aqua resources inc.

2030 Addison Street, Suite 500 • Berkeley, California 94704 • 415 540-6954

July 2, 1990

Alameda County Health Agency
Department of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, CA 94621

87157.6
file: report

Attention: Mr. Lowell Miller

Subject: Groundwater Monitoring Report
Mill Springs Park Apartments (Formerly Livermore Superblock)
Railroad Avenue between South P and South L Streets
Livermore, California

Introduction

This report presents results of a groundwater monitoring program conducted at the subject site from May 1989 to May 1990. Groundwater monitoring was performed on a quarterly basis during this one year period. This monitoring program was performed as part of the approved final closure plan for the subject site. Aqua Resources Inc. (ARI) provided environmental consultation and engineering services during the previous Phase I, Phase II, and Final Site Remediation and Closure for the Mill Springs Park Apartment Site. The site is located on Railroad Avenue, between South L and South P Streets, in Livermore, California. The site was known formerly as the Livermore Superblock, and is shown in relation to the City of Livermore on the Vicinity Map, Figure 1.

The purpose of the monitoring program is to determine whether leakage of fuel oil from the previously removed concrete vault structure had migrated to groundwater underlying the site. Location of the monitoring well was determined based on the results of a March 14, 1989 Groundwater Study Report, and approved by the Alameda County Health Agency. The location of the monitoring well is shown in relation to the approved development plan on the Site Plan, Figure 2.

This letter report includes the following information:

- Summary of the monitoring well installation procedures, sampling methodology and chemical analyses performed,
- Discussion of results of chemical analyses, and
- Conclusions and Recommendations based on field observations and interpretation of chemical analytical data.

Copies of the monitoring well log and the Alameda County Flood Control and Water Conservation District Well Permit Form were presented in the Monitoring Well Installation report dated June 1, 1989. Chain of Custody Forms and the Certified Chemical Analysis reports for the year long monitoring program are presented as attachments to this report.

Monitoring Well Installation Procedure

Prior to installation of the monitoring well, a site reconnaissance was performed to field locate the approved monitoring well. At the time the site reconnaissance was performed, the concrete vault structure excavation had been backfilled and site development was in progress.

On April 20, 1989, one groundwater monitoring well was installed at the site by HEW Drilling Company of Palo Alto, using a CME-75 drill rig equipped with an eight-inch diameter hollow stem auger. Augers were steam cleaned prior to drilling. A standard split barrel sampler, with a 2-5/8 inch outer diameter and 2 inch inner diameter, was used for soil sampling. Prior to obtaining each sample, the disassembled sampler and the brass sample liners were washed in a solution of TSP in water. Each piece was triple rinsed, with the final rinse being distilled water.

A boring log was prepared for the well in the field. Soil samples were collected at five-foot intervals during the drilling of the well. The soil exposed in the ends of the tube was quickly noted, and the ends were then sealed with teflon tape and new snug-fitting plastic caps. The edges of the caps were sealed with plastic tape. The cap was labeled with the sample number, depth, date, and project name. A second sample was taken from each five-foot interval to be reserved for inspection if needed at a later date. The third sample, if recovered, was used for the sample description. The soil samples were placed in a chilled ice chest as they were collected. Selected soil samples were submitted for chemical analyses; remaining samples were held pending results of the chemical analyses. Results of chemical analyses performed on the soil samples were presented in the June 1, 1989 Monitoring Well Installation report.

The monitoring well was installed at the conclusion of soil sampling. The monitoring well casing consisted of two-inch diameter Schedule 40 PVC pipe. The well casing was slotted (slot opening 0.020 inches) between depths of 30 feet and 60 feet. The annulus between the casing and bore wall was backfilled with #3 RMC Lonestar sand to a depth of 28 feet below existing grade (about two feet above the top of slotted casing). A three foot seal of 3/8-inch diameter bentonite pellets was constructed immediately above the sand pack, and the remainder of the annulus was filled with cement grout.

The top of the well casing was fitted with a locking cap. Because the monitoring well is located in a landscaped area, the well head was constructed within a christy box. The christy box was completed in a manner to reduce the potential for surface water runoff from ponding around the well head. After the monitoring well installation was completed, the elevation of the top of the casing was determined by survey methods. The elevation of the top of the casing is +477.08 feet, Mean Sea Level Datum.

