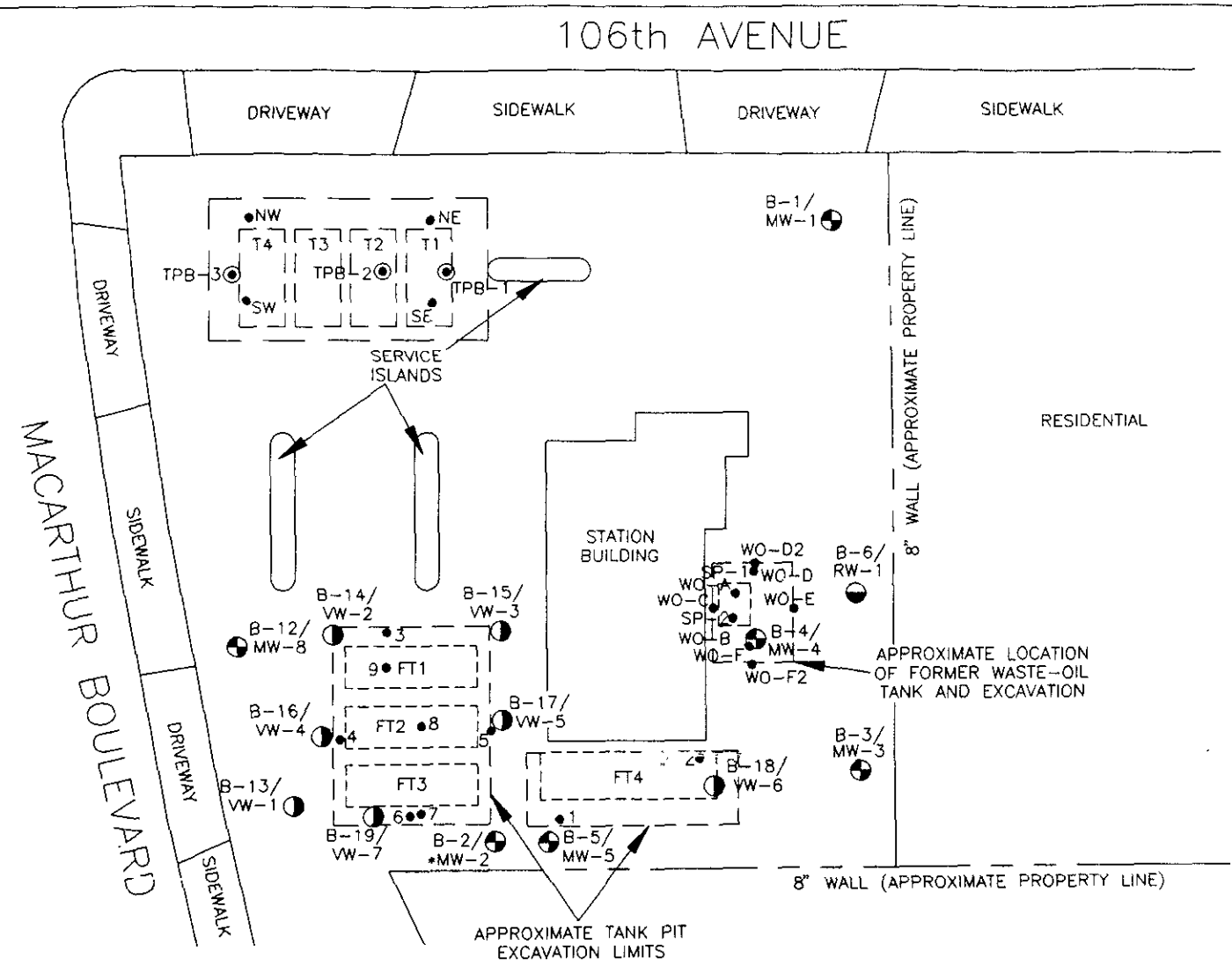
SITE VICINITY MAP
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

PLATE
1



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)

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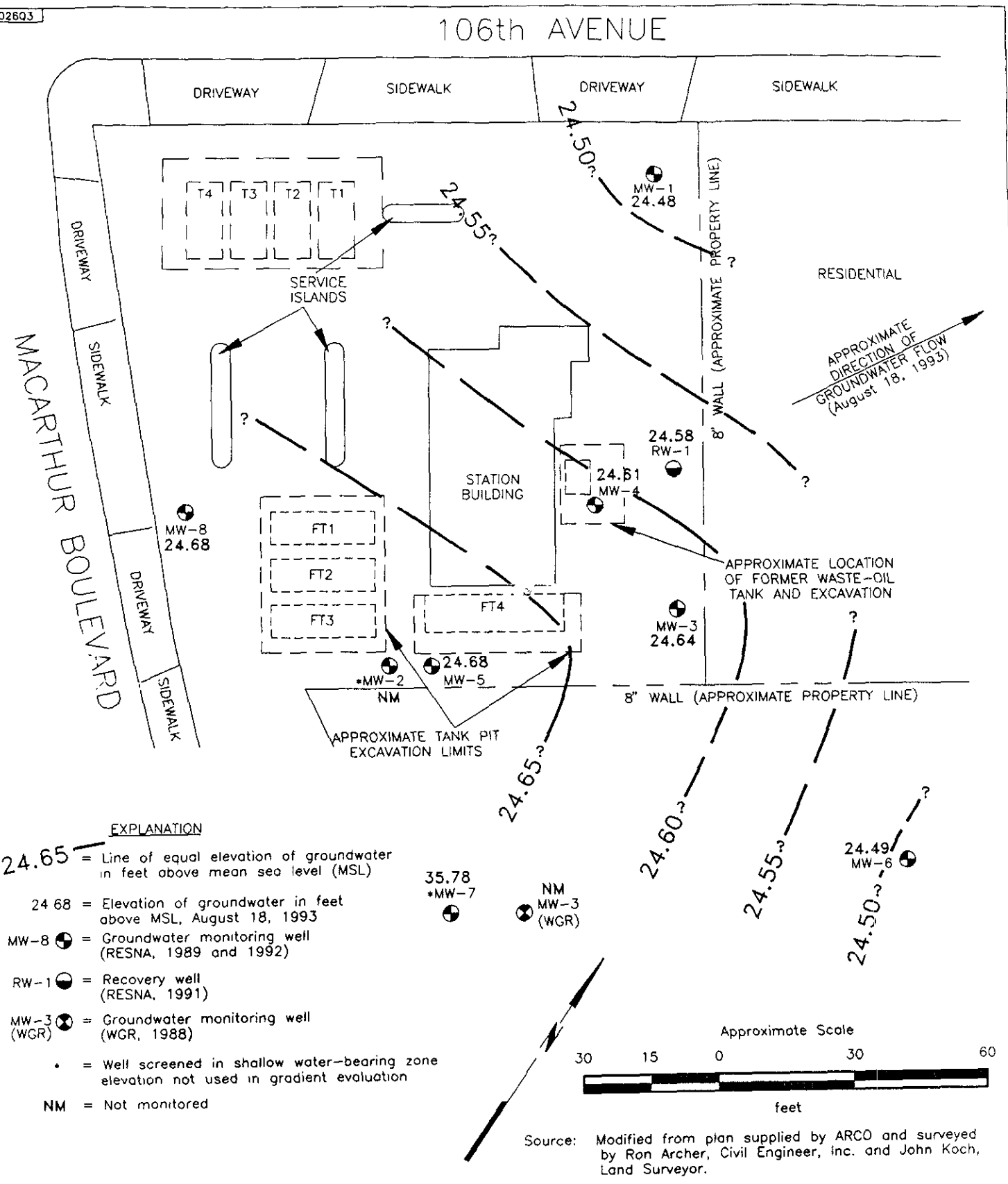
GENERALIZED SITE PLAN
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

PLATE 2

60026Q3



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

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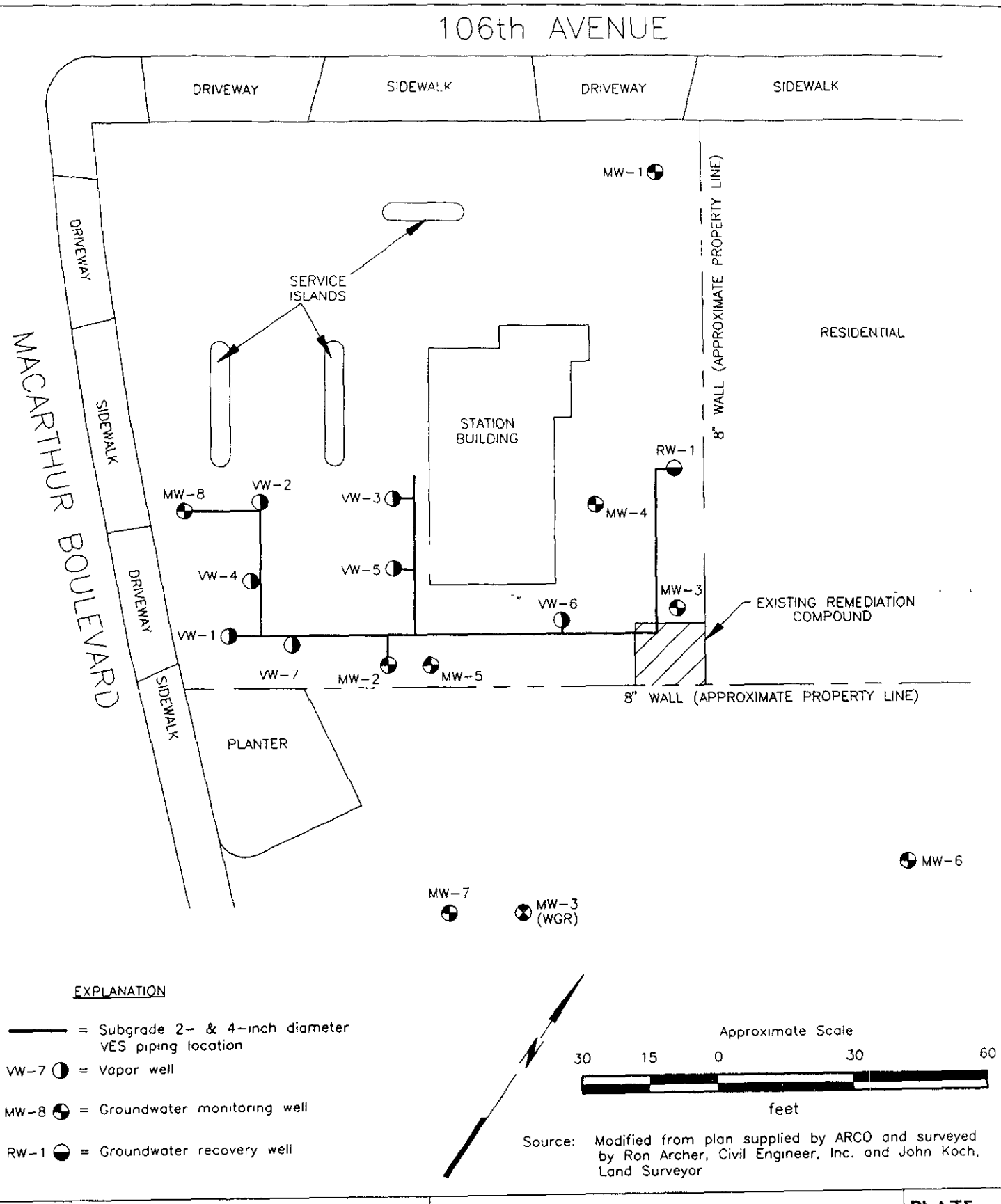
GROUNDWATER GRADIENT MAP
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

