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TRANSMITTAL 3883
 5110

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

DATE: September 28, 1992
PROJECT NUMBER: 69028.08
SUBJECT: Final - Second Quarter 1992
 Quarterly Groundwater Monitoring at
 ARCO Station 6113, 785 East Stanley Ave.,
 Livermore, California.

FROM: Barbara Sieminski
TITLE: Assistant Project Geologist

WE ARE SENDING YOU:

COPIES DATED	DESCRIPTION
1 9/28/92	Final - Second Quarter 1992, Groundwater Monitoring at the above subject site.

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REMARKS: cc: Mr. H.C. Winsor, ARCO Products Company
 Mr. Michael Whelan, ARCO Products Company
 Mr. Eddy So, CRWQCB, San Francisco Bay Region
 Ms. Danielle Stefani, Livermore Fire Department
 Mr. Joel Coffman, RESNA Industries Inc.

Copies: 1 to RESNA project file no. 69028.08



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LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
Second Quarter 1992
at
ARCO Station 6113
785 East Stanley Boulevard
Livermore, California

69028.08



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

Sincerely,
RESNA Industries



Barbara Sieminski
Assistant Project Geologist



Joan E. Tiernan
Registered Civil Engineer
044600

cc: H.C. Winsor, ARCO Products Company

Enclosures: References

Plate 1, Site Vicinity Map
Plate 2, Generalized Site Plan
Plate 3, Groundwater Gradient Map, April 24, 1992
Plate 4, Groundwater Gradient Map, June 29, 1992
Plate 5, TPHg Concentrations in Groundwater, June 29, 1992
Plate 6, Benzene Concentrations in Groundwater, June 29, 1992

Table 1, Cumulative Groundwater Monitoring Data
Table 2, Cumulative Results of Groundwater Laboratory Analyses--TPHg and BTEX
Table 3, Cumulative Results of Groundwater Laboratory Analyses--TPHd TOG, VOC and Metals

Appendix A: EMCON's Depth to Water/Floating Product Survey Results, Summary of Groundwater Monitoring Data, Certified Analytical Reports with Chain-of-Custody, and Water Sample Field Data Sheets.
Monitoring Well Purge Water Disposal Form



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**LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
Second Quarter 1992
at
ARCO Station 6113
785 East Stanley Boulevard
Livermore, California**

69028.08



A RESNA Company

RESNA

Working To Restore Nature

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September 28, 1992

0729MWHE

69028.08

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

Subject: Second Quarter 1992 Groundwater Monitoring Report for ARCO Station 6113, 785 East Stanley Boulevard, Livermore, California.

Mr. Whelan:

As requested by ARCO Products Company (ARCO), this letter report summarizes the results of second quarter 1992 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 are to evaluate changes in the groundwater flow direction and gradient, and changes in concentrations of petroleum hydrocarbons in the local groundwater associated with a former waste-oil and underground gasoline-storage tanks at the site. The field work and laboratory analyses of groundwater samples during this quarter were performed under the direction of EMCON and included measuring depths to groundwater, subjectively analyzing groundwater for the presence of 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; evaluation and warrant of their field data and field protocols is beyond RESNA Industries Inc.'s (RESNA's) scope of work. RESNA's scope of work was limited to 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 6113 is located on the southwestern corner of the intersection of East Stanley and Murrieta Boulevards in Livermore, California, shown on the Site Vicinity Map, Plate 1.

Previous Work

Prior to the present monitoring, Pacific Environmental Group (PEG) and RESNA performed limited subsurface environmental investigations related to the former underground waste-oil storage tank and active gasoline storage tanks at the site. PEG performed soil sampling and observation during removal of the waste-oil tank in January 1989 (PEG, April 1989). Work by RESNA included installation of three groundwater monitoring wells (MW-1, MW-2, and MW-3) in September 1989 (AGS, December 1989) and installation of one groundwater monitoring well (MW-4) in the approximate downgradient direction of the former waste-oil tank in February 1991 (AGS, April 16, 1991). In June 1992 RESNA initiated additional subsurface investigation which included drilling of seven soil borings (B-5 through B-11) and installation of five groundwater monitoring wells (MW-5 through MW-9) and one vapor extraction well (VW-1); and performing a vapor extraction test. The results of this investigation will be presented in the report prepared after completion of the field work. Quarterly groundwater sampling of wells MW-1 through MW-3 was initiated in June 1990; quarterly groundwater sampling of well MW-4 was initiated in February 1991, quarterly groundwater sampling of wells MW-5 through MW-9 was initiated in June 1992. The results of these investigations are presented in the reports listed in the references section included in this letter report. The locations of the groundwater monitoring wells and pertinent site features are shown on the Generalized Site Plan, Plate 2.

Groundwater Sampling and Gradient Evaluation

Depth to water measurements (DTW) were performed by EMCON field personnel on April 24, May 20, and June 29, 1992. Quarterly sampling was performed by EMCON field personnel on June 29, 1992. The results of EMCON's field work on the site, including DTW measurements and subjective analysis for the presence of product in the groundwater in MW-1 through MW-9, are presented on EMCON's field report sheets and EMCON's 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-9 for this quarter and previous quarterly groundwater monitoring at the site are summarized in Table 1, Cumulative Groundwater Monitoring Data. EMCON's DTW measurements were used to evaluate groundwater elevations. Evidence of product or sheen was not observed by EMCON's field personnel during this quarter (see EMCON's field report sheets, Appendix A). Groundwater monitoring well MW-4 was dry during this quarter's monitoring events. Groundwater monitoring well MW-3 contained only residual water trapped at the tip of the well casing during the May monitoring event, and groundwater monitoring wells MW-1 and

MW-3 contained residual water during the June monitoring event, therefore groundwater elevations could not be calculated. As a result, gradients for May and June could not be evaluated for the perched water bearing zone in which wells MW-1 through MW-3 are installed. The groundwater gradient of the perched water bearing zone interpreted from EMCON's April 24, 1992, DTW measurements from wells MW-1 through MW-3 is approximately 0.05 toward the east/northeast. The groundwater gradient of the deeper water bearing zone interpreted from EMCON's June 29, 1992, DTW measurements obtained from newly installed wells MW-5 through MW-9 is approximately 0.01 toward the north/northeast. These groundwater gradients are shown on the Groundwater Gradient Maps, Plates 3 and 4.

Groundwater monitoring wells MW-2 and MW-5 through MW-9 were purged and sampled by EMCON field personnel on June 29, 1992. Because well MW-4 was dry, and wells MW-1 and MW-3 contained residual water only (did not recharge after one well volume was purged), groundwater could not be sampled. EMCON's water sample field data sheets are included in Appendix A. Approximately 3 to 5 well volumes were purged from wells MW-5 through MW-9 before they were sampled. Groundwater monitoring well MW-2 was dewatered after less than two well volumes were purged. The purge water was removed from the site by a licensed hazardous waste hauler; the Monitoring Well Purge Water Disposal Form is also included in Appendix A.

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-2 and MW-5 through MW-9 were analyzed for total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene, and total xylenes (BTEX) using modified Environmental Protection Agency (EPA) Methods 5030/8020. Well MW-8 was also analyzed for: 1) total petroleum hydrocarbons as diesel (TPHd) using EPA Method 3510; 2) total oil and grease (TOG) using EPA method 5520C&F; 3) halogenated volatile organic compounds (VOC) using EPA Method 5030/601; 4) metals cadmium, chromium, nickel and zinc using EPA Method 6010, and lead using EPA Method 7421. Concentrations of TPHg and benzene in the groundwater are shown on Plate 5, TPHg Concentrations in Groundwater, and Plate 6, Benzene Concentrations in Groundwater. The Chain of Custody Records and Laboratory Analysis 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--TPHg and BTEX and Table 3, Cumulative Results of Laboratory Analyses of Groundwater--TPHd, TOG, VOC, and metals.

Results of this quarter's groundwater monitoring indicate:

- o TPHg was detected in groundwater samples from MW-5, MW-6 and MW-7, located in the vicinity of active gasoline storage tanks, at concentrations of 8,900 parts per billion (ppb), 8,600 ppb and 270 ppb, respectively. TPHg was nondetectable (<50 ppb) in the groundwater samples from wells MW-2, MW-8 and MW-9 located in the southern portion of the property.
- o Benzene was detected in groundwater samples from MW-5, MW-6 and MW-7, at concentrations 1,700 ppb, 1,800 ppb and 38 ppb, respectively; and was nondetectable (less than 0.5 ppb) in groundwater samples from wells MW-2, MW-8 and MW-9. Benzene exceeds the State Maximum Contaminant Level (MCL) in MW-5, MW-6 and MW-7.
- o Toluene was detected in groundwater samples from MW-5, MW-6 and MW-7 at concentrations of 640 ppb, 460 ppb and 3.7 ppb; and was nondetectable (less than 0.5 ppb) in groundwater samples from wells MW-2, MW-8 and MW-9. Toluene exceeds the State Action Level in MW-5 and MW-6.
- o Ethylbenzene was detected in groundwater samples from MW-5, MW-6 and MW-7 at concentrations of 310 ppb, 52 ppb and 1.1, respectively; and was nondetectable (less than 0.5 ppb) in groundwater samples from wells MW-2, MW-8 and MW-9. Ethylbenzene was within the State MCL in all wells.
- o Total xylenes were detected in groundwater samples from MW-5, MW-6 and MW-7 at concentrations of 1,100 ppb, 450 ppb and 4.4 ppb; and were nondetectable (less than 0.5 ppb) in groundwater samples from wells MW-2, MW-8 and MW-9. Total xylenes were within the State MCL in all wells.
- o TPHd was nondetectable (<50 ppb) in the groundwater sample from well MW-8, located next to the former waste-oil tank.
- o TOG was nondetectable (<500 ppb) in the groundwater sample from well MW-8, located next to the former waste-oil tank.
- o VOCs were nondetectable (31 compounds tested) in the groundwater sample from well MW-8, located next to the former waste-oil tank.
- o Metals: chromium, lead, zinc and nickel were detected at concentrations of 1,780 ppm, 143 ppm, 1,310 ppm and 5,100 ppm, respectively, and cadmium was

nondetectable (less than 3 ppm) in the groundwater sample from MW-8, located next to the former waste-oil tank. Chromium and lead exceeded the Federal MCLs.

The following general trends were noted in reported hydrocarbon concentrations in groundwater beneath the site since the last quarterly monitoring. Concentrations of TPHg and BTEX remained nondetectable in well MW-2. Because groundwater monitoring wells MW-5 through MW-9 were constructed in June 1992 trends have not been established for the groundwater in these wells.

Conclusions

Groundwater at this site has been impacted by petroleum hydrocarbons based on analytical results of the groundwater samples. The highest TPHg and benzene concentrations in groundwater are in the area around the existing underground storage tanks (USTs) which are located in the northeast corner of the site. The extent of gasoline hydrocarbons in the groundwater appears to be delineated to less than 50 ppb TPHg and less than 0.5 ppb of benzene only south (upgradient) of the active gasoline storage tanks.

Copies of this report should be forwarded to:

Ms. Susan Hugo
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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 regarding this letter report, please call us at (408) 264-7723.

Sincerely,
RESNA Industries

Barbara Sieminski
Assistant Project Geologist

Joan E. Tiernan
Registered Civil Engineer
044600

cc: H.C. Winsor, ARCO Products Company

Enclosures: References

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- Plate 4, Groundwater Gradient Map, June 29, 1992
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Monitoring Well Purge Water Disposal Form

REFERENCES

- Applied GeoSystems. December 6, 1989. Limited Subsurface Environmental Investigation at ARCO Station 6113, 785 East Stanley Boulevard, Livermore, California. AGS Report 69028-2.
- Applied GeoSystems. August 29, 1990. Letter Report, Quarterly Ground-Water Monitoring Second Quarter 1990 at ARCO Station 6113, 785 East Stanley Boulevard, Livermore, California. AGS Report 69028-3.
- Applied GeoSystems. November 2, 1990. Letter Report, Quarterly Ground-Water Monitoring Third Quarter 1990 at ARCO Station 6113, 785 East Stanley Boulevard, Livermore, California. AGS Report 69028-3.
- Applied GeoSystems. January 27, 1991. Letter Report, Quarterly Ground-Water Monitoring Fourth Quarter 1990 at ARCO Station 6113, 785 East Stanley Boulevard, Livermore, California. AGS Report 69028-3.
- Applied GeoSystems. April 16, 1991. Limited Subsurface Environmental Investigation Related to the Former Waste-Oil Tank at ARCO Station 6113, 785 East Stanley Boulevard, Livermore, California. AGS Report 69028-4.
- Applied GeoSystems. April 24, 1991. Letter Report, Quarterly Ground-Water Monitoring First Quarter 1991 at ARCO Station 6113, 785 East Stanley Boulevard, Livermore, California. AGS Report 69028-3.
- Applied GeoSystems. July 11, 1991. Letter Report, Quarterly Ground-Water Monitoring Second Quarter 1991 at ARCO Station 6113, 785 East Stanley Boulevard, Livermore, California. AGS Report 69028-5.
- California Department of Health Services, Office of Drinking Water, October 22, 1990, "Summary of California Drinking Water Standards", Berkeley, California.
- Pacific Environmental Group. April 25, 1989. ARCO Station 6113, 785 E. Stanley Boulevard, Livermore, California. Project 330-53.01

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(Continued)

