EXON COMPANY, U.S.A.

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ENVIRONMENTAL ENGINEERING

G. D. GIBSON SENIOR ENVIRONMENTAL ENGINEER

November 14, 1990

Exxon RAS 7-0104 1725 Park Street Alameda, California

Mr. Ariu Levy Alameda County Health Agency Division of Hazardous Materials 80 Swan Way, Suite 200 Oakland, California 94621

Dear Mr. Levy:

Attached for your review and comment is the letter report on Third Quarter Groundwater Sampling for the above referenced site in the City of Alameda. This report, by Harding Lawson Associates of Novato, California, presents the results of the groundwater sampling event performed in September, 1990.

Detectable levels of disolved hydrocarbons continue to be detected in all wells at this site; we are currently in the process of designing a groundwater remediation system.

Should you have any questions or concerns after your review, please contact me at (415) 246-8768. Thank you.

ر بر Gary D. Gibson

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GDG:rh 1924E 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. J. E. Folger

Mr. J. R. Hastings

Ms. S. M. Watson - Harding Lawson Associates

Harding Lawson Associates



November 2, 1990

04167,326.02

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

Attention:

Mr. Gary D. Gibson

Senior Environmental Engineer

Gentlemen:

Third Quarter Groundwater Sampling Exxon Station #7-0104
Alameda, California

This letter presents the results of Harding Lawson Associates' (HLA) September 1990 monitoring 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 Phase II Evaluation of Petroleum Hydrocarbons, Exxon Service Station R/S #7-0104, 1725 Park Street, Alameda, California, dated March 21, 1989. The sampling round was conducted on September 19, 1990, and represents HLA's sixth sampling event and the second of a renewed year-long monitoring program.

Water-Level Monitoring and Groundwater Sampling

HLA has been obtaining monthly water-level and free-phase hydrocarbon measurements from the seven monitoring wells onsite since September 1989. All measurements were performed with an electric oil-water interface probe. The water was also visually inspected for the presence of free-phase petroleum product using a clear Lucite bailer. No free-phase product was measured in any of the wells during the course of this investigation. On September 19, 1990, prior to groundwater sample collection, the seven monitoring wells were purged a minimum of three well volumes by hand bailing or with a centrifugal pump. The purged water was stored onsite in 55 gallon drums. Measurements of pH, conductivity, and temperature of the purged water were taken during purging of the wells. Copies of HLA's Groundwater Sampling Forms documenting sampling activities are attached. All water-level measurement and sampling equipment was decontaminated prior to use by steam cleaning.

Groundwater samples from each of the monitoring wells were collected using a stainless steel bailer and decanted into 40-milliliter volatile organic analysis (VOA) vials. A laboratory-supplied trip blank accompanied the sample containers from the

04167,326.02 Exxon Company, U.S.A. Mr. Gary D. Gibson Page 2

laboratory into the field. The samples and trip blank were labeled, placed in a cooler with blue ice, and transported under chain of custody procedures to NET Pacific Laboratory (NET), Santa Rosa, California. NET is a state-certified hazardous waste laboratory.

Laboratory Analyses

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

Groundwater Gradient and Flow Direction

Groundwater elevations from the September 1990 water-level survey are presented in Table 2, along with previously measured groundwater elevations. Water-level elevations at the site have decreased slightly over the past three months from the previous measurements. The water table appears to be fluctuating in response to seasonal precipitation and precipitation induced recharge. Groundwater contours are shown on Plate 1. As shown, the direction of groundwater flow is toward the east at an approximate gradient of 0.004 ft/ft. This flow direction is consistent with previous water-level data obtained during this investigation.

Laboratory Analytical Results

Review of laboratory analytical results indicates that petroleum hydrocarbon constituents were detected in all seven wells onsite. The highest concentrations of petroleum hydrocarbon constituents were detected in groundwater samples collected from wells located adjacent to and downgradient of the tank field area (Wells MW-6 and MW-2, respectively).

As presented in Table 1, the concentrations of TPH as gasoline have remained roughly analogous to concentrations detected during the previous sampling event with the exception of Well MW-1. The concentration of TPH as gasoline has decreased in Well MW-1 from 32 to 0.95 mg/l. The detected TPH concentrations range from 0.95 to 63 milligrams per liter (mg/l). The concentration of benzene detected in all monitoring wells at the site are in excess of the California State Department of Health Services (DHS) action level of 1.0 micrograms per liter (μ g/l). Concentrations of toluene detected in Wells MW-2, MW-4, and MW-6 exceed the DHS action level of 100 μ g/l. Ethylbenzene concentrations detected in Wells MW-3, MW-6, and MW-7 exceed the DHS action level of 680 μ g/l. Xylenes concentrations detected in Wells MW-2, MW-4, MW-6, and MW-7 exceed DHS action levels of 620 μ g/l.



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Benzene, ethylbenzene, and xylenes were detected in the trip blank at concentrations of 0.8, 0.6, and 1.0 μ g/l. These concentrations are slightly above the detection limit of 0.5 μ g/l and are probably the result of laboratory cross contamination during the analytical process. However, based on the highly elevated concentrations detected in the other groundwater samples, the low levels detected in the trip blank do not appear to be significant.

