

# GRASSLAND BYPASS PROJECT

## MONTHLY DATA REPORT

September 1999

December 6, 1999

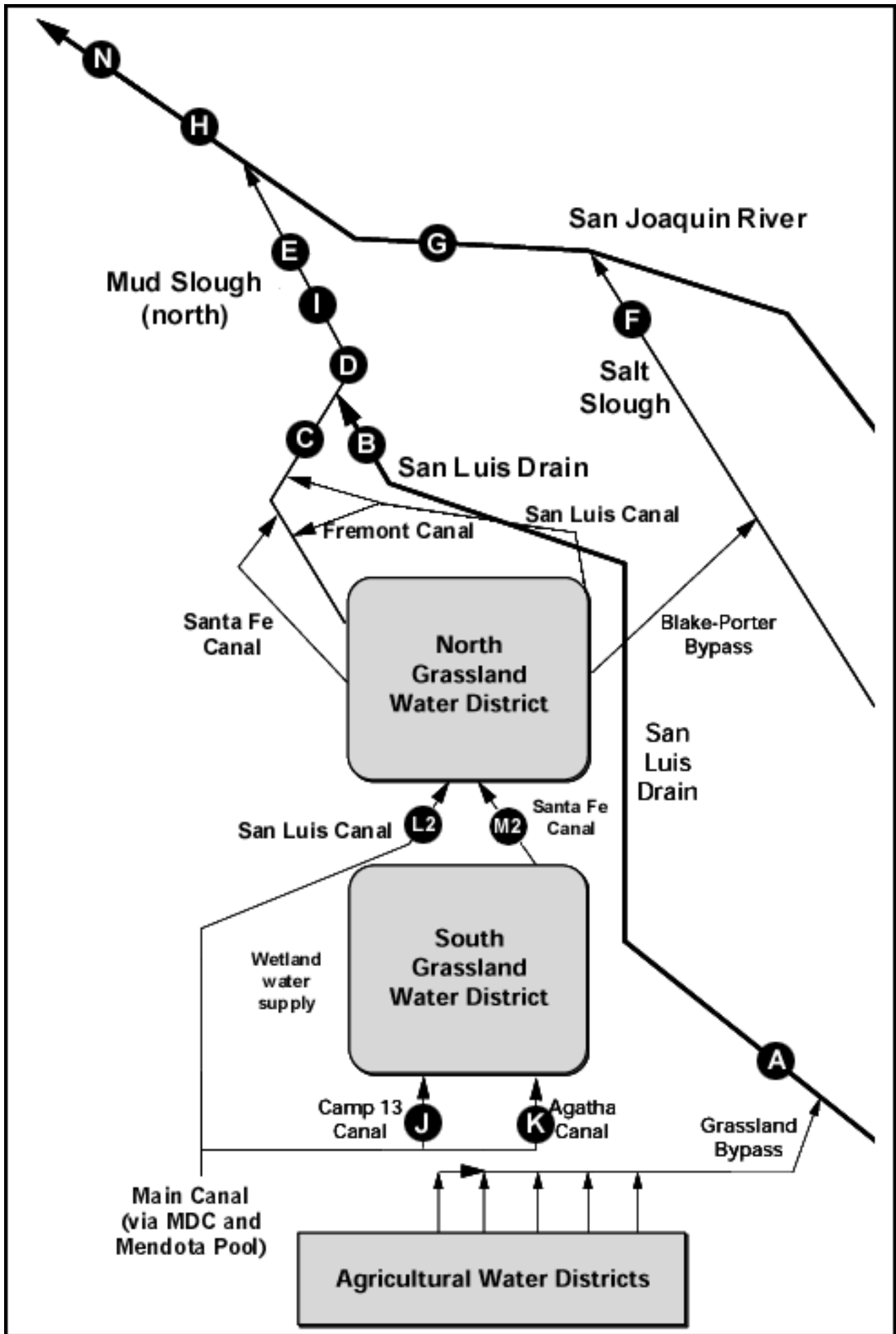
### Preliminary Results

A cooperative effort of:

U.S. Bureau of Reclamation  
Central Valley Regional Water Quality Control Board  
U.S. Fish and Wildlife Service  
California Department of Fish and Game  
San Luis & Delta-Mendota Water Authority  
U.S. Environmental Protection Agency  
U.S. Geological Survey

compiled by San Francisco Estuary Institute





## GRASSLAND BYPASS PROJECT

## MONTHLY DATA REPORT

## LIST OF TABLES FOR MONTHLY REPORT

**Continuous Monitoring**

1. Continuous water monitoring at Station A (inflow to San Luis Drain), September 1999.
2. Continuous water monitoring at Station B (discharge from San Luis Drain), September 1999.
3. Continuous water monitoring at Station D (Mud Slough North downstream of drainage discharges), September 1999.
4. Continuous water monitoring at Station F (Salt Slough at Highway 165), September 1999.
5. Continuous water monitoring at Station N (San Joaquin River at Crow's Landing), September 1999.

