RESNA
Working To Restore Nature

3315 Almaden Expressway, Suite 34
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Phone: (408) 264-7723
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SEMI-ANNUAL GROUNDWATER SAMPLING AND ANALYSIS SEPTEMBER 1993

AT

THREE CITY OF ALAMEDA FACILITIES ALAMEDA, CALIFORNIA

Project No. 11010.02
November 1993

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Working To Restore Nature

3315 Almaden Expressway, Suite 34
San Jose, CA 95118
Phone: (408) 264-7723
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November 3, 1993
Project No. 11010.02

Mr. Jim Sanderson
City of Alameda
Maintenance Service Center
1616 Fortmann Way
Alameda, California 94501

Subject: Semi-Annual Groundwater Sampling and Analysis - September 1993 at Three City of Alameda Facilities, Alameda, California

Dear Mr. Sanderson:

RESNA Industries Inc. has completed the semi-annual sampling and analysis of six groundwater monitoring wells located at three City of Alameda facilities (Plate 1). Groundwater sampling was conducted on September 29, 1993, to satisfy the underground fuel storage compliance requirements of the County of Alameda. The six sampled wells are located at the following locations: Fire Stations No. 2 (FS2-MW1), Fire Station No. 3 (FS3-MW1 and FS3-MW2), City Hall (CH-MW1 and CH-MW2), and the Police Station (PS-MW1). The site plan for each facility is shown on Plates 2 through Plate 4.

Groundwater samples were collected in accordance with RESNA's groundwater sampling protocol (Appendix A). Prior to sampling, the wells were checked for the presence of free-floating product with a clear acrylic bailer; none was observed. Each well was then purged of approximately four well-casing volumes of water before sampling. Groundwater samples were collected in a clean teflon bailer, preserved in laboratory-supplied bottles, and stored in a chilled ice chest for shipment to a state-certified laboratory following proper chain-of-custody procedures.

The groundwater samples were analyzed following EPA-approved methods for the presence of either total petroleum hydrocarbons as diesel (TPHd), total petroleum hydrocarbons as gasoline (TPHg) with a benzene, toluene, ethylbenzene, and total xylenes (BTEX) distinction, or for TPHd, TPHg and BTEX. The type of analysis performed by the laboratory on each sample depended on the type of fuel stored at each City of Alameda Facility.

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City of Alameda **November 3, 1993**
Project No. 11010.02

Laboratory results indicated that no TPHg and BTEX were detected in samples from wells FS3-MW1, FS3-MW2, CH-MW1, and CH-MW2.

Laboratory results indicated that no TPHd were detected in samples from wells FS2-MW1 and FS3-MW2. However, the laboratory reported the presence of 470 parts per billion (ppb) TPHd in well PS-MW1. The chromatogram pattern of TPHd consisted of a "Non-Diesel Mix, C13-C20". The laboratory also reported the presence of 350 ppb TPHd in the bailer blank; the chromatogram pattern of TPHd contained "discrete peaks". A laboratory note states "that the chromatograms of samples PS-MW1 and BB-1 were compared and found not to match". Therefore the presence of TPHd in the BB-1 sample appears to be anomalous. A summary of groundwater analysis data from sampling events is shown in Table 1. Copies of the laboratory report and chain-of-custody record for the September 1993 sampling event are presented in Appendix B.

We recommend that a copy of this report be forwarded by the City of Alameda to the following agency:

Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94612
Attention: Ms. Pamela Evans

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

Sincerely,
RESNA Industries Inc.

Zbigniew L. Ignatowicz
Staff Geologist

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

James L. Nelson
Certified Engineering Geologist 1463

Enclosures:
- Table 1: Summary of Groundwater Analyses Data
- Plate 1: Site Location Map
- Plate 2: Site Plan, Fire Station No.2
- Plate 3: Site Plan, Fire Station No.3
- Plate 4: Site Plan, City Hall and Police Station

- Appendix A: Groundwater Sampling Protocol and Well Purge Data Sheets
- Appendix B: Certified Laboratory Reports and Chain-of-Custody Record

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City of Alameda
Project No. 11010.02

