

DIVISION 6

2016 ANNUAL SUMMARY



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April 14, 2017



COLORADO
Division of Water Resources
Department of Natural Resources

2016 ANNUAL SUMMARY

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Introduction

The following report summarizes the activities of the Division 6 office of the Colorado Division of Water Resources in 2016, presents an overview of the administration activities that took place during both the calendar and irrigation year 2016 and provides statistical data for both the water and irrigation year 2016.

Basin Hydrology

Snow Pack

Table 1 below shows the snow water equivalent for the period October 2015 through May 2016. As a result of cooler spring temperatures and higher precipitation in April and May, by the end of May the snow water equivalent was well above the median.

TABLE 1

**End of Month Snow Water Equivalent as Percent of Median
Water Year 2016**

Drainage	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Laramie/North Platte River	76	88	103	101	92	110	114	176
Yampa/White River	64	81	105	107	94	105	112	178

Stream Flows

As a result of the above median snowpack, streamflows were above average at each of the reported gauges with the exception of the White River near Meeker. Table 2, below, shows the January 1st, March 1st and May 1st runoff forecasts developed by the NRCS in comparison to the actual runoff between April 1 and July 31 as measured at the selected USGS gauging stations.

TABLE 2

2016 Runoff Forecast in 1000's of Acre-Feet

<u>Station Name</u>	<u>1-Jan</u>		<u>1-Mar</u>		<u>1-May</u>		<u>Actual</u>	
	Runoff	% Avg	Runoff	% Avg	Runoff	% Avg	Runoff	% Avg
North Platte nr Northgate (Apr-Jul)	225	100	200	89	235	126	284	118
White River nr Meeker (Apr-Jul)	270	96	225	80	230	82	265	95
Little Snake River nr Lily (Apr-Jul)	285	83	230	67	335	97	406	117
Yampa River nr Maybell (Apr-Jul)	830	89	730	78	980	105	1062	112



Provided in Table 3 below are the annual runoff values for the water year for these stations as well as the minimum daily average flow recorded at each station.

Table 3

2016 Annual Discharge

Station Name	Historic Lowest (AF)	Total 2016 (AF)	Historic Average (AF)	% of Average
North Platte River near Northgate	66,240	351,274	312,400	112
White River near Meeker	198,600	413,359	447,500	92
Little Snake River at Lily	79,600	452,521	410,600	110
Yampa River near Maybell	345,100	1,194,316	1,124,900	106

Lowest Daily Mean

Station Name	Minimum on Record (cfs)	Minimum WY2016 (cfs)	Date of Occurrence
North Platte River near Northgate	15	69.6	Sept. 12, 2016
White River below Boise Creek	53	110	Aug. 22, 2016
Little Snake River at Lily	0.0	8.4	Sept. 1, 2016
Yampa River near Maybell	1.8	81	Sept. 21, 2016

Precipitation

Table 4 below shows the monthly precipitation data for the towns of Walden, Meeker and Steamboat Springs.

Table 4

**Monthly Precipitation Data for Selected Sites
Water Year 2016**

Site	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total
Walden (inches)	1.54	1.01	1.24	0.21	1.10	1.26	1.17	1.07	---	0.62	1.74	0.42	---
% Avg	173	122	210	34	180	154	109	71	---	48	166	35	---
Meeker (inches)	1.19	1.85	2.12	1.66	0.74	1.14	1.96	3.06	0.27	1.41	0.3	1.08	16.78
% Avg	72	168	236	207	99	84	140	204	27	108	24	90	118



Steamboat (inches)	1.97	2.10	3.08	2.86	1.13	3.01	3.62	2.80	0.60	1.62	2.07	2.81	27.67
% Avg	103	89	161	111	53	148	157	121	42	111	142	163	118

**Monthly Precipitation Data for Selected Sites
Calendar Year 2016**

Site	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Walden (inches)	0.21	1.10	1.26	1.17	1.07	---	0.62	1.74	0.42	0.74	0.42	0.96	---
% Avg	34	180	154	109	71	---	48	166	35	83	51	163	---
Meeker (inches)	1.66	0.74	1.14	1.96	3.06	0.27	1.41	0.3	1.08	0.86	1.41	1.34	14.23
% Avg	207	99	84	140	204	27	108	24	90	52	128	149	105
Steamboat (inches)	2.86	1.13	3.01	3.62	2.80	0.60	1.62	2.07	2.81	2.04	1.45	3.62	27.63
% Avg	111	53	148	157	121	42	111	142	163	106	62	153	115