PLATE 3



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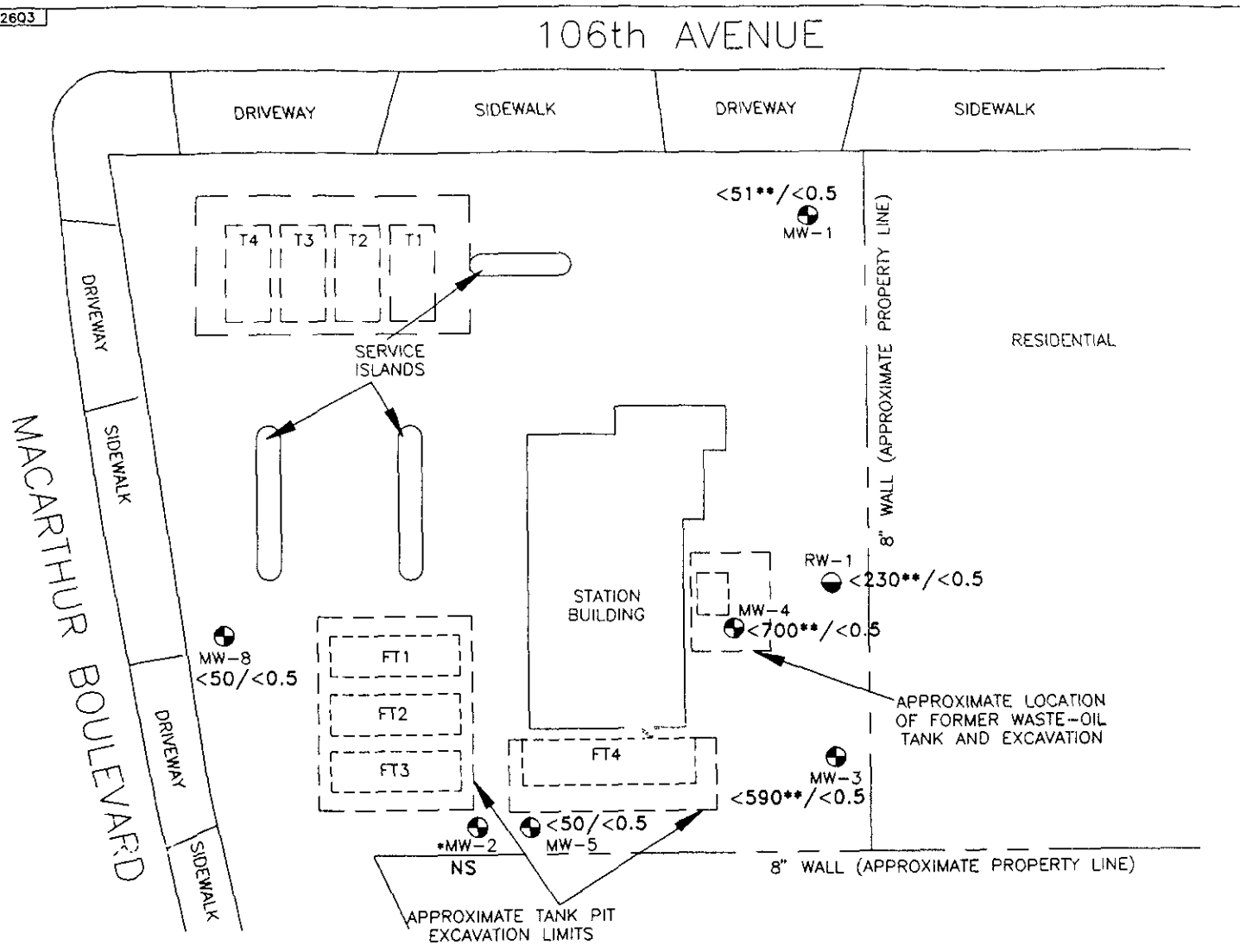
VES SCHEMATIC
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

PLATE 4

6002603



EXPLANATION

<50/<0.5 = Concentration of total petroleum hydrocarbons as gasoline (TPHg) and benzene in groundwater in parts per billion, August 18, 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

NS = Not sampled

** = Detection limit reportedly raised by laboratory because matrix contains PCE

FP = Floating product in well, not sampled

<1,500**/<2.5**
MW-6

FP
*MW-7

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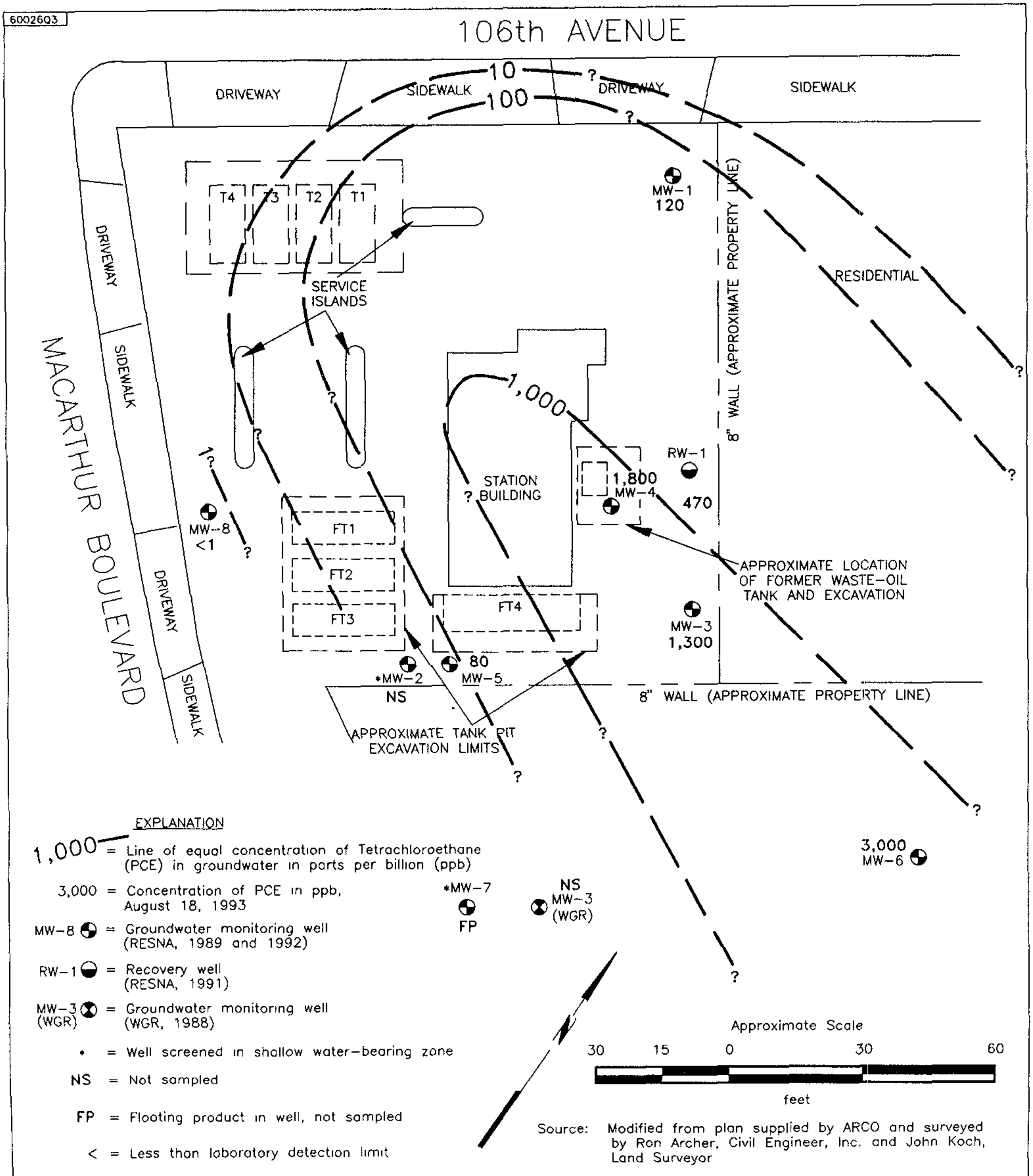
TPHg/BENZENE CONCENTRATIONS IN GROUNDWATER
ARCO Station 276
10600 MacArthur Boulevard
Oakland, California

PLATE 5



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

PLATE 6

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

Date Well Measured	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

See notes on page 7 of 7.

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

Date Well Measured	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

See notes on page 7 of 7.

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

Date Well Measured	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

See notes on page 7 of 7.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 276
Oakland, California
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Date Well Measured	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

See notes on page 7 of 7.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 276
Oakland, California
(Page 5 of 7)

Date Well Measured	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

See notes on page 7 of 7.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 276
Oakland, California
(Page 6 of 7)

Date Well Measured	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
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
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

See notes on page 7 of 7.

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

Date Well Measured	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
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

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 after purging well.
NM = Not monitored.

TABLE 2
APPROXIMATE CUMULATIVE PRODUCT REMOVED
ARCO Station 276
Oakland, California

Year		Floating Product Removed (gallons)
1991	TOTAL:	18.15
1992		0.39

Date	Floating Product Removed (gallons)
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
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
1993 Total:	0.00 Gallons
Product Removed to Date:	18.54 gallons

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

Date/Well	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
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					
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
01/30/91		Not sampled--well dry					
04/30/91		Not sampled--well inaccessible due to construction					

See notes on Page 4 of 4.

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

Date/Well	TPHg (ppb)	TPHd (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	TOG (ppb)
MW-3 Cont.							
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
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	<5,000
10/30/90#	430	<100	<0.5	<0.5	<0.5	<0.5	<5,000
01/30/91	<50	<100	<0.5	<0.5	1.2	<0.5	<5,000
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	<2500
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	<5,000
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

See notes on page 4 of 4.

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

Date/Well	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
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
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					
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

See notes on page 4 of 4.

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

Date/Well	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
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 Method 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).
*: Detection limit reportedly raised by laboratory due to matrix interference.
( ): 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

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

Date/Well	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
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					
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
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
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

See notes on Page 3 of 3.

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

Date/Well	Compound	VOCs (ppb)	Cd (ppm)	Cr (ppm)	Pb (ppm)	Zn (ppm)	Ni (ppm)
MW-4 Cont.							
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
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
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
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				
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

See notes on Page 3 of 3.

