EXXON COMPANY, U.S.A.

POST OFFICE BOX 4032 . CONCORD, CA 94524-2032

ENVIRONMENTAL ENGINEERING

MARLA D. GUENSLER
SENIOR ENVIRONMENTAL ENGINEER
(510) 246-8776

November 16, 1992

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

RE: Exxon RAS 7-0104
1725 Park Street
Alameda, California

Dear Ms. Chesick:

Attached for your review and comment is a letter report entitled **Groundwater Monitoring Results, Fourth Quarter 1992** for the above referenced Exxon station in Alameda. This report, prepared by Harding Lawson Associates of Novato, California, presents the results of the ground water sampling event performed in September, 1992.

Should you have any questions or require additional information, please do not hesitate to call me at the above listed phone number.

Sincerely,

Marla D. Guensler

Attachment

c - w/attachment:
Mr. Richard Hiett - San Francisco Bay RWQCB

w/o attachment:
Mr. G. A. Lieberman - Harding Lawson Associates

MDG/pdp
0559E/70104LTR.11

Inform HLA of
low conc. in wells
at 1726 Park St.
- try to find out whether
they will conduct
remediation
- look in all our files to
see if others
contributing to contam.
(Looks like still coming from site)

RECYCLED

Harding Lawson Associates

October 21, 1992

10495 580

Exxon Company, U.S.A.
2300 Clayton Road
Post Office Box 4032
Concord, California 94524

Attention: Ms. Marla Guensler

Groundwater Monitoring Results, Fourth Quarter 1992
Exxon Station #7-0104
Alameda, California

This letter presents the results of Harding Lawson Associates' (HLA) fourth-quarter 1992 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 September 24, 1992, and represents HLA's second sampling event authorized by Exxon Company, U.S.A. (Exxon), Work Authorization 90066058, Change Order 3.

Groundwater-Level Monitoring and Groundwater Sampling

HLA made monthly groundwater-level and free-phase petroleum product (FPPP) measurements from the monitoring wells between September 1989 and August 1992. All measurements were made with an electric oil-water interface probe or a chalked steel tape. During monthly monitoring, the groundwater collected from each well was visually inspected for the presence of FPPP using a clear Lucite bailer. No measurable FPPP was observed in any of the wells during the course of this investigation. Because of the nondetection of product in the monitoring wells and the consistency of the groundwater gradient at the site, HLA petitioned the Alameda County Department of Environmental Health (County) to delete monthly groundwater-level monitoring but continue with the quarterly sampling. On August 27 the County agreed.

Prior to groundwater sample collection on September 24, 1992, the monitoring wells were purged a minimum of three well volumes using a PVC bailer or centrifugal pump. The purged water was stored onsite in 55-gallon drums. The pH, conductivity, and temperature of the purged water were measured and recorded during the 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 preacidified 40-milliliter volatile organic analysis (VOA) vials. A quality assurance/quality control (QA/QC) water sample (trip blank) was prepared in the field by labeling a laboratory-supplied VOA containing organic-free water. All samples 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 trip blank were analyzed for total petroleum hydrocarbons (TPH) calibrated as gasoline and for benzene, toluene, ethylbenzene, and xylenes (BTEX). The groundwater analytical results are summarized in Table 1 along with results from previous rounds. Copies of the chain of custody and laboratory reports from the September 24, 1992, sampling round are attached to this letter.

Groundwater Gradient and Flow Direction

The potentiometric surface elevations measured during the September 1992 groundwater-level survey are presented in Table 2 along with previous results. The elevations decreased between the previous quarters and the fourth quarter, most likely as a result of decreased precipitation. Plate 1 is a generalized potentiometric surface map for the site. As shown, the generalized local direction of groundwater flow is toward the northeast at an approximate gradient of 0.01 ft/ft. This flow direction is consistent with previous potentiometric surface data obtained during this investigation.

Laboratory Analytical Results

Laboratory analytical results indicate that petroleum hydrocarbon constituents were detected in all seven onsite wells at concentrations generally similar to those previously detected. Detected concentrations of TPH as gasoline ranged from 3.7 to 26 milligrams per liter (mg/l). The concentration of benzene exceeded the California Maximum Contaminant Level (MCL) of 1.0 microgram per liter (μg/l) in all monitoring wells at the site. The MCLs for ethylbenzene (680 μg/l) and xylenes (1,750 μg/l) were exceeded in Wells MW-2, MW-3, and MW-7. The highest concentrations of petroleum hydrocarbon constituents were detected in the groundwater sample from Monitoring Well MW-2, downgradient of the pump island. TPH as gasoline was detected in the trip blank, indicating potential cross-contamination.

HLA has completed an offsite groundwater investigation and is currently constructing a groundwater extraction and treatment system. The next quarterly sampling event is scheduled for January 1993.

