

ArkDSS Memorandum Draft

To: Bill Tyner and Kelley Thompson, Colorado Division of Water Resources
From: Rick Parsons, ParsonsWater Consulting
Subject: Task 2.1 – Water Commissioner Interviews
Notes from Water District 67 Meeting
Date: February 28, 2019

Introduction

This memorandum provides notes from the September 13, 2017 meeting with Water District 67 Water Commissioner. Water District 67 encompasses the Lower Arkansas River Basin below the upstream terminus of John Martin Reservoir. Northern and eastern portions of the basin include portions of the Upper Sandy, Northern High Plains, and Southern High Plains Designated Basins. Meetings were held with Water Commissioners in each Water District in the ArkDSS study area. The objectives of these meetings were 1) to develop an initial basin understanding; 2) to determine diversion and reservoir structures that should be included in future detailed modeling efforts, and 3) to determine which reservoirs and diversions warrant more detailed investigation and technical documentation. These objectives support Task 3 Consumptive Use Analysis and Task 4 Surface Water Modeling. Information in this memorandum is believed to be accurate for water planning and modeling purposes; however this information should not be relied upon in any legal proceeding.

Approach

Prior to the meeting, data discrepancies for District 67 were identified using the following procedure outlined in the ArkDSS Scope of Work:

1. Review the availability of diversion, reservoir storage, and streamflow data.
2. Review historical call data and identify how it may vary from current call reporting standards.
3. Identify net absolute water rights for structures in each Water District. Review the irrigated lands master parcel set and ditch service to identify ditches with water rights and/or diversions records but for which irrigated areas have not been identified.
4. Develop an initial list of key structures and structures with acreage and water rights, but no diversion records to understand areas without records and how to estimate their use.

Maps were developed displaying reservoirs, diversion headgate locations, and irrigated acreage of the Water District to facilitate the discussions.

The interview with the Water Commissioners and the Division Engineer was intended to determine structures that should be considered key based on seniority, water administration, or basin operations. The following is a summary of the meeting agenda:

1. Review straight-line diagrams for accuracy.
2. Gather information on dry up points in the river, calling rights, augmentation plans, and administration specific to the Water District.
3. Gather general information on data discrepancies identified prior to the meeting.
4. Develop information on reservoirs, such as owner entities, ditched s that get reservoir deliveries, seepage, etc.

The final memo was also reviewed by Kevin Salter and Rachel Duran with the Kansas Department of Agriculture.

Meeting Attendance

The meeting was held at the Division of Water Resources Office in Pueblo. The following people attended the meeting:

John Von Oort, DWR Division 2 River Operations Coordinator

Lonnie Spady, DWR, Eastern Region Commissioner and Water District 17 Water Commissioner

Becky Nichols, DWR Water District 66 & 67 Water Commissioner

Kelley Thompson, DWR, Lead Modeler

Bill Tyner, DWR, Assistant Division Engineer

Rick Parsons, ParsonsWater Consulting

Brenna Mefford, Wilson Water Group

Transbasin Diversions

Colorado River water bought by Colorado Parks and Wildlife (CPW) from City of Aurora and/or Colorado Springs Utilities can be stored in the Permanent Pool of John Martin Reservoir. This water is used for fisheries. Additionally, Fryingpan-Arkansas Project water is used by the Fort Lyon Canal resulting in transmountain return flows available for augmentation or return flow maintenance within Water District 67 for structures that are within the Southeastern Colorado Water Conservancy District boundaries. Project water is also used in Water District 67 by the City of Lamar by delivery through the Fort Bent Canal to the Clay Creek Recharge site for well augmentation. No transbasin diversions come directly into this District.

