

**GRASSLAND BYPASS PROJECT**

**MONTHLY DATA REPORT**

**June 1997**

August 21, 1997

**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), June 1997.
2. Continuous water monitoring at Station B (discharge from San Luis Drain), June 1997.
3. Continuous water monitoring at Station D (Mud Slough North downstream of drainage discharges), June 1997.
4. Continuous water monitoring at Station F (Salt Slough at Highway 165), June 1997.
5. Continuous water monitoring at Station N (San Joaquin River at Crow's Landing), June 1997.

**Weekly Monitoring**

6. Weekly water quality monitoring at Station A (inflow to San Luis Drain), 1997.
7. Weekly water quality monitoring at Station B (discharge from San Luis Drain), 1997.
8. Weekly water quality monitoring at Station C (Mud Slough North upstream of drainage discharges), 1997.
9. Weekly water quality monitoring at Station D (Mud Slough North downstream of drainage discharges), 1997.
10. Weekly water quality monitoring at Station F (Salt Slough at Lander Avenue), 1997.
11. Weekly water quality monitoring at Station G (San Joaquin River at Fremont Ford), 1997.
12. Weekly water quality monitoring at Station H (San Joaquin River at Hills Ferry), 1997.
13. Weekly water quality monitoring at Station J (Camp 13 Ditch), 1997.
14. Weekly water quality monitoring at Station K (Agatha Canal), 1997.
15. Weekly water quality monitoring at Station L (San Luis Canal at Henry Miller Road), 1997.
16. Weekly water quality monitoring at Station M (Santa Fe Canal at Henry Miller Road), 1997.
17. Weekly water quality monitoring at Station N (San Joaquin River at Crow's Landing), 1997.

**Monthly Monitoring**

18. Summary of fathead minnow (*Pimephales promelas*) larvae survival in 7-day tests using water samples collected from December 1995 to June 1997. 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 December 1995 to June 1997. 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 December 1995 to June 1997. 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 December 1995 to June 1997. 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 December 1995 to June 1997. Each value is the mean of 4 replicates.
23. Summary of selenium concentrations in grab water samples collected at study sites for use in laboratory toxicity tests, December 1995 to June 1997.
24. Summary of sulfate concentrations in grab water samples collected at study sites for use in laboratory toxicity tests, December 1995 to June 1997.

**Quarterly Monitoring**

25. Summary of quarterly in situ bioassay results from December 1995 to May 1997.
26. Explanations of footnotes and agency abbreviations.

**Table 1. Continuous water monitoring at Station A (inflow to San Luis Drain), June 1997.**

See Table 26 for explanation of footnotes and agency abbreviations.

<b>PARAMETER</b>	<b>Flow</b>
<b>DATA SOURCE</b>	<b>USBR</b>
<b>UNITS</b>	<b>cfs</b>
Jun-01-1997	80.4
Jun-02-1997	77.0
Jun-03-1997	44.0
Jun-04-1997	48.2
Jun-05-1997	51.4
Jun-06-1997	42.2
Jun-07-1997	46.6
Jun-08-1997	44.1
Jun-09-1997	47.2
Jun-10-1997	56.7
Jun-11-1997	52.0
Jun-12-1997	57.1
Jun-13-1997	59.3
Jun-14-1997	57.9
Jun-15-1997	54.9
Jun-16-1997	67.6
Jun-17-1997	66.6
Jun-18-1997	55.3
Jun-19-1997	60.5
Jun-20-1997	57.2
Jun-21-1997	55.9
Jun-22-1997	54.2
Jun-23-1997	56.5
Jun-24-1997	47.5
Jun-25-1997	45.2
Jun-26-1997	49.2
Jun-27-1997	46.9
Jun-28-1997	55.5
Jun-29-1997	51.0
Jun-30-1997	50.9