Groundwater Sampling Procedures and Field Observations

After the monitoring well installation was completed, the monitoring well was developed by surging and bailing. The water removed from the well during development was placed in sealed containers and stored on-site pending results of chemical analyses. Based on the results of the initial analysis, the Livermore Public Works Department, Water Reclamation Plant approved disposal of the development water and water subsequently generated from purging at quarterly sample intervals, to the sanitary sewer.

Prior to sampling the monitoring well, the groundwater depth was measured to the top of the casing in the well and recorded to the nearest hundredth of a foot using an electronic interface probe. The groundwater elevations observed at the time of each sampling interval are shown of Table 1. The plot of groundwater elevation over time is shown on Figure 3.

Table 1
Observed Groundwater Elevations
(Mean Sea Level Datum)

Date of Observation	Groundwater Elevation (feet)
April 20, 1989	433.58
May 1, 1989	434.34
August 1, 1989	433.22
September 1, 1989	431.73
November 2, 1989	430.69
February 2, 1990	431.72
May 2, 1990	434.50

After the water elevation was determined, the monitoring well was purged and allowed to recover. When the groundwater level had recovered, a groundwater sample was collected using a teflon bailer. Prior to purging the well, and again before collection of the groundwater sample, the bailer was cleaned in a solution of TSP in water, rinsed with tap water, and given a final rinse with distilled water. A new length of nylon rope was used for lowering and raising the bailer.

The first sample from the well was retrieved from the surface of the water, and the contents of the bailer were observed to assess whether there was any visible floating product present. At every quarterly sample interval, no visible free product was observed in the groundwater samples taken. The sample vials and jars, provided by the laboratory, were filled from the bailer. The sample vials were placed in a chilled ice chest and transported to the laboratory under chain-of-custody control.

Summary of Chemical Analyses and Discussion of Results

As discussed earlier, groundwater samples obtained at each quarterly sampling interval for chemical analysis were submitted to a State certified laboratory utilizing chain of custody protocols. Chemical analyses were performed by Curtis and Tompkins, Ltd., Analytical Laboratories in Berkeley. For quality assurance purposes, a split sample taken during the third sample interval was also submitted to Brown & Caldwell in Emeryville, California. Travel blanks were also taken and analyzed where considered appropriate.

Chemical analyses included determination of Total Petroleum Hydrocarbons (TPH) by EPA Method 8015, and Benzene, Toluene, Xylene, Ethyl Benzene (BTXE) by EPA Method 8020. Results of the chemical analyses are presented on the attached certified laboratory reports. No analytes were detected above the method detection levels (1 part per million, 1 ppm) for the TPH analyses (EPA Method 8015). Benzene was the only EPA Method 8020 analyte detected above the method detection limit (.5 to 1.0 ppb); the other analytes (Toluene, Xylene and Ethyl Benzene) were not detected.

Benzene was not detected at every sample interval, and its detected concentration was determined to range from less than .5 ppb (method detection limit) to a measured maximum of 5 ppb. The Benzene concentration over time is shown in Figure 4. Benzene was not detected in the baseline sample interval nor in the fourth quarter sample interval; but was detected in the first, second and third quarter sample intervals. At the first, second and third sample intervals, the monitoring well was resampled. Benzene was not detected in the resample analysis at the first and second quarter sample interval, but was detected in the third quarter sample interval.

Conclusions and Recommendations

Based on the analyses of groundwater samples collected during the monitoring period from the monitoring well, there does not appear to be significant hydrocarbon contamination in the groundwater associated with the concrete vault structure that was removed. Review of the chemical test results indicates that all the TPH analytes were below the method detection limits. Benzene was detected above the method detection level (.5 ppb), but not on a consistent, repeatable basis. In addition, the measured Benzene concentration did not exceed the Maximum Contaminant Level (MCL) established by the EPA.

Based on the measured petroleum concentrations and field observation that no free petroleum product was observed in the groundwater sample collected as part of the groundwater monitoring program, ARI concludes that continued monitoring is not beneficial. Therefore, ARI recommends that the monitoring well be abandoned and sealed in conformance with Alameda County Flood Control and Water Conservation District, Zone 7, requirements.