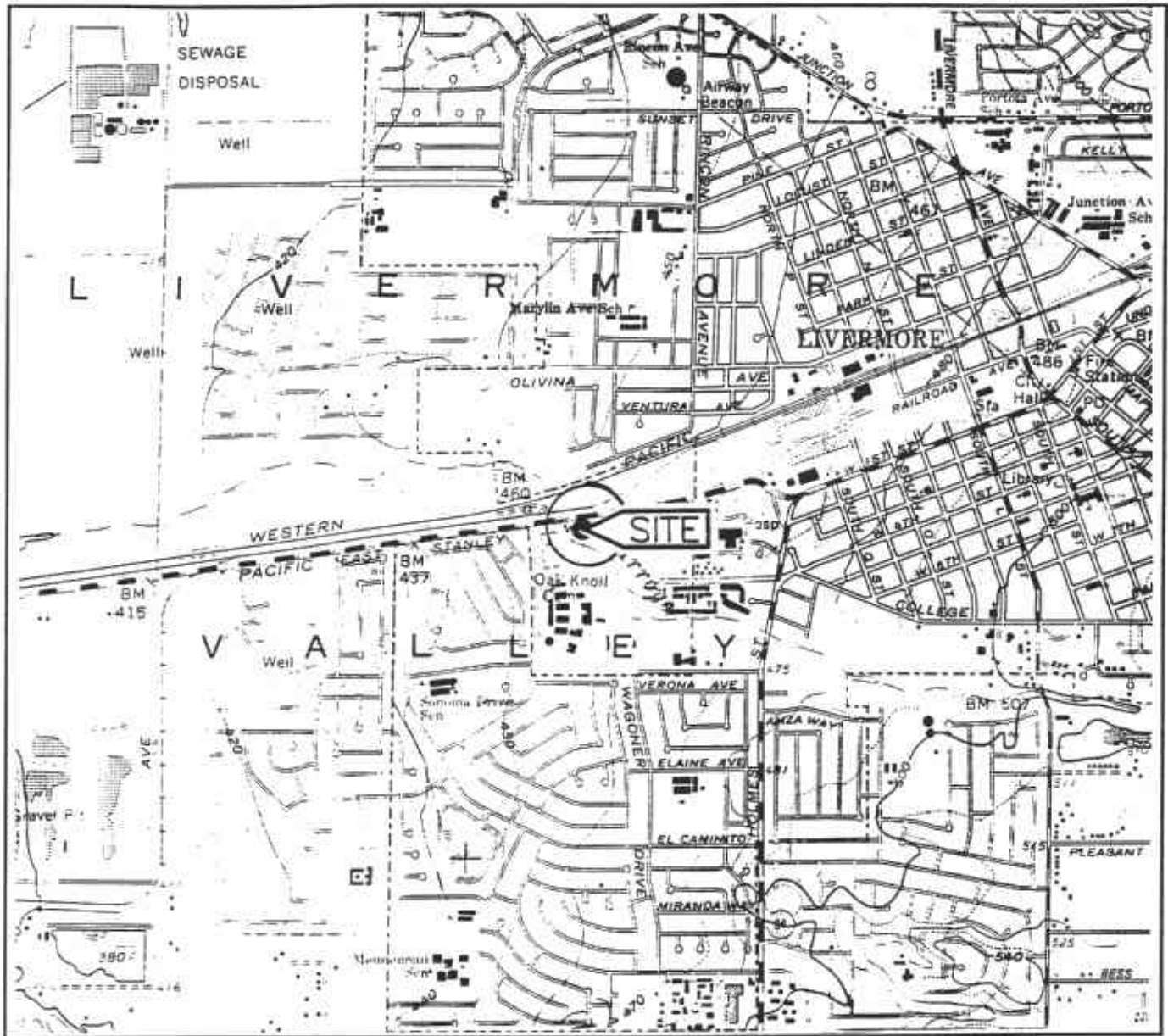
RESNA. October 17, 1991. Work Plan for Additional Subsurface Investigation and Vapor Extraction Test at ARCO Station 6113, 785 East Stanley Boulevard, Livermore, California. 69028.06

RESNA. October 18, 1991. Letter Report, Quarterly Groundwater Monitoring, Third Quarter 1991, at ARCO Station 6113, 785 East Stanley Boulevard, Livermore, California. 69028.05

RESNA. March 3, 1991. Addendum to Work Plan for Additional Subsurface Investigation and Vapor Extraction Test at ARCO Station 6113, 785 East Stanley Boulevard, Livermore, California. 69028.06

RESNA. March 6, 1992. Letter Report, Quarterly Groundwater Monitoring, Fourth Quarter 1991, at ARCO Station 6113, 785 East Stanley Boulevard, Livermore, California. 69028.05

RESNA. May 4, 1992. Letter Report, Quarterly Groundwater Monitoring, First Quarter 1992, at ARCO Station 6113, 785 East Stanley Boulevard, Livermore, California. 69028.05



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



LEGEND

○ = Site Location

Approximate Scale



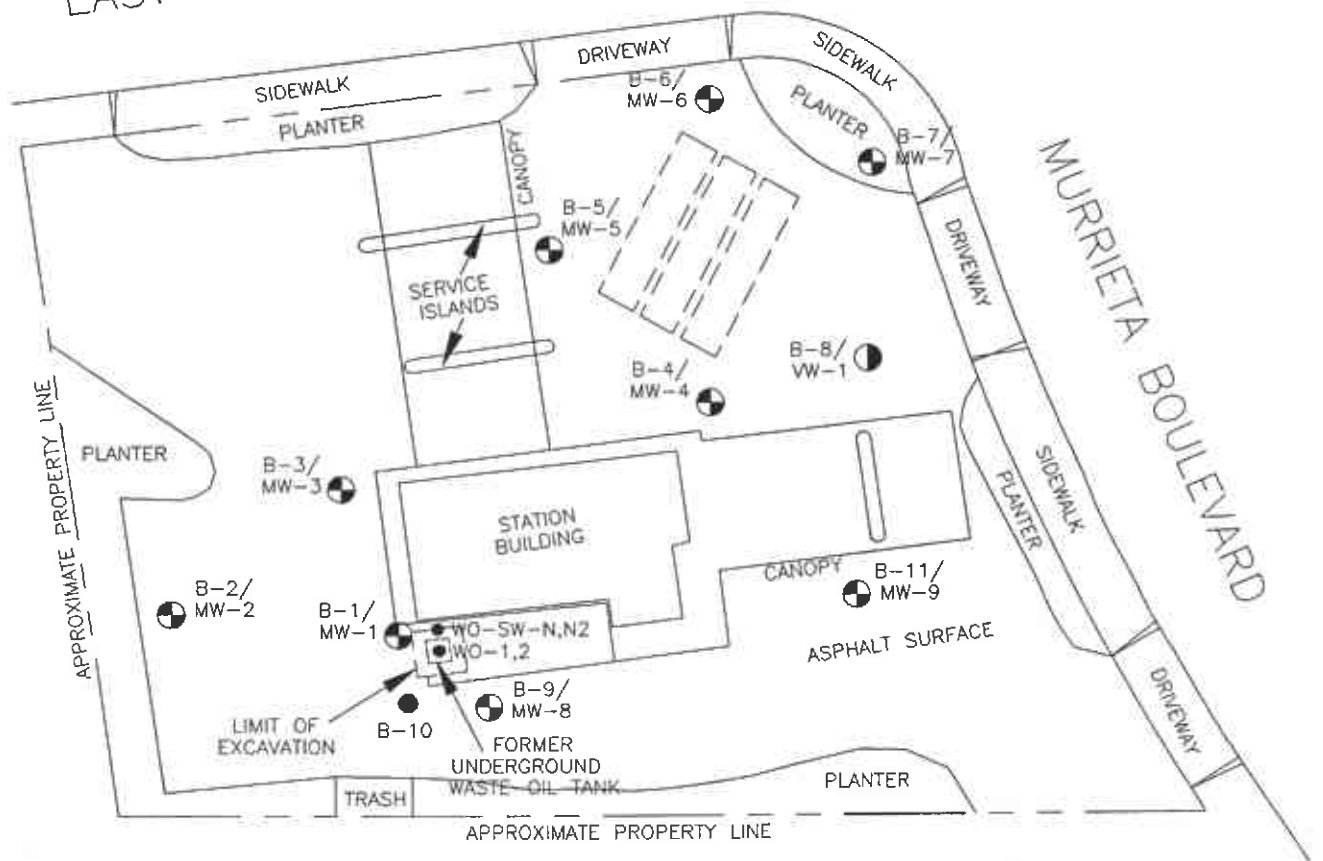
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SITE VICINITY MAP
ARCO Station 6113
785 East Stanley Boulevard
Livermore, California





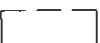
PLATE
1

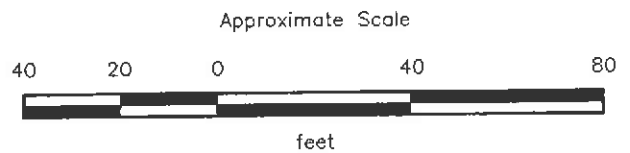
PROJECT 69028.08

EAST STANLEY BOULEVARD



EXPLANATION

- B-11/
MW-9  = Boring/monitoring well
(RESNA, 09/89, 02/91, and 06/92)
- B-8/
VW-1  = Boring/vapor extraction well
(RESNA, 06/92)
- B-10  = Boring
(RESNA, 06/92)
- WO-SW-N,N2  = Soil sample collected by Pacific (1989)
-  = Underground gasoline storage tanks



Source: Modified from plan supplied by Ran Archer, Civil Engineer Inc., February 1991

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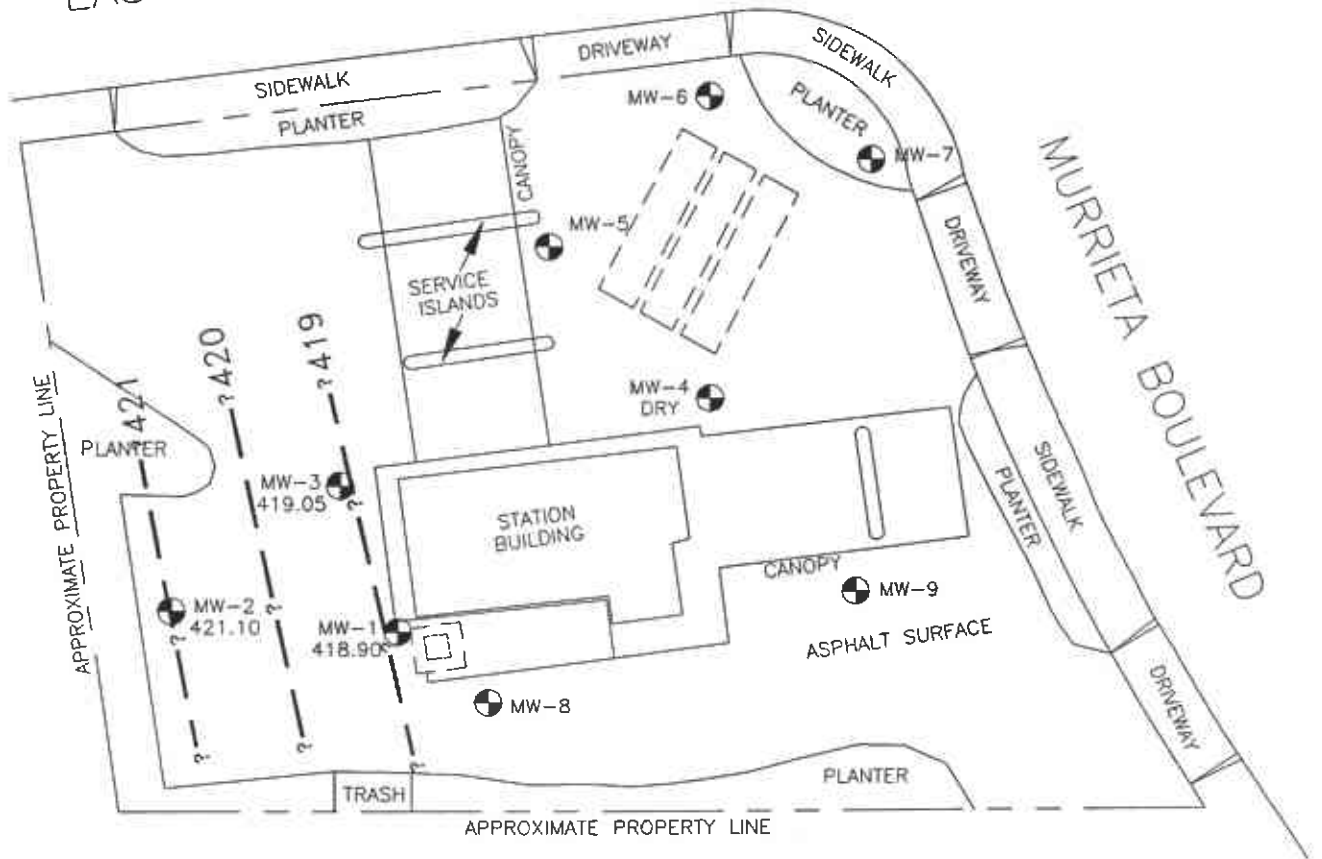
PROJECT: 69028.08

GENERALIZED SITE PLAN
ARCO Station 6113
785 East Stanley Boulevard
Livermore, California

PLATE


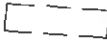
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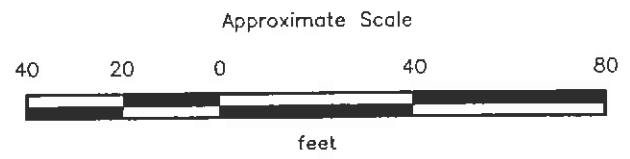
EAST STANLEY BOULEVARD



APPROXIMATE DIRECTION OF GROUNDWATER FLOW (April 24, 1992)

EXPLANATION

- 421 = Line of equal elevation of groundwater in feet above mean sea level (MSL)
- 421.10 = Elevation of groundwater in feet above MSL, April 24, 1992
- MW-4  = Monitoring well (RESNA, 09/89 and 02/91)
-  = Underground gasoline storage tanks



Source: Modified from plan supplied by Ron Archer, Civil Engineer Inc., February 1991

