

Petition to De-List the Lower San Joaquin River

For

Impairment by Salt and Boron

EXHIBIT C

Compiled Crop Data

Submitted By:

SAN JOAQUIN RIVER GROUP AUTHORITY

COMPILED CROP DATA

Table 1: Southern Delta annual rainfall measured at Tracy-Carbona station.¹

Year	Precipitation (Inches)	Year	Precipitation (Inches)	Year	Precipitation (Inches)
1970	12.75	1982	17.39	1993	15.84
1971	5.93	1983	21.14	1994	7.16
1972	4.79	1984	3.35	1995	4.92
1973	14.68	1985	3.50	1996	7.54
1974	8.17	1986	10.0	1997	2.45
1975	8.97	1987	5.38	1998	13.87
1976	7.32	1988	5.25	1999	8.49
1977	10.97	1989	6.65	2000	12.48
1978	NA ²	1990	7.26	2001	11.86
1979	11.72	1991	3.72	2002	4.58
1980	8.45	1992	11.32	2003	5.69
1981	11.21				

¹ Data obtained from the Western Regional Climate Center. The historical average precipitation at the Tracy-Carbona station is 9.94 inches.

² Precipitation data for 1978 was not available.

Table 2: Seasonal electrical conductivity data measured at Vernalis.³

Year	EC (dS/m) ⁴	EC High ⁵	EC Low ⁶	Year	EC (dS/m)	EC High	EC Low
1970	0.68	0.98	0.25	1987	0.72	0.87	0.53
1971	0.72	0.94	0.32	1988	0.74	0.95	0.58
1972	1.01	1.22	0.71	1989	0.75	0.92	0.63
1973	0.68	0.97	0.24	1990	0.75	1.07	0.55
1974	0.53	0.93	0.21	1991	0.86	1.63	0.37
1975	0.57	0.85	0.19	1992	0.78	1.05	0.37
1976	0.99	1.23	0.65	1993	0.64	0.89	0.33
1977	1.49	1.84	1.03	1994	0.74	1.01	0.31
1978	0.41	0.90	0.11	1995	0.26	0.66	0.12
1979	0.68	0.96	0.25	1996	0.49	0.77	0.10
1980	0.71	0.83	0.13	1997	0.56	0.77	0.30
1981	0.73	1.17	0.46	1998	0.19	0.37	0.09
1982	0.28	0.48	0.12	1999	0.45	0.62	0.22
1983	0.19	0.38	0.11	2000	0.46	0.73	0.22
1984	0.63	0.80	0.39	2001	0.58	0.94	0.25
1985	0.62	0.97	0.41	2002	0.56	0.93	0.27
1986	0.38	0.68	0.18	2003	0.55	0.90	0.36

³ All seasonal EC statistics were calculated based on data provided by Daniel Steiner in Appendix C.

⁴ Seasonal average of the daily mean electrical conductivity measured at Vernalis from April 1 through August 31 of each year. The seasonal average was calculated from the daily average EC data provided by Daniel Steiner in Appendix C.

⁵ Highest recorded daily average EC at Vernalis from April 1 through August 31 that year.

⁶ Lowest recorded daily average EC at Vernalis from April 1 through August 31 that year.

Table 3: San Joaquin County dry bean⁷ statistics, 1970-2003.

