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TRANSMITTAL

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

DATE: July 27, 1993
PROJECT NUMBER: 60000.15
SUBJECT: ARCO Station No. 771

FROM: Zbigniew Ignatowicz

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1	7/27/93	Final Second Quarter 1993 Groundwater Monitoring Report for ARCO Station No. 771, 899 Rincon Avenue, Livermore, California.

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Zbigniew Ignatowicz

Zbigniew L. Ignatowicz, Staff Geologist

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LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
Second Quarter 1993
at
ARCO Station 771
899 Rincon Avenue
Livermore, California

60000.15 7/1993

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July 27, 1993
0611MWHE
60000.15

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

Subject: Second Quarter 1993 Groundwater Monitoring Report for ARCO Station 771, 899 Rincon Avenue, Livermore, California.

Mr. Whelan:

As requested by ARCO Products Company (ARCO), RESNA Industries Inc. (RESNA) prepared this letter report which summarizes the results of second quarter 1993 groundwater monitoring performed by ARCO's contractor, EMCON Associates (EMCON) of San Jose, California, at the above-referenced site. The objectives of this quarterly groundwater monitoring event are to evaluate changes in the groundwater flow direction and gradient, and changes in concentrations of petroleum hydrocarbons in the local groundwater associated with the former underground gasoline-storage tanks and a former underground waste-oil tank at the site. The field work and laboratory analyses of groundwater samples during this quarter performed under the direction of EMCON included measuring depths to groundwater, subjectively analyzing groundwater for the presence of petroleum 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; warrant of their field data and evaluation of their field protocols is beyond RESNA's scope of work. RESNA's scope of work was limited to monthly inspections of the Horner EZY Floating Product Skimmers, interpretation of field and laboratory analytical data; which included evaluating trends in reported hydrocarbon concentrations in the local groundwater, the groundwater gradient, and direction of groundwater flow beneath the site.

The operating ARCO Station 771 is located on the southwestern corner of the intersection of Rincon Avenue and Pine Street in Livermore, California. The site location is shown on the Site Vicinity Map, Plate 1.

Results of previous environmental investigations at the site are summarized in reports listed in the References section. The locations of soil borings, groundwater monitoring wells, and other pertinent site features are shown on the Generalized Site Plan, Plate 2.

Groundwater Sampling and Gradient Evaluation

Depth to water levels (DTW) were measured by EMCON field personnel on April 27, May 10, and June 17, 1993. Quarterly sampling was performed by EMCON field personnel on May 10, 1993. The results of EMCON's field work on the site, including DTW measurements and subjective analyses for the presence of product in the groundwater in MW-1 through MW-11 and RW-1, are presented on EMCON's Field Reports, Water Sample Data Sheets, and Summary of Groundwater Monitoring Data. These data are included in Appendix A.

The DTW levels, wellhead elevations, groundwater elevations, and subjective observations of product in the groundwater from MW-1 through MW-11 and RW-1 for this and previous quarterly groundwater monitoring at the site are summarized in Table 1, Cumulative Groundwater Monitoring Data. It appears that DTW level measured in MW-5 may not be accurate because measurements were made through an L-shaped fitting on the well head. Therefore, this DTW level was not used to calculate water elevation. The average groundwater gradient interpreted from the April, May and June 1993 monitoring events is approximately 0.08 ft/ft, with flow directions to the north-northwest. The groundwater gradients and flow directions are shown on Plates 3 through 5, Groundwater Gradient Maps. The presence of product sheen was noted on the purge water from monitoring wells MW-1, MW-2, MW-4, MW-5, and MW-7 during purging on May 10, 1993; although no floating product or product sheen was observed in the samples collected from these wells for the subjective analyses during the May monitoring event. No evidence of floating product or sheen was observed in the other wells by EMCON's field personnel during this quarter (see EMCON's Field Reports, Appendix A).

Groundwater monitoring wells MW-1 through MW-11, and RW-1 were purged and sampled by EMCON field personnel on May 10, 1993. Purge water generated during purging and sampling of the monitoring wells was transported to Gibson Environmental in Redwood City, California for recycling.

Laboratory Methods and Results

Under the direction of EMCON, water 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 water samples from MW-1 through MW-11, and RW-1 were analyzed for benzene, toluene, ethylbenzene, and total xylenes (BTEX) and total petroleum hydrocarbons as gasoline (TPHg) using modified Environmental Protection Agency (EPA) Methods 5030/8020/California DHS LUFT Method. Concentrations of TPHg and benzene in the groundwater are shown on Plate 6, TPHg Concentrations in Groundwater, and Plate 7, Benzene Concentrations in Groundwater. Groundwater samples from well MW-6, the nearest downgradient well to the former waste-oil tank, were also analyzed for total petroleum hydrocarbons as diesel (TPHd) and total oil and grease (TOG) using EPA Methods 3510/California DHS LUFT Method and Standard Methods 5520 C and F, respectively. The Chain of Custody Records and Laboratory Analyses Reports are attached in Appendix A. Results of these and previous water analyses are summarized in Table 2, Cumulative Results of Laboratory Analyses of Groundwater Samples.

The following is a general summary of changes in the concentrations of hydrocarbon constituents in the groundwater from wells MW-1 through MW-4, MW-6 through MW-11, and RW-1 since the last quarterly monitoring. Trends since last quarter could not be evaluated in MW-5 because it was not sampled for analyses. Concentrations of petroleum hydrocarbons generally increased in wells MW-1, MW-2, MW-4, MW-6, and MW-7; and generally decreased in wells MW-3 and RW-1. Concentrations remained nondetectable in offsite wells MW-9 through MW-11. Concentrations of TPHd and TOG increased in MW-6.

Product Recovery

RESNA measured and recovered floating product on a monthly basis, as summarized in Table 3, Approximate Cumulative Product Recovered. In January 1992, Horner EZY Skimmers were installed in wells MW-1, MW-2, and MW-5, for interim remediation at the site. In November 1992 the product skimmers were temporarily removed from the wells due to the installation of new wellhead fittings that connected the wells to the vapor extraction system. The skimmers were reinstalled in wells MW-1 and MW-2 in February 1993. The skimmer in well MW-5 could not be reinstalled because the new L-shaped wellhead fitting blocked access to the well. RESNA inspected wells MW-1 MW-2 and MW-5 for the presence of floating product on April 22, 1993. No measurable floating product was detected in wells during this inspection, however, a product sheen was observed in all three

wells. The results of the monthly inspections are presented on RESNA's Field Reports, which are included in Appendix A. No floating product was recovered during this quarter. The total product recovered at the site for 1991 and 1992 is approximately 3.06 gallons.

Conclusions

Groundwater at the site has been impacted by petroleum hydrocarbons. TPHg and BTEX appear to have been delineated to the north, east and southeast in the vicinity of offsite wells MW-8 through MW-11. The extent of the petroleum hydrocarbons has not yet been delineated to the southwest or west. Attempts to gain access to install offsite wells for further delineation of hydrocarbon-impacted groundwater in the vicinity of the site are ongoing. Ms. Susan Hugo of the Alameda County Health Care Services Agency has agreed to assist with efforts to gain offsite access.

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

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

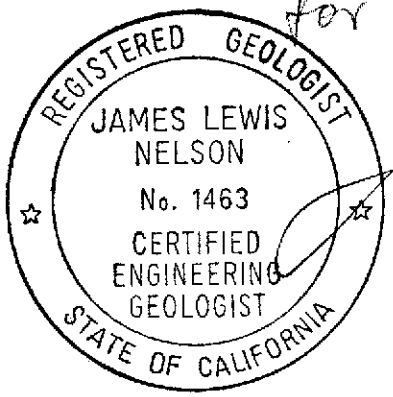
Mr. Eddy So
Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, California 94612

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.

for Erin McLucas
Staff Geologist



James L. Nelson
Certified Engineering
Geologist No. 1463

Enclosures: References

Plate 1, Site Vicinity Map
Plate 2, Generalized Site Plan
Plate 3, Groundwater Gradient Map, April 27, 1993
Plate 4, Groundwater Gradient Map, May 10, 1993
Plate 5, Groundwater Gradient Map, June 17, 1993
Plate 6, TPHg Concentrations in Groundwater, May 10, 1993
Plate 7, Benzene Concentrations in Groundwater, May 10, 1993

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

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

RESNA's Field Reports

REFERENCES

Applied GeoSystems, June 22, 1990. Limited Subsurface Environmental Assessment, ARCO Station No. 771, Livermore, California. AGS 60000-1.

Brown and Caldwell, September 16, 1987. Soil Sample Results for Waste-Oil tank Removal, ARCO Station 771, 899 Rincon Avenue, Livermore, California. 17/3456-02/3.

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

RESNA/Applied Geosystems, April 12, 1991. Supplemental Subsurface Investigation at ARCO Station No. 771, Livermore, California. AGS 60000.

RESNA/Applied GeoSystems, July 12, 1991. Letter Report Quarterly Ground-Water Monitoring Second Quarter 1991 at ARCO Station 771, 899 Rincon Avenue, Livermore, California. AGS 60000.05

RESNA, October 17, 1991. Report on Additional Subsurface Investigation at ARCO Station 771, 899 Rincon Avenue, Livermore, California. 60000.06

RESNA, November 21, 1991. Letter Report Quarterly Ground-Water Monitoring Third Quarter 1991 at ARCO Station 771, 899 Rincon Avenue, Livermore, California. 60000.05

RESNA, April 7, 1992. Letter Report Quarterly Groundwater Monitoring Fourth Quarter 1991 at ARCO Station 771, 899 Rincon Avenue, Livermore, California. 60000.05

RESNA, May 1, 1992. Letter Report Quarterly Groundwater Monitoring First Quarter 1992 at ARCO Station 771, 899 Rincon Avenue, Livermore, California. 60000.05

RESNA, September 28, 1992. Letter Report Quarterly Groundwater Monitoring Second Quarter 1992 at ARCO Station 771, 899 Rincon Avenue, Livermore, California. 60000.13

RESNA, December 4, 1992. Letter Report Quarterly Groundwater Monitoring Third Quarter 1992 at ARCO Station 771, 899 Rincon Avenue, Livermore, California. 60000.13