Compacts and Agreements Affecting District 67 Administration

The Arkansas River Compact ("Compact") between Colorado and Kansas plays a significant role in the administration of District 67. The Compact was approved by the states and the US Congress in 1949; therefore, pre-1949 water rights are referred to as pre-Compact and more junior rights are post-Compact rights. The Compact addresses apportionment of water stored in John Martin Reservoir, and the operations of John Martin Reservoir are regulated primarily by

the Compact, the 1976 Permanent Pool resolution, the 1980 Operating Agreement (revised), and the 1998 Offset Account Resolution. The Compact also states that post-Compact developments should not deplete the usable quantity of water available to Kansas. Kansas sued Colorado in 1985 regarding post-Compact developments; and the Kansas v. Colorado decree and the Colorado 1996 Well Use Rules regulate augmentation of post-Compact well depletions. Since Water District 67 consists of the mainstem of the Arkansas from John Martin Reservoir to the Stateline, administration in the District is critical for making sure that Kansas's Compact apportionment is being met at the state line. Kansas also receives water from John Martin Reservoir which requires the Division of Water Resources to ensure that releases from John Martin Reservoir for Kansas are shepherded to the state line. Colorado water users above and below John Martin Reservoir also entered into an agreement (the 1984 "Agreement B"). Although this agreement was not approved by Kansas or the Arkansas Compact Administration, Colorado has maintained that the agreement is not prohibited by the Compact and has relied on the agreement in administration of Water District 67 water rights.

Stream Gages

There are seven active streamflow gages in Water District 67, operated by either USGS or DWR. The gages, station ID, and comments regarding the use or quality of the gage are summarized below.

Arkansas River below John Martin Reservoir, CO (07130500)

- Good quality gage, considered to be accurate
- Gage used for administration
- Used to monitor releases out of John Martin Reservoir

Arkansas River at Lamar, CO (07133000)

- Good quality gage, considered to be accurate
- Gage used for administration
- Located just below Lamar Canal diversion

Arkansas River near Granada, CO (07131480)

- Good quality gage, considered to be accurate
- Gage used for administration below the Buffalo Canal headgate
- Used to determine how much water is available for a State Line delivery when shepherding water down to Kansas
- Used to assign transit loss to water released from John Martin Reservoir for Kansas
- Water that is in the river at this point and is not a release for Kansas is considered X-Y Canal, Manvel Canal and/or Sisson Stubbs consumptive use credits for augmentation for the Lower Arkansas Water Management Association (LAWMA)

Frontier Ditch (07137000)

- Good quality gage, considered to be accurate
- Used to measure diversions to Kansas' uppermost Compact ditch

Arkansas River near Coolidge (07137500)

- Good quality gage, considered to be accurate
- Water passing through this gage can be delivered to Kansas' five other Compact ditches (Amazon Ditch, Great Eastern Ditch, Garden City Ditch, Southside Ditch, and Farmers Ditch)
- In combination with Frontier Ditch gage, used to determine State Line flows and the state line call

Big Sandy Creek near Lamar, CO (07134100)

- Tributary gage
- Used to determine tributary inflows, which include return flows from Fort Lyon and Amity Canals

Wild Horse Creek above Holly, CO (07134990)

- Tributary gage
- Used to determine return flows coming into the mainstem

Muddy Creek below Muddy Creek Dam near Toonerville, CO (MUDTOOCO)

- Tributary gage; recently installed
- Used to determine if a rainfall event has occurred when Muddy Creek Reservoir right is in priority and can then be used to store water in Permanent Pool of John Martin Reservoir

Rule Creek at HWY 101 near Toonerville, CO (RULTOOCO)

- Tributary gage
- Used with Muddy Creek gage to quantify storage in the Permanent Pool

General Administration

- The current Water Commissioner, Becky Nichols, has been the water commissioner for the past three years and retired in September 2018.
- The District has three different types of administration: regular administration, administration with well augmentation, and administration of releases from John Martin Reservoir and assuring State Line deliveries to Kansas are satisfied.
- Four main canals supply water from the Arkansas River to the majority of irrigated land in District 67: Amity Canal, Fort Bent Canal, Lamar Canal, and Buffalo Canal.

- A significant amount of acreage has been dried up as part of the LAWMA augmentation plans (Case Nos. 02CW181, 05CW52, 10CW85 and 15CW3067). Some of the land is being re-irrigated by wells, with well depletions being augmented by LAWMA.
- Prior to 2009, only the mainstem was regulated. Since 2009, the drain rights (tributaries coming into the mainstem) have also been administered.