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

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

Yours very truly,

HARDING LAWSON ASSOCIATES

Gary A. Lieberman
Staff Geologist

Michael L. Siembieda
Associate Geologist - RG 4007

GAL/MLS/cbn/J26502-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, September 24, 1992
- Groundwater Sampling Forms
- Laboratory Analytical Reports

Table 1. Summary of Groundwater Chemical Results

Groundwater Monitoring Results, Fourth Quarter 1992
Exxon Station #7-0104
Alameda, California

Harding Lawson Associates

Well Number	Date Sampled	TPH Gasoline (mg/l[1])	Benzene (µg/l[2])	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	Total Dissolved Solids (mg/l)
California MCLs[3]			1.0	1,000[4]	680	1,750	
MW-1	06/07/88	27	5,000	77	1,100	2,700	NT[5]
	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[6]	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
	10/22/91	0.540	220	1.8	110	7.8	NT
	01/21/92	1.8	650	23	300	64	NT
	04/24/92	4.9	1,600	78	660	250	NT
	07/16/92	3.4	1,000	11	550	100	NT
	09/24/92	3.7	1,300	21	330	<10	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
	10/22/91	34	3,700	1,100	1,800	5,200	NT
	01/21/92	21	4,600	1,300	1,700	5,100	NT
	04/24/92	36	5,000	970	2,300	5,200	NT
	07/16/92	42	3,500	490	1,800	3,700	NT
	09/24/92	26	3,600	670	1,700	3,300	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

Table 1. Summary of Groundwater Chemical Results

Groundwater Monitoring Results, Fourth Quarter 1992 **Harding Lawson Associates**
Exxon Station #7-0104
Alameda, California

Well Number	Date Sampled	TPH Gasoline (mg/l[1])	Benzene (µg/l[2])	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	Total Dissolved Solids (mg/l)
California MCLs[3]			1.0	1,000[4]	680	1,750	
MW-3 (con't)	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
	10/22/91	23	3,400	150	2,500	4,400	NT
	01/21/92	13	2,700	30	1,800	740	NT
	04/24/92	17	4,200	170	1,600	600	NT
	07/16/92	11	2,700	230	1,100	570	NT
	09/24/92	7.1	2,000	44	1,000	220	NT
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
	10/22/91	4.6	750	190	350	780	NT
	01/21/92	6	1,300	320	510	1,200	NT
	04/24/92	11	1,700	630	710	1,600	NT
	07/16/92	5.4	870	240	440	700	NT
	09/24/92	5.9	1,300	130	530	690	NT
	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
	10/22/91	6.6	2,000	64	320	480	NT
	01/21/92	14	4,000	190	630	1,300	NT
	04/24/92	12	2,600	120	620	530	NT

Table 1. Summary of Groundwater Chemical Results

Groundwater Monitoring Results, Fourth Quarter 1992
Exxon Station #7-0104
Alameda, California

Harding Lawson Associates

Well Number	Date Sampled	TPH Gasoline (mg/l[1])	Benzene (µg/l[2])	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	Total Dissolved Solids (mg/l)
California MCLs[3]			1.0	1,000[4]	680	1,750	
MW-5 (con't)	07/16/92	20	4,000	48	880	720	NT
	09/24/92	9.3	2,200	31	330	250	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
	10/22/91	18	3,100	700	1,400	2,900	NT
	01/21/92	9.4	2,100	370	1,000	1,100	NT
	04/24/92	42	3,500	8,000	2,100	8,000	NT
	07/16/92	14	1,600	1,000	1,000	2,500	NT
	09/24/92	4.7	790	97	640	540	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
	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
	10/22/91	10	990	26	1,900	490	NT
	01/21/92	23	2,200	3,000	1,800	6,100	NT
	04/24/92	25	1,400	220	2,100	2,600	NT
	07/16/92	8.7	470	45	970	86	NT
	09/24/92	9.2	560	48	1,300	54	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
	10/22/91	<0.05	<0.5	<0.5	<0.5	<0.5	NT
	01/21/92	<0.05	<0.5	<0.5	<0.5	<0.5	NT
	07/16/92	<0.05	<0.5	<0.5	<0.5	<0.5	NT

Table 1. Summary of Groundwater Chemical Results

Groundwater Monitoring Results, Fourth Quarter 1992
Exxon Station #7-0104
Alameda, California

Harding Lawson Associates

Well Number	Date Sampled	TPH Gasoline (mg/l[1])	Benzene (µg/l[2])	Toluene (µg/l)	Ethyl-benzene (µg/l)	Xylenes (µg/l)	Total Dissolved Solids (mg/l)
California MCLs[3]			1.0	1,000[4]	680	1,750	
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
	04/24/92	<0.05	<0.5	<0.5	<0.5	<0.5	NT
	09/24/92	0.230	<0.5	<0.5	<0.5	<0.5	NT

[1] mg/l = milligrams per liter.
[2] µg/l = micrograms per liter.
[3] MCL = Maximum contaminant level.
[4] Represents EPA MCL; California MCL has not been established.
[5] NT = Not tested.
[6] Numbers preceded by "<" indicate that sample was not detected at the indicated detection limit

Table 2. Potentiometric Surface and Free-Phase Petroleum Product Thickness Measurements

Harding Lawson Associates

Groundwater Monitoring Results, Fourth Quarter 1992
Exxon Station #7-0104
Alameda, California

Well Number	Top of Well Casing Elevation[1]	Date Measured	Depth to Water BTOC[2] (feet)	Depth to Product BTOC (feet)	FPPP[3] Thickness (feet)	Potentiometric Surface Elevation (feet above MSL)
MW-1	17.35	06-10-88	6.35	NP[4]	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
		09-10-91	7.25	NP	NP	10.10
		09-23-91	7.33	NP	NP	10.02
		10-21-91	7.53	NP	NP	9.82
		11-18-91	7.13	NP	NP	10.22
		12-11-91	7.25	NP	NP	10.10
		01-21-92	6.54	NP	NP	10.81
		02-20-92	4.82	NP	NP	12.53
		03-19-92	5.24	NP	NP	12.11
		04-24-92	5.71	NP	NP	11.64
		05-13-92	5.99	NP	NP	11.36
		06-24-92	6.65	NP	NP	10.70
		07-16-92	6.72	NP	NP	10.63
		08-19-92	7.07	NP	NP	10.28
		09-24-92	7.36	NP	NP	9.99

