



# PORT OF OAKLAND

August 30, 2005

Mr. Barney Chan  
Alameda County Health Care Services Agency (HCSA)  
Environmental Protection Division  
1131 Harbor Bay Parkway, #250  
Alameda, CA 94502-6577

Alameda County  
SEP 02 2005  
Environmental Health  
R087

**SUBJECT: Site Closure Summary - Former USTs: MF08/09/10  
South Field, Oakland International Airport, Oakland, CA 94621**

Dear Mr. Chan:

Enclosed is a copy of the URS report entitled "*Site Closure Report, Self-Fueling Facility Taxiway U*", dated July 19, 2005. Also enclosed is a copy of the Case Closure Summary, Leaking Underground Fuel Storage Tank – Local Oversight Program, dated August 30, 2005. The Case Closure Summary document has been prepared in response to Alameda County HCSA and Regional Water Quality Control Board objectives for obtaining regulatory case closure.

Should you have any questions or need additional information, please contact me at 627-1118. Thank you for your on-going assistance and support on this project.

Sincerely,

Dale H. Klettke, CHMM  
Associate Environmental Scientist  
Environmental Health & Safety Compliance

enclosures

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**CASE CLOSURE SUMMARY  
LEAKING UNDERGROUND FUEL STORAGE TANK - LOCAL OVERSIGHT PROGRAM**

August 30, 2005

**I. AGENCY INFORMATION**

Date:

Agency Name: Alameda County Environmental Health	Address: 1131 Harbor Bay Parkway
City/State/Zip: Alameda, CA 94502-6577	Phone: (510) 567- 6765
Responsible Staff Person: Mr. Barney Chan	Title: Hazardous Materials Specialist

**II. CASE INFORMATION**

Site Facility Name: South Airport Self-Fueling Facility - Oakland International Airport		
Site Facility Address: 1 Airport Drive, Oakland, CA 94621		
RB Case No.:	Local Case No.:	LOP Case No.:
URF Filing Date:	SWEEPS No.: ---	APN:
Responsible Parties	Addresses	Phone Number
Port of Oakland	530 Water Street, Oakland, CA 94607	(510)627-1100

Tank I.D. No	Size in Gallons	Contents	Closed In Place/Removed?	Date
MF-08	1000	Diesel	Removed	4/26/99
MF-09	1000	Diesel	Removed	4/26/99
MF-10	5000	Gasoline	Removed	4/26/99
Piping				

**III. RELEASE AND SITE CHARACTERIZATION INFORMATION**

Cause and Type of Release: Unknown - Possible overfilling		
Site characterization complete? <input checked="" type="radio"/> Yes <input type="radio"/> No	Date Approved By Oversight Agency: ----	
Monitoring wells installed? <input checked="" type="radio"/> Yes <input type="radio"/> No	Number: 4	Proper screened interval? <input checked="" type="radio"/> Yes <input type="radio"/> No
Highest GW Depth Below Ground Surface: 1.55'	Lowest Depth: 6.30'	Flow Direction: Southeast to East
Most Sensitive Current Use: Potential drinking water source.		

Summary of Production Wells in Vicinity:

Not Applicable

Are drinking water wells affected? Yes <input checked="" type="radio"/> No <input type="radio"/>	Aquifer Name: Not Applicable
Is surface water affected? Yes <input checked="" type="radio"/> No <input type="radio"/>	Nearest SW Name:
Off-Site Beneficial Use Impacts (Addresses/Locations): Not Applicable	
Reports on file? Yes	Where are reports filed? Alameda County Environmental Health (and local CUPA where applicable)

TREATMENT AND DISPOSAL OF AFFECTED MATERIAL			
Material	Amount (Include Units)	Action (Treatment or Disposal w/Destination)	Date
Tank	2-1000 gallon 1-5000 gallon	Disposal at ECI, Richmond, CA	4/26/99
Piping	250 pounds	Disposal at ECI, Richmond, CA	4/26/99
Free Product	Not Applicable		
Soil	67 Tons 193.84 Tons	Disposal at Altamont Landfill Disposal at Republic Services	4/30/99 6/8/05
Groundwater	4040 gallons 8500 gallons	Disposal at Industrial Services Oil Disposal at Instrat, Inc.	4/28 & 4/29/99 6/2, 6/3, & 6/6/05

MAXIMUM DOCUMENTED CONTAMINANT CONCENTRATIONS BEFORE AND AFTER CLEANUP (Please see Attachments x-x for additional information on contaminant locations and concentrations)																	
Contaminant	Soil (ppm)				"Grab" Water (ppb) "Grab"				Well 4/12/02								
	Gas	Before	Dies	Gas	After	Dies	Gas	After		Dies							
TPH (Gas)	4300	3000	<1.0	<1.0	380,000	120,000	460	480	<50								
TPH (Diesel)	6200	39,000	<1.0	140	NA	51,000	120	9,200	<50								
Oil & Grease	NA	NA	NA	NA	NA	NA	NA	NA	NA								
Benzene	1.4	<0.1	<0.005	<0.005	1500	<500	0.98	<1.0	<0.5								
Toluene	87	1.5	<0.005	<0.005	11,000	5.4	1.4	<1.0	<0.5								
Ethyl Benzene	65	3.4	<0.005	<0.005	37,000	97	5.2	<1.0	<0.5								
Xylene	540	38	<0.005	<0.005	8,900	1.9	44	<1.0	<0.5								
Heavy Metals	0.10	10	NA	NA	NA	NA	NA	NA	NA								
MTBE (if not analyzed, explain below)	55	<2	<0.005	<0.005	28,000	<2500	0.54	3.0	8.4								
Other (8240/8270)	Jet Fuel Motor Oil	NA NA	NA NA	<1.0 <50	<1.0 <50	NA NA	200 <500	7,300 <2,500	NA NA								
N A=Not applicable (not analyzed).																	
Gas	0.54	ppb MTBE	<25	ppb EIOH	<0.5	ppb TAME	<0.5	ppb ETBE	<1.0	ppb DIPE	<5.0	ppb TBA	<0.5	ppb EDB	and	<0.5	ppb EDC
Diesel	3.0	<50	<1.0	<1.0	<2.0	<10	<1.0	<1.0									

NOTE: "Grab groundwater samples were collected on 4/22/99 and again on 4/30/99 after removal of groundwater from both UST excavations. Highest concentrations from both samplings were used for ROxxx - Closure Summary before concentrations.

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Site History and Description of Corrective Actions:

The three (3) underground storage tanks (USTs) were removed on April 26, 1999. Approximately 67 tons of affected soil and 4040 gallons of groundwater were removed at the time of UST removals. Groundwater monitoring wells were installed and sampled for a minimum of four quarters.

In June 2005, overexcavation of the two former UST pits was conducted, resulting in the removal of an additional 193.84 tons of affected soil, and 8500 gallons of groundwater. Confirmation soil samples collected after the overexcavation of the UST pits were found to contain low to non-detectable concentrations of TPHgasoline, TPHdiesel, TPHjet fuel, BTEX and fuel oxygenates.

IV. CLOSURE

Does completed corrective action protect existing beneficial uses per the Regional Board Basin Plan? <input checked="" type="radio"/> Yes <input type="radio"/> No		
Does completed corrective action protect potential beneficial uses per the Regional Board Basin Plan? <input checked="" type="radio"/> Yes <input type="radio"/> No		
Does corrective action protect public health for current land use? Alameda County Environmental Health staff does not make specific determinations concerning public health risk. However, based upon the information available in our files to date, it does not appear that the release would present a risk to human health based upon current land use and conditions.		
Site Management Requirements: Not applicable		
Should corrective action be reviewed if land use changes? <input checked="" type="radio"/> Yes <input type="radio"/> No		
Monitoring Wells Decommissioned: <input checked="" type="radio"/> Yes <input type="radio"/> No	Number Decommissioned: 4	Number Retained: 0
List Enforcement Actions Taken: None on 6/29/05		
List Enforcement Actions Rescinded:		

V. ADDITIONAL COMMENTS, DATA, ETC.

Considerations and/or Variances:
Conclusion:

**VI. LOCAL AGENCY REPRESENTATIVE DATA**

Prepared by:	Title:
Signature:	Date:
Approved by: Donna L. Drogos, P.E.	Title: Supervising Hazardous Materials Specialist
Signature:	Date:

This closure approval is based upon the available information and with the provision that the information provided to this agency was accurate and representative of site conditions.

**VII. REGIONAL BOARD NOTIFICATION**

Regional Board Staff Name:	Title: Associate Water Resources Control Engineer
RB Response: Concur, based solely upon information contained in this case closure summary.	Date Submitted to RB:
Signature:	Date:

**Attachments:**

1. Site Vicinity Map
2. Site Plan
3. Soil Analytical Data
4. Groundwater Analytical Data
5. Boring Logs
6. Cross Sections

This document and the related CASE CLOSURE LETTER shall be retained by the lead agency as part of the official site file.

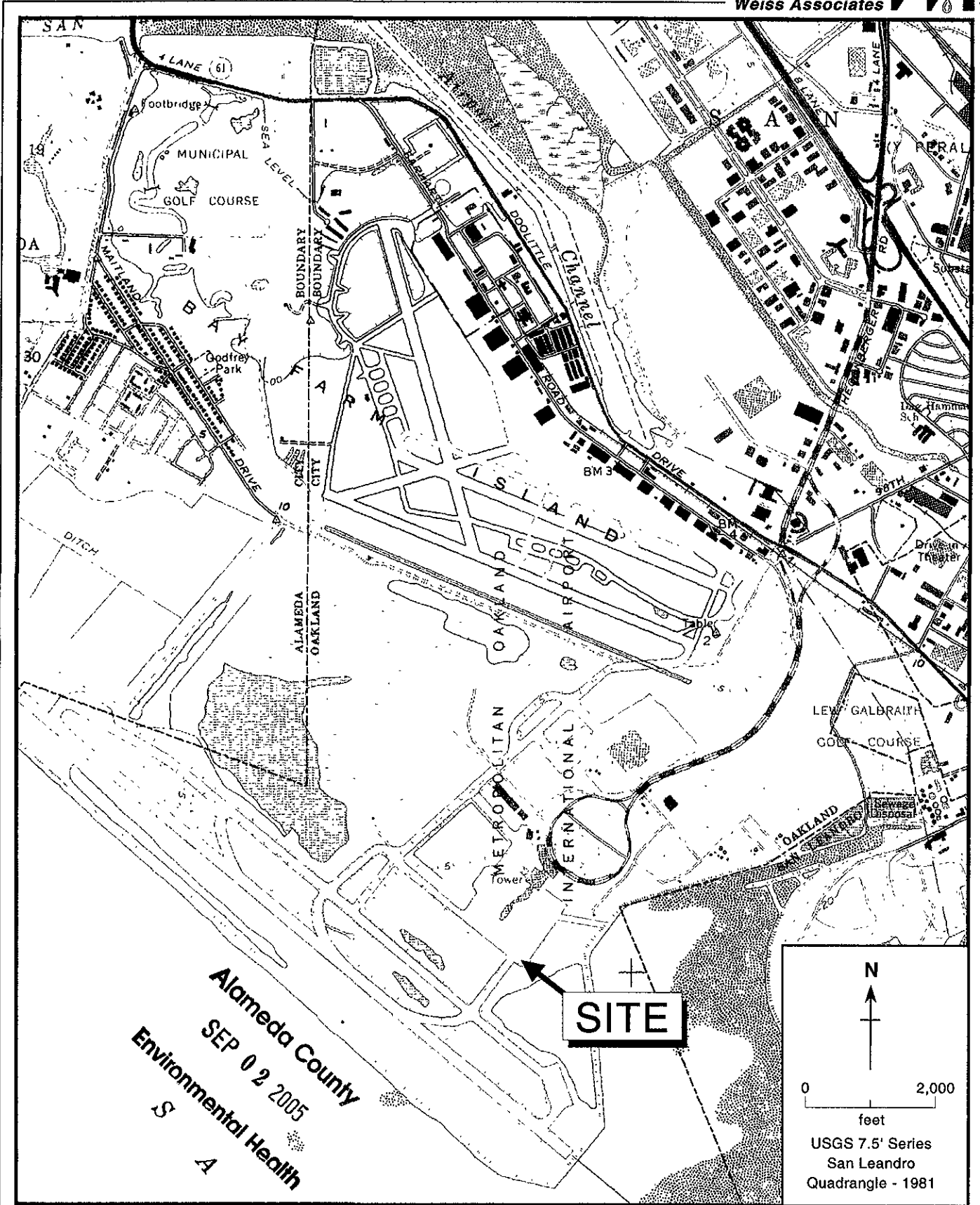
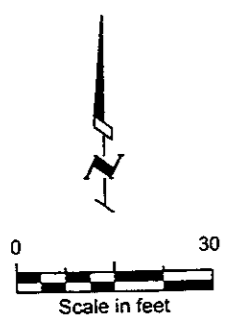
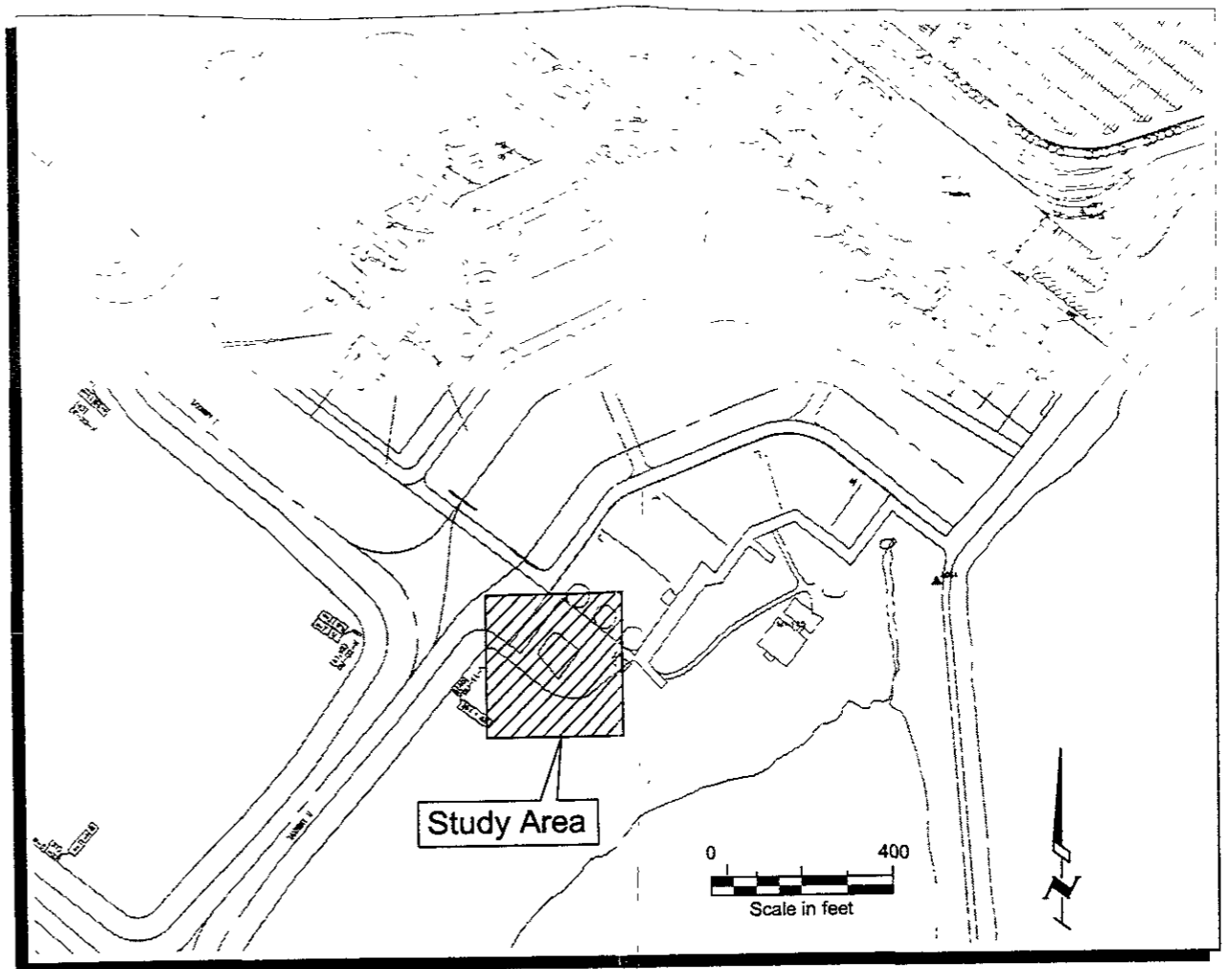
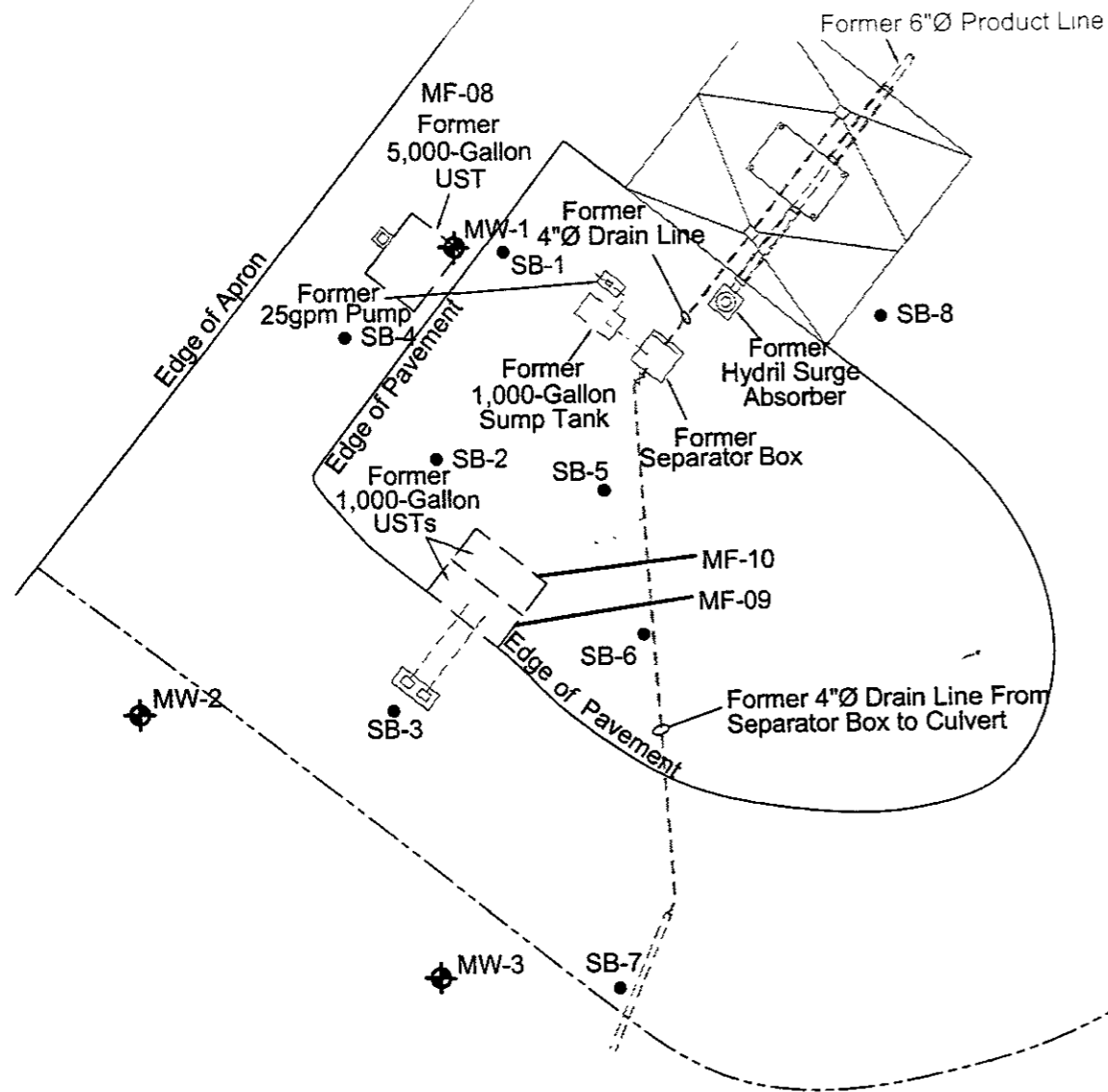


Figure 1. Site Vicinity Map, South Airport Self-Fueling Facility, Taxiway U, Metropolitan Oakland International Airport

**Legend**

- ◆ MW-1 Monitoring Well
- SB-1 Geoprobe Boring



◆ MW-4

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	Harding Lawson Associates Engineering and Environmental Services	<b>Site Plan</b> Groundwater Monitoring Well Installation Report South Airport Self-Fueling Facility, Taxiway U Oakland, California	PLATE <b>2</b>
	DRAWN PCB	JOB NUMBER 49667.1	APPROVED <i>A70</i>
			REVISED DATE 12/00

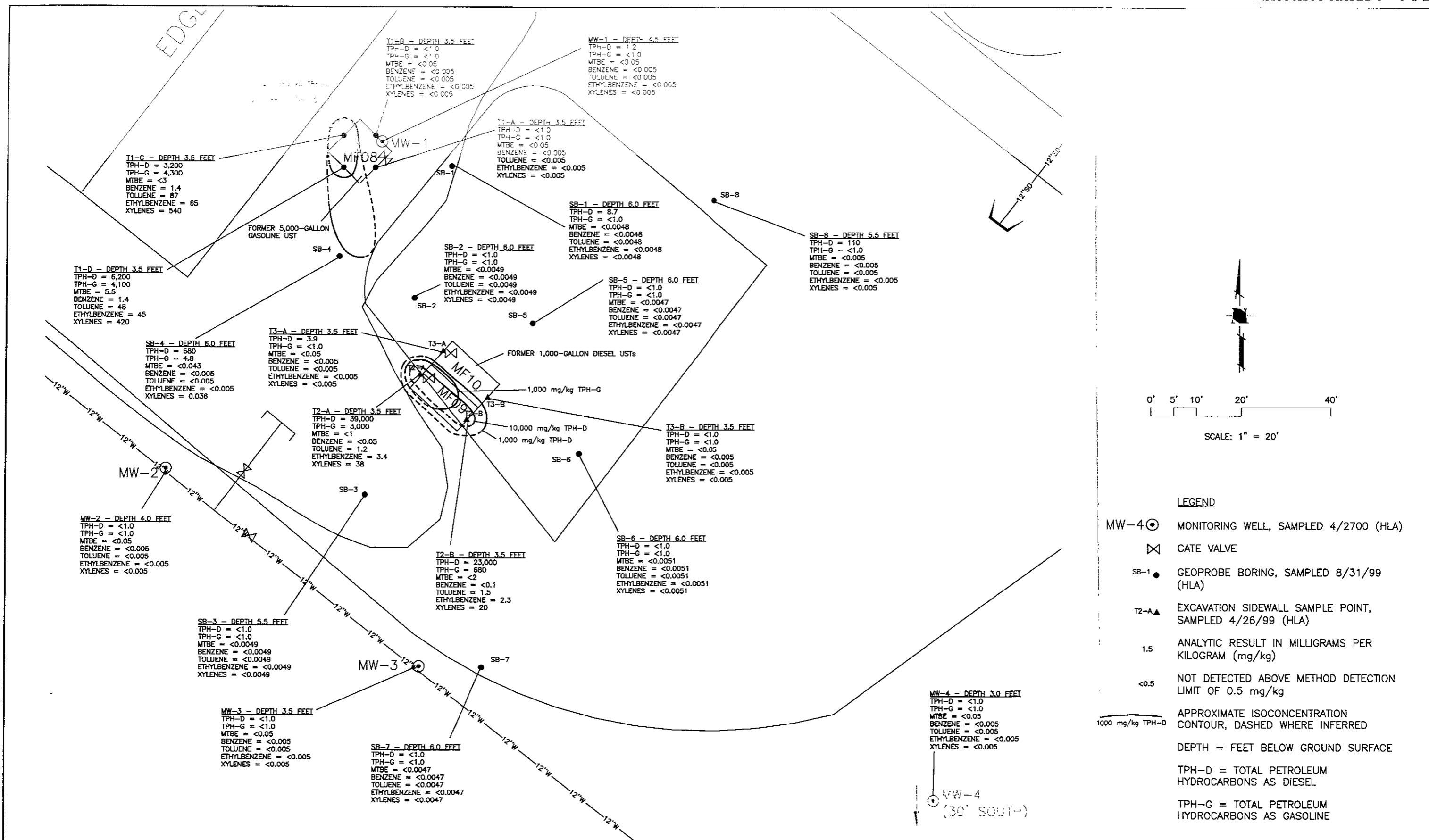


Figure 3. Soil Sample Locations and Summary of Analytic Results, South Airport Self-Fueling Facility, Taxiway U, Metropolitan Oakland International Airport



**TABLE 1 - SUMMARY OF SOIL SAMPLE RESULTS FOR USTs MF-08/MF-09/MF-10  
SOUTH FIELD SELF-FUELING FACILITY, TAXIWAY U  
OAKLAND INTERNATIONAL AIRPORT-SOUTH FIELD (in milligrams per kilogram)**

Sample ID#	Date	Depth (ft bgs)	TPHd	TPHg	MTBE	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Lead
<b>Stockpile Soil Samples Collected After UST Excavations – April 1999</b>										
101	4/22/99	IDW	110	41	<0.005	<0.005	0.039	0.410	0.036	0.10
102	4/22/99	IDW	560	17	<0.005	<0.005	0.025	<0.87	<0.005	10
<b>UST Removals – Soil Confirmation Sidewall Samples – April 1999</b>										
T1-A	4/26/99	3.5	<1.0	<1.0	<0.05	<0.005	<0.005	<0.005	<0.005	---
T1-B	4/26/99	3.5	<1.0	<1.0	<0.05	<0.005	<0.005	<0.005	<0.005	---
T1-C	4/26/99	3.5	3,200	4,300	<3	1.4	87	65	540	---
T1-D	4/26/99	3.5	6,200	4,100	5.5	1.4	48	45	420	---
T2-A	4/26/99	3.5	39,000	3,000	<1	<0.05	1.2	3.4	38	---
T2-B	4/26/99	3.5	23,000	680	<2	<0.1	1.5	2.3	20	---
T3-A	4/26/99	3.5	3.9	<1.0	<0.05	<0.005	<0.005	<0.005	<0.005	---
T3-B	4/26/99	3.5	<1.0	<1.0	<0.05	<0.005	<0.005	<0.005	<0.005	---
<b>Subsurface investigation – August 1999</b>										
SB-1	8/31/99	6.0	8.7	<1.0	<0.0048	<0.0048	<0.0048	<0.0048	<0.0048	---
SB-2	8/31/99	6.0	<1.0	<1.0	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	---
SB-3	8/31/99	5.5	<1.0	<1.0	<0.0049	<0.0049	<0.0049	<0.0049	<0.0049	---
SB-4	8/31/99	6.0	680	4.8	0.043	<0.0050	0.0050	<0.0050	0.036	---
SB-5	8/31/99	6.0	<1.0	<1.0	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	---
SB-6	8/31/99	6.0	<1.0	<1.0	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051	---
SB-7	8/31/99	6.0	<1.0	<1.0	<0.0047	<0.0047	<0.0047	<0.0047	<0.0047	---
SB-8	8/31/99	5.5	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	---
<b>Groundwater Monitoring Well Installations – April 2000</b>										
MW-1	4/27/00	4.5	1.2	<1.0	<0.05	<0.005	<0.005	<0.005	<0.005	1.9
MW-2	4/27/00	4.0	<1.0	<1.0	<0.05	<0.005	<0.005	<0.005	<0.005	1.0
MW-3	4/27/00	3.5	<1.0	<1.0	<0.05	<0.005	<0.005	<0.005	<0.005	<1.0
MW-4	4/27/00	3.0	<1.0	<1.0	<0.05	<0.005	<0.005	<0.005	<0.005	3.2
Drum 4223	4/27/00	IDW	13	<1	<0.05	<0.005	<0.005	<0.005	<0.005	2.5
Drum 4230	4/27/00	IDW	1.2	<1	<0.05	<0.005	<0.005	<0.005	<0.005	3.0
<b>2005 ESLs – Commercial/Industrial</b>			<b>500</b>	<b>400</b>	<b>5.6</b>	<b>0.380</b>	<b>9.3</b>	<b>32</b>	<b>11</b>	<b>750</b>

IDW=Investigation Derived Waste

**TABLE 1 - SUMMARY OF SOIL SAMPLE RESULTS FOR USTs MF-08/MF-09/MF-10  
SOUTH FIELD SELF-FUELING FACILITY, TAXIWAY U  
OAKLAND INTERNATIONAL AIRPORT-SOUTH FIELD (in milligrams per kilogram)**

<b>Sample ID#</b>	<b>Date</b>	<b>Depth</b>	<b>TPHg</b>	<b>TPHd</b>	<b>TPHj</b>	<b>TPHmo</b>	<b>Benzene</b>	<b>Toluene</b>	<b>Ethyl Benzene</b>	<b>Total Xylenes</b>	<b>MTBE</b>
<b>UST Pit Over-excavation Sidewall Soil Confirmation Samples – June 2005</b>											
T1A-EX	6/2/05	7.0	<1.0	<1.0	<1.0	<50	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
T1B-EX	6/2/05	7.0	<1.0	<1.0	<1.0	<50	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
T1C-EX	6/2/05	7.0	<1.0	<1.0	<1.0	<50	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
T2A-EX	6/2/05	7.0	<1.0	<1.0	<1.0	<50	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
T2B-EX	6/2/05	7.0	<1.0	<b>140</b>	<1.0	<50	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
T3A-EX	6/2/05	7.0	<1.0	<1.0	<1.0	<50	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
<b>2005 ESLs – Commercial/Industrial</b>			<b>400</b>	<b>500</b>	<b>500</b>	<b>1,000</b>	<b>0.380</b>	<b>9.3</b>	<b>32</b>	<b>11</b>	<b>5.6</b>

**TABLE 2 - SUMMARY OF GROUNDWATER SAMPLE RESULTS FOR USTs MF-08/MF-09/MF-10  
SOUTH FIELD SELF-FUELING FACILITY, TAXIWAY U  
OAKLAND INTERNATIONAL AIRPORT-SOUTH FIELD (in micrograms per liter)**

Sample ID#	Date	TPHd	TPHg	MTBE	Benzene	Toluene	Ethyl Benzene	Total Xylenes	1,3,5-TMB	1,2,4-TMB
<b>UST Removals – Excavation Groundwater Grab Samples – April 1999</b>										
Diesel Pit	4/22/99	640	NA	<0.5	<0.5	5.4	97	1.9	---	---
Diesel Pit	4/30/99	51,000	120,000	<2,500	<500	<500	<500	<500	---	---
Gas Pit	4/22/99	NA	380,000	28,000	1,500	11,000	37,000	600	---	---
Gas Pit	4/30/99	1,700	42,000	15,000	620	3,100	270	8,900	---	---
<b>Subsurface investigation – August 1999</b>										
SB-1	8/31/99	<50	59	<5.0	<5.0	<5.0	<5.0	3.5	<5.0	<5.0
SB-2	8/31/99	80	300	2,000	63	<63	43	<63	<63	<63
SB-3	8/31/99	<50	<50	3.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
SB-4	8/31/99	380	---	4,500	<130	<130	<130	440	75	150
SB-5	8/31/99	<50	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
SB-6	8/31/99	<50	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
SB-7	8/31/99	<50	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
SB-8	8/31/99	72	33	8.3	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
<b>Groundwater Monitoring Well Sampling</b>										
MW-1	5/30/00	60	<50	<2.5/<2.5	<0.5	<0.5	<0.5	<0.5	---	---
MW-1	9/20/00	<50	<50	<2.5	<0.5	<0.5	<0.5	<0.5	---	---
MW-1	11/15/00	58	<50	<2.5	<0.5	<0.5	<0.5	<0.5	---	---
MW-1	2/15/01	150	<50	<2.5	<0.5	<0.5	<0.5	<0.5	---	---
MW-1	4/12/02	<50	<50	<2.5	<0.5	<0.5	<0.5	<0.5	---	---
MW-1(dup)	4/12/02	<50	<50	<2.5	<0.5	<0.5	<0.5	<0.5	---	---
MW-2	5/30/00	51	<50	<2.5/<2.5	<0.5	<0.5	<0.5	<0.5	---	---
MW-2	9/20/00	<50	<50	<2.5	<0.5	<0.5	<0.5	<0.5	---	---
MW-2	11/15/00	57	<50	<2.5	<0.5	<0.5	<0.5	<0.5	---	---
MW-2	2/15/01	180	<50	<2.5	<0.5	<0.5	<0.5	<0.5	---	---
MW-2	4/12/02	<50	<50	<2.5	<0.5	<0.5	<0.5	<0.5	---	---
MW-3	5/30/00	60	<50	7.5/2.6	<0.5	<0.5	<0.5	<0.5	---	---
MW-3	9/20/00	<50	<50	<2.5	<0.5	<0.5	<0.5	<0.5	---	---
MW-3	11/15/00	67	<50	<2.5	<0.5	<0.5	<0.5	<0.5	---	---
MW-3	2/15/01	<50	<50	<2.5	<0.5	<0.5	<0.5	<0.5	---	---
MW-3	4/12/02	<50	<50	<5.0	<0.5	<0.5	<0.5	<0.5	---	---
<b>2005 ESLs – Commercial/Industrial</b>		<b>640</b>	<b>500</b>	<b>1,800</b>	<b>46</b>	<b>130</b>	<b>290</b>	<b>100</b>	<b>---</b>	<b>---</b>

**TABLE 2 - SUMMARY OF GROUNDWATER SAMPLE RESULTS FOR USTs MF-08/MF-09/MF-10  
SOUTH FIELD SELF-FUELING FACILITY, TAXIWAY U  
OAKLAND INTERNATIONAL AIRPORT-SOUTH FIELD (in micrograms per liter)**

Sample ID#	Date	TPHd	TPHg	MTBE	Benzene	Toluene	Ethyl Benzene	Total Xylenes	1,3,5-TMB	1,2,4-TMB
<b>Groundwater Monitoring Well Sampling (cont.)</b>										
MW-4	5/30/00	210	<50	19/17	<0.5	<0.5	<0.5	<0.5	---	---
MW-4	9/20/00	<50	<50	32/42	<0.5	<0.5	<0.5	<0.5	---	---
MW-4	11/15/00	70	<50	32/44	<0.5	<0.5	<0.5	<0.5	---	---
MW-4	2/15/01	<50	<50	2.6/2.3	<0.5	<0.5	<0.5	<0.5	---	---
MW-4	4/12/02	<50	<50	8.4	<0.5	<0.5	<0.5	<0.5	---	---
<b>2005 ESLs – Commercial/Industrial</b>		<b>640</b>	<b>500</b>	<b>1,800</b>	<b>46</b>	<b>130</b>	<b>290</b>	<b>100</b>	<b>---</b>	<b>---</b>

**TABLE 3 - SUMMARY OF GROUNDWATER SAMPLE RESULTS FOR USTs MF-08/MF-09/MF-10  
SOUTH FIELD SELF-FUELING FACILITY, TAXIWAY U  
OAKLAND INTERNATIONAL AIRPORT-SOUTH FIELD (in micrograms per liter)**

Sample ID#	Date	TPHg	TPHd	TPHj	TPHmo	Benzene	Toluene	Ethyl Benzene	Total Xylenes	MTBE
EX-1 (diesel pit)	6/3/2005	480	9,200	7,300	<2500	<1.0	<1.0	<1.0	<2.0	3.0
EX-2 (gas pit)	6/3/2005	460	120	200	<500	0.98	1.4	5.2	44	0.54
<b>2005 ESLs – Commercial/Industrial</b>		<b>500</b>	<b>640</b>	<b>640</b>	<b>640</b>	<b>46</b>	<b>130</b>	<b>290</b>	<b>100</b>	<b>1,800</b>

**TABLE 4 - SUMMARY OF GROUNDWATER SAMPLE RESULTS FOR USTs MF-08/MF-09/MF-10  
SOUTH FIELD SELF-FUELING FACILITY, TAXIWAY U  
OAKLAND INTERNATIONAL AIRPORT-SOUTH FIELD (in micrograms per liter)**

Sample ID#	Date	Tert-Butyl Alcohol (TBA)	Di-isopropyl Ether (DIPE)	Ethyl tert-Butyl Ether (ETBE)	Tert-Amyl Methyl Ether (TAME)	1,2-Dichloroethane (1,2-DCA)	Ethylene Dibromide (EDB)	Ethanol
<b>UST Pit Over-excavation Grab Groundwater Samples – June 2005</b>								
EX-1 (diesel pit)	6/3/2005	<10	<2.0	<1.0	<1.0	<1.0	<1.0	<50
EX-2 (gas pit)	6/3/2005	<5.0	<1.0	<0.50	<0.50	<0.50	<0.50	<25
<b>2005 ESLs – Commercial/Industrial</b>		<b>18,000</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>200</b>	<b>N/A</b>	<b>50,000</b>

**TABLE 5 - WELL CONSTRUCTION DETAILS AND WATER LEVEL MEASUREMENTS  
SOUTH AIRPORT SELF-FUELING FACILITY, TAXIWAY U  
OAKLAND INTERNATIONAL AIRPORT-SOUTH FIELD**

Well ID#	Date	Well Diameter (inches)	TOC Elevation (ft above msl)	Screened Interval (ft below TOC)	Filter Interval (ft below TOC)	Depth of Well (ft below TOC)	Depth to Water (ft below TOC)	Groudwater Elevation (ft above msl)
MW-1	4/27/00	2	8.28	3.0-10.0	2.0-10.0	10.00	4.91	3.37
	5/18/00						4.96	3.32
	5/30/00						5.11	3.17
	9/20/00						6.30	1.98
	11/15/00						6.10	2.18
	2/15/01					10.00	5.06	3.22
	4/12/02					9.42	4.87	3.41
MW-2	4/27/00	2	6.41	3.0-10.0	2.0-10.0	10.00	4.34	2.07
	5/18/00						3.21	3.20
	5/30/00						3.49	2.92
	9/20/00						4.63	1.78
	11/15/00						4.18	2.23
	2/15/01						2.80	3.61
	4/12/02					9.90	3.08	3.33
MW-3	4/27/00	2	5.24	3.0-10.0	2.0-10.0	10.00	2.38	2.86
	5/18/00						2.33	2.91
	5/30/00						2.70	2.54
	9/20/00						3.76	1.48
	11/15/00						3.26	1.98
	2/15/01					9.73	1.66	3.58
	4/12/02					9.42	2.17	3.07
MW-4	4/27/00	2	4.49	3.0-10.0	2.0-10.0	10.00	2.48	2.01
	5/18/00						2.47	2.02
	5/30/00						2.93	1.56
	9/20/00						4.11	0.38
	11/15/00						3.27	1.22
	2/15/01					9.75	1.55	2.94
	4/12/02					9.74	2.35	2.14

ft= feet

msl=mean sea level

TOC=Top of casing

# UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D2488-93

MAJOR DIVISIONS		SYMBOLS	TYPICAL NAMES		
COARSE-GRAINED SOILS OVER 50% RETAINED ON No.200 SIEVE SIZE	GRAVELS  MORE THAN 1/2 OF COARSE FRACTION RETAINED ON No.4 SIEVE SIZE	CLEAN GRAVELS WITH LESS THAN 5% FINES	GW 	Well-graded gravels or gravel-sand mixtures, little or no fines	
		GRAVELS WITH OVER 15% FINES	GP 	Poorly graded gravels or gravel-sand mixtures, little or no fines	
		SANDS  MORE THAN 1/2 OF COARSE FRACTION PASSING No.4 SIEVE SIZE	CLEAN SANDS WITH LESS THAN 5% FINES	SW 	Well-graded sand or gravelly sands, little or no fines
			SANDS WITH OVER 15% FINES	SP 	Poorly graded sands or gravelly sands, little or no fines
	FINE-GRAINED SOILS OVER 50% PASSING No.200 SIEVE SIZE	SILTS & CLAYS  LIQUID LIMIT 50% OR LESS	ML 	Inorganic silts and sandy or gravelly silts, rock flour	
			CL 	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
			OL 	Organic silts and organic silty clays of low plasticity	
		SILTS & CLAYS  LIQUID LIMIT GREATER THAN 50%	MH 	Inorganic silts, micaceous or diatomaceous fine sandy soils, elastic silts	
CH 			Inorganic clays of high plasticity, fat clays		
OH 			Organic clays and silty clays of medium to high plasticity, organic silts		
HIGHLY ORGANIC SOILS		PT 	Peat and other highly organic soils		

		Shear Strength (psf)	Confining Pressure
	SPT Sampler		
	Modified California Sampler	TxUU 3200 (2600) (FM) or (S)	-Unconsolidated Undrained Triaxial Shear (field moisture or saturated)
	Shelby or Osterberg Sampler	TxCU 3200 (2600) (P)	-Consolidated Undrained Triaxial Shear (with or without pore pressure measurement.)
	Rock Core or Pitcher Barrel	TxCD 3200 (2600)	-Consolidated Drained Triaxial Shear
	Grab or Bulk Sample	SSCU 3200 (2600) (P)	-Simple Shear Consolidated Undrained (with or without pore pressure measurement.)
	G.W. measured after water level stabilizes	SSCD 3200 (2600)	-Simple Shear Consolidated Drained
	G.W. measured during or soon after drilling	DSCD 2700 (2000)	-Consolidated Drained Direct Shear
Perm	Permeability		
Consol	Consolidation	UC 470	-Unconfined Compression
LL	Liquid Limit (%)		
PI	Plasticity Index (%)	LVS 700	-Laboratory Vane Shear
Gs	Specific Gravity		
MA	Particle Size Analysis		
-200=55%	Percent Passing No. 200 Sieve		

## KEY TO TEST DATA

Source: ASTM D 2488-93, based on Unified Soil Classification system

SOIL\_CLASS\_GEOTECH\_NEW\_49667.GPJ GEOTECH.GDT 8/1/00



**Harding Lawson Associates**  
Engineering and  
Environmental Services

Soil Classification Chart and Key to Test Data  
Groundwater Monitoring Well Installation  
South Airport Self-Fueling Facility, Taxiway U  
Oakland, California

PLATE

# A-1

DRAWN AMA	JOB NUMBER 49667 1	APPROVED 	DATE 8/00	REVISED DATE
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Top of PVC Casing  
Elev 8.28 ft.

Equipment Hollow Stem Auger  
Hole Diameter 8 in  
Surface Elevation \_\_\_\_\_ Date 4/27/00  
Reference Datum Port of Oakland

2" Above Ground  
CHRISTY  
BOX  
GROUND SURFACE

TOP OF CASING  
AT 0.5 ft. BGS  
8-in. DIAMETER  
BOREHOLE  
BENTONITE -  
CEMENT SEAL:  
0.5 to 1.25 ft  
BENTONITE  
PELLET SEAL:  
1.25 to 2 ft.  
SANDPACK. 2 to  
10 ft.  
2-IN DIAMETER  
SCHEDULE 40  
PVC BLANK  
CASING: 0.5 to 3.0  
ft

2-in. DIA  
SLOTTED  
SCREEN (0.020"):  
3 to 10 ft.

BOTTOM WELL  
CAP. 10 ft.  
Bottom of well at  
10 ft.

PID Reading  
(ppm)

ND

ND

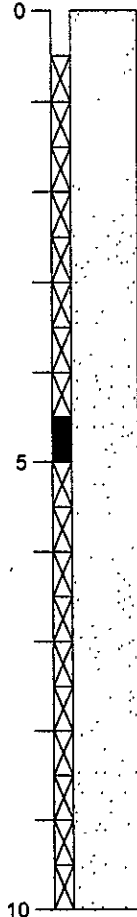
ND

ND

ND

ND

Depth (ft.)  
Sample



LIGHT BROWN SAND (SP) Medium dense,  
damp

Shell fragments

Wet

@ 6 ft.: Color change to gray

Boring terminated at 10 ft.

BORING WELL 49667 GPJ TEMP GDT 8/1/00



**Harding Lawson Associates**  
Engineering and  
Environmental Services

**Log of Boring MW-1**  
Groundwater Monitoring Well Installation  
South Airport Self-Fueling Facility, Taxiway U  
Oakland, California

PLATE

**A-2**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
PCB	49667 1	<i>HLA</i>	8/00	

Top of PVC Casing  
Elev. 6.41 ft.

2" Above Ground  
CHRISTY  
BOX  
GROUND SURFACE

TOP OF CASING  
AT 0 ft. BGS  
8-in. DIAMETER  
BOREHOLE  
BENTONITE-  
CEMENT SEAL 0  
to 1.25 ft.  
2-in. DIAMETER  
SCHEDULE 40  
PVC BLANK  
CASING: 0 to 3 ft.  
BENTONITE  
PELLET SEAL:  
1.25 to 2 ft.  
SANDPACK: 2 to  
10 ft.

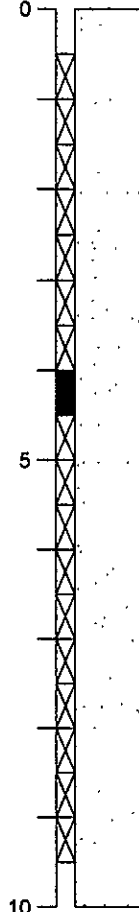
2-in. DIA.  
SLOTTED  
SCREEN (0.020")  
3 to 10 ft.

BOTTOM WELL  
CAP. 10 ft.  
Bottom of well at  
10 ft.

PID Reading  
(ppm)

ND  
ND  
ND  
ND  
ND  
ND

Depth (ft.)  
Sample



Equipment Hollow Stem Auger  
Hole Diameter 8 in.  
Surface Elevation \_\_\_\_\_ Date 4/27/00  
Reference Datum Port of Oakland

LIGHT BROWN SAND (SP) Medium dense,  
dry

@ 4.25 ft.: Wet

Color change to gray, loose, trace of clay

@ 8.5 ft.: Color change to light brown

Boring terminated at 10 ft.

BORING\_WELL\_49667 GPJ TEMP.GDT 8/1/00



**Harding Lawson Associates**  
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Environmental Services

**Log of Boring MW-2**  
Groundwater Monitoring Well Installation  
South Airport Self-Fueling Facility, Taxiway U  
Oakland, California

PLATE

**A-3**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
PCB	49667 1	<i>HLA</i>	8/00	



Top of PVC Casing  
Elev. 5.24 ft.

Equipment Hollow Stem Auger

Hole Diameter 8 in.

Surface Elevation \_\_\_\_\_

Date 4/27/00

Reference Datum Port of Oakland

2" Above Ground  
CHRISTY  
BOX

GROUND SURFACE

TOP OF CASING  
AT 0 ft BGS

8-in. DIAMETER  
BOREHOLE

BENTONITE-  
CEMENT SEAL 0  
to 1.25 ft.

2-in. DIAMETER  
SCHEDULE 40  
PVC BLANK  
CASING: 0 to 3 ft.

BENTONITE  
PELLET SEAL  
1.25 to 2 ft.

SANDPACK: 2 to  
10 ft.

2-in. DIA.  
SLOTTED  
SCREEN (0.020"):  
3 to 10 ft.

BOTTOM WELL  
CAP: 10 ft.

Bottom of well at  
10 ft.

PID Reading  
(ppm)

ND

ND

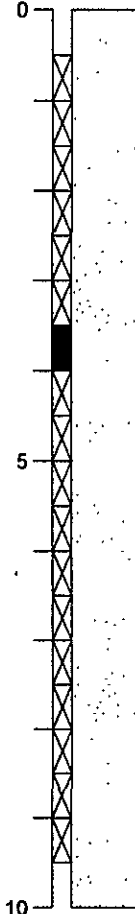
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ND

Depth (ft.)  
Sample



LIGHT BROWN SAND (SP) Medium dense,  
dry

Change to damp

@ 3.75 ft.: Wet

Color change to gray, loose, trace of clay

Boring terminated at 10 ft.

BORING WELL 49667.GPJ TEMP.GDT 8/1/00



**Harding Lawson Associates**

Engineering and  
Environmental Services

**Log of Boring MW-3**

Groundwater Monitoring Well Installation  
South Airport Self-Fueling Facility, Taxiway U  
Oakland, California

PLATE

**A-4**

DRAWN  
PCB

JOB NUMBER  
49667 1

APPROVED

*110*

DATE  
8/00

REVISED DATE

Top of PVC Casing  
Elev. 4.49 ft.

2" Above Ground  
CHRISTY  
BOX

GROUND SURFACE

TOP OF CASING  
AT 0 ft BGS

8-in. DIAMETER  
BOREHOLE

BENTONITE-  
CEMENT SEAL. 0  
to 1.25 ft

2-in. DIAMETER  
SCHEDULE 40  
PVC BLANK  
CASING: 0 to 3 ft.

BENTONITE  
PELLET SEAL.  
1.25 to 2 ft

SANDPACK: 2 to  
10 ft.

2-in. DIA  
SLOTTED  
SCREEN (0.020"):  
3 to 10 ft.

BOTTOM WELL  
CAP: 10 ft.  
Bottom of well at  
10 ft.

PID Reading  
(ppm)

ND

ND

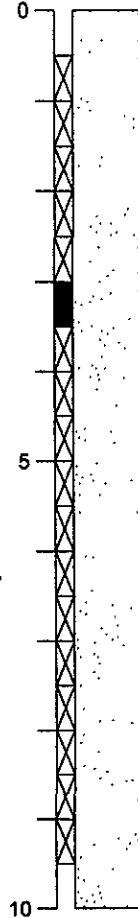
ND

ND

ND

ND

Depth (ft.)  
Sample



LIGHT BROWN SAND (SP) Medium dense,  
dry

@ 3.25 ft.: Wet

Color change to gray, loose, trace of clay

@ 8.5 ft.: Color change to light brown

Boring terminated at 10 ft.

Equipment Hollow Stem Auger  
Hole Diameter 8 in.  
Surface Elevation \_\_\_\_\_ Date 4/27/00  
Reference Datum Port of Oakland

BORING\_WELL\_49667.GPJ TEMP.GDT 8/1/00



**Harding Lawson Associates**  
Engineering and  
Environmental Services

**Log of Boring MW-4**  
Groundwater Monitoring Well Installation  
South Airport Self-Fueling Facility, Taxiway U  
Oakland, California

PLATE

**A-5**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
PCB	49667 1	<i>HLA</i>	8/00	