

SPDSS Memorandum Final

To: Ray Alvarado and Ray Bennett
From: LRE, Erin Wilson
Subject: Task 3 – Identify Key Diversion Structures
Notes from Water District 1 Meeting
Date: July 9, 2004, revised May 3, 2006

Introduction

This memorandum provides notes from September 17, 2003 meeting with Water District 1 Water Commissioner. Meetings are being held with Water Commissioners in each Water District in the SPDSS study area. The objectives of these meetings are 1) to develop an initial basin understanding; 2) to determine what irrigation structures should be included as “Key Structures” in future detailed modeling efforts, and 3) to determine which reservoirs and diversions warrant more detailed investigation and technical documentation. These objectives support both Task 3 – Identify Key Diversion Structures and Task 5 – Identify Key Storage Reservoirs and Develop Operating Memorandum. Information in this memorandum is believed to be accurate. However, this information should not be relied upon in any legal proceeding.

Approach

Prior to the meeting, potential Key Structures for Division 1 were identified using the following procedure outlined in the SPDSS Scope of Work:

1. Identify net absolute water rights per structure. Select initial key structure cutoff value based on the 85 percent recommendation (SPDSS Feasibility Study, October 2001) for each water district.
2. Determine average annual diversion data for structures during three average hydrologic years, one year each during the 1950s, the 1970s, and the 1990s. Add additional structures to the key list that diverted an average of 1,000 acre-feet per year on the main stem during any of the representative years. Note that this step will allow the inclusion of larger diversion structures having active water rights during the earlier years of the study that were subsequently transferred to other ditches or other uses.
3. Review readily available straight-line diagrams and include additional structures as appropriate, based on water rights and location.

Table 1, provided in the Results Section of this memorandum, lists the initial list of key diversion structures, the total of their decreed water rights, the period of record of available diversion records, their average annual diversions for the period of record, and

the water source. In addition, as noted in the comment line, it includes new structures added during the interviews, or structures that were removed as key and will be modeled in an aggregated fashion. Table 1 generally lists structures in upstream to downstream order. On-going Task 3 efforts include review of irrigated acreage, water rights, and diversion records. It is expected that the key structure list shown in Table 1 will be further refined during these, and model development, efforts.

The interview with the Water Commissioner and the Division Engineer was intended to determine additional structures that should be considered key based on seniority, water administration, or basin operations (including structures with supplemental reservoir water). Prior to the meeting, a brief description of the purpose and goals of the interview was provided to the Water Commissioner, Brent Schantz. The following is a summary of the meeting agenda:

1. Review straight-line diagrams for accuracy
2. Develop a list of major projects, reservoirs, and ditches in the water district, including names of knowledgeable contact people
3. Gather information on dry-up points in the river, calling rights, augmentation plans, and administration specific to the water district
4. Gather general information on the preliminary list of irrigation diversions selected to included in future detailed modeling efforts (key structures), and solicit input on their final inclusion
5. Develop information on reservoirs, such as owner entities, ditches that get reservoir deliveries, assigned delivery losses, etc.

David Ellington, Division 1, developed a preliminary straight-line diagram of Water District 1. In addition, LRE developed maps of the water district to facilitate the discussions. Maps displayed reservoirs, diversion headgate locations, and canal layouts on a quad-sheet background.

Meeting Attendance

The meeting was held at RTi's offices in Ft. Collins. The following people attended part or all of the meeting:

Jim Hall – Division 1 Engineer
Brent Schantz – District 1 Water Commissioner
David Ellington – Division 1
Thomas Cirillo – GIS Student at UNC, Assistant to Brent Schantz
Tim Martin – RTi
Nils Bable – RTi
Claudio Schneider – RTi
Steve Malers, RTi
Erin Wilson, Leonard Rice Engineers

Stream Gages and General Administration

- Brent indicated that all structure headgate locations have been determining by GPS – Dave Ellington has the information to update the GIS diversion coverage.
- Permitting issues for wells in the Designated Basins are the responsibility of the Colorado Ground Water Management District. There is no day to day administration. Designated Groundwater Basins in Water District 1 include Upper Crow Creek, Lost Creek, and North Kiowa Bijou Designated Basins.
- Riverside Canal and Sterling #1 (in District 64) have minimal supplemental ground water. All other ditches in District 1 rely on supplemental ground water to some degree.
- Generally, there is limited surface flow in the tributaries to the South Platte, therefore minimal surface water administration is required. Ground water use along the tributaries is administered.
- Lone Tree Creek flows are mostly return flows from diversions in District 3, or District 3 flows “conveyed” to lands via Lone Tree Creek.
- The following table provides a normal year river call sequence:

Normal Year River Call Sequence

November to April	Historically no call, or possibly a 1970’s or junior recharge call. Reservoir filling calls may become more common, based on recent years.
Begin Irrigation Season – April, before runoff	In really good years, continued no call or recharge call. Often a call ranging from 1882 to 1888 (as there are several ditches with rights with these priorities). One common example is a 1882 Fort Morgan call with a junior call downstream of Fort Morgan’s headgate. Often, the call is a bypass to Sterling No. 1 (1873 right) in District 64 from a junior District 1 right.
Runoff (Often the end of May and first two to four weeks in June)	In good years, no call. Sometimes a 1929 reservoir refill call, a 1907 junior direct flow call for Riverside or a 1970’s or junior recharge call. During very dry years direct flow irrigation call continues.
Late June through August	Often bypass to Sterling #1 1873 right from one of several 1882 rights. In extremely dry years, the call may be a Weldon Valley 1881 bypass to Sterling #1 in the middle of the summer. In good years, the call is one of those described for the beginning of the irrigation season or runoff.
September and October	In good years, no call or recharge call. In other years, continued irrigation call though junior to that in July and August.

- Bijou Canal and Lower Platte and Beaver Canal can be dry up points on the river.
- There is a new gage near Ft. Morgan that is maintained by the USGS. This gage is not used for administration. All other gages in District 1 are maintained by DWR.
- The Kersey streamflow gage (06754000) and the Balzac streamflow gage are challenging to maintain due changing sand channels. However, extensive efforts are made to maintain these gages, as data is critical to administration.
- The Balzac streamflow gage (South Platte River at Cooper Bridge, near Balzac - 06759910) was moved upstream in 1980. The previous location (South Platte River at Balzac – 06760000) was downstream of both the Prewitt Inlet Canal (0100829) and Tetsel Ditch (0100525).
- The Weldona streamflow (06758500) gage is easier to maintain.
- The Colorado Division of Water Resources (DWR) established a series of coding principles to be used by the Water Commissioners to accurately describe diversions and uses within the Water Districts. Diversion coding for Water District 1 generally follows these basic coding conventions since the mid-1980s. Simple diversions with direct uses are typically correct from 1950 on. Prior to the mid 1980s, however, the coding for more complex diversions, including carrier ditches and exchanges, does not appear to follow the coding conventions set forth by the DWR.

C-BT Water and Municipal Use

- Some of the ditches may continue to own C-BT shares, however, C-BT water has not been delivered to District 1 for direct use in the last 10 years, except via pipeline to Ft Morgan for municipal use. GASP used some C-BT shares to augmentation use District 1.

Ditch Specific Information

Ditches discussed in this section are generally listed in upstream to downstream order.

- **Lower Latham Ditch** (0200834) diverts water in District 2 for irrigated lands in District 1. The District 2 Commissioner (Bob Stahl) administers their augmentation plan.
- A very limited amount of water diverted in District 2 returns to District 1 via Lost Creek, Box Elder Creek, and Beebe Draw.
- **Sterling Seep and Drain** (0100703) diverts infrequently and should be removed from the Key structure list.
- The **Hoover Ditch** (0100500) water rights were transferred to wells as an alternate point.
- **Empire Inlet Canal** (0100501) is a carrier to **Empire Reservoir** (0103816) – no lands are irrigated from the canal. Bijou Irrigation company owns Empire reservoir and water is delivered directly to Bijou Canal (0100507) from the reservoir.
- **Riverside Canal** (0100503) has only one headgate (Riverside Intake Canal on USGS maps). Water is diverted under direct irrigation rights and for storage in **Riverside Reservoir** (0103651). No lands are irrigated before Riverside Reservoir under Riverside Canal rights. The diversions are gaged close to Riverside Reservoir inlet.

Water also is diverted through Riverside Canal for storage in Vancil Reservoir. Riverside Canal receives seepage credit through the ditch only when water is NOT being diverted under direct flow or Riverside Reservoir storage rights (when in priority to fill Vance, decree allows seepage credit). Note that Riverside Irrigation and Reservoir Company also own shares in Prewitt Reservoir (0103552), Jackson Reservoir (0103817), and in the Weldon Valley Ditch (0100511). There exists a Riverside Reservoir Outlet that can discharge water directly back to the South Platte that has not been used historically, but will likely be used in the future.