Water Administration

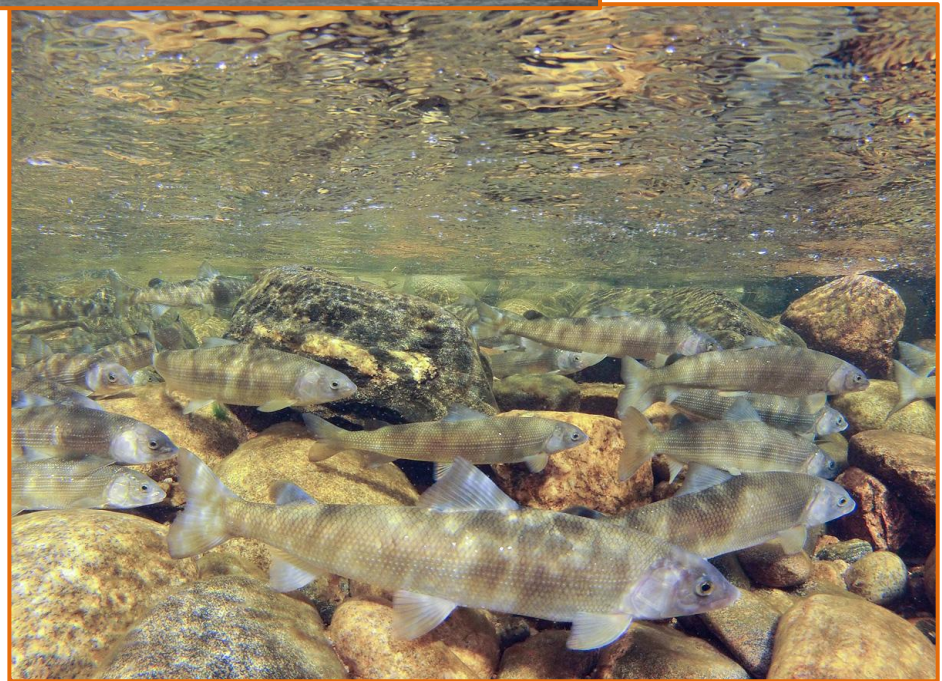
Water administration in water year 2016 in Division 6 was limited to the typical calls. In the North Platte River basin the Illinois River went under administration for a very short duration; 8 days. In the Yampa River basin, administration occurred on Bear River, South Hunt Creek, Middle Hunt Creek, a small tributary of the Yampa River, Deep Creek of the Elk River, the Elk River itself, West Fish Creek of Trout Creek, and Little Bear Creek of Fortification Creek. In the Little Snake River drainage of the Yampa River, nothing was under administration. In the Green River basin, administration was limited to Pot Creek and Talamantes Creek. Finally, in the White River basin, administration occurred on Piceance Creek, which included the entire Piceance Creek basin upstream of the Metz and Reigan Ditch. A complete list of the calls that occurred within Division 6 can be found on the CDSS website. Additionally, releases were made from Elkhead Creek Reservoir, Stagecoach Reservoir and Pearl Lake in 2016 that were protected by our office and are further described below.