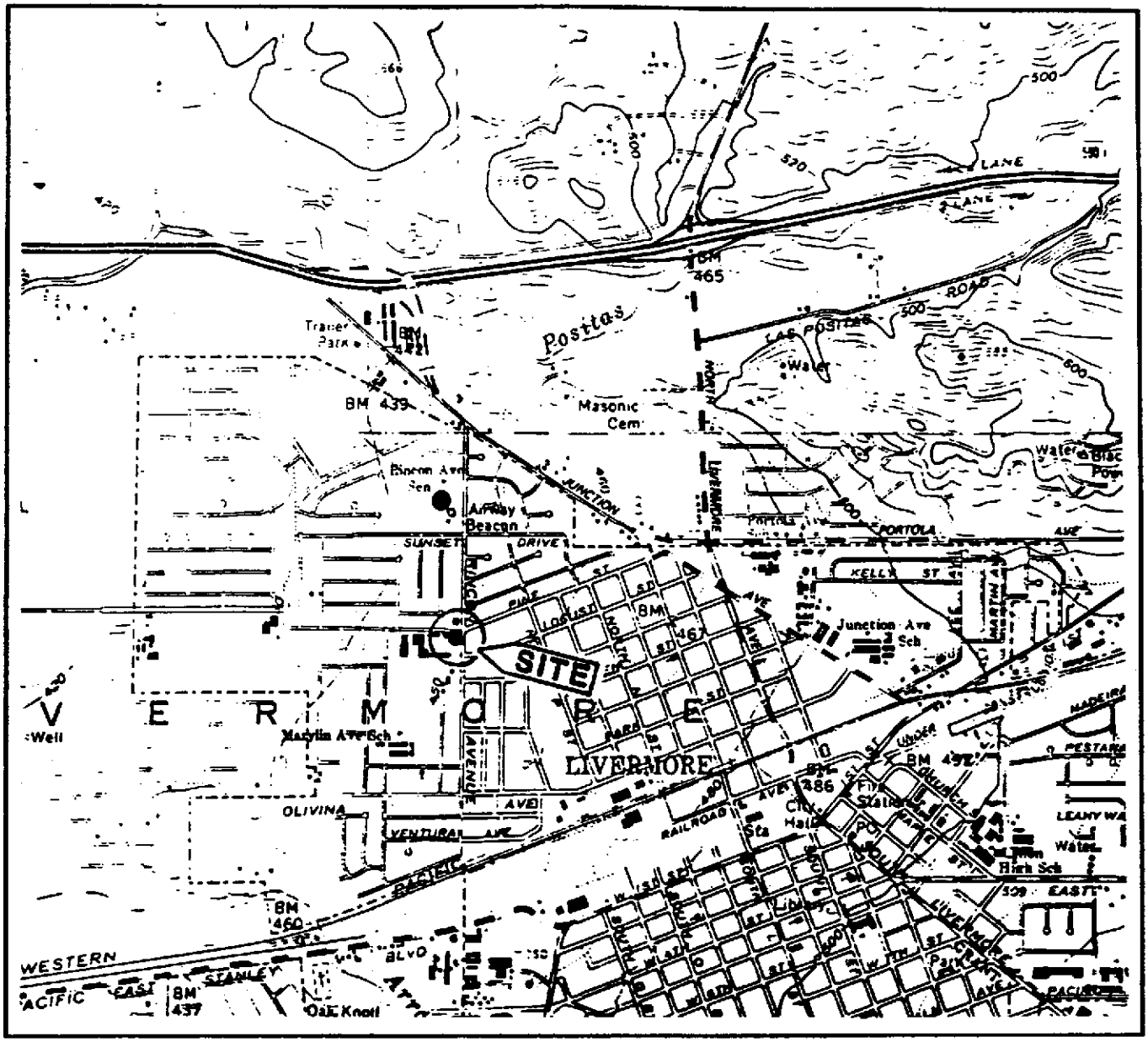
REFERENCES

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 18, 1993. Letter Report Quarterly Groundwater Monitoring Fourth Quarter 1992 at ARCO Station 771, 899 Rincon Avenue, Livermore, California. 60000.13

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

Roux, July 10, 1992. Underground Storage Tank Removal and Soil Sampling, ARCO Facility No. 771, 899 Rincon Avenue, Livermore, California. A135W01



Base: U.S. Geological Survey
7.5-Minute Quadrangles
Livermore, California.
Photorevised 1980

LEGEND

◉ = Site Location

N

Approximate Scale

2000 1000 0 2000 4000

feet

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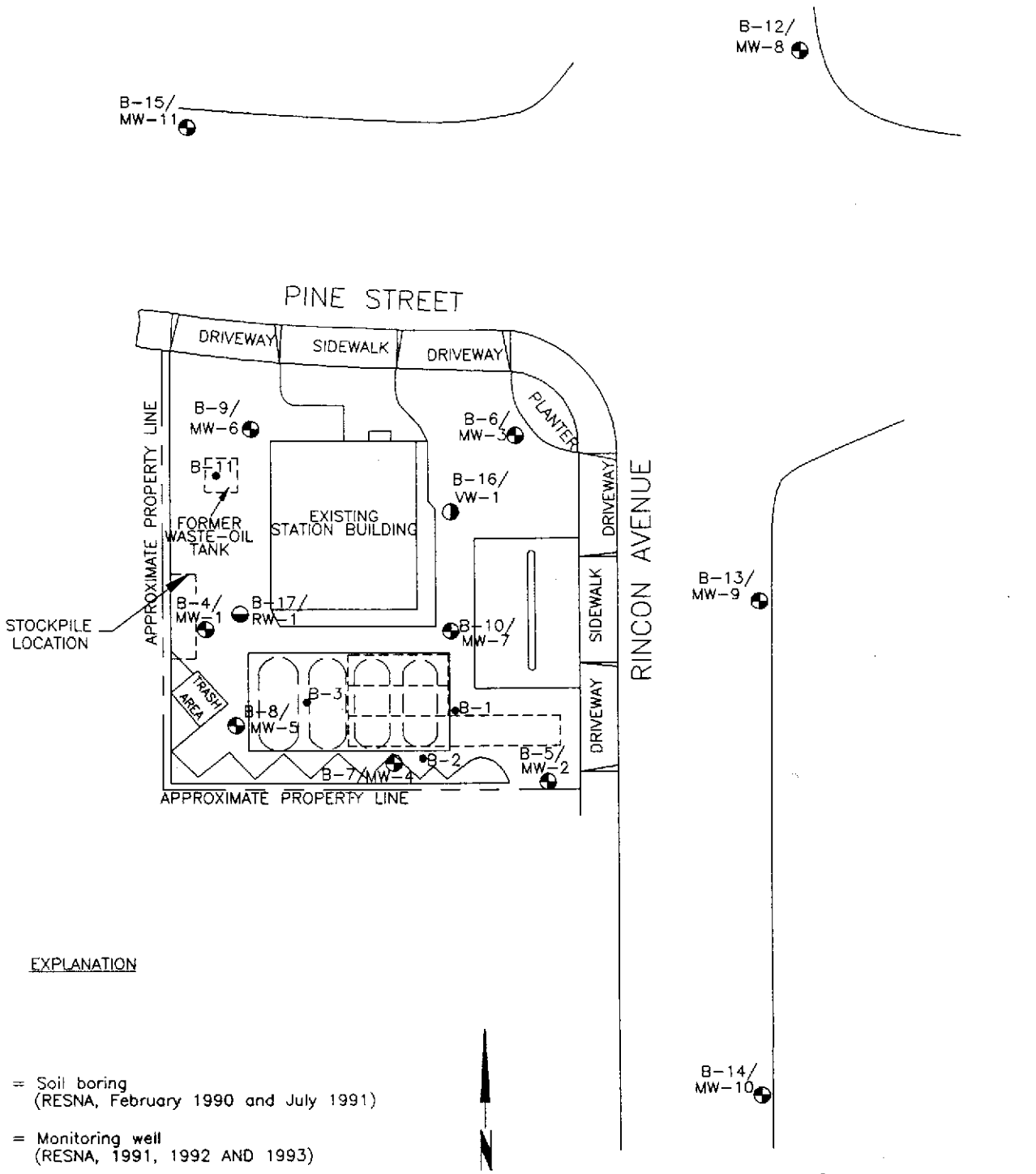
SITE VICINITY MAP
ARCO Station 771
899 Rincon Avenue
Livermore, California

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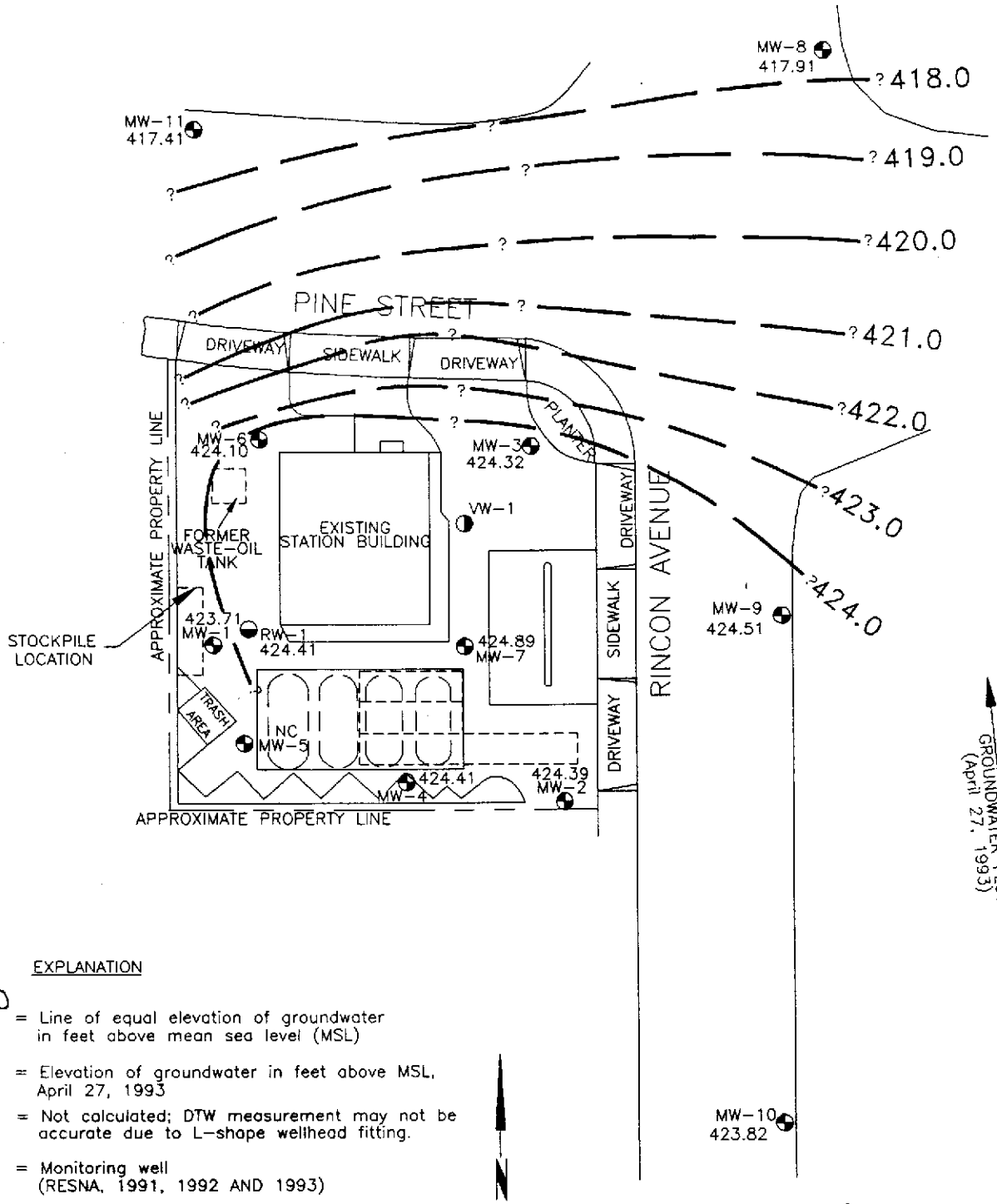
GENERALIZED SITE PLAN
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE
2



Source: Surveyed by John Koch, Licensed Land Surveyor.