Table 2. Potentiometric Surface and Free-Phase Petroleum Product Thickness Measurements

Harding Lawson Associates

Groundwater Monitoring Results, Fourth Quarter 1992
Exxon Station #7-0104
Alameda, California

Well Number	Top of Well Casing Elevation[1]	Date Measured	Depth to Water BTOC[2] (feet)	Depth to Product BTOC (feet)	FPPP[3] Thickness (feet)	Potentiometric Surface Elevation (feet above MSL)
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
		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
		09-10-91	6.81	NP	NP	9.86
		09-23-91	6.82	NP	NP	9.85
		10-21-91	7.01	NP	NP	9.66
		11-18-91	6.66	NP	NP	10.01
		12-11-91	6.85	NP	NP	9.82
		01-21-92	6.22	NP	NP	10.45
		02-20-92	5.28	NP	NP	11.39
		03-19-92	5.34	NP	NP	11.33
		04-24-92	5.75	Sheen	Sheen	10.92
		05-13-92	5.95	NP	NP	10.72
		06-24-92	6.39	NP	NP	10.28
		07-16-92	6.50	Sheen	Sheen	10.17
		08-19-92	6.69	NP	NP	9.98
		09-24-92	6.74	Sheen	Sheen	9.93

Table 2. Potentiometric Surface and Free-Phase Petroleum Product Thickness Measurements

Harding Lawson Associates

Groundwater Monitoring Results, Fourth Quarter 1992
Exxon Station #7-0104
Alameda, California

Well Number	Top of Well Casing Elevation[1]	Date Measured	Depth to Water BTOC[2] (feet)	Depth to Product BTOC (feet)	FPPP[3] Thickness (feet)	Potentiometric Surface Elevation (feet above MSL)
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
		09-10-91	6.80	NP	NP	10.31
		09-23-91	6.80	NP	NP	10.31
		10-21-91	7.09	NP	NP	10.02
		11-18-91	6.74	NP	NP	10.37
		12-11-91	6.79	NP	NP	10.32
		01-21-92	6.16	NP	NP	10.95
		02-20-92	4.89	NP	NP	12.22
		03-19-92	4.85	NP	NP	12.26
		04-24-92	5.28	NP	NP	11.83
		05-13-92	5.58	NP	NP	11.53
		06-24-92	6.22	NP	NP	10.89
		07-16-92	6.36	NP	NP	10.75
		08-19-92	6.65	NP	NP	10.46
		09-24-92	6.93	NP	NP	10.18

Table 2. Potentiometric Surface and Free-Phase Petroleum Product Thickness Measurements

Harding Lawson Associates

Groundwater Monitoring Results, Fourth Quarter 1992
Exxon Station #7-0104
Alameda, California

Well Number	Top of Well Casing Elevation[1]	Date Measured	Depth to Water BTOC[2] (feet)	Depth to Product BTOC (feet)	FPPP[3] Thickness (feet)	Potentiometric Surface Elevation (feet above MSL)
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
		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
		09-10-91	7.04	NP	NP	10.10
		09-23-91	7.14	NP	NP	10.20
		10-21-91	7.30	Sheen	Sheen	10.04
		11-18-91	6.90	NP	NP	10.44
		12-11-91	7.01	NP	NP	10.33
		01-21-92	6.25	NP	NP	11.09
		02-20-92	4.79	NP	NP	12.55
		03-19-92	4.70	NP	NP	12.64
		04-24-92	5.25	Sheen	Sheen	12.09
		05-13-92	5.62	Sheen	Sheen	11.72
		06-24-92	6.19	Sheen	Sheen	11.15
		07-16-92	6.51	Sheen	Sheen	10.83
		08-19-92	6.85	NP	NP	10.49
		09-24-92	7.17	NP	NP	10.17

Table 2. Potentiometric Surface and Free-Phase Petroleum Product Thickness Measurements

Harding Lawson Associates

Groundwater Monitoring Results, Fourth Quarter 1992
Exxon Station #7-0104
Alameda, California

Well Number	Top of Well Casing Elevation[1]	Date Measured	Depth to Water BTOC[2] (feet)	Depth to Product BTOC (feet)	FPPP[3] Thickness (feet)	Potentiometric Surface Elevation (feet above MSL)
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	Sheen	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	Sheen	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
		09-10-91	6.66	NP	NP	10.05
		09-23-91	6.75	NP	NP	9.96
		10-21-91	6.92	Sheen	Sheen	9.79
		11-18-91	6.55	NP	NP	10.16
		12-11-91	6.64	NP	NP	10.07
		01-21-92	6.07	Sheen	Sheen	10.64
		02-20-92	4.83	NP	NP	11.88
		03-19-92	4.83	Sheen	Sheen	11.88
		04-24-92	5.32	Sheen	Sheen	11.39
		05-13-92	5.61	Sheen	Sheen	11.10
		06-24-92	6.17	NP	NP	10.54
		07-16-92	6.25	Sheen	Sheen	10.46
		08-19-92	6.53	Sheen	Sheen	10.18
		09-24-92	6.80	Sheen	Sheen	9.91

Table 2. Potentiometric Surface and Free-Phase Petroleum Product Thickness Measurements

Harding Lawson Associates

Groundwater Monitoring Results, Fourth Quarter 1992
Exxon Station #7-0104
Alameda, California

