STID 147

January 4, 1991

18452,039.02

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
November 1990
1600 63rd Street
Emeryville, California

This report presents the results of the quarterly groundwater monitoring performed in November 1990 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 significantly 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 November 12, 1990, the depth to water was measured in each of the five wells using a steel tape (Table 1). Floating product was observed in Monitoring Well MW-2. On November 21, 1990, an electronic oil-water interface probe was used to measure the product thicknesses in Monitoring Well MW-2. The groundwater surface in this well was also visually inspected for the presence of floating product by carefully lowering a clear disposable bailer into the well, removing it, and observing the water/product interface in the baile

On November 12, 1990, after water levels 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 and one of the bailers were decontaminated at the site by washing with a low phosphate soap and water mixture then double rinsing with tap 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 July 1990 ranged from a 0.29 foot decrease in Well MW-1 to no change in Well MW-2. The water-level elevations measured during this sampling round are shown on Plate 1. The general groundwater flow direction is toward the west.

A product thickness of about 0.03 foot was measured with the oil-interface probe in Well MW-2. Droplets of product were subsequently observed inside the clear, disposable bailer. No product was observed in the other wells.

LABORATORY ANALYSIS AND RESULTS

The groundwater samples were analyzed by NET Pacific, Inc. of Santa Rosa, California, a California-certified laboratory. 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.

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 and MW-2. The groundwater samples from Wells MW-1 and MW-2, and the duplicate sample from Well MW-2 contained 0.16, 61, and 35 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 380 and 7 ppm, respectively. TPH was not detected in the groundwater samples from Wells MW-3, MW-4, and MW-5.

The duplicate groundwater sample from Well MW-2 also contained 0.0009 ppm of toluene, 0.001 ppm of ethylbenzene, and 0.0079 ppm of xylenes. No other compound was detected in any of the groundwater samples or in the trip blank sample.

Although the groundwater sample and duplicate sample were collected from Well MW-2 on the same day after the well was purged, the sample containers were not filled from the same volume of water. This, as well as the inherent limitations of the TPH analyses or laboratory error, may explain the difference in hydrocarbon concentrations detected in the sample and the duplicate from Well MW-2.

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/bag/J15090-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

Key to Sample Identification

Sample Number	Well Number
90460001	MW-1
90460002	MW-2
90460003	MW-3
90460004	MW-4
90460005	MW-5
90460006	MW-2 duplicate
90460007	Trip Blank

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
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	6.66	0.01	7.78	7.78	0.11
		20-Jul-90	6.72	6.74	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	7.00	0.03	7.46	7.45	-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
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
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

* 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
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
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
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
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
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

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.

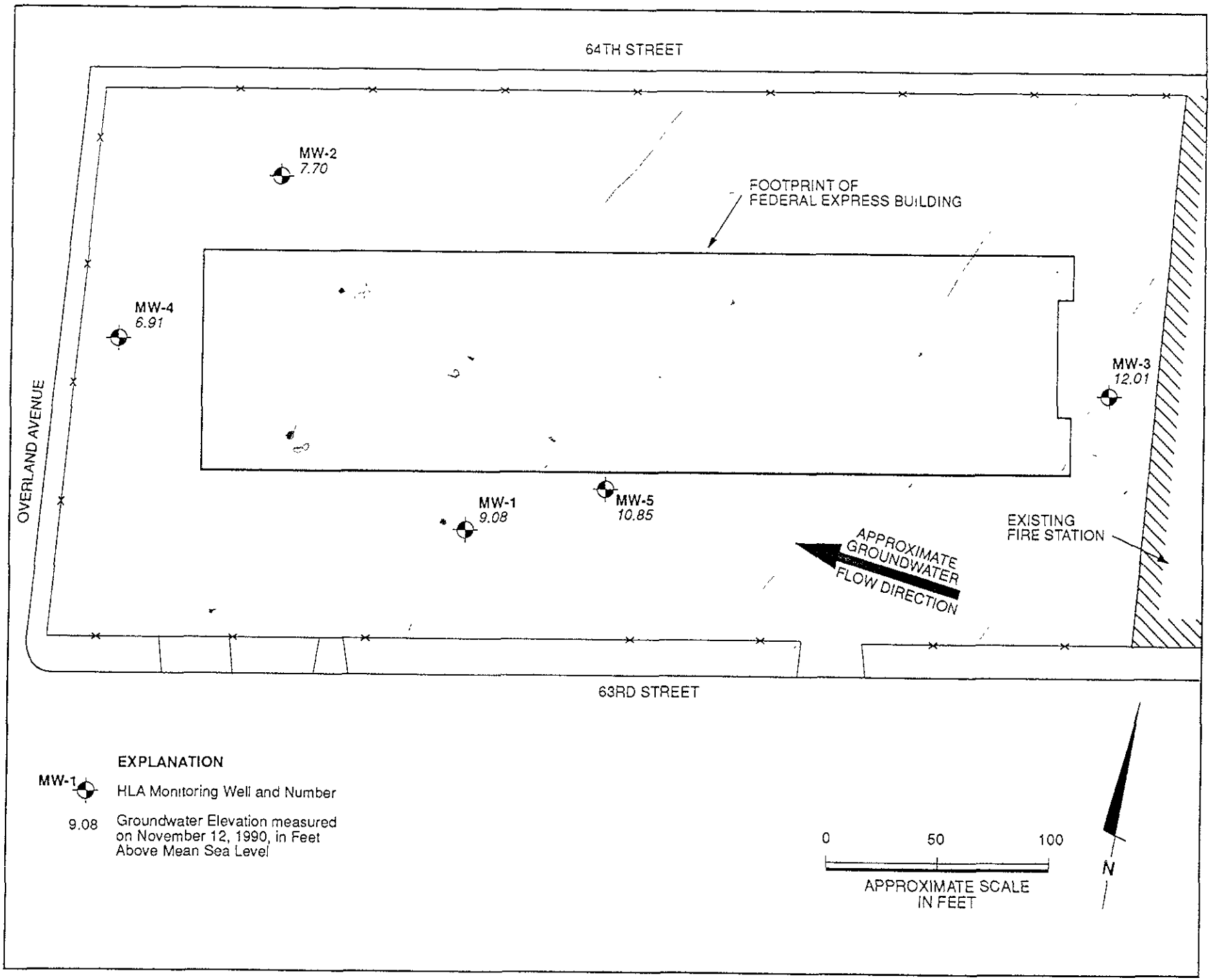
NT = Not tested
FB = Field Blank
D = Duplicate Sample
TB = Trip Blank
* Sample contained 15 ppm of unknown hydrocarbons in about the C-7 to C-23 carbon range and 8 tentatively identified organic compounds.

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
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
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
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
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
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

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.



Harding Lawson Associates
Engineering and
Environmental Services

Site Map
1600 63rd Street
Emeryville, California

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
CVDc	18452,039.02		12/90	

PLATE
1

NATIONAL ENVIRONMENTAL TESTING, INC.

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

Diana Dickerson
Harding Lawson Associates
200 Rush Landing
Novato, CA 94947

Date: 12-07-90
NET Client Acct No: 281
NET Pacific Log No: 4948
Received: 11-14-90 1735

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: 4948

Date: 12-07-90
Page: 2

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

Parameter	Method	Reporting Limit	Descriptor, Lab No. and Results 90460001 11-12-90 1555 68274	 90460002 11-12-90 1810 68275	Units
METHOD 608					
DATE EXTRACTED			11-19-90	11-19-90	
DATE ANALYZED			12-02-90	12-02-90	
DILUTION FACTOR *			10	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: 4948

Date: 12-07-90
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Ref: Wareham/63rd St., Job: 18452,039.02

Parameter	Method	Reporting Limit	Descriptor, Lab No. and Results 90460001 11-12-90 1555 68274	 90460002 11-12-90 1810 68275	Units
PETROLEUM HYDROCARBONS			--	--	
VOLATILE (WATER)			--	--	
DILUTION FACTOR *			1	1000	
DATE ANALYZED			11-23-90	11-24-90	
METHOD GC FID/5030			--	--	
as Gasoline		0.05	ND	380	mg/L
METHOD 602			--	--	
DILUTION FACTOR *			1	1000	
DATE ANALYZED			11-23-90	11-24-90	
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	100	
DATE EXTRACTED			11-17-90	11-17-90	
DATE ANALYZED			11-20-90	11-20-90	
METHOD GC FID/3510			--	--	
as Diesel		0.05	0.16	61	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: 4948

Date: 12-07-90
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Ref: Wareham/63rd St., Job: 18452,039.02

Parameter	Method	Reporting Limit	Descriptor, Lab No. and Results 90460003 11-12-90 1635 68276	 90460004 11-12-90 1725 68277	Units
METHOD 608					
DATE EXTRACTED			11-19-90	11-19-90	
DATE ANALYZED			12-02-90	12-02-90	
DILUTION FACTOR *			20	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: 4948

Date: 12-07-90
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Ref: Wareham/63rd St., Job: 18452,039.02

Parameter	Method	Reporting Limit	Descriptor, Lab No. and Results 90460003 11-12-90 1635 68276	 90460004 11-12-90 1725 68277	Units
PETROLEUM HYDROCARBONS			--	--	
VOLATILE (WATER)			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			11-24-90	11-24-90	
METHOD GC FID/5030			--	--	
as Gasoline		0.05	ND	ND	mg/L
METHOD 602			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			11-24-90	11-24-90	
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			11-17-90	11-17-90	
DATE ANALYZED			11-20-90	11-20-90	
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: 4948

Date: 12-07-90
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Ref: Wareham/63rd St., Job: 18452,039.02

Parameter	Method	Reporting Limit	Descriptor, Lab No. and Results 90460005 11-12-90 1655 68278	 90460006 11-12-90 1840 68279	Units
METHOD 608					
DATE EXTRACTED			11-19-90	11-19-90	
DATE ANALYZED			12-02-90	12-02-90	
DILUTION FACTOR *			10	50	
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: 4948

Date: 12-07-90
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Ref: Wareham/63rd St., Job: 18452,039.02

Parameter	Method	Reporting Limit	Descriptor, Lab No. and Results 90460005 11-12-90 1655 68278	 90460006 11-12-90 1840 68279	Units
PETROLEUM HYDROCARBONS			--	--	
VOLATILE (WATER)			--	--	
DILUTION FACTOR *			1	50	
DATE ANALYZED			11-24-90	11-25-90	
METHOD GC FID/5030			--	--	
as Gasoline		0.05	ND	7.0	mg/L
METHOD 602			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			11-24-90	11-26-90	
Benzene		0.5	ND	ND	ug/L
Ethylbenzene		0.5	ND	1.0	ug/L
Toluene		0.5	ND	0.9	ug/L
Xylenes, total		0.5	ND	7.9	ug/L
PETROLEUM HYDROCARBONS			--	--	
EXTRACTABLE (WATER)			--	--	
DILUTION FACTOR *			1	20	
DATE EXTRACTED			11-17-90	11-17-90	
DATE ANALYZED			11-20-90	11-20-90	
METHOD GC FID/3510			--	--	
as Diesel		0.05	ND	35	mg/L
as Motor Oil		0.5	ND	21	mg/L

NET Pacific, Inc

Client No: 281
Client Name: Harding Lawson Associates
NET Log No: 4948

Date: 12-07-90
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Ref: Wareham/63rd St., Job: 18452,039.02

Parameter	Method	Reporting Limit	Descriptor, Lab No. and Results 90460007 11-12-90 1921 68280	Units
METHOD 608				
DATE EXTRACTED			11-19-90	
DATE ANALYZED			12-02-90	
DILUTION FACTOR *			10	
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

NET Pacific, Inc

Client No: 281
Client Name: Harding Lawson Associates
NET Log No: 4948

Date: 12-07-90
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Ref: Wareham/63rd St., Job: 18452,039.02

Parameter	Method	Reporting Limit	Descriptor, Lab No. and Results 90460007 11-12-90 1921 68280	Units
PETROLEUM HYDROCARBONS			--	
VOLATILE (WATER)			--	
DILUTION FACTOR *			1	
DATE ANALYZED			11-24-90	
METHOD GC FID/5030			--	
as Gasoline		0.05	ND	mg/L
METHOD 602			--	
DILUTION FACTOR *			1	
DATE ANALYZED			11-24-90	
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			11-17-90	
DATE ANALYZED			11-20-90	
METHOD GC FID/3510			--	
as Diesel		0.05	ND	mg/L
as Motor Oil		0.5	ND	mg/L

NET Pacific, Inc

Client Acct: 281
Client Name: Harding Lawson Associates
NET Log No: 4948

Date: 12-04-90
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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	105	ND	87	111	24
Motor Oil	0.5	mg/L	96	ND	N/A	N/A	N/A
Gasoline	0.05	mg/L	103	ND	107	101	5.8
Benzene	0.5	ug/L	84	ND	100	96	4.1
Toluene	0.5	ug/L	90	ND	100	101	1.0
Gasoline	0.05	mg/L	100	ND	99	N/A	N/A
Toluene	0.5	ug/L	96	ND	96	N/A	N/A
Gasoline	0.05	mg/L	78	ND	94	92	2.2
COMMENT: Blank Results were ND on other analytes tested.							
Lindane	0.02	ug/L	N/A	ND	246	303	21
Heptachlor	0.05	ug/L	N/A	ND	88	120	31
Aldrin	0.02	ug/L	N/A	ND	105	180	53
Dieldrin	0.05	ug/L	N/A	ND	71	104	37
Endrin	0.05	ug/L	N/A	ND	45	63	32
4,4' DDT	0.05	ug/L	N/A	ND	27	24	55

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 [Value 1 - Value 2]/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.

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4948

CHAIN OF CUSTODY FORM

Lab: NET

Samplers: ~~JAMES L~~ ANDERSON
DAVID L MYERS

Job Number: 18452.039.02
Name/Location: WAREHAM / 63RD STREET
Project Manager: DIANA DICKERSON

Recorder: (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES
23	X				8			90	46	0001	90	11	12	1655	
23	X				8			90	46	0002	90	11	12	1810	
23	X				8			90	46	0003	90	11	12	1635	
23	X				8			90	46	0004	90	11	12	1725	
23	X				8			90	46	0005	90	11	12	1655	
23	X				8			90	46	0006	90	11	12	1840	
23	X				~~8~~			90	46	0007	90	11	12	1921	

ANALYSIS REQUESTED

EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	ICP METALS	EPA 8015M/TPH	TPH (LIGHT & HEAVY)	BTE & X	ORGANOCHLORINE PESTICIDES (EPA 8080)
					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
						REGULAR TURN AROUND TIME - CONTACT DIANA DICKERSON W/ RESULTS

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY (Signature)	DATE/TIME 11/14 4:15
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 11/14/90 1735
METHOD OF SHIPMENT		

Laboratory Copy White — Project Office Copy Yellow — Field or Office Copy Pink

6533