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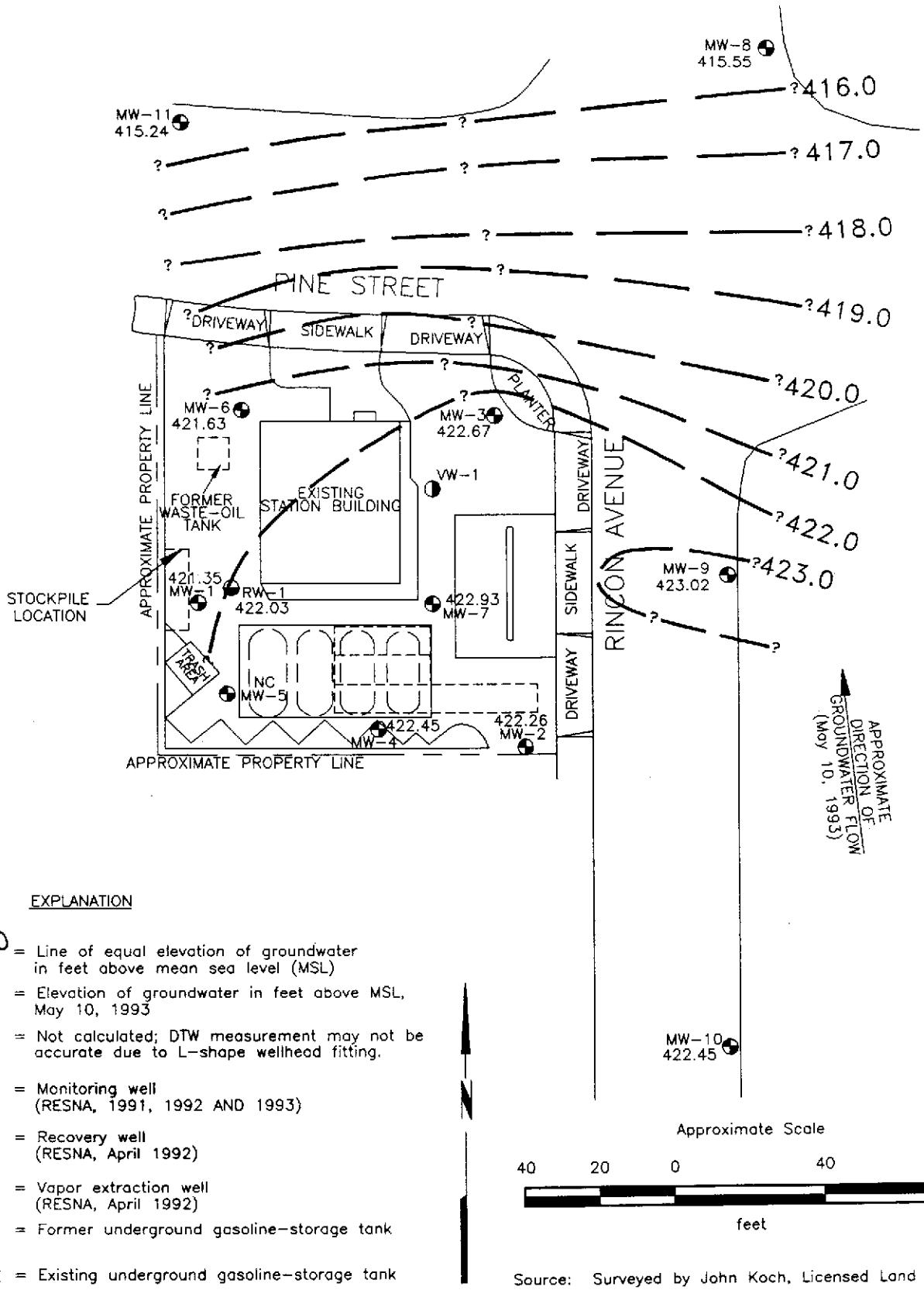
PROJECT 60000.15 000015GW

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

PLATE 3



EXPLANATION

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

423.02 = Elevation of groundwater in feet above MSL, May 10, 1993

NC = Not calculated; DTW measurement may not be accurate due to L-shape wellhead fitting.

MW-15 = 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

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor.

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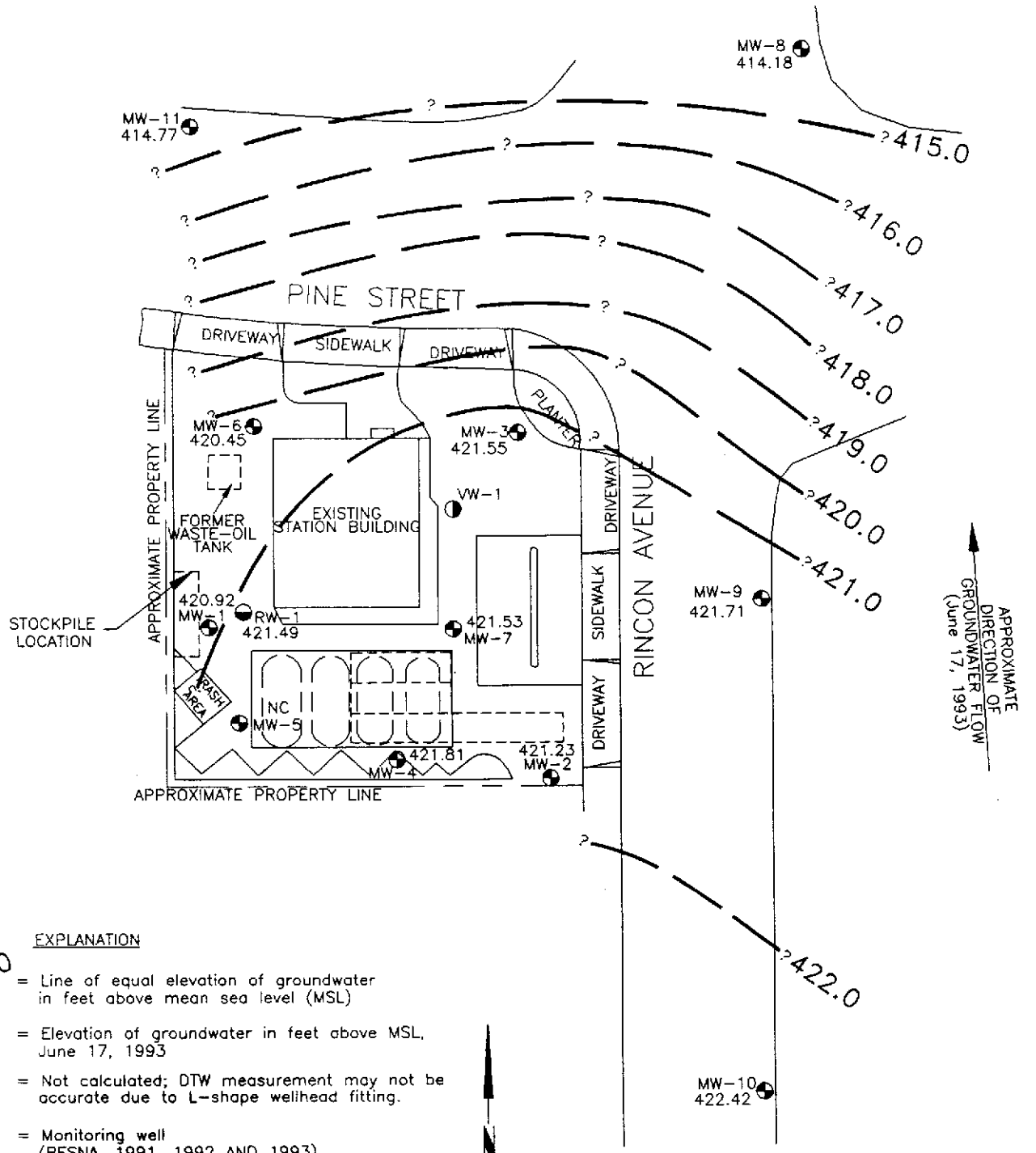
GROUNDWATER GRADIENT MAP
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 4



EXPLANATION

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

422.42 = Elevation of groundwater in feet above MSL, June 17, 1993

NC = Not calculated; DTW measurement may not be accurate due to L-shape wellhead fitting.

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

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor.