Well Number	Top of Well Casing Elevation[1]	Date Measured	Depth to Water BTOC[2] (feet)	Depth to Product BTOC (feet)	FPPP[3] Thickness (feet)	Potentiometric Surface Elevation (feet above MSL)
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
		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
		09-10-91	7.15	NP	NP	10.41
		09-23-91	7.25	NP	NP	10.31
		10-21-91	7.42	NP	NP	10.14
		11-18-91	7.08	NP	NP	10.48
		12-11-91	7.17	NP	NP	10.39
		01-21-92	6.40	NP	NP	11.16
		02-20-92	5.06	NP	NP	12.50
		03-19-92	4.86	NP	NP	12.70
		04-24-92	5.44	NP	NP	12.12
		05-13-92	5.83	NP	NP	11.73
		06-24-92	6.50	NP	NP	11.06
		07-16-92	6.68	NP	NP	10.88
		08-19-92	7.00	NP	NP	10.56
		09-24-92	7.28	NP	NP	10.28

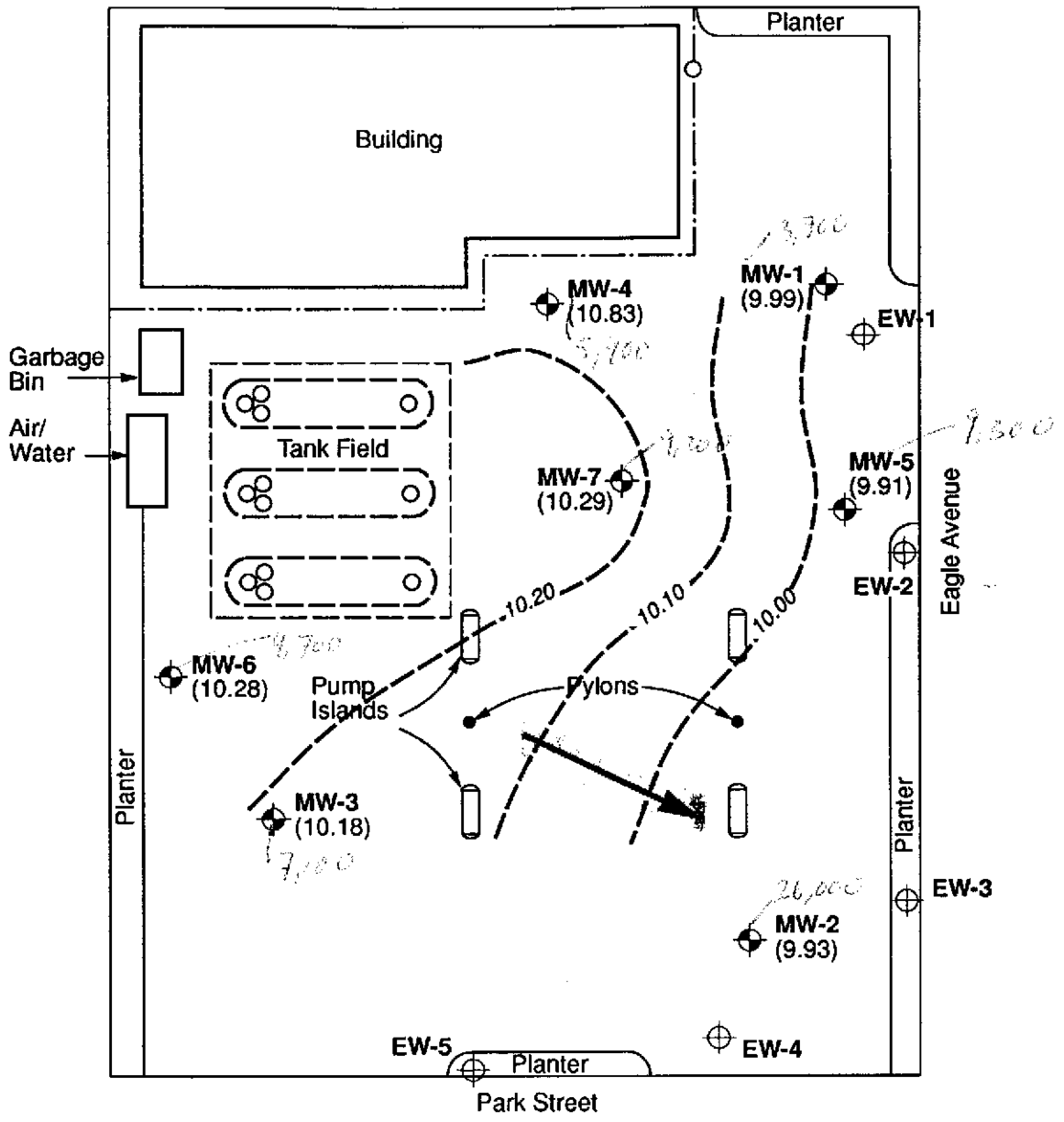
Table 2. Potentiometric Surface and Free-Phase Petroleum Product Thickness Measurements

Harding Lawson Associates

Groundwater Monitoring Results, Fourth Quarter 1992
Exxon Station #7-0104
Alameda, California

Well Number	Top of Well Casing Elevation[1]	Date Measured	Depth to Water BTOC[2] (feet)	Depth to Product BTOC (feet)	FPPP[3] Thickness (feet)	Potentiometric Surface Elevation (feet above MSL)
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
		09-10-91	6.71	NP	NP	10.41
		09-23-91	6.84	NP	NP	10.28
		10-21-91	7.00	NP	NP	10.12
		11-18-91	6.56	NP	NP	10.56
		12-11-91	6.68	NP	NP	10.44
		01-21-92	5.99	NP	NP	11.13
		02-20-92	4.36	NP	NP	12.76
		03-19-92	4.22	NP	NP	12.90
		04-24-92	4.84	Sheen	Sheen	12.28
		05-13-92	5.24	Sheen	Sheen	11.88
		06-24-92	6.04	NP	NP	11.08
		07-16-92	6.19	NP	NP	10.93
		08-19-92	6.55	NP	NP	10.57
		09-24-92	6.83	NP	NP	10.29

[1] Elevation surveyed to mean sea level.
[2] BTOC = Below top of casing.
[3] FPPP = Free-phase petroleum product.
[4] NP = No product.