Table 1 provides a normal Year call sequence:

Table 1
Normal Year River Call Sequence

November to April	Nov 1 st to Mar 31 st – John Martin Reservoir goes into winter storage conservation and is the main call (1949 priority) on the river
April	Before runoff, the call sequence is Buffalo Canal, Lamar Canal, Ft Bent Canal, and Amity Canal (in that order)
Runoff May – June	Generally, no call during runoff, however, the Amity Canal or other canals may “call through” John Martin Reservoir if their Summer Stored water has been extinguished.
July - November	Amity Canal, Ft Bent Canal, Lamar Canal. Return flows typically sufficient to meet Buffalo Canal demands.

Municipal Use

City of Lamar uses groundwater to supply its domestic water needs. Its wells are augmented through the Fort Bent Augmentation station (6700632) and through the Clay Creek Recharge Pond (6700630). Augmentation water goes through the Fort Bent Augmentation station and then back into the river downstream of the Amity Canal headgate (6700607). Water is delivered down to the end of the Fort Bent Canal to the recharge pond. Most of Lamar’s wells are associated with their own augmentation plans (6707009 for Case No. W-4015 and 6707857 for Case No. 05CW107), but a few are on an augmentation plan administered by LAWMA (6707157 for Case No. 02CW181).

City of Holly domestic water is supplied by wells. The wells are decreed non-tributary to the Arkansas River and thus do not require augmentation.

City of Granada domestic water is supplied by wells. The Granada wells are augmented through LAWMA.

Reservoir Specific Information

Two Buttes Reservoir (6703596 aka WM D Purse Res No. 1) is located on Two Buttes Creek. The reservoir is only used for recreation but is decreed for irrigation. The dam is currently under safety restrictions. The reservoir is typically in dead pool and water is not released from the reservoir.

Muddy Creek Reservoir (6703597) dam was breached in June 1965. Prior to 1965, not much water was available to store in the reservoir. CPW owns this water right and can use a portion of this this water right to store water in in the Permanent Pool in John Martin Reservoir. Water can be stored if it is available at the original Muddy Creek Reservoir site and must get all the way down the tributary into John Martin Reservoir. This typically only occurs during high precipitation events.

Ramah Reservoir (6703736) is a CPW reservoir located in upper Sandy Creek. The reservoir is not administered since it is in the Upper Big Sandy Designated Basin.

Great Plains Reservoir System (Queens Reservoir [Neeskah] – 6703513; Neenoshe – 6703883; Neesopah – 1703605; and Nee Gronda – 1703606) are filled from District 17 via the Kickingbird Canal (1700525) which diverts out of the Fort Lyon Canal (1700553). The reservoir system is used primarily by the Amity Canal; however Fort Lyon Canal could physically receive water from part of the system.

John Martin Reservoir (6703512) is a flood control reservoir located on the mainstem of the Arkansas River at the boundary between District 17 and District 67. This reservoir came online in 1949 and is critical to operations in District 67 and for meeting Compact requirements. Some water was stored in the reservoir during construction in years between 1943 and 1949.

Historically, water was stored in the reservoir during the winter months and then released in the summer to replicate what happened under the Compact, which essentially translates into a 60:40 split between Colorado and Kansas. Releases of storage water were on a flow rate demand basis. District 67 rights could call for up to 750 cfs (600 cfs if less than 20,000 ac-ft in storage). Kansas could correspondingly call for up to 500 cfs (400 cfs). Both states typically called for water at the full rate available in a race to use the water first and the reservoir was drained most years. To more efficiently manage the reservoir, specific Operating Principles were established by Kansas and Colorado in a 1980 Resolution Concerning an Operating Plan for John Martin Reservoir. In addition to the Flood Pool, six accounts were created in the reservoir pursuant to the 1980 Resolution and subsequent agreements: Conservation Storage, Section II Water (Distributed Conservation Storage), Section III Water (Other Water), Transit Loss, Permanent Pool, and the Offset account.