**Table 2. Continuous water monitoring at Station B (discharge from San Luis Drain), June 1997.**

See Table 26 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	Specific Conductance	Selenium (total)	Selenium (total) Load
DATA SOURCE	USBR	USBR	CVRWQCB	CVRWQCB	Computed
UNITS	cfs	°C	µS/cm	µg/l	lbs
Jun-01-1997	84.1	25.7	4,580	80.4	36.5
Jun-02-1997	80.4	25.2	4,770	78.8	34.2
Jun-03-1997	59.8	24.1	4,730	75.8	24.4
Jun-04-1997	44.9	22.9	4,820	77.2	18.7
Jun-05-1997	50.2	22.7	4,800	75.7	20.5
Jun-06-1997	53.4	22.5	4,680	56.7	16.3
Jun-07-1997	46.7	23.3	4,660	55.8	14.1
Jun-08-1997	48.7	23.8	4,680	56.5	14.8
Jun-09-1997	51.6	24.1	4,780	51.3	14.3
Jun-10-1997	51.9	24.6	4,680	45.4	12.7
Jun-11-1997	58.1	24.8	4,770	56.8	17.8
Jun-12-1997	56.5	24.5	4,590	58.4	17.8
Jun-13-1997	59.8	22.1	5,040	78.6	25.4
Jun-14-1997	64.4	22.7	4,910	64.4	22.4
Jun-15-1997	62.6	24.0	4,850	67.8	22.9
Jun-16-1997	60.2	25.2	4,840	69.0	22.4
Jun-17-1997	69.9	26.7	4,820	73.0	27.5
Jun-18-1997	66.1	27.1	4,300	61.2	21.8
Jun-19-1997	61.6	27.4	4,440	65.4	21.7
Jun-20-1997	60.8	26.8	4,540	66.7	21.9
Jun-21-1997	61.8	25.4	4,380	57.2	19.1
Jun-22-1997	59.1	24.0	4,580	74.7	23.8
Jun-23-1997	58.9	23.3	4,410	67.7	21.5
Jun-24-1997	58.9	23.5	4,450	66.2	21.0
Jun-25-1997	50.3	24.7	4,260	55.8	15.1
Jun-26-1997	48.2	25.5	4,680	68.1	17.7
Jun-27-1997	50.8	25.3	4,650	59.1	16.2
Jun-28-1997	52.3	24.6	4,570	56.8	16.0
Jun-29-1997	57.7	23.7	4,530	54.2	16.9
Jun-30-1997	53.4	23.4	4,470	53.0	15.3
.	.	.	.	.	.
Mean	58.1	24.5	4,642	64.3	
<b>Total</b>					<b>611</b>

<b>Load Limitation for June 1997 (lbs)</b>	<b>599</b>
--	------------

**Table 3. Continuous water monitoring at Station D  
(Mud Slough North downstream of drainage discharges), June 1997.**

See Table 26 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	Specific Conductance
DATA SOURCE	USGS	USGS	USGS
UNITS	cfs	°C	µS/cm
Jun-01-1997	129	25.4	2,680
Jun-02-1997	115	25.0	3,090
Jun-03-1997	99	23.6	3,290
Jun-04-1997	77	22.3	3,540
Jun-05-1997	81	22.4	3,510
Jun-06-1997	82	22.4	3,490
Jun-07-1997	68	23.6	3,420
Jun-08-1997	74	24.0	3,390
Jun-09-1997	70	24.3	3,560
Jun-10-1997	72	24.7	3,320
Jun-11-1997	81	24.5	3,480
Jun-12-1997	76	24.2	3,530
Jun-13-1997	88	21.9	3,700
Jun-14-1997	86	22.6	3,810
Jun-15-1997	84	24.0	3,950
Jun-16-1997	78	25.5	3,970
Jun-17-1997	83	26.6	3,960
Jun-18-1997	82	26.9	3,500
Jun-19-1997	74	27.1	3,540
Jun-20-1997	79	26.8	3,440
Jun-21-1997	107	25.6	2,800
Jun-22-1997	96	23.9	3,050
Jun-23-1997	80	23.1	3,390
Jun-24-1997	77	23.1	3,450
Jun-25-1997	68	24.6	3,170
Jun-26-1997	63	25.1	3,220
Jun-27-1997	63	24.9	3,070
Jun-28-1997	60	24.2	3,150
Jun-29-1997	66	23.6	3,300
Jun-30-1997	63	23.0	3,050

