PORT OF OAKLAND

May 2, 2001

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

MAY 0 4 2001

#6409

SUBJECT: Groundwater Monitoring, Former USTs: MF08/09/10
South Field, Oakland International Airport, Oakland, CA 94621

Dear Mr. Chan:

Enclosed is a copy of the Harding ESE report entitled "***Quarterly Groundwater Monitoring Report, January 1 through March 31, 2001, South Airport Self-Fueling Facility, Taxiway U***", dated April 30, 2001. This is the last of four (4) scheduled quarterly groundwater monitoring events for this site, and the Port of Oakland requests that Alameda County review this site for regulatory case closure with the San Francisco Regional Water Quality Control Board.

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

enclosure

c: (w/o encl.): Jeff Jones - EH & SC Files
c:\206006bc gwmrmay2001

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Harding ESE
A MACTEC COMPANY

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April 30, 2001

49667.1

Mr. Dale H. Klettke, CHMM
Port of Oakland
Environmental Health & Safety Compliance
530 Water Street, 2nd Floor
Oakland, California 94607

Quarterly Groundwater Monitoring Report
January 1 through March 31, 2001
South Airport Self-Fueling Facility, Taxiway U
Oakland International Airport
Oakland, California

Dear Mr. Klettke:

Harding, ESE, Inc. (Harding), formerly Harding Lawson Associates, presents this groundwater monitoring report summarizing groundwater conditions observed first quarter 2001 in four monitoring wells at the South Airport Self-Fueling Facility adjacent to Taxiway U, Oakland International Airport, Oakland, California (Plate 1). This report is the fourth of four quarterly groundwater monitoring events that Harding will perform for the Port of Oakland in accordance with Harding's *Work Plan – Groundwater Monitoring, Oakland International Airport, Oakland, California*, dated March 16, 2000.

BACKGROUND

UST Removal

On April 26, 1999, the Port of Oakland's contractor, Enviroclean, removed three underground storage tanks (USTs), MF-08, MF-09, and MF-10 from an area adjacent to Taxiway U, see Plate 2. MF-08 and MF-09 were 1,000-gallon diesel tanks, and MF-10 was a 5,000-gallon gasoline tank. Removal of the three USTs involved two separate excavations, one for the diesel tanks and one for the gasoline tank. Soil and groundwater samples collected from the excavations indicated that there had been a release of petroleum hydrocarbons at both sites. Total petroleum hydrocarbons as diesel (TPH-diesel), total petroleum hydrocarbons as gasoline (TPH-gas), benzene, toluene, ethylbenzene, and total xylenes (BTEX) and methyl tertiary butyl-ether (MTBE) were detected in both soil and groundwater samples collected from the excavations.

At the diesel UST excavation, the analytical results of soil samples indicated TPH-diesel and TPH-gas concentrations as high as 39,000 and 3,000 milligrams per kilogram (mg/kg) respectively. Only low

concentrations of the BTEX constituents were detected in the soil. Groundwater samples exhibited TPH-diesel and TPH-gas concentrations of up to 51 and 120 milligrams per liter (mg/L), respectively.

At the excavation of the gasoline UST, the analytical results of soil samples indicated TPH-gas and TPH-diesel concentrations as high as 4,300 and 6,200 mg/kg respectively. BTEX constituents were detected in soil samples at concentrations up to 1.4 mg/kg for benzene, 87 mg/kg for toluene, 65 mg/kg for ethylbenzene, 540 mg/kg for xylenes, and 4.5 mg/kg for MTBE. Groundwater samples contained TPH-gas and TPH-diesel concentrations of up to 42 and 1.7 mg/L, respectively; dissolved BTEX compounds ranged in concentration from 0.27 to 8.9 mg/L and MTBE was detected at 15 mg/L.

Groundwater was measured at a depth of 3.5 to 4.0 feet below the ground surface (bgs). Both excavations were reportedly backfilled with pea gravel to a depth of 3 feet and capped with aggregate base rock.

August 1999 Site Investigation

On August 31, 1999, Harding performed a subsurface investigation at the site. Eight geoprobe borings were advanced in locations surrounding the former USTs. Soil and groundwater samples were collected from the borings. TPH-diesel was detected in soil at concentrations of 8.7 mg/kg to 680 mg/kg. The soil sample with the highest diesel concentration was also analyzed for polynuclear aromatic hydrocarbons (PAHs). Naphthalene was detected at 8,800 µg/kg and benzo(a)pyrene was detected at 620 µg/kg, as well as minimal concentrations of several other PAHs.

TPH-diesel was detected in the groundwater at concentrations ranging from 72 micrograms per liter (µg/L) to 380 µg/L. TPH-gas was detected in the groundwater at concentrations ranging from 33 µg/L to 300 µg/L. MTBE was encountered at concentrations ranging from 3,100 µg/L to 4,500 µg/L. Water samples from two of the borings contained MTBE above the MCL of 13 µg/L. Benzene was detected above the MCL for drinking water at a concentration of 63 µg/L. PAHs were analyzed in the groundwater sample with the highest diesel concentration and no PAHs were detected at or above their reporting limits.

During the August 31, 1999 investigation, the groundwater samples were subjected to a variety of chemical analyses to evaluate the potential for natural attenuation. Harding also measured certain groundwater parameters in the field to supplement the chemical data. The recorded groundwater temperature and pH measurements were all within ranges acceptable to support the presence of microorganisms. The presence of ferrous iron in the groundwater was evidence of natural bio-degradation of the petroleum hydrocarbons. The absence of phosphorous in the groundwater could indicate microbial growth because phosphorous is utilized by the microbes to break down the petroleum hydrocarbons. These results are discussed in more detail in Harding's *Subsurface Investigation Report* issued to the Port on October 7, 1999.

Monitoring Well Installation

On April 27, 2000, Gregg Drilling and Testing, Inc (Gregg), under the direction of Harding, installed four monitoring wells, MW-1, MW-2, MW-3 and MW-4, as located on Plate 2. Gregg installed a monitoring well in each of the four borings at a total depth 10 feet. The wells were constructed of 2-inch diameter schedule 40 polyvinyl chloride (PVC). Under the direction of Harding, Gregg installed the screened interval consisting of 0.02-inch slotted casing between 3 and 10 feet bgs. Three feet of flush-threaded, 2-inch diameter PVC solid casing was installed from the screen interval to the ground surface. The top of the well casing was fitted with an expandable locking well plug.

MW-1, MW-2, MW-3 and MW-4 were developed to remove fine particles from the well near the well screen on May 18, 2000. On July 21, 2000, Harding contracted PLS Surveys, Inc. to locate and provide top of well casing elevations to the nearest 0.01 foot, relative to the Port's datum for the four monitoring wells. The wells were also surveyed in horizontally using NAD '83. Complete details of the well installation can be found in HLA's *Groundwater Monitoring Well Installation Report,* dated December 15, 2000.

GROUNDWATER SAMPLING AND ANALYSIS

For the first quarter of 2001, Harding conducted quarterly groundwater monitoring on February 15. Prior to purging or sampling the monitoring wells, Harding measured dissolved oxygen (DO) concentrations, reduction oxidation potential (Redox), and water levels. Harding monitored the pH, conductivity, and temperature of the groundwater during purging. Harding sampled the monitoring wells after purging at least four well volumes and after parameters had stabilized to within 10 percent; the groundwater sampling forms with the field data are included in Appendix A.

Harding collected groundwater samples from the four monitoring wells using pre-cleaned disposable Teflon bailers and then transferred the groundwater into laboratory-provided containers. Sample containers were labeled with the sample number, date and time of collection, and sampler's initials, then placed in an insulated cooler with ice. The samples were delivered for chemical testing under chain-of-custody to Sequoia Analytical of Walnut Creek, California. The samples were analyzed for the following analytes:

- TPH-gas in accordance with EPA Test Method 8015 modified
- BTEX and MTBE in accordance with EPA Test Method 8020 with MTBE detections confirmed by EPA Test Method 8260.
- TPH-diesel in accordance with EPA Test Method 8015 modified

- Total iron and ferrous iron by EPA Test Method 6000/7000
- Nitrate as NO_3, Orthophosphate as PO_4, and sulfate as SO_4 by EPA Test Method 300
- Total Organic Carbon by EPA Test Method 415.1
- Polyaromatic Hydrocarbons by EPA Test Method 8270C at wells MW-2 and MW-3 only.

Harding contained the purge water in a 55-gallon drum for subsequent disposal by the Port's contractor.

MONITORING RESULTS

Groundwater elevations are presented in Table 1 and shown on Plate 3 with an apparent gradient towards the southeast. Table 2 and Plate 4 present the petroleum hydrocarbon analytical data. Table 3 presents the natural attenuation parameter analytical results. The laboratory report and chain-of-custody form are presented in Appendix B.

TPH-diesel was reported above the detection limit in monitoring wells MW-1 and MW-2 this quarter at concentrations of 150 micrograms per liter (µg/L) and 180 µg/L, respectively. TPH-diesel was reported above the detection limits in all of the four wells during the previous quarter. MTBE was detected in MW-4 at a concentration of 2.6 µg/L. The MTBE detection was confirmed by EPA Method 8260 with results of 2.3 µg/L in MW-4. Last quarter's EPA Method 8260 results yielded a MTBE concentration of 44 µg/L in MW-4. No other petroleum hydrocarbons were detected above the reporting limits.

As requested by the Alameda County Health Care Services Agency, MW-2 and MW-3 were analyzed for polyaromatic hydrocarbons (PAHs) this quarter. Neither well contained PAHs above the detection limit of 5 µg/L.

The groundwater samples were subjected to a variety of chemical analyses to evaluate the potential for natural attenuation. Harding also measured certain groundwater parameters in the field to supplement the chemical data. Because of the low concentrations of petroleum hydrocarbons (the majority being non-detect), evidence indicating high rates of microbial activity are not expected at this time. This data is summarized in Table 3.

QUALITY ASSURANCE AND QUALITY CONTROL

All samples were received by the laboratory cold and intact. Groundwater submitted for TPH-diesel analysis was treated with silica gel prior to analysis. Harding reviewed the data and noted that no samples were extracted or analyzed outside their holding time.

CLOSURE

If you have any questions or need additional information, please contact either of the undersigned at (510) 451-1001. With this report, Harding has completed the groundwater monitoring program currently under contract. If you wish Harding to continue to perform groundwater monitoring at Taxiway U, please advise.

Very truly yours,

HARDING ESE, INC.

Trish Eliasson
Staff Engineer

Stephen J. Osborne
Geotechnical Engineer

REGISTERED PROFESSIONAL ENGINEER
STEPHEN J. OSBORNE
GE 656
Exp. 3-31-03
GEOTECHNICAL
STATE OF CALIFORNIA

TAE/SJO:dmw/p:wpdata/49967/037960R

Attachments.
Table 1 - Groundwater Elevations
Table 2 - Petroleum Hydrocarbon Analytical Results for Groundwater Samples
Table 3 - Natural Attenuation Analytical Results for Groundwater Samples

Plate 1 – Site Location Map
Plate 2 – Site Plan
Plate 3 – Groundwater Elevation (2/15/01)
Plate 4 – Groundwater Chemical Results (2/15/01)

Appendix A - Groundwater Sampling Forms
Appendix B - Laboratory Reports

TABLES

Table 1. Groundwater Elevations
Quarterly Groundwater Monitoring Report
January through March 2001
South Airport Self-Fueling Facility, Taxiway U
Oakland, California

Well ID	Elevation Top of Casing (feet)	Date Of Monitoring	Depth to Water (feet)	Groundwater Elevation (feet)
MW-1	8.28	04/27/00	4.91 [1]	3.37
		05/18/00	4.96 [1]	3.32
		05/30/00	5.11	3.17
		09/20/00	6.30	1.98
		11/15/00	6.10	2.18
		02/15/01	5.06	3.22
MW-2	6.41	04/27/00	4.34 [1]	2.07
		05/18/00	3.21 [1]	3.20
		05/30/00	3.49	2.92
		09/20/00	4.63	1.78
		11/15/00	4.18	2.23
		02/15/01	2.80	3.61
MW-3	5.24	04/24/00	2.38 [1]	2.11
		05/18/00	2.33 [1]	2.16
		05/30/00	2.70	2.54
		09/20/00	3.76	1.48
		11/15/00	3.26	1.98
		02/15/01	1.66	3.58
MW-4	4.49	04/24/00	2.48 [1]	2.01
		05/18/00	2.47 [1]	2.02
		05/30/00	2.93	1.56
		09/20/00	4.11	0.38
		11/15/00	3.27	1.22
		02/15/01	1.55	2.94

Elevation data relative to Port of Oakland datum; well surveys performed on July 21, 2000

[1] Water level taken prior to well development

Table 2. Petroleum Hydrocarbon Analytical Results for Groundwater Samples
Quarterly Groundwater Monitoring Well Report
January through March 2001
South Airport Self-Fueling Facility, Taxiway U
Oakland, California

Well	Date	Analyte: / EPA Method: / Units:	TPH gas 8015 M µg/L	TPH diesel 8015 M µg/L	TPH motor oil 8015 M µg/L	MTBE 8020 µg/L	Confirmation MTBE 8260 µg/L	Benzene 8020 µg/L	Toluene 8020 µg/L	Ethylbeneze 8020 µg/L	Total Xylenes 8020 µg/L	PAHs 8270C µg/L
MW-1	5/30/2000		ND<50	60 [2]	ND<250	ND<2.5	ND<2.5	ND<0.5	ND<0.5	ND<0 5	ND<0.5	-
	9/20/2000		ND<50	ND<50	NA	ND<2.5	NA	ND<0.5	ND<0.5	ND<0 5	ND<0.5	-
	11/15/2000		ND<50	58 [1]	NA	ND<2.5	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-
	2/15/2001		ND<50	150 [1]	NA	ND<2.5	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	NA
MW-2	5/30/2000		ND<50	51 [2]	ND<250	ND<2.5	ND<2.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-
	9/20/2000		ND<50	ND<50	NA	ND<2.5	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-
	11/15/2000		ND<50	57 [1]	NA	ND<2.5	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-
	2/15/2001		ND<50	180 [1] ✓	NA	ND<2.5	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0
MW-3	5/30/2000		ND<50	60 [2]	ND<250	7.5	2.6	ND<0.5	ND<0.5	ND<0.5	ND<0 5	-
	9/20/2000		ND<50	ND<50	NA	ND<2.5	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-
	11/15/2000		ND<50	67 [1]	NA	ND<2.5	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-
	2/15/2001		ND<50	ND<50	NA	ND<2.5	NA	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0
MW-4	5/30/2000		ND<50	210 [1]	ND<250	19	17	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-
	9/20/2000		ND<50	ND<50	NA	32	42	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-
	11/15/2000		ND<50	70 [1]	NA	32	44	ND<0.5	ND<0.5	ND<0.5	ND<0.5	-
	2/15/2001		ND<50	ND<50	NA	2.6	2.3	ND<0.5	ND<0.5	ND<0.5	ND<0.5	NA

Notes

µg/L	micrograms per liter
mg/L	milligrams per liter
mV	millivolts
PAH	Polyaromatic Hydrocarbons
1	Chromatogram pattern: Diesel C9-C24
2	Chromatogram pattern: Unidentified hydrocarbons >C16
NA	Not analyzed
-	Not included as part of the sampling program

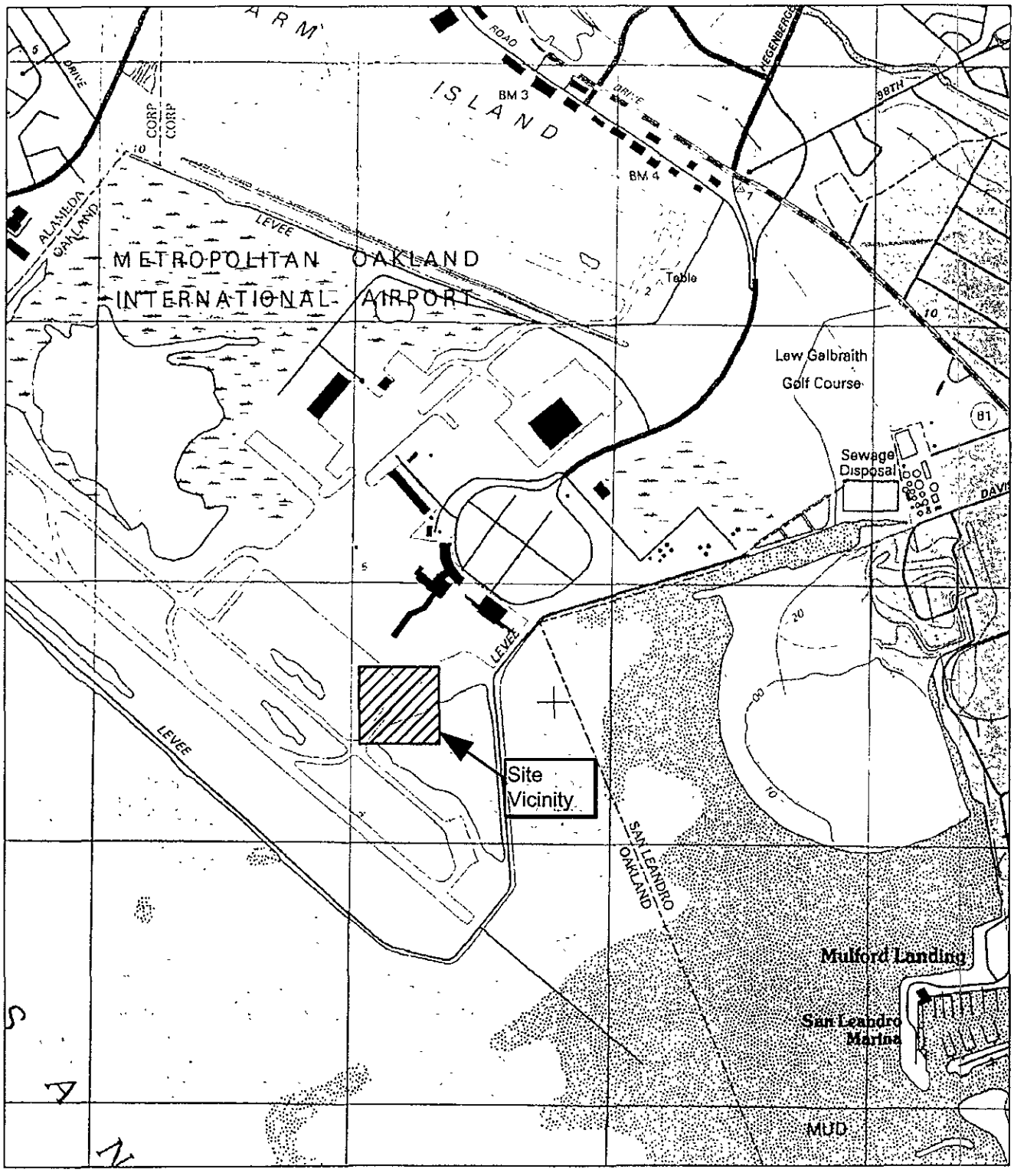
Table 3. Natural Attenuation Analytical Results for Groundwater Samples
Quarterly Groundwater Monitoring Report
January through March 2001
South Airport Self-Fueling Facility, Taxiway U
Oakland, California

Well	Date	Analyte: / EPA Method: / Units:	Ferrous Iron 6000/7000 mg/L	Iron 6000/7000 mg/L	Nitrate 300 mg/L	Orthophosphate 300 mg/L	Sulfate 300 mg/L	Total Organic Carbon 415.1 mg/L	Dissolved Oxygen Field mg/L	Redox Field mV
MW-1	5/30/2000		1.0	0.75	5.5	ND<0.5	76	47.2	2.8	208
	9/20/2000		0.16	7.1	1.4	1.0	60	26.2	1.4	261
	11/15/2000		0.33	2.5	2	ND<0.5	87	1.73	3.6	321
	2/15/2001		0.20	3.2	2.2	1	89	13.1	3.6	333
MW-2	5/30/2000		0.1	2.9	1.3	ND<0.5	14	9.39	2.2	228
	9/20/2000		0.093	12	0.23	ND<0.5	8.9	1.56	2.2	252
	11/15/2000		0.68	13.0	0.4	ND<0.5	8.3	ND<1.0	4.4	317
	2/15/2001		0.18	11.0	2.7	ND<0.5	30	1.93	3.8	290
MW-3	5/30/2000		0.7	3.9	ND<0.1	ND<0.5	51	22.5	1.2	164
	9/20/2000		0.16	6.5	ND<0.1	ND<0.5	51	6.54	0.8	161
	11/15/2000		0.46	7.0	ND<0.2	ND<0.5	59	2.20	3.6	296
	2/15/2001		0.06	10.0	3.6	0.79	36	8.74	4	265
MW-4	5/30/2000		0.4	4.6	ND<0.1	0.94	38	21.4	1.0	184
	9/20/2000		0.33	9.8	ND<0.1	2.8	25	4.12	2.1	241
	11/15/2000		0.52	5.3	ND<0.2	3	22	2.65	3.0	321
	2/15/2001		0.06	17.0	ND<0.1	1.1	29	4.37	2.6	269

µg/L = micrograms per liter
mg/L = milligrams per liter
mV = millivolts

P:wpdata/49667/037960t
4/30/2001

PLATES



Source TOPO! © 1997 Wildflower Productions.

49667001.DWG 1.0
20010417.0903

Harding ESE

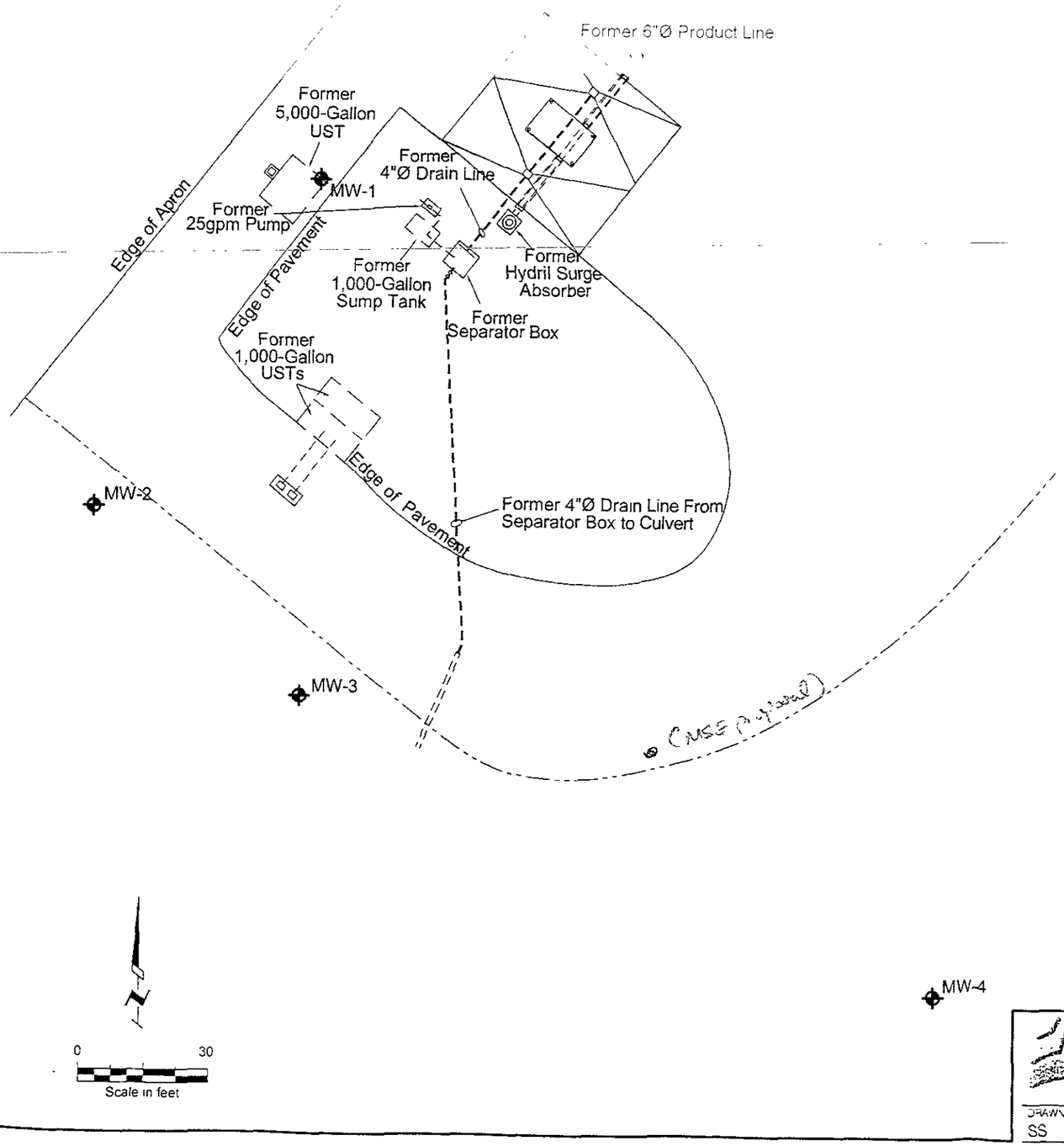
Site Location Map
Groundwater Monitoring Well Installation Report
South Airport Self-Fueling Facility, Taxiway U
Oakland, California

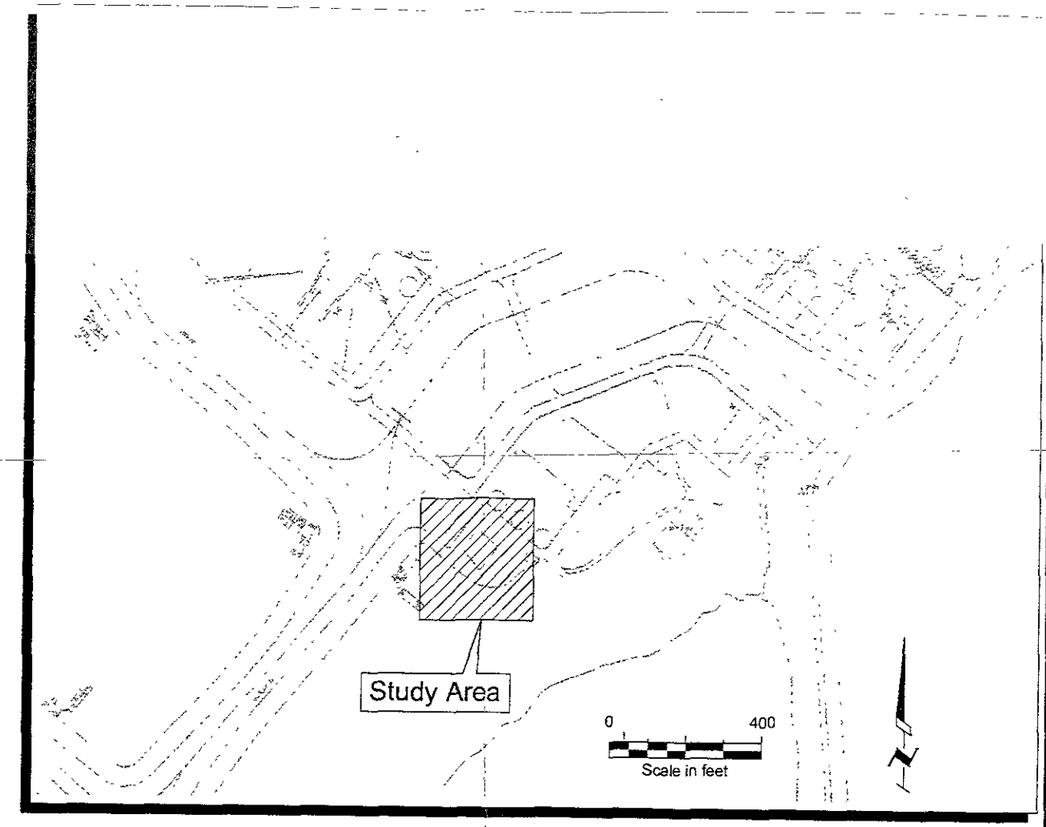
PLATE
1

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
SS			4/01	

Legend

MW-1 Monitoring Well





Harding ESE

Site Plan
Quarterly Groundwater Monitoring Report
South Airport Self-Fueling Facility, Taxiway U
Oakland California

PLATE **2**

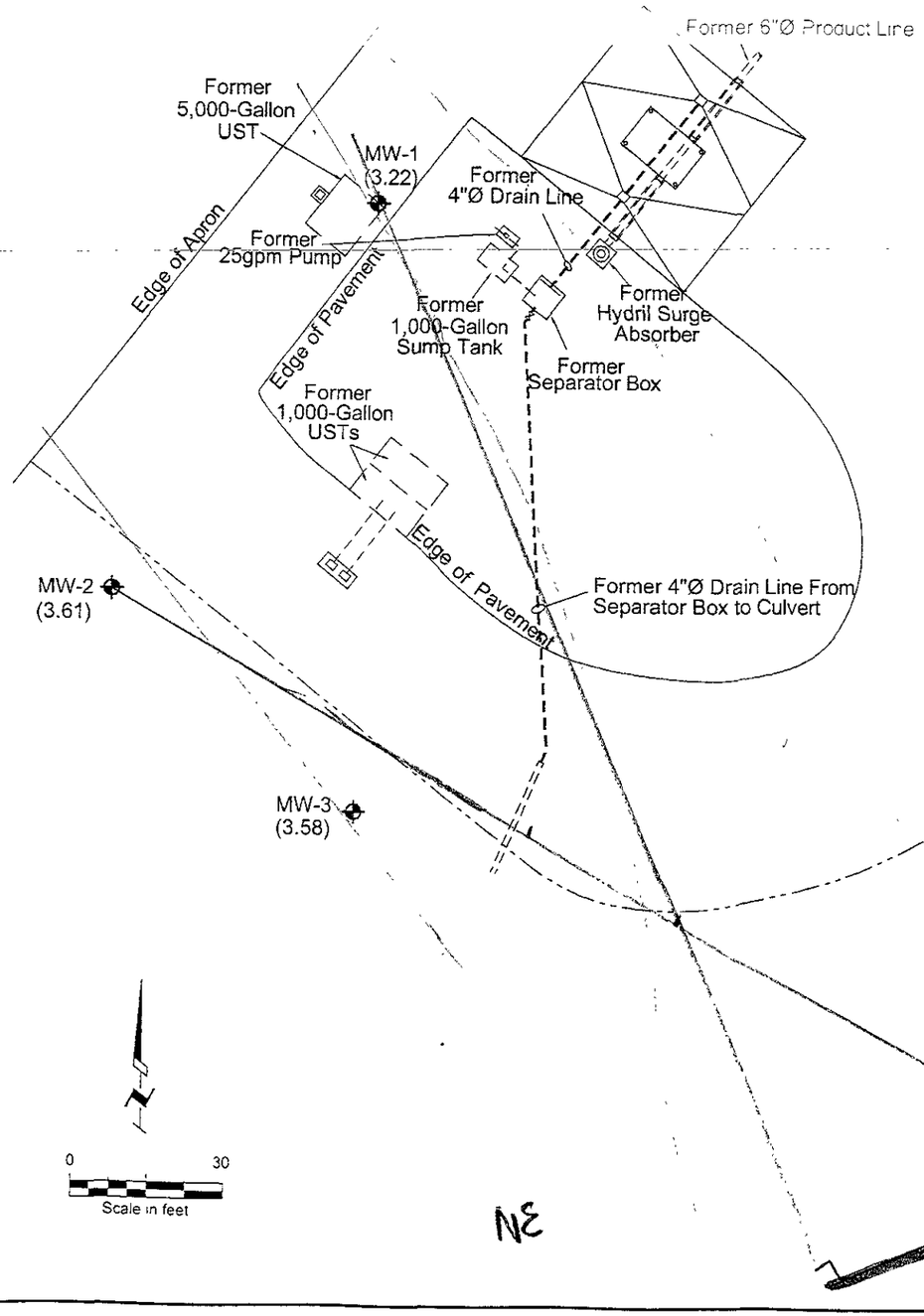
DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
SS	49667.1		4/01	

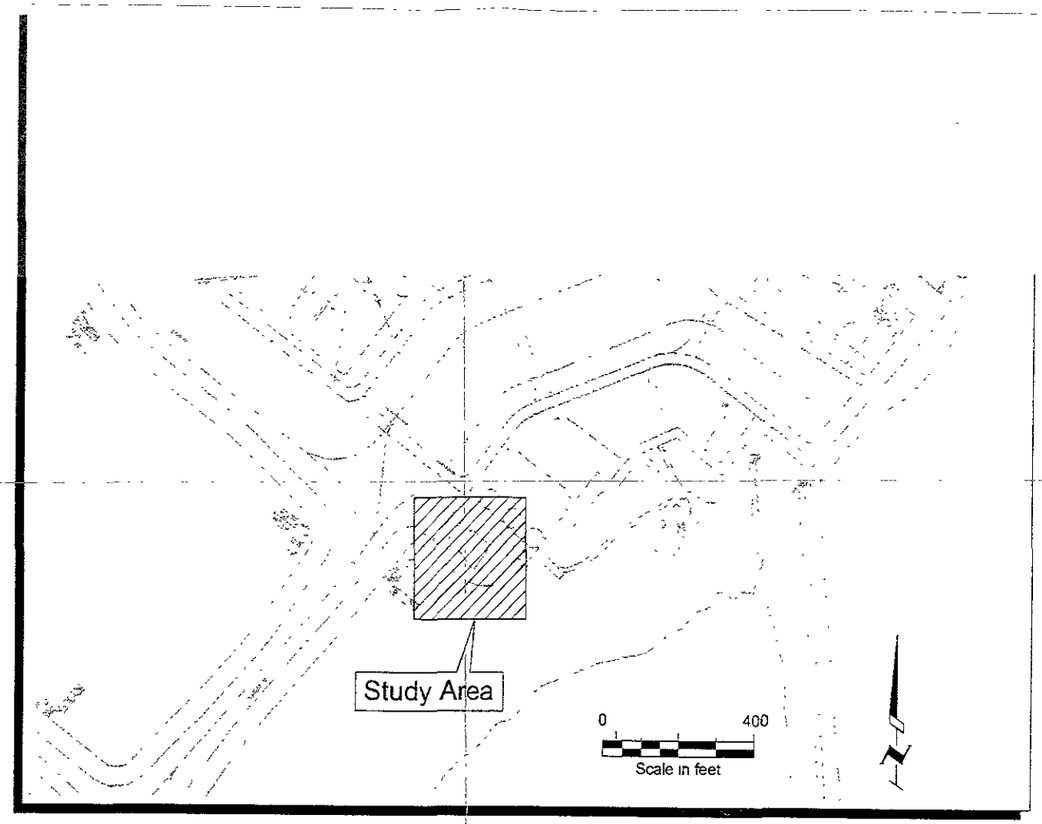
49667011.DWG 0.0
20010417.0930

Legend

MW-1 Groundwater Well

(3.22) Groundwater Elevation (feet datum)





Harding ESE

Groundwater Elevations (2/15/01)
Quarterly Groundwater Monitoring Report
South Airport Self-Fueling Facility, Taxiway U
Oakland, California

PLATE **3**

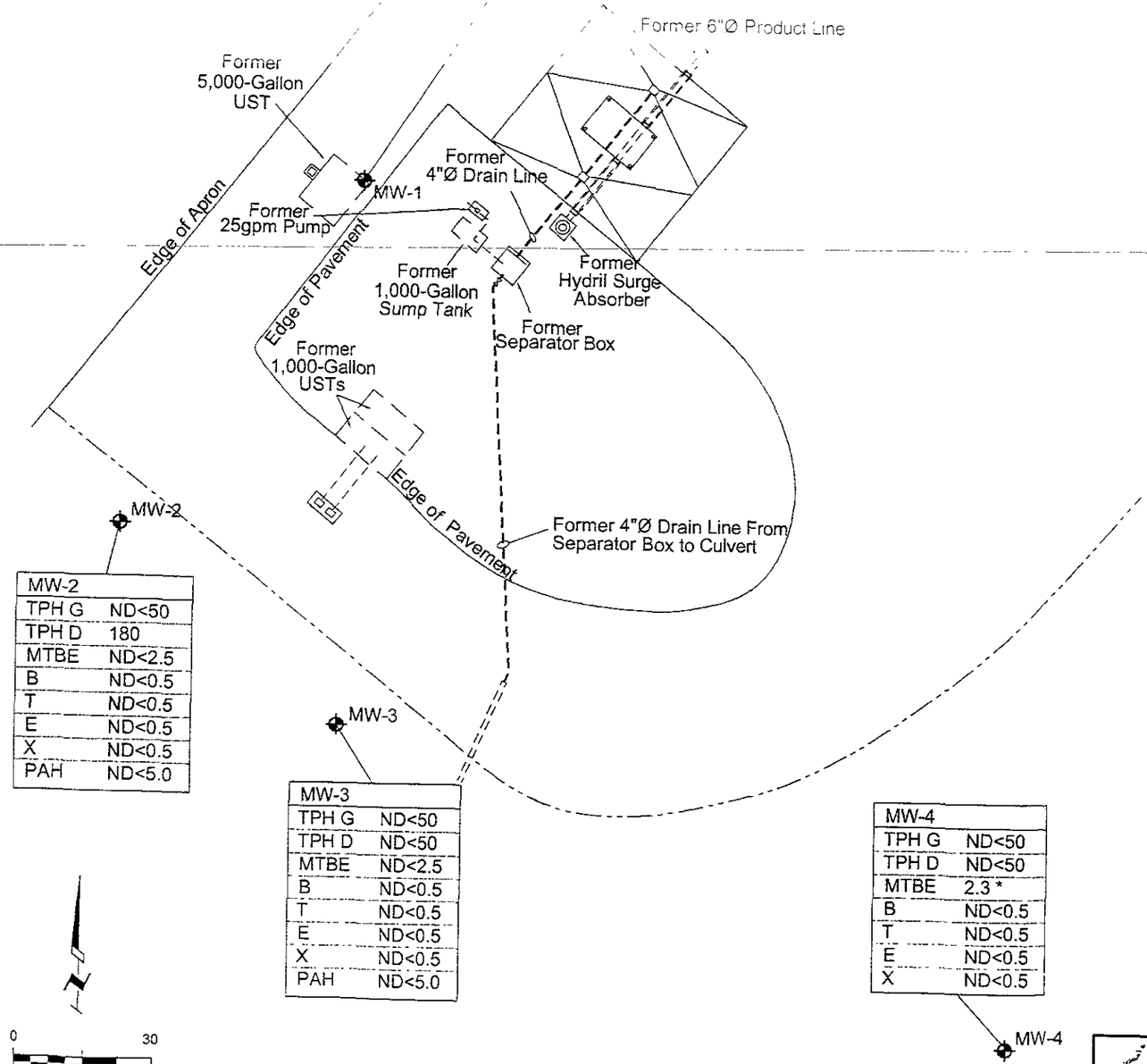
DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
SS	49667.1		4/01	

49667012.DWG 0.0
20010416 16:51

Legend

MW-1 Monitoring Well

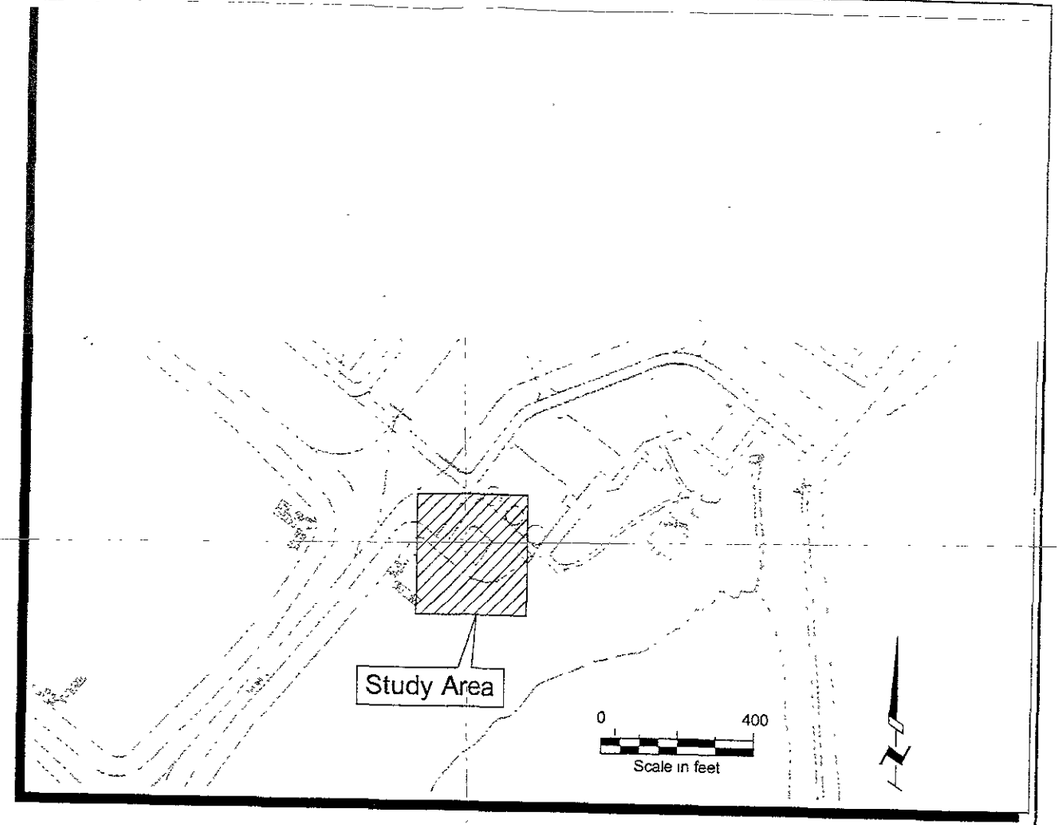
MW-1	
TPH G	ND<50
TPH D	150
MTBE	ND<2.5
B	ND<0.5
T	ND<0.5
E	ND<0.5
X	ND<0.5



MW-2	
TPH G	ND<50
TPH D	180
MTBE	ND<2.5
B	ND<0.5
T	ND<0.5
E	ND<0.5
X	ND<0.5
PAH	ND<5.0

MW-3	
TPH G	ND<50
TPH D	ND<50
MTBE	ND<2.5
B	ND<0.5
T	ND<0.5
E	ND<0.5
X	ND<0.5
PAH	ND<5.0

MW-4	
TPH G	ND<50
TPH D	ND<50
MTBE	2.3 *
B	ND<0.5
T	ND<0.5
E	ND<0.5
X	ND<0.5



KEY:

TPH G = TPH Gas
TPH D = TPH Diesel
MTBE = Methyl Tertiary Butyl Ether
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylene
PAH+Polyaromatic Hydrocarbons
*MTBE results by 8260

NOTES: All results in ug/L.

Samples collected 2/15/01.

Harding ESE
A MACTEC COMPANY

Groundwater Chemical Results (2/15/01)
Quarterly Groundwater Monitoring Report
South Airport Self-Fueling Facility, Taxiway U
Oakland, California

PLATE **4**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
SS	49667.1		4/01	

49667.01.DWG 0.0
20010416.1642

APPENDIX A
GROUNDWATER SAMPLING REPORTS

Harding Lawson Associates
Engineering and Environmental Services

GROUNDWATER SAMPLING FORM

Job Name: Port of Oakland - Taxiway U
Job Number: 49667.1
Recorded By: (Signature)

Well Number: MW-
Well Type: x Monitor ___ Extraction ___ Other ___
x PVC ___ St Steel ___ Other ___
Date: 2/15/01
Sampled By: VJH (Initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
Total Depth of Casing (TD in ft BTOC): 16
Water Level Depth (WL in ft BTOC): 5.66
No.of Well Volumes to be purged (# 4

PURGE METHOD

x Bailer - Type: teflon
___ Submersible - Type
___ Other - Type

PUMP INTAKE SETTING

___ Near Bottom ___ Near Top
___ Other N/A
Depth in feet (BTOC):
Screen Interval in feet (BTOC) from ___ to ___

PURGE VOLUME CALCULATION

(16 - 5.66) X 2 ² X 4 X 0.0408 = 3.22 gals
TD (feet) WL (Feet) D (inches) # V Calculated Purge Volume

PURGE TIME

Purge Start 9:20
Purge Stop 9:34
Elapsed 14

PURGE RATE

GPM
GPM

PURGE VOLUME

Volume 3.5 gallons

Field Parameter Measurement

Minutes	pH	Conductivity (µS)	Temp °C / x °F	DO/redox (mg/L/mV)
Initial	7.18	1043	56	3.6/33
1	6.85	1306	56.2	
2	6.85	1268	57.4	
3	6.75	1322	57.4	
3.5	6.82	1431	57.5	
Meter S/N	9510	9510	9510	

Observations During Purging (Well Condition, Color, Odor)
SLIGHTLY TURB, NO ODOR
NO SHEEN

Discharge Water Disposal ___ Sanitary Sewer
___ Storm Sewer x Other onsite drum

WELL SAMPLING

x Bailer - Type: disposable
Sample Time 8:40

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-1	3 VOA	TPH gas by 8015	HCL	Sequoia	
	3 VOA	8020/MTBE/BTEX	HCL	Sequoia	
	2 amber VOA	TOC by 415.1	HCL	Sequoia	
	2 LA	TPH diesel	none	Sequoia	
	1 500mL Poly	Total Iron	HNO3	Sequoia	
	1 500mL Poly	Ferrous Iron	none	Sequoia	24 hour HT on ferrous iron
	1 L Poly	NO3, SO4, PO4	none	Sequoia	
(MW-2,3 only)	1 L Amber	PAHs ONLY 8270	none	Sequoia	

QUALITY CONTROL SAMPLES

Duplicate Samples	
Original Sample No	Dupl Sample No

Blank Samples	
Type	Sample No

Other Samples	
Type	Sample No

Harding Lawson Associates
Engineering and Environmental Services

GROUNDWATER SAMPLING FORM

Job Name: Port of Oakland - Taxiway U
Job Number: 49667.1
Recorded By: (Signature)

Well Number: MW-2
Well Type: x Monitor ___ Extraction ___ Other ___
x PVC ___ St Steel ___ Other ___
Date: 2/15/01
Sampled By: VJH (initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
Total Depth of Casing (TD in ft BTOC): 10
Water Level Depth (WL in ft BTOC): 2.80
No.of Well Volumes to be purged (# 4

PURGE METHOD

x Bailer - Type teflon
___ Submersible - Type
___ Other - Type

PUMP INTAKE SETTING

___ Near Bottom ___ Near Top
___ Other
Depth in feet (BTOC)
Screen Interval in feet (BTOC) from ___ to ___

PURGE VOLUME CALCULATION

(10 - 2.80) X 2 ² X 4 X 0.0408 = 4.7 gals
TD (feet) WL (Feet) D (inches) #V Calculated Purge Volume

Field Parameter Measurement

Minutes	pH	Conductivity (uS)	Temp ___ °C x °F	DO/redox (mg/L/mV)
Initial	7.93	268	53.2	3.6/291
1.5	7.49	243	55.3	
3.0	7.13	240	56.0	
5.0	6.99	240	56.1	
Meter S/N	9510	9510	9510	

PURGE TIME

Purge Start 9:20
Purge Stop 9:30
Elapsed 10

PURGE RATE

GPM ___
GPM ___

PURGE VOLUME

Volume 5.0 gallons

Observations During Purging (Well Condition, Color, Odor)
ROOTS IN WELL light brown water, turbid, no odor

Discharge Water Disposal ___ Sanitary Sewer
___ Storm Sewer x Other onsite drum

WELL SAMPLING

x Bailer - Type disposable
Sample Time. 9:50

Sample No	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-2	3 VOA	TPH gas by 8015	HCL	Sequoia	
	3 VOA	8020/MTBE/BTEX	HCL	Sequoia	
	2 amber VOA	TOC by 415.1	HCL	Sequoia	
	2 LA	TPH diesel	none	Sequoia	
	1 500mL Poly	Total Iron	HNO3	Sequoia	
	1 500mL Poly	Ferrous Iron	none	Sequoia	24 hour HT on ferrous iron
	1 L Poly	NO3, SO4, PO4	none	Sequoia	
	1 L Amber	PAHs ONLY 8270	none	Sequoia	

QUALITY CONTROL SAMPLES

Duplicate Samples	
Original Sample No	Dupl Sample No

Blank Samples	
Type	Sample No

Other Samples	
Type	Sample No

Harding Lawson Associates
Engineering and Environmental Services

GROUNDWATER SAMPLING FORM

Well Number: MW- 3

Well Type: x Monitor ___ Extraction ___ Other ___
x PVC ___ St Steel ___ Other ___

Job Name: Port of Oakland - Taxiway U

Job Number: 49667.1

Recorded By: [signature] (Signature)

Date: 2/15/01

Sampled By: VJH (Initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
Total Depth of Casing (TD in ft BTOC): 6.43
Water Level Depth (WL in ft BTOC): 1.66
No.of Well Volumes to be purged (# 4

PURGE METHOD

x Bailer - Type teflon
___ Submersible - Type
___ Other - Type

PURGE VOLUME CALCULATION

6.43 (TD feet) - 1.66 (WL Feet) x 2 (D inches) x 4 (#V) x 0.0408 = 5.0 gals (Calculated Purge Volume)

PUMP INTAKE SETTING

___ Near Bottom ___ Near Top
___ Other
Depth in feet (BTOC).
Screen Interval in feet (BTOC) from ___ to ___

Field Parameter Measurement

Minutes	pH	Conductivity (uS)	Temp ___ °C x °F	DO/redox (mg/L/mV)
Initial	7.67	475	56.4	4.0/265
1.5	7.46	503	56.5	
3.0	7.26	521	56.9	
5.0	7.11	535	57.7	
Meter S/N	9510	9510	9510	

PURGE TIME

Purge Start 10:10
Purge Stop 10:20
Elapsed 10

PURGE RATE

GPM ___
GPM ___

PURGE VOLUME

Volume. 5.0 gallons

Observations During Purging (Well Condition, Color, Odor).
clear
no odor, no sheen

Discharge Water Disposal ___ Sanitary Sewer
___ Storm Sewer x Other onsite drum

WELL SAMPLING

x Bailer - Type disposable

Sample Time: 10:40

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-3	3 VOA	TPH gas by 8015	HCL	Sequoia	
	3 VOA	8020/MTBE/BTEX	HCL	Sequoia	
	2 amber VOA	TOC by 415.1	HCL	Sequoia	
	2 LA	TPH diesel	none	Sequoia	
	1 500mL Poly	Total Iron	HNO3	Sequoia	
	1 500mL Poly	Ferrous Iron	none	Sequoia	24 hour HT on ferrous iron
	1 L Poly	NO3, SO4, PO4	none	Sequoia	
	1 L Amber	PAHs ONLY 8270	none	Sequoia	

QUALITY CONTROL SAMPLES

Duplicate Samples	
Original Sample No	Dupl Sample No

Blank Samples	
Type	Sample No

Other Samples	
Type	Sample No

Harding Lawson Associates
Engineering and Environmental Services

GROUNDWATER SAMPLING FORM

Well Number: MW- 4

Well Type: x Monitor ___ Extraction ___ Other ___
x PVC ___ St Steel ___ Other ___

Job Name: Port of Oakland - Taxiway U

Job Number: 49667

Recorded By: (Signature)

Date: 2/15/01

Sampled By: VJH (initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
Total Depth of Casing (TD in ft BTOC): 17.75
Water Level Depth (WL in ft BTOC): 1.55
No.of Well Volumes to be purged (# 4

PURGE METHOD

x Bailer - Type teflon
___ Submersible - Type
___ Other - Type,

PUMP INTAKE SETTING

___ Near Bottom ___ Near Top
___ Other
Depth in feet (BTOC),
Screen Interval in feet (BTOC) from ___ to ___

PURGE VOLUME CALCULATION

(17.75 - 1.55) X 2 ² X 4 X 0.0408 = 5.35 gals

TD (feet) WL (Feet) D (inches) # V Calculated Purge Volume

Field Parameter Measurement

Minutes	pH	Conductivity (µS)	Temp ___ °C x °F	DO/redox (mg/L/mV)
Initial	7.84	405	56.0	[illegible]
2.0	7.20	365	57.8	26.12.69
4.0	6.97	363	56.4	
5.5	6.95	365	57.5	
Meter S/N	9510	9510	9510	

PURGE TIME

Purge Start 1105
Purge Stop 1115
Elapsed 10

PURGE RATE

GPM
GPM

PURGE VOLUME

Volume 5.5 gallons

Observations During Purging (Well Condition, Color, Odor):
yellowish, no odor
no sheen

Discharge Water Disposal, ___ Sanitary Sewer
___ Storm Sewer x Other onsite drum

WELL SAMPLING

x Bailer - Type disposable

Sample Time 1130

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW- 4	3 VOA	TPH gas by 8015	HCL	Sequoia	
	3 VOA	8020/MTBE/BTEX	HCL	Sequoia	
	2 amber VOA	TOC by 415.1	HCL	Sequoia	
	2 LA	TPH diesel	none	Sequoia	
	1 500mL Poly	Total Iron	HNO3	Sequoia	
	1 500mL Poly	Ferrous Iron	none	Sequoia	24 hour HT on ferrous iron
	1 L Poly	NO3, SO4, PO4	none	Sequoia	
	~~1 L Amber~~	~~PAHs ONLY 8270~~	~~none~~	~~Sequoia~~	

QUALITY CONTROL SAMPLES

Duplicate Samples	
Original Sample No	Dupl Sample No

Blank Samples	
Type	Sample No

Other Samples	
Type	Sample No

APPENDIX B
LABORATORY REPORTS

Sequoia
Analytical

404 N. Wiget Lane
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20 March, 2001

Steve Osborne
Harding-Lawson Associates - Oakland
383 Fourth Street
Oakland, CA 94607

RE: Taxiway U
Sequoia Report: W102384

Enclosed are the results of analyses for samples received by the laboratory on 15-Feb-01 17:10. If you have any questions concerning this report, please feel free to contact me.

Sincerely.

Dimple Sharma
Project Manager

CA ELAP Certificate #1271

Sequoia Analytical

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
383 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1	W102384-01	Water	15-Feb-01 08:40	15-Feb-01 17:10
MW-2	W102384-02	Water	15-Feb-01 09:50	15-Feb-01 17:10
MW-3	W102384-03	Water	15-Feb-01 10:40	15-Feb-01 17:10
MW-4	W102384-04	Water	15-Feb-01 11:30	15-Feb-01 17:10

Sequoia Analytical - Walnut Creek

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Dimple Sharma, Project Manager

Sequoia Analytical

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
383 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

Total Purgeable Hydrocarbons (C6-C12), BTEX and MTBE by DHS LUFT

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (W102384-01) Water Sampled: 15-Feb-01 08:40 Received: 15-Feb-01 17:10									
Purgeable Hydrocarbons	ND	50	ug/l	1	1B27001	27-Feb-01	27-Feb-01	EPA 8015M/8020	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*95.7 %*		*70-130*	"	"	"	"	
MW-2 (W102384-02) Water Sampled: 15-Feb-01 09:50 Received: 15-Feb-01 17:10									
Purgeable Hydrocarbons	ND	50	ug/l	1	1B26005	26-Feb-01	26-Feb-01	EPA 8015M/8020	
Benzene	ND	0.50	"	"	"	"	"	"	CC-3
Toluene	ND	0.50	"	"	"	"	"	"	CC-3
Ethylbenzene	ND	0.50	"	"	"	"	"	"	CC-3
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*96.7 %*		*70-130*	"	"	"	"	
MW-3 (W102384-03) Water Sampled: 15-Feb-01 10:40 Received: 15-Feb-01 17:10									
Purgeable Hydrocarbons	ND	50	ug/l	1	1B28001	28-Feb-01	28-Feb-01	EPA 8015M/8020	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*98.7 %*		*70-130*	"	"	"	"	

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
383 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

Total Purgeable Hydrocarbons (C6-C12), BTEX and MTBE by DHS LUFT

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-4 (W102384-04) Water Sampled: 15-Feb-01 11:30 Received: 15-Feb-01 17:10									
Purgeable Hydrocarbons	ND	50	ug/l	1	1B27001	27-Feb-01	27-Feb-01	EPA 8015M/8020	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	**2.6**	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*99.7 %*		*70-130*		"	"	"	

Sequoia Analytical

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Harding-Lawson Associates - Oakland 1383 Fourth Street Oakland CA, 94607	Project: Taxiway U Project Number: # 49667-1 Project Manager: Steve Osborne	**Reported:** 20-Mar-01 12:48

Diesel Hydrocarbons (C9-C24) with Silica Gel Cleanup by DHS LUFT

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (W102384-01) Water Sampled: 15-Feb-01 08:40 Received: 15-Feb-01 17:10									
Diesel Range Hydrocarbons	**150**	50	ug/l	1	1C01007	01-Mar-01	03-Mar-01	EPA 8015M	
Surrogate: n-Pentacosane		*78.1 %*		*50-150*	"	"	"	"	
MW-2 (W102384-02) Water Sampled: 15-Feb-01 09:50 Received: 15-Feb-01 17:10									
Diesel Range Hydrocarbons	**180**	50	ug/l	1	1C01007	01-Mar-01	03-Mar-01	EPA 8015M	
Surrogate: n-Pentacosane		*76.0 %*		*50-150*	"	"	"	"	
MW-3 (W102384-03) Water Sampled: 15-Feb-01 10:40 Received: 15-Feb-01 17:10									
Diesel Range Hydrocarbons	ND	50	ug/l	1	1C01007	01-Mar-01	03-Mar-01	EPA 8015M	
Surrogate: n-Pentacosane		*65.2 %*		*50-150*	"	"	"	"	
MW-4 (W102384-04) Water Sampled: 15-Feb-01 11:30 Received: 15-Feb-01 17:10									
Diesel Range Hydrocarbons	ND	50	ug/l	1	1C01007	01-Mar-01	03-Mar-01	EPA 8015M	
Surrogate: n-Pentacosane		*64.0 %*		*50-150*	"	"	"	"	

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
383 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

MTBE Confirmation by EPA Method 8260B

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-4 (W102384-04) Water Sampled: 15-Feb-01 11:30 Received: 15-Feb-01 17:10									
Methyl tert-butyl ether	**2.3**	2.0	ug/l	1	1C02013	01-Mar-01	01-Mar-01	EPA 8260B	
Surrogate: Dibromofluoromethane		*106 %*	*50-150*		"	"	"	"	
Surrogate: 1,2-Dichloroethane-d4		*92.0 %*	*50-150*		"	"	"	"	

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
383 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

Total Metals by EPA 200 Series Methods

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (W102384-01) Water	**Sampled: 15-Feb-01 08:40**	**Received: 15-Feb-01 17:10**							
Iron	3.2	0.050	mg/l	1	1B28014	28-Feb-01	14-Mar-01	EPA 200.7	
MW-2 (W102384-02) Water	**Sampled: 15-Feb-01 09:50**	**Received: 15-Feb-01 17:10**							
Iron	11	0.050	mg/l	1	1B28014	28-Feb-01	14-Mar-01	EPA 200.7	
MW-3 (W102384-03) Water	**Sampled: 15-Feb-01 10:40**	**Received: 15-Feb-01 17:10**							
Iron	10	0.050	mg/l	1	1B28014	28-Feb-01	20-Mar-01	EPA 200.7	
MW-4 (W102384-04) Water	**Sampled: 15-Feb-01 11:30**	**Received: 15-Feb-01 17:10**							
Iron	17	0.050	mg/l	1	1B28014	28-Feb-01	14-Mar-01	EPA 200.7	

Sequoia Analytical

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
383 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

Total Metals by EPA 6000/7000 Series Methods

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (W102384-01) Water	**Sampled: 15-Feb-01 08:40**	**Received: 15-Feb-01 17:10**							
Ferrous Iron	**0.20**	0.050	mg/l	1	1B28014	28-Feb-01	14-Mar-01	EPA 6010A	
MW-2 (W102384-02) Water	**Sampled: 15-Feb-01 09:50**	**Received: 15-Feb-01 17:10**							
Ferrous Iron	**0.18**	0.050	mg/l	1	1B28014	28-Feb-01	14-Mar-01	EPA 6010A	
MW-3 (W102384-03) Water	**Sampled: 15-Feb-01 10:40**	**Received: 15-Feb-01 17:10**							
Ferrous Iron	**0.062**	0.050	mg/l	1	1B28014	28-Feb-01	20-Mar-01	EPA 6010A	
MW-4 (W102384-04) Water	**Sampled: 15-Feb-01 11:30**	**Received: 15-Feb-01 17:10**							
Ferrous Iron	**0.055**	0.050	mg/l	1	1B28014	28-Feb-01	14-Mar-01	EPA 6010A	

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
383 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

Semivolatile Organic Compounds by EPA Method 8270C

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-2 (W102384-02) Water Sampled: 15-Feb-01 09:50 Received: 15-Feb-01 17:10									
Acenaphthene	ND	5.0	ug/l	1	1B20010	20-Feb-01	07-Mar-01	EPA 8270B	
Acenaphthylene	ND	5.0	"	"	"	"	"	"	
Anthracene	ND	5.0	"	"	"	"	"	"	
Benzo (a) anthracene	ND	5.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	5.0	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	5.0	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	5.0	"	"	"	"	"	"	
Benzo[a]pyrene	ND	5.0	"	"	"	"	"	"	
Chrysene	ND	5.0	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	5.0	"	"	"	"	"	"	
Fluoranthene	ND	5.0	"	"	"	"	"	"	
Fluorene	ND	5.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	5.0	"	"	"	"	"	"	
2-Methylnaphthalene	ND	5.0	"	"	"	"	"	"	
Naphthalene	ND	5.0	"	"	"	"	"	"	
Phenanthrene	ND	5.0	"	"	"	"	"	"	
Pyrene	ND	5.0	"	"	"	"	"	"	
Surrogate: 2-Fluorophenol		*32.2 %*	*21-110*		"	"	"	"	
Surrogate: Phenol-d6		*22.4 %*	*10-110*		"	"	"	"	
Surrogate: Nitrobenzene-d5		*57.2 %*	*35-114*		"	"	"	"	
Surrogate: 2-Fluorobiphenyl		*55.5 %*	*43-116*		"	"	"	"	
Surrogate: 2,4,6-Tribromophenol		*53.8 %*	*10-123*		"	"	"	"	
Surrogate: p-Terphenyl-d14		*57.0 %*	*33-141*		"	"	"	"	
MW-3 (W102384-03) Water Sampled: 15-Feb-01 10:40 Received: 15-Feb-01 17:10									
Acenaphthene	ND	5.0	ug/l	1	1B20010	20-Feb-01	07-Mar-01	EPA 8270B	
Acenaphthylene	ND	5.0	"	"	"	"	"	"	
Anthracene	ND	5.0	"	"	"	"	"	"	
Benzo (a) anthracene	ND	5.0	"	"	"	"	"	"	
Benzo (b) fluoranthene	ND	5.0	"	"	"	"	"	"	
Benzo (k) fluoranthene	ND	5.0	"	"	"	"	"	"	
Benzo (ghi) perylene	ND	5.0	"	"	"	"	"	"	
Benzo[a]pyrene	ND	5.0	"	"	"	"	"	"	
Chrysene	ND	5.0	"	"	"	"	"	"	
Dibenz (a,h) anthracene	ND	5.0	"	"	"	"	"	"	
Fluoranthene	ND	5.0	"	"	"	"	"	"	
Fluorene	ND	5.0	"	"	"	"	"	"	
Indeno (1,2,3-cd) pyrene	ND	5.0	"	"	"	"	"	"	

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
383 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

Semivolatile Organic Compounds by EPA Method 8270C

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-3 (W102384-03) Water Sampled: 15-Feb-01 10:40 Received: 15-Feb-01 17:10									
2-Methylnaphthalene	ND	5.0	ug/l	1	1B20010	20-Feb-01	07-Mar-01	EPA 8270B	
Naphthalene	ND	5.0	"	"	"	"	"	"	
Phenanthrene	ND	5.0	"	"	"	"	"	"	
Pyrene	ND	5.0	"	"	"	"	"	"	
Surrogate: 2-Fluorophenol		*32.3 %*	*21-110*		"	"	"	"	
Surrogate: Phenol-d6		*23.5 %*	*10-110*		"	"	"	"	
Surrogate: Nitrobenzene-d5		*54 9 %*	*35-114*		"	"	"	"	
Surrogate 2-Fluorobiphenyl		*53 5 %*	*43-116*		"	"	"	"	
Surrogate: 2,4,6-Tribromophenol		*56.3 %*	*10-123*		"	"	"	"	
Surrogate. p-Terphenyl-d14		*55 1 %*	*33-141*		"	"	"	"	

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
383 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

Conventional Chemistry Parameters by APHA/EPA Methods

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (W102384-01) Water	**Sampled: 15-Feb-01 08:40**	**Received: 15-Feb-01 17:10**							
Orthophosphate as PO4	**1.0**	0.50	mg/l	1	1B16008	15-Feb-01	15-Feb-01	EPA 300 0	
MW-2 (W102384-02) Water	**Sampled: 15-Feb-01 09:50**	**Received: 15-Feb-01 17:10**							
Orthophosphate as PO4	ND	0.50	mg/l	1	1B16008	15-Feb-01	15-Feb-01	EPA 300 0	
MW-3 (W102384-03) Water	**Sampled: 15-Feb-01 10:40**	**Received: 15-Feb-01 17:10**							
Orthophosphate as PO4	**0.79**	0.50	mg/l	1	1B16008	15-Feb-01	15-Feb-01	EPA 300 0	
MW-4 (W102384-04) Water	**Sampled: 15-Feb-01 11:30**	**Received: 15-Feb-01 17:10**							
Orthophosphate as PO4	**1.1**	0.50	mg/l	1	1B16008	15-Feb-01	15-Feb-01	EPA 300 0	

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Harding-Lawson Associates - Oakland 383 Fourth Street Oakland CA, 94607	Project: Taxiway U Project Number: # 49667-1 Project Manager. Steve Osborne	**Reported:** 20-Mar-01 12:48

Anions by EPA Method 300.0

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (W102384-01) Water	**Sampled: 15-Feb-01 08:40**	**Received: 15-Feb-01 17:10**							
Nitrate as NO3	**2.2**	0.10	mg/l	1	1B16008	15-Feb-01	15-Feb-01	EPA 300.0	
Sulfate as SO4	**89**	1.0	"	10	1B28007	28-Feb-01	28-Feb-01	"	
MW-2 (W102384-02) Water	**Sampled: 15-Feb-01 09:50**	**Received: 15-Feb-01 17:10**							
Nitrate as NO3	**2.7**	0.10	mg/l	1	1B16008	15-Feb-01	15-Feb-01	EPA 300 0	
Sulfate as SO4	**30**	1.0	"	10	1B28007	28-Feb-01	28-Feb-01	"	
MW-3 (W102384-03) Water	**Sampled: 15-Feb-01 10:40**	**Received: 15-Feb-01 17:10**							
Nitrate as NO3	**3.6**	0.10	mg/l	1	1B16008	15-Feb-01	15-Feb-01	EPA 300 0	
Sulfate as SO4	**36**	1.0	"	10	1B28007	28-Feb-01	28-Feb-01	"	
MW-4 (W102384-04) Water	**Sampled: 15-Feb-01 11:30**	**Received: 15-Feb-01 17:10**							
Nitrate as NO3	ND	0.10	mg/l	1	1B16008	15-Feb-01	15-Feb-01	EPA 300.0	
Sulfate as SO4	**29**	1.0	"	10	1B28007	28-Feb-01	28-Feb-01	"	

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Harding-Lawson Associates - Oakland
383 Fourth Street
Oakland CA, 94607

Project: Taxiway U
Project Number: # 49667-1
Project Manager: Steve Osborne

Reported:
20-Mar-01 12:48

Conventional Chemistry Parameters by APHA/EPA Methods

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (W102384-01) Water	**Sampled: 15-Feb-01 08:40**	**Received: 15-Feb-01 17:10**							
Total Organic Carbon	13.1	4.00	mg/l	4	1030046	01-Mar-01	01-Mar-01	EPA 415.1	
MW-2 (W102384-02) Water	**Sampled: 15-Feb-01 09:50**	**Received: 15-Feb-01 17:10**							
Total Organic Carbon	1.93	1.00	mg/l	1	1030046	01-Mar-01	01-Mar-01	EPA 415.1	
MW-3 (W102384-03) Water	**Sampled: 15-Feb-01 10:40**	**Received: 15-Feb-01 17:10**							
Total Organic Carbon	8.74	2.00	mg/l	2	1030046	01-Mar-01	01-Mar-01	EPA 415.1	
MW-4 (W102384-04) Water	**Sampled: 15-Feb-01 11:30**	**Received: 15-Feb-01 17:10**							
Total Organic Carbon	4.37	4.00	mg/l	4	1030046	01-Mar-01	01-Mar-01	EPA 415.1	

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
383 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

Total Purgeable Hydrocarbons (C6-C12), BTEX and MTBE by DHS LUFT - Quality Control

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1B26005 - EPA 5030B P/T										
Blank (1B26005-BLK1)				Prepared & Analyzed: 26-Feb-01						
Purgeable Hydrocarbons	ND	50	ug/l							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Methyl tert-butyl ether	ND	2.5	"							
Surrogate: a,a,a-Trifluorotoluene	*30.5*		"	*30.0*		*102*	*70-130*			
LCS (1B26005-BS1)				Prepared & Analyzed: 26-Feb-01						
Benzene	15.7	0.50	ug/l	20.0		78.5	70-130			
Toluene	16.5	0.50	"	20.0		82.5	70-130			
Ethylbenzene	16.9	0.50	"	20.0		84.5	70-130			
Xylenes (total)	51.0	0.50	"	60.0		85.0	70-130			
Surrogate: a,a,a-Trifluorotoluene	*29.3*		"	*30.0*		*97.7*	*70-130*			
Matrix Spike (1B26005-MS1)	**Source: W102405-13**			Prepared & Analyzed: 26-Feb-01						
Benzene	16.6	0.50	ug/l	20.0	ND	83.0	70-130			
Toluene	17.0	0.50	"	20.0	ND	85.0	70-130			
Ethylbenzene	17.9	0.50	"	20.0	ND	89.5	70-130			
Xylenes (total)	54.4	0.50	"	60.0	ND	90.7	70-130			
Surrogate: a,a,a-Trifluorotoluene	*29.7*		"	*30.0*		*99.0*	*70-130*			
Matrix Spike Dup (1B26005-MSD1)	**Source: W102405-13**			Prepared & Analyzed: 26-Feb-01						
Benzene	16.5	0.50	ug/l	20.0	ND	82.5	70-130	0.604	20	
Toluene	16.5	0.50	"	20.0	ND	82.5	70-130	2.99	20	
Ethylbenzene	17.2	0.50	"	20.0	ND	86.0	70-130	3.99	20	
Xylenes (total)	53.0	0.50	"	60.0	ND	88.3	70-130	2.61	20	
Surrogate: a,a,a-Trifluorotoluene	*30.0*		"	*30.0*		*100*	*70-130*			

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
583 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

Total Purgeable Hydrocarbons (C6-C12), BTEX and MTBE by DHS LUFT - Quality Control

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1B27001 - EPA 5030B P/T										
Blank (1B27001-BLK1)				Prepared & Analyzed: 27-Feb-01						
Purgeable Hydrocarbons	ND	50	ug/l							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Methyl tert-butyl ether	ND	2.5	"							
Surrogate: a,a,a-Trifluorotoluene	*29.6*		"	*30.0*		*98*	*70-130*			
LCS (1B27001-BS1)				Prepared & Analyzed: 27-Feb-01						
Benzene	18.1	0.50	ug/l	20.0		90.5	70-130			
Toluene	18.7	0.50	"	20.0		93.5	70-130			
Ethylbenzene	19.7	0.50	"	20.0		98.5	70-130			
Xylenes (total)	58.7	0.50	"	60.0		97.8	70-130			
Surrogate: a,a,a-Trifluorotoluene	*29.5*		"	*30.0*		*98.3*	*70-130*			
Matrix Spike (1B27001-MS1)		**Source: W102384-01**		Prepared & Analyzed: 27-Feb-01						
Benzene	18.2	0.50	ug/l	20.0	ND	91.0	70-130			
Toluene	19.1	0.50	"	20.0	ND	95.5	70-130			
Ethylbenzene	19.6	0.50	"	20.0	ND	98.0	70-130			
Xylenes (total)	59.9	0.50	"	60.0	ND	99.8	70-130			
Surrogate: a,a,a-Trifluorotoluene	*28.4*		"	*30.0*		*94*	*70-130*			
Matrix Spike Dup (1B27001-MSD1)		**Source: W102384-01**		Prepared & Analyzed: 27-Feb-01						
Benzene	20.3	0.50	ug/l	20.0	ND	101	70-130	10.9	20	
Toluene	20.8	0.50	"	20.0	ND	104	70-130	8.52	20	
Ethylbenzene	21.3	0.50	"	20.0	ND	106	70-130	8.31	20	
Xylenes (total)	64.6	0.50	"	60.0	ND	108	70-130	7.55	20	
Surrogate: a,a,a-Trifluorotoluene	*30.2*		"	*30.0*		*101*	*70-130*			

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
383 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

Total Purgeable Hydrocarbons (C6-C12), BTEX and MTBE by DHS LUFT - Quality Control
Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1B28001 - EPA 5030B P/T										
Blank (1B28001-BLK1)				Prepared & Analyzed: 28-Feb-01						
Purgeable Hydrocarbons	ND	50	ug/l							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Methyl tert-butyl ether	ND	2.5	"							
Surrogate: a,a,a-Trifluorotoluene	*30.1*		"	*30.0*		*100*	*70-130*			
LCS (1B28001-BS1)				Prepared & Analyzed: 28-Feb-01						
Benzene	19.4	0.50	ug/l	20.0		97.0	70-130			
Toluene	20.1	0.50	"	20.0		101	70-130			
Ethylbenzene	21.0	0.50	"	20.0		105	70-130			
Xylenes (total)	62.5	0.50	"	60.0		104	70-130			
Surrogate: a,a,a-Trifluorotoluene	*28.7*		"	*30.0*		*95.7*	*70-130*			
Matrix Spike (1B28001-MS1)	**Source: W102384-03**			Prepared & Analyzed: 28-Feb-01						
Benzene	18.2	0.50	ug/l	20.0	ND	91.0	70-130			
Toluene	19.3	0.50	"	20.0	ND	96.5	70-130			
Ethylbenzene	20.4	0.50	"	20.0	ND	102	70-130			
Xylenes (total)	62.6	0.50	"	60.0	ND	104	70-130			
Surrogate: a,a,a-Trifluorotoluene	*29.7*		"	*30.0*		*99.0*	*70-130*			
Matrix Spike Dup (1B28001-MSD1)	**Source: W102384-03**			Prepared & Analyzed: 28-Feb-01						
Benzene	17.7	0.50	ug/l	20.0	ND	88.5	70-130	2.79	20	
Toluene	18.8	0.50	"	20.0	ND	94.0	70-130	2.62	20	
Ethylbenzene	19.8	0.50	"	20.0	ND	99.0	70-130	2.99	20	
Xylenes (total)	60.3	0.50	"	60.0	ND	100	70-130	3.74	20	
Surrogate: a,a,a-Trifluorotoluene	*30.9*		"	*30.0*		*103*	*70-130*			

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
383 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

Diesel Hydrocarbons (C9-C24) with Silica Gel Cleanup by DHS LUFT - Quality Control

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1C01007 - EPA 3510B										
Blank (1C01007-BLK1)				Prepared: 01-Mar-01 Analyzed: 03-Mar-01						
Diesel Range Hydrocarbons	175	50	ug/l							
Surrogate: n-Pentacosane	*22.3*		*"*	*33.3*		*67.0*	*50-150*			
LCS (1C01007-BS1)				Prepared: 01-Mar-01 Analyzed: 03-Mar-01						
Diesel Range Hydrocarbons	367	50	ug/l	500		73.4	50-125			
Surrogate: n-Pentacosane	*16.0*		*"*	*33.3*		*48.0*	*50-150*			*S-LIM*
LCS Dup (1C01007-BSD1)				Prepared: 01-Mar-01 Analyzed: 03-Mar-01						
Diesel Range Hydrocarbons	405	50	ug/l	500		81.0	50-125	9.84	50	
Surrogate: n-Pentacosane	*16.0*		*"*	*33.3*		*48.0*	*50-150*			*S-LIM*

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
383 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

MTBE Confirmation by EPA Method 8260B - Quality Control
Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1C02013 - EPA 5030B (P/T)										
Blank (1C02013-BLK1)				Prepared & Analyzed: 02-Mar-01						
Methyl tert-butyl ether	ND	2.0	ug/l							
Surrogate: Dibromofluoromethane	*52.9*		"	*50.0*		*106*	*50-150*			
Surrogate: 1,2-Dichloroethane-d4	*48.6*		"	*50.0*		*97.2*	*50-150*			
Blank (1C02013-BLK2)				Prepared & Analyzed: 05-Mar-01						
Methyl tert-butyl ether	ND	2.0	ug/l							
Surrogate: Dibromofluoromethane	*50.1*		"	*50.0*		*100*	*50-150*			
Surrogate: 1,2-Dichloroethane-d4	*44.8*		"	*50.0*		*89.6*	*50-150*			
LCS (1C02013-BS1)				Prepared & Analyzed: 02-Mar-01						
Methyl tert-butyl ether	48.3	2.0	ug/l	50.0		96.6	70-130			
Surrogate: Dibromofluoromethane	*50.8*		"	*50.0*		*102*	*50-150*			
Surrogate: 1,2-Dichloroethane-d4	*48.9*		"	*50.0*		*97.8*	*50-150*			
LCS (1C02013-BS2)				Prepared & Analyzed: 05-Mar-01						
Methyl tert-butyl ether	46.8	2.0	ug/l	50.0		93.6	70-130			
Surrogate: Dibromofluoromethane	*50.7*		"	*50.0*		*101*	*50-150*			
Surrogate: 1,2-Dichloroethane-d4	*45.7*		"	*50.0*		*91.4*	*50-150*			
Matrix Spike (1C02013-MS1)	**Source: W102552-02**			Prepared & Analyzed: 02-Mar-01						
Methyl tert-butyl ether	60.8	2.0	ug/l	50.0	ND	122	60-150			
Surrogate: Dibromofluoromethane	*54.8*		"	*50.0*		*110*	*50-150*			
Surrogate: 1,2-Dichloroethane-d4	*50.2*		"	*50.0*		*100*	*50-150*			
Matrix Spike Dup (1C02013-MSD1)	**Source: W102552-02**			Prepared & Analyzed: 02-Mar-01						
Methyl tert-butyl ether	59.7	2.0	ug/l	50.0	ND	119	60-150	1.83	25	
Surrogate: Dibromofluoromethane	*52.9*		"	*50.0*		*106*	*50-150*			
Surrogate: 1,2-Dichloroethane-d4	*49.6*		"	*50.0*		*99.2*	*50-150*			

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Harding-Lawson Associates - Oakland 383 Fourth Street Oakland CA, 94607	Project: Taxiway U Project Number: # 49667-1 Project Manager: Steve Osborne	**Reported:** 20-Mar-01 12:48

Total Metals by EPA 200 Series Methods - Quality Control

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1B28014 - 200.7										
Blank (1B28014-BLK1)				Prepared: 28-Feb-01 Analyzed: 14-Mar-01						
Iron	ND	0.050	mg/l							
LCS (1B28014-BS1)				Prepared: 28-Feb-01 Analyzed: 14-Mar-01						
Iron	0.937	0.050	mg/l	1.00		93.7	80-120			
LCS Dup (1B28014-BSD1)				Prepared: 28-Feb-01 Analyzed: 14-Mar-01						
Iron	0.922	0.050	mg/l	1.00		92.2	80-120	1.61	20	
Matrix Spike (1B28014-MS1)		Source: W102376-01		Prepared: 28-Feb-01 Analyzed: 14-Mar-01						
Iron	0.926	0.050	mg/l	1.00	0.069	85.7	80-120			
Matrix Spike Dup (1B28014-MSD1)		Source: W102376-01		Prepared: 28-Feb-01 Analyzed: 14-Mar-01						
Iron	1.03	0.050	mg/l	1.00	0.069	96.1	80-120	10.6	20	

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
383 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1B20010 - EPA 3510B Sep Funnel										
Blank (1B20010-BLK1)				Prepared: 20-Feb-01 Analyzed: 23-Feb-01						
Acenaphthene	ND	5.0	ug/l							
Acenaphthylene	ND	5.0	"							
Anthracene	ND	5.0	"							
Benzo (a) anthracene	ND	5.0	"							
Benzo (b) fluoranthene	ND	5.0	"							
Benzo (k) fluoranthene	ND	5.0	"							
Benzo (ghi) perylene	ND	5.0	"							
Benzo[a]pyrene	ND	5.0	"							
Chrysene	ND	5.0	"							
Dibenz (a,h) anthracene	ND	5.0	"							
Fluoranthene	ND	5.0	"							
Fluorene	ND	5.0	"							
Indeno (1,2,3-cd) pyrene	ND	5.0	"							
2-Methylnaphthalene	ND	5.0	"							
Naphthalene	ND	5.0	"							
Phenanthrene	ND	5.0	"							
Pyrene	ND	5.0	"							
Surrogate 2-Fluorophenol	*69.2*		"	*150*		*46.1*	*21-110*			
Surrogate Phenol-d6	*39.8*		"	*150*		*26.5*	*10-110*			
Surrogate: Nitrobenzene-d5	*96.9*		"	*100*		*96.9*	*35-114*			
Surrogate 2-Fluorobiphenyl	*88.3*		"	*100*		*88.3*	*43-116*			
Surrogate. 2,4,6-Tribromophenol	*142*		"	*150*		*94 ?*	*10-123*			
Surrogate p-Terphenyl-d14	*84.4*		"	*100*		*84.4*	*33-141*			
Blank (1B20010-BLK2)				Prepared: 21-Feb-01 Analyzed: 23-Feb-01						
Acenaphthene	ND	5.0	ug/l							
Acenaphthylene	ND	5.0	"							
Anthracene	ND	5.0	"							
Benzo (a) anthracene	ND	5.0	"							
Benzo (b) fluoranthene	ND	5.0	"							
Benzo (k) fluoranthene	ND	5.0	"							
Benzo (ghi) perylene	ND	5.0	"							
Benzo[a]pyrene	ND	5.0	"							
Chrysene	ND	5.0	"							
Dibenz (a,h) anthracene	ND	5.0	"							

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
583 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1B20010 - EPA 3510B Sep Funnel										
Blank (1B20010-BLK2)				Prepared: 21-Feb-01 Analyzed: 23-Feb-01						
Benzoranthene	ND	5.0	ug/l							
Fluorene	ND	5.0	"							
Indeno (1,2,3-cd) pyrene	ND	5.0	"							
2-Methylnaphthalene	ND	5.0	"							
Naphthalene	ND	5.0	"							
Phenanthrene	ND	5.0	"							
Pyrene	ND	5.0	"							
Surrogate: 2-Fluorophenol	*80.8*		"	*150*		*53.9*	*21-110*			
Surrogate: Phenol-d6	*49.0*		"	*150*		*32.7*	*10-110*			
Surrogate: Nitrobenzene-d5	*97.8*		"	*100*		*97.8*	*35-114*			
Surrogate: 2-Fluorobiphenyl	*91.2*		"	*100*		*91.2*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*137*		"	*150*		*91.3*	*10-123*			
Surrogate: p-Terphenyl-d14	*90.1*		"	*100*		*90.1*	*33-141*			
LCS (1B20010-BS1)				Prepared: 20-Feb-01 Analyzed: 23-Feb-01						
Acenaphthene	86.9	5.0	ug/l	100		86.9	46-118			
Pyrene	91.5	5.0	"	100		91.5	26-127			
Surrogate: 2-Fluorophenol	*86.9*		"	*150*		*57.9*	*21-110*			
Surrogate: Phenol-d6	*52.4*		"	*150*		*34.9*	*10-110*			
Surrogate: Nitrobenzene-d5	*107*		"	*100*		*107*	*35-114*			
Surrogate: 2-Fluorobiphenyl	*91.8*		"	*100*		*91.8*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*157*		"	*150*		*105*	*10-123*			
Surrogate: p-Terphenyl-d14	*93.4*		"	*100*		*93.4*	*33-141*			
LCS (1B20010-BS2)				Prepared: 21-Feb-01 Analyzed: 23-Feb-01						
Acenaphthene	89.9	5.0	ug/l	100		89.9	46-118			
Pyrene	88.2	5.0	"	100		88.2	26-127			
Surrogate: 2-Fluorophenol	*89.6*		"	*150*		*59.7*	*21-110*			
Surrogate: Phenol-d6	*56.3*		"	*150*		*37.5*	*10-110*			
Surrogate: Nitrobenzene-d5	*107*		"	*100*		*107*	*35-114*			
Surrogate: 2-Fluorobiphenyl	*97.2*		"	*100*		*97.2*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*153*		"	*150*		*102*	*10-123*			
Surrogate: p-Terphenyl-d14	*89.8*		"	*100*		*89.8*	*33-141*			

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
383 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

Semivolatile Organic Compounds by EPA Method 8270C - Quality Control

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1B20010 - EPA 3510B Sep Funnel										
LCS Dup (1B20010-BSD1)			Prepared: 20-Feb-01 Analyzed: 23-Feb-01							
Acenaphthene	84.5	5.0	ug/l	100		84.5	46-118	2.80	30	
Pyrene	91.5	5.0	"	100		91.5	26-127	0	30	
Surrogate: 2-Fluorophenol	*86.6*		"	*150*		*57.7*	*21-110*			
Surrogate: Phenol-d6	*53.4*		"	*150*		*35.6*	*10-110*			
Surrogate: Nitrobenzene-d5	*97.9*		"	*100*		*97.9*	*35-114*			
Surrogate: 2-Fluorobiphenyl	*84.7*		"	*100*		*84.7*	*43-116*			
Surrogate: 2,4,6-Tribromophenol	*148*		"	*150*		*98.7*	*10-123*			
Surrogate: p-Terphenyl-d14	*90.1*		"	*100*		*90.1*	*33-141*			

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
583 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1B16008 - General Preparation										
Blank (1B16008-BLK1)				Prepared & Analyzed: 15-Feb-01						
Orthophosphate as PO4	ND	0.50	mg/l							
LCS (1B16008-BS1)				Prepared & Analyzed: 15-Feb-01						
Orthophosphate as PO4	19.0	0.50	mg/l	20.0		95.0	80-120			
Matrix Spike (1B16008-MS1)		Source: W102376-01		Prepared & Analyzed: 15-Feb-01						
Orthophosphate as PO4	18.6	1.0	mg/l	20.0	ND	93 0	75-125			
Matrix Spike Dup (1B16008-MSD1)		Source: W102376-01		Prepared & Analyzed: 15-Feb-01						
Orthophosphate as PO4	18 9	1 0	mg/l	20.0	ND	94 5	75-125	1.60	20	

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
383 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

Anions by EPA Method 300.0 - Quality Control
Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1B16008 - General Preparation										
Blank (1B16008-BLK1)				Prepared & Analyzed: 15-Feb-01						
Nitrate as NO3	ND	0.10	mg/l							
LCS (1B16008-BS1)				Prepared & Analyzed: 15-Feb-01						
Nitrate as NO3	10.2	0.10	mg/l	10.0		102	80-120			
Matrix Spike (1B16008-MS1)		Source: W102376-01		Prepared & Analyzed: 15-Feb-01						
Nitrate as NO3	10.5	0.20	mg/l	10.0	ND	103	75-125			
Matrix Spike Dup (1B16008-MSD1)		Source: W102376-01		Prepared & Analyzed: 15-Feb-01						
Nitrate as NO3	10.5	0.20	mg/l	10.0	ND	103	75-125	0	20	
Batch 1B28007 - General Preparation										
Blank (1B28007-BLK2)				Prepared & Analyzed: 28-Feb-01						
Sulfate as SO4	ND	0.10	mg/l							
LCS (1B28007-BS2)				Prepared & Analyzed: 28-Feb-01						
Sulfate as SO4	9.69	0.10	mg/l	10.0		96.9	80-120			
Matrix Spike (1B28007-MS2)		Source: W102632-01		Prepared & Analyzed: 28-Feb-01						
Sulfate as SO4	114	2.0	mg/l	100	17	97.0	75-125			
Matrix Spike Dup (1B28007-MSD2)		Source: W102632-01		Prepared & Analyzed: 28-Feb-01						
Sulfate as SO4	112	2.0	mg/l	100	17	95.0	75-125	1.77	20	

Sequoia Analytical

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Harding-Lawson Associates - Oakland	Project: Taxiway U	
383 Fourth Street	Project Number: # 49667-1	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	20-Mar-01 12:48

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Sequoia Analytical - Petaluma

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1030046 - General Preparation										
Blank (1030046-BLK1)				Prepared & Analyzed: 01-Mar-01						
Total Organic Carbon	ND	1.00	mg/l							
LCS (1030046-BS1)				Prepared & Analyzed: 01-Mar-01						
Total Organic Carbon	40.0	2.00	mg/l	40.0		100	80-120			
Matrix Spike (1030046-MS1)		Source: P102533-01		Prepared & Analyzed: 01-Mar-01						
Total Organic Carbon	37.9	4.00	mg/l	40.0	ND	94.8	75-125			
Matrix Spike Dup (1030046-MSD1)		Source: P102533-01		Prepared & Analyzed: 01-Mar-01						
Total Organic Carbon	38.8	4.00	mg/l	40.0	ND	97.0	75-125	2.35	20	

Sequoia Analytical

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Harding-Lawson Associates - Oakland 383 Fourth Street Oakland CA, 94607	Project: Taxiway U Project Number: # 49667-1 Project Manager: Steve Osborne	**Reported:** 20-Mar-01 12:48

Notes and Definitions

CC-3	Continuing Calibration indicates that the quantitative result for this analyte includes a greater than 15% degree of uncertainty The value as reported is within method acceptance.
S-LIM	Surrogate recovery was outside QC limits.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

WD 501 No.

CHAIN OF CUSTODY FORM

Harding Lawson Associates
383 Fourth Street, Third Floor
Oakland, California 94607
(510) 451-1001 - Phone
(510) 451-3165 - Fax

Lab: SEQUOIA

Samplers: VALERIE HARRIS

Job Number: 49667.1

Name/Location: TAXIWAY U - PORT OF OAK.

Project Manager: STEVE OSBORNE

Recorder: (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	# CONTAINERS & PRESERV.: Unpres	H2SO4	HNO3	HCL	Ice	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Day	Time	STATION DESCRIPTION/ NOTES
	X				4		1	8		M	W	- 1	01	02	15	840	01A-M
	X				5		1	8		M	W	- 2	01	02	15	950	02A-N
	X				5		1	8		M	W	- 3	01	02	15	1040	03A-N
	X				4		1	8		M	W	- 4	01	02	15	1130	04A-M

ANALYSIS REQUESTED

EPA 8010	EPA 8020 CONFIRM	EPA 8260 TIMBE ONLY	EPA 8270	METALS	EPA 8015M/TPHG	EPA 8020/BTEX + MTBE	EPA 8015M/TPHd	PAH ONLY 8270	TOTAL IRON	NITRATE	SULFATE	ORTHOPHOSPHATE	FERROUS IRON	TOC (415.1)
	X				X	X	X		X	X	X	X	X	X
	X				X	X	X		X	X	X	X	X	X
	X				X	X	X		X	X	X	X	X	X
	X				X	X			X	X	X	X	X	X

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE

MISCELLANEOUS

STANDARD TURN AROUND

*Silica gel cleanup on TPH diesel

Email results to tgellasson@mactec.com

CHAIN OF CUSTODY RECORD

	RECEIVED BY (Signature)	DATE/TIME
RELINQUISHED BY (Signature)	Mark Collins	2/15/01 1486
RELINQUISHED BY (Signature)	Mike Gorin	2/15/01 1710
RELINQUISHED BY (Signature)	RECEIVED BY (Signature)	DATE/TIME
DISPATCHED BY (Signature) DATE/TIME	RECEIVED FOR LAB BY (Signature)	DATE/TIME

METHOD OF SHIPMENT: COURIER

SAMPLE CONDITION WHEN RECEIVED BY THE LABORATORY

Lab's Copy (White) — Project Office Copy — Field or Office Copy