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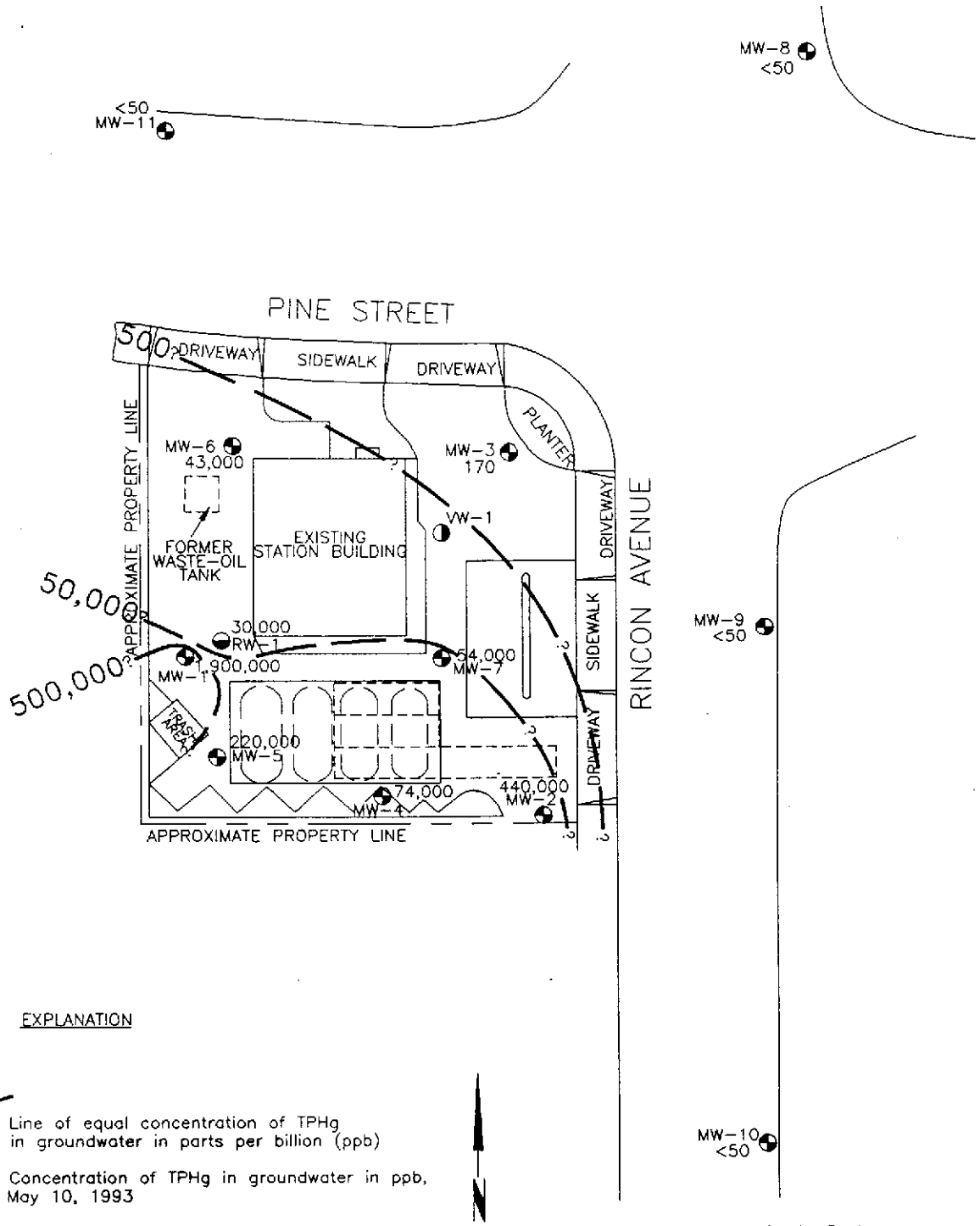
GROUNDWATER GRADIENT MAP
ARCO Station 771
899 Rincon Avenue
Livermore, California

PLATE 5



EXPLANATION

500,000 = Line of equal concentration of TPHg in groundwater in parts per billion (ppb)

1,900,000 = Concentration of TPHg in groundwater in ppb, May 10, 1993

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

N

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor.

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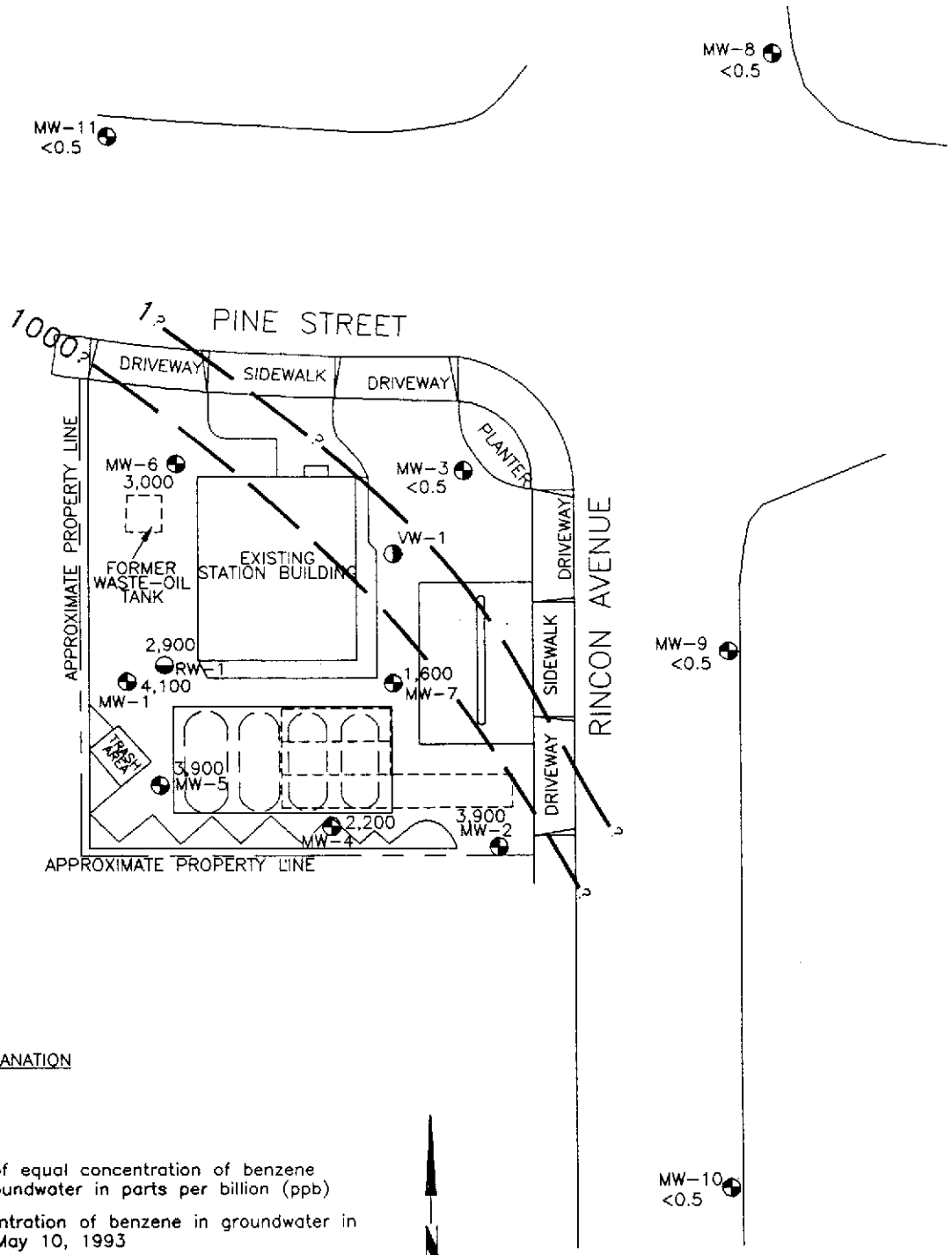
PROJECT 60000.15 00001502

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

PLATE 6



EXPLANATION

1000 = Line of equal concentration of benzene in groundwater in parts per billion (ppb)

4,100 = Concentration of benzene in groundwater in ppb, May 10, 1993

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

N

Approximate Scale

40 20 0 40 80

feet

Source: Surveyed by John Koch, Licensed Land Surveyor.

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PROJECT 60000.15 00001502

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

PLATE 7

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

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
MW-2				
01-15-91	449.52[a]	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
05-20-91	449.51[b]	NM	NM	NM
06-20-91		31.42*	418.09*	0.15

See notes on Page 7 of 7.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 2 of 7)

Well / Date	Well Elevation	Depth-to-Water	Water Elevation	Floating Product
MW-2 (cont.)				
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
MW-3				
01-15-91	450.29[b]	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
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		

See notes on Page 7 of 7.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 3 of 7)

Well Date	Well Elevation	Depth-to-Water	Water Elevation	Floating Product
MW-3 (cont.)				
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
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
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

See notes on Page 7 of 7.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 4 of 7)

Well Date	Well Elevation	Depth-to- Water	Water Elevation	Floating Product
MW-4(cont.)				
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
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
05-10-93		29.04***	NC	None
06-17-93		29.33***	NC	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

See notes on Page 7 of 7.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 5 of 7)

Well Date	Well Elevation	Depth-to-Water	Water Elevation	Floating Product
MW-6(cont.)				
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
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

See notes on Page 7 of 7.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 771
Livermore, California
(Page 6 of 7)

Well Date	Well Elevation	Depth-to- Water	Water Elevation	Floating Product
MW-7(cont.)				
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
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
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
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
MW-11				
04-24-92	448.02[c]	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

See notes on Page 7 of 7.

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

Well Date	Well Elevation	Depth-to- Water	Water Elevation	Floating Product
MW-11(cont.)				
12-14-92		33.18	414.84	None
01-29-93		23.89	424.13	None
02-26-93		27.31	420.71	None
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
RW-1				
04-24-92	451.44[c]	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

Measurements in feet.

* = Floating product present in well; DTW with floating product present was calculated using the following: 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 calculate the differences in 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.

TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF GROUNDWATER SAMPLES
ARCO Station 771
Livermore, California
(Page 1 of 3)

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
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
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
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

See notes on Page 3 of 3.

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

Sample	TPHg	B	T	E	X	TPHd	TOG
MW-4 (cont.)							
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
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
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]
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
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

See notes on Page 3 of 3.

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

Sample	TPHg	B	T	E	X	TPHd	TOG
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
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
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
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
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).

