RESNA
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42501 Albrae Street
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Phone: (510) 440-3300
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TRANSMITTAL

TO: Ms. Susan Hugo
Alameda County Health Care
Services Agency
80 Swan Way, Room 200
Oakland, California 94621

DATE: May 25, 1994
PROJECT NUMBER: 60000.17
SUBJECT: ARCO Station 771

FROM: John C. Young

WE ARE SENDING YOU:

COPIES	DATED	DESCRIPTION
1	05/11/94	Letter Report, Quarterly Groundwater Monitoring, First Quarter 1994 at ARCO Station 771, 899 Rincon Avenue, Livermore, California.

THESE ARE TRANSMITTED as checked below:

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REMARKS:

Copies: 1 to RESNA project file no. 60000.17

John C. Young

John C. Young, Project Manager

cc: Mr. Michael Whelan, ARCO
Mr. Eddy So, RWQCB
Ms. Danielle Stefani, Livermore Fire Dept.

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3315 Almaden Expressway, Suite 34
San Jose, CA 95118
Phone: (408) 264-7723
FAX: (408) 264-2435

LETTER REPORT
QUARTERLY GROUNDWATER AND REMEDIATION SYSTEM MONITORING
First Quarter 1994

ARCO Station 771
899 Rincon Avenue
Livermore, California

May 1994

60000.17

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3315 Almaden Expressway, Suite 34
San Jose, CA 95118
Phone: (408) 264-7723
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May 11, 1994

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

Subject: Letter Report, Quarterly Groundwater and Remediation System Monitoring, First Quarter 1994
ARCO Station 771
899 Rincon Avenue, Livermore, California.

Mr. Whelan:

As requested by ARCO Products Company (ARCO), RESNA Industries Inc. (RESNA) presents this letter report summarizing the results of First Quarter 1994 Groundwater Monitoring performed by Integrated Wastestream Management, Inc. (IWM) of Milpitas, California, at the above-referenced site (Plates 1 and 2). RESNA's scope of work was to interpret field and laboratory analytical data, which included evaluating trends in hydrocarbon concentrations in the local groundwater, the groundwater gradient, and direction of groundwater flow beneath the site. Evaluation and warrant of field procedures, field data, and field protocols, performed by IWM, is beyond RESNA's scope of work. Remediation System Monitoring was performed by RESNA personnel, and included a preliminary system check. Previous environmental work at the site is summarized in RESNA reports cited in the References section.

GROUNDWATER MONITORING

Field Work

IWM field personnel were onsite March 26, 1994, to measure depth to water levels (DTW), perform subjective analysis for the presence of product in groundwater, and perform quarterly groundwater sampling of monitoring wells MW-1 through MW-11 and recovery well RW-1.

Laboratory Analyses

Water samples were analyzed by Columbia Analytical Services, Inc., located in San Jose, California (Hazardous Waste Testing Laboratory Certification No. 1426) for benzene, toluene, ethylbenzene, and total xylenes (BTEX), and total petroleum hydrocarbons as gasoline (TPHg) using Environmental Protection Agency (EPA) Methods 5030/8020/California DHS LUFT Method. In addition, groundwater samples collected from well MW-6, the closest downgradient well to the former waste-oil tank, were also analyzed for total petroleum hydrocarbons as diesel (TPHd) using EPA Methods 3510/California DHS LUFT Method and total oil and grease (TOG) using EPA Method 418.1. The Certified Analytical Reports with Chain of Custody are included in Appendix A.

Results of Groundwater Monitoring

Groundwater elevations rose an average of about 5.07 feet in all the wells since the last quarter. Evidence of floating product or product sheen was not noted in any of the wells during this quarter. Based on March 26, 1994, DTW data, groundwater is interpreted to flow toward the north with a gradient of approximately 0.05 ft/ft (Plate 3). Groundwater monitoring data from this and previous quarters is presented in Table 1. The results of IWM's field work on the site are presented in Appendix A.

The following trends in hydrocarbon concentrations have been identified since the last quarter. Concentrations of TPHg and benzene have generally decreased in wells MW-1, MW-2, and RW-1. Concentrations of TPHg have generally decreased while benzene generally increased in wells MW-4, MW-5, MW-7, and MW-3 (benzene remained not detected). Concentrations of TPHg and benzene have generally increased in well MW-6, and have remained not detected in wells MW-8 through MW-11 (Plate 4). Concentrations of TPHd and TOG in well MW-6 have generally increased since the last quarter. Cumulative analytical results of water samples are presented in Table 2.

Product Recovery

No floating product was recovered during this quarter. The total product recovered at the site since 1991 is 3.06 gallons. Table 3, tabulates the total product recovered at the site.

REMEDIATION SYSTEM MONITORING

The major components of the Vapor Extraction System (VES) include six vapor extraction wells (VW-1, MW-1, MW-2, MW-4, MW-5, and MW-7), a 7.5 horsepower MD Pneumatics blower, and a 200 standard cubic feet per minute (scfm) King-Buck MMC-6a/e catalytic oxidizer (cat-ox) for the combustion treatment of extracted gasoline vapors.

The cat-ox unit was started on fresh air (March 16, 1994) to determine if the unit could still operate following one year of shut-down. This was done to verify that startup of the VES could occur if groundwater elevations decrease and well screen becomes available in the vapor extraction wells.

PREVIOUS AND FUTURE WORK

First Quarter 1994

- Submitted Letter Report, Quarterly Groundwater Monitoring, Fourth Quarter 1993 to ARCO and regulatory agencies.
- Performed First Quarter 1994 Groundwater Monitoring.

Second Quarter 1994

- Submit Letter Report, Quarterly Groundwater Monitoring, First Quarter 1994 to ARCO and regulatory agencies.
- Perform Second Quarter 1994 Groundwater Monitoring.
- If groundwater elevations decrease to expose well screen, the appropriate regulatory agencies will be notified and the VES will be started.

REPORTING REQUIREMENTS

RESNA recommends that copies of this letter report be forwarded to:

RESNA
Working to Restore Nature

Ms. Susan Hugo
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

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

Ms. Danielle Stefani
Livermore Fire Department
4550 East Avenue
Livermore, California 94550

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

Sincerely,
RESNA Industries Inc.

Mary E. Rysdale
Geologic Technician

David Peterson
Staff Engineer

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

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

Attachments:

References

Plate 1: Site Vicinity Map
Plate 2: Generalized Site Plan
Plate 3: Groundwater Gradient Map
Plate 4: TPHg/Benzene Concentrations in Groundwater

Table 1: Cumulative Groundwater Monitoring Data
Table 2: Cumulative Results of Laboratory Analyses of Groundwater Samples
Table 3: Approximate Cumulative Product Recovered

Appendix A: IWM's Summary of Groundwater Monitoring Data, Field Reports, and Certified Analytical Reports with Chain-of-Custody

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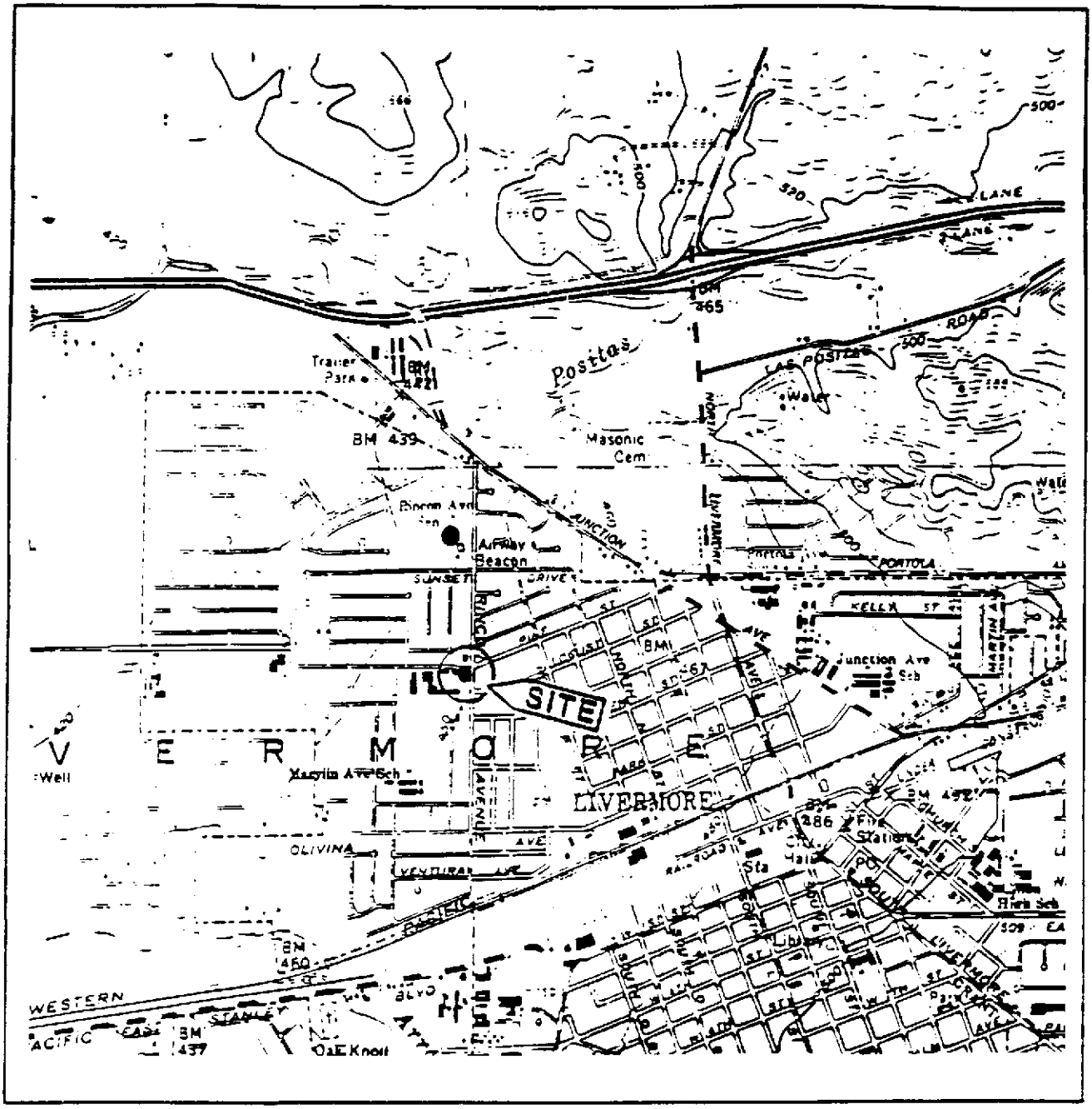
REFERENCES

RESNA, February 26, 1993. Report on Additional Onsite and Initial Offsite Subsurface Investigation at ARCO Station 771, 899 Rincon Avenue, Livermore, California. 60000.09

RESNA, March 3, 1994. Letter Report Quarterly Groundwater Monitoring Fourth Quarter 1993 at ARCO Station 771, 899 Rincon Avenue, Livermore, California. 60000.15