Elk River Administration

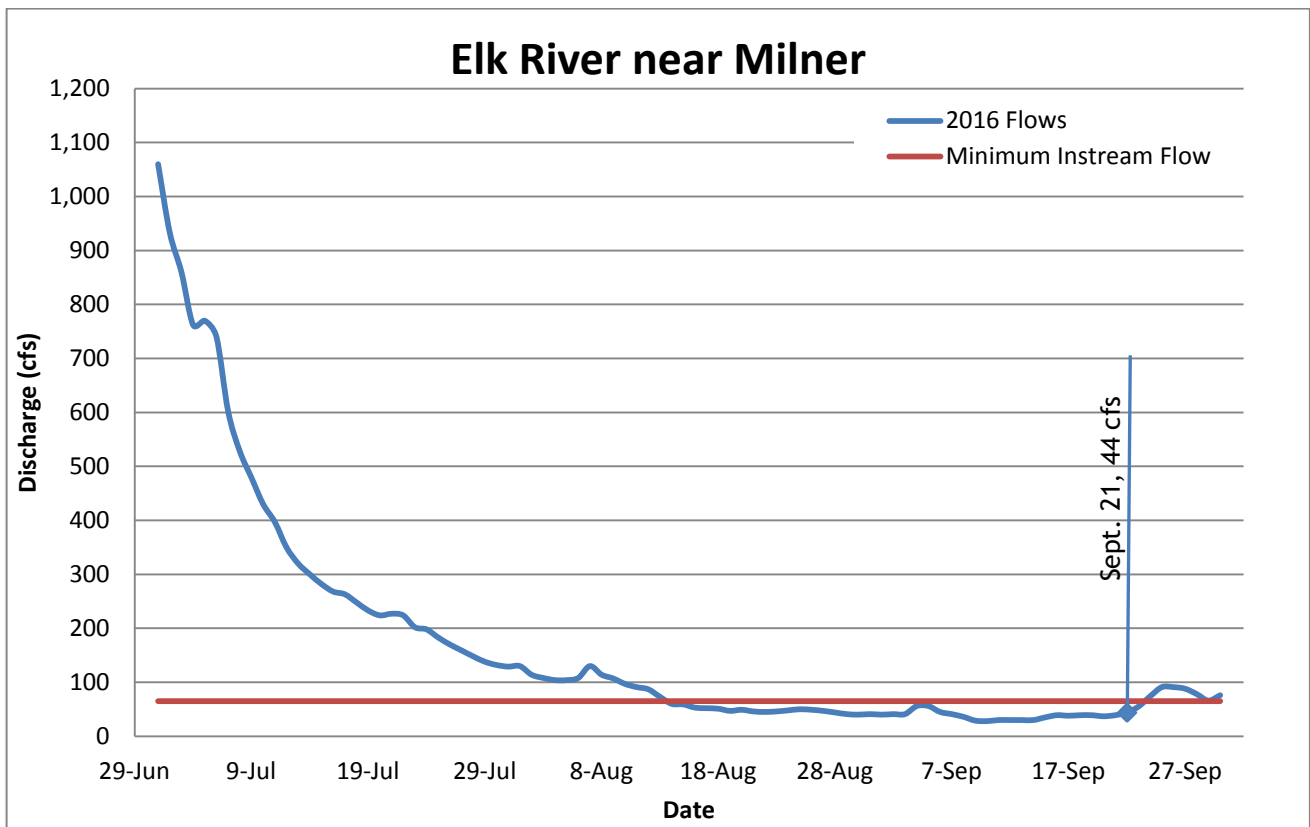
The Elk River was under administration between August 17 and September 27. The Elk River instream flow water right, the calling water right, is decreed in the amount of 65 cfs year round. The lowest daily mean flow that occurred in the months of August and September was 28 cfs on September 10 as measured at the Elk River near Milner gauge station. During this call period, divers had to inspect the outlet at Steamboat Lake, which meant that the outlet had to be completely closed. By doing this, water would be stored out of priority. In order to not cause



injury to the calling right while the inspection was occurring, this office administered an unadjudicated exchange whereby releases were made from Pearl Lake while the out of priority storage was occurring in Steamboat Lake. The releases made from Pearl Lake however were in excess of that amount needed to operate the exchange. The excess water was released due to low flows in the Elk River at the time coinciding with the migration of the Mountain Whitefish. The closure of the outlet gates and operation of the exchange and additional releases began on September 21.



Shown in the following graph are the flows during the summer and fall at the Elk River near Milner gauge station which typically drops below 65 cfs.



In September 2013, 75 orders were issued to the water right owners of 100 structures located within the Elk River basin that were not equipped with measuring devices. These orders provided that any diversion of water starting in the spring of 2014 would be considered contrary to the order if suitable and proper headgates and measuring devices had not been installed. To date, all but 20 of the structures are now in compliance and there are 2 outstanding cease and desist orders. Those structures not in compliance have not diverted water since prior to the spring of 2014. Division 6 continues to work with the owners in trying to bring their structure(s) into compliance.

Throughout this entire process of trying to get diversion structures equipped with adequate headgates and measuring devices, the Upper Yampa Water Conservancy District (UYWCD) offered \$500 grants to people that applied for and then installed headgates and measuring devices (\$500 per device) on their structures. This mini-grant is still being offered to not only water users in the Elk River basin but anywhere with the District boundaries. Additionally, in December 2015, the



UYWCD applied for an Umbrella Augmentation Plan within the Elk River Basin. The plan is designed to provide a means for water users to divert water out of priority during administration on the Elk River, yet have their depletions replaced through the plan. When calls are honored on the Elk River itself, the replacement source of water will be from Steamboat Lake; whereas if a call is honored on the Yampa River below the Elk River, and thus affecting diversions of water on the Elk River, the replacement source will be either Stagecoach Reservoir or Yamcolo Reservoir. This water court application is still pending, but the applicant is making progress in addressing opposer's concerns and entering into stipulations with the opposers.

