South Platte River
Task Force Meeting

Laurel Stadjuhar
City of Sterling

July 16, 2007

BBA
water consultants
BISHOP-BROGDEN ASSOCIATES, INC.

South Platte River
City of Sterling

- Sterling in District 64, downstream of most wells
- Municipal Water Supply = Alluvial Wells
- Developed recharge in 1980's
- Began acquiring Senior Water Rights in 1960's
- Fully augments well depletions pursuant to 1998 Decree
- Depends on reliable aug supply to support 5,000 + taps

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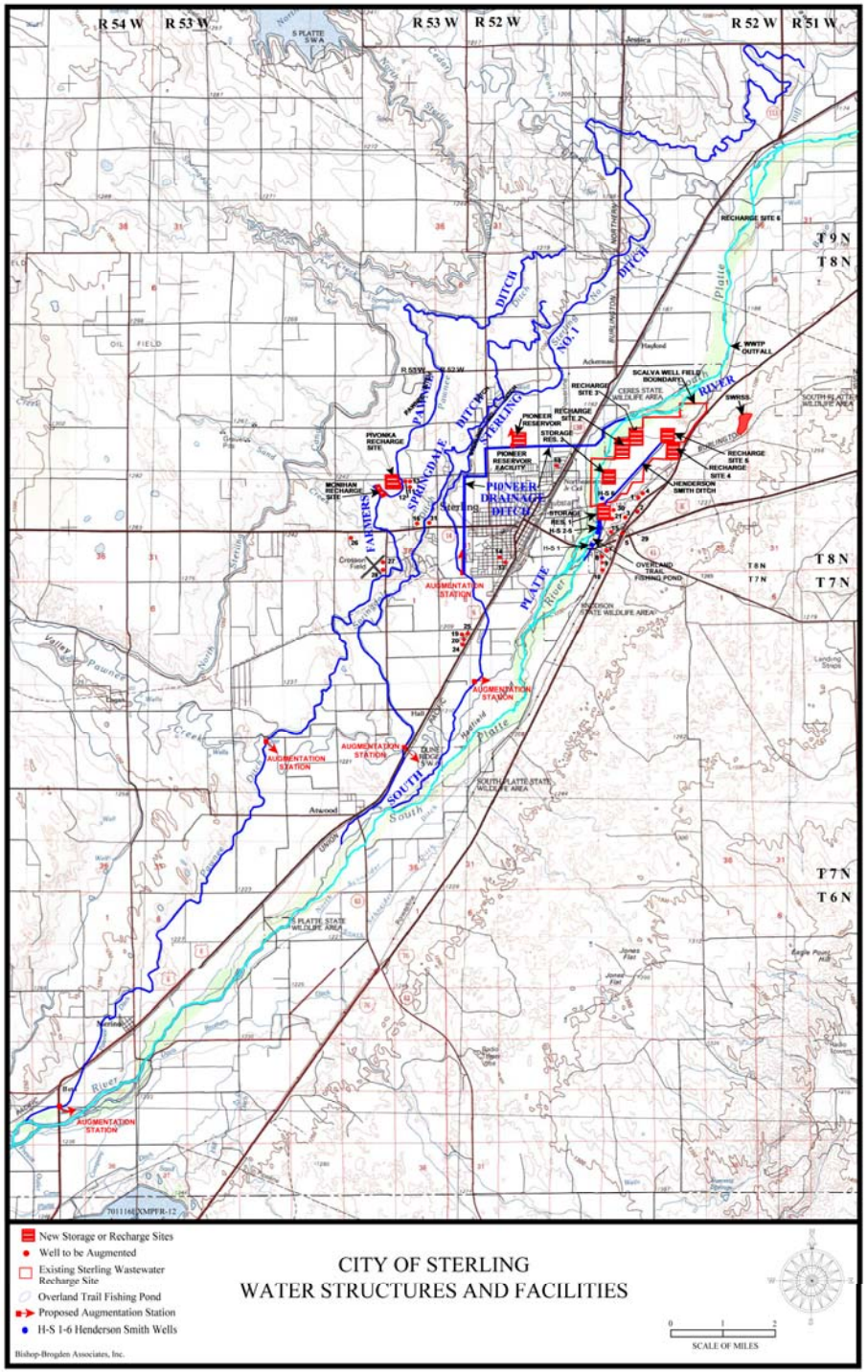