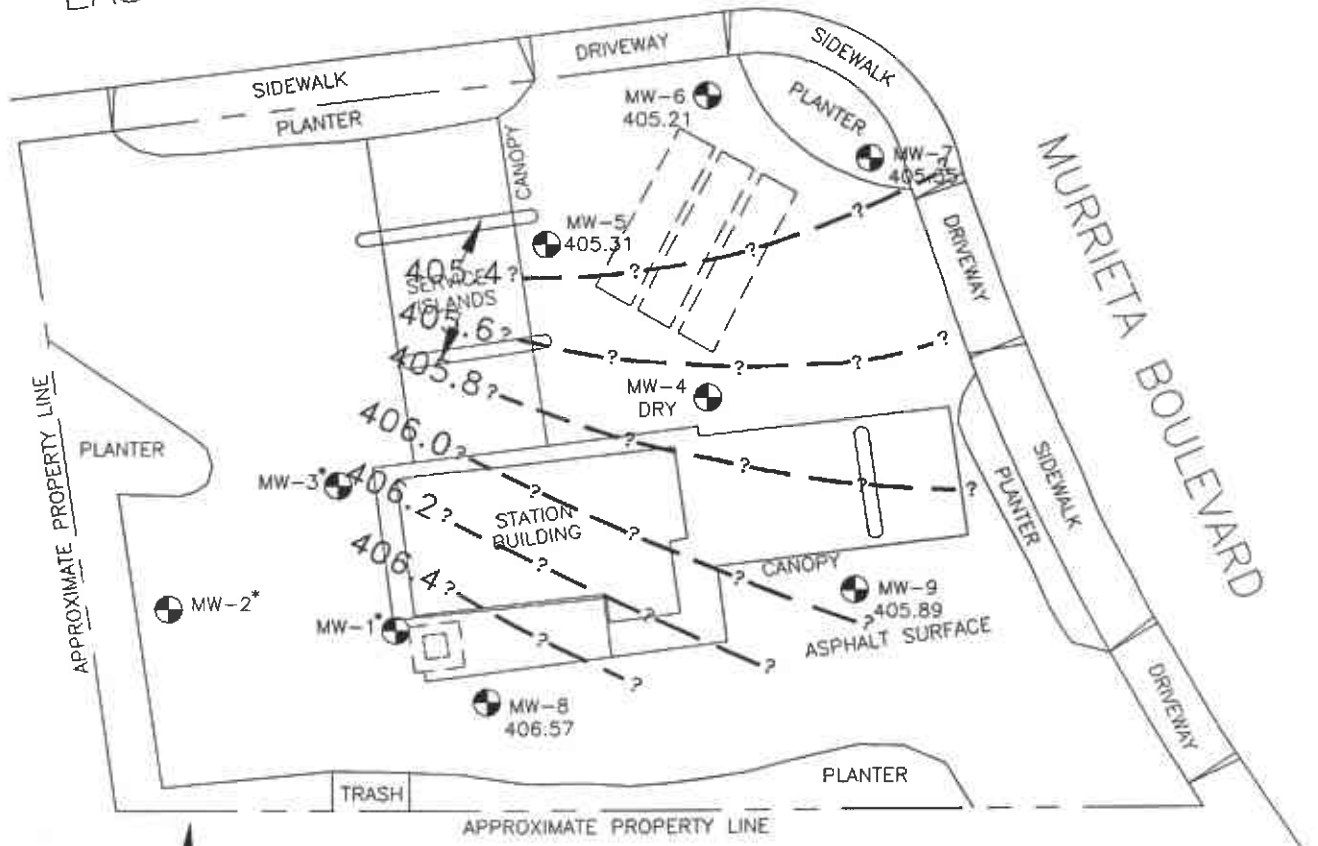


GROUNDWATER GRADIENT MAP
ARCO Station 6113
785 East Stanley Boulevard
Livermore, California

PLATE
3

PROJECT: 69028.08

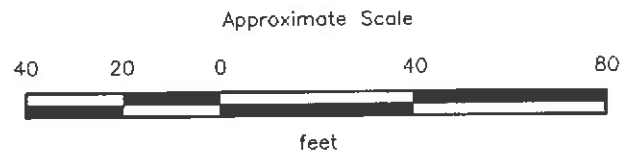
EAST STANLEY BOULEVARD



APPROXIMATE DIRECTION OF GROUNDWATER FLOW (June 29, 1992)

EXPLANATION

- 406.4 = Line of equal elevation of groundwater in feet above mean sea level (MSL)
- 406.57 = Elevation of groundwater in feet above MSL, June 29, 1992
- MW-9 = Monitoring well (RESNA, 09/89, 02/91, and 06/92)
- = Water storage tanks



Source: Modified from plan supplied by Ron Archer, Civil Engineer Inc., February 1991

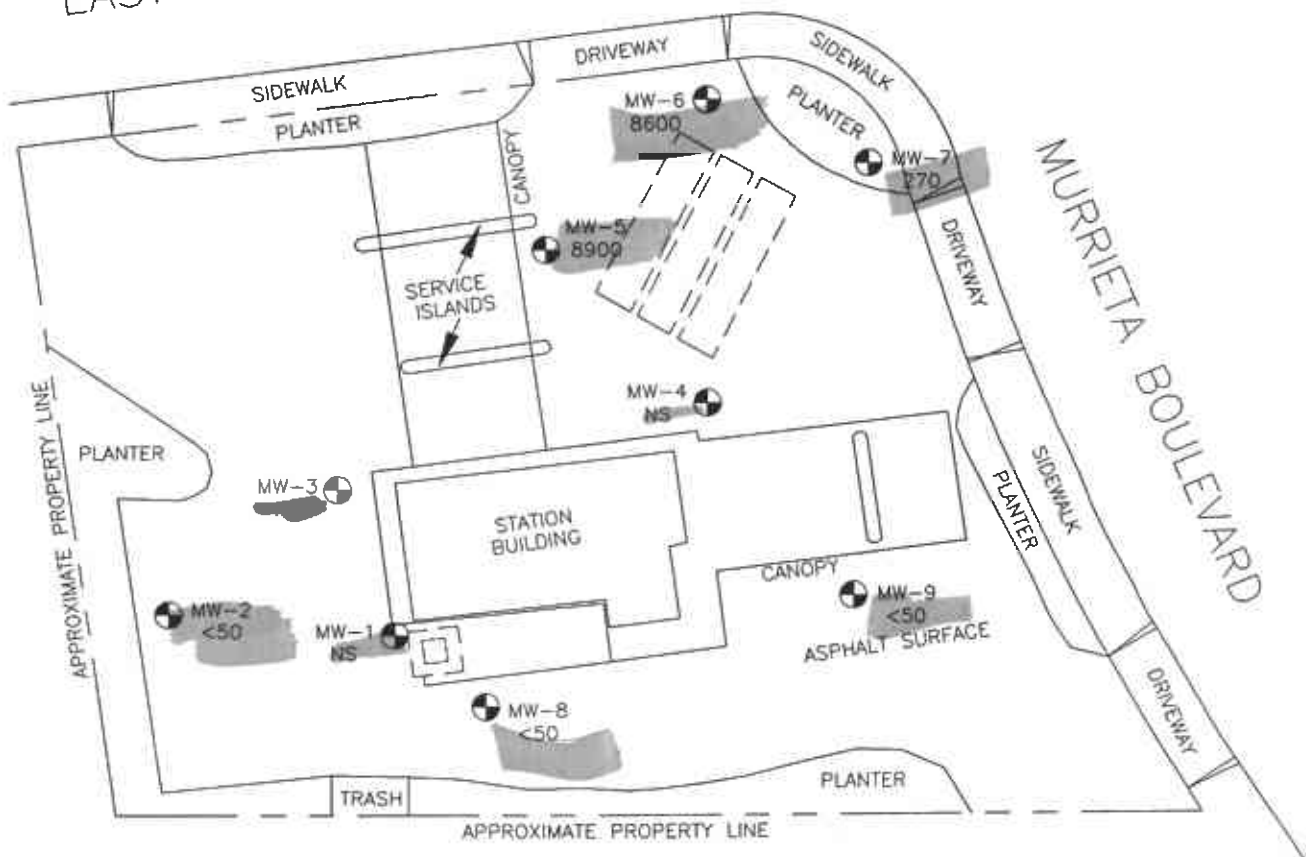


GROUNDWATER GRADIENT MAP
ARCO Station 6113
785 East Stanley Boulevard
Livermore, California

PLATE
4


PROJECT: 69028.08

EAST STANLEY BOULEVARD




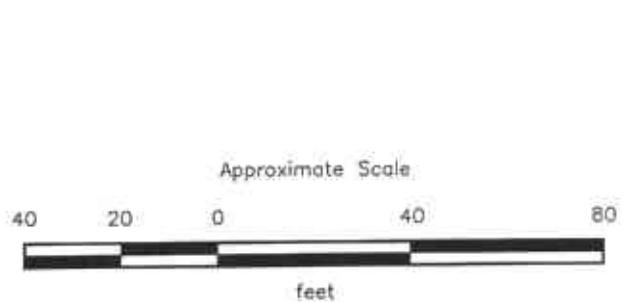
EXPLANATION

8900 = Concentration of TPHg in groundwater in parts per billion, June 29, 1992

MW-9  = Monitoring well (RESNA, 09/89, 02/91, and 06/92)

NS = Not sampled - well dry or residual water only

 = Underground gasoline storage tanks



Source: Modified from plan supplied by Ron Archer, Civil Engineer Inc., February 1991

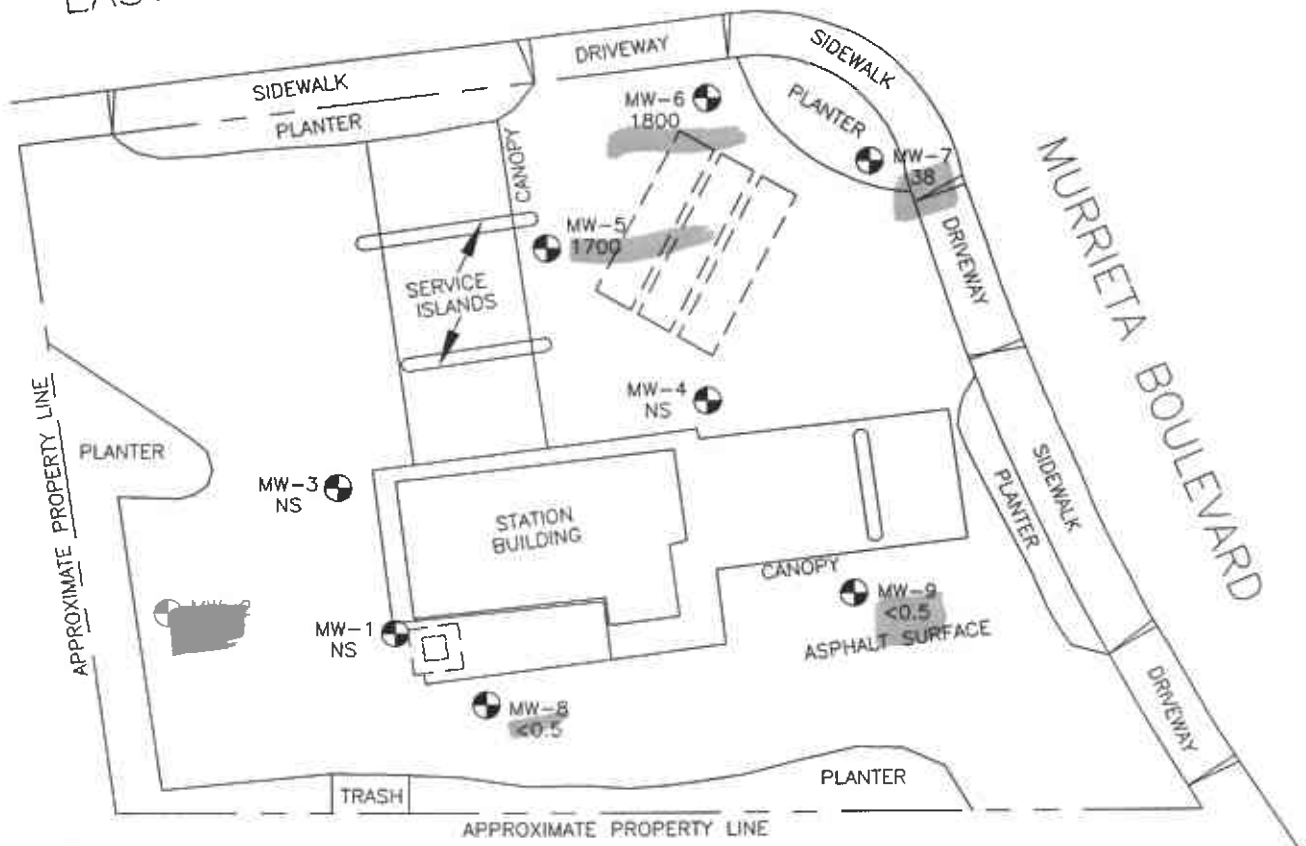
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PROJECT: 69028.08

**TPHg CONCENTRATIONS
IN GROUNDWATER
ARCO Station 6113
785 East Stanley Boulevard
Livermore, California**

**PLATE
5**

EAST STANLEY BOULEVARD



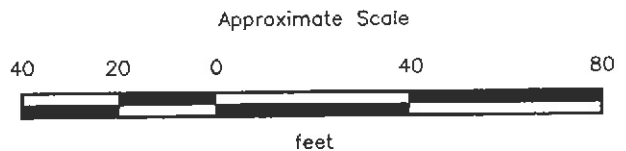
EXPLANATION

1800 = Concentration of benzene in groundwater in parts per billion, June 29, 1992

MW-9 = Monitoring well (RESNA, 09/89, 02/91, and 06/92)

NS = Not sampled--well dry or residual water only

= Underground gasoline storage tanks



Source: Modified from plan supplied by Ron Archer, Civil Engineer Inc., February 1991

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**BENZENE CONCENTRATIONS
IN GROUNDWATER
ARCO Station 6113
785 East Stanley Boulevard
Livermore, California**

**PLATE
6**

TABLE 1
 CUMULATIVE GROUNDWATER MONITORING DATA
 ARCO Station 6113
 785 East Stanley Boulevard
 Livermore, California
 (Page 1 of 4)

Well Date	Elevation of Wellhead	Depth to Water	Elevation of Groundwater	Floating Product
<u>MW-1</u>				
09/20/89	457.04	21.03	436.01	None
10/12/89		19.64	437.40	None
06/21/90		21.72	435.32	None
09/20/90		19.79	437.25	None
12/18/90		19.28	437.76	None
02/21/91		22.45	434.59	None
03/20/91		19.87	437.17	None
04/10/91		19.42	437.62	None
05/20/91		25.95	431.09	None
06/20/91		32.55	424.49	None
07/25/91		38.22	418.82	None
08/13/91		40.74	416.30	None
09/12/91		43.16	413.88	None
10/22/91		Dry	Dry	None
11/13/91		Dry	Dry	None
12/21/91		Dry	Dry	None
01/18/92		Dry	Dry	None
02/21/92		Dry	Dry	None
03/19/92		36.16	420.88	None
04/24/92		38.14	418.90	None
05/20/92		40.74	416.30	None
06/29/92	456.62**	43.80*	-	None
<u>MW-2</u>				
09/20/89	457.74	20.67	437.07	None
10/12/89		18.98	438.76	None
06/21/90		21.88	435.86	None
09/20/90		19.90	437.84	None
12/18/90		19.32	438.42	None
02/21/91		23.02	434.72	None
03/20/91		20.01	437.73	None
04/10/91		19.81	437.93	None
05/20/91		26.62	431.12	None

See notes on Page 4 of 4.