**Weekly Monitoring**

6. Weekly water quality monitoring at Station A (inflow to San Luis Drain), 1999.
7. Weekly water quality monitoring at Station B (discharge from San Luis Drain), 1999.
8. Weekly water quality monitoring at Station C (Mud Slough North upstream of drainage discharge), 1999.
9. Weekly water quality monitoring at Station D (Mud Slough North downstream of drainage discharge), 1999.
10. Weekly water quality monitoring at Station F (Salt Slough at Lander Avenue), 1999.
11. Weekly water quality monitoring at Station G (San Joaquin River at Fremont Ford), 1999.
12. Weekly water quality monitoring at Station H (San Joaquin River at Hills Ferry), 1999.
13. Weekly water quality monitoring at Station J (Camp 13 Ditch), 1999.
14. Weekly water quality monitoring at Station K (Agatha Canal), 1999.
15. Weekly water quality monitoring at Station L2 (San Luis Canal at splits), 1999.
16. Weekly water quality monitoring at Station M2 (Santa Fe Canal at weir), 1999.
17. Weekly water quality monitoring at Station N (San Joaquin River at Crow's Landing), 1999.

**Monthly Monitoring**

18. Summary of fathead minnow (*Pimephales promelas*) larvae survival in 7-day tests using water samples collected from October 1998 to September 1999. Each value is the mean of 4 replicates with 10 fish in each replicate.
19. Summary of fathead minnow (*Pimephales promelas*) larvae growth in 7-day tests using water samples collected from October 1998 to September 1999. Each value is the mean of 4 replicates with 10 fish in each replicate.
20. Summary of *Daphnia magna* survival in 7-day tests using water samples collected from October 1998 to September 1999. Each value is the mean of 10 replicates with 1 animal in each replicate.
21. Summary of *Daphnia magna* reproduction in 7-day tests using water samples collected from October 1998 to September 1999. Each value is the mean of 10 replicates with 1 animal in each replicate.
22. Summary of *Selenastrum capricornutum* growth in 4-day tests using water samples collected from October 1998 to September 1999. Each value is the mean of 4 replicates.
23. Summary of selenium concentrations in grab water samples collected at study stations for use in laboratory toxicity tests, July to September 1999.
24. Summary of sulfate concentrations in grab water samples collected at study stations for use in laboratory toxicity tests, July to September 1999.
25. Summary of total suspended solids concentrations in grab water samples collected from July to September 1999.

**Quarterly Monitoring**

26. Summary of quarterly in situ bioassay results from December 1995 to May 1998.
27. Explanations of footnotes and agency abbreviations.

**Table 1. Continuous water monitoring at Station A (inflow to San Luis Drain), September 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

<b>PARAMETER</b>	<b>Flow</b>
<b>DATA SOURCE</b>	usgs
<b>UNITS</b>	cfs
Sep-01-1999	54
Sep-02-1999	50
Sep-03-1999	55
Sep-04-1999	53
Sep-05-1999	53
Sep-06-1999	51
Sep-07-1999	47
Sep-08-1999	38
Sep-09-1999	31
Sep-10-1999	33
Sep-11-1999	37
Sep-12-1999	29
Sep-13-1999	31
Sep-14-1999	42
Sep-15-1999	44
Sep-16-1999	37
Sep-17-1999	31
Sep-18-1999	29
Sep-19-1999	25
Sep-20-1999	28
Sep-21-1999	31
Sep-22-1999	29
Sep-23-1999	31
Sep-24-1999	32
Sep-25-1999	32
Sep-26-1999	25
Sep-27-1999	21
Sep-28-1999	18
Sep-29-1999	15
Sep-30-1999	16
.	.
Mean	35

**Table 2. Continuous water monitoring at Station B (discharge from San Luis Drain), September 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	Boron	Specific Conductance	Selenium (total)	Selenium (total) Load
DATA SOURCE	USGS	USGS	CVRWQCB	CVRWQCB	CVRWQCB	Computed
UNITS	cfs	°C	mg/L	µS/cm	µg/L	lbs
Sep-01-1999	64	23.0	6.0	3,680	45.4	15.7
Sep-02-1999	56	23.1	6.4	3,820	40.2	12.1
Sep-03-1999	52	23.1	6.4	3,840	44.9	12.6
Sep-04-1999	55	23.4	6.6	4,020	48.8	14.5
Sep-05-1999	55	24.3	6.9	4,230	50.6	15.0
Sep-06-1999	54	25.1	5.9	3,690	33.6	9.8
Sep-07-1999	52	25.7	6.0	3,740	31.2	8.8
Sep-08-1999	48	26.0	6.1	4,090	45.5	11.8
Sep-09-1999	40	25.9	6.1	3,740	35.7	7.7
Sep-10-1999	34	25.5	6.2	3,940	42.7	7.8
Sep-11-1999	36	25.1	6.6	4,160	42.6	8.3
Sep-12-1999	39	25.2	6.5	4,130	44.7	9.4
Sep-13-1999	32	25.1	6.9	4,250	41.2	7.1
Sep-14-1999	36	25.0	7.3	4,310	37.8	7.3
Sep-15-1999	46	25.3	6.9	4,500	47.3	11.7
Sep-16-1999	46	25.3	6.7	4,540	44.1	10.9
Sep-17-1999	39	25.0	6.6	4,180	37.9	8.0
Sep-18-1999	35	24.7	6.0	3,810	36.4	6.9
Sep-19-1999	33	24.2	5.3	3,560	37.3	6.6
Sep-20-1999	31	23.6	6.0	4,070	39.9	6.7
Sep-21-1999	34	23.7	6.4	4,520	43.7	8.0
Sep-22-1999	36	24.6	6.7	4,620	40.0	7.8
Sep-23-1999	35	25.8	6.9	4,740	41.1	7.8
Sep-24-1999	37	26.1	7.2	4,640	38.5	7.7
Sep-25-1999	38	26.0	7.4	4,730	50.3	10.3
Sep-26-1999	36	25.1	7.3	4,820	64.5	12.5
Sep-27-1999	31	22.9	7.1	4,430	37.8	6.3
Sep-28-1999	27	21.9	6.4	3,960	31.1	4.5
Sep-29-1999	28	22.5	6.2	3,890	28.6	4.3
Sep-30-1999	25	23.3	6.6	4,430	51.0	6.9
.	.	.	.	.	.	.
Mean	40	24.5	6.5	4,170	41.8	
<b>Total</b>						<b>275</b>

<b>Load Limitation for September 1999 (lbs)</b>	<b>350</b>
---	------------

**Table 3. Continuous water monitoring at Station D  
(Mud Slough North downstream of drainage discharges), September 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	Specific Conductance
DATA SOURCE	usgs	usgs	usgs
UNITS	cfs	°C	µS/cm
Sep-01-1999	83	22.2	2,720
Sep-02-1999	72	22.4	2,970
Sep-03-1999	69	22.4	2,870
Sep-04-1999	71	22.6	3,060
Sep-05-1999	69	23.3	3,210
Sep-06-1999	67	24.0	2,940
Sep-07-1999	66	24.6	2,910
Sep-08-1999	65	24.6	3,030
Sep-09-1999	58	24.7	2,830
Sep-10-1999	54	24.2	2,770
Sep-11-1999	56	23.7	2,690
Sep-12-1999	71	23.9	2,460
Sep-13-1999	71	23.8	2,140
Sep-14-1999	73	23.6	2,220
Sep-15-1999	79	24.0	2,460
Sep-16-1999	80	23.9	2,650
Sep-17-1999	74	23.5	2,500
Sep-18-1999	72	23.1	2,150
Sep-19-1999	72	22.8	1,920
Sep-20-1999	73	22.6	2,020
Sep-21-1999	76	23.0	2,150
Sep-22-1999	75	24.0	2,390
Sep-23-1999	71	24.4	2,610
Sep-24-1999	74	24.6	2,550
Sep-25-1999	80	24.6	2,390
Sep-26-1999	81	23.5	2,460
Sep-27-1999	77	21.4	2,300
Sep-28-1999	70	20.9	2,270
Sep-29-1999	73	21.9	2,030
Sep-30-1999	73	22.8	1,930
.	.	.	.

**Table 4. Continuous water monitoring at Station F (Salt Slough at Highway 165), September 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	Specific Conductance
DATA SOURCE	USGS	USGS	USGS
UNITS	cfs	°C	µS/cm
Sep-01-1999	137	21.8	898
Sep-02-1999	109	22.3	1,110
Sep-03-1999	116	22.6	1,050
Sep-04-1999	149	22.9	961
Sep-05-1999	156	23.7	903
Sep-06-1999	163	24.4	904
Sep-07-1999	153	24.8	903
Sep-08-1999	155	24.8	880
Sep-09-1999	138	24.4	954
Sep-10-1999	156	23.5	961
Sep-11-1999	141	23.3	953
Sep-12-1999	149	23.7	955
Sep-13-1999	154	23.7	931
Sep-14-1999	159	23.4	923
Sep-15-1999	153	23.8	945
Sep-16-1999	148	23.6	952
Sep-17-1999	155	23.1	902
Sep-18-1999	181	22.8	852
Sep-19-1999	175	22.3	875
Sep-20-1999	165	21.8	945
Sep-21-1999	160	22.6	933
Sep-22-1999	125	24.1	1,060
Sep-23-1999	119	24.8	1,060
Sep-24-1999	121	24.8	1,040
Sep-25-1999	140	24.6	922
Sep-26-1999	157	23.4	931
Sep-27-1999	152	21.7	970
Sep-28-1999	152	20.9	1,030
Sep-29-1999	169	21.7	1,030
Sep-30-1999	185	22.8	1,020
.	.	.	.

**Table 5. Continuous water monitoring at Station N (San Joaquin River at Crow's Landing), September 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	Specific Conductance	Selenium (total)
DATA SOURCE	usgs	usgs	CVRWQCB	CVRWQCB
UNITS	cfs	°C	µS/cm	µg/L
Sep-01-1999	668	21.8	1,170	5.4
Sep-02-1999	631	22.1	1,080	4.2
Sep-03-1999	614	22.6	1,170	4.0
Sep-04-1999	631	22.6	1,220	4.0
Sep-05-1999	615	23.3	1,210	4.4
Sep-06-1999	637	24.0	1,150	4.2
Sep-07-1999	548	24.4	1,180	4.2
Sep-08-1999	544	24.3	1,190	3.3
Sep-09-1999	549	24.1	1,260	3.5
Sep-10-1999	533	23.6	1,210	3.6
Sep-11-1999	534	23.5	1,200	2.9
Sep-12-1999	587	23.6	1,130	2.7
Sep-13-1999	666	23.6	1,060	2.8
Sep-14-1999	627	23.3	1,030	2.6
Sep-15-1999	591	23.5	1,000	2.3
Sep-16-1999	558	23.6	1,130	2.7
Sep-17-1999	600	23.1	1,200	4.4
Sep-18-1999	617	22.9	1,190	3.2
Sep-19-1999	595	22.7	1,090	2.8
Sep-20-1999	585	22.7	1,070	2.6
Sep-21-1999	626	22.9	1,010	2.3
Sep-22-1999	605	23.9	990	2.2
Sep-23-1999	542	24.6	1,130	2.7
Sep-24-1999	495	24.5	1,220	2.7
Sep-25-1999	462	24.3	1,380	3.3
Sep-26-1999	534	23.5	1,300	3.0
Sep-27-1999	587	21.9	1,140	3.5
Sep-28-1999	547	20.5	1,100	3.6
Sep-29-1999	562	21.5	1,100	2.5
Sep-30-1999	565	22.3	1,040	2.0
.	.	.	.	.



**Table 6. Weekly water quality monitoring at Station A (inflow to San Luis Drain), 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	.	.	Specific Conductance	Total Suspended Solids	Selenium (total)	Selenium (dissolved)	Boron
DATA SOURCE	usgs	.	.	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	.	.	µS/cm	mg/L	µg/L	µg/L	mg/L
Jul-07-1999	70			4,510	150	47.8	47.2	7.1
Jul-14-1999	58	.	.	4,640	130	41.2	42.3	7.7
Jul-21-1999	62	.	.	4,480	150	42.9	39.9	7.3
Jul-28-1999	60	.	.	4,250	150	40.3	40.8	7.1
Aug-04-1999	61	.	.	4,550	200	47.3	43.9	7.0
Aug-11-1999	55	.	.	4,180	79	39.3	39.0	6.9
Aug-18-1999	53	.	.	4,410	P	43.7	45.2	7.3
Aug-25-1999	76	.	.	3,870	220	51.6	49.3	6.0
Sep-01-1999	54	.	.	4,040	120	45.7	48.0	6.6
Sep-08-1999	38	.	.	4,110	61	46.7	46.1	6.6
Sep-15-1999	44	.	.	3,510	32	36.9	37.8	5.5
Sep-22-1999	29	.	.	5,200	46	66.5	68.3	7.7
Sep-29-1999	15	.	.	5,840	87	72.9	70.9	9.2

**Table 7. Weekly water quality monitoring at Station B (discharge from San Luis Drain), 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	pH	Specific Conductance	Total Suspended Solids	Selenium (total)	Selenium (dissolved)	Boron
DATA SOURCE	usgs	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C		µS/cm	mg/L	µg/L	µg/L	mg/L
Jun-10-1999	66	21.5	8.1	5,090	83	60.0	59.3	7.3
Jul-15-1999	57	28.4	8.0	4,200	56	40.5	38.6	7.3
Jul-22-1999	60	22.9	8.3	4,030	31	36.1	35.8	6.5
Jul-29-1999	58	21.5	8.1	4,370	38	47.7	48.9	7.3
Aug-05-1999	59	24.3	8.3	3,870	50	42.6	40.5	7.0
Aug-12-1999	56	22.9	8.3	3,720	58	31.4	29.5	6.2
Aug-19-1999	53	23.2	8.1	3,960	69	32.2	30.8	6.6
Aug-26-1999	76	24.0	7.6	3,590	66	42.1	38.3	5.6
Sep-02-1999	56	21.8	6.2	3,780	86	41.5	41.7	6.4
Sep-09-1999	40	24.6	8.0	3,750	P	36.3	36.3	6.1
Sep-16-1999	46	22.0	7.0	4,210	79	34.6	36.7	6.3
Sep-23-1999	35	26.2	7.9	4,700	66	38.9	39.1	6.7
Sep-30-1999	25	22.5	7.5	4,540	54	61.1	60.9	6.4

**Table 8. Weekly water quality monitoring at Station C (Mud Slough North upstream of drainage discharges), 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	calculated **	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C		µS/cm	µg/L	mg/L
Jun-10-1999	43	23.0	8.1	1,420	1.0	1.2
Jul-15-1999	19	31.2	8.2	1,260	2.0	1.3
Jul-22-1999	11	22.9	8.6	1,670	1.7	1.9
Jul-29-1999	9	19.3	7.6	1,800	1.9	2.1
Aug-05-1999	8	23.8	8.2	1,860	1.8	2.1
Aug-12-1999	7	22.4	8.2	1,870	1.5	1.7
Aug-19-1999	10	20.5	8.0	2,040	1.5	1.7
Aug-26-1999	3	22.2	6.1	1,190	1.4	1.2
Sep-02-1999	16	24.1	8.1	898	0.6	0.7
Sep-09-1999	18	25.9	8.2	890	0.7	0.7
Sep-16-1999	34	22.5	8.0	697	0.5	0.5
Sep-23-1999	36	25.7	8.0	766	<0.4	0.5
Sep-30-1999	48	22.5	7.6	873	0.5	0.6

++ Calculated flow value. Flow at Station C = flow at Station D - flow at Station B.

**Table 9. Weekly water quality monitoring at Station D (Mud Slough North downstream of drainage discharges), 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	USGS	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C		µS/cm	µg/L	mg/L
Jun-10-1999	109	22.6	8.3	3,570	32.1	4.9
Jul-15-1999	76	29.1	7.9	3,910	38.6	6.0
Jul-22-1999	71	22.8	8.3	4,160	38.9	6.8
Jul-29-1999	67	21.5	7.7	4,110	38.7	6.9
Aug-05-1999	67	24.6	8.2	4,360	50.7	7.7
Aug-12-1999	63	23.4	8.3	3,700	29.3	6.2
Aug-19-1999	63	23.1	7.9	3,990	33.2	6.5
Aug-26-1999	79	24.0	6.6	3,790	42.4	5.7
Sep-02-1999	72	23.4	7.5	3,480	39.8	5.6
Sep-09-1999	58	25.1	7.1	3,050	28.2	4.9
Sep-16-1999	80	22.7	7.9	2,860	23.2	4.0
Sep-23-1999	71	26.2	7.6	2,730	17.6	3.6
Sep-30-1999	73	22.0	7.7	1,870	9.2	2.3

**Table 10. Weekly water quality monitoring at Station F (Salt Slough at Lander Avenue), 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	USGS	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C		µS/cm	µg/L	mg/L
Jun-10-1999	175	20.0	7.8	1,180	0.8	0.5
Jul-15-1999	208	26.2	8.7	864	0.9	0.5
Jul-22-1999	160	22.2	7.7	1,120	0.6	0.6
Jul-29-1999	233	22.1	7.5	885	0.8	0.6
Aug-05-1999	161	23.4	8.0	1,010	0.8	0.5
Aug-12-1999	152	21.7	7.7	1,070	0.7	0.5
Aug-19-1999	193	21.3	7.2	868	0.8	0.5
Aug-26-1999	182	24.3	7.3	872	0.7	0.4
Sep-02-1999	109	21.4	7.2	1,240	0.7	0.5
Sep-09-1999	138	22.6	7.3	912	1.0	0.4
Sep-16-1999	148	20.9	7.2	978	1.1	0.5
Sep-23-1999	119	23.0	7.1	1,100	0.6	0.5
Sep-30-1999	185	20.9	7.3	1,030	0.8	0.5

**Table 11. Weekly water quality monitoring at Station G (San Joaquin River at Fremont Ford), 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	.	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	.	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	.	°C		µS/cm	µg/L	mg/L
Jun-10-1999	.	19.0	7.4	1,340	0.7	0.5
Jul-15-1999	.	26.8	7.9	972	0.9	0.4
Jul-22-1999	.	21.3	7.8	1,120	0.7	0.5
Jul-29-1999	.	22.7	7.9	1,050	0.6	0.5
Aug-05-1999	.	22.8	7.3	1,080	0.8	0.5
Aug-12-1999	.	21.1	7.1	970	0.7	0.4
Aug-19-1999	.	21.2	8.3	967	0.7	0.5
Aug-26-1999	.	24.5	8.1	1,070	0.7	0.4
Sep-02-1999	.	21.4	6.9	1,130	0.6	0.4
Sep-09-1999	.	24.8	8.3	936	0.7	0.4
Sep-16-1999	.	20.4	6.7	988	0.8	0.4
Sep-23-1999	.	22.6	6.8	1,000	0.5	0.4
Sep-30-1999	.	20.2	7.2	1,030	0.7	0.4

**Table 12. Weekly water quality monitoring at Station H (San Joaquin River at Hills Ferry), 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	.	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	.	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	.	°C		µS/cm	µg/L	mg/L
Jun-03-1999	.	20.4	7.5	2,170	6.8	1.7
Jul-08-1999	.	26.9	8.5	2,020	11.1	2.1
Jul-15-1999	.	25.4	8.2	1,870	7.5	1.9
Jul-29-1999	.	24.2	8.2	1,650	5.5	1.6
Aug-05-1999	.	26.0	8.1	1,700	8.4	1.9
Aug-12-1999	.	24.2	8.1	1,580	5.2	1.4
Aug-19-1999	.	23.4	7.5	1,710	6.5	1.7
Aug-26-1999	.	24.4	8.0	1,730	6.0	1.6
Sep-02-1999	.	20.1	7.4	1,460	6.7	1.3
Sep-09-1999	.	26.2	8.2	1,590	7.2	1.4
Sep-16-1999	.	23.2	6.9	1,480	5.5	1.3
Sep-23-1999	.	26.1	7.7	1,560	4.5	1.3
Sep-30-1999	.	22.5	6.9	1,350	3.0	1.0

**Table 13. Weekly water quality monitoring at Station J (Camp 13 Ditch), 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	.	.	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	SLDMWA <sup>††</sup>	.	.	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	.	.	µS/cm	µg/L	mg/L
Jun-02-1999	10	.	.	512	0.9	0.3
Jul-14-1999	20	.	.	371	1.2	0.3
Jul-21-1999	5	.	.	446	1.9	0.6
Jul-28-1999	5	.	.	492	0.9	0.5
Aug-04-1999	5	.	.	753	1.1	0.9
Aug-11-1999	5	.	.	633	1.2	0.7
Aug-18-1999	5	.	.	401	1.3	0.5
Aug-25-1999	20	.	.	417	1.4	0.4
Sep-01-1999	20	.	.	385	1.3	0.4
Sep-08-1999	100	.	.	467	2.7	0.3
Sep-15-1999	130	.	.	441	1.3	0.2
Sep-22-1999	190	.	.	458	0.7	0.2
Sep-29-1999	190	.	.	484	0.7	0.2

**Table 14. Weekly water quality monitoring at Station K (Agatha Canal), 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	.	.	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	SLDMWA <sup>1†</sup>	.	.	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	.	.	µS/cm	µg/L	mg/L
Jun-02-1999	40	.	.	452	1.0	0.2
Jul-14-1999	10	.	.	329	1.0	0.2
Jul-21-1999	10	.	.	352	1.0	0.2
Jul-28-1999	10	.	.	417	0.8	0.2
Aug-04-1999	10	.	.	315	0.8	0.2
Aug-11-1999	10	.	.	345	0.9	0.2
Aug-18-1999	10	.	.	303	0.8	0.2
Aug-25-1999	30	.	.	316	1.3	0.2
Sep-01-1999	90	.	.	406	1.3	0.2
Sep-08-1999	115	.	.	403	2.1	0.2
Sep-15-1999	115	.	.	387	1.1	0.2
Sep-22-1999	200	.	.	500	0.8	0.2
Sep-29-1999	200	.	.	662	2.1	0.4

**Table 15. Weekly water quality monitoring at Station L2 (San Luis Canal at splits), 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	.	.	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	SLDMWA <sup>1†</sup>	.	.	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	.	.	µS/cm	µg/L	mg/L
Jun-02-1999	78	.	.	671	1.1	0.5
Jul-14-1999	38	.	.	965	2.0	1.0
Jul-21-1999	13	.	.	1,330	2.1	1.4
Jul-28-1999	7	.	.	1,520	2.1	1.8
Aug-04-1999	10	.	.	960	1.7	1.0
Aug-11-1999	25	.	.	867	1.5	0.9
Aug-18-1999	25	.	.	806	1.5	0.9
Aug-25-1999	50	.	.	744	1.6	0.7
Sep-01-1999	70	.	.	504	1.4	0.4
Sep-08-1999	130	.	.	528	2.5	0.4
Sep-15-1999	130	.	.	470	1.7	0.3
Sep-22-1999	150	.	.	522	1.1	0.3
Sep-29-1999	160	.	.	513	0.9	0.2

**Table 16. Weekly water quality monitoring at Station M2 (Santa Fe Canal at weir), 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	.	.	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	SLDMWA <sup>††</sup>	.	.	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	.	.	µS/cm	µg/L	mg/L
Jun-02-1999	48	.	.	791	1.3	0.7
Jul-14-1999	12	.	.	979	1.7	1.4
Jul-21-1999	22	.	.	1,320	2.1	2.4
Jul-28-1999	28	.	.	1,060	1.6	1.6
Aug-04-1999	12	.	.	1,400	2.5	2.5
Aug-11-1999	15	.	.	1,140	2.1	1.6
Aug-18-1999	18	.	.	1,250	2.5	2.2
Aug-25-1999	22	.	.	1,070	2.1	1.1
Sep-01-1999	17	.	.	516	1.6	0.4
Sep-08-1999	14	.	.	536	1.8	0.4
Sep-15-1999	63	.	.	514	1.2	0.3
Sep-22-1999	77	.	.	611	1.0	0.4
Sep-29-1999	67	.	.	771	1.7	0.6

**Table 17. Weekly water quality monitoring at Station N (San Joaquin River at Crow's Landing), 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	USGS	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C		µS/cm	µg/L	mg/L
Jun-10-1999	832	21.5	8.0	1,210	4.0	0.9
Jul-15-1999	515	25.6	8.1	1,430	5.1	1.2
Jul-22-1999	563	24.4	8.2	1,200	3.7	1.1
Jul-29-1999	584	23.3	8.0	1,320	4.2	1.2
Aug-05-1999	675	26.1	8.1	1,180	4.8	1.1
Aug-12-1999	604	23.7	7.9	1,250	3.5	1.0
Aug-19-1999	533	25.0	8.0	1,300	4.2	1.0
Aug-26-1999	509	24.8	8.1	1,310	3.4	1.0
Sep-02-1999	631	19.5	7.2	1,130	5.1	0.8
Sep-09-1999	549	24.9	7.0	1,230	4.2	0.9
Sep-16-1999	558	24.4	7.7	1,160	2.6	0.9
Sep-23-1999	542	25.0	7.9	1,140	2.4	0.7
Sep-30-1999	565	22.6	7.6	1,030	1.8	0.6

Table 18. Summary of fathead minnow (*Pimephales promelas*) larvae survival in 7-day tests using water samples collected from October 1998 to September 1999. Each value is the mean of 4 replicates with 10 fish in each replicate.

See Table 27 for explanation of footnotes and agency abbreviations.

LOCATION	Station B	Station C	Station D	Station F	Delta Mendota Canal	Laboratory Control
DATA SOURCE	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA
UNITS	%	%	%	%	%	%
October-98	98	53*	80	85	97	100
November-98	95	55*	55*	45*	90	85
December-98	98	68*	68	80	93	93
January-99	100	88	60*	43*	80	100
February-99	98	65	90	78	48 <sup>†</sup>	83
March-99	75	58	88	85	65 <sup>†</sup>	100
April-99	93	88	100	83	73 <sup>†</sup>	100
May-99	98	90	93	88	50 <sup>†</sup>	98
June-99	98	93	100	98	70 <sup>†</sup>	100
July-99	93	100	90	93	98	100
August-99	93	100	89	68	98	100
September-99	95	85	93	53	93	98

Table 19. Summary of fathead minnow (*Pimephales promelas*) larvae growth in 7-day tests using water samples collected from October 1998 to September 1999. Each value is the mean of 4 replicates with 10 fish in each replicate.

See Table 27 for explanation of footnotes and agency abbreviations.

LOCATION	Station B	Station C	Station D	Station F	Delta Mendota Canal	Laboratory Control
DATA SOURCE	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA
UNITS	mg	mg	mg	mg	mg	mg
October-98	0.74	0.31*	0.53	0.55	0.58	0.67
November-98	0.53	0.31*	0.28*	0.26*	0.50	0.49
December-98	0.68	0.48	0.45	0.50	0.53	0.55
January-99	0.72	0.62	0.38	0.23*	0.49	0.69
February-99	0.64	0.43	0.50	0.47	0.30	0.50
March-99	0.45	0.37	0.55	0.54	0.38	0.56
April-99	0.66	0.61	0.78	0.57	0.48	0.72
May-99	0.78	0.76	0.74	0.61	0.39	0.71
June-99	0.67	0.68	0.72	0.67	0.43	0.72
July-99	0.72	0.77	0.69	0.67	0.68	0.63
August-99	0.60	0.70	0.54	0.44*	0.65	0.63
September-99	0.65	0.49	0.54	0.35	0.59	0.58

Table 20. Summary of *Daphnia magna* survival in 7-day tests using water samples collected from October 1998 to September 1999. Each value is the mean of 10 replicates with 1 animal in each replicate.

See Table 27 for explanation of footnotes and agency abbreviations.

LOCATION	Station B	Station C	Station D	Station F	Delta Mendota Canal	Laboratory Control
DATA SOURCE	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA
UNITS	%	%	%	%	%	%
October-98	80	90	70	70	90	80
November-98	100	80	90	100	90	90
December-98	100	100	100	100	80	90
January-99	100	100	100	100	100	100
February-99	100	100	90	90	80	90
March-99	100	90	90	100	80	90
April-99	90	100	100	100	100	100
May-99	100	90	90	100	100	100
June-99	100	80	90	100	90	90
July-99	90	100	80	90	50 <sup>†</sup>	90
August-99	100	100	100	100	90	80
September-99	100	100	100	80	100	80

Table 21. Summary of *Daphnia magna* reproduction in 7-day tests using water samples collected from October 1998 to September 1999. Each value is the mean of 10 replicates with 1 animal in each replicate.

See Table 27 for explanation of footnotes and agency abbreviations.

LOCATION	Station B	Station C	Station D	Station F	Delta Mendota Canal	Laboratory Control
DATA SOURCE	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA
UNITS	neonates per female	neonates per female	neonates per female	neonates per female	neonates per female	neonates per female
October-98	14.7*	22.9	12.5*	22.0	24.2	23.5
November-98	53.4	50.0	53.4	50.6	38.9	24.3
December-98	30.2	38.4	35.0	35.8	30.0	26.8
January-99	33.0	28.7	31.2	22.9	14.9	48.0
February-99	25.4	24.0	31.7	21.1	23.8	20.3
March-99	65.4	69.6	70.9	57.4	45.1	52.7
April-99	17.1	24.4	20.6	21.6	19.9	13.8
May-99	31.6	36.0	33.8	37.4	30.8	39.2
June-99	23.8	24.0	21.2	18.5	8.6 <sup>†††</sup>	10.3
July-99	31.1	35.9	32.6	27.2	12.8	15.7
August-99	19.9	23.2	24.3	19.9	11.4	12.3
September-99	29.2	37.7	36.1	28.4	17.9	14.6

Table 22. Summary of *Selenastrum capricornutum* growth in 4-day tests using water samples collected from October 1998 to September 1999. Each value is the mean of 4 replicates.

See Table 27 for explanation of footnotes and agency abbreviations.

LOCATION	Station B	Station C	Station D	Station F	Delta Mendota Canal	Laboratory Control
DATA SOURCE	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA
UNITS	10 <sup>5</sup> cells/mL	10 <sup>5</sup> cells/mL	10 <sup>5</sup> cells/mL	10 <sup>5</sup> cells/mL	10 <sup>5</sup> cells/mL	10 <sup>5</sup> cells/mL
October-98	15.5*	33.5	29.8	29.0	26.5	22.0
November-98	10.8*	16.7	15.0*	21.5	21.3 <sup>‡</sup>	22.0
December-98	6.0*	18.9	16.0	13.6*	16.2	24.4 <sup>‡</sup>
January-99	13.0*	20.6	20.7	19.2*	24.4	25.6
February-99	16.0*	33.5	24.1*	15.7*	31.5	27.1
March-99	14.5	11.8*	15.5	17.6	17.1	22.9
April-99	17.6	14.4*	15.8	23.0	19.6	22.6 <sup>‡</sup>
May-99	12.0	13.3	11.8	8.5	11.5 <sup>‡</sup>	14.7 <sup>‡</sup>
June-99	9.3	10.1	9.4	11.1	7.4 <sup>††††</sup>	11.6
July-99	9.1	10.5	9.9	11.2	7.5 <sup>††††</sup>	11.9
August-99	9.2*	10.0	10.2	11.9	13.3 <sup>‡</sup>	14.9 <sup>‡</sup>
September-99	9.8	11.1	10.8	10.2	14.1	23.5



**Table 23. Summary of selenium concentrations in grab water samples collected at study stations for use in laboratory toxicity tests, July to September 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

LOCATION	Station B	Station C	Station D	Station F	Delta Mendota Canal
DATA SOURCE #	SLDMWA/USBR	SLDMWA/USBR	SLDMWA/USBR	SLDMWA/USBR	SLDMWA/USBR
UNITS	µg/L	µg/L	µg/L	µg/L	µg/L
Jul-12-1999	45	2.5	38	0.9	<0.4
Jul-14-1999	38	1.9	28	0.9	<0.4
Jul-16-1999	43	1.9	29	1.0	<0.4
Aug-09-1999	23	1.8	13	0.8	<0.4
Aug-11-1999	18	0.9	16	0.7	<0.4
Aug-13-1999	24	1.0	21	0.9	<0.4
Sep-13-1999	43	1.2	19	1.2	0.6
Sep-15-1999	34	0.9	23	1.1	<0.4
Sep-17-1999	43	1.0	22	1.3	<0.4

**Table 24. Summary of sulfate concentrations in grab water samples collected at study stations for use in laboratory toxicity tests, July to September 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

LOCATION	Station B	Station C	Station D	Station F	Delta Mendota Canal
DATA SOURCE	SLDMWA/USBR	SLDMWA/USBR	SLDMWA/USBR	SLDMWA/USBR	SLDMWA/USBR
UNITS	mg/L	mg/L	mg/L	mg/L	mg/L
Jul-12-1999	1,360	308	1,190	128	24
Jul-14-1999	1,370	245	1,060	120	18
Jul-16-1999	1,370	260	1,060	135	18
Aug-09-1999	1,170	230	1,020	89	19
Aug-11-1999	1,020	299	1,110	62	16
Aug-13-1999	866	296	1,230	130	12
Sep-13-1999	1,430	104	638	112	48
Sep-15-1999	1,370	74	843	115	22
Sep-17-1999	1,520	77	758	114	28

**Table 25. Summary of total suspended solids concentrations in grab water samples collected from July to September 1999.**

See Table 27 for explanation of footnotes and agency abbreviations.

LOCATION	Station B	Station C	Station D	Station F	Delta Mendota Canal
DATA SOURCE	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA
UNITS	mg/L	mg/L	mg/L	mg/L	mg/L
Jul-12-1999	49	97	60	122	21
Jul-14-1999	50	86	77	71	0
Jul-16-1999	29	50	23	89	3
Aug-09-1999	28	95	49	128	21
Aug-11-1999	23	117	100	131	19
Aug-13-1999	40	107	44	119	29
Sep-13-1999	42	93	69	109	21
Sep-15-1999	31	82	75	55	17
Sep-17-1999	50	64	90	104	12

Table 26. Summary of quarterly in situ bioassay results from December 1995 to May 1998.

Results are the number of live fathead minnows (*Pimephales promelas*) per number of fish recovered at the end of the 7 day deployment at each station (initial count of 80 used at each station).

See Table 27 for explanation of footnotes and agency abbreviations.

LOCATION	Windmill (4 day old larvae)	Station B (4 day old larvae)	Station D (4 day old larvae)	Station D (14 day old larvae)	Station F (4 day old larvae)	Station F (14 day old larvae)
DATA SOURCE	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA	SLDMWA
UNITS	# alive/total count	# alive/total count	# alive/total count	# alive/total count	# alive/total count	# alive/total count
December-1995 <sup>(4)</sup>	NT	NT	NT	NT	NT	NT
March-1996 <sup>(5)</sup>	80/80	NT	NT	44/44	NT	70/70
August-1996 <sup>(6)</sup>	NT	NT	13/19	22/29	28/40	20/49
November-1996 <sup>(7)</sup>	46/62	63/68	0/2	.	16/36	.
February-1997 <sup>(8)</sup>	NT	3/13	0/0	.	0/11	.
May-1997	64/66	0/0	0/24	.	5/9	.
August-1997 <sup>(9)</sup>	NT	38/38	27/31	.	0/8	.
May-1998	5/24	3/23	2/21	.	1/21	.

Table 27. Explanations of footnotes and agency abbreviations.

Footnote	Explanation
CVRWQCB	California Regional Water Quality Control Board, Central Valley Region
SLDMWA	San Luis & Delta-Mendota Water Authority
USBR	U.S. Bureau of Reclamation
USGS	U.S. Geological Survey
.	Not applicable
<	Less than MDL. If needed in calculation, use 1/2 MDL
e	Estimated value
P	Pending, data not available at this time but will be available in the future
NA	Not analyzed - operator error, data will not be available in the future
NT	Not tested
(4)	In situ cages could not be deployed due to wet weather conditions.
(5)	Baseline results for 3/96 are for 14-day old larvae. There was no survival for the 24-hour old larvae.
(6)	Windmill station was dry due to water drainage. Use of plastic screened beakers for Station F during 8/96 with use of 4-day old larvae resulted in 0/39. Apparent cause of mortality was elevated temperature and sediment which was found in all cages and beakers.
(7)	Heavy silt accumulation was noted in Stations D and F cages and light silt accumulation was observed in both the Windmill Station and Station B.
(8)	Moderate silt accumulation was noted in Stations B and F cages and light silt accumulation was observed in Station D.
(9)	No test deployment was done at the Windmill Station due to extreme conditions (stagnant & pH>9.0). At Station B, replicate A was retrieved with no cork and replicate C lost its cork during retrieval. There were no surviving fish for a growth determination for Station F cages.
*	Significantly reduced from Delta Mendota Canal (p<0.05)
†	DMC water failed to meet the survival (>80%) acceptability criteria.
††	Data from records of the Grassland Water District. Data is not subjected to the criteria documented in the Compliance Monitoring Program for the Use and Operation of the Grassland Bypass Project (1996) nor the Quality Assurance Project Plan for the GBP (1997 draft).
†††	DMC water failed to meet the reproduction (>10 neonates/adult) acceptability criteria.
††††	DMC water failed to meet minimum growth (10 <sup>5</sup> cell/mL) acceptability criteria.
‡	Control value exceeds suggested maximum variance (20%) acceptability criteria.
#	New testing laboratory with reporting limit of 0.4 µg/L as of June 1998.