November 3, 1993

TABLE 1

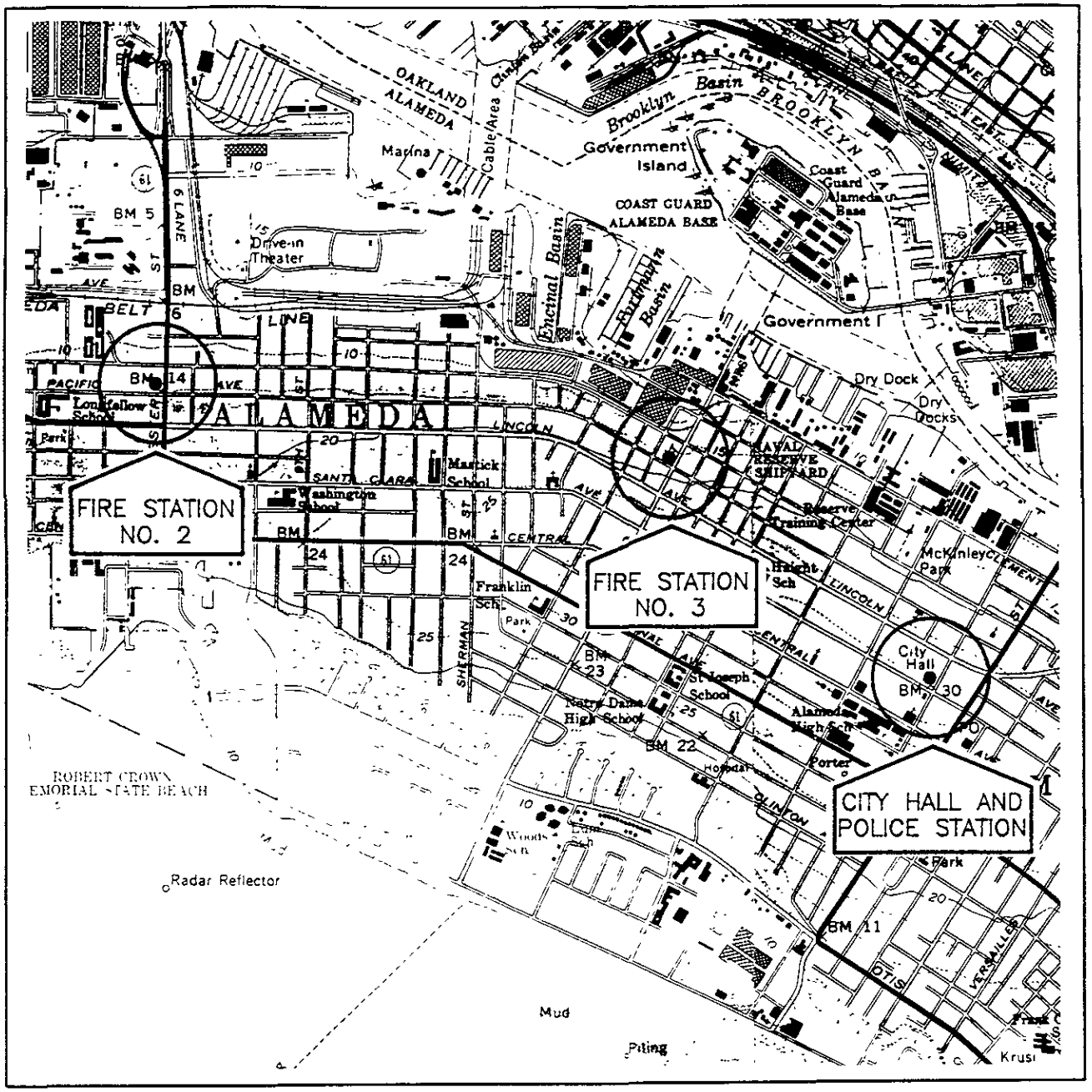
SUMMARY OF GROUNDWATER ANALYSIS DATA
at
Three City of Alameda Facilities
Alameda, California

Sample Number	Date Sampled	TPHg (ppb)	TPHd (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl benzene (ppb)	Total Xylenes (ppb)
FS2-MW1	05/05/87	NA	120	NA	NA	NA	NA
	02/16/88	NA	<50	NA	NA	NA	NA
	08/24/88	NA	<60	NA	NA	NA	NA
	02/08/89	NA	<50	NA	NA	NA	NA
	08/07/89	NA	<50	NA	NA	NA	NA
	02/06/90	NA	<50	NA	NA	NA	NA
	08/28/90	NA	<50	NA	NA	NA	NA
	02/08/91	NA	<50	NA	NA	NA	NA
	03/04/92	NA	<100	NA	NA	NA	NA
	09/08/92	NA	<50	NA	NA	NA	NA
	03/11/93	NA	<50	NA	NA	NA	NA
	09/29/93	NA	<50	NA	NA	NA	NA
FS3-MW1	08/05/87	<20	NA	<0.7	<0.7	<0.7	<0.7
	02/16/88	<50	<0.5	<0.5	<0.5	<0.5	<0.5
	08/24/88	36	NA	<0.1	<0.1	<0.1	<0.2
	02/08/89	<50	NA	<0.5	<0.5	0.86	<0.5
	08/07/89	93	NA	3.0	<0.3	<0.3	0.38
	02/06/90	<30	NA	<0.3	<0.3	<0.3	<0.3
	08/28/90	<30	<50	<0.3	<0.3	<0.3	<0.3
	02/08/91	<30	NA	<0.3	<0.3	<0.3	<0.3
	03/04/92	<50	NA	<0.5	<0.5	<0.5	<0.5
	09/08/92	<50	NA	NA	NA	NA	NA
	03/11/93	<50	NA	<0.5	<0.5	<0.5	<0.5
	09/29/93	<50	NA	<0.50	<0.50	<0.50	<0.50

TABLE 1 - (con't)

SUMMARY OF GROUNDWATER ANALYSIS DATA
at
Three City of Alameda Facilities
Alameda, California

Sample Number	Date Sampled	TPHg (ppb)	TPHd (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl benzene (ppb)	Total Xylenes (ppb)
FS3-MW2	08/05/87	NA	<10	NA	NA	NA	NA
	02/16/88	NA	<50	NA	NA	NA	NA
	08/24/88	NA	<60	NA	NA	NA	NA
	02/08/89	NA	<50	NA	NA	NA	NA
	08/07/89	NA	<50	NA	NA	NA	NA
	02/06/90	<30	<50	<0.3	<0.3	<0.3	<0.3
	08/28/90	<30	<50	<0.3	<0.3	<0.3	<0.3
	02/08/91	NA	<50	NA	NA	NA	NA
	03/04/92	<50	<100	<0.5	<0.5	<0.5	<0.5
	09/08/92	<50	<50	NA	NA	NA	NA
	03/11/93	<50	<50	<0.5	<0.5	<0.5	<0.5
	09/29/93	<50	<50	<0.50	<0.50	<0.50	<0.50
CH-MW1	08/05/87	<20	NA	<0.4	<0.4	NA	<0.4
	02/16/88	<50	NA	<0.5	<0.5	NA	<0.5
	08/24/88	<7	NA	<0.1	<0.1	<0.1	<0.2
	02/08/89	<50	NA	<0.5	<0.5	<0.5	<0.5
	08/07/89	<30	NA	<0.3	<0.3	<0.3	<0.3
	02/09/90	<30	NA	<0.3	<0.3	<0.3	<0.3
	08/28/90	<30	NA	<0.3	<0.3	<0.3	<0.3
	02/08/91	<30	NA	<0.3	<0.3	<0.3	<0.3
	03/04/92	<50	NA	<0.5	<0.5	<0.5	<0.5
	09/08/92	<50	NA	NA	NA	NA	NA
	03/11/93	<50	NA	<0.5	<0.5	<0.5	<0.5
	09/29/93	<50	NA	<0.50	<0.50	<0.50	<0.50