TABLE 3
APPROXIMATE CUMULATIVE PRODUCT RECOVERED
ARCO Station 771
Livermore, California
(Page 1 of 2)

Year/Date	Floating Product Recovered (gallons)
1991	TOTAL: 2.77 Gallons
MW-1	
01-15-92	Well inaccessible due to construction
02-28-92	Well inaccessible due to construction
03-26-92	0.25
04-27-92	Well inaccessible due to construction
05-14-92	None present
06-30-92	0.02
07-27-92	Sheen
08-28-92	Sheen
09-28-92	Sheen
10-26-92	Sheen
11-30-92	Sheen
12-30-92	Sheen
MW-2	
01-15-92	Well inaccessible due to construction
02-28-92	None present
03-26-92	0.01
04-27-92	None present
05-14-92	None present
06-30-92	None present
07-27-92	Sheen
08-28-92	Sheen
09-28-92	Sheen
10-26-92	Sheen
11-30-92	Sheen
12-30-92	Sheen
MW-5	
01-15-92	Well inaccessible due to construction
02-28-92	None present
03-26-92	0.01
04-27-92	None present
05-14-92	None present
06-30-92	None present
07-27-92	Sheen
08-28-92	Sheen
09-28-92	Sheen
10-26-92	Sheen
11-30-92	Sheen
12-30-92	Sheen
1992	TOTAL: 0.29 Gallons

TABLE 3
APPROXIMATE CUMULATIVE PRODUCT RECOVERED
ARCO Station 771
Livermore, California
(Page 2 of 2)

Year/Date		Floating Product Recovered (gallons)
MW-1		
01-15-93		Sheen
02-26-93		Sheen
03-26-93		Sheen
04-22-93		Sheen
MW-2		
01-15-93		Sheen
02-26-93		Sheen
03-26-93		Sheen
04-22-93		Sheen
MW-5		
01-15-93		Sheen
02-26-93		Sheen
03-26-93		Sheen
04-22-93		Not Monitored
1993	TOTAL:	0.00 Gallons
1991-1993	**TOTAL:**	**3.06 Gallons**

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

RESNA'S FIELD REPORTS

EMCON Associates
1938 Junction Avenue • San Jose, California 95131-2102 • **(408) 453-0719** • Fax (408) 453-0452

Date June 21, 1993
Project 0G70-012.01

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

We are enclosing:

Copies	Description
1	Depth To Water/Floating Product Survey Results
	June 1993 monthly water level survey, ARCO
	station 771, 899 Rincon Avenue, Livermore, CA

For your: X Information Sent by: X Mail

Comments:
Monthly water level data for the above mentioned site are attached. Please call if you have any questions: (408) 453-2266.

Jim Butera JB

Reviewed by:

REGISTERED PROFESSIONAL ENGINEER ROBERT CURTIS PORTER No. 4004 Exp. 6/30/94 GEOLOGIST STATE OF CALIFORNIA

Robert C Porter
Robert Porter, Senior Project Engineer.

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-012.01 STATION ADDRESS : 899 Rincon Avenue, Livermore, CA DATE : 6-17-93

ARCO STATION # : 771 FIELD TECHNICIAN : J Williams DAY : Thurs

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	MW-8	OK	YES	YES	3499	OK	35.25	35.25	ND	ND	41.7	—
2	MW-9	OK	YES	YES	3499	OK	29.50	29.50	ND	ND	39.2	—
3	MW-10	OK	YES	YES	3476	OK	26.80	26.80	ND	ND	36.2	—
4	MW-11	OK	YES	YES	3476	OK	33.25	33.25	ND	ND	38.6	—
5	MW-3	OK	YES	YES	3476	OK	28.73	28.73	ND	ND	39.6	—
6	RW-1	OK	3/4	YES	NONE	Slip	30.18	30.18	ND	ND	39.7	STRONG
7	MW-6	OK	YES	YES	3259	OK	30.92	30.92	ND	ND	43.2	—
8	MW-7	OK	3/4	YES	NONE	Slip	28.80	28.80	ND	ND	39.7	—
9	MW-4	OK	3/4	YES	NONE	Slip	29.28	29.28	ND	ND	41.1	—
10	MW-5	OK	YES	YES	NONE	Slip	29.33	29.33	ND	ND	40.0	—
11	MW-2	OK	3/4	YES	3259	OK	28.26	28.26	ND	ND	39.8	—
12	MW-1	BAD	3/4	YES	NONE	Slip	30.81	30.81	ND	ND	40.5	—

SURVEY POINTS ARE TOP OF WELL CASINGS

EMCON Associates
1938 Junction Avenue • San Jose, California 95131-2102 • **(408) 453-0719** • Fax (408) 453-0452

MAY

Date May 4, 1993
Project 0G70-012.01

To:
Mr. Joel Coffman
RESNA/ Applied Geosystems
3315 Almaden Expressway, Suite 34
San Jose, California 95118

We are enclosing:

Copies	Description
1	Depth To Water/Floating Product Survey Results
	April 1993 monthly water level survey, ARCO
	station 771, 899 Rincon Avenue, Livermore, CA

For your: X Information Sent by: X Mail

Comments:
Monthly water level data for the above mentioned site are attached. Please call if you have any questions: (408) 453-2266.

Reviewed by:

REGISTERED PROFESSIONAL ENGINEER ROBERT CURTIS PORTER No: 4084 Exp. 6/3/93 INDUSTRIAL STATE OF CALIFORNIA

Jim Butera JB

Robert Porter, Senior Project Engineer.

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-012.01 STATION ADDRESS : 899 Rincon Avenue, Livermore, CA DATE : 4-27-93

ARCO STATION # : 771 FIELD TECHNICIAN : J. BUTERA DAY : TUESDAY

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	MW-8	ok	EW	ok	3499	REPLACED	31.52	31.52	ND	ND	41.8	REPLACED LOCK & LOC
2	MW-9	OK	EW	ok	3499	REPLACED	24.70	24.70	ND	ND	39.2	REPLACED LOCK & LOC
3	MW-10	OK	EW	ok	DOLPHIN	OK	25.40*	25.40	ND	ND	36.3	~~REPLACED LOCK & LOC~~ DOLPHIN LOCK.
4	MW-11	ok	EW	ok	3476	ok	30.61	30.61	ND	ND	38.6	REPLACED LOCK
5	MW-3	ok	EW	ok	3259	ok	25.96	25.96	ND	ND	39.6	—
6	MW-6	ok	EW	ok	3259	ok	27.27	27.27	ND	ND	43.2	—
7	MW-4	ok	3'	NA	NA	NA	26.68	26.68	ND	ND	41.2	—
8	MW-7	OK	3'	NA	NA	NA	25.44	25.44	ND	ND	39.6	ONE BOLT HOLE STRIPPED
9	RW-1	ok	SQUARE	NA	NA	NA	27.26	27.26	ND	ND	39.8	TWO SCREEN BOLT HOLES STRIPPED
10	MW-1	ok	3'	NA	NA	YES	28.02	28.02	ND	ND	40.5	SKIMMER IN WELL DID NOT HAVE PRODUCT.
11	MW-2	ok	3'	NA	NA	YES	25.10	25.10	ND	ND	38.0	SKIMMER IN WELL NO PRODUCT IN.
12	MW-5	ok	3'	NA	NA	NA	27.11	27.11	ND	ND	40.2	—
												* WELL WAS UNDER VACUUM WATER LEVEL DROPPED.

SURVEY POINTS ARE TOP OF WELL CASINGS

EW = EMCO WHEATON WELL BOX

EMCON Associates
1938 Junction Avenue • San Jose, California 95131-2102 • **(408) 453-0719** • Fax (408) 453-0452

Date May 27, 1993
Project 0G70-012.01

To:
Ms. Erin McLucas
RESNA/ Applied Geosystems
3315 Almaden Expressway, Suite 34
San Jose, California 95118

We are enclosing:

Copies	Description
1	Depth To Water / Floating Product Survey Results
1	Summary of Groundwater Monitoring Data
1	Certified Analytical Reports with Chain-of-Custody
12	Water Sample Field Data Sheets

For your: X Information Sent by: X Mail

Comments:
Enclosed are the data from the second quarter 1993 monitoring event at ARCO service station 771, located at 899 Rincon Avenue, Livermore,CA. Groundwater monitoring is conducted consistent with applicable regulatory guidelines. Please call if you have any questions. (408) 453-2266.

Jim Butera JB

Reviewed by:

4/30/96

Robert Porter, Senior Project Engineer.

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 0G70-012.01 STATION ADDRESS : 899 Rincon Avenue, Livermore, CA DATE : May 10, 1993

ARCO STATION # : 771 FIELD TECHNICIAN : S. Horton / B. Stafford DAY : Monday

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	MW-8	good	yes	na	3499	yes	33.88	33.88	ND	ND	41.8	water in box
2	MW-9	good	yes	na	3499	yes	26.19	26.19	ND	ND	39.2	—
3	MW-10	good	yes	na	3476	yes	26.71	26.17	ND	ND	36.3	replaced dolphin lock with 3476
4	MW-11	good	yes	na	3476	yes	32.78	32.78	ND	ND	38.6	water in box
5	MW-3	good	yes	na	3476	yes	27.61	27.61	ND	ND	39.7	water in box
6	MW-6	good	yes	na	3259	yes	29.74	29.74	ND	ND	43.3	moderate odor
7	MW-4	good	yes	na	none	no	28.64	28.64	ND	ND	41.1	moderate odor installed 2 new bolts
8	MW-7	good	yes	na	none	no	27.40	27.40	ND	ND	39.7	moderate odor installed 3 new bolts
9	RW-1	good	yes	na	none	no	29.64	29.64	ND	ND	39.7	strong odor installed 1 new bolt
10	MW-5	good	yes	na	none	no	29.04	29.04	ND	ND	40.0	strong odor installed 4 new bolts
11	MW-2	good	yes	na	3259 Acme	yes no	27.23	27.25	ND	ND	37.8	skimmer inside well skimmer completely filled w/ water installed 3 new bolts
12	MW-1	good	yes	na	none	yes	30.38	30.38	ND	ND	40.5	strong odor skimmer inside well strong odor installed 2 new bolts

SURVEY POINTS ARE TOP OF WELL CASINGS

Summary of Groundwater Monitoring Data
Second Quarter 1993
ARCO Service Station 771
899 Rincon Avenue, Livermore, California
micrograms per liter (µg/l) and milligrams per liter (mg/l)

Well ID and Sample Depth	Sampling Date	Depth To Water (feet)	Floating Product Thickness (feet)	TPH[1] as Gasoline (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethyl-benzene (µg/l)	Total Xylenes (µg/l)	TPH as Diesel (ug/l)	Total Oil and Grease, 5520C/F (mg/l)
MW-1(39)	05/10/93	30.38	ND.[2]	1,900,000	4,100.	15,000.	21,000.	140,000.	NR.[3]	NR.
MW-2(37)	05/10/93	27.23	ND.	440,000.	3,900.	4,300.	4,400.	36,000.	NR.	NR.
MW-3(38)	05/10/93	27.61	ND.	170.	<0.5	<0.5	2.0	0.6	NR.	NR.
MW-4(40)	05/10/93	28.64	ND.	74,000.	2,200.	890.	1,400.	4,000.	NR.	NR.
MW-5(40)	05/10/93	29.04	ND.	220,000.	3,900.	3,700.	3,400.	15,000.	NR.	NR.
MW-6(43)	05/10/93	29.74	ND.	43,000.	3,000.	1,700.	1,100.	4,800.	3,900	110/16
MW-7(39)	05/10/93	27.40	ND.	54,000.	1,600.	160.	560.	3,100.	NR.	NR.
MW-8(41)	05/10/93	33.88	ND.	<50.	<0.5	<0.5	<0.5	<0.5	NR.	NR.
MW-9(38)	05/10/93	26.19	ND.	<50.	<0.5	<0.5	<0.5	<0.5	NR.	NR.
MW-10(35)	05/10/93	26.77	ND.	<50.	<0.5	<0.5	<0.5	<0.5	NR.	NR.
MW-11(38)	05/10/93	32.78	ND.	<50	<0.5	<0.5	<0.5	<0.5	NR.	NR.
RW-1(38)	05/10/93	29.64	ND.	30,000.	2,900.	1,100.	690.	4,300.	NR.	NR.
FB-1.[4]	05/10/93	NA.[5]	NA.	<50	<0.5	<0.5	<0.5	<0.5	NR.	NR.