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

Date/Well	Compound	VOCs (ppb)	Cd (ppm)	Cr (ppm)	Pb (ppm)	Zn (ppm)	Ni (ppm)
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
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
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
FROM 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

SEE NOTES ON PAGE 3 OF 3.

TABLE 5
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
12/16/93	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-COMBINF	51	1.5	2.0	0.38	1.3
EXHAUST STACK***						
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
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
1/05/92	EFFL	17	<0.5	8	<0.5	1

SEE NOTES ON PAGE 3 OF 3.

TABLE 6
OPERATION AND PERFORMANCE DATA
ARCO STATION 276
Oakland, California
(Page 1 of 2)

DATE	VAPOR EXTRACTION WELL								TOTAL FLOW (SCFM)	TPHg WELL CONC (mg/m^3)	TPHg INF CONC. (mg/m^3)	TPHg EFF CONC. (mg/m^3)	EXOTHERM (°F)	INSTANT. REMOVAL RATE (lb/day)
	1	2	3	4	5	6	7	MW-2						
8/25/92			✓	✓					500	NS	NS	NS	NM	N/A
9/09/92			✓	✓					500	9,500	NS	NS	NM	N/A
10/05/92			✓	✓					500	1,200	578	18	19	25.9
10/23/92			✓	✓					500	990	240	12	9	10.8
10/23/92		✓			✓				500	NS	NS	NS	NM	N/A
11/03/92		✓			✓				500	350	64	<10	12	2.87
11/17/92		✓			✓				500	NS	NS	NS	NM	N/A
11/17/92	✓								500	200	NS	NS	2	N/A
12/07/92	✓								500	NS	NS	NS	8	N/A
12/07/92			✓	✓					500	<10	<10	<10	7	N/A
12/21/92			✓	✓					500	NS	NS	NS	NM	N/A
12/21/92		✓							500	37	NS	NS	7	N/A
1/05/93		✓							500	34	53	17	2	2.38
1/05/93	SYSTEM SHUTDOWN FROM 1/05/93 TO 7/19/93 (HIGH GROUNDWATER LEVEL).													
7/19/93			✓						500	250	20	25	6	0.90
8/10/93			✓						500	20	NS	NS	8	N/A

TABLE 6
OPERATION AND PERFORMANCE DATA
ARCO STATION 276
Oakland, California
(Page 2 of 2)

DATE	VAPOR EXTRACTION WELL								TOTAL FLOW (SCFM)	TPHg WELL CONC (mg/m^3)	TPHg INF CONC. (mg/m^3)	TPHg EFF CONC. (mg/m^3)	EXOTHERM (°F)	INSTANT. REMOVAL RATE (lb/day)
	1	2	3	4	5	6	7	MW-2						
8/10/93		✓							500	110	8.7	10	8	0.39
8/25/93		✓							500	30	NS	NS	5	N/A
8/25/93					✓				500	19	NS	NS	8	N/A
9/09/93					✓				500	22	NS	NS	NM	N/A
9/09/93								✓	500	330	87	18	NM	3.9
9/22/93	SYSTEM SHUTDOWN 9/09/93 TO 9/30/93. (SYSTEM REPAIR)													

NOTES:

SCFM: Standard Cubic Feet Per Minute (standard temperature is defined as 70 degrees)
TOTAL FLOW: Flow Rate From Combined Well Flow Rate Plus Dilution Air Flow Rate
TPHg WELL CONC.: Total Petroleum Hydrocarbons as Gasoline (TPHg) from wells [before dilution] in Milligrams per Cubic Meter (mg/m^3), equivalent to micrograms per liter ($\mu g/\ell$)
TPHg INF CONC: TPHg Influent Concentration [After Dilution] (mg/m^3)
TPHg EFF CONC.. TPHg Effluent Concentration (mg/m^3)
EXOTHERM: The Difference Between the Catalyst Bed Inlet Temperature and the Outlet Temperature as Recorded by the Remote Monitoring System. (150 °F Exotherm = Approx. 1,000 Parts Per million by Volume Hydrocarbon Concentration, in general)
INSTANT. REMOVAL RATE: Instantaneous Removal Rate in Pounds Per Day (lb/day) Based upon Influent Sample Concentrations and Total Flow Rate
Example Calculation:
Removal Rate (lb/day) = TPHg Inf. Conc. ($\mu g/\ell$) x Total Flow (SCFM) x 1,440 min/day x 1 lb/454,000,000 μg x 28.32 ℓ/ft^3
✓: Vapor Extraction Well is Online
NM: Not Measured
NS: Not Sampled
N/A: Not Analyzed

TABLE 7
ESTIMATED QUANTITY OF GASOLINE REMOVED
ARCO STATION 276
Oakland, California
(Page 1 of 1)

OPERATING PERIOD		OPERATING DAYS IN PERIOD	INSTANT. REMOVAL RATE (lb/day)	ESTIMATED TOTAL POUNDS REMOVED IN PERIOD *
July				
07/01/93	07/19/93	SYSTEM SHUTDOWN		
07/19/93	07/31/93	12	0.90	11
August				
07/31/93	08/10/93	10	0.90	9.0
08/10/93	08/31/93	21	0.39	8.2
September				
08/31/93	09/09/93	9	0.39	3.5
09/09/93	09/30/93	SYSTEM SHUTDOWN		
ESTIMATED CUMULATIVE POUNDS REMOVED THIS QUARTER				32
ESTIMATED CUMULATIVE GALLONS REMOVED THIS QUARTER				5.2
ESTIMATED CUMULATIVE POUNDS REMOVED SINCE STARTUP				3647
ESTIMATED CUMULATIVE GALLONS REMOVED SINCE STARTUP				582

* Results rounded to two significant figures.
Gallon Conversion Factor: 0.16 gallons Gasoline = 1 pound Gasoline (approximately).

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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

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-002.01 STATION ADDRESS : 10600 MacArthur Blvd. Oakland DATE : 8-18-93

ARCO STATION # : 276 FIELD TECHNICIAN : REICHELDERFER / STAFFORD 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	OK	VAULT	OK	NONE	GAGE	15.49	15.49	ND	NA	16.3	0 IN Hg ON GAUGE
2	VW-2	OK	VAULT	OK	NONE	GAGE	DRY	DRY	ND	NA	12.5	0 IN Hg ON GAUGE (COULD HEAR/F SUCTION/VACC
3	VW-3	OK	VAULT	OK	NONE	GAGE	DRY	DRY	ND	NA	15.1	6 in Hg (EVEN WHEN UNSCREWED) ON GAUGE
4	VW-4	OK	VAULT	OK	NONE	GAGE	16.72	16.72	ND	NA	17.5	0 in Hg ON GAUGE
5	VW-5	OK	VAULT	OK	NONE	GAGE	DRY	DRY	ND	NA	16.0	0 in Hg ON GAUGE
6	VW-6	OK	* NO VAULT	OK	NONE	GAGE	16.64	16.64	ND	NA	17.4	0 in Hg ON GAUGE IN LID; * NO ALLEN
7	VW-7	OK	VAULT	OK	NONE	GAGE	DRY	DRY	ND	NA	8.6	0 in Hg ON GAUGE (VW-6)
8	MW-5	OK	HEX (Y)	OK	3499	OK	30.75	30.75	ND	NA	47.0	—
9	MW-1	OK	HEX (Y)	OK	3259	~~OK~~ BAD	31.44	31.44	ND	NA	38.9	LOC IS BROKEN
10	MW-8	OK	VAULT	OK	NONE	SLIP	28.97	28.97	ND	NA	47.7	0 in Hg ON GAUGE
11	RW-1	OK	VAULT	OK	NONE	SLIP	31.74	31.74	ND	NA	48.9	CASING IS 6 3/4" O.D. (GREY STEEL SLIP CAP IS CRACKED
12	MW-3	OK	9/16	OK	3259	OK	31.91	31.91	ND	NA	38.6	—
13	MW-4	OK	9/16	OK	3259	OK	31.37	31.37	ND	NA	48.4	—
14	MW-6	OK	15/16	OK	3616	OK	36.72	36.72	ND	NA	54.1	—

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 : 8-18-93

ARCO STATION # : 276 FIELD TECHNICIAN : REICHELDERFER / STAFFORD 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				~~NONE~~ 2357		WELL IS PARKED ON W/ ALHAMBRA TRUCK-TRAILER					
16	MW-7	OK	YES	OK	~~3250~~ 2357	OK	22.44	22.45	22.44	0.01	55.0	0.01' PRODUCT IN BAILER

SURVEY POINTS ARE TOP OF WELL CASINGS

Summary of Groundwater Monitoring Data
Third 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)	08/18/93	31.44	ND.[3]	<51.	<0.5	<0.5	<0.5	<0.5	NR.[4]
MW-2	08/18/93	IW.[5]	IW.	IW.	IW.	IW.	IW.	IW.	IW.
MW-3(38)	08/18/93	31.91	ND.	<590.	<0.5	<0.5	<0.5	<0.5	NR.
MW-4(48)	08/18/93	31.37	ND.	<700.	<0.5	<0.5	<0.5	<0.5	<0.5
MW-5(46)	08/18/93	30.75	ND.	<50.	<0.5	<0.5	<0.5	<0.5	NR.
MW-6(54)	08/18/93	36.72	ND.	<1,500.	<2.5	<2.5	<2.5	<2.5	NR.
MW-7	08/18/93	22.44	0.01	FP.[6]	FP.	FP.	FP.	FP.	FP.
MW-8(46)	08/18/93	28.97	ND.	<50.	<0.5	<0.5	<0.5	<0.5	NR.
RW-1(47)	08/18/93	31.74	ND.	<230.	<0.5	<0.5	<0.5	<0.5	NR.
FB-1[7]	08/18/93	NA.[8]	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. IW. = Inaccessable well, well was not sampled
6. FP. = Floating product detected in well, no samples were taken
7. FB. = Field blank
8. NA. = Not applicable

Summary of Analytical Results
Volatile Organic Compounds by EPA[1] Methods 624
Third 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)	08/18/93	120.
MW-2	08/18/93	IW.[3]
MW-3(38)	08/18/93	1,300.
MW-4(48)	08/18/93	1,800.
MW-5(46)	08/18/93	80.
MW-6(54)	08/18/93	3,000.
MW-7	08/18/93	FP.[4]
MW-8(46)	08/18/93	<1.
RW-1(47)	08/18/93	470.
FB-1[5]	08/18/93	<1.

1. EPA = United States Environmental Protection Agency
2. PCE = Tetrachloroethene
3. IW . = Inaccessable well, well was not sampled
4. FP. = Floating product detected in well, no samples were taken
5. FB = Field blank

Columbia Analytical Services, Inc.