Source U.S Geological Survey
7 5–Minute Quadrangle
Oakland East, Oakland West, California
Photorevised 1980

N

Approximate Scale
2000 1000 0 2000
feet

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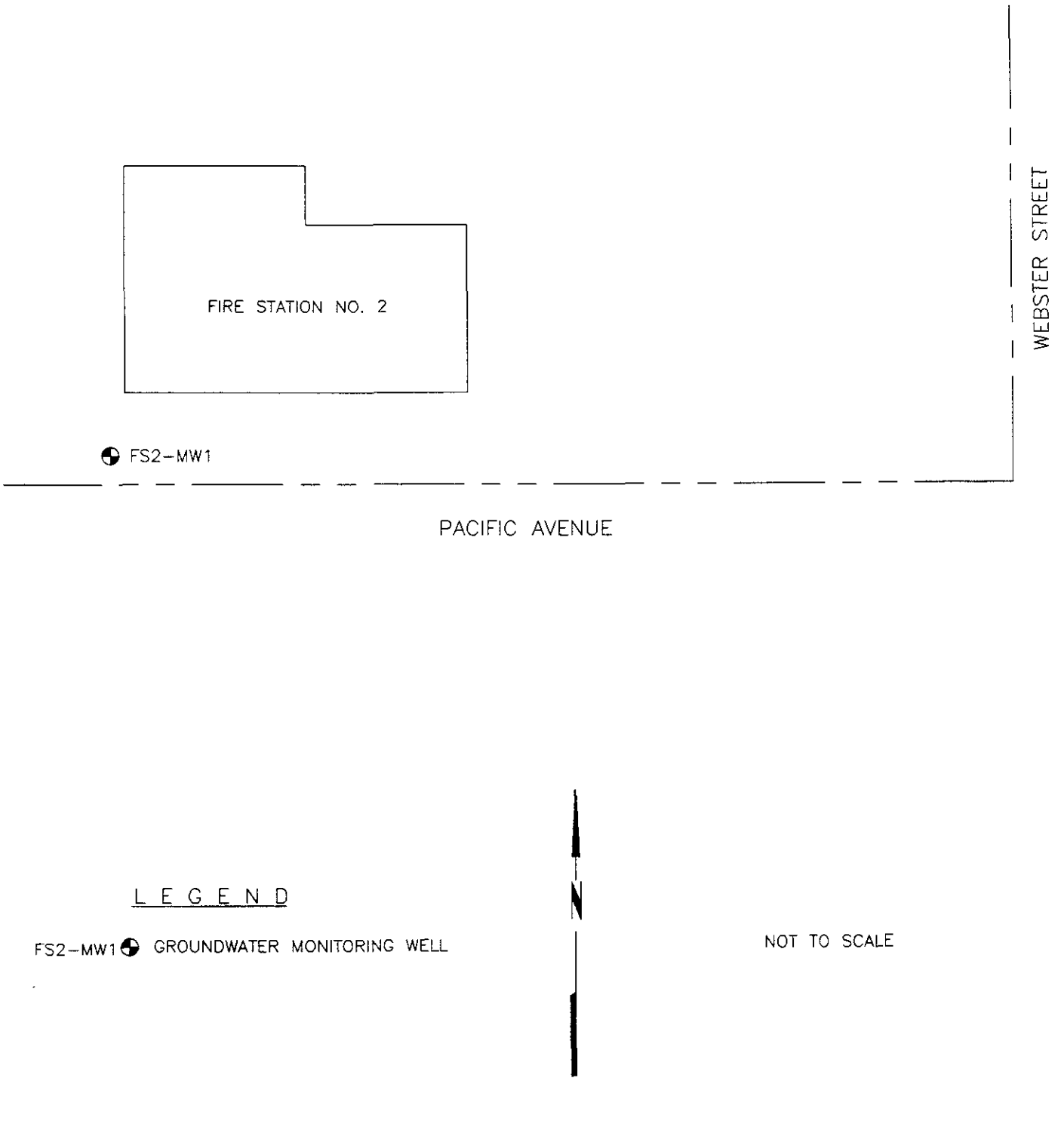
SITE VICINITY MAP
Fire Station No. 2, and No. 3
City Hall and Police Station
Alameda, California

PLATE
1

110102F2



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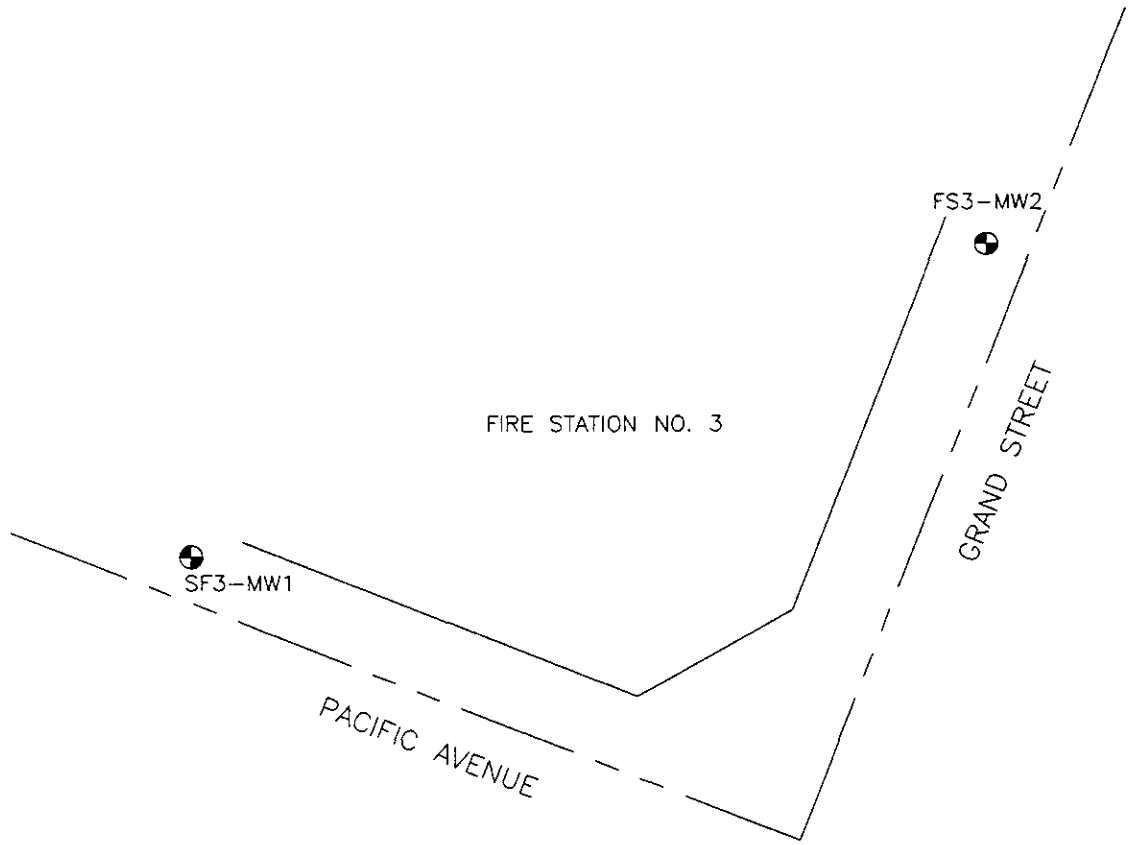
SITE PLAN
Fire Station No. 2
636 Pacific Avenue
Alameda, California

PLATE
2

110102F3



L E G E N D

FS3-MW2 GROUNDWATER MONITORING WELL

N

NOT TO SCALE

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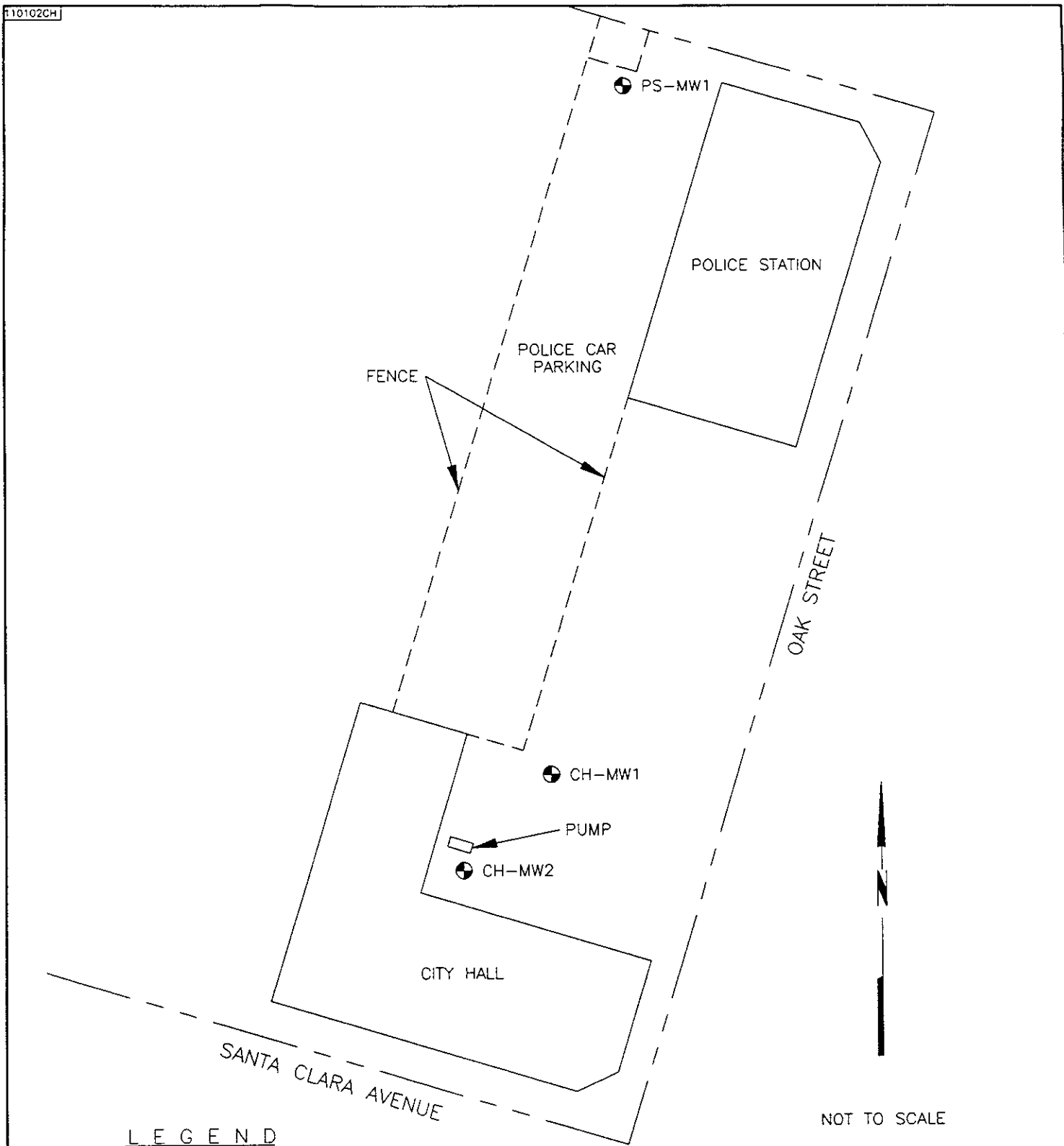
SITE PLAN
Fire Station No. 3
1703 Grand Street
Alameda, California

PLATE
3



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SITE PLAN
City Hall and Police Station
2263 Santa Clara Avenue
Alameda, California

PLATE
4

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APPENDIX A

GROUNDWATER SAMPLING PROTOCOL AND WELL PURGE DATA SHEETS

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GROUNDWATER SAMPLING PROTOCOL

Sampling of groundwater is performed by RESNA Industries Inc., sampling technicians. Monitoring well sampling procedures are summarized as follows:

1. Wells are sampled in approximately order of increasing contamination.
2. Proceed to first well with clean and decontaminated equipment.
3. Measure depths to liquid surface(s) in the well, and total depth of monitoring well. Note presence of sediment.
4. Field check for presence of floating product; measure apparent thickness.
5. Calculate minimum purge volume (well volumes) then purge well.
6. Monitor groundwater for temperature, pH, and specific conductance during purging. Following stabilization of parameters and removal of minimum volume, allow well to recover adequately.
7. Collect samples using Environmental Protection Agency (EPA) approved sample collection devices, i.e., teflon or stainless steel bailers or pumps.
8. Transfer samples into laboratory-supplied EPA-approved containers.
9. Label samples and log onto chain-of-custody form.
10. Store samples in a chilled ice chest for shipment to state-certified analytical laboratory.
11. Secure wellhead.
12. Decontaminate equipment prior to sampling next well.

Equipment Cleaning and Decontamination

All water samples are placed in precleaned laboratory-supplied bottles. Sample bottles and caps remain sealed until actual usage at the site. All equipment which comes in contact with interior of the well or groundwater is thoroughly cleaned with either a steam cleaner, a trisodium phosphate (TSP) solution or an Alconox™ solution and rinsed with deionized or distilled water before use at the site. This cleaning procedure is followed between each well sampled. If a teflon cord is used, the cord is cleaned. If a nylon or cotton cord is used, a new cord is used in each well.

All equipment blanks are collected prior to sampling. The blanks are analyzed periodically to ensure proper cleaning procedures are used.

Water Level Measurements

Depth to groundwater is measured in each well using a sealed sampling tape or scaled electric sounder prior to purging or sampling. If the well is known or suspected of containing free-phase petroleum hydrocarbons, either an optical interface probe or a bailer is used to measure the hydrocarbon thickness. Measurements are collected and recorded to the nearest 0.01 foot. Each monitoring well's total depth will be measured; this will allow a relative judgement of well sedimentation and need for redevelopment to be made.

Bailer Sheen Check

If no measurable free-phase petroleum hydrocarbons are detected, a clear acrylic bailer is used to determine the presence of a sheen. The color of the water and any film or obvious odor are recorded.

Groundwater Sampling

Prior to groundwater sampling, each well is purged of "standing" groundwater. Either a bailer, hand pump, or submersible pump is used to purge the well. The amount of purging is dependent on the well hydraulics. Samples will be collected when temperature, pH, and specific conductance stabilize and a minimum of three well-casing volumes of water have been removed. Field measurements will be taken after purging each well volume. Physical parameter measurements (temperature, pH, and specific conductance) are closely monitored throughout the well purging process and are used as indicators for assessing sufficient purging. The purging parameters are measured to observe stabilization to a range of values typical for that aquifer and well. Stable field parameters are recognized as indicative of groundwater aquifer chemistry entering the well. Specific conductance (conductivity) meters are read to the nearest ± 10 μmhos/cm and are calibrated daily. pH meters are read to the nearest ± 0.1 pH units and are calibrated daily. Temperature is read to the nearest $\pm$ °F.

Calibration of physical parameter meters will follow manufacturer's specifications. Collected field data during purging activities will be entered on the Well Sampling Field Data Sheet.

Following purging, the well is allowed to recharge prior to sampling. When recovery to 80% of the static water level is estimated or observed to exceed two hours, a sample will be collected when sufficient volume is available to fill all sample containers. The well will be purged slowly enough to minimize the volatilization of organic contaminants during well recharge.

In wells where free-phase hydrocarbons are detected, the free-phase portion will be bailed from the well and its volume recorded. If free-phase hydrocarbons persist through bailing, a groundwater sample will not be collected.