1. TPH. = Total petroleum hydrocarbons
2. ND. = Not detected
3. NR. = Not reported; sample was not scheduled for analysis of the selected parameter
4. FB. = Field blank
5. NA. = Not applicable

Columbia Analytical Services, Inc.

May 26, 1993

Service Request No. SJ93-0645

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

Re: **EMCON Project No. 0G70-012.01**
ARCO Facility No. 771

Dear Mr. Butera:

Attached are the results of the water samples submitted to our lab on May 11, 1993. For your reference, these analyses have been assigned our service request number SJ93-0645.

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

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	Date Received:	05/11/93
Project:	EMCON Project No. 0G70-012.01	Service Request No.:	SJ93-0645
	ARCO Facility No. 771	Sample Matrix:	Water

Inorganic Parameters[1]
mg/L (ppm)

Sample Name:			MW-6 (43)	Method Blank
Date Sampled:			05/10/93	
Analyte	**Method**	**MRL**		
Total Oil and Grease	SM 5520C	0.5	110.	ND
Hydrocarbons, IR	SM 5520F	0.5	16.	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
SM *Standard Methods for the Examination of Water and Wastewater*, 17th Ed., 1989
[1] Unless otherwise noted, all analyses were performed within EPA recommended maximum holding times specified in *Test Methods for Evaluating Solid Waste,* (SW-846, 3rd Edition) and *Methods for Chemical Analysis of Water and Waste* (EPA-600/4-79-020, Revised March 1983).

Approved by: Keenan Murphy Date: May 26, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	Date Received:	05/11/93
Project:	EMCON Project No. 0G70-012.01	Date Extracted:	05/21/93
	ARCO Facility No. 771	Date Analyzed:	05/22/93
Sample Matrix:	Water	Service Request No.:	SJ93-0645

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

Sample Name	MRL	TPH as Diesel
MW-6 (43)	50	3,900. *
Method Blank	50	ND

MRL Method Reporting Limit
TPH Total Petroleum Hydrocarbons
ND None Detected at or above the method reporting limit
* The sample contains components eluting in the diesel range that were quantitated as diesel. The chromatogram does not match the typical diesel fingerprint.

Approved by: Kevin Murphy Date: May 26, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	05/11/93
Project:	EMCON Project No. 0G70-012.01	**Service Request No.:**	SJ93-0645
	ARCO Facility No. 771	**Sample Matrix:**	Water

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

Sample Name:		MW-1 (39)	MW-2 (37)	MW-3 (38)
Date Analyzed:		05/20/93 *	05/20/93 *	05/20/93 *
Analyte	**MRL**			
Benzene	0.5	4,100.	3,900.	ND
Toluene	0.5	15,000.	4,300.	ND
Ethylbenzene	0.5	21,000.	4,400.	2.0
Total Xylenes	0.5	140,000.	36,000.	0.6
TPH as Gasoline	50	1,900,000.	440,000.	170.

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
* This sample was part of the analytical batch started on May 20, 1993. However, it was analyzed after midnight so the actual date analyzed is May 21, 1993.

Approved by: Keenan Murphy Date: May 26, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	05/11/93
Project:	EMCON Project No. 0G70-012.01	**Service Request No.:**	SJ93-0645
	ARCO Facility No. 771	**Sample Matrix:**	Water

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

Sample Name:		MW-4 (40)	MW-5 (40)	MW-6 (43)
Date Analyzed:		05/19/93 *	05/19/93 *	05/19/93 *
Analyte	**MRL**			
Benzene	0.5	2,200.	3,900.	3,000.
Toluene	0.5	890.	3,700.	1,700.
Ethylbenzene	0.5	1,400.	3,400.	1,100.
Total Xylenes	0.5	4,000.	15,000.	4,800.
TPH as Gasoline	50	74,000.	220,000.	43,000.

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
* This sample was part of the analytical batch started on May 19, 1993. However, it was analyzed after midnight so the actual date analyzed is May 20, 1993.

Approved by: Kevin Murphy Date: May 26, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	05/11/93
Project:	EMCON Project No. 0G70-012.01	**Service Request No.:**	SJ93-0645
	ARCO Facility No. 771	**Sample Matrix:**	Water

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

Sample Name:		MW-7 (39)	MW-8 (41)	MW-9 (38)
Date Analyzed:		05/19/93 *	05/19/93 *	05/19/93 *
Analyte	**MRL**			
Benzene	0.5	1,600.	ND	ND
Toluene	0.5	160.	ND	ND
Ethylbenzene	0.5	560.	ND	ND
Total Xylenes	0.5	3,100.	ND	ND
TPH as Gasoline	50	54,000.	ND	ND

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
* This sample was part of the analytical batch started on May 19, 1993. However, it was analyzed after midnight so the actual date analyzed is May 20, 1993.

Approved by: Kevin Murphy Date: May 26 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	05/11/93
Project:	EMCON Project No. 0G70-012.01	**Service Request No.:**	SJ93-0645
	ARCO Facility No. 771	**Sample Matrix:**	Water

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

Sample Name:		MW-10(35)	MW-11 (38)	RW-1 (38)
Date Analyzed:		05/19/93 *	05/19/93 *	05/19/93 *
Analyte	**MRL**			
Benzene	0.5	ND	ND	2,900.
Toluene	0.5	ND	ND	1,100.
Ethylbenzene	0.5	ND	ND	690.
Total Xylenes	0.5	ND	ND	4,300.
TPH as Gasoline	50	ND	ND	30,000.

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
* This sample was part of the analytical batch started on May 19, 1993. However, it was analyzed after midnight so the actual date analyzed is May 20, 1993.

Approved by: Kevin Murphy Date: May 26, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Date Received:**	05/11/93
Project:	EMCON Project No. 0G70-012.01	**Service Request No.:**	SJ93-0645
	ARCO Facility No. 771	**Sample Matrix:**	Water

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

Sample Name:		FB-1	Method Blank	Method Blank
Date Analyzed:		05/19/93 *	05/19/93	05/20/93
Analyte	**MRL**			
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	0.5	ND	ND	ND
TPH as Gasoline	50	ND	ND	ND

TPH Total Petroleum Hydrocarbons
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit
* This sample was part of the analytical batch started on May 19, 1993. However, it was analyzed after midnight so the actual date analyzed is May 20, 1993.

Approved by: Kevin Murphy Date: May 26, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	05/11/93
Project:	EMCON Project No. 0G70-012.01	**Service Request No.:**	SJ93-0645
	Arco Facility No. 771	**Sample Matrix:**	Water

Continuing Calibration Summary
Inorganics
SM5520C
mg/L

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Total Oil and Grease	40.	41.1	103.	90-110

Approved by: Kenneth Murphy Date: May 26, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	05/11/93
Project:	EMCON Project No. 0G70-012.01	**Service Request No.:**	SJ93-0645
	Arco Facility No. 771	**Sample Matrix:**	Water

Matrix Spike Summary
Inorganic Parameters
mg/L (ppm)

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Criteria
Total Oil and Grease	4.	120.	152.	142.	NA	NA	56-151

NA Not Applicable because the analyte concentration in the sample is 30 times greater than the spike level.

Approved by: Kevin Murphy Date: May 26 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-012.01
ARCO Facility No. 771

Date Received: 05/11/93
Service Request No.: SJ93-0645
Sample Matrix: Water

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

Date Analyzed: 05/22/93

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
TPH as Diesel	500.	511.	102.	90-110

TPH Total Petroleum Hydrocarbons

Approved by: K. Donnelly Date: May 26, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	05/11/93
Project:	EMCON Project No. 0G70-012.01	**Service Request No.:**	SJ93-0645
	ARCO Facility No. 771	**Sample Matrix:**	Water

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

Sample Name	Date Analyzed	Percent Recovery *p*-Terphenyl
MW-6 (43)	05/22/93	94.
MS	05/22/93	100.
DMS	05/22/93	90.
Method Blank	05/22/93	87.
	CAS Acceptance Criteria	46-133

Approved by: Keenan Murphy Date: May 26 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-012.01
ARCO Facility No. 771

Date Received: 05/11/93
Service Request No.: SJ93-0645
Sample Matrix: Water

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

Date Analyzed: 05/22/93

Analyte	Spike Level	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	Acceptance Criteria
Diesel	4,000.	ND	4,580.	4,210.	114.	105.	61-121

ND None Detected at or above the method reporting limit

Approved by: Kevin Murphy Date: May 26, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: EMCON Project No. 0G70-012.01
ARCO Facility No. 771

Date Received: 05/11/93
Service Request No.: SJ93-0645

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

Date Analyzed: 05/19/93

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Criteria
Benzene	25.	23.7	95.	85-115
Toluene	25.	26.1	104.	85-115
Ethylbenzene	25.	25.3	101.	85-115
Total Xylenes	75.	75.6	101.	85-115
TPH as Gasoline	250.	255.	102.	90-110

TPH Total Petroleum Hydrocarbons

Approved by: _____ Date: May 26/1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	05/11/93
Project:	EMCON Project No. 0G70-012.01	**Service Request No.:**	SJ93-0645
	ARCO Facility No. 771	**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 (39)	05/20/93	109.
MW-2 (37)	05/20/93	101.
MW-3 (38)	05/20/93	104.
MW-4 (40)	05/19/93	116.
MW-5 (40)	05/19/93	110.
MW-6 (43)	05/19/93	100.
MW-7 (39)	05/19/93	101.
MW-8 (41)	05/19/93	89.
MW-9 (38)	05/19/93	86.
MW-10 (35)	05/19/93	87.
MW-11 (38)	05/19/93	87.
RW-1 (38)	05/19/93	91.
FB-1	05/19/93	87.
MW-1 (39) MS	05/19/93	116. *
MW-1 (39) DMS	05/19/93	119.
Method Blank	05/19/93	92.
Method Blank	05/20/93	91.
CAS Acceptance Criteria		70-130

TPH Total Petroleum Hydrocarbons
* The surrogate used for this sample was 4-Bromofluorobenzene.