Year	Harvested (Acres)	Yield (Tons/Acre)	Production (Tons)	\$/ton	Total \$	\$/Acre
1970	16,120	0.88	14,178	233	3,307,100	205
1971	17,834	0.88	15,760	270	4,251,000	238
1972	18,530	1.05	19,405	327	6,345,000	342
1973	17,275	1.16	19,987	553	11,030,400	640
1974	17,875	1.18	21,115	423	8,938,000	500
1975	23,504	1.18	25,250	461	11,642,000	542
1976	21,751	0.91	19,814	413	8,187,000	376
1977	22,200	0.89	19,800	535	10,602,000	476
1978	29,200	0.85	24,800	478	11,859,000	406
1979	27,600	0.97	26,900	502	13,504,000	487
1980	27,803	1.07	29,628	613	18,149,000	656
1981	28,239	1.04	29,425	623	18,334,000	648
1982	36,105	0.80	28,800	405	11,638,400	324
1983	23,000	0.85	19,450	672	13,078,100	571
1984	23,700	0.91	21,700	639	13,838,000	581
1985	28,900	1.15	33,300	489	16,289,000	562
1986	19,200	1.05	20,100	626	12,590,000	657
1987	20,600	1.06	21,800	557	12,144,000	590
1988	24,300	1.07	26,100	729	19,013,000	780
1989	26,600	1.04	27,700	739	20,466,000	769
1990	25,900	1.50	38,900	547	21,290,000	821
1991	20,600	1.15	23,600	588	13,877,000	676
1992	20,900	1.09	22,800	565	12,885,000	616
1993	24,500	1.13	27,600	692	19,101,000	782
1994	16,200	1.20	23,000	663	15,254,000	796
1995	24,100	1.15	27,600	698	19,269,000	803
1996	22,800	1.08	24,600	820	20,181,000	886
1997	24,200	1.14	27,700	717	19,874,000	817
1998	22,300	0.80	17,900	672	12,032,000	538
1999	19,600	1.15	22,600	565	12,765,000	650
2000	21,700	1.09	23,600	527	12,431,000	574
2001	15,200	1.05	16,000	617	9,875,000	648
2002	10,600	1.08	11,400	693	7,895,000	748
2003	9,400	1.09	10,200	640	6,526,000	698

⁷ Dry beans include Blackeye, Pinto, and Lima varieties.

Table 4: San Joaquin County alfalfa statistics, 1970-2003.

Year	Harvested (Acres)	Yield (Tons/Acre)	Production (Tons)	\$/ton	Total \$	\$/Acre
1970	61,800	6.33	391,200	30	11,736,000	190
1971	67,200	6.70	450,200	32	14,519,000	216
1972	68,300	6.63	452,800	34	15,576,000	228
1973	65,300	7.00	457,100	52	23,769,000	364
1974	60,000	6.66	399,600	67	26,853,000	448
1975	55,000	6.54	359,700	65	23,273,000	423
1976	53,000	7.32	387,960	80	30,897,000	583
1977	53,600	7.47	400,000	68	27,000,000	504
1978	50,400	6.77	341,000	60	20,392,000	405
1979	65,200	6.86	447,000	87	38,978,000	598
1980	48,000	6.48	311,000	113	35,150,000	732
1981	43,470	6.83	297,000	84	24,875,000	572
1982	44,900	6.93	311,000	100	31,035,000	692
1983	40,900	6.74	276,000	111	30,519,000	748
1984	47,200	6.95	328,000	84	27,726,000	584
1985	59,600	7.31	436,000	88	38,326,000	643
1986	56,500	6.46	365,000	84	30,675,000	543
1987	54,800	6.79	372,000	80	29,749,000	543
1988	65,400	7.14	467,000	89	41,505,000	635
1989	64,800	6.90	447,000	100	44,593,000	689
1990	63,100	6.78	428,000	105	44,757,000	712
1991	64,500	7.30	471,000	91	42,760,000	664
1992	63,500	8.33	529,000	89	46,941,000	741
1993	64,000	7.00	448,000	117	52,416,000	819
1994	70,300	7.25	510,000	113	57,604,000	819
1995	59,830	7.25	397,200	114	49,372,000	827
1996	64,890	6.81	441,900	116	51,049,000	790
1997	61,200	6.98	427,000	128	54,661,000	893
1998	63,800	6.10	388,900	120	46,672,000	732
1999	64,200	6.32	405,600	102	41,372,000	645
2000	57,600	6.22	358,000	105	37,587,000	653
2001	59,900	7.20	431,400	125	54,012,000	900
2002	67,810	7.00	474,670	120	56,960,000	840
2003	63,476	7.11	451,314	100	45,303,000	711

Table 5: San Joaquin County corn grain statistics, 1970-2003.