HLA is in the process of designing a soil and groundwater remediation program for the site. Quarterly sampling and monthly groundwater level measurements will continue. The next quarterly sampling event is scheduled for December 1990. HLA recommends that this report be submitted to the Regional Water Quality Control Board and the Alameda County Health Agency.

No: 4007

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

Yours very truly,

HARDING LAWSON ASSOCIATES

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S. Michelle Watson

Project Geologist

Michael L. Siembieda

Associate Geologist - RG 4007

SMW/MLS/bag/J14065-H

Attachments:

Table 1

Table 2 Plate 1

Groundwater Sampling Forms Laboratory Analytical Reports

Table 1. Summary of Chemical Results of Groundwater Samples

Well Number	Date	TPH Gasoline mg/l ¹	Benzene μg/l²	Toluene μg/l	Ethyl- benzene μg/l	Xylenes μg/l	Total Dissolved Solids mg/l
DHS Acti	on Levels		1.0	100	680	620	
	06/07/00	27	5 000	77	1,100	2,700	NT³
MW-1	06/07/88	27 6.8	5,000 2,000	91	800	1,600	NT
	01/17/89 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
	03/07/90	2.3	430	14	16	220	NT
	06/14/90	3 <u>2</u>	1,400	19	<5 ⁴	120	NT
	09/19/90	0.95	290	2.9	<0.5	27	NT
MW-2	06/07/88	110	12,000	12,000	2,100	12,000	NT
101 11 -2	01/17/89	30	6,600	3,300	1,600	7,700	NT
	06/01/89		330	280	680	1,200	NT
	09/18/89		580	280	570	220	NT
	12/11/89		1,000	850	310	1,200	NT
	03/13/90		3,500	1,500	2,100	3,900	NT
	06/14/90		3,800	730	1,600	3,900	NT
	09/19/90		670	180	390	1,000	NT
MW-3	06/07/88	_28	6,000	80	940	1,900	NT
11111	01/17/89		2,500	230	590	1,100	NT
	06/01/89		330	300	570	680	NT
	09/18/89		680	170	350	860	NT
	12/11/89		1,100	150	670	690	NT
	03/13/90		6,300	200	1,100	1,100	NT
	06/14/90		1,300	880	310	1,800	NT
	09/19/90		5,000	65	1,500	450	NT

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

Well Number	Date	TPH Gasoline mg/l	Benzene μg/l	Toluene μg/l	Ethyl- benzene μg/l	Xylenes μg/l	Total Dissolved Solids mg/l
DHS Acti	on Levels		1.0	100	680	620	
 MW-4	01/17/89	19_	1,000	1,500	360	2,200	NT
141.44 - 4	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
MW-5	01/17/89	_ 26	8,700	3,900	990	5,900	NT
2.27.	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
MW-6	01/17/89	38	7,400	9,300	2,000	9,900	NT
	06/01/89		1,900	2,500	2,000	6,000	NT
	09/18/89		650	410	650	320	NT
	12/11/89		1,100	810	330	1,500	NT
	03/13/90	38	12,000	15,000	2,500	12,000	NT
	06/14/90		9,100	7,800	2,900	12,000	NT
	09/19/90		4,200	300	1,400	3,400	NT
MW-7	01/09/90	17_	380	180	330	1,300	NT
	03/13/90		360	270	83	460	NT
	06/14/90		1,200	2,800	75	930	NT
	09/19/90		2,800	95	2,500	1,700	NT
Field					0.40	1.7	NIT
Blank	12/11/89	<0.05	0.88	0.95	0.62	1.7	NT

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

Well Number	Date	TPH Gasoline mg/I	Benzene μg/l	Toluene μg/l	Ethyl- benzene µg/l	Xylenes μg/l	Total Dissolved Solids mg/l
Trip	06/14/90	<0.05	<0.5	<0.5	<0.5	<0.5	NT
Blank	09/19/90	<0.05	0.8	<0.5	0.6	1.0	NT

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

² μ g/l: micrograms per liter (parts per billion)

³ NT: Not tested

^{4 &}lt;: Numbers preceded by "<" indicate that sample was below the indicated detection limit.

Table 2. Groundwater Elevations 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
X12 11 2	1,,,,,	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
MW-2	16.67	06-10-88	6.20	NP	NP	10.47
171 17 2	10.0.	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
MW-3	17.11	06-10-88	6.05	NP	NP	11.06
172 17 2		01-17-89	5.49	NP	NP	11.62
		01-24-89	5.38	NP	NP	11.73

Table 2. Groundwater Elevations 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)
			and the grant of the state of t			
		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
MW-4	17.34	01-17-89	5.36	NP	NP	11.98
2,2,11		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
MW-5	16.71	01-17-89	5.39	NP	NP	11.32
747 44 - N	10.71	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

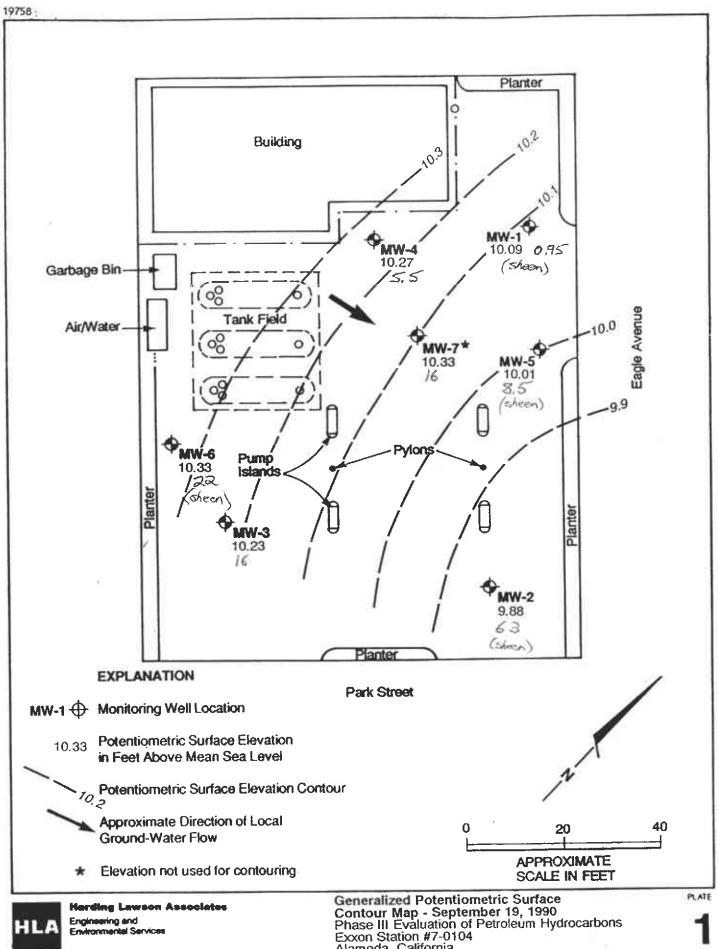
Table 2. Groundwater Elevations and Product Thickness Measurements (continued)

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)
			<u> </u>			
		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
_					» TP»	11.07
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
MW-7	17.12	02-13-90	4.98	NP	NP	12.14
TAT 44 - 1	17.12	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

¹ Elevations surveyed to mean sea level.

² BTOC - Below top of casing.

³ NP: No product.



Alameda, California

REVISED DATE DATE APPROVED REBINAN BOL Smw 04167,326.02 10/90

Engineers	Lawson Associates and Geoscientists		Well No.		AMPLING FORM
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Ø3 □4 □5 [☐ 10 ☐ Other		Depth in feet (BTOC): Scree	en Interval in feet (STOC):
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120.5'-	7.26 X	$(4)^2 \times 3$	X 0.0408	= 26	gallons
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Company of the compan	:06 Stop ZIMIR	Japsed Initial	RATE Spm Final 4	ACTI	JAL PURGE VOLUME Z.D gallons
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Harding Lawson Associates Engineers and Geoscientists

GROUND-WATER SAMPLING FORM

mw-2

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	Samples		Blan	nk Samples		Oth	ner Samp	oles
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Harding Lawson Associates Engineers and Geoscientists

GROUND).WATER	IGMM2	INC	FORM
GUODINE	J-YVA I EI	1 DAIVIPL	JIVG	FURI

MW-3

Well Type: ☐Monitor ☐ Extraction ☐ Other _

Well No.

ob Name E-X								
	(XON AL	AROM						
ob Number 🚢	1167.326	02		Date			Time <u>l</u>	<u>6:20</u>
ecorded by	homos	Muthal gnature)		Sampled by	TSI	V	Sritlais)	
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THE COURSE OF THE PARTY OF THE				PURGE MET	PV	'C.		
Casing Diameter (D 2-inch 4-inc	•	Other		•			fac Dumo	No:
Total Depth of Casi			.2	Submersible		ја Приаси	zer, rump	140
Water Level Depth	MAT in fact BTOCL	6.8	? 	_ ☐ Other - Type _ PUMP INTAL	IN CORNEL PROPERTY	2		
Number of Well Vol				Near Botton		The state of the s	har	
±3 □4 □5 □		. (1010)		Depth in tegt_(I				n feet-(BTQC):
PURGE VOLUM	and the second s	aladia.			60 mm 1 mm			
	Charles of the Control of the Contro	-	2 2	V 0.0400	_			
<u>/ 1. み</u> ー TD (feet)	WL (feet) X	D (inches)	- ×	X 0.0408		alculated Po	ປ urge Volun	gallon:
	` .	- , ,	A whole ten man ha	Crant discharace Walter C				E VOLUME
PURGETIME	O.	G	G-140-24 - 140 - 140	EBATE		ALE IX	15.0	
	Stop		Initial	gpm Final	gpm	-	1.0.0	gallon:
FIELD PARAME	A CALL SOUTH STREET	The state of the s	-	Minutes Since		Cond,	П°С	
Pumping Began	pH Cond. (μmhos/cr			Pumping Began	рН (д	mhos/cm)	T °Ç	Other
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	650	26°						
	6.5 700	26	>100					
	.6 650	26°	>100		-			
15 94 6	.7 600	260	>100		, other			f
								[‡] e&x403249
				Odor): gas line ver Gother (N	DEVIM	- 0 419	1T6	
Discharge Water Di	sposal: 🔲 Sanita							
W-34 (30) 715(3)		是#24.20	WELL	SAMPLING		Test Section		E. Je W.
17 2 7 7 7 7 7 7 7 7								
SAMPLING MET	THOD			Same As Al	oove			
SAMPLING MET				☐ Same As Al ☐ Grab - Type				
	SS Centrifugal [] Blai			_	e:			
Bailer - Type:	SS Centrifugal [] Blai	ample Series	9009	Grab - Type	e:			
Bailer - Type:	Centrifugal Blau IBUTION S Volume/Cont.	ample Series Analysis R	9009 lequested	Grab - Type Other - Typ Preservatives	e:	Lab	C	omments
Bailer - Type: Submersible ☐ SAMPLE DISTR	Centrifugat Blad	ample Series	9009 lequested	Grab - Type Grab - Type Other - Typ	e;		C	omments
Bailer - Type: Submersible SAMPLE DISTR Sample No.	Centrifugal Blau IBUTION S Volume/Cont.	ample Series Analysis R	9009 lequested	Grab - Type Other - Typ Preservatives	e:		0	omments
Bailer - Type: Submersible SAMPLE DISTR Sample No.	Centrifugal Blau IBUTION S Volume/Cont.	ample Series Analysis R	9009 lequested	Grab - Type Other - Typ Preservatives	e:		C	omments
Bailer - Type: Submersible SAMPLE DISTR Sample No.	Centrifugal Blau IBUTION S Volume/Cont.	ample Series Analysis R	9009 lequested	Grab - Type Other - Typ Preservatives	e:		0	omments
Bailer - Type: Submersible SAMPLE DISTR Sample No.	Centrifugal Blau IBUTION S Volume/Cont.	ample Series Analysis R	9009 lequested	Grab - Type Other - Typ Preservatives	e:		C	omments
Bailer - Type: Submersible SAMPLE DISTR Sample No.	Centrifugal Blau IBUTION S Volume/Cont.	ample Series Analysis R	9009 lequested	Grab - Type Other - Typ Preservatives	e:		0	omments
Bailer - Type: Submersible SAMPLE DISTR Sample No	Centrifugal Blau IBUTION S Volume/Cont.	ample Series Analysis R	9009 lequested	Grab - Type Other - Typ Preservatives	e:		C	omments
Bailer - Type: Submersible SAMPLE DISTR Sample No. 1904	Centrifugal [] Black IBUTION S Volume/Cont. 3 VO/A-5	ample Series Analysis R TPH(Gees)	9009 lequested	Grab - Type Other - Typ Preservatives	e:		C	omments
Bailer · Type: Submersible SAMPLE DISTR Sample No. 1904 QUALITY CON	Centrifugal [] Blau IBUTION S Volume/Cont. 3 V D/A-5	ample Series Analysis R TPH(Gees)	9009 Requested	Grab - Type Other - Typ Preservatives None	e:			
Bailer - Type: Submersible SAMPLE DISTR Sample No 1904 QUALITY CONT	Centrifugal Black IBUTION S Volume/Cont. 3 VO/A-5	ample Series Analysis R TPH(Ges)	9009 Requested	Grab - Type Other - Typ Preservatives	e:	Ott	ner Sample	
Bailer - Type: Submersible SAMPLE DISTR Sample No 1904 QUALITY CONT	Centrifugal [] Blau IBUTION S Volume/Cont. 3 V D/A-5	ample Series Analysis R TPH(Ges)	9009 Requested	Grab - Type Other - Typ Preservatives None	e:			*
Bailer - Type: Submersible SAMPLE DISTR Sample No 1904 QUALITY CONT	Centrifugal Black IBUTION S Volume/Cont. 3 VO/A-5	ample Series Analysis R TPH(Ges)	9009 Requested	Grab - Type Other - Typ Preservatives None	e:	Ott		*
Bailer - Type: Submersible SAMPLE DISTR Sample No 1904 QUALITY CONT	Centrifugal Black IBUTION S Volume/Cont. 3 VO/A-5	ample Series Analysis R TPH(Ges)	9009 Requested	Grab - Type Other - Typ Preservatives None	e:	Ott		*

	g Lawson Ass rs and Geoscien							WATER S.	AMPL	ING FOR
	\tilde{t}					Well No.	34 CO 15	J-4	0 N=50	3
- I		۸				· ·		tor DExtract		
ob Name	KKON	ALAN	NEDA	-	_		ZSP.	VC St. Ste		ther
ob Number 🔍	1916	10	UA-		_	Date 9	411	TIO III	Time	10.21
ecorded by	four c	(Signature	alla.			Sampled by	-	- AM	(Initials)	
(五)	No. of the State o	de pro	物学者	# WEL	(PP)	JRGING	明	地名海南	8.4	storal and
PURGE VOLUM	NE .					PURGEMET		our C	-11	
Casing Diameter (-					Bailer - Type		VC.	<u> </u>	
☐ 2-inch 34-i			(47)	/	_	☐ Submersible	☐ Cen	itrifugal 🗌 Blade	der; Pump	No.:
Total Depth of Ca			18	,		Other - Type	T ANTENNA	20100		
Water Level Depti			10.0		-	PUMP INTAK	22/11/11/11/11			
Number of Well V			Vols)			Near Bottom				
/ 1	10 Other	and the state of t				Depth in feet (B	1061:			in feet (BTOC):
PURGE VOLU		MON	\ 2	2				from		_ to
(_18)	7.07	x_(<	+)_	X	5_	X 0.0408	=	21.9		gailor
TD (feet)	WL (feet)	D	(inches)	#	Vols			Calculated P	urge Volun	ne
RURGERIME				9 14+	E R	FIE		ACTU	JALPUR	GE-VOLUME
15:45 Start 1	0.30 Stop 4	S_Ela	osed	initial _	-	_gpm Final	gp	m	22_	gallor
FIELD PARAMI	TER MEASL	JREMEN	Ē							
Minutes Since Pumping Began	pH (μmh	nd. os/cm)	τ <mark>⊠</mark> °°	Other UK	ZB	Minutes Since Pumping Began	рΗ	Cond. (µmhos/cm)	тД:	Other
		0 $\sqrt{2}$	25	23						
b 11	67 5		24	48						
15 "	6.7 50	0 7	23	67						
20 11	67 50	5	23	>100	5					
21.460 H	6.8 49	5	23.5	>100	,	Meter Nos.	CNO	4768, pH#5221	TORE EFF	3403249
						"CLEAR -S	i. Tu		ODER-	
Discharge Water				Storm Sev		Other SS			Chec	0/05///
一种是50%的位置	能が理じる。	100	0.50	WELL	SA	MPLING*	No.		R.	
SAMPLING ME		20 1				Same As Ab	ove			
Baller - Type:	STAIN	LESS	DIT.	5 BL	-	☐ Grab - Type				
Submersible [Centrifugal					Other - Type	:			
SAMPLE DIST	WARD DESCRIPTION OF THE PROPERTY OF THE PROPER			9009	-					
Sample No.	Volume/Co	700	alysis Red		-	Preservatives		Lab	C	comments
1905	3 VOA	SIP	Highs I'i	STEX	N	10ME		NET	-	
		_			-				-	
	-	-			_		_			
		-		-			-			
		-								
		-			-				-	
		-							-	
QUALITY CON	TROL SAMP	LES								
Dup	licate Samples			8	Blank :	Samples		Oth	her Sample	rs .
Original Sample	No. Duplicate	Sample N	0.	Туре		Sample No.		Туре		Sample No.
_										

$\frac{19' - (6.70') \times (4)^2 \times 3}{\text{TD (feet)}} \times \frac{3}{\text{Vols}} \times 0.0408 = \frac{24}{\text{Calculated}}$	teel Other Time 14:50 TSN (Initials) dder; Pump No.:
Date 9191990 Sampled by JNA Casing Diameter (D in inches): Bailer - Type: Submersible Centrifugal Blader - Type: Submersible Centrifugal Su	Time 14:50 TSN (Initials) dder; Pump No.: Other een Interval in feet (BTOC): m to gallons Purge Volume
Sampled by Sam	dder; Pump No.: Other to gallons Purge Volume
Casing Diameter (D in inches): Bailer - Type: Submersible Centrifugal Blater Depth of Casing (TD in feet BTOC): 19	odder; Pump No.: Other een Interval in feet (BTOC): m to gallons Purge Volume
PURGE VOLUME Casing Diameter (D in inches): 2-inch 24-inch 6-inch Other	Other to gallons Purge Volume
Casing Diameter (D in inches): 2 inch 3 4-inch 6-inch Other	Other to gallons Purge Volume
Casing Diameter (D in inches): 2-inch	Other to gallons Purge Volume
Total Depth of Casing (TD in feet BTOC):	Other to gallons Purge Volume
Water Level Depth (WL in feet BTOC):	een Interval in feet (BTOC): n to gallons Purge Volume
Number of Well Volumes to be purged (# Vols) Near Bottom Near Top Condition Near Top Near To	een Interval in feet (BTOC): n to gallons Purge Volume
Sor	een Interval in feet (BTOC): n to gallons Purge Volume
PURGE VOLUME CALCULATION 19	n to gallons Purge Volume
TD (feet) WL (feet) X D (inches) X 3 X 0.0408 = Z4 Calculated RURGETME 14:19 Start	Purge Volume
TD (feet) WL (feet) D (inches) Vols Calculated RURGERIME 14:19 Start 14:41 Stop ZZ MIN PURGERATE ACT 14:19 Start 14:41 Stop ZZ MIN PURGERATE Initial 13:0 gpm Final 10:0 gpm FELD PARAMETER MEASUREMENT Minutes Since Pumping Began PH (µmhos/cm) T 0°F Other 10RB Other 10R	Purge Volume
PURGERIME 14:19 Start	
14:19 Start 14:41 Stop ZZ MIN Elapsed Initial 13:0 gpm Final 10:0 gpm	UAL PURGE VOLUME
Minutes Since Pumping Began PH (µmhos/cm) T\(\text{\text{\text{\color}}}\) Other TURB (\text{\text{\text{\text{\color}}}}\) Other TURB (\text{\text{\text{\color}}}\) Other TURB (\text{\text{\text{\color}}}\) Other TURB (\text{\text{\text{\color}}}\) Other TURB (\text{\text{\color}}\) Other TURB (\text{\color}\) Other TURB (\text{\color}	24 gallons
O GALLONG 6.7 700 Z5.5 >100 0	TR'C Other
0	, Dak Onter
15 11 6.7 700 26.5 92 20 11 6.9 700 27.5 7 100 24 11 6.9 700 27 81 Observations During Purging (Well Condition, Turbidity, Color, Odor): Turbid - CLEAR 51. Discharge Water Disposal: Sanitary Sewer Storm Sewer Other 55 CACON DRI WELL SAMPLING	
20 11 6.9 700 77.5 7 100 24 11 6.9 700 27 81 Meter Nos. Crop HTX: Type of Observations During Purging (Well Condition, Turbidity, Color, Odor): Turbid - CLEAR 51. Discharge Water Disposal: Sanitary Sewer Storm Sewer Other 55 CACON DEL WELL SAMPLING	
24 11 6.9 700 27 81 Meter Nos. Crop 1476: Tyrob Observations During Purging (Well Condition, Turbidity, Color, Odor): TURBID - CLEAR SI. Discharge Water Disposal: Sanitary Sewer Storm Sewer Other 55 CACON DRIVER WELL SAMPLING	
Observations During Purging (Well Condition, Turbidity, Color, Odor): TURBID - CLEAR 51. Discharge Water Disposal: Sanitary Sewer Storm Sewer Other 55 CACON DEL WELL SAMPLING	000 0000 0H#522
WELLSAMPLING	GASOLINE ODOR
4 - 100 March 1990	新田民
Same As Above Same As Above Grab - Type: ☐ Submersible ☐ Centrifugal ☐ Bladder, Pump No.: SAMPLE DISTRIBUTION Sample Series: 9009	
Sample No. Volume/Cont. Analysis Requested Preservatives Lab	Comments
1902 3 VOA'S PHIGAS BTEN NONE NET	Comments
110000 10000 14000	
CIMITY CONTROL OMOLES	
QUALITY CONTROL SAMPLES Duplicate Samples Blank Samples C	
Original Sample No. Duplicate Sample No. Type Sample No. Type	ther Samples

-

Harding Lawson Associates		GRO	UND-WATER	SAMPLING FOR			
Engineers and Geoscientists		Well No	Well No. MW-6				
_ 1,		Well Type:	Monitor □Ext	raction			
b Name ExxON / ALAMET	A.	_ Well Materi	al: TAPVC St.	Steel Other			
b Number 04167.326	2		19/1990	Time15:33			
ecorded by	Lower	Sampled b	11 //	4 75N			
(Signature)			**	(Initials)			
数数多数数 分 数数数数数数数数	WELL	PURGING	介。维护与一治人	一种级品产品的			
PURGE VOLUME		PURGE ME	THOD				
Casing Diameter (D in inches):		☐ Bailer - Ty	-				
		Submersib	le X Centrifugal 🔲	Bladder; Pump No.;			
☐ 2-inch	.6	☐ Other - Ty	pe:				
Water Level Depth (WL in feet BTOC):	7.23	SALES OF THE PROPERTY AND ADDRESS OF THE PARTY OF THE PAR	KE SETTING				
Number of Well Volumes to be purged (# Vols)				Other			
13 □4 □5 □10 □ Other		/		Screen Interval in feet (BTOC):			
PURGE VOLUME CALCULATION		,		from to			
	2						
$(18.6 - 7.23)$ \times (4) \times	_ X	/ols X 0.0408	Calculate	gallor ed Purge Volume			
			100	A COLUMN TO THE PROPERTY OF TH			
Stan 1525 Stop 25 Elapsed	PURGE			CTUAL PURGE VOLUME			
A STATE OF THE PARTY OF THE PAR	Initial 4	2.0 gpm Final 7	<u>-5·</u> gpm	gatlor			
TELD PARAMETER MEASUREMENT				T-00-1			
Minutes Since Pumping Began PH (μmhos/cm) ΤΑΘΟ	Other 10K	B Minutes Sino Pumping Bega					
D GALLON 6. 1 575 27.5	58						
10 11 6.6 575 25	69						
5 1 6.4 575 25	53						
20 6.6 550 24	93						
22.3 " 6.6 550 24	7100	Meter Nos.	TUZE 84:04:03249	in 5226; Como 14768			
Observations During Purging (Well Condition, Tur	hidity Color C	Mort SI - TUR	ED GASOLIN	E ODOR			
Discharge Water Disposal: Sanitary Sewer	Storm Sew	er Mother 55	5 GALLON I	DRUM-ONSITE			
and the second s		The same of the sa	5000 H				
	AACUL	SAIVIPLING	Se IAC				
SAMPLING METHOD	1573	☐ Same As .	Above				
Bailer - Type: STAINLESS ST		Grab - Ty	oe:				
Submersible Centrifugal Bladder; Pump	No.:	Other - Ty	pe:				
	9009						
	Requested	Preservatives	Lab	Comments			
1903 3- VOA's TPHICA	5) 8 BIEX	NONE	NET PAC	VENC			
			+				
			-				
		1921					
QUALITY CONTROL SAMPLES							
Duplicate Samples		ank Samples		Other Samples			
	2.2 (12.4)	Same A	Trees.	e Sample No.			
Original Sample No. Duplicate Sample No.	Туре	Sample N	Ка. Тур	Sample No.			

	Lawson Associations and Geoscientists	ites			ND-V	VATER S	AMPL	ING FOI
				Well No.	IX.	M		
- /A A				Well Type: 🗡	Monit	tor DExtract	ion ∐Oi	ther
b Name EXXON / ALAMEDA			Well Material:	1 IXIP	/C LISt. Ste	ed □O	iher	
b Number Q	4161 3	denta		Date	419	1111	I imeI	1
corded by	Janes In	ignature)	ere	Sampled by		JMIN	(Initials)	
2018 34	建設的 对於200	新教 文章	* # WELL P	URGING	郭南	使 排作的 	大型製	Salar Const
URGE VOLUM	Ē			PURGEMET	HOD	1110 Cm	(1)	
asing Diameter (D	in inches):			Bailer - Type:		VC (Z	-)	
] 2-inch (\$\d-inc	ch 🗌 6-inch 🔲	Other		Submersible	☐ Cen	trifugal 🗌 Blade	der; Pump	No.:
otal Depth of Casi	ing (TD in feet BTC	oc):		Other - Type:				
Vater Level Depth	(WL in feet BTOC)	6.7	"	PUMP INTAK	E SET	UNG		
umber of Well Vol	lumes to be purge	d (# Vols)		Near Bottom	_ N	ear Top 🗌 Ot	her	
Á 3 □4 □5 □	10			Depth in feet #	roc):_	Series	en Interval.	in feet (BTOC
URGE VOLUM	E CALCULATIO	N	201			from		to
17.01	(0.79')x	(4)	2 x 3	X 0.0408 =	=	70		galle
TD (feet)	WL (feet)	(inches)	# Vols			Calculated P	urge Volun	
SRCIEDEME			PURGER	3.57E		ACTI	IAI PUR	GE VOLUM
<u>060eseivie</u> (.:50 _{a.}	19 Stop 29 1	414 Doored			***		20	galk
and the second s	A STATE OF THE PARTY OF THE PAR	VIVE BOTH BUILDING	Initial	gpm Final —	—— gþi			goin
DESCRIPTION AND PROPERTY OF THE PERSON NAMED IN COLUMN	TER MEASURE Cond.	a minute service.	1,427-7	Minutes Since		Cond.	+∏°C	Tanana a
Minutes Since Pumping Began	PH (μmhos/c		Other TURD	Pumping Began	рΗ	(µmhos/cm)	T B°F	Other
) GNLONS		24	14					
36	6.6 575	24	2100					
	0.4 575	74.5	>100					
20 11 1	6.7 575	24.5	7100					
				Meter Nos.	TURE E	F-1032491, C	015 1476	, pH 52
Observations Durin	ng Purging (Well C	Condition, Turb	idity, Color, Odo	CLEAR	2/61	S OBOR -	>TOPB	1D W SI.
Discharge Water D	isposal: 🔲 Sanit	ary Sewer (Storm Sewer	Other 55	GA	- Dizene	-0N	SITE
ALCO PART		14 E E E	WELLS	AMPLING	11.59		Dinites .	
AND THE PERSON NAMED IN		04	-1-0-0000000000000000000000000000000000	□ Same As Abo				
SAMPLING ME	STANLES	C STEE	13		-			
				☐ Grab - Type:				
	Centrifugat Bla	idder; Pump N -	9009	Other - Type				
SAMPLE DISTF	Volume/Cont.	Sample Series:	anunetad	Preservatives		Lab	1 6	Comments
Sample No.	3 LOA	TP(+/GAS)		NONE	1	JEI		201111111111111111111111111111111111111
1.10.1	- > rrve	1 (+(GAS)	n bi ca	NONE		41	+	
	-							
							-	
					-			
					-		1	
	1				1			
					-		-	
011414737 00:1	TROL 0444015							
	TROL SAMPLE: licate Samples	5	Blank	Samples		Ot	her Sample	es
	No. Duplicate Sar	mple No.	Туре	Sample No.		Туре		Sample No.



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

: CC1 90 9 <u>:</u> 44

Michelle Watson Harding Lawson Associates 200 Rush Landing Novato, CA 94947 Date: 10-04-90

NET Client Acct No: 281 NET Pacific Log No: 3918 Received: 09-19-90 1942

Client Reference Information

Exxon Alameda, Job: 4167,326.02

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

Approved by:

Juyes Skamarack Laboratory Manager

JS:rct Enclosure(s)

Date: 10-04-90

Page: 2

Ref: Exxon Alameda, Job: 4167,326.02

Descriptor, Lab No. and Results

				
	Danantina	90091901 09-19-90 1414	90091902 09-19-90 1450	
Method	Limit	63273	63274	Units
		1 00-28-00	50 09-29-90	
	0.05	0.95 	8.5 	mg/L
		1	50	
	0.5 0.5 0.5 0.5	09-28-90 290 ND 2.9 27	1,800 120 85 460	ug/L ug/L ug/L ug/L
	Method	0.05 0.5 0.5 0.5	Method Limit 63273	09-19-90 09-19-90 1414 1450 Reporting Limit 63273 63274 1 50 09-29-90 1 50 09-29-90 0.5 0.95 8.5 1 50 09-29-90 0.5 0.5 ND 120 0.5 0.5 ND 120 0.5 0.5 2.9 85

Date: 10-04-90

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Ref: Exxon Alameda, Job: 4167,326.02

Descriptor, Lab No. and Results

		Depositing	90091903 09-19-90 1533	90091904 09-19-90 1620	
Parameter	Method	Reporting Limit	63275	63276	Units
PETROLEUM HYDROCARBONS VOLATILE (WATER) DILUTION FACTOR * DATE ANALYZED METHOD GC FID/5030 as Gasoline METHOD 602 DILUTION FACTOR * DATE ANALYZED Benzene Ethylbenzene Toluene Xylenes, total		0.05 0.5 0.5 0.5 0.5	 50 09-29-90 22 50 09-29-90 4,200 1,400 300 3,400	 50 09-29-90 16 50 09-29-90 5,000 1,500 65 450	mg/L ug/L ug/L ug/L ug/L

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Ref: Exxon Alameda, Job: 4167,326.02

Descriptor, Lab No. and Results

Date: 10-04-90

			90091907 09-19-90 1727	90091908 09-19-90 1800	
Parameter	Method	Reporting Limit	63279	63280	Units
PETROLEUM HYDROCARBONS VOLATILE (WATER) DILUTION FACTOR * DATE ANALYZED METHOD GC FID/5030 as Gasoline METHOD 602 DILUTION FACTOR * DATE ANALYZED Benzene Ethylbenzene Toluene Xylenes, total		0.05 0.5 0.5 0.5 0.5	 50 09-29-90 16 50 09-29-90 2,800 2,500 95 1,700	 1 09-28-90 ND 1 09-28-90 0.8 0.6 ND 1.0	mg/L ug/L ug/L ug/L ug/L

Page: 4

Date: 10-04-90

Ref: Exxon Alameda, Job: 4167,326.02

Descriptor, Lab No. and Results

	. •	_	90091905 09-19-90 1637	90091906 09-19-90 1725	
Parameter	Method	Reporting Limit	63277	63278	Units
PETROLEUM HYDROCARBONS VOLATILE (WATER) DILUTION FACTOR * DATE ANALYZED METHOD GC FID/5030 as Gasoline METHOD 602 DILUTION FACTOR * DATE ANALYZED Benzene Ethylbenzene Toluene Xylenes, total		0.05 0.5 0.5 0.5 0.5	 50 09-29-90 5.5 50 09-29-90 450 170 220 650	 100 09-28-90 63 100 09-28-90 670 390 180 1,000	mg/L ug/L ug/L ug/L ug/L

Ref: Exxon Alameda, Job: 4167,326.02

Date: 10-04-90

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QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Gasoline	0.05	mg/L	91	ND	97	99	2.0
Toluene	0.5	ug/L	92	ND	106	108	1.9
Benzene	0.5	ug/L	92	ND	132	133	< 1
COMMENT: Blank	Results were	ND on oth	ner analyte	es tested.			
Gasoline	0.05	mg/L	108	ND	82	96	15.7
Benzene	0.5	ug/L	98	ND	71	87	20.3
Toluene	0.5	ug/L	103	ND	82	91	10.4

 ${\it COMMENT:}\ {\it Blank}\ {\it Results}\ {\it were}\ {\it ND}\ {\it on}\ {\it other}\ {\it analytes}\ {\it tested.}$

KEY TO ABBREVIATIONS and METHOD REFERENCES

: Less than; When appearing in results column indicates analyte

not detected at the value following, which supercedes the

listed reporting limit.

mean : Average; sum of measurements divided by number of measurements.

mg/Kg (ppm): Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis

(parts per million).

mg/L : Concentration in units of milligrams of analyte per liter of sample.

mL/L/hr : Milliliters per liter per hour.

MPN/100 mL : Most probable number of bacteria per one hundred milliliters of sample.

N/A : Not applicable.

NA : Not analyzed.

ND : Not detected; the analyte concentration is less than applicable listed

reporting limit.

NTU : Nephelametric turbidity units.

RPD : Relative percent difference, 100 [Value 1 - Value 2]/mean value.

SNA : Standard not available.

ug/Kg (ppb) : Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis

(parts per billion).

ug/L : Concentration in units of micrograms of analyte per liter of sample.

umhos/an : Micramhos per centimeter.

Method References

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

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

* Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated reporting limits by the dilution factor.

SOURCE CODE

Harding Lawson Associates

7655 Redwood Boulevard P.O. Box 578 Novato, California 94948

415/892-0821

Telecopy: 415/892-0831 Telex: 340523

MATRIX

Sediment Soil Oil

Water

4167, 326.02 Job Number:

#CONTAINERS & PRESERV.

Unpres. H₂ SO₄ HNO₃

3 3

3

2

EXXON ALAMEDA Name/Location:__

Project Manager: MICHELLE WATSON

SAMPLE NUMBER

OR

LAB

NUMBER

Seq

Υr

Мо

Wk

Y٢

Recorder: (Signature Required)

STATION DESCRIPTION/

NOTES

CHAIN OF CUSTODY FORM

Samplers: JWA

Time

DATE

Dν

ANALYSIS REQUESTED Total Petrol. Hydrocarb (LICHT) Benzene/Toluene/Xylene Priority Plitnt. Metals EPA 602/8020 EPA 624/8240 EPA 601/8010 EPA 625/8270

Lab: NET PACIFIC

LAB NUMBER Yr Wk Sea	1	COL MTD CD	QA CODE	MISCELLANEOUS	CHAIN	OF CUSTODY RECORD
Yr Wk Seq					RELINQUISHED BY: (Signature) RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature) RECEIVED BY: (Signature) RECEIVED BY: (Signature) DATE/TIME DATE/TIME
					RELINQUISHED BY: (Signature) DISPATCHED BY: (Signature) DAT 1/19/70	RECEIVED BY: (Signature) DATE/TIME E/TIME RECEIVED FOR LAB BY: DATE/TIME (Signature) Amount and 9/19/90 7:42