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April 23, 1991

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1600 63rd Street Associates, Inc.  
c/o Wareham Property Group  
1120 Nye Street, Suite 400  
San Rafael, California 94901

Attention: Mr. Dan Nourse

Gentlemen:

**Quarterly Groundwater Monitoring  
February 1991  
1600 63rd Street  
Emeryville, California**

This report presents the results of the quarterly groundwater monitoring performed in February 1991 by Harding Lawson Associates (HLA) at 1600 63rd Street, Emeryville, California. HLA installed five groundwater monitoring wells at this site (Plate 1) in May and June 1989. The results of initial groundwater sampling and analyses, evaluation of water-level measurements, and a summary of investigations and remediation performed at the site by HLA and others are presented in HLA's October 2, 1989, report, *Groundwater Quality Investigation, 1600 63rd Street, Emeryville, California*. Details of the investigations and remedial activities conducted prior to HLA's involvement were presented in a December 1988 report prepared by Engineering Science (ES) of Berkeley, California.

In the October 2, 1989 report, HLA recommended that groundwater monitoring be continued at the site for one year to document the distribution of chemicals in the groundwater. The initial year of quarterly sampling was completed and the data were presented in HLA's letter, *Fourth Quarter Groundwater Monitoring, 1600 63rd Street, Emeryville, California*, dated August 8, 1990. Because detected concentrations of total petroleum hydrocarbons increased during the fourth quarter sampling round (March 1990) and gamma-BHC was detected, HLA recommended that groundwater monitoring, incorporating a modified analytical program, be performed for an additional year.

**FIELD INVESTIGATION**

On February 7, 1991, an electronic oil-water interface probe was used to measure the groundwater level and product thickness, if encountered, in each of the five monitoring wells. The groundwater surface in each well was also visually inspected for

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the presence of floating petroleum hydrocarbons (product) by carefully lowering a clear Lucite bailer into the well, removing it, and observing the water/product interface, if present, in the bailer.

After water levels in all five wells were measured, the wells were purged using a clean PVC bailer. Measurements of pH, conductivity, turbidity, and temperature were collected during well purging. The wells were purged of approximately three well casing volumes prior to sampling. All purged water was placed into labeled 55-gallon steel drums and stored onsite in a secured steel containment structure.

Immediately following purging of each well, groundwater was removed using a clean stainless steel bailer and decanted into laboratory-prepared sample bottles. A duplicate groundwater sample was collected from Well MW-2. The sample bottles and a trip blank sample were labeled, placed in a refrigerated environment, and transported under chain of custody to the analytical laboratory.

All water-level measurement and sampling equipment was decontaminated prior to use in each well. The sampling equipment had been steam cleaned at HLA and wrapped in clean plastic before being transported to the site. The water-level measurement equipment was decontaminated at the site by washing with a low phosphate soap and water mixture then double rinsing with deionized water.

#### **GROUNDWATER GRADIENT AND FLOW DIRECTION**

Groundwater elevations and product thicknesses measured from August 1989 to the present are presented in Table 1. The changes in water-level elevations in the wells compared to the previous sampling round in November 1990 ranged from a 0.61-foot decrease in Well MW-1 to a 0.19-foot increase in Well MW-4. The water-level elevations measured during this sampling round are shown on the Site Plan, Plate 1. The general groundwater flow direction is toward the west.

In Well MW-2, a product thickness of about 0.02 foot was measured with the oil-interface probe and a sheen of product was observed using the clear Lucite bailer. No product was observed in the other four wells.

#### **LABORATORY ANALYSIS AND RESULTS**

The groundwater samples were analyzed by NET Pacific, Inc. of Santa Rosa, California, a California-certified laboratory for the analyses performed. The samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline, motor oil, and diesel using the analytical methods described in the California State Water Resources Control Board's *Leaking Underground Fuel Tank (LUFT) Field Manual*, October 1989; for organochlorine pesticides using EPA Test Method 608; and for purgeable aromatics using EPA Test Method 602. The trip blank was also analyzed for these same chemicals.

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Results for selected analyses performed during this and previous quarterly sampling rounds are summarized in Table 2. The remaining analytes for which the samples were analyzed were not detected; copies of the laboratory report and chain of custody form for this sampling round are included in the attachment.

TPH was detected in groundwater samples from Wells MW-1, MW-2, and MW-3. The groundwater samples from Wells MW-1, MW-2, and MW-3, and the duplicate sample from Well MW-2 contained 0.20, 41, 0.12, and 27 parts per million (ppm) of TPH as diesel, respectively. TPH as gasoline was detected in both the sample and duplicate from Well MW-2 at concentrations of 11 and 13 ppm, respectively. TPH was not detected in the groundwater samples from Wells MW-4 and MW-5.

The duplicate groundwater sample from Well MW-2 also contained 0.043 ppm of xylenes. No other compound was detected in any of the groundwater samples or in the trip blank sample.

If you have any questions, please call.

Yours very truly,

HARDING LAWSON ASSOCIATES



Richard F. McCartney  
Project Hydrogeologist



Lisa S. Teague  
Geologist - 3839

RFM/LST/lah/B15997-H

cc: Dennis Byrne, Alameda County Department of Environmental Health  
Steven Ritchie, California Regional Water Quality Control Board,  
San Francisco Bay Region

Attachments: Table 1 - Groundwater Elevations  
Table 2 - Selected Results of Organic Analyses of Groundwater  
Samples  
Plate 1 - Site Map  
Laboratory Report and Chain of Custody Form

**ATTACHMENTS**

Table 1. Groundwater Elevations  
1600 63rd Street, Emeryville

WELL NUMBER	TOP OF CASING ELEVATION (FT) Above MSL)	DATE MEASURED	DEPTH TO PRODUCT FROM TOP OF CASING (FT)	DEPTH TO WATER FROM TOP OF CASING (FT)	PRODUCT THICKNESS (FT)	PRODUCT LEVEL ELEVATION (FT)	WATER-LEVEL ELEVATION, CORR. FOR PRODUCT (FT)	CHANGE IN WATER-LEVEL ELEVATION* (FT)
MW-1	15.12	03-Aug-89	NO PRODUCT	5.99	0.00	NO PRODUCT	9.13	
		21-Sep-89	NO PRODUCT	5.81	0.00	NO PRODUCT	9.31	0.18
		20-Oct-89	NO PRODUCT	6.24	0.00	NO PRODUCT	8.88	-0.43
		20-Dec-89	NO PRODUCT	6.09	0.00	NO PRODUCT	9.03	0.15
		20-Mar-90	NO PRODUCT	5.87	0.00	NO PRODUCT	9.25	0.22
		20-Jul-90	NO PRODUCT	5.75	0.00	NO PRODUCT	9.37	0.12
		12-Nov-90	NO PRODUCT	6.04	0.00	NO PRODUCT	9.08	-0.29
		07-Feb-91	NO PRODUCT	6.65	0.00	NO PRODUCT	8.47	-0.61
MW-2	14.43	03-Aug-89	NO PRODUCT	6.66	0.00	NO PRODUCT	7.77	
		21-Sep-89	NO PRODUCT	6.32	0.00	NO PRODUCT	8.11	0.34
		20-Oct-89	NO PRODUCT	6.78	0.00	NO PRODUCT	7.65	-0.46
		20-Dec-89	NO PRODUCT	7.32	0.00	NO PRODUCT	7.11	-0.54
		20-Mar-90	NO PRODUCT	6.76	0.00	NO PRODUCT	7.67	0.56
		11-May-90	6.65	0.01	7.78	7.78	0.11	
		20-Jul-90	6.72	0.02	7.69	7.70	-0.07	
		12-Nov-90	NOT MEASURED	6.75	-	PRODUCT	-7.70	-0.00
		21-Nov-90	6.97	0.03	7.46	7.45	-0.25	
		07-Feb-91	6.86	0.02	7.57	7.56	-0.25	
MW-3	15.90	03-Aug-89	NO PRODUCT	4.06	0.00	NO PRODUCT	11.84	
		21-Sep-89	NO PRODUCT	3.77	0.00	NO PRODUCT	12.13	0.29
		20-Oct-89	NO PRODUCT	4.49	0.00	NO PRODUCT	11.41	-0.72
		20-Dec-89	NO PRODUCT	4.32	0.00	NO PRODUCT	11.58	0.17
		20-Mar-90	NO PRODUCT	3.78	0.00	NO PRODUCT	12.12	0.54
		20-Jul-90	NO PRODUCT	3.73	0.00	NO PRODUCT	12.17	0.05
		12-Nov-90	NO PRODUCT	3.89	0.00	NO PRODUCT	12.01	-0.16
		07-Feb-91	NO PRODUCT	3.92	0.00	NO PRODUCT	11.98	-0.03
MW-4	14.04	03-Aug-89	NO PRODUCT	7.10	0.00	NO PRODUCT	6.94	
		21-Sep-89	NO PRODUCT	6.90	0.00	NO PRODUCT	7.14	0.20
		20-Oct-89	NO PRODUCT	6.95	0.00	NO PRODUCT	7.09	-0.05
		20-Dec-89	NO PRODUCT	7.24	0.00	NO PRODUCT	6.80	-0.29
		20-Mar-90	NO PRODUCT	6.94	0.00	NO PRODUCT	7.10	0.30
		20-Jul-90	NO PRODUCT	6.94	0.00	NO PRODUCT	7.10	0.00
		12-Nov-90	NO PRODUCT	7.13	0.00	NO PRODUCT	6.91	-0.19
		07-Feb-91	NO PRODUCT	6.94	0.00	NO PRODUCT	7.10	0.19
MW-5	15.21	03-Aug-89	NO PRODUCT	4.35	0.00	NO PRODUCT	10.86	
		21-Sep-89	NO PRODUCT	4.38	0.00	NO PRODUCT	10.83	-0.03
		20-Oct-89	NO PRODUCT	4.37	0.00	NO PRODUCT	10.84	0.01
		20-Dec-89	NO PRODUCT	4.48	0.00	NO PRODUCT	10.73	-0.11
		20-Mar-90	NO PRODUCT	4.07	0.00	NO PRODUCT	11.14	0.41
		20-Jul-90	NO PRODUCT	4.12	0.00	NO PRODUCT	11.09	-0.05
		12-Nov-90	NO PRODUCT	4.36	0.00	NO PRODUCT	10.85	-0.24
		07-Feb-91	NO PRODUCT	4.44	0.00	NO PRODUCT	10.77	-0.08

\* Change from previous measurement. Negative sign denotes decrease in water level.  
- Because product thickness was not measured, an estimate was made to account for the effect of product on the water level.

Table 2. Selected Results of Organic Analyses of Groundwater Samples  
1600 63rd Street, Emeryville

Well Number	Date Sampled	Benzene EPA 8240 or 602	Toluene EPA 8240 or 602	Ethyl- benzene EPA 8240 or 602	Xylenes EPA 8240 or 602	TPH as gasoline EPA 8015/ 3510-5030	TPH as diesel EPA 8015/ 3510	TPH as kerosene EPA 8015/ 3510	Endrin Aldehyde EPA 8080/ 608	Heptachlor EPA 8080/ 608
MW-1	18-Jun-89	<0.001	<0.001	<0.001	<0.001	<0.5	<0.5	<0.5	NT	NT
	21-Sep-89	<0.005	<0.005	<0.005	<0.005	<0.5	<0.5	<0.5	0.0001	<0.00005
	20-Dec-89	<0.005	<0.005	<0.005	<0.005	<0.05	<0.5	<0.5	<0.00005	<0.00005
	20-Mar-90	<0.005	<0.005	<0.005	<0.005	<0.05	<0.5	<0.5	<0.00005	<0.00005
	20-Jul-90	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	0.17	<0.05	<0.00025	<0.00025
	12-Nov-90	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	0.16	NT	<0.00005	<0.00005
	07-Feb-91	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	0.20	NT	<0.00005	<0.00005
MW-2	25-Jun-89	<0.005	<0.005	<0.005	<0.005	0.3	<0.5	<0.5	NT	<0.00005
	21-Sep-89	<0.005	<0.005	<0.005	<0.005	<0.5	1.0	<0.5	<0.00005	0.00016
	20-Dec-89	<0.005	<0.005	<0.005	<0.005	0.53	<0.5	2.2	<0.00005	<0.00005
	20-Mar-90	<0.005	<0.005	<0.005	<0.005	0.42	49	<1.0	<0.00005	<0.00005
	11-May-90	<0.005	<0.005	<0.005	<0.005	1.2	8.4	<0.5	NT	NT
	11-May-90 D*	<0.01	<0.01	<0.01	<0.01	<0.05	<2.5	<2.5	NT	NT
	20-Jul-90	<0.005	<0.005	<0.005	0.011	3.9	27	<1.0	<0.0001	<0.00010
	20-Jul-90 D	<0.0025	<0.0025	<0.0025	0.0033	2.3	30	<1.0	<0.0001	<0.00010
	12-Nov-90	<0.0005	<0.0005	<0.0005	<0.0005	380	61	NT	<0.00005	<0.00005
	12-Nov-90 D	<0.0005	0.0009	0.001	0.0079	7	35	NT	<0.00005	<0.00005
	07-Feb-91	<0.0005	<0.0005	<0.0005	<0.0005	11	41	NT	<0.00005	<0.00005
07-Feb-91 D	<0.0005	<0.0005	<0.0005	0.043	13	27	NT	<0.00005	<0.00005	
MW-3	18-Jun-89	<0.001	<0.001	<0.001	<0.001	<0.5	<0.5	<0.5	NT	NT
	21-Sep-89	<0.005	<0.005	<0.005	<0.005	<0.5	<0.5	<0.5	<0.00005	<0.00005
	20-Dec-89	<0.005	<0.005	<0.005	<0.005	<0.05	<0.5	<0.5	<0.00005	<0.00005
	20-Mar-90	<0.005	<0.005	<0.005	<0.005	<0.05	<0.5	<0.5	<0.00005	<0.00005
	20-Jul-90	<0.0005	<0.0005	<0.0005	<0.0005	0.11	<0.05	<0.05	<0.00005	<0.00005
	12-Nov-90	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	<0.05	NT	<0.00005	<0.00005
	07-Feb-91	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	0.12	NT	<0.00005	<0.00005
MW-4	25-Jun-89	<0.005	<0.005	<0.005	<0.005	<0.05	<0.5	<0.5	NT	<0.00005
	21-Sep-89	<0.005	<0.005	<0.005	<0.005	<0.5	<0.5	<0.5	<0.00005	<0.00005
	20-Dec-89	<0.005	<0.005	<0.005	<0.005	<0.05	<0.5	<0.5	<0.00005	<0.00005
	20-Dec-89 D	<0.005	<0.005	<0.005	<0.005	NT	NT	NT	NT	NT
	20-Mar-90	<0.005	<0.005	<0.005	<0.005	<0.05	<0.5	<0.5	<0.00005	<0.00005
	20-Jul-90	<0.0005	<0.0005	<0.0005	<0.0005	0.12	<0.05	<0.05	<0.00005	<0.00005
	12-Nov-90	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	<0.05	NT	<0.00005	<0.00005
07-Feb-91	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	<0.05	NT	<0.00005	<0.00005	
MW-5	30-Jun-89	<0.005	<0.005	<0.005	<0.005	<0.05	<0.5	<0.5	NT	NT
	21-Sep-89	<0.005	<0.005	<0.005	<0.005	<0.5	<0.5	<0.5	0.00015	<0.00005
	20-Dec-89	<0.005	<0.005	<0.005	<0.005	<0.05	<0.5	<0.5	<0.00005	<0.00005
	20-Mar-90	<0.005	<0.005	<0.005	<0.005	<0.05	<0.5	<0.5	<0.00005	<0.00005
	20-Jul-90	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	<0.05	<0.05	<0.00005	<0.00005
	12-Nov-90	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	<0.05	NT	<0.00005	<0.00005
	07-Feb-91	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	<0.05	NT	<0.00005	<0.00005
Blank Samples										
FB	30-Jun-89	<0.005	<0.005	<0.005	<0.005	<0.05	<0.5	<0.5	NT	NT
FB	21-Sep-89	<0.005	<0.005	<0.005	<0.005	<0.5	<0.5	<0.5	<0.00005	<0.00005
TB	20-Mar-90	<0.005	<0.005	<0.005	<0.005	NT	NT	NT	NT	NT
TB	20-Jul-90	<0.0005	0.0006	<0.0005	<0.0005	<0.05	NT	NT	NT	NT
TB	12-Nov-90	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	<0.05	NT	<0.00005	<0.00005
TB	07-Feb-91	<0.0005	<0.0005	<0.0005	<0.0005	<0.05	<0.05	NT	<0.00005	<0.00005

Concentrations expressed as milligrams of chemical per liter of water (mg/l), which is essentially equivalent to parts per million (ppm) at low concentrations. Less than symbol indicates result below listed reporting limit. Where they were analyzed, unlisted EPA Test Method 602, 8015, 8080, 8240 and 8270 parameters were not detected.

NT = Not tested

FB = Field Blank

D = Duplicate Sample

TB = Trip Blank

\* Sample contained 15 ppm of unknown hydrocarbons in about the C-7 to C-23 carbon range and 8 tentatively identified organic compounds.

Table 2. Selected Results of Organic Analyses of Groundwater Samples (Continued)  
1600 63rd Street, Emeryville

Well Number	Date Sampled	4,4'-DDD EPA 8080/ 608	Gamma-BHC EPA 8080/ 608	Fluorene EPA 8270	Bis (2-ethyl- hexyl) phthalate EPA 8270	2-Methyl- naphthalene EPA 8270	Phen- anthrene EPA 8270	Acetone EPA 8240	PCB 1260 EPA 8080/ 608
MW-1	18-Jun-89	NT	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.01	NT
	21-Sep-89	<0.00005	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.01	0.0005
	20-Dec-89	<0.00005	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.0005
	20-Mar-90	<0.00005	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.0005
	20-Jul-90	<0.00025	<0.00010	NT	NT	NT	NT	NT	NT
	12-Nov-90	<0.00005	<0.00002	NT	NT	NT	NT	NT	<0.0005
	07-Feb-91	<0.00005	<0.00002	NT	NT	NT	NT	NT	<0.0005
MW-2	25-Jun-89	NT	<0.00005	trace	<0.005	<0.005	<0.005	<0.01	<0.0005
	21-Sep-89	0.00015	<0.00005	0.006	0.005	0.0061	<0.005	<0.01	<0.0005
	20-Dec-89	<0.00005	<0.00005	<0.005	<0.005	0.012	<0.005	<0.01	<0.0005
	20-Mar-90	<0.00005	0.00035	0.0061	<0.005	0.018	0.0055	0.044	<0.0005
	11-May-90	NT	NT	NT	NT	NT	NT	<0.01	NT
	11-May-90 D*	NT	NT	NT	NT	NT	NT	<0.02	NT
	20-Jul-90	<0.00010	<0.00004	NT	NT	NT	NT	NT	NT
	20-Jul-90 D	<0.00010	<0.00004	NT	NT	NT	NT	NT	NT
	12-Nov-90	<0.00005	<0.00002	NT	NT	NT	NT	NT	<0.0005
	12-Nov-90 D	<0.00005	<0.00002	NT	NT	NT	NT	NT	<0.0005
	07-Feb-91	<0.00005	<0.00002	NT	NT	NT	NT	NT	<0.0005
07-Feb-91 D	<0.00005	<0.00002	NT	NT	NT	NT	NT	<0.0005	
MW-3	18-Jun-89	NT	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.01	NT
	21-Sep-89	<0.00005	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.0005
	20-Dec-89	<0.00005	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.0005
	20-Mar-90	<0.00005	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.0005
	20-Jul-90	<0.00005	<0.00002	NT	NT	NT	NT	NT	NT
	12-Nov-90	<0.00005	<0.00002	NT	NT	NT	NT	NT	<0.0005
	07-Feb-91	<0.00005	<0.00002	NT	NT	NT	NT	NT	<0.0005
MW-4	25-Jun-89	NT	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.0005
	21-Sep-89	<0.00005	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.0005
	20-Dec-89	<0.00005	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.0005
	20-Dec-89 D	NT	NT	NT	NT	NT	NT	<0.01	NT
	20-Mar-90	<0.00005	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.0005
	20-Jul-90	<0.00005	<0.00002	NT	NT	NT	NT	NT	NT
	12-Nov-90	<0.00005	<0.00002	NT	NT	NT	NT	NT	<0.0005
07-Feb-91	<0.00005	<0.00002	NT	NT	NT	NT	NT	<0.0005	
MW-5	30-Jun-89	NT	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.01	NT
	21-Sep-89	<0.00005	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.01	0.00090
	20-Dec-89	<0.00005	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.0005
	20-Mar-90	<0.00005	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.0005
	20-Jul-90	<0.00005	<0.00002	NT	NT	NT	NT	NT	NT
	12-Nov-90	<0.00005	<0.00002	NT	NT	NT	NT	NT	<0.0005
	07-Feb-91	<0.00005	<0.00002	NT	NT	NT	NT	NT	<0.0005
Blank Samples									
FB	30-Jun-89	NT	NT	<0.005	<0.005	<0.005	<0.005	<0.01	NT
FB	21-Sep-89	<0.00005	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.00050
TB	20-Mar-90	NT	NT	NT	NT	NT	NT	<0.01	NT
TB	20-Jul-90	NT	NT	NT	NT	NT	NT	NT	NT
TB	12-Nov-90	<0.00005	<0.00002	NT	NT	NT	NT	NT	<0.0005
TB	07-Feb-91	<0.00005	<0.00002	NT	NT	NT	NT	NT	<0.0005

Concentrations expressed as milligrams of chemical per liter of water (mg/l), which is essentially equivalent to parts per million (ppm) at low concentrations. Less than symbol indicates result below listed reporting limit. Where they were analyzed, unlisted EPA Test Method 602, 8015, 8080, 8240 and 8270 parameters were not detected.

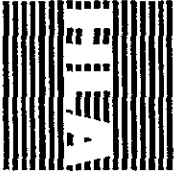
NT = Not tested

FB = Field Blank

D = Duplicate Sample

TB = Trip Blank

\* Sample contained 15 ppm of unknown hydrocarbons in about the C-7 to C-23 carbon range and 8 tentatively identified organic compounds.



**Hardling Lawson Associates**  
Engineering and  
Environmental Services

DRAWN  
CVDC

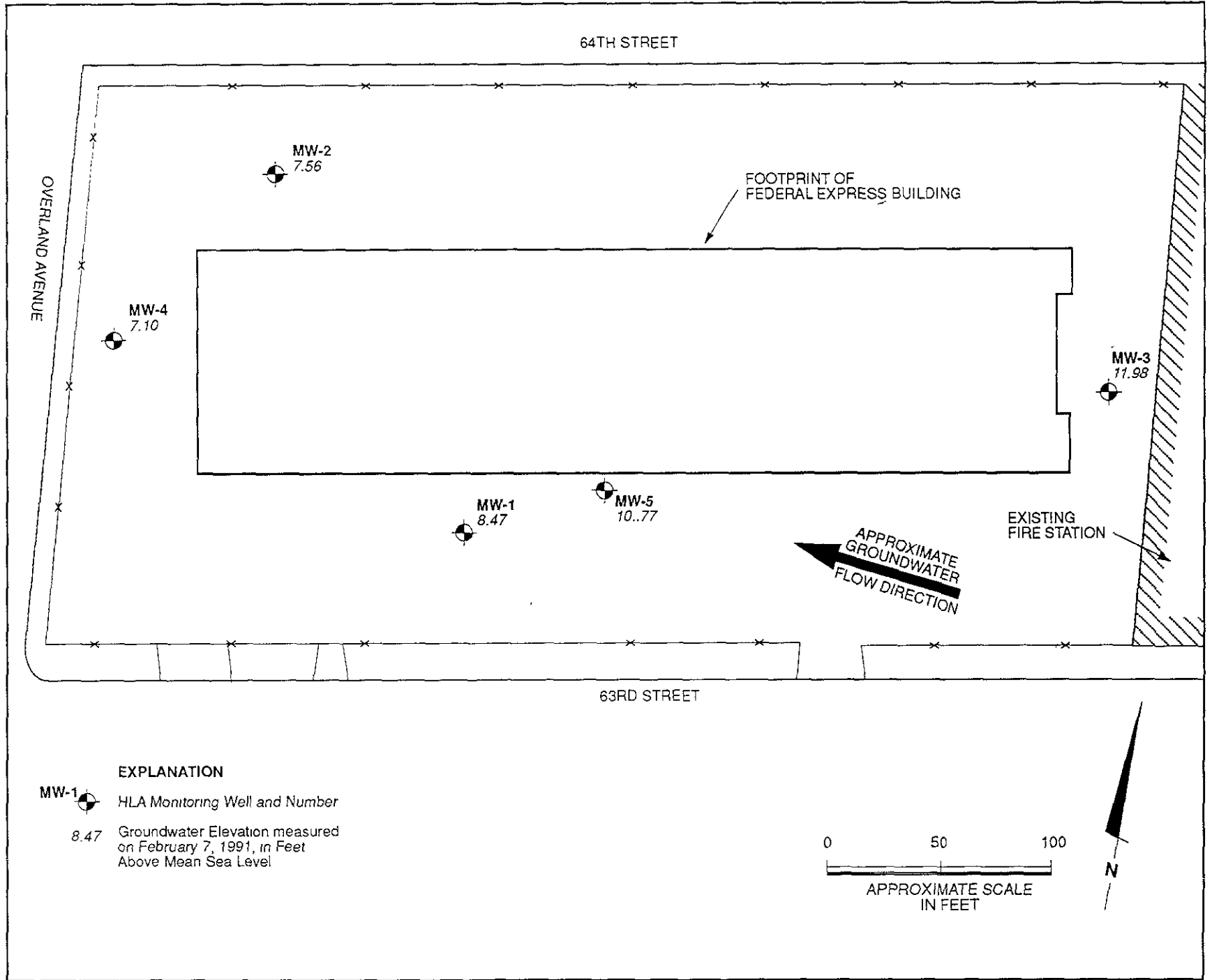
JOB NUMBER  
18452.039.02

APPROVED  
*APM*

DATE  
12/90

REVISED DATE  
2/91

**Site Map**  
1600 63rd Street  
Emeryville, California



**EXPLANATION**



- MW-1  HLA Monitoring Well and Number
- 8.47  Groundwater Elevation measured on February 7, 1991, in Feet Above Mean Sea Level

PLATE  
**1**



Key to Sample Identification

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Sample Number	Well Number
91020001	MW-1
91020002	MW-2
91020003	MW-3
91020004	MW-4
91020005	MW-5
91020012	MW-2 duplicate
91020013	Trip Blank

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NATIONAL  
ENVIRONMENTAL  
TESTING, INC.

NET Pacific, Inc.  
435 Tesconi Circle  
Santa Rosa, CA 95401  
Tel: (707) 526-7200  
Fax: (707) 526-9623

HARDING LAWSON  
AP - 1

Rick McCartney  
Harding Lawson Associates  
200 Rush Landing  
Novato, CA 94947


Date: 02-28-91  
NET Client Acct No: 281  
NET Pacific Log No: 6012  
Received: 02-07-91 1835  
REVISED: 03-01-91

Client Reference Information

Wareham 63rd St., Job: 18452,039.02

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

  
\_\_\_\_\_  
Jules Skamarack  
Laboratory Manager

JS:rct  
Enclosure(s)



NET Pacific, Inc

Client No: 281  
Client Name: Harding Lawson Associates  
NET Log No: 6012

Date: 02-28-91

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Ref: Wareham 63rd St., Job: 18452,039.02

Descriptor, Lab No. and Results

Parameter	Method	Reporting Limit	Descriptor, Lab No. and Results		Units
			91020001 02-07-91 1355	91020002 02-07-91 1510	
			75650	75651	
PETROLEUM HYDROCARBONS			--	--	
VOLATILE (WATER)			--	--	
DILUTION FACTOR *			1	10	
DATE ANALYZED			02-15-91	02-19-91	
METHOD GC FID/5030			--	--	
as Gasoline		0.05	ND	11	mg/L
METHOD 602			--	--	
DILUTION FACTOR *			1	10	
DATE ANALYZED			02-15-91	02-19-91	
Benzene		0.5	ND	ND	ug/L
Ethylbenzene		0.5	ND	ND	ug/L
Toluene		0.5	ND	ND	ug/L
Xylenes, total		0.5	ND	ND	ug/L
PETROLEUM HYDROCARBONS			--	--	
EXTRACTABLE (WATER)			--	--	
DILUTION FACTOR *			1	20	
DATE EXTRACTED			02-13-91	02-13-91	
DATE ANALYZED			02-19-91	02-19-91	
METHOD GC FID/3510			--	--	
as Diesel		0.05	0.20	41	mg/L
as Motor Oil		0.5	ND	31	mg/L



Client No: 281  
 Client Name: Harding Lawson Associates  
 NET Log No: 6012

Date: 02-28-91

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NET Pacific, Inc

Ref: Wareham 63rd St., Job: 18452,039.02

Descriptor, Lab No. and Results

Parameter	Method	Reporting Limit	Descriptor, Lab No. and Results		Units
			91020001 02-07-91 1355	91020002 02-07-91 1510	
			75650	75651	
METHOD 608					
DATE EXTRACTED			02-13-91	02-13-91	
DATE ANALYZED			02-20-91	02-20-91	
DILUTION FACTOR *			2	10	
Aldrin		0.02	ND	ND	ug/L
alpha-BHC		0.005	ND	ND	ug/L
beta-BHC		0.005	ND	ND	ug/L
delta-BHC		0.005	ND	ND	ug/L
gamma-BHC (Lindane)		0.02	ND	ND	ug/L
Chlordane		0.4	ND	ND	ug/L
4,4'-DDD		0.05	ND	ND	ug/L
4,4'-DDE		0.05	ND	ND	ug/L
4,4'-DDT		0.05	ND	ND	ug/L
Dieldrin		0.05	ND	ND	ug/L
Endosulfan I		0.05	ND	ND	ug/L
Endosulfan II		0.05	ND	ND	ug/L
Endosulfan sulfate		0.05	ND	ND	ug/L
Endrin		0.05	ND	ND	ug/L
Endrin aldehyde		0.05	ND	ND	ug/L
Heptachlor		0.05	ND	ND	ug/L
Heptachlor epoxide		0.05	ND	ND	ug/L
Methoxychlor		0.08	ND	ND	ug/L
Toxaphene		1.0	ND	ND	ug/L
POLYCHLORINATED BIPHENYLS					
Aroclor 1016		2.0	ND	ND	ug/L
Aroclor 1221		8.0	ND	ND	ug/L
Aroclor 1232		3.0	ND	ND	ug/L
Aroclor 1242		2.0	ND	ND	ug/L
Aroclor 1248		2.0	ND	ND	ug/L
Aroclor 1254		0.5	ND	ND	ug/L
Aroclor 1260		0.5	ND	ND	ug/L



NET Pacific, Inc.

Client No: 281  
Client Name: Harding Lawson Associates  
NET Log No: 6012

Date: 02-28-91

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Ref: Wareham 63rd St., Job: 18452,039.02

Descriptor, Lab No. and Results

Parameter	Method	Reporting Limit	91020012	91020003	Units
			02-07-91 1530	02-07-91 1600	
			75652	75653	
PETROLEUM HYDROCARBONS			--	--	
VOLATILE (WATER)			--	--	
DILUTION FACTOR *			5	1	
DATE ANALYZED			02-15-91	02-15-91	
METHOD GC FID/5030			--	--	
as Gasoline		0.05	13	ND	mg/L
METHOD 602			--	--	
DILUTION FACTOR *			5	1	
DATE ANALYZED			02-15-91	02-15-91	
Benzene		0.5	ND	ND	ug/L
Ethylbenzene		0.5	ND	ND	ug/L
Toluene		0.5	ND	ND	ug/L
Xylenes, total		0.5	43	ND	ug/L
PETROLEUM HYDROCARBONS			--	--	
EXTRACTABLE (WATER)			--	--	
DILUTION FACTOR *			20	1	
DATE EXTRACTED			02-13-91	02-13-91	
DATE ANALYZED			02-19-91	02-19-91	
METHOD GC FID/3510			--	--	
as Diesel		0.05	27	0.12	mg/L
as Motor Oil		0.5	21	ND	mg/L



NET Pacific, Inc.

Client No: 281  
Client Name: Harding Lawson Associates  
NET Log No: 6012

Date: 02-28-91

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Ref: Wareham 63rd St., Job: 18452,039.02

Descriptor, Lab No. and Results

Parameter	Method	Reporting Limit	Descriptor, Lab No. and Results		Units
			91020012 02-07-91 1530	91020003 02-07-91 1600	
			75652	75653	
METHOD 608					
DATE EXTRACTED			02-13-91	02-13-91	
DATE ANALYZED			02-20-91	02-20-91	
DILUTION FACTOR *			10	1	
Aldrin		0.02	ND	ND	ug/L
alpha-BHC		0.005	ND	ND	ug/L
beta-BHC		0.005	ND	ND	ug/L
delta-BHC		0.005	ND	ND	ug/L
gamma-BHC (Lindane)		0.02	ND	ND	ug/L
Chlordane		0.4	ND	ND	ug/L
4,4'-DDD		0.05	ND	ND	ug/L
4,4'-DDE		0.05	ND	ND	ug/L
4,4'-DDT		0.05	ND	ND	ug/L
Dieldrin		0.05	ND	ND	ug/L
Endosulfan I		0.05	ND	ND	ug/L
Endosulfan II		0.05	ND	ND	ug/L
Endosulfan sulfate		0.05	ND	ND	ug/L
Endrin		0.05	ND	ND	ug/L
Endrin aldehyde		0.05	ND	ND	ug/L
Heptachlor		0.05	ND	ND	ug/L
Heptachlor epoxide		0.05	ND	ND	ug/L
Methoxychlor		0.08	ND	ND	ug/L
Toxaphene		1.0	ND	ND	ug/L
POLYCHLORINATED BIPHENYLS					
Aroclor 1016		2.0	ND	ND	ug/L
Aroclor 1221		8.0	ND	ND	ug/L
Aroclor 1232		3.0	ND	ND	ug/L
Aroclor 1242		2.0	ND	ND	ug/L
Aroclor 1248		2.0	ND	ND	ug/L
Aroclor 1254		0.5	ND	ND	ug/L
Aroclor 1260		0.5	ND	ND	ug/L



NET Pacific, Inc.

Client No: 281  
Client Name: Harding Lawson Associates  
NET Log No: 6012

Date: 02-28-91

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Ref: Wareham 63rd St., Job: 18452,039.02

Descriptor, Lab No. and Results

Parameter	Method	Reporting Limit	91020013	91020005	Units
			02-07-91 1615	02-07-91 1640	
			75654	75655	
PETROLEUM HYDROCARBONS			--	--	
VOLATILE (WATER)			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			02-15-91	02-15-91	
METHOD GC FID/5030			--	--	
as Gasoline		0.05	ND	ND	mg/L
METHOD 602			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			02-15-91	02-15-91	
Benzene		0.5	ND	ND	ug/L
Ethylbenzene		0.5	ND	ND	ug/L
Toluene		0.5	ND	ND	ug/L
Xylenes, total		0.5	ND	ND	ug/L
PETROLEUM HYDROCARBONS			--	--	
EXTRACTABLE (WATER)			--	--	
DILUTION FACTOR *			1	1	
DATE EXTRACTED			02-13-91	02-13-91	
DATE ANALYZED			02-19-91	02-19-91	
METHOD GC FID/3510			--	--	
as Diesel		0.05	ND	ND	mg/L
as Motor Oil		0.5	ND	ND	mg/L



NET Pacific, Inc.

Client No: 281  
Client Name: Harding Lawson Associates  
NET Log No: 6012

Date: 02-28-91

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Ref: Wareham 63rd St., Job: 18452,039.02

Descriptor, Lab No. and Results

Parameter	Method	Reporting Limit	91020013	91020005	Units
			02-07-91 1615	02-07-91 1640	
			75654	75655	
METHOD 608					
DATE EXTRACTED			02-13-91	02-13-91	
DATE ANALYZED			02-20-91	02-20-91	
DILUTION FACTOR *			1	1	
Aldrin		0.02	ND	ND	ug/L
alpha-BHC		0.005	ND	ND	ug/L
beta-BHC		0.005	ND	ND	ug/L
delta-BHC		0.005	ND	ND	ug/L
gamma-BHC (Lindane)		0.02	ND	ND	ug/L
Chlordane		0.4	ND	ND	ug/L
4,4'-DDD		0.05	ND	ND	ug/L
4,4'-DDE		0.05	ND	ND	ug/L
4,4'-DDT		0.05	ND	ND	ug/L
Dieldrin		0.05	ND	ND	ug/L
Endosulfan I		0.05	ND	ND	ug/L
Endosulfan II		0.05	ND	ND	ug/L
Endosulfan sulfate		0.05	ND	ND	ug/L
Endrin		0.05	ND	ND	ug/L
Endrin aldehyde		0.05	ND	ND	ug/L
Heptachlor		0.05	ND	ND	ug/L
Heptachlor epoxide		0.05	ND	ND	ug/L
Methoxychlor		0.08	ND	ND	ug/L
Toxaphene		1.0	ND	ND	ug/L
POLYCHLORINATED BIPHENYLS					
Aroclor 1016		2.0	ND	ND	ug/L
Aroclor 1221		8.0	ND	ND	ug/L
Aroclor 1232		3.0	ND	ND	ug/L
Aroclor 1242		2.0	ND	ND	ug/L
Aroclor 1248		2.0	ND	ND	ug/L
Aroclor 1254		0.5	ND	ND	ug/L
Aroclor 1260		0.5	ND	ND	ug/L





NET Pacific, Inc.

Client No: 281  
Client Name: Harding Lawson Associates  
NET Log No: 6012

Date: 02-28-91

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Ref: Wareham 63rd St., Job: 18452,039.02

Descriptor, Lab No. and Results

Parameter	Method	Reporting Limit	75656	Units
PETROLEUM HYDROCARBONS			91020004	
VOLATILE (WATER)			02-07-91	
DILUTION FACTOR *			1710	
DATE ANALYZED				
METHOD GC FID/5030				
as Gasoline		0.05	ND	mg/L
METHOD 602			--	
DILUTION FACTOR *			1	
DATE ANALYZED			02-15-91	
Benzene		0.5	ND	ug/L
Ethylbenzene		0.5	ND	ug/L
Toluene		0.5	ND	ug/L
Xylenes, total		0.5	ND	ug/L
PETROLEUM HYDROCARBONS			--	
EXTRACTABLE (WATER)			--	
DILUTION FACTOR *			1	
DATE EXTRACTED			02-13-91	
DATE ANALYZED			02-19-91	
METHOD GC FID/3510			--	
as Diesel		0.05	ND	mg/L
as Motor Oil		0.5	ND	mg/L



NET Pacific, Inc

Client No: 281  
Client Name: Harding Lawson Associates  
NET Log No: 6012

Date: 02-28-91

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Ref: Wareham 63rd St., Job: 18452,039.02

Descriptor, Lab No. and Results

91020004  
02-07-91  
1710

Parameter	Method	Reporting Limit	75656	Units
-----------	--------	-----------------	-------	-------

METHOD 608

DATE EXTRACTED			02-13-91	
DATE ANALYZED			02-20-91	
DILUTION FACTOR *			1	
Aldrin		0.02	ND	ug/L
alpha-BHC		0.005	ND	ug/L
beta-BHC		0.005	ND	ug/L
delta-BHC		0.005	ND	ug/L
gamma-BHC (Lindane)		0.02	ND	ug/L
Chlordane		0.4	ND	ug/L
4,4'-DDD		0.05	ND	ug/L
4,4'-DDE		0.05	ND	ug/L
4,4'-DDT		0.05	ND	ug/L
Dieldrin		0.05	ND	ug/L
Endosulfan I		0.05	ND	ug/L
Endosulfan II		0.05	ND	ug/L
Endosulfan sulfate		0.05	ND	ug/L
Endrin		0.05	ND	ug/L
Endrin aldehyde		0.05	ND	ug/L
Heptachlor		0.05	ND	ug/L
Heptachlor epoxide		0.05	ND	ug/L
Methoxychlor		0.08	ND	ug/L
Toxaphene		1.0	ND	ug/L
POLYCHLORINATED BIPHENYLS			--	
Aroclor 1016		2.0	ND	ug/L
Aroclor 1221		8.0	ND	ug/L
Aroclor 1232		3.0	ND	ug/L
Aroclor 1242		2.0	ND	ug/L
Aroclor 1248		2.0	ND	ug/L
Aroclor 1254		0.5	ND	ug/L
Aroclor 1260		0.5	ND	ug/L



Client Acct: 281  
 Client Name: Harding Lawson Associates  
 NET Log No: 6012

Date: 02-22-91  
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NET Pacific, Inc

Ref: Wareham 63rd St., Job: 18452,039.02

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Diesel	0.05	mg/L	111	ND	63	66	3.9
Motor Oil	0.5	mg/L	112	ND	N/A	N/A	N/A
Gasoline	0.05	mg/L	92	ND	90	90	< 1
Benzene	0.5	ug/L	117	ND	95	94	1.0
Toluene	0.5	ug/L	114	ND	99	98	1.0
Gasoline	0.05	mg/L	94	ND	90	90	< 1
Benzene	0.5	ug/L	109	ND	95	94	1.0
Toluene	0.5	ug/L	113	ND	99	97	2.0

COMMENT: Blank Results were ND on other analytes tested.

Lindane	0.02	ug/L	N/A	ND	133	145	8.6
Heptachlor	0.05	ug/L	N/A	ND	103	103	< 1
Aldrin	0.02	ug/L	N/A	ND	128	139	8.2
Dieldrin	0.05	ug/L	N/A	ND	128	140	9.0
Endrin	0.05	ug/L	N/A	ND	100	109	8.6
4,4' DDT	0.05	ug/L	N/A	ND	108	115	6.3

COMMENT: Blank Results were ND on other analytes tested.



NET Pacific, Inc

KEY TO ABBREVIATIONS and METHOD REFERENCES

- < : Less than; When appearing in results column indicates analyte not detected at the value following. This datum supercedes the listed Reporting Limit.
- \* : Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated Reporting Limits by the dilution factor (but do not multiply reported values).
- ICVS : Initial Calibration Verification Standard (External Standard).
- mean : Average; sum of measurements divided by number of measurements.
- mg/Kg (ppm) : Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
- mg/L : Concentration in units of milligrams of analyte per liter of sample.
- mL/L/hr : Milliliters per liter per hour.
- MPN/100 mL : Most probable number of bacteria per one hundred milliliters of sample.
- N/A : Not applicable.
- NA : Not analyzed.
- ND : Not detected; the analyte concentration is less than applicable listed reporting limit.
- NTU : Nephelometric turbidity units.
- RPD : Relative percent difference,  $100 \frac{|\text{Value 1} - \text{Value 2}|}{\text{mean value}}$ .
- SNA : Standard not available.
- ug/Kg (ppb) : Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
- ug/L : Concentration in units of micrograms of analyte per liter of sample.
- umhos/cm : Micromhos per centimeter.

Method References

Methods 100 through 493: see "Methods for Chemical Analysis of Water & Wastes", U.S. EPA, 600/4-79-020, rev. 1983.

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

SM: see "Standard Methods for the Examination of Water & Wastewater, 16th Edition, APHA, 1985.



**Harding Lawson Associates**

7655 Redwood Boulevard  
P.O. Box 578  
Novato, California 94948  
415/892-0821  
Telecopy: \_\_\_\_\_

General: 415/892-0831  
Accounting: 415/898-1052

# CHAIN OF CUSTODY FORM

6012

Lab: NET Pacific

Job Number: 18452, 039, 02  
Name/Location: Wareham 63rd Street  
Project Manager: Rick McCartney

Samplers: David McEvans  
Recorder: David McEvans  
(Signature Required)

ANALYSIS REQUESTED										
EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH (Light + Heavy)	BTEX	Organochlorides + Pesticides (EPA 8080)		
						X	X	X		
						X	X	X		
						X	X	X		
						X	X	X		
						X	X	X		
						X	X	X		
						X	X	X		
						X	X	X		

SOURCE CODE	MATRIX				CONTAINERS & PRESERV.				SAMPLE NUMBER OR LAB NUMBER			DATE				STATION DESCRIPTION/NOTES
	Water	Sediment	Soil	Oil	Unpres.	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCl	Yr	Wk	Seq	Yr	Mo	Dy	Time	
23	X				5		3		9	10	2000	19	10	20	71355	
23	X				5		3		9	10	2000	29	10	20	71510	
23	X				5		3		9	10	2001	29	10	20	71530	
23	X				5		3		9	10	2000	03	10	20	71600	
23	X				2		2		9	10	2001	39	10	20	71615	
23	X				5		3		9	10	2000	05	10	20	71640	
23	X				5		3		9	10	2000	04	10	20	71710	

LAB NUMBER			DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS
Yr	Wk	Seq				
						Normal turnaround time

CHAIN OF CUSTODY RECORD		
RELINQUISHED BY: (Signature) <u>David McEvans</u>	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) <u>David McEvans</u>	DATE/TIME <u>2/7/91 1835</u>	RECEIVED FOR BY: (Signature) <u>Mr. Kullingham</u>
METHOD OF SHIPMENT <u>Hand delivered in cooler w/ice</u>		