Limitations

Consistent with our discussions with the Client and the lead regulatory agency, namely the Alameda County Health Agency, our groundwater monitoring program was limited to the installation and development of one groundwater monitoring well and quarterly groundwater sample collection. Chemical analyses were performed by others, not under ARI direct supervision. Test results are reported as received. Final determination of additional site remediation, if required, will be determined by the Alameda County Public Health Agency. We cannot guarantee or warrant that soil or groundwater at this site are not contaminated above allowable limits for a given contaminant. This report is limited in its scope to the analyses and review of samples obtained from the one monitoring well as required by the regulatory agency. All services were performed in substantial conformance with current standards of environmental engineering practice. No other warranty, express or implied, is made.

It has been a pleasure to provide you with this information. If you have any questions regarding the above, please do not hesitate to contact the undersigned.

Very truly yours,
AQUA RESOURCES INC.

Mark Milani

Mark Milani, P.E.
Project Manager

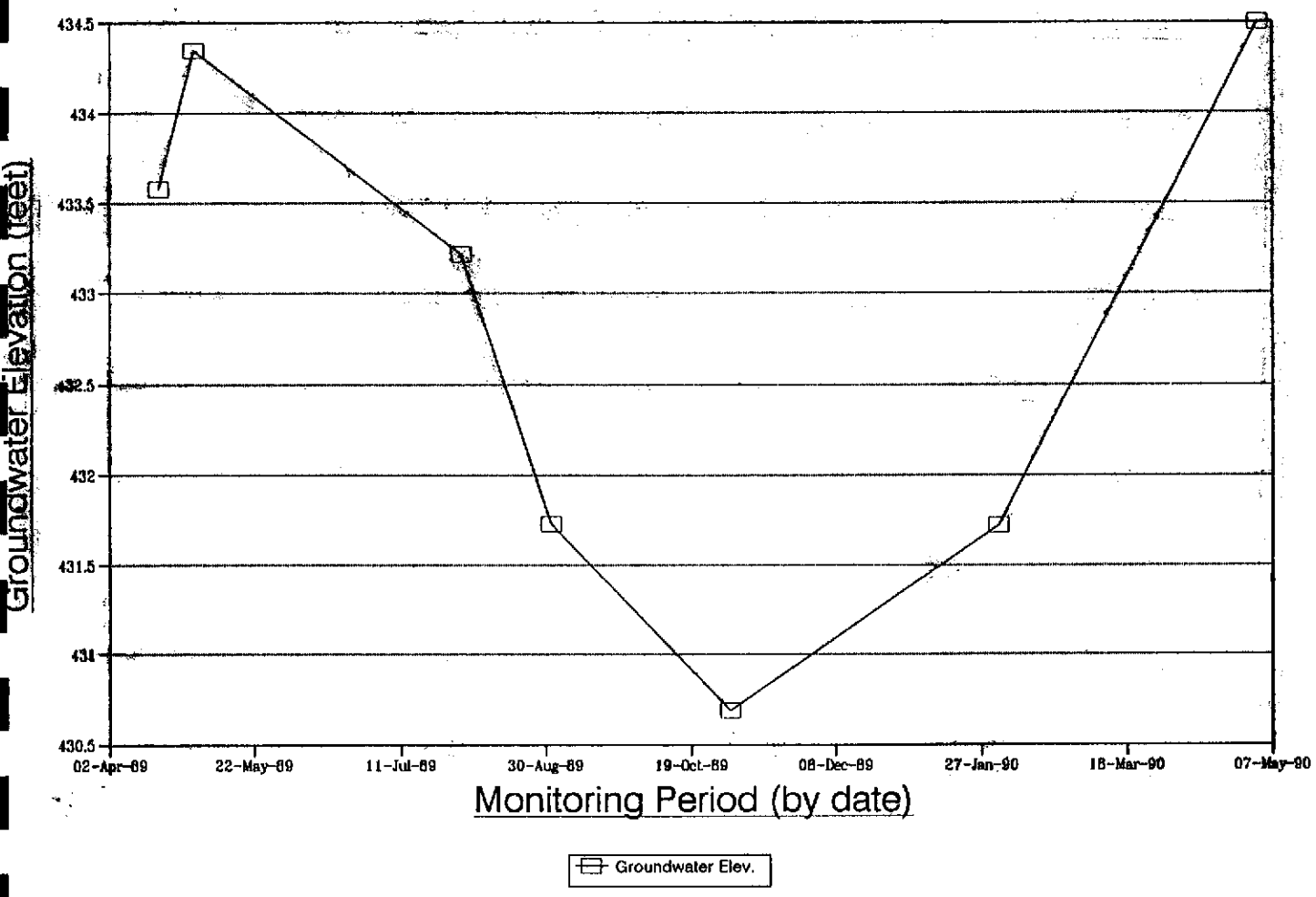
Attachments:
- Certified Laboratory Reports
- Chain of Custody Form
- Figure 1 - Vicinity Map
- Figure 2 - Monitoring Well Location Plan
- Figure 3 - Groundwater Elevation Over Time
- Figure 4 - Benzene Concentration Over Time