Volatile organic groundwater samples are collected so that air passage through the sample does not occur or is minimal (to prevent volatiles from being stripped from the samples). Sample bottles are filled by slowly running the sample down the side of the bottle until there is a positive convex meniscus over the mouth of the bottle. The teflon side of the septum (in cap) is then positioned against the meniscus, the cap is screwed on tightly, the sample is inverted, and the bottle is lightly tapped. If a bubble is evident, the cap is removed, more sample is added, and the bottle is resealed.

Chain-of-Custody

Groundwater sample containers are labeled with a unique sample number, location, and date of collection. All samples are logged into a chain-of-custody form and placed in a secure, chilled ice chest for shipment to a laboratory certified by the State of California.

Sample Storage

Groundwater samples collected in the field are stored in an ice chest cooled to approximately 4 °C while in transit to the office or analytical laboratory. Sample are stored in a refrigerator overnight and during weekends and holidays. The refrigerator is set to 4 °C and is locked with access controlled by a designated sample custodian.

Quality Assurance/Quality Control

The sampling and analysis procedures employed by RESNA for groundwater sampling and monitoring follow regulatory guidance for quality assurance/quality control (QA/QC).

Laboratory and field handling procedures of samples may be monitored by including QC samples for analysis. QC samples may include any combination of the following:

- **Trip Blanks:** Trip blanks are sent to the project site, and travel with project site samples. Trip blanks are **not** opened, and are returned from a project site with the project site samples for analysis.
- **Duplicates:** Duplicated samples are collected "second samples" from a selected well and project site. They are collected as either split samples or second-run samples collected from the same well.
- **Equipment Blank:** Periodic QC samples collected from field equipment rinseate to verify decontamination procedures.

The number and types of QC samples are determined and analyzed on a project-specific basis.

Shallow Groundwater Survey

A shallow groundwater survey employs reconnaissance field sampling and chemical analysis for rapid plume mapping. A state-certified mobile laboratory may be used. The subcontractor would sample for analysis at locations marked by the RESNA field geologist. The thin-diameter probes from which groundwater is collected are advanced to the water bearing stratum and a groundwater sample is withdrawn to the surface, and analyzed immediately thereafter. Probe holes are backfilled with a grout slurry or as the local permitting agency requires. The contractor will report the details and results sampling, purging, and chemical analysis to RESNA. RESNA considers this type of shallow probe mapping (together with shallow groundwater sampling) to be a reconnaissance technique only.

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WELL PURGE DATA SHEET

Project Name: City of Alameda, Alameda, California

Job No. 11010.02

Date: September 29, 1993

Page 1 of 1

Well No. CH-MW-1

Time Started 9:57

TIME (hr)	GALLONS (cum.)	TEMP. (F)	pH	CONDUCT. (micromho)	TURBIDITY (NTU)
9:57	Start purging CH-MW-1				
9:59	1	67.5	7.21	460	---*
10:01	2	69.0	7.16	470	---
10:03	3	70.1	7.04	460	---
10:06	4	69.9	6.96	470	---
10:06	Stop purging CH-MW-1				

Notes:

Well Diameter (inches) : 2
Depth to Bottom (feet) : 15.13
Depth to Water - initial (feet) : 10.15
Depth to Water - final (feet) : 10.21
% recovery : 99
Time Sampled : 10:45
Gallons per Well Casing Volume : 0.84
Gallons Purged : 4.0
Well Casing Volume Purged : 4.7
Approximate Pumping Rate (gpm) : 0.44

---* No Readings Collected

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WELL PURGE DATA SHEET

Project Name: City of Alameda, Alameda, California

Job No. 11010.02

Date: September 29, 1993

Well No. CH-MW-2

Time Started 9:38

TIME (hr)	GALLONS (cum.)	TEMP. (F)	pH	CONDUCT. (micromho)	TURBIDITY (NTU)
9:38	Start purging CH-MW-2				
9:40	1	66.0	7.54	440	---
9:43	2	66.9	7.42	440	---
9:46	3	67.3	7.15	440	---
9:49	4	67.2	7.10	430	---
	Stop purging CH-MW-2				

Notes:

Well Diameter (inches) : 2
Depth to Bottom (feet) : 15.73
Depth to Water - initial (feet) : 10.00
Depth to Water - final (feet) : 10.25
% recovery : 95
Time Sampled : 10:55
Gallons per Well Casing Volume : 0.97
Gallons Purged : 4.0
Well Casing Volume Purged : 4.1
Approximate Pumping Rate (gpm) : 0.36

---* No Readings Collected

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WELL PURGE DATA SHEET

Project Name: City of Alameda, Alameda, California

Job No. 11010.02

Date: September 29, 1993

Well No. PS-MW-1

Time Started 11:22

TIME (hr)	GALLONS (cum.)	TEMP. (F)	pH	CONDUCT. (micromho)	TURBIDITY (NTU)
11:22	Start purging PS-MW-1				
11:24	1	68.2	7.46	440	---
11:26	2	68.5	7.33	460	---
11:28	3	68.7	7.24	460	---
11:32	3.75	68.7	7.18	460	---
11:32	Stop purging PS-MW-1				

Notes:

Well Diameter (inches) : 2
Depth to Bottom (feet) : 15.85
Depth to Water - initial (feet) : 10.42
Depth to Water - final (feet) : 10.80
% recovery : 93
Time Sampled : 11:50
Gallons per Well Casing Volume : 0.92
Gallons Purged : 3.75
Well Casing Volume Purged : 4.0
Approximate Pumping Rate (gpm) : 0.375

