

# GRASSLAND BYPASS PROJECT

## MONTHLY DATA REPORT

May 1999

July 26, 1999

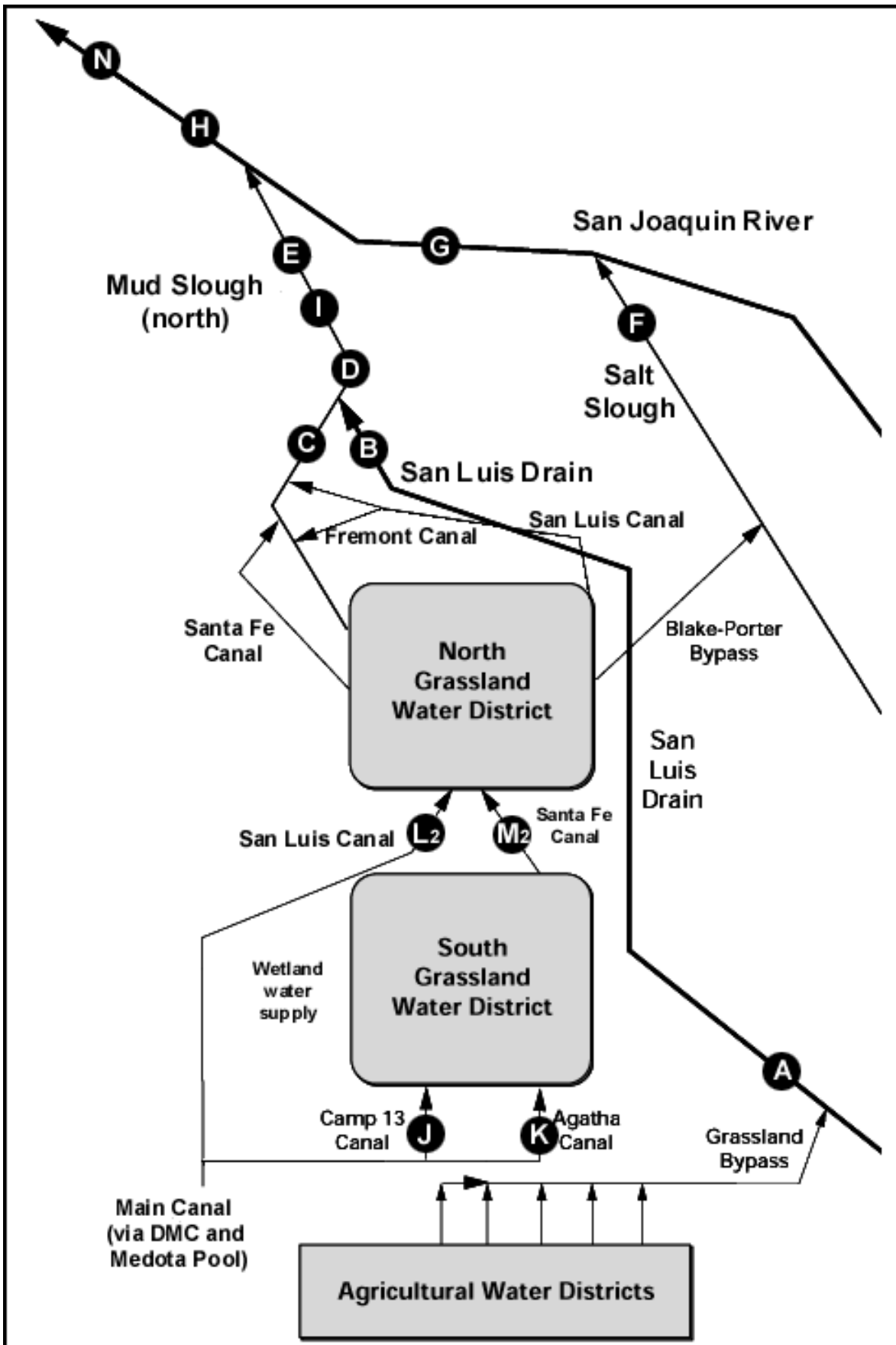
### Preliminary Results

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

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

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow
DATA SOURCE	usgs
UNITS	cfs
May-01-1999	43
May-02-1999	41
May-03-1999	39
May-04-1999	37
May-05-1999	40
May-06-1999	44
May-07-1999	47
May-08-1999	45
May-09-1999	51
May-10-1999	47
May-11-1999	41
May-12-1999	41
May-13-1999	51
May-14-1999	53
May-15-1999	51
May-16-1999	57
May-17-1999	55 e
May-18-1999	54 e
May-19-1999	48
May-20-1999	49
May-21-1999	48
May-22-1999	50
May-23-1999	53
May-24-1999	57
May-25-1999	56
May-26-1999	51
May-27-1999	52
May-28-1999	46
May-29-1999	51
May-30-1999	54
May-31-1999	59
Mean	49

**Table 2. Continuous water monitoring at Station B (discharge from San Luis Drain), May 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
May-01-1999	41.5	18.1	7.7	5,330	75.8	17.0
May-02-1999	42.9	17.9	7.7	5,330	73.0	16.9
May-03-1999	41.3	16.9	8.0	5,300	76.7	17.1
May-04-1999	38.7	17.4	7.9	5,270	82.7	17.3
May-05-1999	40.0	18.9	7.5	4,900	69.8	15.1
May-06-1999	42.0	20.3	6.2	4,340	55.0	12.5
May-07-1999	44.1	20.7	6.6	4,420	58.8	14.0
May-08-1999	45.1	19.6	7.1	4,690	61.5	15.0
May-09-1999	45.7	18.0	6.9	4,500	60.2	14.8
May-10-1999	51.0	17.8	7.2	4,660	64.4	17.7
May-11-1999	46.1	19.2	7.3	4,650	63.0	15.7
May-12-1999	42.2	20.9	7.2	4,680	67.8	15.4
May-13-1999	41.1	20.8	6.9	4,610	63.4	14.1
May-14-1999	49.1	19.8	7.8	4,420	62.7	16.6
May-15-1999	50.8	19.2	7.4	4,930	64.1	17.6
May-16-1999	53.5	18.9	7.6	4,860	65.3	18.8
May-17-1999	57.7	19.9	7.6	4,720	67.5	21.0
May-18-1999	52.6	21.0	7.5	4,540	61.5	17.4
May-19-1999	53.2	21.4	6.9	4,350	52.5	15.1
May-20-1999	48.6	20.9	7.1	4,380	51.8	13.6
May-21-1999	49.9	20.2	6.9	4,720	54.3	14.6
May-22-1999	48.8	21.0	7.0	4,740	50.3	13.2
May-23-1999	51.3	22.1	7.2	4,820	51.2	14.2
May-24-1999	54.7	22.6	7.3	4,760	46.5	13.7
May-25-1999	58.2	23.4	7.3	4,900	54.4	17.1
May-26-1999	55.5	24.5	7.3	4,860	58.8	17.6
May-27-1999	51.1	24.5	6.9	4,710	54.0	14.9
May-28-1999	43.3	24.2	6.8	4,570	49.7	11.6
May-29-1999	45.5	23.0	7.0	4,710	51.1	12.5
May-30-1999	52.1	21.5	7.3	4,820	49.4	13.9
May-31-1999	54.4	21.8	7.6	5,130	53.6	15.7
Mean	48.1	20.5	7.2	4,760	60.3	
<b>Total</b>						<b>482</b>

<b>Load Limitation for May 1999 (lbs)</b>	<b>633</b>
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**Table 3. Continuous water monitoring at Station D  
(Mud Slough North downstream of drainage discharges), May 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
May-01-1999	81	18.7	2,840
May-02-1999	77	17.9	2,900
May-03-1999	79	16.9	2,960
May-04-1999	87	17.2	3,010
May-05-1999	94	18.7	2,950
May-06-1999	93	20.3	2,750
May-07-1999	88	20.1	2,940
May-08-1999	84	19.0	2,980
May-09-1999	83	17.5	2,950
May-10-1999	83	17.7	3,130
May-11-1999	90	19.4	2,980
May-12-1999	89	21.1	2,850
May-13-1999	85	20.5	3,400
May-14-1999	89	19.9	3,700
May-15-1999	100	19.2	3,650
May-16-1999	90	19.2	4,140
May-17-1999	89	20.3	3,810
May-18-1999	97	21.5	3,360
May-19-1999	95	21.7	3,070
May-20-1999	95	21.2	2,710
May-21-1999	95	20.9	2,860
May-22-1999	101	21.9	2,720
May-23-1999	106	22.9	2,630
May-24-1999	106	23.0	2,720
May-25-1999	104	23.7	2,900
May-26-1999	103	25.1	3,030
May-27-1999	118	24.8	2,450
May-28-1999	136	24.1	2,160
May-29-1999	133	22.6	2,030
May-30-1999	129	21.7	2,240
May-31-1999	122	22.4	2,510

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

See Table 27 for explanation of footnotes and agency abbreviations.

<b>PARAMETER</b>	<b>Flow</b>	<b>Temperature</b>	<b>Specific Conductance</b>
<b>DATA SOURCE</b>	usgs	usgs	usgs
<b>UNITS</b>	cfs	°C	µS/cm
May-01-1999	246	18.9	910
May-02-1999	258	17.9	901
May-03-1999	279	16.3	891
May-04-1999	282	17.1	921
May-05-1999	262	18.5	1,050
May-06-1999	226	20.7	1,160
May-07-1999	189	20.8	1,230
May-08-1999	167	19.1	1,270
May-09-1999	139	17.6	1,410
May-10-1999	141	17.8	1,420
May-11-1999	157	19.7	1,240
May-12-1999	162	21.9	1,230
May-13-1999	130	20.8	1,320
May-14-1999	98	19.7	1,710
May-15-1999	94	19.0	1,760
May-16-1999	98	19.5	1,710
May-17-1999	100	21.0	1,620
May-18-1999	108	21.9	1,500
May-19-1999	113	21.5	1,490
May-20-1999	124	20.6	1,350
May-21-1999	125	20.2	1,350
May-22-1999	144	21.9	1,440
May-23-1999	173	23.0	1,230
May-24-1999	185	23.0	1,120
May-25-1999	179	23.8	1,070
May-26-1999	128	25.2	1,360
May-27-1999	116	24.5	1,300
May-28-1999	111	24.1	1,200
May-29-1999	105	22.2	1,200
May-30-1999	98	21.2	1,330
May-31-1999	139	22.1	1,170

**Table 5. Continuous water monitoring at Station N (San Joaquin River at Crow's Landing), May 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
May-01-1999	1,680	17.7	764	3.0
May-02-1999	1,870	17.4	636	2.7
May-03-1999	2,030	16.4	546	2.1
May-04-1999	1,980	15.6	553	2.2
May-05-1999	2,010	16.4	553	2.1
May-06-1999	1,890	17.8	561	2.2
May-07-1999	1,870	18.2	575	1.9
May-08-1999	2,040	17.4	500	1.5
May-09-1999	2,060	16.4	508	1.6
May-10-1999	2,000	16.3	510	1.4
May-11-1999	1,810	17.5	592	1.7
May-12-1999	1,670	19.0	684	2.2
May-13-1999	1,640	19.0	631	1.8
May-14-1999	1,560	18.6	620	1.5
May-15-1999	1,460	18.0	664	1.8
May-16-1999	1,160	18.3	907	2.4
May-17-1999	1,050	19.5	1,050	2.8
May-18-1999	958	20.6	1,140	3.6
May-19-1999	893	20.7	1,180	3.9
May-20-1999	836	21.0	1,200	3.6
May-21-1999	803	21.0	1,220	3.2
May-22-1999	729	21.9	1,210	3.2
May-23-1999	740	22.8	1,290	3.5
May-24-1999	878	23.1	1,210	3.0
May-25-1999	878	23.5	1,080	2.9
May-26-1999	860	24.6	1,100	2.9
May-27-1999	836	24.8	1,140	3.5
May-28-1999	773	24.1	1,170	3.5
May-29-1999	708	23.6	1,200	3.4
May-30-1999	741	22.8	1,200	3.2
May-31-1999	714	23.1	1,180	3.0



**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	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
Mar-03-1999	61	NA	NA	5,110	120	87.0	81.2	7.8
Mar-10-1999	57	NA	NA	5,420	56	88.8	80.9	8.1
Mar-17-1999	55	NA	NA	5,320	58	96.3	92.5	7.4
Mar-24-1999	49	NA	NA	5,780	32	96.1	88.2	7.5
Mar-31-1999	37	NA	NA	5,780	20	91.7	90.0	8.0
Apr-07-1999	37	NA	NA	5,460	30	92.9	86.8	6.5
Apr-14-1999	33	NA	NA	5,740	NA	98.5	94.3	8.1
Apr-21-1999	30	NA	NA	5,150	27	81.4	80.2	P
Apr-28-1999	36	NA	NA	5,270	72	75.3	74.6	7.9
May-05-1999	40	NA	NA	4,520	35	51.0	50.9	6.7
May-12-1999	41	NA	NA	4,880	41	64.6	60.3	7.9
May-19-1999	48	NA	NA	4,640	210	51.4	51.7	7.2
May-26-1999	51	NA	NA	4,840	100	48.9	51.2	7.6

**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
Mar-04-1999	63.3	14.0	7.6	5,400	P	80.7	79.3	7.6
Mar-11-1999	60.0	13.4	7.7	5,210	42	87.3	80.2	7.9
Mar-18-1999	57.4	15.5	8.1	5,130	34	79.6	80.6	7.4
Mar-25-1999	53.5	15.9	7.8	5,390	27	82.7	81.1	7.9
Mar-30-1999	43.3	14.4	8.5	5,670	27	87.0	88.4	8.0
Apr-08-1999	37.6	10.6	7.8	5,920	29	122	124	7.6
Apr-15-1999	26.6	20.9	7.4	5,480	42	90.3	93.4	7.2
Apr-22-1999	28.1	18.0	7.8	5,640	49	91.8	90.0	8.0
Apr-29-1999	35.0	13.9	7.4	5,910	30	98.0	98.4	8.2
May-06-1999	42.0	20.2	7.5	4,360	46	53.3	52.1	6.3
May-13-1999	41.1	19.5	7.5	4,260	36	59.7	58.3	6.8
May-20-1999	48.6	20.8	6.5	4,630	78	58.0	60.1	7.0
May-27-1999	51.1	NA	NA	4,670	80	54.1	53.9	6.7

**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
Mar-04-1999	211	12.6	8.1	1,700	0.7	1.6
Mar-11-1999	169	13.2	8.1	1,920	0.7	2.0
Mar-18-1999	133	16.5	8.1	2,090	0.7	1.9
Mar-25-1999	157	16.3	7.9	1,860	0.8	1.9
Mar-30-1999	121	16.2	NA	2,190	0.9	2.1
Apr-08-1999	93	11.1	8.5	2,300	1.0	2.2
Apr-15-1999	95	22.3	8.4	2,130	1.1	2.0
Apr-22-1999	69	19.0	6.8	2,010	1.6	2.0
Apr-29-1999	54	13.6	8.5	835	2.6	0.7
May-06-1999	51	22.5	8.4	1,180	1.2	1.0
May-13-1999	44	19.4	8.2	1,710	1.1	1.4
May-20-1999	46	21.9	7.9	1,140	0.9	0.9
May-27-1999	67	NA	NA	1,170	0.9	1.0

\*\* 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
Mar-04-1999	274	12.8	8.1	2,670	21.8	3.2
Mar-11-1999	229	13.3	8.0	3,020	24.2	3.8
Mar-18-1999	190	16.0	7.5	3,240	29.7	4.0
Mar-25-1999	210	16.1	7.2	2,910	21.8	3.5
Mar-30-1999	164	16.0	NA	3,350	26.4	4.0
Apr-08-1999	131	10.7	8.3	3,830	43.3	4.3
Apr-15-1999	122	22.2	8.0	3,330	33.4	3.9
Apr-22-1999	97	19.0	6.8	3,490	33.3	4.2
Apr-29-1999	89	14.7	8.2	2,690	21.5	2.9
May-06-1999	93	21.1	8.3	2,860	28.1	3.5
May-13-1999	85	18.9	7.9	3,970	45.5	6.1
May-20-1999	95	21.4	7.5	2,850	25.2	3.7
May-27-1999	118	NA	NA	2,730	22.9	3.3

**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
Mar-04-1999	415	12.7	7.4	1,370	0.9	0.7
Mar-11-1999	273	12.2	7.6	1,610	0.9	1.0
Mar-18-1999	394	14.3	8.4	1,420	1.3	1.1
Mar-25-1999	400	15.9	6.9	1,600	1.1	1.2
Mar-31-1999	234	16.5	8.4	554	<0.4	0.1
Apr-08-1999	210	10.8	7.7	1,850	1.5	1.4
Apr-15-1999	208	19.9	7.4	1,700	0.8	0.9
Apr-22-1999	156	17.1	7.2	1,790	1.3	1.0
Apr-29-1999	145	12.8	7.5	1,490	0.9	0.6
May-06-1999	226	18.8	8.1	1,130	0.6	0.5
May-13-1999	130	18.6	7.8	1,290	0.9	0.6
May-20-1999	124	17.9	7.1	1,370	0.8	0.6
May-27-1999	116	22.7	7.5	1,440	0.7	0.6

**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
Mar-04-1999	.	12.5	6.6	1,310	0.8	0.6
Mar-11-1999	.	11.9	6.9	1,530	0.7	0.7
Mar-18-1999	.	13.7	7.2	1,560	1.1	0.9
Mar-25-1999	.	15.6	7.1	1,390	0.8	0.9
Mar-31-1999	.	15.7	7.9	1,640	0.7	0.9
Apr-08-1999	.	10.8	7.2	1,630	0.7	1.0
Apr-15-1999	.	18.6	6.9	955	<0.4	0.4
Apr-22-1999	.	17.7	7.0	1,540	0.7	0.7
Apr-29-1999	.	12.8	6.5	2,060	0.7	0.7
May-06-1999	.	18.2	7.5	1,310	0.5	0.5
May-13-1999	.	18.2	7.2	1,490	0.8	0.6
May-20-1999	.	18.7	7.3	1,740	0.6	0.7
May-27-1999	.	21.4	7.4	1,530	0.6	0.5

**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
Mar-04-1999	.	13.6	7.8	1,630	5.2	1.2
Mar-11-1999	.	13.3	8.0	1,770	6.5	1.5
Mar-18-1999	.	16.0	8.1	1,980	6.4	1.6
Mar-25-1999	.	18.0	7.9	1,790	5.2	1.6
Mar-30-1999	.	16.4	7.9	2,110	6.3	1.7
Apr-08-1999	.	12.1	6.9	2,270	9.5	1.7
Apr-15-1999	.	22.2	7.2	1,240	3.5	0.9
Apr-22-1999	.	18.3	7.3	1,440	4.5	1.0
Apr-29-1999	.	15.2	7.6	2,160	8.1	1.4
May-06-1999	.	20.6	7.6	1,370	4.3	0.9
May-13-1999	.	19.6	8.1	1,680	6.2	1.2
May-20-1999	.	22.6	7.3	2,340	7.7	1.8
May-27-1999	.	26.4	7.2	1,960	6.9	1.5

**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	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	SLDMWA <sup>††</sup>	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C		µS/cm	µg/L	mg/L
Mar-03-1999	5	NA	NA	374	1.1	0.4
Mar-10-1999	5	NA	NA	518	1.7	0.5
Mar-17-1999	5	NA	NA	686	2.3	0.9
Mar-24-1999	5	NA	NA	1,480	2.7	1.9
Mar-31-1999	5	NA	NA	913	3.1	1.0
Apr-07-1999	5	NA	NA	887	2.9	1.0
Apr-14-1999	5	NA	NA	987	2.5	1.1
Apr-21-1999	5	NA	NA	679	2.3	P
Apr-28-1999	5	NA	NA	561	2.1	0.5
May-05-1999	5	NA	NA	435	1.3	0.3
May-12-1999	15	NA	NA	418	1.8	0.3
May-19-1999	15	NA	NA	454	1.3	0.3
May-26-1999	60	NA	NA	459	1.0	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	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	SLDMWA <sup>1†</sup>	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C		µS/cm	µg/L	mg/L
Mar-03-1999	5	NA	NA	524	0.7	0.7
Mar-10-1999	5	NA	NA	1,850	0.5	4.1
Mar-17-1999	5	NA	NA	2,000	0.8	3.9
Mar-24-1999	5	NA	NA	2,130	1.5	3.3
Mar-31-1999	15	NA	NA	853	2.2	1.1
Apr-07-1999	15	NA	NA	659	3.1	0.6
Apr-14-1999	15	NA	NA	582	2.7	0.6
Apr-21-1999	20	NA	NA	900	2.0	P
Apr-28-1999	20	NA	NA	514	1.7	0.4
May-05-1999	30	NA	NA	396	1.0	0.3
May-12-1999	4	NA	NA	359	1.4	0.2
May-19-1999	7	NA	NA	419	1.2	0.3
May-26-1999	5	NA	NA	461	1.0	0.2

**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	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	SLDMWA <sup>1†</sup>	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C		µS/cm	µg/L	mg/L
Mar-03-1999	25	NA	NA	460	1.9	0.3
Mar-10-1999	18	NA	NA	856	2.2	0.9
Mar-17-1999	36	NA	NA	730	1.9	0.7
Mar-24-1999	34	NA	NA	618	2.2	0.5
Mar-31-1999	31	NA	NA	889	2.9	0.9
Apr-07-1999	30	NA	NA	847	2.9	0.8
Apr-14-1999	28	NA	NA	685	2.7	0.5
Apr-21-1999	42	NA	NA	1,040	2.6	P
Apr-28-1999	60	NA	NA	627	1.9	0.5
May-05-1999	66	NA	NA	656	1.2	0.5
May-12-1999	80	NA	NA	569	2.1	0.4
May-19-1999	110	NA	NA	497	1.4	0.3
May-26-1999	90	NA	NA	485	1.3	0.3

**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	Temperature	pH	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	SLDMWA <sup>††</sup>	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C		µS/cm	µg/L	mg/L
Mar-03-1999	76	NA	NA	1,640	1.3	2.1
Mar-10-1999	61	NA	NA	1,780	1.6	2.5
Mar-17-1999	70	NA	NA	2,160	1.5	3.4
Mar-24-1999	59	NA	NA	2,050	1.7	2.7
Mar-31-1999	49	NA	NA	2,580	1.6	3.8
Apr-07-1999	59	NA	NA	2,320	1.8	3.4
Apr-14-1999	51	NA	NA	2,380	1.6	3.3
Apr-21-1999	39	NA	NA	1,670	2.0	P
Apr-28-1999	41	NA	NA	920	2.2	0.9
May-05-1999	28	NA	NA	950	1.4	0.8
May-12-1999	36	NA	NA	968	1.7	1.0
May-19-1999	43	NA	NA	840	1.4	0.8
May-26-1999	54	NA	NA	1,060	1.7	1.3

**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
Mar-04-1999	2,390	13.5	8.1	958	2.7	0.6
Mar-11-1999	2,120	13.1	8.2	850	2.8	0.7
Mar-18-1999	1,740	15.6	8.1	1,170	3.4	0.8
Mar-25-1999	1,590	17.8	7.9	1,290	3.6	1.0
Mar-30-1999	1,380	16.7	7.6	1,440	4.0	1.1
Apr-08-1999	1,130	12.4	7.7	1,380	4.3	0.9
Apr-15-1999	2,270	20.3	8.0	609	1.5	0.4
Apr-22-1999	2,460	17.6	7.9	550	1.2	0.3
Apr-29-1999	1,850	14.7	8.0	669	2.0	0.4
May-06-1999	1,890	19.9	8.2	544	1.6	0.3
May-13-1999	1,640	18.2	8.4	610	1.9	0.4
May-20-1999	836	22.2	7.6	1,200	2.8	0.8
May-27-1999	836	25.8	7.9	1,180	3.7	0.8

Table 18. Summary of fathead minnow (*Pimephales promelas*) larvae survival in 7-day tests using water samples collected from June 1998 to May 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	%	%	%	%	%	%
June-98	88	98	98	65*	98	95
July-98	98	93	100	78	93	100
August-98	88	100	95	95	95	100
September-98	98	93	100	100	100	100
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

Table 19. Summary of fathead minnow (*Pimephales promelas*) larvae growth in 7-day tests using water samples collected from June 1998 to May 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
June-98	0.64	0.56	0.59	0.38*	0.57	0.64
July-98	0.69	0.52	0.68	0.45	0.53	0.68
August-98	0.65	0.59*	0.64	0.65	0.65	0.63
September-98	0.57	0.56	0.60	0.51	0.53	0.66
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

Table 20. Summary of *Daphnia magna* survival in 7-day tests using water samples collected from June 1998 to May 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	%	%	%	%	%	%
June-98	90	100	75	100	90	0
July-98	70	90	100	90	90	70
August-98	100	100	100	90	90	100
September-98	80	100	90	100	80	100
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

**Table 21. Summary of *Daphnia magna* reproduction in 7-day tests using water samples collected from June 1998 to May 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
June-98	30.8	5.7	7.9	2.3	9.0 <sup>†††</sup>	0
July-98	10.8	11.9	12.6	8.2	6.6 <sup>†††</sup>	5.9
August-98	57.5	71.3	49.1	29.9	32.7	28.2
September-98	46.4	56.2	50.7	45.8	40.5	50.2
October-98	14.7 <sup>*</sup>	22.9	12.5 <sup>*</sup>	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

**Table 22. Summary of *Selenastrum capricornutum* growth in 4-day tests using water samples collected from June 1998 to May 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
June-98	15.8 <sup>*</sup>	25.4	21.3	20.1	22.7	32.1
July-98	23.4	20.5	23.7	23.2	22.2	27.6
August-98	5.6	6.4	6.0	7.5	4.2 <sup>††††</sup>	7.5
September-98	21.6 <sup>*</sup>	27.4	27.7 <sup>*</sup>	29.8	32.3	28.0
October-98	15.5 <sup>*</sup>	33.5	29.8	29.0	26.5	22.0
November-98	10.8 <sup>*</sup>	16.7	15.0 <sup>*</sup>	21.5	21.3 <sup>†</sup>	22.0
December-98	6.0 <sup>*</sup>	18.9	16.0	13.6 <sup>*</sup>	16.2	24.4 <sup>†</sup>
January-99	13.0 <sup>*</sup>	20.6	20.7	19.2 <sup>*</sup>	24.4	25.6
February-99	16.0 <sup>*</sup>	33.5	24.1 <sup>*</sup>	15.7 <sup>*</sup>	31.5	27.1
March-99	14.5	11.8 <sup>*</sup>	15.5	17.6	17.1	22.9
April-99	17.6	14.4 <sup>*</sup>	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>



**Table 23. Summary of selenium concentrations in grab water samples collected at study stations for use in laboratory toxicity tests, March to May 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
Mar-08-1999	89	1.3	26	1.3	0.9
Mar-10-1999	80	0.9	25	1.1	1.0
Mar-12-1999	88	0.9	27	1.4	1.1
Apr-05-1999	94	1.2	45	1.2	1.0
Apr-07-1999	133	1.3	40	1.1	0.8
Apr-09-1999	88	1.4	36	1.5	0.7
May-10-1999	P	P	P	P	P
May-12-1999	P	P	P	P	P
May-14-1999	P	P	P	P	P

**Table 24. Summary of sulfate concentrations in grab water samples collected at study stations for use in laboratory toxicity tests, March to May 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
Mar-08-1999	1,860	286	734	229	40
Mar-10-1999	1,730	296	716	246	43
Mar-12-1999	1,840	322	778	234	51
Apr-05-1999	2,010	423	1,010	365	78
Apr-07-1999	2,150	394	1,010	363	67
Apr-09-1999	1,920	355	875	275	78
May-10-1999	P	P	P	P	P
May-12-1999	P	P	P	P	P
May-14-1999	P	P	P	P	P

**Table 25. Summary of total suspended solids concentrations in grab water samples collected from March to May 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
Mar-08-1999	33	31	29	22	19
Mar-10-1999	16	57	32	18	12
Mar-12-1999	33	24	26	20	<1
Apr-05-1999	28	68	44	29	15
Apr-07-1999	24	98	61	59	12
Apr-09-1999	23	84	54	41	12
May-10-1999	24	132	25	142	19
May-12-1999	24	143	82	138	13
May-14-1999	36	45	24	31	11

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). 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%) and the 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 (1 X 10 <sup>6</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.