EXPLANATION

MW-3 ⊕	Monitoring Well Location
EW1 ⊕	Extraction Well Location
(10.28)	Potentiometric Surface Elevation in Feet Above Mean Sea Level
10.00	Potentiometric Surface Elevation Contour
→	Approximate Groundwater Flow Direction

N

0 20 40

APPROXIMATE SCALE IN FEET

1015NB

Harding Lawson Associates
Engineering and Environmental Services

Generalized Potentiometric Surface Contour Map - September 24, 1992
Exxon Station #7-0104
Alameda, California

PLATE **1**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
LZc	10495 580	GAL	10/92	

Harding Lawson Associates
Engineering and
Environmental Services

GROUND-WATER SAMPLING FORM

Job Name Exxon Alameda
Job Number 10495-580
Recorded by [signature] (Signature)

Well No. MW-1
Well Type: ☒ Monitor ☐ Extraction ☐ Other
Well Material: ☒ PVC ☐ St. Steel ☐ Other
Date 9-24-92 Time 1115
Sampled by DNE (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): 20.5
Water Level Depth (WL in feet BTOC): 7.36
Number of Well Volumes to be purged (# Vols)
☒ 3 ☐ 4 ☐ 5 ☐ 10 ☐ Other

PURGE METHOD

☒ Bailer - Type: TEFLON
☐ 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 (TD feet) - 7.36 (WL feet)) X 4 (D inches)^2 X 3 (# Vols) X 0.0408 = 26 gallons (Calculated Purge Volume)

PURGE TIME

1050 Start 1107 Stop ____ Elapsed

PURGE RATE

Initial ____ gpm Final ____ gpm

ACTUAL PURGE VOLUME

Dry @ 19 gallons

FIELD PARAMETER MEASUREMENTS

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☒ °C ☐ °F	Other ORP
Initial	7.1	900	24.0	>100
8	7.0	850	24.3	>100
16	7.0	800	22.3	>100
19	7.0	750	22.5	>100

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other
Meter Nos.	3677	5209		2249

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

WELL SAMPLING

SAMPLING METHOD

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

SAMPLING DISTRIBUTION

Sample Series: 9209

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
2407	3 VOAs	TPH-L/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
Engineering and Environmental Services

GROUND-WATER SAMPLING FORM

Job Name: Exxon Alameda
Job Number: 10445-580
Recorded by: [signature] (Signature)

Well No.: MW-2
Well Type: ☒ Monitor ☐ Extraction ☐ Other
Well Material: ☒ PVC ☐ St. Steel ☐ Other
Date: 9-24-92 Time: 0830
Sampled by: DMC (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): 15.9
Water Level Depth (WL in feet BTOC): 6.74
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

$(15.9 - 6.74) \times 4^2 \times 3 \times 0.0408 = 18$ gallons

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

PURGE TIME

0815 Start 0823 Stop ______ Elapsed

PURGE RATE

Initial — gpm Final — gpm

ACTUAL PURGE VOLUME

Dry @ 22 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☒°C ☐°F	Other NTU
Initial	6.8	825	23	17
6	6.8	850	23	>100
12	6.9	825	23	>100

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐°C ☐°F	Other
Meter Nos.	3677	5209	3249	

Observations During Purging (Well Condition, Turbidity, Color, Odor): Clear, odor + sheen @ 6 gallons
Discharge Water Disposal: ☐ Sanitary Sewer ☐ Storm Sewer ☒ Other 55 gal drum onsite

WELL SAMPLING

SAMPLING METHOD

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

SAMPLING DISTRIBUTION

Sample Series: 9209

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
2402	3 VOAs	TPHG/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
Engineering and
Environmental Services

GROUND-WATER SAMPLING FORM

Job Name Exxon Alameda
Job Number 10495-580
Recorded by David M Edwards (Signature)

Well No. MW-3
Well Type: ☒ Monitor ☐ Extraction ☐ Other
Well Material: ☒ PVC ☐ St. Steel ☐ Other
Date 9-24-92 Time 0800
Sampled by DKE RLN (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): 16.2
Water Level Depth (WL in feet BTOC): 6.93
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

$(16.2 - 6.93) \times 4^2 \times 3 \times 0.0408 = 18.1$ gallons

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

PURGE TIME

0740 Start 0750 Stop Elapsed

PURGE RATE

Initial gpm Final gpm

ACTUAL PURGE VOLUME

Dry @ 10 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☒ °C ☐ °F	Other NTU
Initial	6.7	600	22	38.3
6	6.8	600	23	>100
~~12~~ 10	7.0	600	24	>100
18.1				

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other
Meter Nos.	3677	5209	3245	

Observations During Purging (Well Condition, Turbidity, Color, Odor): Clear, slight 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:

SAMPLING DISTRIBUTION

Sample Series: 9209

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
2401	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
Engineering and
Environmental Services

GROUND-WATER SAMPLING FORM

Job Name Exxon Alameda
Job Number 10495-580
Recorded by Dave McGrath (Signature)

Well No. MW-4
Well Type: ☒ Monitor ☐ Extraction ☐ Other
Well Material: ☒ PVC ☐ St. Steel ☐ Other
Date 9-24-92 Time 1050
Sampled by DME (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): 17.9
Water Level Depth (WL in feet BTOC): 7.17
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

(17.9 TD (feet) - 7.17 WL (feet)) X 4 D (inches)^2 X 3 # Vols X 0.0408 = 21 gallons
Calculated Purge Volume

PURGE TIME

1010 Start 1020 Stop Elapsed

PURGE RATE

Initial ~~—~~ gpm Final — gpm

ACTUAL PURGE VOLUME

Dry @ 17 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☒ °C ☐ °F	Other NTU
Initial	6.6	650	22.5	29
7	6.7	675	23.0	>100
14	6.8	675	22.0	>100
~~21~~ 17	6.8	675	21.0	>100

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other
Meter Nos.	3677	5209		3249

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

WELL SAMPLING

SAMPLING METHOD

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

SAMPLING DISTRIBUTION

Sample Series: 9209

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
2406	3 VOAs	TPH-L/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
Engineering and
Environmental Services

GROUND-WATER SAMPLING FORM

Job Name Exxon Alameda
Job Number 10495-530
Recorded by _____ (Signature)

Well No. MW-5
Well Type: ☒ Monitor ☐ Extraction ☐ Other _____
Well Material: ☒ PVC ☐ St. Steel ☐ Other _____
Date 9-24-92 Time 0915
Sampled by DNE RLN (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): 19.0
Water Level Depth (WL in feet BTOC): 6.80
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

$(19.0 - 6.80) \times 4^2 \times 3 \times 0.0408 = 24$ gallons

(19.0 TD (feet) − 6.80 WL (feet)) × 4 D (inches)² × 3 # Vols × 0.0408 = 24 Calculated Purge Volume (gallons)

PURGE TIME

0845 Start 0905 Stop _____ Elapsed

PURGE RATE

Initial _____ gpm Final _____ gpm

ACTUAL PURGE VOLUME

Dupe 18 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☒ °C ☐ °F	Other Turb
Initial	6.9	800	21.0	51
8	6.9	825	22.0	>100
16	6.9	825	22.5	>100
18	7.1	800	21.5	>100

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other ____
Meter Nos.	B687	9209	92469	

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

WELL SAMPLING

SAMPLING METHOD

☒ Bailer - Type: SS
☐ Submersible ☐ Centrifugal ☐ Bladder; Pump No.: _____

☐ Same As Above
☐ Grab - Type: _____
☐ Other - Type: _____

SAMPLING DISTRIBUTION

Sample Series: 9209

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
2403	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
Engineering and
Environmental Services

GROUND-WATER SAMPLING FORM

Job Name: Exxon Alameda
Job Number: 10495-580
Recorded by: [signature] (Signature)

Well No.: MW-6
Well Type: ☒ Monitor ☐ Extraction ☐ Other
Well Material: ☒ PVC ☐ St. Steel ☐ Other
Date: 9-24-92 Time: 0733
Sampled by: DNCE RLN (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): 18.5
Water Level Depth (WL in feet BTOC): 7.28
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

$$\left(\underset{\text{TD (feet)}}{18.5} - \underset{\text{WL (feet)}}{7.28}\right) \times \underset{\text{D (inches)}}{4}^2 \times \underset{\text{\# Vols}}{3} \times 0.0408 = \underset{\text{Calculated Purge Volume}}{22} \text{ gallons}$$

PURGE TIME

0717 Start 0727 Stop Elapsed

PURGE RATE

Initial — gpm Final — gpm

ACTUAL PURGE VOLUME

Dry @ 18 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☒ °C ☐ °F	Other NTU
Initial	6.4	550	19.0	>100
10	6.6	525	21.5	>100
18	6.7	525	20.5	>100

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other
Meter Nos.	3677	5204	3249	

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

SAMPLING DISTRIBUTION

Sample Series: 9209

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
2400	3 VOAs	TPHG/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
Engineering and
Environmental Services

GROUND-WATER SAMPLING FORM

Job Name: Exxon Alameda
Job Number: 10495-580
Recorded by: David McGovern (Signature)

Well No.: MW-7
Well Type: ☒ Monitor ☐ Extraction ☐ Other
Well Material: ☐ PVC ☐ St. Steel ☐ Other
Date: 9-24-92 Time: 0940
Sampled by: DME (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): 16.2
Water Level Depth (WL in feet BTOC): 6.83
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

$(16.2 - 6.83) \times 4^2 \times 3 \times 0.0408 = 18.3$ gallons

TD (feet), WL (feet), D (inches), # Vols, Calculated Purge Volume

PURGE TIME

0925 Start 0935 Stop ___ Elapsed

PURGE RATE

Initial ——— gpm Final ——— gpm

ACTUAL PURGE VOLUME

18.5 gallons

FIELD PARAMETER MEASUREMENT

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☒ °C ☐ °F	Other NTU
Initial	6.7	575	22.0	>100
6	6.7	575	23.5	>100
12	6.7	575	23.0	>100
18.5	6.7	575	24.0	>100

Minutes Since Pumping Began	pH	Cond. (µmhos/cm)	T ☐ °C ☐ °F	Other
Meter Nos.	3677	5209	3249	

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

WELL SAMPLING

SAMPLING METHOD

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

SAMPLING DISTRIBUTION

Sample Series: 9209

Sample No.	Volume/Cont.	Analysis Requested	Preservatives	Lab	Comments
2404	3 VOAs	TPHG/BTEX	HCl	Pace	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples 0955

Type	Sample No.
Trip Blank	2405

Other Samples

Type	Sample No.

RL004 Office Copy - White Field Copy - Canary 0746

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

October 01, 1992

Mr. Gary Leiberman
Harding Lawson Associates
7655 Redwood Boulevard
Novato, CA 94948

RE: PACE Project No. 420924.501
Client Reference: Exxon 7-0104 (EE)

Dear Mr. Leiberman:

Enclosed is the report of laboratory analyses for samples received September 24, 1992.

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

Sincerely,

Carol Reid

Carol Reid
Project Manager

Enclosures

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

Harding Lawson Associates
7655 Redwood Boulevard
Novato, CA 94948

October 01, 1992
PACE Project Number: 420924501

Attn: Mr. Gary Leiberman

Client Reference: Exxon 7-0104 (EE)

Parameter	Units	MDL		DATE ANALYZED
PACE Sample Number:			70 0212413	
Date Collected:			09/24/92	
Date Received:			09/24/92	
Client Sample ID:			92092400	
ORGANIC ANALYSIS			mw-6	
TPH GASOLINE/BTEX				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	09/28/92
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	500	4700	09/28/92
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	09/28/92
Benzene	ug/L	5.0	790	09/28/92
Toluene	ug/L	5.0	97	09/28/92
Ethylbenzene	ug/L	5.0	640	09/28/92
Xylenes, Total	ug/L	5.0	540	09/28/92

MDL Method Detection Limit

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THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Mr. Gary Leiberman
Page 2

October 01, 1992
PACE Project Number: 420924501

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0212421	
Date Collected:			09/24/92	
Date Received:			09/24/92	
Client Sample ID:			92092401	
Parameter	Units	MDL	mw-3	DATE ANALYZED
ORGANIC ANALYSIS				
TPH GASOLINE/BTEX				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	09/28/92
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	1200	7100	09/28/92
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	09/28/92
Benzene	ug/L	12	2000	09/28/92
Toluene	ug/L	12	44	09/28/92
Ethylbenzene	ug/L	12	1000	09/28/92
Xylenes, Total	ug/L	12	220	09/28/92

MDL Method Detection Limit

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REPORT OF LABORATORY ANALYSIS

Mr. Gary Leiberman
Page 3

October 01, 1992
PACE Project Number: 420924501

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0212430	
Date Collected:			09/24/92	
Date Received:			09/24/92	
Client Sample ID:			92092402	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS			MW-2	
TPH GASOLINE/BTEX				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	09/30/92
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	2500	26000	09/30/92
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	09/30/92
Benzene	ug/L	25	3600	09/30/92
Toluene	ug/L	25	670	09/30/92
Ethylbenzene	ug/L	25	1700	09/30/92
Xylenes, Total	ug/L	25	3300	09/30/92

MDL Method Detection Limit

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REPORT OF LABORATORY ANALYSIS

October 01, 1992
PACE Project Number: 420924501

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0212448	
Date Collected:			09/24/92	
Date Received:			09/24/92	
Client Sample ID:			92092403	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS			MW-5	
TPH GASOLINE/BTEX				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	09/28/92
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	2500	9300	09/28/92
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	09/28/92
Benzene	ug/L	25	2200	09/28/92
Toluene	ug/L	25	31	09/28/92
Ethylbenzene	ug/L	25	330	09/28/92
Xylenes, Total	ug/L	25	250	09/28/92

MDL Method Detection Limit

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REPORT OF LABORATORY ANALYSIS

Mr. Gary Leiberman
Page 5

October 01, 1992
PACE Project Number: 42092450l

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0212456	
Date Collected:			09/24/92	
Date Received:			09/24/92	
Client Sample ID:			92092404	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS			mw-7	
TPH GASOLINE/BTEX				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	09/28/92
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	1200	9200	09/28/92
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	09/28/92
Benzene	ug/L	12	560	09/28/92
Toluene	ug/L	12	48	09/28/92
Ethylbenzene	ug/L	12	1300	09/28/92
Xylenes, Total	ug/L	12	54	09/28/92

MDL Method Detection Limit

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REPORT OF LABORATORY ANALYSIS

October 01, 1992
PACE Project Number: 420924501

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0212464	
Date Collected:			09/24/92	
Date Received:			09/24/92	
Client Sample ID:			92092405	
Parameter	Units	MDL	Trip Blank	DATE ANALYZED
ORGANIC ANALYSIS				
TPH GASOLINE/BTEX				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	09/28/92
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	50	230	09/28/92
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	09/28/92
Benzene	ug/L	0.5	ND	09/28/92
Toluene	ug/L	0.5	ND	09/28/92
Ethylbenzene	ug/L	0.5	ND	09/28/92
Xylenes, Total	ug/L	0.5	ND	09/28/92

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

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REPORT OF LABORATORY ANALYSIS

October 01, 1992
PACE Project Number: 420924501

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0212472	
Date Collected:			09/24/92	
Date Received:			09/24/92	
Client Sample ID:			92092406	
Parameter	Units	MDL	mw-4	DATE ANALYZED
ORGANIC ANALYSIS				
TPH GASOLINE/BTEX				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	09/28/92
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	1000	5900	09/28/92
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	09/28/92
Benzene	ug/L	10	1300	09/28/92
Toluene	ug/L	10	130	09/28/92
Ethylbenzene	ug/L	10	530	09/28/92
Xylenes, Total	ug/L	10	690	09/28/92

MDL Method Detection Limit

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REPORT OF LABORATORY ANALYSIS

Mr. Gary Leiberman
Page 8

October 01, 1992
PACE Project Number: 420924501

Client Reference: Exxon 7-0104 (EE)

PACE Sample Number:			70 0212480	
Date Collected:			09/24/92	
Date Received:			09/24/92	
Client Sample ID:			92092407	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS			MW-1	
TPH GASOLINE/BTEX				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	09/28/92
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	1000	3700	09/28/92
PURGEABLE AROMATICS (BTXE BY EPA 8020):			-	09/28/92
Benzene	ug/L	10	1300	09/28/92
Toluene	ug/L	10	21	09/28/92
Ethylbenzene	ug/L	10	330	09/28/92
Xylenes, Total	ug/L	10	ND	09/28/92

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

These data have been reviewed and are approved for release.

Darrell Cain for

Mark A. Valentini, Ph.D.
Regional Director

11 Digital Drive
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FAX: 415-883-2673

Client Reference: Exxon 7-0104 (EE)

TPH GASOLINE/BTEX
Batch: 70 15754
Samples: 70 0212413, 70 0212421, 70 0212448, 70 0212456, 70 0212472
70 0212480

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015)	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

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	50	297	100%	95%	5%
Benzene	ug/L	0.5	40.0	87%	89%	2%
Toluene	ug/L	0.5	40.0	96%	96%	0%
Ethylbenzene	ug/L	0.5	40.0	99%	100%	1%
Xylenes, Total	ug/L	0.5	80.0	99%	100%	1%

MDL Method Detection Limit
ND Not detected at or above the MDL.
RPD Relative Percent Difference

REPORT OF LABORATORY ANALYSIS

Mr. Gary Leiberman
Page 10

QUALITY CONTROL DATA

October 01, 1992
PACE Project Number: 420924501

Client Reference: Exxon 7-0104 (EE)

TPH GASOLINE/BTEX
Batch: 70 15854
Samples: 70 0212430

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015)	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

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	50	297	99%	100%	1%
Benzene	ug/L	0.5	40.0	83%	89%	6%
Toluene	ug/L	0.5	40.0	91%	97%	6%
Ethylbenzene	ug/L	0.5	40.0	94%	100%	6%
Xylenes, Total	ug/L	0.5	80.0	95%	101%	6%

MDL Method Detection Limit
ND Not detected at or above the MDL.
RPD Relative Percent Difference

REPORT OF LABORATORY ANALYSIS

Mr. Gary Leiberman
Page 11

QUALITY CONTROL DATA

October 01, 1992
PACE Project Number: 420924501

Client Reference: Exxon 7-0104 (EE)

TPH GASOLINE/BTEX
Batch: 70 15860
Samples: 70 0212464

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015)	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

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015)	ug/L	50	427	99%	100%	1%
Benzene	ug/L	0.5	40.0	93%	95%	2%
Toluene	ug/L	0.5	40.0	98%	97%	1%
Ethylbenzene	ug/L	0.5	40.0	108%	106%	1%
Xylenes, Total	ug/L	0.5	80.0	112%	109%	2%

MDL Method Detection Limit
ND Not detected at or above the MDL.
RPD Relative Percent Difference

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EXXON COMPANY, U.S.A.

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

CHAIN OF CUSTODY

420924.501

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

☐ Huntington Beach, CA, 5702 Bolsa Avenue, 92649 (714) 892-2565

Consultant's Name: Harding Lawson Associates — Page 1 of 1

Address: 200 Rushlanding Novato, CA 94948 — Site Location: Exxon Alameda

Project #: 10495-580 — Consultant Project #: 10495-580 — Consultant Work Release #: 90006054

Project Contact: Gary Lieberman — Phone #: 4153920321 Fax #: 8921586 — Laboratory Work Release #:

EXXON Contact: Marla Guensler ☐ EE ☐ C&M — Phone #: Fax #: — EXXON RAS #: 70104

Sampled by (print): David M Evans — Sampler's Signature: David M Evans

Shipment Method: Hand delivered — Air Bill #: — Shipment Date: 9-24-92

TAT: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Standard (5 day)

ANALYSIS REQUIRED

Sample Condition as Received
Temperature ° C: ____
Cooler #: ____
Inbound Seal Yes No
Outbound Seal Yes No

Sample Description	Collection Date/Time	Matrix Soil/Water	Prsv	# of Cont	PACE Sample #	TPH/GAS/BTEX EPA 8015/8020	TPH/Diesel EPA 8015	TRPH EPA 418.1	COMMENTS
92092400	9-24-92 0933	W	HCL	3	21241.3	X			
92092401	0800	W		3	42.1	X			
92092402	0830	W		3	43.0	X			
92092403	0915	W		3	44.8	X			
92092404	0940	W		3	45.6	X			
92092405	0955	W		2	46.4	X			
92092406	1030	W		3	47.2	X			
92092407	1115	W		3	48.0	X			
10/2									

Relinquished by/Affiliation	Date	Time	Accepted by/Affiliation	Date	Time
David M Evans HLA	9/24/92	1220	Lisa Jaffore PACE	9/24/92	1220

Additional Comments:

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