City of Sterling Water Structures and Facilities Map

- Municipal Wells
- Recharge Ponds
  - Henderson Smith Sites
  - SWRSS
- Direct Flow Aug Water
  - Farmers Pawnee Ditch
  - Springdale Ditch
  - Sterling No. 1 Ditch
  - Henderson-Smith Ditch
- Storage
- Augmentation Well

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City of Sterling
Municipal Well System

Well No.	Appropriation Date (Note 1)	Location	Amount (cfs)
1 (1st Appropriation)	Dec. 31, 1890	NE 1/4, SE 1/4, S27-T8N-R52W 1759 ft N, 713 ft W of SE corner S.27	0.0334
1 (2nd Appropriation)	Dec. 31, 1903	NE 1/4, SE 1/4, S27-T8N-R52W 1759 ft N, 713 ft W of SE corner S.27	0.2785
1 (3rd Appropriation)	Dec. 31, 1917	NE 1/4, SE 1/4, S27-T8N-R52W 1759 ft N, 713 ft W of SE corner S.27	0.5793
2	Dec. 31, 1917	SE 1/4, SE 1/4, S27-T8N-R52W 825 ft N, 955 ft W of SE corner S.27	0.8912
3	Dec. 31, 1917	SW 1/4, SE 1/4, S27-T8N-R52W 300 ft N, 1620 ft W of SE corner S.27	1.0026
4 (1st Appropriation)	Dec. 31, 1917	NE 1/4, SE 1/4, S27-T8N-R52W 2007 ft N, 397 ft W of SE corner S.27	0.7576
4 (2nd Appropriation)	Oct. 20, 1941	NE 1/4, SE 1/4, S27-T8N-R52W 2007 ft N, 397 ft W of SE corner S.27	0.2450
4 (Well No. 6 Transfer)	Mar. 10, 1942	NE 1/4, SE 1/4, S27-T8N-R52W 2007 ft N, 397 ft W of SE corner S.27	1.1140
5	Mar. 10, 1942	SW 1/4, NE 1/4, S34-T8N-R52W 1435 ft S, 2400 ft W of NE corner S.34	1.1140
7 (1st Appropriation)	Dec. 31, 1917	NE 1/4, SW 1/4, S34-T8N-R52W 2360 ft N, 1470 ft E of SW corner S.34	0.8912
7 (2nd Appropriation)	Mar 31, 1978	NE 1/4, SW 1/4, S34-T8N-R52W 2360 ft N, 1470 ft E of SW corner S.34	0.2700
7 (3rd Appropriation)	June 30, 1998	NE 1/4, SW 1/4, S34-T8N-R52W 2360 ft N, 1470 ft E of SW corner S.34	0.045 conditional
8 (1st Appropriation)	Mar. 31, 1945	NW 1/4, SW 1/4, S34-T8N-R52W 1385 ft N, 620 ft E of SW corner S.34	0.8912
8 (2nd Appropriation)	Feb 28, 1981	NW 1/4, SW 1/4, S34-T8N-R52W 1385 ft N, 620 ft E of SW corner S.34	0.4000
9	Dec. 31, 1917	SW 1/4, SW 1/4, S34-T8N-R52W 750 ft N, 660 ft E of SW corner S.34	1.0026
10 (1st Appropriation)	Dec. 31, 1917	SW 1/4, SW 1/4, S34-T8N-R52W 75 ft N, 775 ft E of SW corner S.34	0.9469
10 (2nd Appropriation)	Jun 30, 1998	SW 1/4, SW 1/4, S34-T8N-R52W 75 ft N, 775 ft E of SW corner S.34	0.17 conditional
11	Jun. 5, 1956	SE 1/4, NW 1/4, S25-T8N-R53W 1808 ft S, 2456 ft E of NW corner S.25	2.4508
12	Sep. 16, 1958	SE 1/4, NW 1/4, S25-T8N-R53W 1362 ft S, 2155 ft E of NW corner S.25	2.4509
13	Dec. 28, 1960	SE 1/4, NW 1/4, S25-T8N-R53W 1360 ft S, 2495 ft E of NW corner S.25	2.4508
14	Apr. 23, 1964	NE 1/4, SW 1/4, S32-T8N-R52W 2210 ft N, 1511 ft E of SW corner S.32	2.6737
15 (1st Appropriation)	Apr. 23, 1964	NE 1/4, NW 1/4, S34-T8N-R52W 1029 ft S, 1553 ft E of NW corner S.34	1.3368
15 (2nd Appropriation)	Mar 31, 1978	NE 1/4, NW 1/4, S34-T8N-R52W 1029 ft S, 1553 ft E of NW corner S.34	0.5600
15 (3rd Appropriation)	Jun 30, 1998	NE 1/4, NW 1/4, S34-T8N-R52W 1029 ft S, 1553 ft E of NW corner S.34	0.11 conditional
16	Dec. 23, 1960	SW 1/4, SE 1/4, S25-T8N-R53W 88 ft N, 1820 ft W of SE corner S.25	0.5013
17	Jun. 30, 1930	SE 1/4, SW 1/4, S32-T8N-R52W 1299 ft N, 2189 ft E of SW corner S.32	1.3368
18	Apr. 5, 1956	SE 1/4, SW 1/4, S21-T8N-R52W 580 ft N, 1654 ft E of SW corner S.21	0.5570
19	Sep. 7, 1955	NE 1/4, NW 1/4, S7-T7N-R52W 774 ft S, 2474 ft E of NW corner S.7	2.2280
20	May 31, 1942	NE 1/4, NW 1/4, S7-T7N-R52W 998 ft S, 2351 ft E of NW corner S.7	2.2280
21 (1st Appropriation)	Apr. 29, 1964	SE 1/4, SW 1/4, S27-T8N-R52W 230 ft N, 1890 ft E of SW corner S.27	1.3368
21 (2nd Appropriation)	Apr. 29, 1964	SE 1/4, SW 1/4, S27-T8N-R52W 230 ft N, 1890 ft E of SW corner S.27	0.4500
24	Jul. 15, 1942	NE 1/4, NW 1/4, S7-T7N-R52W 1002 ft S, 2446 ft E of NW corner S.7	0.0445
25	Dec. 31, 1909	NW 1/4, NE 1/4, S7-T7N-R52W 123 ft S, 2268 ft W of NE corner S.7	0.0222
26	Sep. 30, 1954	NW 1/4, NE 1/4, S35-T8N-R53W 458 ft S, 2086 ft W of NE corner S.35	0.0334
27	Jun. 30, 1936	NE 1/4, SE 1/4, S35-T8N-R53W 1882 ft N, 196 ft W of SE corner S.35	0.0334
28	Jun 30, 1947	SE 1/4, SE 1/4, S35-T8N-R53W 1122 ft N, 160 ft W of SE corner S.35	0.0334
29	Nov. 21, 1968	SE 1/4, NE 1/4, S34-T8N-R52W 1564 ft S, 1218 ft W of NE corner S.34	0.0334
30	Dec. 27, 1998	SE 1/4, SW 1/4, S27-T8N-R52W 880 ft N, 1770 ft E of SW corner S.27	2.2200
31	Mar. 21, 2000	SE 1/4, SE 1/4, S25-T8N-R53W	2.6700 conditional
Scalva Farm Wellfield (15 wells)	Jun. 30, 1998	Portions of Sections 13, 14, 22, 23 24, 27 of T8N-R52W (Note 2)	15.6000 conditional
Overland Trail Fishing Pond	Jun. 29, 1993	SE 1/4, NE 1/4, S33-T8N-R52W & SW 1/4, NW 1/4, S34-T8N-R52W	0.2000 (14.56 ac-ft annual evaporation)
Ethanol Plant Well #1	Oct. 26, 2004	NW 1/4, NE 1/4, S28-T8N-R52W 1320 ft S, 1585 ft W of NE corner S.28	1.648
Ethanol Plant Well #2	Oct. 26, 2004	NW 1/4, NE 1/4, S28-T8N-R52W 1360 ft S, 1610 ft W of NE corner S.28	1.648

