APPENDIX B

COMPARATIVE WATER QUALITY DATA

LIST OF TABLES

Table B-1. EBMUD Berkeley City Water Analyses (1986)

Parameter	EBMUD Water	MCL/SMCL
pH (std. units)	7.7	6.5-8.5
Alkalinity (as $CaCO_3$)	22	-
Total Hardness (as $CaCO_3$)	24	-
Conductivity (umhos/cm)	63	900
Total Dissolved Solids	46	500
Color (c.u)	4	15
Nitrate	<0.01	10.0
Phosphate (as PO_4)	<0.02	-
Chloride	3	250
Total Arsenic	<0.003	0.05
Total Cadmium	<0000.1	0.01
Total Chromium	0.0051	0.05
Total Copper	<0.007	1.0
Total Iron	0.02	0.3
Total Lead	<0.003	0.05
Total Manganese	<0.0006	0.05
Total Mercury	<0.0002	0.002
Total Nickel	<0.003	-
Total Silver	<0.0003	0.05
Total Zinc	<0.01	5.0

Notes:
All analyses in mg/l unless otherwise noted.

Samples collected May 1986.

MCL/SMCL = National Drinking Water Regulations Maximum Contaminant Levels or Secondary Maximum Contaminant Levels.

Table B-2. Mean Water Quality Data (ABAG)

Parameter (units)	Low-Flow Data (Mean)
pH (std. units)	7.7
Turbidity (NTU)	6.0
Conductivity (umhos/cm)	753
Suspended Solids (mg/l)	11.1
Dissolved Solids (mg/l)	738
Oil and Grease (mg/l)	3.0

Wet Weather Data (Mean)

	During Storm	Following Storm	Day After Storm
pH (std. units)	7.0	7.3	7.6
Turbidity (NTU)	37	34	24
Conductivity (umhos/cm)	143	455	414
Suspended Solids (mg/1)	495.0	97.0	43.7
Dissolved Solids (mg/1)	191	516	513
Oil and Grease (mg/1)	9.7	7.4	4.0

Note: Data taken from Evaluation of Hydrocarbons in Runoff to San Fransisco Bay, (ABAG, 1985). Data was collected from 15 creeks around S.F. Bay on seven occasions from April 1984 - March 1985.

Table B-3. Castro Valley Creek Low Flow Water Quality Data

Parameter (units)	n	Mean	SD	Range
pH (std. units)	34	7.8	0.5	6.7-8.6
Alkalinity (mg/l as $CaCO_3$)	20	262	33	180-310
Conductivity (unhos/cm)	36	1215	763	340-4410
Dissolved Oxygen (mg/l)	5	7.2	3.1	2.6-12.2
BOD_5 (mg/l)	15	12.3	15.8	0.9-57.0
COD (mg/l)	26	51.6	62.2	<4-250
Suspended Solids (mg/l)	21	44	85	2-410
Dissolved Solids (mg/l)	15	731	151	510-1000
Oil and Grease (mg/l)	5	2.6	1.0	1.0-4.0
Total Kjeldahl Nitrogen (mg/l as N)	28	1.4	1.0	0.12-4.5
Ammonia Nitrogen (mg/l as N)	8	0.15	0.13	0-0.36
Dissolved Nitrate Nitrogen (mg/l N)	11	2.0	1.2	0.7-4.8
Dissolved Nitrate Nitrogen (mg/l as N03)	9	10.6	5.3	3.1-21.0
Total Nitrogen (mg/l as N03)	16	21.6	7.8	2.9-39.0
Total Organic Nitrogen (mg/l as N)	10	0.94	0.34	0.41-1.40
Total Inorganic Nitrogen (mg/l as N)	16	3.1	1.5	0.03-5.40
Total Phosphorus (mg/l as P)	16	0.49	0.38	0.08-1.10
Total Coliform Bacteria (MPN/100 ml)	4	203,756	169,756	5,000-460,000
Fecal Coliform Bacteria (MPN/100 m1)	5	4,278	3,614	90-9,300
Fecal Streptococci Bacteria (MPN/100 m1)	3	28,333	13,021	15,000-46,000

Table B-3 (Continued)

Parameter (units)	n	Mean	SD	Range
Dissolved Calcium	12	22	19	6.5-67.0
Dissolved Magnesium (mg/1)	9	8.4	8.0	1.7-27.0
Dissolved Sodium (mg/1)	14	21.6	24.7	3.8-92.0
Dissolved Chloride (mg/1)	15	21	17	4.9-69.0
Dissolved Iron (ug/1)	14	84	60	40-270
Total Arsenic (ug/1)	83	4	2	1.10
Total Cadmium (ug1)	85	<3	8	<1-50
Total Chromium (ug/1)	96	31	52	0-480
Total Copper)ug/1)	18	115	106	20-360
Total Lead (ug/1)	121	208	227	0-1200
Total Mercury (ug/1)	103	<1.8	2.7	0.1-14.0
Total Nickel (ug/1)	18	84	70	5-200
Total Zinc (ug/1)	117	169	116	30-720
Precipitation (daily inches)	144	0.67	0.67	0.01-4.66

Notes

n = number of observations
SD = standard deviation

All data collected by USGS October 1971 - February 1986 at Hayward, CA.

Table B-4. Peralta Creek Low Flow Water Quality Data

Parameter (units)	n	Mean	SD	Range
pH (std. units)	4	7.2	0.4	6.8-7.7
Conductivity (umhos/cm)	4	364	125	270-580
Alkalinity (mg/l as $CaC0_3$)	4	126	55	82-220
Dissolved Oxygen (mg/1)	1	(7.4)	-	-
BOD_5 (mg/l)	4	5.1	2.4	1.6-8.4
COD (mg/1)	3	21.7	9.6	13-35
Total Organic Nitrogen (mg/l as N)	4	0.55	0.22	0.30-0.90
Ammonia Nitrogen (mg/l as N)	1	(0.08)	-	-
Kjeldahl Nitrogen (mg/l as N)	4	0.70	0.31	0.54-1.20
Total Phosphorus (mg/l as P)	4	0.28	0.07	0.19-0.37
Total Dissolved Solids (mg/l)	2	259	71	188-330
Dissolved Chloride (mg/l)	1	(36)	-	-
Dissolved Iron (ug/l)	1	(20)	-	-
Total Cadmium (ug/l)	1	(1)	-	-
Total Lead (ug/l)	1	(1)	-	-
Total Mercury (ug/l)	1	(0.5)	-	-
Fecal Coliform (#/100 ml)	1	(350)	-	-
Streamflow (cfs)	4	1.36	0.86	0.15-2.40

Notes

n = number of observations
SD = standard deviation
( ) = value based on one sample

All data collected by USGS September - December 1972 at Oakland

Table B-5. Caldecott Creek Low Flow Water Quality Data

Parameter (units)	n	Mean	SD	Range
pH (std. units)	4	6.4	0.3	6.1-6.7
Conductivity (umhos/cm)	4	1445	64	1350-1530
Dissolved Oxygen (mg/l)	3	7.1	0.6	6.6-7.9
Total Organic Nitrogen (mg/l as N)	3	0.91	0.64	0.31-1.80
Total Nitrate Nitrogen (mg/l as N)	3	0.32	0.15	0.15-0.52
Total Nitrogen (mg/l as NO_3)	3	5.7	2.6	2.8-9.2
Total Ammonia Nitrogen (mg/l as N)	3	0.02	0.03	0-0.06
Total Kjeldahl Nitrogen (mg/l as N)	3	0.95	0.68	0.32-1.90
Total Ammonia Nitrogen (mg/l as NH_4)	3	0.95	0.03	0-0.07
Total Inorganic Nitrogen (mg/l as N)	3	0.34	0.16	0.17-0.55
Total Phosphorus (mg/l as P)	3	0.03	0.01	0.02-0.04
Fecal Coliform (#/100 ml)	4	>1635	2523	20->6000
Fecal Streptococci (#/100 ml)	4	1132	64	130-2500
Streamflow (cfs)	2	0.05	0.01	0.04-0.06

Notes:

n= number of observations

SD = standard deviation

All data collected by USGS October - December 1979 above Lake Temescal, Oakland.

Table B-6. Temescal Creek Low Flow Water Quality Data

Parameter (units)	
pH (std. units)	7.7
Conductivity (umhos/cm)	921
Dissolved Oxygen (mg/l)	8.6
Suspended Solids (mg/l)	10
Total Organic Nitrogen (mg/l as N)	0.12
Total Nitrate Nitrogen (mg/l as N)	0.58
Total Nitrogen (mg/l as NO_3)	3.4
Total Ammonia Nitrogen (mg/l as N)	0.03
Total Ammonia Nitrogen (mg/l as NH_4)	0.04
Total Kjeldahl Nitrogen (mg/l as N)	0.15
Total Inorganic Nitrogen (mg/l as N)	0.62
Total Phosphorus (mg/l as P)	0.24
Fecal Coliform (#/100 ml)	16,000
Fecal Streptococci (#/100 ml)	9,200
Streamflow (cfs)	0.12

Note:

Sample taken above Lake Temescal, Oakland on September 20, 1979 by USGS.

Table B-7. Castro Valley Creek Wet Weather Water Quality Data

Parameter (units)	n	Mean	SD	Range
pH (std. units)	228	7.3	0.5	5.4-87
Conductivity (umhos/cm)	246	287	210	59-1170
Alkalinity (mg/l as CaC03)	124	57	54	< 1-271
Dissolved Oxygen (mg/1)	24	8.5	1.7	4.4-10.4
BOD5 (mg/l)	100	31.3	22.5	1.7-100.0
COD (mg/1)	203	124	118	< 9-810
Suspended Solids (mg/l)	148	320	356	10-1810
Dissolved Solids (mg/l)	63	189	172	34-734
Total Organic Nitrogen (mg/l as N)	136	1.7	0.9	0.15-5.40
Total Inorganic Nitrogen (mg/l as N)	124	1.6	1.0	0.09-5.0
Ammonia Nitrogen (mg/l as N)	116	0.22	0.25	0.01-1.80
Total Kjeldahl Nitrogen (mg/l as N)	211	2.8	2.3	0.1-13.0
Dissolved Nitrate Nitrogen (mg/l as N)	35	1.2	0.9	<0.07-4.20
Dissolved Nitrate Nitrogen (mg/l as NO3)	37	4.9	3.9	0-19
Total Nitrogen (mg/l as NO3)	148	21	11	4.1-65.0
Total Phosphorus (mg/l as P)	152	0.52	0.29	0.05-2.10
Total Coliform bacteria (MPN/100 ml)	17	107,241	127,506	5,200-460,000
Fecal Coliform bacteria (MPN/100 ml)	22	34,304	50,739	2,500-240,000
Fecal Streptococci bacteria (MPN/100 ml)	7	121,857	102,570	24,000->240,000
Oil and Grease (mg/l)	24	14	22	0-91
Dissolved Chloride (mg/l)	4	96	20	72-120
Dissolved Iron (ug/l)	3	43	5	40-50
Total Cadmium (ug/l)	2	0.5	0.5	0-1
Total Chromium (ug/l)	8	16	11	3-40

Table B-7. (continued)

Parameter (units)	n	Mean	SD	Range
Total Copper (ug/l)	8	26	11	9-42
Total Lead (ug/l)	9	78	98	6-310
Total Mercury (ug/l)	9	0.9	0.5	0.3-2.2
Total Nickel (ug/l)	8	40	65	0-200
Total Zinc (ug/l)	9	151	139	30-460
Streamflow (cfs)	36	4.06	5.10	0.17-26.0

Notes

n = number of observations
SD = standard deviation

All data collected by USGS October 1971 - April 1980 at Hayward CA.

Table B-8. Peralta Creek Wet Weather Water Quality Data

Parameter (units)	n	Mean	SD	Range
pH (std. units)	19	7.0	0.5	6.3-7.7
Conductivity (umhos/cm)	19	190	109	93-524
Alkalinity (mg/l as $CaCO_3$)	19	62	40	27-191
Dissolved Oxygen (mg/l)	6	8.7	0.9	7.7-10.0
BOD_5 (mg/l)	18	>21.2	13.2	4.3->47
COD (mg/l)	14	84	39	34-160
Oil and Grease (mg/l)	3	83	97	12-220
Total Organic Nitrogen (mg/l as N)	16	1.5	0.6	0.9-3.3
Ammonia Nitrogen (mg/l as N)	8	0.18	0.10	0.11-0.44
Kjeldahl Nitrogen (mg/l as N)	16	1.8	0.6	1.1-4.0
Total Nitrogen (mg/l as NO_3)	3	13	6	7.8-21.0
Inorganic Nitrogen (mg/l as N)	3	1.21	0.92	0.46-2.50
Total Phosphorus (mg/l as P)	16	0.75	0.43	0.28-2.20
Dissolved Magnesium (mg/l)	4	6.1	1.6	4.1-8.3
Dissolved Chloride (mg/l)	4	6.4	2.4	3.6-9.6
Dissolved Iron (mg/l)	4	270	352	60-880
Total Dissolved Solids (mg/l)	15	136	77	50-317
Fecal Coliform (#/100 ml)	5	15100	6515	9500-27000
Total Cadmium (ug/l)	4	<10	9.5	1-<20
Total Lead (ug/l)	4	455	227	210-800
Total Mercury (ug/l)	4	<0.9	0.8	<0.05-2.3
Precipitation (daily inches)	7	0.78	0.75	0.05-2.05

Notes
n = number of observations
SD = standard deviation
All data collected by USGS September - December 1972 at Oakland.

Table B-9. Caldecott Creek Wet Weather Water Quality Data

Parameter (units)	n	Mean	SD	Range
pH (std. units)	5	7.5	0.1	7.45-7.6
Conductivity (umhos/cm)	5	704	192	410-930
Suspended Solids (mg/l)	9	291	262	26-934
Total Organic Nitrogen (mg/l as N)	9	1.50	0.48	0.59-2.2
Total Nitrate Nitrogen (mg/l as N)	9	0.92	0.44	0.41-1.80
Total Nitrogen (mg/l as NO_3)	9	11.6	3.0	8.4-18.0
Total Ammonia Nitrogen (mg/l as N)	9	0.09	0.10	0-0.29
Total Kjeldahl Nitrogen (mg/l as N)	9	1.58	0.52	0.66-2.50
Total Ammonia Nitrogen (mg/l as NH_4)	9	0.11	0.12	0-0.35
Total Inorganic Nitrogen (mg/l as N)	9	1.03	0.42	0.45-1.80
Total Phosphorus (mg/l as P)	9	0.39	0.24	0.10-0.91
Precipitation (daily inches)	9	0.23	0.18	0.05-0.53

Notes

n = number of observations
SD = standard deviation
All data collected by USGS October - December 1979 above Lake Temescal, Oakland.

Table B-10. Temescal Creek Wet Weather Water Quality Data

Parameter (units)	n	Mean	SD	Range
pH (std. units)	6	7.7	0.2	7.4-8.2
Conductivity (umhos/cm)	6	336	88	240-480
Suspended Solids (mg/l)	12	289	164	37-722
Total Organic Nitrogen (mg/l as N)	10	1.9	0.69	0.92-3.2
Total Nitrate Nitrogen (mg/l as N)	11	1.43	1.00	0.71-4.3
Total Nitrogen (mg/l as NO_3)	10	15.7	5.1	8.2-27
Total Ammonia Nitrogen (mg/l as N)	11	0.06	0.06	0.01-0.23
Total Ammonia Nitrogen (mg/l as NH_4)	11	0.07	0.07	0.01-0.28
Total Kjeldahl Nitrogen (mg/l as N)	10	2.0	0.72	0.95-3.4
Total Inorganic Nitrogen (mg/l as N)	11	1.52	0.96	0.82-4.3
Total Phosphorus (mg/l as P)	12	0.35	0.15	0.06-0.65
Total Phosphorus (mg/l as PO_4)	12	1.07	0.47	0.18-2.0
Precipitation (daily inches)	12	0.50	0.54	0.05-1.71

Notes:

n = number of observations

SD = standard deviation

All data collected by USGS October 1979 - February 1980 above Lake Temescal, Oakland.