

RECEIVED

2:42 pm, Apr 28, 2008

Alameda County
Environmental Health

This file contains the following documents:

- 1) ATT – Request to reuse pumped groundwater (1/9/90)**
- 2) McGuire Hester – Letter to ACH regarding Kaldaveer data (10/27/89)**
- 3) Kaldaveer Associates – Soil Sampling and Testing (10/17/89)**
- 4) ATT – Groundwater Investigation Report (1/9/89)**



January 5, 1990

90 JAN -8 AM 10:46

Mr. Lester Feldman
Supervising Environmental Specialist IV
San Francisco Regional Water Quality Control Board
1800 Harrison, Suite 700
Oakland, CA 94612

Subject: Request to Irrigate With Recovered Groundwater
From The Former McGuire & Hester Property
Located at 796 66th Avenue, Oakland, CA 94621
(Project No. 892.1)

Dear Lester:

In response to our recent phone conversation, I am providing you with the chemical data and bioassay results conducted on recovered groundwater at the subject property (Plate 1, Attachment A). To facilitate management of the wastewater, we request permission to use the wastewater for irrigation purposes at the site. The following presents supporting data for this management option.

BACKGROUND

Prior to 1956, the site was used as a slaughter and meat packing facility. From 1957 to 1988 the property was occupied by McGuire & Hester, a general engineering contractor. The property is now under construction and will be occupied by Cruise America Corp. Aqua Terra Technologies, Inc. (ATT) was retained by McGuire & Hester in 1988 to conduct a preliminary groundwater investigation associated with the closure of underground fuel tanks. ATT presently is conducting the investigation, which is taking place concurrent with Cruise America's remodeling and new facility construction activities.

Part of the remodel plans of Cruise America calls for the installation of one 10,000 gallon fuel storage tank and one 500 gallon oil tank. The new tank installation is located some distance from the removed tanks, Plate 2, Attachment A. In response to the need to dewater the tank pits during installation, coupled with the uncertainty pertaining to the water quality characteristics of the groundwater, McGuire & Hester elected to provide above ground temporary storage tanks for Cruise America's use. Approximately 40,000 gallons was pumped from the tank pits to the storage tanks. The tank installation is now complete and no additional pumping is expected to occur.

Aqua Terra Technologies
Consulting Engineers
& Scientists

2950 Buskirk Avenue
Suite 120
Walnut Creek, CA
94596
415 934-4884

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WATER QUALITY CHARACTERISTICS

Analytical data collected from monitoring wells located in the upgradient direction are assumed to reflect the general characteristics of the tank water for levels of total petroleum hydrocarbons (TPH), benzene, ethylbenzene, toluene, and xylene (BET&X).

Chemical data were collected from the monitoring wells in March 1987 and in December 1988. Results from data collected in March 1987 indicate concentrations of TPH-gasoline and trace concentrations of BET&X. However, analytical data collected from the monitoring wells in December 1988 indicate that all concentrations are below the level of detection. These data are presented in Table 1, Attachment B, and certified laboratory data and chain of custody documentation are presented in Attachment C.

To ensure completeness of the data set for determining the suitability of the water for irrigation, water samples were taken from each tank, composited and subsampled for the following analyses:

- o Acute aquatic toxicity 96-hour LC50 according to EPA 600/4-85/014
- o Total oil and grease (TOG) according to EPA Method 503E protocol
- o Semi-volatile organics according to EPA Method 8270 protocol
- o Metals (Sb, As, Be, Cd, Cr, Cu, Pb, Hg, Ni, Se, Ag, Tl, Zn) according to EPA-SW 846 protocol
- o Total ammonia according to EPA 600/4-85/014 toxicity testing protocol.

Analytical results for semi-volatile organics and TOG were below the level of detection in the wastewater sampled. Certified analytical results and chain of custody documentation are presented in Attachment C. The concentrations of metals are well below the recommended maximum concentrations of trace elements in irrigation waters defined in Water Quality Criteria as presented in Pettygrove and Asano (1985). These

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guidelines were prepared for the California State Water Resource Control Board. These data are presented in Table 2, Attachment B.

Aquatic toxicity survival tests were performed using threespine stickleback (Gasterosteus aculeatus) exposed to serial dilutions of tank water at 10%, 25%, 50%, 75% and 100%. Results of the aquatic bioassay tests are summarized in Table 3, Attachment B. No mortality occurred at the 10% dilution while there was 5% mortality with the 25% dilution, occurring in the last day of testing. All test organisms died when exposed to the 50%, 75% and 100% treatments.

The major complication with fish survival when exposed to the tank water above 25% dilution arises from the elevated levels of ammonia. Total ammonia concentrations of the water ranged from 35 mg/l to 40 mg/l.

Ammonia is a toxic metabolite to fish resulting from the breakdown and decay of organic matter. Presumably, the presence of ammonia in water captured at the site is the result of organic decomposition occurring from the previous slaughter and meat packing activities.

CONCLUSIONS

1. The analytical record shows reduced concentrations of TPH and BET&X collected from nearby monitoring wells. Assuming upgradient monitoring well data is reflective of the downgradient captured wastewater, the water quality characteristics do not preclude the intended use of the wastewater for irrigation. Analysis of the wastewater for semi-volatile organics and TOG indicate concentrations below the level of detection.
2. Concentrations of metals analyzed from the wastewater are sufficiently below the suggested maximum trace metal concentrations for irrigation waters and use of the wastewater for irrigation purposes would not result in levels of concern.
3. Examination of the aquatic toxicity data indicates that due to the elevated levels of ammonia, management options would exclude discharge to receiving waters and the preferred option is irrigation.

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4. Application of the wastewater to soil will provide an ancillary benefit by augmenting the buildup of nitrifying bacteria resulting in a nitrogen source for plant up-take. In general terms, nitrate is essential for plant growth, and conversion of ammonia to nitrate by soil bacteria (nitrification) takes place at rates from 5 to 70 lbs. N/acre-day. The calculated yield in the wastewater is approximately 12 lbs. N/acre-day. Based on these data the ammonia will enhance production of a nitrogen source for plant up-take.

We would like your concurrence with the management option presented herein as soon as possible. Please contact us if you have any questions or comments.

Sincerely,

AQUA TERRA TECHNOLOGIES, INC.

Terrance E. Carter
Terrance E. Carter
Senior Environmental Engineer

Ronald M. Block
Ronald M. Block, Ph.D.
Environmental Toxicologist

TEC/RMB:pd
Attachments

cc: Perry Peterson
McGuire & Hester

Ariu Levi
Alameda County Health Agency

Randy Harris
McInerney & Dillon

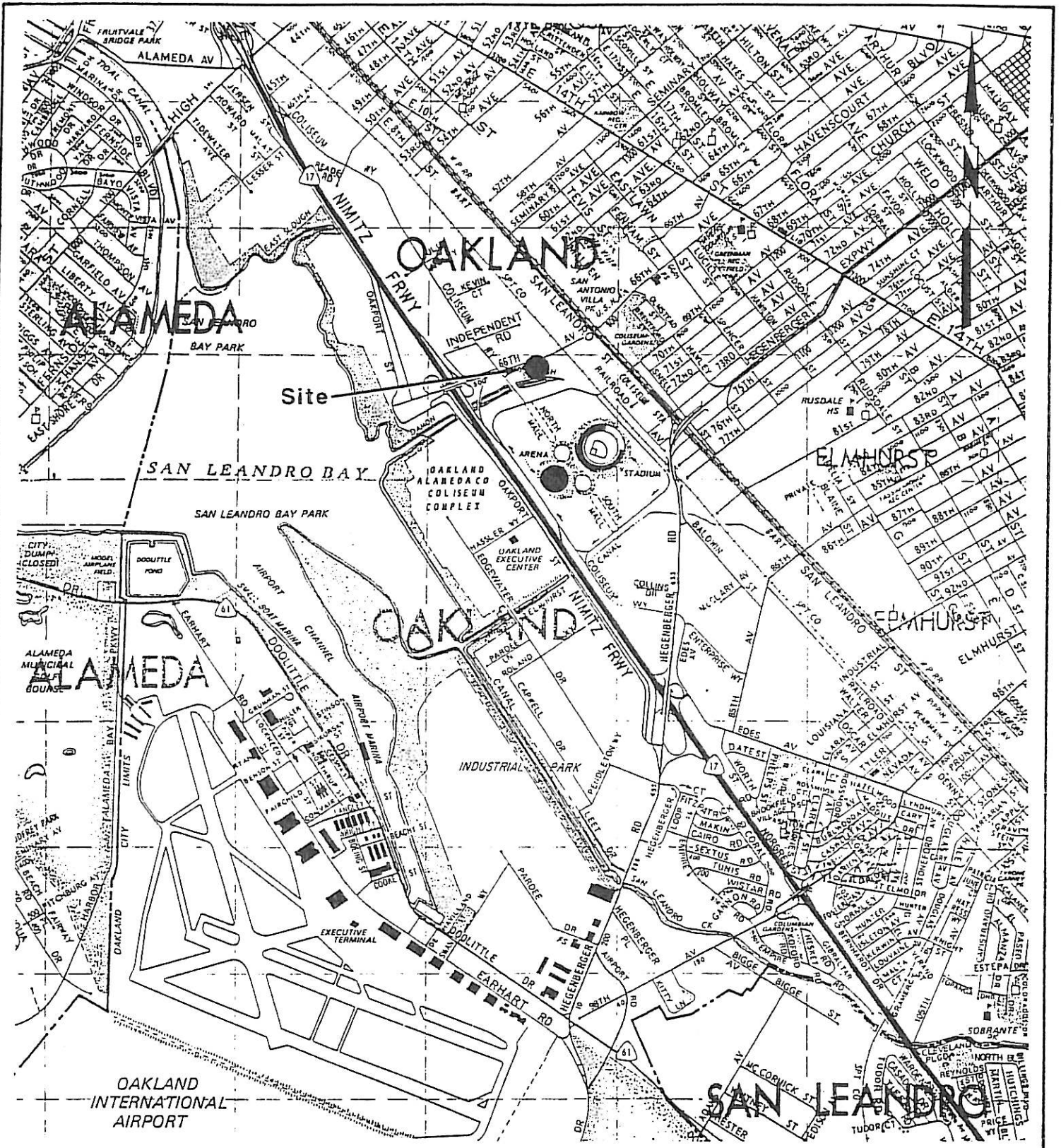
REFERENCES

REFERENCES

Petty G.S., T. Asano. 1985. Irrigation with Reclaimed Municipal Wastewater - A Guidance Manual. California State Water Resource Control Board. 1985.

ATTACHMENT A

Plates



Site Location Map

ATT

Aqua Terra Technologies
Consulting Engineers
& Scientists

McGuire and Hester

JOB NUMBER

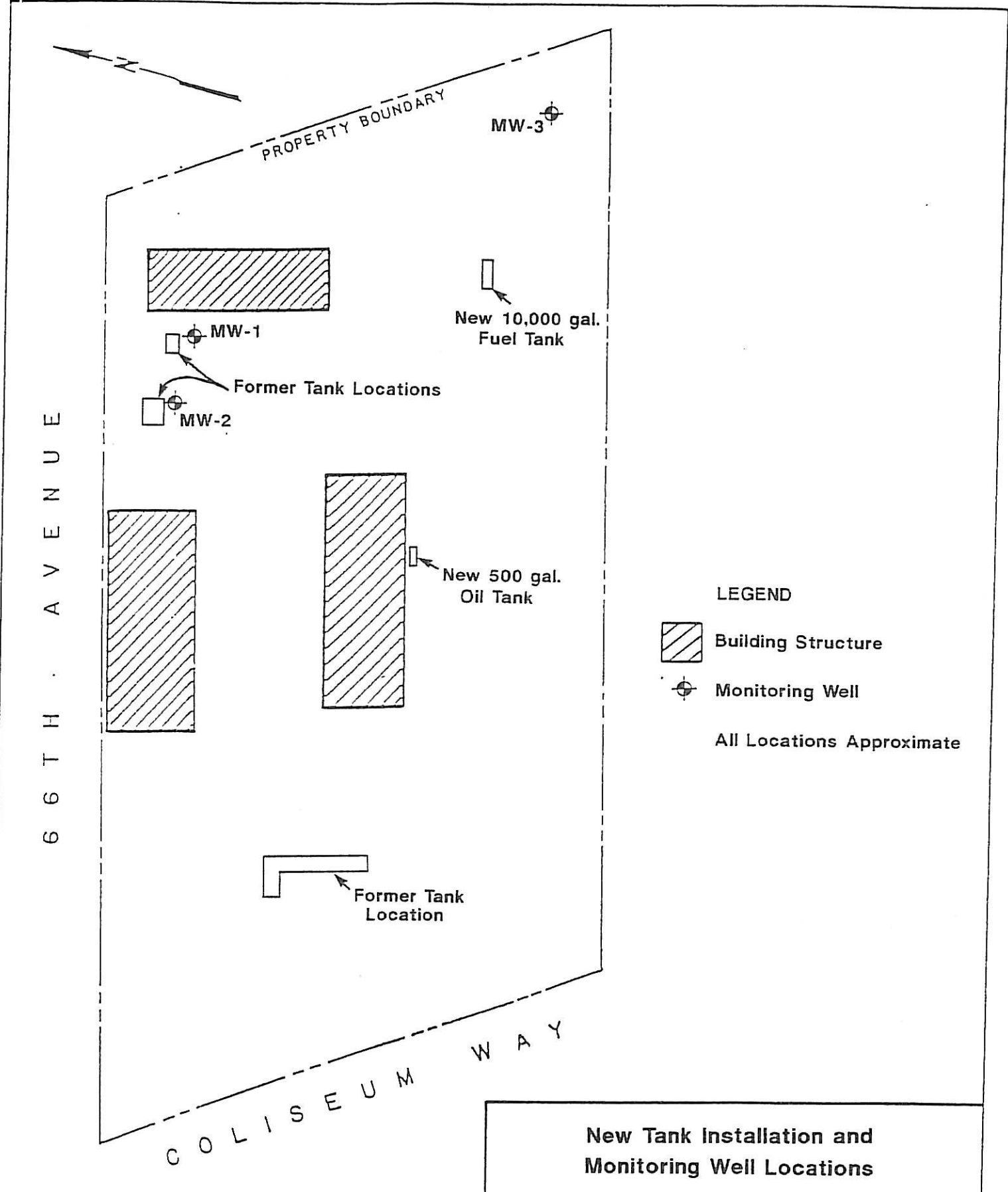
892.1

DATE

12/89

PLATE

1



**New Tank Installation and
Monitoring Well Locations**

McGuire and Hester		PLATE 2
JOB NUMBER 892.1	DATE 12/89	

ATTACHMENT B

Tables

Table 1. Groundwater Analytical Data Summary^a
 Groundwater Investigation
 McGuire & Hester, Oakland, CA

Well Designation	Sampling Date	TPH ^b as Diesel (µg/L)	Oil & Grease (µg/L)	TPH ^b as Gasoline (µg/L)	Hydrocarbons ^c			
					B	T	E	X
MW-1	12/28/88	NA ^d	NA	ND ^e	ND	ND	ND	ND
	02/12/87	NA	NA	29	0.7	4.2	1.2	5.8
MW-2	12/28/88	NA	NA	ND	ND	ND	ND	ND
	02/12/87	NA	NA	23.7	ND	1.3	0.8	4.3
MW-3	12/28/88	<90	<300	NA	NA	NA	NA	NA
	02/12/87	ND	NA	NA	NA	NA	NA	NA

- a. Summary of certified analytical results presented in Attachment C.
- b. TPH = Total Petroleum Hydrocarbons reported as either gasoline or diesel. Analysis for TPH as diesel using EPA Method 3550/8015. Analysis for TPH as gasoline using EPA Method 5030.
- c. B = Benzene
 E = Ethylbenzene
 T = Toluene
 X = Xylene
- d. NA = sample not analyzed for this constituent.
- e. ND = None detected above detection limit of instrument.

Table 2. Recommended Maximum Concentrations of Metals in Irrigation Waters^a
 McGuire & Hester, Oakland, CA.

Parameter	Recommended Maximum Concentration (mg/L)	McGuire & Hester Wastewater Collected 12/13/89 ^b (mg/L)
Antimony & compounds	NR ^c	ND
Arsenic & compounds	0.10	0.005
Barium & compounds ^e	NR	NA
Beryllium & compounds	0.10	ND
Cadmium & compounds	0.01	ND
Chromium (VI) & compounds	--	NA ^d
Chromium & compounds	0.01	ND
Cobalt & compounds	0.05	NA
Copper & compounds	0.20	0.025
Lead & compounds	5.0	.074
Mercury & compounds	NR	ND
Molybdenum & compounds	0.01	NA
Nickel & compounds	0.20	0.029
Selenium & compounds	0.02	ND
Silver & compounds	NR	ND
Thallium & compounds	NR	0.069
Vanadium & compounds	0.10	NA
Zinc & compounds	2.0	0.188

- a. Irrigation with Reclaimed Water, California State Water Resources Control Board, 1985.
- b. Samples collected 12/13/89.
- c. NR - No Recommendation at this time.
- d. NA - Not analyzed, Cr below regulatory criterion for Cr (VI).

Table 3. Static Acute, Percent Survival, Bioassay Summary of Tank Water Sample from McGuire and Hester, Oakland, California

CLIENT: ATT, Inc., Job #892.1 ATTENTION: Mr. Terrance Carter
 Control (C-1) and
 SAMPLE ID#: 8520 SAMPLE DESCRIPTION: 100% sample (water) dilutions TESTING DATES: 12/18/89 to 12/22/89
 CLIENT ID#: EFF-2

TEST CONC %	INITIAL						24-HOUR				48-HOUR				72-HOUR				96-HOUR			
	Alk mg/L	Hard mg/L	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC	Live	pH	DO mg/L	Temp oC
C-1 *	58	113	10	7.9	8.8	19	10	7.9	8.7	20	10	8.0	8.4	20	10	7.9	8.3	19	10	8.0	8.4	20
10-A			10	8.0	8.4	19	10	8.0	8.7	20	10	8.1	7.9	20	10	8.0	8.5	19	10	8.0	7.6	20
25-A			10	8.1	8.9	19	10	8.4	8.1	20	10	8.5	8.1	20	10	8.4	8.3	19	9**	8.4	8.3	20
50-A			10	8.1	8.8	19	0	8.6	8.3	20	-	-	-	-	-	-	-	-	-	-	-	-
75-A			10	8.1	8.8	19	0	8.5	7.9	20	-	-	-	-	-	-	-	-	-	-	-	-
100-A *	940	731	10	7.5	6.7	19	0*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Test Species threespine stickleback Avg Length 39.3 mm SL Max Length 44.0 mm SL Min Length 30.0 mm SL

Source of Test Species Thomas Fish Company Avg Wt. 0.885 g Max Wt. 1.25 g Min Wt. 0.34 g
 10/tank Control &

Species Density 10/treatment Dilution Water dechlorinated tap Test Soln Vol 3 L Depth 17 cm Aeration bubble

Acclimation Tank % Dead 0 Accl. Tank Water dechlorinated tap Accl. Period 21 days Accl. Temp. 20 +/- 2°C

REMARKS: * 100-A: Conductivity = 4190; 2⁰/oo; NH₃-N ≥ 35 mg/l; All fish dead within 2 hours. C-1: Conductivity = 756.
 ** 25-A: Surviving fish appeared stressed and swimming erratically.

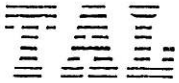
TECHNICIAN(S): WF, RD, JF, FW
 (Initials Only)

Percent Survival: 100% in Control and 10%; 95% in 25%; and zero in all other treatments.

LABORATORY MANAGER: William E. Foster, M.S.

ATTACHMENT C

Certified Laboratory Data
Chain of Custody Documentation



DATE: 12/30/88
 LOG NO.: 6845
 DATE SAMPLED: 12/28/88
 DATE RECEIVED: 12/28/88

CUSTOMER: Aqua Terra Technologies
 REQUESTER: Karen Singer
 PROJECT: No. 892.1, 66th Avenue, Oakland

Sample Type: Water

Method and Constituent	Units	MW-1		MW-2		MW-3	
		Concen- tration	Detection Limit	Concen- tration	Detection Limit	Concen- tration	Detection Limit
DHS Method:							
Total Petroleum Hydro- carbons as Diesel	ug/l					< 90	90
Total Petroleum Hydro- carbons as Gasoline	ug/l	< 2	2	< 2	2		
Modified EPA Method 8020:							
Benzene	ug/l	< 0.3	0.3	< 0.3	0.3		
Toluene	ug/l	< 0.3	0.3	< 0.3	0.3		
Xylenes	ug/l	< 0.4	0.4	< 0.4	0.4		
Ethyl Benzene	ug/l	< 0.3	0.3	< 0.3	0.3		
Standard Method 503E, Hydrocarbons:							
Oil and Grease	ug/l					< 300	300



CHAIN OF SAMPLE CUSTODY RECORD

Collector: Tejesh Mishra Field Facility Date Sampled: _____ Time: _____
Location of Sampling: 66 E Ave. Oakland

Project Number: _____ Survey Number: _____
Sample Type: _____
Container Type and Condition: 2 100 ml bottles
Contract Laboratory Record/Name: TSL

Sample ID	Field Information
<u>11111</u>	<u>1 100 ml bottle</u>
<u>11112</u>	<u>1 100 ml bottle</u>
<u>11113</u>	<u>1 100 ml bottle</u>
<u>11114</u>	<u>1 100 ml bottle</u>

Analysis Requested: TPH as Gas, TPH - MW1, MW2, C15, T15
TPH as Diesel, Total Petroleum MW 3 - MW 9, C15, T15

Results Needed By: 4th hour turn-in to H&AP

Contact and results to be sent to: Chris French at K&S

Travel Blank: Yes No Travel Blank to be Analyzed Separately: Yes No
Duplicate Samples: Yes No Duplicates to be Analyzed Separately: Yes No
Cleaning Blank: Yes No Cleaning Blank to be Analyzed Separately: Yes No
Background Soil Sample: Yes No Background Soil Sample to be Analyzed Separately: Yes No

Chain of Custody:
1. [Signature] Field Personnel Date 12/28/88 10:50 AM
2. _____ Date _____
3. Lab Lab Date 12/28/88 10:50 AM
Lab _____ Date _____
K&S, CA 94645
(415) 733-6960

REPORT SUMMARY
 ANAMETRIX, INC. (408) 432-8192

Client : Aqua Terra Technologies
 Address : 2950 Buskirk Avenue
 Suite 120
 City : Walnut Creek, CA 94596
 Attn. : Terry Carter

Anamatrix W.O.#: 8912157
 Date Received : 12/14/89
 Purchase Order#: N/A
 Project No. : 892.1
 Date Released : 12/26/89

Anamatrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
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RESULTS

8912157-01	BAKER TANK	WATER	12/13/89	8270	12/19/89	12/21/89	F2
8912157-01	BAKER TANK	WATER	12/13/89	503E	12/19/89	12/19/89	N/A
8912157-01	BAKER TANK	WATER	12/13/89	PP-MET		12/20/89	AA1/

QUALITY ASSURANCE (QA)

2CB1219C01	METHOD BLANK	WATER	N/A	8270	12/19/89	12/21/89	F2
MB121889W	METHOD BLANK	WATER	N/A	PP-MET		12/18/89	AA1/

ANALYSIS DATA SHEET - PRIORITY POLLUTANT METALS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : METHOD BLANK
Matrix : WATER
Date Sampled : N/A
Date Prepared: 12/18/89
Date Analyzed: 12/18/89

Anamatrix ID : MB121889W
Analyst : MA
Supervisor : RA
Instrument ID: AA1/ICP1
Date released: 12/26/89

EPA METHOD NO.	COMPOUNDS	Reporting Limit (mg/L)	Amount Found (mg/L)
6010	Silver (Ag)	0.01	ND
7060	Arsenic (As)	0.001	ND
6010	Beryllium (Be)	0.01	ND
6010	Cadmium (Cd)	0.01	ND
6010	Total Chromium (TTL Cr)	0.01	ND
6010	Copper (Cu)	0.01	ND
7470	Mercury (Hg)	0.001	ND
6010	Nickel (Ni)	0.02	ND
6010	Lead (Pb)	0.02	ND
6010	Antimony (Sb)	0.04	ND
6010	Selenium (Se)	0.08	ND
6010	Thallium (Tl)	0.04	ND
6010	Zinc (Zn)	0.01	ND

ND : Not detected at or above the practical quantitation limit for the method.

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 625/8270
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 892.1 BAKER TANK
Matrix : WATER
Date sampled : 12/13/89
Date ext. : 12/19/89
Date analyzed: 12/21/89
Dilut. factor: NONE

Anamatrix I.D. : 8912157-01
Analyst : UH
Supervisor : PG
Date released : 12/26/89
Weight ext. : 1 LITER
Instrument ID : N/A

CAS #	Compound Name	Reporting Limit (ug/L)	Amount Found (ug/L)
62-75-9	* N-Nitrosodimethylamine	10	ND
108-95-2	* Phenol	10	ND
62-53-3	**Aniline	10	ND
111-44-4	* bis(-2-Chloroethyl) Ether	10	ND
95-57-8	* 2-Chlorophenol	10	ND
541-73-1	* 1,3-Dichlorobenzene	10	ND
106-46-7	* 1,4-Dichlorobenzene	10	ND
100-51-6	**Benzyl Alcohol	10	ND
95-50-1	* 1,2-Dichlorobenzene	10	ND
95-48-7	**2-Methylphenol	10	ND
108-60-1	**bis(2-chloroisopropyl) Ether	10	ND
106-44-5	**4-Methylphenol	10	ND
621-64-7	* N-Nitroso-Di-n-Propylamine	10	ND
67-72-1	* Hexachloroethane	10	ND
98-95-3	* Nitrobenzene	10	ND
78-59-1	* Isophorone	10	ND
88-75-5	* 2-Nitrophenol	10	ND
105-67-9	* 2,4-Dimethylphenol	10	ND
65-85-0	**Benzoic Acid	50	ND
111-91-1	* bis(-2-Chloroethoxy)Methane	10	ND
120-83-2	* 2,4-Dichlorophenol	10	ND
120-82-1	* 1,2,4-Trichlorobenzene	10	ND
91-20-3	* Naphthalene	10	ND
106-47-8	**4-Chloroaniline	10	ND
87-68-3	* Hexachlorobutadiene	10	ND
59-50-7	* 4-Chloro-3-Methylphenol	10	ND
91-57-6	**2-Methylnaphthalene	10	ND
77-47-4	* Hexachlorocyclopentadiene	10	ND
88-06-2	* 2,4,6-Trichlorophenol	10	ND
95-95-4	**2,4,5-Trichlorophenol	10	ND
91-58-7	* 2-Chloronaphthalene	50	ND
88-74-4	**2-Nitroaniline	10	ND
131-11-3	* Dimethyl Phthalate	50	ND
208-96-8	* Acenaphthylene	10	ND
99-09-2	**3-Nitroaniline	10	ND
83-32-9	* Acenaphthene	50	ND
51-28-5	* 2,4-Dinitrophenol	10	ND
100-02-7	* 4-Nitrophenol	50	ND
132-64-9	**Dibenzofuran	50	ND
		10	ND

ND : Not detected at or above practical quantitation limit for the method.
* A 625 approved compound (Federal Register, 10/26/84).
** A compound on the U.S. EPA CLP Hazardous Substance List (HSL).

DEC 28 1989 09:37 ANAMETRIX, INC. (408) 432-8192

ORGANIC ANALYSIS DATA SHEET -- EPA METHOD 625/8270
 ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 892.1 BAKER TANK
 Matrix : WATER
 Date sampled : 12/13/89
 Date ext. : 12/19/89
 Date analyzed: 12/21/89
 Dilut. factor: NONE

Anamatrix I.D. : 8912157-01
 Analyst : UH
 Supervisor : PG
 Date released : 12/26/89
 Weight ext. : 1 LITER
 Instrument ID : N/A

CAS #	Compound Name	Reporting Limit (ug/L)	Amount Found (ug/L)
121-14-2	* 2,4-Dinitrotoluene	10	ND
606-20-2	* 2,6-Dinitrotoluene	10	ND
84-66-2	* Diethylphthalate	10	ND
7005-72-3	* 4-Chlorophenyl-phenylether	10	ND
86-73-7	* Fluorene	50	ND
100-01-6	**4-Nitroaniline	50	ND
534-52-1	**4,6-Dinitro-2-Methylphenol	10	ND
86-30-6	* N-Nitrosodiphenylamine	10	ND
122-66-7	**Azobenzene	10	ND
101-55-3	* 4-Bromophenyl-phenylether	10	ND
118-74-1	* Hexachlorobenzene	50	ND
87-86-5	* Pentachlorophenol	10	ND
85-01-8	* Phenanthrene	10	ND
120-12-7	* Anthracene	10	ND
84-74-2	* Di-n-Butylphthalate	10	ND
206-44-0	* Fluoranthene	50	ND
92-87-5	* Benzidine	10	ND
129-00-0	* Pyrene	10	ND
85-68-7	* Butylbenzylphthalate	20	ND
91-94-1	* 3,3'-Dichlorobenzidine	10	ND
56-55-3	* Benzo(a)Anthracene	10	ND
117-81-7	* bis(2-Ethylhexyl) Phthalate	10	ND
218-01-9	* Chrysene	10	ND
117-84-0	* Di-n-Octyl phthalate	10	ND
205-99-2	* Benzo(b) Fluoranthene	10	ND
207-08-9	* Benzo(k) Fluoranthene	10	ND
50-32-8	* Benzo(a) Pyrene	10	ND
193-39-5	* Indeno(1,2,3-cd) Pyrene	10	ND
53-70-3	* Dibenz(a,h) Anthracene	10	ND
191-24-2	* Benzo(g,h,i) Perylene	10	ND

CAS #	Surrogate Compounds	Limits	%Recover
		11-70%	25%
		10-62%	24%
367-12-4	2-Fluorophenol	20-105%	46%
4165-62-2	Phenol-d6	26-110%	60%
4165-60-0	Nitrobenzene-d5	26-154%	109%
321-60-8	2-Fluorobiphenyl	16-131%	78%
118-79-6	2,4,6-Tribromophenol		
1718-51-0	Terphenyl-d14		

ND : Not detected at or above practical quantitation limit for the method
 * A 625 approved compound (Federal Register, 10/26/84).
 ** A compound on the U.S. EPA CLP Hazardous Substance List (HSL).

ANALYSIS DATA SHEET - TOTAL OIL AND GREASE
 ANAMETRIX, INC. (408) 432-8192

Project # : 892.1
 Matrix : WATER
 Date sampled : 12/13/89
 Date ext. TOG: 12/19/89
 Date anl. TOG: 12/19/89

Anamatrix I.D. : 8912157-01
 Analyst : A.S.
 Supervisor : ODG
 Date released : 12/26/89

Workorder #	Sample I.D.	Reporting Limit (ug/L)	Amount Found (ug/L)
8912157-01	BAKER TANK	5000	ND

ND - Not detected at or above the practical quantitation limit for the method.

TOG - Total Oil & Grease is determined by Standard Method 503E.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Aqua Terra Technologies
 2950 Buskirk Avenue Ste. 120
 Walnut Creek, CA 94596
 Tel. (415) 934-4884
 Fax. (415) 934-0418



CHAIN OF SAMPLE CUSTODY RECORD
 (original document, please return)

Sampled By: Terry Carter

Date Sampled: Dec 13/ 13 /89

Signature: Terry Carter

Job Number: 892.1

Results To Be Sent To: Terry Carter

Laboratory Name: ANALYTIC

Results Needed By: Dec 21, 1989

Contact: TERRY CARTER

Sampling Location: McGuire - Hester

Phone #: 415 934-4884

Sample Identification					Analysis/EPA Method No.								
Sample Collection			Number of Containers	Preserved	Containers			P270	P271	503 E	Metals (P31)	Pollutants	Remarks
Sample ID	Time (24 hr)	Matrix											
Baker-Tank water	15:45	Water	2	B				X	X	X	X		
	:												
	:												
	:												
	:												
	:												
	:												
	:												
	:												
	:												

Notes:

Relinquished By	Date	Time
<u>Terry Carter</u>	<u>Dec 14, 89</u>	<u>12:30</u>
		:
		:

Received By	Date	Time
<u>Jayhi Mohammed</u>	<u>12/14/89</u>	<u>12:30</u>
		:
		:



Applied GeoSystems

43255 Mission Blvd Suite B Fremont, CA 94539 (415) 651-1906

RECORD OF ANALYSIS

Date 2-20-87

Applied GeoSystems
43255 Mission Blvd.
Fremont, CA. 94539

Attention: Steve M. Zigan

Date Received: 2-12-87

Laboratory# 8702W042

Date Analyzed: 2-19-87

Procedure:

The water samples referenced on the attached Chain-of-Custody were analyzed for the presence and concentration of Benzene, Ethyl-Benzene, Toluene, and Xylenes (BETX) and for Total Volatile Hydrocarbons (TVH) by EPA method 602. The samples were concentrated on a Tekmar LSC-2 and ALS automatic sampler prior to injection into a 5890 Hewlett Packard gas chromatograph fitted with a Photo-Ionization detector (PID) and a Flame Ionization detector (FID). The limit of detection for these samples is 0.0005 milligrams/liter (parts per million = ppm).

The results are presented in the table below:

<u>SAMPLE</u>	<u>SITE</u>	<u>BENZENE</u>	<u>ETHYL BENZENE</u>	<u>TOLUENE</u>	<u>TOTAL XYLENES</u>	<u>TVH</u>
W-19-MW1	86120-2	0.0007	0.0012	0.0042	0.0058	0.0290
W-18-MW2	86120-2	ND	0.0008	0.0013	0.0043	0.0237

Results in milligrams/liter (parts per million = ppm).

ND=Non Detectable - Less than 0.0005 milligrams/liter (ppm).

Tia Tran, Chemist



Applied GeoSystems

43255 Mission Blvd. Suite B Fremont, CA 94539 (415) 651-1906

RECORD OF ANALYSIS

Date 2-19-87

Applied GeoSystems
43255 Mission Blvd.
Fremont, CA. 94539

Attention: Steve M. Zigan

Date Received: 2-13-87

Laboratory# 8702DW11

Date Analyzed: 2-18-87

Procedure:

The water sample was analyzed for high boiling point hydrocarbons by EPA method 3510 for water extraction. The sample was injected into a 5890 Hewlett Packard gas chromatograph fitted with a Flame Ionization detector (FID). The limit of detection for this sample is 0.5 milligrams/liter (parts per million = ppm).

The results are presented in the table below:

<u>SAMPLE</u>	<u>SITE</u>	<u>TOTAL EXTRACTABLE HYDROCARBONS</u>
W-18-MW3	86120-2	ND

Results in milligrams/liter (parts per million = ppm).

ND=Non Detectable - Less than 0.5 milligrams/liter (ppm).

Tia Tran, Chemist



9009 Railroad Avenue
Oakland, California 94603
(415) 632-7676
FAX (415) 562-5209

October 27, 1989

Mr. Rafat Shahid, Chief, Hazardous Materials Program
ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY
80 Swan Way, Suite 200
Oakland, CA 94621

Subject: Remediation of oily sludge at 796 66th Ave., Oakland

94621

Dear Mr. Shahid:

In the process of new construction project at property previously owned by us, a deposit of oily sludge was noted upon demolition. A sample of the sludge was taken by Kaldveer Associates and analyzed for volatile organics, semi-volatile organics and heavy metals (see attached data analysis). The results of the sample indicate the presence of petroleum hydrocarbons only.

It is our intent to manage this waste as hazardous under the Title 22, California Code of Regulation. However, because of the construction project underway, it is necessary that the only sludge deposit be remediated as soon as possible. McGuire and Hester proposed to remove the oily sludge material via excavation until clean material is encountered. Samples will be collected and analyzed by our consultants, Aqua Terra Technologies, Inc. (ATT) to verify that the oil sludge was removed for the excavation. The sludge will be stored on the property until arrangement can be made for proper hauling and disposal at a Class I facility. Storage will be less than 90 days. The material will be wrapped appropriately in plastic to be sure no seepage of petroleum hydrocarbons occurs from the material. A closure report will be provided by our consultants. In addition, ATT will be preparing a groundwater monitoring plan for your approval as part of our total facility remediation investigation. The area where the sludge is excavated will be included in the groundwater monitoring plan.

Because of the ongoing construction, it is necessary that we initiate the remedial activity on November 1, 1989 if this meets with your approval. If you wish to send an inspector to oversee our remedial activity, please feel free to do so.

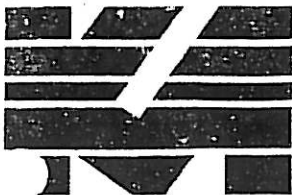
Please contact me at our earliest convenience if you do not agree with our proposal. Time is of the essence related to on-going construction activities. Thank you for your attention.

Very truly yours,

Perry Petersen
Vice President

cc: ATT; CruiseAmerica; R. Harris; MJH; MLL; LW

Attachment: Regt.



**Kaldveer Associates
Geoscience Consultants**

*Rec'd
20/89
PITP/2000
Tom Albert*

Peter Kaldveer, PE, G.E.
President
Richard Short, PE, G.E.
Executive Vice President
Ronald L. Bajuniemi, PE, G.E.
Vice President Engineering
Patrick Stevens, PE, G.E.
Associate
David Hoexter, C.E.G., R.E.A.
Associate
Michael McRae, PE
Associate
William Bender, PE, S.E., A.I.A.
Associate
Dawn Rinaldi, PE
Barbara L. Potter, PE
Randy P. Rowley, R.E.A.
Polly L. Worrell, R.E.A.

October 17, 1989
KE936-3, 14799

CSB Construction
P.O. Box 6059
Oakland, California 94603-0059

Attention: Mr. Ray Kelley

RE: SOIL SAMPLING AND TESTING
CRUISE AMERICA FACILITY
OAKLAND, CALIFORNIA

Gentlemen:

In this letter report, we present the results of our soil sampling and analytical testing program at the Cruise America Facility site. The project property is located along 66th Avenue in Oakland, California, as shown on the Site Plan, Figure 1.

The purpose of this investigation is to provide analytical data as to the nature of contaminated soil at the subject site and to provide preliminary remediation recommendations. The work has been performed by Mr. Ben H. LeFebvre, Staff Geologist and Mr. Randy P. Rowley, Senior Engineering Geologist/Environmental Specialist.

In summary, elevated levels of hazardous waste contaminants, in the form of hydrocarbons are present in the soils in the area sampled. We recommend that the contaminated soils be remediated by removal and disposal at an appropriate facility. To document the complete removal, we recommend that the removal process be observed by our personnel and that we document complete removal by performing closure sampling and analytical testing.

SCOPE OF WORK

The scope of work included: 1) sampling and analysis of a single soil sample; 2) preparation of this letter/report presenting a description of the sampling procedures and results of the analytical program, and 3) preliminary recommendations for remediation.

RECEIVED

OCT 17 1989

CSB CONSTRUCTION, INC.

425 Roland Way
Oakland, California 94621
(415) 568-4001
FAX: 415-568-2205

A California Corporation

FIELD SAMPLING PROCEDURES

Field Investigation

The soil sampling program consisted of sampling the near surface soils at one location on the site. The test hole was excavated using hand tools to a depth of approximately one-half foot. The soil sample obtained for analytical testing was collected from the bottom of this test hole at a depth interval of six inches to twelve inches ("one-foot sample"). The approximate location of the test hole is shown on Figure 1.

The soil sample was collected by hand using a sampler with a two-inch diameter, six-inch long brass liner. The brass liners were cleaned with a trisodium phosphate solution, rinsed with clear water and a final rinse with distilled water prior to sampling. The ends of the soil-filled liner were sealed with aluminum foil, rubber capped, and refrigerated. The sample was transported under chain-of-custody control to Med-Tox Analytical Laboratories in Pleasant Hill, California for analytical analysis. Med-Tox is a California Department of Health Services approved laboratory.

Analytical Tests

The analytical testing consisted of the following analysis:

<u>Test Name</u>	<u>EPA Approved Test Method</u>
*TPH (gasoline) with **BTXE	8015/8020
TPH (diesel)	8015
Total Oil and Grease	SM503D
Total Hydrocarbons (waste oil)	SM503E
Volatile Organic Compounds	8240
Semi-Volatile Organic Compounds	8270
Chlorinated Pesticides and PCBs	8080
CAM metals	AA or ICAD

* TPH = Total Petroleum Hydrocarbons

** BTXE = Benzene, Toluene, Xylene, Ethylbenzene

Analytical Test Results and Discussion

Analytical results are summarized on Table 1 and laboratory results and chain-of-custody records are attached to this letter as Appendix A. The analytical results indicate that there are elevated levels of several compounds in the sample tested, primarily waste oil. The very high concentration of waste oil required that the tested sample be diluted by 100 times which results in elevated detection levels or in other words, may mask other contaminants at low levels.

The "Regional Water Quality Control Board (RWQCB) Staff Recommendation for Initial Evaluation and Investigation of Underground Tanks" (1988), recommends removal and disposal for soils containing greater than 1,000 ppm of hydrocarbon compounds.

Conclusions and Recommendations

This investigation was conducted to sample and test soil at the subject site. The analytical results shown that the soil in the area of the sample (see Figure 1) is contaminated with waste oil at levels requiring remediation. Therefore, we recommend one or both of the following:

1. An expanded soil sampling program to determine the lateral and vertical extent of contamination.
2. Excavation and removal of all observed contaminated soils, and disposal of an appropriate waste disposal site.

We further recommend:

3. Closure soil sampling to document that all contaminated soils have been removed.

LIMITATIONS

Our services have been performed in accordance with generally accepted engineering and environmental principles and practices within the area at the time of our investigation. No other warranty, either expressed or implied as to the professional advice provided is made. The analysis and conclusions contained in this report are based on the site conditions as they existed at the time of our reconnaissance.

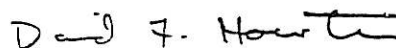
We appreciate the opportunity to provide our services to you on this project. If you have any questions or require additional information, please don't hesitate to call.

Very truly yours,

KALDVEER ASSOCIATES, INC.



Randy P. Rowley, R.E.A.
Senior Engineering Geologist/
Environmental Specialist



David F. Hoexter, C.E.G./R.E.A.
Manger, Environmental/Geological
Services
Associate

RPR/DFH:pv
Copies: Addressee (4)

TABLE 1
SUMMARY OF TEST RESULTS ABOVE
DETECTION LIMITS
(in parts-per-million)

<u>Test</u>	<u>Compound</u>	<u>Concentration</u>
SM503D	Oil and Grease	360,000
SM503E	Hydrocarbons	330,000
Metals	Barium	100
Metals	Beryllium	0.3
Metals	Chromium	7.0
Metals	Cooper	31.0
Metals	Lead	36.0
Metals	Mercury	0.3
Metals	Nickel	1.0
Metals	Zinc	25.0
EPA 8020	Waste Oil	400,000
EPA 8240	Xylenes (total)	1,200

APPENDIX A

CHAIN-OF-CUSTODY RECORD AND
ANALYTICAL TEST RESULTS

R-4, S-K

8909132

CHAIN-OF-CUSTODY RECORD

Project Number KE936-3		Project Name EA Oakland					Number/Type of Containers	Analytical Tests Priority Pollutants	Remarks
Sampler's Name (printed) B. H. Lefebvre									
Boring Number	Date	Time	Soil	Water	Sample Location or Depth	Sample Number			
OIA 1	9/27/39		✓		0.5 ft	1	✓		

Relinquished by: (Signature) <i>B. H. Lefebvre</i>	Date/Time 9-27-39	Received by: (Signature) <i>L. St John</i>
Relinquished by: (Signature) <i>B. H. Lefebvre</i>	Date/Time 9-20-39 2:00 PM	Received by: (Signature) <i>L. St John</i>
Relinquished by: (Signature) <i>L. St John</i>	Date/Time 9-27-39 3:5	Received for Laboratory by: (Signature) <i>Denise Harrington</i>

Ship To: Mut-tox
Pleasant Hill, CA

Attention: ~~Randy~~ Suzanne Silvera/Robin Blair

Phone No: _____

Requested Turnaround Time: Normal

Remarks:

Kaldveer Assoc. Contact: Randy Rowley

Please address correspondence to:
Kaldveer Associates, Inc.
425 Roland Way
Oakland, California 94621
(415) 568-4001



ENVIRONMENTAL & OCCUPATIONAL HEALTH SERVICES

3440 Vincent Road Pleasant Hill, CA 94523 • (415) 930-9090 • FAX# (415) 930-0256

LABORATORY ANALYSIS REPORT

KALDVEER ASSOCIATES, INC.
425 ROLAND WAY
OAKLAND, CA 94621

ATTN: RANDY ROWLEY

CLIENT PROJECT NO: KE936-3

REPORT DATE: 10/11/89

DATE SAMPLED: 09/20/89

DATE RECEIVED: 09/20/89

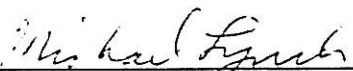
DATE EXTRACTED: 10/03/89

DATE ANALYZED: 10/04-05/89

MED-TOX JOB NO: 8909132

ANALYSIS OF: ONE SOIL SAMPLE

Sample Identification	Oil & Grease	Hydrocarbons
Client Id. Lab No.	(mg/kg)	(mg/kg)
#1 01A	360,000	330,000
Detection limit	500	500
Method	SM 503 D	SM 503 E


Michael Lynch, Manager
Organic Laboratory

Results FAXed to Randy Rowley 10/04/89 and 10/09/89

This is a revision of the report dated 10/10/89

KALDVEER ASSOCIATES, INC.

CLIENT ID: #1
 CLIENT JOB NO: KE936-3
 DATE RECEIVED: 09/20/89

MED-TOX LAB NO: 8909132-01A
 MED-TOX JOB NO: 8909132
 REPORT DATE: 10/11/89

CAM-17 METALS

CODE	METAL	CONCENTRATION (mg/kg)	TTLIC (mg/kg)	DETECTION LIMIT (mg/kg)	METHOD REFERENCE
Sb	Antimony	ND	500	5	7040
As	Arsenic	ND	500	50	7060
Ba	Barium	100	10,000	5	7080
Be	Beryllium	0.3	75	0.2	7090
Cd	Cadmium	ND	100	0.2	7130
Cr	Chromium	7	2,500	1	7190
Co	Cobalt	ND	8,000	1	7200
Cu	Copper	31	2,500	1	7210
Pb	Lead	36	1,000	1	7420
Hg.	Mercury	0.3	20	0.2	7471
Mo	Molybdenum	ND	3,500	3	7480
Ni	Nickel	1	2,000	1	7520
Se	Selenium	ND	100	50	7740
Ag	Silver	ND	500	0.3	7760
Tl	Thallium	ND	700	1	7840
V	Vanadium	ND	2,400	20	7910
Zn	Zinc	25	5,000	2	7950

ND = Not Detected

KALDVEER ASSOCIATES, INC.

CLIENT ID: #1
 CLIENT JOB NO: KE936-3
 DATE SAMPLED: 09/20/89
 DATE RECEIVED: 09/20/89

MED-TOX LAB NO: 8909132-01A
 MED-TOX JOB NO: 8909132
 DATE EXTRACTED: 09/25/89
 DATE ANALYZED: 10/06/89
 REPORT DATE: 10/11/89

EPA METHOD 8080
 ORGANOCHLORINE PESTICIDES AND PCBs

COMPOUND	CAS #	CONCENTRATION (ug/kg)	DETECTION LIMIT (ug/kg)
Aldrin	309-00-2	ND	1,000
alpha-BHC	319-84-6	ND	1,000
beta-BHC	319-85-7	ND	1,000
delta-BHC	319-86-8	ND	1,000
gamma-BHC (Lindane)	58-89-9	ND	1,000
Chlordane	57-74-9	ND	10,000
4,4'-DDD	72-54-8	ND	3,000
2,4'-DDD	53-19-0	ND	3,000
4,4'-DDE	72-55-9	ND	3,000
2,4'-DDE	3424-82-6	ND	3,000
4,4'-DDT	50-29-3	ND	3,000
2,4'-DDT	789-02-6	ND	3,000
Dieldrin	60-57-1	ND	3,000
Endosulfan I	959-98-8	ND	1,000
Endosulfan II	33212-65-9	ND	3,000
Endosulfan sulfate	1031-07-8	ND	3,000
Endrin	72-20-8	ND	3,000
Endrin aldehyde	7421-93-4	ND	3,000
Heptachlor	76-44-8	ND	1,000
Heptachlor epoxide	1024-57-3	ND	1,000
Methoxychlor	72-43-5	ND	3,000
Toxaphene	8001-35-2	ND	10,000
PCB-1016	12674-11-2	ND	10,000
PCB-1221	11104-28-2	ND	10,000
PCB-1232	11141-16-5	ND	10,000
PCB-1242	53469-21-9	ND	10,000
PCB-1248	12672-29-6	ND	10,000
PCB-1254	11097-69-1	ND	10,000
PCB-1260	11096-82-5	ND	10,000

ND = Not Detected

KALDVEER ASSOCIATES, INC.

CLIENT ID: #1
CLIENT JOB NO: KE936-3

MED-TOX LAB NO: 8909132-01A
MED-TOX JOB NO: 8909132
DATE EXTRACTED: 09/25/89

DATE SAMPLED: 09/20/89
DATE RECEIVED: 09/20/89

DATE ANALYZED: 09/28-29/89
REPORT DATE: 10/11/89

BTXE AND TOTAL PETROLEUM HYDROCARBONS

METHOD: EPA 8020, 8015 (PURGE & TRAP AND EXTRACTION)

	CONCENTRATION (ug/kg)	DETECTION LIMIT (ug/kg)
Benzene	ND	1,000
Toluene	ND	1,000
Ethylbenzene	ND	1,000
Xylenes	ND	3,000

TOTAL PETROLEUM HYDROCARBONS AS:

Gasoline	ND mg/kg	2,000 mg/kg
Diesel	ND mg/kg	400 mg/kg
Waste Oil	400,000 mg/kg	800 mg/kg

ND = Not Detected

KALDVEER ASSOCIATES, INC.

CLIENT ID: #1
 CLIENT JOB NO: KE936-3
 DATE SAMPLED: 09/20/89
 DATE RECEIVED: 09/20/89

MED-TOX LAB NO: 8909132-01A
 MED-TOX JOB NO: 8909132
 DATE EXTRACTED: 10/03/89
 DATE ANALYZED: 10/04/89
 REPORT DATE: 10/11/89

EPA METHOD 8270
 BASE NEUTRAL EXTRACTABLES

COMPOUND	CAS #	CONCENTRATION (ug/kg)	DETECTION LIMIT (ug/kg)
Acenaphthene	83-32-9	ND	500,000
Acenaphthylene	208-96-8	ND	500,000
Anthracene	120-12-7	ND	500,000
Benzidine	92-87-5	ND	2400,000
Benzoic Acid	65-85-0	ND	2400,000
Benzo(a)anthracene	56-55-3	ND	500,000
Benzo(b)fluoranthene	205-99-2	ND	500,000
Benzo(k)fluoranthene	207-08-9	ND	500,000
Benzo(g,h,i)perylene	191-24-2	ND	500,000
Benzo(a)pyrene	50-32-8	ND	500,000
Benzyl Alcohol	100-51-6	ND	990,000
Bis(2-chloroethoxy) methane	111-91-1	ND	500,000
Bis(2-chloroethyl)ether	111-44-4	ND	500,000
Bis(2-chloroisopropyl) ether	39638-32-9	ND	500,000
Bis(2-ethylhexyl) phthalate	117-81-7	ND	500,000
4-Bromophenyl phenyl ether	101-55-3	ND	500,000
Butylbenzyl phthalate	85-68-7	ND	500,000
4-Chloroaniline	106-47-8	ND	990,000
2-Chloronaphthalene	91-58-7	ND	500,000
4-Chlorophenyl phenyl ether	7005-72-3	ND	500,000
Chrysene	218-01-9	ND	500,000
Dibenzo(a,h)anthracene	53-70-3	ND	500,000
Dibenzofuran	132-64-9	ND	500,000
Di-n-butylphthalate	84-74-2	ND	500,000
1,2-Dichlorobenzene	95-50-1	ND	500,000

ND = Not Detected

KALDVEER ASSOCIATES, INC.

CLIENT ID: #1
 CLIENT JOB NO: KE936-3
 DATE SAMPLED: 09/20/89
 DATE RECEIVED: 09/20/89

MED-TOX LAB NO: 8909132-01A
 MED-TOX JOB NO: 8909132
 DATE EXTRACTED: 10/03/89
 DATE ANALYZED: 10/04/89
 REPORT DATE: 10/11/89

EPA METHOD 8270
 BASE NEUTRAL EXTRACTABLES (cont.)

COMPOUND	CAS #	CONCENTRATION (ug/kg)	DETECTION LIMIT (ug/kg)
1,3-Dichlorobenzene	541-73-1	ND	500,000
1,4-Dichlorobenzene	106-46-7	ND	500,000
3,3'-Dichlorobenzidine	91-94-1	ND	990,000
Diethylphthalate	84-66-2	ND	500,000
Dimethylphthalate	131-11-3	ND	500,000
2,4-Dinitrotoluene	121-14-2	ND	500,000
2,6-Dinitrotoluene	606-20-2	ND	500,000
Di-n-octylphthalate	117-84-0	ND	500,000
1,2-Diphenylhydrazine	122-66-7	ND	500,000
Fluoranthene	206-44-0	ND	500,000
Fluorene	86-73-7	ND	500,000
Hexachlorobenzene	118-74-1	ND	500,000
Hexachlorobutadiene	87-68-3	ND	500,000
Hexachlorocyclopentadiene	77-47-4	ND	500,000
Hexachloroethane	67-72-1	ND	500,000
Indeno(1,2,3-cd)pyrene	193-39-5	ND	500,000
Isophorone	78-59-1	ND	500,000
2-Methylnaphthalene	91-57-6	ND	500,000
Naphthalene	91-20-3	ND	500,000
2-Nitroaniline	88-74-4	ND	2400,000
3-Nitroaniline	99-09-2	ND	2400,000
4-Nitroaniline	100-01-6	ND	2400,000
Nitrobenzene	98-95-3	ND	500,000
N-nitrosodimethylamine	62-75-9	ND	500,000
N-nitrosodiphenylamine	86-30-6	ND	500,000
N-nitroso-di-n-propylamine	621-64-7	ND	500,000
Phenanthrene	85-01-8	ND	500,000
Pyrene	129-00-0	ND	500,000
1,2,4-Trichlorobenzene	120-82-1	ND	500,000

ND = Not Detected

KALDVEER ASSOCIATES, INC.

CLIENT ID: #1
 CLIENT JOB NO: KE936-3
 DATE SAMPLED: 09/20/89
 DATE RECEIVED: 09/20/89

MED-TOX LAB NO: 8909132-01A
 MED-TOX JOB NO: 8909132
 DATE EXTRACTED: 10/03/89
 DATE ANALYZED: 10/04/89
 REPORT DATE: 10/11/89

EPA METHOD 8270
 ACID EXTRACTABLES

COMPOUND	CAS #	CONCENTRATION (ug/kg)	DETECTION LIMIT (ug/kg)
4-Chloro-3-methylphenol	59-50-7	ND	500,000
2-Chlorophenol	95-57-8	ND	500,000
2,4-Dichlorophenol	120-83-2	ND	500,000
2,4-Dimethylphenol	105-67-9	ND	500,000
4,6-Dinitro-2-methylphenol	534-52-1	ND	2400,000
2,4-Dinitrophenol	51-28-5	ND	2400,000
2-Methylphenol	95-48-7	ND	500,000
4-Methylphenol	106-44-5	ND	500,000
2-Nitrophenol	88-75-5	ND	500,000
4-Nitrophenol	100-02-7	ND	2400,000
Pentachlorophenol	87-86-5	ND	2400,000
Phenol	108-95-2	ND	500,000
2,4,5-Trichlorophenol	95-95-4	ND	500,000
2,4,6-Trichlorophenol	88-06-2	ND	500,000

ND = Not Detected

KALDVEER ASSOCIATES, INC.

CLIENT ID: #1
 CLIENT JOB NO: KE936-3
 DATE SAMPLED: 09/20/89
 DATE RECEIVED: 09/20/89

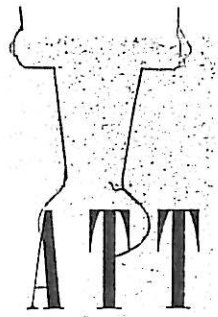
MED-TOX LAB NO: 8909132-01A
 MED-TOX JOB NO: 8909132
 DATE ANALYZED: 09/28/89
 REPORT DATE: 10/11/89

EPA METHOD 8240
 GC/MS VOLATILE ORGANICS

COMPOUND	CAS #	CONCENTRATION (ug/kg)	DETECTION LIMIT (ug/kg)
Acetone	67-64-1	ND	10,000
Benzene	71-43-2	ND	500
Bromodichloromethane	75-27-4	ND	500
Bromoform	75-25-2	ND	500
Bromomethane	74-83-9	ND	1,000
2-Butanone	78-93-3	ND	10,000
Carbon Disulfide	75-15-0	ND	1,000
Carbon Tetrachloride	56-23-5	ND	500
Chlorobenzene	108-90-7	ND	500
Chloroethane	75-00-3	ND	1,000
2-Chloroethyl Vinyl Ether	110-75-8	ND	1,000
Chloroform	67-66-3	ND	500
Chloromethane	74-87-3	ND	1,000
Dibromochloromethane	124-48-1	ND	500
1,1-Dichloroethane	75-34-3	ND	500
1,2-Dichloroethane	107-06-2	ND	500
1,1-Dichloroethene	75-35-4	ND	500
1,2-Dichloroethene, total	540-59-0	ND	500
1,2-Dichloropropane	78-87-5	ND	500
cis-1,3-Dichloropropene	10061-01-5	ND	500
trans-1,3-Dichloropropene	10061-02-6	ND	500
Ethylbenzene	100-41-4	ND	500
2-Hexanone	591-78-6	ND	5,000
Methylene Chloride	75-09-2	ND	500
4-Methyl-2-pentanone	108-10-1	ND	5,000
Styrene	100-42-5	ND	1,000
1,1,2,2-Tetrachloroethane	79-34-5	ND	500
Tetrachloroethene	127-18-4	ND	500
Toluene	108-88-3	ND	500
1,1,1-Trichloroethane	71-55-6	ND	500
1,1,2-Trichloroethane	79-00-5	ND	500
Trichloroethene	79-01-6	ND	500
Vinyl Acetate	108-05-4	ND	5,000
Vinyl Chloride	75-01-4	ND	1,000
Xylenes, total	1330-20-7	1,200	1,000

ND = Not Detected

NOTE: Due to an apparent "matrix effect", it was necessary to dilute this sample 100x to achieve adequate surrogate recovery. Reported detection limits have been adjusted accordingly.



4
RECEIVED
JAN 13 1989

January 9, 1989

Mr. Peter Johnson
California Regional Water Quality Control Board HAYWARD
San Francisco Bay Region
1111 Jackson Street, Room 6000
Oakland, CA 94607

Re: Groundwater Investigation Report
McGuire & Hester Facility
796 66th Avenue, Oakland, CA

Dear Ms. McCann:

Aqua Terra Technologies, Inc. (ATT) is pleased to present the results of a groundwater investigation associated with underground tank closure at the former McGuire and Hester 66th Avenue facility, located at 796 66th Avenue, Oakland. The investigation proceeded in accordance with guidelines and recommendations established by the San Francisco Bay Region of the California Regional Water Quality Control Board (RWQCB, June 2, 1988). The report includes a review of previous site investigations and analytical results from all previous groundwater sampling events. Previous work associated with tank closure at the facility was submitted in an ATT report dated December 6, 1988, presented to Mr. Ariu Levi of the Alameda County Health Care Services Agency (ACHCSA). A copy of the Plan of correction was addressed to Peter Johnson of the RWQCB.

REGIONAL SETTING

The property is located at the southeast corner of 66th Avenue and Coliseum Way in an industrialized portion of Oakland, California (Plate 1, Attachment A). McGuire and Hester, a heavy engineering general contractor, has been located at the 66th Avenue facility for 32 years. The facility is used primarily for offices, storage of construction material, heavy engineering equipment storage and light maintenance, and default inventory.

The site is located within the San Leandro Cone groundwater subarea of the East Bay Plain, near the lower portion of the Oakland Upland and Alluvial Plain, as described in Geohydrology and Groundwater - Quality Overview, East Bay Plain Area, Alameda County, California, 205(J) Report, Alameda County Flood Control and Water Conservation District (ACFCWCD), June, 1988. Shallow sediments deposited within the groundwater subarea include bay mud, interfluvial deposits of silt and clay rich in organic material, fluvial deposits of

Aqua Terra Technologies
Consulting Engineers
& Scientists

2950 Buskirk Avenue
Suite 120
Walnut Creek, CA
94596
415 934-4884

Mr. Peter Johnson
California Regional Water Quality Control Board
January 9, 1989
Page 2

sand and silty to clayey sand, and younger alluvium consisting of sand and gravel. The bay mud deposits, upon which the site is located, are generally of very low permeability, and are saturated with brackish water. Information presented in the ACFCWCD 205(J) report indicates that the regional shallow groundwater gradient in the vicinity of the site is directed southwest to south-southwest, away from the Hayward fault and towards San Francisco Bay.

Six soil and/or groundwater contamination sites have been identified within a one-mile radius of the facility, based on information presented in the ACFCWCD 205(J) report.

SITE GEOLOGY

Boring logs from a geotechnical investigation of the site conducted by others were reviewed to determine the subsurface geologic conditions. The upper 40 to 50 feet of saturated material beneath the site is composed of clay and silty clay. Thin discontinuous lenses of fine silty sand are present locally, as is typical of the forebay mud and interfluvial deposits. Groundwater was generally encountered at depths of four to six feet at the time of drilling. A well graded sand ranging from five to 10 feet in thickness is located at an approximate depth of 50 feet. Silty clays interbedded with fine sands were encountered in the borings below 55 feet. The deepest boring was terminated at approximately 77 feet.

BACKGROUND AND PREVIOUS WORK

On August 19, 1988 McGuire and Hester closed escrow for the property located at 796 66th Avenue, Oakland. The property was sold to Cruise America, Inc. (CAI), located in Miami, Florida. It was agreed that McGuire and Hester would vacate the 66th Avenue property by January 15, 1989.

Previous investigations at the site included: 1) underground tank closure activities conducted for McGuire and Hester, 2) post closure soil and groundwater sampling and analyses conducted for McGuire and Hester, 3) due diligence environmental investigations conducted for CAI, and 4) recent work

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conducted for McGuire and Hester by ATT and others. All reports and data documenting previous investigations are included in the above referenced ATT Plan of Correction for Petroleum Hydrocarbon Contaminated Soil, dated December 6, 1988.

Summary of Tank Closure and Soil Investigations

The former location of three underground tanks, designated T1, T2, and T3, are shown on Plate 2, Attachment A. In January 1987, the tanks were removed and soil samples were collected from the base of each excavation. Concentrations of TPH as gasoline from the T1 and T2 gasoline tank excavations ranged from 3.8 mg/Kg (ppm) to 758 mg/Kg. Concentrations of TPH diesel in the T3 diesel tank excavation ranged from 78 mg/Kg to 492 mg/Kg.

Additional soil samples were collected from exploratory borings in March 1987. Analyses indicated that TPH concentrations in excess of 1,000 ppm were present in the area of the excavated diesel tank to an approximate depth of five feet.

During February 1988, a property preacquisition survey was conducted in accordance with due diligence activities for CAI. Soil samples collected to depths of three feet in the vicinity of the former underground diesel tank fell below the 1,000 ppm RWQCB (1985) general decision value for requiring excavation of contaminated soil.

A supplemental investigation conducted for CAI included removal of area soils for visual inspection and sampling. Soils were excavated in the vicinity of the former underground diesel tank until analyses indicated that remaining soils contained concentrations below the general RWQCB decision level criteria for requiring soil excavation.

Summary of Previous Groundwater Investigations

During March 1987, Applied Geosystems installed three monitoring wells in the vicinity of the removed underground storage tanks in accordance with RWQCB guidelines for addressing fuel leaks (RWQCB, 1985). These wells are designated as AGS-MW-1, AGS-MW-2, and

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AGS-MW-3 on Plate 2, Attachment A. Results of the AGS sampling event are presented in Table 1, Attachment B. Concentrations of TPH, ethylbenzene, toluene, and xylene were detected in Wells AGS-MW-1 and AGS-MW-2. Trace concentrations of benzene were detected in AGS-MW-1. TPH concentrations were not detected in AGS-MW-3.

Two additional monitoring wells, designated on Plate 2, Attachment A as PRA-MW-1 and PRA-MW-2 were subsequently installed by Purcell, Rhodes & Associates (PRA) for CAI in the area of the excavated diesel tank. Groundwater samples were collected from the three monitoring wells during July 1988. Analytical results of the sampling event are presented in Table 2, Attachment B. Reported concentrations range from 0.72 to 2,300 mg/L (ppm) TPH as diesel. A thin product sheen (less than one quarter inch) was observed during sampling of the wells with a bailer. Due to media cross contamination, caused by contacting the bailer with the free product sheen the reported results are likely not representative of actual groundwater conditions.

Monitoring wells AGS-MW-3, PRA-MW-1, and PRA-MW-2 were destroyed in late July 1988 during a subsequent soil investigation. An additional monitoring well, designated PRA-MW-4, was installed and sampled by PRA in the vicinity of the former diesel fuel tank in August 1988 (Plate 3, Attachment A). TPH diesel concentrations of 2,300 mg/L are reported by the laboratory. The sample is reported to have an absence of floating product. At no time are the wells on site reported to have contained a measurable thickness of floating product.

ATT GROUNDWATER INVESTIGATION

ATT personnel reviewed site groundwater monitoring well locations in November 1988. Four wells were located onsite: AGS-MW-1, AGS-MW-2, PRA-MW-4, and an unidentified monitoring well. The unidentified monitoring well is designated as Well MW-3 on Plate 3, Attachment A.

Groundwater levels were measured on November 22, 1988 and twice on December 28, 1988. Results of the groundwater elevation surveys are presented in Table 3, Attachment B. Depth to the potentiometric surface

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ranges from five to 13 feet below grade. Variations in the level of the potentiometric surface may be attributable to differences in the total depth of the wells (Table 3, Attachment B). Due to differences in the total depth of the wells, groundwater elevation data cannot be compared between well pairs AGS-MW-1/AGS-MW-2 and MW-3/PRA-MW-4. Consequently, conclusions regarding groundwater gradient and flow cannot be made at this time.

Groundwater Quality Results

ATT personnel collected groundwater samples from each of the existing monitoring wells in accordance with protocol presented in Attachment C. Wells MW-1 and MW-2 were analyzed for TPH gasoline, benzene, toluene, ethylbenzene, and xylene (BTEX). Wells MW-3 and MW-4 were each analyzed for TPH diesel and oil & grease.

Certified analytical results, chain of custody documentation, and field sample collection records are presented in Attachment D. Analytical results are presented in Table 4, Attachment B. Only one well contained any contaminants above the laboratory detection limit. Well PRA-MW-4 contained 3.7 mg/L TPH as diesel. This is considerably below the 2,300 mg/L detected on August 11, 1988 by Purcell Rhoades & Associates.

CONCLUSIONS AND RECOMMENDATIONS

The analytical record shows decreasing concentrations through time of petroleum hydrocarbons in groundwater beneath the site. The decreasing concentrations may be attributable to successful source removal, as documented in previous ATT reports. It is recommended that a graduated groundwater monitoring plan be implemented to verify current trends.

CAI plans to construct new buildings at the site, as shown in Plate 4, Attachment A. Monitoring wells AGS-MW-1 and AGS-MW-2 should remain as part of the monitoring system since they were properly constructed and adequate construction data exists for these wells. Monitoring wells MW-3 and PRA-MW-4 should be properly abandoned according to local Zone 7 regulations. There are no construction details or permits for these wells.

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ATT recommends replacing Well PRA-MW-4 with a new well following completion of site building construction. The new well will be installed according to the procedures outlined in Attachment E. The total depth of the new well will match that of the existing AGS wells on site.

The proposed location for the new monitoring well is presented in Plate 4, Attachment A. The well will be located within 10 feet of the excavated diesel tank, in accordance with applicable RWQCB guidelines (RWQCB, June, 1988). The well will be labeled ATT-MW-3 to avoid confusion with the abandoned wells. The new monitoring well location will be used to confirm the groundwater flow direction and gradient, and to monitor groundwater quality.

The wells will be monitored on a quarterly basis for a minimum of one year. Wells AGS-MW-1 and AGS-MW-2 will be monitored for TPH as gasoline and BTXE compounds by EPA Method 602. Well ATT-MW-3 will be monitored for TPH as diesel and oil and grease. Based on the results of analyses during this time period, additional monitoring may be recommended on an annual basis.

SCHEDULE

ATT requests review and approval of this groundwater monitoring plan be expedited in order to meet scheduling requirements for site construction associated with the recent transfer of the property.

ATT

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January 9, 1989
Page 7

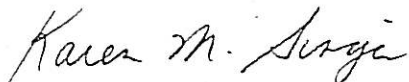
Should you have any questions concerning this
groundwater monitoring plan, please do not hesitate to
call us.

Very truly yours,

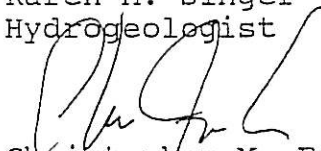
AQUA TERRA TECHNOLOGIES, INC.



R. Wane Schneiter, Ph.D.
Principal Environmental Engineer
Civil Engineer # 38735 (Expires 3/31/89)



Karen M. Singer
Hydrogeologist



Christopher M. French
Registered Geologist #4465 (Expires 6/30/90)

RMB/CMF:dh
Attachments

cc: Perry Peterson, McGuire and Hester
Dwight Hoenig, DHS
Gil Jensen, Alameda County District Attorney
Mr. Ariu Levi, Alameda County Health Care Agency

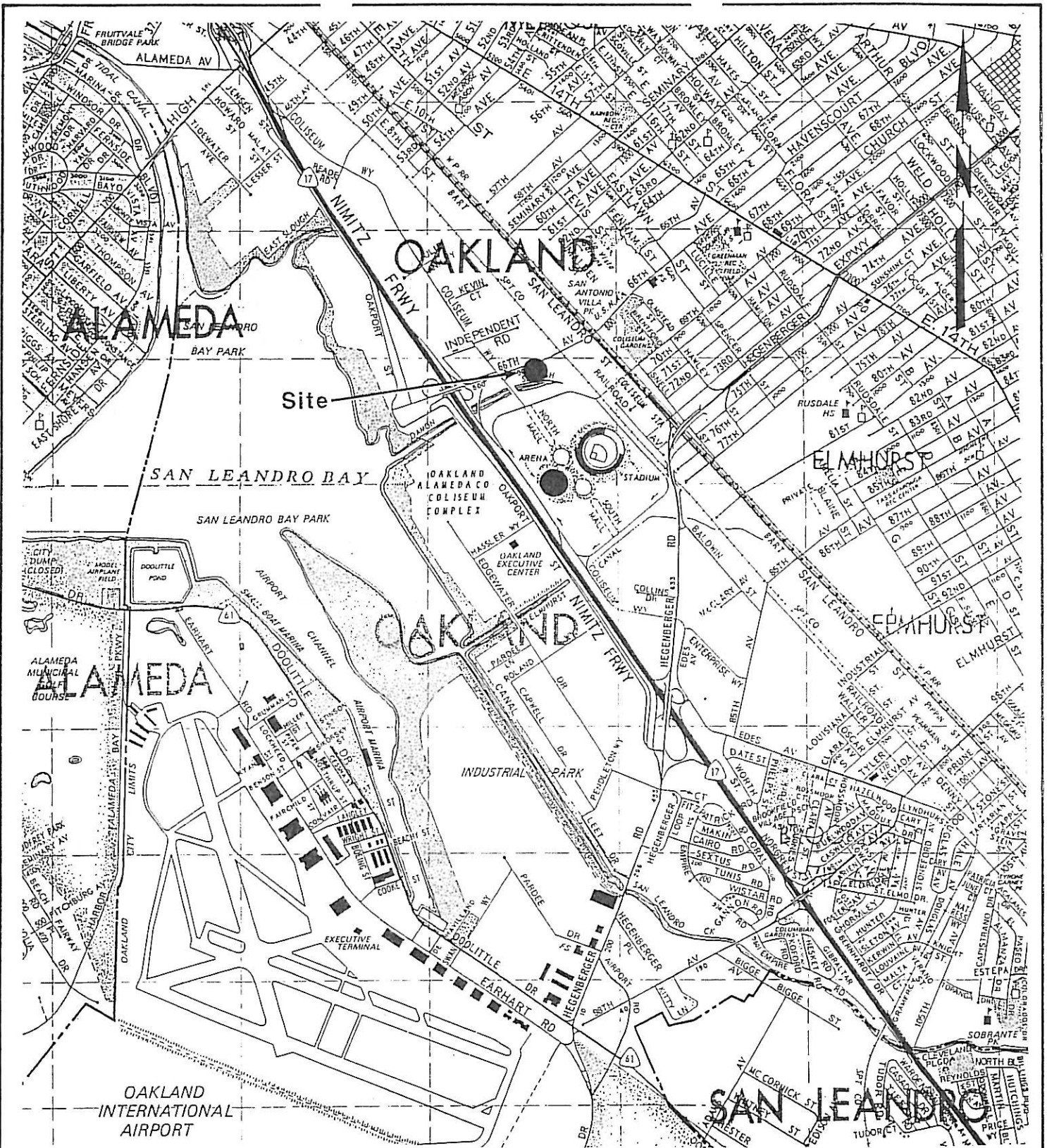
REFERENCES

REFERENCES

- Alameda County Flood Control and Water Conservation District. 1988. Geohydrology and Groundwater - Quality Overview, East Bay Plain Area, Alameda County, California, 205 (J) Report. June 1988.
- Aqua Terra Technologies, Inc. 1988. Plan of Correction for Petroleum Hydrocarbon Contaminated Soil. Letter Report to Ariv Levi, ACHCSA December 6, 1988.
- Regional Water Quality Control Board. 1988. Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks. June 1988.

ATTACHMENT A

Plates

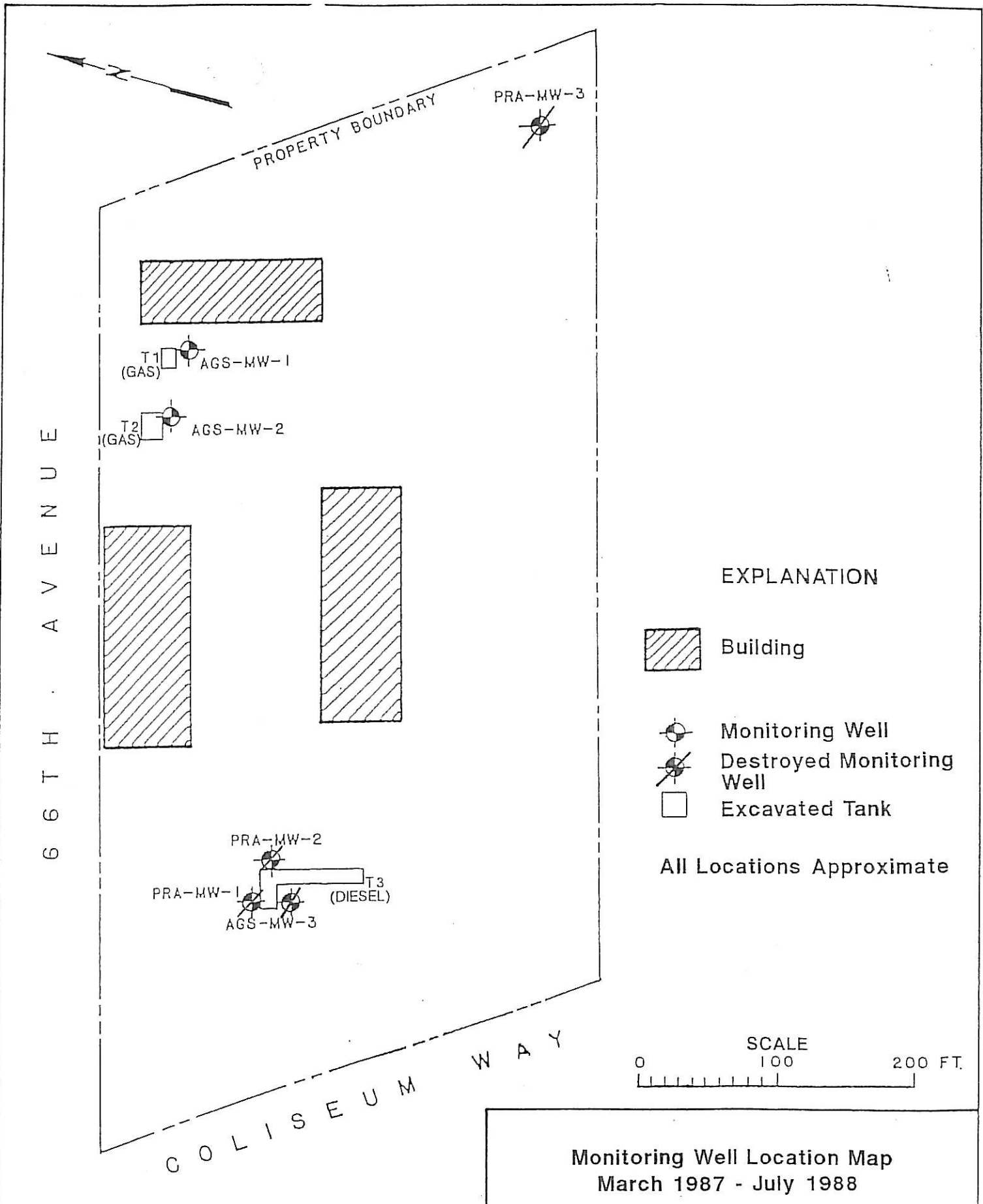


Site Location Map

ATT Aqua Terra Technologies
 Consulting Engineers
 & Scientists

McGuire and Hester
 JOB NUMBER 892
 DATE 1/89

PLATE
 1



EXPLANATION



Building



Monitoring Well



Destroyed Monitoring Well



Excavated Tank

All Locations Approximate

Monitoring Well Location Map
March 1987 - July 1988

ATT

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Consulting Engineers
& Scientists

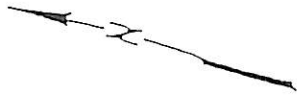
McGuire and Hester

PLATE

JOB NUMBER
892

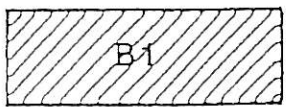
DATE
1/89

2



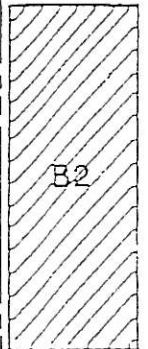
PROPERTY BOUNDARY

66TH AVENUE

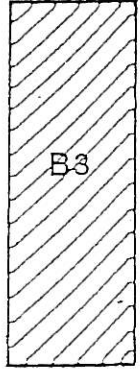


AGS-MW-1

AGS-MW-2



B2



B3

MW-3

B4

PRA-MW-4

COLISEUM WAY

EXPLANATION

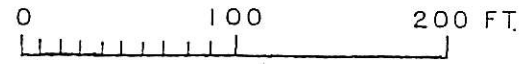
Monitoring Well

Building

NOTE:

- All Locations Approximate
- Well MW-3 was not identified in previous information reviewed by ATT

SCALE



Existing Monitoring Well Locations
November 1988 - January 1989

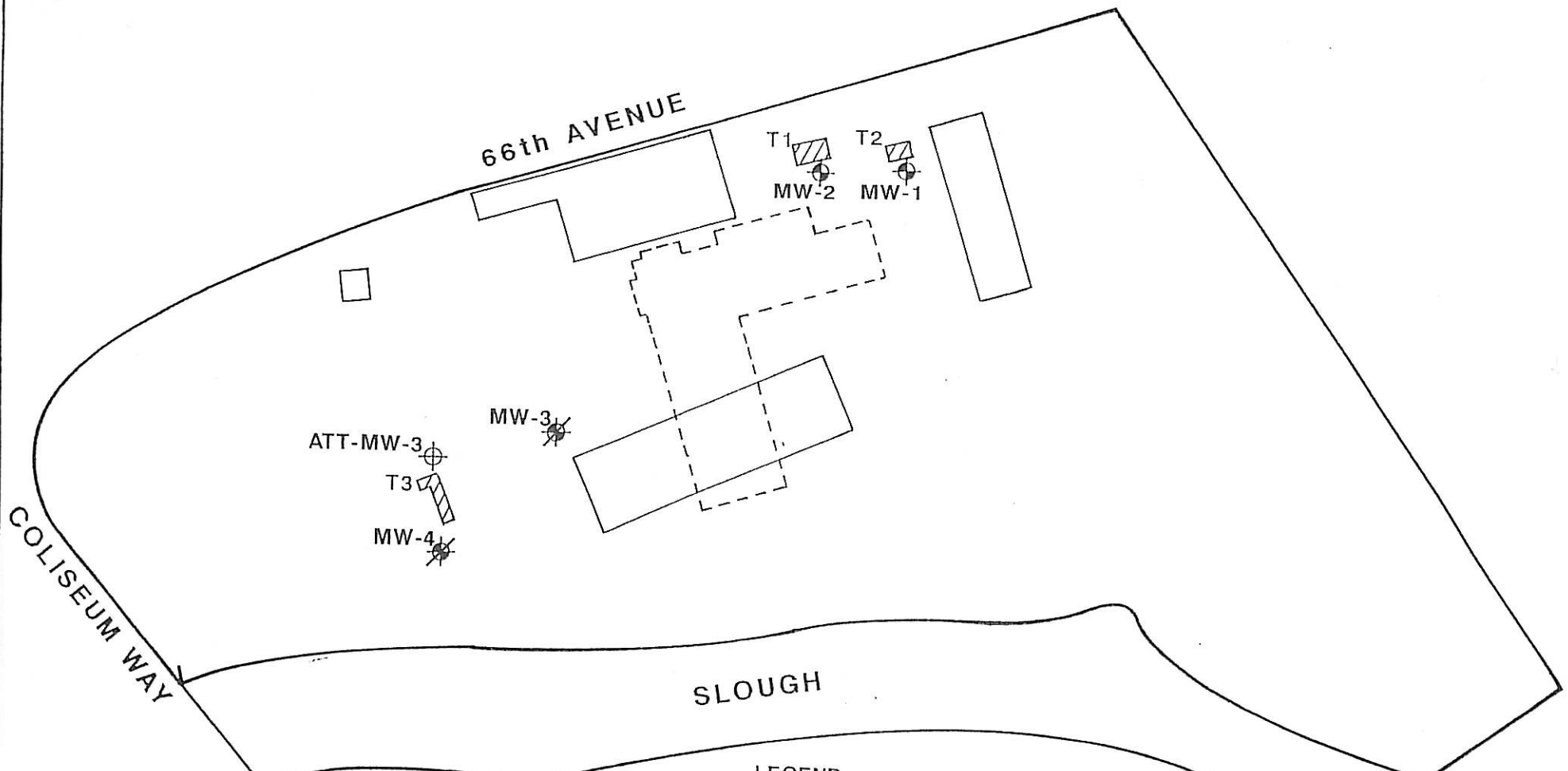
McGuire and Hester

PLATE

JOB NUMBER
892

DATE
1/89

3



- LEGEND
- Existing Building
 - ▨ Excavated Tank Site
 - ⊗ Destroyed Monitoring Well
 - ⊕ Existing Monitoring Well
 - ⊕ Proposed Monitoring Well
 - ⊔ Proposed Building

0 100 200 feet
SCALE
approximate



PLATE
4

ATT Aqua Terra Technologies
Consulting Engineers
& Scientists

Proposed Monitoring Well Network

McGuire & Hester

JOB NUMBER
892

DATE
1/89

ATTACHMENT B

Tables

Table 1. Groundwater Chemical Data Summary^a
 Post Closure Underground Tank Investigation
 McGuire & Hester, Oakland, CA

Well Designation	Sampling Date	TPH ^b as Diesel (ug/L)	TPH ^b as Gasoline (ug/L)	Aromatic Hydrocarbons ^c			
				B	E	T	X
MW-1	02/12/87	NA ^d	29.0	0.7	4.2	1.2	5.8
MW-2	02/12/87	NA	23.7	ND	1.3	0.8	4.3
MW-3	02/12/87	ND ^e	NA	NA	NA	NA	NA

- a. Summary of Analytical Results presented in AGS report dated March 24, 1987.
- b. TPH = Total petroleum hydrocarbons reported as either gasoline or diesel. Analysis for TPH as diesel using EPA Method 3550/8015. Analysis for TPH as gasoline using EPA Method 5030.
- c. B = Benzene, E = Ethylbenzene, T = Toluene, X = Xylenes.
- d. NA = Sample not analyzed for this constituent.
- e. Not present in sample of concentration above the analytical detection limit.

Table 2. Groundwater Analytical Data Summary^a
Preacquisition Due Diligence Investigation
McGuire & Hester, Oakland, CA

Well Designation	Sample Date	TPH ^b (mg/L)
MW-1	7/11/88	0.72
MW-2	7/11/88	60
MW-3	7/11/88	33
MW-4	8/11/88	2,300

- a. Summary of analytical results presented in Purcell, Rhoades & Associates reports dated August 16, 1988 (preliminary and supplemental reports).
- b. Total petroleum hydrocarbons reported as diesel by EPA Method 3510/8015. Results presented in milligrams per liter (mg/L) in report. Sampling method may not have been appropriate for site conditions.
- c. Concentration reported as petroleum oil by Method 418.1.

Table 3. Groundwater Elevation Data
 Groundwater Investigation
 McGuire & Hestor, Oakland, CA

Well Number	Top Casing Elevation ^a	Well Depth	Date (Time)	Water Depth	Groundwater Elevation ^a
MW-1	0.00	31	11/22/88	12.84	-12.84
			12/28/88 (0748)	12.13	-12.13
			12/28/88 (1548)	12.17	-12.17
MW-2	-0.38	27	11/22/88	12.27	-12.65
			12/28/88 (0750)	11.44	-11.82
			12/28/88 (1550)	11.65	-12.03
MW-3	+0.15	9.7	11/22/88	5.97	- 5.82
			12/28/88 (0752)	5.51	- 5.36
			12/28/88 (1552)	5.51	- 5.36
MW-4	+1.20	9.7	11/22/88	7.78	- 6.58
			12/28/88 (0754)	7.45	- 6.25
			12/28/88 (1554)	7.47	- 6.27

a. Elevation relative to grade (0.00)

Table 4. Groundwater Analytical Data Summary^a
 Groundwater Investigations
 McGuire & Hestor, Oakland, CA

Well Designation	Sampling Date	TPH ^b as		TPH ^b as Gasoline (mg/L)	Hydrocarbons ^c			
		Diesel (mg/L)	Oil & Grease (mg/L)		B	T	E	X
MW-1	12/28/88	NA ^d	NA	ND ^e	ND	ND	ND	ND
MW-2	12/28/88	NA	NA	ND	ND	ND	ND	ND
MW-3	12/28/88	<90	<300	NA	NA	NA	NA	NA
MW-4	12/28/88	3.7	<300	NA	NA	NA	NA	NA

- a. Summary of certified analytical results presented in Attachment D.
- b. TPH = Total Petroleum Hydrocarbons reported as either gasoline or diesel. Analysis for TPH as diesel using EPA Method 3550. Analysis for TPH as gasoline using EPA Method 5030.
- c. B = Benzene, E = Ethylbenzene, T = Toluene, X = Xylenes.
- d. NA = Sample not analyzed for this constituent.
- e. ND = None detected above detection limit of instrument.

ATTACHMENT C

Soil and Groundwater Sampling Protocol

ATTACHMENT C

SOIL & GROUNDWATER SAMPLE
COLLECTION & HANDLING PROTOCOL

INTRODUCTION & PURPOSE

Because reliable and representative test results must be generated from soil and groundwater samples, it is essential to establish a sampling procedure which assures that all samples are:

- o Collected by approved and repeatable methods
- o Representative of the materials(s) at the desired location and depth
- o Uncontaminated by container and sampling equipment

The following sampling protocol was designed to be a guide to the sampling and handling procedures for soil and groundwater samples. Based on conditions which may be encountered in the field, some modifications to this protocol may be required to fit the needs of an individual site.

SAMPLING PROCEDURES

Groundwater Sampling

Prior to collecting groundwater samples, monitoring wells were purged by bailing until pH, conductivity, and temperature levels stabilize. Wells were purged and groundwater samples were obtained using a Teflon bailer and nylon rope. New nylon rope is used for each well.

The appropriate number of sample containers and type were used for each sample collected, in accordance with the analytical laboratory requirements and EPA protocol. The bottles were filled using the bailer. All sample bottles were pre-cleaned by the supplier according to EPA protocols.

To prevent cross contamination of groundwater samples by the sampling equipment, all equipment used in sampling was washed with a trisodium phosphate solution, triple rinsed with distilled water, and allowed to air dry prior to each use. A sample of the distilled water used

in the final rinse was retained for analysis as part of sample quality assurance.

Soil Sampling

After the soil sampler is driven to the desired depth and the samples are retrieved, each end of the ring containing the soil sample is retained for laboratory analysis was sealed with Teflon sheeting, covered with plastic end caps, and sealed with PVC tape. All sample containers (tubes and end caps) were steamed cleaned and air dried prior to use. The soil sample recovered in the ring just above the sample retained for chemical analysis was examined in the field for visual and olfactory indications of chemical contamination and used for lithologic description.

The Unified Soil Classification System (USCS) was used to log and describe the soil by the on-site geologist. These logs also include details of the sampling process such as depth, apparent odors, discoloration, and any other factors which may be required to evaluate the presence of contamination at the site.

POST SAMPLING PROCEDURES

One field/travel blank consisting of one sample bottle filled with distilled water accompanied soil and groundwater sample containers at all times, including during transport to and from the site. Distilled water field/travel blanks were analyzed according to the appropriate EPA Methods corresponding to the soil/groundwater sample analyses.

Sample containers were labeled with sample number, project number, date, and the initials of the person collecting the sample. A separate sample collection record was maintained for each groundwater sample collected.

Soil and groundwater samples collected were analyzed by an analytical laboratory certified by the California Department of Health Services (DHS) for complete chemical analysis of hazardous waste as well as drinking water samples. Quality assurance documentation accompanied all analytical reports generated by the laboratory.

ATT

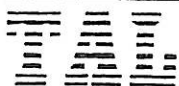
The samples were placed in an ice cooler immediately following collection, and remained in the ice cooler until refrigerated at the analytical laboratory. The samples were delivered to the laboratory direct by courier or overnight freight within 48 hours of time of collection. Appropriate chain of custody forms were used for all samples.

ATTACHMENT D

Certified Analytical Results
Chain of Custody Documentation
Field Sample Records

ATTACHMENT D-1

Certified Analytical Reports



DATE: 12/30/88

LOG NO.: 6845

DATE SAMPLED: 12/28/88

DATE RECEIVED: 12/28/88

CUSTOMER: Aqua Terra Technologies

REQUESTER: Karen Singer

PROJECT: No. 892.1, 66th Avenue, Oakland

Sample Type: Water

Method and Constituent	Units	MW-1		MW-2		MW-3	
		Concen- tration	Detection Limit	Concen- tration	Detection Limit	Concen- tration	Detection Limit
DHS Method:							
Total Petroleum Hydro- carbons as Diesel	ug/l					< 90	90
Total Petroleum Hydro- carbons as Gasoline	ug/l	< 2	2	< 2	2		
Modified EPA Method 8020:							
Benzene	ug/l	< 0.3	0.3	< 0.3	0.3		
Toluene	ug/l	< 0.3	0.3	< 0.3	0.3		
Xylenes	ug/l	< 0.4	0.4	< 0.4	0.4		
Ethyl Benzene	ug/l	< 0.3	0.3	< 0.3	0.3		
Standard Method 503E, Hydrocarbons:							
Oil and Grease	ug/l					< 300	300

DATE: /30/88
 LOG NO.: 6845
 DATE SAMPLED: 12/28/88
 DATE RECEIVED: 12/28/88
 PAGE: Two

Sample Type: Water

Method and Constituent	Units	MW-4		CB		TB	
		Concen- tration	Detection Limit	Concen- tration	Detection Limit	Concen- tration	Detection Limit
DHS Method:							
Total Petroleum Hydro- carbons as Diesel	ug/l	3,700	90	< 90	90	< 90	90
Total Petroleum Hydro- carbons as Gasoline	ug/l			< 2	2	< 2	2
Modified EPA Method 8020:							
Benzene	ug/l			< 0.3	0.3	< 0.3	0.3
Toluene	ug/l			< 0.3	0.3	< 0.3	0.3
Xylenes	ug/l			< 0.4	0.4	< 0.4	0.4
Ethyl Benzene	ug/l			< 0.3	0.3	< 0.3	0.3
Standard Method 503E, Hydrocarbons:							
Oil and Grease	ug/l	< 300	300	8,400	800	< 800	800

Hugh R. McLean

Hugh R. McLean
 Supervisory Chemist

ATTACHMENT D-2

Environmental Sample Collection Records
and Chain of Custody Documentation



CHAIN OF SAMPLE CUSTODY RECORD

Collector: Terrell Miller - Brent Park Date Sampled: _____ Time: _____
Location of Sampling: 66th Ave Oakland

Project Number: 1111 Survey Number: _____
Sample Type: Water
Container Type and Condition: 2 100ml Vials, 1 1/2 liter jug
Contract Laboratory Record/Name: TAL

Sample ID	Field Information
<u>MW 1, MW 2</u>	<u>2 x 100ml vials each</u>
<u>MW 3, MW 4</u>	<u>2 x 1 liter jugs each</u>
<u>CRS, TB</u>	<u>2 x 100ml vials each</u>
<u>CRS, TB</u>	<u>1 x 1 liter jug each</u>

Analysis Requested: TPH as Gas, BTEX - MW1, MW2, CRS, TB
TPH as Diesel, Total Oil & Grease MW3-MW4, CRS, TB

Results Needed By: 48 hours for all - verticals ASAP!

Contact and results to be sent to: Chris French or Karen Singer

Travel Blank: Yes No Travel Blank to be Analyzed Separately: Yes No

Duplicate Samples: Yes No Duplicates to be Analyzed Separately: Yes No

Cleaning Blank: Yes No Cleaning Blank to be Analyzed Separately: Yes No

Background Soil Sample: Yes No Background Soil Sample to be Analyzed Separately: Yes No

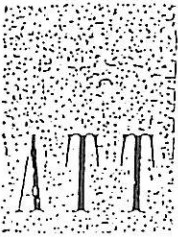
Chain of Custody:

1. [Signature] Field Personnel Date: 12/28/88 10:50 AM

2. _____ Date: _____

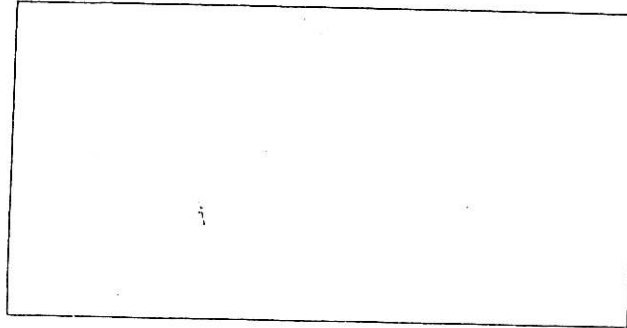
3. Spanish Courier Lab Date: 12/28/88 10:50 AM

TERRILL MILLER LABORATORY
Berkeley, CA 94545
(415) 733-6960



ENVIRONMENTAL SAMPLE COLLECTION RECORD

Site Plan:



Date: 12/28/88 Time: 0930 Job No: 892.1

Sample ID: MW1 Location: OAKLAND

Sampling Procedure: 3 TIMES THE STANDING VOLUME WAS PURGED FROM THE WELL USING A BAILER. A SAMPLE WAS THEN COLLECTED, USING THE SAME BAILER, AND PLACED IN THE APPROPRIATE CONTAINERS

Water Level: 12.13' pH: _____

Depth to bottom of well: 28.20' Salinity: _____

Well Purge Volume: 9 GAL Turbidity: _____

Purge Water Fate: GROUND Organic Vapor: _____

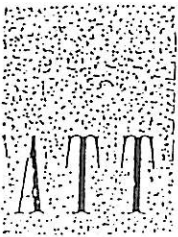
Sampling Equipment: TEFLON BAILER, NYLON ROPE, TEFLON AND STAINLESS STEEL BED

Equipment Cleaning Procedures: EQUIPMENT WAS WASHED IN A TSP SOLN AND RINSED TWICE WITH DISTILLED WATER

Sampling Handling/Storage: SAMPLES WERE KEPT COLD UNTIL REACHING LAB

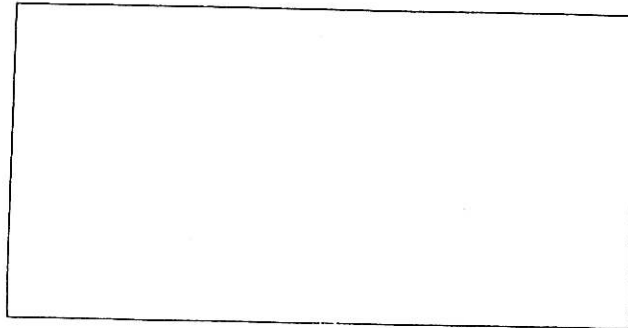
Sample Collected By: TODD MILLER + BJ BENNETT

Signature: Todd Miller Title: STAFF ENGINEER



ENVIRONMENTAL SAMPLE COLLECTION RECORD

Site Plan:



Date: 12/28/88 Time: 0920 Job No: 892.1

Sample ID: MW2 Location: OAKLAND

Sampling Procedure: 3 TIMES THE STANDING VOLUME WAS PURGED FROM THE WELL USING A BAILER. A SAMPLE WAS THEN COLLECTED, USING THE SAME BAILER, AND PLACED IN THE APPROPRIATE CONTAINERS

Water Level: 11.44 pH: _____

Depth to bottom of well: 23.85 Salinity: _____

Well Purge Volume: 5.5 GAL Turbidity: _____

Purge Water Fate: GROUND Organic Vapor: _____

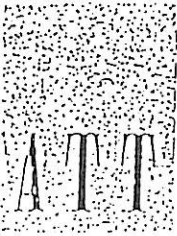
Sampling Equipment: TEFLON BAIER, NYLON ROPE, TEFLON AND STAINLESS STEEL BOD

Equipment Cleaning Procedures: EQUIPMENT WAS WASHED IN A TSP SOLN AND RINSED TWICE WITH DISTILLED WATER

Sampling Handling/Storage: SAMPLES WERE KEPT COLD UNTIL REACHING LAB

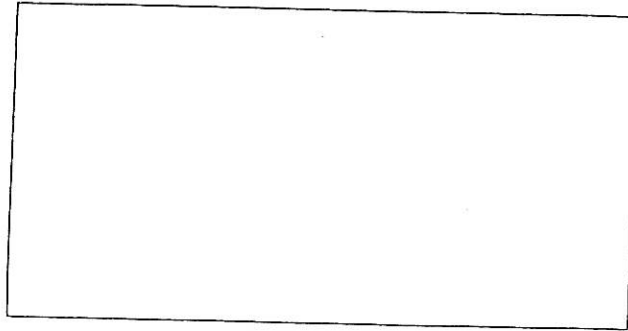
Sample Collected By: TODD MILLER + BJ BENNETT

Signature: Todd Miller Title: STAFF ENGINEER



ENVIRONMENTAL SAMPLE COLLECTION RECORD

Site Plan:



Date: 12/28/88 Time: 1005 Job No: 892.1

Sample ID: MW3 Location: OAKLAND

Sampling Procedure: 3 TIMES THE STANDING VOLUME WAS PURGED FROM THE WELL USING A BAILER. A SAMPLE WAS THEN COLLECTED, USING THE SAME BAILER, AND PLACED IN THE APPROPRIATE CONTAINERS

Water Level: 5.51 pH: _____

Depth to bottom of well: 9.74 Salinity: _____

Well Purge Volume: 5 GAL Turbidity: _____

Purge Water Fate: GROUND Organic Vapor: _____

Sampling Equipment: TEFLON BAILER, NYLON ROPE, TEFLON AND STAINLESS STEEL BED

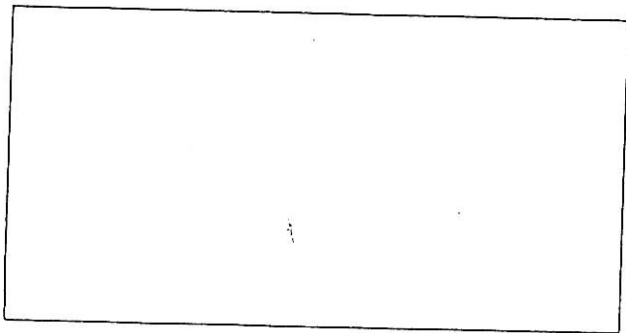
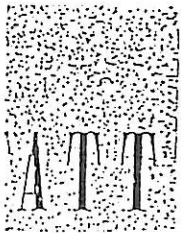
Equipment Cleaning Procedures: EQUIPMENT WAS WASHED IN A TSP SOLN AND RINSED TWICE WITH DISTILLED WATER

Sampling Handling/Storage: SAMPLES WERE KEPT COLD UNTIL REACHING LAB

Sample Collected By: TODD MILLER + BJ BENNETT

Signature: Todd Miller Title: STAFF ENGINEER

ENVIRONMENTAL SAMPLE COLLECTION RECORD



Site Plan:

Date: 12/28/88 Time: 1015 Job No: 892.1

Sample ID: MW4 Location: OAKLAND

Sampling Procedure: 3 TIMES THE STANDING VOLUME WAS PURGED FROM THE WELL USING A BAILER. A SAMPLE WAS THEN COLLECTED, USING THE SAME BAILER, AND PLACED IN THE APPROPRIATE CONTAINERS

Water Level: 7.45 pH: _____

Depth to bottom of well: 9.72 Salinity: _____

Well Purge Volume: 2.5 GAL Turbidity: _____

Purge Water Fate: GROUND Organic Vapor: _____

Sampling Equipment: TEFLON BAILER, NYLON ROPE, TEFLON AND STAINLESS STEEL RED

Equipment Cleaning Procedures: EQUIPMENT WAS WASHED IN A TSP SOLN AND RINSED TWICE WITH DISTILLED WATER

Sampling Handling/Storage: SAMPLES WERE KEPT COLD UNTIL REACHING LAB

Sample Collected By: TODD MILLER + BJ BENNETT

Signature: Todd Miller Title: STAFF ENGINEER

ATTACHMENT E

Drilling Procedures & Groundwater
Monitoring Well Construction/Design

ATTACHMENT E

DRILLING PROCEDURES & GROUNDWATER
MONITORING WELL CONSTRUCTION/DESIGN

DRILLING AND SAMPLING PROCEDURES

All borings for well construction were drilled using eight-inch diameter or larger hollow stem auger equipment. A California Registered Geologist directed the collection of undisturbed samples of the soils encountered and the preparation of detailed logs of each boring.

Soil sampling was conducted using a modified California drive sampler, a standard penetration sampler, or a five-foot continuous sampler. Representative samples of each soil type were retained in either Ziploc bags or two-inch to three-inch diameter, six-inch long, clean, brass tubes. The samples were retained for verification of soil classification and for chemical laboratory analytical testing, as appropriate. Teflon sheeting was placed between the soil sample and the cap, and the cap was sealed with PVC tape.

Where access limitations did not allow drilling with truck mounted equipment, either a trailer mounted drilling rig, portable power driven, or manually operated soil sampling equipment was utilized. If soil samples were to be retained for analysis, they were collected in clean brass tubes fitted within a thin walled drive sampler. The soil samples were capped and sealed as described above.

All down hole sampling, drilling, and well construction equipment and materials, including augers, casing, and screens were steam cleaned prior to their initial use. The sampling equipment was cleaned prior to each assembly by washing with a trisodium phosphate solution, rinsing with distilled water, and allowing to air dry. The auger flights, drill bit, and sampler were steam cleaned at each boring location.

MONITORING WELL CONSTRUCTION

Monitoring wells were constructed in accordance with applicable local water district or California Department of Water Resources guidelines. The specific completion details for each well were determined in the field at the time of drilling by a California Registered

Geologist experienced in groundwater monitoring system design and installation.

Monitoring wells consist of two or four-inch diameter, Schedule 40 PVC casing and screens with flush, threaded joints. No PVC glue is used. The screened sections are machine slotted with either 0.010-inch (0.255 mm) 0.020-inch (0.51 mm) openings. The smaller slot size was used where the wells are screened within fine-grained sandy soils, and the larger slots were used where coarse sand or gravels are encountered. The slotted sections were fitted with a slip-on cap and placed opposite the water-bearing strata in the boring. The blank pipe was connected to the perforated pipe and extends to just below the ground surface.

The annulus between the side of the borehole and the slotted section was filled with a clean sand pack to variable depths, but not less than one or two feet above the perforated pipe. The annulus was packed with either Lonestar No. 1/20 (where 0.010-inch slotted pipe is used) or No. 3 (where 0.020-inch slotted pipe is used) washed sand filter material. The gradation of the filter material is summarized below:

U.S. Sieve No.	Opening (mm)	Percent Passing (No. 3)	Percent Passing (No. 1/20)
6	3.35	100	
8	2.36	99 - 100	
12	1.70	62 - 78	
16	1.18	15 - 33	100
20	0.85	0 - 8	90 - 100
30	0.60	0 - 4	14 - 40
40	0.425		0 - 5

A seal of bentonite pellets approximately 24-inches thick was placed above the sand pack to reduce the risk of grout penetration into the sand. The bentonite pellets were hydrated with distilled water to form a tight plug. A cement/bentonite grout was placed above the bentonite plug to a depth of approximately two feet below the ground surface. The grout was pumped into the boreholes using a tremie pipe. Concrete was placed from the top of the cement/bentonite mixture to the ground surface.

At most sites in sedimentary formations, it is not practical to "rationally design" a filter pack based on sieve analyses. From experience, Lonestar No. 1/20 or No. 3 washed sand as a filter material was selected for use in wells. The 0.010-inch and 0.020-inch slot sizes were selected to retain 100 percent of the filter material.

The completed wells were enclosed in a traffic rated enclosure placed flush with grade or in an above-ground metal enclosure, and were fitted with a locking cap. If a groundwater level contour map was prepared, well head elevations were determined by a level survey, and well coordinates were determined by a traverse survey. The level/traverse survey was referenced to a bench mark of known or assigned elevation and coordinates. Once water levels have stabilized, water levels in all wells were measured.

After the wells had been completed, they were developed by pumping and surging to clean and stabilize the soils around the screens. A manually operated, positive displacement surge pump and Teflon bailer, surge block, and/or centrifugal pump was used for development. A minimum of 10 well casing volumes of water was removed during development; however, development continued until water flowed clear and pH, temperature, and conductivity had stabilized. All development equipment was steam cleaned prior to its initial use in each well. A well development log was maintained which included 1) a record of development water parameters at frequent intervals, 2) the quantity of water removed during development, and 3) flow rates during development.

Soil cuttings generated during drilling were wrapped in plastic sheeting, and water generated during well development was retained in secured 55-gallon drums until chemical analytical data from samples were received.