Approved by: Kevin Murphy Date: May 26, 1993

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Date Received:**	05/11/93
Project:	EMCON Project No. 0G70-012.01	**Service Request No.:**	SJ93-0645
	ARCO Facility No. 771	**Sample Matrix:**	Water

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

Sample Name: MW-1 (39)
Date Analyzed: 05/19/93 *

			Spike Result		Percent Recovery		CAS Acceptance
Analyte	Spike Level	Sample Result	MS	DMS	MS	DMS	Criteria
Benzene	25,000.	4,080.	30,800.	29,100.	107.	100.	76-122
Toluene	25,000.	15,000.	39,900.	37,600.	98.	90.	75-127
Ethylbenzene	25,000.	20,700.	40,700.	38,700.	80.	72.	70-135

ND None Detected at or above the method reporting limit
* This sample was part of the analytical batch started on May 19, 1993. However, it was analyzed after midnight so the actual date analyzed is May 20, 1993.

Approved by: Kenneth Murphy Date: May 26, 1993

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ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. EMC-93-5

Chain of Custody

ARCO Facility no. 771	City (Facility) LIVERMORE	Project manager (Consultant) JIM BUTERA		Laboratory name CAS	
ARCO engineer KYLE CHRISTIE	Telephone no. (ARCO) 571-2434	Telephone no. (Consultant) 455-0719	Fax no (Consultant) 455-0452	Contract number 07077	
Consultant name EMCON ASSOCIATES	Address (Consultant) 1938 JUNCTION AVENUE			Method of shipment SAMPLER WILL DELIVER	

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015 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 ☐ Sem VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
MW1 (39)	1-2	2		X		X	HCl	5/10/93	1830		X											
MW2 (37)	3-4	2						5/10/93	1840		X											
MW3 (38)	5-6	2						5/10/93	1530		X											
MW4 (40)	7-8	2						5/10/93	1628		X											
MW5 (40)	9-10	2						5/10/93	1805		X											
MW6 (43)	11-16	6						5/10/93	1540		X		X									
MW7 (39)	17-18	2						5/10/93	1650		X											
MW8 (41)	19-20	2						5/10/93	1405		X											
MW9 (38)	21-22	2						5/10/93	1402		X											
MW10 (35)	23-24	2						5/10/93	1430		X											
MW11 (38)	25-26	2						5/10/93	1435		X											
RW1 (38)	27-28	2						5/10/93	1739		X											
FB-1	29-30	2		↓		↓	↓	5/10/93	1407		X											
MW4 (43)	31-32	2		X		X	NP	5/10/93	1540			X										

Special detection Limit/reporting: LOWEST POSSIBLE

Special QA/QC: AS NORMAL

Remarks: 2-40 ml HCl VOA's
4 - LITER HCl
2 - LITER NP
0620-012.01

Lab number: SJ93-0645

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

Condition of sample: OK		Temperature received: Cool	
Relinquished by sampler: [signature]	Date 5/11/93 Time 0937	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory [signature]	Date 5-11-93 Time 9:40

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: 0670.012.01 SAMPLE ID: MW-1 (39)

PURGED BY: B. Stafford CLIENT NAME: Arco 771

SAMPLED BY: B. Stafford LOCATION: 899 Rincon Ave. Livermore, CA.

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	5.85
DEPTH TO WATER (feet):	31.49	CALCULATED PURGE (gal.):	17.64
9.01 DEPTH OF WELL (feet):	40.5	ACTUAL PURGE VOL. (gal.):	18.0

DATE PURGED: 5/10/93 Start (2400 Hr) 1803 1758 End (2400 Hr) 1825

DATE SAMPLED: 5/10/93 Start (2400 Hr) 1830 End (2400 Hr) 1832

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1813 1758	6.0	7.21	1357.	67.4	Brown	Moderate
1820	12.0	6.90	1336.	65.3	Brown	Heavy
1827	18.0	6.91	1280.	64.7	↓	Heavy

D. O. (ppm): NA ODOR: Strong

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

WELL INTEGRITY: OK LOCK #: None

REMARKS: Sheen on purge H2O.

Meter Calibration: Date: 5/10/93 Time: 1333 Meter Serial #: 9204 Temperature °F: ___

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

Location of previous calibration: MW-9

Signature: Brent Stafford Reviewed By: [illegible] Page 1 of 12

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0070-012.01 SAMPLE ID: MW-7

PURGED BY: S Horton CLIENT NAME: ARCO #771

SAMPLED BY: S Horton LOCATION: Livermore, CA

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

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 6.90

DEPTH TO WATER (feet): 27.23 CALCULATED PURGE (gal.): 20.71

DEPTH OF WELL (feet): 37.7 ACTUAL PURGE VOL. (gal.): 21.0

DATE PURGED: 5/10/93 Start (2400 Hr) 18:14 End (2400 Hr) 18:35

DATE SAMPLED: 5/10/93 Start (2400 Hr) 18:39 End (2400 Hr) 18:40

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
18:21	7.0	7.14	1074	67.6	Gray	moderate
18:25	14.0	6.94	966	66.9	Gray	heavy
18:35	21.0	6.97	954	67.1	Gray	heavy

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

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

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

WELL INTEGRITY: Good LOCK #: none

REMARKS: layer of sheen on surface of purge water

Meter Calibration: Date: 5/10/93 Time: 13:35 Meter Serial #: 9205 Temperature °F: ___

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

Location of previous calibration: MW-5

Signature: [signature] Reviewed By: JB Page 2 of 12

Rev. 2, 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: OG70.012.01 | SAMPLE ID: MW-3 (38')
PURGED BY: B. Stafford | CLIENT NAME: Arco 771
SAMPLED BY: B Stafford | LOCATION: 899 Rincon Ave. Livermore, CA.

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

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

CASING ELEVATION (feet/MSL): NR
DEPTH TO WATER (feet): 27.56
DEPTH OF WELL (feet): 39.6 (12.04)

VOLUME IN CASING (gal.): 7.85
CALCULATED PURGE (gal.): 23.56
ACTUAL PURGE VOL. (gal.): 235

DATE PURGED: 5/10/93 | Start (2400 Hr) 1506 | End (2400 Hr) 1524
DATE SAMPLED: 5/10/93 | Start (2400 Hr) 1530 | End (2400 Hr) 1532

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1511	8.0	7.23	1160.	74.6	Brown	Moderate
1518	16.0	7.18	1145.	71.9	"	"
1523	23.5	7.17	1137.	70.9	"	"

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

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

PURGING EQUIPMENT
___ 2" Bladder Pump
___ Centrifugal Pump
___ Submersible Pump
___ Well Wizard™
___ Bailer (Teflon®)
X 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: OK | LOCK #: 3259

REMARKS: ___

Meter Calibration: Date: 5/10/93 Time: 1333 Meter Serial #: 9204 Temperature °F: ___
(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)
Location of previous calibration: MW-9

Signature: Kurt Shelton | Reviewed By: JE | Page 3 of 12

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: OG70.012.01
PURGED BY: B. Stafford
SAMPLED BY: B. Stafford

SAMPLE ID: MW-4(40)
CLIENT NAME: Arco 771
LOCATION: 899 Rincon Ave. Livermore, CA.

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

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

CASING ELEVATION (feet/MSL): NR
DEPTH TO WATER (feet): 28.66
DEPTH OF WELL (feet): 41.2 (12.54)

VOLUME IN CASING (gal.): 8.18
CALCULATED PURGE (gal.): 24.55
ACTUAL PURGE VOL. (gal.): 24.5

DATE PURGED: 5/10/93 Start (2400 Hr) 1552 End (2400 Hr) 1625
DATE SAMPLED: 5/10/93 Start (2400 Hr) 1625 End (2400 Hr) 1630

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1600	8.0	7.10	1424	72.9	Cloudy	Moderate
1609	16.5	6.84	1352	71.1	Brown	Heavy
1620	24.5	6.93	1296	69.9	Gray	↓

D. O. (ppm): NA
ODOR: ~~Moderate~~ Strong
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
___ Submersible Pump
___ Well Wizard™
___ Bailer (Teflon®)
X 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: OK
LOCK #: 5112

REMARKS: Sheen on Purge H2O

Meter Calibration: Date: 5/10/93 Time: 1333 Meter Serial #: 9204 Temperature °F: ___

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

Location of previous calibration: MW-9

Signature: Brent Stafford
Reviewed By: JB
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WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-017.01 SAMPLE ID: MW-5

PURGED BY: S. Horton CLIENT NAME: ARCO #771

SAMPLED BY: S. Horton LOCATION: Livermore, CA

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

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 7.16

DEPTH TO WATER (feet): 29.04 CALCULATED PURGE (gal.): 21.45

DEPTH OF WELL (feet): 46.0 ACTUAL PURGE VOL. (gal.): 20.5

DATE PURGED: 5/10/93 Start (2400 Hr) 17:23 End (2400 Hr) 17:51

DATE SAMPLED: 5/10/93 Start (2400 Hr) 18:04 End (2400 Hr) 18:05

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
17:36	7.5	7.22	1136	70.9	gray	moderate
17:45	15.0	7.00	1087	68.9	gray	moderate
17:51	___	Well Dried At 20.5 Gallons				
18:05	recharge	7.00	1082	68.7	gray	moderate
___	___	___	___	___	___	___

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

COLOR (COBALT 0 - 100): NR TURBIDITY (NTU 0 - 200): NR

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

PURGING EQUIPMENT

___ 2" Bladder Pump ___ Bailer (Teflon®)

___ Centrifugal Pump X Bailer (PVC)

___ Submersible Pump ___ Bailer (Stainless Steel)

___ Well Wizard™ ___ Dedicated

Other: ___

SAMPLING EQUIPMENT

___ 2" Bladder Pump X Bailer (Teflon®)

___ DDL Sampler ___ Bailer (Stainless Steel)

___ Dipper ___ Submersible Pump

___ Well Wizard™ ___ Dedicated

Other: ___

WELL INTEGRITY: Good LOCK #: none

REMARKS: Sheen on surface of purge water

Meter Calibration: Date: 5/10/93 Time: 13:55 Meter Serial #: 9209 Temperature °F: ___

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

Location of previous calibration: MW-5

Signature: [signature] Reviewed By: [signature] Page 5 of 12

WATER SAMPLE FIELD DATA SHEET

Rev. 2. 5/91

EMCON ASSOCIATES

PROJECT NO: 0676-017.01 | SAMPLE ID: MW-6
PURGED BY: S. Horton | CLIENT NAME: ARCO #771
SAMPLED BY: S. Horton | LOCATION: Livermore, CA