Typical operations pursuant to the 1980 Resolution are described below:

- November 1 to March 31 – The gates on John Martin Reservoir are shut and all inflows accrue to the Conservation Storage (Section II Winter Water) account (varied historically based on available space below Elevation 3851.87; currently up to 330,703 acre-feet with all other accounts spilled) and Section III (Other Water) accounts used to store water for the lower Winter Water Program participants (Up to 75,000 acre-feet total annual storage, split 50,000 acre-feet to the Amity Canal (not specified in the 1980 Resolution, but controlled by decree); 20,000 acre-feet to the Fort Lyon Canal; and 5,000 acre-feet to the Las Animas Consolidated Canal). Note that Amity Canal could store water either during the Winter Storage season or when the Great Plains water right is in-priority during the summer season and that Amity can carry water over in their Article III account in amounts greater than 50,000 acre-feet. Winter storage in the Section III accounts for Fort Lyon and Las Animas Consolidated is limited to the November 15 – March 15 Winter Water storage season.
 - After the irrigation season ends (October 31), inflows to the reservoir measured at the Arkansas River at Las Animas gage (07124000) are predominantly return flows. Most of the District 17 ditches stop diverting once the Winter Water storage season starts (November 15), which causes the inflows at Las Animas to increase. This change in the river is used to differentiate storage to Conservation Storage and to the Section III accounts.
 - Conservation Storage starts with a Baseflow inflow to John Martin Reservoir, calculated using the average flow over a stable seven day period between November 1 and November 15. Enhanced Baseflows are calculated using the average flow over a seven day period once flows have stabilized after November 16. Over the remainder of the storage season, gage flows up to the Enhanced Baseflow rate are split between Conservation Storage and the Section III accounts; flows greater than the Enhanced Baseflow are split between the two accounts based on the ratio of Baseflow Rate : Enhanced Baseflow Rate above Baseflow Rate. For example, for a Baseflow Rate of 75 cfs and Enhanced Baseflow Rate of 250 cfs, the ratio would be 1 : 2.3 (equal to 75 divided by 175)
 - Note inflows to the reservoir from the Purgatoire River near Las Animas gage (07128500) bypass the Arkansas River at Las Animas gage. All Purgatoire River inflows during the winter accrue to Conservation Storage.
- March 16 – Pursuant to the 1980 Resolution, 35% of the water stored in the Section III accounts is transferred as a storage charge to the Transit Loss account (1,700 acre-foot capacity, maximum), Conservation Storage for Kansas, and Conservation Storage for the Water District 67 ditches. A flow diagram of the distribution of the Section III Water is included in Appendix A. If a deficit in a delivery of Kansas Section II account water previously occurred, the 35% storage water first goes to pay back the Kansas deficit,

then to fill the Transit Loss account, then is distributed 11/35 to Kansas and 24/35 to District 67 ditches.

- April 1 to April 7 – At the first request for a release in this time period, but no later than 8:00 am on April 7, Winter Conservation Storage is distributed to the Section II accounts at a rate of 1,250 cfs (1,000 cfs if less than 20,000 ac-ft in Conservation Storage) – 60% to Colorado and 40% to Kansas based on the ratio of calling rights listed above (CO and KS Section II accounts). Colorado’s 60% is further split among the mainstem District 67 ditches according to percentages outlined in the 1980 Resolution. The dam gates remain shut unless someone is calling for water.
- Starting April 1 – Section II and Section III account holders typically begin to demand release of water in their respective accounts even while Conservation Storage is accruing or being distributed.
- After April 1st, water accruing to Conservation Storage is considered Summer Stored water. Although Kansas does not particularly agree with this practice, Colorado administers Agreement B based on this distinction. During the April through October period, the reservoir may store additional water as Summer Conservation Storage if the inflow to John Martin Reservoir is anticipated to be 500 cfs (expressed as 1,000 acre-feet) more than the Colorado ditch existing irrigation requirements below the reservoir. The Summer Conservation Storage is distributed into Summer Stored Section II accounts at the same rates and percentages as for the Winter Conservation Storage. If the reservoir is not storing or distributing Conservation Storage, then inflows are passed through the reservoir. District 67 ditches can then also place a call that can affect ditches upstream of John Martin Reservoir if they do not have any Summer Stored Section II water (pursuant to “Agreement B”).