TABLE 1
 CUMULATIVE GROUNDWATER MONITORING DATA
 ARCO Station 6113
 785 East Stanley Boulevard
 Livermore, California
 (Page 2 of 4)

<u>Well</u> Date	Elevation of Wellhead	Depth to Water	Elevation of Groundwater	Floating Product
<u>MW-2cont.</u>				
06/20/91		33.15	424.59	None
07/25/91		37.10	420.64	None
08/13/91		37.20	420.54	None
09/12/91		37.44*	—	None
10/22/91		37.38*	—	None
11/13/91		37.39*	—	None
12/21/91		Dry	Dry	None
01/18/92		37.65*	—	None
02/21/92		37.75*	—	None
03/19/92		35.82	421.92	None
04/24/92		36.64	421.10	None
05/20/92		37.23	420.51	None
06/29/92	457.32**	37.67	—	None
<u>MW-3</u>				
09/20/89	456.97	20.98	435.99	None
10/12/89		19.66	437.31	None
06/21/90		21.72	435.25	None
09/20/90		19.72	437.25	None
12/18/90		19.21	437.76	None
02/21/91		22.36	434.61	None
03/20/91		19.79	437.18	None
04/10/91		19.35	437.62	None
05/20/91		25.86	431.11	None
06/20/91		32.45	424.52	None
07/25/91		38.06	418.91	None
08/13/91		38.40	418.57	None
09/12/91		Dry	Dry	None
10/22/91		Dry	Dry	None
11/13/91		Dry	Dry	None
12/21/92		Dry	Dry	None
01/18/92		38.90*	—	None

See notes on Page 4 of 4.

TABLE 1
 CUMULATIVE GROUNDWATER MONITORING DATA
 ARCO Station 6113
 785 East Stanley Boulevard
 Livermore, California
 (Page 3 of 4)

Well Date	Elevation of Wellhead	Depth to Water	Elevation of Groundwater	Floating Product
<u>MW-3cont.</u>				
02/21/92		38.88*	—	None
03/19/92		36.03	420.94	None
04/24/92		37.92	419.05	None
05/20/92		38.57*	—	None
06/29/92	456.55**	38.70*	—	None
<u>MW-4</u>				
02/21/91	456.97	22.01	434.96	None
03/20/91		20.31	436.66	None
04/10/91		19.55	437.42	None
05/20/91		25.24	431.73	None
06/20/91		Dry	Dry	None
07/25/91		Dry	Dry	None
08/13/91		Dry	Dry	None
09/12/91		Dry	Dry	None
10/22/91		Dry	Dry	None
11/13/91		Dry	Dry	None
12/21/92		Dry	Dry	None
01/18/92		Dry	Dry	None
02/21/92		Dry	Dry	None
03/19/92		Dry	Dry	None
04/24/92		Dry	Dry	None
05/20/92		Dry	Dry	None
06/29/92	456.55**	Dry	Dry	None
<u>MW-5</u>				
06/29/92	455.84	50.53	405.31	Odor
<u>MW-6</u>				
06/29/92	454.93	49.72	405.21	None
<u>MW-7</u>				
06/29/92	454.92	49.57	405.35	None

See notes on Page 4 of 4.

TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 6113
785 East Stanley Boulevard
Livermore, California
(Page 4 of 4)

<u>Well Date</u>	<u>Elevation of Wellhead</u>	<u>Depth to Water</u>	<u>Elevation of Groundwater</u>	<u>Floating Product</u>
<u>MW-8</u> 06/29/92	456.97	50.40	406.57	None
<u>MW-9</u> 06/29/92	456.18	50.29	405.89	None

For MW-1 through MW-3 wellhead elevation based on benchmark: Top of pin set in concrete in the most westerly monument at the intersection of East Stanley Boulevard and Fenton Avenue. Elevation taken as 455.896 mean sea level. City of Livermore Datum. For MW-4 through MW-9 wellhead elevation based on benchmark: Top of pin in standard monument, at intersection of El Rancho Drive and Albatross Ave. Elevation taken as 448.218'. City of Livermore Datum.

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

* Residual water.

** Wellhead elevation adjusted to new survey data.

TABLE 2
 CUMULATIVE RESULTS OF GROUNDWATER LABORATORY ANALYSES – TPHg and BTEX
 ARCO Station 6113
 785 East Stanley Boulevard
 Livermore, California
 (Page 1 of 2)

Well Date	TPHg	Benzene	Toluene	Ethyl- benzene	Total Xylenes
<u>MW-1</u>					
09/20/89	80	3.0	1.0	0.7	1
06/21/90	<20	<0.50	0.66	<0.50	<0.50
09/20/90	<50	<0.5	1.0	<0.5	1.8
12/18/90	<50	<0.5	1.8	<0.5	1.7
02/21/91	<50	1.2	2.3	<0.5	2.2
05/20/91	<30	<0.30	<0.30	<0.30	<0.30
08/13/91		Not sampled—dry			
11/13/91		Not sampled—dry			
03/19/92	400	<3.5*	<1.2*	<0.8*	<1.0*
06/29/92		Not sampled—residual water only			
<u>MW-2</u>					
09/20/89	<50	<0.5	<0.5	<0.5	<1
06/21/90	<20	<0.50	<0.50	<0.50	<0.50
09/20/90	<50	<0.5	0.7	<0.5	1.4
12/18/90	<50	0.6	1.5	<0.5	1.9
02/21/91	<50	<0.5	<0.5	<0.5	<0.5
05/20/91	<30	<0.30	<0.30	<0.30	<0.30
08/13/91		Not sampled—dry			
11/13/91		Not sampled—dry			
03/19/92	<50	<0.5	<0.5	<0.5	<0.5
06/29/92	<50	<0.5	<0.5	<0.5	<0.5
<u>MW-3</u>					
09/20/89	170	8.9	0.6	1.1	<1
06/21/90	<20	<0.50	1.0	<0.50	<0.50
09/20/90	<50	<0.5	1.0	<0.5	1.9
12/18/90	<50	<0.5	1.7	<0.5	2.0
02/21/91	<50	<0.5	<0.5	<0.5	<0.5
05/20/91	97	1.3	1.1	6.2	8.4
08/13/91		Not sampled—dry			
11/13/91		Not sampled—dry			
03/19/92	220	<1.1*	<1.9	<0.6*	<0.8*
06/29/92		Not sampled—residual water only			
<u>MW-4</u>					
02/21/91	3,500	410	7.6	30	47
05/20/91	1,400	150	6.0	4.4	3.1
08/13/91		Not sampled—dry			
11/13/91		Not sampled—dry			
03/19/92		Not sampled—dry			
06/29/92		Not sampled—dry			

See notes on Page 2 of 2.

TABLE 2
 CUMULATIVE RESULTS OF GROUNDWATER LABORATORY ANALYSES – TPHg and BTEX
 ARCO Station 6113
 785 East Stanley Boulevard
 Livermore, California
 (Page 2 of 2)

Well Date	TPHg	Benzene	Toluene	Ethyl- benzene	Total Xylenes
<u>MW-5</u> 06/29/92	8,900	1,700	640	310	1,100
<u>MW-6</u> 06/29/92	8,600	1,800	460	52	450
<u>MW-7</u> 06/29/92	270	38	3.7	1.1	4.4
<u>MW-8</u> 06/29/92	<50	<0.5	<0.5	<0.5	<0.5
<u>MW-9</u> 06/29/92	<50	<0.5	<0.5	<0.5	<0.5
<u>Jan. 1990</u> MCLs	None	1.0	None	680	1,750
Als	None	None	100	None	None

Results in parts per billion (ppb).

TPHg = Total petroleum hydrocarbons as gasoline

< = Less than the detection limits shown.

MCLs = Adopted Maximum Contaminant Levels in Drinking Water, DHS (October 1990)

Als = Recommended Drinking Water Action Levels, DHS (October 1990)

NA = Not Analyzed

NS = Not Sampled

* = Laboratory reportedly raised detection limit due to matrix interference.

Quarterly Groundwater Monitoring
 ARCO Station 6113, 785 East Stanley Boulevard, Livermore, CA

September 28, 1992
 69028.08

TABLE 3
 CUMULATIVE RESULTS OF GROUNDWATER LABORATORY ANALYSES -- TPHd, TOG, VOC and Metals
 ARCO Station 6113
 785 East Stanley Boulevard
 Livermore, California
 (Page 1 of 2)

Date	VOC	TPHd	TOG	Cd	Cr	Pb	Zn	Ni
<u>MW-1</u>								
09/20/89	NA	<50	<5,000	NA	NA	NA	NA	NA
06/21/90	NA	<100	13,000	NA	NA	NA	NA	NA
09/20/90	NA	<50	<5,000	NA	NA	NA	NA	NA
12/18/90	NA	NA	<5,000	NA	NA	NA	NA	NA
02/21/91	NA	NA	<5,000	NA	NA	NA	NA	NA
05/20/91	NA	NA	<75,000	NA	NA	NA	NA	NA
08/13/91	NS	NS	NS	NS	NS	NS	NS	NS
11/13/91	NS	NS	NS	NS	NS	NS	NS	NS
03/19/92	NA	NA	NA	NA	NA	NA	NA	NA
<u>MW-2</u>								
09/20/89	NA	<50	<5,000	NA	NA	NA	NA	NA
06/21/90	NA	<100	<5,000	NA	NA	NA	NA	NA
09/20/90	NA	<50	<5,000	NA	NA	NA	NA	NA
12/18/90	NA	NA	<5,000	NA	NA	NA	NA	NA
02/21/91	NA	NA	<5,000	NA	NA	NA	NA	NA
05/20/91	NA	NA	<75,000	NA	NA	NA	NA	NA
08/13/91	NS	NS	NS	NS	NS	NS	NS	NS
11/13/91	NS	NS	NS	NS	NS	NS	NS	NS
03/19/92	NA	NA	NA	NA	NA	NA	NA	NA
<u>MW-3</u>								
09/20/89	NA	<50	<5,000	NA	NA	NA	NA	NA
06/21/90	NA	<100	10,000	NA	NA	NA	NA	NA
09/20/90	NA	<50	<5,000	NA	NA	NA	NA	NA
12/18/90	NA	NA	<5,000	NA	NA	NA	NA	NA
02/21/91	NA	NA	<5,000	NA	NA	NA	NA	NA
05/20/91	NA	NA	<75,000	NA	NA	NA	NA	NA
08/13/91	NS	NS	NS	NS	NS	NS	NS	NS
11/13/91	NS	NS	NS	NS	NS	NS	NS	NS
03/19/92	NA	<50	<5,000	NA	NA	NA	NA	NA
<u>MW-4</u>								
02/21/91	NA	NA	<5,000	NA	NA	NA	NA	NA
05/20/91	NA	NA	<75,000	NA	NA	NA	NA	NA
08/13/91	NS	NS	NS	NS	NS	NS	NS	NS
11/13/91	NS	NS	NS	NS	NS	NS	NS	NS
03/19/92	NS	NS	NS	NS	NS	NS	NS	NS
<u>MW-8</u>								
06/29/92	ND*	<50	<500	<3	1,780	143	1,310	5,100
MCL:	Varies	—	—	10	50	50	5,000	—

See notes on Page 2 of 2.

TABLE 3
CUMULATIVE RESULTS OF GROUNDWATER LABORATORY ANALYSES – TPHd, TOG, VOC and Metals
ARCO Station 6113
785 East Stanley Boulevard
Livermore, California
(Page 2 of 2)

Results for VOC, TPHd and TOG in micrograms per liter (ug/L) = parts per billion (ppb).

Results for Cd, Cr, Pb, Zn and Ni in micrograms per liter (ug/L) = parts per billion (ppb).

VOC: Halogenated Volatile Organic Compounds by EPA Method 5030/601.

TPHd: Total petroleum hydrocarbons as diesel by EPA Methods 3510/California DHS LUFT Method.

TOG: Total oil and grease measured by EPA Method 5520C&F.

NA: Not analyzed.

<: Results reported as less than the detection limit.

NS: Not sampled.

ND: Not detected.

*: 31 compounds tested were nondetectable.

APPENDIX A

**EMCON'S DEPTH TO WATER/FLOATING PRODUCT SURVEY,
SUMMARY OF GROUNDWATER MONITORING DATA,
CERTIFIED ANALYTICAL REPORTS WITH CHAIN-OF-CUSTODY, AND
WATER SAMPLE FIELD DATA SHEETS**

MONITORING WELL PURGE WATER DISPOSAL FORM



RECEIVED

MAY 27 1992

RESNA
SAN JOSE

Date May 21, 1992
Project G70-38.01

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

We are enclosing:

Copies	Description
<u>1</u>	<u>Depth To Water/Floating Product Survey Results</u>
<u> </u>	<u>May 1992 monthly water level survey, ARCO</u>
<u> </u>	<u>station 6113, 785 East Stanley Blvd., Livermore, CA</u>

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:



Jim Butera

Robert Porter
Robert Porter, Senior Project Engineer.





EMCON
ASSOCIATES

Consultants in Wastes
Management and
Environmental Control

Date April 27, 1992
Project G70-38.01

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

We are enclosing:

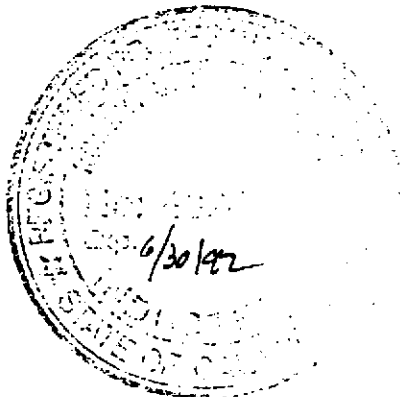
Copies	Description
<u>1</u>	<u>Depth To Water/Floating Product Survey Results</u>
<u> </u>	<u>April 1992 monthly water level survey, ARCO</u>
<u> </u>	<u>station 6113, 785 East Stanley Blvd., Livermore, CA</u>

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:



Mark Knutzel *MK*

Robert Porter
Robert Porter, Senior Project
Engineer.



July 13, 1992

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

Re: EMCON Project No. G70-38.01
Arco Facility No. 6113

Dear Mr. Butera:

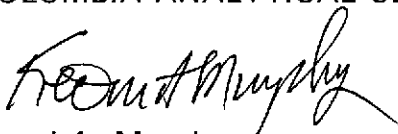
Enclosed are the results of the water samples submitted to our lab on June 30, 1992. For your reference, our service request number for this work is SJ92-0788.

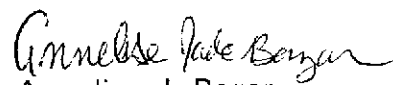
All analyses were performed in accordance with the laboratory's quality assurance program.

