Harding Lawson Associates

Transmittal/Memorandum

To: Alameda County Department of Environmental Health
80 Swan Way, Room 210
Oakland, California 94621

Attention: Ms. Juliet Shin

From: Gary Lieberman/Michelle Watson GAL
Date: July 9, 1992
Subject: Work Plan Submittal
Job No.: 10495 579

Remarks:

Exxon has requested that Harding Lawson Associates transmit the attached Work Plan to the Alameda County Department of Environmental Health. The Work Plan concerns the offsite evaluation of groundwater in the vicinity of Exxon Station 7-0104, Alameda, California.

If you have any questions, please call (415) 892-0821.

GL/MW:sg/GAL1

cc:

EXXON COMPANY, U.S.A.

POST OFFICE BOX 4032 • CONCORD, CA 94524-2032

ENVIRONMENTAL ENGINEERING

W. Y. WANG
SENIOR ENVIRONMENTAL ENGINEER

11 September, 1991

Need ID #
3601

Exxon RAS 7-0104
1725 Park Street
Alameda, California

Ms. Katherine Chesick
Alameda County Health Agency
Division of Hazardous Materials
80 Swan Way, Suite 200
Oakland, California 94621

Dear Ms. Chesick:

Attached for your review and comment is the letter report on Groundwater Monitoring Results, Third Quarter 1991 for the above referenced Exxon Company, U.S.A. facility in the City of Alameda. This report, prepared by Harding Lawson Associates of Novato, California, presents the results of the ground water sampling event performed in July, 1991.

Although no observable free phase hydrocarbons were found during this monitoring event, detectable levels of dissolved hydrocarbons were detected in all wells at this site. Under separate cover I have forwarded for your review the work plan for the construction of a ground water treatment system at the above site. ?

Should you have any questions or require additional information, please do not hesitate to call me at (415) 246-8768.

Sincerely,

William Y. Wang

WYW:hs
0559E.2
Attachment

c - w/attachment:
Mr. L. Feldman - San Francisco Bay Region Water Quality Control Board

w/o attachment:
Mr. D. J. Bertoch
Mr. P. J. Brininstool
Ms. G. DeMarzo
Mr. J. R. Hastings
Ms. S. M. Watson - Harding Lawson Associates

August 28, 1991

4167,416.02

Exxon Company, U.S.A.
Post Office Box 4032
Concord, California 94520

Attention: Mr. Bill Wang

Gentlemen:

Groundwater Monitoring Results, Third Quarter 1991
Exxon Station #7-0104
Alameda, California

This letter presents the results of Harding Lawson Associates' (HLA) third quarter of 1991 sampling of seven groundwater monitoring wells at Exxon Station #7-0104, 1725 Park Street, Alameda, California (site). The site history and detailed monitoring well sampling procedures are described in HLA's report *Phase II Evaluation of Petroleum Hydrocarbons, Exxon Service Station R/S #7-0104, 1725 Park Street, Alameda, California*, dated March 21, 1989. This sampling event was conducted on July 24, 1991, and represents HLA's first sampling event authorized by Exxon Company, U.S.A. (Exxon) Work Authorization #90066058.

Groundwater-Level Monitoring and Groundwater Sampling

HLA has obtained monthly groundwater-level and free-phase hydrocarbon measurements from the monitoring wells since September 1989. All measurements were performed with an electric oil-water interface probe or a chalked steel tape. During monthly groundwater monitoring, the groundwater collected from each well was visually inspected for the presence of free-phase petroleum product using a clear Lucite bailer. No measurable free-phase petroleum product has been observed in any of the wells during the course of this investigation, with the exception of a sheen in Well MW-2, detected in 3 out of 20 monitoring events.

Prior to groundwater sample collection on July 24, 1991, the monitoring wells were purged a minimum of three well volumes with a PVC bailer or centrifugal pump. The purged water was stored onsite in 55-gallon drums. Measurements of pH, conductivity, and temperature of the purged water were monitored and recorded during purging of the wells. Copies of HLA's Groundwater Sampling Forms documenting sampling activities are attached to this letter.

Groundwater samples were collected from each of the monitoring wells using a stainless steel bailer and decanted into pre-acidified 40-milliliter volatile organic analysis (VOA) vials. A quality assurance/quality control (QA/QC) field blank water sample was prepared in the field by decanting deionized water into VOA vials. The groundwater samples and QA/QC field blank were labeled, placed in a cooler with blue ice, and transported under chain of custody procedures to PACE, Inc., Novato, California. PACE is a state-certified hazardous waste laboratory.

To help prevent potential cross-contamination, all water-level measurement and sampling equipment was decontaminated prior to use by steam cleaning or washing in a low phosphorous soap solution.

Laboratory Analyses

The groundwater samples and field blank were analyzed for total petroleum hydrocarbons (TPH) calibrated as gasoline, and for benzene, toluene, ethylbenzene, and xylenes (BTEX). Groundwater analytical results are summarized in Table 1, along with analytical results from HLA's previous groundwater sampling rounds. Copies of laboratory reports from the July 24, 1991, sampling are attached to this letter.

Groundwater Gradient and Flow Direction

Potentiometric surface elevations from the July 1991 groundwater-level survey are presented in Table 2, along with previously measured potentiometric surface elevations. Potentiometric surface elevations at the site have decreased over the past three months, most likely as a result of the lack of precipitation induced recharge. Plate 1 presents a generalized potentiometric surface map for the site. As shown on Plate 1, the generalized local direction of groundwater flow is toward the east at an approximate gradient of 0.008 to 0.02 ft/ft. This flow direction is consistent with previous potentiometric surface data obtained during this investigation.

Laboratory Analytical Results

Laboratory analytical results from the July sampling indicate that petroleum hydrocarbon constituents were detected in all seven wells onsite. Detected concentrations of TPH as gasoline ranged from 9.7 to 49 milligrams per liter (mg/l). The highest concentrations of petroleum hydrocarbon constituents were detected in the groundwater sample collected from Monitoring Well MW-2, located downgradient of the fuel storage and distribution systems. No petroleum hydrocarbons were detected in the field blank submitted to the laboratory for analysis.

Review of chemical analyses reveals that concentrations of petroleum constituents have increased in Monitoring Wells MW-1 and MW-3, decreased in Wells MW-6 and MW-7, and have remained roughly the same in the remaining wells. The concentrations of benzene, toluene, and xylenes detected in all monitoring wells at the

site exceed the California State Department of Health Services (DHS) action levels of 0.7, 100, and 620 micrograms per liter (μg/l), respectively. Ethylbenzene concentrations detected in all wells except MW-4 exceed the DHS action level of 680 μg/l.

HLA plans to continue quarterly sampling and monthly groundwater level monitoring and is currently developing site soil and groundwater remediation programs. The next quarterly sampling event is scheduled for October 1991.

We trust that this is the information Exxon requires at the present time. HLA recommends that copies of this report be submitted to the Regional Water Quality Control Board and the Alameda County Health Department for their review.

Please call us at 415/892-0821 if you have any questions.

Yours very truly,

HARDING LAWSON ASSOCIATES

S. Michelle Watson
Senior Geologist

Michael L. Siembieda
Associate Geologist - RG 4007

REGISTERED GEOLOGIST
MICHAEL L. SIEMBIEDA
No: 4007
STATE OF CALIFORNIA

SMW/MLS/amw/T19020-H

Attachments: Table 1 - Summary of Chemical Results of Groundwater Samples
Table 2 - Potentiometric Surface Elevations and Product Thickness Measurements
Plate 1 - Generalized Potentiometric Surface Contour Map, March 19, 1991
Groundwater Sampling Forms
Laboratory Analytical Reports

EXXON ALAMEDA
Table 1. Summary of Chemical Results of Groundwater Samples

Well Number	Date	TPH Gasoline mg/l[1]	Benzene µg/l[2]	Toluene µg/l	Ethyl-benzene µg/l	Xylenes µg/l	Total Dissolved Solids mg/l
DHS Action Levels			0.7	100	680	620	
MW-1	06/07/88	27	5,000	77	1,100	2,700	NT[3]
	01/17/89	6.8	2,000	91	800	1,600	NT
	06/01/89	1.7	170	6.9	13	230	NT
	09/18/89	2.1	9.0	53	18	130	NT
	12/11/89	5.8	200	42	290	330	NT
	03/07/90	NT	NT	NT	NT	NT	910
	03/13/90	2.3	430	14	16	220	NT
	06/14/90	32	1,400	19	<5[4]	120	NT
	09/19/90	0.95	290	2.9	<0.5	27	NT
	12/17/90	2.1	550	13	350	110	NT
	03/19/91	1.4	900	45	390	150	NT
	07/24/91	9.7	1,300	670	950	2,100	NT
MW-2	06/07/88	110	12,000	12,000	2,100	12,000	NT
	01/17/89	30	6,600	3,300	1,600	7,700	NT
	06/01/89	8.7	330	280	680	1,200	NT
	09/18/89	17	580	280	570	220	NT
	12/11/89	32	1,000	850	310	1,200	NT
	03/13/90	39	3,500	1,500	2,100	3,900	NT
	06/14/90	34	3,800	730	1,600	3,900	NT
	09/19/90	63	670	180	390	1,000	NT
	12/17/90	140	3,700	2,500	3,000	8,300	NT
	03/19/91	48	4,500	1,600	2,100	5,500	NT
	07/24/91	49	3,500	2,200	2,000	6,400	NT
MW-3	06/07/88	28	6,000	80	940	1,900	NT
	01/17/89	5.3	2,500	230	590	1,100	NT
	06/01/89	5.4	330	300	570	680	NT
	09/18/89	12	680	170	350	860	NT
	12/11/89	14	1,100	150	670	690	NT
	03/13/90	18	6,300	200	1,100	1,100	NT
	06/14/90	9.5	1,300	880	310	1,800	NT
	09/19/90	16	5,000	65	1,500	450	NT
	12/17/90	6.7	1,500	64	650	460	NT
	03/19/91	18	4,200	2,100	1,100	1,200	NT
	07/24/91	38	6,200	990	2,900	9,600	NT

EXXON ALAMEDA
Table 1. Summary of Chemical Results of Groundwater Samples (continued)

Well Number	Date	TPH Gasoline mg/l[1]	Benzene µg/l[2]	Toluene µg/l	Ethyl-benzene µg/l	Xylenes µg/l	Total Dissolved Solids mg/l
DHS Action Levels			0.7	100	680	620	
MW-4	01/17/89	19	1,000	1,500	360	2,200	NT
	06/01/89	3.6	180	240	63	810	NT
	09/18/89	6.0	290	200	28	510	NT
	12/11/89	13	750	910	510	1,200	NT
	03/07/90	NT	NT	NT	NT	NT	370
	03/13/90	12	1,500	1,500	470	2,800	NT
	06/14/90	12	5,700	400	1,300	760	NT
	09/19/90	5.5	670	180	390	1,000	NT
	12/17/90	14	1,400	620	540	2,100	NT
	03/19/91	11	1,500	740	620	2,100	NT
	07/24/91	10	1,200	440	410	1,200	NT
MW-5	01/17/89	26	8,700	3,900	990	5,900	NT
	06/01/89	5.2	240	220	130	690	NT
	09/18/89	8.0	340	150	140	460	NT
	12/11/89	15	720	320	450	870	NT
	03/13/90	10	3,400	220	280	800	NT
	06/14/90	12	3,300	160	350	730	NT
	09/19/90	8.5	1,800	85	120	460	NT
	12/17/90	18	2,300	810	430	1,400	NT
	03/19/91	17	2,900	610	580	1,200	NT
	07/24/91	16	3,200	320	690	1,100	NT
MW-6	01/17/89	38	7,400	9,300	2,000	9,900	NT
	06/01/89	23	1,900	2,500	2,000	6,000	NT
	09/18/89	17	650	410	650	320	NT
	12/11/89	29	1,100	810	330	1,500	NT
	03/13/90	38	12,000	15,000	2,500	12,000	NT
	06/14/90	38	9,100	7,800	2,900	12,000	NT
	09/19/90	22	4,200	300	1,400	3,400	NT
	12/17/90	20	3,100	4,100	890	2,700	NT
	03/19/91	180	11,000	55,000	5,600	28,000	NT
	07/24/91	48	5,400	2,300	2,000	9,000	NT
MW-7	01/09/90	17	380	180	330	1,300	NT
	03/13/90	16	360	270	83	460	NT
	06/14/90	14	1,200	2,800	75	930	NT

EXXON ALAMEDA
Table 1. Summary of Chemical Results of Groundwater Samples (continued)

Well Number	Date	TPH Gasoline mg/l[1]	Benzene µg/l[2]	Toluene µg/l	Ethyl-benzene µg/l	Xylenes µg/l	Total Dissolved Solids mg/l
DHS Action Levels			0.7	100	680	620	
MW-7 (cont.)	09/19/90	16	2,800	95	2,500	1,700	NT
	12/17/90	75	2,600	7,000	3,300	14,000	NT
	03/19/91	44	1,600	740	3,400	8,600	NT
	07/24/91	18	1,300	160	2,700	1,000	NT
Field Blank	12/11/89	<0.05	0.88	0.95	0.62	1.7	NT
	12/17/90	<0.05	<0.5	<0.5	<0.5	<0.5	NT
	03/19/91	<0.05	<0.5	<0.5	<0.5	<0.5	NT
	07/24/91	<0.05	<0.5	<0.5	<0.5	<0.6	NT
Trip Blank	06/14/90	<0.05	<0.5	<0.5	<0.5	<0.5	NT
	09/19/90	<0.05	0.8	<0.5	0.6	1.0	NT

1 mg/l: milligrams per liter (parts per million)

2 µg/l: micrograms per liter (parts per billion)

3 NT: Not tested

4 <: Numbers preceded by "<" indicate that sample was below the indicated detection limit.

Table 2. Potentiometric Surface and Product Thickness Measurements

Well Number	Elevation Top of Well Casing[1]	Date	Depth to Water BTOC[2] (feet)	Depth to Product BTOC (feet)	Product Thickness (feet)	Potentiometric Surface Elevation (feet above MSL)
MW-1	17.35	06-10-88	6.35	NP[3]	NP	11.00
		01-17-89	5.81	NP	NP	11.54
		01-24-89	5.16	NP	NP	12.19
		06-01-89	6.27	NP	Sheen	11.08
		09-18-89	7.11	NP	NP	10.24
		10-20-89	7.28	NP	NP	10.07
		11-22-89	7.02	NP	NP	10.33
		12-11-89	6.60	NP	NP	10.75
		02-13-90	6.02	NP	NP	11.33
		03-13-90	5.91	NP	NP	11.44
		04-18-90	6.18	NP	NP	11.17
		05-23-90	6.29	NP	NP	11.06
		06-14-90	6.19	NP	NP	11.28
		08-21-90	7.03	NP	NP	10.32
		09-19-90	7.26	NP	NP	10.09
		12-17-90	6.75	NP	NP	10.60
		01-31-91	6.78	NP	NP	10.57
		02-25-91	6.59	NP	NP	10.76
		03-19-91	5.85	NP	NP	11.50
		04-22-91	5.72	Sheen	Sheen	11.63
		05-17-91	6.00	NP	NP	11.35
		07-24-91	6.79	NP	NP	10.56
MW-2	16.67	06-10-88	6.20	NP	NP	10.47
		01-17-89	5.96	NP	NP	10.71
		01-24-89	5.04	NP	NP	11.63
		06-01-89	6.32	NP	Sheen	10.35
		09-18-89	6.73	NP	NP	9.94
		10-20-89	6.87	NP	NP	9.80
		11-22-89	6.80	NP	NP	9.87
		12-11-89	6.57	NP	NP	10.10
		02-13-90	6.12	NP	NP	10.55
		03-13-90	6.02	NP	NP	10.65
		04-18-90	6.35	NP	NP	10.32
		05-23-90	6.28	NP	NP	10.39
		06-14-90	6.14	NP	NP	10.53
		08-21-90	6.70	NP	NP	9.97
		09-19-90	6.84	NP	NP	9.83
		12-17-90	6.46	NP	NP	10.21
		01-31-91	6.66	Sheen	Sheen	10.01

Table 2. Potentiometric Surface and Product Thickness Measurements (continued)

Well Number	Elevation Top of Well Casing[1]	Date	Depth to Water BTOC[2] (feet)	Depth to Product BTOC (feet)	Product Thickness (feet)	Potentiometric Surface Elevation (feet above MSL)
MW-2 (cont.)		02-25-91	6.50	NP	NP	10.17
		03-19-91	5.76	Sheen	Sheen	10.91
		04-22-91	5.78	NP	NP	10.89
		05-17-91	6.01	NP	NP	10.66
		07-24-91	6.43	NP	NP	10.24
MW-3	17.11	06-10-88	6.05	NP	NP	11.06
		01-17-89	5.49	NP	NP	11.62
		01-24-89	5.38	NP	NP	11.73
		06-01-89	5.96	NP	NP	11.15
		09-18-89	6.65	NP	NP	10.46
		10-20-89	6.88	NP	NP	10.23
		11-22-89	6.74	NP	NP	10.37
		12-11-89	6.37	NP	NP	10.74
		02-13-90	5.58	NP	NP	11.53
		03-13-90	5.48	NP	NP	11.63
		04-18-90	6.01	NP	NP	11.10
		05-23-90	6.14	NP	NP	10.97
		06-14-90	5.83	NP	NP	11.28
		08-21-90	6.67	NP	NP	10.44
		09-19-90	6.88	NP	NP	10.23
		12-17-90	6.46	NP	NP	10.65
		01-31-91	6.24	NP	NP	10.87
		02-25-91	6.18	NP	NP	10.93
		03-19-91	5.35	NP	NP	11.76
		04-22-91	5.72	NP	NP	11.39
		05-17-91	5.55	NP	NP	11.56
		07-24-91	6.41	NP	NP	10.70
MW-4	17.34	01-17-89	5.36	NP	NP	11.98
		01-24-89	5.46	NP	NP	11.88
		06-01-89	6.01	NP	NP	11.33
		09-18-89	6.80	NP	NP	10.54
		10-20-89	7.08	NP	NP	10.26
		11-22-89	6.82	NP	NP	10.52
		12-11-89	6.37	NP	NP	10.97
		02-13-90	5.49	NP	NP	11.85
		03-13-90	5.44	NP	NP	11.90
		04-18-90	6.14	NP	NP	11.20
		05-23-90	6.22	NP	NP	11.12
		06-14-90	5.92	NP	NP	11.42

Table 2. Potentiometric Surface and Product Thickness Measurements (continued)

Well Number	Elevation Top of Well Casing[1]	Date	Depth to Water BTOC[2] (feet)	Depth to Product BTOC (feet)	Product Thickness (feet)	Potentiometric Surface Elevation (feet above MSL)
MW-4 (cont.)		08-21-90	6.83	NP	NP	10.51
		09-19-90	7.07	NP	NP	10.27
		12-17-90	6.50	NP	NP	10.84
		01-31-91	6.66	NP	NP	10.68
		02-25-91	6.21	NP	NP	11.13
		03-19-91	5.29	NP	NP	12.05
		04-22-91	5.26	NP	NP	12.08
		05-17-91	5.60	NP	NP	11.74
		07-24-91	6.54	NP	NP	10.80
MW-5	16.71	01-17-89	5.39	NP	NP	11.32
		01-24-89	5.51	NP	NP	11.20
		06-01-89	5.83	NP	Sheen	10.88
		09-18-89	6.52	NP	NP	10.19
		10-20-89	6.72	NP	NP	9.99
		11-22-89	6.54	NP	NP	10.17
		12-11-89	6.21	NP	NP	10.50
		02-13-90	5.60	NP	NP	11.11
		03-13-90	5.54	NP	NP	11.17
		04-18-90	5.75	NP	NP	10.76
		05-23-90	5.98	NP	NP	10.73
		06-14-90	5.81	NP	NP	10.90
		08-21-90	6.51	NP	NP	10.20
		09-19-90	6.70	NP	NP	10.01
		12-17-90	6.24	NP	Sheen	10.47
		01-31-91	6.31	NP	NP	10.40
		02-25-91	6.13	NP	NP	10.58
		03-19-91	5.32	NP	NP	11.39
		04-22-91	5.30	Sheen	Sheen	11.41
		05-17-91	5.59	NP	NP	11.12
		07-24-91	6.33	NP	NP	10.38
MW-6	17.56	01-17-89	5.59	NP	NP	11.97
		01-24-89	5.27	NP	NP	12.29
		06-01-89	6.25	NP	Sheen	11.31
		09-18-89	6.95	NP	NP	10.61
		10-20-89	7.24	NP	NP	10.32
		11-22-89	7.05	NP	NP	10.51
		12-11-89	6.63	NP	NP	10.93
		02-13-90	5.70	NP	NP	11.86
		03-13-90	5.63	NP	NP	11.93
		04-18-90	6.26	NP	NP	11.30
		05-23-90	6.42	NP	NP	11.14

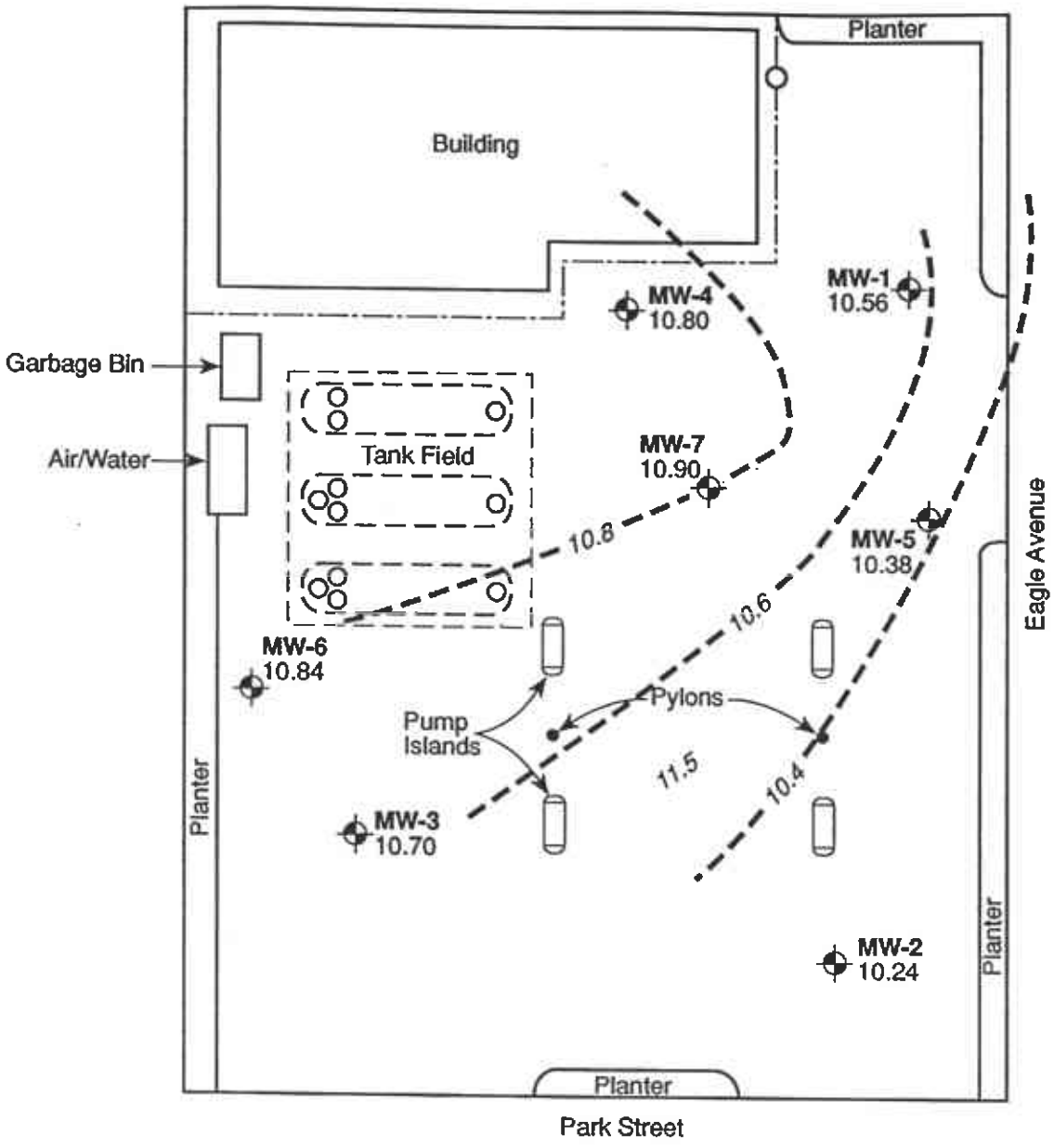
Table 2. Potentiometric Surface and Product Thickness Measurements (continued)

Well Number	Elevation Top of Well Casing[1]	Date	Depth to Water BTOC[2] (feet)	Depth to Product BTOC (feet)	Product Thickness (feet)	Potentiometric Surface Elevation (feet above MSL)
MW-6 (cont.)		06-14-90	6.19	NP	NP	11.37
		08-21-90	7.01	NP	NP	10.55
		09-19-90	7.23	NP	NP	10.33
		12-17-90	6.66	NP	NP	10.90
		01-31-91	6.39	NP	NP	11.17
		02-25-91	6.39	NP	NP	11.17
		03-19-91	5.57	NP	NP	11.99
		04-22-91	5.42	NP	NP	12.14
		05-17-91	5.73	NP	NP	11.83
		07-24-91	6.72	NP	NP	10.84
MW-7	17.12	02-13-90	4.98	NP	NP	12.14
		03-13-90	4.94	NP	NP	12.18
		05-23-90	5.87	NP	NP	11.25
		06-14-90	5.55	NP	NP	11.57
		09-19-90	6.79	NP	NP	10.33
		12-17-90	6.15	NP	NP	10.97
		01-31-91	6.64	NP	NP	10.48
		02-25-91	5.80	NP	NP	11.32
		03-19-91	4.96	NP	NP	12.16
		04-22-91	4.82	Sheen	Sheen	12.30
		05-17-91	5.18	NP	NP	11.94
		07-24-91	6.22	NP	NP	10.90

1 Elevations surveyed to mean sea level.

2 BTOC - Below top of casing.

3 NP: No product.



EXPLANATION

Monitoring Well Locations

10.70 Potentiometric Surface Elevation in Feet Above Mean Sea Level

10.6 Potentiometric Surface Elevation Contour

N

0 20 40

SCALE IN FEET

0827PK01

Harding Lawson Associates
Engineering and Environmental Services

Generalized Potentiometric Surface Contour Map - July 24, 1991
Exxon Station #7-0104
Alameda, California

PLATE **1**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
DMc	4167,416.02		8/91	

Job # 04167,416.07

Date 7-24-91

WATER LEVEL DATA SHEET

Recorded by: David M Evans

Instrument used: SS Tape

BORING NUMBER	DEPTH TO PRODUCT 1st	2nd	3rd	DEPTH TO WATER 1st	2nd	3rd	TIME	DATE	PRODUCT THICK-NESS	COMMENTS
NW-1				6.74	6.74		0735			
NW-4				6.54	6.54		0738			
NW-6				6.72	6.72		0741			
NW 3				6.41	6.41		0743			
NW 2				6.43	6.43		0746			
NW-7				6.22	6.22		0744			
NW-5				6.33	6.33		0752			

Harding Lawson Associates
Engineers and Geoscientists

GROUND-WATER SAMPLING FORM

Well No. MW-1
Well Type: ☒ Monitor ☐ Extraction ☐ Other ____
Well Material: ☒ PVC ☐ St. Steel ☐ Other ____
Date 7-24-91 Time 1055
Sampled by DME (Initials)

Job Name Exxon
Job Number 4663.46.02
Recorded by [signature] (Signature)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches):
☐ 2-inch ☒ 4-inch ☐ 6-inch ☐ Other ____
Total Depth of Casing (TD in feet BTOC): 20.5
Water Level Depth (WL in feet BTOC): 6.79
Number of Well Volumes to be purged (# Vols)
☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ____

PURGE METHOD

☐ Bailer - Type: ____
☐ Submersible ☒ Centrifugal ☐ Bladder; Pump No.: ____
☐ Other - Type: ____

PUMP INTAKE SETTING

☒ Near Bottom ☐ Near Top ☐ Other ____
Depth in feet (BTOC): ____ Screen Interval in feet (BTOC): from ____ to ____

PURGE VOLUME CALCULATION

(20.5 − 6.79) TD (feet) − WL (feet) × 4 D (inches)^2 × 3 # Vols × 0.0408 = 27 gallons
Calculated Purge Volume

PURGE TIME

1032 Start 1047 Stop ____ Elapsed

PURGE RATE

Initial 5 gpm Final 2.5 gpm

ACTUAL PURGE VOLUME

27 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☒ °C ☐ °F	Other NTU
Initial	6.8	450	21	>100
10	6.6	495	22	>100
20	6.9	500	22.5	27
27	6.8	485	22.0	97

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other ____
Meter Nos.	PH 5926	E/C 6095	Tur 3249	

Observations During Purging (Well Condition, Turbidity, Color, Odor): Cloudy grey no odor
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☒ Other 55 gal drum

WELL SAMPLING

SAMPLING METHOD

☒ Bailer - Type: SS
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.: ____
☐ Same As Above
☐ Grab - Type: ____
☐ Other - Type: ____

SAMPLE DISTRIBUTION

Sample Series: 9107

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
EXA7	3 VOAs	TPH-g/BTEX	HCl	Pace	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.

RL004

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GROUND-WATER SAMPLING FORM

Job Name: Exxon
Job Number: 4167,416,02
Recorded by: [signature] (Signature)

Well No. MW-2
Well Type: ☒ Monitor ☐ Extraction ☐ Other
Well Material: ☒ PVC ☐ St. Steel ☐ Other
Date: 7-24-91 Time: 0925
Sampled by: DNLE (initials)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches):
☐ 2-inch ☒ 4-inch ☐ 6-inch ☐ Other

Total Depth of Casing (TD in feet BTOC): 16.0'
Water Level Depth (WL in feet BTOC): 6.43
Number of Well Volumes to be purged (# Vols)
☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other

PURGE METHOD

☒ Bailer - Type: PVC
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.:
☐ Other - Type:

PUMP INTAKE SETTING

☐ ~~Near Bottom~~ ☐ ~~Near Top~~ ☐ Other
Depth in feet (BTOC): ~~Screen Interval in feet (BTOC):~~
~~from to~~

PURGE VOLUME CALCULATION

(16' TD (feet) − 6.43 WL (feet)) × 4 D (inches)^2 × 3 # Vols × 0.0408 = 19 Calculated Purge Volume gallons

PURGE TIME

0909 Start 0917 Stop ____ Elapsed

PURGE RATE

Initial —— gpm Final —— gpm

ACTUAL PURGE VOLUME

Dry 12 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☒°C ☐°F	Other NTU
Initial	6.7	500	20.0	>100
10	6.8	500	22.0	>100
19				

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐°C ☐°F	Other

Meter Nos. PH 5226 E/C 6095 Tur 3249

Observations During Purging (Well Condition, Turbidity, Color, Odor): Cloudy grey, sheen + odor
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☒ Other 55 gal drums

WELL SAMPLING

SAMPLING METHOD

☒ Bailer - Type: SS
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.:
☐ Same As Above
☐ Grab - Type:
☐ Other - Type:

SAMPLE DISTRIBUTION

Sample Series: 9107

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
EXA3	3 VOAs	TPHL/BTEX	HCl	Pace	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.

Harding Lawson Associates
Engineers and Geoscientists

GROUND-WATER SAMPLING FORM

Well No. MW 3
Well Type: ☒ Monitor ☐ Extraction ☐ Other ____
Well Material: ☒ PVC ☐ St. Steel ☐ Other ____
Date 7-24-91 Time 0855
Sampled by DME (Initials)

Job Name Exxon
Job Number 04167446.02
Recorded by David M Graves (Signature)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches):
☐ 2-inch ☒ 4-inch ☐ 6-inch ☐ Other ____
Total Depth of Casing (TD in feet BTOC): 14'
Water Level Depth (WL in feet BTOC): 6.41
Number of Well Volumes to be purged (# Vols)
☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ____

PURGE METHOD

☒ Bailer - Type: PVC
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.: ____
☐ Other - Type: ____

PUMP INTAKE SETTING

~~☐ Near Bottom~~ ☐ Near Top ☐ Other ____
Depth in feet (BTOC): ____ Screen Interval in feet (BTOC): from ____ to ____

PURGE VOLUME CALCULATION

$(14' - 6.41) \times 4^2 \times 3 \times 0.0408 = 15$ gallons

(TD (feet) − WL (feet)) × D (inches)² × # Vols × 0.0408 = Calculated Purge Volume

PURGE TIME

0838 Start 0849 Stop ____ Elapsed

PURGE RATE

Initial ____ gpm Final ____ gpm

ACTUAL PURGE VOLUME

Dry @ 12 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☒ °C ☐ °F	Other Nitrate
Initial	6.6	435	21	27
7.5	6.7	440	21	>100
15	6.8	430	22.5	>100

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other ____
Meter Nos.	PH 5206	E/C 6045	TMV 3249	

Observations During Purging (Well Condition, Turbidity, Color, Odor): Clear, slight odor @ 2 gallon Cloudy grey
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☒ Other 55 gal drum

WELL SAMPLING

SAMPLING METHOD

☒ Bailer - Type: SS
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.: ____
☐ Same As Above
☐ Grab - Type: ____
☐ Other - Type: ____

SAMPLE DISTRIBUTION

Sample Series: 9107

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
EXA2	3 40As	TPHL/BTEX	HCl	Pace	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.

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Engineers and Geoscientists

GROUND-WATER SAMPLING FORM

Well No. MW-4
Well Type: ☒ Monitor ☐ Extraction ☐ Other
Well Material: ☒ PVC ☐ St. Steel ☐ Other
Date 7-24-91 Time 1015
Sampled by DHE (Initials)

Job Name Exxon
Job Number 4167.416.02
Recorded by David McCrowell (Signature)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches):
☐ 2-inch ☒ 4-inch ☐ 6-inch ☐ Other
Total Depth of Casing (TD in feet BTOC): 18.2
Water Level Depth (WL in feet BTOC): 6.54
Number of Well Volumes to be purged (# Vols)
☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other

PURGE METHOD

☒ Bailer - Type: PVC
☐ Submersible ☒ Centrifugal ☐ Bladder; Pump No.:
☐ Other - Type:

PUMP INTAKE SETTING

~~☒ Near Bottom~~ ☐ Near Top ☐ Other
Depth in feet (BTOC): Screen Interval in feet (BTOC): from to

PURGE VOLUME CALCULATION

(18.2 (TD) - 6.54 (WL)) X 4 (D, inches)^2 X 3 (# Vols) X 0.0408 = 23.4 gallons (Calculated Purge Volume)

PURGE TIME

1005 Start Stop Elapsed

PURGE RATE

Initial 5 gpm Final 1.0 gpm

ACTUAL PURGE VOLUME

Dry @ 14 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☒ °C ☐ °F	Other NTU
Initial	6.9	500	24	>100
10	6.6	500	21	>100
20				
23.5				

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other

Meter Nos. PH 5226 E/C 6093 Turb 2249

Observations During Purging (Well Condition, Turbidity, Color, Odor): cloudy grey + odor sheen
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☒ Other 55 gal drum

WELL SAMPLING

SAMPLING METHOD

☒ Bailer - Type: SS
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.:
☐ Same As Above
☐ Grab - Type:
☐ Other - Type:

SAMPLE DISTRIBUTION

Sample Series: 9107

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
EXA5	3 VOAs	TPHL / BTEX	HCl	Pace	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples 1025

Type	Sample No.
Field Blank	EXA6

Other Samples

Type	Sample No.

RL004

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GROUND-WATER SAMPLING FORM

Well No. MW-5
Well Type: ☒ Monitor ☐ Extraction ☐ Other ____
Well Material: ☒ PVC ☐ St. Steel ☐ Other ____
Date 7-24-91 Time 0955
Sampled by DME (Initials)

Job Name Exxon
Job Number 04167.116.02
Recorded by [signature] (Signature)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches):
☐ 2-inch ☒ 4-inch ☐ 6-inch ☐ Other ____
Total Depth of Casing (TD in feet BTOC): 19'
Water Level Depth (WL in feet BTOC): 6.33
Number of Well Volumes to be purged (# Vols)
☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other ____

PURGE METHOD

☐ Bailer - Type: ____
☐ Submersible ☒ Centrifugal ☐ Bladder; Pump No.: ____
☐ Other - Type: ____

PUMP INTAKE SETTING

☒ Near Bottom ☐ Near Top ☐ Other ____
Depth in feet (BTOC): ____ Screen Interval in feet (BTOC): from ____ to ____

PURGE VOLUME CALCULATION

(19' (TD) - 6.33 (WL)) X 4 (D, inches)^2 X 3 (# Vols) X 0.0408 = 25 gallons (Calculated Purge Volume)

PURGE TIME

0938 Start 0946 Stop ____ Elapsed

PURGE RATE

Initial 3 gpm Final 1.5 gpm

ACTUAL PURGE VOLUME

Dry @ 15 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☒ °C ☐ °F	Other NTU
Initial	6.5	500	20	>100
10	6.7	600	20	>100
20 15	6.7	600	21.0	>100
25				

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other
Meter Nos.	PH 5226	EK 6095	TW 3249	

Observations During Purging (Well Condition, Turbidity, Color, Odor): cloudy gray, slight color
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☒ Other 55 gal drum

WELL SAMPLING

SAMPLING METHOD

☒ Bailer - Type: SS
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.: ____
☐ Same As Above
☐ Grab - Type: ____
☐ Other - Type: ____

SAMPLE DISTRIBUTION

Sample Series: 9107

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
EXA4	3 VOAs	TPHL/BTEX	HCl	Pace	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.

RL004

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Engineers and Geoscientists

GROUND-WATER SAMPLING FORM

Well No. MW-6
Well Type: ☒ Monitor ☐ Extraction ☐ Other
Well Material: ☒ PVC ☐ St. Steel ☐ Other
Date 7-24-91 Time 0830
Sampled by DME (Initials)

Job Name Exxon
Job Number 4167.416.02
Recorded by (Signature)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches):
☐ 2-inch ☒ 4-inch ☐ 6-inch ☐ Other
Total Depth of Casing (TD in feet BTOC): 19.0'
Water Level Depth (WL in feet BTOC): 6.72
Number of Well Volumes to be purged (# Vols)
☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other

PURGE METHOD

☒ Bailer - Type: PVC
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.:
☐ Other - Type:

PUMP INTAKE SETTING

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

PURGE VOLUME CALCULATION

$(19.0 - 6.72)$ (TD (feet) − WL (feet)) $\times$ 4^2 (D (inches)) $\times$ 3 (# Vols) $\times$ 0.0408 = 24 gallons (Calculated Purge Volume)

PURGE TIME

0800 Start 0817 Stop ____ Elapsed

PURGE RATE

Initial ____ gpm Final ____ gpm

ACTUAL PURGE VOLUME

24 @ 17 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☒ °C ☐ °F	Other HNU
Initial	6.4	405	20.0	>100
10	6.8	385	20.0	>100
20				
24				

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other
Meter Nos.	PH5226	E/C 60915	TMP 32469	

Observations During Purging (Well Condition, Turbidity, Color, Odor): Cloudy grey, slight gas odor
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☐ Other 55 gal drums

WELL SAMPLING

SAMPLING METHOD

☒ Bailer - Type: SS
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.:
☐ Same As Above
☐ Grab - Type:
☐ Other - Type:

SAMPLE DISTRIBUTION

Sample Series: 9107

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
EXA1	3 VOAs	TPHL/BTEX	HCl	Pace	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.

RL004

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Engineers and Geoscientists

GROUND-WATER SAMPLING FORM

Well No. MW-7
Well Type: ☒ Monitor ☐ Extraction ☐ Other
Well Material: ☒ PVC ☐ St. Steel ☐ Other
Date 7-24-91 Time 1120
Sampled by DME (Initials)

Job Name Exxon
Job Number 4167.416.02
Recorded by (Signature)

WELL PURGING

PURGE VOLUME

Casing Diameter (D in inches):
☐ 2-inch ☒ 4-inch ☐ 6-inch ☐ Other
Total Depth of Casing (TD in feet BTOC): 17'
Water Level Depth (WL in feet BTOC): 6.22
Number of Well Volumes to be purged (# Vols)
☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other

PURGE METHOD

☒ Bailer Type: PVC DME
☐ Submersible ☒ Centrifugal ☐ Bladder; Pump No.:
☐ Other - Type:

PUMP INTAKE SETTING

☒ Near Bottom ☐ Near Top ☐ Other
Depth in feet (BTOC): Screen Interval in feet (BTOC):
from to

PURGE VOLUME CALCULATION

$(17' - 6.22)$ (TD (feet) − WL (feet)) $\times$ 4^2 (D (inches)) $\times$ 3 (# Vols) $\times$ 0.0408 = 21 gallons (Calculated Purge Volume)

PURGE TIME

1103 Start 1111 Stop Elapsed

PURGE RATE

Initial 5 gpm Final 5 gpm

ACTUAL PURGE VOLUME

21 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☒ °C ☐ °F	Other HNu
Initial	6.9	500	24	>100
10	6.3	400	22.5	>100
21	6.4	430	22	>100

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other
Meter Nos.	PH5206	E/C6095	Tur 3249	

Observations During Purging (Well Condition, Turbidity, Color, Odor): Cloudy grey, slight odor
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☒ Other 55 gal drum

WELL SAMPLING

SAMPLING METHOD

☒ Bailer - Type: PVC
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.:
☐ Same As Above
☐ Grab - Type:
☐ Other - Type:

SAMPLE DISTRIBUTION

Sample Series: 9107

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
EX A	3 VOAs	TPHL / BTEX	HCl	Pace	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.

Other Samples

Type	Sample No.

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THE ASSURANCE OF QUALITY

☒ Novato, CA
11 Digital Drive, 94949
(415) 883-6100

☐ Irvine, CA
Alton Business Park
30 Hughes St., Suite 206, 92718
(714) 380-9559

EXXON COMPANY, U.S.A.

P.O. Box 4415, Houston, TX 77210-4415

CHAIN OF CUSTODY

Consultant Name: [illegible]

Address: [illegible]

Project Contact: [illegible] Project #: [illegible]

Phone #: [illegible] Fax #: [illegible]

Consultant Work Release #: [illegible]

Exxon Contact: Gary [illegible] Phone #: [illegible]

Site RAS #: 7-0104

Site Location: [illegible]

Laboratory Work Release #:

Sampled by (please print): [illegible]

Sampler Signature: [illegible]

Date Sampled:

Sample Description	Collection Date/Time	Matrix	Prsv.	# of Cont.	SOIL: TPH/GAS/BTEX EPA 8015/8020	SOIL: TPH/Diesel EPA 8015	SOIL: Organic Lead DHS Method	WATER: TPH/GAS/BTEX EPA 8015/602	WATER: TPH/Diesel EPA 8015	WATER: Organic Lead DHS Method	TRPH EPA 418.1	Total Oil & Grease SM 5520					Remarks
[illegible]	[illegible]		3					X									MW-6
[illegible]	[illegible]		3					X									MW-3
[illegible]	[illegible]		3					X									MW-2
[illegible]	[illegible]		3					X									MW-5
[illegible]	[illegible]		3					X									MW-4
[illegible]	[illegible]		3					X									Field Blank
[illegible]	[illegible]		3					X									MW-1
[illegible]	[illegible]		3					X									MW-7

Cooler No.:

Cooler Seal Intact: ☒ Yes ☐ No

Turnaround Time (circle choice): 24 hr. / 48 hr. / 72 hr. / 96 hr. / **(5 workday (standard))** [circled]

Shipment Method: [illegible]

Shipment Date: [illegible]

Relinquished by/Affiliation	Accepted by/Affiliation	Date	Time
[illegible]	[illegible] PACE	4/24/91	12:45 PM

Additional Comments:

Distribution: White - Original | Yellow - Exxon | Pink - Lab | Goldenrod - Consultant Field Staff

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REPORT OF LABORATORY ANALYSIS

August 23, 1991

26 AUG 91 9:59

Ms. S.Michelle Watson
Harding Lawson Associates
P.O. Box 578
Novato, CA 94948

RE: PACE Project No. 410724.500
Exxon 7-0104

Dear Ms. Watson:

Enclosed is the revised report of laboratory analyses for samples received July 24, 1991.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,

Carol Posthuma

Carol Posthuma
Project Manager

Enclosures

11 Digital Drive
Novato, CA 94949
TEL: 415-883-6100
FAX: 415-883-2673

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REPORT OF LABORATORY ANALYSIS

Harding Lawson Associates
P.O. Box 578
Novato, CA 94948

August 23, 1991
PACE Project Number: 410724500

Attn: Ms. S.Michelle Watson

Exxon 7-0104

PACE Sample Number:			70 0067669	
Date Collected:			07/24/91	
Date Received:			07/24/91	
Parameter	Units	MDL	9107EXA1	DATE ANALYZED
ORGANIC ANALYSIS				
TPH GASOLINE/BTEX				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	07/25/91
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	2500	48000	07/25/91
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	07/25/91
Benzene	ug/L	25	5400	07/25/91
Toluene	ug/L	25	8300	07/25/91
Ethylbenzene	ug/L	25	2000	07/25/91
Xylenes, Total	ug/L	25	9000	07/25/91

MDL Method Detection Limit

11 Digital Drive
Novato, CA 94949
TEL: 415-883-6100
FAX: 415-883-2673

REPORT OF LABORATORY ANALYSIS

Ms. S.Michelle Watson
Page 2

August 23, 1991
PACE Project Number: 410724500

Exxon 7-0104

PACE Sample Number:			70 0067677	
Date Collected:			07/24/91	
Date Received:			07/24/91	
Parameter	Units	MDL	9107EXA2	DATE ANALYZED
ORGANIC ANALYSIS				
TPH GASOLINE/BTEX				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	07/25/91
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	2500	38000	07/25/91
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	07/25/91
Benzene	ug/L	25	6200	07/25/91
Toluene	ug/L	25	990	07/25/91
Ethylbenzene	ug/L	25	2900	07/25/91
Xylenes, Total	ug/L	25	9600	07/25/91

MDL Method Detection Limit

11 Digital Drive
Novato, CA 94949
TEL: 415-883-6100
FAX: 415-883-2673

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Ms. S.Michelle Watson
Page 3

August 23, 1991
PACE Project Number: 410724500

Exxon 7-0104

Parameter	Units	MDL	70 0067685 07/24/91 07/24/91 9107EXA3	DATE ANALYZED
PACE Sample Number:				
Date Collected:				
Date Received:				
ORGANIC ANALYSIS				
TPH GASOLINE/BTEX				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	07/29/91
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	5000	49000	07/29/91
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	07/29/91
Benzene	ug/L	50	3500	07/29/91
Toluene	ug/L	50	2200	07/29/91
Ethylbenzene	ug/L	50	2000	07/29/91
Xylenes, Total	ug/L	50	6400	07/29/91

MDL Method Detection Limit

11 Digital Drive
Novato, CA 94949
TEL: 415-883-6100
FAX: 415-883-2673

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Ms. S.Michelle Watson
Page 4

August 23, 1991
PACE Project Number: 410724500

Exxon 7-0104

Parameter	Units	MDL	70 0067693 9107EXA4	DATE ANALYZED
PACE Sample Number:			70 0067693	
Date Collected:			07/24/91	
Date Received:			07/24/91	
ORGANIC ANALYSIS				
TPH GASOLINE/BTEX				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	07/29/91
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	1000	16000	07/29/91
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	07/29/91
Benzene	ug/L	20	3200	07/29/91
Toluene	ug/L	10	320	07/29/91
Ethylbenzene	ug/L	10	690	07/29/91
Xylenes, Total	ug/L	10	1100	07/29/91

MDL Method Detection Limit

11 Digital Drive
Novato, CA 94949
TEL: 415-883-6100
FAX: 415-883-2673

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REPORT OF LABORATORY ANALYSIS

Ms. S.Michelle Watson
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August 23, 1991
PACE Project Number: 410724500

Exxon 7-0104

Parameter	Units	MDL	70 0067707 07/24/91 07/24/91 9107EXA5	DATE ANALYZED
PACE Sample Number:				
Date Collected:				
Date Received:				
ORGANIC ANALYSIS				
TPH GASOLINE/BTEX				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	07/25/91
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	1000	10000	07/25/91
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	07/25/91
Benzene	ug/L	10	1200	07/25/91
Toluene	ug/L	10	440	07/25/91
Ethylbenzene	ug/L	10	410	07/25/91
Xylenes, Total	ug/L	10	1200	07/25/91

MDL Method Detection Limit

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REPORT OF LABORATORY ANALYSIS

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August 23, 1991
PACE Project Number: 410724500

Exxon 7-0104

PACE Sample Number:			70 0067715	
Date Collected:			07/24/91	
Date Received:			07/24/91	
Parameter	Units	MDL	9107EXA6	DATE ANALYZED
ORGANIC ANALYSIS				
TPH GASOLINE/BTEX				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	07/26/91
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	50	ND	07/26/91
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	07/26/91
Benzene	ug/L	0.5	ND	07/26/91
Toluene	ug/L	0.5	ND	07/26/91
Ethylbenzene	ug/L	0.5	ND	07/26/91
Xylenes, Total	ug/L	0.5	0.6	07/26/91

MDL Method Detection Limit
ND Not detected at or above the MDL.

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August 23, 1991
PACE Project Number: 410724500

Exxon 7-0104

PACE Sample Number:			70 0067723	
Date Collected:			07/24/91	
Date Received:			07/24/91	
Parameter	Units	MDL	9107EXA7	DATE ANALYZED
ORGANIC ANALYSIS				
TPH GASOLINE/BTEX				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	07/29/91
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	500	9700	07/29/91
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	07/29/91
Benzene	ug/L	5.0	1300	07/29/91
Toluene	ug/L	5.0	670	07/29/91
Ethylbenzene	ug/L	5.0	950	07/29/91
Xylenes, Total	ug/L	5.0	2100	07/29/91

MDL Method Detection Limit

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August 23, 1991
PACE Project Number: 410724500

Exxon 7-0104

Parameter	Units	MDL	70 0067731 07/24/91 07/24/91 9107EXA8	DATE ANALYZED
PACE Sample Number:				
Date Collected:				
Date Received:				
ORGANIC ANALYSIS				
TPH GASOLINE/BTEX				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	07/25/91
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	2500	18000	07/25/91
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	07/25/91
Benzene	ug/L	25	1300	07/25/91
Toluene	ug/L	25	160	07/25/91
Ethylbenzene	ug/L	25	2700	07/25/91
Xylenes, Total	ug/L	25	1000	07/25/91

MDL Method Detection Limit

These data have been reviewed and are approved for release.

Mark A. Valentini

Mark A. Valentini, Ph.D.
Regional Director

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Ms. S.Michelle Watson
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QUALITY CONTROL DATA

August 23, 1991
PACE Project Number: 410724500

Exxon 7-0104

PURGEABLE FUELS AND AROMATICS
Batch: 70 05293
Samples: 70 0067685, 70 0067693, 70 0067723

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 801	ug/L	50	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020			-
Benzene	ug/L	0.5	ND
Toluene	ug/L	0.5	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND

SPIKE AND SPIKE DUPLICATE:

Parameter	Units	MDL	70 0068495	Spike	Spike Recv	Spike Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 801	ug/L	50	ND	421.00	97%	105%	7%
Benzene	ug/L	0.5	ND	40.00	101%	102%	0%
Toluene	ug/L	0.5	ND	40.00	106%	107%	0%
Xylenes, Total	ug/L	0.5	ND	120.00	115%	114%	0%

MDL Method Detection Limit
RPD Relative Percent Difference

Ms. S.Michelle Watson
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QUALITY CONTROL DATA

August 23, 1991
PACE Project Number: 410724500

Exxon 7-0104

TPH GASOLINE/BTEX
Batch: 70 05273
Samples: 70 0067715

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 801	ug/L	50	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020			-
Benzene	ug/L	0.5	ND
Toluene	ug/L	0.5	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND

SPIKE AND SPIKE DUPLICATE:

Parameter	Units	MDL	70 0067715 9107EXA6	Spike	Spike Recv	Spike Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 801	ug/L	50	ND	375.00	117%	113%	3%
Benzene	ug/L	0.5	ND	40.00	91%	95%	4%
Toluene	ug/L	0.5	ND	40.00	97%	101%	4%
Xylenes, Total	ug/L	0.5	0.6	120.00	96%	101%	5%

MDL Method Detection Limit
RPD Relative Percent Difference

Ms. S.Michelle Watson
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QUALITY CONTROL DATA

August 23, 1991
PACE Project Number: 410724500

Exxon 7-0104

TPH GASOLINE/BTEX
Batch: 70 05281
Samples: 70 0067669, 70 0067677, 70 0067707, 70 0067731

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 801	ug/L	50	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020			-
Benzene	ug/L	0.5	ND
Toluene	ug/L	0.5	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND

SPIKE AND SPIKE DUPLICATE:

Parameter	Units	MDL	70 0056705	Spike	Spike Recv	Spike Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 801	ug/L	50	ND	411.00	120%	111%	7%
Benzene	ug/L	0.5	ND	40.00	112%	120%	6%
Toluene	ug/L	0.5	ND	40.00	106%	113%	6%
Xylenes, Total	ug/L	0.5	ND	120.00	113%	121%	6%

MDL Method Detection Limit
RPD Relative Percent Difference

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THE ASSURANCE OF QUALITY

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Alton Business Park
30 Hughes St., Suite 206, 92718
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EXXON COMPANY, U.S.A.
P.O. Box 4415, Houston, TX 77210-4415
CHAIN OF CUSTODY

Consultant Name: Harding Lawson
Address: 200 Rushlanding Novato, CA
Project Contact: Michelle Watson Project #: 04167, 416.02
Phone #: 415 892 0821 Fax #: 415 892-1586
Consultant Work Release #: 91 06 46 98

Exxon Contact: Gary Gibson Phone #: 415-246 8768
Site RAS #: 7-0104
Site Location: 1725 Park Street
Laboratory Work Release #: 91105165

Sampled by (please print): David M Evans
Sampler Signature: David M Evans Date Sampled: 7/24/91

Sample Description	Collection Date/Time	Matrix	#Cl Prsv.	# of Cont.	SOIL: TPH/GAS/BTEX EPA 8015/8020	SOIL: TPH/Diesel EPA 8015	SOIL: Organic Lead DHS Method	WATER: TPH/GAS/BTEX EPA 8015/602	WATER: TPH/Diesel EPA 8015	WATER: Organic Lead DHS Method	TRPH EPA 418.1	Total Oil & Grease SM 5520					Remarks
9107EXA1	7/24/91 0830		3					X									6766.9
9107EXA2	0855		3					X									67.7
9107EXA3	0925		3					X									68.5
9107EXA4	0955		3					X									69.3
9107EXA5	1015		3					X									70.7
9107EXA6	1035		3					X									71.5
9107EXA7	1055		3					X									72.3
9107EXA8	1120		3					X									73.1

Cooler No.	Relinquished by/Affiliation	Accepted by/Affiliation	Date	Time
Cooler Seal Intact ☒ Yes ☐ No	David M Evans	Steph Matz PACE Inc	7/24/91	12:45 PM

Turnaround Time (circle choice)
24 hr.
48 hr.
72 hr.
96 hr.
(5 workday) (standard)

Shipment Method: Hand delivered
Shipment Date: 7-24-91

Additional Comments: 9/3

Distribution: White - Original Yellow - Exxon Pink - Lab Goldenrod - Consultant Field Staff