Year	Harvested (Acres)	Yield (Tons/Acre)	Production (Tons)	\$/ton	Total \$	\$/Acre
1970	33,000	3.14	103,600	52	5,387,000	163
1971	52,500	3.25	170,600	53	9,042,000	172
1972	41,800	3.15	131,700	58	7,652,000	183
1973	47,000	3.6	170,000	93	15,725,000	333
1974	51,100	3.40	173,700	121	20,974,000	411
1975	67,000	3.59	240,500	109	26,128,000	390
1976	75,540	3.51	265,145	101	26,780,000	355
1977	70,100	3.95	277,000	83	23,046,000	329
1978	79,000	3.85	304,000	95	28,771,000	364
1979	85,700	4.03	345,000	105	36,225,000	423
1980	66,816	4.40	294,000	128	37,723,000	563
1981	70,000	3.89	272,000	122	33,238,000	475
1982	71,500	4.50	322,000	103	33,208,000	464
1983	40,100	3.92	157,000	139	22,500,000	545
1984	78,000	4.47	349,000	117	40,841,000	523
1985	72,300	4.70	340,000	104	35,235,000	489
1986	61,000	4.62	282,000	80	22,497,000	370
1987	51,700	4.70	243,000	84	20,424,000	395
1988	44,600	4.46	199,000	116	23,150,000	517
1989	54,800	4.64	254,000	107	27,211,000	496
1990	42,800	4.32	185,000	108	19,992,000	467
1991	35,100	4.67	164,000	106	17,371,000	495
1992	43,200	5.07	219,000	103	22,585,000	522
1993	56,200	5.04	283,000	117	33,074,000	590
1994	67,680	5.20	352,000	105	36,953,000	546
1995	40,430	4.97	200,900	121	24,217,000	601
1996	57,270	4.48	256,500	119	30,642,000	533
1997	68,000	5.14	349,300	123	42,832,000	632
1998	28,996	4.50	130,480	100	13,048,000	450
1999	54,500	4.95	269,900	83	22,403,000	411
2000	56,500	5.13	289,800	88	25,359,000	451
2001	57,800	4.76	275,000	92	25,409,000	438
2002	47,600	5.20	247,600	102	25,254,000	530
2003	46,700	4.63	216,000	95	20,619,000	440

Table 6: San Joaquin County corn silage statistics, 1970-2003.

Year	Harvested (Acres)	Yield (Tons/Acre)	Production (Tons)	\$/ton	Total \$	\$/Acre
1970	15,200	22.75	345,800	7	2,507,000	165
1971	17,900	20.50	367,000	7	2,661,000	149
1972	18,200	25.00	455,000	8	3,572,000	196
1973	19,900	23.70	471,600	13	5,895,000	296
1974	20,000	24.30	486,000	16	7,873,000	394
1975	22,700	22.11	502,000	12	6,054,000	267
1976	26,780	23.50	629,330	12	7,552,000	282
1977	26,600	21.40	569,000	10	5,861,000	220
1978	22,500	20.94	471,000	12	5,652,000	251
1979	23,200	24.87	577,000	16	9,232,000	398
1980	28,747	24.14	694,000	18	12,835,000	435
1981	24,300	23.90	581,000	19	11,022,000	454
1982	24,100	24.20	584,000	16	9,541,000	387
1983	23,000	25.10	579,000	18	10,492,000	452
1984	21,500	24.51	527,000	16	8,565,000	392
1985	20,000	27.30	545,000	16	8,737,000	437
1986	24,200	26.30	637,000	17	10,541,000	447
1987	21,200	26.60	563,000	15	8,681,000	399
1988	22,200	22.90	509,000	20	10,286,000	458
1989	22,200	24.50	543,000	19	10,329,000	466
1990	20,000	23.70	474,000	22	10,388,000	521
1991	21,500	26.90	579,000	18	10,510,000	484
1992	24,200	25.10	608,000	16	9,942,000	402
1993	25,400	26.10	663,000	17	11,142,000	444
1994	27,008	29.00	783,000	18	14,302,000	522
1995	41,350	27.73	1,146,600	20	22,771,000	555
1996	23,120	27.55	636,800	21	13,182,000	579
1997	32,400	27.18	913,700	20	18,000,000	544
1998	31,300	28.17	880,400	20	17,441,000	563
1999	32,900	28.15	925,500	18	16,206,000	507
2000	33,600	28.89	971,000	18	17,944,000	520
2001	37,600	29.87	1,122,500	21	23,449,000	627
2002	39,700	30.00	1,191,700	22	26,217,000	660
2003	40,100	28.35	1,136,800	20	22,828,000	567

Table 7: Southern Delta crops, 1996.⁸

LAND USE TYPE	Total	Surface	Mixed	Ground	Unknown/Other	Non-Irrigated
CITRUS (Eucalyptus)	49	38	11	0	0	0
DECIDUOUS FRUITS & NUTS						
Almonds	4,565	2,454	553	1,539	19	0
Apples	126	126	0	0	0	0
Apricots	7,011	1,680	162	131	110	0
Cherries	393	239	111	44	0	0
Fallow	38	38	0	0	0	0
Miscellaneous	89	50	0	39	0	0
Peaches & Nectarines	100	100	0	0	0	0
Pistachios	30	30	0	0	0	0
Plums	68	68	0	0	0	0
Unknown	210	172	2	26	9	0
Walnuts	4,518	3,942	250	313	13	0
FIELD CROPS						0
Beans (Dry)	10,541	7,946	339	2,256	0	0
Corn (Field & Sweet)	18,926	17,431	584	866	45	0
Fallow	7	7	0	0	0	0
Grain Sorghum	8	0	8	0	0	0
Miscellaneous	0	0	0	0	0	0
Safflower	12,188	11,173	59	951	5	0
Sudan	575	505	0	69	0	0
Sugar Beets	2,338	2,304	0	34	0	0
Sunflowers	141	141	0	0	0	0
Unknown	719	474	209	36	0	0
GRAIN & HAY CROPS						
Fallow	58	12	0	0	46	0
Miscellaneous	309	309	0	0	0	0
Oats	0	0	0	0	0	0
Unknown	22,688	17,781	868	3,058	29	952
IDLE						
Cropped in last 3 years	674	578	0	14	82	0
Fallow	0	0	0	0	0	0
PASTURE						
Alfalfa	35,607	30,962	1,182	3,464	0	0
Clover	0	0	0	0	0	0
Fallow	0	0	0	0	0	0
Mixed	2,655	1,948	458	237	13	0
Native	73	54	8	0	11	0
Turf Farms	580	580	0	0	0	0
Unknown	0	121	0	17	0	0

⁸ Statistics obtained from San Joaquin County Land use surveys conducted by the Department of Water Resources in 1996.

Table 7: Southern Delta crops, 1996 (continued).

LAND USE TYPE	Total	Surface	Mixed	Ground	Unknown/Other	Non-Irrigated
TRUCK, NURSERY, & BERRY						
Asparagus	12,661	12,460	201	0	0	0
Beans (Green)	167	126	41	0	0	0
Cabbage	14	12	0	0	2	0
Carrots	273	231	0	42	0	0
Cole Crops	21	21	0	0	0	0
Fallow	0	0	0	0	0	0
Flowers & Nursery	0	0	0	0	0	0
Melons, Squash, & Cucumbers	6,287	4,933	298	1,057	0	0
Miscellaneous	154	77	29	48	0	0
Mixed	415	48	0	367	0	0
Onions & Garlic	585	300	0	51	234	0
Peppers	50	50	0	0	0	0
Potatoes	324	324	0	0	0	0
Strawberries	63	8	0	56	0	0
Tomatoes	17,263	15,236	373	1,653	0	0
Unknown	236	134	0	77	24	0
VINEYARDS						
Fallow	0	0	0	0	0	0
Unknown	1,902	1,811	43	48	0	0
SEMIAGRICULTURAL & INCIDENTAL						
Dairies	641	0	0	0	0	641
Farmsteads	1,321	0	0	0	0	1,321
Lawn Areas	0	0	0	0	0	0
Livestock Feed Lots	132	0	0	0	0	132
Poultry Farms	64	0	0	0	0	64
TOTAL	167,858	137,036	5,789	16,491	643	3,109

Table 8: Southern Delta crops, 1988.⁹

LAND USE TYPE	Total	Surface	Mixed	Ground	Unknown/Other	Non-Irrigated
CITRUS (Eucalyptus)	12	12	0	0	0	0
DECIDUOUS FRUITS & NUTS						
Almonds	5,537	3,578	458	1,501	0	0
Apples	14	14	0	0	0	0
Apricots	2,464	2,366	0	98	0	0
Cherries	67	34	0	33	0	0
Fallow	0	0	0	0	0	0
Miscellaneous	38	30	0	8	0	0
Peaches & Nectarines	0	0	0	0	0	0
Pistachios	42	42	0	0	0	0
Plums	0	0	0	0	0	0
Unknown	651	424	75	135	0	17
Walnuts	5,017	4,448	70	489	0	10
FIELD CROPS						
Beans (Dry)	10,293	7,148	96	3,049	0	0
Corn (Field & Sweet)	24,277	15,389	7,700	773	415	0
Fallow	0	0	0	0	0	0
Grain Sorghum	150	150	0	0	0	0
Miscellaneous	16	16	0	0	0	0
Safflower	7,616	7,405	0	211	0	0
Sudan	281	223	5	53	0	0
Sugar Beets	16,022	14,231	370	1,421	0	0
Sunflowers	783	783	0	0	0	0
Unknown	2,162	1,474	189	421	0	78
GRAIN & HAY CROPS						
Fallow	2,415	861	66	250	0	1,238
Miscellaneous	16	16	0	0	0	0
Oats	78	0	0	0	0	78
Unknown	14,901	12,665	287	1,788	0	161
IDLE						
Cropped in last 3 years	5,146	2,517	692	1,285	0	651
Fallow	33	0	33	0		0
PASTURE						
Alfalfa	39,547	33,928	855	4,764	0	0
Clover	32	32	0	0	0	0
Fallow	294	222	53	19	0	0
Mixed	2,563	1,560	771	232	0	0
Native	128	109	12	7	0	0
Turf Farms	314	314	0	0	0	0
Unknown	0	0	0	0	0	0

⁹ Statistics obtained from San Joaquin County Land use surveys conducted by the Department of Water Resources in 1988.

Table 8: Southern Delta crops, 1988 (continued).

LAND USE TYPE	Total	Surface	Mixed	Ground	Unknown/Other	Non-Irrigated
TRUCK, NURSERY, & BERRY						
Asparagus	16,202	15,977	61	164	0	0
Beans (Green)	0	0	0	0	0	0
Cabbage	0	0	0	0	0	0
Carrots	0	0	0	0	0	0
Cole Crops	0	0	0	0	0	0
Fallow	725	639	13	73	0	0
Flowers & Nursery	37	12	0	25	0	0
Melons, Squash, & Cucumbers	2,540	1,902	435	203	0	0
Miscellaneous	731	66	93	572	0	0
Mixed	8	8	0	0	0	0
Onions & Garlic	366	291	1	74	0	0
Peppers	96	81	0	15	0	0
Potatoes	103	95	0	8	0	0
Strawberries	0	0	0	0	0	0
Tomatoes	18,463	16,151	163	2,149	0	0
Unknown	0	0	0	0	0	0
VINEYARDS						
Fallow	68	68	0	0	0	0
Unknown	318	140	83	95	0	0
SEMIAGRICULTURAL & INCIDENTAL						
Dairies	399	0	0	0	0	399
Farmsteads	1,129	0	0	0	0	1,129
Lawn Areas	388	277	0	111	0	0
Livestock Feed Lots	123	0	0	0	0	123
Poultry Farms	8	0	0	0	0	8
TOTAL	182,612	145,697	12,581	20,027	415	3,892