

P.2

SEDIMENT SAMPLE MEASUREMENTS AND CHEMISTRY

Appendix P.2: Summary of Physical Measurements and Chemistry Analysis for Sediment Samples Collected from the Port of Los Angeles

	ER-L	ER-M	TTL	LAI-6	LAI-11	LAM-4	LAM-6	LAM-9	LAM-11	LAO-1	LAO-2	LAO-3	LAO-5	LAO-6	LAO-7	LAO-10
Analyte																
Physical Analyses																
Gravel (%)	-	-	-	1.7	0.7	0.37	0.00	5.59	0.01	0.28	0.50	0.00	0.00	0.00	0.00	0.00
Sand (%)	-	-	-	22.4	43.9	48.22	82.53	5.35	5.26	5.57	39.44	4.60	1.49	0.79	15.50	0.97
Silt (%)	-	-	-	56.2	31.4	34.94	10.28	38.97	44.55	68.72	45.68	59.02	49.53	57.35	61.86	52.87
Clay (%)	-	-	-	19.7	24.0	16.47	7.19	50.09	50.18	25.43	14.38	36.38	48.98	41.87	22.64	46.15
Solids, Total (%)	-	-	-	66.5	59.7	67.7	75.9	47.1	35.4	54.2	62.2	48.9	40.2	46.1	57.7	42.6
Specific Gravity	-	-	-	1.8	1.6	1.78	1.85	1.44	1.29	1.51	1.48	1.46	1.30	1.41	1.46	1.36
General Chemistry																
TOC (%)	-	-	-	0.41	1.14	0.59	0.25	3.05	5.81	3.08	1.22	2.11	3.87	2.70	2.21	3.39
Ammonia (mg/kg wet weight)	-	-	-	37.34	4.53	3.03	1.81	15.93	8.59	6.02	14.58	9.82	6.37	4.45	4.70	6.72
Sulfide, Dissolved (mg/kg)	-	-	-	0.61	0.73	0.39	0.29	0.59	0.31	0.22	0.10	0.74	0.31	0.24	0.43	0.25
Sulfide, Total (mg/kg)	-	-	-	0.47	5.73	2.31	0.52 <0.05		14.61	40.60	7.12	60.71	207.82	6.26	0.47	26.44
Oil and Grease (% dry weight)	-	-	-	0.05	0.06	0.03	0.03	0.03	0.09	0.06	0.02	0.04	0.03	0.02 0.01J		0.03
TRPH (% dry weight)	-	-	-	<0.01	0.03	0.02	0.02 0.01J		0.04	0.03	0.02	0.03	0.02	0.02 0.01J		0.02
Metals																
Arsenic (As)	8.2	70.0	500	8.67	8.05	7.74	3.68	13.14	15.91	12.3	5.6	10.9	14.0	11.9	7.9	13.0
Barium (Ba)	-	-	1000	166.60	164.10	204.70	73.50	270.30	302.20	658.4	707.4	311.0	296.7	283.8	573.0	309.9
Beryllium (Be)	-	-	-	0.38	0.37	0.32	0.18	0.65	0.44	0.3	0.2	0.5	0.5	0.5	0.2	0.5
Cadmium (Cd)	1.2	9.6	1200	0.19	0.40	0.37	0.13	1.08	0.97	1.1	0.5	0.8	0.9	0.9	0.9	0.9
Chromium (Cr)	81.0	370.0	-	30.51	48.31	34.87	16.96	63.50	76.38	51.4	28.2	50.1	69.6	56.3	37.6	68.8
Cobalt (Co)	-	-	8000	12.23	9.50	9.82	5.26	15.77	9.57	8.6	6.4	12.1	12.3	13.1	7.6	12.9
Copper (cu)	34.0	270.0	2500	35.65	75.43	40.32	61.61	71.32	376.32	134.0	48.2	54.8	209.5	75.5	43.5	103.7
Iron (Fe)	-	-	-	32649.00	30609.00	28749.00	16569.00	45369.00	39359.00	33879.0	22119.0	38179.0	44439.0	42639.0	27419.0	45429.0
Lead (Pb)	46.7	218.0	1000	9.37	35.68	17.17	8.86	20.55	74.08	21.8	9.0	16.7	28.2	16.8	7.2	19.9
Manganese (Mn)	-	-	-	401.30	298.10	325.00	171.60	482.40	281.00	288.2	235.8	411.6	394.0	425.2	271.6	420.9
Mercury (Hg)	0.2	0.7	20	0.14	0.38	0.28	0.11	0.24	0.21	0.2	0.1	0.2	0.3	0.2	0.1	0.2
Molybdenum (Mo)	-	-	3500	0.78	1.48	1.82	0.65	5.03	3.52	3.2	1.8	3.7	4.9	5.9	6.9	5.3
Nickel (Ni)	20.9	51.6	2000	23.60	24.33	21.78	11.43	49.83	37.33	32.8	17.2	35.5	44.4	42.8	37.0	46.3
Selenium (Se)	-	-	100	0.47	0.78	0.70	0.31	2.37	3.22	2.4	0.9	2.0	2.9	2.5	3.0	2.9
Silver (Ag)	1.0	3.7	500	0.40	0.49	0.33	0.16	0.78	0.44	0.2	0.1	0.1	0.3	0.2	0.1	0.2
Strontium (Sr)	-	-	-	61.09	62.89	111.20	31.45	99.06	76.38	86.3	68.2	103.0	95.6	38.4	88.5	101.0
Thallium (Tl)	-	-	700	0.16	0.18	0.17	0.08	0.28	0.27	0.2	0.1	0.2	0.3	0.2	0.2	0.3
Tin (Sn)	-	-	-	0.81	3.14	1.57	0.88	1.83	12.67	2.6	1.3	2.5	4.0	2.2	1.0	2.9
Titanium (Ti)	-	-	-	1090.99	1039.99	957.89	600.69	1149.99	1035.98	1121.0	895.4	1081.0	1290.0	1258.0	907.7	1459.0
Vanadium (V)	-	-	-	51.20	56.38	51.39	27.99	82.80	86.95	66.6	44.0	62.8	81.6	73.5	46.5	84.0
Zinc (Zn)	150.0	410.0	5000	65.83	117.64	72.64	57.14	117.34	287.15	166.6	96.9	101.4	162.6	121.9	82.8	136.4

Appendix P.2: Summary of Physical Measurements and Chemistry Analysis for Sediment Samples Collected from the Port of Los Angeles

Analyte	ER-L	ER-M	TTL	LAI-6	LAI-11	LAM-4	LAM-6	LAM-9	LAM-11	LAO-1	LAO-2	LAO-3	LAO-5	LAO-6	LAO-7	LAO-10
PCBs (ug/kg)																
PCB018	.	.	.	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB028	.	.	.	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB031	.	.	.	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB033	.	.	.	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB037	.	.	.	<1	<1	<1	<1	<1	22.60	<1	<1	<1	<1	<1	<1	<1
PCB044	.	.	.	<1	<1	<1	<1	<1	11.20	<1	<1	<1	<1	<1	<1	<1
PCB049	.	.	.	<1	<1	3.3J	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB052	.	.	.	<1	<1	1.9J	<1	<1	6.30	<1	<1	<1	<1	<1	<1	<1
PCB066	.	.	.	<1	<1	<1	<1	<1	9.80 3.7J	<1	<1	2.8J	<1	<1	<1	<1
PCB070	.	.	.	<1	<1	<1	<1	<1	10.00 3J	<1	<1	<1	<1	<1	<1	<1
PCB074	.	.	.	<1	<1	<1	<1	<1	7.20	<1	<1	<1	<1	<1	<1	<1
PCB077	.	.	.	<1	<1	<1	<1	<1	<1	4.3J	<1	<1	<1	<1	<1	<1
PCB081	.	.	.	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB087	.	.	.	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB095	.	.	.	<1	2.4J	1.5J	<1	<1	13.90 4J	<1	<1	2.1J	1J	<1	<1	1J
PCB097	.	.	.	<1	2.5J	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB099	.	.	.	<1	2.2J	1.2J	<1	<1	11.00 4.5J	<1	<1	2.5J	<1	<1	<1	<1
PCB101	.	.	.	<1	3.3J	2.2J	<1	<1	19.90 3.1J	<1	1.3J	<1	5.0 1.4J	<1	<1	1.3J
PCB105	.	.	.	<1	4.4J	<1	<1	<1	<1	2.5J	<1	<1	<1	<1	<1	<1
PCB110	.	.	.	<1	4J	1.9J	1J	<1	16.30	<1	<1	3.8J	1.2J	<1	<1	2J
PCB114	.	.	.	<1	<1	<1	<1	<1	<1	2.4J	<1	<1	<1	<1	<1	<1
PCB118	.	.	.	<1	3J	2.3J	<1	<1	16.60	<1	<1	1.5J	<1	<1	<1	2.2J
PCB119	.	.	.	<1	<1	<1	<1	<1	<1	3.4J	<1	<1	<1	<1	<1	<1
PCB123	.	.	.	<1	<1	<1	<1	<1	<1	2.6J	<1	<1	<1	<1	<1	<1
PCB126	.	.	.	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB128+167	.	.	.	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB138	.	.	.	<1	5.60	1.8J	1.2J	<1	20.20	<1	<1	2.1J	6.3 3.5J	<1	<1	3J
PCB141	.	.	.	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB149	.	.	.	<1	4J	1.9J	<1	<1	13.40	<1	<1	<1	1.9J	<1	<1	<1
PCB151	.	.	.	<1	1J	<1	<1	<1	4.5J	<1	<1	<1	<1	<1	<1	<1
PCB153	.	.	.	<1	6.30	3.5J	1.4J	<1	18.30	<1	<1	1.5J	4.1J	1.9J	<1	1.7J
PCB156	.	.	.	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB157	.	.	.	<1	1J	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB158	.	.	.	<1	1.3J	<1	<1	<1	<1	<1	5.7	<1	<1	<1	<1	<1
PCB168+132	.	.	.	<1	3J	2.4J	<1	<1	4.2J	<1	5.6	<1	<1	<1	<1	<1
PCB169	.	.	.	<1	<1	<1	<1	<1	<1	2J	<1	<1	<1	<1	<1	<1
PCB170	.	.	.	<1	4.7J	1.6J	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB177	.	.	.	<1	<1	<1	<1	<1	3.6J	<1	<1	<1	<1	<1	<1	<1
PCB180	.	.	.	<1	3.2J	1.3J	<1	<1	10.40	<1	<1	<1	<1	<1	<1	<1
PCB183	.	.	.	<1	<1	<1	<1	<1	2.7J	<1	<1	<1	<1	<1	<1	<1
PCB187	.	.	.	<1	1.6J	<1	<1	<1	6.80	<1	<1	<1	<1	<1	<1	<1
PCB189	.	.	.	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB194	.	.	.	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB200	.	.	.	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
PCB201	.	.	.	<1	<1	<1	<1	<1	4.5J	<1	<1	<1	<1	<1	<1	<1
PCB206	.	.	.	<1	<1	<1	<1	<1	2.9J	<1	<1	<1	<1	<1	<1	<1
Total PCB	22.7	180	50000	0.00	53.50	26.80	3.60	0.00	236.30	46.8	0.0	6.4	28.5	9.0	0.0	11.2

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Organotins (ug/kg)																
Dibutyltin	-	-	-	<1	9.1	10.10	<1	<1	32.20	14.7	11.5	<1	17.5	<1	<1	<1
Monobutyltin	-	-	-	<1	<1	<1	<1	<1	32.80	<1	<1	<1	<1	<1	<1	<1
Tetrabutyltin	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Tributyltin	-	-	-	4.0	56.7	12.60	<1	<1	287.30	51.9	15.2	<1	41.4	<1	<1	15.8
PAHs (ug/kg)																
1-Methylnaphthalene	-	-	-	3.5J	9.3	8.5 4.3J		5.0	19.0	26.2	5.4 2.8J		35.4	10.7	8.7	18.5
1-Methylphenanthrene	-	-	-	3.4J	24.1	11.6 3J	3.5J		169.2	14.6	<1 4.8J		20.7	7.2 4.8J		12.0
2,3,5-Trimethylnaphthalene	-	-	-	1.9J	7.1	6.9 2.6J	2.7J		31.0	79.2	10.1 3.4J		96.8	14.2	8.7	39.4
2,6-Dimethylnaphthalene	-	-	-	5.5	12.7	10.9	6.4	6.1	38.9	33.9 4.3J		7.6	55.7	20.8	9.8	38.2
2-Methylnaphthalene	70	670	-	10.8	20.7	20.2	11.8	12.6	43.7	37.3	8.1 3.3J		52.8	21.6	18.2	39.2
Acenaphthene	16	500	-	3J	8.2 4.1J		2.1J	2.6J	23.0	6.8 4.1J	2.2J		7.0 4J	4.9J		5.8
Acenaphthylene	44	640	-	4.7J	98.5	25.1	7.3 2.8J		795.0	15.0 4.3J	4.3J		34.7	13.0	5.6	15.3
Anthracene	85	1100	-	19.3	227.5	56.7	19.1	8.7	2652.1	55.4	13.1	14.4	134.5	37.9	14.1	48.8
Benz[a]anthracene	261	1600	-	28.5	295.4	86.0	21.5	7.5	4125.2	98.6	24.7	32.2	207.4	59.7	28.5	90.4
Benzo[a]pyrene	430	1600	-	22.1	574.3	73.6	25.3	8.4	10964.0	274.3	28.8	29.4	404.5	56.9	18.8	67.1
Benzo[b]fluoranthene	-	-	-	52.8	813.2	200.9	50.3	20.3	12762.8	271.5	54.5	46.6	484.5	147.4	48.7	154.7
Benzo[e]pyrene	-	-	-	36.9	494.1	126.1	32.8	14.6	8425.4	244.7	45.2	42.2	420.0	108.5	40.8	125.2
Benzo[g,h,i]perylene	-	-	-	24.2	291.8	101.2	23.6	13.5	6788.6	211.2	36.2	38.9	277.8	91.9	33.2	90.9
Benzo[k]fluoranthene	-	-	-	54.4	767.2	218.5	28.7	25.0	11918.9	239.3	54.5	48.3	432.0	146.6	58.8	167.4
Biphenyl	-	-	-	2.3J	5.1 3.7J	1.9J	2.3J		15.3 4.1J	<1	1J		7.0 3.4J	2.1J		5.3
Chrysene	384	2800	-	57.6	615.8	158.6	50.2	16.6	9928.0	163.2	48.0	43.7	417.1	121.2	53.9	193.1
Dibenz[a,h]anthracene	63	260	-	7.2	112.2	33.5	9.3 4.5J		2543.9	88.6	10.5	12.1	91.7	27.7	8.9	28.4
Dibenzothiophene	-	-	-	2.4J	7.1 4.6J	2J	2.3J		35.3	6.7	<1	3.8J	10.0	5.7	<1	7.2
Fluoranthene	600	5100	-	47.4	247.1	133.0	31.3	18.0	3920.6	198.3	97.5	80.6	305.2	146.2	79.3	231.1
Fluorene	19	540	-	7.0	19.7	12.4 4.7J	3.8J		145.8	10.0 3.9J		5.9	21.9	6.4 3.6J		13.9
Indeno[1,2,3-c,d]pyrene	-	-	-	27.7	373.8	102.5	27.4	9.6	8334.5	150.4	34.7	34.7	242.3	80.6	31.6	89.4
Naphthalene	160	2100	-	5.1	14.2	14.0	5.1	5.7	41.1	14.8 3.8J	4.1J		22.8	9.1	5.4	15.6
Perylene	-	-	-	30.0	154.5	57.9	18.2	88.8	2532.0	1105.3	210.5	297.6	833.3	691.8	508.4	551.2
Phenanthrene	240	1500	-	30.5	102.2	51.4	14.6	12.6	968.3	53.9	15.9	19.7	85.8	31.6	17.2	51.9
Pyrene	665	2600	-	29.7	217.3	141.8	28.6	16.1	2523.7	118.9	46.1	49.5	243.6	93.6	43.4	131.8
Total LMW PAHs	552	3160	-	99.4	556.4	230.1	84.9	70.7	4977.7	357.9	74.5	77.3	585.1	185.6	103.6	311.1
Total HMW PAHs	1700	9600	-	418.5	4956.7	1433.6	347.2	242.9	84767.6	3164.3	691.2	755.8	4359.4	1772.1	954.3	1920.7
Total PAHs	4022	44792	-	524.0	5575.2	1686.0	438.1	319.3	90003.7	3559.0	772.5	842.2	5004.7	1977.9	1064.5	2263.5
Mean ER-MQs																
Metals	-	-	-	0.15	0.24	0.17	0.10	0.29	0.46	0.27	0.13	0.21	0.35	0.25	0.17	0.28
PCBs	-	-	-	0.00	0.15	0.15	0.02	0.00	1.31	0.15	0.13	0.12	0.17	0.11	0.13	0.11
Pesticides	-	-	-	0.06	0.60	0.24	0.09	0.07	1.46	1.99	0.22	1.78	0.79	0.26	0.11	0.36
PAHs	-	-	-	0.01	0.14	0.04	0.01	0.01	2.25	0.07	0.01	0.01	0.11	0.03	0.01	0.04
Mean Overall ER-M Q	-	-	-	0.05	0.28	0.15	0.06	0.09	1.37	0.62	0.12	0.53	0.36	0.16	0.11	0.20

< = Below the method detection limit indicated.

J Analyte was detected at a concentration below the reporting limit and above the laboratory detection limit. Reported value is an estimate.