September 2, 1993

Service Request No. SJ93-1030

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

Re: **EMCON Project No. 0G70-002.01**
ARCO Facility No. 276

Dear Mr. Butera:

Attached are the results of the water samples submitted to our lab on August 19, 1993. For your reference, these analyses have been assigned our service request number SJ93-1030.

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

Please call if you have any questions.

Respectfully submitted:

COLUMBIA ANALYTICAL SERVICES, INC.

Keoni A. Murphy
Laboratory Manager

Annelise J. Bazar
Regional QA Coordinator

KAM/kmh

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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:**	08/19/93
Project:	ARCO Project No. 0G70-002.01	**Service Request No.:**	SJ93-1030
	ARCO Facility No. 276	**Sample Matrix:**	Water

Inorganic Parameters[1]
µg/mg (ppm)

			Sample Name:	MW-4 (48)	Method Blank
			Date Sampled:	08/18/93	
Analyte	**EPA Method**	**MRL**			
Total Oil and Grease	SM 5520C	0.5		ND	ND
Hydrocarbons, IR	SM 5520F	0.5		ND	ND

[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: Kathleen A Murphy Date: September 2, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	08/19/93
Project:	EMCON Project No. 0G70-002.01	**Service Request No.:**	SJ93-1030
	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:		08/26/93	08/26/93	08/26/93
Analyte	**MRL**			
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	0.5	ND	ND	ND
TPH as Gasoline	50	<51. *	<590. *	<700. *

Sample Name:		MW-5 (46)	MW-6 (54)	MW-8 (46)
Date Analyzed:		08/26/93	08/26/93	08/26/93
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	ND	<2.5 **	ND
TPH as Gasoline	50	ND	<1,500. *	ND

* 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.

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

Approved by: _____ Date: September 2, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	08/19/93
Project:	EMCON Project No. 0G70-002.01	**Service Request No.:**	SJ93-1030
	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 (47)	FB-1	Method Blank
Date Analyzed:		08/26/93	08/26/93	08/26/93
Analyte	**MRL**			
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	0.5	ND	ND	ND
TPH as Gasoline	50	<230. *	ND	ND

* 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: Keon A Murphy Date: September 2, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	08/19/93
Project:	EMCON Project No. 0G70-002.01	**Service Request No.:**	SJ93-1030
	ARCO Facility No. 276	**Sample Matrix:**	Water

Volatile Organic Compounds
EPA Method 624
µg/L (ppb)

Sample Name:		MW-1 (38)	MW-3 (38) *	MW-4 (48) *
Date Analyzed:		08/24/93	08/24/93	08/24/93
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	<200.	<200.
Tetrachloroethene (PCE)	1	120.	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: September 2, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	Date Received:	08/19/93
Project:	EMCON Project No. 0G70-002 01	Service Request No.:	SJ93-1030
	ARCO Facility No. 276	Sample Matrix:	Water

Volatile Organic Compounds
EPA Method 624
µg/L (ppb)

Sample Name:		MW-5 (46)	MW-6 (54) *	MW-8 (46)
Date Analyzed:		08/24/93	08/25/93	08/24/93
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	80.	3,000.	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: Keenan Murphy Date: September 9, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	08/19/93
Project:	EMCON Project No. 0G70-002.01	**Service Request No.:**	SJ93-1030
	ARCO Facility No. 276	**Sample Matrix:**	Water

Volatile Organic Compounds
EPA Method 624
µg/L (ppb)

Sample Name:		RW-1 (47) *	FB-1	Method Blank
Date Analyzed:		08/25/93	08/25/93	08/24/93
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	<200.	ND	ND
Tetrachloroethene (PCE)	1	470.	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: Keoni Murphy Date: September 4, 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: 08/19/93
Service Request No.: SJ93-1030
Sample Matrix: Water

Volatile Organic Compounds
EPA Method 624
µg/L (ppb)

Sample Name:	Method Blank
Date Analyzed:	08/25/93

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 A Murphy Date: September 2, 1993

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APPENDIX A

LABORATORY QC RESULTS

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	08/19/93
Project:	EMCON Project No. 0G70-002.01	**Service Request No.:**	SJ93-1030
	ARCO Facility No. 276	**Sample Matrix:**	Water

Continuing Calibration Summary
Inorganics
Method 5520F
mg/L

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Hydrocarbons, IR	40.	37.1	93.	90-110

Approved by: Kevin A Murphy Date: September 2, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	08/19/93
Project:	EMCON Project No.0G70-002.01	**Service Request No.:**	SJ93-1030
	ARCO Facility No. 276	**Sample Matrix:**	Water

Matrix Spike Summary
Hydrocarbons IR
Method 5520F
mg/L (ppm)

Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria
8.0	1.2	9.3	8.9	101.	96.	56-151

Approved by: _____ Date: September 2, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	08/19/93
Project:	EMCON Project No. 0G70-002.01	**Service Request No.:**	SJ93-1030
	ARCO Facility No. 276	**Sample Matrix:**	Water

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

Sample Name	Date Analyzed	Percent Recovery *a,a,a*-Trifluorotoluene
MW-1 (38)	08/26/93	106.
MW-3 (38)	08/26/93	98.
MW-4 (48)	08/26/93	96.
MW-5 (46)	08/26/93	94.
MW-6 (54)	08/26/93	99.
MW-8 (46)	08/26/93	96.
RW-1 (47)	08/26/93	98.
FB-1	08/26/93	96.
MW-1 (38) MS	08/26/93	96.
MW-1 (38) DMS	08/26/93	99.
Method Blank	08/26/93	99.
	CAS Acceptance Criteria	70-130

Approved by: Kevin A Murphy Date: September 2, 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: 08/19/93
Service Request No.: SJ93-1030

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

Date Analyzed: 08/26/93

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Benzene	25.	23.1	92.	85-115
Toluene	25.	23.7	95.	85-115
Ethylbenzene	25.	23.0	92.	85-115
Total Xylenes	75.	67.2	90.	85-115
TPH as Gasoline	250.	261.	104.	90-110

Approved by: Kevin Murphy Date: September 2, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	Date Received:	08/19/93
Project:	EMCON Project No. 0G70-002.01	Service Request No.:	SJ93-1030
	ARCO Facility No. 276	Sample Matrix:	Water

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

Sample Name: MW-1 (38)
Date Analyzed: 08/26/93

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria
Benzene	25.	ND	23.4	23.0	94.	92.	76-122
Toluene	25.	ND	24.4	24.1	98.	96.	75-127
Ethylbenzene	25.	ND	23.9	24.0	96.	96.	70-135

Approved by: Kevin Murphy Date: September 2, 1993

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

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

Date Received: 08/19/93
Service Request No.: SJ93-1030
Sample Matrix: Water

Surrogate Recovery Summary
Volatile Organic Compounds
EPA Method 624

Sample Name	Date Analyzed	Percent Recovery		
		1,2-Dichloroethane - D_4	Toluene - D_8	4-Bromofluorobenzene
MW-1 (38)	08/24/93	102.	96.	104.
MW-3 (38)	08/24/93	103.	97.	105.
MW-4 (48)	08/24/93	103.	96.	106.
MW-5 (46)	08/24/93	104.	97.	105.
MW-6 (54)	08/24/93	103.	96.	105.
MW-8 (46)	08/24/93	102.	96.	105.
RW-1 (47)	08/25/93	102.	97.	105.
FB-1	08/25/93	105.	96.	105.
MW-4 (48) MS	08/24/93	96.	96.	104.
MW-4 (48) DMS	08/24/93	96.	98.	106.
Method Blank	08/24/93	94.	93.	103.
Method Blank	08/25/93	102.	94.	104.
	EPA Acceptance Criteria	76-114	88-110	86-115

Approved by: Kevin Murphy Date: September 2, 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: 08/19/93
Service Request No.: SJ93-1030

Initial Calibration Verification
Volatile Organic Compounds
EPA Method 624
µg/L (ppb)

Date Analyzed: 08/24/93

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Chloromethane	50	52.0	104.	70-130
Vinyl Chloride	50	55.7	111.	70-130
Bromomethane	50	53.0	106.	70-130
Chloroethane	50	46.6	93.	70-130
Acetone	50	52.3	105.	70-130
1,1-Dichloroethene	50	56.3	113.	70-130
Carbon Disulfide	50	54.2	108.	70-130
Methylene Chloride	50	48.7	97.	70-130
trans-1,2-Dichloroethene	50	53.6	107.	70-130
cis-1,2-Dichloroethene	50	50.6	101.	70-130
1,1-Dichloroethane	50	52.0	104.	70-130
Vinyl Acetate	50	40.8	82.	70-130
2-Butanone	50	56.8	114.	70-130
Chloroform	50	51.7	103.	70-130
1,1,1-Trichloroethane (TCA)	50	56.2	112.	70-130
Carbon Tetrachloride	50	58.5	117.	70-130
Benzene	50	50.7	101.	70-130
1,2-Dichloroethane	50	48.8	98.	70-130
Trichloroethene (TCE)	50	54.3	109.	70-130
1,2-Dichloropropane	50	50.2	100.	70-130
Bromodichloromethane	50	50.0	100.	70-130
2-Chloroethyl Vinyl Ether	50	45.1	90.	70-130
2-Hexanone	50	46.5	93.	70-130
trans-1,3-Dichloropropene	50	50.3	101.	70-130
Toluene	50	48.6	97.	70-130
cis-1,3-Dichloropropene	50	48.2	96.	70-130
1,1,2-Trichloroethane	50	52.6	105.	70-130
Tetrachloroethene (PCE)	50	56.1	112.	70-130
Dibromochloromethane	50	54.3	109.	70-130
Chlorobenzene	50	49.8	100.	70-130
Ethylbenzene	50	51.4	103.	70-130
o-Xylene	50	49.6	99.	70-130
Styrene	50	48.2	96.	70-130
Bromoform	50	48.6	97.	70-130
1,1,2,2-Tetrachloroethane	50	51.1	102.	70-130

Approved by: Kevin A. Murphy Date: September 2, 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: 08/19/93
Service Request No.: SJ93-1030
Sample Matrix: Water

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds
EPA Method 624
µg/L (ppb)

Sample Name: MW-4 (48)
Date Analyzed: 08/24/93

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	1,000.	ND	1,120.	1,050.	112.	105.	61-145	6.
Trichloroethene	1,000.	ND	1,080.	1,070.	108.	107.	71-120	<1.
Chlorobenzene	1,000.	ND	990.	992.	99.	99.	75-130	<1.
Toluene	1,000.	ND	954.	976.	95.	98.	76-125	2.
Benzene	1,000.	ND	996.	994.	100.	99.	76-127	1.

Approved by: Kevin Murphy Date: September 2, 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

Chain of Custody

Task Order No. EMC-93-5

ARCO Facility no	276
City (Facility)	OAKLAND
ARCO engineer	Kyle Christie
Telephone no (ARCO)	571-2434
Consultant name	EMCON ASSOCIATES
Project manager (Consultant)	JIM BUTERA
Telephone no (Consultant)	453-0719
Fax no (Consultant)	453-0452
Address (Consultant)	1938 Junction Avenue San Jose
Laboratory name	CAS
Contract number	07077
Method of shipment	Sampler will deliver
Special detection Limit/reporting	Lowest Possible
Special QA/QC	As Normal
Remarks	4-40ml HCl VOA's 4 liter HCl (2 L HCl + 4 500 HCl = 4 L HCl)
Lab number	SJ93-1030

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 (CAS)	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			Notes
MW-1(38)	1-4	4		X		X	HCl	8-18-93	1257		X					X							
~~MW-2( )~~		~~4~~									X					X							INACCESIBLE WELL, NO SAMPLES TAKEN
MW-3(38)	5-8	4						8-18-93	1325		X					X							
MW-4(48)	9-12	4							1411		X					X							
MW-5(46)	13-16	4							1312		X					X							
MW-6(54)	17-20	4							1515		X					X							
~~MW-7( )~~		~~4~~									X					X							NO SAMPLES TAKEN, PRODUCT IN WELL
MW-8(46)	21-24	4							1420		X					X							
MW-1(47)	25-28	4							1550		X					X							
FB-1	29-32	4		↓		↓	↓		1302		X					X							
MW-4(48)	33-36	4		X		X	HCl	↓	1411				X										

Condition of sample: OK	Temperature received: cool
Relinquished by sampler: Kim Buchholz [signature] — Date 8-19-93 Time 0830	Received by
Relinquished by — Date — Time	Received by
Relinquished by — Date — Time	Received by laboratory: [signature] — Date [illegible] — Time [illegible]

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

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-002.01 SAMPLE ID: MW-1 (38)

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 276

SAMPLED BY: ↓ LOCATION: 10600 MacARTHUR Blvd
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.):	1.22
DEPTH TO WATER (feet):	31.44	CALCULATED PURGE (gal.):	3.66
DEPTH OF WELL (feet):	38.9	ACTUAL PURGE VOL. (gal.):	4.00

DATE PURGED: 8-18-93 Start (2400 Hr) 1236 End (2400 Hr) 1251

DATE SAMPLED: 8-18-93 Start (2400 Hr) 1257 End (2400 Hr) 1259

TIME (2400 Hr)	VOLUME (gal)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1240	1.50	6.49	2920	68.1	BROWN	MODERATE
1247	3.00	6.57	3000	69.9	↓	HEAVY
1251	4.00	6.59	2990	69.6	↓	↓

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): FB-1 @ 1302

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

WELL INTEGRITY: OK LOCK #: 3259

REMARKS: LWC IS BROKEN - NEEDS A NEW LWC

Meter Calibration: Date: 8-18-93 Time: 1210 Meter Serial #: 9203 Temperature °F: 81.4

(EC 1000 991 / 1000) (DI 6.78) (pH 7 7.03 / 7.00) (pH 10 9.99 / 10.00) (pH 4 3.92 / —)

Location of previous calibration: ___

Signature: Kevin Reichelderfer Reviewed By: JB Page 1 of 9

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670002.01 | SAMPLE ID: MW-2 (NA)

PURGED BY: B. Stafford | CLIENT NAME: Arco 276

SAMPLED BY: B. Stafford NA | LOCATION: 10600 MacArthur Blvd. 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):	NA	VOLUME IN CASING (gal.):	NA
DEPTH TO WATER (feet):	NA	CALCULATED PURGE (gal.):	NA
DEPTH OF WELL (feet):	NA	ACTUAL PURGE VOL. (gal.):	NA

DATE PURGED: 8/18/93 | Start (2400 Hr) NA | End (2400 Hr) NA

DATE SAMPLED: 8/18/93 NA | 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)
TRACTOR-TRAILER PARKED ON WELL, NO SAMPLES TAKEN						

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

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: NA		Other: NA	

WELL INTEGRITY: NA | LOCK #: NA

REMARKS: TRACTOR-TRAILER PARKED ON WELL, NO SAMPLES TAKEN

Meter Calibration: Date: 8/18/93 Time: ___ Meter Serial #: ___ Temperature °F: ___

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

Location of previous calibration: ___

Signature: [signature] Reviewed By: JB

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-002.01 SAMPLE ID: MW-3 (38)

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 276

SAMPLED BY: ↓ LOCATION: 10600 MacARTHUR @ 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.):	1.10
DEPTH TO WATER (feet):	31.89	CALCULATED PURGE (gal.):	3.29
DEPTH OF WELL (feet):	38.16	ACTUAL PURGE VOL. (gal.):	3.50

DATE PURGED: 8-18-93 Start (2400 Hr) 1309 End (2400 Hr) 1318

DATE SAMPLED: 8-18-93 Start (2400 Hr) 1325 End (2400 Hr) 1327

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1312	1.50	6.71	1394	68.9	BROWN	HEAVY
1315	2.50	6.66	1374	67.6	↓	↓
1318	3.50	6.65	1387	67.2		

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

WELL INTEGRITY: OK LOCK #: 3259

REMARKS: 9/16" BOLTS IN LID

Meter Calibration: Date: 8-18-93 Time: 1210 Meter Serial #: 9203 Temperature °F: ___

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

Location of previous calibration: MW-1

Signature: Kevin Reichelderfer 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: K REICHELDERFER CLIENT NAME: ARCO 276

SAMPLED BY: ↓ LOCATION: 10600 MacARTHUR @ 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.):	2.79
DEPTH TO WATER (feet):	31.32	CALCULATED PURGE (gal.):	8.37
DEPTH OF WELL (feet):	48.4	ACTUAL PURGE VOL. (gal.):	8.50

DATE PURGED: 8-18-93 Start (2400 Hr) 1351 End (2400 Hr) 1405

DATE SAMPLED: 8-18-93 Start (2400 Hr) 1411 End (2400 Hr) 1423

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1356	3.00	7.13	1354	70.0	BROWN	HEAVY
1400	6.00	7.03	1362	69.8	↓	↓
1405	8.50	7.07	1369	69.6	↓	↓

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

WELL INTEGRITY: OK LOCK #: 3259

REMARKS: ___

Meter Calibration: Date: 8-18-93 Time: 1210 Meter Serial #: 9203 Temperature °F: ___

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

Location of previous calibration: MW-1

Signature: Kevin Reichelderfer Reviewed By: JB Page 4 of 9

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0G70-0027.01 | SAMPLE ID: MW-5 (42)

PURGED BY: B Stafford | CLIENT NAME: Arco 2776

SAMPLED BY: B Stafford | LOCATION: 10600 MacArthur Blvd. 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): N/A | VOLUME IN CASING (gal.): 10.62

DEPTH TO WATER (feet): 30.72 | CALCULATED PURGE (gal.): 31.86

DEPTH OF WELL (feet): 47.0 (16.28) | ACTUAL PURGE VOL. (gal.): 32.0

DATE PURGED: 8/18/93 | Start (2400 Hr) 12:46 | End (2400 Hr) 1307

DATE SAMPLED: 8/18/93 | Start (2400 Hr) 1312 | End (2400 Hr) 1317

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1255	10.5	6.37	589.	73.2	Clear	low
1301	21.0	6.21	573.	72.1	"	"
1305	32.0	6.21	577.	71.6	"	"

D.O. (ppm): N/A | ODOR: None | COLOR: N/A (COBALT 0 - 100) | TURBIDITY: N/A (NTU 0 - 200)

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

PURGING EQUIPMENT

- ___ 2" Bladder Pump
- ___ Centrifugal Pump
- 2" 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 #: 3499

REMARKS:

Meter Calibration: Date: 8/18/93 Time: 12:19 Meter Serial #: 9072 Temperature °F: 82.4

(EC 1000 991 / 1000.) (DI 4.11) (pH 7 9.83 / 7.00) (pH 10 9.65 / 10.00) (pH 4 3.95 / ___)

Location of previous calibration: N/A

Signature: [signature] 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 (54)

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 276

SAMPLED BY: ↓ LOCATION: 10600 MacARTHUR BL. 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.):	2.83
DEPTH TO WATER (feet):	36.76	CALCULATED PURGE (gal.):	8.50
DEPTH OF WELL (feet):	54.1	ACTUAL PURGE VOL. (gal.):	8.50

DATE PURGED: 8-18-93 Start (2400 Hr) 1456 End (2400 Hr) 1510

DATE SAMPLED: 8-18-93 Start (2400 Hr) 1515 End (2400 Hr) 1517

TIME (2400 Hr)	VOLUME (gal)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1501	3.00	6.90	2210	69.2	BROWN	HEAVY
1506	6.00	6.88	2120	68.6	↓	MODERATE
1510	8.50	6.95	2070	68.1		↓

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

WELL INTEGRITY: OK LOCK #: 3616

REMARKS: ___

Meter Calibration: Date: 8-18-93 Time: 1210 Meter Serial #: 9203 Temperature °F: ___

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

Location of previous calibration: MW-1

Signature: Kevin Reichelderfer 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 (NA)

PURGED BY: K REICHELDERFER CLIENT NAME: ARCO 276

SAMPLED BY: ↓ LOCATION: 10600 MacARTHUR @ 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.):	NA
DEPTH TO WATER (feet):	22.44	CALCULATED PURGE (gal.):	NA
DEPTH OF WELL (feet):	55.0	ACTUAL PURGE VOL. (gal.):	NA

DATE PURGED: 8-18-93 Start (2400 Hr) NA End (2400 Hr) NA

DATE SAMPLED: NA 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 SAMPLES TAKEN, PRODUCT IN WELL 0.01'						

D. O. (ppm): NR ODOR: NA 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™ NA	___ Dedicated	___ Well Wizard™ NA	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: 2357

REMARKS: NO SAMPLES TAKEN, PRODUCT IN WELL

Meter Calibration: Date: 8-18-93 Time: ___ Meter Serial #: 9203 Temperature °F: ___

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

Location of previous calibration: ___

Signature: Kim Reichelderfer Reviewed By: JB Page 1 of 9

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670002.01 | SAMPLE ID: MW-8 (46)
PURGED BY: B. Stafford | CLIENT NAME: Arco 276
SAMPLED BY: B. Stafford | LOCATION: 10600 MacArthur Blvd. Oakland, CA

TYPE: Ground Water Y | Surface Water ___ | Treatment Effluent ___ | Other ___

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

CASING ELEVATION (feet/MSL):	N/A	VOLUME IN CASING (gal.):	12.26
DEPTH TO WATER (feet):	28.93	CALCULATED PURGE (gal.):	36.74
DEPTH OF WELL (feet): (18"+)	47.7	ACTUAL PURGE VOL. (gal.):	370

DATE PURGED: 8/18/93 | Start (2400 Hr) 1347 | End (2400 Hr) 1419
DATE SAMPLED: 8/18/93 | Start (2400 Hr) 1420 | End (2400 Hr) 1425

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1357	12.5	6.35	597.	80.8	Clear	low
1408	25.0	6.36	601.	80.0	"	"
1418	37.0	6.41	594.	80.5	Cloudy	"

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

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

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

WELL INTEGRITY: Good | LOCK #: Slip Cap

REMARKS: Needs crow bar and 2 screw drivers to open.

Meter Calibration: Date: 8/18/93 Time: 1219 Meter Serial #: 9072 Temperature °F: ___

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

Location of previous calibration: MW-5

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

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 0670-002.01 | SAMPLE ID: RW-1 (47)
PURGED BY: B Stafford | CLIENT NAME: Arco 276
SAMPLED BY: B Stafford | LOCATION: 10600 MacArthur Blvd. 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): NA
DEPTH TO WATER (feet): 31.69
17.21 DEPTH OF WELL (feet): 48.9

VOLUME IN CASING (gal.): 25.26
CALCULATED PURGE (gal.): 75.8
ACTUAL PURGE VOL. (gal.): 76.0

DATE PURGED: 8/18/93 | Start (2400 Hr) 15:05 | End (2400 Hr) 1548
DATE SAMPLED: 8/18/93 | Start (2400 Hr) 1550 | End (2400 Hr) 1553

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1518	25.5	6.41	1334	75.1	Clear	low
1534	51.0	6.51	1353	73.5	"	"
1548	76.0	6.60	1345	72.6	"	"

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

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

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

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

WELL INTEGRITY: Good | LOCK #: Slip cap

REMARKS: ___

Meter Calibration: Date: 8/18/93 Time: 1219 Meter Serial #: 9072 Temperature °F: ___
(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)
Location of previous calibration: MW-5

Signature: Bart Stafford | Reviewed By: JB | Page 9 of 9

RESNA
Working to Restore Nature

APPENDIX B

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

Client Number RSN04ARC01
Facility Number: 276
Arco Representative: Michael Whelan
Project ID: Oakland, CA
Work Order Number C3-07-0322

Table 1

ANALYTICAL RESULTS

Aromatic Volatile Organics and
Total Petroleum Hydrocarbons as Gasoline in Air

Modified EPA Methods 8020 and 8015[a]

GTEL Sample Number		01	02	03	04
Client Identification		AS VW3 14:00	AS-VW4 14.30	AS-VW3 14:45	AS-15 SYS INF 15:00
Date Sampled		07/19/93	07/19/93	07/19/93	07/19/93
Date Analyzed		07/21/93	07/21/93	07/21/93	07/21/93
Analyte	Detection Limit, mg/m^3	Concentration, mg/m^3			
Benzene	0.5	1	7	3	<0.5
Toluene	0.5	2	3	2	2
Ethylbenzene	0.5	1	3	2	<0.5
Xylene, total	0.5	2	7	3	<0.5
BTEX, total	--	6	20	10	2
TPH as Gasoline	10	250	1900	1000	20
Detection Limit Multiplier		1	1	1	1
BFB surrogate, % recovery		95.8	94.8	94.0	92.2

a Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Modification for TPH as gasoline as per California State Water Resources Control Board LUFT Manual protocols, May 1988 revision. Bromofluorobenzene surrogate recovery acceptability limits are 70-130%.

GTEL ENVIRONMENTAL LABORATORIES INC

Client Number: RSN04ARC01
Facility Number 276
Arco Representative Michael Whelan
Project ID Oakland, CA
Work Order Number C3-07-0322

Table 1 (Continued)

ANALYTICAL RESULTS

Aromatic Volatile Organics and Total Petroleum Hydrocarbons as Gasoline in Air

Modified EPA Methods 8020 and 8015[a]

GTEL Sample Number		05	E072193		
Client Identification		AS-SYS EFF 15:00	METHOD BLANK		
Date Sampled		07/19/93	--		
Date Analyzed		07/21/93	07/21/93		
Analyte	Detection Limit, mg/m^3	Concentration, mg/m^3			
Benzene	0.5	<0.5	<0.5		
Toluene	0.5	8	<0.5		
Ethylbenzene	0.5	<0.5	<0.5		
Xylene, total	0.5	1	<0.5		
BTEX, total	--	9	--		
TPH as Gasoline	10	25	<10		
Detection Limit Multiplier		1	1		
BFB surrogate, % recovery		81.1	79.2		

a. Test Methods for Evaluating Solid Waste, SW-846, Third Edition, Revision 0, US EPA November 1986. Modification for TPH as gasoline as per California State Water Resources Control Board LUFT Manual protocols, May 1988 revision. Bromofluorobenzene surrogate recovery acceptability limits are 70-130%

GTEL ENVIRONMENTAL LABORATORIES INC

Client Number: RSN04ARC01
Facility Number: 276
Arco Representative: Michael Whelan
Project ID: Oakland, CA
Work Order Number: C3-07-0322

Table 1

ANALYTICAL RESULTS

Methane in Air

Method: GC-FID[a]

GTEL Sample Number		01	02	072093 GC-O	
Client Identification		AS-VW3	AS-VW4	METHOD BLANK	
Date Sampled		07/19/93	07/19/93	--	
Date Analyzed		07/20/93	07/20/93	07/20/93	
Analyte	Detection Limit, ppm-V	Concentration, ppm-V			
Methane	2	310	710	<2	
Detection Limit Multiplier		1	1	1	

a. Method developed by GTEL for fixed gas analysis.

GTEL ENVIRONMENTAL LABORATORIES INC

Client Number: RSN04ARC01
Facility Number: 276
Arco Representative: Michael Whelan
Project ID: Oakland, CA
Work Order Number: C3-07-0322

QC Check Sample Results

Analyte	Source	Date of Analysis	Expected Value	Units	Recovery[a], %
Modified EPA 8020:					
Benzene	Supelco	06/24/93	50.0	ug/L	95.0
Toluene	Supelco	06/24/93	50.0	ug/L	90.2
Ethylbenzene	Supelco	06/24/93	50.0	ug/L	90.4
Xylene, total	Supelco	06/24/93	150.0	ug/L	91.9

Sample and Sample Duplicate Results

Matrix: Air

Analyte	Sample ID	Date of Analysis	Sample Results	Sample Duplicate Results	Units	RPD[a], %
Modified EPA 8020:						
Benzene	C3070322-04	07/21/93	ND	ND	ug/L	NA
Toluene	C3070322-04	07/21/93	2.37	2.71	ug/L	13.4
Ethylbenzene	C3070322-04	07/21/93	ND	ND	ug/L	NA
Xylene, total	C3070322-04	07/21/93	ND	ND	ug/L	NA
GC-FID:						
Methane	ASVW3	07/20/93	304	310	ppm-V	2.00

a. See attached table for acceptability limits.
ND = Not Detected.
NA = Not Applicable.

GTEL ENVIRONMENTAL LABORATORIES INC

ARCO Products Company ◇
Division of AtlanticRichfieldCompany

Task Order No. 276-93-SA

Chain of Custody

ARCO Facility no.	276.
City (Facility)	OAKLAND, CA.
Project manager (Consultant)	VALLI VORUGANTI
Laboratory name	GTEL
ARCO engineer	MICHAEL WHELAN.
Telephone no. (ARCO)	
Telephone no. (Consultant)	(408) 264-7723
Fax no. (Consultant)	(408) 264-2435
Contract number	
Consultant name	RESNA INDUSTRIES, INC.
Address (Consultant)	3315 ALMADEN EXPWY # 34, San JOSE CA 95118

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other (Air)	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org/DHS ☐ Lead EPA 7420/7421 ☐	Methane
AS-VW3-14:00	01	1			X			07/19	14:00		X										X
AS-VW4-14:30	02	1			X			↓	14:30		X										X
AS-VW3 2-14:45	03	1			X			↓	14:45		X										
AS-15 SYS INFL -1500	04	1			X			↓	15:00		X										
AS-SYS-EFFL 1500	05	1			X			↓	15:00		X										

Method of shipment: Courier

Special detection Limit/reporting: Report results in mg/m³

Special QA/QC:

Remarks: Rep

Lab number: C3070322

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	Date	Time	Received by
Relinquished by sampler: [signature]	07/20	8:00am	Joe Weber 2:00 PM
Relinquished by: John Weber	7/20/93	11:20	Received by:
Relinquished by:	Date	Time	Received by laboratory: [signature]

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: 60026.15, Arco 276
Sample Matrix: Air
Analysis Method: EPA 5030/8015/8020
First Sample #: 3H46601

Sampled: Aug 10, 1993
Received: Aug 11, 1993
Reported: Aug 16, 1993

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3H46601 AS-VW-3	Sample I.D. 3H46602 AS-EFF	Sample I.D. 3H46603 AS-INF	Sample I.D. 3H46604 AS-VW-2
Purgeable Hydrocarbons	5.0	20	10	8.7	110
Benzene	0.050	N.D.	N.D.	N.D.	0.95
Toluene	0.050	0.20	0.098	0.061	0.48
Ethyl Benzene	0.050	0.73	0.46	0.33	0.56
Total Xylenes	0.050	2.2	1.5	0.79	1.8
Chromatogram Pattern:		Gas	Gas	Gas	Gas + Non-Gas Mix <C8

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0
Date Analyzed:	8/12/93	8/11/93	8/12/93	8/13/93
Instrument Identification:	GCHP-2	GCHP-3	GCHP-2	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	127	90	105	119

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

3H46601.RES <1>

SEQUOIA ANALYTICAL

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

Client Project ID: 60026.15, Arco 276
Matrix: Liquid
QC Sample Group: 3H46601,3

Reported: Aug 16, 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#:	BLK081293	BLK081293	BLK081293	BLK081293
Date Prepared:	-	-	-	-
Date Analyzed:	8/12/93	8/12/93	8/12/93	8/12/93
Instrument I.D.#:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
LCS % Recovery:	120	120	120	120
Control Limits:	80-120	80-120	80-120	80-120
MS/MSD Batch #:	3H43801	3H43801	3H43801	3H43801
Date Prepared:	-	-	-	-
Date Analyzed:	8/12/93	8/12/93	8/12/93	8/12/93
Instrument I.D.#:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
Matrix Spike % Recovery:	110	110	110	110
Matrix Spike Duplicate % Recovery:	120	120	120	120
Relative % Difference:	8.7	8.7	8.7	8.7

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/MSDs are advisory only and are not used to accept or reject batch results.

SEQUOIA ANALYTICAL

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

Client Project ID: 60026.15, Arco 276
Matrix: Liquid
QC Sample Group: 3H46602

Reported: Aug 16, 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#:	BLK081193	BLK081193	BLK081193	BLK081193
Date Prepared:	-	-	-	-
Date Analyzed:	8/11/93	8/11/93	8/11/93	8/11/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCH[illegible]	[illegible]3
LCS % Recovery:	99	99	99	100
Control Limits:	80-120	80-120	80-120	80-120
MS/MSD Batch #:	3H40907	3H40907	3H40907	3H40907
Date Prepared:	-	-	-	-
Date Analyzed:	8/11/93	8/11/93	8/11/93	8/11/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Matrix Spike % Recovery:	100	100	100	100
Matrix Spike Duplicate % Recovery:	100	100	100	103
Relative % Difference:	0.0	0.0	0.0	3.0

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

SEQUOIA ANALYTICAL

MTague

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.

SEQUOIA ANALYTICAL

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(415) 364-9600 • FAX (415) 364-9233

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

Client Project ID: 60026.15, Arco 276
Matrix: Liquid
QC Sample Group: 3H46604

Reported: Aug 16, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A. Miraftab	A. Miraftab	A. Miraftab	A. Miraftab
Conc. Spiked:	10	10	10	30
Units:	µg/L	µg/L	µg/L	µg/L
LCS Batch#:	BLK081393	BLK081393	BLK081393	BLK081393
Date Prepared:	-	-	-	-
Date Analyzed:	8/13/93	8/13/93	8/13/93	8/13/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
LCS % Recovery:	100	93	97	97
Control Limits:	80-120	80-120	80-120	80-120
MS/MSD Batch #:	3H57701	3H57701	3H57701	3H57701
Date Prepared:	-	-	-	-
Date Analyzed:	8/13/93	8/13/93	8/13/93	8/13/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Matrix Spike % Recovery:	92	91	93	93
Matrix Spike Duplicate % Recovery:	94	93	94	93
Relative % Difference:	2.2	2.2	1.1	0.0

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.

RESNA

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO.	PROJECT NAME/SITE
6CK126.15	Arco 376

SAMPLERS (SIGN) / (PRINT)

SAMPLE IDENTIFICATION	DATE	TIME	COMP	GRAB	PRES. USED	ICED	NO CONTAINERS	SAMPLE TYPE	BTEX (602/8020)	TPHg (8015)	TPHd (8015)	TOG 418.1/5520	601/8010	624/8240	625/8270				REMARKS
AS-VW-3	8-10-93	10:50					1	A	X	X			9308466001						Please call
AS-EFF		12:23					1	A	X	X								02	Vaili on
AS-INF		12:28					1	A	X	X								03	turnaround
AS-VW-2		12:45					1	A	X	X								04	time.
																			Thank you

ANALYSIS REQUESTED

P.O. #.

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
[signature]	8/11/93	0950	Lisa Hanstrom
Lisa Hanstrom	8/11/93	1050	
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY LABORATORY:

LABORATORY: Sequoia

REQUESTED TURNAROUND TIME: 2

RECEIPT CONDITION: Good

PLEASE SEND RESULTS TO: SW
Joe Ortiz

PROJECT MANAGER: Vaili Voroganty

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

Project: 60026.15, Arco 276

Enclosed are the results from 4 air samples received at Sequoia Analytical on August 11,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3H46601	Air, AS-VW-3	8/10/93	EPA 5030/8015/8020
3H46602	Air, AS-EFF	8/10/93	EPA 5030/8015/8020
3H46603	Air, AS-INF	8/10/93	EPA 5030/8015/8020
3H46604	Air, AS-VW-2	8/10/93	EPA 5030/8015/8020

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

Very truly yours,

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

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

Client Project ID: 60026.15, Arco 276
Sample Matrix: Air
Analysis Method: EPA 5030/8015/8020
First Sample #: 3H46601

Sampled: Aug 10, 1993
Received: Aug 11, 1993
Reported: Aug 16, 1993

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3H46601 AS-VW-3	Sample I.D. 3H46602 AS-EFF	Sample I.D. 3H46603 AS-INF	Sample I.D. 3H46604 AS-VW-2
Purgeable Hydrocarbons	5.0	20	10	8.7	110
Benzene	0.050	N.D.	N.D.	N.D.	0.95
Toluene	0.050	0.20	0.09[illegible]	0.001	0.48
Ethyl Benzene	0.050	0.73	0.46	0.33	0.56
Total Xylenes	0.050	2.2	1.5	0.79	1.8
Chromatogram Pattern:		Gas	Gas	Gas	Gas + Non-Gas Mix <C8

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0
Date Analyzed:	8/12/93	8/11/93	8/12/93	8/13/93
Instrument Identification:	GCHP-2	GCHP-3	GCHP-2	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	127	90	105	119

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

Client Project ID: 60026.15, Arco 276
Matrix: Liquid

QC Sample Group: 3H46601,3

Reported: Aug 16, 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#:	BLK081293	BLK081293	BLK081293	BLK081293
Date Prepared:	-	-	-	-
Date Analyzed:	8/12/93	8/12/93	8/12/93	8/12/93
Instrument I.D.#:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
LCS % Recovery:	120	120	120	120
Control Limits:	80-120	80-120	80-120	80-120
MS/MSD Batch #:	3H43801	3H43801	3H43801	3H43801
Date Prepared:	-	-	-	-
Date Analyzed:	8/12/93	8/12/93	8/12/93	8/12/93
Instrument I.D.#:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
Matrix Spike % Recovery:	110	110	110	110
Matrix Spike Duplicate % Recovery:	120	120	120	120
Relative % Difference:	8.7	8.7	8.7	8.7

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.

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: 60026.15, Arco 276
Matrix: Liquid

QC Sample Group: 3H46602

Reported: Aug 16, 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#:	BLK081193	BLK081193	BLK081193	BLK081193
Date Prepared:	-	-	-	-
Date Analyzed:	8/11/93	8/11/93	8/11/93	8/11/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
LCS % Recovery:	99	99	99	100
Control Limits:	80-120	80-120	80-120	80-120
MS/MSD Batch #:	3H40907	3H40907	3H40907	3H40907
Date Prepared:	-	-	-	-
Date Analyzed:	8/11/93	8/11/93	8/11/93	8/11/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Matrix Spike % Recovery:	100	100	100	100
Matrix Spike Duplicate % Recovery:	100	100	100	103
Relative % Difference:	0.0	0.0	0.0	3.0

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.

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: 60026.15, Arco 276
Matrix: Liquid

QC Sample Group: 3H46604

Reported: Aug 16, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	A. Miraftab	A. Miraftab	A. Miraftab	A. Miraftab
Conc. Spiked:	10	10	10	30
Units:	µg/L	µg/L	µg/L	µg/L
LCS Batch#:	BLK081393	BLK081393	BLK081393	BLK081393
Date Prepared:	-	-	-	-
Date Analyzed:	8/13/93	8/13/93	8/13/93	8/13/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
LCS % Recovery:	100	93	97	97
Control Limits:	80-120	80-120	80-120	80-120
MS/MSD Batch #:	3H57701	3H57701	3H57701	3H57701
Date Prepared:	-	-	-	-
Date Analyzed:	8/13/93	8/13/93	8/13/93	8/13/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Matrix Spike % Recovery:	92	91	93	93
Matrix Spike Duplicate % Recovery:	94	93	94	93
Relative % Difference:	2.2	2.2	1.1	0.0

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.

RESNA

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO.	PROJECT NAME/SITE	P.O. #.
60026.15	Arco 276	

SAMPLERS (SIGN) / (PRINT)

ANALYSIS REQUESTED

SAMPLE IDENTIFICATION	DATE	TIME	COMP	GRAB	PRES USED	ICED	NO. CONTAINERS	SAMPLE TYPE	BTEX (602/8020)	TPHg (8015)	TPHd (8015)	TOG 418.1/5520	601/8010	624/8240	625/8270					REMARKS
AS-VW-3	8-10-93	10:50					1	A	X	X			9308466					01		Please call
AS-EFF	↓	12:23					1	A	X	X								02		Vaili on
AS-INF		12:28					1	A	X	X								03		turnaround
AS-VW-2		12:45					1	A	X	X								04		time.
																				Thank you

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	LABORATORY: Sequoia	PLEASE SEND RESULTS TO San Jose Office.
[signature]	8/11/93	0950	Lisa Stenstrom		
RELINQUISHED BY: Lisa Stenstrom	8/11/93	1050	RECEIVED BY		
RELINQUISHED BY	DATE	TIME	RECEIVED BY.	REQUESTED TURNAROUND TIME 2	
RELINQUISHED BY	DATE	TIME	RECEIVED BY LABORATORY [signature]	RECEIPT CONDITION Good	PROJECT MANAGER Vaili Voroganty

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

Project: ARCO 276, Oakland

Enclosed are the results from 2 air samples received at Sequoia Analytical on August 26,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3HC8601	Air, AS-VW2 14:26	8/25/93	EPA 5030/8015/8020
3HC8602	Air, AS-VW5 17:17	8/25/93	EPA 5030/8015/8020 Calderon Inert Gases

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: Valli Voruganti

Client Project ID: ARCO 276, Oakland
Sample Matrix: Air
Analysis Method. EPA 5030/8015/8020
First Sample #: 3HC8601

Sampled: Aug 25, 1993
Received: Aug 26, 1993
Reported: Aug 30, 1993

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit mg/m3	Sample I.D. 3HC8601 AS-VW2 14:26	Sample I.D. 3HC8602 AS-VW5 17:17
Purgeable Hydrocarbons	5.0	30	19
Benzene	0.050	0.31	0.46
Toluene	0.050	0.23	0.22
Ethyl Benzene	0.050	0.46	0.43
Total Xylenes	0.050	1.9	1.5
Chromatogram Pattern:		Gas	Gas

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0
Date Analyzed:	8/26/93	8/26/93
Instrument Identification:	GCHP-3	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	123	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: Valli Voruganti

Client Project ID: ARCO 276, Oakland
Matrix: Liquid

QC Sample Group: 3HC8601-2

Reported: Aug 30, 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#:	BLK082693	BLK082693	BLK082693	BLK082693
Date Prepared:	-	-	-	-
Date Analyzed:	8/26/93	8/26/93	8/26/93	8/26/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
LCS % Recovery:	97	97	99	97
Control Limits:	80-120	80-120	80-120	80-120
MS/MSD Batch #:	3HC3602	3HC3602	3HC3602	3HC3602
Date Prepared:	-	-	-	-
Date Analyzed:	8/26/93	8/26/93	8/26/93	8/26/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Matrix Spike % Recovery:	95	95	96	93
Matrix Spike Duplicate % Recovery:	99	98	99	100
Relative % Difference:	4.1	3.1	3.1	7.3

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.

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
Sample Descript: Air

First Sample #. 3HC8602

Sampled: Aug 25, 1993
Received: Aug 26, 1993

Reported: Sep 3, 1993

CALDERON INERT GASES

Sample Number	Sample Description	Inert Gases, mg/m3 CO2
3HC8602	AS-VW5 17'17	29000
	Lab Blank	N.D.

Detection Limits:	18

SEQUOIA ANALYTICAL

for Vickie Tague
Project Manager

Please Note:
As requested by Air Toxics Ltd., converted to mg/m3.

ARCO Products Company Division of AtlanticRichfieldCompany

Task Order No. 276-93-5A

Chain of Custody

ARCO Facility no	276	City (Facility)	Oakland, CA	Project manager (Consultant)	Valli Voruganti
ARCO engineer	M. Whelan	Telephone no (ARCO)	(415) 571-2434	Telephone no (Consultant)	(408) 264 7723
				Fax no (Consultant)	(408) 264 2435
Consultant name	Resna	Address (Consultant)	3315 Almaden Expw #34, San Jose, 95118		

Laboratory name: Sequoia

Contract number: 07-073

Sample I D	Lab no	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other (Air)	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015 (gas)	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org/DHS ☐ Lead EPA 7420/7421 ☐	CO_2	
AS-VW2	14:26	1			X			08/25	14:26		X											
					X			08/25	17:17													
AS-VW5	17:17	1			S			S	S		X										X	

9308C86

Method of shipment:

Special detection Limit/reporting:

Special QA/QC:

Remarks:

Lab number: 9308C86

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

Condition of sample:

Temperature received:

	Date	Time		
Relinquished by sampler: [signature]	08/26	8:00am	Received by: David Alderman	8/26/93
Relinquished by: David Alderman	8/26/93	11:10	Received by:	
Relinquished by:			Received by laboratory: [signature]	Date 8.26.93 Time 1110

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

APPC 329

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

Project: Arco 276, Oakland

Enclosed are the results from 4 air samples received at Sequoia Analytical on September 10,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3I36401	Air, AS-INFL	9/9/93	EPA 5030/8015/8020
3I36402	Air, AS-MW2	9/9/93	Inert Gases EPA 5030/8015/8020
3I36403	Air, AS-EFFL	9/9/93	EPA 5030/8015/8020
3I36404	Air, AS-VW5	9/9/93	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
3315 Almaden Expwy , Suite 34
San Jose, CA 95118
Attention Valli Voruganti

Client Project ID: Arco 276, Oakland
Sample Matrix. Air
Analysis Method EPA 5030/8015/8020
First Sample # 3I36401

Sampled: Sep 9, 1993
Received: Sep 10, 1993
Reported: Sep 14, 1993

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit mg/m3	Sample I.D. 3I36401 AS-INFL	Sample I.D. 3I36402 AS-MW2	Sample I.D. 3I36403 AS-EFFL	Sample I.D. 3I36404 AS-VW5
Purgeable Hydrocarbons	5.0	82	330	18	22
Benzene	0.050	N D	2 9	0.13	0.26
Toluene	0.050	14	4.5	N.D.	3.2
Ethyl Benzene	0.050	0.79	0.47	0.72	0.53
Total Xylenes	0.050	3.6	10	2.3	2.0
Chromatogram Pattern:		Gas	Gas	Gas	Gas

Quality Control Data

Report Limit Multiplication Factor:	2.5	5.0	1.0	1.0
Date Analyzed:	9/10/93	9/10/93	9/10/93	9/10/93
Instrument Identification:	GCHP-2	GCHP-3	GCHP-2	GCHP-2
Surrogate Recovery, %: (QC Limits = 70-130%)	101	129	100	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 Valli Voruganti

Client Project ID. Arco 276, Oakland
Matrix: Liquid

QC Sample Group: 3I36401, 3-4

Reported: Sep 14, 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#:	BLK091093	BLK091093	BLK091093	BLK091093
Date Prepared:	-	-	-	-
Date Analyzed:	9/10/93	9/10/93	9/10/93	9/10/93
Instrument I.D.#:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
LCS % Recovery:	110	100	99	100
Control Limits:	80-120	80-120	80-120	80-120
MS/MSD Batch #:	3I23002	3I23002	3I23002	3I23002
Date Prepared:	-	-	-	-
Date Analyzed:	9/10/93	9/10/93	9/10/93	9/10/93
Instrument I.D.#:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
Matrix Spike % Recovery:	110	100	100	103
Matrix Spike Duplicate % Recovery:	110	110	100	103
Relative % Difference:	0.0	9.5	0.0	0.0

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.

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: 3I36402

Reported: Sep 14, 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#:	BLK091093	BLK091093	BLK091093	BLK091093
Date Prepared:	-	-	-	-
Date Analyzed:	9/10/93	9/10/93	9/10/93	9/10/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
LCS % Recovery:	100	96	95	93
Control Limits:	80-120	80-120	80-120	80-120
MS/MSD Batch #:	3I30312	3I30312	3I30312	3I30312
Date Prepared:	-	-	-	-
Date Analyzed:	9/10/93	9/10/93	9/10/93	9/10/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Matrix Spike % Recovery:	110	110	100	103
Matrix Spike Duplicate % Recovery:	110	110	100	100
Relative % Difference:	0.0	0 0	0 0	3.0

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.

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
Sample Descript: Air

First Sample # 3136402

Sampled: Sep 9, 1993
Received: Sep 10, 1993

Reported: Sep 17, 1993

CALDERON INERT GASES

Sample Number	Sample Description	Inert Gases, mg/m³ CO2
3136402	AS-MW2	32000
	Lab Blank	N.D.

Detection Limits:	18

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
Results as reported by Air Toxics Ltd. converted to mg/m³.

ARCO Products Company

Division of Atlantic Richfield Company

Chain of Custody

Task Order No. 276-93-5A

ARCO Facility no: 276 | City (Facility): Oakland, CA | Project manager (Consultant): | Laboratory name: Sequoia

ARCO engineer: M. Whelan | Telephone no (ARCO): | Telephone no (Consultant): | Fax no (Consultant): | Contract number: 93-073

Consultant name: Resna Industries | Address (Consultant): 3315 Almaden Expwy #34, San Jose, 95118 | Method of shipment: Courier

Sample ID	Lab no	Container no	Matrix: Soil	Matrix: Water	Matrix: Other (Air)	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	02
AS-INFL	1				X			9/9	4:50		X					01					
AS-NW2	1				X				4:55		X					02					X
AS-EFFL	1				X				4:45		X					03					
AS-WW5					X				3:45		X					04					

Special detection Limit/reporting: mg/m3

Special QA/QC:

Remarks:

Lab number: 9309364

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: [signature] Date 9/10/93 Time 9:27a

Received by: [signature]

Relinquished by: [signature] Date 9/10/93 Time 1140

Received by:

Relinquished by: Date Time

Received by laboratory: S Stenstrom Date 9-10-93 Time 1140

Temperature received:

Distribution W[illegible]py -- Laboratory, Canary copy -- ARCO Environmental Engineering, Pink copy -- Cons[illegible]

ARPC 3292 (2-

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

Project: Arco 276, Oakland

Enclosed are the results from 2 air samples received at Sequoia Analytical on September 23,1993. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
3IB1501	Air, A0922-VW2	9/22/93	EPA 5030/8015/8020
3IB1502	Air, A0922-VW4	9/22/93	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: Valli Voruganti

Client Project ID: Arco 276, Oakland
Sample Matrix: Air
Analysis Method: EPA 5030/8015/8020
First Sample #: 3IB1501

Sampled: Sep 22, 1993
Received: Sep 23, 1993
Reported: Sep 28, 1993

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit mg/m³	Sample I.D. 3IB1501 A0922-VW2	Sample I.D. 3IB1502 A0922-VW4
Purgeable Hydrocarbons	5.0	130	110
Benzene	0.050	0.94	2.5
Toluene	0.050	1.7	0.9
Ethyl Benzene	0.050	0.84	0.43
Total Xylenes	0.050	2.7	1.6
Chromatogram Pattern:		Gas + Non-Gas Mix < C8	Gas + Non-Gas Mix < C8

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0
Date Analyzed:	9/23/93	9/23/93
Instrument Identification:	GCHP-2	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	160*	117

* Coelution Confirmed.

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

SEQUOIA ANALYTICAL

V. Tague

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: 3IB1501

Reported: Sep 28, 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#:	GBLK092393	GBLK092393	GBLK092393	GBLK092393
Date Prepared:	N/A	N/A	N/A	N/A
Date Analyzed:	9/23/93	9/23/93	9/23/93	9/23/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
LCS % Recovery:	91	93	93	93
Control Limits:	80-120	80-120	80-120	80-120
MS/MSD Batch #:	G3I75409	G3I75409	G3I75409	G3I75409
Date Prepared:	N/A	N/A	N/A	N/A
Date Analyzed:	9/23/93	9/23/93	9/23/93	9/23/93
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Matrix Spike % Recovery:	83	84	87	83
Matrix Spike Duplicate % Recovery:	93	94	95	93
Relative % Difference:	11	11	8.8	11

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.

SEQUOIA ANALYTICAL

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

Client Project ID: Arco 276, Oakland
Matrix: Liquid

QC Sample Group: 3IB1502

Reported: Sep 28, 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#:	GBLK092393	GBLK092393	GBLK092393	GBLK092393
Date Prepared:	N/A	N/A	N/A	N/A
Date Analyzed:	9/23/93	9/23/93	9/23/93	9/23/93
Instrument I.D.#:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
LCS % Recovery:	110	110	110	110
Control Limits:	80-120	80-120	80-120	80-120
MS/MSD Batch #:	G3I75408	G3I75408	G3I75408	G3I75408
Date Prepared:	N/A	N/A	N/A	N/A
Date Analyzed:	9/23/93	9/23/93	9/23/93	9/23/93
Instrument I.D.#:	GCHP-2	GCHP-2	GCHP-2	GCHP-2
Matrix Spike % Recovery:	100	110	110	107
Matrix Spike Duplicate % Recovery:	99	100	100	103
Relative % Difference:	1.0	9.5	9.5	3.8

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): Valli Voruganti	Laboratory name: Sequoia
ARCO engineer: M. Whelan.	Telephone no (ARCO): (415) 571 2449.	Telephone no (Consultant): (408) 264-7723	Fax no (Consultant): (408) 264-2435
Consultant name: RESNA Ind.	Address (Consultant): 3315 Almaden #74 San Jose		Contract number: 07-073

Method of shipment:

Special detection Limit/reporting:

Special QA/QC:

Remarks: Report Results in Mg/m3

Lab number: 9309B15

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

Sample I.D.	Lab no	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other: Air	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ✓ Diesel [ ]	Oil and Grease 413.1 [ ] 413.2 [ ]	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals [ ] VOA [ ] Semi VOA [ ]	CAM Metals EPA 6010/7000 TTLC [ ] STLC [ ]	Lead Org./DHS [ ] Lead EPA 7420/7421 [ ]	
A-0922-VW2		1			✓			9-22	1610	✓		✓									01
A-0922-VW4		1			✓			9-22	1600	✓		✓									02

Condition of sample: good

Temperature received: Cool

	Date	Time		Date	Time
Relinquished by sampler: Rich Johnson	9-23	1145	Received by: Del Yeng #653		
Relinquished by: Del Yeng #653	9/23/93	1245	Received by:		
Relinquished by:			Received by laboratory:	9/23/93	1245

Canary copy — ARCO Environmental Engineering Pink copy — Consultant