Please call if you have any questions.

Respectfully submitted:

COLUMBIA ANALYTICAL SERVICES, INC.


Keoni A. Murphy
Laboratory Manager


Annelise J. Bazar
Regional QA Coordinator

le/KAM

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : G70-38.01

STATION ADDRESS : 785 East Stanley Blvd. Livermore

DATE : 6-29-92

ARCO STATION # : 6113

FIELD TECHNICIAN : L. RATH

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 Survey points are top of casing
1	MW-2	OK	Yes	OK	3259	OK	37.67	37.68	ND	ND	38.60	--
2	MW-3	OK	Yes	OK	3259	OK	38.70	38.70	ND	NA	39.10	-
3	MW-8	OK	Yes	OK	3259	OK	50.40	50.41	ND	NA	66.60	-
4	MW-1	Good	Yes	OK	3259	OK	43.80	43.80	ND	NA	44.80	-
5	MW-9	OK	Yes	OK	3259	OK	50.29	50.29	ND	NA	68.00	-
6	MW-7	OK	Yes	OK	3259	OK	49.57	49.58	ND	NA	67.70	-
7	MW-6	OK	Yes	OK	3259	OK	49.72	49.72	ND	NA	67.40	-
8	MW-5	OK	Yes	OK	3259	OK	50.53	50.53	ND	NA	62.60	-
9	MW-4	OK	Yes	OK	3259	OK	DRY	DRY	NA	—	26.70	-

Summary of Groundwater Monitoring Data
 Second Quarter 1992
 ARCO Service Station 6113
 785 East Stanley Boulevard, Livermore, California
 micrograms per liter ($\mu\text{g/l}$) 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 ($\mu\text{g/l}$)	Benzene ($\mu\text{g/l}$)	Toluene ($\mu\text{g/l}$)	Ethyl-benzene ($\mu\text{g/l}$)	Total Xylenes ($\mu\text{g/l}$)	TPH as Diesel (mg/l)	Total Oil and Grease, 5520C (mg/l)	Hydrocarbons 5520F IR (mg/l)
MW-1	NS. ²	43.80	ND. ³	NS	NS	NS	NS	NS	NR. ⁴	NR.	NR
MW-2(38)	06/29/92	37.67	ND	<50	<0.5	<0.5	<0.5	<0.5	NR	NR	NR
MW-3	NS	38.70	ND	NS	NS	NS	NS	NS	NS	NS	NS
MW-4	NS	Dry	NA. ⁵	NS	NS	NS	NS	NS	NS	NS	NS
MW-5(61)	06/30/92	50.53	ND	8,900.	1,700.	640.	310.	1,100.	NR	NR	NR
MW-6(66)	06/30/92	49.72	ND	8,600.	1,800.	460.	52.	450.	NR	NR	NR
MW-7(66)	06/30/92	49.57	ND	270.	38.	3.7	1.1	4.4	NR	NR	NR
MW-8(65)	06/29/92	50.40	ND	<50	<0.5	<0.5	<0.5	<0.5	<50	<0.5	<0.5
MW-9(67)	06/29/92	50.29	ND	<50	<0.5	<0.5	<0.5	<0.5	NR	NR	NR
FB-1. ⁶	06/29/92	NA.	NA.	<50	<0.5	<0.5	<0.5	<0.5	NR.	NR.	NR.

1. TPH. = Total petroleum hydrocarbons

2. NS. = Not sampled; dry well

3. ND. = Not detected

4. NR. = Not reported; sample was not scheduled for analysis of the selected parameter

5. NA. = Not applicable

6. FB. = Field Blank

Summary of Groundwater Monitoring Data
Second Quarter 1992
ARCO Service Station 6113
785 East Stanley Boulevard, Livermore, California
micrograms per liter ($\mu\text{g/l}$) and milligrams per liter (mg/l)

Well ID and Sample Depth	Sampling Date	Depth To Water (feet)	Floating Product Thickness (feet)	Cadmium ($\mu\text{g/l}$) (ppb)	Chromium ($\mu\text{g/l}$) (ppb)	Lead ($\mu\text{g/l}$) (ppb)	Nickel ($\mu\text{g/l}$) (ppb)	Zinc ($\mu\text{g/l}$) (ppb)
MW-8(65)	06/29/92	50.40	ND	<3	1,780.	143.	5,100.	1,310.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report



Client: EMCON Associates
Project: EMCON Project No. G70-38.01
Arco Facility No. 6113

Date Received: 06/30/92
Work Order #: SJ92-0788
Sample Matrix: Water

Inorganic Parameters¹
mg/L (ppm)

Sample Name: MW-8 (65) Method Blank
Date Sampled: 06/29/92

<u>Analyte</u>	<u>Method</u>	<u>MRL</u>		
Total Oil and Grease	5520C	0.5	ND	ND
Hydrocarbons, IR	5520F	0.5	ND	ND

MRL Method Reporting Limit

ND None Detected at or above the method reporting limit

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 Roan Murphy Date July 13, 1992

Analytical Report



Client: EMCON Associates
Project: EMCON Project No. G70-38.01
Arco Facility No. 6113
Sample Matrix: Water

Date Received: 06/30/92
Date Extracted: 07/07/92
Date Analyzed: 07/08/92
Work Order #: SJ92-0788

Total Petroleum Hydrocarbons as Diesel
EPA Method 3510/California DHS LUFT Method
 $\mu\text{g/L}$ (ppb)

<u>Sample Name</u>	<u>MRL</u>	<u>TPH as Diesel</u>
MW-8 (65)	50.	ND
Method Blank	50.	ND

MRL Method Reporting Limit
TPH Total Petroleum Hydrocarbons
ND None Detected at or above the method reporting limit

Approved by Karen Murphy Date July 13, 1992

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report



Client: EMCON Associates
 Project: EMCON Project No. G70-38.01
 Arco Facility No. 6113

Date Received: 06/30/92
 Work Order #: SJ92-0788
 Sample Matrix: Water

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

Sample Name:	<u>MW-2 (38)</u>	<u>MW-5 (61)</u>	<u>MW-6 (66)</u>
Date Analyzed:	07/01/92	07/07/92	07/08/92

<u>Analyte</u>	<u>MRL</u>			
Benzene	0.5	ND	1,700.	1,800.
Toluene	0.5	ND	640.	460.
Ethylbenzene	0.5	ND	310.	52.
Total Xylenes	0.5	ND	1,100.	450.
TPH as Gasoline	50	ND	8,900.	8,600.

TPH Total Petroleum Hydrocarbons
 MRL Method Reporting Limit
 ND None Detected at or above the method reporting limit

Approved by *Kom Murphy* Date July 13, 1992

Analytical Report



Client: EMCON Associates
 Project: EMCON Project No. G70-38.01
 Arco Facility No. 6113

Date Received: 06/30/92
 Work Order #: SJ92-0788
 Sample Matrix: Water

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

Sample Name:	<u>MW-7 (66)</u>	<u>MW-8 (65)</u>	<u>MW-9 (67)</u>
Date Analyzed:	07/07/92	07/02/92	07/02/92

<u>Analyte</u>	<u>MRL</u>			
Benzene	0.5	38.	ND	ND
Toluene	0.5	3.7	ND	ND
Ethylbenzene	0.5	1.1	ND	ND
Total Xylenes	0.5	4.4	ND	ND
TPH as Gasoline	50	270.	ND	ND

TPH Total Petroleum Hydrocarbons
 MRL Method Reporting Limit
 ND None Detected at or above the method reporting limit

Approved by K. M. Murphy Date July 13, 1992

Analytical Report

Client: EMCON Associates
 Project: EMCON Project No. G70-38.01
 Arco Facility No. 6113

Date Received: 06/30/92
 Work Order #: SJ92-0788
 Sample Matrix: Water



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

Sample Name: FB-1 Method Blank Method Blank
 Date Analyzed: 07/01/92 07/01/92 07/02/92

<u>Analyte</u>	<u>MRL</u>			
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

Approved by Kenneth Murphy Date July 13, 1992

Analytical Report



Client: EMCON Associates
 Project: EMCON Project No. G70-38.01
 Arco Facility No. 6113

Date Received: 06/30/92
 Work Order #: SJ92-0788
 Sample Matrix: Water

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

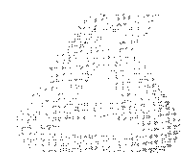
Sample Name: Method Blank Method Blank
 Date Analyzed: 07/07/92 07/08/92

<u>Analyte</u>	<u>MRL</u>		
Benzene	0.5	ND	ND
Toluene	0.5	ND	ND
Ethylbenzene	0.5	ND	ND
Total Xylenes	0.5	ND	ND
TPH as Gasoline	50	ND	ND

TPH Total Petroleum Hydrocarbons
 MRL Method Reporting Limit
 ND None Detected at or above the method reporting limit

Approved by Kenneth Murphy Date July 13, 1992

Analytical Report



Client: EMCON Associates
 Project: EMCON Project No. G70-38.01
 Arco Facility No. 6113

Date Received: 06/30/92
 Work Order #: SJ92-0788
 Sample Matrix: Water

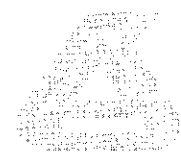
Halogenated Volatile Organic Compounds
 EPA Methods 5030/601
 µg/L (ppb)

Sample Name: MW-8 (65) Method Blank
 Date Analyzed: 07/01/92 07/01/92

Analyte	MRL		
Dichlorodifluoromethane (Freon 12)	1	ND	ND
Chloromethane	1	ND	ND
Vinyl Chloride	0.5	ND	ND
Bromomethane	0.5	ND	ND
Chloroethane	0.5	ND	ND
Trichlorofluoromethane (Freon 11)	0.5	ND	ND
1,1-Dichloroethene	0.5	ND	ND
Trichlorotrifluoroethane (Freon 113)	0.5	ND	ND
Methylene Chloride	0.5	ND	ND
trans-1,2-Dichloroethene	0.5	ND	ND
cis-1,2-Dichloroethene	0.5	ND	ND
1,1-Dichloroethane	0.5	ND	ND
Chloroform	0.5	ND	ND
1,1,1-Trichloroethane (TCA)	0.5	ND	ND
Carbon Tetrachloride	0.5	ND	ND
1,2-Dichloroethane	0.5	ND	ND
Trichloroethene (TCE)	0.5	ND	ND
1,2-Dichloropropane	0.5	ND	ND
Bromodichloromethane	0.5	ND	ND
2-Chloroethyl Vinyl Ether	5	ND	ND
trans-1,3-Dichloropropene	0.5	ND	ND
cis-1,3-Dichloropropene	0.5	ND	ND
1,1,2-Trichloroethane	0.5	ND	ND
Tetrachloroethene (PCE)	0.5	ND	ND
Dibromochloromethane	0.5	ND	ND
Chlorobenzene	0.5	ND	ND
Bromoform	0.5	ND	ND
1,1,2,2-Tetrachloroethane	0.5	ND	ND
1,3-Dichlorobenzene	1	ND	ND
1,4-Dichlorobenzene	1	ND	ND
1,2-Dichlorobenzene	1	ND	ND

MRL Method Reporting Limit
 ND None Detected at or above the method reporting limit

Approved by Krom Murphy Date July 13, 1992



Client: EMCON Associates
Project: EMCON Project No. G70-38.01
Arco Facility No. 6113

Date Received: 06/30/92
Work Order #: SJ92-0788
Sample Matrix: Water

QA/QC Report
Continuing Calibration Summary
Inorganics
mg/L (ppm)

<u>Analyte</u>	<u>True Value</u>	<u>Result</u>	<u>Percent Recovery</u>	<u>CAS Percent Recovery Acceptance Criteria</u>
Total Oil and Grease	100.	105.	105.	80-120

Approved by Kenn Murphy Date July 13, 1992



Client: EMCON Associates
 Project: EMCON Project No. G70-38.01
 Arco Facility No. 6113

Date Received: 06/30/92
 Work Order #: SJ92-0788
 Sample Matrix: Water

QA/QC Report
 Matrix Spike Summary
 Inorganic Parameters
 mg/L (ppm)

<u>Parameter</u>	<u>Spike Level</u>	<u>Sample Result</u>	<u>Spike Result</u>		<u>Percent Recovery</u>		<u>Acceptance Criteria</u>
			<u>MS</u>	<u>DMS</u>	<u>MS</u>	<u>DMS</u>	
Total Oil and Grease	4.0	ND	3.5	3.7	88.	93.	53-149

ND None Detected at or above the method reporting limit

Approved by *Thomas Murphy* Date July 13, 1992



Client: EMCON Associates
 Project: EMCON Project No. G70-38.01
 Arco Facility No. 6113

Date Received: 06/30/92
 Work Order #: SJ92-0788
 Sample Matrix: Water

QA/QC Report
 Continuing Calibration Summary
 Total Petroleum Hydrocarbons as Diesel
 EPA Method 3510/DHS LUFT Method
 mg/L (ppm)

Date Analyzed: 07/08/92

<u>Analyte</u>	<u>True Value</u>	<u>Result</u>	<u>Percent Recovery</u>	<u>CAS Percent Recovery Acceptance Criteria</u>
TPH as Diesel	1,000.	907.	91.	90-110

TPH Total Petroleum Hydrocarbons

Approved by *Kean Murphy* Date *July 13, 1992*



Client: EMCON Associates
 Project: EMCON Project No. G70-38.01
 Arco Facility No. 6113

Date Received: 06/30/92
 Work Order #: SJ92-0788
 Sample Matrix: Water

QA/QC Report
 Surrogate Recovery Summary
 Total Petroleum Hydrocarbons as Diesel
 EPA Method 3510/DHS LUFT Method

<u>Sample Name</u>	<u>Date Analyzed</u>	<u>Percent Recovery</u> P-Terphenyl
MW-8 (65)	07/08/92	77.
MS	07/08/92	90.
DMS	07/08/92	96.
Method Blank	07/08/92	86.
	CAS Acceptance Criteria	55-145

Approved by *K. O. Murphy* Date *July 13, 1992*



Client: EMCON Associates
 Project: EMCON Project No. G70-38.01
 Arco Facility No. 6113

Date Received: 06/30/92
 Work Order #: SJ92-0788
 Sample Matrix: Water

QA/QC Report
 Matrix Spike/Duplicate Matrix Spike Summary
 Total Petroleum Hydrocarbons as Diesel
 DHS LUFT Method
 µg/L (ppb)