**Table 4. Continuous water monitoring at Station F (Salt Slough at Highway 165), June 1997.**

See Table 26 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	Specific Conductance
DATA SOURCE	usgs	usgs	usgs
UNITS	cfs	°C	µS/cm
Jun-01-1997	164	25.6	1,480
Jun-02-1997	168	24.8	1,360
Jun-03-1997	163	23.6	1,370
Jun-04-1997	135	22.2	1,450
Jun-05-1997	130	22.2	1,510
Jun-06-1997	176	22.7	1,280
Jun-07-1997	175	24.2	1,280
Jun-08-1997	151	24.4	1,340
Jun-09-1997	168	24.3	1,370
Jun-10-1997	141	24.9	1,410
Jun-11-1997	131	24.5	1,520
Jun-12-1997	151	24.0	1,330
Jun-13-1997	177	21.3	1,170
Jun-14-1997	208	23.0	1,120
Jun-15-1997	204	24.7	1,120
Jun-16-1997	224	26.1	1,080
Jun-17-1997	218	27.5	1,060
Jun-18-1997	156	27.2	1,190
Jun-19-1997	117	27.2	1,320
Jun-20-1997	122	26.1	1,460
Jun-21-1997	134	24.6	1,300
Jun-22-1997	117	23.3	1,390
Jun-23-1997	113	23.2	1,350
Jun-24-1997	111	23.8	1,370
Jun-25-1997	124	25.5	1,280
Jun-26-1997	132	25.8	1,260
Jun-27-1997	129	24.8	1,290
Jun-28-1997	138	23.7	1,200
Jun-29-1997	145	22.2	NP
Jun-30-1997	179	21.7	NP

**Table 5. Continuous water monitoring at Station N (San Joaquin River at Crow's Landing), June 1997.**

See Table 26 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
Jun-01-1997	747	24.9	1,511	8.3
Jun-02-1997	712	24.4	1,598	10.0
Jun-03-1997	721	23.3	1,503	8.9
Jun-04-1997	720	22.0	1,441	7.7
Jun-05-1997	738	21.9	1,294	5.9
Jun-06-1997	689	22.3	1,346	5.4
Jun-07-1997	665	23.7	1,447	6.3
Jun-08-1997	673	25.0	1,322	4.2
Jun-09-1997	683	25.1	1,305	4.3
Jun-10-1997	621	25.5	1,394	4.7
Jun-11-1997	541	25.4	1,501	4.7
Jun-12-1997	568	24.4	1,493	4.9
Jun-13-1997	534	23.4	1,649	6.2
Jun-14-1997	583	23.6	1,578	6.5
Jun-15-1997	683	24.9	1,385	6.6
Jun-16-1997	651	26.2	1,461	7.0
Jun-17-1997	646	27.3	1,442	7.1
Jun-18-1997	631	27.1	1,409	7.6
Jun-19-1997	578	26.8	1,494	8.9
Jun-20-1997	517	26.6	1,530	7.3
Jun-21-1997	487	26.0	1,706	9.1
Jun-22-1997	544	24.9	1,585	7.5
Jun-23-1997	566	24.3	1,438	7.5
Jun-24-1997	576	24.0	1,390	7.3
Jun-25-1997	514	25.0	1,455	7.7
Jun-26-1997	522	25.4	1,482	6.7
Jun-27-1997	523	24.6	1,430	6.7
Jun-28-1997	499	24.3	1,511	7.1
Jun-29-1997	548	23.6	1,428	5.7
Jun-30-1997	577	23.4	1,400	5.7

**Table 6. Weekly water quality monitoring at Station A (inflow to San Luis Drain), 1997.**

See Table 26 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	pH	Specific Conductance	Total Suspended Solids	Selenium (total)	Selenium (dissolved)	Boron
DATA SOURCE	USBR	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C		µS/cm	mg/l	µg/l	µg/l	mg/l
Apr-02-1997	88.8	NA	NA	5,370	120	93.0	95.8	8.1
Apr-09-1997	76.8	NP	NP	5,600	130	108.0	117.0	7.6
Apr-16-1997	82.0	NP	NP	5,310	83	104.0	104.0	7.1
Apr-23-1997	74.8	NP	NP	5,290	110	101.0	97.6	8.0
May-01-1997	62.6	NP	NP	5,480	110	96.8	96.6	8.4
May-07-1997	52.7	NP	NP	4,930	62	73.6	73.0	7.3
May-14-1997	67.1	NP	NP	4,380	130	61.6	57.6	6.8
May-21-1997	69.3	NP	NP	4,380	160	65.0	63.6	7.4
May-28-1997	88.7	NP	NP	4,330	45	58.5	60.6	P
Jun-04-1997	48.2	NA	NA	4,780	87	52.1	50.6	P
Jun-11-1997	52.0	NA	NA	4,980	39	81.0	78.9	P
Jun-18-1997	55.3	NA	NA	4,690	170	67.5	63.1	P
Jun-25-1997	45.2	NA	NA	4,850	130	61.5	60.5	P

**Table 7. Weekly water quality monitoring at Station B (discharge from San Luis Drain), 1997.**

See Table 26 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	pH	Specific Conductance	Total Suspended Solids	Selenium (total)	Selenium (dissolved)	Boron
DATA SOURCE	USBR	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C		µS/cm	mg/l	µg/l	µg/l	mg/l
Apr-03-1997	85.3	14.9	8.1	5,130	33	96.2	93.7	7.4
Apr-10-1997	73.7	14.3	7.6	5,270	37	105.0	102.0	7.2
Apr-17-1997	78.2	21.6	8.2	5,460	34	107.0	110.0	7.8
Apr-24-1997	70.7	18.2	8.0	5,020	48	95.2	93.6	7.3
May-02-1997	61.4	17.1	8.4	5,080	39	72.6	73.7	7.3
May-08-1997	52.1	19.3	8.3	5,270	29	80.3	78.3	7.7
May-15-1997	68.4	24.3	8.5	4,670	28	75.2	75.7	6.6
May-23-1997	69.8	23.2	8.2	4,200	46	64.2	64.6	6.7
May-29-1997	87.3	25.4	8.2	4,350	140	62.3	60.9	P
Jun-05-1997	50.2	23.2	8.0	4,820	46	72.8	70.4	P
Jun-12-1997	56.5	24.3	8.5	4,560	27	54.6	55.0	P
Jun-19-1997	61.6	NA	NA	NA	23	NA	71.3	NA
Jun-25-1997	50.3	24.3	8.3	4,690	13	73.3	73.6	P



Table 8. Weekly water quality monitoring at Station C (Mud Slough North upstream of drainage discharges), 1997.

See Table 26 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
Apr-03-1997	.	18.8	8.2	2,350	1.1	2.6
Apr-10-1997	.	12.1	6.8	2,960	1.3	2.9
Apr-17-1997	.	22.1	8.2	1,720	1.7	1.5
Apr-24-1997	.	16.6	8.4	2,360	1.2	2.1
May-02-1997	.	17.1	8.2	2,430	0.9	2.3
May-08-1997	.	17.1	8.3	2,470	0.8	2.1
May-15-1997	.	28.8	8.5	1,430	1.4	1.1
May-23-1997	.	21.0	7.9	1,083	0.7	0.1
May-29-1997	.	24.3	8.3	1,134	1.2	P
Jun-05-1997	.	23.2	8.3	1,610	1.6	P
Jun-12-1997	.	25.4	8.3	1,502	1.5	P
Jun-19-1997	.	NA	NA	NA	NA	NA
Jun-25-1997	.	24.3	7.9	1,456	1.7	P

Table 9. Weekly water quality monitoring at Station D (Mud Slough North downstream of drainage discharges), 1997.

See Table 26 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
Apr-03-1997	118	15.4	8.1	4,420	61.9	6.1
Apr-10-1997	104	14.3	7.3	4,770	69.1	6.2
Apr-17-1997	143	22.1	8.0	3,870	58.6	4.9
Apr-24-1997	95	17.7	8.4	4,660	79.6	6.5
May-02-1997	90	17.7	8.4	4,280	52.0	5.9
May-08-1997	68	19.3	8.1	4,930	63.1	6.8
May-15-1997	95	28.2	8.6	3,920	58.7	5.3
May-23-1997	173	22.1	7.9	2,730	33.4	3.8
May-29-1997	180	24.3	8.5	2,890	32.3	P
Jun-05-1997	81	23.2	8.3	3,810	47.2	P
Jun-12-1997	76	25.4	8.5	3,730	36.4	P
Jun-19-1997	74	NA	NA	NA	NA	NA
Jun-25-1997	68	24.3	8.2	3,640	41.6	P

Table 10. Weekly water quality monitoring at Station F (Salt Slough at Lander Avenue), 1997.

See Table 26 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	USBR	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C		µS/cm	µg/l	mg/l
Apr-03-1997	176	15.4	7.7	1,996	1.0	1.1
Apr-10-1997	143	14.3	8.1	1,857	0.9	0.8
Apr-17-1997	151	21.0	8.0	1,770	1.1	0.8
Apr-24-1997	121	16.6	7.5	1,817	1.1	0.8
May-02-1997	106	16.0	8.2	1,670	1.1	0.8
May-08-1997	121	20.4	7.9	1,705	1.1	0.8
May-15-1997	125	23.8	7.9	1,670	1.1	0.7
May-23-1997	128	22.1	8.2	1,358	0.9	0.6
May-29-1997	213	25.4	8.4	1,201	1.3	P
Jun-05-1997	130	21.0	6.6	1,620	1.2	P
Jun-12-1997	151	26.6	8.1	1,372	1.1	P
Jun-19-1997	117	NA	NA	NA	NA	NA
Jun-25-1997	124	24.3	7.8	1,353	1.1	P

Table 11. Weekly water quality monitoring at Station G (San Joaquin River at Fremont Ford), 1997.

See Table 26 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
Apr-03-1997	.	14.9	8.1	1,650	0.6	0.6
Apr-10-1997	.	14.3	7.9	1,700	0.8	2.0
Apr-17-1997	.	20.4	7.1	2,030	0.9	0.8
Apr-24-1997	.	17.7	7.9	1,972	0.8	0.7
May-02-1997	.	17.7	8.1	1,840	0.8	0.7
May-08-1997	.	19.3	8.0	1,900	1.0	0.7
May-15-1997	.	23.2	7.8	2,110	0.9	0.7
May-23-1997	.	21.0	6.8	1,626	0.8	0.6
May-29-1997	.	24.3	8.2	1,348	1.1	P
Jun-05-1997	.	21.0	8.2	1,820	1.1	P
Jun-12-1997	.	26.6	8.4	1,594	1.5	P
Jun-19-1997	.	NA	NA	NA	NA	NA
Jun-25-1997	.	23.8	8.2	1,516	1.0	P

**Table 12. Weekly water quality monitoring at Station H (San Joaquin River at Hills Ferry), 1997.**

See Table 26 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
Apr-03-1997	13.8	7.9	2,270	11.4	1.7
Apr-10-1997	14.3	7.8	2,500	15.0	2.0
Apr-17-1997	20.4	7.6	2,670	18.0	2.1
Apr-24-1997	16.6	7.5	2,590	16.0	2.1
May-02-1997	18.8	8.2	2,340	15.8	2.0
May-08-1997	20.4	6.5	2,240	9.7	1.6
May-15-1997	27.1	8.2	2,700	15.3	2.1
May-23-1997	21.0	7.6	2,040	10.2	1.7
May-29-1997	26.6	8.1	1,984	13.0	P
Jun-05-1997	20.4	8.1	2,390	13.2	P
Jun-12-1997	24.3	8.3	2,410	11.3	P
Jun-19-1997	NA	NA	NA	NA	NA
Jun-25-1997	23.2	8.3	2,400	16.3	P

**Table 13. Weekly water quality monitoring at Station J (Camp 13 Ditch), 1997.**

See Table 26 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
Apr-02-1997	NA	NA	3,750	4.7	6.5
Apr-09-1997	NA	NA	560	1.7	0.3
Apr-16-1997	NA	NA	1,288	2.7	1.6
Apr-23-1997	NA	NA	480	1.6	0.3
May-01-1997	NA	NA	955	2.6	1.0
May-07-1997	NA	NA	1,207	13.5	1.1
May-14-1997	NA	NA	520	1.0	0.3
May-21-1997	NA	NA	496	1.0	0.3
May-28-1997	NA	NA	715	2.5	P
Jun-04-1997	NA	NA	1,186	2.3	P
Jun-11-1997	NA	NA	703	1.5	P
Jun-18-1997	NA	NA	519	1.4	P
Jun-25-1997	NA	NA	1,392	2.3	P

**Table 14. Weekly water quality monitoring at Station K (Agatha Canal), 1997.**

See Table 26 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
Apr-02-1997	NA	NA	457	3.0	0.3
Apr-09-1997	NA	NA	661	2.0	0.4
Apr-16-1997	NA	NA	559	2.6	0.3
Apr-23-1997	NA	NA	481	1.5	0.3
May-01-1997	NA	NA	520	1.5	0.3
May-07-1997	NA	NA	547	1.1	0.3
May-14-1997	NA	NA	497	1.3	0.3
May-21-1997	NA	NA	486	1.0	0.3
May-28-1997	NA	NA	504	1.1	P
Jun-04-1997	NA	NA	481	1.7	P
Jun-11-1997	NA	NA	476	1.3	P
Jun-18-1997	NA	NA	484	1.2	P
Jun-25-1997	NA	NA	423	1.1	P

**Table 15. Weekly water quality monitoring at Station L (San Luis Canal at Henry Miller Road), 1997.**

See Table 26 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
Apr-02-1997	NA	NA	1,820	3.6	2.3
Apr-09-1997	NA	NA	1,550	2.7	1.8
Apr-16-1997	NA	NA	1,114	3.2	0.9
Apr-23-1997	NA	NA	1,122	3.3	1.1
May-01-1997	NA	NA	860	3.0	0.8
May-07-1997	NA	NA	775	2.3	0.6
May-14-1997	NA	NA	803	1.6	0.6
May-21-1997	NA	NA	908	1.9	0.9
May-28-1997	NA	NA	848	1.9	P
Jun-04-1997	NA	NA	909	2.6	P
Jun-11-1997	NA	NA	798	2.1	P
Jun-18-1997	NA	NA	813	2.2	P
Jun-25-1997	NA	NA	860	2.1	P

**Table 16. Weekly water quality monitoring at Station M (Santa Fe Canal at Henry Miller Road), 1997.**

See Table 26 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
Apr-02-1997	NA	NA	1,570	1.8	2.6
Apr-09-1997	NA	NA	1,480	2.4	1.8
Apr-16-1997	NA	NA	1,717	3.0	1.7
Apr-23-1997	NA	NA	1,128	3.2	1.1
May-01-1997	NA	NA	870	2.6	0.8
May-07-1997	NA	NA	825	2.9	0.7
May-14-1997	NA	NA	861	1.9	0.7
May-21-1997	NA	NA	746	1.6	0.6
May-28-1997	NA	NA	892	2.1	P
Jun-04-1997	NA	NA	1,097	2.6	P
Jun-11-1997	NA	NA	1,068	2.5	P
Jun-18-1997	NA	NA	968	2.4	P
Jun-25-1997	NA	NA	1,065	2.4	P

**Table 17. Weekly water quality monitoring at Station N (San Joaquin River at Crow's Landing), 1997.**

See Table 26 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
Apr-03-1997	1,660	12.1	7.9	1,039	3.9	0.7
Apr-10-1997	1,080	14.3	7.9	1,436	7.4	1.0
Apr-17-1997	1,160	19.9	7.5	1,390	8.2	1.0
Apr-24-1997	1,450	17.1	7.4	990	5.2	0.7
May-02-1997	1,550	16.6	8.1	695	3.3	0.5
May-08-1997	1,560	18.8	7.8	691	2.9	0.4
May-15-1997	1,090	24.9	7.9	1,091	4.8	0.7
May-23-1997	808	21.0	7.7	1,310	6.1	1.0
May-29-1997	839	25.4	8.2	1,274	6.5	P
Jun-05-1997	738	19.9	8.0	1,299	5.7	P
Jun-12-1997	568	24.3	8.1	1,460	4.7	P
Jun-19-1997	578	NA	NA	NA	NA	NA
Jun-25-1997	514	23.2	8.1	1,412	6.9	P

Table 18. Summary of fathead minnow (*Pimephales promelas*) larvae survival in 7-day tests using water samples collected from December 1995 to June 1997. Each value is the mean of 4 replicates with 10 fish in each replicate.

See Table 26 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	%	%	%	%	%	%
December-95	NT	83	95	93	90	93
March-96	NT	93	95	93	95	96
August-96	NT	98	93	96	90	100
October-96	68	83	88	88	93	98
November-96	98	98	95	85	95	93
December-96	98	50*	78*	93	98	100
January-97	95	92	83	90	88	95
February-97	95	90*	95	90	100	48
March-97	95	98	98	93	98	95
April-97	95	100	95	98	88	83
May-97	95	100	95	100	93	100
June-97	93	98	95	93	90	90

Table 19. Summary of fathead minnow (*Pimephales promelas*) larvae growth in 7-day tests using water samples collected from December 1995 to June 1997. Each value is the mean of 4 replicates with 10 fish in each replicate.

See Table 26 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
December-95	NT	0.32	0.27	0.32	0.32	0.32
March-96	NT	0.43	0.44	0.44	0.47	0.48
August-96	NT	0.56	0.45	0.44	0.50	0.47
October-96	0.56	0.56	0.53*	0.59	0.60	0.59
November-96	0.53	0.57	0.63	0.53	0.55	0.59
December-96	0.71	0.71	0.83	0.65	0.68	0.58
January-97	0.74	0.80	0.80	0.83	0.65	0.71
February-97	0.69*	0.79	0.77	0.92	0.76	0.31
March-97	0.99	0.96	1.01	0.90	0.81	0.81
April-97	1.11	1.02	1.06	1.15	1.05	0.83
May-97	0.85	0.91	0.95	0.89	0.88	0.80
June-97	0.66	0.69	0.71	0.72	0.68	0.73

Table 20. Summary of *Daphnia magna* survival in 7-day tests using water samples collected from December 1995 to June 1997. Each value is the mean of 10 replicates with 1 animal in each replicate.

See Table 26 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	%	%	%	%	%	%
December-95 <sup>(1)</sup>	NT	100	100	100	100	100
March-96	NT	90	90	100	100	100
August-96	NT	100	100	100	100	100
October-96	90	100	100	100	100	70
November-96	100	90	90	100	100	100
December-96	100	80	80	100	100	100
January-97	100	90	100	100	100	100
February-97	100	100	100	100	100	100
March-97	100	90	90	80	100	50
April-97	80	90	100	90	90	50
May-97	90	90	90	80	90	30
June-97	90	100	70	100	80	90

Table 21. Summary of *Daphnia magna* reproduction in 7-day tests using water samples collected from December 1995 to June 1997. Each value is the mean of 10 replicates with 1 animal in each replicate.

See Table 26 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
December-95 <sup>(1)</sup>	NT	21.5	18.5	18.4	19.8	15.5
March-96	NT	18.8	23.9	18.2	20.1	20.8
August-96	NT	27.0	32.8	27.4	27.8	26.4
October-96	16.8	20.2	17.9	13.1	12.9	16.0
November-96	30.6	21.8	21.9	22.4	21.5	15.9
December-96	23.2	14.0	17.2	17.8	16.8	14.8
January-97	15.2	15.4	15.3	15.6	13.6	10.9
February-97	25.1	23.0	22.8	20.1	18.0	22.7
March-97	22.8	16.6	15.3	9.7	8.9	5.5
April-97	23.6	24.4	24.6	16.3	12.9	10.0
May-97	30.6	33.8	34.0	21.6	17.2	20.0
June-97	50.9	58.8	41.1	50.2	29.6	31.6

Table 22. Summary of *Selenastrum capricornutum* growth in 4-day tests using water samples collected from December 1995 to June 1997. Each value is the mean of 4 replicates.

See Table 26 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
December-95	NT	22.0	12.0	11.0	12.0	11.0
March-96	NT	9.4*	11.3	14.7	11.9	10.7
August-96	NT	6.2*	5.6*	13.8	16.8	14.7
October-96 <sup>(2)</sup>	4.3	12.3	11.3	8.5	3.5	36.6
November-96 <sup>(3)</sup>	16.6	56.1	48.9	33.5	39.7	91.1
December-96	0.5*	5.9	0.5*	4.2	3.4	18.9
January-97	11.0	9.3	12.5	11.6	8.0	8.2
February-97	10.6	5.5*	8.2*	13.7	19.8	22.2
March-97	11.0 *	13.8	11.7 *	6.0 *	20.0	21.6
April-97	19.7*	35.4*	46.5	30.8*	78.5	62.9
May-97	22.4	12.6*	18.6*	16.8*	26.3	17.2
June-97	42.0*	55.6	44.6	44.4	54.2	57.9

Table 23. Summary of selenium concentrations in grab water samples collected at study sites for use in laboratory toxicity tests, December 1995 to June 1997.

See Table 26 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
Dec-11-1995	NT	1	1	12	<1
Dec-12-1995	NT	<1	<1	14	<1
Dec-15-1995	NT	<1	<1	12	<1
Mar-18-1996	NT	<1	<1	17	<1
Mar-21-1996	NT	<1	<1	16	<1
Mar-23-1996	NT	<1	<1	18	<1
Mar-27-1996	NT	1	<1	19	<1
Aug-06-1996	NT	3	2	13	<1
Aug-08-1996	NT	<1	1	13	<1
Aug-10-1996	NT	2	2	11	<1
Aug-13-1996	NT	NT	NT	NT	NT
Oct-08-1996	65	<1	20	1	<1
Oct-10-1996	62	<1	16	1	<1
Oct-12-1996	72	<1	19	<1	<1
Nov-12-1996	59	<1	7	<1	<1
Nov-14-1996	75	<1	9	<1	<1
Nov-16-1996	69	<1	11	<1	<1
Nov-19-1996	94	<1	12	<1	<1
Dec-10-1996	36	<1	5	<1	<1
Dec-12-1996	54	<1	8	<1	<1
Dec-14-1996	51	<1	5	2	<1
Jan-07-1997	37	<2	3	<2	<2
Jan-09-1997	45	<2	4	<2	<2
Jan-11-1997	48	<2	5	<2	<2
Feb-04-1997	58	<2	6	5	<2
Feb-06-1997	66	<2	8	6	<2
Feb-08-1997	89	<2	15	<2	<2
Mar-11-1997	100	<2	50	<2	<2
Mar-13-1997	99	<2	49	<2	<2
Mar-15-1997	95	<2	33	<2	<2
Apr-15-1997	130	2.7	100	<2	<2
Apr-17-1997	130	<2	67	<2	<2
Apr-19-1997	120	<2	69	<2	<2
May-13-1997	84	<2	64	<2	<2
May-15-1997	79	<2	58	<2	<2
May-17-1997	64	<2	47	<2	<2
May-20-1997	64	<2	34	<2	<2
Jun-10-1997	46	<2	28	<2	<2
Jun-12-1997	56	<2	37	<2	<2
Jun-14-1997	75	<2	43	<2	<2



Table 24. Summary of sulfate concentrations in grab water samples collected at study sites for use in laboratory toxicity tests, December 1995 to June 1997.

See Table 26 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
Dec-11-1995	NT	NT	NT	NT	NT
Dec-12-1995	NT	NT	NT	NT	NT
Dec-15-1995	NT	NT	NT	NT	NT
Mar-18-1996	NT	320	320	520	55
Mar-21-1996	NT	330	360	490	52
Mar-23-1996	NT	350	370	530	52
Mar-27-1996	NT	350	330	550	51
Aug-06-1996	NT	220	270	410	55
Aug-08-1996	NT	680	450	390	20
Aug-10-1996	NT	260	370	370	48
Aug-13-1996	NT	NT	NT	NT	NT
Oct-08-1996	1,400	89	480	140	32
Oct-10-1996	1,400	89	480	140	31
Oct-12-1996	1,600	85	540	150	26
Nov-12-1996	1,200	124	311	227	66
Nov-14-1996	1,380	120	336	231	26
Nov-18-1996	1,420	138	465	214	25
Dec-10-1996	1,590	138	330	284	33
Dec-12-1996	1,540	124	351	255	33
Dec-14-1996	1,330	133	269	288	33
Jan-07-1997	766	105	170	347	29
Jan-09-1997	1,210	107	229	172	27
Jan-11-1997	1,210	115	224	199	20
Feb-04-1997	1,310	104	241	389	49
Feb-06-1997	1,420	135	315	410	50
Feb-08-1997	1,660	200	450	351	59
Mar-11-1997	1,600	391	1,010	147	34
Mar-12-1997	1,500	361	953	156	39
Mar-13-1997	1,440	429	845	175	43
Apr-15-1997	1,800	402	1,440	248	36
Apr-17-1997	1,750	340	1,080	259	38
Apr-19-1997	1,680	378	1,120	251	37
May-13-1997	1,520	348	1,270	197	37
May-15-1997	1,450	117	683	111	13
May-17-1997	1,320	253	1,070	209	23
May-20-1997	1,300	102	688	181	36
Jun-10-1997	940	76	458	184	48
Jun-12-1997	1,360	278	1,120	179	36
Jun-14-1997	1,520	248	1,160	157	36

Table 25. Summary of quarterly in situ bioassay results from December 1995 to May 1997.

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 26 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-95 <sup>(4)</sup>	NT	NT	NT	NT	NT	NT
March-96 <sup>(5)</sup>	80/80	NT	NT	44/44	NT	70/70
August-96 <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	.

Table 26. 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
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
NP	data not provided - future unknown
NT	not tested
(1)	This test used <i>Ceriodaphnia dubia</i> in water with high hardness. Results were compared to hard water and moderately hard water for definitive bioassays. All treatment means were significantly different from the laboratory control (hard water) for definitive tests.
(2)	Selenate added
(3)	Lab Control was significantly different from DMC, Site B, and Site F samples. (There was no significant difference for site samples versus DMC water.)
(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 Sites D and F cages and light silt accumulation was observed in both the Windmill site and Site B.
(8)	Moderate silt accumulation was noted in Sites B and F cages and light silt accumulation was observed in Site D.
*	Significantly reduced from Delta Mendota Canal (p<0.05)