Elkhead Creek Reservoir

Releases were made from Elkhead Creek Reservoir between August 17, 2016 and October 8, 2016 for a total of 5,000 acre-feet. This release was made for the purpose of in-river fish habitat and river flow maintenance and enhancement under the Upper Colorado River Endangered Fish Recovery Implementation Program (Recovery Program). Releases are made from Elkhead Creek Reservoir when the flows in the Yampa River drop below 200 cfs at the Yampa River near Maybell gauge station. Water released from Elkhead Creek Reservoir is protected by this office through the entire length of the critical habitat reach which extends from the City of Craig downstream to the confluence of the Yampa River and Green River.

In the summer of 2015, we worked with the Maybell Irrigation District to reduce wasted water at the tail end of the Maybell Canal. The Maybell Canal typically diverts between 50 and 60 cfs during times when reservoir water is being released. The headgate of the canal is located upstream of the Yampa River near Maybell gauging station yet its tailwater is released back to the River downstream of the gauge station. Historically, operators of the Maybell Canal opened their headgate at the beginning of the irrigation season in the spring and did not adjust it again until they turned the ditch off in the fall. As a result, it was not uncommon for them to divert water in excess of their need especially when people on the ditch were haying or were simply done using water for the season prior to the ditch being turned off. Any water not being used of course would run out the tail end of the ditch. This wasted water was returning to the critical habitat reach almost 18 miles downstream of its headgate and almost 15 miles downstream of the measuring point used to determine needed releases from Elkhead Creek Reservoir (Yampa River near Maybell). At one point during the 2015 releases being made from Elkhead Creek Reservoir, as much as 18 cfs was observed running through the tail end of the ditch; while the diversion at the headgate was 54 cfs - a wasting of 33% of the water diverted.



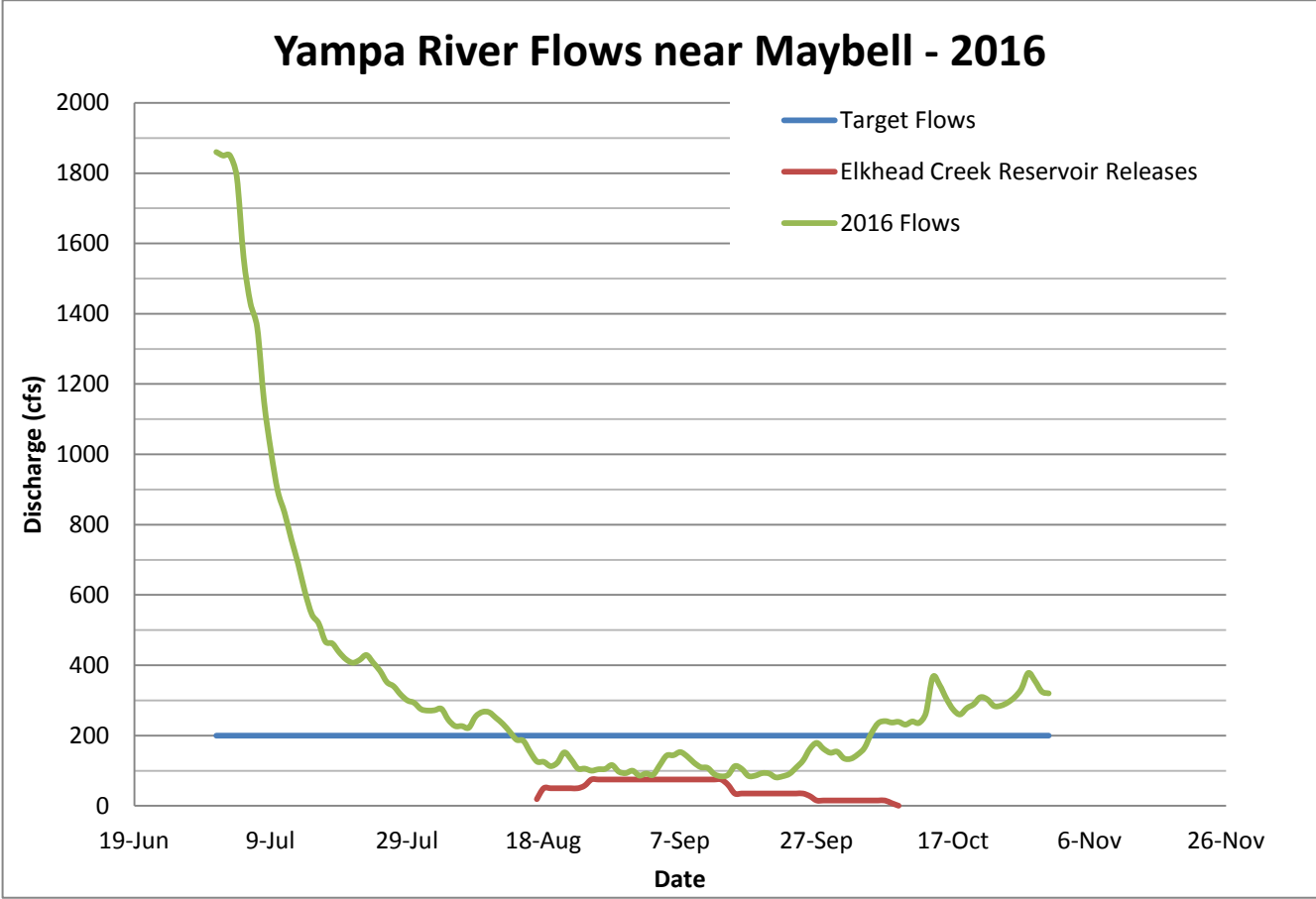
The primary reason why headgate adjustments were not being made on the Canal was because of the difficulty in accessing the headgate. The ditch bank to the headgate for one mile was completely overgrown with brush. As such, in 2016, Division 6 required that the Maybell Irrigation District clean the bank of the Maybell Canal to its headgate in order to make it more accessible. Along with cleaning the bank, the District hired a new ditch rider with a good deal of experience in managing ditch systems. Between the cleaning of the ditch bank and the new ditch rider, this office observed an excessive amount of waste through the tail end of the ditch only one time. When this was observed, the president of the District was contacted and the diversions at the headgate were quickly reduced.