In Case No. 80CW19, the Amity Mutual Irrigation Company (AMIC) adjudicated John Martin Reservoir as an alternate place of storage for 50,000 acre-feet of yield of its Great Plains Reservoir storage rights. During the summer irrigation season, AMIC can store that water in its Section III account when the 1896 Great Plains Reservoir storage rights are in priority. The alternate place of storage is limited to 50,000 acre-feet, annually, regardless of whether the water was stored during Winter Water or in the summer. Note the storage right priorities in Water District 17, including the Great Plains Reservoir rights, are not exercised during the winter, as a concession to participation in the Winter Water Storage Program, however AMIC does at times still choose to store in the Great Plains Reservoirs in lieu of or in addition to John Martin Reservoir. The 35% transfer of Section III Water stored in the summer occurs at the time the water is stored.

The distinction between the Colorado Section II Winter Water and Summer Water is important for administration of the District 67 water rights. Pursuant to the 1984 “Agreement B” between the District 67 ditches and the ditches in Districts 14 and 17, water cannot be called through John Martin Reservoir to meet District 67 calls if the calling right has any Summer Water in storage. To remove this limitation, the District 67 ditches will typically prioritize the release of water from the Summer Storage accounts ahead of water from the Winter Storage accounts.

The delivery of Kansas’ of and equivalent of the Conservation Storage water from John Martin Reservoir is measured at the State line. Therefore, water must also be released from the Transit Loss account in John Martin Reservoir to ensure Kansas receives its entitlement (as measured at the Frontier Ditch gage plus the Coolidge gage). Transit losses are estimated and agreed upon between the States based on antecedent stream conditions, in-basin precipitation events and considering the flows already occurring at the State line that can be counted towards the delivery. The transit loss needed to make deliveries to Kansas is generally in the range of 0% (Transit Loss account water sufficient to make full delivery) to 27.3%.

- A 15,000 acre-foot Permanent Pool was authorized pursuant to a 1976 agreement between Colorado and Kansas. Of this, up to 10,000 acre-feet is to be retained within the Flood Pool in the event of a spill. Water in the account is made up of water from CPW’s Muddy Creek Reservoir water right pursuant to the change case adjudicated in Civil Action 1434 and Colorado River water purchased by CPW to store in John Martin Reservoir. In 2017 and 2018, LAWMA was approved to store consumptive use water in the Permanent Pool from its shares of the Highland Canal in District 17. The Highland Canal source was approved for ongoing long term use by ARCA on February 14, 2019.
- A 20,000 acre-foot Offset Account was created by an agreement and resolution in the late 1990s. This water is owned by Colorado Well Associations to deliver water directly to Kansas to offset State Line well depletions. LAWMA is the primary user of this account. Transit losses associated with releases from the Offset Account must come from the Offset Account and not rely on water in the Transit Loss Account. Pursuant to the 1998 Offset Account Resolution, an additional 5% of the Offset Account inflow will be allocated to Kansas and accounted for in the Kansas Charge subaccount.

Section III Water for Fort Lyon and Las Animas Consolidated cannot be carried over; therefore, any water remaining in these Section III accounts on October 31 will be added to the Winter Conservation Storage for the following Compact year. Pursuant to Colorado’s Agreement B, Colorado Winter Stored Section II sub-account water is transferred to the respective Colorado Summer Stored Section II sub-account if it is stored beyond May 1st of the year following the initial storage.

John Martin Reservoir spills after reaching storage of approximately 340,000 acre-feet (Currently 330,730 AF plus the Permanent Pool up to 10,000 AF; will be 330,771 AF plus the

Permanent Pool up to 10,000 AF as of November 1, 2019). The reservoir has only spilled a handful of times, but when it does, water in the Permanent Pool above 10,000 acre-feet spills first, followed by Section III water, followed by the Offset Account water, Section II water, and then Transit Loss water.

Tributary Specific Information

Water District 67 can be divided into two main sections; the Upper Reach comprising of John Martin Reservoir to the Lamar Canal, and the Lower Reach comprising of the Lamar Canal to the Stateline.

The Upper Reach

The Upper reach extends from John Martin Reservoir to the Lamar Canal. The upper reach consists of the mainstem Arkansas and some small tributary drainages including, but not limited to: Prowers Arroyo, Limestone Creek, Graveyard Creek, and McClave Drain. This reach of the river is considered to be the losing reach of the Arkansas River, with not many return flows coming back into the river. Arkansas River Farms recently purchased a large share of Fort Lyon Canal shares and has installed augmentation stations on the canal that will bring water into these drainages in the future. Mudd Creek also flows into this reach, rarely, but sometimes in significant amounts.

Mainstem

- **Fort Bent Canal** (6700610) has a carrying capacity of 200 to 300 cfs. The measuring device is considered accurate. City of Lamar has bought ~20% of the shares of the Fort Bent and uses them for augmentation. There is one augmentation station (6700632) on the Fort Bent Canal run by LAWMA for City of Lamar. Irrigated acreage supplied by the Fort Bent Canal ends east of Clay Creek below the siphon at Clay Creek. Canal loss is estimated as 11.9% in the H-I Model.
- **Keesee Ditch** (6700613) previously shared a headgate with the Fort Bent Canal. The ditch is no longer active after all the rights were changed by LAWMA. Lands under the ditch are re-irrigated using wells that are augmented through LAWMA. The changed rights are quantified at John Martin Reservoir based on available inflows (in consideration of Agreement B), with some credits stored in the John Martin Reservoir Offset Account (part of 6703512.035) and some released to the river for in-state replacement (part of LAWMA's augmentation WDID 6700999). Canal loss is estimated as 3.3% in the H-I Model.
- **Amity Canal** (6700607) has a carrying capacity of 500 cfs. The measurement device is considered to be accurate. Conveyance losses are approximately 35% of diversions; canal loss is estimated as 30.5% in the H-I Model. The Amity Mutual Irrigation Company (AMIC) diverts water from the Arkansas River, but also picks up water from multiple tributaries, including Big Bend (aka Wiley Drain, 6700575), Goulds Draw (aka Pleasant

Valley, 6700533), May Valley (aka Markham Arroyo, 6700520), and Big Sandy (6700672). Diversion records are maintained for all; however the Big Sandy diversion has not been used in the past few decades.

In addition to its direct flow water, AMIC is a beneficiary of John Martin Reservoir and owns the storage water in the Great Plains Reservoir system (Queens Reservoir [Neeskah] – 6703513; Neenoshe – 6703883; Neesopah – 1703605; and Nee Gronda – 1703606). The Great Plains Reservoirs are filled from District 17 via the Kickingbird Canal (1700525), which diverts out of the Fort Lyon Canal (1700553). Since transit losses in the inflow canals and seepage loss from the reservoirs are so high, AMIC entered into a decree that adjudicated John Martin Reservoir as an alternate place of storage (Case No. 80CW19).

Although the reservoirs are owned by AMIC, the Fort Lyon Company was granted preferential use of the first 5,483 acre-feet of the storage rights to compensate the company for use of its canals to convey water into the reservoirs. Somewhat vague agreements between the two companies regarding storage operations were recently settled under a formalized agreement.

Tri-State Generation and Transmission purchased and changed 49% of the shares in AMIC (Case No. 07CW74). The Tri-State shares are currently leased back to farmers but canal operations may change significantly if Tri-State develops power generation facilities in the area.

Although use of supplemental supplies differs depending on several conditions, a general order of supplemental water use is as follows:

- Direct flow
- Section II Water (winter and summer)
- Section III Water
- Great Plains Reservoir storage water

Occasionally AMIC receives Pueblo Winter Storage water from a reservoir upstream of John Martin Reservoir (excluding the Great Plains Reservoirs), but this is rare.

- **Lamar Canal** (6700614) has a carrying capacity of about 315 cfs. The measurement device is considered to be accurate. Conveyance losses are approximately 20% - 25% of diversions; canal loss is estimated as 9.7% in the H-I Model. There are four augmentation stations on the canal that LAWMA operates for augmentation (Center Farm – 6700611; West Farm – 6700663; Granada East – 6700618; and Granada West - 6700727). Around 30% of all the river diversions into the Lamar Canal is returned to the river through the augmentation stations.

- **L & L Seepage Ditch** (6700588) hasn't been used recently
- **Sayler & Nowells Ditch** (6700519) is supplemental to lands with Amity Canal shares. The Sayler & Nowells water rights are picked up in the Amity Canal and delivered to the irrigated land along with Amity Canal share water.
- **Nowels Pipeline** (6700594) hasn't been use recently
- **Hutchinson Ditch** (6700587) has surface rights and wells that are augmented through LAWMA. It pulls water out of the Vista Del Rio which is a seep drain, but on records it lists Arkansas River as its source.

West Prowers Arroyo

- **Lyvere Ditch** (6700580) is an active structure and is generally under a futile call
- **Swallow Seepage Ditch** (6700581) has not be used recently
- **James Cushny Ditch** (6700579) diverts water from West Prowers Arroyo and is generally under a futile call
- **Dudley Ditch No. 1** (6700630) is an active structure that receives water form Lubbers Drain

East Prowers Arroyo

- **Gerald Verhoeff Reservoir** (6703599) receives water from East Prowers Arroyo and Lubbers Drain
- **Gerald Verhoeff Ditch** (6700544) receives water from direct flow and from Gerald Verhoeff Reservoir
- **Dingwall Ditch** (6700543) receives water from direct flow and from tailwater from the Fort Lyon Canal
- **Dingwall Reservoir** is a post-Compact reservoir that is used as a head stabilization structure, but has a junior water right that could be filled under futile call or rare free river circumstances.

Limestone Creek

- **August Reyher Seep 1 & 2** (6700624 & 6700625) get water from Limestone Creek

Graveyard Creek

- **Graveyard Ditch** (6700545) has not been used recently
- **Jen Copeland Ditch** (6700627) has not been used recently
- **R M Ray Seep Ditch No. 1** (6700506) has not been used recently

Wiley Drainage Ditch

Brings return flow and seepage from the Fort Lyon Canal plus some natural flows to the Arkansas River. Numerous direct rights on this drainage have been transferred to an Upper and Lower diversion; both of which divert in the winter and are subject to seasonal limitations.

- **Upper Wiley Diversion** (6700687) is located at the diversion location of the Parmenter Seepage Ditch (6700540). The following ditches, including the Parmenter Seepage Ditch, were transferred to the Upper Wiley Diversion: Pleasant Valley Ditch (6700664), Taylor Ditch Nos. 1, 2, & 4 (6700662, 6700663, and 6700621, respectively).
- **Lower Wiley Diversion** (6700726) is located at the diversion location of the Koen Seepage Ditch (6700538). The following ditches, including the Koen Seepage Ditch, were transferred to the Lower Wiley Diversion: Ecton Ditch (6700534) and McKibbon Short Line Ditch (6700537).
- A number of the ditches in the Wiley Diversions are alternate points of diversion at both locations.
- Both diversions on the Wiley Drain have gotten project water from Pueblo using an exchange. Pueblo Reservoir has a release to this location.
- **Pearl Ditch** (6700576) has not been recently used

Pleasant Valley Drainage

Brings return flow and seepage from the Fort Lyon Canal plus some natural flows to the Arkansas River.

- **Andrew Kern Drainage Ditch** (6700626) is used to supplement lands that are irrigated by the Fort Lyon Canal. Water is diverted in a pipeline and has a measuring device.
- **Marburg (Sutphin) Ditch** (6700693) is operational and does irrigate
- **Marburg (Ray) Seepage** (6700629) has not been used recently
- **Amity Canal (Goulds Draw, 6700553)** is also called the Parmenter Seep. This is one of the Amity Canal tributary rights and receives water from Goulds Draw. Most of this water is considered to be tail water from the Fort Lyon Canal.

