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PORT OF OAKLAND

ENVIRONMENTAL PROTECTION

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July 11, 2000

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

1049

SUBJECT: QUARTERLY GROUNDWATER MONITORING REPORT - FORMER TANK NUMBERS MF-25 AND MF-26, METROPOLITAN OAKLAND INTERNATIONAL AIRPORT, UNITED AIRLINES HANGAR AREA - ECONOMY PARKING LOT SITE, 1100 AIRPORT DRIVE, OAKLAND, CALIFORNIA

Dear Mr. Chan:

Enclosed is a copy of the July 11, 2000 "*Quarterly Groundwater Monitoring Report, January 1, through March 31, 2000, United Airlines Hangar - Economy Parking Lot Site, Metropolitan Oakland International Airport (MOIA)*", 1100 Airport Drive, Oakland, California. Monitoring activities were performed by Harding Lawson Associates, (HLA), one of the as-needed consultants retained by the Port of Oakland (Port).

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 Klettke

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

enclosure

c: Jeff Jones - EH & SC Files
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HLA

R0949

July 11, 2000

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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, 2000
United Airlines Hangar Area – Economy Parking Lot Site
Oakland International Airport
Oakland, California

Dear Mr. Klettke:

Harding Lawson Associates (HLA) presents this groundwater monitoring report summarizing groundwater conditions observed during the first quarter of 2000 in eight monitoring wells at the United Airlines Hangar Area - Economy Parking Lot Site, Oakland International Airport, Oakland, California (Plate 1). This report is the sixth of eight quarterly groundwater monitoring events that HLA will perform for the Port of Oakland in accordance with HLA's *Work Plan for Installation of Oxygen Releasing Compound (ORC)*, dated December 18, 1999.

may or may not be extended for monitoring.

BACKGROUND

In March 1992, the Port of Oakland removed two underground storage tanks (USTs) from the Economy Parking Lot Site, MF-25 and MF-26. The Port's contractor removed approximately 700 cubic yards of impacted soil and collected confirmation soil samples following soil removal. The former UST excavation (approximately 80-feet by 80-feet) was reportedly backfilled with permeable material. The area is now paved and used for parking (Plate 2). The Port's contractor installed Monitoring well MW-1 in 1992 where elevated concentrations of total petroleum hydrocarbons as diesel (TPHd) and total petroleum hydrocarbons as motor oil (TPHmo) were reported and two additional monitoring wells, MW-2 and MW-3, in 1995. Free product was observed in MW-2 and MW-3 in 1996 and 1997. The Port's contractor then installed MW-4 though MW-8 in 1998 and observed a sheen on groundwater from MW-2 and MW-4.

780/60(7.48)+780 = 63.5%
1228

HLA installed the first batch treatment of ORC on December 23, 1998 along the upgradient edge of the former UST excavation at 11 locations. We installed a total of 780 pounds of time-release ORC after checking that no free product was present in the monitoring wells. HLA's subcontractor used a direct-push rig to inject at total of 780 pounds of time-release ORC mixed into 60 gallons of water through 2-inch diameter rods to a depth of 4 to 8 feet below ground surface.

SECOND ORC APPLICATION

HLA installed a second batch treatment of ORC on January 7, 2000. We mobilized a direct-push rig to inject ORC-grout under pressure at the former UST excavation at 9 locations. Initially, HLA planned to inject 250 pounds of ORC at four locations: one in the vicinity of MW-3; one adjacent to MW-4; and the remaining two focused in the vicinity of MW-2. Due to the low permeability of the formation around MW-2, HLA was only able to inject between 10 to 18 pounds of ORC in five of the locations.

2244 #

1000/3244 = 30.8%

At all locations, a 2-inch diameter rod was pushed to a depth of 4 feet below ground surface. A total of approximately 1,000 pounds of time-release ORC was mixed into 300 gallons of water providing a 30 percent blend with a consistency similar to white wash. Each push-point was completed with neat grout upon completion.

GROUNDWATER SAMPLING AND ANALYSIS

HLA measured dissolved oxygen (DO) concentrations in the eight monitoring wells on a monthly basis between January 1 through March 31, 2000. On March 23, HLA measured groundwater elevations and collected groundwater samples for chemical analyses. Prior to purging or sampling the monitoring wells, HLA measured DO concentrations, reduction oxidation potential (Redox), water levels, and checked for free product with an interface probe. HLA monitored the pH, conductivity, and temperature of the groundwater during purging. We sampled the monitoring wells after purging at least three well volumes of groundwater and after parameters had stabilized to within 10 percent; the groundwater sampling forms with the field data are included in Appendix A. HLA collected water samples using a disposable Teflon bailer and decontaminated all sampling equipment by washing with a non-phosphate cleaning solution and rinsing with distilled water. HLA contained purged water in a 55-gallon drum for subsequent disposal by the Port of Oakland.

HLA placed the water samples in ice-chilled coolers and submitted them to Sequoia Analytical of Walnut Creek, California under chain-of-custody protocol. The samples were analyzed for the following analytes:

- Total petroleum hydrocarbons as gasoline (TPHg) by EPA Test Method 8015 (modified)
- Benzene, toluene, ethylbenzene, total xylenes (BTEX) and methyl t-butyl ether (MTBE) by EPA Test Method 8020

- TPHd, total petroleum hydrocarbons as jet fuel A (TPHjA), TPHmo by EPA Method 8015 with a silica gel cleanup procedure
- Purgeable halocarbons by EPA Method 8010
- Ferrous iron, ferric iron, nitrate, sulfate, orthophosphate
- Total organic carbon (TOC) by EPA Method 415.2
- Halogenated/Aromatic Volatile Organics by EPA Method 8010/8020.

Due to an oversight in preparing the chain-of-custody, none of the samples were analyzed for TPHg and MW-3 was not sampled for TPHd, TPHmo or TPHjA. HLA resampled and analyzed the wells on April 25 for those analyses using the same sampling protocol. HLA performed these supplementary activities at no cost to the Port. The results of the April sampling event are included in this report. HLA contained the purge water in a 55-gallon drum for subsequent disposal by the Port of Oakland.

MONITORING RESULTS

No free product was observed in any of the eight monitoring wells and recent data indicate that ORC is reducing dissolved hydrocarbon concentrations. Groundwater elevations are presented in Table 1 and the elevations from March 23, 2000 are shown on Plate 3. The apparent groundwater gradient is towards the southwest. Chemical concentration results are shown in Tables 2, 3, and 4. DO concentrations are summarized in Table 5. The laboratory report and chain-of-custody forms are presented in Appendix B.

Petroleum hydrocarbons continue to be the found on site. The analytical results for the petroleum hydrocarbons can be found in Table 2. TPHg was reported in five of the monitoring wells, MW-1, MW-2, MW-3, MW-4 and MW-8 at concentrations ranging from 8,000 micrograms per liter (µg/L) in MW-3 to 60 µg/L in MW-1. TPHd was reported in six of the wells, MW-1, MW-3, MW-4, MW-5, MW-6 and MW-8 at concentrations ranging from 120 µg/L in MW-6 to 6,200 µg/L in MW-3. TPHjA was reported in MW-2 at a concentration of 36,000 µg/L and in MW-3 at a concentration of 7,100 µg/L. TPHmo was reported in all wells except MW-7 at concentrations ranging from 26,000 µg/L in MW-2 to 280 µg/L in MW-6.

Volatile organic compounds (VOCs) are also present in all wells except downgradient wells MW-5 and MW-6 (Table 3). The largest VOC concentrations were present at the upgradient well MW-8 and adjacent to the former UST excavation at MW-2. Several VOCs exceed the Maximum Contaminant Levels (MCLs).

The remaining chemical results for this quarterly report are found in Table 4. The concentration of TOC decreased significantly in all wells with decreases ranging from 46 percent in MW-4 to 89 percent in MW-8 from the previous quarter's sample results from November 11, 1999. For the same period, the concentrations of ferrous iron increased in all wells with increases ranging from 59 percent in MW-1 to ninety percent and above in the remaining wells. The sulfate concentrations decreased in all wells except MW-8 and MW-4, while the nitrate and orthophosphates remained relatively consistent with the previous quarter results.

QUALITY ASSURANCE AND QUALITY CONTROL

HLA collected quality assurance/quality control (QA/QC) samples to evaluate sample collection methods, sample handling procedures, and laboratory analysis. The field QA/QC samples consisted of a duplicate sample at MW-4.

The duplicate sample was submitted to the laboratory for same analyses as the original sample. HLA evaluated the analytical laboratory precision by calculating the relative percent difference (RPD) between original and duplicate samples collected at MW-4. The equation used to calculate the RPD is:

$$RPD = \frac{(X_1 - X_2)}{\bar{X}} \times 100$$

Where:

X_1 = concentration for sample 1 (original)

X_2 = concentration for sample 2 (duplicate)

$\bar{X}$ = mean of samples 1 and 2.

The relative percent difference between the analytical results from MW-4 and the duplicate sample ranged from zero to 62 percent, and HLA considers the range of RPD to be acceptable.

CLOSURE

If you have any questions or need additional information, please contact either of the undersigned at (510) 451-1001.

Very truly yours,

HARDING LAWSON ASSOCIATES

Heather Lee
Staff Engineer

Stephen J. Osborne
Geotechnical Engineer

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

SJO/HL/leh/43145.4/037739L

Attachments:
Table 1 - Groundwater Elevations
Table 2 - Groundwater Analytical Results – Petroleum Hydrocarbons
Table 3 - Groundwater Analytical Results – VOCs
Table 4 - Groundwater Analytical Results – Inorganics
Table 5 - Dissolved Oxygen Concentrations
Plate 1 - Vicinity Map
Plate 2 - Site Map
Plate 3 – Groundwater Elevation Map
Appendix A- Groundwater Sampling Forms
Appendix B - Laboratory Reports

Table 1. Groundwater Elevations
United Airlines Hanger - Economy Parking Lot
Metropolitan Oakland International Airport

Well Name	Top of Casing Elevation (feet)	Date	Depth to Water (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Note
MW-1	6.91	15-May-92	3.10	3.81	--	1
		7-Aug-92	3.20	3.71	--	1
		24-Nov-92	4.04	2.87	--	1
		12-Feb-93	--	--	--	1
		11-Mar-93	2.09	4.82	--	1
		17-May-93	3.14	3.77	--	1
		3-Aug-93	3.15	3.76	--	1
		25-Nov-93	3.59	3.32	--	1
		24-Mar-94	3.21	3.70	--	1
		9-May-94	2.99	3.92	--	1
		29-Aug-94	3.34	3.57	--	1
		27-Sep-94	3.51	3.40	--	1
		25-Apr-95	2.38	4.53	--	1
		11-Aug-95	3.08	3.83	--	1
		3-Nov-95	3.52	3.39	--	1
		19-Jun-96	2.93	3.98	--	1
		24-Oct-96	3.52	3.39	--	1
		22-Jan-97	2.61	4.30	--	1
		25-Apr-97	2.77	4.14	--	1
		6-Aug-97	3.27	3.64	--	1
		23-Dec-97	3.14	3.77	--	1
		26-Mar-98	2.09	4.82	--	1
		13-May-98	--	--	--	2
		16-Dec-98	2.95	3.96	--	
		26-Feb-99	5.83	1.08	--	
		20-May-99	2.62	4.29	--	
		17-Aug-99	3.30	3.61	--	
		11-Nov-99	4.44	2.47	--	
		23-Mar-00	2.57	4.34	--	
		25-Apr-00	2.67	4.24	--	
MW-2	6.63	25-Apr-95	2.20	4.43	--	1
		11-Aug-95	3.11	3.52	--	1
		3-Nov-95	3.28	3.35	--	1
		19-Jun-96	2.53	4.14	0.05	1,3
		24-Oct-96	3.44	3.31	0.16	1,3
		22-Jan-97	2.45	4.20	0.02	1,3
		25-Apr-97	2.60	4.05	0.03	1,3
		30-Jul-97	--	--	0.14	1,4
		6-Aug-97	2.96	3.67	--	1
		23-Dec-97	2.85	3.97	0.25	1,3
		26-Mar-98	1.72	4.92	0.005	1,3
	6.58	13-May-98	1.80	4.78	--	2,5
		16-Dec-98	2.60	3.98	--	

Table 1. Groundwater Elevations
United Airlines Hanger - Economy Parking Lot
Metropolitan Oakland International Airport

Well Name	Top of Casing Elevation (feet)	Date	Depth to Water (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Note
MW-2		26-Feb-99	2.06	4.52	--	
		20-May-99	2.40	4.18	--	
		17-Aug-99	2.92	3.66	--	
		11-Nov-99	3.05	3.53	--	
		23-Mar-00	2.27	4.31	--	
		25-Apr-00	2.34	4.24	--	
MW-3	7.36	25-Apr-95	2.20	5.16	--	1
		11-Aug-95	3.11	4.25	--	1
		3-Nov-95	3.28	4.08	--	1
		19-Jun-96	2.53	4.14	0.05	1,3
		24-Oct-96	3.44	3.31	0.16	1,3
		22-Jan-97	2.45	4.20	0.02	1,3
		25-Apr-97	3.13	4.24	0.01	1,3
		30-Jul-97	NM	NM	0.03	1,4
		6-Aug-97	3.76	3.60	--	1
		23-Dec-97	3.48	3.88	--	1
		26-Mar-98	2.36	5.00	0.005	1,3
		13-May-98	--	--	--	2
		16-Dec-98	3.40	3.96	--	
		26-Feb-99	2.49	4.87	--	
		20-May-99	2.96	4.40	--	
		17-Aug-99	3.64	3.72	--	
		11-Nov-99	3.88	3.48	--	
		23-Mar-00	2.55	4.81	--	
		25-Apr-00	2.90	4.46	--	
MW-4	6.92	13-May-98	2.01	4.91	--	2
		16-Dec-98	2.84	4.08	--	
		26-Feb-99	1.94	4.98	--	
		20-May-99	2.47	4.45	--	
		17-Aug-99	3.10	3.82	--	
		11-Nov-99	3.38	3.54	--	
		23-Mar-00	2.06	4.86	--	
		25-Apr-00	2.44	4.48	--	
MW-5	5.79	13-May-98	1.05	4.74	--	2
		16-Dec-98	1.95	3.84	--	
		26-Feb-99	1.50	4.29	--	
		20-May-99	2.05	3.74	--	
		17-Aug-99	2.30	3.49	--	
		11-Nov-99	2.34	3.45	--	
		23-Mar-00	1.60	4.19	--	6
		25-Apr-00	1.87	3.92	--	6
MW-6	6.39	13-May-98	1.91	4.48	--	2
		16-Dec-98	2.64	3.75	--	

Table 1. Groundwater Elevations
United Airlines Hanger - Economy Parking Lot
Metropolitan Oakland International Airport

Well Name	Top of Casing Elevation (feet)	Date	Depth to Water (feet)	Groundwater Elevation (feet)	Product Thickness (feet)	Note
MW-6		26-Feb-99	1.89	4.50	--	
		20-May-99	2.65	3.74	--	
		17-Aug-99	3.03	3.36	--	
		11-Nov-99	3.07	3.32	--	
		23-Mar-00	2.34	4.05	--	
		25-Apr-00	2.50	3.89	--	
MW-7	5.86	13-May-98	1.51	4.35	--	2
		16-Dec-98	2.13	3.73	--	
		26-Feb-99	1.58	4.28	--	
		20-May-99	2.23	3.63	--	
		17-Aug-99	2.57	3.29	--	
		11-Nov-99	2.57	3.29	--	
		23-Mar-00	1.90	3.96	--	
		25-Apr-00	2.16	3.70	--	
MW-8	7.56	13-May-98	2.46	5.10	--	2
		16-Dec-98	3.51	4.05	--	
		26-Feb-99	2.59	4.97	--	
		20-May-99	3.06	4.50	--	
		17-Aug-99	3.75	3.81	--	
		11-Nov-99	4.04	3.52	--	
		23-Mar-00	2.63	4.93	--	
		25-Apr-00	3.02	4.54	--	

Notes
1 - Data from Table 1-Results of Groundwater Sampling and Analysis, Port of Oakland, Oakland International Airport, United Airlines Hanger Area-Economy Parking Lot Site, by ITSI
2 - Data from Table 1of Results of Additional Site Investigation, Port of Oakland, Oakland International Airport, United Airlines Hanger Area-Economy Parking Lot Site, dated October 21, 1998 by ITSI
3 - GroundWater elevation calculated assuming a specific gravity of 0.75 for product.
4 - Free product removed from well during redevelopment (July 30, 1997).
5 - Well MW-2 was reconstructed in May 1998.
6 - Well MW-5 was damaged during construction activities in February 2000, top of casing elevation may have been effected.

Table 2. Groundwater Analytical Results - Petroleum Hydrocarbos
United Airlines Hanger Economy Parking
Metropolitan Oakland International Airport

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethyl - benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TPHg (µg/L)	TPH Diesel (C1-C-22) (µg/L)	TPH Jet Fuel A (C9-C16) (µg/L)	TPH Motor Oil (>C16) (µg/L)	Unidentified Extractable Hydrocarbons (µg/L)	Note
MW-1	05/15/92	<0.4	<0.3	<0.3	<0.4	--	<50	--	--	--	--	1
	08/07/92	<0.4	<0.3	<0.3	<0.4	--	<50	--	800	--	--	1
	11/24/92	<0.4	<0.3	<0.3	<0.4	--	<50	--	<50	--	--	1
	02/12/93	<0.4	<0.3	<0.3	<0.4	--	<50	--	--	--	--	1
	05/17/93	<0.4	<0.3	<0.3	<0.4	--	<50	--	--	--	--	1
	08/03/93	<0.5	<0.5	<0.5	<0.5	--	<50	5,200	--	--	--	1
	11/25/93	<0.5	<0.5	<0.5	0.6	--	70	--	--	--	--	1
	05/09/94	<0.5	<0.5	<0.5	<0.5	--	<50	--	--	--	--	1
	08/29/94	<0.5	<0.5	2.7	<0.5	--	<50	--	--	--	--	1
	04/25/95	<5	<5	<5	<5	--	<50	1,400	<50	610	--	1
	08/11/95	<0.4	<0.3	<0.3	<0.4	--	<50	1,900	<50	1,200	--	1
	11/03/95	0.4	0.4	<0.3	<0.4	--	<50	4,200	<50	1,800	--	1
	06/19/96	0.99	<0.5	1.1	<1.0	--	<50	11,000	<500	820	--	1
	10/24/96	1.9	<0.5	<0.5	1.3	--	57	<250	<500	<250	--	1
	01/22/97	<0.5	<0.5	<0.5	<1.0	--	<50	220	<500	<250	--	1
	04/25/97	1.2	<0.5	1.0	1.2	--	110	<50	<500	<250	--	1
	08/06/97	2.1	<0.5	<0.5	<1.0	--	100	340	<500	<250	--	1
	12/23/97	0.7	<0.5	<0.5	<1.0	--	<50	<50	<50	<300	--	1
	03/26/98	<0.5	<0.5	<0.5	<1.0	--	<50	<48	<48	<290	--	2
	12/16/98	1.8	<0.5	<0.5	<0.5	<2.5	120	640	<50	<250	340	--
	02/26/99	0.96	<0.5	<0.5	<0.5	2.6	69	670	<50	350	<50	4
	05/20/99	1.7	<0.5	<0.5	<0.5	<2.5	85	380	<50	<250	<50	--
	08/17/99	2.6	0.52	<0.5	<0.5	<2.5	54	530	<50	<500	--	--
	11/11/99	2.5	<0.5	<0.5	<0.5	<2.5	96	1,100	<50	<250	--	--
	03/23/00	1.7	<0.5	<0.5	<0.5	3.2	--	1,100	<50	1,100	--	8
	04/25/00	--	--	--	--	--	60	--	--	--	--	8
MW-2	04/25/95	340	570	110	580	--	5,200	<10,000	13,000	19,000	--	1
	08/11/95	320	680	110	510	--	5,500	<8,000	7,900	20,000	--	1
	11/03/95	200	400	27	360	--	3,800	<11,000	11,000	4,200	--	1
	06/19/96	--[3]	--[3]	--[3]	--[3]	--	--[3]	--[3]	--[3]	--[3]	--	1
	10/24/96	--[3]	--[3]	--[3]	--[3]	--	--[3]	--[3]	--[3]	--[3]	--	1
	01/22/97	--[3]	--[3]	--[3]	--[3]	--	--[3]	--[3]	--[3]	--[3]	--	1
	04/25/97	--[3]	--[3]	--[3]	--[3]	--	--[3]	--[3]	--[3]	--[3]	--	1
	08/06/97	170	270	92	410	--	9,900	12,000	<1,000	2,300	--	1
	12/23/97	--[3]	--[3]	--[3]	--[3]	--	--[3]	--[3]	--[3]	--[3]	--	1
	03/26/98	--[3]	--[3]	--[3]	--[3]	--	--[3]	--[3]	--[3]	--[3]	--	1
	05/13/98	150	270	94	440	--	4,000	2,600	3,400	<290	--	2,3,4
	12/16/98	130	180	71	330	<50	4,600	<1,000	31,000	8,200	<1,000	--
	02/26/99	86	210	64	350	<100	4,700	<1,000	18,000	7,800	<1,000	--
	05/20/99	120	280	76	360	<2.5	4,700	<50	15,000	5,800	<50	--
	08/17/99	55	44	57	200	<2.5	17,000	<1000	22,000	<10000	--	--
	11/11/99	60	37	78	190	<2.5	3,800	<500	10,000	<2500	--	--
	03/23/00	92	160	97	310	<25	--	<500	36,000	26,000	--	8

Table 2. Groundwater Analytical Results - Petroleum Hydrocarbons
United Airlines Hanger Economy Parking
Metropolitan Oakland International Airport

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethyl - benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TPHg (µg/L)	TPH Diesel (C1-C-22) (µg/L)	TPH Jet Fuel A (C9-C16) (µg/L)	TPH Motor Oil (>C16) (µg/L)	Unidentified Extractable Hydrocarbons (µg/L)	Note
MW-2	04/25/00	--	--	--	--	--	7,600	--	--	--	--	8
MW-3	04/25/95	150	600	100	580	--	7,200	<40000	38,000	31,000	--	1
	08/11/95	--	--	--	--	--	--	--	--	--	--	1,5
	11/03/95	--	--	--	--	--	--	--	--	--	--	1,5
	06/19/96	--	--	--	--	--	--	--	--	--	--	1,5
	10/24/96	--	--	--	--	--	--	--	--	--	--	1,5
	01/22/97	--	--	--	--	--	--	--	--	--	--	1,5
	04/25/97	--	--	--	--	--	--	--	--	--	--	1,5
	08/06/97	4	16	14	90	--	4,200	1,400	<500	<250	--	1,5
	12/23/97	13	16	9	116	--	2,200	79,000	110,000	8,200	--	1,5
	03/26/98	--	--	--	--	--	--	--	--	--	--	2,5
	12/16/98	<10	12	<10	43	<50	2,300	--	--	--	--	7
	02/26/99	16	16	10	40	<100	5,700	--	--	--	--	7
	05/20/99	20	25	7.8	37	<2.5	2,700	--	--	--	--	7
	08/17/99	14	<0.5	<0.5	15	<2.5	2,100	--	--	--	--	7
	11/11/99	7.8	<0.5	<0.5	17	<2.5	3,300	--	--	--	--	7
	03/23/00	13	20	16	48	<50	--	--	--	--	--	8
	04/25/00	--	--	--	--	--	8,000	6,200	7,100	4,600	--	8
MW-4	05/13/98	9.8	23	13	79	--	1,400	2,000	2,300	<310	--	2,3,4
	12/16/98	<10	<10	<10	58	<50	1,900	<1,000	40,000	8,800	<1,000	--
(Dup)	12/16/98	<10	<10	<10	51	<50	1,700	<1,000	41,000	9,400	<1,000	--
	02/26/99	13	<10	<10	22	<50	1,200	<500	5,500	<2,500	<500	--
(Dup)	02/26/99	16	<2.5	6.2	20	<10	1,200	<500	5,200	<2,500	<500	--
	05/20/99	16	0.83	3.0	10	5.5	670	<50	1,900	560	<50	--
(Dup)	05/20/99	15	0.78	3.0	11	5.4	1,100	<50	1,200	290	<50	--
	08/17/99	22	<0.5	<0.5	<0.5	<2.5	1,000	<50	2,000	<500	<50	--
(Dup)	08/17/99	24	3.10	3.2	16	<2.5	690	<50	1,700	<500	--	--
	11/01/99	11	<0.5	<0.5	12	<2.5	1,600	<50	2,400	<50	--	--
(Dup)	11/01/99	11	1.40	2.7	16	<2.5	1,300	<50	1,800	<50	--	--
	03/23/00	10	0.95	2.0	12	<2.5	--	2,800	<50	2,200	--	8
(Dup)	03/23/00	10	0.81	2.0	12	<2.5	--	2,800	<50	2,100	--	8
	04/25/00	--	--	--	--	--	1,200	--	--	--	--	8
(Dup)	04/25/00	--	--	--	--	--	630	--	--	--	--	8
MW-5	05/13/98	<0.5	<0.5	<0.5	<1.0	--	<50	<50	<50	<300	--	2
	12/16/98	<0.5	<0.5	<0.5	<0.5	<2.5	<50	<50	<50	<250	260	--
	02/26/99	<0.5	<0.5	<0.5	<0.5	<2.5	<50	69	<50	<250	<50	--
	05/20/99	<0.5	<0.5	<0.5	<0.5	<2.5	<50	<50	<50	<250	<50	--
	08/17/99	<0.5	<0.5	<0.5	<0.5	<2.5	<50	79	<50	<500	--	--
	11/11/99	<0.5	<0.5	<0.5	<0.5	<2.5	<50	93	<50	<250	--	--
	03/23/00	<0.5	<0.5	<0.5	<0.5	<2.5	--	140	<50	530	--	8
	04/25/00	--	--	--	--	--	<50	--	--	--	--	8
MW-6	05/13/98	<0.5	<0.5	<0.5	<1.0	--	<50	<48	<48	<290	--	2
	12/16/98	<0.5	<0.5	<0.5	<0.5	<2.5	<50	<50	<50	<250	<50	--

not run —

— TPHg not run

Table 2. Groundwater Analytical Results - Petroleum Hydrocarbos
United Airlines Hanger Economy Parking
Metropolitan Oakland International Airport

Monitoring Well ID	Date	Benzene (µg/L)	Toluene (µg/L)	Ethyl - benzene (µg/L)	Total Xylenes (µg/L)	MTBE (µg/L)	TPHg (µg/L)	TPH Diesel (C1-C-22) (µg/L)	TPH Jet Fuel A (C9-C16) (µg/L)	TPH Motor Oil (>C16) (µg/L)	Unidentified Extractable Hydrocarbons (µg/L)	Note
MW-6	02/26/99	<0.5	<0.5	<0.5	<0.5	<2.5	<50	83	<50	<250	<50	--
	05/20/99	<0.5	<0.5	<0.5	<0.5	<2.5	<50	<50	<50	<250	<50	--
	08/17/99	<0.5	<0.5	<0.5	<0.5	<2.5	<50	72	<50	<500	--	--
	11/11/99	<0.5	<0.5	<0.5	<0.5	<2.5	<50	93	<50	<250	--	--
	03/23/00	<0.5	<0.5	<0.5	<0.5	<2.5	--	120	<50	280	--	8
	04/25/00	--	--	--	--	--	<50	--	--	--	--	8
MW-7	05/13/98	<0.5	0.6	<0.5	<1.0	--	<50	<51	<51	<310	--	2
	12/16/98	<0.5	<0.5	<0.5	<0.5	<2.5	<50	<50	<50	<250	<50	--
	02/26/99	<0.5	<0.5	<0.5	<0.5	<2.5	<50	<50	<50	<250	<50	--
	05/20/99	<0.5	<0.5	<0.5	<0.5	<2.5	<50	<50	<50	<250	<50	--
	08/17/99	<0.5	<0.5	<0.5	<0.5	<2.5	<50	52	<50	<500	--	--
	11/11/99	<0.5	<0.5	<0.5	<0.5	<2.5	<50	<50	<50	<250	--	--
	03/23/00	<0.5	<0.5	<0.5	<0.5	<2.5	--	<50	<50	<250	--	8
	04/25/00	--	--	--	--	--	<50	--	--	--	--	8
MW-8	05/13/98	2	<0.5	<0.5	<1.0	--	<50	<47	<47	<280	--	2
	12/16/98	4.1	<0.5	<0.5	<0.5	2.9	53	<50	200	<250	<50	6
	02/26/99	3.5	<0.5	<0.5	<0.5	2.7	<50	<50	<50	<250	<50	6
	05/20/99	2.8	<0.5	<0.5	<0.5	<2.5	<50	150	<50	<250	<50	--
	08/17/99	3.5	<0.5	<0.5	<0.5	2.9	51	190	<50	<250	--	--
	11/11/99	3.0	<0.5	<0.5	<0.5	3.2	<50	310	<50	<250	--	--
	03/23/00	2.1	<0.5	<0.5	<0.5	<2.5	--	450	<50	530	--	8
	03/23/00	--	--	--	--	--	77	--	--	--	--	8
MCLs		1	150	700	1,750	--	--	--	--	--	--	--

Note:

1 - Data from Table 2-Summary of Laboratory Results Tanks MF25 and MF26 (United Airlines Hanger Area - Economy Parking Lot Site) Metropolitan Oakland International Airport (MOIA), 1100 Airport Drive, Oakland California by ITSI.

2 - Data from Table 3 of Results of Additional Site Investigation, Port of Oakland, Oakland Internatinonal Airport, United Airlines Hanger Area-Economy Parking Lot Site, dated October 21, 1998 by ITSI dated October 21, 1998 by ITSI

3 - Hydrocarbons for TPHd do not match profile for laboratory standards

4 - Hydrocarbons for TPHd are lighter than indicated standard

5 - Not analyzed due to the presence of free product

6 - MTBE detected by GC methods at slightly over reporting limit has not been confirmed by MS.

7 - MW-3 has slow recovery so not enough water could be collected for all analysis.

8 - Due to an oversight TPH gas was not analyzed for in the March sampling event, the wells were resampled in April.

MCLs - Maximum Contaminant Levels

 - Shaded areas indicate detected concentration exceeds MCL.

Clayey-Silt

Cliff Oak

Indoor
Inhal

Table B-2
Water Bound RBCA

Assume the exposure pathway

GW Volatilization - Commercial

1,1-DCA	~~max~~	240	1,963 mg/L	47
~~1,2-DCA~~ 1,2DCE		160	5,963	3800 / 260 (c/t)
Chlorobenzene		5.5		14 ppb
1,1-DCE		230	3,961	9.6

Table 3. Groundwater Analytical Results - VOCs
United Airlines Hanger Economy Parking
Metropolitan Oakland International Airport

Monitoring Well ID	Date	Acetone (µg/L)	2-Butanone (µg/L)	Chloroform (µg/L)	1,1-DCA (µg/L)	(cis/trans) 1,2-DCE (µg/L)	4-Methyl-2-Pentanone (µg/L)	1,1,1-TCA (µg/L)	TCE (µg/L)	PCE (µg/L)	Chloroethane (µg/L)	1,2-DCA (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Notes
MW-1	11/24/92	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	1
	02/12/93	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	1
	05/17/93	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	1
	08/03/93	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	1
	11/25/93	ND	ND	ND	ND	6.0	ND	ND	ND	ND	--	--	--	--	1
	05/09/94	ND	ND	ND	ND	ND	ND	ND	ND	5.5	--	--	--	--	1
	09/27/94	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	--	1
	01/25/95	<20	<20	<5	<5	<5	<20	--	--	<5	--	--	--	--	1
	08/11/95	--	--	<0.5	4.3	13	--	2.0	1.8	0.6	--	--	--	--	1
	11/03/95	--	--	<0.5	1.3	3.7	--	0.6	0.5	<0.5	--	--	--	--	1
	06/19/96	--	--	<0.5	5.4	<0.5	--	<0.5	1.2	<0.5	--	--	--	--	1
	10/24/96	--	--	<0.5	12	<1.0	--	<0.5	1.4	<0.5	--	--	--	--	1
	01/22/97	--	--	<0.5	3.9	8.4	--	<0.5	1.7	<0.5	--	--	--	--	1
	04/25/97	--	--	<0.5	6.2	10	--	<0.5	1.2	0.62	--	--	--	--	1
	08/06/97	--	--	<0.5	14	19	--	<0.5	2.5	0.54	--	--	--	--	1
	12/23/97	--	--	<1.0	6.6	9.3	--	<1.0	<1.0	<1.0	--	--	--	--	1
	03/26/98	--	--	<1.0	5.3	8.1	--	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<2.0	3
	12/16/98	--	--	<0.5	20	18	--	<0.5	<0.5	<0.5	<1.0	<0.5	1.5	<1.0	
	02/26/99	--	--	<0.5	15	9.8	--	2.9	<0.5	<0.5	<1.0	<0.5	0.79	<1.0	
	05/20/99	--	--	<0.5	22	17	--	<0.5	<0.5	<0.5	<1.0	<0.5	1.5	1.2	
	08/17/99	--	--	<0.5	23	15	--	<0.5	<0.5	<0.5	<1.0	<0.5	2.1	<1.0	
	11/11/99	--	--	<0.5	21	19	--	<0.5	<0.5	<0.5	<1.0	<0.5	1.5	<1.0	
	03/23/00	--	--	<1.0	24	11	--	<1.0	<1.0	<1.0	<1.0	<2.0	1.3	<1.0	
MW-2	04/25/95	<200	200	<50	50	<50	<200	--	--	<50	--	--	--	--	1
	08/11/95	--	--	5.0	79	26	--	20	4.0	9.0	--	--	--	--	1
	11/03/95	--	--	<0.5	73	24	--	4.8	6.7	6.6	--	--	--	--	1
	06/19/96	--	--	--	--	--	--	--	--	--	--	--	--	--	1,2
	10/24/96	--	--	--	--	--	--	--	--	--	--	--	--	--	1,2
	01/22/97	--	--	--	--	--	--	--	--	--	--	--	--	--	1,2
	04/25/97	--	--	--	--	--	--	--	--	--	--	--	--	--	1,2
	08/06/97	--	--	<5	69	160	--	<5	<12	<5	--	--	--	--	1
	12/23/97	--	--	--	--	--	--	--	--	--	--	--	--	--	1,2
	03/26/98	--	--	--	--	--	--	--	--	--	--	--	--	--	1,2
	05/13/98	--	--	--	61	140	--	--	ND	<1.0	3.4	<1.0	<1.0	<2.0	3
	12/16/98	--	--	<5.0	58	220	--	<2.5	<2.5	<2.5	<1.0	<2.5	<2.5	<5.0	--
	02/26/99	--	--	<1.3	19	57	--	2.9	<1.3	<1.3	<2.5	<1.3	<1.3	<2.5	--
	05/20/99	--	--	<0.5	63	191.5	--	5.8	1.1	1.5	4.4	<0.5	0.82	<1.0	--
	08/17/99	--	--	<2.5	70	140	--	<2.5	<2.5	<2.5	<5.0	<2.5	<2.5	<5.0	--
	11/11/99	--	--	<2.5	48	160	--	<2.5	<2.5	<2.5	<5.0	<2.5	<2.5	<5.0	--

Table 3. Groundwater Analytical Results - VOCs
United Airlines Hanger Economy Parking
Metropolitan Oakland International Airport

Monitoring Well ID	Date	Acetone (µg/L)	2-Butanone (µg/L)	Chloroform (µg/L)	1,1-DCA (µg/L)	(cis/trans) 1,2-DCE (µg/L)	4-Methyl-2-Pentanone (µg/L)	1,1,1-TCA (µg/L)	TCE (µg/L)	PCE (µg/L)	Chloroethane (µg/L)	1,2-DCA (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Notes
MW-2	03/23/00	--	--	<5.0	55	160	--	<5.0	<5.0	<5.0	<5.0	<10	<5.0	<5.0	--
MW-3	04/25/95	300	300	--	30	<30	200	--	--	<30	--	--	--	--	1
	08/11/95	--	--	--	--	--	--	--	--	--	--	--	--	--	1,2
	11/03/95	--	--	--	--	--	--	--	--	--	--	--	--	--	1,2
	06/19/96	--	--	--	--	--	--	--	--	--	--	--	--	--	1,2
	10/24/96	--	--	--	--	--	--	--	--	--	--	--	--	--	1,2
	01/22/97	--	--	--	--	--	--	--	--	--	--	--	--	--	1,2
	04/25/97	--	--	--	--	--	--	--	--	--	--	--	--	--	1,2
	08/06/97	--	--	2.1	3.8	<0.5	--	<0.5	<1.2	0.62	--	--	--	--	1
	12/23/97	--	--	<1.0	4.2	<1.0	--	<1.0	<1.0	<1.0	--	--	--	--	1
	03/26/98	--	--	--	--	--	--	--	--	--	--	--	--	--	3,2
	12/16/98	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4
	02/26/99	--	--	<0.5	4.4	<0.5	--	1.6	<0.5	<0.5	<1.0	<0.5	<0.5	<1.0	--
	05/20/99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4
	08/17/99	NA	NA	<0.5	3.6	<0.5	NA	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	<1.0	--
	11/11/99	--	--	<0.5	3.2	<0.5	--	2.4	<0.5	<0.5	<1.0	<0.5	<0.5	<1.0	--
	03/23/00	--	--	<1.0	4.8	<1.0	--	<1.0	<1.0	<1.0	1.8	<2.0	<1.0	<1.0	--
MW-4	05/13/98	--	--	--	31	9.9	--	--	--	2.8	2.8	<1.0	<1.0	<2.0	3
	12/16/98	--	--	<0.5	53	17	--	<5.0	<0.5	0.94	6.8	<0.5	1.6	<1.0	--
(dup)	12/16/98	--	--	<0.5	52	14	--	<5.0	<0.5	0.88	4.4	<0.5	1.2	<1.0	--
	02/26/99	--	--	<0.5	39	28	--	1.4	<0.5	0.97	6.5	<0.5	<0.5	<1.0	--
(dup)	02/26/99	--	--	<0.5	43	36	--	1.7	<0.5	1.3	8.3	<0.5	2.8	<1.0	--
	05/20/99	--	--	<0.5	45	42.1	--	<0.5	0.54	1.7	8.9	<0.5	2.8	<1.0	--
(dup)	05/20/99	--	--	<0.5	48	39.4	--	3.9	0.59	1.9	8.6	<0.5	2.5	<1.0	--
	08/17/99	--	--	<0.5	37	22	--	<0.5	0.7	1.8	4.3	<0.5	2	<1.0	--
(dup)	08/17/99	--	--	<0.5	45	0.77	--	<0.5	5.5	2	13	<0.5	2.8	<1.0	--
	11/11/99	--	--	<0.5	34	22	--	<0.5	<0.5	0.76	6.9	<0.5	1.1	<1.0	--
(dup)	11/11/99	--	--	<0.5	38	23	--	<0.5	<0.5	0.85	7.9	<0.5	1.1	<1.0	--
	03/23/00	--	--	<1.0	24	13	--	<1.0	<1.0	<1.0	4.1	<2.0	<1.0	<1.0	--
(dup)	03/23/00	--	--	<1.0	26	14	--	<1.0	<1.0	1.1	5.5	<2.0	1.1	<1.0	--
MW-5	05/13/98	--	--	--	<1.0	<1.0	--	--	--	<1.0	<2.0	<1.0	<1.0	<2.0	3
	12/16/98	--	--	<0.5	<0.5	<0.5	--	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	<1.0	--
	02/26/99	--	--	<0.5	<0.5	<0.5	--	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	<1.0	--
	05/20/99	--	--	<0.5	<0.5	<0.5	--	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	<1.0	--
	08/17/99	--	--	<0.5	<0.5	<0.5	--	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	<1.0	--
	11/11/99	--	--	<0.5	<0.5	<0.5	--	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	<1.0	--
	03/23/00	--	--	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	--
MW-6	05/13/98	--	--	--	<1.0	<1.0	--	--	--	<1.0	<2.0	<1.0	<1.0	<2.0	3
	12/16/98	--	--	<0.5	<0.5	<0.5	--	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	<1.0	--

Table 3. Groundwater Analytical Results - VOCs
United Airlines Hanger Economy Parking
Metropolitan Oakland International Airport

Monitoring Well ID	Date	Acetone (µg/L)	2-Butanone (µg/L)	Chloroform (µg/L)	1,1-DCA (µg/L)	(cis/trans) 1,2-DCE (µg/L)	4-Methyl-2-Pentanone (µg/L)	1,1,1-TCA (µg/L)	TCE (µg/L)	PCE (µg/L)	Chloroethane (µg/L)	1,2-DCA (µg/L)	1,1-DCE (µg/L)	Vinyl Chloride (µg/L)	Notes
MW-6	02/26/99	--	--	<0.5	<0.5	<0.5	--	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	<1.0	--
	05/20/99	--	--	<0.5	<0.5	<0.5	--	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	<1.0	--
	08/17/99	--	--	<0.5	<0.5	<0.5	--	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	<1.0	--
	11/11/99	--	--	<0.5	<0.5	<0.5	--	<0.5	<0.5	<0.5	<1.0	<0.5	<0.5	<1.0	--
	03/23/00	--	--	<1.0	<1.0	<1.0	--	<1.0	<1.0	<1.0	<1.0	<2.0	<1.0	<1.0	--
MW-7	05/13/98	--	--	--	8	<1.0	--	--	--	<1.0	<2.0	<1.0	3.4	<2.0	3
	12/16/98	--	--	<0.5	12	<0.5	--	<0.5	<0.5	<0.5	<1.0	<0.5	5.0	<1.0	--
	02/26/99	--	--	<0.5	15	<0.5	--	<0.5	<0.5	<0.5	<1.0	<0.5	6.8	<1.0	--
	05/20/99	--	--	<0.5	19	0.74	--	<0.5	<0.5	<0.5	<1.0	<0.5	7.3	<1.0	--
	08/17/99	--	--	<0.5	22	0.59	--	<0.5	<0.5	0.52	<1.0	<0.5	9.6	<1.0	--
	11/11/99	--	--	<0.5	17	<0.5	--	<0.5	<0.5	<0.5	<1.0	<0.5	6.8	<1.0	--
	03/23/00	--	--	<0.5	16	<1.0	--	<1.0	<1.0	<1.0	<1.0	<2.0	5.6	<1.0	--
MW-8	05/13/98	--	--	--	180	1.9	--	--	--	<1.0	<2.0	2.7	180	6.0	3
	12/16/98	--	--	<0.5	440	1.2	--	<0.5	<0.5	<0.5	<1.0	10	520	8.6	--
	02/26/99	--	--	<2.5	390	<2.5	--	<2.5	<2.5	<2.5	<5.0	8.9	490	10	--
	05/20/99	--	--	<0.5	410	1.2	--	<0.5	<0.5	<0.5	<1.0	8.3	480	3.9	--
	08/17/99	--	--	<2.5	500	<2.5	--	<2.5	<2.5	<2.5	<5	11	700	<5.0	--
	11/11/99	--	--	<5.0	300	<5.0	--	<5.0	<5.0	<5.0	<10	7.5	340	<10	--
	03/23/00	--	--	<10	240	<10	--	<10	<10	<10	<10	<20	230	<10	5
MCLs (California/Fed)		--	--	--	5/-	6/70	--	--	5/5	5/5	--	0.5/5	6/7	0.5/2	

1 - Data from Table 3-Summary of Laboratory Results for Volatile Organic Compounds Tanks MF25 and MF26 (United Airlines Hanger Area - Economy Parking Lot Site) Metropolitan Oakland International Airport (MOIA), 1100 Airport Drive, Oakland California by ITSI.

2 - Not sampled due to the presence of free product in monitoring well.

3 - Data from Table 4 of Results of Additional Site Investigation, Port of Oakland, Oakland International Airport, United Airlines Hanger Area - Economy Parking Lot Site, dated October 21, 1998 by ITSI

4 - MW-3 has slow recovery so not enough water could be collected for all analysis.

5 - A suspected lab contaminant, mehtylene chloride was detected at a concentration of 15 µg/L

MCLs - Maximum Contaminant Levels

- Shaded areas indicate detected concentration exceeds MCL.

Table 4. Groundwater Analytical Results - Inorganics
United Airlines Hanger Economy Parking
Metropolitan Oakland International Airport

Monitoring Well ID	Date	Ferrous Iron Fe^{+2} (mg/L)	Ferric Iron Fe^{+3} (mg/L)	Total Iron (mg/L)	Nitrate NO_3 (mg/L)	Sulfate (mg/L)	Ortho-phosphate PO_4 (mg/L)	TDS (mg/L)	TOC (mg/L)	Redox (millivolts)	Notes
MW-1	05/15/92	--	--	--	--	--	--	5,900	<5	--	1
	08/07/92	--	--	--	--	--	--	--	<5	--	1
	11/24/92	--	--	--	--	--	--	--	<5	--	1
	02/12/93	--	--	--	--	--	--	--	<5	--	1
	05/17/93	--	--	--	--	--	--	4,100	<5	--	1
	08/03/93	--	--	--	--	--	--	7,700	<5	--	1
	11/25/93	--	--	--	--	--	--	3,790	<5	--	1
	05/09/94	--	--	--	--	--	--	9,600	<0.93	--	1
	08/29/94	--	--	--	--	--	--	3,900	<1.0	--	1
	04/25/95	--	--	--	--	--	--	4,000	--	--	1
	08/11/95	--	--	--	--	--	--	8,500	--	--	1
	11/03/95	--	--	--	--	--	--	6,600	--	--	1
	06/19/96	--	--	--	--	--	--	3,040	--	--	1
	10/24/96	--	--	--	--	--	--	3,090	--	--	1
	01/22/97	--	--	--	--	--	--	4,240	--	--	1
	04/25/97	--	--	--	--	--	--	2,770	--	--	1
	08/06/97	--	--	--	--	--	--	2,430	--	--	1
	12/23/97	<0.2	3.9	--	<0.2	120	--	3,570	--	--	1
	03/26/98	0.41	2.1	--	<0.2	110	--	3,240	--	--	3
	12/16/98	--	--	3.3	<0.1	70	<0.5	--	32	40	--
	02/26/99	0.21	--	0.57	<0.1	110	1.1	--	30	147	--
	05/20/99	0.26	1.2	--	<0.1	97	1.5	--	22	96	--
	08/17/99	0.31	--	0.88	<0.1	100	1.3	--	74	151	--
	11/11/99	0.27	--	0.96	<0.1	110	1.3	--	108	57	--
	03/23/00	0.65	--	1.5	<0.1	53	<0.5	--	16.6	79	--
	04/25/00	--	--	--	--	--	--	--	--	90	--
MW-2	04/25/95	--	--	--	--	--	--	1,700	--	--	1
	08/11/95	--	--	--	--	--	--	2,500	--	--	1
	11/03/95	--	--	--	--	--	--	2,000	--	--	1
	06/19/96	--	--	--	--	--	--	--	--	--	1
	10/24/96	--	--	--	--	--	--	--	--	--	1
	01/22/97	--	--	--	--	--	--	--	--	--	1
	04/25/97	--	--	--	--	--	--	--	--	--	1
	08/06/97	--	--	--	--	--	--	--	--	--	1

Table 4. Groundwater Analytical Results - Inorganics
United Airlines Hanger Economy Parking
Metropolitan Oakland International Airport

Monitoring Well ID	Date	Ferrous Iron Fe^{+2} (mg/L)	Ferric Iron Fe^{+3} (mg/L)	Total Iron (mg/L)	Nitrate NO_3 (mg/L)	Sulfate (mg/L)	Ortho-phosphate PO_4 (mg/L)	TDS (mg/L)	TOC (mg/L)	Redox (millivolts)	Notes
MW-2	04/25/97	--	--	--	--	--	--	--	--	--	1
	12/23/97	--	--	--	--	--	--	--	--	--	1,2
	05/13/98	0.53	8.0	--	<0.05	12	0.72	3,240	--	123	3
	12/16/98	--	--	28	<0.1	21	<0.5	--	210	146	--
	02/26/99	17	--	36	<0.1	27	0.59	--	100	-235	--
	05/20/99	8.9	36	--	<0.1	2	<1.0	--	130	-124	--
	08/17/99	0.37	--	31	0.15	33	<0.5	--	210	-110	--
	11/11/99	0.1	--	17	<0.1	10	<0.5	--	214	-145	--
	03/23/00	9	--	36	<0.1	4	<0.5	--	103	-116	--
	04/25/00	--	--	--	--	--	--	--	--	-118	--
MW-3	04/25/95	--	--	--	--	--	--	5,600	--	--	1
	08/11/95	--	--	--	--	--	--	--	--	--	1
	11/03/95	--	--	--	--	--	--	--	--	--	1
	06/19/96	--	--	--	--	--	--	--	--	--	1
	10/24/96	--	--	--	--	--	--	--	--	--	1
	01/22/97	--	--	--	--	--	--	--	--	--	1
	04/25/97	--	--	--	--	--	--	--	--	--	1
	08/06/97	--	--	--	--	--	--	15,100	--	--	1
	04/25/97	--	--	--	--	--	--	13,900	--	--	1
	12/23/97	--	--	--	--	--	--	--	--	--	1
	03/26/98	--	--	--	--	--	--	--	--	--	3,2
	12/16/98	--	--	--	--	--	--	--	240	157	4
	02/26/99	--	--	--	--	--	--	--	100	-142	4
	05/20/99	--	--	--	--	--	--	--	84	-125	4
	08/17/99	--	--	--	--	--	--	--	290	-156	4
	11/11/99	--	--	--	--	--	--	--	217	-272	4
	03/23/00	0.54	--	6.3	<1.0	380	4.7	--	102	-237	--
	04/25/00	--	--	--	--	--	--	--	--	-244	--
MW-4	05/13/98	0.53	2.9	--	<0.05	20	2.1	1,420	66	168	3
	12/16/98	--	--	13	<0.1	2.8	4.1	--	140	118	-
	12/16/98	--	--	11	<0.1	2.6	4.6	--	110	118	--
	02/26/99	<0.01	--	2.7	1.6	56	2.8	--	60	81	--
	02/26/99	<0.01	--	2.9	1.3	54	2.9	--	95	81	--
	05/20/99	<0.01	3.7	--	<0.1	44	3.3	--	36	89	--

Table 4. Groundwater Analytical Results - Inorganics
United Airlines Hanger Economy Parking
Metropolitan Oakland International Airport

Monitoring Well ID	Date	Ferrous Iron Fe^{+2} (mg/L)	Ferric Iron Fe^{+3} (mg/L)	Total Iron (mg/L)	Nitrate NO_3 (mg/L)	Sulfate (mg/L)	Ortho-phosphate PO_4 (mg/L)	TDS (mg/L)	TOC (mg/L)	Redox (millivolts)	Notes
MW-4	05/20/99	<0.01	2.9	--	0.22	56	2.2	--	39	208	--
	08/17/99	0.36	--	0.91	<0.1	13	2.4	--	110	208	--
	08/17/99	0.017	--	1.3	<0.1	14	2.4	--	130	208	--
	11/11/99	<0.01	--	1.1	<0.1	3	2.8	--	116	122	--
	11/11/99	<0.01	--	0.89	<0.1	3	2.9	--	93.5	122	--
	03/23/00	0.091	--	2.8	1.0	36	3.2	--	62.5	122	--
	03/23/00	0.14	--	2	1.1	33	3.5	--	51.4	112	--
	4/25/2000	--	--	--	--	--	--	--	--	-204	--
MW-5	05/13/98	<0.2	0.7	--	0.36	250	0.47	2,300	20	150	3
	12/16/98	--	--	10	<0.1	340	0.57	--	32	46	--
	02/26/99	0.64	--	23	<0.1	260	1.2	--	22	230	--
	05/20/99	0.75	11	--	0.11	260	<1.0	--	15	209	--
	08/17/99	0.23	--	12	<0.1	350	<0.5	--	82	62	--
	11/11/99	0.046	--	2.9	<0.1	320	<0.5	--	94.5	-48	--
	03/23/00	8.6	--	74	<0.1	190	0.67	--	14.1	76	--
	04/25/00	--	--	--	--	--	--	--	--	-15	--
MW-6	05/13/98	<0.2	0.69	--	2.1	400	0.15	4,240	13	126	3
	12/16/98	--	--	26	0.45	400	0.65	--	22	47	--
	02/26/99	0.44	--	16	4.3	380	0.89	--	42	262	--
	05/20/99	1.2	8.7	--	7.5	300	<1.0	--	22	227	--
	08/17/99	3.7	--	18	2.1	470	0.64	--	92	251	--
	11/11/99	0.15	--	12	0.91	440	0.58	--	103	216	--
	03/23/00	1.9	--	38	1.2	350	<0.5	--	22.3	133	--
	04/25/00	--	--	--	--	--	--	--	--	169	--
MW-7	05/13/98	<0.2	0.62	--	0.9	100	<0.03	1,380	7	132	3
	12/16/98	--	--	19	6.9	100	0.53	--	7.7	159	--
	02/26/99	0.15	--	14	8.3	82	0.78	--	20	272	--
	05/20/99	0.89	13	--	4.3	160	<1.0	--	6.8	243	--
	08/17/99	0.52	--	12	3.4	160	0.68	--	38	200	--
	11/11/99	0.34	--	3.7	2.9	140	<0.5	--	49.6	137	--
	03/23/00	3.4	--	53	7.1	120	<0.5	--	7.2	205	--
	04/25/00	--	--	--	--	--	--	--	--	237	--
MW-8	05/13/98	<0.2	2.2	--	<0.5	500	0.08	8,300	99	60.4	3
	12/16/98	--	--	37	<0.1	360	<0.5	--	2.4	83	--

Table 4. Groundwater Analytical Results - Inorganics
United Airlines Hanger Economy Parking
Metropolitan Oakland International Airport

Monitoring Well ID	Date	Ferrous Iron Fe^{+2} (mg/L)	Ferric Iron Fe^{+3} (mg/L)	Total Iron (mg/L)	Nitrate NO_3 (mg/L)	Sulfate (mg/L)	Ortho-phosphate PO_4 (mg/L)	TDS (mg/L)	TOC (mg/L)	Redox (millivolts)	Notes
MW-8	02/26/99	0.076	--	26	<0.1	290	0.69	--	63	280	--
	05/20/99	2	26	--	17	440	<1.0	--	21	196	--
	08/17/99	1.4	--	3.8	<0.2	580	<1.0	--	150	-62	--
	11/11/99	<0.01	--	46	20	400	<0.5	--	163	-31	--
	03/23/00	1.6	--	41	<1.0	440	<5.0	--	17.2	-10	--
	04/25/00	--	--	--	--	--	--	--	--	-70	--

Notes

1 - Data from Table 4-Summary of Laboratory Results for Inorganic Anaalytes Tanks MF25 and MF26 (United Airlines Hanger Area - Economy Parking Lot Site) Metropolitan Oakland International Airport (MOIA), 1100 Airport Drive, Oakland California by ITSI.

2 - Not sampled due to presence of free product in monitoring well.

3 - Data from Table 5 of Results of Additional Site Investigation, Port of Oakland, Oakland International Airport, United Airlines Hanger Area Economy Parking Lot Site, dated October 21, 1998

4 - MW-3 has slow recovery so not enough water could be collected for all analysis.

Table 5 - Dissolved Oxygen Concentrations
United Airlines Hanger Economy Parking
Metropolitan Oakland International Airport

	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8
16-Dec-98	2.0	1.2	0.5	1.2	2.0	1.1	2.4	0.8
23-Dec-98		ORC injected in former UST cavity.						
6-Jan-99	>15 [1]	1.1 [2]	0.9	>15 [1,2]	1.3	2.8	3.0	0.6
12-Jan-99	>15 [1]	0.8	1.0	8.0	0.7	2.4	3.2	0.7
22-Jan-99	>15 [1]	0.6	0.8	1.4	1.1	3.1	4.7	1.4
30-Jan-99	>15 [1]	0.6	1.6	1.0	1.6	4.8	2.6	2.8
26-Feb-99	>15	0.5	0.5	1.4	1.1	4.4	4.0	5.2
30-Mar-99	>15	0.5 [2]	0.8	1.0	1.2	1.1	4.2	1.6
20-May-99	>15	1.0 [2]	1.4 [2]	1.5	1.7	1.9	3.2	1.2
23-Jun-99	>15	0.5 [2]	0.4 [2]	0.6	0.6	1.0	0.8	0.6
26-Jul-99	>15	0.5 [2]	0.4 [2]	0.6	0.8	0.6	0.5	0.7
17-Aug-99	>15	0.3 [2]	0.45 [2]	0.5	0.2	0.3	0.8	0.6
12-Sep-99	>15	0.5 [2]	0.3 [2]	0.8	0.4	0.5	0.5	0.4
19-Oct-99	>15	0.4 [2]	0.3 [2]	0.2	0.6	0.4	0.3	0.6
11-Nov-99	10.2	0.6 [2]	0.7 [2]	0.7	0.8	0.8	1.8	1.1
22-Dec-99	>15	0.3 [2]	0.3 [2]	0.4	0.7	0.4	0.8	0.4
6-Jan-00	>15	0.3 [2]	0.4 [2]	0.4	0.6	1.0	1.4	0.4
7-Jan-00		ORC injected in the vicinity of MW-2 and in the former UST cavity.						
14-Jan-00	>15	0.8 [2]	0.4 [2]	0.5	2.2	0.4	2.0	1.0
19-Jan-00	>15	0.6 [2]	0.4 [2]	0.4	1.4	1.6	1.0	0.7
26-Jan-00	14.2	0.7 [2]	0.4 [2]	0.6	0.5	2.7	6.0	1.7
29-Feb-00	13.2	0.9 [2]	0.9 [2]	0.8	-- [3]	1.0	2.2	3.4
23-Mar-00	>15	2.8 [2]	1.1 [2]	1.0	1.0	1.4	2.4	2.2
25-Apr-00	4.2	0.7 [2]	1.3 [2]	0.8	0.6	1.1	2.6	0.6

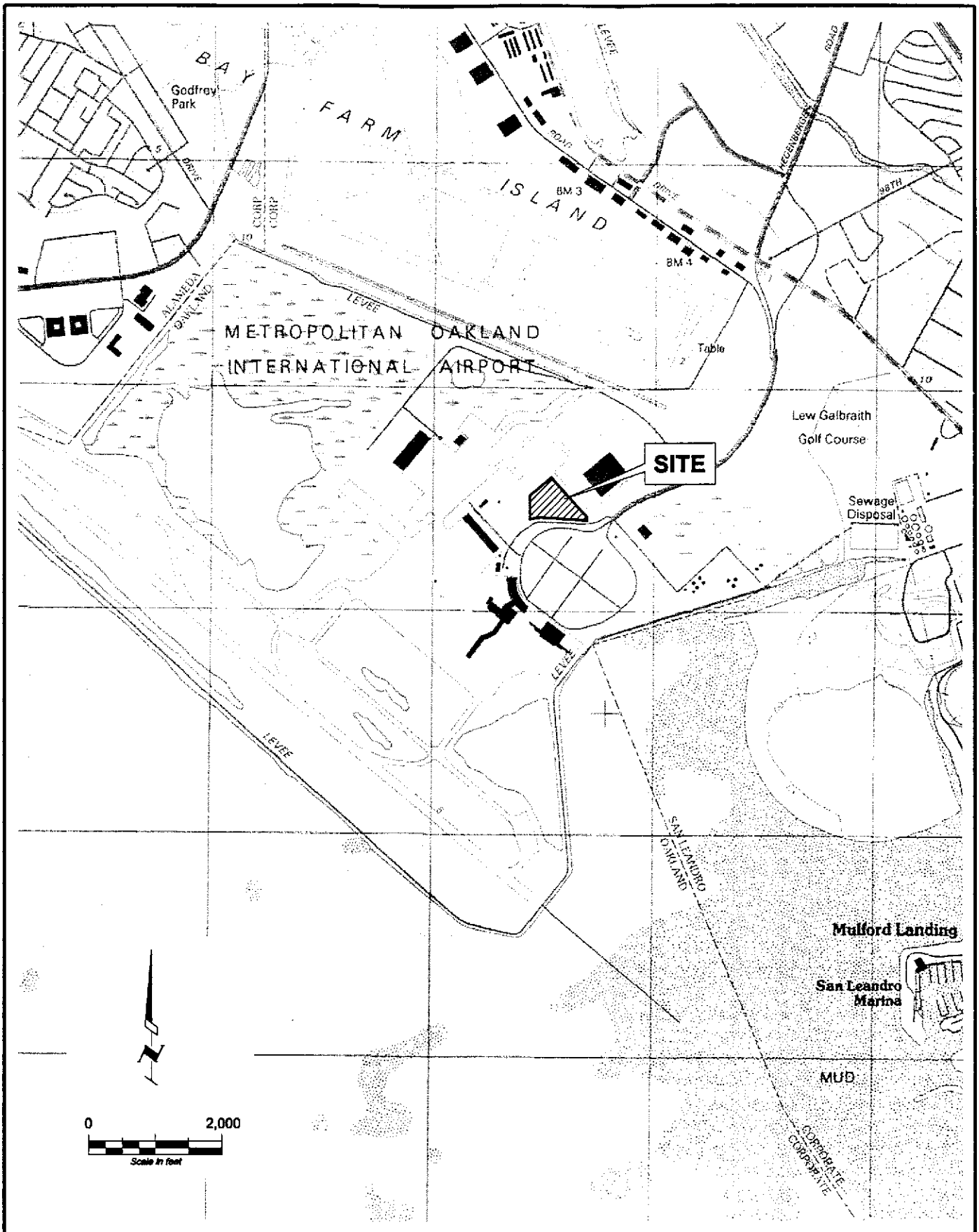
All concentrations are presented in milligrams per liter (mg/L)

Notes:

1 Milky water; ORC is visibly present in well.

2 Diesel odor

3 Well damaged in bus route repavement, unable to access



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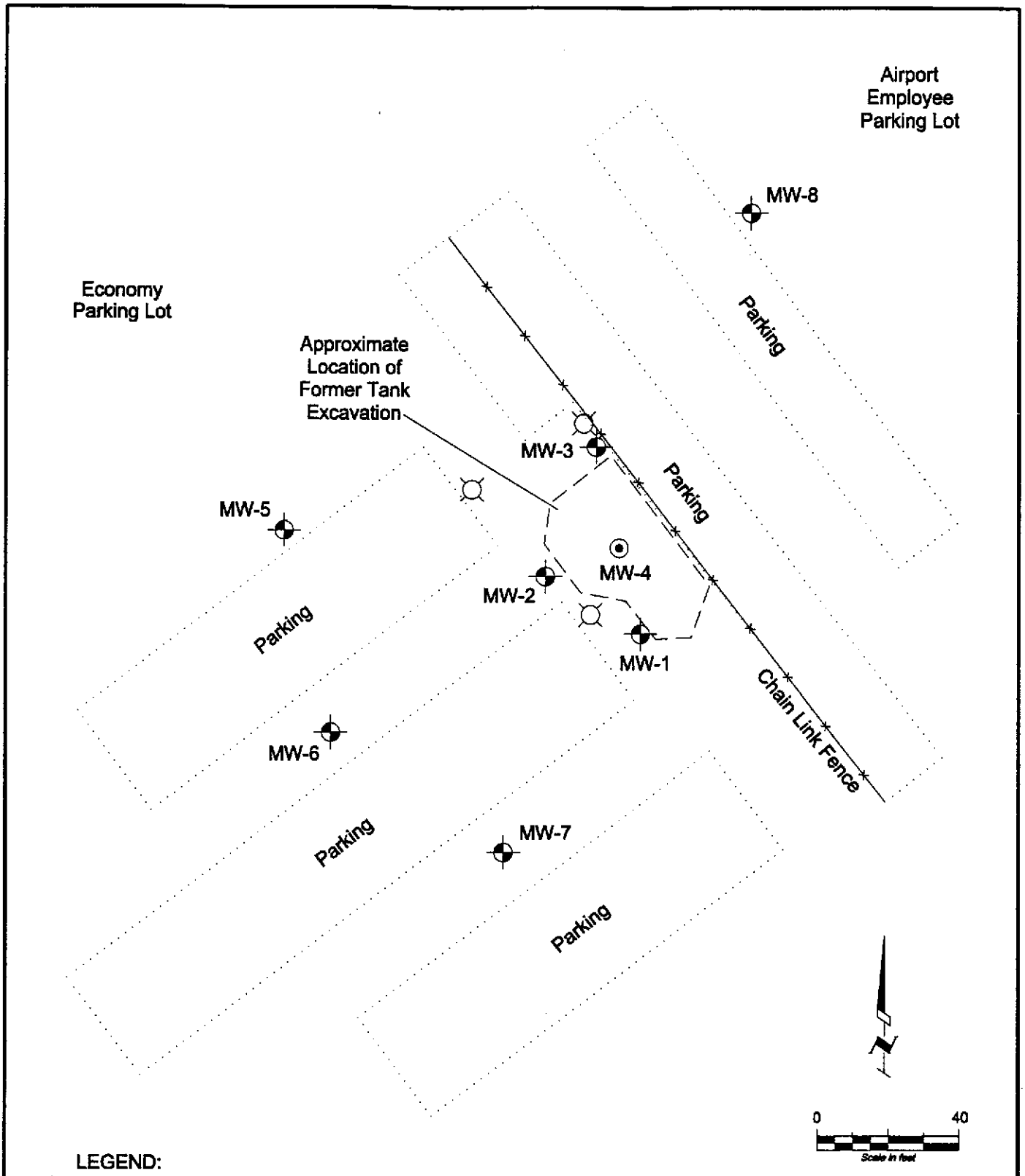
Harding Lawson Associates
Engineering and Environmental Services

Site Location Map

Economy Parking Lot - United Airlines Hanger Site
Oakland International Airport
1100 Airport Drive, Oakland, California

PLATE **1**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
AJW	43145.4	HDL	04/00	...



LEGEND:

- Monitoring Well (2-in. diameter)
- Remediation Well (4-in. diameter)
- Light Pole

Reference:
Map based on a figure prepared by
Innovative Technologies Solutions, Inc.

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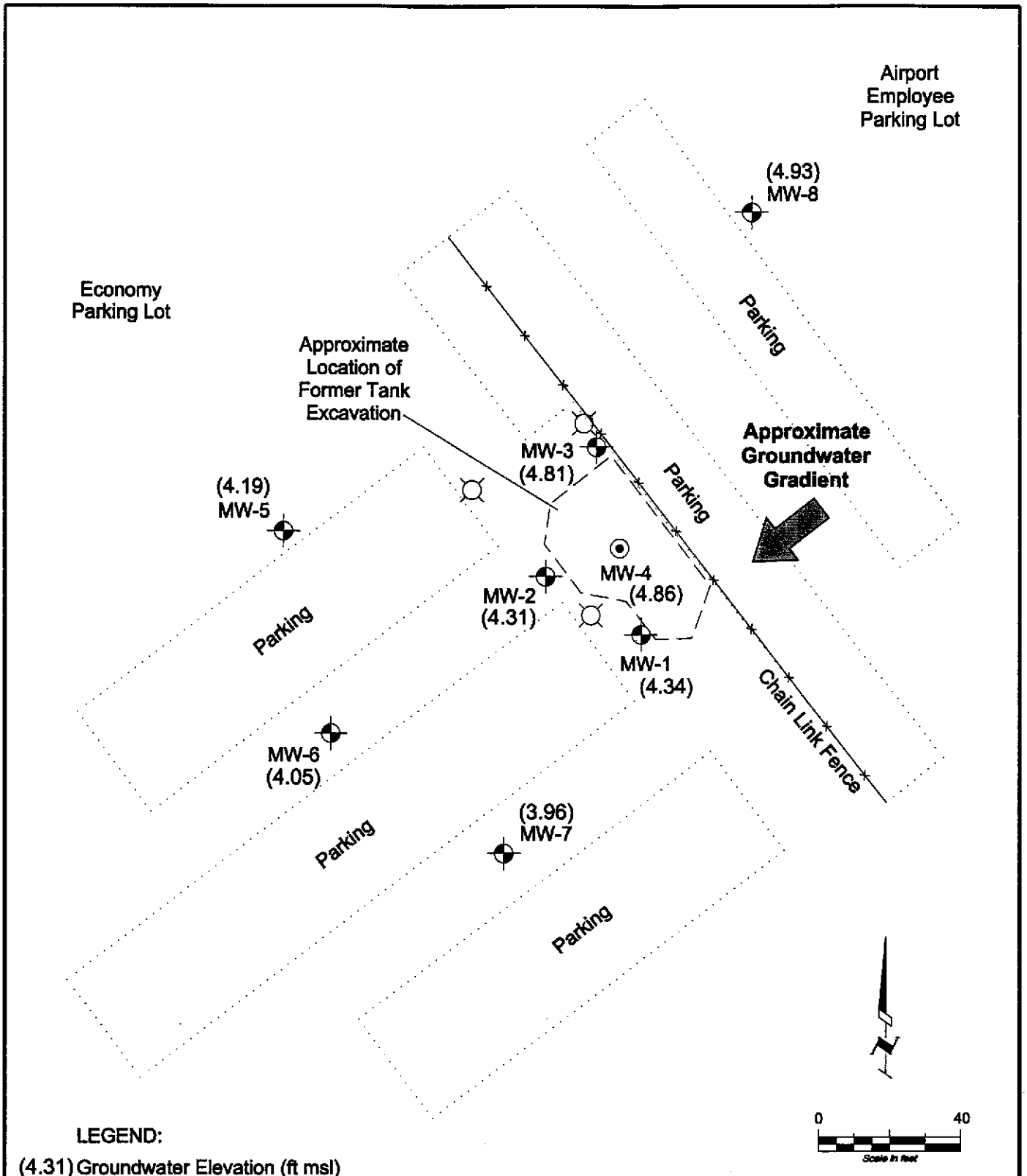
Harding Lawson Associates
Engineering and
Environmental Services

Site Plan
Economy Parking Lot - United Airlines Hanger Site
Oakland International Airport
1100 Airport Drive, Oakland, California

PLATE
2

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
AJW	43145.4	HDL	04/00	...



LEGEND:

(4.31) Groundwater Elevation (ft msl)

Monitoring Well (2-in. diameter)

Remediation Well (4-in. diameter)

Light Pole

Reference:
Map based on a figure prepared by
Innovative Technologies Solutions, Inc.

econpark0400.dwg

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Environmental Services

Groundwater Elevation Map
Economy Parking Lot - United Airlines Hanger Site
Oakland International Airport
1100 Airport Drive, Oakland, California

PLATE
3

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
AJW	43145.4	HDL	04/00	...

APPENDIX A

GROUNDWATER SAMPLING REPORTS

Harding Lawson Associates
Engineering and Environmental Services

GROUNDWATER SAMPLING FORM

Well Number: MW- 1

Well Type: [x] Monitor [ ] Extraction [ ] Other ___
[x] PVC [ ] St. Steel [ ] Other ___

Job Name: Port of Oakland - ORC Injection

Job Number: 43145.4

Date: 3/23/2000

Recorded By: _____ (Signature)

Sampled By: HDL (Initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
Total Depth of Casing (TD in ft BTOC): 13.09
Water Level Depth (WL in ft BTOC): 2.87
No.of Well Volumes to be purged (# 3

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

(13.09 - 2.87) x 2² x 3 x 0.0408 = 5.15 gals
TD (feet) WL (Feet) D (inches) # V Calculated Purge Volume

Field Parameter Measurement

Minutes	pH	Conductivity (uS)	Temp °C / °F	Turbidity (NTU)
Initial	8.48	9880	61.8	
1.5	9.63	8180	63.6	
3.5	9.65	6220	64.0	
5.5	9.23	5760	65.8	
Meter S/N	9510	9510	9510	

PURGE TIME

Purge Start: 1038
Purge Stop: 1052
Elapsed: 14

PURGE RATE

GPM: —
GPM: —

PURGE VOLUME

Volume: 5.5 gallons

Observations During Purging (Well Condition, Color, Odor):
clear at first w/ no odor

Discharge Water Disposal: [ ] Sanitary Sewer [ ] Storm Sewer [x] Other onsite drum

WELL SAMPLING

[x] Bailer - Type: teflon disposable

Sample Time: 1102

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	
	1 LA	TPH diesel and TPH motor oil	none	Sequoia	
	1 500mL Poly	Ferric Iron	HNO3	Sequoia	
	1 500mL Poly	Ferrous Iron, NO3, SO4, PO4	none	Sequoia	24 hour hold on Ferrous Iron

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- 2

Well Type: [x] Monitor [ ] Extraction [ ] Other ___
[x] PVC [ ] St. Steel [ ] Other ___

Job Name: Port of Oakland - ORC Injection

Job Number: 43145.4

Date: 3/23/2000

Recorded By: [signature] (Signature)

Sampled By: HDL (initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
Total Depth of Casing (TD in ft BTOC): 10.29
Water Level Depth (WL in ft BTOC): 2.27
No.of Well Volumes to be purged (# 3

PURGE METHOD

[x] Bailer - Type: teflon
[ ] Submersible - Type:
[ ] Other - Type:

PURGE VOLUME CALCULATION

(10.29 - 2.27) x 2 ² x 3 X 0.0408 = 4.72 gals
TD (feet) WL (Feet) D (inches) #V 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 (µS)	Temp. [x] °C [ ] °F	Turbidity (NTU)
Initial	7.07	4750	62.0	
1.5	7.04	2430	62.6	
3	6.75	2430	62.7	
4.5	6.75	3910	62.8	
Meter S/N	9510	9510	9510	

PURGE TIME

Purge Start: 0930
Purge Stop: 0937
Elapsed:

PURGE RATE

GPM: ~
GPM: —

PURGE VOLUME

Volume: 4.5 gallons

Observations During Purging (Well Condition, Color, Odor):
initially clear, slight fuel odor, turn brown w/ white floaters

Discharge Water Disposal: [ ] Sanitary Sewer [ ] Storm Sewer [x] Other onsite drum

WELL SAMPLING

[x] Bailer - Type: teflon disposable

Sample Time:

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	
	1 LA	TPH diesel and TPH motor oil	none	Sequoia	
	1 500mL Poly	Ferric Iron	HNO3	Sequoia	
	1 500mL Poly	Ferrous Iron, NO3, SO4, PO4	none	Sequoia	24 hour hold on Ferrous Iron

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 - ORC Injection

Job Number: 43145.4

Date: 3/23/2000

Recorded By: (Signature)

Sampled By: HDL (initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
Total Depth of Casing (TD in ft BTOC): 11.06
Water Level Depth (WL in ft BTOC): 2.55
No.of Well Volumes to be purged (# 3

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

(11.06 - 2.55) x 2 ² x 3 X 0.0408 = 4.17 gals

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

Field Parameter Measurement

Minutes	pH	Conductivity (µS)	Temp. °C / °F	Turbidity (NTU)
Initial	6.52	4160	60.2	
1.5	~~8.39~~	15540	60.2	
dry@ 3	8.44	15790	60.3	
4.5				
Meter S/N	9510	9510	9510	

PURGE TIME

Purge Start: 0710
Purge Stop: 0722
Elapsed:

PURGE RATE

GPM: ~
GPM: ~

PURGE VOLUME

Volume: dry@ 3 gallons

Observations During Purging (Well Condition, Color, Odor):
fuel odor, sheen

Discharge Water Disposal: [ ] Sanitary Sewer
[ ] Storm Sewer [x] Other onsite drum

WELL SAMPLING

[x] Bailer - Type: teflon disposable

Sample Time: 0730

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	
	1 LA	TPH diesel and TPH motor oil	none	Sequoia	
	1 500mL Poly	Ferric Iron	HNO3	Sequoia	
	1 500mL Poly	Ferrous Iron, NO3, SO4, PO4	none	Sequoia	24 hour hold on Ferrous Iron

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 - ORC Injection

Job Number: 43145.4

Date: 3/23/2000

Recorded By: (Signature)

Sampled By: HDL (initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 4
Total Depth of Casing (TD in ft BTOC): 9.97
Water Level Depth (WL in ft BTOC): 2.06
No.of Well Volumes to be purged (# 3

PURGE METHOD

[x] Bailer - Type: ~~teflon~~ PVC
[ ] 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

(9.97 - 2.06) x 4 ²x 3 X 0.0408 = 15.49 gals

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

Field Parameter Measurement

Minutes	pH	Conductivity (µS)	Temp. [x] °C [ ] °F	Turbidity (NTU)
Initial	8.35	2080	60.4	
5	8.69	5300	62.9	
10	9.20	3750	64.4	
16	9.01	3050	64.7	
Meter S/N	9510	9510	9510	

PURGE TIME

Purge Start: 1119
Purge Stop: 1125
Elapsed: 7

PURGE RATE

GPM:
GPM:

PURGE VOLUME

Volume: 16 gallons

Observations During Purging (Well Condition, Color, Odor):
clear & first, no odor, turn light brown, sheen

Discharge Water Disposal: [ ] Sanitary Sewer [ ] Storm Sewer [x] Other onsite drum

WELL SAMPLING

[x] Bailer - Type: teflon disposable

Sample Time:

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	
	1 LA	TPH diesel and TPH motor oil	none	Sequoia	
	1 500mL Poly	Ferric Iron	HNO3	Sequoia	
	1 500mL Poly	Ferrous Iron, NO3, SO4, PO4	none	Sequoia	24 hour hold on Ferrous Iron

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Dupl. Sample No.
MW-4 (1135)	DUP (1155)

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.

Harding Lawson Associates
Engineering and Environmental Services

GROUNDWATER SAMPLING FORM

Well Number: MW- 5

Well Type: [x] Monitor [ ] Extraction [ ] Other ___
[x] PVC [ ] St. Steel [ ] Other ___

Job Name: Port of Oakland - ORC Injection

Job Number: 43145.4

Recorded By: _____ (Signature)

Date: 3/23/2000

Sampled By: HDL (initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
Total Depth of Casing (TD in ft BTOC): 7.92
Water Level Depth (WL in ft BTOC): 1.60
No.of Well Volumes to be purged (# 3

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

(7.92 - 1.60) x 2² x 3 x 0.0408 = 3.09 gals
TD (feet) WL (Feet) D (inches) # V Calculated Purge Volume

Field Parameter Measurement

Minutes	pH	Conductivity (µS)	Temp. [x] °C [ ] °F	Turbidity (NTU)
Initial	7.85	2,910	64.3	
1	7.58	5150	65.4	
2	7.62	6010	65.3	
3.25	7.66	6490	65.7	
Meter S/N	9510	9510	9510	

PURGE TIME

Purge Start: 1000
Purge Stop: 1008
Elapsed: 8

PURGE RATE

GPM: ___
GPM: ___

PURGE VOLUME

Volume: ___ gallons

Observations During Purging (Well Condition, Color, Odor):
clear to brown, no odor

Discharge Water Disposal: [ ] Sanitary Sewer
[ ] Storm Sewer [x] Other onsite drum

WELL SAMPLING

[x] Bailer - Type: teflon disposable

Sample Time: 1018

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW- 5	3 VOA	TPH gas by 8015	HCL	Sequoia	
	3 VOA	8020/MTBE/BTEX	HCL	Sequoia	
	2 amber VOA	TOC by 415.1	HCL	Sequoia	
	1 LA	TPH diesel and TPH motor oil	none	Sequoia	
	1 500mL Poly	Ferric Iron	HNO3	Sequoia	
	1 500mL Poly	Ferrous Iron, NO3, SO4, PO4	none	Sequoia	24 hour hold on Ferrous Iron

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- 6

Well Type: [x] Monitor [ ] Extraction [ ] Other ___
[x] PVC [ ] St. Steel [ ] Other ___

Job Name: Port of Oakland - ORC Injection

Job Number: 43145.4

Recorded By: (Signature)

Date: 3/23/2000

Sampled By: HDL (initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
Total Depth of Casing (TD in ft BTOC): 5.13
Water Level Depth (WL in ft BTOC): 2.34
No.of Well Volumes to be purged (# 3

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

(5.13 - 2.34) x 2 ² X 3 X 0.0408 = 2.83 gals

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

Field Parameter Measurement

Minutes	pH	Conductivity (µS)	Temp [x] °C [ ] °F	Turbidity (NTU)
Initial	7.31	5,820	59.4	
1	7.42	4,800	62.8	
2	7.38	5830	63.3	
3	7.35	7800	62.7	
Meter S/N	9510	9510	9510	

PURGE TIME

Purge Start: 0858
Purge Stop: 0907
Elapsed: 9

PURGE RATE

GPM: ~3
GPM:

PURGE VOLUME

Volume: 2 gallons

Observations During Purging (Well Condition, Color, Odor):
no odor start clear finish
light brown

Discharge Water Disposal: [ ] Sanitary Sewer
[ ] Storm Sewer [x] Other onsite drum

WELL SAMPLING

[x] Bailer - Type: teflon disposable

Sample Time: 0917

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW- 6	3 VOA	TPH gas by 8015	HCL	Sequoia	
	3 VOA	8020/MTBE/BTEX	HCL	Sequoia	
	2 amber VOA	TOC by 415.1	HCL	Sequoia	
	1 LA	TPH diesel and TPH motor oil	none	Sequoia	
	1 500mL Poly	Ferric Iron	HNO3	Sequoia	
	1 500mL Poly	Ferrous Iron, NO3, SO4, PO4	none	Sequoia	24 hour hold on Ferrous Iron

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- 7

Well Type: [x] Monitor [ ] Extraction [ ] Other ___ ; [x] PVC [ ] St. Steel [ ] Other ___

Job Name: Port of Oakland - ORC Injection

Job Number: 43145.4

Date: 3/23/2000

Recorded By: (Signature)

Sampled By: HDL (Initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
Total Depth of Casing (TD in ft BTOC): 3.43
Water Level Depth (WL in ft BTOC): 1.90
No.of Well Volumes to be purged (# 3

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

(3.43 - 1.90) x 2² x 3 x 0.0408 = 3.20 gals

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

Field Parameter Measurement

Minutes	pH	Conductivity (µS)	Temp. [x] °C [ ] °F	Turbidity (NTU)
Initial	7.81	1,700	59.0	
1.	7.50	1770	62.1	
2	6.98	4,140	61.9	
3.5	7.14	3770	61.5	
Meter S/N	9510	9510	9510	

PURGE TIME

Purge Start: 0826
Purge Stop: 0835
Elapsed: 9

PURGE RATE

GPM: —
GPM: —

PURGE VOLUME

Volume: 3.5 gallons

Observations During Purging (Well Condition, Color, Odor):
no odor, clear @ first
turn yellow brown

Discharge Water Disposal: [ ] Sanitary Sewer [ ] Storm Sewer [x] Other onsite drum

WELL SAMPLING

[x] Bailer - Type: teflon disposable

Sample Time: 0845

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW- 7	3 VOA	TPH gas by 8015	HCL	Sequoia	
	3 VOA	8020/MTBE/BTEX	HCL	Sequoia	
	2 amber VOA	TOC by 415.1	HCL	Sequoia	
	1 LA	TPH diesel and TPH motor oil	none	Sequoia	
	1 500mL Poly	Ferric Iron	HNO3	Sequoia	
	1 500mL Poly	Ferrous Iron, NO3, SO4, PO4	none	Sequoia	24 hour hold on Ferrous Iron

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- 8

Well Type: [x] Monitor [ ] Extraction [ ] Other ___ ; [x] PVC [ ] St. Steel [ ] Other ___

Job Name: Port of Oakland - ORC Injection

Job Number: 43145.4

Recorded By: (Signature)

Date: 3/23/2000

Sampled By: HDL (initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
Total Depth of Casing (TD in ft BTOC): 11.02
Water Level Depth (WL in ft BTOC): 2.63
No.of Well Volumes to be purged (# 3

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

(11.02 - 2.63) x 2 x 3 x 0.0408 = 4.1 gals

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

Field Parameter Measurement

Minutes	pH	Conductivity (µS)	Temp. °C / °F	Turbidity (NTU)
Initial	6.87	10,000	59.6	
1.5	9	9,450	61.3	
3	6.92	11,490	61.3	
4.5	6.95	11,530	60.9	
Meter S/N	9510	9510	9510	

PURGE TIME

Purge Start: 0749
Purge Stop: 0759
Elapsed: 10

PURGE RATE

GPM: ___
GPM: ___

PURGE VOLUME

Volume: 4.5 gallons

Observations During Purging (Well Condition, Color, Odor):
clear, no odor turns murky brown.

Discharge Water Disposal: [ ] Sanitary Sewer [ ] Storm Sewer [x] Other onsite drum

WELL SAMPLING

[x] Bailer - Type: teflon disposable

Sample Time: 0810

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW- 8	3 VOA	TPH gas by 8015	HCL	Sequoia	
	3 VOA	8020/MTBE/BTEX	HCL	Sequoia	
	2 amber VOA	TOC by 415.1	HCL	Sequoia	
	1 LA	TPH diesel and TPH motor oil	none	Sequoia	
	1 500mL Poly	Ferric Iron	HNO3	Sequoia	
	1 500mL Poly	Ferrous Iron, NO3, SO4, PO4	none	Sequoia	24 hour hold on Ferrous Iron

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- 1

Well Type: [x] Monitor [ ] Extraction [ ] Other ___ ; [x] PVC [ ] St. Steel [ ] Other ___

Job Name: Port of Oakland - ORC Injection

Job Number: 43145.5

Date: 4/25/00

Recorded By: Heather L Lee (Signature)

Sampled By: HDL (initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
Total Depth of Casing (TD in ft BTOC): 13.09
Water Level Depth (WL in ft BTOC): 2.67
No.of Well Volumes to be purged (# 3

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

(13.09 - 2.67) x 2 ² x 3 X 0.0408 = 5.1 gals
TD (feet) WL (Feet) D (inches) # V Calculated Purge Volume

Field Parameter Measurement

Minutes	pH	Conductivity (µS)	Temp, [x] °C [ ] °F	Turbidity (NTU)
Initial	8.11	5300	69.1	
1.5	8.60	7080	67.0	
3.5	8.66	6210	66.0	
5.5	8.69	5460	67.7	
Meter S/N	9510	9510	9510	

PURGE TIME

Purge Start: 0921
Purge Stop: 0936
Elapsed: 15

PURGE RATE

GPM: —
GPM: —

PURGE VOLUME

Volume: _____ gallons

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

Discharge Water Disposal: [ ] Sanitary Sewer [ ] Storm Sewer [x] Other onsite drum

WELL SAMPLING

[x] Bailer - Type: teflon disposable

Sample Time: 0942

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW- 1	3 VOA	TPH gas by 8015	HCL	Sequoia	

QUALITY CONTROL SAMPLES

Duplicate Samples	
Original Sample No.	Dupl. Sample No.

Blank Samples	
Type	Sample No.

Other Samples	
Type	Sample No.

Engineering and Environmental Services

Well Number: MW- 2

Well Type: [x] Monitor [ ] Extraction [ ] Other ___ [x] PVC [ ] St. Steel [ ] Other ___

Job Name: Port of Oakland - ORC Injection

Job Number: 43145.5

Recorded By: Heather Dale (Signature)

Date: 4/25/00

Sampled By: HDL (initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
Total Depth of Casing (TD in ft BTOC): 10.89
Water Level Depth (WL in ft BTOC): 2.34
No.of Well Volumes to be purged (# 3

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

10.89 (TD feet) − 2.34 (WL Feet) = 8.55 × 2² (D inches) × 3 (# V) × 0.0408 = 4.18 gals (Calculated Purge Volume)

Field Parameter Measurement

Minutes	pH	Conductivity (µS)	Temp. °C / °F	Turbidity (NTU)
Initial	7.32	3090	63.6	
1.5	6.78	7900	65.5	
3	~~7.64~~ HDL 7.30	2420	67.0	
4.5	7.26	4490	66.3	
Meter S/N	9510	9510	9510	

PURGE TIME

Purge Start: 0937
Purge Stop: 0844
Elapsed: 7

PURGE RATE

GPM: —
GPM: —

PURGE VOLUME

Volume: 4.5 gallons

Observations During Purging (Well Condition, Color, Odor):
clear to light brown, slight fuel odor

Discharge Water Disposal: [ ] Sanitary Sewer [ ] Storm Sewer [x] Other onsite drum

WELL SAMPLING

[x] Bailer - Type: teflon disposable

Sample Time:

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW- 2	3 VOA	TPH gas by 8015	HCL	Sequoia	

QUALITY CONTROL SAMPLES

Duplicate Samples	
Original Sample No.	Dupl. Sample No.

Blank Samples	
Type	Sample No.

Other Samples	
Type	Sample No.

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 - ORC Injection

Job Number: 43145

Recorded By: Heather Lee (Signature)

Date: 4/25/00

Sampled By: HDL (initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
Total Depth of Casing (TD in ft BTOC): 11.06
Water Level Depth (WL in ft BTOC): 2.90
No.of Well Volumes to be purged (# 3

PURGE METHOD

[x] Bailer - Type: teflon
[ ] Submersible - Type:
[ ] Other - Type:

PURGE VOLUME CALCULATION

(11.06 - 2.90) x 2 ² x 3 X 0.0408 = 3.99 gals

TD (feet) WL (Feet) D (inches) #V 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 (µS)	Temp. [x] °C [ ] °F	Turbidity (NTU)
Initial	7.95	2640	60.6	
1.5	8.35	12500	60.5	
dry 2.5	8.39	12550	61.0	
4				
Meter S/N	9510	9510	9510	

PURGE TIME

Purge Start: 0720
Purge Stop: 0730
Elapsed: 10

PURGE RATE

Purge Start: GPM: -
Purge Stop: GPM: -

PURGE VOLUME

Volume: drayed 2.5 gallons

Observations During Purging (Well Condition, Color, Odor):
Sheen, light grey, fuel odor

Discharge Water Disposal: [ ] Sanitary Sewer [ ] Storm Sewer [x] Other onsite drum

WELL SAMPLING

[x] Bailer - Type: teflon disposable

Sample Time: 0735

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-3	3 VOA	TPH gas by 8015	HCL	Sequoia	
# MW-3a (1045)	1 LA	TPH d, mo, ~~jet A~~ by 8015	none	↓	

QUALITY CONTROL SAMPLES

Duplicate Samples	
Original Sample No.	Dupl. Sample No.

Blank Samples	
Type	Sample No.

Other Samples	
Type	Sample No.

Engineering and Environmental Services

Well Number: MW-4

Well Type: [x] Monitor [ ] Extraction [ ] Other ___ [x] PVC [ ] St. Steel [ ] Other ___

Job Name: Port of Oakland - ORC Injection

Job Number: 43145.5

Recorded By: Heath Dee (Signature)

Date: 4/25/00

Sampled By: HDL (initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 4

Total Depth of Casing (TD in ft BTOC): 9.97

Water Level Depth (WL in ft BTOC): 2.44

No.of Well Volumes to be purged (# 3

PURGE METHOD

[x] Bailer - Type: ~~teflon~~ SDC PVC

[ ] 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

(9.97 - 2.44) x 4 ² X 3 X 0.0408 = 14.74 gals

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

Field Parameter Measurement

Minutes	pH	Conductivity (µS)	Temp. [x] °C [ ] °F	Turbidity (NTU)
Initial	8.14	2240	70.5	
5	8.09	3050	69.0	
10	8.09	3560	68.2	
15	8.09	3610	67.7	
Meter S/N	9510	9510	9510	

PURGE TIME

Purge Start: 0957

Purge Stop: 0959

Elapsed: 8

PURGE RATE

GPM: ~

GPM: ~

PURGE VOLUME

Volume: 15 gallons

Observations During Purging (Well Condition, Color, Odor):

clear, fuel odor

Discharge Water Disposal: [ ] Sanitary Sewer [ ] Storm Sewer [x] Other onsite drum

WELL SAMPLING

[x] Bailer - Type: teflon disposable

Sample Time: 1002

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-4	3 VOA	TPH gas by 8015	HCL	Sequoia	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Dupl. Sample No.
MW-4 (1002)	~~ALW~~ HDL DUP (1015)

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.

Engineering and Environmental Services

GROUNDWATER SAMPLING FORM

Well Number: MW-5

Well Type: [x] Monitor [ ] Extraction [ ] Other ___ ; [x] PVC [ ] St. Steel [ ] Other ___

Job Name: Port of Oakland - ORC Injection

Job Number: 43145.5

Date: 4/25/00

Recorded By: Heather O'Lee (Signature)

Sampled By: HDL (Initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
Total Depth of Casing (TD in ft BTOC): 7.92
Water Level Depth (WL in ft BTOC): 1.89
No.of Well Volumes to be purged (# 3

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

(7.92 TD (feet) − 1.89 WL (Feet)) × 2 D (inches)² × 3 #V × 0.0408 = 2.96 gals Calculated Purge Volume

PURGE TIME

Purge Start: 1020
Purge Stop: 1027
Elapsed: 7

PURGE RATE

Purge Start: GPM: ?
Purge Stop: GPM: ?

PURGE VOLUME

Volume: 3 gallons

Field Parameter Measurement

Minutes	pH	Conductivity (µS)	Temp [ ]°C [x]°F	Turbidity (NTU)
Initial	8.42	1858	73.3	
1	8.45	870	72.5	
2	8.48	1047	72.0	
3	8.40	1093	70.9	
Meter S/N	9510	9510	9510	

Observations During Purging (Well Condition, Color, Odor):
clear, no odor
become light brown.

Discharge Water Disposal: [ ] Sanitary Sewer [ ] Storm Sewer [x] Other onsite drum

WELL SAMPLING

[x] Bailer - Type: teflon disposable

Sample Time: 1033

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-5	3 VOA	TPH gas by 8015	HCL	Sequoia	

QUALITY CONTROL SAMPLES

Duplicate Samples	
Original Sample No.	Dupl. Sample No.

Blank Samples	
Type	Sample No.

Other Samples	
Type	Sample No.

Engineering and Environmental Services

Well Number: MW- 6

Well Type: [x] Monitor [ ] Extraction [ ] Other ___ [x] PVC [ ] St. Steel [ ] Other ___

Job Name: Port of Oakland - ORC Injection

Job Number: 43145.5

Date: 4/25/00

Recorded By: Heather D'Jee (Signature)

Sampled By: HDL (initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2

Total Depth of Casing (TD in ft BTOC): 8.13

Water Level Depth (WL in ft BTOC): 2.50

No.of Well Volumes to be purged (# 3

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

(8.13 - 2.50) x 2 ² x 3 x 0.0408 = 2.75 gals

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

Field Parameter Measurement

Minutes	pH	Conductivity (µS)	Temp. [x] °C [ ] °F	Turbidity (NTU)
Initial	7.56	808	60.3	
1	7.92	544	64.2	
2	7.96	491	65.1	
3	7.87	515	63.4	
Meter S/N	9510	9510	9510	

PURGE TIME

Purge Start: 0749

Purge Stop: 0755

Elapsed: 07

PURGE RATE

Purge Start: GPM: ___

Purge Stop: GPM: ___

PURGE VOLUME

Volume: 3 gallons

Observations During Purging (Well Condition, Color, Odor):

yellow, clear, no odor

Discharge Water Disposal: [ ] Sanitary Sewer [ ] Storm Sewer [x] Other onsite drum

WELL SAMPLING

[x] Bailer - Type: teflon disposable

Sample Time: 0830

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW- 6	3 VOA	TPH gas by 8015	HCL	Sequoia	

QUALITY CONTROL SAMPLES

Duplicate Samples	
Original Sample No.	Dupl. Sample No.

Blank Samples	
Type	Sample No.

Other Samples	
Type	Sample No.

Engineering and Environmental Services

Well Number: MW- 7

Well Type: [x] Monitor [ ] Extraction [ ] Other ___
[x] PVC [ ] St. Steel [ ] Other ___

Job Name: Port of Oakland - ORC Injection

Job Number: 43145.5

Recorded By: Heather Lee (Signature)

Date: 4/25/00

Sampled By: HDL (initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2
Total Depth of Casing (TD in ft BTOC): 8.43
Water Level Depth (WL in ft BTOC): 2.16
No.of Well Volumes to be purged (# 3

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

(8.43 - 2.16) x 2 ² x 3 X 0.0408 = 3.06 gals

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

Field Parameter Measurement

Minutes	pH	Conductivity (µS)	Temp. [x] °C [ ] °F	Turbidity (NTU)
Initial	8.36	1080	59.5	
1	7.66	2440	64.5	
2.25	7.57	3080	64.7	
3.5	7.60	3580	62.6	
Meter S/N	9510	9510	9510	

PURGE TIME

Purge Start: 0811
Purge Stop: 0820
Elapsed: 9

PURGE RATE

GPM: ~
GPM: —

PURGE VOLUME

Volume: 3.5 gallons

Observations During Purging (Well Condition, Color, Odor):
no odor, clear to light brown w/ bail

Discharge Water Disposal: [ ] Sanitary Sewer [ ] Storm Sewer [x] Other onsite drum

WELL SAMPLING

[x] Bailer - Type: teflon disposable

Sample Time:

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW- 7	3 VOA	TPH gas by 8015	HCL	Sequoia	

QUALITY CONTROL SAMPLES

Duplicate Samples	
Original Sample No.	Dupl. Sample No.

Blank Samples	
Type	Sample No.

Other Samples	
Type	Sample No.

Engineering and Environmental Services

Well Number: MW- 8

Well Type: [x] Monitor [ ] Extraction [ ] Other ___ ; [x] PVC [ ] St. Steel [ ] Other ___

Job Name: Port of Oakland - ORC Injection

Job Number: 43145.5

Date: 4/25/00

Recorded By: [signature] (Signature)

Sampled By: HDL (initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches): 2

Total Depth of Casing (TD in ft BTOC): 11.02

Water Level Depth (WL in ft BTOC): 3.02

No.of Well Volumes to be purged (# 3

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

(11.02 - 3.02) x 2 ² x 3 X 0.0408 = 3.91 gals

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

Field Parameter Measurement

Minutes	pH	Conductivity (µS)	Temp. [ ]°C [x]°F	Turbidity (NTU)
Initial	7.48	9070	67.6	
1.5	7.31	12210	67.8	
3	7.34	13360	67.5	
4	7.39	14320	67.4	
Meter S/N	9510	9510	9510	

PURGE TIME

Purge Start: 0900

Purge Stop: 0907

Elapsed: 7

PURGE RATE

GPM: ~

GPM: ~

PURGE VOLUME

Volume: 4 gallons

Observations During Purging (Well Condition, Color, Odor):

no odor, clear becomes light grey

Discharge Water Disposal: [ ] Sanitary Sewer [ ] Storm Sewer [x] Other onsite drum

WELL SAMPLING

[x] Bailer - Type: teflon disposable

Sample Time: 0912

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
MW-8	3 VOA	TPH gas by 8015	HCL	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
Walnut Creek, CA 94598
(925) 988-9600
FAX (925) 988-9673
www.sequoialabs.com

19 April, 2000

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

RE: Port of Oakland
Sequoia Report: W003554

Enclosed are the results of analyses for samples received by the laboratory on 23-Mar-00 13:40. 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
383 Fourth Street
Oakland CA, 94607

Project: Port of Oakland
Project Number: 43145.4
Project Manager: Mike Brink

Reported:
19-Apr-00 17:29

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-3	W003554-01	Water	23-Mar-00 00:00	23-Mar-00 13:40
MW-8	W003554-02	Water	23-Mar-00 00:00	23-Mar-00 13:40
MW-7	W003554-03	Water	23-Mar-00 00:00	23-Mar-00 13:40
MW-6	W003554-04	Water	23-Mar-00 00:00	23-Mar-00 13:40
MW-2	W003554-05	Water	23-Mar-00 00:00	23-Mar-00 13:40
MW-5	W003554-06	Water	23-Mar-00 00:00	23-Mar-00 13:40
MW-1	W003554-07	Water	23-Mar-00 00:00	23-Mar-00 13:40
MW-4	W003554-08	Water	23-Mar-00 00:00	23-Mar-00 13:40
DUP	W003554-09	Water	23-Mar-00 00:00	23-Mar-00 13:40
MW-3A	W003554-10	Water	23-Mar-00 12:05	23-Mar-00 13:40

Dimple Sharma, Project Manager

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

CHAIN OF CUSTODY FORM

WO04564

No 2499

Lab: Sequoia

Samplers: Heather Lee

Job Number: 43145.5

Name/Location: Port of Oakland - Economy Parking Lot

Project Manager: Steve Osborne

Recorder: Heather D Lee (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	# CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCL	Ice	SAMPLE NUMBER OR LAB NUMBER	DATE: Yr	Mo	Day	Time	STATION DESCRIPTION/ NOTES
	X							3	X	MW-3	00	04	25	0735	
	X							3	X	MW-6	00	04	25	0800	
	X							3	X	MW-7	00	04	25	0825	
	X							3	X	MW-2	00	04	25	0850	
	X							3	X	MW-8	00	04	25	0912	
	X							3	X	MW-1	00	04	25	0942	
	X							3	X	MW-4	00	04	25	1002	
	X							3	X	DUP	00	04	25	1015	
	X							3	X	MW-5	00	04	25	1033	
	X				1				X	MW-3A	00	04	25	1045	

ANALYSIS REQUESTED

EPA 8010	EPA 8020	EPA 8260	EPA 8270	METALS	EPA 8015M/TPHG	EPA 8020/BTEX	EPA 8015M/TPHd,o	TPH_{mo}, TPH; (A)
					X			
					X			
					X			
					X			
					X			
					X			
					XX			
					X			
					X			
							X	

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

MISCELLANEOUS

7 day TAT

Bill directly to HLA

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
Heather D Lee	Will H	4-25-00 17:40
RELINQUISHED BY: (Signature) Will H 4-25-00 1730	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME 4/25/00 17:30

METHOD OF SHIPMENT

SAMPLE CONDITION WHEN RECEIVED BY THE LABORATORY

Laboratory Copy — Project Office Copy — Field or Other Copy

Sequoia Analytical

404 N. Wiget Lane
Walnut Creek, CA 94598
(925) 988-9600
FAX (925) 988-9673
www.sequoialabs.com

Harding-Lawson Associates - Oakland 383 Fourth Street Oakland CA, 94607	Project: Port of Oakland Project Number: 43145.5 Project Manager: Steve Osborne	**Reported:** 15-May-00 13:31

Notes and Definitions

D-02	Chromatogram Pattern: Unidentified Hydrocarbons C9-C40.
D-03	Chromatogram Pattern: Unidentified Hydrocarbons C9-C17.
D-07	Surrogate out of control limits because of peak coelution with the sample.
D-18	Chromatogram Pattern: Diesel C9-C24 + Unidentified Hydrocarbons >C16
P-01	Chromatogram Pattern: Gasoline C6-C12
P-03	Chromatogram Pattern: Unidentified Hydrocarbons C6-C12
P-07	Chromatogram Pattern: Gasoline C6-C12 + Unidentified Hydrocarbons >C10
Q-07	The RPD value for this QC sample is above the established control limit. Review of associated QC indicates the high RPD does not represent an out-of-control condition for the batch.
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

Sequoia Analytical

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.5	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	15-May-00 13:31

Custom Extractable Hydrocarbons 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 0E08017 - EPA 3510B										
Blank (0E08017-BLK1)				Prepared: 08-May-00 Analyzed: 13-May-00						
Jet-A (C9-C17)	ND	50	ug/l							
Motor Oil (C16-C36)	ND	250	"							
Diesel Range Hydrocarbons	ND	50	"							
Diesel Range Hydrocarbons	ND	50	"							
Surrogate: n-Pentacosane	*26.0*		"	*33.3*		*78.1*	*50-150*			
Surrogate: n-Pentacosane	*26.0*		"	*33.3*		*78.1*	*50-150*			
LCS (0E08017-BS1)				Prepared: 08-May-00 Analyzed: 13-May-00						
Diesel Range Hydrocarbons	323	50	ug/l	500		64.6	60-140			
Diesel Range Hydrocarbons	323	50	"	500		64.6	60-140			
Surrogate: n-Pentacosane	*30.3*		"	*33.3*		*91.0*	*50-150*			
Surrogate: n-Pentacosane	*30.3*		"	*33.3*		*91.0*	*50-150*			
LCS Dup (0E08017-BSD1)				Prepared: 08-May-00 Analyzed: 13-May-00						
Diesel Range Hydrocarbons	392	50	ug/l	500		78.4	60-140	19.3	50	
Diesel Range Hydrocarbons	392	50	"	500		78.4	60-140	19.3	50	
Surrogate: n-Pentacosane	*32.7*		"	*33.3*		*98.2*	*50-150*			
Surrogate: n-Pentacosane	*32.7*		"	*33.3*		*98.2*	*50-150*			

Sequoia Analytical

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.5	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	15-May-00 13:31

Total Purgeable Hydrocarbons 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 0E04003 - EPA 5030B [P/T]										
Matrix Spike Dup (0E04003-MSD1)	**Source: W004541-09**			Prepared & Analyzed: 04-May-00						
Benzene	19.3	0.50	ug/l	20.0	ND	96.5	70-130	8.91	20	
Toluene	19.8	0.50	"	20.0	ND	99.0	70-130	7.30	20	
Ethylbenzene	21.3	0.50	"	20.0	ND	106	70-130	1.42	20	
Xylenes (total)	61.2	0.50	"	60.0	ND	102	70-130	0.656	20	
Surrogate: a,a,a-Trifluorotoluene	*28.3*		"	*30.0*		*94.3*	*70-130*			

Sequoia Analytical

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.5	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	15-May-00 13:31

Total Purgeable Hydrocarbons 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 0E02001 - EPA 5030B [P/T]										
Matrix Spike Dup (0E02001-MSD1)	**Source: W004505-01**			Prepared & Analyzed: 02-May-00						
Benzene	17.7	0.50	ug/l	20.0	ND	88.5	70-130	1.71	20	
Toluene	18.8	0.50	"	20.0	ND	94.0	70-130	2.15	20	
Ethylbenzene	20.6	0.50	"	20.0	ND	103	70-130	7.04	20	
Xylenes (total)	61.8	0.50	"	60.0	ND	103	70-130	2.79	20	
Surrogate: a,a,a-Trifluorotoluene	*25.8*		"	*30.0*		*86.0*	*70-130*			
Batch 0E04003 - EPA 5030B [P/T]										
Blank (0E04003-BLK1)				Prepared & Analyzed: 04-May-00						
Purgeable Hydrocarbons	ND	50	ug/l							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Surrogate: a,a,a-Trifluorotoluene	*29.6*		"	*30.0*		*98.7*	*70-130*			
LCS (0E04003-BS1)				Prepared & Analyzed: 04-May-00						
Benzene	21.3	0.50	ug/l	20.0		106	70-130			
Toluene	21.7	0.50	"	20.0		109	70-130			
Ethylbenzene	21.9	0.50	"	20.0		109	70-130			
Xylenes (total)	62.8	0.50	"	60.0		105	70-130			
Surrogate: a,a,a-Trifluorotoluene	*29.2*		"	*30.0*		*97.3*	*70-130*			
Matrix Spike (0E04003-MS1)	**Source: W004541-09**			Prepared & Analyzed: 04-May-00						
Benzene	21.1	0.50	ug/l	20.0	ND	106	70-130			
Toluene	21.3	0.50	"	20.0	ND	106	70-130			
Ethylbenzene	21.0	0.50	"	20.0	ND	105	70-130			
Xylenes (total)	60.8	0.50	"	60.0	ND	101	70-130			
Surrogate: a,a,a-Trifluorotoluene	*27.6*		"	*30.0*		*92.0*	*70-130*			

Sequoia Analytical

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.5	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	15-May-00 13:31

Total Purgeable Hydrocarbons 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 0E01001 - EPA 5030B [P/T]										
Matrix Spike Dup (0E01001-MSD1)	**Source: W004511-01RE1**			Prepared & Analyzed: 01-May-00						**Q-07**
Benzene	17.0	0.50	ug/l	20.0	ND	85.0	70-130	7.37	20	
Toluene	18.3	0.50	"	20.0	ND	91.5	70-130	6.86	20	
Ethylbenzene	17.8	0.50	"	20.0	ND	89.0	70-130	22.0	20	
Xylenes (total)	59.0	0.50	"	60.0	ND	98.3	70-130	9.52	20	
Surrogate: a,a,a-Trifluorotoluene	*25.7*		*"*	*30.0*		*85.7*	*70-130*			
Batch 0E02001 - EPA 5030B [P/T]										
Blank (0E02001-BLK1)				Prepared & Analyzed: 02-May-00						
Purgeable Hydrocarbons	ND	50	ug/l							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Surrogate: a,a,a-Trifluorotoluene	*30.5*		*"*	*30.0*		*102*	*70-130*			
LCS (0E02001-BS1)				Prepared & Analyzed: 02-May-00						
Benzene	17.8	0.50	ug/l	20.0		89.0	70-130			
Toluene	18.9	0.50	"	20.0		94.5	70-130			
Ethylbenzene	19.4	0.50	"	20.0		97.0	70-130			
Xylenes (total)	62.5	0.50	"	60.0		104	70-130			
Surrogate: a,a,a-Trifluorotoluene	*27.4*		*"*	*30.0*		*91.3*	*70-130*			
Matrix Spike (0E02001-MS1)	**Source: W004505-01**			Prepared & Analyzed: 02-May-00						
Benzene	17.4	0.50	ug/l	20.0	ND	87.0	70-130			
Toluene	18.4	0.50	"	20.0	ND	92.0	70-130			
Ethylbenzene	19.2	0.50	"	20.0	ND	96.0	70-130			
Xylenes (total)	60.1	0.50	"	60.0	ND	100	70-130			
Surrogate: a,a,a-Trifluorotoluene	*25.9*		*"*	*30.0*		*86.3*	*70-130*			

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.5	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	15-May-00 13:31

Total Purgeable Hydrocarbons 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 0E01001 - EPA 5030B [P/T]										
Blank (0E01001-BLK1)				Prepared & Analyzed: 01-May-00						
Purgeable Hydrocarbons	ND	50	ug/l							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Surrogate: a,a,a-Trifluorotoluene	*31.4*		"	*30.0*		*105*	*70-130*			
LCS (0E01001-BS1)				Prepared & Analyzed: 01-May-00						
Benzene	17.0	0.50	ug/l	20.0		85.0	70-130			
Toluene	18.1	0.50	"	20.0		90.5	70-130			
Ethylbenzene	18.0	0.50	"	20.0		90.0	70-130			
Xylenes (total)	58.8	0.50	"	60.0		98.0	70-130			
Surrogate: a,a,a-Trifluorotoluene	*26.0*		"	*30.0*		*86.7*	*70-130*			
LCS Dup (0E01001-BSD1)				Prepared & Analyzed: 01-May-00						
Benzene	17.8	0.50	ug/l	20.0		89.0	70-130	4.60	20	
Toluene	18.9	0.50	"	20.0		94.5	70-130	4.32	20	
Ethylbenzene	21.2	0.50	"	20.0		106	70-130	16.3	20	
Xylenes (total)	62.4	0.50	"	60.0		104	70-130	5.94	20	
Surrogate: a,a,a-Trifluorotoluene	*26.4*		"	*30.0*		*88.0*	*70-130*			
Matrix Spike (0E01001-MS1)				**Source: W004511-01RE1** Prepared & Analyzed: 01-May-00						
Benzene	18.3	0.50	ug/l	20.0	ND	91.5	70-130			
Toluene	19.6	0.50	"	20.0	ND	98.0	70-130			
Ethylbenzene	22.2	0.50	"	20.0	ND	111	70-130			
Xylenes (total)	64.9	0.50	"	60.0	ND	108	70-130			
Surrogate: a,a,a-Trifluorotoluene	*26.8*		"	*30.0*		*89.3*	*70-130*			

Sequoia Analytical

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Walnut Creek, CA 94598
(925) 988-9600
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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.5	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	15-May-00 13:31

Custom Extractable Hydrocarbons by DHS LUFT

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-3A (W004564-10) Water	**Sampled: 25-Apr-00 10:45**		**Received: 25-Apr-00 17:30**						
Jet-A (C9-C17)	**7100**	50	ug/l	1	0E08017	08-May-00	13-May-00	DHS LUFT	D-03
Diesel Range Hydrocarbons	**6200**	50	"	"	"	"	"	"	D-18
Surrogate: n-Pentacosane		*180 %*	*50-150*		"	"	"	"	*D-07*
Motor Oil (C16-C36)	**4600**	250	"	"	"	"	"	"	D-02

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.5	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	15-May-00 13:31

Total Purgeable Hydrocarbons by DHS LUFT

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MUP (W004564-08) Water Sampled: 25-Apr-00 10:15 Received: 25-Apr-00 17:30									**P-01**
Purgeable Hydrocarbons	**630**	500	ug/l	10	0E01001	01-May-00	01-May-00	EPA 8015M	
Surrogate: a,a,a-Trifluorotoluene		*97.0 %*		*70-130*		"	"	"	
MW-5 (W004564-09) Water Sampled: 25-Apr-00 10:33 Received: 25-Apr-00 17:30									
Purgeable Hydrocarbons	ND	50	ug/l	1	0E04003	04-May-00	04-May-00	EPA 8015M	
Surrogate: a,a,a-Trifluorotoluene		*104 %*		*70-130*		"	"	"	

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.5	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	15-May-00 13:31

Total Purgeable Hydrocarbons by DHS LUFT

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-3 (W004564-01) Water	**Sampled: 25-Apr-00 07:35**	**Received: 25-Apr-00 17:30**							**P-07**
Purgeable Hydrocarbons	**8000**	1000	ug/l	20	0E02001	02-May-00	02-May-00	EPA 8015M	
Surrogate: a,a,a-Trifluorotoluene		*88.0 %*	*70-130*		"	"	"	"	
MW-6 (W004564-02) Water	**Sampled: 25-Apr-00 08:00**	**Received: 25-Apr-00 17:30**							
Purgeable Hydrocarbons	ND	50	ug/l	1	0E01001	01-May-00	01-May-00	EPA 8015M	
Surrogate: a,a,a-Trifluorotoluene		*96.7 %*	*70-130*		"	"	"	"	
MW-7 (W004564-03) Water	**Sampled: 25-Apr-00 08:25**	**Received: 25-Apr-00 17:30**							
Purgeable Hydrocarbons	ND	50	ug/l	1	0E01001	01-May-00	01-May-00	EPA 8015M	
Surrogate: a,a,a-Trifluorotoluene		*100 %*	*70-130*		"	"	"	"	
MW-2 (W004564-04) Water	**Sampled: 25-Apr-00 08:50**	**Received: 25-Apr-00 17:30**							**P-07**
Purgeable Hydrocarbons	**7600**	500	ug/l	10	0E02001	02-May-00	02-May-00	EPA 8015M	
Surrogate: a,a,a-Trifluorotoluene		*97.0 %*	*70-130*		"	"	"	"	
MW-8 (W004564-05) Water	**Sampled: 25-Apr-00 09:12**	**Received: 25-Apr-00 17:30**							**P-03**
Purgeable Hydrocarbons	**77**	50	ug/l	1	0E01001	01-May-00	01-May-00	EPA 8015M	
Surrogate: a,a,a-Trifluorotoluene		*84.7 %*	*70-130*		"	"	"	"	
MW-1 (W004564-06) Water	**Sampled: 25-Apr-00 09:42**	**Received: 25-Apr-00 17:30**							**P-01**
Purgeable Hydrocarbons	**60**	50	ug/l	1	0E01001	01-May-00	01-May-00	EPA 8015M	
Surrogate: a,a,a-Trifluorotoluene		*90.0 %*	*70-130*		"	"	"	"	
MW-4 (W004564-07) Water	**Sampled: 25-Apr-00 10:02**	**Received: 25-Apr-00 17:30**							**P-07**
Purgeable Hydrocarbons	**1200**	130	ug/l	2.5	0E02001	02-May-00	02-May-00	EPA 8015M	
Surrogate: a,a,a-Trifluorotoluene		*96.0 %*	*70-130*		"	"	"	"	

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.5	**Reported:**
Oakland CA, 94607	Project Manager: Steve Osborne	15-May-00 13:31

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-3	W004564-01	Water	25-Apr-00 07:35	25-Apr-00 17:30
MW-6	W004564-02	Water	25-Apr-00 08:00	25-Apr-00 17:30
MW-7	W004564-03	Water	25-Apr-00 08:25	25-Apr-00 17:30
MW-2	W004564-04	Water	25-Apr-00 08:50	25-Apr-00 17:30
MW-8	W004564-05	Water	25-Apr-00 09:12	25-Apr-00 17:30
MW-1	W004564-06	Water	25-Apr-00 09:42	25-Apr-00 17:30
MW-4	W004564-07	Water	25-Apr-00 10:02	25-Apr-00 17:30
DUP	W004564-08	Water	25-Apr-00 10:15	25-Apr-00 17:30
MW-5	W004564-09	Water	25-Apr-00 10:33	25-Apr-00 17:30
MW-3A	W004564-10	Water	25-Apr-00 10:45	25-Apr-00 17:30

Dimple Sharma, Project Manager

Sequoia Analytical

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2 June, 2000

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

RE: Port of Oakland
Sequoia Report: W004564 RECREATE

Enclosed are the results of analyses for samples received by the laboratory on 25-Apr-00 17:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Dimple Sharma
Project Manager

CA ELAP Certificate #1271

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

CHAIN OF CUSTODY FORM

No 2492

WO03554

Lab: Sequoia

Samplers: Heather Lee

Job Number: 43145.4

Name/Location: Port of Oakland - OEC Injection (TSO-007)

Project Manager: Mike Porink

Recorder: Heather Lee (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	# CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCL	Ice	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Day	Time	STATION DESCRIPTION/ NOTES
	X						1	8	X	M	W	- 3 91	0	0	3	2	3	0 7 3 0	
	X				2		1	8	X	M	W	- 8	0	0	3	2	3	0 8 1 0	
	X				2		1	8	X	M	W	- 7 03	0	0	3	2	3	0 8 4 5	
	X				2		1	8	X	M	W	- 6 04	0	0	3	2	3	0 9 1 7	
	X				2		1	8	X	M	W	- 2 05	0	0	3	2	3	0 9 4 7	
	X				2		1	8	X	M	W	- 5 06	0	0	3	2	3	1 0 1 8	
	X				2		1	8	X	M	W	- 1 07	0	0	3	2	3	1 1 0 2	
	X				2		1	8	X	M	W	- 4 08	0	0	3	2	3	1 1 3 5	
	X				2		1	8	X	D	U	P 09	0	0	3	2	3	1 1 5 5	
	X				2				X	M	W	- 3 a/0AK	0	0	3	2	3	1 2 0 5	

ANALYSIS REQUESTED

EPA 8010 Purgeable Halocarbons	EPA 8020	EPA 8260	EPA 8270	METALS	EPA 8015M/TPHG	EPA 8020/BTEX/MTBE	EPA 8015M/TPHd,o,g TPH(D)	TPH mo TPH(A)	EPA 415.1 TOC	Nitrate	Sulfate	Orthophosphate	Ferrous Iron **	Ferric Iron
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
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		X	X	X	X	X	X

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

MISCELLANEOUS

Stand TAT

** Ferrous Iron 24 hr hold time/ Lab Filtered.

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature) Heather Lee 3/23/00 1340	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME
METHOD OF SHIPMENT		
SAMPLE CONDITION WHEN RECEIVED BY THE LABORATORY		

[redacted] Copy [redacted] Project [redacted] Copy [redacted] Field or Other Copy [redacted]

1 OF 1

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

Notes and Definitions

A-01	Methylene chloride is a suspected lab contaminant.
A-01a	Reporting limit raised due to contamination of Continuing Calibration Blank.
D-04	Chromatogram Pattern: Jet Fuel C9-C17.
D-06	Discrete peaks.
D-07	Surrogate out of control limits because of peak coelution with the sample.
D-12	Chromatogram Pattern: Unidentified Hydrocarbons > C16
D-13	Chromatogram Pattern: Diesel C9-C24
D-14	Chromatogram Pattern: Unidentified Hydrocarbons C9-C24
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

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0030330 - General Preparation										
Blank (0030330-BLK1)				Prepared & Analyzed: 27-Mar-00						
Total Organic Carbon	ND	1.00	mg/l							
LCS (0030330-BS1)				Prepared & Analyzed: 27-Mar-00						
Total Organic Carbon	1020	1.00	mg/l	1000		102	80.0-120			
Matrix Spike (0030330-MS1)		Source: S003339-05		Prepared & Analyzed: 27-Mar-00						
Total Organic Carbon	105	1.00	mg/l	100	2.85	102	75.0-125			
Matrix Spike Dup (0030330-MSD1)		Source: S003339-05		Prepared & Analyzed: 27-Mar-00						
Total Organic Carbon	103	1.00	mg/l	100	2.85	100	75.0-125	1.98	20.0	
Batch 0040054 - General Preparation										
Blank (0040054-BLK1)				Prepared & Analyzed: 06-Apr-00						
Total Organic Carbon	ND	2.00	mg/l							A-01a
LCS (0040054-BS1)				Prepared & Analyzed: 06-Apr-00						
Total Organic Carbon	1100	2.00	mg/l	1000		110	80.0-120			A-01a
Matrix Spike (0040054-MS1)		Source: W003554-09		Prepared & Analyzed: 06-Apr-00						
Total Organic Carbon	172	2.00	mg/l	100	51.4	121	75.0-125			A-01a
Matrix Spike Dup (0040054-MSD1)		Source: W003554-09		Prepared & Analyzed: 06-Apr-00						
Total Organic Carbon	154	2.00	mg/l	100	51.4	103	75.0-125	16.1	20.0	A-01a

Sequoia Analytical

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

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 0C27004 - General Preparation										
Blank (0C27004-BLK1)				Prepared & Analyzed: 24-Mar-00						
Nitrate as NO3	ND	0.10	mg/l							
LCS (0C27004-BS1)				Prepared & Analyzed: 24-Mar-00						
Nitrate as NO3	9.85	0.10	mg/l	10.0		98.5	80-120			
Matrix Spike (0C27004-MS1)		Source: W003538-02		Prepared & Analyzed: 24-Mar-00						
Nitrate as NO3	29.2	0.20	mg/l	10.0	20	92.0	75-125			
Matrix Spike Dup (0C27004-MSD1)		Source: W003538-02		Prepared & Analyzed: 24-Mar-00						
Nitrate as NO3	29.0	0.20	mg/l	10.0	20	90.0	75-125	0.687	20	
Batch 0D07021 - General Preparation										
Blank (0D07021-BLK1)				Prepared & Analyzed: 07-Apr-00						
Sulfate as SO4	ND	0.10	mg/l							
LCS (0D07021-BS1)				Prepared & Analyzed: 07-Apr-00						
Sulfate as SO4	9.41	0.10	mg/l	10.0		94.1	80-120			
Matrix Spike (0D07021-MS1)		Source: W003554-03		Prepared & Analyzed: 07-Apr-00						
Sulfate as SO4	234	2.0	mg/l	100	120	114	75-125			
Matrix Spike Dup (0D07021-MSD1)		Source: W003554-03		Prepared & Analyzed: 07-Apr-00						
Sulfate as SO4	235	2.0	mg/l	100	120	115	75-125	0.426	20	

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

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 0C27004 - General Preparation										
Blank (0C27004-BLK2)				Prepared & Analyzed: 24-Mar-00						
Orthophosphate as PO4	ND	0.50	mg/l							
LCS (0C27004-BS2)				Prepared & Analyzed: 24-Mar-00						
Orthophosphate as PO4	18.7	0.50	mg/l	20.0		93.5	80-120			
Matrix Spike (0C27004-MS2)		Source: W003559-04		Prepared & Analyzed: 24-Mar-00						
Orthophosphate as PO4	17.2	1.0	mg/l	20.0	ND	86.0	75-125			
Matrix Spike Dup (0C27004-MSD2)		Source: W003559-04		Prepared & Analyzed: 24-Mar-00						
Orthophosphate as PO4	17.2	1.0	mg/l	20.0	ND	86.0	75-125	0	20	

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Harding-Lawson Associates - Oakland .	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

Volatile Organic Compounds by EPA Method 8010B - Quality Control

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0D05017 - EPA 5030B [P/T]										
LCS (0D05017-BS1)				Prepared & Analyzed: 05-Apr-00						
1,1-Dichloroethene	20.0	1.0	ug/l	20.0		100	65-135			
Trichloroethene	24.0	1.0	"	20.0		120	70-130			
Chlorobenzene	25.0	1.0	"	20.0		125	70-130			
Surrogate: Dibromodifluoromethane	*7.20*		"	*10.0*		*72.0*	*50-150*			
Surrogate: 4-Bromofluorobenzene	*8.90*		"	*10.0*		*89.0*	*50-150*			
LCS (0D05017-BS2)				Prepared & Analyzed: 06-Apr-00						
1,1-Dichloroethene	21.0	1.0	ug/l	20.0		105	65-135			
Trichloroethene	23.0	1.0	"	20.0		115	70-130			
Chlorobenzene	23.0	1.0	"	20.0		115	70-130			
Surrogate: Dibromodifluoromethane	*9.90*		"	*10.0*		*99.0*	*50-150*			
Surrogate: 4-Bromofluorobenzene	*7.30*		"	*10.0*		*73.0*	*50-150*			
Matrix Spike (0D05017-MS1)	**Source: W003554-03**			Prepared & Analyzed: 05-Apr-00						
1,1-Dichloroethene	26.0	1.0	ug/l	20.0	5.6	102	60-140			
Trichloroethene	26.0	1.0	"	20.0	ND	130	60-140			
Chlorobenzene	26.0	1.0	"	20.0	ND	130	60-140			
Surrogate: Dibromodifluoromethane	*11.0*		"	*10.0*		*110*	*50-150*			
Surrogate: 4-Bromofluorobenzene	*9.30*		"	*10.0*		*93.0*	*50-150*			
Matrix Spike Dup (0D05017-MSD1)	**Source: W003554-03**			Prepared & Analyzed: 05-Apr-00						
1,1-Dichloroethene	24.0	1.0	ug/l	20.0	5.6	92.0	60-140	8.00	25	
Trichloroethene	24.0	1.0	"	20.0	ND	120	60-140	8.00	25	
Chlorobenzene	25.0	1.0	"	20.0	ND	125	60-140	3.92	25	
Surrogate: Dibromodifluoromethane	*8.20*		"	*10.0*		*82.0*	*50-150*			
Surrogate: 4-Bromofluorobenzene	*8.30*		"	*10.0*		*83.0*	*50-150*			

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

Volatile Organic Compounds by EPA Method 8010B - Quality Control

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0D05017 - EPA 5030B [P/T]										
Blank (0D05017-BLK2)			Prepared & Analyzed: 06-Apr-00							
Chloromethane	ND	2.0	ug/l							
Vinyl chloride	ND	1.0	"							
Bromomethane	ND	1.0	"							
Chloroethane	ND	1.0	"							
Trichlorofluoromethane	ND	0.50	"							
Freon 113	ND	1.0	"							
1,1-Dichloroethene	ND	1.0	"							
Methylene chloride	ND	5.0	"							
trans-1,2-Dichloroethene	ND	1.0	"							
1,1-Dichloroethane	ND	1.0	"							
cis-1,2-Dichloroethene	ND	1.0	"							
Chloroform	ND	1.0	"							
1,1,1-Trichloroethane	ND	1.0	"							
Carbon tetrachloride	ND	1.0	"							
1,2-Dichloroethane	ND	2.0	"							
Trichloroethene	ND	1.0	"							
1,2-Dichloropropane	ND	1.0	"							
Bromodichloromethane	ND	1.0	"							
cis-1,3-Dichloropropene	ND	1.0	"							
trans-1,3-Dichloropropene	ND	0.50	"							
1,1,2-Trichloroethane	ND	0.50	"							
Tetrachloroethene	ND	1.0	"							
Dibromochloromethane	ND	0.50	"							
1,2-Dibromoethane	ND	1.0	"							
Chlorobenzene	ND	1.0	"							
Bromoform	ND	0.50	"							
1,1,2,2-Tetrachloroethane	ND	0.50	"							
1,3-Dichlorobenzene	ND	0.50	"							
1,4-Dichlorobenzene	ND	1.0	"							
1,2-Dichlorobenzene	ND	2.0	"							
Surrogate: Dibromodifluoromethane	*8.80*		"	*10.0*		*88.0*	*50-150*			
Surrogate: 4-Bromofluorobenzene	*9.50*		"	*10.0*		*95.0*	*50-150*			

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

Volatile Organic Compounds by EPA Method 8010B - Quality Control

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 0D05017 - EPA 5030B [P/T]										
Blank (0D05017-BLK1)			Prepared & Analyzed: 05-Apr-00							
Chloromethane	ND	2.0	ug/l							
Vinyl chloride	ND	1.0	"							
Bromomethane	ND	1.0	"							
Chloroethane	ND	1.0	"							
Trichlorofluoromethane	ND	0.50	"							
Freon 113	ND	1.0	"							
1,1-Dichloroethene	ND	1.0	"							
Methylene chloride	ND	10	"							
trans-1,2-Dichloroethene	ND	1.0	"							
1,1-Dichloroethane	ND	1.0	"							
cis-1,2-Dichloroethene	ND	1.0	"							
Chloroform	ND	1.0	"							
1,1,1-Trichloroethane	ND	1.0	"							
Carbon tetrachloride	ND	1.0	"							
1,2-Dichloroethane	ND	2.0	"							
Trichloroethene	ND	1.0	"							
1,2-Dichloropropane	ND	1.0	"							
Bromodichloromethane	ND	1.0	"							
cis-1,3-Dichloropropene	ND	1.0	"							
trans-1,3-Dichloropropene	ND	0.50	"							
1,1,2-Trichloroethane	ND	0.50	"							
Tetrachloroethene	ND	1.0	"							
Dibromochloromethane	ND	0.50	"							
1,2-Dibromoethane	ND	1.0	"							
Chlorobenzene	ND	1.0	"							
Bromoform	ND	0.50	"							
1,1,2,2-Tetrachloroethane	ND	0.50	"							
1,3-Dichlorobenzene	ND	0.50	"							
1,4-Dichlorobenzene	ND	1.0	"							
1,2-Dichlorobenzene	ND	2.0	"							
Surrogate: Dibromodifluoromethane	*7.30*		"	*10.0*		*73.0*	*50-150*			
Surrogate: 4-Bromofluorobenzene	*5.70*		"	*10.0*		*57.0*	*50-150*			

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

Total Metals by EPA 6000/7000 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 0D19009 - 200.7										
LCS Dup (0D19009-BSD1)				Prepared & Analyzed: 19-Apr-00						
Ferrous Iron	0.930	0.010	mg/l	1.00		93.0	80-120	2.13	20	
Iron	0.930	0.010	"	1.00		93.0	80-120	2.13	20	

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

Total Metals by EPA 6000/7000 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 0D05019 - 200.7										
Blank (0D05019-BLK1)				Prepared: 05-Apr-00 Analyzed: 06-Apr-00						
Ferrous Iron	ND	0.010	mg/l							
Iron	ND	0.010	"							
LCS (0D05019-BS1)				Prepared: 05-Apr-00 Analyzed: 06-Apr-00						
Ferrous Iron	1.10	0.010	mg/l	1.00		110	80-120			
Iron	1.10	0.010	"	1.00		110	80-120			
LCS Dup (0D05019-BSD1)				Prepared: 05-Apr-00 Analyzed: 06-Apr-00						
Ferrous Iron	1.10	0.010	mg/l	1.00		110	80-120	0	20	
Iron	1.10	0.010	"	1.00		110	80-120	0	20	
Matrix Spike (0D05019-MS1)		Source: W003554-07		Prepared: 05-Apr-00 Analyzed: 06-Apr-00						
Iron	2.50	0.010	mg/l	1.00	1.5	100	80-120			
Matrix Spike Dup (0D05019-MSD1)		Source: W003554-07		Prepared: 05-Apr-00 Analyzed: 06-Apr-00						
Iron	2.70	0.010	mg/l	1.00	1.5	120	80-120	7.69	20	
Batch 0D19009 - 200.7										
Blank (0D19009-BLK1)				Prepared & Analyzed: 19-Apr-00						
Ferrous Iron	ND	0.010	mg/l							
Iron	ND	0.010	"							
LCS (0D19009-BS1)				Prepared & Analyzed: 19-Apr-00						
Ferrous Iron	0.950	0.010	mg/l	1.00		95.0	80-120			
Iron	0.950	0.010	"	1.00		95.0	80-120			

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

BTEX 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 0C30001 - EPA 5030B [P/T]										
Blank (0C30001-BLK1)				Prepared & Analyzed: 30-Mar-00						
Benzene	ND	0.50	ug/l							
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	*28.1*		"	*30.0*		*93.7*	*70-130*			
LCS (0C30001-BS1)				Prepared & Analyzed: 30-Mar-00						
Benzene	16.6	0.50	ug/l	20.0		83.0	70-130			
Toluene	17.2	0.50	"	20.0		86.0	70-130			
Ethylbenzene	18.0	0.50	"	20.0		90.0	70-130			
Xylenes (total)	56.3	0.50	"	60.0		93.8	70-130			
Surrogate: a,a,a-Trifluorotoluene	*26.0*		"	*30.0*		*86.7*	*70-130*			
Matrix Spike (0C30001-MS1)		**Source: W003663-04**		Prepared & Analyzed: 30-Mar-00						
Benzene	18.0	0.50	ug/l	20.0	ND	90.0	70-130			
Toluene	18.3	0.50	"	20.0	ND	91.5	70-130			
Ethylbenzene	20.5	0.50	"	20.0	ND	103	70-130			
Xylenes (total)	58.4	0.50	"	60.0	ND	97.3	70-130			
Surrogate: a,a,a-Trifluorotoluene	*26.4*		"	*30.0*		*88.0*	*70-130*			
Matrix Spike Dup (0C30001-MSD1)		**Source: W003663-04**		Prepared & Analyzed: 30-Mar-00						
Benzene	17.7	0.50	ug/l	20.0	ND	88.5	70-130	1.68	20	
Toluene	18.0	0.50	"	20.0	ND	90.0	70-130	1.65	20	
Ethylbenzene	20.8	0.50	"	20.0	ND	104	70-130	1.45	20	
Xylenes (total)	58.4	0.50	"	60.0	ND	97.3	70-130	0	20	
Surrogate: a,a,a-Trifluorotoluene	*26.4*		"	*30.0*		*88.0*	*70-130*			

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

BTEX 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 0C29003 - EPA 5030B [P/T]										
Blank (0C29003-BLK1)				Prepared & Analyzed: 30-Mar-00						
Benzene	ND	0.50	ug/l							
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	*31.0*		"	*30.0*		*103*	*70-130*			
LCS (0C29003-BS1)				Prepared & Analyzed: 30-Mar-00						
Benzene	20.2	0.50	ug/l	20.0		101	70-130			
Toluene	20.3	0.50	"	20.0		101	70-130			
Ethylbenzene	20.3	0.50	"	20.0		101	70-130			
Xylenes (total)	58.6	0.50	"	60.0		97.7	70-130			
Surrogate: a,a,a-Trifluorotoluene	*28.7*		"	*30.0*		*95.7*	*70-130*			
Matrix Spike (0C29003-MS1)		**Source: W003663-16**		Prepared & Analyzed: 30-Mar-00						
Benzene	20.1	0.50	ug/l	20.0	ND	101	70-130			
Toluene	22.9	0.50	"	20.0	2.5	102	70-130			
Ethylbenzene	23.3	0.50	"	20.0	2.9	102	70-130			
Xylenes (total)	73.2	0.50	"	60.0	14	98.7	70-130			
Surrogate: a,a,a-Trifluorotoluene	*26.5*		"	*30.0*		*88.3*	*70-130*			
Matrix Spike Dup (0C29003-MSD1)		**Source: W003663-16**		Prepared & Analyzed: 30-Mar-00						
Benzene	20.3	0.50	ug/l	20.0	ND	101	70-130	0.990	20	
Toluene	22.9	0.50	"	20.0	2.5	102	70-130	0	20	
Ethylbenzene	23.2	0.50	"	20.0	2.9	102	70-130	0.430	20	
Xylenes (total)	72.7	0.50	"	60.0	14	97.8	70-130	0.685	20	
Surrogate: a,a,a-Trifluorotoluene	*27.7*		"	*30.0*		*92.3*	*70-130*			

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

Project: Port of Oakland
Project Number: 43145.4
Project Manager: Mike Brink

Reported:
19-Apr-00 17:29

BTEX 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 0C29001 - EPA 5030B [P/T]										
Blank (0C29001-BLK1)				Prepared & Analyzed: 29-Mar-00						
Benzene	ND	0.50	ug/l							
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	*32.6*		"	*30.0*		*109*	*70-130*			
LCS (0C29001-BS1)				Prepared & Analyzed: 29-Mar-00						
Benzene	17.4	0.50	ug/l	20.0		87.0	70-130			
Toluene	18.1	0.50	"	20.0		90.5	70-130			
Ethylbenzene	18.7	0.50	"	20.0		93.5	70-130			
Xylenes (total)	59.4	0.50	"	60.0		99.0	70-130			
Surrogate: a,a,a-Trifluorotoluene	*24.7*		"	*30.0*		*82.3*	*70-130*			
Matrix Spike (0C29001-MS1)		**Source: W003554-03**		Prepared & Analyzed: 29-Mar-00						
Benzene	16.9	0.50	ug/l	20.0	ND	84.5	70-130			
Toluene	17.3	0.50	"	20.0	ND	86.5	70-130			
Ethylbenzene	19.9	0.50	"	20.0	ND	99.5	70-130			
Xylenes (total)	56.1	0.50	"	60.0	ND	93.5	70-130			
Surrogate: a,a,a-Trifluorotoluene	*27.6*		"	*30.0*		*92.0*	*70-130*			
Matrix Spike Dup (0C29001-MSD1)		**Source: W003554-03**		Prepared & Analyzed: 29-Mar-00						
Benzene	17.7	0.50	ug/l	20.0	ND	88.5	70-130	4.62	20	
Toluene	18.4	0.50	"	20.0	ND	92.0	70-130	6.16	20	
Ethylbenzene	17.7	0.50	"	20.0	ND	88.5	70-130	11.7	20	
Xylenes (total)	59.4	0.50	"	60.0	ND	99.0	70-130	5.71	20	
Surrogate: a,a,a-Trifluorotoluene	*27.8*		"	*30.0*		*92.7*	*70-130*			

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

Custom Extractable Hydrocarbons 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 0D02012 - EPA 3510B										
Blank (0D02012-BLK1)				Prepared: 02-Apr-00 Analyzed: 04-Apr-00						
Motor Oil (C16-C36)	ND	250	ug/l							
Jet-A (C9-C17)	ND	50	"							
Diesel Range Hydrocarbons	ND	50	"							
Surrogate: n-Pentacosane	*32.7*		"	*33.3*		*98.2*	*50-150*			
LCS (0D02012-BS1)				Prepared: 02-Apr-00 Analyzed: 04-Apr-00						
Diesel Range Hydrocarbons	492	50	ug/l	500		98.4	60-140			
Surrogate: n-Pentacosane	*31.7*		"	*33.3*		*95.2*	*50-150*			
LCS Dup (0D02012-BSD1)				Prepared: 02-Apr-00 Analyzed: 04-Apr-00						
Diesel Range Hydrocarbons	429	50	ug/l	500		85.8	60-140	13.7	50	
Surrogate: n-Pentacosane	*30.3*		"	*33.3*		*91.0*	*50-150*			

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

Project: Port of Oakland
Project Number: 43145.4
Project Manager: Mike Brink

Reported:
19-Apr-00 17:29

Conventional Chemistry Parameters by APHA/EPA Methods

Sequoia Analytical - Sacramento

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-3 (W003554-01) Water	**Sampled: 23-Mar-00 00:00**	**Received: 23-Mar-00 13:40**							
Total Organic Carbon	**102**	1.00	mg/l	1	0030330	27-Mar-00	27-Mar-00	EPA 415.1	
MW-8 (W003554-02) Water	**Sampled: 23-Mar-00 00:00**	**Received: 23-Mar-00 13:40**							
Total Organic Carbon	**17.2**	1.00	mg/l	1	0030330	27-Mar-00	27-Mar-00	EPA 415.1	
MW-7 (W003554-03) Water	**Sampled: 23-Mar-00 00:00**	**Received: 23-Mar-00 13:40**							
Total Organic Carbon	**7.20**	1.00	mg/l	1	0030330	27-Mar-00	27-Mar-00	EPA 415.1	
MW-6 (W003554-04) Water	**Sampled: 23-Mar-00 00:00**	**Received: 23-Mar-00 13:40**							
Total Organic Carbon	**22.3**	1.00	mg/l	1	0030330	27-Mar-00	27-Mar-00	EPA 415.1	
MW-2 (W003554-05) Water	**Sampled: 23-Mar-00 00:00**	**Received: 23-Mar-00 13:40**							
Total Organic Carbon	**103**	1.00	mg/l	1	0030330	27-Mar-00	27-Mar-00	EPA 415.1	
MW-5 (W003554-06) Water	**Sampled: 23-Mar-00 00:00**	**Received: 23-Mar-00 13:40**							
Total Organic Carbon	**14.1**	1.00	mg/l	1	0030330	27-Mar-00	27-Mar-00	EPA 415.1	
MW-1 (W003554-07) Water	**Sampled: 23-Mar-00 00:00**	**Received: 23-Mar-00 13:40**							
Total Organic Carbon	**16.6**	1.00	mg/l	1	0030330	27-Mar-00	27-Mar-00	EPA 415.1	
MW-4 (W003554-08) Water	**Sampled: 23-Mar-00 00:00**	**Received: 23-Mar-00 13:40**							
Total Organic Carbon	**62.5**	1.00	mg/l	1	0030330	27-Mar-00	27-Mar-00	EPA 415.1	
DUP (W003554-09) Water	**Sampled: 23-Mar-00 00:00**	**Received: 23-Mar-00 13:40**							
Total Organic Carbon	**51.4**	2.00	mg/l	1	0040054	06-Apr-00	06-Apr-00	EPA 415.1	A-01a

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

Anions by EPA Method 300.0

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
DUP (W003554-09) Water Sampled: 23-Mar-00 11:55 Received: 23-Mar-00 13:40									
Nitrate as NO3	**1.1**	0.10	mg/l	1	0C27004	24-Mar-00	24-Mar-00	EPA 300.0	
Sulfate as SO4	**33**	1.0	"	10	0D07021	07-Apr-00	07-Apr-00	"	
MW-3A (W003554-10) Water Sampled: 23-Mar-00 12:05 Received: 23-Mar-00 13:40									
Nitrate as NO3	ND	1.0	mg/l	10	0C27004	24-Mar-00	24-Mar-00	EPA 300.0	
Sulfate as SO4	**380**	10	"	100	0D07021	07-Apr-00	07-Apr-00	"	

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

Anions by EPA Method 300.0

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-8 (W003554-02) Water	**Sampled: 23-Mar-00 08:10**		**Received: 23-Mar-00 13:40**						
Nitrate as NO3	ND	1.0	mg/l	10	0C27004	24-Mar-00	24-Mar-00	EPA 300.0	
Sulfate as SO4	**440**	10	"	100	0D07021	07-Apr-00	07-Apr-00	"	
MW-7 (W003554-03) Water	**Sampled: 23-Mar-00 08:45**		**Received: 23-Mar-00 13:40**						
Nitrate as NO3	**7.1**	0.10	mg/l	1	0C27004	24-Mar-00	24-Mar-00	EPA 300.0	
Sulfate as SO4	**120**	1.0	"	10	0D07021	07-Apr-00	07-Apr-00	"	
MW-6 (W003554-04) Water	**Sampled: 23-Mar-00 09:17**		**Received: 23-Mar-00 13:40**						
Nitrate as NO3	**1.2**	0.10	mg/l	1	0C27004	24-Mar-00	24-Mar-00	EPA 300.0	
Sulfate as SO4	**350**	5.0	"	50	0D07021	07-Apr-00	07-Apr-00	"	
MW-2 (W003554-05) Water	**Sampled: 23-Mar-00 09:47**		**Received: 23-Mar-00 13:40**						
Nitrate as NO3	ND	0.10	mg/l	1	0C27004	24-Mar-00	24-Mar-00	EPA 300.0	
Sulfate as SO4	**4.0**	0.10	"	"	0D07021	07-Apr-00	07-Apr-00	"	
MW-5 (W003554-06) Water	**Sampled: 23-Mar-00 10:18**		**Received: 23-Mar-00 13:40**						
Nitrate as NO3	ND	0.10	mg/l	1	0C27004	24-Mar-00	24-Mar-00	EPA 300.0	
Sulfate as SO4	**190**	1.0	"	10	0D07021	07-Apr-00	07-Apr-00	"	
MW-1 (W003554-07) Water	**Sampled: 23-Mar-00 11:02**		**Received: 23-Mar-00 13:40**						
Nitrate as NO3	ND	0.10	mg/l	1	0C27004	24-Mar-00	24-Mar-00	EPA 300.0	
Sulfate as SO4	**53**	1.0	"	10	0D07021	07-Apr-00	07-Apr-00	"	
MW-4 (W003554-08) Water	**Sampled: 23-Mar-00 11:35**		**Received: 23-Mar-00 13:40**						
Nitrate as NO3	**1.0**	0.10	mg/l	1	0C27004	24-Mar-00	24-Mar-00	EPA 300.0	
Sulfate as SO4	**36**	1.0	"	10	0D07021	07-Apr-00	07-Apr-00	"	

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Harding-Lawson Associates - Oakland 383 Fourth Street Oakland CA, 94607	Project: Port of Oakland Project Number: 43145.4 Project Manager: Mike Brink	**Reported:** 19-Apr-00 17:29

Conventional Chemistry Parameters by APHA/EPA Methods

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-8 (W003554-02) Water	**Sampled: 23-Mar-00 08:10**	**Received: 23-Mar-00 13:40**							
Orthophosphate as PO4	ND	5.0	mg/l	10	0C27004	24-Mar-00	24-Mar-00	EPA 300.0	
MW-7 (W003554-03) Water	**Sampled: 23-Mar-00 08:45**	**Received: 23-Mar-00 13:40**							
Orthophosphate as PO4	ND	0.50	mg/l	1	0C27004	24-Mar-00	24-Mar-00	EPA 300.0	
MW-6 (W003554-04) Water	**Sampled: 23-Mar-00 09:17**	**Received: 23-Mar-00 13:40**							
Orthophosphate as PO4	ND	0.50	mg/l	1	0C27004	24-Mar-00	24-Mar-00	EPA 300.0	
MW-2 (W003554-05) Water	**Sampled: 23-Mar-00 09:47**	**Received: 23-Mar-00 13:40**							
Orthophosphate as PO4	ND	0.50	mg/l	1	0C27004	24-Mar-00	24-Mar-00	EPA 300.0	
MW-5 (W003554-06) Water	**Sampled: 23-Mar-00 10:18**	**Received: 23-Mar-00 13:40**							
Orthophosphate as PO4	**0.67**	0.50	mg/l	1	0C27004	24-Mar-00	24-Mar-00	EPA 300.0	
MW-1 (W003554-07) Water	**Sampled: 23-Mar-00 11:02**	**Received: 23-Mar-00 13:40**							
Orthophosphate as PO4	ND	0.50	mg/l	1	0C27004	24-Mar-00	24-Mar-00	EPA 300.0	
MW-4 (W003554-08) Water	**Sampled: 23-Mar-00 11:35**	**Received: 23-Mar-00 13:40**							
Orthophosphate as PO4	**3.2**	0.50	mg/l	1	0C27004	24-Mar-00	24-Mar-00	EPA 300.0	
DUP (W003554-09) Water	**Sampled: 23-Mar-00 11:55**	**Received: 23-Mar-00 13:40**							
Orthophosphate as PO4	**3.5**	0.50	mg/l	1	0C27004	24-Mar-00	24-Mar-00	EPA 300.0	
MW-3A (W003554-10) Water	**Sampled: 23-Mar-00 12:05**	**Received: 23-Mar-00 13:40**							
Orthophosphate as PO4	**4.7**	0.50	mg/l	1	0C27004	24-Mar-00	24-Mar-00	EPA 300.0	

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

Volatile Organic Compounds by EPA Method 8010B

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
DUP (W003554-09) Water **Sampled: 23-Mar-00 11:55** **Received: 23-Mar-00 13:40**									
Chloromethane	ND	2.0	ug/l	1	0D05017	05-Apr-00	05-Apr-00	EPA 8010B	
Vinyl chloride	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
Chloroethane	**5.5**	1.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.50	"	"	"	"	"	"	
Freon 113	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethene	**1.1**	1.0	"	"	"	"	"	"	
Methylene chloride	ND	10	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethane	**26**	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	**14**	1.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	2.0	"	"	"	"	"	"	
Trichloroethene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	**1.1**	1.0	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dibromoethane	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.50	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	2.0	"	"	"	"	"	"	
Surrogate: Dibromodifluoromethane		*89.0 %*	*50-150*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*56.0 %*	*50-150*		"	"	"	"	

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

Volatile Organic Compounds by EPA Method 8010B

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-4 (W003554-08) Water Sampled: 23-Mar-00 11:35 Received: 23-Mar-00 13:40									
Chloromethane	ND	2.0	ug/l	1	0D05017	05-Apr-00	05-Apr-00	EPA 8010B	
Vinyl chloride	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
Chloroethane	**4.1**	1.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.50	"	"	"	"	"	"	
Freon 113	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethane	**24**	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	**13**	1.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	2.0	"	"	"	"	"	"	
Trichloroethene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	1.0	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dibromoethane	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.50	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	2.0	"	"	"	"	"	"	
Surrogate: Dibromodifluoromethane		*88.0 %*	*50-150*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*71.0 %*	*50-150*		"	"	"	"	

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

Project: Port of Oakland
Project Number: 43145.4
Project Manager: Mike Brink

Reported:
19-Apr-00 17:29

Volatile Organic Compounds by EPA Method 8010B

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (W003554-07) Water Sampled: 23-Mar-00 11:02 Received: 23-Mar-00 13:40									
Chloromethane	ND	2.0	ug/l	1	0D05017	05-Apr-00	05-Apr-00	EPA 8010B	
Vinyl chloride	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
Chloroethane	ND	1.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.50	"	"	"	"	"	"	
Freon 113	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethene	**1.3**	1.0	"	"	"	"	"	"	
Methylene chloride	ND	5.0	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethane	**24**	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	**11**	1.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	2.0	"	"	"	"	"	"	
Trichloroethene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	1.0	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dibromoethane	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.50	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	2.0	"	"	"	"	"	"	
Surrogate: Dibromodifluoromethane		*86.0 %*	*50-150*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*73.0 %*	*50-150*		"	"	"	"	

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

Volatile Organic Compounds by EPA Method 8010B

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-5 (W003554-06) Water Sampled: 23-Mar-00 10:18 Received: 23-Mar-00 13:40									
Chloromethane	ND	2.0	ug/l	1	0D05017	05-Apr-00	05-Apr-00	EPA 8010B	
Vinyl chloride	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
Chloroethane	ND	1.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.50	"	"	"	"	"	"	
Freon 113	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.0	"	"	"	"	"	"	
Methylene chloride	ND	10	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	2.0	"	"	"	"	"	"	
Trichloroethene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	1.0	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dibromoethane	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.50	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	2.0	"	"	"	"	"	"	
Surrogate: Dibromodifluoromethane		*85.0 %*	*50-150*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*86.0 %*	*50-150*		"	"	"	"	

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

Volatile Organic Compounds by EPA Method 8010B

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-2 (W003554-05) Water Sampled: 23-Mar-00 09:47 Received: 23-Mar-00 13:40									
Chloromethane	ND	10	ug/l	5	0D05017	05-Apr-00	05-Apr-00	EPA 8010B	
Vinyl chloride	ND	5.0	"	"	"	"	"	"	
Bromomethane	ND	5.0	"	"	"	"	"	"	
Chloroethane	ND	5.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	2.5	"	"	"	"	"	"	
Freon 113	ND	5.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	5.0	"	"	"	"	"	"	
Methylene chloride	ND	10	"	1	"	"	"	"	
trans-1,2-Dichloroethene	ND	5.0	"	5	"	"	"	"	
1,1-Dichloroethane	**55**	5.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	**160**	5.0	"	"	"	"	"	"	
Chloroform	ND	5.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	5.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	10	"	"	"	"	"	"	
Trichloroethene	ND	5.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	5.0	"	"	"	"	"	"	
Bromodichloromethane	ND	5.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	2.5	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	2.5	"	"	"	"	"	"	
Tetrachloroethene	ND	5.0	"	"	"	"	"	"	
Dibromochloromethane	ND	2.5	"	"	"	"	"	"	
1,2-Dibromoethane	ND	5.0	"	"	"	"	"	"	
Chlorobenzene	ND	5.0	"	"	"	"	"	"	
Bromoform	ND	2.5	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	2.5	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	2.5	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	10	"	"	"	"	"	"	
Surrogate: Dibromodifluoromethane		*78.0 %*	*50-150*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*74.0 %*	*50-150*		"	"	"	"	

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

Volatile Organic Compounds by EPA Method 8010B

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-6 (W003554-04) Water Sampled: 23-Mar-00 09:17 Received: 23-Mar-00 13:40									
Chloromethane	ND	2.0	ug/l	1	0D05017	05-Apr-00	05-Apr-00	EPA 8010B	
Vinyl chloride	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
Chloroethane	ND	1.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.50	"	"	"	"	"	"	
Freon 113	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.0	"	"	"	"	"	"	
Methylene chloride	ND	10	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethane	ND	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	2.0	"	"	"	"	"	"	
Trichloroethene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	1.0	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dibromoethane	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.50	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	2.0	"	"	"	"	"	"	
Surrogate: Dibromodifluoromethane		*72.0 %*		*50-150*	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*77.0 %*		*50-150*	"	"	"	"	

Sequoia Analytical

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

Project: Port of Oakland
Project Number: 43145.4
Project Manager: Mike Brink

Reported:
19-Apr-00 17:29

Volatile Organic Compounds by EPA Method 8010B

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-7 (W003554-03) Water Sampled: 23-Mar-00 08:45 Received: 23-Mar-00 13:40									
Chloromethane	ND	2.0	ug/l	1	0D05017	05-Apr-00	05-Apr-00	EPA 8010B	
Vinyl chloride	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
Chloroethane	ND	1.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.50	"	"	"	"	"	"	
Freon 113	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethene	**5.6**	1.0	"	"	"	"	"	"	
Methylene chloride	ND	10	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethane	**16**	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	2.0	"	"	"	"	"	"	
Trichloroethene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	1.0	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dibromoethane	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.50	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	2.0	"	"	"	"	"	"	
Surrogate: Dibromodifluoromethane		*82.0 %*	*50-150*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*82.0 %*	*50-150*		"	"	"	"	

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Harding-Lawson Associates - Oakland 383 Fourth Street Oakland CA, 94607	Project: Port of Oakland Project Number: 43145.4 Project Manager: Mike Brink	**Reported:** 19-Apr-00 17:29

Volatile Organic Compounds by EPA Method 8010B

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-8 (W003554-02) Water Sampled: 23-Mar-00 08:10 Received: 23-Mar-00 13:40									
Chloromethane	ND	20	ug/l	10	0D05017	05-Apr-00	05-Apr-00	EPA 8010B	
Vinyl chloride	ND	10	"	"	"	"	"	"	
Bromomethane	ND	10	"	"	"	"	"	"	
Chloroethane	ND	10	"	"	"	"	"	"	
Trichlorofluoromethane	ND	5.0	"	"	"	"	"	"	
Freon 113	ND	10	"	"	"	"	"	"	
1,1-Dichloroethene	**230**	10	"	"	"	"	"	"	
Methylene chloride	**15**	10	"	1	"	"	"	"	A-01
trans-1,2-Dichloroethene	ND	10	"	10	"	"	"	"	
1,1-Dichloroethane	**240**	10	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	10	"	"	"	"	"	"	
Chloroform	ND	10	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	10	"	"	"	"	"	"	
Carbon tetrachloride	ND	10	"	"	"	"	"	"	
1,2-Dichloroethane	ND	20	"	"	"	"	"	"	
Trichloroethene	ND	10	"	"	"	"	"	"	
1,2-Dichloropropane	ND	10	"	"	"	"	"	"	
Bromodichloromethane	ND	10	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	10	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	5.0	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	5.0	"	"	"	"	"	"	
Tetrachloroethene	ND	10	"	"	"	"	"	"	
Dibromochloromethane	ND	5.0	"	"	"	"	"	"	
1,2-Dibromoethane	ND	10	"	"	"	"	"	"	
Chlorobenzene	ND	10	"	"	"	"	"	"	
Bromoform	ND	5.0	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	5.0	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	5.0	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	10	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	20	"	"	"	"	"	"	
Surrogate: Dibromodifluoromethane		*67.0 %*	*50-150*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*71.0 %*	*50-150*		"	"	"	"	

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

Volatile Organic Compounds by EPA Method 8010B

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-3 (W003554-01) Water Sampled: 23-Mar-00 07:30 Received: 23-Mar-00 13:40									
Chloromethane	ND	2.0	ug/l	1	0D05017	06-Apr-00	06-Apr-00	EPA 8010B	
Vinyl chloride	ND	1.0	"	"	"	"	"	"	
Bromomethane	ND	1.0	"	"	"	"	"	"	
Chloroethane	**1.8**	1.0	"	"	"	"	"	"	
Trichlorofluoromethane	ND	0.50	"	"	"	"	"	"	
Freon 113	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethene	ND	1.0	"	"	"	"	"	"	
Methylene chloride	ND	10	"	"	"	"	"	"	
trans-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
1,1-Dichloroethane	**4.8**	1.0	"	"	"	"	"	"	
cis-1,2-Dichloroethene	ND	1.0	"	"	"	"	"	"	
Chloroform	ND	1.0	"	"	"	"	"	"	
1,1,1-Trichloroethane	ND	1.0	"	"	"	"	"	"	
Carbon tetrachloride	ND	1.0	"	"	"	"	"	"	
1,2-Dichloroethane	ND	2.0	"	"	"	"	"	"	
Trichloroethene	ND	1.0	"	"	"	"	"	"	
1,2-Dichloropropane	ND	1.0	"	"	"	"	"	"	
Bromodichloromethane	ND	1.0	"	"	"	"	"	"	
cis-1,3-Dichloropropene	ND	1.0	"	"	"	"	"	"	
trans-1,3-Dichloropropene	ND	0.50	"	"	"	"	"	"	
1,1,2-Trichloroethane	ND	0.50	"	"	"	"	"	"	
Tetrachloroethene	ND	1.0	"	"	"	"	"	"	
Dibromochloromethane	ND	0.50	"	"	"	"	"	"	
1,2-Dibromoethane	ND	1.0	"	"	"	"	"	"	
Chlorobenzene	ND	1.0	"	"	"	"	"	"	
Bromoform	ND	0.50	"	"	"	"	"	"	
1,1,2,2-Tetrachloroethane	ND	0.50	"	"	"	"	"	"	
1,3-Dichlorobenzene	ND	0.50	"	"	"	"	"	"	
1,4-Dichlorobenzene	ND	1.0	"	"	"	"	"	"	
1,2-Dichlorobenzene	ND	2.0	"	"	"	"	"	"	
Surrogate: Dibromodifluoromethane		*96.0 %*	*50-150*		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		*79.0 %*	*50-150*		"	"	"	"	

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

Total Metals by EPA 6000/7000 Series Methods

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-4 (W003554-08) Water Sampled: 23-Mar-00 11:35 Received: 23-Mar-00 13:40									
Ferrous Iron	**0.091**	0.010	mg/l	1	0D05019	05-Apr-00	06-Apr-00	EPA 6010A	
Iron	**2.8**	0.010	"	"	"	"	"	"	
DUP (W003554-09) Water Sampled: 23-Mar-00 11:55 Received: 23-Mar-00 13:40									
Ferrous Iron	**0.14**	0.010	mg/l	1	0D05019	05-Apr-00	06-Apr-00	EPA 6010A	
Iron	**2.0**	0.010	"	"	"	"	"	"	
MW-3A (W003554-10) Water Sampled: 23-Mar-00 12:05 Received: 23-Mar-00 13:40									
Ferrous Iron	**0.54**	0.010	mg/l	1	0D05019	05-Apr-00	06-Apr-00	EPA 6010A	

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Harding-Lawson Associates - Oakland 383 Fourth Street Oakland CA, 94607	Project: Port of Oakland Project Number: 43145.4 Project Manager: Mike Brink	**Reported:** 19-Apr-00 17:29

Total Metals by EPA 6000/7000 Series Methods

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-3 (W003554-01) Water Sampled: 23-Mar-00 07:30 Received: 23-Mar-00 13:40									
Iron	6.3	0.010	mg/l	1	0D05019	05-Apr-00	06-Apr-00	EPA 6010A	
MW-8 (W003554-02RE1) Water Sampled: 23-Mar-00 08:10 Received: 23-Mar-00 13:40									
Ferrous Iron	1.6	0.010	mg/l	1	0D19009	19-Apr-00	19-Apr-00	EPA 6010A	
Iron	41	0.010	"	"	"	"	"	"	
MW-7 (W003554-03) Water Sampled: 23-Mar-00 08:45 Received: 23-Mar-00 13:40									
Ferrous Iron	3.4	0.010	mg/l	1	0D05019	05-Apr-00	06-Apr-00	EPA 6010A	
Iron	53	0.010	"	"	"	"	"	"	
MW-6 (W003554-04) Water Sampled: 23-Mar-00 09:17 Received: 23-Mar-00 13:40									
Ferrous Iron	1.9	0.010	mg/l	1	0D05019	05-Apr-00	06-Apr-00	EPA 6010A	
Iron	38	0.010	"	"	"	"	"	"	
MW-2 (W003554-05) Water Sampled: 23-Mar-00 09:47 Received: 23-Mar-00 13:40									
Ferrous Iron	9.0	0.010	mg/l	1	0D05019	05-Apr-00	06-Apr-00	EPA 6010A	
Iron	36	0.010	"	"	"	"	"	"	
MW-5 (W003554-06) Water Sampled: 23-Mar-00 10:18 Received: 23-Mar-00 13:40									
Ferrous Iron	8.6	0.010	mg/l	1	0D05019	05-Apr-00	06-Apr-00	EPA 6010A	
Iron	74	0.010	"	"	"	"	"	"	
MW-1 (W003554-07) Water Sampled: 23-Mar-00 11:02 Received: 23-Mar-00 13:40									
Ferrous Iron	0.65	0.010	mg/l	1	0D05019	05-Apr-00	06-Apr-00	EPA 6010A	
Iron	1.5	0.010	"	"	"	"	"	"	

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

BTEX by DHS LUFT

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
DUP (W003554-09) Water Sampled: 23-Mar-00 11:55 Received: 23-Mar-00 13:40									
Benzene	**10.0**	0.50	ug/l	1	0C29003	30-Mar-00	30-Mar-00	DHS LUFT	
Toluene	**0.81**	0.50	"	"	"	"	"	"	
Ethylbenzene	**2.0**	0.50	"	"	"	"	"	"	
Xylenes (total)	**12**	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*87.0 %*	*70-130*		"	"	"	"	

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

BTEX by DHS LUFT

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-2 (W003554-05) Water Sampled: 23-Mar-00 09:47 Received: 23-Mar-00 13:40									
Benzene	**92**	5.0	ug/l	10	0C29003	30-Mar-00	30-Mar-00	DHS LUFT	
Toluene	**180**	5.0	"	"	"	"	"	"	
Ethylbenzene	**97**	5.0	"	"	"	"	"	"	
Xylenes (total)	**310**	5.0	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	25	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*86.7 %*	*70-130*		"	"	"	"	
MW-5 (W003554-06) Water Sampled: 23-Mar-00 10:18 Received: 23-Mar-00 13:40									
Benzene	ND	0.50	ug/l	1	0C29001	29-Mar-00	29-Mar-00	DHS LUFT	
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		*98.3 %*	*70-130*		"	"	"	"	
MW-1 (W003554-07) Water Sampled: 23-Mar-00 11:02 Received: 23-Mar-00 13:40									
Benzene	**1.7**	0.50	ug/l	1	0C29001	29-Mar-00	29-Mar-00	DHS LUFT	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	**3.2**	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*96.7 %*	*70-130*		"	"	"	"	
MW-4 (W003554-08) Water Sampled: 23-Mar-00 11:35 Received: 23-Mar-00 13:40									
Benzene	**10**	0.50	ug/l	1	0C29003	30-Mar-00	30-Mar-00	DHS LUFT	
Toluene	**0.95**	0.50	"	"	"	"	"	"	
Ethylbenzene	**2.0**	0.50	"	"	"	"	"	"	
Xylenes (total)	**12**	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*86.7 %*	*70-130*		"	"	"	"	

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Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

BTEX by DHS LUFT

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-3 (W003554-01) Water Sampled: 23-Mar-00 07:30 Received: 23-Mar-00 13:40									
Benzene	**13**	10	ug/l	20	0C30001	30-Mar-00	30-Mar-00	DHS LUFT	
Toluene	**20**	10	"	"	"	"	"	"	
Ethylbenzene	**16**	10	"	"	"	"	"	"	
Xylenes (total)	**48**	10	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	50	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		*83.3 %*	*70-130*		"	"	"	"	
MW-8 (W003554-02) Water Sampled: 23-Mar-00 08:10 Received: 23-Mar-00 13:40									
Benzene	**2.1**	0.50	ug/l	1	0C29003	30-Mar-00	30-Mar-00	DHS LUFT	
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		*116 %*	*70-130*		"	"	"	"	
MW-7 (W003554-03) Water Sampled: 23-Mar-00 08:45 Received: 23-Mar-00 13:40									
Benzene	ND	0.50	ug/l	1	0C29001	29-Mar-00	29-Mar-00	DHS LUFT	
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		*103 %*	*70-130*		"	"	"	"	
MW-6 (W003554-04) Water Sampled: 23-Mar-00 09:17 Received: 23-Mar-00 13:40									
Benzene	ND	0.50	ug/l	1	0C29001	29-Mar-00	29-Mar-00	DHS LUFT	
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		*97.7 %*	*70-130*		"	"	"	"	

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

Project: Port of Oakland
Project Number: 43145.4
Project Manager: Mike Brink

Reported:
19-Apr-00 17:29

Custom Extractable Hydrocarbons by DHS LUFT

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
W-8 (W003554-02) Water	**Sampled: 23-Mar-00 08:10**	**Received: 23-Mar-00 13:40**							
Motor Oil (C16-C36)	**530**	250	ug/l	1	0D02012	02-Apr-00	05-Apr-00	DHS LUFT	D-12
t-A (C9-C17)	ND	50	"	"	"	"	"	"	
iesel Range Hydrocarbons	**450**	50	"	"	"	"	"	"	D-06,D-14
Surrogate: n-Pentacosane		*83.2 %*	*50-150*		"	"	"	"	
W-7 (W003554-03) Water	**Sampled: 23-Mar-00 08:45**	**Received: 23-Mar-00 13:40**							
otor Oil (C16-C36)	ND	250	ug/l	1	0D02012	02-Apr-00	05-Apr-00	DHS LUFT	D-12
Jet-A (C9-C17)	ND	50	"	"	"	"	"	"	
iesel Range Hydrocarbons	ND	50	"	"	"	"	"	"	
rrogate: n-Pentacosane		*75.1 %*	*50-150*		"	"	"	"	
MW-6 (W003554-04) Water	**Sampled: 23-Mar-00 09:17**	**Received: 23-Mar-00 13:40**							
otor Oil (C16-C36)	**280**	250	ug/l	1	0D02012	02-Apr-00	05-Apr-00	DHS LUFT	D-12
t-A (C9-C17)	ND	50	"	"	"	"	"	"	
Diesel Range Hydrocarbons	**120**	50	"	"	"	"	"	"	D-06,D-12
rrogate: n-Pentacosane		*86.2 %*	*50-150*		"	"	"	"	
W-2 (W003554-05) Water	**Sampled: 23-Mar-00 09:47**	**Received: 23-Mar-00 13:40**							
Motor Oil (C16-C36)	**26000**	13000	ug/l	50	0D02012	02-Apr-00	05-Apr-00	DHS LUFT	D-12
t-A (C9-C17)	**36000**	2500	"	"	"	"	"	"	D-04
iesel Range Hydrocarbons	ND	2500	"	"	"	"	"	"	
Surrogate: n-Pentacosane		*300 %*	*50-150*		"	"	"	"	*D-07*
W-5 (W003554-06) Water	**Sampled: 23-Mar-00 10:18**	**Received: 23-Mar-00 13:40**							
Motor Oil (C16-C36)	**530**	250	ug/l	1	0D02012	02-Apr-00	05-Apr-00	DHS LUFT	D-12
Jet-A (C9-C17)	ND	50	"	"	"	"	"	"	
iesel Range Hydrocarbons	**140**	50	"	"	"	"	"	"	D-12
Surrogate: n-Pentacosane		*127 %*	*50-150*		"	"	"	"	

Sequoia Analytical

404 N. Wiget Lane
Walnut Creek, CA 94598
(925) 988-9600
FAX (925) 988-9673
www.sequoialabs.com

Harding-Lawson Associates - Oakland	Project: Port of Oakland	
383 Fourth Street	Project Number: 43145.4	**Reported:**
Oakland CA, 94607	Project Manager: Mike Brink	19-Apr-00 17:29

Custom Extractable Hydrocarbons by DHS LUFT

Sequoia Analytical - Walnut Creek

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
MW-1 (W003554-07) Water	**Sampled: 23-Mar-00 11:02**	**Received: 23-Mar-00 13:40**							
Motor Oil (C16-C36)	**1100**	250	ug/l	1	0D02012	02-Apr-00	05-Apr-00	DHS LUFT	D-12
Jet-A (C9-C17)	ND	50	"	"	"	"	"	"	
Diesel Range Hydrocarbons	**1100**	50	"	"	"	"	"	"	D-06,D-13
Surrogate: n-Pentacosane		*119 %*	*50-150*		"	"	"	"	
MW-4 (W003554-08) Water	**Sampled: 23-Mar-00 11:35**	**Received: 23-Mar-00 13:40**							
Motor Oil (C16-C36)	**2200**	250	ug/l	1	0D02012	02-Apr-00	05-Apr-00	DHS LUFT	D-12
Jet-A (C9-C17)	ND	50	"	"	"	"	"	"	
Diesel Range Hydrocarbons	**2800**	50	"	"	"	"	"	"	D-06,D-13
Surrogate: n-Pentacosane		*153 %*	*50-150*		"	"	"	"	*D-07*
DUP (W003554-09) Water	**Sampled: 23-Mar-00 11:55**	**Received: 23-Mar-00 13:40**							
Motor Oil (C16-C36)	**2100**	250	ug/l	1	0D02012	02-Apr-00	05-Apr-00	DHS LUFT	D-12
Jet-A (C9-C17)	ND	50	"	"	"	"	"	"	
Diesel Range Hydrocarbons	**2800**	50	"	"	"	"	"	"	D-06,D-13
Surrogate: n-Pentacosane		*123 %*	*50-150*		"	"	"	"	