Also, in 2016, the Maybell Irrigation District applied for and was awarded a grant for improvements on the Maybell Canal from both the Colorado River Water Conservation District (\$49,000) and the Yampa White Green Roundtable (\$45,675). The entire project cost for the improvements is estimated to be \$197,000 which includes the cost for hillside stabilization, construction of a new flume to carry water across the Yampa River which includes a ditch liner to reduce water loss and improve efficiency, installation of check gates within the ditch to assist in better management of water flows and reduction of tailwater, and installation of measuring device and automated “waste gate”.



Finally this office worked very closely with Tom Pitts who was assisting the Maybell Irrigation District to develop a written procedure for the protection of the Elkhead Creek Reservoir releases for endangered fish and administration/operation of the Maybell Canal. The purpose of the procedure is to clarify the manner by which Elkhead Creek Reservoir releases for the purpose of enhancing flows for endangered fish in the lower Yampa River will be delivered through the critical habitat reach with respect to diversion of natural flows at the Maybell Canal headgate.

Shown in the following graph are the flows during the summer and fall on the Yampa River near Maybell, which typically drop below the 200 cfs target flow, along with the Elkhead Creek Reservoir releases.

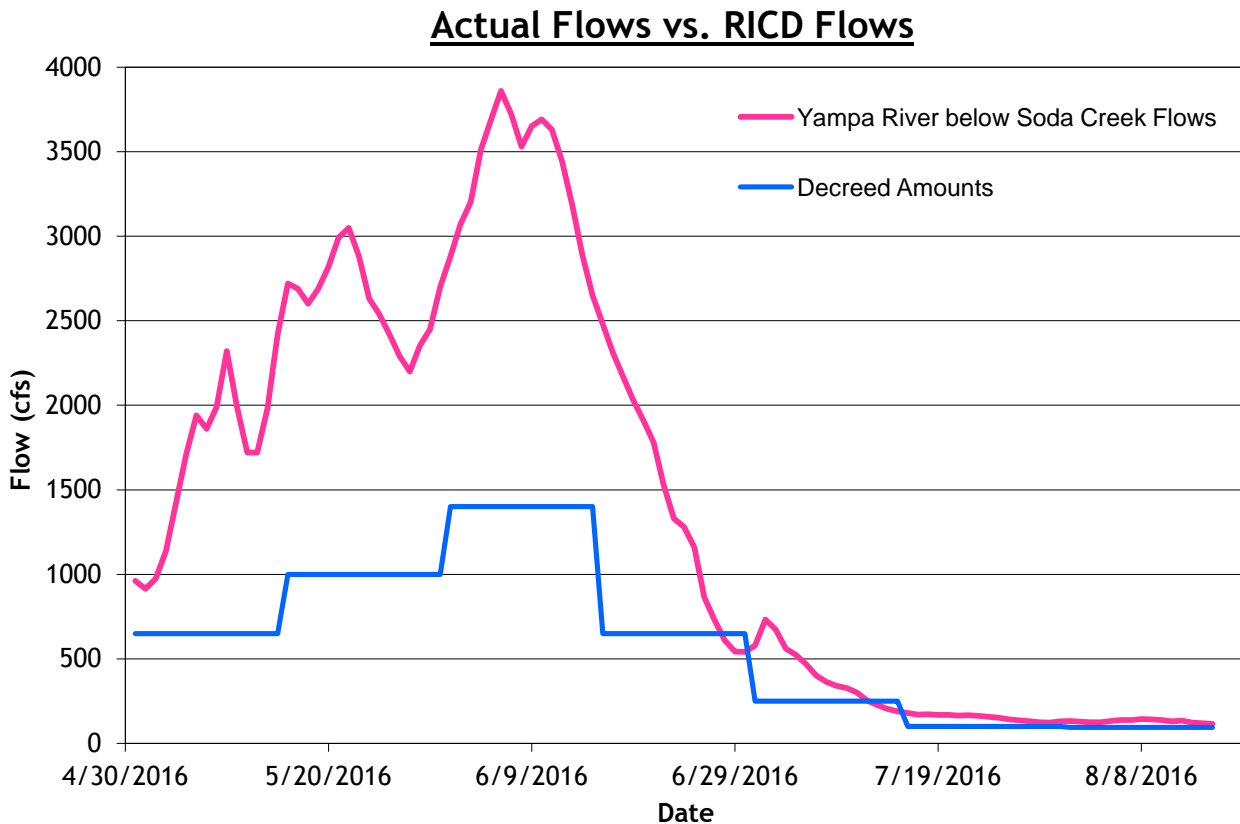


Yampa River RICD Flows

Though the Yampa River has never been subject to administration as a result of a call for water by the City of Steamboat Springs for their Recreational In-Channel Diversion (RICD) water right, this office tracks the flows through the diversions in the event the potential for a call were to arise.

The decreed amounts for the RICD are: 400 cfs from April 15 to April 30, 650 cfs from May 1 to May 15, 1000 cfs from May 16 to May 31, 1400 cfs from June 1 to June 15, 650 cfs from June 16 to June 30, 250 cfs from July 1 to July 15, 100 cfs from July 16 to July 31 and 95 cfs from August 1 to August 15. The City of Steamboat Springs does not begin operation of the gauge station (Yampa River below Soda Creek) that acts as their measurement for their water right until May 1 of each year, and as such a call would not be honored prior to May 1 unless they begin operation of the gauge station prior to this date.