Date Analyzed: 07/08/92

<u>Parameter</u>	<u>Spike Level</u>	<u>Sample Result</u>	<u>Spike Result</u>		<u>Percent Recovery</u>		<u>Acceptance Criteria</u>
			<u>MS</u>	<u>DMS</u>	<u>MS</u>	<u>DMS</u>	
TPH as Diesel	4,440.	ND	4,200.	4,290.	95.	97.	55-145

ND None Detected at or above the method reporting limit
 TPH Total Petroleum Hydrocarbons

Approved by *Tom Murphy* Date July 13, 1992



Client: EMCON Associates
 Project: EMCON Project No. G70-38.01
 Arco Facility No. 6113

Date Received: 06/30/92
 Work Order #: SJ92-0788
 Sample Matrix: Water

QA/QC Report
 Continuing Calibration Summary
 BTEX and TPH as Gasoline
 EPA Methods 5030/8020/DHS LUFT Method
 Nanograms

Date Analyzed: 07/01/92

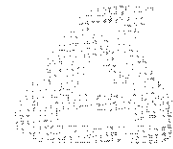
<u>Analyte</u>	<u>True Value</u>	<u>Result</u>	<u>Percent Recovery</u>	<u>CAS Percent Recovery Acceptance Criteria</u>
Benzene	250.	239.	96.	85-115
Toluene	250.	254.	102.	85-115
Ethylbenzene	250.	253.	101.	85-115
Total Xylenes	750.	698.	93.	85-115
TPH as Gasoline	2,500.	2,482.	99.	90-110

Date Analyzed: 07/02/92

<u>Analyte</u>	<u>True Value</u>	<u>Result</u>	<u>Percent Recovery</u>	<u>CAS Percent Recovery Acceptance Criteria</u>
Benzene	250.	263.	105.	85-115
Toluene	250.	280.	112.	85-115
Ethylbenzene	250.	280.	112.	85-115
Total Xylenes	750.	776.	103.	85-115
TPH as Gasoline	2,500.	2,511.	100.	90-110

TPH Total Petroleum Hydrocarbons

Approved by K. O. Murphy Date July 13, 1992



Client: EMCON Associates
 Project: EMCON Project No. G70-38.01
 Arco Facility No. 6113

Date Received: 06/30/92
 Work Order #: SJ92-0788
 Sample Matrix: Water

QA/QC Report
 Continuing Calibration Summary
 BTEX and TPH as Gasoline
 EPA Methods 5030/8020/DHS LUFT Method
 Nanograms

Date Analyzed: 07/07/92

<u>Analyte</u>	<u>True Value</u>	<u>Result</u>	<u>Percent Recovery</u>	<u>CAS Percent Recovery Acceptance Criteria</u>
Benzene	250.	248.	99.	85-115
Toluene	250.	262.	105.	85-115
Ethylbenzene	250.	260.	104.	85-115
Total Xylenes	750.	710.	95.	85-115
TPH as Gasoline	2,500.	2,331.	93.	90-110

Date Analyzed: 07/08/92

<u>Analyte</u>	<u>True Value</u>	<u>Result</u>	<u>Percent Recovery</u>	<u>CAS Percent Recovery Acceptance Criteria</u>
Benzene	250.	266.	106.	85-115
Toluene	250.	286.	114.	85-115
Ethylbenzene	250.	285.	114.	85-115
Total Xylenes	750.	798.	106.	85-115
TPH as Gasoline	2,500.	2,325.	93.	90-110

TPH Total Petroleum Hydrocarbons

Approved by *Keon Murphy* Date *July 13, 1992*



Client: EMCON Associates
 Project: EMCON Project No. G70-38.01
 Arco Facility No. 6113

Date Received: 06/30/92
 Work Order #: SJ92-0788
 Sample Matrix: Water

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

<u>Sample Name</u>	<u>Date Analyzed</u>	<u>Percent Recovery</u> <i>α,α,α-Trifluorotoluene</i>
MW-2 (38)	07/01/92	105.
MW-5 (61)	07/07/92	106.
MW-6 (66)	07/08/92	105.
MW-7 (66)	07/07/92	113.*
MW-8 (65)	07/02/92	112.
MW-9 (67)	07/02/92	108.
FB-1	07/01/92	113.
MS	07/01/92	112.
DMS	07/01/92	112.
Method Blank	07/01/92	111.
Method Blank	07/02/92	103.
Method Blank	07/07/92	98.
Method Blank	07/08/92	106.

CAS Acceptance Criteria 70-130

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

Approved by *K. O'Malley* Date *July 13, 1992*



Client: EMCON Associates
 Project: EMCON Project No. G70-38.01
 Arco Facility No. 6113

Date Received: 06/30/92
 Work Order #: SJ92-0788
 Sample Matrix: Water

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

Date Analyzed: 07/01/92

Percent Recovery

Analytes	Spike Level	Sample Result	Spike Result		Percent Recovery		Acceptance Criteria
			MS	DMS	MS	DMS	
Benzene	25.	ND	26.2	25.9	105.	104.	39-150
Toluene	25.	ND	27.4	27.1	110.	108.	46-148
Ethylbenzene	25.	ND	28.6	28.2	114.	113.	32-160

ND None Detected at or above the method reporting limit

Approved by Korn Murphy Date July 13, 1992

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report



Client: EMCON Associates
 Project: EMCON Project No. G70-38.01
 Arco Facility No. 6113

Date Received: 06/30/92
 Work Order #: SJ92-0788
 Sample Matrix: Water

Continuing Calibration Summary
 Halogenated Volatile Organic Compounds
 EPA Methods 5030/601
 Nanograms

Date Analyzed: 07/01/92

<u>Analyte</u>	<u>True Value</u>	<u>Result</u>	<u>Percent Recovery</u>	<u>EPA Percent Recovery Acceptance Criteria</u>
Chloromethane	50	60.	120.	D-193
Vinyl Chloride	50	65.	130.	28-163
Bromomethane	50	56.	112.	D-144
Chloroethane	50	55.	110.	46-137
Trichlorofluoromethane (Freon 11)	50	46.	92.	21-156
1,1-Dichloroethene	50	44.	88.	28-167
Methylene Chloride	50	48.	96.	25-162
trans-1,2-Dichloroethene	50	50.	100.	38-155
1,1-Dichloroethane	50	49.	98.	47-132
Chloroform	50	46.	92.	49-133
1,1,1-Trichloroethane (TCA)	50	50.	100.	41-138
Carbon Tetrachloride	50	52.	104.	43-143
1,2-Dichloroethane	50	53.	106.	51-147
Trichloroethene (TCE)	50	50.	100.	35-146
1,2-Dichloropropane	50	51.	102.	44-156
Bromodichloromethane	50	50.	100.	42-172
trans-1,3-Dichloropropene	50	57.	114.	22-178
cis-1,3-Dichloropropene	50	50.	100.	22-178
1,1,2-Trichloroethane	50	50.	100.	39-136
Tetrachloroethene (PCE)	50	53.	106.	26-162
Dibromochloromethane	50	49.	98.	24-191
Chlorobenzene	50	52.	104.	38-150
Bromoform	50	44.	88.	13-159
1,1,2,2-Tetrachloroethane	50	48.	96.	8-184
1,3-Dichlorobenzene	50	49.	98.	7-187
1,4-Dichlorobenzene	50	53.	106.	42-143
1,2-Dichlorobenzene	50	52.	104.	D-208

D Detected

Approved by Kenneth Murphy Date July 13, 1992



Client: EMCON Associates
 Project: EMCON Project No. G70-38.01
 Arco Facility No. 6113

Date Received: 06/30/92
 Work Order #: SJ92-0788
 Sample Matrix: Water

QA/QC Report
 Surrogate Recovery Summary
 Halogenated Volatile Organic Compounds
 EPA Methods 5030/601

<u>Sample Name</u>	<u>Date Analyzed</u>	<u>Percent Recovery</u> 4-Bromofluorobenzene
MW-8 (65)	07/01/92	99.
MW-8 (65) MS	07/01/92	119.
MW-8 (65) DMS	07/01/92	123.
Method Blank	07/01/92	96.
	CAS Acceptance Criteria	70-130

Approved by *Kenneth Murphy* Date July 13, 1992



Client: EMCON Associates
 Project: EMCON Project No. G70-38.01
 Arco Facility No. 6113

Date Received: 06/30/92
 Work Order #: SJ92-0788
 Sample Matrix: Water

QA/QC Report
 Matrix Spike/Duplicate Matrix Spike Summary
 Halogenated Volatile Organic Compounds
 EPA Methods 5030/601
 µg/L (ppb)

Sample Name: MW-8 (65)
 Date Analyzed: 07/01/92

Analyte	Spike Level	Sample Result	Spike Result		Percent Recovery		EPA Acceptance Criteria
			MS	DMS	MS	DMS	
1,1-Dichloroethene	10.	ND	10.6	10.3	106.	103.	28-167
Trichloroethene	10.	ND	10.1	10.2	101.	102.	35-146
Tetrachloroethene	10.	ND	10.0	10.3	100.	103.	26-162

ND None Detected at or above the method reporting limit

Approved by *Kenn Murphy* Date July 13, 1992

ARCO Facility no. 6113	City (Facility) LIVERMORE 2434	Project manager (Consultant) Jim Butera	Laboratory name CAS
ARCO engineer Kyle Christie	Telephone no. (ARCO) (915) 571-2494	Telephone no. (Consultant) (408) 453-0719	Contract number 07077
Consultant name EMCON ASSOCIATES	Address (Consultant)		
Fax no. (Consultant) (408) 453-0452			Method of shipment Sample will be delivered

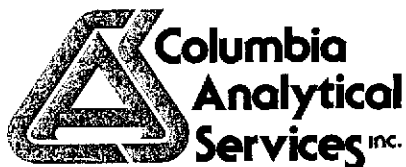
Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH GAS EPA 821/8020/8015	TPH Modified 8015 Gas <input type="checkbox"/> Diesel <input checked="" type="checkbox"/>	Oil and Grease 413.1 <input type="checkbox"/> 413.2 <input type="checkbox"/>	TPH EPA 418.1/SM503E	EPA 8010	EPA 624/8240	EPA 625/8270	TCLP Metals <input type="checkbox"/> VOA <input type="checkbox"/> VOA <input type="checkbox"/>	Semi Metals <input type="checkbox"/> VOA <input type="checkbox"/> VOA <input type="checkbox"/>	CAM Metals EPA 6010/7000 TLC <input type="checkbox"/> STLC <input type="checkbox"/>	Lead Org./DHS Lead EPA 7420/7421 <input checked="" type="checkbox"/>	TOTAL METALS Cd, Cr, Ni, Zn by method EPA 200.7	Special detection Limit/reporting	
			Soil	Water	Other	Ice	Acid																	
MW 1		2	X			X	HCl	No Sample		X		X		X										Lowest possible
MW 2(38)	1-2	2						6-29-92 1130		X														
MW 3		2						No Sample		X														
MW 4		2						No Sample		X														
MW 5(61)	3-4	2						6-30-92 1140		X														AS Normal
MW 6(66)	5-6	2						6-30-92 1045		X														
MW 7(66)	7-9	2						6-30-92 1000		X														
MW 8(65)	11-14	6						6-29-92 1240		X		X		X										Remarks 2 40 ml VOA's mw-1 and mw-8 Add: 2-40 ml VOA's 2-liter glass NP 2-liter glass HCl 1-HNO ₃ 500 LPE GTO-3801
MW 9(67)	15-16	2						6-29-92 1435		X														
FB-1	14-20	2						6-29-92 1300		X														
MW 1		2						NP				X												
MW 2(65)	17-18	2						NP 6-29-92 1240				X												
MW 7		1						HNO ₃													X	X		Lab number GJ92-0788
MW 8(65)		1						HNO ₃ 6-29-92 1240													X	X		Turnaround time

Condition of sample: OK		Temperature received: cool	
Relinquished by sampler Steve Ruty	Date 6-30-92	Time 1424	Received by [Signature]
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory
			Date
			Time

RECEIVED

JUL 14 1992

CAS S.J.



July 13, 1992

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

Re: ARCO #6113 - Livermore/Project #G70-38.01/SJ920788

Dear Jim:

Enclosed are the results of the sample submitted to our lab on June 30, 1992. For your reference, these analyses have been assigned our work order number K924102C.

All analyses were performed in accordance with our laboratory's quality assurance program. Reproduction of reports is allowed only in whole, not in part. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted,

Columbia Analytical Services, Inc.

A handwritten signature in cursive script that reads "Colin B. Elliott".

Colin B. Elliott
Senior Project Chemist

CBE/das

Columbia Analytical Services, Inc.

A handwritten signature in cursive script that reads "Lawrence J. Jacoby".

Lawrence J. Jacoby, Ph.D.
Quality Assurance Coordinator

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
 Project: ARCO #6113 - Livermore
 Sample Matrix: Water

Date Received: 06/30/92
 Work Order No.: K924102C

Total Metals
 µg/L (ppb)

Sample Name:
 Lab Code:

MW-8
 K4102-1

Method Blank
 K4102-MB

Analyte	EPA Method	MRL	MW-8	Method Blank
Cadmium	6010	3	ND	ND
Chromium	6010	5	1,780	ND
Lead	7421	2	143	ND
Nickel	6010	20	5,100	ND
Zinc	6010	10	1,310	ND

MRL Method Reporting Limit
 ND None Detected at or above the method reporting limit

Approved by Alvin Elliott Date 7/13/92

00001

APPENDIX A
LABORATORY QC RESULTS

00002

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
 Project: ARCO #6113 - Livermore
 Sample Matrix: Water

Date Received: 06/30/92
 Work Order No.: K924102C

Matrix Spike/Duplicate Matrix Spike Summary
 Total Metals
 µg/L (ppb)

Sample Name: MW-8
 Lab Code: K4102-1

Percent Recovery

Analyte	MRL	Spike Level	Sample Result	Spiked Sample Result	Duplicate Spiked Sample Result	Spiked Sample	Duplicate Spiked Sample	CAS Acceptance Criteria	Relative Percent Difference
Cadmium	3	50	ND	54	56	108	112	75-125	4
Chromium	5	200	1,780	2,050	1,980	NA	NA	75-125	3
Lead	2	20	143	170	170	NA	NA	75-125	<1
Nickel	20	500	5,100	5,720	5,850	NA	NA	75-125	2
Zinc	10	500	1,310	1,790	1,810	96	100	75-125	1

MRL Method Reporting Limit
 ND None Detected at or above the method reporting limit
 NA Not Applicable because of the sample matrix. Accuracy of the spike recovery value is reduced, since the sample concentration was greater than four times the amount spiked.

Approved by Alan Elliott Date 7/13/92

0003

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: ARCO #6113 - Livermore

Date Analyzed: 07/08/92
Work Order No.: K924102C

Initial Calibration Verification (ICV) Summary
 $\mu\text{g/L}$ (ppb)

Analyte	EPA Method	True Value	Result	Percent Recovery
Cadmium	6010	1,250	1,260	101
Chromium	6010	500	523	105
Lead	7421	98.4	104	105
Nickel	6010	1,250	1,260	101Z
Zinc	6010	1,250	1,280	102

ICV Source: EPA ICV

Approved by

Alvin Elliott

Date

7/13/92

00004

ARCO Products Company

Division of AtlanticRichfieldCompany

Task Order No. **EMCCG-92-1**

Chain of Custody

ARCO Facility no. **6113** City (Facility) **LIVERMORE 2134** Project manager (Consultant) **Jim Butera**
 ARCO engineer **Kyle Christie** Telephone no. (ARCO) **(915) 571-2000** Telephone no. (Consultant) **(415) 453-0719** Fax no. (Consultant) **(415) 453-0452**
 Consultant name **EMCON ASSOCIATES** Address (Consultant)

Laboratory name **CAS**
 Contract number **07077**

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX EPA 8015/8020	BTEX/TPH GAS EPA 8020/8020/8015	TPH Modified 9015 Gas <input type="checkbox"/> Diesel <input checked="" type="checkbox"/>	Oil and Grease 413.1 <input type="checkbox"/> 413.2 <input type="checkbox"/>	TPH EPA 418.1/SM503E	EPA 8010	EPA 824/8240	EPA 825/8270	TCLP Metals <input type="checkbox"/> VOC <input type="checkbox"/> VOA <input type="checkbox"/>	CAM Metals EPA 8010/7000 TTL <input type="checkbox"/> STL <input type="checkbox"/>	[REDACTED]	[REDACTED]	[REDACTED]	
			Soil	Water	Other	Ice	Acid																
MW-1	2	2	X			X	HCl	NO Sample		X	X			X									
MW-2(38)	1-2	2						6-29-92 1130		X													
MW-3	2	2						NO Sample		X													
MW-4	2	2						NO Sample		X													
MW-5(G1)	3-4	2						6-30-92 1140		X													
MW-6(G6)	5-6	2						6-30-92 1045		X													
MW-7(G6)	7-9	2						6-30-92 1000		X													
MW-8(G5)	11-14	2						6-29-92 1240		X		X		X									
MW-9(G7)	15-14	2						6-29-92 1435		X													
FB-1	19-20	2						6-29-92 1300		X													
MW-1	2	2						NP				X											
MW-2(G5)	17-18	2						NP 6-29-92 1240				X											
MW-1	1	1						HNO ₃															
MW-2(G5)	1	1						HNO ₃ 6-29-92 1240															

Method of shipment **sample will be delivered**

Special detection Limit/reporting **Lowest possible**

Special QA/QC **AS Normal**

Remarks **2**
40ml VOH's MW-1 and MW-8
Add:
2-40 ml VOH's
2-liter glass NP
2-liter glass HCl
1-HNO₃ 500 LPE
G7-3801

Lab number **K72 4000**
G592-0788

Turnaround time

Priority Rush 1 Business Day

Rush 2 Business Days

Expedited 5 Business Days

Standard 10 Business Days

Condition of sample: **OK** Temperature received: **cool**

Relinquished by sampler **Jesse Rudy** Date **6-30-92** Time **1424** Received by **[Signature]** Date **6-30-92** Time **1424**

Relinquished by _____ Date _____ Time _____ Received by _____ Date _____ Time _____

Relinquished by _____ Date _____ Time _____ Received by laboratory **[Signature]** Date **7/1/92** Time **0930**



WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 670 38 01

SAMPLE ID: MW-1

PURGED BY: L. RATH

CLIENT NAME: ARCO 6113

SAMPLED BY: ~

LOCATION: 785 E Stanley Bl
Livermore CA

TYPE: Ground Water Surface Water Treatment Effluent Other

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

CASING ELEVATION (feet/MSL): 112 VOLUME IN CASING (gal.): 0.15

DEPTH TO WATER (feet): 43.85 CALCULATED PURGE (gal.): 0.77

DEPTH OF WELL (feet): 44.80 ACTUAL PURGE VOL. (gal.): 250 ml

DATE PURGED: 6-29-92 Start (2400 Hr) 1306 End (2400 Hr) 1307

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

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1307</u>	<u>250 ml</u>	<u>6.14</u>	<u>815</u>	<u>68.3</u>	<u>Brown</u>	<u>1teuvf</u>
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____

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

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

PURGING EQUIPMENT

SAMPLING EQUIPMENT

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

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

WELL INTEGRITY: good LOCK #: 3259

REMARKS: well dried on first bailer
Came back to well at 1345 NO Recharge
Came back to well on 6-30-92 1200 hrs
NO Recharge NO Sample taken

Meter Calibration: Date: 6-29-92 Time: _____ Meter Serial #: 9111 Temperature °F: _____
(EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)

Location of previous calibration: MW-2

Signature: [Signature] Reviewed By: JB Page 1 of 0



EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

PROJECT NO: G70 38-01

SAMPLE ID: MW-2 (38)

PURGED BY: L. RATH

CLIENT NAME: ARCO 6113

SAMPLED BY: L. Ruth

LOCATION: 785 E Stanley Blvd
Livermore CA

TYPE: Ground Water Surface Water Treatment Effluent Other

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 0.15

DEPTH TO WATER (feet): 37.67 CALCULATED PURGE (gal.): 0.76

DEPTH OF WELL (feet): 38.60 ACTUAL PURGE VOL (gal.): approx 15 gal
.93

DATE PURGED: 6-29-92 Start (2400 Hr) 1101 End (2400 Hr) 1103

DATE SAMPLED: 6-29-92 Start (2400 Hr) 1130 End (2400 Hr) ---

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. ($\mu\text{mhos/cm @ } 25^\circ\text{C}$)	TEMPERATURE ($^\circ\text{F}$)	COLOR (visual)	TURBIDITY (visual)
<u>1103</u>	<u>0.15</u>	<u>6.41</u>	<u>1605</u>	<u>75.1</u>	<u>Brown</u>	<u>Heavy</u>
<u>1130</u>	<u>Recnary</u>	<u>6.50</u>	<u>1621</u>	<u>74.8</u>	<u>Brown</u>	<u>Heavy</u>

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

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

PURGING EQUIPMENT

SAMPLING EQUIPMENT

- | | | | |
|---|---|--|--|
| <input type="checkbox"/> 2" Bladder Pump | <input type="checkbox"/> Bailer (Teflon®) | <input type="checkbox"/> 2" Bladder Pump | <input checked="" type="checkbox"/> Bailer (Teflon®) |
| <input type="checkbox"/> Centrifugal Pump | <input checked="" type="checkbox"/> Bailer (PVC) | <input type="checkbox"/> DDL Sampler | <input type="checkbox"/> Bailer (Stainless Steel) |
| <input type="checkbox"/> Submersible Pump | <input type="checkbox"/> Bailer (Stainless Steel) | <input type="checkbox"/> Dipper | <input type="checkbox"/> Submersible Pump |
| <input type="checkbox"/> Well Wizard™ | <input type="checkbox"/> Dedicated | <input type="checkbox"/> Well Wizard™ | <input type="checkbox"/> Dedicated |
- Other: _____ Other: _____

WELL INTEGRITY: good LOCK #: 3259

REMARKS: well dried after one Bailer 1103 HRS
approx .15 gal purge

Meter Calibration: Date: 6-29-92 Time: 1048 Meter Serial #: 9111 Temperature $^\circ\text{F}$: 74.1
(EC 1000 102011000) (DI 9.94) (pH 7 6.971700) (pH 10 9.99140.00) (pH 4 3.951)

Location of previous calibration: _____

Signature: L. Ruth Reviewed By: JB Page 1 of 9



WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 670 38.01

SAMPLE ID: mw-3

PURGED BY: L. RATH

CLIENT NAME: ARCO 6113

SAMPLED BY: —

LOCATION: 785 E Stanley Bl

Livermore CA

TYPE: Ground Water Surface Water Treatment Effluent Other

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 0.065

DEPTH TO WATER (feet): 38.70 CALCULATED PURGE (gal.): 0.32

DEPTH OF WELL (feet): 39.10 ACTUAL PURGE VOL (gal.): 0.06/NA

DATE PURGED: 6-29-92 Start (2400 Hr) 1139 End (2400 Hr) 1140

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

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>NO ENOUGH VOLUME FOR SAMPLE OR READINGS</u>						

D. O. (ppm): NR ODOR: — 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®)
 Centrifugal Pump Bailer (PVC)
 Submersible Pump Bailer (Stainless Steel)
 Well Wizard™ Dedicated
 Other: —

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

WELL INTEGRITY: good LOCK #: 3259

REMARKS: Well Dried on first Bailer 1140 HRS at approx 75 ml
came back to well at 1330 HRS NO Recharge
came back to well on 6-30-92 at 1215 HRS
NO Recharge NO sample taken

Meter Calibration: Date: 6-29-92 Time: — Meter Serial #: 9111 Temperature °F: —
(EC 1000 — / —) (DI —) (pH 7 — / —) (pH 10 — / —) (pH 4 — / —)

Location of previous calibration: mw-2

Signature: L. Rath Reviewed By: JB Page 3 of 9



WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: G70-38-01

SAMPLE ID: MW-4

PURGED BY: L. RATH

CLIENT NAME: ARLO G113

SAMPLED BY: _____

LOCATION: 785 E Stanley Bl
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): NK VOLUME IN CASING (gal.): NA
 DEPTH TO WATER (feet): DRY CALCULATED PURGE (gal.): _____
 DEPTH OF WELL (feet): 26.70 ACTUAL PURGE VOL (gal.): _____

DATE PURGED: 6-29-92 Start (2400 Hr) NA End (2400 Hr) NA
 DATE SAMPLED: NA Start (2400 Hr) _____ End (2400 Hr) _____

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

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

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

PURGING EQUIPMENT

SAMPLING EQUIPMENT

- | | | | |
|---|---|--|---|
| <input type="checkbox"/> 2" Bladder Pump | <input type="checkbox"/> Bailer (Teflon®) | <input type="checkbox"/> 2" Bladder Pump | <input type="checkbox"/> Bailer (Teflon®) |
| <input type="checkbox"/> Centrifugal Pump | <input type="checkbox"/> Bailer (PVC) | <input type="checkbox"/> DDL Sampler | <input type="checkbox"/> Bailer (Stainless Steel) |
| <input type="checkbox"/> Submersible Pump | <input type="checkbox"/> Bailer (Stainless Steel) | <input type="checkbox"/> Dipper | <input type="checkbox"/> Submersible Pump |
| <input type="checkbox"/> Well Wizard™ | <input type="checkbox"/> Dedicated | <input type="checkbox"/> Well Wizard™ | <input type="checkbox"/> Dedicated |
| Other: _____ | | Other: _____ | |

WELL INTEGRITY: Fine LOCK #: 3259

REMARKS: _____

Meter Calibration: Date: _____ Time: _____ Meter Serial #: _____ Temperature °F: _____
 (EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)

Location of previous calibration: _____

Signature: L. Rath Reviewed By: JB Page 4 of 9



EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

PROJECT NO: G70 3801
PURGED BY: L. RATH
SAMPLED BY: L. RATH

SAMPLE ID: MW-5 (G1)
CLIENT NAME: ARCO G113
LOCATION: 785 E Stanley Bl
Livermore CA

TYPE: Ground Water Surface Water Treatment Effluent Other
CASING DIAMETER (inches): 2 3 4 4.5 6 Other

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 7.90
DEPTH TO WATER (feet): 50.55 CALCULATED PURGE (gal.): 39.52
DEPTH OF WELL (feet): 62.60 ACTUAL PURGE VOL. (gal.): 30.00
12.05

DATE PURGED: 6-30-92 Start (2400 Hr) 1105 End (2400 Hr) 1132
DATE SAMPLED: 6-30-92 Start (2400 Hr) 1140 End (2400 Hr)

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1115</u>	<u>8</u>	<u>6.44</u>	<u>1025</u>	<u>69.9</u>	<u>Brown</u>	<u>Heavy</u>
<u>1122</u>	<u>16</u>	<u>6.55</u>	<u>997</u>	<u>70.1</u>	<u>Brown</u>	<u>Heavy</u>
<u>1129</u>	<u>24</u>	<u>6.50</u>	<u>964</u>	<u>69.6</u>	<u>Brown</u>	<u>Heavy</u>
<u>1132</u>	32 <u>well dried at 30 gal</u>					
<u>1140</u>	40 <u>Reverse</u>	<u>6.55</u>	<u>966</u>	<u>69.5</u>	<u>Brown</u>	<u>Heavy</u>
D. O. (ppm):	<u>NR</u>	ODOR:	<u>Strong</u>		<u>NR</u>	<u>NR</u>
					(COBALT 0 - 100)	(NTU 0 - 200)

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

PURGING EQUIPMENT

SAMPLING EQUIPMENT

- | | | | |
|--|---|--|--|
| <input type="checkbox"/> 2" Bladder Pump | <input type="checkbox"/> Bailer (Teflon®) | <input type="checkbox"/> 2" Bladder Pump | <input checked="" type="checkbox"/> Bailer (Teflon®) |
| <input type="checkbox"/> Centrifugal Pump | <input type="checkbox"/> Bailer (PVC) | <input type="checkbox"/> DDL Sampler | <input type="checkbox"/> Bailer (Stainless Steel) |
| <input checked="" type="checkbox"/> Submersible Pump | <input type="checkbox"/> Bailer (Stainless Steel) | <input type="checkbox"/> Dipper | <input type="checkbox"/> Submersible Pump |
| <input type="checkbox"/> Well Wizard™ | <input type="checkbox"/> Dedicated | <input type="checkbox"/> Well Wizard™ | <input type="checkbox"/> Dedicated |
| Other: _____ | | Other: _____ | |

WELL INTEGRITY: good LOCK #: 3259

REMARKS: well dried at 30 gal at 1132 HRS

Meter Calibration: Date: 6-30-92 Time: _____ Meter Serial #: 911 Temperature °F: _____
(EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)