cc:
- Addressee (2)
- Barnett-Range Corporation, Attn: Mr. Larry Malcolm (2)
- Regional Water Quality Control Board, San Francisco Bay Region

another year of monitoring - seems to be [illegible] phenomenon

2 Annabel Lane
Suite [illegible]
San Ramon CA 94583
277-1061

Figure 3
Groundwater Elevation Over Time



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

ATE RECEIVED: 05/02/89
ATE REPORTED: 05/10/89
AGE 1 OF 3

LAB NUMB

CLIENT: AQUA RESOURCES, INC.

REPORT ON: 1 WATER SAMPLE

JOB #: 87157.6
LOCATION: MILL SPRINGS PARK

RESULTS: SEE ATTACHED

Laboratory Director

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 17307
CLIENT: AQUA RESOURCES, INC.
PROJECT #: 87157.6
LOCATION: MILL SPRINGS PARK

DATE RECEIVED: 05/02/89
DATE ANALYZED: 05/08/89
DATE REPORTED: 05/10/89

Extractable Petroleum Hydrocarbons in Aqueous Solutions
EPA 8015 (Modified)
Extraction Method: EPA 3510

LAB ID	CLIENT ID	GASOLINE (mg/L)	KEROSINE (mg/L)	DIESEL (mg/L)	OTHER (mg/L)
17307-1A	MW-1	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

RPD, %	5
Spike: % Recovery	89

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 17307
CLIENT: AQUA RESOURCES, INC.
JOB NUMBER: 87157.6
JOB LOCATION: MILL SPRINGS PARK

DATE RECEIVED: 05/02/89
DATE ANALYZED: 05/03/89
DATE REPORTED: 05/10/89

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020
Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	BENZENE (ug/kg)	TOLUENE (ug/kg)	TOTAL XYLENES (ug/kg)	ETHYL BENZENE (ug/kg)
17307-1B	MW-1	ND(1)	ND(1)	ND(1)	ND(1)

QA/QC SUMMARY

%RPD	5
%RECOVERY	96

17307

AQUA RESOURCES, INC.
2030 ADDISON STREET, SUITE 500
Berkeley, CA. 94704
(415)540-6954

CHAIN OF CUSTODY RECORD

Project Code	Project Name	SAMPLERS (Signature)	TPH	BTX&E	REMARKS
87157.6	~~Barnett Range~~ Mill Springs Park	J. Shakofsky			
MW-1			✓	✓	

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
S. Shakofsky				05/02/89 8:11	J. Anderson
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received for Laboratory by: (Signature)	Date/Time	Remarks	
		J. Anderson			

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 08/01/89
DATE REPORTED: 08/09/89

LAB NUMBER: 17928

CLIENT: AQUA RESOURCES

REPORT ON: 1 WATER SAMPLE

JOB #: 87157.6
PROJECT NAME: BARNETT RANGE

RESULTS: SEE ATTACHED

Laboratory Director

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 17928
CLIENT: AQUA RESOURCES
PROJECT #: 87157.6
PROFECT NAME: BARNETT RANGE

DATE RECEIVED: 08/01/89
DATE ANALYZED: 08/03/89
DATE REPORTED: 08/09/89

Extractable Petroleum Hydrocarbons in Aqueous Solutions
EPA 8015 (Modified)
Extraction Method: EPA 3510

LAB ID	CLIENT ID	GASOLINE (mg/L)	KEROSINE (mg/L)	DIESEL (mg/L)	OTHER (mg/L)
17928	MW-1	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

RPD, %	7
Spike: % Recovery	95

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 17928
CLIENT: AQUA RESOURCES
JOB NUMBER: 87157.6
PROJECT NAME: BARNETT RANGE

DATE RECEIVED: 08/01/89
DATE ANALYZED: 08/08/89
DATE REPORTED: 08/09/89

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020
Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	BENZENE (ug/L)	TOLUENE (ug/L)	TOTAL XYLENES (ug/L)	ETHYL BENZENE (ug/L)
17928	MW-1	5	ND(1)	ND(1)	ND(1)

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

%RPD	5
%RECOVERY	95

AQUA RESOURCES, INC.

SHIPMENT NO.: _____

PAGE _____ OF _____

CHAIN OF CUSTODY RECORD

DATE 8/1/89

PROJECT NAME: Summit Range

PROJECT NO.: 87157.6

Sample Number	Location	Type of Sample		Type of Container	Type of Preservation		Analysis Required
		Material	Method		Temp	Chemical	
MW-1		water	bailer	glass jar + vials	ice		TPH, BTX+E

Total Number of Samples Shipped: 2

Sampler's Signature: Patricia Rodgers

Relinquished By:
Signature: Patricia Rodgers
Printed Name: PATRICIA RODGERS
Company: AQUA RESOURCES INC
Reason: analysis

Received By:
Signature: Nancy Patten
Printed Name:
Company: CTR

Date: 8/01/89
Time: 1:25 PM

Relinquished By:
Signature:
Printed Name:
Company:
Reason:

Received By:
Signature:
Printed Name:
Company:

Date: / /
Time:

REMARKS:

Special Shipment / Handling / Storage Requirements:

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 09/01/89
DATE REPORTED: 09/13/89

LAB NUMBER: 18172

CLIENT: AQUA RESOURCES, INC.

REPORT ON: 2 WATER SAMPLES

JOB #: 87157.6
LOCATION: LIVERMORE

RESULTS: SEE ATTACHED

M.E. Printera
QA/QC Officer

Laboratory Director

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 18172
CLIENT: AQUA RESOURCES
PROJECT #: 87157.6
LOCATION: LIVERMORE

DATE RECEIVED: 09/01/89
DATE ANALYZED: 09/07/89
DATE REPORTED: 09/13/89

Extractable Petroleum Hydrocarbons in Aqueous Solutions
EPA 8015 (Modified)
Extraction Method: EPA 3510

LAB ID	CLIENT ID	GASOLINE (mg/L)	KEROSENE (mg/L)	DIESEL (mg/L)	OTHER (mg/L)
18172-1	1T	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
18172-2	2T	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

RPD, %	8
Spike: % Recovery	100

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 18172
CLIENT: AQUA RESOURCES
JOB NUMBER: 87157.6
JOB LOCATION: LIVERMORE

DATE RECEIVED: 09/01/89
DATE ANALYZED: 09/13/89
DATE REPORTED: 09/13/89

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020
Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	BENZENE (ug/L)	TOLUENE (ug/L)	TOTAL XYLENES (ug/L)	ETHYL BENZENE (ug/L)
18172-1	1T	ND(1)	ND(1)	ND(1)	ND(1)
18172-2	2T	ND(1)	ND(1)	ND(1)	ND(1)

QA/QC SUMMARY

%RPD	<1
%RECOVERY	92

1872

AQUA RESOURCES, INC.

SHIPMENT NO.: 1

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

DATE 9/1/89

PROJECT NAME: LIVERMORE

PROJECT NO.: 87152.6

Sample Number	Location	Type of Sample		Type of Container	Type of Preservation		Analysis Required
		Material	Method		Temp	Chemical	
#1T	WELL	WATER		BOTTLE	4°C		TEH
#2T	-"-	-"-		VIAL	4°C		BTX&E

Total Number of Samples Shipped: 4

Sampler's Signature: Wojciech Bajsarowicz

Relinquished By:
Signature: Wojciech Bajsarowicz
Printed Name: WOJTEK BAJSAROWICZ
Company: AQUA RESOURCES
Reason:

Received By:
Signature: Nancy L. Wilson
Printed Name: Nancy Wilson
Company: Curtis & Tompkins

Date: 9/01/89
Time: 2:55

Relinquished By:
Signature:
Printed Name:
Company:
Reason:

Received By:
Signature:
Printed Name:
Company:

Date: / /
Time:

REMARKS:

2 BOTTLES AND 2 VIALS SUBMITTED:
1 BOTTLE AND 1 VIAL IS TRAVEL BLANK
1 BOTTLE AND 1 VIAL IS SAMPLE FROM WELL

IDENTITY OF TRAVEL BLANK RETAINED BY ARI NW 9/01/89

Special Shipment / Handling / Storage Requirements:

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 11/03/89
DATE REPORTED: 11/13/89

LAB NUMBER: 18621

CLIENT: AQUA RESOURCES

REPORT ON: 1 WATER SAMPLE

JOB #: 87157.6

RESULTS: SEE ATTACHED

M.E. Printiss
QA/QC Officer

for CGG
Laboratory Director

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 18621-1
CLIENT: AQUA RESOURCES
JOB #: 87157.6
SAMPLE ID: W - 1

DATE RECEIVED: 11/03/89
DATE ANALYZED: 11/03/89
DATE REPORTED: 11/13/89

EPA 602: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	DETECTION LIMIT ug/L
Benzene	3.6	1
Toluene	ND	1
Ethyl Benzene	ND	1
Total Xylenes	ND	1
Chlorobenzene	ND	1
1,4-Dichlorobenzene	ND	1
1,3-Dichlorobenzene	ND	1
1,2-Dichlorobenzene	ND	1

ND = None Detected

QA/QC SUMMARY

RPD %	27
SPIKE RECOVERY %	81

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 18621
CLIENT: AQUA RESOURCES
PROJECT #: 87157.6

DATE RECEIVED: 11/03/89
DATE ANALYZED: 11/08/89
DATE REPORTED: 11/13/89

Extractable Petroleum Hydrocarbons in Aqueous Solutions
EPA 8015 (Modified)
Extraction Method: EPA 3510

LAB ID	CLIENT ID	GASOLINE (mg/L)	KEROSENE (mg/L)	DIESEL (mg/L)	OTHER (mg/L)
18621-1	W - 1	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

RPD, %	31
Spike: % Recovery	97

AQUA RESOURCES, INC.

SHIPMENT NO.: 1

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

DATE 11/2/89

PROJECT NAME: 871526

PROJECT NO.:

Sample Number	Location	Type of Sample: Material	Type of Sample: Method	Type of Container	Type of Preservation: Temp	Type of Preservation: Chemical	Analysis Required
W-1		Water		Vials	ice		total petroleum hydrocarbons BTX+E

Total Number of Samples Shipped: 2

Sampler's Signature: Patricia Rodgers

Relinquished By:
Signature: Patricia Rodgers
Printed Name: PATICIA RODGERS
Company: AQUA RESOURCES
Reason: for analysis

Relinquished By:
Signature:
Printed Name:
Company:
Reason:

Received By:
Signature: Scott Rithman
Printed Name: Scott Rithman
Company: C+T

Received By:
Signature:
Printed Name:
Company:

Date: 11/2/89
Time: 2:50

Date: / /
Time:

REMARKS:

Please have Steve Jensen contact Mark Milani prior to analysis. Phone: 540-6954

Special Shipment / Handling / Storage Requirements:

AQUA RESOURCES, INC.

SHIPMENT NO.: _____

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

DATE 11/2/89

PROJECT NAME: 87157.6

PROJECT NO.: _____

Sample Number	Location	Type of Sample: Material	Type of Sample: Method	Type of Container	Type of Preservation: Temp	Type of Preservation: Chemical	Analysis Required
W-1		water	bailer	liter bottle	ice		TEH

Total Number of Samples Shipped: 1

Sampler's Signature: Patricia Rodgers

Relinquished By:
Signature: Patricia Rodgers
Printed Name: PATRICIA RODGERS
Company: AQUA RESOURCES
Reason: analysis

Received By:
Signature: Maria J. Watson
Printed Name: _____
Company: _____
Date: 11/3/89
Time: _____

Relinquished By:
Signature: _____
Printed Name: _____
Company: _____
Reason: _____

Received By:
Signature: _____
Printed Name: _____
Company: _____
Date: / /
Time: _____

REMARKS:

Special Shipment / Handling / Storage Requirements:

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 02/05/90
DATE REPORTED: 02/12/90

LAB NUMBER: 19482

CLIENT: AQUA RESOURCES

REPORT ON: 1 WATER SAMPLE

PROJECT #: 87157.6

RESULTS: SEE ATTACHED

M. E. Printers
QA/QC Officer

Laboratory Director

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 19482
CLIENT: AQUA RESOURCES
PROJECT #: 87157.6