The following graph shows the average daily flows at the Yampa River below Soda Creek gauge station in comparison to the decreed flows. The flows on the Yampa River below Soda Creek dropped below the decreed amounts on June 28, June 29, June 30, July 13, July 14, and July 15.



Stagecoach Reservoir Releases

In the summers of 2012 and 2013, UYWCD, the owner and operator of Stagecoach Reservoir, and the Colorado Water Trust (CWT) entered into contracts for 4,000 acre-feet of water to be delivered to the Colorado Water Conservation Board’s (CWCB) instream flow reach located downstream of

Stagecoach Reservoir. In 2014, no contract was entered into between the UYWCD and CWT since the flows in the Yampa River appeared as though they would stay above the decreed instream flow amounts. In 2015, the two entities again entered into a contract for water to be released from Stagecoach Reservoir but in the amount of 1,185 acre-feet and with no specific delivery point.

In 2016, releases were made at a rate of 10 cfs from Stagecoach Reservoir under the City of Steamboat Springs' contract (552 acre-feet) with UYWCD along with a sublease from the CWT (264 acre-feet) who had entered into a contract with the District in the fall. The releases were made in an effort to reduce streamflow temperature at the location of the City of Steamboat Springs' effluent discharge point along the Yampa River. In total 816 acre-feet was released under these contracts between August 19 and September 15 and September 22 and October 5. Though difficult to determine, the City does believe that the release of the 10 cfs from Stagecoach Reservoir did have a minor affect on the temperature at their effluent discharge point.

Groundwater and Well Permitting

There were no unusual groundwater administrative or well permitting issues in 2016. However, there have been an increasing number of illegally constructed infiltration gallery wells being discovered. When discovered, the Chief Well Inspector has been in charge of determining whether a well permit can be issued to the well or if it is a matter that needs to be brought to the Board of Examiners. To date, the illegally constructed wells brought to the Board of Examiners for review have been ordered to be plugged and abandoned.