- **Riverside Ditch aka New England Ditch** (0100710) water rights are taken through **Riverside Canal** (0100503). Diversions are now reported separately, but historically were reported with Riverside Canal. This structure should be treated as a multi-system with Riverside Canal as the key structure.
- **Illinois Ditch** (0100504) diverts through the Riverside Canal headgate, but diversions are recorded separately.
- **Bijou Canal** (0100507) has a shared headgate with both Putnam Ditch (0100506) and Corona Ranch Ditch (0100509). The measuring device on Bijou Canal includes water diverted under Bijou and Putnam rights – Bijou separates them based on water rights and provides them to the commissioner. The measuring device is downstream from the Corona Ranch ditch takeout, and Corona Ranch is measured separately. Bijou Canal delivers water to irrigators and to Bijou Number 2 Reservoir (0103570) for augmentation recharge. These three ditches should be treated as a multi-system with Bijou Canal as the key structure. Bijou Canal often places a call and can dry up the river.
- **Jackson Reservoir Inlet Canal** (0100513) is a carrier to Jackson Reservoir (0103817) – no lands are irrigated from the canal. Ft. Morgan Canal Company owns three-quarters of Jackson Reservoir. Deuel and Snyder Ditch (0100517), Upper Platte and Beaver Canal (0100515), Riverside Canal, and Lower Platte and Beaver Canal (0100518) also own shares in Jackson Reservoir.
- **Weldon Valley Ditch** (0100511) – Riverside Canal (0100503) has shares in Weldon Valley Ditch. These shares are pumped from the Weldon Valley ditch to Riverside Canal. Weldon Valley returns water through a natural drainage equipped with a flume to measure Riverside's water for exchange or to ditches below Weldon Valley that own Riverside shares. Water returns to the South Platte below the Weldon Gage (correct straight-line diagram). There has been a law suite surrounding expanded use of lands associated with this ditch and there is some lingering sensitivity.
- **Ft. Morgan Canal** (0100514), as noted above, is the majority owner of Jackson Reservoir. Riverside shares in Jackson Lake storage are generally stored in Prewitt Reservoir by exchange.
- **Upper Platte and Beaver Canal** (0100515) has a shared river diversion structure with Deuel and Snyder Ditch (0100515). The Upper Platte and Beaver Ditch Company own shares in Jackson Reservoir, as noted above. They also own shares in Prewitt Reservoir, and they can divert Prewitt storage water by exchange.
- **Deuel and Snyder Ditch** (0100517) has a shared river diversion structure with Upper Platte and Beaver Canal (0100515). They own shares in Jackson Reservoir, as noted

above. They also own shares in Prewitt Reservoir, and they can divert Prewitt storage water by exchange.

- **Brown and Pyott Ditch** (0100516) rights have been transferred to Dueul and Snyder, there are no diversion records and this structure should be removed from the key list.
- **Lower Platte and Beaver Canal** (0100518) has a shared river diversion structure with the Tremont Ditch system (0100519). Lower Platte and Beaver Ditch Company own shares in Jackson Reservoir, as noted above. They also own shares in Prewitt Reservoir, and they can divert Prewitt storage water by exchange.
- **Tremont Ditch** (0100519) has a shared river diversion structure with the Lower Platte and Beaver Canal (0100518). **Snyder Ditch** (water rights transferred to 0100519), **A.A. Smith Ditch** (0100522) and the **Pioneer Augmentation Plan** (0102518) water rights are diverted under the Tremont Ditch and the diversions are recorded together, but reported separately. This should be modeled as a multi-system, with Tremont Ditch as the key structure.
- **Gill and Stevens Ditch** (0100520) water rights have been transferred to wells as an alternate point. There are no historical diversion records - Brent indicated that alternate point diversions are not being reported.
- **Trowel Ditch** (0100524) water rights have been transferred to wells as an alternate point. There are no historical diversion records - Brent indicated that alternate point diversions are not being reported.
- **North Sterling Inlet Canal** (0100687) diverts in District 1 to fill North Sterling Reservoir (0103551). No lands are irrigated before the reservoir. Reservoir water is used for irrigation in District 64.
- **Union Ditch** (0100688) shares the same diversion dam as North Sterling Inlet Canal, but has a separate headgate. Union ditch is used to for irrigation of wetlands. Diversions are significant.
- **Tetsel Ditch** (0100525) has significant diversions for irrigation.
- **Prewitt Inlet Canal** (0100829) is the inlet canal for Prewitt Reservoir (0103552). Prewitt Reservoir is primarily a source for augmentation water, although some water is used for irrigation by direct release or by exchange. As noted above, storage water can be used, by exchange, by Lower Platte and Beaver, Upper Platte and Beaver, and Deuel and Snyder ditches. Prewitt Inlet canal also conveys water to the **Johnson and Edwards Ditch** (0100526) for irrigation use. Prewitt Inlet Canal and Johnson and Edward Ditch are gaged separately. It requires a significant amount of headgate diversion for water to be delivered through Prewitt Inlet Canal, so if Prewitt Reservoir is not filling, the Johnson and Edwards Ditch use alternate point wells.

Recommended Detailed Documentation

More detailed information should be developed and included in the Basin Information Report for the following canals and reservoirs:

- Riverside Reservoir and Canal
- Bijou Canal and Empire Reservoir
- Ft. Morgan Canal and Jackson Reservoir
- Weldon Valley Ditch

Table 1

Structure	Name	Total Decree (cfs)	Diversion Record Period	Average Annual Divert (af)	Diversion Source	Comment	Key
0100703	STERLING DRAIN SEEP D	28.00	1975 - 1978	503	WASTE	Minimal diversion	No
0100501	EMPIRE DITCH (INLET CANAL)	1837.44	1968 - 2001	45816	SOUTH PLATTE RIVER		Yes
0100503	RIVERSIDE CANAL	4739.75	1949 - 2001	46567	SOUTH PLATTE RIVER	Primary ditch of Multi-system	Yes
0100504	ILLINOIS DITCH		1949 - 2001	4839	SOUTH PLATTE RIVER	Multisystem with Riverside Canal	MS
0100710	RIVERSIDE DITCH	16.00			SOUTH PLATTE RIVER	Multisystem with Riverside Canal	MS
0100507	BIJOU CANAL	2249.22	1949 - 2001	47449	SOUTH PLATTE RIVER	Primary ditch of Multi-system	Yes
0100506	PUTNAM DITCH		1949 - 1989	9028	SOUTH PLATTE RIVER	Multi-system with Bijou Canal	MS
0100509	CORONA RANCH DITCH	56.00	1985 - 2001	1767	SOUTH PLATTE RIVER	Multi-system with Bijou Canal	MS
0100513	JACKSON LAKE INLET DITCH	800.00	1969 - 2001	35088	SOUTH PLATTE RIVER	No Irrigated Lands	Yes
0100511	WELDON VALLEY DITCH	165.00	1949 - 2001	35197	SOUTH PLATTE RIVER		Yes
0100514	FT MORGAN CANAL	520.90	1949 - 2001	49946	SOUTH PLATTE RIVER		Yes
0100515	UPPER PLATTE BEAVER CNL	468.34	1949 - 2001	29109	SOUTH PLATTE RIVER		Yes
0100517	DEUEL SNYDER CANAL	76.00	1949 - 2001	4354	SOUTH PLATTE RIVER		Yes
0100516	BROWN PYOTT DITCH	8.00			SOUTH PLATTE RIVER	Transferred to Deuel Snyder Canal	No
0100518	LOWER PLATTE BEAVER D	1018.00	1949 - 2001	24540	SOUTH PLATTE RIVER		Yes
0100519	TREMONT DITCH	382.00	1949 - 2001	6361	SOUTH PLATTE RIVER	Primary ditch of Multi-system	Yes
0100522	A A SMITH DITCH		1949 - 1954	2338	SOUTH PLATTE RIVER	Multi-system with Tremont Ditch	MS
0100523	SNYDER DITCH		1954 - 1992	2382	SOUTH PLATTE RIVER	Multi-system with Tremont Ditch	MS
0100520	GILL STEVENS DITCH	23.00			SOUTH PLATTE RIVER	Alternate point wells	Yes
0100524	TROWEL DITCH	90.00			SOUTH PLATTE RIVER	Alternate point wells	Yes
0100687	NORTH STERLING CANAL	1010.00	1951 - 2001	73278	SOUTH PLATTE RIVER		Yes
0100688	UNION DITCH	34.70	1990 - 2001	1304	SOUTH PLATTE RIVER	Used for irrigation of wetlands	Yes
0100525	TETSEL DITCH	37.00	1949 - 2001	5054	SOUTH PLATTE RIVER		Yes
0100829	PREWITT INLET CANAL	1390.00	1995 - 2001	26871	SOUTH PLATTE RIVER	No irrigated lands	Yes
0100526	JOHNSON EDWARDS DITCH	63.00	1949 - 2001	3162	SOUTH PLATTE RIVER		Yes