Markham Arroyo

- **Amity Canal (May Valley, 6700520)** gets water from Markham Arroyo, although there is rarely sufficient water to divert

The Lower Reach

The Lower reach extends from the Lamar Canal to the State line. The upper reach consists of the mainstem Arkansas River and small tributary drainages that typically only flow during rain events.

Mainstem

- **Coen Ditch** (6706000) has a flow meter and runs water all the time. It's decreed non-tributary water and has records.
- **Sapp Ditch** (6700639) all lands under the ditch have been transferred to wells and out-of-priority depletions are augmented by LAWMA. In-priority diversions under the Sapp

Ditch right through the wells as applied to historical Sapp Ditch lands are not required to be augmented.

- **Lamar Feeder Canal** (6700691 and 6700690) do not exist anymore, but are still on the records.
- **Hyde Ditch** (6700612) is an active water right and has a pump on the river as an alternate point of diversion (Hyde AP, 6700648). Hyde Ditch is also decreed as an alternate point for the Ideal Ditch (6700555) and J.K. Martin Ditch (6700530) from Markum Arroyo.
- **Graham Ditch** (6700572), **XY Irrigating Ditch** (6700617), **Manvel Canal** (6700573), and **Sisson & Stubbs Ditch** (6700616) have all been dried up and are part of the LAWMA plan. The lands are no longer irrigated with surface water, but can still be irrigated by wells. Note that these water rights are quantified by LAWMA via accounting of flows at the Arkansas River near Granada stream gage. A portion of the Graham Ditch lands irrigated by wells are assigned a credit in LAWMA's plan for augmentation to the extent the Graham water right was in priority in any given month.
- **Buffalo Canal** (6700608) has a senior right on the Arkansas. Typically, the Buffalo has not placed a call due to all the return flows coming back into the river. Canal loss is estimated as 8.9% in the H-I Model. The canal ends at Cheyenne Creek that takes water to the Arkansas River right before the State line.

Lower Basin Tributaries

- **Cottonwood Ditch** (6700563) is owned by Tri-State, who supplies ditch records. Not much water coming down the drainage for use in the ditch.
- **Boggs Ditch** (6700556) has a good water right, but not currently in use. Has been used historically. Gets water from the Boggs Drainage that normally runs 5 to 6 cfs.
- **Buffalo Canal** (Deadman, 6700565) takes water into Buffalo Canal
- **R W Sickelbower No. 1** (6700655) has not been used recently
- **Floyd Verhoeff No. 1 & 2** (6700567 & 6700566) are active, but not currently being used. Verhoeff No. 2's water right is tail water from the Amity. Verhoeff 1 does not receive any Amity water.
- **Wood Ditch (East Wild Horse, 6700583)** wasn't being used historically, but is now being used again
- **Wood Ditch (Wild Horse, 6700582)** according to the owner the ditch was just transferred into two wells under LAWMA and no longer being used. This transfer has not officially occurred.
- **Bryce -McKeever Ditch** (6700515) has not been used recently

Big Sandy Creek Basin

The upper reaches of the big Sandy Creek, from about the town of Calhan to the town of Limon, are in the Upper Big Sandy Designated Basin, which is regulated by the Ground Water

Commission. The water commissioner does not visit Big Sandy Creek above the Fort Lyon Amity Canal, which includes various smaller tributaries, including: North, Middle and South Rush Creek, Koon Creek, and Antelope Creek.

- **Amity Canal (Big Sandy, 6700672)** is active, but doesn't get hardly any water from the Big Sandy drainage.
- Similar to wells on Two Buttes Creek, non-exempt wells outside of the designated basin are augmented at the Arkansas River using a 4% unlagged rate by LAWMA.

APPENDIX A - Distribution of John Martin Reservoir Section III (Other Water) Accounts