Compacts and Inter-State Agreements

Following is a description of the interstate compacts and agreements administered by Division 6.

Upper Colorado River Compact

Under Article XIII (a) of the Upper Colorado River Compact, the State of Colorado will not cause the flow of the Yampa River at the Maybell gauge to be depleted below an aggregate amount of 5,000,000 acre-feet for any period of ten consecutive years. The annual runoff for water year 2016 at this gauge was 1,194,316 acre-feet and the ten year (2007 to 2016) aggregate flow was 11,601,566 acre-feet; obviously well above that required under Article XIII (a).

The Little Snake River is administered jointly with the State of Wyoming during times of shortage pursuant to Article XI of the Upper Colorado River Compact. There were no calls made in water

year 2016 on the Little Snake River. However releases were made from High Savory Reservoir located in Wyoming for use by both Colorado and Wyoming (primarily) water users.

Nebraska v. Wyoming, U.S. Supreme Court Decree

Under the “North Platte River Decree”, Colorado is limited to a total of 145,000 acres of irrigation, no more than 17,000 acre-feet per year of storage for irrigation purposes and no more than 60,000 acre-feet of transmountain diversions in any period of ten consecutive years from the North Platte drainage of Colorado. In water year 2016, a total of 110,281 acres were irrigated and 7,713 acre-feet was stored for irrigation purposes. Transmountain diversions out of the basin totaled 630 acre-feet. The cumulative ten-year transmountain diversion out of the basin is 35,316 acre-feet. None of the limits established by the Supreme Court Decree were exceeded in 2016.

A Division 6 representative attended the North Platte Decree Committee meetings held in Scottsbluff, NE in April 2016 and Torrington, WY in October 2016.

Pot Creek MOU

Pot Creek is a small tributary of the Green River; the headwaters of which are in Utah and enter the Green River in Colorado. Pot Creek water is apportioned among the users of Utah and Colorado under a Memorandum of Understanding (MOU) last updated and signed by the State Engineers of Utah and Colorado on March 1, 2005.

The Pot Creek system is comprised primarily of five reservoirs; three of which are located in Utah and two of which are located in Colorado. The three Utah reservoirs are Matt Warner, Calder and Crouse with Matt Warner being the highest, most upstream reservoir in the system and Crouse the lowest. Matt Warner Reservoir is used primarily for recreation and is consider gold water fisheries. Calder and Crouse Reservoirs have each experienced a fish kill. Additionally, Crouse Reservoir was abandoned, for the most part, many years ago and its low level outlet was filled with concrete. As such when water is released from Matt Warner or Calder Reservoirs for delivery to Colorado users, Crouse Reservoir must fill to its lowest point where water either is released or spills.

The most senior water right in the Pot Creek system is a 4.0 cfs right that is decreed to fill any of the three Utah reservoirs, though is typically used to fill Matt Warner Reservoir. When inflows to Matt Warner Reservoir exceed 4.0 cfs and there is a request from a Colorado water user to receive

water, any amount above 4.0 cfs must be released until the Colorado water right for Dry Lake Reservoir up to 18.36 acre-feet and Offield Reservoir up to 64 acre-feet are satisfied.

A total of 980 acre-feet of water was stored out of priority in the three Utah reservoirs throughout the winter months, November 1, 2015 through April 30, 2016. As a result, releases began being made from Matt Warner Reservoir on May 2 at a rate of 8.5 cfs under a call for water in Offield Reservoir. Releases continued to be made until June 13 at which time Dry Lake Reservoir located in Colorado was storing an estimated 64 acre-feet, which is well in excess of its water right decreed in the amount of 18.36 acre-feet. Offield Reservoir, also located in Colorado, was storing 245 acre-feet which was comprised of 64 acre-feet under its senior water right and 181 acre-feet under a portion of its junior right. Despite the releases being made Matt Warner Reservoir continued to store water and began spilling on May 27.

The State of Colorado owns and operates a gauging station located on Pot Creek just upstream of the state line. The records from this gauge show that a total of 485 acre-feet of water entered into Colorado between May 7 and June 17. Outside of this time period, Pot Creek for the most part was completely dry at the gauge location. Dry Lake Reservoir is filled by the Miles Ditch that diverts water from Pot Creek, and Offield Reservoir is located directly on Pot Creek. During the release from Matt Warner Reservoir no water was being released from either Dry Lake Reservoir or Offield Reservoir, yet the amount recorded as being stored was 309 acre-feet between the two reservoirs; a difference of 176 acre-feet between what went past the Stateline gauge and what was stored or otherwise diverted for beneficial use. The majority of this difference was likely due to stream flow losses and transit losses within the Miles Ditch. Also, it became very evident for the first time in 2016 that Dry Lake Reservoir has the capacity to store well in excess of its water right which could also make up for some of the difference. Because of this, a letter was sent to the owner of Dry Lake Reservoir requiring that it be surveyed and a stage-storage table developed.