Location of previous calibration: MW-7
Signature: [Signature] Reviewed By: TB Page 5 of 9



EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

PROJECT NO: 6703801

SAMPLE ID: MW-6(66)

PURGED BY: L-RATH

CLIENT NAME: ARCO 6113

SAMPLED BY: L-RATH

LOCATION: 785 E Stanley Bl
Livermore CA

TYPE: Ground Water Surface Water _____ Treatment Effluent _____ Other _____

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 11.58

DEPTH TO WATER (feet): 49.74 CALCULATED PURGE (gal.): 57.92

DEPTH OF WELL (feet): 67.40 ACTUAL PURGE VOL (gal.): 58.00
17.66

DATE PURGED: 6-30-92 Start (2400 Hr) 1012 End (2400 Hr) 1042

DATE SAMPLED: 6-30-92 Start (2400 Hr) 1045 End (2400 Hr) 1045

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1017</u>	<u>11.75</u>	<u>6.29</u>	<u>799</u>	<u>67.2</u>	<u>Brown</u>	<u>Heavy</u>
<u>1023</u>	<u>23.50</u>	<u>6.50</u>	<u>793</u>	<u>66.5</u>	<u>Brown</u>	<u>Heavy</u>
<u>1030</u>	<u>35.25</u>	<u>6.61</u>	<u>806</u>	<u>66.9</u>	<u>Brown</u>	<u>Heavy</u>
<u>1036</u>	<u>47.00</u>	<u>6.63</u>	<u>795</u>	<u>66.2</u>	<u>Brown</u>	<u>Heavy</u>
<u>1042</u>	<u>58.00</u>	<u>6.62</u>	<u>790</u>	<u>65.9</u>	<u>Brown</u>	<u>Heavy</u>

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

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

PURGING EQUIPMENT

SAMPLING EQUIPMENT

- | | | | |
|--|---|--|--|
| <input type="checkbox"/> 2" Bladder Pump | <input type="checkbox"/> Bailer (Teflon®) | <input type="checkbox"/> 2" Bladder Pump | <input checked="" type="checkbox"/> Bailer (Teflon®) |
| <input type="checkbox"/> Centrifugal Pump | <input type="checkbox"/> Bailer (PVC) | <input type="checkbox"/> DDL Sampler | <input type="checkbox"/> Bailer (Stainless Steel) |
| <input checked="" type="checkbox"/> Submersible Pump | <input type="checkbox"/> Bailer (Stainless Steel) | <input type="checkbox"/> Dipper | <input type="checkbox"/> Submersible Pump |
| <input type="checkbox"/> Well Wizard™ | <input type="checkbox"/> Dedicated | <input type="checkbox"/> Well Wizard™ | <input type="checkbox"/> Dedicated |
- Other: _____ Other: _____

WELL INTEGRITY: good LOCK #: 3259

REMARKS: _____

Meter Calibration: Date: 6-30-92 Time: _____ Meter Serial #: 9111 Temperature °F: _____
(EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)

Location of previous calibration: MW-7

Signature: Lance Rake Reviewed By: JB Page 4 of 9



WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

EMCON ASSOCIATES

PROJECT NO: 670 38 01

SAMPLE ID: MW-7 (66)

PURGED BY: L. RATH

CLIENT NAME: ARCO 6113

SAMPLED BY: L. RATH

LOCATION: 785 E Stanley Bl
Livermore CA

TYPE: Ground Water Surface Water Treatment Effluent Other

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

CASING ELEVATION (feet/MSL): <u>NR</u>	VOLUME IN CASING (gal.): <u>11.88</u>
DEPTH TO WATER (feet): <u>49.58</u>	CALCULATED PURGE (gal.): <u>59.43</u>
DEPTH OF WELL (feet): <u>67.70</u>	ACTUAL PURGE VOL (gal.): <u>45.00</u>

DATE PURGED: <u>6-30-92</u>	Start (2400 Hr) <u>0925</u>	End (2400 Hr) <u>0953</u>
DATE SAMPLED: <u>6-30-92</u>	Start (2400 Hr) <u>1000</u>	End (2400 Hr) <u> </u>

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	EC. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>0930</u>	<u>12.00</u>	<u>6.04</u>	<u>900</u>	<u>70.1</u>	<u>Brown</u>	<u>Heavy</u>
<u>0938</u>	<u>24.00</u>	<u>6.29</u>	<u>862</u>	<u>69.4</u>	<u>Brown</u>	<u>Heavy</u>
<u>0947</u>	<u>36.00</u>	<u>6.47</u>	<u>858</u>	<u>68.2</u>	<u>Brown</u>	<u>Heavy</u>
<u>0953</u>	<u>48.00</u>	<u>well Dried at 45 gal</u>				
<u>1000</u>	<u>66.00</u>	<u>6.49</u>	<u>849</u>	<u>68.4</u>	<u>Brown</u>	<u>Heavy</u>

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

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

PURGING EQUIPMENT

SAMPLING EQUIPMENT

- | | | | |
|--|---|--|--|
| <input type="checkbox"/> 2" Bladder Pump | <input type="checkbox"/> Bailer (Teflon®) | <input type="checkbox"/> 2" Bladder Pump | <input checked="" type="checkbox"/> Bailer (Teflon®) |
| <input type="checkbox"/> Centrifugal Pump | <input type="checkbox"/> Bailer (PVC) | <input type="checkbox"/> DDL Sampler | <input type="checkbox"/> Bailer (Stainless Steel) |
| <input checked="" type="checkbox"/> Submersible Pump | <input type="checkbox"/> Bailer (Stainless Steel) | <input type="checkbox"/> Dipper | <input type="checkbox"/> Submersible Pump |
| <input type="checkbox"/> Well Wizard™ | <input type="checkbox"/> Dedicated | <input type="checkbox"/> Well Wizard™ | <input type="checkbox"/> Dedicated |
- Other: _____

WELL INTEGRITY: good LOCK #: 3259

REMARKS: well Dried at 45 gal at 0953 HRS

Meter Calibration: Date: 6-30-92 Time: 0910 Meter Serial #: 9111 Temperature °F: 70.8
 (EC 1000 940/1000) (DI 7.03) (pH 7 6.90/7.00) (pH 10 1006/10.00) (pH 4 4.06/)
 Location of previous calibration: _____

Signature: Steven R. Rath Reviewed By: JB Page 7 of 9



EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

PROJECT NO: G70 38 01
PURGED BY: L. RATH
SAMPLED BY: L. RATH

SAMPLE ID: mw-8 (65)
CLIENT NAME: ARCO G113
LOCATION: 755 E Stanley Bl
Livermore ca

TYPE: Ground Water Surface Water Treatment Effluent Other
CASING DIAMETER (inches): 2 3 4 4.5 6 Other

CASING ELEVATION (feet/MSL): 11R VOLUME IN CASING (gal.): 10.61
DEPTH TO WATER (feet): 50.42 CALCULATED PURGE (gal.): 53.07
DEPTH OF WELL (feet): 66.60 ACTUAL PURGE VOL (gal.): 30.00
16.18

DATE PURGED: 6-29-92 Start (2400 Hr) 1155 End (2400 Hr) 1220
DATE SAMPLED: 6-29-92 Start (2400 Hr) 1240 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1205</u>	<u>10.75</u> <u>21.50</u>	<u>6.17</u>	<u>850</u>	<u>67.7</u>	<u>Brown</u>	<u>Heavy</u>
<u>1212</u>	<u>32.25</u> <u>33.25</u>	<u>6.22</u>	<u>834</u>	<u>66.0</u>	<u>Brown</u>	<u>Heavy</u>
<u>1220</u>	<u>43.00</u> <u>53.75</u>	<u>well Dried at 30 gal</u>				
<u>1240</u>	<u>Recharge</u>	<u>6.25</u>	<u>828</u>	<u>66.3</u>	<u>Brown</u>	<u>very Heavy</u>

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

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

PURGING EQUIPMENT

SAMPLING EQUIPMENT

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

WELL INTEGRITY: good LOCK #: 3259

REMARKS: well Dried at 30 gal at 1220HRS
Water is very silty. 2" grubs drilled up and stopped running
cleaned at site (LD)

Meter Calibration: Date: 6-29-92 Time: _____ Meter Serial #: 911 Temperature °F: _____
(EC 1000 _____ / _____) (DI _____) (pH 7 _____ / _____) (pH 10 _____ / _____) (pH 4 _____ / _____)

Location of previous calibration: mw-2

Signature: [Signature] Reviewed By: JTB Page 8 of 9



EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

Rev. 2, 5/91

PROJECT NO: 670 38 01
PURGED BY: L. RATH
SAMPLED BY: L. RATH

SAMPLE ID: mw-9 (67)
CLIENT NAME: ARCO 6113
LOCATION: 785 E Stanley Bl
Livermore Cal

TYPE: Ground Water Surface Water Treatment Effluent Other
CASING DIAMETER (inches): 2 3 4 4.5 6 Other

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 11.61
DEPTH TO WATER (feet): 50.30 CALCULATED PURGE (gal.): 58.05
DEPTH OF WELL (feet): 68.00 ACTUAL PURGE VOL (gal.): 50.0
17.70

DATE PURGED: 6-29-92 Start (2400 Hr) 1348 End (2400 Hr) 1425
DATE SAMPLED: 6-29-92 Start (2400 Hr) 1435 End (2400 Hr)

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
<u>1355</u>	<u>11.75</u>	<u>6.15</u>	<u>820</u>	<u>63.9</u>	<u>Brown</u>	<u>Heavy</u>
<u>1404</u>	<u>23.50</u>	<u>6.39</u>	<u>856</u>	<u>65.5</u>	<u>Brown</u>	<u>Heavy</u>
<u>1411</u>	<u>35.25</u>	<u>6.47</u>	<u>844</u>	<u>65.7</u>	<u>Brown</u>	<u>Heavy</u>
<u>1421</u>	<u>47.00</u>	<u>6.46</u>	<u>836</u>	<u>65.9</u>	<u>Brown</u>	<u>Heavy</u>
<u>1425</u>	<u>58.75</u>	<u>well</u>	<u>Dried at</u>	<u>50 gal</u>	<u>at 1425</u>	<u>HRS</u>

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

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

PURGING EQUIPMENT

SAMPLING EQUIPMENT

- | | | | |
|--|---|--|--|
| <input type="checkbox"/> 2" Bladder Pump | <input type="checkbox"/> Bailer (Teflon®) | <input type="checkbox"/> 2" Bladder Pump | <input checked="" type="checkbox"/> Bailer (Teflon®) |
| <input type="checkbox"/> Centrifugal Pump | <input type="checkbox"/> Bailer (PVC) | <input type="checkbox"/> DDL Sampler | <input type="checkbox"/> Bailer (Stainless Steel) |
| <input checked="" type="checkbox"/> Submersible Pump | <input type="checkbox"/> Bailer (Stainless Steel) | <input type="checkbox"/> Dipper | <input type="checkbox"/> Submersible Pump |
| <input type="checkbox"/> Well Wizard™ | <input type="checkbox"/> Dedicated | <input type="checkbox"/> Well Wizard™ | <input type="checkbox"/> Dedicated |
| Other: <u> </u> | | Other: <u> </u> | |

WELL INTEGRITY: good LOCK #: 3259

REMARKS: well Dried at 50 gal at 1425 HRS.

time	vol.	pH	E.C.	Temp	color	turbidity	
<u>Recharge</u>	<u>1425</u>	<u>Recharge</u>	<u>6.44</u>	<u>834</u>	<u>65.8</u>	<u>Brown</u>	<u>Heavy</u>

Meter Calibration: Date: 6-29-92 Time: Meter Serial #: 911 Temperature °F:
(EC 1000 /) (DI) (pH 7 /) (pH 10 /) (pH 4 /)
Location of previous calibration: mw-2

Signature: L. RATH Reviewed By: JB Page 9 of 9

1048

TF NUMBER: 1048

GIB-92-057

MONITORING WELL PURGE WATER TRANSPORT FORM

GENERATOR INFORMATION

NAME: ARCO PRODUCTS

ADDRESS: P.O. BOX 5811

CITY, STATE, ZIP: SAN MATEO, CA 94402 PHONE #: (415) 571-2434

DESCRIPTION OF WATER: PURGE WATER GENERATED DURING SAMPLING OR DEVELOPMENT OF MONITORING WELLS LOCATED AT VARIOUS SITES. AUGER RINSATE GENERATED DURING THE INSTALLATION OF MONITORING WELLS AT VARIOUS SITES. THE WATER MAY CONTAIN DISSOLVED HYDROCARBONS.

THE GENERATOR CERTIFIES THAT THIS WATER AS DESCRIBED IS NON-HAZARDOUS

Kyle Christie by Jon DeJong 7-8-92
 (Typed or printed full name & signature) (Date)

SITE INFORMATION

	STA #	JOB #	ADDRESS	GALS
1	A-6095	20722-PW	2329 NO. TEXAS ST., FAIRFIELD, CA	36
2	A-2180	20723-PW	3000 TRAVIS BLVD., FAIRFIELD, CA	126
3	A-4931	20756&20685	731 W. MACARTHUR BLVD., OAKLAND, CA	951
4	A-276	20735-PW	10600 MACARTHUR BLVD., OAKLAND, CA	268
5	A-6113	20734&20694	785 E. STANLEY BLVD., LIVERMORE, CA	442
6	A-5334	20719-PW	707 SO. MATHILDA AVE., SUNNYVALE, CA	39
7	A-2135	20594-PW	440 THIRD ST., SAN RAFAEL, CA	99
8	A-2112	20686-DW	1260 PARK ST., ALAMEDA, CA	221
9	A-6064	20670-PW	3611 SO. MOONEY BLVD., VISALIA, CA	69
10	A-1316	20725-DW	1800 OLIVE DR., DAVIS, CA	188
TOTAL GALLONS:				2,439

TRANSPORTER INFORMATION

NAME: BALCH PETROLEUM

ADDRESS: 930 AMES AVE.

CITY, STATE, ZIP: MILPITAS, CA 95035 PHONE #: (408) 942-8686

TRUCK ID #: PETERBILT HURSCHEL WARD 7-8-92
 (Typed or printed full name & signature) (Date)

TSD FACILITY INFORMATION

NAME: GIBSON OIL & REFINING

ADDRESS: 475 SEAPORT BLVD

CITY, STATE, ZIP: REDWOOD CITY, CA 94063 PHONE #: (415) 368-5511

RELEASE #: 11320 BILL EDWIN Bill Edw 7-8-92
 (Typed or printed full name & signature) (Date)

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