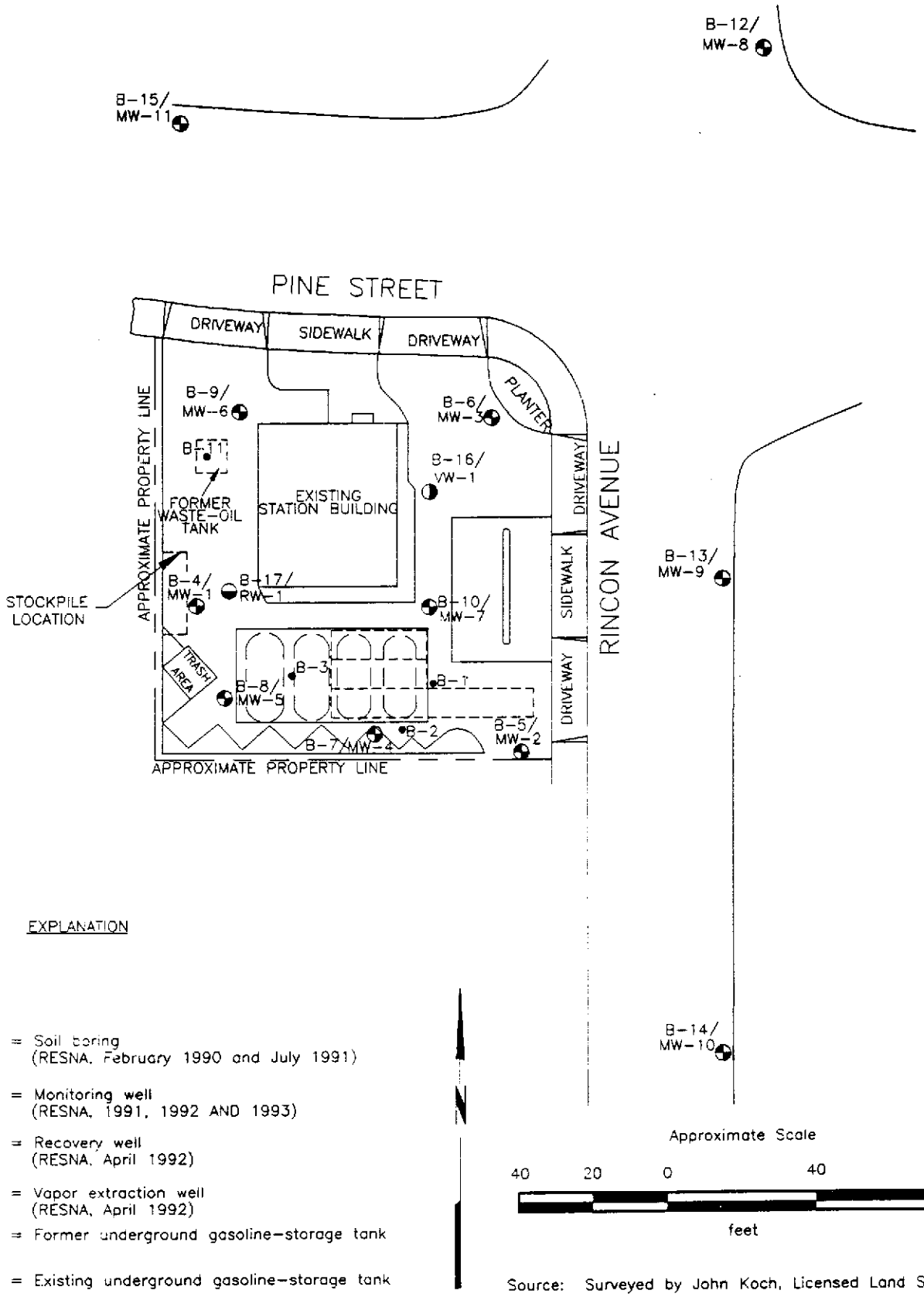
Source: U.S. Geological Survey
7.5-Minute Quadrangle
Livermore, California
Photorevised 1980

Approximate Scale

2000 1000 0 2000

feet

RESNA Working to Restore Nature PROJECT 60000.17	SITE VICINITY MAP ARCO Station 771 899 Rincon Avenue Livermore, California	PLATE 1



EXPLANATION

B-11 ● = Soil boring (RESNA, February 1990 and July 1991)

B-15/ MW-11 ◓ = Monitoring well (RESNA, 1991, 1992 AND 1993)

B-17/ RW-1 ◒ = Recovery well (RESNA, April 1992)

B-16/ VW-1 ◑ = Vapor extraction well (RESNA, April 1992)

▭ = Former underground gasoline-storage tank

▭ = Existing underground gasoline-storage tank

N

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor.

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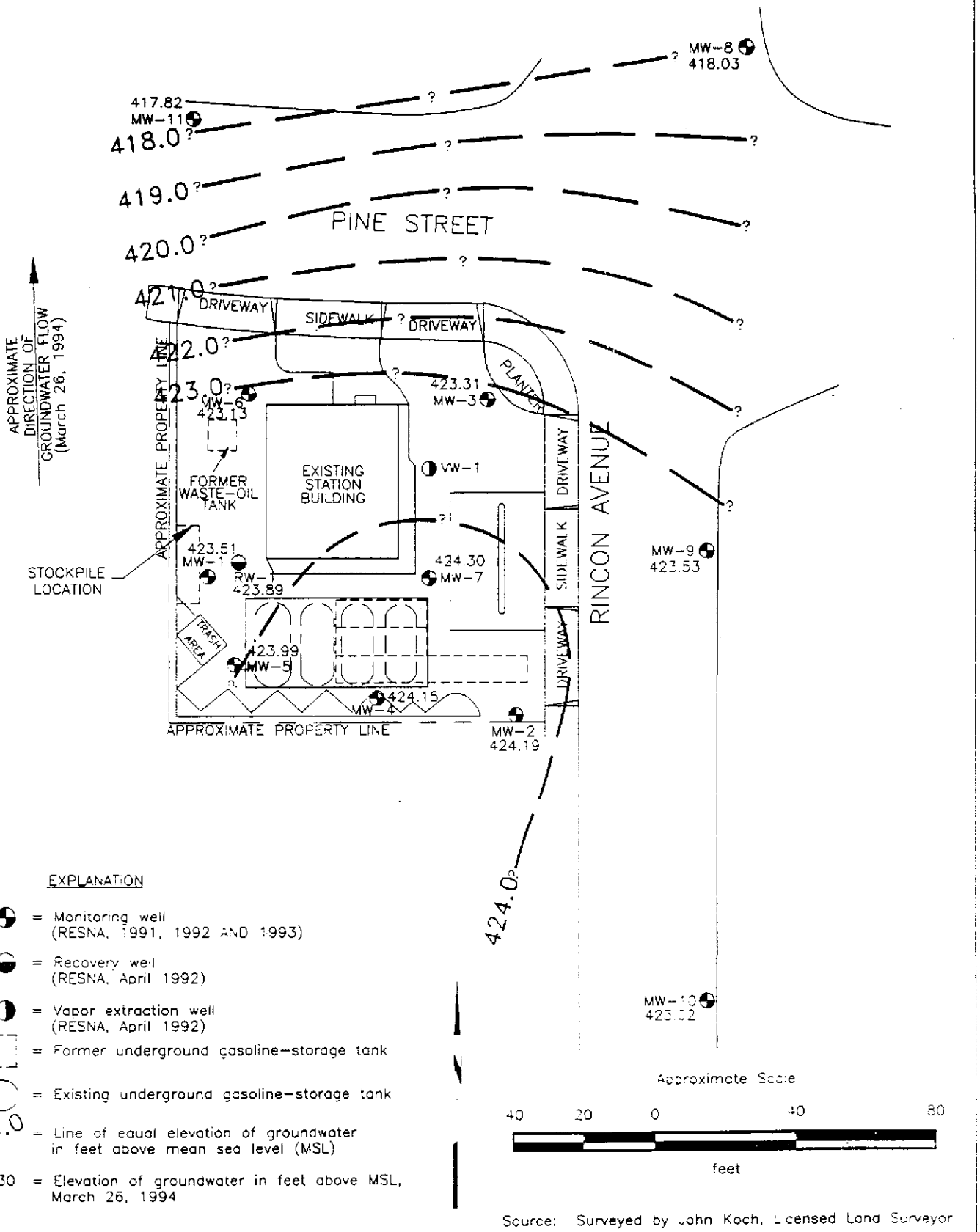
PROJECT 60000.17

GENERALIZED SITE PLAN
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
2



Source: Surveyed by John Koch, Licensed Land Surveyor.

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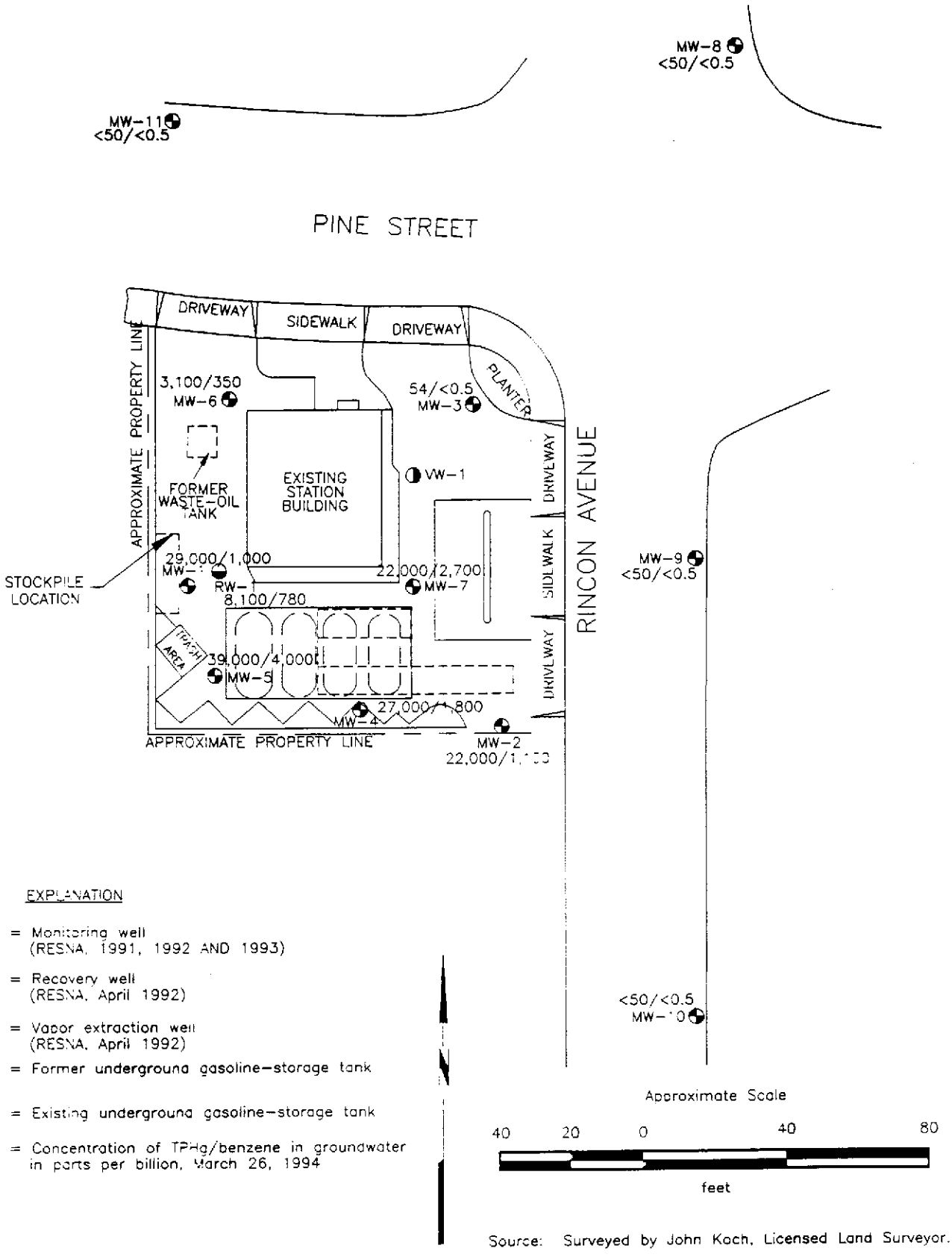
GROUNDWATER GRADIENT MAP
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 3



EXPLANATION

MW-11 = Monitoring well (RESNA, 1991, 1992 AND 1993)

RW-1 = Recovery well (RESNA, April 1992)

VW-1 = Vapor extraction well (RESNA, April 1992)

= Former underground gasoline-storage tank

= Existing underground gasoline-storage tank

39,000/4,000 = Concentration of TPHg/benzene in groundwater in parts per billion, March 26, 1994

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor.

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PROJECT 60000.17 00001701

TPHg/BENZENE CONCENTRATIONS IN GROUNDWATER
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 4

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 1 of 8)

Well / Date	Well Elevation	Depth-to-Water	Water Elevation	Floating Product
MW-1				
01-15-91	451.80[a]	32.77	419.03	Sheen
02-27-91		32.23	419.57	None
03-20-91		27.38	424.42	Sheen
04-10-91		26.49	425.31	None
05-20-91	451.80[b]	Not measured - interface probe failure		
06-20-91		33.95	417.85	Sheen
07-25-91		36.59*	415.21*	0.10
08-13-91		37.72*	414.08*	0.20
09-12-91		39.25*	412.55*	0.23
10-30-91		39.14*	412.66*	0.20
11-13-91		Dry	Dry	None
12-26-91		39.30*	412.50	0.01
01-18-92		37.81**	NC	Skimmer
02-21-92		Well inaccessible due to construction		
03-31-92		31.90**	NC	Skimmer
04-24-92	451.42[c]	Well inaccessible due to construction		
05-20-92		33.00	418.42	Skimmer
06-12-92		33.25	418.17	0.02
07-28-92		32.31	419.11	None
08-24-92		30.87	420.55	None
09-15-92		32.24*	419.18*	0.01
10-29-92		32.29	419.13	None
11-25-92	451.73[d]	32.15	419.58	Floating product**
12-14-92		30.54	421.19	None
01-29-93		23.49	428.24	None
02-26-93		25.23	426.50	None
03-29-93		25.66	426.07	None
04-27-93		28.02	423.71	None
05-10-93		30.38	421.35	None
06-17-93		30.81	420.92	None
07-27-93		Not monitored-truck parked on well		
08-26-93		31.23	420.50	None
09-14-93		32.59	419.14	None
11-05-93		32.13	419.60	None
03-26-94		28.22	423.51	None
MW-2				
01-15-91	449.52[e]	30.89*	418.63*	0.16
02-27-91		29.11*	420.41*	0.02
03-20-91		24.57*	424.95*	0.02
04-10-91		22.85*	426.67*	0.05

See notes on page 8 of 8

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 2 of 8)

Well Date	Well Elevation	Depth-to-Water	Water Elevation	Floating Product
MW-2 (cont.)				
05-20-91	449.51[b]	NM	NM	NM
06-20-91		31.42*	418.09*	0.15
07-25-91		33.69*	415.82*	0.49
08-13-91		34.80*	414.71*	0.47
09-12-91		36.39*	413.12*	0.45
10-30-91		Dry	Dry	None
11-13-91		Dry	Dry	None
12-26-91		36.45	413.06	Sheen
01-18-92		Well inaccessible due to construction		
02-21-92	449.51[b]	26.27	NC	Skimmer
03-31-92		28.85	NC	Skimmer
04-24-92		30.95	418.56	Skimmer
05-20-92		30.69	418.82	Skimmer
06-12-92		31.25	418.26	None
07-28-92		30.31	419.20	None
08-24-92		29.83	419.68	None
09-15-92		30.06	419.45	Sheen
10-29-92		30.90	418.61	None
11-25-92	449.49[d]	31.13	418.36	Floating Product**
12-14-92		29.24	420.25	None
01-29-93		20.12	429.39	None
02-26-93		22.59	426.90	None
03-29-93		22.83	426.66	None
04-27-93		25.10	424.39	None
05-10-93		27.23	422.26	None
06-17-93		28.26	421.23	None
07-27-93		29.50	419.99	None
08-26-93		29.85	419.64	None
09-14-93		30.43	419.06	None
11-05-93		30.20	419.29	None
03-26-94		25.30	424.19	None
MW-3				
01-15-91	450.29[a]	32.34	417.95	None
02-27-91		31.78	418.51	None
03-20-91		27.74	422.55	None
04-10-91		25.05	425.24	None
05-20-91	450.28[b]	27.06	423.22	None
06-20-91		32.35	417.93	None
07-25-91		35.02	415.26	None
08-13-91		36.50	413.78	None

See notes on page 8 of 8

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 3 of 8)

Well Date	Well Elevation	Depth-to-Water	Water Elevation	Floating Product
MW-3 (cont.)				
09-12-91		38.47	413.81	None
10-30-91		Dry	Dry	None
11-13-91		Dry	Dry	None
12-26-91		38.53	411.75	None
01-18-92		Well inaccessible due to construction		
02-21-92		Well inaccessible due to construction		
03-31-92		30.61	NC	None
04-24-92	450.28[c]	32.83	417.45	None
05-20-92		33.85	416.43	None
06-12-92		34.51	415.77	None
07-28-92		34.42	415.86	None
08-24-92		32.46	417.82	None
09-15-92		34.29	415.99	None
10-29-92		33.40	416.88	None
11-25-92		33.67	416.61	None
12-14-92		34.26	416.02	None
01-29-93		21.88	428.40	None
02-26-93		24.71	425.57	None
03-29-93	450.28[c]	24.74	425.54	None
04-27-93		25.96	424.32	None
05-10-93		27.61	422.67	None
06-17-93		28.73	421.55	None
07-27-93		30.37	419.91	None
08-26-93		30.94	419.34	None
09-14-93		31.84	418.44	None
11-05-93		33.22	417.06	None
03-26-94		26.97	423.31	None
MW-4				
07-25-91	451.56[b]	36.07	415.49	None
08-13-91		37.54	414.02	None
09-12-91		38.73	412.83	None
10-10-91	451.56[b]	39.90	411.66	None
11-13-91		40.56	411.00	None
12-26-91	450.99[c]	38.78	412.78	None
01-18-92		38.71	NC	None
02-21-92		31.91	NC	None
03-31-92		30.36	NC	None
04-24-92		32.65	418.34	None
05-20-92		32.62	418.37	None
06-12-92		32.73	418.26	None

See notes on page 8 of 8

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 4 of 8)

Well Date	Well Elevation	Depth-to-Water	Water Elevation	Floating Product
MW-4 (cont.)				
07-28-92		31.48	419.51	None
08-24-92		32.84	418.15	None
09-15-92		31.37	419.62	None
10-29-92		32.58	418.41	None
11-25-92	451.09[d]	32.37	418.72	None
12-14-92		30.99	420.10	None
01-29-93		22.30	428.79	None
02-26-93		24.47	426.62	None
03-29-93		24.67	426.42	None
04-27-93		26.68	424.41	None
05-10-93		28.64	422.45	None
06-17-93		29.28	421.81	None
07-27-93		31.14	419.95	None
08-26-93		31.38	419.71	None
09-14-93		32.00	419.01	None
11-05-93		31.16	419.93	None
03-26-94		26.94	424.15	None
MW-5				
07-25-91	451.41[b]	36.67	414.74	Sheen
08-13-91		37.98*	413.43*	0.01
09-12-91		39.01*	412.40*	0.05
10-30-91		38.28	412.13	Sheen
11-13-91		39.24	412.17	Sheen
12-26-91		39.11	412.30	Sheen
01-18-92		38.15	NC	Skimmer
02-21-92		30.59	NC	Skimmer
03-18-92		30.84	NC	Skimmer
04-24-92	451.40[c]	33.00	418.40	Skimmer
05-20-92		32.86	418.54	Skimmer
06-12-92		33.03	418.37	None
07-28-92		31.92	419.48	None
08-24-92		32.17	419.23	None
09-15-92		31.90	419.50	None
10-29-92		32.94	418.46	None
11-25-92	Not measured - new L-shape wellhead fitting prevented sounder from going down well			
12-14-92		30.90***	NC	None
01-29-93		23.25***	NC	None
02-26-93		25.02***	NC	None
03-29-93		24.72***	NC	None
04-27-93		27.11***	NC	None

See notes on page 8 of 8

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 5 of 8)

Well Date	Well Elevation	Depth-to-Water	Water Elevation	Floating Product
MW-5 (cont.)				
05-10-93		29.04***	NC	None
06-17-93		29.33***	NC	None
07-27-93		31.12	420.28	None
08-26-93		31.37	420.03	None
09-14-93		31.96	419.44	None
11-05-93		31.03	420.37	None
03-26-94		27.41	423.99	None
MW-6				
07-25-91	451.38[b]	37.68	413.70	None
08-13-91		39.17	412.21	None
09-12-91		41.14	410.24	None
10-30-91		42.10	409.28	None
11-13-91		41.45	409.93	None
12-26-91		41.23	410.15	None
01-18-92		38.23	NC	None
02-21-92	451.37[c]	35.21	NC	None
03-31-92		32.26	NC	None
04-24-92		33.24	418.13	None
05-20-92		33.14	418.23	None
06-12-92		33.43	417.94	None
07-28-92		32.52	418.85	None
08-24-92		32.57	418.80	None
09-15-92		32.58	418.79	None
10-29-92		32.33	419.04	None
11-25-92		32.43	418.94	None
12-14-92		31.52	419.85	None
01-29-93		23.70	427.67	None
02-26-93		26.22	425.15	None
03-29-93		26.13	425.24	None
04-27-93		27.27	424.10	None
05-10-93		29.74	421.63	None
06-17-93		30.92	420.45	None
07-27-93		30.90	420.47	None
08-26-93		31.18	420.19	None
09-14-93		31.70	419.67	None
11-05-93		31.83	419.54	None
03-26-94		28.24	423.13	None

See notes on page 8 of 8

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 6 of 8)

Well Date	Well Elevation	Depth-to- Water	Water Elevation	Floating Product
MW-7				
07-25-91	450.65[b]	34.88	415.77	Sheen
08-13-91		36.17	414.48	None
09-12-91		37.81	412.84	None
10-30-91		38.50	412.15	None
11-13-91		38.31	412.34	None
12-26-91		37.90	412.75	None
01-18-92		Well inaccessible due to construction		
02-21-92		31.50	NC	None
03-31-92		29.40	NC	None
04-24-92	450.63[c]	32.14	418.49	None
05-20-92		32.51	418.12	None
06-12-92		32.45	418.18	None
07-28-92		32.08	418.55	None
08-24-92		32.29	418.34	None
09-15-92		31.93	418.70	None
10-29-92		32.37	418.26	None
11-25-92	450.33[d]	31.80	418.53	None
12-14-92		30.44	419.89	None
01-29-93		21.76	428.57	None
02-26-93		24.16	426.17	None
03-29-93		24.32	426.01	None
04-27-93		25.44	424.89	None
05-10-93		27.40	422.93	None
06-17-93		28.80	421.53	None
07-27-93		29.89	420.44	None
08-26-93		30.52	419.81	None
09-14-93		31.09	419.24	None
11-05-93		31.42	418.91	None
03-26-94		26.03	424.30	None
MW-8				
01-29-93	449.43[d]	23.23	426.20	None
02-26-93		29.20	420.23	None
03-29-93		29.77	419.66	None
04-27-93		31.52	417.91	None
05-10-93		33.88	415.55	None
06-17-93		35.25	414.18	None
07-27-93		36.61	412.82	None
08-26-93		37.71	411.72	None
09-14-93		38.78	410.65	None

See notes on page 8 of 8

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 7 of 8)

Well Date	Well Elevation	Depth-to-Water	Water Elevation	Floating Product
MW-8 (cont.)				
11-05-93		39.01	410.42	None
03-26-94		31.40	418.03	None
MW-9				
01-29-93	449.21[d]	18.91	430.30	None
02-26-93		21.35	427.86	None
03-29-93		21.78	427.43	None
04-27-93		24.70	424.51	None
05-10-93		26.19	423.02	None
06-17-93		27.50	421.71	None
07-27-93		29.11	420.10	None
08-26-93		29.55	419.66	None
09-14-93		30.65	418.56	None
11-05-93		32.24	416.97	None
03-26-94		25.68	423.53	None
MW-10				
01-29-93	449.22[d]	19.27	429.95	None
02-26-93		21.34	427.88	None
03-29-93		20.89	428.33	None
04-27-93		25.40	423.82	None
05-10-93		26.77	422.45	None
06-17-93		26.80	422.42	None
07-27-93		29.87	419.35	None
08-26-93		29.67	419.55	None
09-14-93		31.07	418.15	None
11-05-93		30.42	418.80	None
03-26-94		26.20	423.02	None
MW-11				
04-24-92	448.02[e]	35.06	412.96	None
05-20-92		34.10	413.92	None
06-12-92		34.48	413.54	None
07-28-92		35.13	412.89	None
08-24-92		33.32	414.70	None
09-15-92		35.72	412.30	None
10-29-92		35.26	412.76	None
11-25-92		36.44	411.58	None
12-14-92		33.18	414.84	None
01-29-93		23.89	424.13	None
02-26-93		27.31	420.71	None

See notes on page 8 of 8

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 8 of 8)

Well Date	Well Elevation	Depth-to-Water	Water Elevation	Floating Product
MW-11 (cont.)				
03-29-93		27.27	420.75	None
04-27-93		30.61	417.41	None
05-10-93		32.78	415.24	None
06-17-93		33.25	414.77	None
07-27-93		34.49	413.53	None
08-26-93		35.44	412.58	None
09-14-93		36.62	411.40	None
11-05-93		36.68	411.34	None
03-26-94		30.20	417.82	None
RW-1				
04-24-92	451.44[a]	32.85	418.59	None
05-20-92		32.60	418.84	None
06-12-92	451.44[c]	32.72	418.72	None
07-28-92		31.94	419.50	None
08-24-92		31.73	419.71	None
09-15-92		31.94	419.50	None
10-29-92		32.15	419.29	None
11-25-92	451.67[d]	32.21	419.46	None
12-14-92		30.58	421.09	None
01-29-93		22.89	428.78	None
02-26-93		23.97	427.70	None
03-29-93		23.98	427.69	None
04-27-93		27.26	424.41	None
05-10-93		29.64	422.03	None
06-17-93		30.18	421.49	None
07-27-93		31.55	420.12	None
08-26-93		31.82	419.85	None
09-14-93		32.32	419.35	None
11-05-93		31.91	419.76	None
03-26-94		27.78	423.89	None

Notes: Measurements in feet.

* = Floating product present in well; therefore the DTW was adjusted as follows: The recorded thickness of the floating product was multiplied by 0.80 to obtain an approximate value for the displacement of water by the floating product. This approximate displacement value was then subtracted from the measured depth to water to obtain an adjusted depth to water. These adjusted groundwater depths were subtracted from wellhead elevations to correct the groundwater elevations.

** = Floating product not initially present but came into well during purging.

*** = DTW measurement may not be accurate due to L-shape wellhead fitting.

[a] = Surveyed by Ron Archer, Civil Engineer, in January 1991.

[b] = Surveyed by John Koch, Licensed Land Surveyor, in July 1991.

[c] = Surveyed by John Koch, Licensed Land Surveyor, in May 1992.

[d] = Surveyed by John Koch, Licensed Land Surveyor, in January 1993.

Wellhead elevations based on benchmark: top of pin in standard monument, west side of intersection of Rincon Avenue and Pine Street. Elevation taken as 448.741 feet. City of Livermore Datum.

NC = Elevation not calculated; wellhead elevations may no longer be correct due to construction of remediation system.

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TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER SAMPLES
ARCO Station 771
Livermore, California
(Page 1 of 4)

Sample	TPHg	B	T	E	X	TPHd	TOG
MW-1							
01-15-91	Not sampled--sheen						
04-10-91	98,000	11,000	18,000	2,800	20,000	NA	NA
07-25-91	Not sampled--floating product						
10-30-91	Not sampled--floating product						
03-31-92	Not sampled--floating product						
06-12-92	Not sampled--floating product						
09-16-92	Not sampled--floating product						
11-25-92	Not sampled--floating product						
01-29-93	360,000	2,500	9,300	5,100	41,000	NA	NA
05-10-93	1,900,000	4,100	15,000	21,000	140,000	NA	NA
09-16-93	1,800,000	6,400	21,000	19,000	140,000	NA	NA
11-05-93	700,000	3,000	7,600	8,600	65,000	NA	NA
03-26-94	29,000	1,000	290	610	3,300	NA	NA
MW-2							
01-15-91	Not sampled--floating product						
04-10-91	Not sampled--floating product						
07-25-91	Not sampled--floating product						
10-30-91	Not sampled--sheen						
03-31-92	270,000	7,000	12,000	4,400	40,000	NA	NA
06-12-92	110,000	8,900	13,000	2,800	16,000	NA	NA
09-16-92	Not sampled--sheen						
11-25-92	Not sampled--floating product						
01-29-93	89,000	4,600	5,700	1,800	15,000	NA	NA
05-10-93	440,000	3,900	4,300	4,400	36,000	NA	NA
09-16-93	200,000	5,500	4,300	2,300	19,000	NA	NA
11-05-93	250,000	7,800	8,400	3,100	24,000	NA	NA
03-26-94	22,000	1,100	1,400	190	3,700	NA	NA
MW-3							
01-15-91	230	<0.5	<0.5	2.2	2.1	NA	NA
04-10-91	530	12	8.4	4.0	7.0	NA	NA
07-25-91	110	0.32	0.75	1.2	1.0	NA	NA
10-30-91	Not sampled--dry						
03-31-92	670	12	1.1	7.4	27	NA	NA
06-12-92	280	<0.5	<0.5	2.1	2.0	NA	NA
09-15-92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
11-25-92	220	1.0	<0.5	4.9	1.2	NA	NA
01-29-93	380***	0.8	0.6	2.1	2.0	NA	NA
05-10-93	170	<0.5	<0.5	2.0	0.6	NA	NA
09-15-93	120	<0.5	<0.5	<0.5	<0.5	NA	NA

See notes page 4 of 4.

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TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER SAMPLES
ARCO Station 771
Livermore, California
(Page 2 of 4)

Sample	TPHg	B	T	E	X	TPHd	TOG
MW-3 (cont.)							
11-05-93	110	<0.5	<0.5	<0.5	<0.5	NA	NA
03-26-94	54	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-4							
07-25-91	23,000	590	730	360	3,500	NA	NA
10-30-91	19,000	320	340	230	180	NA	NA
03-31-92	30,000	1,300	740	770	4,800	NA	NA
06-12-92	28,000	990	440	550	3,200	NA	NA
09-16-92	21,000	740	240	350	1,300	NA	NA
11-25-92	26,000	1,200	300	350	730	NA	NA
01-29-93	23,000	2,000	580	770	2,500	NA	NA
05-10-93	74,000	2,200	890	1,400	4,000	NA	NA
09-16-93	43,000	640	90	360	690	NA	NA
11-05-93	30,000	1,000	240	390	1,300	NA	NA
03-26-94	27,000	1,800	830	1,300	2,900	NA	NA
MW-5							
07-25-91	57,000	2,300	4,200	77	14,000	NA	NA
10-30-91		Not sampled--sheen					
03-31-92	80,000	7,100	9,100	2,000	16,000	NA	NA
06-12-92	69,000	4,000	5,300	2,200	12,000	NA	NA
09-16-92	65,000	2,300	2,600	1,700	9,900	NA	NA
11-25-92	Inaccessible for sampling, L-shape fitting installed at wellhead for use in interim remediation system						
01-29-93	Inaccessible for sampling, L-shape fitting installed at wellhead for use in interim remediation system						
05-10-93	220,000	3,900	3,700	3,400	15,000	NA	NA
09-16-93	180,000	3,500	3,300	2,700	10,000	NA	NA
11-05-93	66,000	3,000	2,300	1,700	6,200	NA	NA
03-26-94	39,000	4,000	2,300	1,600	6,200	NA	NA
MW-6							
07-25-91	10,000	3,000	200	340	1,000	NA	NA
10-30-91	970	150	4.4	4.9	6.6	NA	NA
03-31-92	16,000	3,600	1,500	660	1,700	2,400*	2.5[a], 4.0[b]
06-12-92	2,900	480	17	190	170	1,100*	1.2[c]
09-16-92	2,300	220	<5**	92	43	810*	1.5[d]
11-25-92	2,700	240	11	103	32	720*	1.6[a], 1.8[b]
01-29-93	20,000	1,800	1,700	490	2,600	2,300*	3.6[a], 4.0[b]
05-10-93	43,000	3,000	1,700	1,100	4,800	3,900*	16[a], 110[b]
09-15-93	3,500	300	10	100	180	1,100*	1.0[a], 1.0[b]
11-05-93	1,100	140	<5**	35	23	290	1.0[a], 1.0[b]
03-26-94	3,100	350	99	130	340	880	1.5[d]

See notes page 4 of 4.

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TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER SAMPLES
ARCO Station 771
Livermore, California
(Page 3 of 4)

Sample	TPHg	B	T	E	X	TPHd	TOG
MW-7							
07-25-91	45,000	1,500	2,700	1,200	9,200	NA	NA
10-30-91	93,000	1,800	770	780	6,700	NA	NA
03-31-92	35,000	960	350	300	5,900	NA	NA
06-12-92	27,000	900	270	340	4,800	NA	NA
09-16-92	39,000	1,900	410	470	5,000	NA	NA
11-25-92	49,000	2,900	810	750	5,300	NA	NA
01-29-93	38,000	3,200	1,100	740	4,300	NA	NA
05-10-93	54,000	1,600	160	560	3,100	NA	NA
09-16-93	37,000	1,400	170	560	2,700	NA	NA
11-05-93	40,000	1,900	210	570	2,900	NA	NA
03-26-94	22,000	2,700	280	500	2,600	NA	NA
MW-8							
01-29-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
05-10-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
09-15-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
11-05-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
03-26-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-9							
01-29-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
05-10-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
09-15-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
11-05-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
03-26-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-10							
01-29-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
05-10-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
09-15-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
11-05-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
03-26-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
MW-11							
06-12-92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
09-15-92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
11-25-92	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
01-29-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
05-10-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
09-15-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
11-05-93	<50	<0.5	<0.5	<0.5	<0.5	NA	NA
03-26-94	<50	<0.5	<0.5	<0.5	<0.5	NA	NA

See notes page 4 of 4.

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TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER SAMPLES
ARCO Station 771
Livermore, California
(Page 4 of 4)

Sample	TPHg	B	T	E	X	TPHd	TOG
RW-1							
06-12-92	54,000	2,300	4,400	1,200	12,000	NA	NA
09-15-92	49,000	1,500	2,200	870	6,900	NA	NA
11-25-92	32,000	1,500	2,500	1,000	5,500	NA	NA
01-29-93	43,000	3,100	2,500	990	7,400	NA	NA
05-10-93	30,000	2,900	1,100	690	4,300	NA	NA
09-16-93	20,000	1,800	580	620	2,300	NA	NA
11-05-93	25,000	1,800	250	740	1,300	NA	NA
03-26-94	8,100	780	100	360	340	NA	NA
MCLs	—	1	---	680	1,750		
DWAL	—	—	100	—	—		

Results in parts per billion (ppb), except TOG, which is reported in parts per million (ppm).
TPHg: Total petroleum hydrocarbons as gasoline (measured using EPA Method 5030/8015).
B: Benzene T: toluene E: ethylbenzene X: total xylene isomers
BTEX: Measured using EPA Method 5030/8020.
TPHd: Total petroleum hydrocarbons as diesel (measured using EPA Method 3510). May be weathered gasoline.
TOG: Total oil and grease: [a] using method 5520F-IR; [b] using method 5520C; [c] using method 413.2; [d] using method 418.1
NA: Not analyzed.
<: Less than the laboratory detection limit.
*: Sample contains a lower boiling point hydrocarbon mixture quantified as diesel. The chromatogram does not match the typical diesel fingerprint.
**: Method Reporting Limit raised due to high analyte concentration requiring sample dilution.
***: Sample contained components eluting in the gasoline range that were quantitated as gasoline. The chromatogram did not match the typical gasoline fingerprint.
MCL: State Maximum Contaminant Level in ppb (October 1990).
DWAL: State Recommended Drinking Water Action Level in ppb (October 1990).

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TABLE 3
APPROXIMATE CUMULATIVE PRODUCT RECOVERED
ARCO Station 771
Livermore, California

Year/Date	Floating Product Recovered (gallons)	
1991		
TOTAL:	2.77 Gallons	
1992		
TOTAL:	0.29 Gallons	
1993		
TOTAL:	0.00 Gallons	
1994		
TOTAL:	0.00 Gallons	
MW-1		
03-26-94		None
MW-2		
03-26-94		None
MW-5		
03-26-94		None
1991-1994		
TOTAL:	**3.06 Gallons**	

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APPENDIX A
IWM'S SUMMARY OF GROUND WATER SAMPLE ANALYSES, FIELD REPORTS, AND CERTIFIED ANALYTICAL REPORTS WITH CHAIN-OF-CUSTODY

I NTEGRATED
W ASTESTREAM
M ANAGEMENT, INC.

April 18, 1994

Mr. John Young
RESNA Industries
3315 Almaden Expressway
Suite 34
San Jose, CA. 95118

Dear Mr. Young:

Attached are the field data sheets and analytical results for quarterly ground water sampling at ARCO Facility No. 771 in Livermore, California. Integrated Wastestream Management measured the depth to water and collected samples from wells at this site on March 26, 1994.

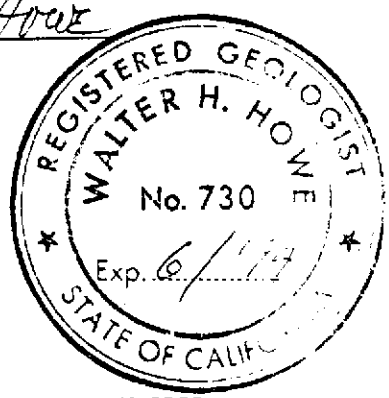
Sampling was carried out in accordance with the protocols described in the "Request for Bid for Quarterly Sampling at ARCO Facilities in Northern California".

Please call us if you have any questions.

Sincerely,
Integrated Wastestream Management

Tom DeLon
Project Manager

Walter H. Howe
Registered Geologist



950 AMES AVENUE MILPITAS, CA. 95035 (408) 942-8955

INTEGRATED
WASTESTREAM
MANAGEMENT

A771QA.XLS

Summary of Ground Water Sample Analyses for ARCO Facility A-771, Livermore, California

WELL NUMBER	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	RW-1
DATE SAMPLED	3/26/94	3/26/94	3/26/94	3/26/94	3/26/94	3/26/94	3/26/94	3/26/94	3/26/94	3/26/94	3/26/94	3/26/94
DEPTH TO WATER	28.22	25.30	26.97	26.94	27.41	28.24	26.03	31.40	25.68	26.20	30.20	27.78
SHEEN	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
PRODUCT THICKNESS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPHg	29,000	22,000	54	27,000	39,000	3,100	22,000	ND	ND	ND	ND	8,100
BTEX												
BENZENE	1,000	1,100	ND	1,800	4,000	350	2,700	ND	ND	ND	ND	780
TOLUENE	290	1,400	ND	830	2,300	99	280	ND	ND	ND	ND	100
ETHLYBENZENE	610	190	ND	1,300	1,600	130	500	ND	ND	ND	ND	360
XYLENES	3,300	3,700	ND	2,900	6,200	340	2,600	ND	ND	ND	ND	340
TPHd												
DIESEL						880						
EPA 418.1												
OIL & GREASE						1.5						

FOOTNOTES:

Concentrations reported in ug/L (ppb).

TPHg = Total Purgeable Petroleum Hydrocarbons (USEPA Method 8015 Modified)

BTEX Distinction (USEPA Method 8020)

PCE = Tetrachloroethene (USEPA Method 8010)

DCE = cis-1, 2-Dichloroethene (USEPA Method 8010)

TCE = Trichloroethene (USEAP Method 8010)

ND = Not Detected.

NA = Not applicable.

950 AMES AVENUE MILPITAS, CA 95035 (408) 942-8955

FIELD REPORT

Depth To Water / Floating Product Survey

Site Arrival Time: _____

Site Departure Time: _____

Weather Conditions: _____

DTW: Well Box or Well Casing (circle one)

Project No.: _____ **Location:** 899 Rincon Ave. SJ. **Date:** 3-26-94

Client / Station#: Arco 771 **Field Technician:** Vince / Francisco **Day of Week:** Saturday

DTW ORDER	WELL ID	SURFACE SEAL	LID SECURE	GASKET	LOCK	EXPANDING CAP	TOTAL DEPTH (Feet)	FIRST DEPTH TO WATER (Feet)	SECOND DEPTH TO WATER (Feet)	DEPTH TO FLOATING PRODUCT (Feet)	FLOATING PRODUCT THICKNESS (Feet)	SHEEN (Y = YES, N = NO)	COMMENTS	MATERIALS
12	mw-1	OK	yes	OK	OK	OK	40.6	28.22	28.22	N/A	N/A	N	4" CIRCULAR lid / Skimmer in Sump Well	3/4 bolts
11	mw-2	OK	yes	OK	OK	OK	37.9	25.30	25.30	N/A	N/A	N	4" CIRCULAR LID / Skimmer IN Sump Well	3/4 bolts
5	mw-3	OK	yes	OK	OK	OK	39.6	26.97	26.97	N/A	N/A	N	4"	
9	mw-4	OK	yes	OK	OK	OK	41.1	26.94	26.94	N/A	N/A	N	4" CIRCULAR lid 3/4 bolts Sump	3/4 bolts
10	mw-5	OK	yes	OK	OK	OK	40.1	27.41	27.41	N/A	N/A	N	4" CIRCULAR lid Sump	3/4 bolts
6	mw-6	OK	yes	OK	OK	OK	43.3	28.24	28.24	N/A	N/A	N	4"	
8	mw-7	OK	yes	OK	OK	OK	39.7	26.03	26.03	N/A	N/A	N	4" CIRCULAR LID Sump	3/4 bolts
1	mw-8	OK	yes	OK	OK	OK	41.7	31.40	31.40	N/A	N/A	N	2" H2O2 Well TRAFFIC control	
2	mw-9	OK	yes	OK	OK	OK	40.2	25.68	25.68	N/A	N/A	N	2" TRAFFIC control	
3	mw-10	OK	yes	OK	OK	OK	36.1	26.20	26.20	N/A	N/A	N	2" "	
4	mw-11	OK	yes	OK	OK	OK	38.6	30.20	30.20	N/A	N/A	N	2" "	
7	RW-1	OK	yes	OK	OK	OK	39.7	27.78	27.78	N/A	N/A	N	6" ARCO TOOL SQUARE lid	ARCO TOOL

PAGE 2 OF 4 DATE: 3-26-94 CLIENT/STATION #: ARCO 771 ADDRESS: 889 Rincon AV. Liv.

WELL ID: MW-4 TD 41.1 · DTW 26.94 x Gal./Linear Ft. 0.66 x Casing Volume 3 - Calculated Purge 28.03

DATE PURGED: 3-26-94 START (2400 HR): 1410 END (2400 HR) 1438
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1441 DTW: 38

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1415	3	6.31	0.93	65.9	clear
1420	12	6.60	1.00	66.9	clear
1427	21	6.68	0.99	66.7	clear
1438	28	6.69	0.99	66.5	clear

Total purge: 28
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: MW-5 TD 40.1 · DTW 27.41 x Gal./Linear Ft. 0.66 x Casing Volume 3 - Calculated Purge 25.12

DATE PURGED: 3-26-94 START (2400 HR): 1459 END (2400 HR) 1518
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1528 DTW: 37

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1503	5	6.57	0.96	65.9	clear
1507	12	6.63	1.00	66.8	clear
1512	20	6.72	1.00	66.4	clear
1518	22	6.71	1.01	66.0	clear

Total purge: 22
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: well pumped dry at 22 gallons.

WELL ID: MW-2 TD 37.9 · DTW 25.30 x Gal./Linear Ft. 0.66 x Casing Volume 3 - Calculated Purge 24.94

DATE PURGED: 3-26-94 START (2400 HR): 1535 END (2400 HR) 1551
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1600 DTW: 36

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1540	3	6.68	0.98	67.2	cloudy
1548	12	6.69	0.98	67.0	cloudy
1551	24	6.73	0.96	66.8	clear

Total purge: 24
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: MW-1 TD 40.6 · DTW 23.22 x Gal./Linear Ft. 0.66 x Casing Volume 3 - Calculated Purge 24.51

DATE PURGED: 3-26-94 START (2400 HR): 1607 END (2400 HR) 1628
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1645 DTW: 38

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1614	5	6.72	0.89	67.5	cloudy
1621	11	6.76	0.91	67.4	cloudy
1628	21	6.77	0.93	67.0	clear

Total purge:
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: well pumped dry at 21 gallons

PRINT NAME: Vince Valdez SIGNATURE: Vince Valdez

CASING DIAMETER (inches):	2	3	4	6	8	12	Other:
GALLON/LINEAR FOOT:	0.17	0.38	0.66	1.5	2.6	5.8	Other:

PAGE 3 OF 4 DATE: 3-26-94 CLIENT/STATION #: Arco 771 ADDRESS: 889 Rincon ave. San.

WELL ID: MW-3 TD 39.6 - DTW 26.97 x Gal./Linear Ft. 0.66 x Casing Volume 3 - Calculated Purge 25.00

DATE PURGED: 3-26-94 START (2400 HR): 1120 END (2400 HR) 1137
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1141 DTW: 29

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1124	4	7.15	0.88	70.0	clear
1128	11	7.18	0.79	69.2	clear
1132	19	7.20	0.80	69.1	clear
1137	25	7.23	0.86	68.8	clear

Total purge: 25
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: MW-6 TD 43.3 - DTW 28.24 x Gal./Linear Ft. 0.66 x Casing Volume 3 - Calculated Purge 29.81

DATE PURGED: 3-26-94 START (2400 HR): 1149 END (2400 HR) 1200
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1206 DTW: 40

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1152	2	7.16	0.92	67.1	cloudy gray
1155	11	7.13	0.86	67.2	clear
1200	21	7.11	0.84	66.8	clear

Total purge:
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: Well pumped dry at 21 gallons.

WELL ID: RW-1 TD 39.7 - DTW 27.78 x Gal./Linear Ft. 1.5 x Casing Volume 3 - Calculated Purge 53.64

DATE PURGED: 3-26-94 START (2400 HR): 1215 END (2400 HR) 1258
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1310 DTW: 69

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1219	5	6.78	0.90	66.7	black
1225	20	6.72	0.93	69.0	clear
1241	37	6.62	0.99	68.6	clear
1258	46	6.60	0.94	68.2	clear

Total purge: 46
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: Well pumped dry at 46 gallons.

WELL ID: MW-7 TD 39.7 - DTW 26.03 x Gal./Linear Ft. 0.66 x Casing Volume 3 - Calculated Purge 27.06

DATE PURGED: 3-26-94 START (2400 HR): 1323 END (2400 HR) 1336
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1340 DTW: 38.5

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1324	2	6.57	0.95	67.9	cloudy
1329	12	6.80	0.97	67.2	clear
1336	22	6.82	0.98	67.0	clear

Total purge: 22
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

PRINT NAME: Vince Valdez SIGNATURE: Vince Valdez

CASING DIAMETER (inches): 2 3 4 6 8 12 Other:
GALLON/LINEAR FOOT: 0.17 0.38 0.66 1.5 2.6 5.8 Other:

PAGE 4 OF 4 DATE: 3-26-94 CLIENT/STATION #: Arco 771 ADDRESS: 889 Rincon Av. Liv.

WELL ID: MW-8 TD 41.7 . DTW 31.40 x 0.17 (Gal. / Linear Ft.) x 3 (Casing Volume) - 5.25 (Calculated Purge)

DATE PURGED: 3-26-94 START (2400 HR): 1001 END (2400 HR) 1034
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1036 DTW: 33

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1010	1	~~7.35~~ (7.35)	1.19	71.3	cloudy
1021	3	7.31	0.75	69.0	cloudy
1034	5	7.29	0.74	66.3	cloudy

Total purge: 5
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: MW-9 TD 40.2 . DTW 25.68 x 0.17 (Gal. / Linear Ft.) x 3 (Casing Volume) - 7.40 (Calculated Purge)

DATE PURGED: 3-26-94 START (2400 HR): 926 END (2400 HR) 930
DATE SAMPLED: 3-26-94 TIME (2400 HR): 933 DTW: 27

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
928	2	7.21	0.79	67.0	cloudy
929	4	7.18	0.86	66.5	cloudy
930	7	7.17	0.86	66.0	cloudy

Total purge: 7
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: MW-10 TD 30.1 . DTW 26.20 x 0.17 (Gal. / Linear Ft.) x 3 (Casing Volume) - 5.04 (Calculated Purge)

DATE PURGED: 3-26-94 START (2400 HR): 914 END (2400 HR) 919
DATE SAMPLED: 3-26-94 TIME (2400 HR): 923 DTW: 28

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
916	~~1~~ (1)	6.93	1.18	71.4	cloudy
917	3	7.20	1.11	68.4	cloudy
919	5	7.18	1.09	68.0	cloudy

Total purge: 5
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: MW-11 TD 38.6 . DTW 30.20 x 0.17 (Gal. / Linear Ft.) x 3 (Casing Volume) - 4.28 (Calculated Purge)

DATE PURGED: 3-26-94 START (2400 HR): 1040 END (2400 HR) 1110
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1112 DTW: 32

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1051	1	7.20	0.76	65.4	cloudy
1059	~~3~~ (3)	7.17	0.79	65.8	cloudy
1110	4	7.15	0.78	65.9	cloudy

Total purge: 4
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

PRINT NAME: Vince Vallejos SIGNATURE: Vince Vallejos

CASING DIAMETER (inches): 2 | 3 | 4 | 6 | 8 | 12 | Other:
GALLONS PER LINEAR FOOT: 0.17 | 0.38 | 0.66 | 1.5 | 2.6 | 5.8 | Other:

Columbia Analytical Services, Inc.

April 12, 1994

Service Request No. SJ94-0373

Gina Austin
Tom DeLon
IWM
950 Ames Avenue
Milpitas, CA 95035

Re: **ARCO Facility No. 771**

Dear Ms. Austin/Mr. DeLon:

Attached are the results of the water samples submitted to our lab on March 28, 1994. For your reference, these analyses have been assigned our service request number SJ94-0373.

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/drf

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COLUMBIA ANALYTICAL SERVICES, Inc.

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: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Date Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: 4/5/94
Date Analyzed: 4/8/94
Service Request: SJ94-0373

Total Recoverable Petroleum Hydrocarbons
EPA Method 418.1
Units: mg/L (ppm)

Sample Name	Lab Code	MRL	Result
MW-6 (40)	SJ940373-7	0.5	1.5
Method Blank	SJ940405-WMB	0.5	ND

Approved By: Kevin A Murphy Date: April 12, 1994

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Date Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: 3/31/94
Date Analyzed: 4/7/94
Service Request: SJ94-0373

Total Petroleum Hydrocarbons as Diesel
EPA Method 3510/California DHS LUFT Method
Units: µg/L (ppb)

Sample Name	Lab Code	TPH as Diesel
MW-6 (40)	SJ940373-7	880.
Method Blank	SJ940331-WMB	ND

Approved By: _____ Date: April 12, 1994

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Dates Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: N/A
Date Analyzed: 4/5-7/94
Service Request: SJ94-0373

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

Analyte:		**Benzene**	**Toluene**	**Ethyl-benzene**	**Total Xylenes**	**TPH as Gasoline**
Units:		µg/L (ppb)	µg/L (ppb)	µg/L (ppb)	µg/L (ppb)	µg/L (ppb)
Method Reporting Limit:		0.5	0.5	0.5	0.5	50
Sample Name	**Lab Code**					
MW-1 (38)	SJ940373-2	1,000.	290.	610.	3,300.	29,000.
MW-2 (36)	SJ940373-3	1,100.	1,400.	190.	3,700.	22,000.
MW-3 (29)	SJ940373-4	ND	ND	ND	ND	54.
MW-4 (38)	SJ940373-5	1,800.	830.	1,300.	2,900.	27,000.
MW-5 (37)	SJ940373-6	4,000.	2,300.	1,600.	6,200.	39,000.
MW-6 (40)	SJ940373-7	350.	99.	130.	340.	3,100.
MW-7 (38.5)	SJ940373-8	2,700.	280.	500.	2,600.	22,000.
MW-8 (33)	SJ940373-9	ND	ND	ND	ND	ND
MW-9 (27)	SJ940373-10	ND	ND	ND	ND	ND
MW-10 (28)	SJ940373-11	ND	ND	ND	ND	ND
MW-11 (32)	SJ940373-12	ND	ND	ND	ND	ND
RW-1 (36)	SJ940373-13	780.	100.	360.	340.	8,100.
Method Blank	SJ940405-WMB	ND	ND	ND	ND	ND
Method Blank	SJ940406-WMB	ND	ND	ND	ND	ND
Method Blank	SJ940407-WMB	ND	ND	ND	ND	ND

Approved By: Leona Murphy Date: April 12, 1994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Date Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: 4/5/94
Date Analyzed: 4/8/94
Service Request: SJ94-0373

Matrix Spike/Duplicate Matrix Spike Summary
Total Recoverable Petroleum Hydrocarbons
EPA Method 418.1
Units: mg/L (ppm)

Sample Name: Batch QC

					Percent Recovery		
		Sample	Spike Result				CAS Acceptance
Analyte	Spike Level	Result	MS	DMS	MS	DMS	Criteria
Hydrocarbon Mix	8.0	0.7	8.5	7.7	98.	88.	57-127

Approved By: Keo M A Murphy Date: April 12, 1994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Date Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: 4/5/94
Date Analyzed: 4/8/94
Service Request: SJ94-0373

Initial Calibration Verification
Total Recoverable Petroleum Hydrocarbons
EPA Method 418.1
Units: mg/L (ppm)

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Hydrocarbon Mix	40.	42.	105.	90-110

Approved By Leona Murphy Date April 12, 1994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Date Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: 4/5/94
Date Analyzed: 4/8/94
Service Request: SJ94-0373

Surrogate Recovery Summary
Total Petroleum Hydrocarbons as Diesel
EPA Method 3510/California DHS LUFT Method

Sample Name	Lab Code	Percent Recovery p-Terphenyl
MW-6 (40)	SJ940373-7	101.
MS	SJ940356-3MS	93.
DMS	SJ940356-3DMS	91.
Method Blank	SJ940407-WMB	114.

CAS Acceptance Limits: 66-123

Approved By: Kevin A Murphy Date: April 12, 1994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Date Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: 3/31/94
Date Analyzed: 4/6/94
Service Request: SJ94-0373

Initial Calibration Verification
Total Petroleum Hydrocarbons as Diesel
EPA Method 3510/California DHS LUFT Method
Units: mg/L (ppm)

Analyte	True Value	Result	Percent Recovery	CAS Acceptance Criteria
TPH as Diesel	500.	468.	94.	90-110

Approved By: Kevin A Murphy Date: April 12, 1994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Dates Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: 3/31/94
Date Analyzed: 4/6/94
Service Request: SJ94-0373

Matrix Spike/Duplicate Matrix Spike Summary
Total Petroleum Hydrocarbons as Diesel
EPA Method 3510/California DHS LUFT Method
Units: µg/L (ppb)

Sample Name: Batch QC

					Percent Recovery		
		Sample	Spike Result				CAS Acceptance
Analyte	Spike Level	Result	MS	DMS	MS	DMS	Criteria
Diesel	4,000.	ND	5,160.	5,100.	129.	128.	61-141

Approved By: Kevin A Murphy Date: April 12, 1994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Dates Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: N/A
Date Analyzed: 4/5-7/94
Service Request: SJ94-0373

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

Sample Name	Lab Code	Percent Recovery a,a,a-Trifluorotoluene
MW-1 (38)	SJ940373-2	94.
MW-2 (36)	SJ940373-3	83.
MW-3 (29)	SJ940373-4	93.
MW-4 (38)	SJ940373-5	77.
MW-5 (37)	SJ940373-6	81.
MW-6 (40)	SJ940373-7	85.
MW-7 (38.5)	SJ940373-8	77.
MW-8 (33)	SJ940373-9	80.
MW-9 (27)	SJ940373-10	85.
MW-10 (28)	SJ940373-11	76.
MW-11 (32)	SJ940373-12	83.
RW-1 (36)	SJ940373-13	87.
MW-8 (33) MS	SJ940373-9MS	86.
MW-8 (33) DMS	SJ940373-9DMS	83.
Method Blank	SJ940405-WMB	87.
Method Blank	SJ940406-WMB	84.
Method Blank	SJ940407-WMB	84.

CAS Acceptance Limits: 62-112

Approved By: Karen A Murphy Date: April 12, 1994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Dates Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: N/A
Date Analyzed: 4/5/94
Service Request: SJ94-0373

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

Analyte	True Value	Result	Percent Recovery	CAS Acceptance Criteria
Benzene	25.	26.7	107.	85-115
Toluene	25.	26.4	106.	85-115
Ethylbenzene	25.	26.1	104.	85-115
Total Xylenes	75.	79.8	106.	85-115
TPH as Gasoline	250.	234.	94.	90-110

Approved By: Karen A Murphy Date: April 12, 1994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Dates Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: N/A
Date Analyzed: 4/5/94
Service Request: SJ94-0373

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

Sample Name: MW-8 (33)

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria
Benzene	25.	ND	25.8	26.5	103.	106.	75-135
Toluene	25.	ND	25.4	26.3	102.	105.	73-136
Ethylbenzene	25.	ND	25.3	25.9	101.	104.	69-142

Approved By: Kevin A. Murphy Date: April 12, 1994

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ARCO Products Company ◆
Division of AtlanticRichfieldCompany

Task Order No. IWM-94-5CC

Chain of Custody

ARCO Facility no.	A771
City (Facility)	Livermore
Project manager (Consultant)	TOM DeCon / J Young
Laboratory name	Columbia
ARCO engineer	Kyle Christie
Telephone no. (ARCO)	415 571 2434
Telephone no. (Consultant)	408/942 8955
Fax no. (Consultant)	408/942/1499
Contract number	07077
Consultant name	IWM / ResNA
Address (Consultant)	950 Ames av. Milp. Ca
Method of shipment	CAS Courier

	Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	TPH-d/HBO	
	FB-1	1	2		✓		✓	✓	3-26-94	800		✓	✓										
38	MW-1	2	2		✓		✓	✓		1645		✓	✓										
36	MW-2	3	2		✓		✓	✓		1600		✓	✓										
29	MW-3	4	2		✓		✓	✓		1141		✓	✓										
38	MW-4	5	2		✓		✓	✓		1411		✓	✓										
37	MW-5	6	2		✓		✓	✓		1528		✓	✓										
40	MW-6	7	4		✓		✓	✓		1206		✓	✓		✓							✓	
32.5	MW-7	8	2		✓		✓	✓		1340		✓	✓										
33	MW-8	9	2		✓		✓	✓		1036		✓	✓										
27	MW-9	10	2		✓		✓	✓		933		✓	✓										
28	MW-10	11	2		✓		✓	✓		923		✓	✓										
32	MW-11	12	2		✓		✓	✓		1112		✓	✓										
36	RW-1	13	2		✓		✓	✓		1310		✓	✓										

Special detection Limit/reporting

Special QA/QC

Remarks
Hold on FB

Lab number
SJ94-0373

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

Condition of sample: Good

Temperature received: Cool

	Date	Time		Date	Time
Relinquished by sampler: Vince Saldaña	3/28/94	8:10am	Received by: Alra Austin		
Relinquished by: Alra Austin	3/28/94	10:40	Received by: [illegible]	3/28/94	10:40
Relinquished by:			Received by laboratory:		

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

I NTEGRATED
W ASTESTREAM
M ANAGEMENT, INC.

April 18, 1994

Mr. John Young
RESNA Industries
3315 Almaden Expressway
Suite 34
San Jose, CA. 95118

Dear Mr. Young:

Attached are the field data sheets and analytical results for quarterly ground water sampling at ARCO Facility No. 771 in Livermore, California. Integrated Wastestream Management measured the depth to water and collected samples from wells at this site on March 26, 1994.

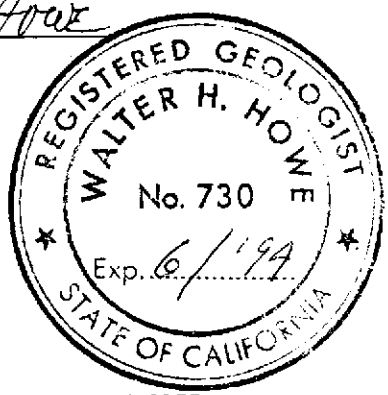
Sampling was carried out in accordance with the protocols described in the "Request for Bid for Quarterly Sampling at ARCO Facilities in Northern California".

Please call us if you have any questions.

Sincerely,
Integrated Wastestream Management

Tom DeLon
Project Manager

Walter H. Howe
Registered Geologist



950 AMES AVENUE MILPITAS, CA. 95035 (408) 942-8955

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

A771QA.XLS

Summary of Ground Water Sample Analyses for ARCO Facility A-771, Livermore, California

WELL NUMBER	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	RW-1
DATE SAMPLED	3/26/94	3/26/94	3/26/94	3/26/94	3/26/94	3/26/94	3/26/94	3/26/94	3/26/94	3/26/94	3/26/94	3/26/94
DEPTH TO WATER	28.22	25.30	26.97	26.94	27.41	28.24	26.03	31.40	25.68	26.20	30.20	27.78
SHEEN	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
PRODUCT THICKNESS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPHg	29,000	22,000	54	27,000	39,000	3,100	22,000	ND	ND	ND	ND	8,100
BTEX												
BENZENE	1,000	1,100	ND	1,800	4,000	350	2,700	ND	ND	ND	ND	780
TOLUENE	290	1,400	ND	830	2,300	99	280	ND	ND	ND	ND	100
ETHLYBENZENE	610	190	ND	1,300	1,600	130	500	ND	ND	ND	ND	360
XYLENES	3,300	3,700	ND	2,900	6,200	340	2,600	ND	ND	ND	ND	340
TPHd												
DIESEL						880						
EPA 418.1												
OIL & GREASE						1.5						

FOOTNOTES:

Concentrations reported in ug/L (ppb).

TPHg = Total Purgeable Petroleum Hydrocarbons (USEPA Method 8015 Modified)

BTEX Distinction (USEPA Method 8020)

PCE = Tetrachloroethene (USEPA Method 8010)

DCE = cis-1, 2-Dichloroethene (USEPA Method 8010)

TCE = Trichloroethene (USEAP Method 8010)

ND = Not Detected.

NA = Not applicable.

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FIELD REPORT

Depth To Water / Floating Product Survey

Site Arrival Time:

Site Departure Time:

Weather Conditions:

DTW: Well Box or Well Casing (circle one)

Project No.: _____ **Location:** 899 Rincon Ave. Liv. **Date:** 3-26-94

Client / Station#: Arco 771 **Field Technician:** Vince / Francisco **Day of Week:** Saturday

DTW ORDER	WELL ID	SURFACE SEAL	LID SECURE	GASKET	LOCK	EXPANDING CAP	TOTAL DEPTH (Feet)	FIRST DEPTH TO WATER (Feet)	SECOND DEPTH TO WATER (Feet)	DEPTH TO FLOATING PRODUCT (Feet)	FLOATING PRODUCT THICKNESS (Feet)	SHEEN (Y = YES, N = NO)	COMMENTS	MATERIALS
12	MW-1	OK	Yes	OK	OK	OK	40.6	28.22	28.22	N/A	N/A	N	4" CIRCULAR lid / Skimmer in Sump Well	3/4 bolts
11	MW-2	OK	Yes	OK	OK	OK	37.9	25.30	25.30	N/A	N/A	N	4" CIRCULAR LID / Skimmer IN Sump Well	3/4 bolts
5	MW-3	OK	Yes	OK	OK	OK	39.6	26.97	26.97	N/A	N/A	N	4"	
9	MW-4	OK	Yes	OK	OK	OK	41.1	26.94	26.94	N/A	N/A	N	4" CIRCULAR lid 3/4 bolts Sump	3/4 bolts
10	MW-5	OK	Yes	OK	OK	OK	40.1	27.41	27.41	N/A	N/A	N	4" CIRCULAR lid Sump	3/4 bolts
6	MW-6	OK	Yes	OK	OK	OK	43.3	28.24	28.24	N/A	N/A	N	4"	
8	MW-7	OK	Yes	OK	OK	OK	39.7	26.03	26.03	N/A	N/A	N	4" CIRCULAR LID Sump	3/4 bolts
1	MW-8	OK	Yes	OK	OK	OK	41.7	31.40	31.40	N/A	N/A	N	2" #20# Well TRAFFIC CONTROL	
2	MW-9	OK	Yes	OK	OK	OK	40.2	25.68	25.68	N/A	N/A	N	2" TRAFFIC CONTROL	
3	MW-10	OK	Yes	OK	OK	OK	36.1	26.20	26.20	N/A	N/A	N	2" "	
4	MW-11	OK	Yes	OK	OK	OK	38.6	30.20	30.20	N/A	N/A	N	2" "	
7	RW-1	OK	Yes	OK	OK	OK	39.7	27.78	27.78	N/A	N/A	N	6" ARCO TOOL SQUARE LID	ARCO TOOL

PAGE 2 OF 4 DATE: 3-26-94 CLIENT/STATION #: ARCO 771 ADDRESS: 889 Rincon AV. Liv.

WELL ID: MW-4 TD 41.1 - 26.94 DTW x 0.66 Gal./Linear Ft. x 3 Casing Volume - 28.03 Calculated Purge

DATE PURGED: 3-26-94 START (2400 HR): 1410 END (2400 HR) 1438
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1441 DTW: 38

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1415	3	6.54	0.93	65.9	clear
1420	12	6.60	1.00	66.9	clear
1427	21	6.68	0.99	66.7	clear
1438	28	6.69	0.99	66.5	clear

Total purge: 28
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: MW-5 TD 40.1 - 27.41 DTW x 0.66 Gal./Linear Ft. x 3 Casing Volume - 25.12 Calculated Purge

DATE PURGED: 3-26-94 START (2400 HR): 1459 END (2400 HR) 1518
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1528 DTW: 37

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1503	5	6.57	0.96	65.9	clear
1507	12	6.63	1.00	66.8	clear
1512	20	6.72	1.00	66.4	clear
1518	22	6.71	1.01	66.0	clear

Total purge: 22
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: well pumped dry at 22 Gallons.

WELL ID: MW-2 TD 37.9 - 25.30 DTW x 0.66 Gal./Linear Ft. x 3 Casing Volume - 24.94 Calculated Purge

DATE PURGED: 3-26-94 START (2400 HR): 1535 END (2400 HR) 1551
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1600 DTW: 36

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1540	3	6.68	0.98	67.2	cloudy
1548	12	6.69	0.98	67.0	cloudy
1551	24	6.73	0.96	66.8	clear

Total purge: 24
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: MW-1 TD 40.6 - 23.22 DTW x 0.66 Gal./Linear Ft. x 3 Casing Volume - 24.51 Calculated Purge

DATE PURGED: 3-26-94 START (2400 HR): 1607 END (2400 HR) 1628
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1645 DTW: 38

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1614	5	6.72	0.89	67.5	cloudy
1621	11	6.76	0.91	67.4	cloudy
1628	21	6.77	0.93	67.0	clear

Total purge:
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: well pumped dry at 21 Gallons

PRINT NAME: Vince Valdez SIGNATURE: Vince Valdez

CASING DIAMETER (inches):	2	3	4	6	8	12	Other:
GALLON/LINEAR FOOT:	0.17	0.38	0.66	1.5	2.6	5.8	Other:

PAGE 3 OF 4 DATE: 3-26-94 CLIENT/STATION #: Arco 771 ADDRESS: 889 Rincon ave. Liv.

WELL ID: MW-3 TD 39.6 - DTW 26.97 x Gal. (Linear Ft.) 0.66 x Casing Volume 3 - Calculated Purge 25.00

DATE PURGED: 3-26-94 START (2400 HR): 1120 END (2400 HR) 1137
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1141 DTW: 29

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1124	4	7.15	0.88	70.0	clear
1128	11	7.18	0.79	69.2	clear
1132	19	7.20	0.80	69.1	clear
1137	25	7.23	0.86	68.8	clear

Total purge: 25
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: MW-6 TD 43.3 - DTW 28.24 x Gal. (Linear Ft.) 0.66 x Casing Volume 3 - Calculated Purge 29.81

DATE PURGED: 3-26-94 START (2400 HR): 1149 END (2400 HR) 1200
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1206 DTW: 40

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1152	2	7.16	0.92	67.1	cloudy gray
1155	11	7.13	0.86	67.2	clear
1200	21	7.11	0.84	66.8	clear

Total purge:
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: Well pumped dry at 21 gallons.

WELL ID: RW-1 TD 39.7 - DTW 27.78 x Gal. (Linear Ft.) 1.5 x Casing Volume 3 - Calculated Purge 53.64

DATE PURGED: 3-26-94 START (2400 HR): 1215 END (2400 HR) 1258
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1310 DTW:

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1219	5	6.78	0.90	66.7	black
1225	20	6.72	0.93	69.0	clear
1241	37	6.62	0.99	68.6	clear
1258	46	6.60	0.94	68.2	clear

Total purge: 46
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: Well pumped dry at 46 gallons.

WELL ID: MW-7 TD 39.7 - DTW 26.03 x Gal. (Linear Ft.) 0.66 x Casing Volume 3 - Calculated Purge 27.06

DATE PURGED: 3-26-94 START (2400 HR): 1323 END (2400 HR) 1336
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1340 DTW: 38.5

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1324	2	6.57	0.95	67.9	cloudy
1329	12	6.80	0.97	67.2	clear
1336	22	6.82	0.98	67.0	clear

Total purge: 22
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

PRINT NAME: Vince Valdez SIGNATURE: Vince Valdez

CASING DIAMETER (inches): 2 3 4 6 8 12 Other:
GALLON/LINEAR FOOT: 0.17 0.38 0.66 1.5 2.6 5.8 Other:

PAGE 4 OF 4 DATE: 3-26-94 CLIENT/STATION #: Arco 771 ADDRESS: 889 Rincon Av. Liv.

WELL ID: MW-8 TD 41.7 . DTW 31.40 X 0.17 (Gal./Linear Ft.) X 3 (Casing Volume) - 5.25 (Calculated Purge)

DATE PURGED: 3-26-94 START (2400 HR): 1001 END (2400 HR) 1034
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1036 DTW: 33

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1010	1	(7.35)	1.19	71.3	cloudy
1021	3	7.31	0.75	69.0	cloudy
1034	5	7.29	0.74	66.3	cloudy

Total purge: 5
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: MW-9 TD 40.2 . DTW 25.68 X 0.17 (Gal./Linear Ft.) X 3 (Casing Volume) - 7.40 (Calculated Purge)

DATE PURGED: 3-26-94 START (2400 HR): 926 END (2400 HR) 930
DATE SAMPLED: 3-26-94 TIME (2400 HR): 933 DTW: 27

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
928	2	7.21	0.79	67.0	cloudy
929	4	7.18	0.86	66.5	cloudy
930	7	7.17	0.86	66.0	cloudy

Total purge: 7
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: MW-10 TD 36.1 . DTW 26.20 X 0.17 (Gal./Linear Ft.) X 3 (Casing Volume) - 5.04 (Calculated Purge)

DATE PURGED: 3-26-94 START (2400 HR): 914 END (2400 HR) 919
DATE SAMPLED: 3-26-94 TIME (2400 HR): 923 DTW: 28

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
916	(1)	6.93	1.18	71.4	cloudy
917	3	7.20	1.11	68.4	cloudy
919	5	7.18	1.09	68.0	cloudy

Total purge: 5
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: MW-11 TD 38.6 . DTW 30.20 X 0.17 (Gal./Linear Ft.) X 3 (Casing Volume) - 4.28 (Calculated Purge)

DATE PURGED: 3-26-94 START (2400 HR): 1040 END (2400 HR) 1110
DATE SAMPLED: 3-26-94 TIME (2400 HR): 1112 DTW: 32

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1051	1	7.20	0.76	65.4	cloudy
1059	3 (3)	7.17	0.79	65.8	cloudy
1110	4	7.15	0.78	65.9	cloudy

Total purge: 4
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

PRINT NAME: Vince Vallejos SIGNATURE:

CASING DIAMETER (inches):	2	3	4	6	8	12	Other:
GALLON/LINEAR FOOT:	0.17	0.38	0.66	1.5	2.6	5.8	Other:

Columbia Analytical Services, Inc.

April 12, 1994

Service Request No. SJ94-0373

Gina Austin
Tom DeLon
IWM
950 Ames Avenue
Milpitas, CA 95035

Re: **ARCO Facility No. 771**

Dear Ms. Austin/Mr. DeLon:

Attached are the results of the water samples submitted to our lab on March 28, 1994. For your reference, these analyses have been assigned our service request number SJ94-0373.

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/drf

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COLUMBIA ANALYTICAL SERVICES, Inc.

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: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Date Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: 4/5/94
Date Analyzed: 4/8/94
Service Request: SJ94-0373

Total Recoverable Petroleum Hydrocarbons
EPA Method 418.1
Units: mg/L (ppm)

Sample Name	Lab Code	MRL	Result
MW-6 (40)	SJ940373-7	0.5	1.5
Method Blank	SJ940405-WMB	0.5	ND

Approved By: Kevin A Murphy Date: April 12, 1994

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Date Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: 3/31/94
Date Analyzed: 4/7/94
Service Request: SJ94-0373

Total Petroleum Hydrocarbons as Diesel
EPA Method 3510/California DHS LUFT Method
Units: µg/L (ppb)

Sample Name	Lab Code	TPH as Diesel
MW-6 (40)	SJ940373-7	880.
Method Blank	SJ940331-WMB	ND

Approved By: _____ Date: April 12, 1994

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Dates Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: N/A
Date Analyzed: 4/5-7/94
Service Request: SJ94-0373

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

Analyte:		**Benzene**	**Toluene**	**Ethyl-benzene**	**Total Xylenes**	**TPH as Gasoline**
Units:		µg/L (ppb)	µg/L (ppb)	µg/L (ppb)	µg/L (ppb)	µg/L (ppb)
Method Reporting Limit:		0.5	0.5	0.5	0.5	50
Sample Name	**Lab Code**					
MW-1 (38)	SJ940373-2	1,000.	290.	610.	3,300.	29,000.
MW-2 (36)	SJ940373-3	1,100.	1,400.	190.	3,700.	22,000.
MW-3 (29)	SJ940373-4	ND	ND	ND	ND	54.
MW-4 (38)	SJ940373-5	1,800.	830.	1,300.	2,900.	27,000.
MW-5 (37)	SJ940373-6	4,000.	2,300.	1,600.	6,200.	39,000.
MW-6 (40)	SJ940373-7	350.	99.	130.	340.	3,100.
MW-7 (38.5)	SJ940373-8	2,700.	280.	500.	2,600.	22,000.
MW-8 (33)	SJ940373-9	ND	ND	ND	ND	ND
MW-9 (27)	SJ940373-10	ND	ND	ND	ND	ND
MW-10 (28)	SJ940373-11	ND	ND	ND	ND	ND
MW-11 (32)	SJ940373-12	ND	ND	ND	ND	ND
RW-1 (36)	SJ940373-13	780.	100.	360.	340.	8,100.
Method Blank	SJ940405-WMB	ND	ND	ND	ND	ND
Method Blank	SJ940406-WMB	ND	ND	ND	ND	ND
Method Blank	SJ940407-WMB	ND	ND	ND	ND	ND

Approved By: Kevin Murphy Date: 4/12/1994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Date Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: 4/5/94
Date Analyzed: 4/8/94
Service Request: SJ94-0373

Matrix Spike/Duplicate Matrix Spike Summary
Total Recoverable Petroleum Hydrocarbons
EPA Method 418.1
Units: mg/L (ppm)

Sample Name: Batch QC

					Percent Recovery		
		Sample	Spike Result				CAS Acceptance
Analyte	Spike Level	Result	MS	DMS	MS	DMS	Criteria
Hydrocarbon Mix	8.0	0.7	8.5	7.7	98.	88.	57-127

Approved By: Kevin A Murphy Date: April 12, 1994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Date Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: 4/5/94
Date Analyzed: 4/8/94
Service Request: SJ94-0373

Initial Calibration Verification
Total Recoverable Petroleum Hydrocarbons
EPA Method 418.1
Units: mg/L (ppm)

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Hydrocarbon Mix	40.	42.	105.	90-110

Approved By Kevin Murphy Date April 12, 1994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Date Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: 4/5/94
Date Analyzed: 4/8/94
Service Request: SJ94-0373

Surrogate Recovery Summary
Total Petroleum Hydrocarbons as Diesel
EPA Method 3510/California DHS LUFT Method

Sample Name	Lab Code	Percent Recovery p-Terphenyl
MW-6 (40)	SJ940373-7	101.
MS	SJ940356-3MS	93.
DMS	SJ940356-3DMS	91.
Method Blank	SJ940407-WMB	114.

CAS Acceptance Limits: 66-123

Approved By: Kevin A Murphy Date: April 12, 1994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Date Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: 3/31/94
Date Analyzed: 4/6/94
Service Request: SJ94-0373

Initial Calibration Verification
Total Petroleum Hydrocarbons as Diesel
EPA Method 3510/California DHS LUFT Method
Units: mg/L (ppm)

Analyte	True Value	Result	Percent Recovery	CAS Acceptance Criteria
TPH as Diesel	500.	468.	94.	90-110

Approved By: Kevin Murphy Date: 4/12/1994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Dates Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: 3/31/94
Date Analyzed: 4/6/94
Service Request: SJ94-0373

Matrix Spike/Duplicate Matrix Spike Summary
Total Petroleum Hydrocarbons as Diesel
EPA Method 3510/California DHS LUFT Method
Units: µg/L (ppb)

Sample Name: Batch QC

					Percent Recovery		
		Sample	Spike Result				CAS Acceptance
Analyte	Spike Level	Result	MS	DMS	MS	DMS	Criteria
Diesel	4,000.	ND	5,160.	5,100.	129.	128.	61-141

Approved By: Keith A Murphy Date: April 12, 1994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Dates Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: N/A
Date Analyzed: 4/5-7/94
Service Request: SJ94-0373

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

Sample Name	Lab Code	Percent Recovery a,a,a-Trifluorotoluene
MW-1 (38)	SJ940373-2	94.
MW-2 (36)	SJ940373-3	83.
MW-3 (29)	SJ940373-4	93.
MW-4 (38)	SJ940373-5	77.
MW-5 (37)	SJ940373-6	81.
MW-6 (40)	SJ940373-7	85.
MW-7 (38.5)	SJ940373-8	77.
MW-8 (33)	SJ940373-9	80.
MW-9 (27)	SJ940373-10	85.
MW-10 (28)	SJ940373-11	76.
MW-11 (32)	SJ940373-12	83.
RW-1 (36)	SJ940373-13	87.
MW-8 (33) MS	SJ940373-9MS	86.
MW-8 (33) DMS	SJ940373-9DMS	83.
Method Blank	SJ940405-WMB	87.
Method Blank	SJ940406-WMB	84.
Method Blank	SJ940407-WMB	84.

CAS Acceptance Limits: 62-112

Approved By: Karen A Murphy Date: April 12, 1994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Dates Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: N/A
Date Analyzed: 4/5/94
Service Request: SJ94-0373

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

Analyte	True Value	Result	Percent Recovery	CAS Acceptance Criteria
Benzene	25.	26.7	107.	85-115
Toluene	25.	26.4	106.	85-115
Ethylbenzene	25.	26.1	104.	85-115
Total Xylenes	75.	79.8	106.	85-115
TPH as Gasoline	250.	234.	94.	90-110

Approved By: Karen A Murphy Date: April 12, 1994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 771
Sample Matrix: Water

Dates Collected: 3/26/94
Date Received: 3/28/94
Date Extracted: N/A
Date Analyzed: 4/5/94
Service Request: SJ94-0373

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

Sample Name: MW-8 (33)

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria
Benzene	25.	ND	25.8	26.5	103.	106.	75-135
Toluene	25.	ND	25.4	26.3	102.	105.	73-136
Ethylbenzene	25.	ND	25.3	25.9	101.	104.	69-142

Approved By: Kevin A. Murphy Date: April 12, 1994

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ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. IWM-94-5CC

Chain of Custody

ARCO Facility no. A771	City (Facility) Livermore	Project manager (Consultant) TOM DeLong / J Young	Laboratory name Columbia
ARCO engineer Kyle CAustin	Telephone no. (ARCO) 415 5712434	Telephone no. (Consultant) 408/842-8955	Fax no. (Consultant) 408/842-1499	Contract number 07077
Consultant name IWM / ResWA	Address (Consultant) 950 Ames av. Milp. Ca		Method of shipment CAS COURIER

	Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH Silica Gel EPA 418.1	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 ☐	TPH 5030/8015
	FB-1	1	2		✓		✓	✓	3-26-94	800		✓	✓									
38	MW-1	2	2		✓		✓	✓		1645		✓	✓									
36	MW-2	3	2		✓		✓	✓		1600		✓	✓									
29	MW-3	4	2		✓		✓	✓		1141		✓	✓									
38	MW-4	5	2		✓		✓	✓		1411		✓	✓									
37	MW-5	6	2		✓		✓	✓		1528		✓	✓									
40	MW-6	7	4		✓		✓	✓		1206		✓	✓		✓							✓
385	MW-7	8	2		✓		✓	✓		1340		✓	✓									
33	MW-8	9	2		✓		✓	✓		1036		✓	✓									
27	MW-9	10	2		✓		✓	✓		933		✓	✓									
23	MW-10	11	2		✓		✓	✓		923		✓	✓									
32	MW-11	12	2		✓		✓	✓		1112		✓	✓									
36	RW-1	13	2		✓		✓	✓		1310		✓	✓									

Special detection Limit/reporting

Special QA/QC

Remarks: Hold on FB

Lab number: SJ94-0373

Turnaround time

Condition of sample: Good	Temperature received: Cool	Priority Rush 1 Business Day ☐
Relinquished by sampler: [signature]	Date: 3/28/94 Time: 8:10am	Received by: [signature]	Rush 2 Business Days ☐
Relinquished by: [signature]	Date: 3/28/94 Time: 10:40	Received by: [signature] 3/28/94 10:40	Expedited 5 Business Days ☐
Relinquished by:	Date: Time:	Received by laboratory: Date: Time:	Standard 10 Business Days ☒

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