---* No Readings Collected

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WELL PURGE DATA SHEET

Project Name: City of Alameda, Alameda, California

Job No. 11010.02

Date: September 29, 1993

Page 1 of 1

Well No. FS2-MW-1

Time Started 15:24

TIME (hr)	GALLONS (cum.)	TEMP. (F)	pH	CONDUCT. (micromho)	TURBIDITY (NTU)
15:24	Start purging FS2-MW-1				
15:29	2	71.2	9.56	490	---
15:33	4	70.3	9.14	540	---
15:37	6	69.7	8.98	540	---
15:41	7.5	69.2	8.89	540	---
15:41	Stop purging FS2-MW-1				

Notes:

Well Diameter (inches) : 2
Depth to Bottom (feet) : 17.64
Depth to Water - initial (feet) : 6.80
Depth to Water - final (feet) : 7.19
% recovery : 96
Time Sampled : 16:00
Gallons per Well Casing Volume : 1.84
Gallons Purged : 7.5
Well Casing Volume Purged : 4.0
Approximate Pumping Rate (gpm) : 0.44

---* No Readings Collected

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WELL PURGE DATA SHEET

Project Name: City of Alameda, Alameda, California — Job No. 11010.02

Date: September 29, 1993 — Page 1 of 1

Well No. FS3-MW-1 — Time Started 13:12

TIME (hr)	GALLONS (cum.)	TEMP. (F)	pH	CONDUCT. (micromho)	TURBIDITY (NTU)
13:12	Start purging FS3-MW-1				
13:16	2	72.8	9.42	310	---
13:20	4	71.8	9.09	330	---
13:24	6	71.5	8.98	380	---
13:29	8.75	71.3	8.70	400	---
13:29	Stop purging FS3-MW-1				

Notes:

Well Diameter (inches) : 2
Depth to Bottom (feet) : 19.60
Depth to Water - initial (feet) : 6.95
Depth to Water - final (feet) : 7.03
% recovery : 99
Time Sampled : 14:30
Gallons per Well Casing Volume : 2.15
Gallons Purged : 8.75
Well Casing Volume Purged : 4.0
Approximate Pumping Rate (gpm) : 0.51

---* No Readings Collected

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WELL PURGE DATA SHEET

Project Name: City of Alameda, Alameda, California

Job No. 11010.02

Date: September 29, 1993

Page 1 of 1

Well No. FS3-MW-2

Time Started 13:33

TIME (hr)	GALLONS (cum.)	TEMP. (F)	pH	CONDUCT. (micromho)	TURBIDITY (NTU)
13:33	Start purging FS3-MW-2				
13:37	2	70.5	8.46	320	---
13:42	4	70.4	8.47	320	---
13:47	6	69.8	8.56	340	---
13:53	8	70.3	8.49	330	---
13:53	Stop purging FS3-MW-2				

Notes:

Well Diameter (inches) : 2
Depth to Bottom (feet) : 17.87
Depth to Water - initial (feet) : 6.55
Depth to Water - final (feet) : 7.00
% recovery : 96 %
Time Sampled : 14:40
Gallons per Well Casing Volume : 1.92
Gallons Purged : 8.0
Well Casing Volume Purged : 4.1
Approximate Pumping Rate (gpm) : 0.80

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APPENDIX B

CERTIFIED LABORATORY REPORTS AND CHAIN-OF-CUSTODY RECORD

SEQUOIA ANALYTICAL

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

RESNA	Client Project ID:	11010.02, City of Alameda	Sampled:	Sep 29, 1993
3315 Almaden Expwy., Suite 34	Sample Matrix:	Water	Received:	Sep 30, 1993
San Jose, CA 95118	Analysis Method:	EPA 5030/8015/8020	Reported:	Oct 14, 1993
Attention: Zbig Ignatowicz	First Sample #:	3IF6501		

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit µg/L	Sample I.D. 3IF6501 CH-MW1	Sample I.D. 3IF6502 CH-MW2	Sample I.D. 3IF6504 FS3-MW1	Sample I.D. 3IF6505 FS3-MW2
Purgeable Hydrocarbons	50	N.D.	N.D.	N.D.	N.D.
Benzene	0.50	N.D.	N.D.	N.D.	N.D.
Toluene	0.50	N.D.	N.D.	N.D.	N.D.
Ethyl Benzene	0.50	N.D.	N.D.	N.D.	N.D.
Total Xylenes	0.50	N.D.	N.D.	N.D.	N.D.
Chromatogram Pattern:		--	--	--	--

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0
Date Analyzed:	10/5/93	10/5/93	10/5/93	10/5/93
Instrument Identification:	GCHP-7	GCHP-7	GCHP-7	GCHP-7
Surrogate Recovery, %: (QC Limits = 70-130%)	106	115	114	101

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

SEQUOIA ANALYTICAL

V. Tague

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

RESNA	Client Project ID:	11010.02, City of Alameda	Sampled:	Sep 29, 1993
3315 Almaden Expwy., Suite 34	Sample Matrix:	Water	Received:	Sep 30, 1993
San Jose, CA 95118	Analysis Method:	EPA 3510/3520/8015	Reported:	Oct 14, 1993
Attention: Zbig Ignatowicz	First Sample #:	3IF6503	Amended:	Oct 25, 1993

TOTAL EXTRACTABLE PETROLEUM HYDROCARBONS

Analyte	Reporting Limit µg/L	Sample I.D. 3IF6503 PS-MW1	Sample I.D. 3IF6505 FS3-MW2	Sample I.D. 3IF6506 FS2-MW1	Sample I.D. 3IF6507 BB-1
Extractable Hydrocarbons	50	470	N.D.	N.D.	350
Chromatogram Pattern:		Non-Diesel Mix C13 - C20	--	--	Discrete Peaks

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0
Date Extracted:	10/5/93	10/5/93	10/5/93	10/6/93
Date Analyzed:	10/8/93	10/7/93	10/7/93	10/8/93
Instrument Identification:	GCHP-5	GCHP-5	GCHP-5	GCHP-5

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
The chromatograms of samples PS-MW1 and BB-1 were compared and found not to match.