DATE RECEIVED: 02/05/90
DATE ANALYZED: 02/10/90
DATE REPORTED: 02/12/90

Extractable Petroleum Hydrocarbons in Aqueous Solutions
California DOHS Method
LUFT Manual October 1989

LAB ID	CLIENT ID	KEROSENE (mg/L)	DIESEL (mg/L)	OTHER (mg/L)
19482-1	W - 1	ND(0.5)	ND(0.5)	ND(0.5)

ND = NOT DETECTED; LIMIT OF DETECTION IN PARENTHESES

QA/QC SUMMARY

RPD, %	4
Spike: % Recovery	96

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 19482-1
CLIENT: AQUA RESOURCES
JOB #: 87157.6
SAMPLE ID: W - 1

JOB NO.
FILE

DATE RECEIVED: 02/05/90
DATE ANALYZED: 02/15/90
DATE REPORTED: 02/16/90

EPA 602: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	DETECTION LIMIT ug/L
Benzene	4.5	0.5
Toluene	ND	0.5
Ethyl Benzene	ND	0.5
Total Xylenes	ND	0.5
Chlorobenzene	ND	0.5
1,4-Dichlorobenzene	ND	0.5
1,3-Dichlorobenzene	ND	0.5
1,2-Dichlorobenzene	ND	0.5

ND = None Detected

QA/QC SUMMARY

RPD %	<1
SPIKE RECOVERY %	93

1978 2

AQUA RESOURCES, INC.

SHIPMENT NO.:

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

DATE 2/2/90

PROJECT NAME:

PROJECT NO.: 87157.6

Sample Number	Location	Type of Sample: Material	Type of Sample: Method	Type of Container	Type of Preservation: Temp	Type of Preservation: Chemical	Analysis Required
W-1		water		liter	ice		TEH
W-1		water		vials	ice		602

Total Number of Samples Shipped:

Sampler's Signature: Patricia Rodgers

Relinquished By:
Signature: Patricia Rodgers
Printed Name: PATRICIA RODGERS
Company: AQUA RESOURCES
Reason: analysis

Received By:
Signature:
Printed Name: N Parish
Company: UTI

Date: 2-15-90
Time: 5:15pm

Relinquished By:
Signature:
Printed Name:
Company:
Reason:

Received By:
Signature:
Printed Name:
Company:

Date: / /
Time:

REMARKS:

Sold travel blanks for possible analyses

Special Shipment / Handling / Storage Requirements:

Analytical Report

LOG NO: E90-02-104

Received: 02 FEB 90
Reported: 14 FEB 90

Mr. Mark Milani
Aqua Resources Inc.
2030 Addison Street, Suite 500
Berkeley, California 94704

Purchase Order: 87157.6

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, AQUEOUS SAMPLES	DATE SAMPLED
02-104-1	W-1	02 FEB 90

PARAMETER	02-104-1
EPA Method 602	
Date Extracted	02.12.90
1,2-Dichlorobenzene, ug/L	<0.5
1,3-Dichlorobenzene, ug/L	<0.5
1,4-Dichlorobenzene, ug/L	<0.5
Benzene, ug/L	3.2
Chlorobenzene, ug/L	<0.5
Ethylbenzene, ug/L	<0.5
Toluene, ug/L	<0.5
Total Xylene Isomers, ug/L	<0.5

1255 Powell Street
Emeryville, CA 94608

415/428-2300
Fax: 415/547-3643

BCA B C Analytical

Analytical Report

LOG NO: E90-02-104

Received: 02 FEB 90
Reported: 14 FEB 90

Mr. Mark Milani
Aqua Resources Inc.
2030 Addison Street, Suite 500
Berkeley, California 94704

Purchase Order: 87157.6

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION, BLANK WATER SAMPLES	DATE SAMPLED
02-104-2	Trip Blank	

PARAMETER	02-104-2
EPA Method 602	
Date Extracted	02.09.90
1,2-Dichlorobenzene, ug/L	<0.5
1,3-Dichlorobenzene, ug/L	<0.5
1,4-Dichlorobenzene, ug/L	<0.5
Benzene, ug/L	<0.5
Chlorobenzene, ug/L	<0.5
Ethylbenzene, ug/L	<0.5
Toluene, ug/L	<0.5
Total Xylene Isomers, ug/L	<0.5

Sim D. Lessley, Ph.D., Laboratory Director

1255 Powell Street
Emeryville, CA 94608

4151428-2300
Fax: 4151547-3643

BCA B C Analytical

LOG # 9002104

AQUA RESOURCES, INC.