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City of Sterling
Ditch and Reservoir Company, Logan Irrigation District, and Henderson-Smith Water Rights

Structure	Decreed Amount (cfs)	Appropriation Date	Adjudication Date	Total Shares	Shares Owned By City
Sterling No. 1 Ditch	113.9	7/15/1873	11/15/1894	1290	117.5
Farmers Pawnee Canal	14.4	9/17/1873	11/15/1894	500	10.0
	126		11/15/1894	500	10.0
Springdale Ditch	62.5	7/19/1886	11/15/1894	831.5	14.0
Henderson Smith Ditch	12.5	11/30/1880	11/15/1894	NA	NA
Cole Extension	24	2/17/1902	7/5/1928	NA	NA
Morgan Prewitt Reservoir	32,300 (ac-ft)	5/25/1910	1/5/1922		
Logan Irrigation District	(54.8% of Prewitt Res.)			12881.9	54.0
Morgan Prewitt Reservoir	(19.4% of Prewitt Res.)			261	2.0
Morgan Prewitt Reservoir Refill	34,690 (ac-ft Refill)	12/31/1929	10/18/1965		
Logan Irrigation District	(54.8% of Prewitt Res.)			12881.9	54.0
Morgan Prewitt Reservoir	(19.4% of Prewitt Res.)			261	2.0
Sterling No. 2 Ditch	50	6/7/1884	11/15/1894	59.5	4.0

NA, City of Sterling owns 100% of the Henderson Smith water right

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City of Sterling
Storage, Recharge and Exchange Water Rights

Water Right	Amount (ac-ft)	Location	Source	Decree	Point of Diversion	Rate of Fill (cfs)	Appropriation Date
Sterling Wastewater Recharge Storage System (SWRSS)	3500	E1/2,NE1/4, Sec 24, T8N, R52W & W1/2, NW1/4, Sec 19, T8N, R51W	South Platte River	W-9507-78	E1/2,NE1/4, Sec 24, T8N, R52W & W1/2, NW1/4, Sec 19, T8N, R51W	NA	Dec 27, 1978
Pioneer Reservoir	200	SW1/4, NE1/4, Sec 20, T8N, R52W	South Platte River & Pioneer Drainage Ditch	98CW450	Sterling No. 1 HG - NW1/4, Sec 19, T7N, R52W	20	June 30, 1998
					Pioneer Res Feeder Facility - SW1/4, SE/14, Sec 20. T8N, R52W	12	
Sterling Storage Reservoir No. 1	200	SW1/4, SW1/4, Sec 27, T8N, R52W	South Platte River	98CW450	Henderson Smith HG - NE1/4, SE1/4, Sec 33, T8N, R52W	35	June 30, 1998
					Hend. Smith Well No. 1 - SE1/4, NE1/4, Sec 33, T8N, R52W	4.45	
					Hend. Smith Well No. 2 - NW1/4, NW1/4, Sec 34, T8N, R52W	4.45	
					Hend. Smith Well No. 3 - NW1/4, NW1/4, Sec 34, T8N, R52W	4.45	
					Hend. Smith Well No. 4 - NW1/4, NW1/4, Sec 34, T8N, R52W	4.45	
					Hend. Smith Well No. 5 - NW1/4, NW1/4, Sec 34, T8N, R52W	4.45	
					Hend. Smith Well No. 6 - NW1/4, SW1/4, Sec 27, T8N, R52W	5.57	
Sterling Storage Reservoir No. 2	200	NE1/4, NW1/4, Sec 27, T8N, R52W	South Platte River	98CW450	Henderson Smith HG - NE1/4, SE1/4, Sec 33, T8N, R52W	35	June 30, 1998
					Hend. Smith Well No. 1 - SE1/4, NE1/4, Sec 33, T8N, R52W	4.45	
					Hend. Smith Well No. 2 - NW1/4, NW1/4, Sec 34, T8N, R52W	4.45	
					Hend. Smith Well No. 3 - NW1/4, NW1/4, Sec 34, T8N, R52W	4.45	
					Hend. Smith Well No. 4 - NW1/4, NW1/4, Sec 34, T8N, R52W	4.45	
					Hend. Smith Well No. 5 - NW1/4, NW1/4, Sec 34, T8N, R52W	4.45	
					Hend. Smith Well No. 6 - NW1/4, SW1/4, Sec 27, T8N, R52W	5.57	
Sterling Recharge Sites 2 thru 5	3000	#2 - NW1/4, SE1/4, Sec 22, T8N, R52W #3 - SE1/4, NE1/4, Sec 22, T8N, R52W #4 - NE1/4, SW1/4, Sec 23, T8N, R52W #5 - E1/2, SE1/4, NW1/4, & W1/2, SW1/4 NE1/4, Sec 23, T8N, R52W	South Platte River	98CW450	Henderson Smith HG - NE1/4, SE1/4, Sec 33, T8N, R52W	35	June 30, 1998
					H.S. Well No. 1 (54322-F) - SE1/4, NE1/4, Sec 33, T8N, R52W	4.45	
					H.S. Well No. 2 (54319-F) - NW1/4, NW1/4, Sec 34, T8N, R52W	4.45	
					H.S. Well No. 3 - NW1/4, NW1/4, Sec 34, T8N, R52W	4.45	
					H.S. Well No. 4 - NW1/4, NW1/4, Sec 34, T8N, R52W	4.45	
					H.S. Well No. 5 (54320-F) - NW1/4, NW1/4, Sec 34, T8N, R52W	4.45	
					H.S. Well No. 6 (54321-F) - NW1/4, SW1/4, Sec 27, T8N, R52W	5.57	
Farmers Pawnee Recharge	NA	Various sites as listed in 95CW263	South Platte River - City's Prorata Share of FPIC Yield	95CW263	FPIC HG - NE1/4, Sec 26, T6N, R54W	NA	Dec 22, 1995
Springdale Ditch Recharge	NA	Various sites as proposed by SDC in the future	South Platte River - City's Prorata Share of SDC Yield	NA	SDC HG - NW1/4, NW 1/4, Sec 35, T7N, R53W	NA	NA
Sterling No. 1 Ditch Recharge	NA	Various sites as proposed by SIC in the future	South Platte River - City's Prorata Share of SIC Yield	NA	SIC HG - NW1/4 Sec 19, T7N, R52W	NA	NA
Exchange and Plan for Augmentation	35 cfs	Multiple	Excess HCU credits, reuse, return flows, junior storage releases, and recharge credits.	98CW450 & 00CW253	Multiple	35	June 30, 1998

South Platte River
Calling Water Rights
District 64

- South Platte Ditch
- Farmers Pawnee Ditch
- Schneider Ditch
- Springdale Ditch
- Sterling No. 1 Ditch
- Low Line Ditch
- Henderson-Smith Ditch
- Iliff and Platte Valley Canal
- Powell and Blair Ditch
- Harmony No. 1 Ditch
- Peterson Ditch
- South Reservation Ditch
- Liddle Ditch

- Julesburg Reservoir

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South Platte River

Days of Free River - District 64

Year	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Apr-Oct	Nov-Mar	Total
1950	30	31	31	28	31	23	4	0	0	0	14	31	72	151	223
1951	30	31	31	28	31	19	19	26	13	14	29	31	151	151	302
1952	30	31	31	29	31	30	31	18	0	0	0	23	102	152	254
1953	30	31	31	28	31	30	19	1	2	2	0	17	71	151	222
1954	30	31	31	28	31	12	0	0	0	0	0	16	28	151	179
1955	30	31	31	28	31	8	10	24	0	0	0	0	42	151	193
1956	0	0	0	0	0	0	0	1	0	0	0	16	17	0	17
1957	30	31	31	28	31	25	19	30	23	14	13	31	155	151	306
1958	30	31	31	28	31	30	31	30	30	0	7	31	159	151	310
1959	30	31	31	28	31	30	31	11	0	0	0	30	102	151	253
1960	30	31	31	29	31	30	31	26	0	0	0	16	103	152	255
1961	30	31	31	28	31	29	17	30	16	8	21	31	152	151	303
1962	30	31	31	28	31	24	15	30	20	11	3	31	134	151	285
1963	30	31	31	28	31	16	0	0	1	0	6	31	54	151	205
1964	30	31	31	29	31	30	4	1	2	0	0	16	53	152	205
1965	30	31	31	28	31	0	3	26	27	21	27	31	135	151	286
1966	30	31	31	28	31	30	3	9	1	0	0	18	61	151	212
1967	30	31	31	28	28	0	4	30	29	0	0	23	86	148	234
1968	30	31	31	29	31	18	7	13	1	19	21	26	105	152	257
1969	30	31	31	28	31	16	25	30	22	0	0	27	120	151	271
1970	30	31	31	28	31	30	31	30	23	1	15	31	161	151	312
1971	30	31	31	28	31	30	31	30	6	0	16	31	144	151	295
1972	30	31	31	29	31	13	15	18	0	2	14	20	82	152	234
1973	30	31	31	28	31	30	31	30	14	9	21	31	166	151	317
1974	30	31	31	28	31	30	10	10	0	0	25	31	106	151	257
1975	30	31	31	28	31	30	10	30	1	0	17	31	119	151	270
1976	30	31	31	29	31	20	10	1	0	0	3	15	49	152	201
1977	0	0	0	1	31	30	1	0	0	0	0	23	54	32	86
1978	0	0	0	0	0	0	4	22	0	0	0	19	45	0	45
1979	30	31	31	28	31	30	31	11	9	21	30	31	163	151	314
1980	30	31	31	29	31	30	31	30	8	0	26	22	147	152	299
1981	30	31	31	28	31	21	31	16	3	0	0	23	94	151	245
1982	12	0	0	0	0	0	7	29	13	6	17	27	99	12	111
1983	30	31	31	28	31	30	31	30	31	31	30	31	214	151	365
1984	30	31	31	29	31	30	31	30	19	27	30	31	198	152	350
1985	30	31	31	28	31	19	31	21	10	9	28	31	149	151	300
1986	30	31	31	28	31	30	26	29	14	1	30	31	161	151	312
1987	30	31	31	28	31	30	31	30	21	3	30	31	176	151	327
1988	30	31	31	29	31	30	27	27	0	0	13	31	128	152	280
1989	30	31	31	28	31	26	0	8	0	0	22	30	86	151	237
1990	30	31	31	28	31	30	13	7	0	4	11	31	96	151	247
1991	30	31	31	28	31	26	7	27	0	0	21	31	112	151	263
1992	30	31	31	29	31	28	0	26	21	18	30	31	154	152	306
1993	30	31	31	28	31	30	17	22	0	1	20	31	121	151	272
1994	30	31	31	28	31	22	6	4	0	0	0	27	59	151	210
1995	30	31	31	28	31	30	31	30	31	16	19	31	188	151	339
1996	30	31	31	29	31	25	16	30	2	6	30	31	140	152	292
1997	30	31	31	28	31	28	11	30	12	31	29	31	172	151	323
1998	30	31	31	28	31	30	31	29	8	19	20	31	168	151	319
1999	30	31	31	28	31	27	31	30	31	31	30	31	211	151	362
2000	30	31	31	29	31	30	23	2	0	0	5	23	83	152	235
2001	15	31	31	28	31	30	20	17	4	2	17	31	121	136	257
2002	30	31	31	28	31	12	0	0	0	0	0	7	19	151	170
2003	0	23	31	20	18	15	6	1	0	0	0	16	38	92	130
2004	0	12	31	29	5	0	0	0	0	0	0	9	9	77	86
2005	0	21	31	28	11	22	8	21	0	0	0	22	73	91	164
2006	6	31	31	28	27	17	0	0	0	0	0	0	17	123	140
2007	0	13	31	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AVG	25.8	28.2	28.8	26.1	28.2	22.6	16.0	18.3	8.2	5.7	13.0	25.3	109.2	137.2	246.4
MIN	0	0	0	0	0	0	0	0	0	0	0	0	9	0	17
MAX	30	31	31	29	31	30	31	30	31	31	30	31	214	152	365

Notes: Values listed above from daily priority analysis based on Division 1 call records through January 31, 2007.
Release dates not listed for all calls until 1981 water year. Listed calls assumed in place until next call or 'no demand' listed for water years prior to 1981.
The water right is considered not fully satisfied when it is the calling right or a more senior downstream right is calling.
A call start time up to and including 12:00pm is considered a call for the start date, after 12:00pm is considered a call starting the next day.
A call end time up to and including 12:00pm is not considered a call for the end date, after 12:00pm is considered a call for the end date.
State Line Compact Call (6/14/1897) is assumed to be in effect whenever the flow rate at the Julesburg gage is less than 120 cfs, or as indicated by the call records.
Farmers Pawnee and Schneider Ditch calls were assumed to affect the reach down to the Sterling No. 1, due to proximity of headgates.
Prewitt Reservoir is assumed to be affected by North Sterling calls.

BBA water consultants

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South Platte River
Calls – District 64

- Winter:
  - Julesburg Reservoir Call
  - Nov-Dec, March typically
  - Enough free river in the winter that District 64 wells can get enough augmentation with recharge in the winter typically
- Summer:
  - State line call, only District 64 rights get shut down
    - Upstream well users deplete state line
    - Only District 64 pays
  - Irrigation water rights
    - One call above Sterling No. 1
    - Another call below Sterling No. 1

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South Platte River
Aggregation

- Hard to predict in Districts 1&2 if storage will fill.
  - Still need to have the water in case reservoirs won't fill
  - Insurance policy
  - Must account separately for each reservoir
- Much easier in District 64
  - Only one reservoir
  - Need to have water in case reservoir does not fill

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South Platte River

Forgiving PPDs / Grandfathering Wells

- Old depletions injure senior water rights just as much as new depletions.
- Doesn't help to forgive old depletions if you don't cut back on irrigated land because new depletions just grow back to level of past depletions unless land is dried up.

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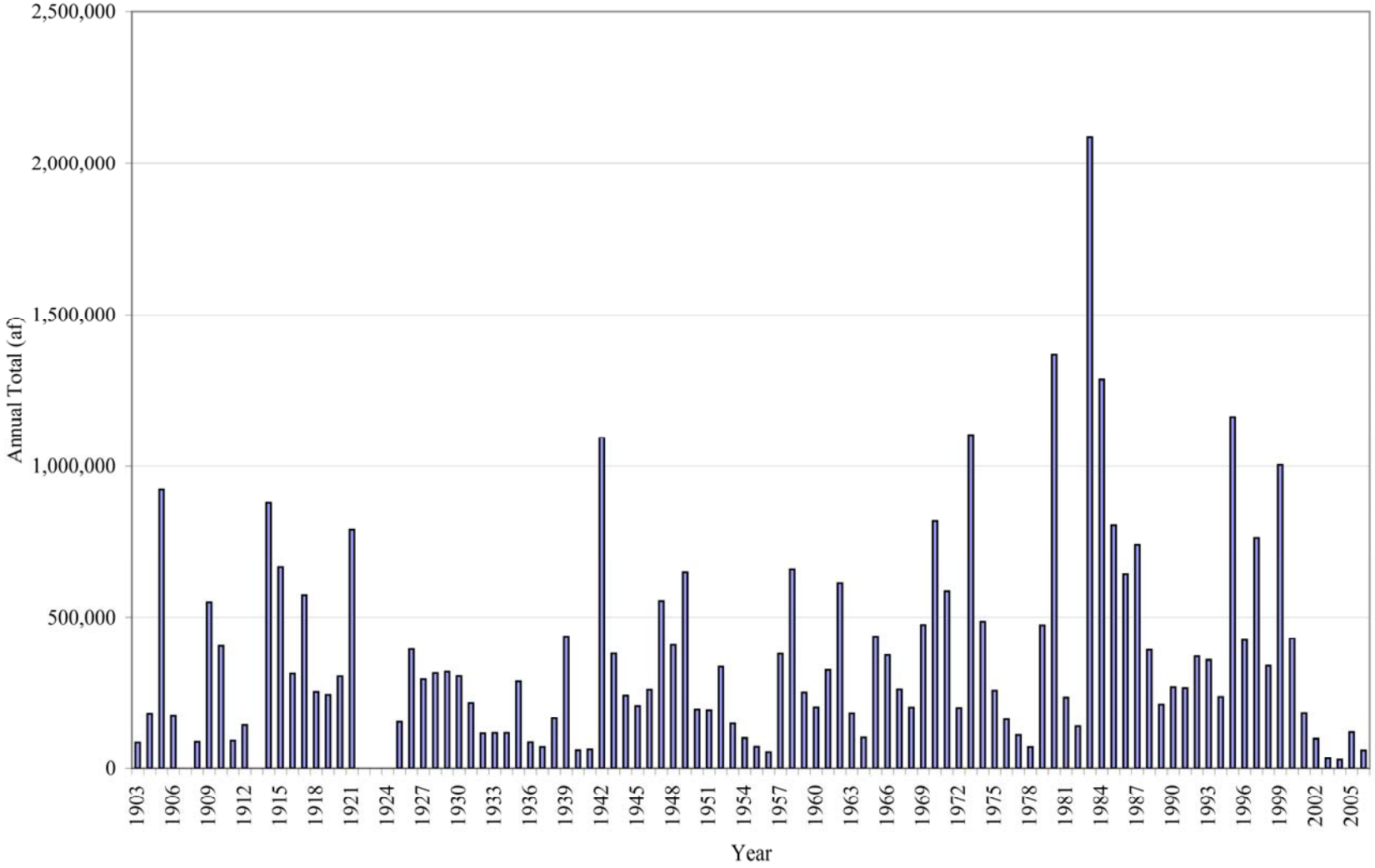
South Platte River
Streamflow at Julesburg Gage
Water Flowing out of State / District 64



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South Platte River
Streamflow – District 64

- Little flow has left the state during recent drought.
- Almost every drop has been used
- No one is wasting it at well users' expense
- Demonstrates no water is available in these type of conditions to next junior water rights – which are the wells

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South Platte River
Solution

- Problem on the South Platte is a water supply problem.
- Best solution is to increase the augmentation supply, not to undermine senior water rights or existing augmentation plans.
- The alternatives are building new recharge and storage.
  - Recharge is most cost effective solution, and well users have already built a lot of recharge.
    - In average or wet years, well users will divert to recharge and more well pumping can occur during next drought
    - Assisting with construction of additional recharge could enhance this already existing opportunity.
  - Storage should also be investigated
    - Smaller to moderate sized reservoirs (such as lined gravel pits)
    - Economize on cost of construction.
- The storage and recharge should be for the benefit of all users, not a select few.
- Don't promote storage or recharge that will adversely affect water users that have complied with the law.
- Problem solves itself as much as it can under the priority system.

BBA water consultants
BISHOP-BROGDEN ASSOCIATES, INC.