SEQUOIA ANALYTICAL

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

RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Zbig Ignatowicz

Client Project ID: 11010.02, City of Alameda
Matrix: Water

QC Sample Group: 3IF6501-6

Reported: Oct 14, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	E. Cunanan	E. Cunanan	E. Cunanan	E. Cunanan
Conc. Spiked:	10	10	10	30
Units:	µg/L	µg/L	µg/L	µg/L
LCS Batch#:	BLK100593	BLK100593	BLK100593	BLK100593
Date Prepared:	-	-	-	-
Date Analyzed:	10/5/93	10/5/93	10/5/93	10/5/93
Instrument I.D.#:	GCHP-7	GCHP-7	GCHP-7	GCHP-7
LCS % Recovery:	110	110	110	100
Control Limits:	80-120	80-120	80-120	80-120
MS/MSD Batch #:	3J08402	3J08402	3J08402	3J08402
Date Prepared:	-	-	-	-
Date Analyzed:	10/5/93	10/5/93	10/5/93	10/5/93
Instrument I.D.#:	GCHP-7	GCHP-7	GCHP-7	GCHP-7
Matrix Spike % Recovery:	98	99	100	93
Matrix Spike Duplicate % Recovery:	93	94	96	93
Relative % Difference:	5.2	5.2	4.1	0.0

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation and analytical methods employed for the samples. The LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.

SEQUOIA ANALYTICAL

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RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Zbig Ignatowicz

Client Project ID: 11010.02, City of Alameda
Matrix: Water

QC Sample Group: 3IF6503, 5-6

Reported: Oct 14, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Diesel

Method:	EPA 8015
Analyst:	V. Harabajahian
Conc. Spiked:	300
Units:	µg/L
LCS Batch#:	BLK100593
Date Prepared:	10/5/93
Date Analyzed:	10/7/93
Instrument I.D.#:	GCHP-5
LCS % Recovery:	80
Control Limits:	50-150

MS/MSD Batch #:	3IF6506
Date Prepared:	10/5/93
Date Analyzed:	10/7/93
Instrument I.D.#:	GCHP-5
Matrix Spike % Recovery:	68
Matrix Spike Duplicate % Recovery:	63
Relative % Difference:	7.6

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
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SEQUOIA ANALYTICAL

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RESNA
3315 Almaden Expwy., Suite 34
San Jose, CA 95118
Attention: Zbig Ignatowicz

Client Project ID: 11010.02, City of Alameda
Matrix: Water

QC Sample Group: 3IF6507

Reported: Oct 14, 1993

QUALITY CONTROL DATA REPORT

ANALYTE	Diesel

Method:	EPA 8015
Analyst:	V. Harabajahian
Conc. Spiked:	300
Units:	µg/L
LCS Batch#:	BLK100693
Date Prepared:	10/6/93
Date Analyzed:	10/8/93
Instrument I.D.#:	GCHP-5
LCS % Recovery:	55
Control Limits:	50-150
MS/MSD Batch #:	3J13304
Date Prepared:	10/6/93
Date Analyzed:	10/8/93
Instrument I.D.#:	GCHP-5
Matrix Spike % Recovery:	*
Matrix Spike Duplicate % Recovery:	*
Relative % Difference:	*

*MS/MSD diluted out.

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation and analytical methods employed for the samples. The LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.

RESNA

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO.	PROJECT NAME/SITE	SAMPLERS (SIGN)	(PRINT)
11010.02	City of Alameda City Hall, Police Station, Fire Station, Alameda, CA	Jeffrey D. Sola	JEFFREY D. SALA

ANALYSIS REQUESTED: BTEX (602/8020); TPHg (8015); TPHd (8015); TOG 418.1/5520; 601/8010; 624/8240; 625/8270; 9309 FLS

P.O #.

SAMPLE IDENTIFICATION	DATE	TIME	COMP	GRAB	PRES. USED	ICED	NO. CONTAINERS	SAMPLE TYPE	REMARKS
BB-1	9/29/93	10:40			[illegible]	Y	3	W	2 VOA'S HCL AMBER * HOLD
CH-MW1		10:45			HCL		2		9309F05-01
CH-MW2		10:55			HCL		2		-02
PS-MW1		11:50			—		2		-03
FS3-MW1		2:30			HCL		2		-04
FS3-MW2		2:40			[illegible]		3		-05 2 VOA'S HCL AMBER
FS2-MW1		4:00			—		2		-06

* IF ANY [illegible] COMPOUND IS Detected IN ANY OF THE WELLS THAN ANALYZE Bailer BLANK BB-

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
Jeffrey D. Sola	9/30/93	1:46	[signature]
[signature]	9/30/93	1200	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE	TIME	RECEIVED BY LABORATORY: [signature]

LABORATORY: SEQUOIA

REQUESTED TURNAROUND TIME: NORMAL

RECEIPT CONDITION: COOL

PLEASE SEND RESULTS TO: ZBIG IGNATOWICZ San Jose

PROJECT MANAGER: