

Appendix B

Summary Statistics

Summary statistics for AMP data for the period December 1992 through June 2009 are presented in **Tables B-1** through **B-6**. All the parameters listed in Tables 3-1 through 3-5 in Section 3 of the main report are included.

For each water quality parameter measured by the AMP, the following statistics were calculated:

- Number of measurements (n)
- Number of measurements for which a measurable quantity was detected
- Percent of measurements for which a measurable quantity was detected
- Mean and standard deviation
- Minimum and maximum detected values
- Minimum and maximum reporting limits for data below detection.

If the data set for a parameter contained no data below the reporting limits, the arithmetic mean and standard deviation were calculated using the complete data set. If 80 to 99 percent of the data were above their respective Ambient Program reporting limits, distribution parameters were estimated using the Robust Lognormal Regression method (see following discussion). If less than 80% of the data were above their Ambient Program reporting limits, the program considered the data set to have insufficient detected data available to reliably estimate the mean and standard deviation, and no additional statistics were calculated.

Split samples submitted as part of the QA/QC program are not used to calculate summary statistics. For cases where parameters were analyzed by more than one method (most commonly 625 and 8260 for volatile organics), the more definitive of the two (or more) results was used for plots and other analyses. This was generally considered to be the result from the method with the lowest detection limit.

Treatment of Values below Reporting Limits

Summary statistics are computed using the Robust Lognormal Regression method (Helsel and Cohn 1988; Helsel 1990) when censored data were reported (i.e. data below program reporting limits). This method fits the detected values to a lognormal distribution, using the censored data to calculate cumulative distribution values for the detected data. Data below detection are assigned values based on the lognormal distribution regression statistics and distributional parameters (means and standard deviations) are calculated directly from the combined data set of detected and synthetic data. In cases where more than 20% of the values are censored, the mean and standard deviation are not calculated because the data set is considered insufficient to accurately estimate these statistics.

Table B-1. Summary Statistics for the Sacramento River at Veterans Bridge

Parameter	Unit	n (a)	% det. (b)	n det. (c)	mean (d)	std dev (e)	min det. (f)	max det. (g)	min reporting limit (h)	max reporting limit (i)
Ammonia (as n)	mg/L	57	12%	7	id	id	0.027	0.12	0.1	0.1
Arsenic (dissolved)	ug/L	103	79%	81	1.3503	0.5125	0.29	3.4	0.15	1
Arsenic (total)	ug/L	172	95%	163	1.7332	0.5119	0.7	3.63	0.15	1
Cadmium (dissolved)	ug/L	158	53%	83	0.0149	0.0242	0.003	0.24	0.008	0.02
Cadmium (total)	ug/L	170	88%	149	0.0616	0.0993	0.008	0.74	0.008	0.1
Chloride	mg/L	107	93%	100	5.5714	2.2006	2.2	14	2	3
Chromium (dissolved)	ug/L	93	22%	20	0.2037	0.2273	0.02	1.2	0.03	1
Chromium (total)	ug/L	173	87%	150	2.711	2.7828	0.03	19.2	0.03	1
Copper (dissolved)	ug/L	173	98%	170	1.4916	0.5568	0.33	5	0.04	0.5
Copper (total)	ug/L	173	100%	173	4.2521	2.5078	0.72	18.3	0.04	0.51
Cyanide	ug/L	24	8%	2	id	id	1.16	5	3	5
Dissolved organic carbon	mg/L	136	73%	99	2.4465	1.4353	0.7	10	0.2	1
Dissolved oxygen	mg/L	185	100%	185	10.0163	1.4207	6.6	17	0.1	1
<i>E. coli</i>	MPN/100 ml	80	97%	78	45.2785	97.6231	2	500	2	2
Electrical conductivity	umhos/cm	195	100%	195	149.1995	43.1485	21.2	260	0.1	10
Fecal coliform	MPN/100 ml	124	98%	122	113.6631	359.188	2	2400	2	2
Hardness	mg/L	186	99%	185	60.7407	13.5363	28	120	4	16
Lead (dissolved)	ug/L	154	54%	83	0.0508	0.0612	0.011	0.4	0.015	0.1
Lead (total)	ug/L	173	95%	164	0.6152	0.7078	0.04	7.2	0.015	0.31
Mercury (filtered)	ng/L	176	90%	158	1.4285	1.1489	0.35	7.96	0.0005	0.5
Mercury (unfiltered)	ng/L	177	99%	175	7.7753	5.6795	0.77	34.9	0.15	0.51
Methyl mercury (filtered)	ng/L	69	65%	45	0.0417	0.0227	0.0252	0.113	0.025	0.056
Methyl mercury (unfiltered)	ng/L	73	85%	62	0.1005	0.042	0.047	0.216	0.025	0.056
Molybdenum (dissolved)	ug/L	32	100%	32	0.5963	0.256	0.22	1.1	0.02	0.3
Molybdenum (total)	ug/L	38	95%	36	0.4529	0.1968	0.18	0.99	0.02	0.3
Nickel (dissolved)	ug/L	152	78%	118	0.7948	0.4355	0.2	2.8	0.04	0.2
Nickel (total)	ug/L	154	98%	151	4.8609	4.4609	0.43	28	0.04	0.5
Nitrate (as n)	mg/L	60	68%	41	0.1779	0.4147	0.035	2.6	0.05	0.5
Nitrite (as n)	mg/L	60	20%	12	id	id	0.0025	0.22	0.03	0.33
Orthophosphate (dissolved)	mg/L	52	29%	15	0.0395	0.0247	0.015	0.16	0.05	0.1
pH	pH Units	196	100%	196	7.6064	0.4055	6.2	8.94	0	0.1
Silver (dissolved)	ug/L	33	18%	6	id	id	0.001	0.049	0.015	0.02
Silver (total)	ug/L	40	28%	11	0.0077	0.0073	0.004	0.04	0.015	0.1
Temperature	deg C	188	100%	188	15.0227	4.5416	7.09	25	0	0.1
Total coliform	MPN/100 ml	124	100%	124	1600.354	3008.62	17	16000	2	2
Total dissolved solids	mg/L	83	98%	81	117.0066	31.6683	63	193	20	20
Turbidity	NTU	87	100%	87	29.6586	36.7755	1.5	200	0	1
Uva 254	cm-1	53	98%	52	0.0767	0.0568	0.026	0.3	0.0001	0.014
Zinc (dissolved)	ug/L	168	58%	98	1.4542	5.0455	0.04	51	0.1	1
Zinc (total)	ug/L	172	91%	157	7.3065	6.7115	0.49	41	0.1	1