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

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

CASING ELEVATION (feet/MSL): NR | VOLUME IN CASING (gal.): 8.95
DEPTH TO WATER (feet): 29.74 | CALCULATED PURGE (gal.): 26.57
DEPTH OF WELL (feet): 43.3 | ACTUAL PURGE VOL. (gal.): 27.0

DATE PURGED: 5/10/93 | Start (2400 Hr) 14:53 | End (2400 Hr) 15:27
DATE SAMPLED: 5/10/93 | Start (2400 Hr) 15:35 | End (2400 Hr) 15:40

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
15:02	9.0	7.36	906	74.1	gray	moderate
15:15	18.0	7.33	1039	72.5	gray	heavy
15:27	~~27.0~~	Well Dried At	19.5 Gallons			
15:[illegible]	recharge	7.36	1105	73.9	gray	heavy

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

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

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

WELL INTEGRITY: Good | LOCK #: 3259

REMARKS: ___

Meter Calibration: Date: 5/10/93 Time: 13:35 Meter Serial #: 9208 Temperature °F: ___

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

Location of previous calibration: MW-9

Signature: [signature] | Reviewed By: [signature] | Page 6 of 12

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-012.01 SAMPLE ID: MW-7(39)

PURGED BY: S. Horton CLIENT NAME: ARCO #771

SAMPLED BY: S. Horton LOCATION: Livermore, CA

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

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 8.03

DEPTH TO WATER (feet): 27.40 CALCULATED PURGE (gal.): 24.10

DEPTH OF WELL (feet): 39.7 ACTUAL PURGE VOL. (gal.): 24.5

DATE PURGED: 5/10/93 Start (2400 Hr) 16:22 End (2400 Hr) 16:43

DATE SAMPLED: 5/10/93 Start (2400 Hr) 16:49 End (2400 Hr) 16:50

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
16:31	8.5	7.36	1054	70.8	gray	heavy
16:43	~~16.5~~	Well	Dried At	16.0 Gallons		
16:50	~~recharge 24.~~	7.05	1029	71.5	gray	heavy

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

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

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

PURGING EQUIPMENT

___ 2" Bladder Pump
___ Centrifugal Pump
___ Submersible Pump
___ Well Wizard™
___ Bailer (Teflon®)
X 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 #: ~~PA~~ none

REMARKS: Light sheen on surface of purge water
Rocks, gravel, and sand on bottom of well

Meter Calibration: Date: 5/10/93 Time: 13:39 Meter Serial #: 9208 Temperature °F: ___

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

Location of previous calibration: MW-5

Signature: [signature] Reviewed By: JB Page 7 of 12

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 0670-012.01 SAMPLE ID: MW-8(41)

PURGED BY: S. Horton CLIENT NAME: ARCO #771

SAMPLED BY: S. Horton LOCATION: Livermore, 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.): 1.29

DEPTH TO WATER (feet): 33.95 CALCULATED PURGE (gal.): 3.58

DEPTH OF WELL (feet): 41.8 ACTUAL PURGE VOL. (gal.): 4.0

DATE PURGED: 5/10/93 Start (2400 Hr) 13:46 End (2400 Hr) 13:57

DATE SAMPLED: 5/10/93 Start (2400 Hr) 14:04 End (2400 Hr) 14:05

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
13:48	1.5	7.22	963	76.3	brown	heavy
13:53	3.0	7.19	933	73.4	brown	heavy
13:57	4.0	7.19	914	73.3	brown	heavy

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

COLOR (COBALT 0 - 100): NR

TURBIDITY (NTU 0 - 200): NR

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

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

WELL INTEGRITY: Good LOCK #: 3499

REMARKS: ___

Meter Calibration: Date: 5/10/93 Time: 13:39 Meter Serial #: 9708 Temperature °F: 54.2

(EC 1000 1028 / 1000) (DI ___) (pH 7 7.02 / 7.00) (pH 10 10.31 / 10.00) (pH 4 4.00 / ___)

Location of previous calibration: ___

Signature: [signature] Reviewed By: [signature] Page 5 of 12

Rev. 2, 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: OG70.012.01 | SAMPLE ID: MW-9(38)

PURGED BY: B. Stafford | CLIENT NAME: Arco 771

SAMPLED BY: B. Stafford | LOCATION: 899 Rincon Ave. Livermore, 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.): 2.13

DEPTH TO WATER (feet): 26.14 | CALCULATED PURGE (gal.): 6.38

DEPTH OF WELL (feet): 39.2 | ACTUAL PURGE VOL. (gal.): 6.50

DATE PURGED: 5/10/93 | Start (2400 Hr) 1345 | End (2400 Hr) 1358

DATE SAMPLED: 5/10/93 | Start (2400 Hr) 1402 | End (2400 Hr) 1404

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1350	2.0	6.41	1166	74.5	Brown	Heavy
1354	4.0	7.03	1125	70.9	"	"
1357	6.5	7.12	1108	69.9	"	"

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

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

PURGING EQUIPMENT

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

SAMPLING EQUIPMENT

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

WELL INTEGRITY: OK | LOCK #: 3499

REMARKS: ___

Meter Calibration: Date: 5/10/93 | Time: ~~1335~~ 13:33 | Meter Serial #: 9204 | Temperature °F: 65.6

(EC 1000 916 / 1000) (DI 2.51) (pH 7 7.11 / 7.00) (pH 10 10.32 / 10.00) (pH 4 3.93 / ___)

Location of previous calibration: NA

Signature: [signature] | Reviewed By: JB | Page 9 of 12

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: OG70.012.01 | SAMPLE ID: MW-10(35)

PURGED BY: B. Stafford | CLIENT NAME: Arco 771

SAMPLED BY: B. Stafford | LOCATION: 899 Rincon Ave. Livermore, CA.

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

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

CASING ELEVATION (feet/MSL): NR | VOLUME IN CASING (gal.): 1.55

DEPTH TO WATER (feet): 26.77 | CALCULATED PURGE (gal.): 4.66

4:53 DEPTH OF WELL (feet): 36.3 | ACTUAL PURGE VOL. (gal.): 5.00

DATE PURGED: 5/10/93 | Start (2400 Hr) 1413 | End (2400 Hr) 1427

DATE SAMPLED: 5/10/93 | Start (2400 Hr) 1430 | End (2400 Hr) 1432

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1420	1.5	7.24	1408	74.8	Brown	Heavy
1422	3.0	7.17	1346.	70.9	↓	↓
1425	5.0	7.16	1440.	~~68.9~~ 69.8	↓	↓

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

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

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 #: 3476

REMARKS: ___

Meter Calibration: Date: 5/10/93 Time: 13.33 Meter Serial #: 9204 Temperature °F: ___

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

Location of previous calibration: MW-9

Signature: Brent Stafford | Reviewed By: [illegible] | Page 10 of 12

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: OGTC-012.01 SAMPLE ID: MW-11

PURGED BY: S. Horton CLIENT NAME: ARCO #771

SAMPLED BY: S. Horton LOCATION: Livermore, 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.): .95

DEPTH TO WATER (feet): 32.78 CALCULATED PURGE (gal.): 2.85

DEPTH OF WELL (feet): 38.6 ACTUAL PURGE VOL. (gal.): 3.0

DATE PURGED: 5/10/93 Start (2400 Hr) 14:21 End (2400 Hr) 14:30

DATE SAMPLED: 5/10/93 Start (2400 Hr) 14:34 End (2400 Hr) 14:35

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
14:23	1.0	7.07	900	75.4	brown	heavy
14:27	2.0	7.09	879	73.4	brown	heavy
14:30	3.0	7.08	873	73.2	brown	heavy

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

COLOR (COBALT 0 - 100): NR

TURBIDITY (NTU 0 - 200): NR

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

PURGING EQUIPMENT

___ 2" Bladder Pump
___ Centrifugal Pump
___ Submersible Pump
___ Well Wizard™
___ Bailer (Teflon®)
X 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 #: 3476

REMARKS: ___

Meter Calibration: Date: 5/10/93 Time: 13:38 Meter Serial #: 9208 Temperature °F: ___

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

Location of previous calibration: MW-8

Signature: [signature] Reviewed By: [signature] Page 11 of 12

Rev. 2, 5/91

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: OG70-012.01 | SAMPLE ID: RW-1 (38)

PURGED BY: B. Stafford | CLIENT NAME: Arco 771

SAMPLED BY: B. Stafford | LOCATION: 899 Rincon Ave, Livermore, CA.

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	14.93
DEPTH TO WATER (feet):	29.63	CALCULATED PURGE (gal.):	44.78
DEPTH OF WELL (feet):	35.8	ACTUAL PURGE VOL. (gal.):	33.5

DATE PURGED: 5/10/93 | Start (2400 Hr) 1710 | End (2400 Hr) 1737

DATE SAMPLED: 5/10/93 | Start (2400 Hr) 1739 | End (2400 Hr) 1743

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1721	15.0	7.02	1470.	72.2	Clear	low
1728	30.0	6.83	1407.	69.0	↓	↓
1731	~~35.0~~	dried	at 33.5 gal	hours @	1732.	
1743	Recharge	6.85	1351	68.7	Cloudy	~~Extremely~~
					NA	NA

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

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

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

WELL INTEGRITY: OK | LOCK #: None

REMARKS: DTW @ 17:32 = 37.64'.
DTW @ 17:34 = 37.62'. Continuing purging.
Well dried a 3rd time
DTW = 37.74' @ 17:37 Sampling.

Meter Calibration: Date: 5/10/93 Time: 1333 Meter Serial #: 9204 Temperature °F: ___

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

Location of previous calibration: MW-9

Signature: [signature] Reviewed By: [signature] Page 12 of 12

FIELD REPORT
SKIMMER INSPECTION/FLOATING PRODUCT REMOVAL

DATE: 4/22/93

SITE: 771

ADDRESS: 899 Rincon Ave, Livermore

JOB #: 6000015

FIELD TECHNICIAN: B. Sieminski

WELL NO/ TIME	ODOR (OBS)	SHEEN (H,M,S-EMUL., COLOR)	PROD(FRESH (TRANSCLU-SCENT), DEGRADED(DK.BR.),ASPHALTINE(DK,VISCOUS)	WELL ELEV	DTP	DTW	TOT. DET.	WAT. EL.
MW-1	yes	yes	no			26.70		
MW-2	yes	yes	no			24.26		

PRODUCT REMOVED: 0

Notes: