FIRST QUARTER 1996 GROUNDWATER MONITORING REPORT

HOUSING AUTHORITY OF THE CITY OF ALAMEDA FACILITY
1916 Webster Street
Alameda, California

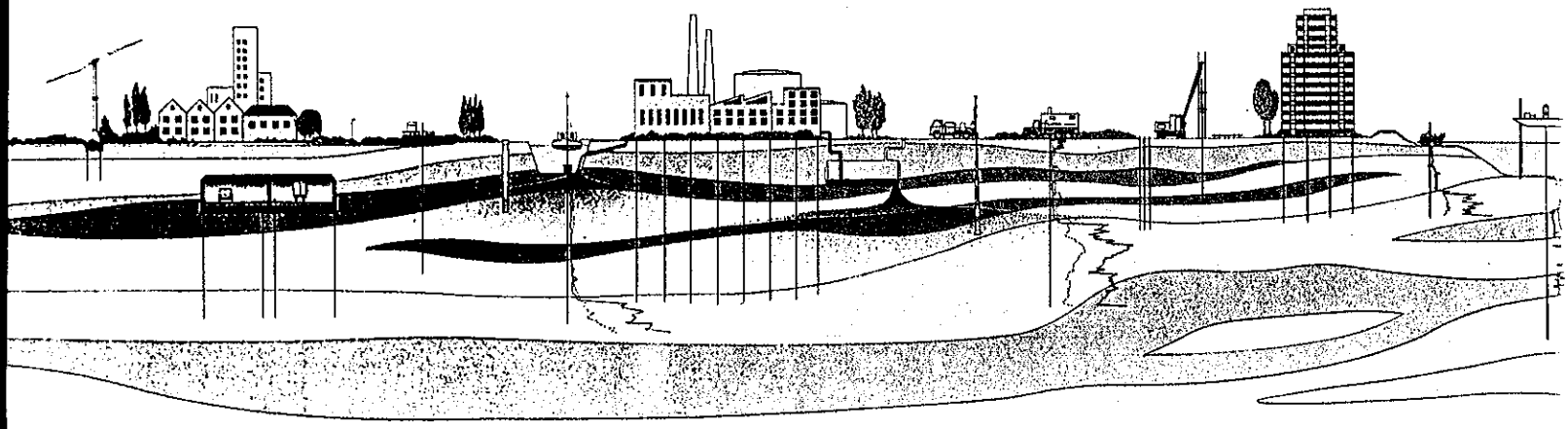
Prepared for:

HOUSING AUTHORITY OF THE CITY OF ALAMEDA
701 Atlantic Avenue
Alameda, California

Prepared by:

FUGRO WEST, INC.
44 Montgomery, Suite 1010
San Francisco, California 94104

April 1996
Fugro Project No. 9437-7623



FUGRO WEST, INC.

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May 1, 1996
Project No. 9437-7623

Ms. Eileen Duffy
Project Administrator
Housing Authority of the City of Alameda
701 Atlantic Avenue
Alameda, California 94501

First Quarter 1996 Groundwater Monitoring Report
Housing Authority of the City of Alameda
1916 Webster Street
Alameda, California

Dear Ms. Duffy:

This report presents the results of quarterly ground water monitoring and sampling conducted by Fugro West, Inc., (Fugro) on March 7, 1996, at the Housing Authority of the City of Alameda (AHA) facility located at 1916 Webster Street in Alameda, California (subject property), as shown on the Site Location Map, Figure 1.

BACKGROUND

The subject property consists of a warehouse building and adjacent parking lot located at the southeast corner of Webster Street and Atlantic Avenue in a commercial area of Alameda, California.

Tank Removal and Initial Investigation/Remediation

According to reports provided by AHA, a 280-gallon underground storage tank (UST) was removed from the site during July and August 1986. An environmental investigation was conducted to determine the extent of hydrocarbon-impacted soils. A series of soil borings were drilled at the site and soil samples were collected for laboratory analysis. Ground water monitoring wells MW-1 and MW-2 were installed in two of the borings. Hydrocarbons were identified in all soil and ground water samples analyzed. Additional soil excavation conducted during September 1986 failed to remove all of the impacted soil. Subsequent investigations included drilling and sampling additional soil borings and installing one additional ground water monitoring well (MW-3).

On September 12, 1994, Fugro installed three additional ground water monitoring wells at the site (MW-4, MW-5, and MW-6). Ground water monitoring/extraction well MW-4 was installed within 10 feet downgradient of the former UST. Monitoring well MW-5 was installed approximately 27 feet northeast of MW-4. Monitoring well MW-6 was installed south of the warehouse building (upgradient of the former UST). Ground water monitoring and sampling has been conducted at the site since October 1992. Monitoring events prior to July 1994 were performed by consultants other than Fugro. In September, 1995, the Alameda County Health Department advised the AHA to discontinue sampling from well MW-6 and reduce the sampling frequency of wells MW- 1, MW-2, and MW-3 to once a year. Monitoring wells MW-4 and MW-5 are sampled quarterly. Ground water elevations in wells MW-1 through MW-6 are measured and recorded on a quarterly basis.

CURRENT GROUND WATER MONITORING

All field work documented in this report was conducted according to the Fugro standard operating procedures (SOPs) included in Attachment 1.

Ground Water Elevations

Since the last quarterly monitoring event, ground water elevations in wells MW-1 through MW-6 increased an average of 1.62 feet. No free product was detected in any of the wells. Based on field data, the calculated ground water flow direction on March 7, 1996, was generally north-northwest at a gradient between 0.006 and 0.019 foot per foot. Figure 2 is a potentiometric surface map of the shallow water-bearing zone beneath the site according to water level measurements collected on March 7, 1996. Current and previous ground water elevation data are summarized in Table 1.

Ground Water Sampling and Analysis

On March 7, 1996, Fugro personnel collected ground water samples from monitoring wells MW-4 and MW-5. The samples were submitted under chain-of-custody to American Environmental Network (AEN) laboratory in Pleasant Hill, California for analysis of total petroleum hydrocarbons as gasoline (TPH-g) by EPA Method 8015M; benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 602; and total petroleum hydrocarbons as diesel (TPH-d) by EPA Method 3510. The Alameda County Health Department has recently determined that it is not necessary to conduct lead analysis on groundwater from the Subject Property as has been done in the past. AEN is a California state certified analytical laboratory.

Detected concentrations of TPH-g and BTEX in water samples from monitoring well MW-4 have increased and from monitoring well MW-5 have decreased since the November 1995 sampling event. The maximum concentrations of TPH-g and benzene on March 7, 1996, were detected at 2,200 micrograms per liter (µg/L) and 920 µg/L, respectively, in water samples from well MW-5. TPH-d was detected at concentration of 240 µg/L and 300 µg/L in MW-4 and MW-5, respectively. Prior TPH-d sampling has not occured at the Subject Property. There have been no documented release of diesel fuel at the Subject Property, and in Fugro's opinion, the TPH-d results are most likely representative of weathered gasoline hydrocarbons.

Results of laboratory analysis are reported on Table 2. Benzene and TPH-g concentrations are shown on Figure 3. The laboratory analytical reports and chain-of-custody form are included in Attachment 2.

REMARKS

The interpretations contained within this report represent our professional opinions. These opinions are based on available information, and were developed in accordance with currently accepted geologic, hydrogeologic, and engineering practices.

This report has been prepared solely for the use of the AHA. Any reliance on this report by other parties shall be at such parties' own risk. This report was prepared under the review and supervision of the professional engineer, registered with the State of California, whose signature appears below.

The next quarterly sampling event is scheduled for June, 1996.

We appreciate the opportunity to provide the AHA with environmental consulting services, and trust this report meets your needs. If you have any questions about this or any other matter, please call us at (415) 296-1041.

Sincerely,

FUGRO WEST, INC.

Jeffrey Landry.
Environmental Scientist

Peter Hudson
Project Geologist

REGISTERED PROFESSIONAL ENGINEER
SUDHAKAR TALANKI R.
No. C055195
Exp. 6/30/96
CIVIL
STATE OF CALIFORNIA

Sudhakar Talanki
P.E. No. C055195

4/29/96
(Date)

Attachments

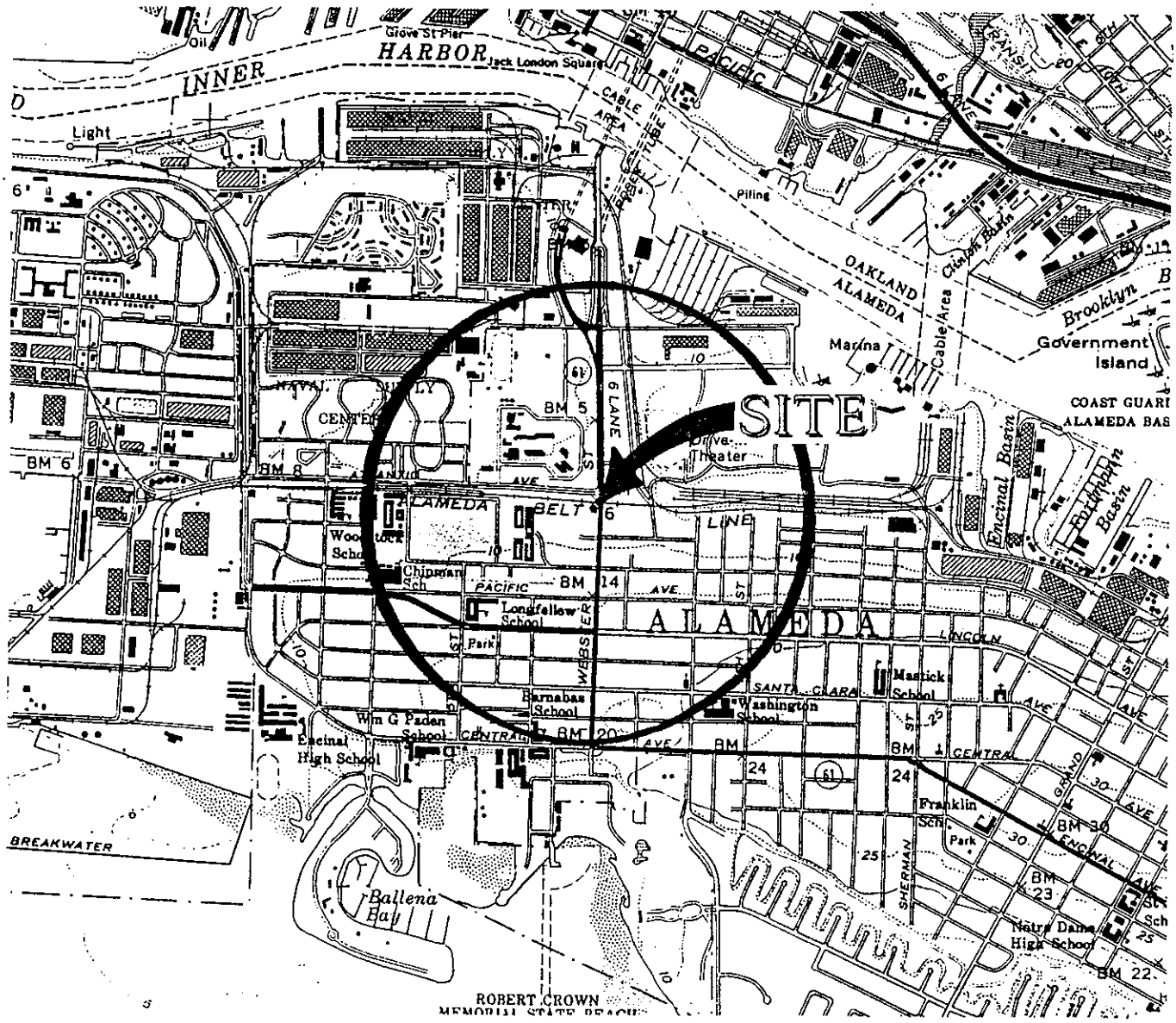
cc: Eva Chu, Alameda County Environmental Health Department

FIGURES:

TABLES:

ATTACHMENTS:

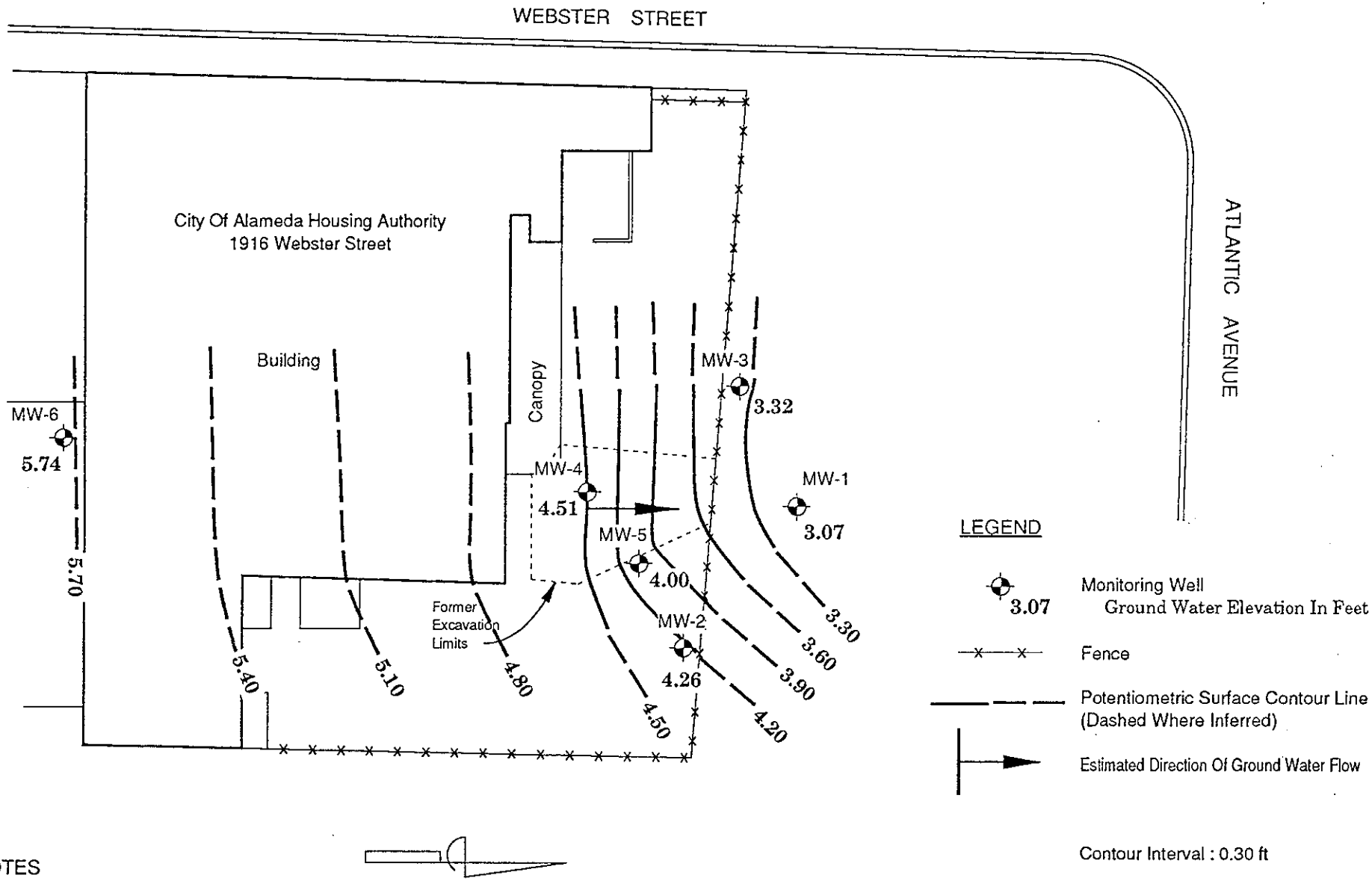
FIGURES



GENERAL NOTES:

BASE MAP FROM USGS
7.5 MINUTE TOPOGRAPHIC
OAKLAND WEST, CA

FUGRO	DRAWN BY: D. Haga	SITE LOCATION MAP	FIGURE 1
	DATE: September 19, 1994		
	REVISED BY:	Alameda Housing 1916 Webster Street Alameda, CA	PROJECT NUMBER: 94-37-7623
	DATE:		



NOTES

Site Sketch After Map
By Ron Archer, Civil Engineer, Inc.

All Locations Are Approximate

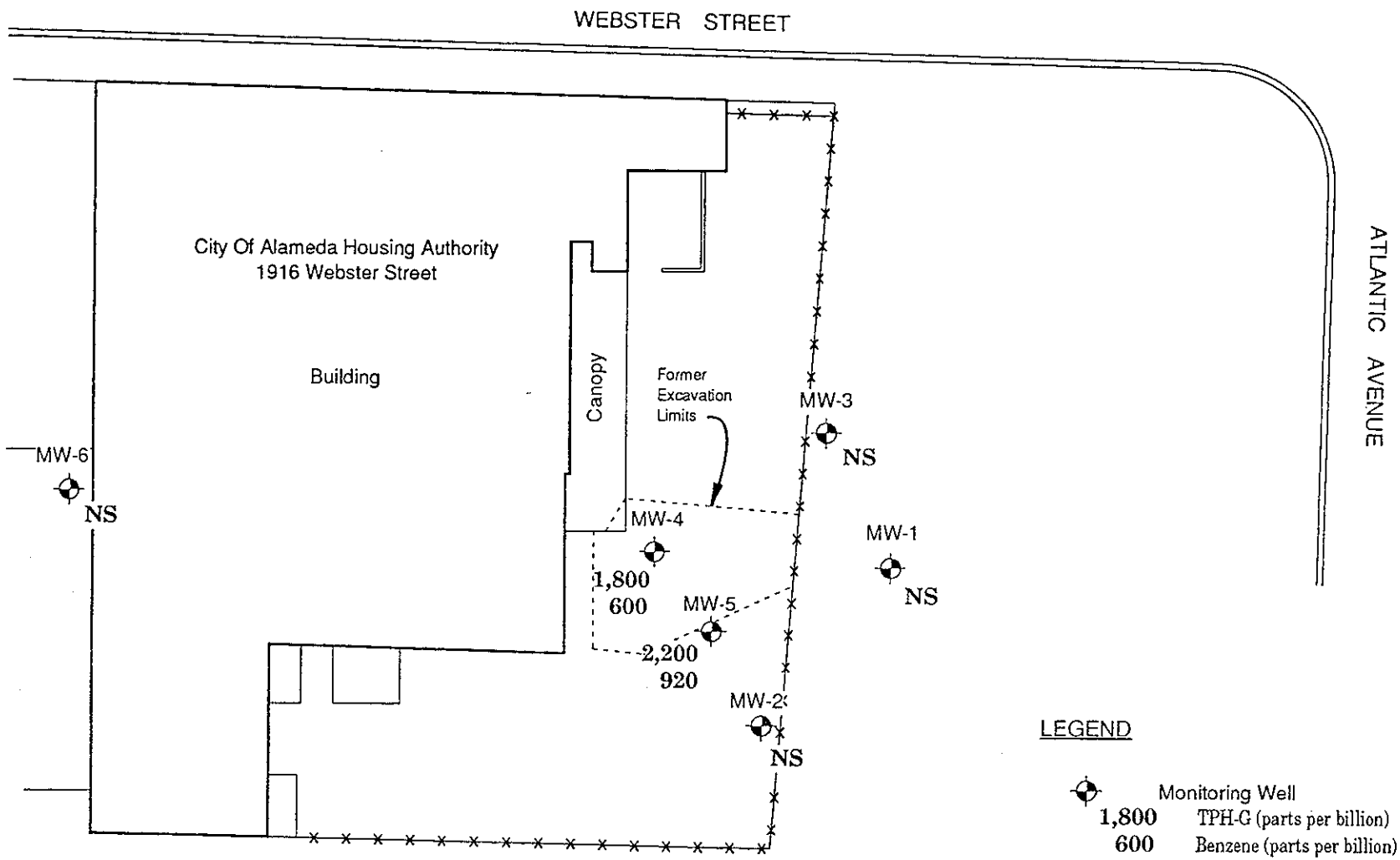
0 50 100
Approximate Scale In Feet

FUGRO

DRAWN BY: D. Hada	POTENTIOMETRIC SURFACE MAP MARCH 7, 1996
DATE: April 17, 1996	
REVISED BY:	Alameda Housing 1916 Webster Street Alameda, CA
DATE:	

FIGURE 2

PROJECT NUMBER: 94-37-7623



LEGEND

- Monitoring Well
- 1,800 TPH-G (parts per billion)
- 600 Benzene (parts per billion)
- Fence
- NS Not Sampled

NOTES

Site Sketch After Map
By Ron Archer, Civil Engineer, Inc.

All Locations Are Approximate

0 50 100
Approximate Scale In Feet

FUGRO

DRAWN BY: D. Hada
DATE: April 17, 1996
REVISED BY:
DATE:

DISTRIBUTION MAP OF TPH-G AND BENZENE IN GROUND WATER MARCH 7, 1996

Alameda Housing
1916 Webster Street
Alameda, CA

FIGURE 3

PROJECT NUMBER: 94-37-7623

TABLES

TABLE 1
GROUNDWATER ELEVATION DATA

Housing Authority of the City of Alameda Facility
1916 Webster Street
Alameda, California

Well No.	Date	Top of Casing Reference Elevation (feet above MSL)	Depth to Groundwater (feet)	Groundwater Elevation (feet above MSL)
MW-1	10/22/92	9.23(1)	4.94	4.29
	03/19/93		3.72	5.51
	04/19/93		3.91	4.92
	05/30/93		3.94	5.29
	06/29/93		4.36	4.87
	08/04/93		4.55	4.68
	01/26/94		4.14	5.09
	07/16/94		4.65	4.58
	10/10/94	6.51(2)	4.86	1.65
	03/29/95		3.54	2.97
	05/25/95		4.09	2.42
	08/16/95		4.41	2.10
	11/30/95		4.84	1.67
	03/07/96		3.44	3.07
MW-2	10/22/92	10.00(1)	5.22	4.78
	03/19/93		3.39	6.61
	04/19/93		3.78	6.22
	05/30/93		3.86	6.14
	06/29/93		4.41	5.59
	08/04/93		4.72	5.28
	01/26/94		3.98	6.02
	07/16/94		4.86	5.14
	10/10/94	7.26(2)	5.02	2.24
	03/29/95		NA	NA
	05/25/95		N/A	N/A
	08/16/95		4.60	2.66
	11/30/95		5.03	2.23
	03/07/96		3.00	4.26
MW-3	10/22/92	9.44(1)	4.66	4.78
	03/19/93		3.18	6.26
	04/19/93		3.44	4.65
	05/30/93		3.45	5.99
	06/29/93		3.95	5.49
	08/04/93		4.13	5.31
	01/26/94		3.7	5.74
	07/16/94		4.41	5.03
	10/10/94	6.71(2)	4.52	2.19
	03/29/95		3.02	3.69
	05/25/95		3.52	3.19
	08/16/95		4.09	2.62
	11/30/95		4.64	2.07
	03/07/96		3.39	3.32
MW-4	10/10/94	7.55(2)	4.94	2.61
	03/29/95		3.00	4.55
	05/25/95		3.52	4.03
	08/16/95		4.18	3.37
	11/30/95		4.71	2.84
	03/07/96		3.04	4.51

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TABLE 1

GROUNDWATER ELEVATION DATA
(cont'd)

Housing Authority of the City of Alameda Facility
1916 Webster Street
Alameda, California

Well No.	Date	Top of Casing Reference Elevation (feet above MSL)	Depth to Groundwater (feet)	Groundwater Elevation (feet above MSL)
MW-5	10/10/94	7.31(2)	4.91	2.40
	03/29/95		3.41	3.90
	05/25/95		3.65	3.66
	08/16/95		4.31	3.00
	11/30/95		4.59	2.72
	03/07/96		3.31	4.00
MW-6	10/10/94	8.09(2)	4.37	3.72
	03/29/95		2.29	5.80
	05/25/95		3.52	4.57
	08/16/95		3.41	4.68
	11/30/95		4.45	3.64
	03/07/96		2.35	5.74

NOTES:
MSL = mean sea level
(1) = Top of casing reference elevations surveyed using an assumed elevation of 10.00 feet above MSL for MW-2.
(2) = Top of casing reference elevations were resurveyed on September 12, 1994 using a cut square benchmark in the top of the concrete curb at a storm inlet on the south side of Atlantic Avenue approximately 75 feet east of the intersection of Atlantic Avenue and Constitution Way. Benchmark elevation 7.50 feet above MSL.
NA = Not available; well inaccessible due to construction debris.

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TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS

Housing Authority of the City of Alameda Facility
1916 Webster Street
Alameda, California

Sample I.D.	Date (µ/L)	TPH-G (µ/L)	Benzene (µ/L)	Toluene (µ/L)	Ethylbenzene (µ/L)	Xylenes (µ/L)	Organic Lead (mg/L)
MW-1	07/91	ND (50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.5)	NA
	11/91	ND (50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.5)	NA
	02/92	ND (50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.5)	NA
	07/92	ND (50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.5)	NA
	03/93	ND (50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.5)	NA
	04/93	NS	NS	NS	NS	NS	NA
	06/93	ND (50)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.50)	NA
	01/94	ND (50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (50)
	07/16/94	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (20)
	10/10/94	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA
	3/29/95	ND (50)	0.9	1.3	ND (0.5)	ND (0.5)	NA
	05/25/95	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (25)*
	08/16/95	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.01)
	11/30/95	NS	NS	NS	NS	NS	NS
	03/07/96	NS	NS	NS	NS	NS	NS
MW-2	07/91	ND (50)	3.7	ND (0.50)	0.50	5.1	NA
	11/91	ND (50)	1.1	ND (0.50)	ND (0.50)	4.5	NA
	02/92	ND (50)	ND (0.50)	ND (0.50)	ND (0.50)	1.6	NA
	07/92	ND (50)	ND (0.50)	0.59	ND (0.50)	ND (1.5)	NA
	03/93	ND (250)	ND (52)	ND (50)	ND (59)	ND (150)	NA
	04/93	ND (50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.5)	NA
	06/93	ND (50)	ND (0.30)	ND (0.30)	ND (0.30)	.95	NA
	01/94	ND (50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (50)
	07/16/94	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (20)
	10/10/94	ND (50)	0.5	ND (0.5)	ND (0.5)	1.2	NA
	3/29/95	NS	NS	NS	NS	NS	NS
	05/25/95	NS	NS	NS	NS	NS	NS
	08/16/95	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.01)
	11/30/95	NS	NS	NS	NS	NS	NS
	03/07/96	NS	NS	NS	NS	NS	NS

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TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
(cont'd)

Housing Authority of the City of Alameda Facility
1916 Webster Street
Alameda, California

Sample I.D.	Date (µ/L)	TPH-G (µ/L)	Benzene (µ/L)	Toluene (µ/L)	Ethylbenzene (µ/L)	Xylenes (µ/L)	Organic Lead (µ/L)
MW-3	07/91	ND (50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.5)	NA
	11/91	ND (50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.5)	NA
	02/92	ND (50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.5)	NA
	07/92	ND (50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.5)	NA
	03/93	ND (250)	ND (52)	ND (50)	ND (59)	ND (152)	NA
	04/93	ND (50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (1.5)	NA
	06/93	ND (50)	ND (0.30)	ND (0.30)	ND (0.30)	ND (0.50)	NA
	01/94	ND (50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (50)
	07/16/94	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (20)
	10/10/94	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA
	3/29/95	ND (50)	ND (0.5)	0.9	ND (0.5)	ND (0.5)	NA
	05/25/95	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (25)*
	08/16/05	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.01)
	11/30/95	NS	NS	NS	NS	NS	NS
	03/07/96	NS	NS	NS	NS	NS	NS
MW-4	10/10/94	2,400	900	44	12	80	NA
	3/29/95	1,500	580	4.9	4.3	7.0	NA
	05/25/95	1,100	260	6.0	5.5	3.3	ND (25)*
	08/16/95	650	230	2.6	23	1.9	ND (0.01)
	11/30/95	700	280	ND (3)	8	ND (10)	ND(0.04)
	03/07/96	1,800	600	4.3	15	ND (10)	NA
MW-5	10/10/94	2,000	840	4.8	0.6	110	NA
	3/29/95	4,900	1,600	61	20	76	NA
	05/25/95	2,500	680	6.5	3.5	110	ND (25)*
	08/16/95	2,200	930	6	6.5	100	ND (0.01)
	11/30/95	3,400	1,400	4	5	21	ND(0.04)
	03/07/96	2,200	920	3	ND (3)	25	NA

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TABLE 2

SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
(cont'd)

Housing Authority of the City of Alameda Facility
1916 Webster Street
Alameda, California

Sample I.D.	Date (µ/L)	TPH-G (µ/L)	Benzene (µ/L)	Toluene (µ/L)	Ethylbenzene (µ/L)	Xylenes (µ/L)	Organic Lead (µ/L)
MW-6	10/10/94	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA
	3/29/95	ND (50)	0.5	0.9	ND (0.5)	ND (0.5)	NA
	05/25/95	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND (25)*
	08/16/95	ND (50)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	ND(0.01)
	03/07/96	NS	NS	NS	NS	NS	NS

NOTES:

mg/L = Milligrams per Liter (ppm)
µg/L = Micrograms per Liter (ppb)
ND (0.5) = Not detected at or above the method reporting limit shown in parenthesis
NA = Not analyzed
NS = No sample collected
Data prior to 1/94 reported by Versar, Inc.
* = Total lead

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ATTACHMENT 1

STANDARD OPERATING PROCEDURES

SAMPLE IDENTIFICATION AND CHAIN-OF-CUSTODY PROCEDURES
SOP-4

Sample identification and chain-of-custody procedures ensure sample integrity, and document sample possession from the time of collection to its ultimate disposal. Each sample container submitted for analysis is labeled to identify the job number, date, time of sample collection, a sample number unique to the sample, any name(s) of on-site personnel and any other pertinent field observations also recorded on the field excavation or boring log.

Chain-of-custody forms are used to record possession of the sample from time of collection to its arrival at the laboratory. During shipment, the person with custody of the samples will relinquish them to the next person by signing the chain-of-custody form(s) and noting the date and time. The sample-control officer at the laboratory will verify sample integrity, correct preservation, confirm collection in the proper container(s), and ensure adequate volume for analysis.

If these conditions are met, the samples will be assigned unique laboratory log numbers for identification throughout analysis and reporting. The log numbers will be recorded on the chain-of-custody forms and in the legally-required log book maintained in the laboratory. The sample description, date received, client's name, and any other relevant information will also be recorded.

LABORATORY ANALYTICAL QUALITY ASSURANCE AND CONTROL
SOP-5

In addition to routine instrument calibration, replicates, spikes, blanks, spiked blanks, and certified reference materials are routinely analyzed at method-specific frequencies to monitor precision and bias. Additional components of the laboratory Quality Assurance/Quality Control program include:

1. Participation in state and federal laboratory accreditation/certification programs;
2. Participation in both U.S. EPA Performance Evaluation studies (WS and WP studies) and inter-laboratory performance evaluation programs;
3. Standard operating procedures describing routine and periodic instrument maintenance;
4. "Out-of-Control"/Corrective Action documentation procedures; and,
5. Multi-level review of raw data and client reports.

GROUNDWATER PURGING AND SAMPLING
SOP-7

Prior to water sampling, each well is purged by evacuating a minimum of three wetted well-casing volumes of groundwater. When required, purging will continue until either the discharge water temperature, conductivity, or pH stabilize to within 10% of previously measured values; and a maximum of ten wetted casing volumes of groundwater have been recovered, or the well is bailed dry. When practical, the groundwater sample should be collected when the water level in the well recovers to at least 80 percent of its static level. Field measurements, observations and procedures are noted.

The sampling equipment consists of a clean bailer, or stainless steel bladder pump with a "Teflon" bladder. If the sampling system is dedicated to the well, then the bailer is usually "Teflon," but the bladder pump may be PVC with a polypropylene bladder. Sample container type, preservation, and volume depends on the intended analyses.

The groundwater sample is decanted into each VOA vial in such a manner that there is no meniscus at the top of the vial. A cap is quickly secured to the top of the vial. The vial is then inverted and gently tapped to see if air bubbles are present. If none are present, the vial is labeled and refrigerated for delivery, under strict chain-of-custody, to the analytical laboratory. Label information should include a unique sample identification number, job identification number, date, time, and the sampler's initials.

For quality control purposes, a duplicate water sample may be collected from a well. When required, a trip blank is prepared at the laboratory and placed in the transport cooler. It is labeled similar to the well samples, remains in the cooler during transport, and is analyzed by the laboratory along with the groundwater samples. In addition, a field blank may be prepared in the field when sampling equipment is not dedicated. The field blank is prepared after a pump or bailer has been either steam cleaned or properly washed, prior to use in the next well, and is analyzed along with the other samples. The field blank analysis demonstrates the effectiveness of in-field cleaning procedures to prevent cross-contamination.

To minimize the potential for cross-contamination between wells, all well development and water sampling equipment not dedicated to a well is either steam cleaned or properly washed between use. As a second precautionary measure, wells are sampled in order of lowest to highest concentrations as established by available previous analytical data.

In the event the water samples cannot be submitted to the analytical laboratory on the same day they are collected (e.g., due to weekends or holidays), the samples are temporarily stored until the first opportunity for submittal either on ice in a cooler, such as when in the field, or in a refrigerator.

MEASURING LIQUID LEVELS USING A WATER LEVEL INDICATOR OR INTERFACE PROBE
SOP-12

Field equipment used for liquid-level gauging typically includes the measuring probe (water level or interface) and a clean product bailer(s). The field kit also includes cleaning supplies (buckets, TSP, spray bottles, and deionized water) to be used in cleaning the equipment between wells.

Prior to measurement, the probe tip is lowered into the well until it touches bottom. Using the previously established top-of-casing or top-of-box (i.e., wellhead vault) point, the probe cord (or halyard) is marked and a measuring tape (graduated in hundredths of a foot) is used to determine the distance between the probe end and the marking on the cord. This measurement is then recorded on the liquid-level data sheet as the "Measured Total Depth" of the well.

When necessary in using the interface probe to measure liquid levels, the probe is first electrically grounded to either the metal stove pipe or another metal object nearby. When no ground is available, reproducible measurements can be obtained by clipping the ground lead to the handle of the interface probe case.

The probe tip is then lowered into the well and submerged in the groundwater. An oscillating (beeping) tone indicates the probe is in water. The probe is slowly raised until either the oscillating tone ceases or becomes a steady tone. In either case, this is the depth-to-water (DTW) indicator and the DTW measurement is made accordingly. The steady tone indicates floating hydrocarbons. In this case, the probe is slowly raised until the steady tone ceases. This is the depth-to-product (DTP) indicator and the measurement of DTP is recorded. A corrected depth to groundwater to account for floating hydrocarbons can be calculated by using the following formula:

CDTW = DTW - (SP.G x LHT).
CDTW = Corrected depth to groundwater.
DTW = Measured depth to groundwater.
SP.G = Specific gravity: unweathered gasoline = 0.75; diesel = 0.80
LHT = Measured liquid hydrocarbon thickness.

The corresponding groundwater elevation is the difference between a previously determined well reference elevation and either the depth to groundwater or the corrected depth to groundwater.

The process of lowering and raising the probe must be repeated several times to ensure accurate measurements. The DTW and DTP measurements are recorded on the liquid-level data sheet. When floating product is indicated by the probe's response, a product bailer is lowered partially through the product-water interface to confirm the product on the water surface, and as further indication of product thickness, particularly in cases where the product layer is quite thin. Either this measurement or the difference between DTW and DTP is recorded on the data sheet as "product thickness."

In order to avoid cross-contamination of wells during the liquid-level measurement process, wells are measured in the order of "clean" to "dirty" (where such information is available). In addition, all measurement equipment is cleaned with TSP or similar solution and thoroughly rinsed with deionized water before use, between measurements in respective wells, and at the completion of the day's activities.

ATTACHMENT 2

LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY FORMS

American Environmental Network

Certificate of Analysis

DOHS Certification: 1172

AIHA Accreditation: 11134

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FUGRO WEST, INC.
44 MONTGOMERY ST. #1010
SAN FRANCISCO, CA 94104

ATTN: BILL BASSETT
CLIENT PROJ. ID: 9437-7623

REPORT DATE: 03/21/96

DATE(S) SAMPLED: 03/07/96

DATE RECEIVED: 03/07/96

AEN WORK ORDER: 9603096

PROJECT SUMMARY:

On March 7, 1996, this laboratory received 2 water sample(s).

Client requested sample(s) be analyzed for chemical parameters. Results of analysis are summarized on the following page(s). Please see quality control report for a summary of QC data pertaining to this project.

Samples will be stored for 30 days after completion of analysis, then disposed of in accordance with State and Federal regulations. Samples may be archived by prior arrangement.

If you have any questions, please contact Client Services at (510) 930-9090.

Larry Klein
Laboratory Director

FUGRO WEST, INC.

SAMPLE ID: MW-4
AEN LAB NO: 9603096-01
AEN WORK ORDER: 9603096
CLIENT PROJ. ID: 9437-7623

DATE SAMPLED: 03/07/96
DATE RECEIVED: 03/07/96
REPORT DATE: 03/21/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	600 *	3	ug/L	03/14/96
Toluene	108-88-3	4.3 *	3	ug/L	03/14/96
Ethylbenzene	100-41-4	15 *	3	ug/L	03/14/96
Xylenes, Total	1330-20-7	ND	10	ug/L	03/14/96
Purgeable HCs as Gasoline	5030/GCFID	1.8 *	0.3	mg/L	03/14/96
#Extraction for TPH	EPA 3510	-		Extrn Date	03/13/96
TPH as Diesel	GC-FID	0.24 *	0.05	mg/L	03/15/96

Reporting limits elevated due to high levels of target compounds. Sample run at dilution.

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

FUGRO WEST, INC.

SAMPLE ID: MW-5
AEN LAB NO: 9603096-02
AEN WORK ORDER: 9603096
CLIENT PROJ. ID: 9437-7623

DATE SAMPLED: 03/07/96
DATE RECEIVED: 03/07/96
REPORT DATE: 03/21/96

ANALYTE	METHOD/ CAS#	RESULT	REPORTING LIMIT	UNITS	DATE ANALYZED
BTEX & Gasoline HCs	EPA 8020				
Benzene	71-43-2	920 *	3	ug/L	03/15/96
Toluene	108-88-3	3 *	3	ug/L	03/15/96
Ethylbenzene	100-41-4	ND	3	ug/L	03/15/96
Xylenes, Total	1330-20-7	25 *	10	ug/L	03/15/96
Purgeable HCs as Gasoline	5030/GCFID	2.2 *	0.3	mg/L	03/15/96
#Extraction for TPH	EPA 3510	-		Extrn Date	03/13/96
TPH as Diesel	GC-FID	0.38 *	0.05	mg/L	03/15/96

Reporting limits elevated due to high levels of target compounds. Sample run at dilution.

ND = Not detected at or above the reporting limit
* = Value at or above reporting limit

AEN (CALIFORNIA)
QUALITY CONTROL REPORT

AEN JOB NUMBER: 9603096

CLIENT PROJECT ID: 9437-7623

Quality Control and Project Summary

All laboratory quality control parameters were found to be within established limits.

Definitions

Laboratory Control Sample (LCS)/Method Spike(s): Control samples of known composition. LCS and Method Spike data are used to validate batch analytical results.

Matrix Spike(s): Aliquot of a sample (aqueous or solid) with added quantities of specific compounds and subjected to the entire analytical procedure. Matrix spike and matrix spike duplicate QC data are advisory.

Method Blank: An analytical control consisting of all reagents, internal standards, and surrogate standards carried through the entire analytical process. Used to monitor laboratory background and reagent contamination.

Not Detected (ND): Not detected at or above the reporting limit.

Relative Percent Difference (RPD): An indication of method precision based on duplicate analysis.

Reporting Limit (RL): The lowest concentration routinely determined during laboratory operations. The RL is generally 1 to 10 times the Method Detection Limit (MDL). Reporting limits are matrix, method, and analyte dependent and take into account any dilutions performed as part of the analysis.

Surrogates: Organic compounds which are similar to analytes of interest in chemical behavior, but are not found in environmental samples. Surrogates are added to all blanks, calibration and check standards, samples, and spiked samples. Surrogate recovery is monitored as an indication of acceptable sample preparation and instrumental performance.

D: Surrogates diluted out.

#: Indicates result outside of established laboratory QC limits.

QUALITY CONTROL DATA

METHOD: EPA 3510 GCFID

AEN JOB NO: 9603096
DATE EXTRACTED: 03/13/96
INSTRUMENT: A
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery n-Pentacosane
03/15/96	MW-4	01	69
03/15/96	MW-5	02	75
QC Limits:			59-118

DATE EXTRACTED: 03/12/96
DATE ANALYZED: 03/14/96
SAMPLE SPIKED: 9602282-01
INSTRUMENT: A

Matrix Spike Recovery Summary

Analyte	Spike Added (mg/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Diesel	4.18	89	3	58-107	15

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit.

QUALITY CONTROL DATA

METHOD: EPA 8020, 5030 GCFID

AEN JOB NO: 9603096
INSTRUMENT: H
MATRIX: WATER

Surrogate Standard Recovery Summary

Date Analyzed	Client Id.	Lab Id.	Percent Recovery Fluorobenzene
03/14/96	MW-4	01	120
03/15/96	MW-5	02	123
QC Limits:			70-130

DATE ANALYZED: 03/12/96
SAMPLE SPIKED: 9603103-02
INSTRUMENT: H

Matrix Spike Recovery Summary

Analyte	Spike Added (ug/L)	Average Percent Recovery	RPD	QC Limits Percent Recovery	QC Limits RPD
Benzene	22.2	99	<1	85-109	17
Toluene	73.9	96	1	87-111	16
Hydrocarbons as Gasoline	500	115	3	66-117	19

Daily method blanks for all associated analytical runs showed no contamination at or above the reporting limit

*** END OF REPORT ***

Reporting Information:

1. Client: Alameda Housing Auth.
Address: 1714 Webster St
Alameda, CA
Contact:
Alt. Contact:

Address Report To:

2. Foard West, Inc
411 Montgomery St, #1010
So. F., CA 94104

Send Invoice To:

3.

American Environmental Network

3440 Vincent Road, Pleasant Hill, CA 94523
Phone (510) 930-9090
FAX (510) 930-0256

AEN

Page 1 of 1

R-3, S-2
R-5, S-F

REQUEST FOR ANALYSIS / CHAIN OF CUSTODY

Lab Job Number: 9603096 9603096
Lab Destination:
Date Samples Shipped:
Lab Contact:
Date Results Required: Normal (A)
Date Report Required:
Client Phone No.:
Client FAX No.:

Send Report To: 1 or (2) (Circle one)

Client P.O. No.: Client Project I.D. No.: 9437-7623

Sample Team Member (s) Bill Bassett

Lab Number	Client Sample Identification	Air Volume	Date/ Time Collected	Sample Type*	Pres.	No. of Cont.	Type of Cont.	ANALYSIS: BTEX	ANALYSIS: TPH-D	Comments / Hazards
01AB	MW-4		3/7/96	H_2O	HCl	2	VOA	X		
C	MW-4		↓	↓	NONE	1	L		X	
02AB	MW-5		↓	↓	HCl	2	VOA	X		
C	MW-5		↓	↓	NONE	1	L		X	

Relinquished by: (Signature)	DATE 3/7/96	TIME 4:45 PM	Received by: (Signature) Ronald C. Jensen DATE 3/7/96 TIME 4:45 PM
Relinquished by: (Signature)	DATE	TIME	Received by: (Signature) DATE TIME
Relinquished by: (Signature)	DATE	TIME	Received by: (Signature) DATE TIME
Method of Shipment			Lab Comments

*Sample type (Specify): 1) 37mm 0.8 µm MCEF 2) 25mm 0.8 µm MCEF 3) 25mm 0.4 µm polycarb. filter
4) PVC filter, diam. ____ pore size ____ 5) Charcoal tube 6) Silica gel tube 7) Water 8) Soil 9) Bulk Sample
10) Other ____ 11) Other ____

COPIES: WHITE - JOB FILE YELLOW - PROJECT FILE PINK - CLIENT