- (a) number of samples analyzed
- (b) percent of samples in which analyte was detected
- (c) number of samples in which analyte was detected
- (d) arithmetic mean value; "id" indicates insufficient detected data to calculate value
- (e) standard deviation of data; "id" indicates insufficient detected data to calculate value
- (f) minimum detected value reported, or ND if no detected values
- (g) maximum detected value reported, or ND if no detected values
- (h) minimum reporting limit for data below detection, or NA if all data above
- (i) maximum reporting limit for data below detection, or NA if all data above reporting limits

Table B-1. Summary Statistics for the Sacramento River at Veterans Bridge

Parameter	Unit	n (a)	% det. (b)	n det. (c)	mean (d)	std dev (e)	min det. (f)	max det. (g)	min reporting limit (h)	max reporting limit (i)
2,4,6-Trichlorophenol	ng/L	48	0%	0	id	id	ND	ND	100	100
Acenaphthene	ng/L	51	6%	3	id	id	0.34	1	2	5
Anthracene	ng/L	55	5%	3	id	id	0.18	1.1	2	5
Benz(a)anthracene	ng/L	51	14%	7	id	id	0.12	0.45	2	5
Benzo(a)pyrene	ng/L	51	8%	4	id	id	0.18	1.1	2	5
Benzo(b)fluoranthene	ng/L	42	2%	1	id	id	2.3	2.3	2	5
Benzo(g,h,i)perylene	ng/L	42	2%	1	id	id	1.3	1.3	2	5
Benzo(k)fluoranthene	ng/L	42	0%	0	id	id	ND	ND	2	5
Bis(2-ethylhexyl) phthalate	ng/L	43	12%	5	id	id	72.3	1190	10	125
Chlorpyrifos	ug/L	86	0%	0	id	id	ND	ND	0.002	0.1
Chrysene	ng/L	51	22%	11	0.484	0.3143	0.15	1.3	2	5
Diazinon	ug/L	113	7%	8	id	id	0.0026	0.16	0.004	0.1
Dibenz(a,h)anthracene	ng/L	51	0%	0	id	id	ND	ND	2	5
Fluoranthene	ng/L	51	39%	20	1.138	0.9309	0.41	5.2	2	5
Fluorene	ng/L	51	12%	6	id	id	0.379	1.7	2	5
Glyphosate	ug/L	17	0%	0	id	id	ND	ND	25	25
Hexachlorobenzene	ng/L	51	2%	1	id	id	1.11	1.11	5	62.5
Indeno(1,2,3-c,d)pyrene	ng/L	51	10%	5	id	id	0.39	1.5	2	5
Malathion	ug/L	84	0%	0	id	id	ND	ND	0.006	0.1
Methyl parathion	ug/L	80	0%	0	id	id	ND	ND	0.1	0.1
MTBE	ug/L	25	12%	3	id	id	0.51	0.7	0.5	0.5
Naphthalene	ng/L	43	23%	10	2.106	3.0615	1	15.1	1	5
N-nitroso-di-n-propylamine	ng/L	51	4%	2	id	id	8.6	48.2	62	100
Pentachlorophenol	ng/L	51	2%	1	id	id	2.5	2.5	100	100
Phenanthrene	ng/L	42	14%	6	id	id	1	2.1	2	5

(a) number of samples analyzed

(b) percent of samples in which analyte was detected

(c) number of samples in which analyte was detected

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(e) standard deviation of data; "id" indicates insufficient detected data to calculate value

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(h) minimum reporting limit for data below detection, or NA if all data above

(i) maximum reporting limit for data below detection, or NA if all data above reporting limits

Table B-2. Summary Statistics for the Sacramento River at Freeport Marina

Parameter	Unit	n (a)	% det. (b)	n det. (c)	mean (d)	std dev (e)	min det. (f)	max det. (g)	min reporting limit (h)	max reporting limit (i)
Ammonia (as n)	mg/L	55	22%	12	0.045	0.0308	0.017	0.14	0.1	0.1
Arsenic (dissolved)	ug/L	95	75%	71	1.218	0.4653	0.6	2.9	0.15	1
Arsenic (total)	ug/L	166	93%	155	1.541	0.4331	0.78	3.6	0.15	1
Cadmium (dissolved)	ug/L	153	48%	73	0.011	0.0092	0.003	0.06	0.008	0.02
Cadmium (total)	ug/L	164	76%	124	0.053	0.2609	0.01	2.5	0.008	0.1
Chloride	mg/L	105	91%	96	5.118	1.9201	2.1	11	2	3
Chromium (dissolved)	ug/L	85	25%	21	0.223	0.335	0.11	2.25	0.03	1
Chromium (total)	ug/L	165	87%	143	2.603	2.8827	0.13	18.5	0.03	1
Copper (dissolved)	ug/L	165	99%	163	1.457	0.5606	0.27	5.1	0.04	0.5
Copper (total)	ug/L	166	100%	166	4.005	2.7335	1.19	20.4	0.04	0.51
Cyanide	ug/L	23	9%	2	id	id	1.34	5	3	5
Dissolved organic carbon	mg/L	131	79%	103	2.395	1.346	1.1	11	0.2	1
Dissolved oxygen	mg/L	181	100%	181	9.972	1.525	6.9	16	0.1	1
<i>E. coli</i>	MPN/100 ml	79	99%	78	89.95	184.278	2	900	2	2
Electrical conductivity	umhos/cm	189	100%	189	143.7	37.452	54	254	1	10
Fecal coliform	MPN/100 ml	124	100%	124	225.7	951.424	2	8000	2	2
Hardness	mg/L	179	99%	178	57.15	13.6472	26	100	4	8
Lead (dissolved)	ug/L	151	57%	86	0.062	0.1259	0.006	1.2	0.015	0.1
Lead (total)	ug/L	166	90%	150	0.611	0.5767	0.017	3.71	0.015	0.31
Mercury (filtered)	ng/L	177	92%	162	1.495	1.619	0.26	14.92	0.0005	0.5
Mercury (unfiltered)	ng/L	177	98%	174	7.639	9.0905	1.2	89.1	0.15	0.51
Methyl mercury (filtered)	ng/L	71	66%	47	0.041	0.0273	0.009	0.171	0.025	0.056
Methyl mercury (unfiltered)	ng/L	77	87%	67	0.096	0.0572	0.038	0.318	0.025	0.056
Molybdenum (dissolved)	ug/L	32	97%	31	0.523	0.1743	0.28	0.95	0.02	0.3
Molybdenum (total)	ug/L	38	95%	36	0.431	0.1623	0.11	0.81	0.02	0.3
Nickel (dissolved)	ug/L	144	79%	114	0.751	0.4264	0.075	2.5	0.04	0.2
Nickel (total)	ug/L	147	96%	141	4.405	4.5117	0.51	30.6	0.04	0.5
Nitrate (as n)	mg/L	58	64%	37	0.134	0.093	0.023	0.42	0.05	0.1
Nitrite (as n)	mg/L	58	21%	12	0.010	0.0194	0.002	0.1	0.03	0.1
Orthophosphate (dissolved)	mg/L	50	34%	17	0.042	0.0281	0.014	0.15	0.05	0.1
pH	pH Units	189	100%	189	7.573	0.3982	5.6	8.79	0	0.1
Silver (dissolved)	ug/L	33	6%	2	id	id	0.001	0.002	0.015	0.02
Silver (total)	ug/L	40	23%	9	0.006	0.0059	0.003	0.026	0.015	0.1
Temperature	deg C	184	100%	184	14.90	4.5165	6.2	23.1	0	0.1
Total coliform	MPN/100 ml	125	100%	125	2199.	6053.09	13	50000	2	2
Total dissolved solids	mg/L	81	98%	79	106.5	28.0388	39	180	20	20
Turbidity	NTU	87	100%	87	22.59	33.8767	3.2	250	0.1	1
UVA 254	cm-1	54	94%	51	0.068	0.0571	0.024	0.37	0.0001	0.014
Zinc (dissolved)	ug/L	159	69%	109	1.619	4.5785	0.12	43	0.1	1
Zinc (total)	ug/L	165	88%	146	6.556	6.7163	0.74	44	0.1	1

(a) number of samples analyzed

(b) percent of samples in which analyte was detected

(c) number of samples in which analyte was detected

(d) arithmetic mean value; "id" indicates insufficient detected data to calculate value

(e) standard deviation of data; "id" indicates insufficient detected data to calculate value

(f) minimum detected value reported, or ND if no detected values

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Table B-2. Summary Statistics for the Sacramento River at Freeport Marina

Parameter	Unit	n (a)	% det. (b)	n det. (c)	mean (d)	std dev (e)	min det. (f)	max det. (g)	min reporting limit (h)	max reporting limit (i)
2,4,6-Trichlorophenol	ng/L	50	0%	0	id	id	ND	ND	100	100
Acenaphthene	ng/L	54	11%	6	id	id	0.35	5.2	2	5
Anthracene	ng/L	56	11%	6	id	id	0.124	4.8	2	5
Benz(a)anthracene	ng/L	53	13%	7	id	id	0.182	3.1	2	5
Benzo(a)pyrene	ng/L	53	8%	4	id	id	0.29	2.5	2	5
Benzo(b)fluoranthene	ng/L	42	2%	1	id	id	2.3	2.3	2	5
Benzo(g,h,i)perylene	ng/L	42	5%	2	id	id	2.9	4.4	2	5
Benzo(k)fluoranthene	ng/L	42	2%	1	id	id	2.7	2.7	2	5
Bis(2-ethylhexyl) phthalate	ng/L	43	9%	4	id	id	172	574.8	10	125
Chlorpyrifos	ug/L	87	1%	1	id	id	0.15	0.15	0.002	0.05
Chrysene	ng/L	53	28%	15	1.0292	1.1344	0.2	4.8	2	5
Diazinon	ug/L	113	8%	9	id	id	0.011	0.14	0.004	0.06
Dibenz(a,h)anthracene	ng/L	53	4%	2	id	id	2.1	2.6	2	5
Fluoranthene	ng/L	53	47%	25	1.8056	1.5743	0.54	8.6	2	5
Fluorene	ng/L	53	13%	7	id	id	0.41	7.5	2	5
Glyphosate	ug/L	17	0%	0	id	id	ND	ND	25	25
Hexachlorobenzene	ng/L	53	6%	3	id	id	0.43	1.17	5	62.5
Indeno(1,2,3-c,d)pyrene	ng/L	53	11%	6	id	id	0.38	2.1	2	5
Malathion	ug/L	84	0%	0	id	id	ND	ND	0.006	0.1
Methyl parathion	ug/L	80	0%	0	id	id	ND	ND	0.1	0.1
MTBE	ug/L	26	15%	4	id	id	0.43	2.3	0.5	0.5
Naphthalene	ng/L	43	30%	13	3.2719	4.7399	1.5	25.5	1	5
N-nitroso-di-n-propylamine	ng/L	53	2%	1	id	id	12	12	62	100
Pentachlorophenol	ng/L	52	8%	4	id	id	1.7	26	100	100
Phenanthrene	ng/L	42	26%	11	2.0818	1.0715	1.3	5.7	2	5

(a) number of samples analyzed

(b) percent of samples in which analyte was detected

(c) number of samples in which analyte was detected

(d) arithmetic mean value; "id" indicates insufficient detected data to calculate value

(e) standard deviation of data; "id" indicates insufficient detected data to calculate value

(f) minimum detected value reported, or ND if no detected values

(g) maximum detected value reported, or ND if no detected values

(h) minimum reporting limit for data below detection, or NA if all data above

(i) maximum reporting limit for data below detection, or NA if all data above reporting limits

Table B-3. Summary Statistics for the Sacramento River at River Mile 44

Parameter	Unit	n (a)	% det. (b)	n det. (c)	mean (d)	std dev (e)	min det. (f)	max det. (g)	min reporting limit (h)	max reporting limit (i)
Ammonia (as n)	mg/L	47	81%	38	0.2393	0.1963	0.088	1	0.1	0.1
Arsenic (dissolved)	ug/L	86	74%	64	1.3115	0.452	0.87	3.1	0.15	1
Arsenic (total)	ug/L	148	94%	139	1.5502	0.4606	0.24	3.07	0.15	1
Cadmium (dissolved)	ug/L	139	55%	77	0.0172	0.0209	0.003	0.18	0.008	0.02
Cadmium (total)	ug/L	146	83%	121	0.0627	0.1117	0.007	0.78	0.008	0.1
Chloride	mg/L	97	94%	91	5.8652	1.962	2.5	12	2	3
Chromium (dissolved)	ug/L	78	18%	14	id	id	0.13	1.2	0.07	1
Chromium (total)	ug/L	148	85%	126	2.4617	2.7937	0.19	20	0.07	1
Copper (dissolved)	ug/L	148	99%	147	1.5515	0.6572	0.29	6	0.04	0.5
Copper (total)	ug/L	148	100%	148	4.2044	2.9268	0.69	20.1	0.04	0.51
Cyanide	ug/L	22	14%	3	id	id	0.93	5	3	5
Dissolved organic carbon	mg/L	119	67%	80	2.8164	4.199	1.3	38	0.2	1
Dissolved oxygen	mg/L	180	100%	180	9.6952	1.3669	6.7	14	0.05	1
<i>E. coli</i>	MPN/100 ml	28	100%	28	99.3571	208.0005	4	800	2	2
Electrical conductivity	umhos/cm	188	100%	188	142.1463	42.8223	45	235	1	10
Fecal coliform	MPN/100 ml	33	100%	33	151.1818	292.2245	4	1300	2	2
Hardness	mg/L	169	99%	168	58.6125	14.0548	24	110	4	8
Lead (dissolved)	ug/L	135	53%	71	0.0533	0.055	0.008	0.3	0.015	0.1
Lead (total)	ug/L	148	97%	143	0.6803	0.6555	0.1	3.78	0.015	0.31
Mercury (filtered)	ug/L	159	92%	147	1.5226	1.3699	0.45	11.1	0.0005	0.5
Mercury (unfiltered)	ng/L	161	99%	159	8.1025	8.5229	1.02	73.41	0.15	0.51
Methyl mercury (filtered)	ng/L	64	72%	46	0.0559	0.1157	0.023	0.752	0.025	0.056
Methyl mercury (unfiltered)	ng/L	64	88%	56	0.1025	0.0532	0.0462	0.324	0.025	0.056
Molybdenum (dissolved)	ug/L	19	100%	19	0.5437	0.1859	0.28	1.02	0.02	0.3
Molybdenum (total)	ug/L	25	96%	24	0.4717	0.1805	0.18	0.93	0.02	0.3
Nickel (dissolved)	ug/L	126	76%	96	0.7723	0.3984	0.21	2.3	0.04	0.2
Nickel (total)	ug/L	128	97%	124	4.7625	5.8817	0.63	42	0.04	0.5
Nitrate (as n)	mg/L	48	62%	30	0.1126	0.0946	0.0054	0.44	0.05	0.1
Nitrite (as n)	mg/L	48	19%	9	id	id	0.0027	0.1	0.03	0.1
Orthophosphate (dissolved)	mg/L	46	46%	21	0.0594	0.0246	0.027	0.13	0.05	0.1
pH	pH Units	186	100%	186	7.4773	0.4043	6.14	8.83	0.1	0.1
Silver (dissolved)	ug/L	20	5%	1	id	id	0.003	0.003	0.015	0.02
Silver (total)	ug/L	27	22%	6	0.007	0.0036	0.0041	0.018	0.015	0.1
Temperature	deg C	179	100%	179	15.3692	4.4985	7.1	22.86	0	0.1
Total coliform	MPN/100 ml	32	100%	32	2315.625	4551.3533	130	17000	2	2
Total dissolved solids	mg/L	71	97%	69	109.6121	28.8041	33	200	20	20
Total kjeldahl nitrogen	mg/L	47	85%	40	0.6136	0.2855	0.11	1.6	0.05	0.1
Total organic carbon	mg/L	114	66%	75	2.4572	1.2628	0.91	6.9	0.2	0.5
Total phosphorus	mg/L	46	78%	36	0.1404	0.5001	0.036	2.5	0.05	0.1
Total suspended solids	mg/L	189	98%	186	35.0682	36.9985	2	250	3	3
Turbidity	NTU	77	100%	77	22.6351	36.4082	3.6	260	0	1
UVA 254	cm-1	47	96%	45	0.0673	0.0592	0.025	0.37	0.014	0.014
Zinc (dissolved)	ug/L	147	61%	90	1.7079	5.0926	0.12	49	0.1	1
Zinc (total)	ug/L	147	90%	133	9.0607	9.5721	0.36	56	0.1	1

- (a) number of samples analyzed
- (b) percent of samples in which analyte was detected
- (c) number of samples in which analyte was detected
- (d) arithmetic mean value; "id" indicates insufficient detected data to calculate value
- (e) standard deviation of data; "id" indicates insufficient detected data to calculate value
- (f) minimum detected value reported, or ND if no detected values
- (g) maximum detected value reported, or ND if no detected values
- (h) minimum reporting limit for data below detection, or NA if all data above
- (i) maximum reporting limit for data below detection, or NA if all data above reporting limits

Table B-3. Summary Statistics for the Sacramento River at River Mile 44

Parameter	Unit	n (a)	% det. (b)	n det. (c)	mean (d)	std dev (e)	min det. (f)	max det. (g)	min reporting limit (h)	max reporting limit (i)
2,4,6-Trichlorophenol	ng/L	35	23%	8	4.713	6.8196	0.81	19	100	100
Acenaphthene	ng/L	34	18%	6	id	id	0.43	71.5	2	5
Anthracene	ng/L	38	11%	4	id	id	0.18	1	2	5
Benz(a)anthracene	ng/L	34	18%	6	id	id	0.151	0.571	2	5
Benzo(a)pyrene	ng/L	34	12%	4	id	id	0.2	0.51	2	5
Benzo(b)fluoranthene	ng/L	27	4%	1	id	id	1.6	1.6	2	5
Benzo(g,h,i)perylene	ng/L	27	0%	0	id	id	ND	ND	2	5
Benzo(k)fluoranthene	ng/L	27	4%	1	id	id	2.7	2.7	2	5
Bis(2-ethylhexyl) phthalate	ng/L	29	14%	4	id	id	120.6	1260	10	125
Chlorpyrifos	ug/L	69	1%	1	id	id	0.1	0.1	0.01	0.05
Chrysene	ng/L	34	32%	11	0.798	1.2499	0.25	6	2	5
Diazinon	ug/L	92	2%	2	id	id	0.015	0.039	0.05	0.05
Dibenz(a,h)anthracene	ng/L	34	6%	2	id	id	0.4	0.44	2	5
Fluoranthene	ng/L	34	44%	15	1.831	1.9156	0.64	9.8	2	5
Fluorene	ng/L	34	26%	9	0.820	0.5089	0.407	2.3	2	5
Glyphosate	ug/L	1	0%	0	id	id	ND	ND	25	25
Hexachlorobenzene	ng/L	34	6%	2	id	id	0.28	2.11	5	62.5
Indeno(1,2,3-c,d)pyrene	ng/L	34	12%	4	id	id	0.46	1.05	2	5
Malathion	ug/L	67	0%	0	id	id	ND	ND	0.1	0.1
Methyl parathion	ug/L	67	0%	0	id	id	ND	ND	0.1	0.1
MTBE	ug/L	26	23%	6	0.517	0.4698	0.34	2.1	0.5	0.5
Naphthalene	ng/L	28	25%	7	2.234	1.9384	1.5	8.9	1	5
N-nitroso-di-n-propylamine	ng/L	34	3%	1	id	id	17	17	62.5	100
Pentachlorophenol	ng/L	35	6%	2	id	id	1.5	4.3	100	100
Phenanthrene	ng/L	27	22%	6	2.279	1.3718	1.3	6.3	2	5

(a) number of samples analyzed

(b) percent of samples in which analyte was detected

(c) number of samples in which analyte was detected

(d) arithmetic mean value; "id" indicates insufficient detected data to calculate value

(e) standard deviation of data; "id" indicates insufficient detected data to calculate value

(f) minimum detected value reported, or ND if no detected values

(g) maximum detected value reported, or ND if no detected values

(h) minimum reporting limit for data below detection, or NA if all data above

(i) maximum reporting limit for data below detection, or NA if all data above reporting limits

Table B-4. Summary Statistics for the American River at Nimbus Dam

Parameter	Unit	n (a)	% det. (b)	n det. (c)	mean (d)	std dev (e)	min det. (f)	max det. (g)	min reporting limit (h)	max reporting limit (i)
Ammonia (as n)	mg/L	55	16%	9	id	id	0.026	0.24	0.1	0.1
Arsenic (dissolved)	ug/L	89	31%	28	0.3286	0.1567	0.2	1	0.15	1
Arsenic (total)	ug/L	159	63%	100	0.4006	0.3295	0.03	2.9	0.15	1
Cadmium (dissolved)	ug/L	142	39%	55	0.0094	0.0125	0.002	0.083	0.008	0.02
Cadmium (total)	ug/L	156	51%	80	0.0545	0.5566	0.002	5.1	0.008	0.1
Chloride	mg/L	98	38%	37	1.6926	0.9424	0.2	3.6	2	3
Chromium (dissolved)	ug/L	91	13%	12	id	id	0.02	0.3	0.03	1
Chromium (total)	ug/L	167	58%	97	0.6217	4.3548	0.02	41	0.03	1
Copper (dissolved)	ug/L	166	83%	137	0.5798	0.2541	0.13	1.9	0.04	0.5
Copper (total)	ug/L	168	93%	157	0.8286	0.5432	0.24	4.3	0.04	0.51
Cyanide	ug/L	24	12%	3	id	id	1.1	5	3	5
Dissolved organic carbon	mg/L	123	62%	76	1.6083	0.4799	0.7	3.8	0.2	1
Dissolved oxygen	mg/L	185	100%	185	10.5958	2.1617	5.8	16	0.05	1
<i>E. coli</i>	MPN/100 ml	78	100%	78	76.2949	160.6118	2	800	2	2
Electrical conductivity	umhos/cm	194	100%	194	56.5454	16.2346	4.3	123	0.1	10
Fecal coliform	MPN/100 ml	121	100%	121	103.3471	212.7931	4	1300	2	2
Hardness	mg/L	180	99%	179	25.4352	8.8275	4	64	1	8
Lead (dissolved)	ug/L	136	39%	53	0.0417	0.0581	0.004	0.332	0.015	0.1
Lead (total)	ug/L	165	73%	121	0.1554	0.2376	0.004	1.95	0.015	0.31
Mercury (filtered)	ng/L	175	87%	152	0.8566	0.6539	0.19	4.43	0.0005	0.5
Mercury (unfiltered)	ng/L	173	97%	168	2.1323	2.2131	0.42	15.4	0.15	0.5
Methyl mercury (filtered)	ng/L	68	32%	22	0.0249	0.047	0.008	0.314	0.025	0.056
Methyl mercury (unfiltered)	ng/L	73	55%	40	0.0426	0.058	0.0152	0.406	0.025	0.056
Molybdenum (dissolved)	ug/L	31	90%	28	0.2095	0.05	0.12	0.31	0.02	0.3
Molybdenum (total)	ug/L	37	92%	34	0.2205	0.0629	0.14	0.46	0.02	0.3
Nickel (dissolved)	ug/L	90	53%	48	0.414	0.3114	0.07	1.9	0.04	0.2
Nickel (total)	ug/L	148	78%	115	1.1367	3.0792	0.21	30	0.04	0.5
Nitrate (as n)	mg/L	58	33%	19	0.073	0.1766	0.015	1.1	0.05	0.1
Nitrite (as n)	mg/L	58	12%	7	id	id	0.0018	0.1	0.03	0.1
Orthophosphate (dissolved)	mg/L	50	12%	6	id	id	0.012	0.05	0.05	0.1
pH	pH Units	196	100%	196	7.2606	0.5763	5.82	9.4	0.1	0.1
Silver (dissolved)	ug/L	32	9%	3	id	id	0.002	0.002	0.015	0.02
Silver (total)	ug/L	39	13%	5	id	id	0.001	0.071	0.015	0.1
Temperature	deg C	189	100%	189	13.5874	3.7044	7.04	23	0	0.1
Total coliform	MPN/100 ml	122	100%	122	565.9918	803.2199	13	3000	2	2
Total dissolved solids	mg/L	81	95%	77	50.1415	21.2991	13	150	20	20
Total kjeldahl nitrogen	mg/L	56	70%	39	0.2731	0.2222	0.1	1.1	0.1	0.2
Total organic carbon	mg/L	120	61%	73	1.8217	0.7037	0.93	6.4	0.2	1
Total phosphorus	mg/L	52	21%	11	0.0399	0.0181	0.033	0.11	0.05	0.1
Total suspended solids	mg/L	192	59%	114	3.7978	7.3557	1	68	2	3
Turbidity	NTU	30	97%	29	4.5584	5.4008	0.3	26	0	1
UVA 254	cm-1	52	96%	50	0.041	0.0205	0.017	0.14	0.0001	0.014
Zinc (dissolved)	ug/L	163	57%	93	0.9273	4.8304	0.04	48	0.1	1
Zinc (total)	ug/L	164	70%	115	3.121	8.3288	0.1	60	0.1	1

(a) number of samples analyzed

(b) percent of samples in which analyte was detected

(c) number of samples in which analyte was detected

(d) arithmetic mean value; "id" indicates insufficient detected data to calculate value

(e) standard deviation of data; "id" indicates insufficient detected data to calculate value

(f) minimum detected value reported, or ND if no detected values

(g) maximum detected value reported, or ND if no detected values

(h) minimum reporting limit for data below detection, or NA if all data above

(i) maximum reporting limit for data below detection, or NA if all data above reporting limits

Table B-4. Summary Statistics for the American River at Nimbus Dam

Parameter	Unit	n (a)	% det. (b)	n det. (c)	mean (d)	std dev (e)	min det. (f)	max det. (g)	min reporting limit (h)	max reporting limit (i)
2,4,6-Trichlorophenol	ng/L	50	0%	0	id	id	ND	ND	100	100
Acenaphthene	ng/L	50	4%	2	id	id	0.56	1.5	2	5
Anthracene	ng/L	53	4%	2	id	id	0.28	0.36	2	5
Benz(a)anthracene	ng/L	50	6%	3	id	id	0.25	2.4	2	5
Benzo(a)pyrene	ng/L	50	0%	0	id	id	ND	ND	2	5
Benzo(b)fluoranthene	ng/L	41	0%	0	id	id	ND	ND	2	5
Benzo(g,h,i)perylene	ng/L	41	5%	2	id	id	2	2.4	2	5
Benzo(k)fluoranthene	ng/L	41	0%	0	id	id	ND	ND	2	5
Bis(2-ethylhexyl) phthalate	ng/L	42	14%	6	id	id	108.9	148000	10	125
Chlorpyrifos	ug/L	83	0%	0	id	id	ND	ND	0.002	0.1
Chrysene	ng/L	50	10%	5	id	id	0.35	1.8	2	5
Diazinon	ug/L	110	2%	2	id	id	0.012	0.09	0.004	0.1
Dibenz(a,h)anthracene	ng/L	50	2%	1	id	id	0.35	0.35	2	5
Fluoranthene	ng/L	50	28%	14	2.15	10.22	0.317	53.1	2	5
Fluorene	ng/L	50	14%	7	id	id	0.219	1.3	2	5
Glyphosate	ug/L	18	0%	0	id	id	ND	ND	4.6	25
Hexachlorobenzene	ng/L	50	6%	3	id	id	0.27	1.1	5	62.5
Indeno(1,2,3-c,d)pyrene	ng/L	50	6%	3	id	id	0.22	2.3	2	5
Malathion	ug/L	80	0%	0	id	id	ND	ND	0.006	0.1
Methyl parathion	ug/L	77	0%	0	id	id	ND	ND	0.1	0.1
MTBE	ug/L	25	16%	4	id	id	0.26	0.85	0.5	0.5
Naphthalene	ng/L	42	29%	12	2.80	1.645	1.7	7.2	1	5
N-nitroso-di-n-propylamine	ng/L	50	0%	0	id	id	ND	ND	62	100
Pentachlorophenol	ng/L	52	4%	2	id	id	4.5	4.6	100	100
Phenanthrene	ng/L	41	20%	8	id	id	1	3.5	2	5

(a) number of samples analyzed

(b) percent of samples in which analyte was detected

(c) number of samples in which analyte was detected

(d) arithmetic mean value; "id" indicates insufficient detected data to calculate value

(e) standard deviation of data; "id" indicates insufficient detected data to calculate value

(f) minimum detected value reported, or ND if no detected values

(g) maximum detected value reported, or ND if no detected values

(h) minimum reporting limit for data below detection, or NA if all data above

(i) maximum reporting limit for data below detection, or NA if all data above reporting limits

Table B-5. Summary Statistics for the American River at Discovery Park

Parameter	Unit	n (a)	% det. (b)	n det. (c)	mean (d)	std dev (e)	min det. (f)	max det. (g)	min reporting limit (h)	max reporting limit (i)
Ammonia (as n)	mg/L	56	16%	9	id	id	0.029	0.16	0.1	0.1
Arsenic (dissolved)	ug/L	93	34%	32	0.4057	0.283	0.16	1.82	0.15	1
Arsenic (total)	ug/L	164	63%	103	0.415	0.2972	0.02	2.9	0.15	1
Cadmium (dissolved)	ug/L	153	44%	67	0.0094	0.0113	0.002	0.1	0.008	0.02
Cadmium (total)	ug/L	161	54%	87	0.0493	0.3345	0.003	3.3	0.008	0.02
Chloride	mg/L	101	40%	40	2.1721	1.1242	1	10	2	3
Chromium (dissolved)	ug/L	95	15%	14	id	id	0.02	0.23	0.03	1
Chromium (total)	ug/L	170	58%	98	0.4542	0.6459	0.03	6.4	0.03	1
Copper (dissolved)	ug/L	169	87%	147	0.6658	0.2973	0.28	1.9	0.04	0.5
Copper (total)	ug/L	171	96%	165	1.0099	0.6563	0.4	5.5	0.04	0.51
Cyanide	ug/L	23	9%	2	id	id	0.88	5	3	5
Dissolved organic carbon	mg/L	125	63%	79	1.8964	0.5732	0.9	4.4	0.2	1
Dissolved oxygen	mg/L	194	100%	194	10.2024	1.6821	6.18	18	0	1
<i>E. coli</i>	MPN/100 ml	80	100%	80	472.675	2261.374	2	16000	2	2
Electrical conductivity	umhos/cm	195	100%	195	60.9195	54.0061	17	644	1	10
Fecal coliform	MPN/100 ml	123	100%	123	706.4878	2468.898	2	16000	2	2
Hardness	mg/L	184	99%	182	25.6875	8.2203	14	66	2	16
Lead (dissolved)	ug/L	152	51%	77	0.0481	0.062	0.01	0.5	0.015	0.1
Lead (total)	ug/L	169	91%	154	0.2673	0.3244	0.03	2.36	0.015	0.31
Mercury (filtered)	ng/L	172	87%	150	1.1533	1.1899	0.07	11.3	0.0005	0.5
Mercury (unfiltered)	ng/L	176	98%	172	3.5339	13.7354	0.078	139	0.15	0.51
Methyl mercury (filtered)	ng/L	70	57%	40	0.0322	0.0197	0.011	0.11	0.025	0.056
Methyl mercury (unfiltered)	ng/L	74	81%	60	0.0717	0.0975	0.016	0.714	0.025	0.056
Molybdenum (dissolved)	ug/L	33	88%	29	0.2493	0.1177	0.15	0.69	0.02	0.2
Molybdenum (total)	ug/L	39	92%	36	0.228	0.08	0.06	0.46	0.02	0.2
Nickel (dissolved)	ug/L	94	50%	47	0.4135	0.2183	0.09	1.1	0.04	0.2
Nickel (total)	ug/L	153	79%	121	0.948	1.0543	0.18	8	0.04	0.2
Nitrate (as n)	mg/L	60	37%	22	0.0588	0.0756	0.002	0.46	0.05	0.5
Nitrite (as n)	mg/L	60	20%	12	id	id	0.002	0.42	0.03	0.328
Orthophosphate (dissolved)	mg/L	51	14%	7	id	id	0.012	0.64	0.05	0.1
pH	pH Units	196	100%	196	7.4381	0.4428	6.37	8.62	0	0.1
Silver (dissolved)	ug/L	34	12%	4	id	id	0.001	0.016	0.015	0.02
Silver (total)	ug/L	41	10%	4	id	id	0.001	0.004	0.015	0.02
Temperature	deg C	194	100%	194	14.1076	4.035	7.56	24.4	0	0.1
Total coliform	MPN/100 ml	124	100%	124	3935	18214	17	160000	2	2
Total dissolved solids	mg/L	82	96%	79	53.6722	22.4456	16	140	20	20
Total kjeldahl nitrogen	mg/L	57	63%	36	0.2645	0.1841	0.1	0.97	0.05	0.5
Total organic carbon	mg/L	123	61%	75	2.1112	1.0205	1.1	9.6	0.2	0.5
Total phosphorus	mg/L	53	26%	14	0.044	0.0152	0.036	0.092	0.05	0.1
Total suspended solids	mg/L	199	68%	135	5.2409	7.6463	1	50.5	2	3
Turbidity	NTU	84	100%	84	4.5917	4.9435	0.2	25	1	1
UVA 254	cm-1	53	100%	53	0.0437	0.0133	0.022	0.0873	0.0001	0.014
Zinc (dissolved)	ug/L	167	58%	97	1.1449	3.9981	0.03	41	0.1	1
Zinc (total)	ug/L	171	70%	120	5.2649	23.0432	0.15	230	0.1	1

(a) number of samples analyzed

(b) percent of samples in which analyte was detected

(c) number of samples in which analyte was detected

(d) arithmetic mean value; "id" indicates insufficient detected data to calculate value

(e) standard deviation of data; "id" indicates insufficient detected data to calculate value

(f) minimum detected value reported, or ND if no detected values

(g) maximum detected value reported, or ND if no detected values

(h) minimum reporting limit for data below detection, or NA if all data above

(i) maximum reporting limit for data below detection, or NA if all data above reporting limits

Table B-5. Summary Statistics for the American River at Discovery Park

Parameter	Unit	n (a)	% det. (b)	n det. (c)	mean (d)	std dev (e)	min det. (f)	max det. (g)	min reporting limit (h)	max reporting limit (i)
2,4,6-Trichlorophenol	ng/L	48	2%	1	id	id	0.29	0.29	100	100
Acenaphthene	ng/L	51	8%	4	id	id	0.72	1.5	2	5
Anthracene	ng/L	55	9%	5	id	id	0.3	1.6	2	5
Benz(a)anthracene	ng/L	51	22%	11	0.5949	0.819	0.11	3.2	2	5
Benzo(a)pyrene	ng/L	51	8%	4	id	id	0.27	3.4	2	5
Benzo(b)fluoranthene	ng/L	42	5%	2	id	id	2.3	3.4	2	5
Benzo(g,h,i)perylene	ng/L	42	2%	1	id	id	2.4	2.4	2	5
Benzo(k)fluoranthene	ng/L	42	2%	1	id	id	4	4	2	5
Bis(2-ethylhexyl) phthalate	ng/L	43	12%	5	id	id	101	160	10	125
Chlorpyrifos	ug/L	83	0%	0	id	id	ND	ND	0.002	0.05
Chrysene	ng/L	51	31%	16	1.2636	1.1664	0.29	5	2	5
Diazinon	ug/L	109	11%	12	id	id	0.013	0.1	0.004	0.05
Dibenz(a,h)anthracene	ng/L	51	4%	2	id	id	0.33	0.57	2	5
Fluoranthene	ng/L	51	53%	27	2.3634	2.1154	0.519	8.6	2	5
Fluorene	ng/L	51	20%	10	id	id	0.32	2.9	2	5
Glyphosate	ug/L	18	0%	0	id	id	ND	ND	25	25
Hexachlorobenzene	ng/L	51	6%	3	id	id	0.81	1.3	5	62.5
Indeno(1,2,3-c,d)pyrene	ng/L	51	10%	5	id	id	0.36	1.9	2	5
Malathion	ug/L	81	0%	0	id	id	ND	ND	0.006	0.1
Methyl parathion	ug/L	76	0%	0	id	id	ND	ND	0.1	0.1
MTBE	ug/L	25	12%	3	id	id	0.47	0.55	0.5	0.5
Naphthalene	ng/L	43	26%	11	2.8153	3.4936	1.2	17.3	1	5
N-nitroso-di-n-propylamine	ng/L	51	2%	1	id	id	13	13	62	100
Pentachlorophenol	ng/L	50	8%	4	id	id	0.95	26	100	100
Phenanthrene	ng/L	42	29%	12	2.3952	1.935	1.3	8.8	2	5

(a) number of samples analyzed

(b) percent of samples in which analyte was detected

(c) number of samples in which analyte was detected

(d) arithmetic mean value; "id" indicates insufficient detected data to calculate value

(e) standard deviation of data; "id" indicates insufficient detected data to calculate value

(f) minimum detected value reported, or ND if no detected values

(g) maximum detected value reported, or ND if no detected values

(h) minimum reporting limit for data below detection, or NA if all data above

(i) maximum reporting limit for data below detection, or NA if all data above reporting limits