GRASSLAND BYPASS PROJECT

MONTHLY DATA REPORT

April 1999

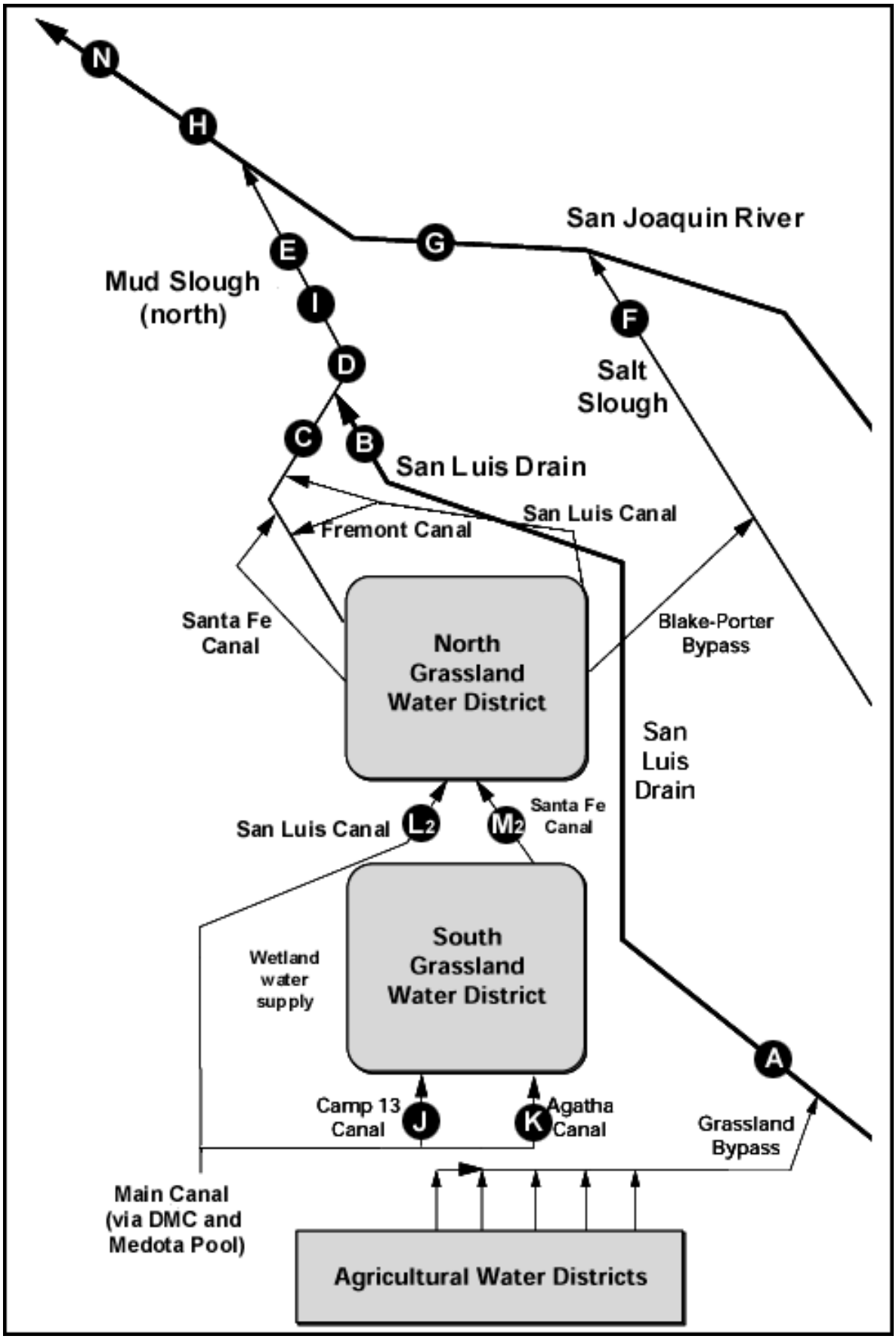
June 28, 1999

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


N
H
San Joaquin River
G
E
Mud Slough
(north)
I
F
D
Salt
Slough
C
B
San Luis Drain
San Luis Canal
Fremont Canal
Santa Fe
Canal
North
Grassland
Water District
Blake-Porter
Bypass
San
Luis
Drain
San Luis Canal
L2
M2
Santa Fe
Canal
South
Grassland
Water District
Wetland
water
supply
A
Camp 13
Canal
J
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Agatha
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Bypass
Main Canal
(via DMC and
Medota Pool)
Agricultural Water Districts

GRASSLAND BYPASS PROJECT

MONTHLY DATA REPORT

LIST OF TABLES FOR MONTHLY REPORT

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

See Table 27 for explanation of footnotes and agency abbreviations.

PARAMETER	Flow
DATA SOURCE	USGS
UNITS	cfs
Apr-01-1999	40
Apr-02-1999	41
Apr-03-1999	44
Apr-04-1999	40
Apr-05-1999	38
Apr-06-1999	35
Apr-07-1999	37
Apr-08-1999	35
Apr-09-1999	33
Apr-10-1999	34
Apr-11-1999	38
Apr-12-1999	37
Apr-13-1999	36
Apr-14-1999	33
Apr-15-1999	33
Apr-16-1999	35
Apr-17-1999	32
Apr-18-1999	32
Apr-19-1999	32
Apr-20-1999	36
Apr-21-1999	30
Apr-22-1999	30
Apr-23-1999	34
Apr-24-1999	35
Apr-25-1999	37
Apr-26-1999	39
Apr-27-1999	37
Apr-28-1999	36
Apr-29-1999	39
Apr-30-1999	39
.	.
Mean	36

Table 2. Continuous water monitoring at Station B (discharge from San Luis Drain), April 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
Apr-01-1999	37.3	15.4	7.5	5,180	96.8	19.5
Apr-02-1999	39.8	14.9	7.3	5,060	90.2	19.4
Apr-03-1999	40.9	14.0	7.6	5,310	97.6	21.5
Apr-04-1999	43.8 e	11.6	7.8	5,330	94.6	22.3
Apr-05-1999	43.3	12.0	8.1	5,410	103	24.1
Apr-06-1999	39.4	12.1	7.8	5,610	98.4	20.9
Apr-07-1999	38.2	11.9	7.7	5,620	99.7 est 1	20.5
Apr-08-1999	37.6	11.8	7.4	5,510	101	20.5
Apr-09-1999	36.5	12.1	7.4	5,360	110	21.7
Apr-10-1999	35.1	13.5	6.9	5,290	90.4	17.1
Apr-11-1999	36.1	13.2	6.4	5,310	92.7	18.0
Apr-12-1999	38.9	13.7	6.5	5,230	90.1	18.9
Apr-13-1999	38.3	16.4	6.4	5,240	81.8	16.9
Apr-14-1999	37.3	18.6	7.1	5,440	83.7	16.8
Apr-15-1999	26.6	20.1	7.4	5,570	92.5	13.3
Apr-16-1999	20.7 e	21.4	7.0	5,410	89.4	10.0
Apr-17-1999	31.9 e	22.9	6.7	5,320	87.3	15.0
Apr-18-1999	29.7 e	23.3	7.5	5,590	98.6	15.8
Apr-19-1999	29.2 e	23.1	7.7	5,600	92.5	14.6
Apr-20-1999	30.2	22.8	7.7	5,680	100	16.3
Apr-21-1999	30.9	21.3	7.7	5,690	103	17.2
Apr-22-1999	28.1	19.6	7.2	5,620	97.8	14.8
Apr-23-1999	29.3	17.0	P	5,860	97.6	15.4
Apr-24-1999	33.0	18.1	P	5,710	95.0	16.9
Apr-25-1999	33.5	18.8	P	5,320	81.8	14.8
Apr-26-1999	36.0	19.4	P	5,460	87.1	16.9
Apr-27-1999	36.7	19.4	P	5,800	86.9	17.2
Apr-28-1999	36.3	15.9	P	5,850	90.8	17.8
Apr-29-1999	35.0	15.1	P	5,940	94.1	17.8
Apr-30-1999	38.1	17.0	P	5,510	81.7	16.8
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Mean	34.9	16.9	7.3	5,490	93.5	
Total						**529**

Load Limitation for April 1999 (lbs)	**759**

Table 3. Continuous water monitoring at Station D (Mud Slough North downstream of drainage discharges), April 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
Apr-01-1999	150	15.0	2,520
Apr-02-1999	147	14.7	2,520
Apr-03-1999	146	13.6	2,530
Apr-04-1999	143	11.3	2,550
Apr-05-1999	142	11.9	2,570
Apr-06-1999	137	12.1	2,590
Apr-07-1999	131	12.1	2,620
Apr-08-1999	131	11.6	2,640
Apr-09-1999	138	12.0	2,660
Apr-10-1999	135	13.2	2,650
Apr-11-1999	132	13.0	2,630
Apr-12-1999	135	13.8	2,620
Apr-13-1999	138	16.7	2,570
Apr-14-1999	137	19.1	2,570
Apr-15-1999	122	20.7	2,560
Apr-16-1999	119	22.6	2,550
Apr-17-1999	124	23.2	2,520
Apr-18-1999	119	23.4	2,490
Apr-19-1999	116	22.8	2,460
Apr-20-1999	112	22.3	2,470
Apr-21-1999	108	20.8	2,480
Apr-22-1999	97	19.1	2,490
Apr-23-1999	103	16.7	2,500
Apr-24-1999	110	18.5	2,520
Apr-25-1999	97	19.2	2,550
Apr-26-1999	93	19.8	2,580
Apr-27-1999	90	19.4	2,630
Apr-28-1999	87	17.7	2,690
Apr-29-1999	89	14.7	2,730
Apr-30-1999	81	17.3	2,780
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Table 4. Continuous water monitoring at Station F (Salt Slough at Highway 165), April 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
Apr-01-1999	203	14.8	2,170
Apr-02-1999	191	14.5	2,090
Apr-03-1999	177	13.6	2,110
Apr-04-1999	166	11.4	2,110
Apr-05-1999	169	12.2	2,150
Apr-06-1999	176	12.3	2,050
Apr-07-1999	185	12.1	1,940
Apr-08-1999	210	11.4	1,740
Apr-09-1999	210	11.9	1,590
Apr-10-1999	181	13.2	1,660
Apr-11-1999	173	13.4	1,770
Apr-12-1999	184	13.8	1,770
Apr-13-1999	202	17.1	1,690
Apr-14-1999	188	19.5	1,710
Apr-15-1999	208	20.9	1,620
Apr-16-1999	219	22.4	1,540
Apr-17-1999	225	23.0	1,410
Apr-18-1999	211	23.0	1,400
Apr-19-1999	188	22.4	1,410
Apr-20-1999	172	21.7	1,470
Apr-21-1999	174	20.0	1,430
Apr-22-1999	156	18.7	1,590
Apr-23-1999	170	16.7	1,380
Apr-24-1999	189	18.2	1,250
Apr-25-1999	177	19.0	1,220
Apr-26-1999	132	19.8	1,490
Apr-27-1999	120	19.6	1,620
Apr-28-1999	115	17.5	1,650
Apr-29-1999	145	14.9	1,440
Apr-30-1999	194	17.3	1,130
.	.	.	.

Table 5. Continuous water monitoring at Station N (San Joaquin River at Crow's Landing), April 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
Apr-01-1999	1,210	15.3	1,520	1.8
Apr-02-1999	1,110	15.0	1,540	1.8
Apr-03-1999	1,070	14.8	1,630	1.7
Apr-04-1999	1,070	12.8	1,520	1.9
Apr-05-1999	1,060	13.2	1,520	2.0
Apr-06-1999	1,080	12.9	1,480	2.4
Apr-07-1999	1,100	13.0	1,430	2.4
Apr-08-1999	1,130	12.3	1,380	2.3
Apr-09-1999	1,210	12.2	1,340	4.6
Apr-10-1999	1,390	12.9	1,160	4.0
Apr-11-1999	1,530	13.0	895	2.5
Apr-12-1999	1,570	13.4	897	1.8
Apr-13-1999	1,940	15.2	755	2.0
Apr-14-1999	2,190	16.4	626	1.3
Apr-15-1999	2,270	17.9	624	1.3
Apr-16-1999	2,230	19.1	631	1.9
Apr-17-1999	2,230	19.8	606	1.2
Apr-18-1999	2,350	19.6	579	1.6
Apr-19-1999	2,430	19.0	557	1.5
Apr-20-1999	2,390	18.6	553	1.5
Apr-21-1999	2,390	17.7	542	1.5
Apr-22-1999	2,460	16.9	549	1.6
Apr-23-1999	2,760	15.3	437	1.3
Apr-24-1999	2,910	15.6	420	1.2
Apr-25-1999	2,950	16.0	414	1.3
Apr-26-1999	2,770	16.4	420	1.3
Apr-27-1999	2,390	16.6	504	1.4
Apr-28-1999	2,140	15.9	573	1.6
Apr-29-1999	1,850	14.6	613	1.7
Apr-30-1999	1,750	16.3	729	P
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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
Feb-03-1999	40	NA	NA	4,940	NA	79.7	82.2	7.3
Feb-10-1999	66	NA	NA	4,110	210	62.0	60.9	5.4
Feb-17-1999	59	NA	NA	4,780	140	70.2	70.6	6.7
Feb-24-1999	62	NA	NA	5,190	98	79.2	79.1	7.9
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	P	75.3	74.6	P

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
Feb-04-1999	42.6	11.8	8.0	3,990	30	54.1	56.6	5.9
Feb-11-1999	67.8	10.3	7.8	4,370	47	71.8	68.7	6.0
Feb-18-1999	65.3	13.6	7.6	4,570	53	68.5	69.5	6.1
Feb-25-1999	68.4	15.2	7.9	4,780	68	69.6	68.1	6.9
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	P

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
Feb-04-1999	139	10.6	8.1	1,780	0.4	1.5
Feb-11-1999	234	9.0	8.1	1,340	0.8	1.2
Feb-18-1999	200	13.7	8.0	1,680	0.9	1.5
Feb-25-1999	173	15.0	7.9	1,700	0.6	1.7
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	P

++ 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
Feb-04-1999	182	11.5	8.1	2,380	12.4	2.6
Feb-11-1999	302	9.3	8.0	2,050	16.3	2.3
Feb-18-1999	265	13.3	7.9	2,460	20.0	2.9
Feb-25-1999	241	14.7	8.0	2,680	22.0	3.5
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	P

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
Feb-04-1999	284	10.3	7.8	1,460	0.8	0.9
Feb-11-1999	493	8.5	7.3	1,300	1.2	0.8
Feb-18-1999	285	13.5	7.6	1,400	0.7	0.8
Feb-25-1999	526	12.9	7.6	1,140	0.8	0.7
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	P

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
Feb-04-1999	.	10.0	7.7	1,310	0.6	0.7
Feb-10-1999	.	10.6	8.0	472	<0.4	0.2
Feb-18-1999	.	12.7	7.9	1,040	0.6	0.5
Feb-25-1999	.	12.6	7.9	839	0.6	0.4
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	P

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
Feb-04-1999	.	11.0	7.8	1,670	3.0	1.2
Feb-10-1999	.	10.7	7.9	793	2.6	0.6
Feb-18-1999	.	12.6	7.7	1,270	4.5	1.0
Feb-25-1999	.	13.6	7.9	1,160	4.2	0.9
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	P

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††	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C		µS/cm	µg/L	mg/L
Feb-03-1999	7	NA	NA	680	2.0	0.6
Feb-10-1999	10	NA	NA	839	1.4	1.1
Feb-17-1999	10	NA	NA	479	1.2	0.4
Feb-24-1999	5	NA	NA	551	1.0	0.7
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	P

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††	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C		µS/cm	µg/L	mg/L
Feb-03-1999	10	NA	NA	2,070	0.9	3.7
Feb-10-1999	20	NA	NA	645	1.5	0.7
Feb-17-1999	20	NA	NA	540	1.0	0.5
Feb-24-1999	10	NA	NA	275	0.6	0.3
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	P

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††	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C		µS/cm	µg/L	mg/L
Feb-03-1999	16	NA	NA	982	1.9	0.9
Feb-10-1999	16	NA	NA	1,010	3.2	0.9
Feb-17-1999	16	NA	NA	786	1.9	0.8
Feb-24-1999	21	NA	NA	690	1.8	0.7
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	P

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††	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB	CVRWQCB
UNITS	cfs	°C		µS/cm	µg/L	mg/L
Feb-03-1999	42	NA	NA	2,100	1.0	2.8
Feb-10-1999	57	NA	NA	1,690	1.3	2.1
Feb-17-1999	70	NA	NA	1,960	1.0	2.6
Feb-24-1999	66	NA	NA	1,880	1.1	2.5
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	P

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
Feb-04-1999	1,550	12.3	8.1	1,050	2.1	0.7
Feb-10-1999	3,100	11.1	7.8	539	1.4	0.3
Feb-18-1999	2,920	11.8	7.7	637	2.0	0.5
Feb-25-1999	3,340	13.0	7.9	614	2.2	0.4
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	P

Table 18. Summary of fathead minnow (*Pimephales promelas*) larvae survival in 7-day tests using water samples collected from May 1998 to April 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	%	%	%	%	%	%
May-98	100	98	98	58	80	100
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 †	83
March-99	75	58	88	85	65 †	100
April-99	93	88	100	83	73 †	100

Table 19. Summary of fathead minnow (*Pimephales promelas*) larvae growth in 7-day tests using water samples collected from May 1998 to April 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
May-98	0.62	0.50	0.54	0.32	0.41	0.51
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

Table 20. Summary of *Daphnia magna* survival in 7-day tests using water samples collected from May 1998 to April 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	%	%	%	%	%	%
May-98	100	100	90	100	100	40
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

Table 21. Summary of *Daphnia magna* reproduction in 7-day tests using water samples collected from May 1998 to April 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
May-98	34.9	34.6	31.6	21.1	20.1	18.4
June-98	30.8	5.7	7.9	2.3	9.0 †††	0
July-98	10.8	11.9	12.6	8.2	6.6 †††	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*	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

Table 22. Summary of *Selenastrum capricornutum* growth in 4-day tests using water samples collected from May 1998 to April 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	10^5 cells/mL	10^5 cells/mL	10^5 cells/mL	10^5 cells/mL	10^5 cells/mL	10^5 cells/mL
May-98	8.7*	26.6	17.8	9.9*	22.2	19.3
June-98	15.8*	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 ††††	7.5
September-98	21.6*	27.4	27.7*	29.8	32.3	28.0
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 ‡	22.0
December-98	6.0*	18.9	16.0	13.6*	16.2	24.4
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 ‡

Table 23. Summary of selenium concentrations in grab water samples collected at study stations for use in laboratory toxicity tests, February to April 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
Feb-08-1999	57	0.7	11	1.1	0.6
Feb-10-1999	60	0.8	17	1.0	0.8
Feb-12-1999	66	0.8	11	1.0	0.6
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

Table 24. Summary of sulfate concentrations in grab water samples collected at study stations for use in laboratory toxicity tests, February to April 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
Feb-08-1999	1,350	269	482	260	47
Feb-10-1999	1,410	272	586	231	45
Feb-12-1999	1,380	215	403	259	56
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

Table 25. Summary of total suspended solids concentrations in grab water samples collected from February to April 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
Feb-08-1999	19	83	73	76	22
Feb-10-1999	40	77	60	115	18
Feb-12-1999	21	85	60	43	20
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

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 (4)	NT	NT	NT	NT	NT	NT
March-1996 (5)	80/80	NT	NT	44/44	NT	70/70
August-1996 (6)	NT	NT	13/19	22/29	28/40	20/49
November-1996 (7)	46/62	63/68	0/2	.	16/36	.
February-1997 (8)	NT	3/13	0/0	.	0/11	.
May-1997	64/66	0/0	0/24	.	5/9	.
August-1997 (9)	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
est 1	Estimated value determined by using method for missing values - average of 4/6/99 - 4/8/99
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 (1×10^6 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.