The 2015 Pot Creek Distribution System Water Users meeting held on February 25, 2016 in Vernal, UT was attended by Division 6 representatives. Likewise, the 2016 Pot Creek Distribution System Water Users meeting held on February 22, 2017 in Vernal, UT was attended by phone by Division 6 representatives. Both the 2015 and 2016 Annual Water Distribution Reports of the Pot Creek Distribution System can be found in Laserfiche.

Division Highlights

Lysimeter Project

The Yampa-White Lysimeter Study (Study) was a five year study that began with the installation and operation of a weather station in fall 2011 and the final installation and start of operation of the lysimeter plots in the spring of 2012. The funding for the study ended in early spring 2016; however, because it was believed that not enough high quality data was obtained during the study period, the Colorado Climate Center and Division 6 Water Resources applied for and received additional grant money through the Round Table process to allow five additional years of operation of the Study.

The purpose of the Study is to provide a quantitative assessment of irrigated hay meadow consumptive use and its relationship to local weather conditions. The Study site consists of four lysimeter plots. Two of the plots were seeded in 2012 with an ET grass reference crop (Orchard Grass) and the other two had sod from the surrounding irrigated meadow planted in them.

In 2016 the site was visited by the water commissioner on regular intervals between April 25 and October 28. Measurements were taken twice on each day of a visit. The plots are weighed upon arrival (referred to as the dry weights) and then weighed again several hours after saturation (referred to as the wet weights). There is no consistency on the timing between the first and second weighing however ample time is given to assure that all excess water applied to the plots has drained out of them.

Under the operating guidelines for the Division 6 Lysimeters, the goal is to maintain the individual lysimeter surfaces and the ground surrounding the weather station with green active growing vegetation, the vegetation of which is to mimic that of the larger nearby irrigated hay field of Carpenter Ranch. For the lysimeters to represent and yield an accurate measurement of ET of the surrounding irrigated hay fields, it is important that the grass/vegetation in the lysimeter plot area be the same height, density and moisture as the surrounding larger grass hay field area. As you can see in the picture below showing the plots in 2016, the plots and surrounding area have become fully vegetated and there is now complete coverage of grasses, creating more of the idealistic field study conditions.



Lysimeter Site 2016

Abandonment Process

As water rights are discovered that this office believes should be included on the 2020 Decennial Abandonment List, Division 6 staff is flagging these water rights in HBDMC under the Activity Manager.

Important Court Cases

The State Engineer and Division 6 Engineer have filed very few statements of opposition in new cases or filed protests to cases recently. In 2013 and 2014, no statements of opposition were filed; in 2015, two statements of opposition were filed and in 2016, two statements of opposition were filed. No protests to any of the referee rulings were filed in 2016. The four cases for which a statement of opposition was filed in 2015 and 2016 are still pending. The Division Engineer filed 69 Reports of the Division Engineer in 2013, 79 in 2014, 90 in 2015 and 89 in 2016.

Involvement in the Water User Community

The Division 6 staff continues to assist the public in preparing water court and well permit applications by providing water right and diversion record information, by providing information on



proper selection and installation of water measuring devices, and by providing assistance to dam owners with completing Notices of Intent to Construct Non-Jurisdictional Dams, Livestock Water Tank Permits and Emergency Action Plans. The Division 6 field office in Craig continues to be a vital aspect of our public relations.

Following is a list of meetings attended by Division 6 staff in 2016. This list is not meant to be all inclusive, but rather provide an idea of the types of meetings attended.

- Spring North Platte Decree Committee meeting held in Scottsbluff, NE
- Fall North Platte Decree Committee meeting held in Torrington WY
- Annual meeting of the Pot Creek Distribution System in Vernal, UT
- Little Snake River Conservation District annual meeting held in Baggs, WY
- Board meetings held by the Upper Yampa Water Conservancy District
- Board meetings held by Yellow Jacket Water Conservancy District
- Bear River Irrigators annual meeting
- Stillwater Ditch Company annual meeting
- All roundtable meetings for the Yampa/White River and North Platte River
- Colorado Water Congress Annual Convention held in Denver, CO

Division 6 staff also made presentations at several water workshops and conferences in 2016 and early part of 2017.

Division 6 Organization Chart