SHIPMENT NO.: _____

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

DATE 2/2/90

PROJECT NAME: _____

PROJECT NO.: 87516

Sample Number	Location	Type of Sample: Material	Type of Sample: Method	Type of Container	Type of Preservation: Temp	Type of Preservation: Chemical	Analysis Required
A1-1		water		vials	ice		BTEX & 602
Trip Blank							

Total Number of Samples Shipped: 5

Sampler's Signature: Patricia Rodgers

Relinquished By:
Signature: Patricia Rodgers
Printed Name: PATRICIA RODGERS
Company: AQUA RESOURCES
Reason: analysis

Received By:
Signature: Marla Scott
Printed Name: Marla Scott
Company: BCAL

Date: 2/2/90
Time: 4:42pm

Relinquished By:
Signature: _____
Printed Name: _____
Company: _____
Reason: _____

Received By:
Signature: _____
Printed Name: _____
Company: _____

Date: / /
Time: _____

REMARKS:

Lab to run blanks for possible analysis

Special Shipment / Handling / Storage Requirements: Requires 0.5 ug/L RDL Contact client if problems are encountered.

KC 2/2/90

Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 05/02/90
DATE REPORTED: 05/07/90

LAB NUMBER: 100358

CLIENT: AQUA RESOURCES

REPORT ON: 1 WATER SAMPLES

PROJECT #: 87157.6

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 100358
CLIENT: AQUA RESOURCES
JOB #: 87157.6

DATE RECEIVED: 05/02/90
DATE EXTRACTED: 05/03/90
DATE ANALYZED: 05/04/90
DATE REPORTED: 05/07/90

Extractable Petroleum Hydrocarbons in Aqueous Solutions
California DOHS Method
LUFT Manual October 1989

LAB ID	CLIENT ID	KEROSENE RANGE (mg/L)	DIESEL RANGE (mg/L)	REPORTING LIMIT (mg/L)
100358-1	W-1	ND	ND	0.50

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	96

Curtis & Tompkins, Ltd.

LABORATORY NUMBER: 100358-1
CLIENT: AQUA RESOURCES
JOB #: 87157.6
SAMPLE ID: W-1

DATE RECEIVED: 05/02/90
DATE ANALYZED: 05/03/90
DATE REPORTED: 05/07/90

EPA 8020: Volatile Aromatic Hydrocarbons in Water

COMPOUND	RESULT ug/L	REPORTING LIMIT ug/L
Benzene	ND	0.50
Toluene	ND	0.50
Ethyl Benzene	ND	0.50
Total Xylenes	ND	0.50
Chlorobenzene	ND	0.50
1,4-Dichlorobenzene	ND	0.50
1,3-Dichlorobenzene	ND	0.50
1,2-Dichlorobenzene	ND	0.50

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

RPD, %	2
RECOVERY, %	90

100358

AQUA RESOURCES, INC.

SHIPMENT NO.: _____

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

DATE 5/2/90

PROJECT NAME: _____

PROJECT NO.: 87157.6

Sample Number	Location	Type of Sample: Material	Type of Sample: Method	Type of Container	Type of Preservation: Temp	Type of Preservation: Chemical	Analysis Required
W-1		water		Liter	ice		TEH
W-1		water		vials	ice		602

Total Number of Samples Shipped: _____ Sampler's Signature: Patricia Rodgers

Relinquished By: Signature: Patricia Rodgers; Printed Name: PATRICIA RODGERS; Company: AQUA RESOURCES; Reason: analysis	Received By: Signature: Nancy L. Wilson; Printed Name: Nancy L. Wilson; Company: C ST Lab	Date: 5/2/90; Time: 4:15
Relinquished By: Signature: _____; Printed Name: _____; Company: _____; Reason: _____	Received By: Signature: _____; Printed Name: _____; Company: _____	Date: / /; Time: _____

REMARKS:

Detection Limit Should be 0.5 ug/L

Hold travel blanks for possible analysis.

Special Shipment / Handling / Storage Requirements: