Grassland Bypass Project
Interim Baseline Monitoring Program

Monthly Data Report

October 2013

A Cooperative Effort Of:

U.S. Bureau of Reclamation

Central Valley Regional Water Quality Control Board

U.S. Fish and Wildlife Service

National Marine Fisheries Service

California Department of Fish and Wildlife

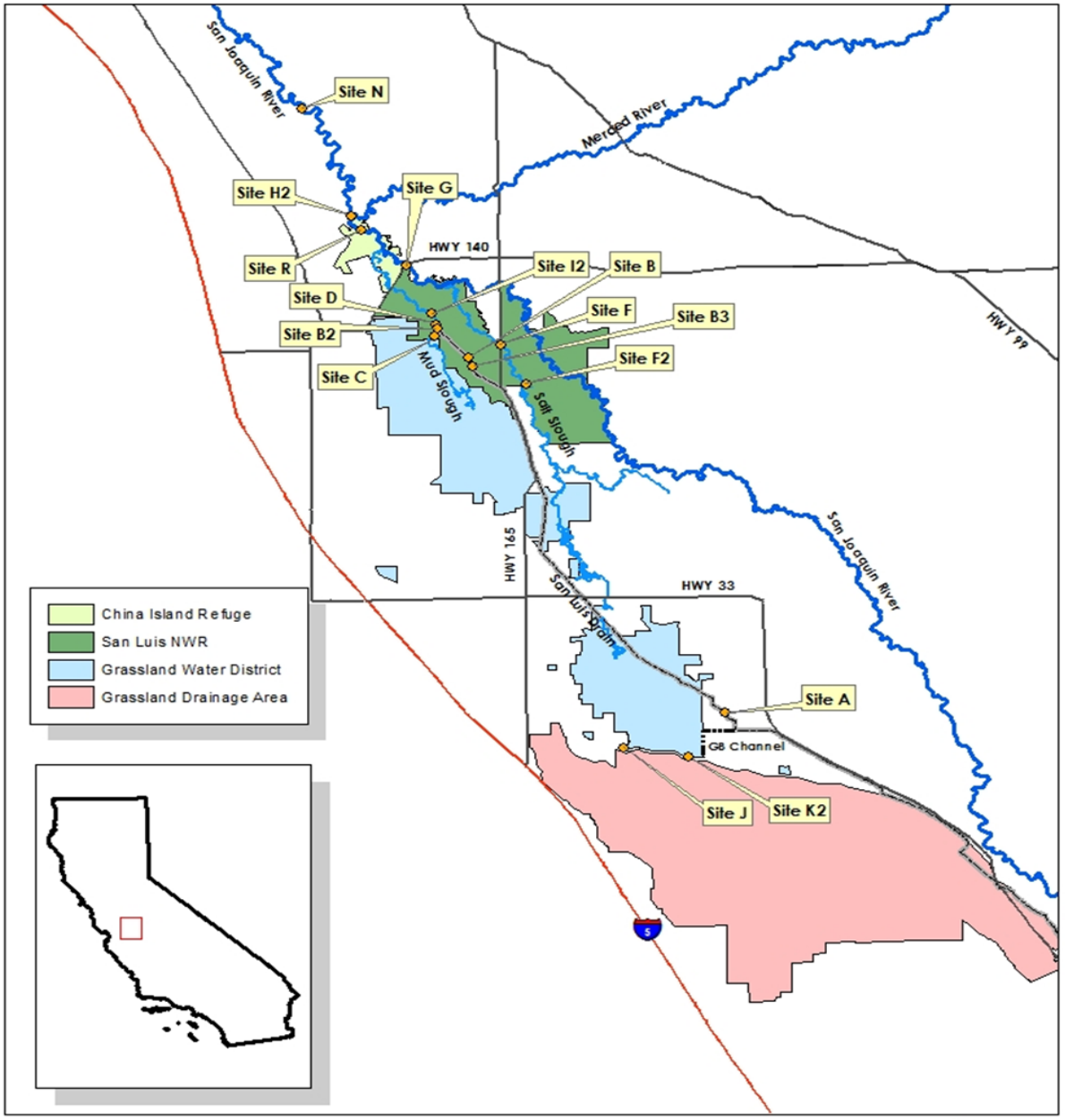
San Luis & Delta-Mendota Water Authority

U.S. Environmental Protection Agency

U.S. Geological Survey

Compiled by San Francisco Estuary Institute

Figure 1. Map of the Grassland Bypass Project area



Grassland Bypass Project

2013 Monitoring Plan Sites

0 2.5 5 10 Miles

N W E S

Grassland Bypass Project
NAD 1983 California Zone 10
U.S. Bureau of Reclamation

GRASSLAND BYPASS PROJECT
MONTHLY DATA REPORT

LIST OF TABLES FOR MONTHLY REPORT

Table 1. Water monitoring of inflow to the San Luis Drain (Station A)

PARAMETER	Flow	Temperature	Specific Conductance	Total Dissolved Solids	Salt Load	Total Suspended Solids	Total Selenium
DATA SOURCE	SLDMWA	SLDMWA	SLDMWA	Calculated	Calculated	SLDMWA	SLDMWA/USBR
UNITS	cfs	°C	µS/cm	mg/L	tons	mg/L	ug/L
Oct-01-2013	9	21.4	6,680	4,943	119		NA
Oct-02-2013	9	20.3	6,620	4,899	117		NA
Oct-03-2013	7	17.7	6,540	4,840	91		NA
Oct-04-2013	4	17.6	6,600	4,884	48		NA
Oct-05-2013	3	18.7	6,770	5,010	40		NA
Oct-06-2013	7	19.1	7,030	5,202	97		NA
Oct-07-2013	5	20.0	8,240	6,098	90	69	NA
Oct-08-2013	6	18.9	9,420	6,971	104		NA
Oct-09-2013	10	17.2	9,290	6,875	179		NA
Oct-10-2013	10	17.3	8,360	6,186	173		NA
Oct-11-2013	10	17.9	8,050	5,957	163		NA
Oct-12-2013	11	18.5	8,360	6,186	176		NA
Oct-13-2013	11	17.7	8,270	6,120	177		NA
Oct-14-2013	8	17.7	8,810	6,519	147	88	16
Oct-15-2013	7	17.7	9,500	7,030	133		16
Oct-16-2013	8	18.0	8,860	6,556	137		17
Oct-17-2013	7	18.2	8,590	6,357	118		15
Oct-18-2013	6	18.3	8,790	6,505	98		15
Oct-19-2013	5	18.2	9,660	7,148	104		17
Oct-20-2013	5	18.3	9,500	7,030	98		14
Oct-21-2013	6	18.2	9,960	7,370	126	42	16
Oct-22-2013	7	18.4	9,210	6,815	136		14
Oct-23-2013	7	18.4	7,800	5,772	107		13
Oct-24-2013	6	18.2	7,680	5,683	90		12
Oct-25-2013	6	17.7	7,530	5,572	93		9.1
Oct-26-2013	5	17.8	8,640	6,394	92		8.7
Oct-27-2013	4	16.9	9,680	7,163	85		10
Oct-28-2013	7	15.2	8,940	6,616	118	89	13
Oct-29-2013	4	14.6	8,940	6,616	79		14
Oct-30-2013	2	14.5	8,870	6,564	43		14
Oct-31-2013	6	15.0	7,840	5,802	93		14
Mean	7	17.8	8,360				14
Total acre-feet	414						
Total (tons)					3,472		
Salt Load Objective (tons)					2,180		

Notes:

See Table 19 for explanation of footnotes and agency abbreviations.

Preliminary Results

October 1-13 no selenium samples collected due to federal furlough

Table 2a. Water monitoring of San Luis Drain Discharge into Mud Slough (north) Station B2 (Terminus at Mud Slough) and Station B3 (Gun Club Road)

PARAMETER	Flow (B2)	Temperature (B2)	Specific Conductance (B2)	Boron (B3)	Total Selenium (B3)	Total Selenium Load
DATA SOURCE	SLDMWA♦	SLDMWA	SLDMWA	USBR	USBR	Computed
UNITS	cfs	°C	µS/cm	mg/L	µg/L	lbs
Oct-01-2013	12	19.7	7,410	17.0	7.3	0.5
Oct-02-2013	13	19.0	6,820	17.0	6.7	0.5
Oct-03-2013	11	18.4	6,640	16.0	7.3	0.4
Oct-04-2013	12	18.7	7,110	18.0	7.5	0.5
Oct-05-2013	10	18.4	7,070	17.0	6.8	0.4
Oct-06-2013	9	20.0	6,880	19.0	7.0	0.3
Oct-07-2013	11	19.5	7,370	18.0	6.8	0.4
Oct-08-2013	11	17.5	6,730	18.0	6.9	0.4
Oct-09-2013	11	15.8	6,560	17.0	7.5	0.4
Oct-10-2013	15	15.8	6,510	18.0	7.8	0.6
Oct-11-2013	15	17.1	6,600	NA	NA	NA
Oct-12-2013	16	18.2	6,250	NA	NA	NA
Oct-13-2013	15	16.3	5,910	NA	NA	NA
Oct-14-2013	16	16.6	6,540	NA	NA	NA
Oct-15-2013	14	16.6	6,290	NA	NA	NA
Oct-16-2013	13	18.4	6,920	NA	NA	NA
Oct-17-2013	13	18.2	6,620	NA	NA	NA
Oct-18-2013	13	18.8	6,230	NA	NA	NA
Oct-19-2013	12	18.5	6,200	NA	NA	NA
Oct-20-2013	12	18.4	6,280	NA	NA	NA
Oct-21-2013	12	18.0	6,090	NA	NA	NA
Oct-22-2013	13	18.0	5,840	NA	NA	NA
Oct-23-2013	14	18.0	5,970	NA	NA	NA
Oct-24-2013	15	16.3	6,030	13.0	8.3	0.7
Oct-25-2013	15	15.7	5,560	12.0	7.7	0.6
Oct-26-2013	14	17.3	5,220	13.0	7.0	0.5
Oct-27-2013	12	15.8	5,480	13.0	7.6	0.5
Oct-28-2013	10	14.9	5,530	13.0	8.3	0.5
Oct-29-2013	12	14.1	6,120	15.0	8.6	0.6
Oct-30-2013	11	13.3	6,220	14.0	7.7	0.5
Oct-31-2013	10	14.8	5,960	13.0	7.3	0.4
Mean	13	17.3	6,350	11.0	7.6	
Total Acre-feet	**777**					
Total (lbs)						**16**
Selenium Load Value (lbs)						**55**

Notes:
See Table 19 for explanation of footnotes and agency abbreviations.
Preliminary Data

Table 2b. Water quality monitoring at Station B3 (discharge from San Luis Drain)

	Physicals						
PARAMETER	Dissolved Oxygen	pH	Specific Conductance	Temperature	Turbidity	Total Selenium	Total Suspended Solids (Site B2)
DATA SOURCE	USBR	USBR	USBR	USBR	USBR	USBR	USBR
UNITS	mg/L	units	µS/cm	°C	NTU	ug/L	mg/L
Oct-01-2013	NA	NA	NA	NA	NA	NA	NA
Oct-08-2013	NA	NA	NA	NA	NA	NA	42
Oct-15-2013	NA	NA	NA	NA	NA	NA	29
Oct-21-2013	10.3	7.5	5,200	18.2	10.3	9.9	31
Oct-28-2013	11.8	7.7	6,560	15.3	11.8	8.9	45
Nov-04-2013	14.0	8.2	5,880	11.5	14.0	5.5	67
Nov-15-2013	11.3	7.7	4,710	15.7	11.3	4.9	34
Nov-22-2013	12.1	7.9	4,620	11.1	12.1	6.2	34
Nov-25-2013	18.6	8.2	5,000	10.4	18.6	6	NA
Dec-06-2013	16.0	7.9	4,940	7.0	16.0	10	10
Dec-10-2013	16.8	7.9	6,650	5.1	16.8	9.8	NA
Dec-17-2013	21.8	7.9	4,620	7.8	21.8	12.0	NA
Dec-27-2013	13.7	7.6	5,540	8.5	13.7	13.0	NA

Notes:

No samples collected early October due to federal furlough

TSS samples collected once a month starting in December

	General Minerals							
	Calcium	Magnesium	Potassium	Sodium	Chloride (Dissolved)	Sulfate (Dissolved)	Total Organic Carbon	Total Dissolved Solids
	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
October 2013	NA	NA	NA	NA	NA	NA	NA	NA
Nov-04-2013	340	150	<10	970	900	1,600	11	NA
Dec-10-2013	280	120	5	930	960	1,800	9	NA

Notes:

No samples collected in October due to federal furlough

	Nutrients				
	Nitrates as N (Dissolved)	Ammonia as N	Total Kjeldahl Nitrogen	Total Phosphorous as P	Ortho-phosphate as P
	USBR	USBR	USBR	USBR	USBR
	mg/L	mg/L	mg/L	mg/L	mg/L
October 2013	NA	NA	NA	NA	NA
Nov-04-2013	0.2	0.1	<0.20	0.2	<0.010
Dec-10-2013	0.3	0.1	1.4	0.1	<0.010

Notes:

No samples collected in October due to federal furlough

	Total Metals								
	Arsenic	Boron	Cadmium	Copper	Lead	Mercury	Molybdenum	Nickel	Zinc
	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
October 2013	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nov-04-2013	6.4	14000	<1.0	26	<2.5	<100	21.0	11.0	6.2
Dec-1-2013	3.3	12000	<0.2	1.0	<0.2	<200	22.0	3.60	<20

Notes:

No samples collected in October due to federal furlough

Figure 2. Monthly selenium discharges from the terminus of the San Luis Drain into Mud Slough compared to load values.

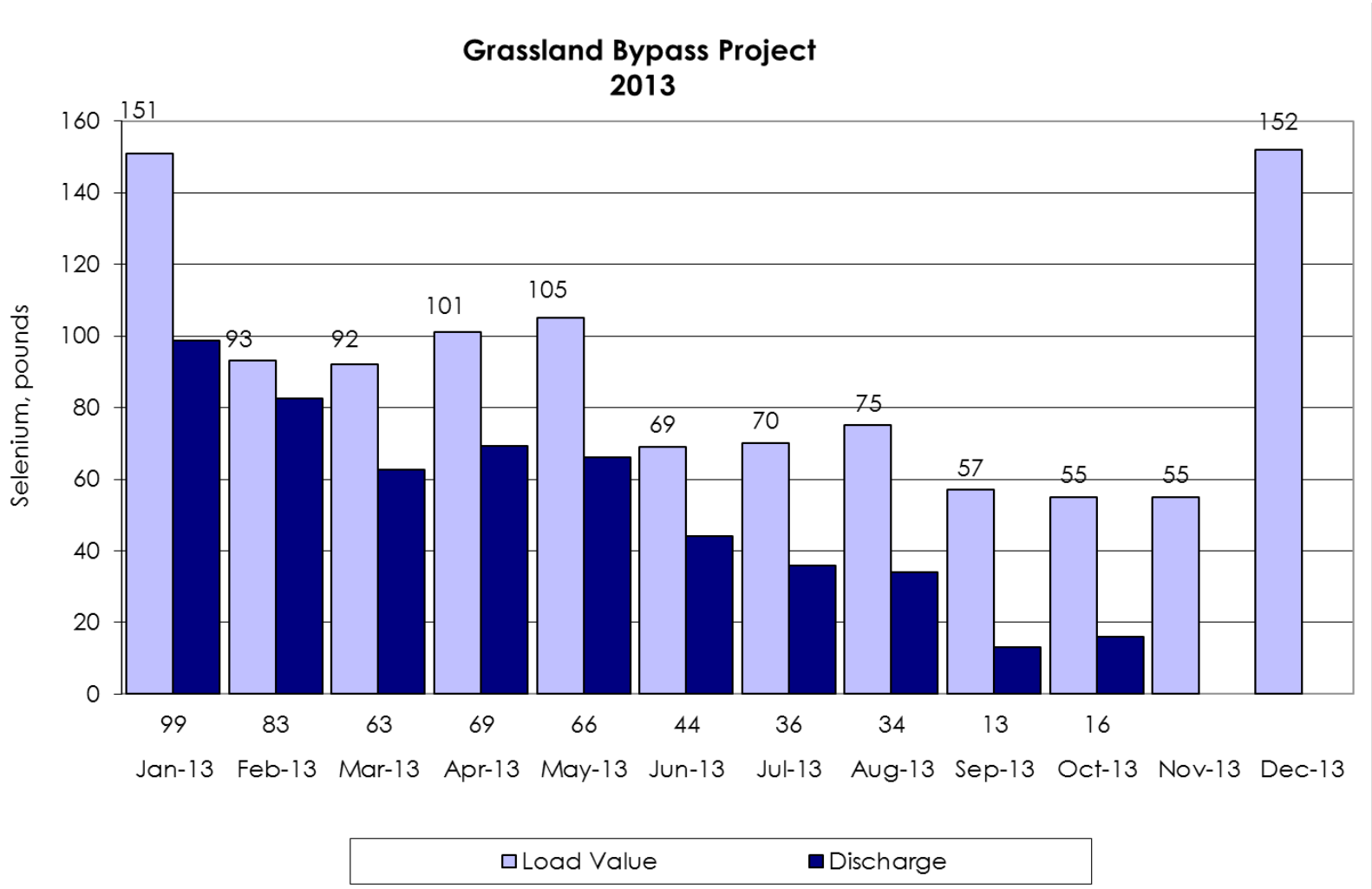


Table 3a. Water monitoring in Mud Slough (north) below San Luis Drain Discharge Station D

PARAMETER	Flow	Temperature	Specific Conductance
DATA SOURCE	USGS	USGS	USGS
UNITS	cfs	°C	µS/cm
Oct-01-2013	50	20.9	2,340
Oct-02-2013	54	20.2	2,230
Oct-03-2013	60	18.3	2,000
Oct-04-2013	63	16.8	2,080
Oct-05-2013	59	17.7	2,020
Oct-06-2013	58	18.6	1,870
Oct-07-2013	57	19.0	2,210
Oct-08-2013	62	18.6	2,120
Oct-09-2013	55	17.7	2,180
Oct-10-2013	59	17.4	2,510
Oct-11-2013	62	17.8	2,530
Oct-12-2013	77	18.3	2,210
Oct-13-2013	109	17.9	1,750
Oct-14-2013	104	17.5	2,000
Oct-15-2013	93	17.7	1,860
Oct-16-2013	112	18.0	1,790
Oct-17-2013	120	18.4	1,730
Oct-18-2013	130	18.3	1,670
Oct-19-2013	123	18.6	1,670
Oct-20-2013	117	18.7	1,720
Oct-21-2013	112	18.8	1,760
Oct-22-2013	108	18.8	1,800
Oct-23-2013	104	18.8	1,920
Oct-24-2013	104	18.5	1,940
Oct-25-2013	103	17.8	1,940
Oct-26-2013	102	17.7	1,850
Oct-27-2013	102	17.5	1,830
Oct-28-2013	100	15.8	1,770
Oct-29-2013	93	15.4	2,010
Oct-30-2013	89	15.2	2,050
Oct-31-2013	84	15.4	1,950
Mean	88	17.9	1,980
Total Acre-feet	**5,405**		

Notes:
See Table 19 for explanation of footnotes and agency abbreviations.
Preliminary Data

Table 3b. Water quality monitoring in Mud Slough (north) below San Luis Drain discharge (Station D)

	Physicals					Total Selenium	Total Molybdenum
PARAMETER	Dissolved Oxygen	pH	Specific Conductance	Temperature	Turbidity		
DATA SOURCE	USBR	USBR	USBR	USBR	USBR	USBR	USBR
UNITS	mg/L	units	µS/cm	°C	NTU	ug/L	ug/L
Oct-01-2013	NA	NA	NA	NA	NA	NA	NA
Oct-08-2013	NA	NA	NA	NA	NA	NA	NA
Oct-15-2013	NA	NA	NA	NA	NA	NA	NA
Oct-21-2013	6.2	8.0	1,600	17.6	16.8	1.3	NA
Oct-28-2013	8.3	7.9	1,750	15.0	14.8	0.8	NA
Nov-04-2013	10.7	7.9	2,060	12.0	10.4	1.1	NA
Nov-15-2013	8.7	7.8	2,010	13.7	25.4	0.8	NA
Nov-22-2013	9.3	7.4	2,040	11.2	12.3	1.0	NA
Nov-25-2013	9.8	7.9	2,070	11.2	11.5	0.9	NA
Dec-06-2013	14.0	8.0	2,450	6.2	9.5	1.2	NA
Dec-10-2013	12.6	7.8	2,650	5.1	7.4	1.5	NA
Dec-17-2013	12.3	8.0	2,460	7.7	7.0	1.9	NA
Dec-27-2013	11.2	7.8	2,780	8.2	9.2	1.9	NA

Notes:

No samples collected early October due to federal furlough

Weekly Molybdenum sampling started in Febuary 2014

	General Minerals							
	Calcium	Magnesium	Potassium	Sodium	Chloride (dissolved)	Sulfate (dissolved)	Total Organic Carbon	Total Dissolved Solids
	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
October 2013	NA	NA	NA	NA	NA	NA	NA	NA
Nov-04-2013	85.0	53.0	7.0	290.0	300.0	310.0	16.0	NA
Dec-10-2013	97	62.0	6.1	360.0	380	500.0	12.00	NA

Notes:

No samples collected in October due to federal furlough

	Nutrients				
	Nitrates as N (dissolved)	Ammonia as N	Total Kjeldahl Nitrogen	Total phosphorous as P	Ortho-phosphate as P
	USBR	USBR	USBR	USBR	USBR
	mg/L	mg/L	mg/L	mg/L	mg/L
October 2013	NA	NA	NA	NA	NA
Nov-04-2013	0.2	0.2	1.5	0.2	0.2
Dec-10-2013	0.1	0.2	1.2	0.2	0.1

Notes:

No samples collected in October due to federal furlough

	Total Metals								
	Arsenic	Boron	Cadmium	Copper	Lead	Mercury	Molybdenum	Nickel	Zinc
	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
October 2013	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nov-04-2013	5.7	2500	<1.0	8.3	<2.5	<100	NA	<10	<5.0
Dec-10-2013	3.5	2300.0	<0.2	1.1	<0.1	<200	8.70	3.30	<20

Notes:

No samples collected in October due to federal furlough

Table 4. Water quality monitoring in Mud Slough (north) above the San Luis Drain (Site C)

	Physicals						
PARAMETER	Dissolved Oxygen	pH	Specific Conductance	Turbidity	Temperature	Boron	Total Selenium
DATA SOURCE	Westside San Joaquin River Watershed Coalition	GWD	GWD/Westside San Joaquin River Watershed Coalition	Westside San Joaquin River Watershed Coalition	GWD	GWD	GWD
UNITS	mg/L	units	µS/cm	NTU	°C	mg/L	µg/L
Oct-08-2013	6.2	7.6	1,160	10	18.9	NA	NA
Oct-28-2013	NA	NA	1,310	NA	NA	0.8	<20
Nov-12-2013	6.9	7.6	1,630	11	15.6	NA	NA
Nov-25-2013	NA	NA	1,600	NA	NA	1.0	<20
Dec-10-2013	7.2	7.8	1,800	27	6.1	NA	NA
Dec-20-2013	NA	NA	2,180	NA	NA	1.5	<20

Notes:

Samples collected by GWD and Westside San Joaquin River Watershed Coalition Engineering

Table 5. Water quality monitoring in Mud Slough (north) backwater below San Luis Drain discharge Station I2

	Physicals					
PARAMETER	Dissolved Oxygen	pH	Specific Conductance	Temperature	Turbidity	Total Selenium
DATA SOURCE	USBR	USBR	USBR	USBR	USBR	USBR
UNITS	mg/L	units	µS/cm	°C	NTU	µg/L
Oct-01-2013	NA	NA	NA	NA	NA	NA
Oct-08-2013	NA	NA	NA	NA	NA	NA
Oct-15-2013	NA	NA	NA	NA	NA	NA
Oct-21-2013	NA	NA	NA	NA	NA	NA
Oct-28-2013	7.1	8.0	2,050	14.1	14.3	0.9
Nov-04-2013	10.5	8.2	2,360	12.6	19.0	1.0
Nov-15-2013	8.7	8.0	2,640	12.8	10.0	0.9
Nov-22-2013	10.2	7.9	2,120	10.8	9.5	1.0
Nov-25-2013	9.8	8.0	2,760	11.0	16.7	1.2
Dec-06-2013	13.3	8.2	2,570	6.0	5.3	1.2
Dec-10-2013	10.4	7.8	4,490	4.8	7.4	1.7
Dec-17-2013	11.1	7.8	5,630	8.2	6.0	2.2
Dec-27-2013	8.6	7.3	11,500	7.5	19.8	2.3

Notes:

Samples collected only when site is flooded

No samples collected in early October due to federal furlough

Table 6a. Water monitoring in Salt Slough at Highway 165
Station F

PARAMETER	Flow	Temperature	Specific Conductance
DATA SOURCE	USGS	USGS	USGS
UNITS	cfs	°C	µS/cm
Oct-01-2013	87	20.9	1,240
Oct-02-2013	83	20.1	1,280
Oct-03-2013	78	17.8	1,300
Oct-04-2013	76	16.7	1,330
Oct-05-2013	81	17.6	1,270
Oct-06-2013	77	18.6	1,300
Oct-07-2013	76	19.1	1,350
Oct-08-2013	76	18.4	1,320
Oct-09-2013	71	17.3	1,390
Oct-10-2013	71	17.0	1,390
Oct-11-2013	70	17.6	1,400
Oct-12-2013	70	18.1	1,360
Oct-13-2013	70	17.6	1,370
Oct-14-2013	65	17.1	1,400
Oct-15-2013	71	17.3	1,450
Oct-16-2013	78	17.4	1,350
Oct-17-2013	77	17.9	1,300
Oct-18-2013	78	17.6	1,380
Oct-19-2013	91	17.9	1,300
Oct-20-2013	102	18.0	1,230
Oct-21-2013	105	17.9	1,220
Oct-22-2013	104	18.0	1,260
Oct-23-2013	105	18.0	1,290
Oct-24-2013	108	17.8	1,300
Oct-25-2013	98	17.2	1,330
Oct-26-2013	89	17.0	1,380
Oct-27-2013	87	16.6	1,400
Oct-28-2013	95	15.1	1,430
Oct-29-2013	111	14.9	1,320
Oct-30-2013	116	14.7	1,280
Oct-31-2013	116	14.8	1,280
Mean	87	17.5	1,330
Total Acre-feet	**5,320**		

Notes:
See Table 19 for explanation of footnotes and agency abbreviations.
Preliminary Data

Table 6b. Water quality monitoring in Salt Slough at Highway 165 (Station F)

	Physicals					Total Selenium	Total Molybdenum
PARAMETER	Dissolved Oxygen	pH	Specific Conductance	Temperature	Turbidity		
DATA SOURCE	USBR	USBR	USBR	USBR	USBR	USBR	USBR
UNITS	mg/L	units	µS/cm	°C	NTU	ug/L	ug/L
Oct-01-2013	NA	NA	NA	NA	NA	NA	NA
Oct-08-2013	NA	NA	NA	NA	NA	NA	NA
Oct-15-2013	NA	NA	NA	NA	NA	NA	NA
Oct-21-2013	9.1	6.8	1,160	16.7	75.5	<0.4	NA
Oct-28-2013	10.5	7.5	1,470	13.7	64.3	<0.4	NA
Nov-04-2013	10.4	7.4	1,440	11.9	36.9	<0.4	NA
Nov-15-2013	9.6	6.9	1,240	14.5	49.3	<0.4	NA
Nov-22-2013	11.3	8.0	1,310	11.0	81.3	<0.4	NA
Nov-25-2013	12.7	7.1	1,430	11.0	39.9	<0.4	NA
Dec-06-2013	12.3	7.3	1,520	6.7	25.7	<0.4	NA
Dec-10-2013	NA	NA	NA	NA	NA	NA	NA
Dec-17-2013	12.2	7.0	1610	7.3	35.0	<0.4	NA
Dec-27-2013	11.9	7.5	1570	7.9	39.4	<0.4	NA

Notes:
No samples collected in early October due to federal furlough
Site F Inaccessible 12/10/2013 (No samples collected)
Weekly Molybdenum sampling starting in Febuary 2014

	General Minerals						
	Calcium	Magnesium	Potassium	Sodium	Chloride (dissolved)	Sulfate (dissolved)	Total Organic Carbon
	USBR	USBR	USBR	USBR	USBR	USBR	USBR
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
October 2013	NA	NA	NA	NA	NA	NA	NA
Nov-04-2013	59	36	4.6	190	220	170	5.8
Dec-10-2013	NA	NA	NA	NA	NA	NA	NA

Notes:
No samples collected in October due to federal furlough
Site F Inaccessible 12/10/2013 (No samples collected)

	Nutrients				
	Nitrates as N (dissolved)	Ammonia as N	Total Kjeldahl Nitrogen	Total phosphorous	Ortho-phosphate as P
	USBR	USBR	USBR	USBR	USBR
	mg/L	mg/L	mg/L	mg/L	mg/L
October 2013	NA	NA	NA	NA	NA
Nov-04-2013	0.5	0.2	0.8	0.1	0.1
Dec-10-2013	NA	NA	NA	NA	NA

Notes:
No samples collected in October due to federal furlough
Site F Inaccessible 12/10/2013 (No samples collected)

	Total Metals								
	Arsenic	Boron	Cadmium	Copper	Lead	Mercury	Molybdenum	Nickel	Zinc
	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
October 2013	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nov-04-2013	<0.5	720	<1.0	7.6	<2.5	<100	7.9	<10	9.9
Dec-10-2013	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
No samples collected in October due to federal furlough
Site F Inaccessible 12/10/2013 (No samples collected)

Table 7a. Water quality monitoring in Grasslands Wetlands Water Supply Channels
Station J Camp 13 Ditch headworks

PARAMETER	Flow *		Specific Conductance	Temperature	Total Selenium
DATA SOURCE	Grasslands WD		Grasslands WD	Grasslands WD	USBR
UNITS	cfs		µS/cm	°C	µg/L
Oct-01-2013	175		770	18.9	NA
Oct-08-2013	132		773	18.6	NA
Oct-15-2013	94		777	18.2	NA
Oct-21-2013	62		774	18.2	0.6
Oct-28-2013	57		821	16.9	0.5
Nov-04-2013	65		1,020	14.1	2.4
Nov-11-2013	59		594	14.1	< 0.4
Nov-18-2013	61		722	13.7	< 0.4
Nov-25-2013	46		663	12.1	0.7
Dec-02-2013	45		738	12.1	0.9
Dec-09-2013	66		699	6.6	0.6
Dec-16-2013	56		733	7.3	0.7
Dec-23-2013	39		949	7.8	1.0
Dec-30-2013	39		963	8.0	0.8

Notes:
Samples only collected when flow is passing site
No samples collected in early October due to federal furlough

Table 7b. Water quality monitoring in Grasslands Wetlands Water Supply Channels
Station K Agatha Canal headworks

PARAMETER	Flow *	pH	Specific Conductance	Temperature	Total Selenium
DATA SOURCE	Grasslands WD	Grasslands WD	Grasslands WD	Grasslands WD	USBR
UNITS	cfs	units	µS/cm	°C	µg/L
Oct-01-2013	240	8.1	540	18.8	NA
Oct-08-2013	204	8.2	545	18.3	NA
Oct-15-2013	169	8.3	550	17.7	NA
Oct-21-2013	153	8.3	568	17.9	0.5
Oct-28-2013	99	8.4	551	16.6	<0.8
Nov-04-2013	123	8.4	394	13.5	0.6
Nov-11-2013	99	8.1	300	14.1	<0.4
Nov-18-2013	89	8.1	543	13.7	0.7
Nov-25-2013	70	7.9	479	12.1	0.6
Dec-02-2013	70	8.0	505	12.1	0.8
Dec-09-2013	69	8.6	418	6.3	0.6
Dec-16-2013	68	8.9	436	7.1	0.7
Dec-23-2013	55	9.0	450	7.3	0.9
Dec-30-2013	67	9.5	413	7.7	0.8

Notes:
Samples only collected when flow is passing site
No samples collected in early October due to federal furlough

Table 8. Water monitoring in the San Joaquin River above Merced River Station H2

PARAMETER	Flow	Temperature	Specific Conductance
DATA SOURCE	USGS	USGS	USGS
UNITS	cfs	°C	µS/cm
Oct-01-2013	168	23.3	1,570
Oct-02-2013	172	NA	1,670
Oct-03-2013	169	23.4	1,720
Oct-04-2013	174	22.9	1,700
Oct-05-2013	182	21.2	1,780
Oct-06-2013	203	20.4	1,670
Oct-07-2013	191	20.5	1,680
Oct-08-2013	191	20.3	1,840
Oct-09-2013	183	19.7	1,790
Oct-10-2013	174	19.6	1,840
Oct-11-2013	174	18.1	1,960
Oct-12-2013	175	17.6	1,950
Oct-13-2013	183	17.9	1,790
Oct-14-2013	191	18.7	1,640
Oct-15-2013	187	19.5	1,780
Oct-16-2013	185	20.5	1,670
Oct-17-2013	202	19.8	1,560
Oct-18-2013	219	19.7	1,530
Oct-19-2013	246	20.6	1,520
Oct-20-2013	270	20.5	1,550
Oct-21-2013	285	19.2	1,490
Oct-22-2013	292	17.9	1,530
Oct-23-2013	300	16.8	1,560
Oct-24-2013	286	15.8	1,610
Oct-25-2013	280	16.4	1,610
Oct-26-2013	292	15.5	1,630
Oct-27-2013	312	15.8	1,690
Oct-28-2013	290	16.8	1,740
Oct-29-2013	238	17.5	1,720
Oct-30-2013	208	18.0	1,720
Oct-31-2013	180	17.8	1,740
Mean	219	19.1	1,680
Total Acre-feet	**13,492**		

Notes:

See Table 19 for explanation of footnotes and agency abbreviations.

Preliminary Data

Table 9. Water quality monitoring in the San Joaquin River above Merced River at China Island Refuge
Station R

	Physicals						
PARAMETER	Dissolved Oxygen	pH	Specific Conductance	Temperature	Turbidity	Total Selenium	Total Molybdenum
DATA SOURCE	USBR	USBR	USBR	USBR	USBR	USBR	USBR
UNITS	mg/L	units	µS/cm	°C	NTU	ug/L	ug/L
Oct-02-2013	NA	NA	1,695	NA	NA	0.9	NA
Oct-09-2013	NA	NA	NA	NA	NA	NA	NA
Oct-16-2013	NA	NA	NA	NA	NA	NA	NA
Oct-23-2013	NA	NA	1,650	NA	NA	<0.8	NA
Oct-29-2013	NA	NA	1,760	NA	NA	<0.8	NA
Nov-04-2013	11.9	8.0	1,900	12.0	23.1	<0.8	NA
Nov-15-2013	11.1	8.0	1,700	13.2	36.9	0.5	NA
Nov-22-2013	10.4	7.9	1,700	11.3	29.0	0.5	NA
Nov-25-2013	11.4	8.0	1,740	10.9	41.6	0.4	NA
Dec-06-2013	12.8	8.1	2,000	6.0	15.1	0.6	NA
Dec-10-2013	13.0	8.0	2,200	5.2	14.5	0.8	NA
Dec-17-2013	12.7	8.0	2,150	8.0	19.4	0.9	NA
Dec-27-2013	12.3	8.6	2,590	8.6	15.3	0.8	NA

Notes:
No samples collected mid October due to federal furlough
Reclamation sampling this site starting 11/04/2013
Weekly Molybdenum sampling starting in Febuary 2014

	General Minerals							
	Calcium	Magnesium	Potassium	Sodium	Chloride (Dissolved)	Sulfate (Dissolved)	Total Organic Carbon	Total Dissolved Solids
	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	Units	mg/L
Oct-01-2013	NA	NA	NA	NA	NA	NA	NA	NA
Nov-04-2013	76.0	47.0	5.6	260.0	280.0	250.0	NA	NA
Dec-01-2013	78.0	50.0	4.8	290.0	340.0	360.0	8.8	NA

Notes:
No samples collected in October due to federal furlough

	Nutrients				
	Nitrates as N (Dissolved)	Total ammonia	Total Kjeldahl Nitrogen	Total phosphorous	Ortho-phosphate as P
	USBR	USBR	USBR	USBR	USBR
	mg/L	mg/L	mg/L	mg/L	mg/L
Oct-01-2013	NA	NA	NA	NA	NA
Nov-04-2013	0.3	0.1	1.2	0.2	0.1
Dec-01-2013	0.2	0.1	0.9	0.2	0.1

Notes:
No samples collected in October due to federal furlough

	Total Metals								
	Arsenic	Boron	Cadmium	Copper	Lead	Mercury	Molybdenum	Nickel	Zinc
	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR	USBR
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Oct-01-2013	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nov-01-2013	<5.0	1500.0	<1.0	9.4	<2.5	<100	9.2	<10	8.7
Dec-01-2013	3.1	1400.0	<0.2	1.4	0.3	<200	8.7	2.9	<20

Notes:
No samples collected in October due to federal furlough

Table 10. Water monitoring in the San Joaquin River at Fremont Ford (Station G)

PARAMETER	Flow	Temperature	Specific Conductance
DATA SOURCE	USGS	USGS	USGS
UNITS	cfs	°C	µS/cm
Oct-01-2013	107	20.9	1,150
Oct-02-2013	97	20.1	1,300
Oct-03-2013	91	18.0	1,370
Oct-04-2013	84	16.6	1,480
Oct-05-2013	85	17.5	1,510
Oct-06-2013	90	18.2	1,420
Oct-07-2013	83	18.9	1,590
Oct-08-2013	82	18.4	1,590
Oct-09-2013	78	17.5	1,640
Oct-10-2013	75	17.1	1,730
Oct-11-2013	77	17.4	1,680
Oct-12-2013	78	17.9	1,680
Oct-13-2013	80	17.6	1,630
Oct-14-2013	79	17.1	1,620
Oct-15-2013	79	17.0	1,630
Oct-16-2013	84	17.2	1,580
Oct-17-2013	91	17.7	1,470
Oct-18-2013	85	17.4	1,540
Oct-19-2013	87	17.7	1,560
Oct-20-2013	105	17.7	1,320
Oct-21-2013	108	17.7	1,320
Oct-22-2013	107	17.8	1,390
Oct-23-2013	105	17.8	1,420
Oct-24-2013	105	17.6	1,440
Oct-25-2013	105	17.0	1,450
Oct-26-2013	98	16.7	1,550
Oct-27-2013	92A	16.5	1,660
Oct-28-2013	91A	15.4	1,700
Oct-29-2013	106	14.8	1,540
Oct-30-2013	111	14.5	1,490
Oct-31-2013	108	14.5	1,500
Mean	92	17.4	1,515
Total Acre-feet	**5,296**		

Notes:
See Table 19 for explanation of footnotes and agency abbreviations.
Preliminary Data

Table 11a. Water monitoring in the San Joaquin River at Crows Landing (Station N)

PARAMETER	Flow	Temperature	Specific Conductance	Total Selenium
DATA SOURCE	USGS	USGS	USGS	USBR
UNITS	cfs	°C	µS/cm	µg/L
Oct-01-2013	508	20.4	771	< 0.4
Oct-02-2013	459	19.8	836	< 0.4
Oct-03-2013	453	18.3	904	0.4
Oct-04-2013	399	16.8	962	0.5
Oct-05-2013	377	17.8	1,020	0.4
Oct-06-2013	396	18.4	1,090	0.5
Oct-07-2013	389	18.8	1,050	0.4
Oct-08-2013	374	18.3	1,060	0.4
Oct-09-2013	383	17.9	1,140	0.5
Oct-10-2013	368	17.6	1,150	< 0.4
Oct-11-2013	351	17.8	1,190	NA
Oct-12-2013	341	18.0	1,280	NA
Oct-13-2013	369	17.6	1,320	NA
Oct-14-2013	355	17.2	1,300	NA
Oct-15-2013	355	17.1	1,280	NA
Oct-16-2013	343	17.4	1,310	NA
Oct-17-2013	358	17.8	1,320	NA
Oct-18-2013	377	17.7	1,290	NA
Oct-19-2013	415	17.8	1,190	NA
Oct-20-2013	447	17.9	1,080	NA
Oct-21-2013	494	17.8	1,000	NA
Oct-22-2013	508	17.7	982	NA
Oct-23-2013	513	17.7	956	NA
Oct-24-2013	502	17.4	988	< 0.4
Oct-25-2013	531	16.9	982	0.7
Oct-26-2013	685	16.5	750	< 0.4
Oct-27-2013	904	16.2	546	< 0.4
Oct-28-2013	999	15.4	516	< 0.4
Oct-29-2013	936	15.2	565	< 0.4
Oct-30-2013	834	14.8	642	< 0.4
Oct-31-2013	739	14.8	733	< 0.4
Mean	499	17.4	1,010	0.5
Total Acre-feet	**30,669**			

Notes:
See Table 19 for explanation of footnotes and agency abbreviations.
Preliminary Data

Table 11b. Water quality monitoring in the San Joaquin River at Crows Landing (Station N)

	Physicals						
PARAMETER	Dissolved Oxygen	pH	Specific Conductance	Temperature	Turbidity	Selenium	Boron
DATA SOURCE	USBR	USBR	USBR	USBR	USBR	USBR	USBR
UNITS	mg/L	units	µS/cm	°C	NTU	µg/L	µg/L
Oct-01-2013	NA	NA	NA	NA	NA	NA	NA
Oct-08-2013	NA	NA	NA	NA	NA	NA	NA
Oct-15-2013	NA	NA	NA	NA	NA	NA	NA
Oct-21-2013	9.3	7.9	940	16.2	20.0	0.5	720
Oct-28-2013	10.0	8.1	517	14.2	18.0	< 0.4	330
Nov-04-2013	11.3	8.1	1,040	11.9	16.5	< 0.4	650
Nov-15-2013	11.0	8.1	1,100	13.0	12.7	< 0.4	730
Nov-22-2013	10.6	8.0	1,060	11.8	13.1	< 0.4	720
Nov-25-2013	11.4	8.2	1,180	11.2	14.8	< 0.4	780
Dec-06-2013	13.4	8.2	1,340	5.9	8.6	< 0.4	880
Dec-10-2013	14.1	8.2	1,400	5.2	8.3	0.4	980
Dec-17-2013	13.1	8.1	1,440	7.0	9.8	0.5	P
Dec-27-2013	13.3	7.8	1,450	7.8	9.9	0.5	P

Table 12. Summary of fathead minnow (Pimephales promelas) larvae survival in 7-day tests using water samples collected from March 2014 to March 2016. Each value is the mean of 4 replicates with 10 fish in each replicate.

See Table 19 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	%	%	%	%	%	%
Mar-2014						
Jun-2014						
Sep-2014						
Nov-2014						
Mar-2015						
Jun-2015						
Sep-2015						
Mar-2016						

Table 13. Summary of fathead minnow (Pimephales promelas) larvae growth in 7-day tests using water samples collected from March 2014 to March 2016. Each value is the mean of 4 replicates with 10 fish in each replicate.

See Table 19 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
Mar-2014						
Jun-2014						
Sep-2014						
Nov-2014						
Mar-2015						
Jun-2015						
Sep-2015						
Mar-2016						

Table 14. Summary of Daphnia magna survival in 7-day tests using water samples collected from March 2014 to March 2016. Each value is the mean of 10 replicates with 1 animal in each replicate.

See Table 19 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	%	%	%	%	%	%
Mar-2014						
Jun-2014						
Sep-2014						
Nov-2014						
Mar-2015						
Jun-2015						
Sep-2015						
Mar-2016						

Table 15. Summary of *Daphnia magna* reproduction in 7-day tests using water samples collected from March 2014 to March 2016. Each value is the mean of 10 replicates with 1 animal in each replicate.

See Table 19 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
Mar-2014						
Jun-2014						
Sep-2014						
Nov-2014						
Mar-2015						
Jun-2015						
Sep-2015						
Mar-2016						

Table 16. Summary of *Selenastrum capricornutum* growth in 4-day tests using water samples collected from March 2014 to March 2016. Each value is the mean of 4 replicates.

See Table 19 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
Mar-2014						
Jun-2014						
Sep-2014						
Nov-2014						
Mar-2015						
Jun-2015						
Sep-2015						
Mar-2016						

Table 17. Summary of selenium concentrations in grab water samples collected at study stations for use in laboratory toxicity tests

See Table 19 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-2014					
Jun-2014					
Sep-2014					
Nov-2014					
Mar-2015					
Jun-2015					
Sep-2015					
Mar-2016					

Table 18. Summary of total suspended solids concentrations in grab water samples collected at study stations for use in laboratory toxicity tests

See Table 19 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-2014					
Jun-2014					
Sep-2014					
Nov-2014					
Mar-2015					
Jun-2015					
Sep-2015					
Mar-2016					

Table 19. Explanations of footnotes and agency abbreviations.

Agency	
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

Water Quality Monitoring	
e	Estimated value
.	Not applicable
<	Less than MDL
D	Sample was dechlorinated
G	Data from records of the Grassland Water District.
H	Result may have high bias
J	Result is between the MDL and RL
L	Result may have low bias,
MDL	Minimum detection level
NA	Not analyzed - operator error, data will not be available in the future
NP	Not Provided. Data may be available in the future.
NT	Not tested
P	Pending, data not available at this time but will be available in the future
RL	Reporting level
T	Result obtained past the holding time
U	Result determined to be an outlier at the time of data validation
V	Result may vary excessively from the true value

Toxicity	
*	Significantly reduced from Delta Mendota Canal ($p<0.05$)
**	Sample re-analyzed and result confirmed.
L	Result may be biased low. Sample was not preserved in the field
†	DMC water failed to meet the survival (>80%) acceptability criteria.
†††	DMC water failed to meet the reproduction (>10 neonates/adult) acceptability criteria.
††††	DMC water failed to meet minimum growth (10^6cell/mL) acceptability criteria.
‡	Control value exceeds suggested maximum variance (20%) acceptability criteria.
‡‡	Fungal growth observed on test organisms.
‡‡‡	Failed cell density requirement of 1E6 cells.
#	New testing laboratory with reporting limit of 0.4 µg/L as of June 1998.
v	Based on definitive bioassay, NOEC is 50 percent