COLORADO
Division of Water Resources
Department of Natural Resources

2013 Annual Report

Big Thompson River 8:30 a.m., September 14, 2013

"What is the role of engineers in our society? I believe engineers make improvements to the status quo, while recognizing our commitment to service within our communities and stewardship of our natural resources. It is part of your character. It is the knowledge that in service to others lies your real value, a value multiplied by the number of lives you touch."

Dick Wolfe, Colorado's State Engineer

It is not often that an organization can turn to one defining event in a year. However, the 2013 flood was such an event that will also be remembered as the flood of our generation. The response by DWR was unprecedented. The responses by the communities in the affected areas were tremendous including the exemplary efforts of many DWR staff.

I would like to specifically recognize the Dam Safety Branch and the Hydrographic Branch, as well as the Staff in Water Divisions No. 1 and 2 for their outstanding efforts. They all immediately went into action in response to the emerging crisis in the early hours of September 12 and have continued to do so even today.

I also want to thank the staff from the Attorney General's Office. They responded immediately to our emergency request to address any liability issues regarding our efforts to use volunteers for dam safety inspections.

This was truly a team effort. I am so grateful for the professionalism, expertise and sheer effort that these folks employed to respond to this remarkable flooding event.

The main focus since the flood has been on repair and reconstruction. We deployed teams to assess our most vulnerable dams in the flooded areas as well as an assessment of the damage and destruction to our hydrographic equipment and structures, and the many diversion structures that were damaged or destroyed.

We embarked on three different levels of assessment:

- Assessment of dam integrity;
- Assessment of gaging station equipment and structures; and
- Assessment of diversion structures

Our number 1 priority is public safety. We needed to ensure dams were safe as recovery efforts ensued as it would have been irresponsible for us to put people in harm's way as they made their way back in to the affected areas.

There were 207 dams in the affected areas that needed inspection. The Dam Safety Branch marshaled 113 private dam-safety engineers from 27 Colorado engineering firms, 4 Federal agencies (NRCS, USACE, FEMA, USFWS) and 1 State agency (WY SEO) to perform these reviews. While our staff certainly worked hard to conduct inspections and coordinate and review the volunteer efforts, these volunteers contributed over 1900 hours of time to conduct the inspections at no cost to the State. We are extremely appreciative of the generous volunteer efforts.

In addition to dam safety concerns, the prompt restoration of the gaging stations and diversions structures was as paramount. The gaging stations are critical for water administration but also important for flood alerts. The diversion structures are critical for storage, municipal use and irrigation use. Please refer to the annual report for more details on these two areas of ongoing operations.

The response to this flooding event is indicative that the engineering paradigm is shifting towards designing structures that are more suited for a world of extreme events. We need to design and build structures that work effectively but when exposed to extreme events they will fail in ways that allow them to be quickly rebuilt and put back into service to support basic life functions. We need to employ fail-safe design concepts to address vulnerability and resilience.

We saw the need immediately to re-build for the future. These events presented us with an opportunity to look forward and utilize the most progressive and advanced thinking to be able to build back structures in ways that will reduce the impact for the next generation who will be faced with similar challenges the next time another extreme event happens. And it will happen again.

Best wishes for a prosperous 2014.

Colorado Hydrology 2013 – A Land of Extremes

Drought SE Portion of State 2013

- Vegetable acreage in Otero County 70% < avg.
- Throughout the Arkansas Basin corn acreage < 1% avg.
- Limited supplies were applied to save alfalfa and yet estimated losses > 40%

Flood Comparisons, CFS		
	Fort Morgan	Julesburg
Jun-1965	100,000	37,600
Jun-1935	84,300	31,300
Sep-2013	50,600	21,440

Programs

- Water Administration
  - Field Offices
- Dam Safety
- Hydrographic & Satellite Monitoring
- Hydrogeological Services
- Interstate Compacts
- Water Supply

Our Mission is:
To provide competent and dependable distribution of water in accordance with statutes, decrees and interstate compacts.
To ensure public safety through safe dams and properly permitted and constructed water wells.
To maintain and provide accurate and timely information concerning water.
To promote stewardship of all human, fiscal and natural resources.
To serve the public through the generation of creative solutions to problems.
To help the public understand complex water issues.
To promote stability in the use of the state's limited water resources.
To apply modern technology to its greatest advantage.

The Flood of 2013 – A 1,000 Year Precipitation Event

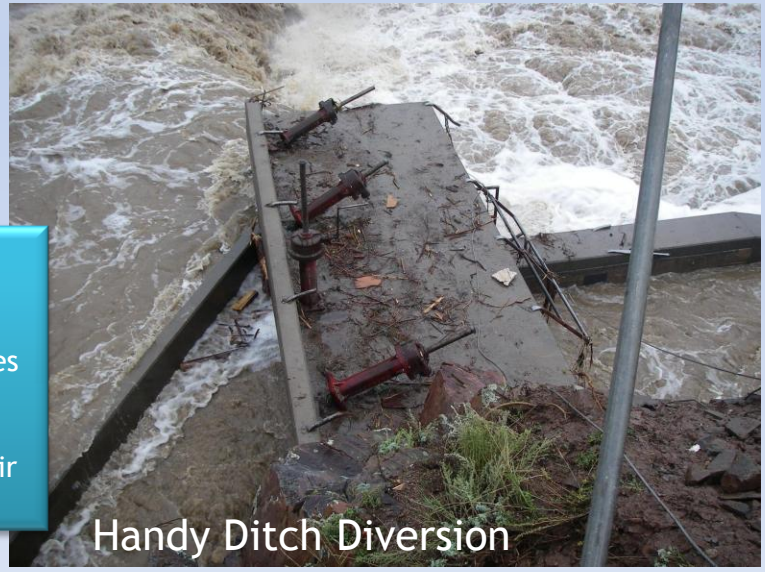
During the event DWR:

- Called 226 Dam Owners
- Responded to 34 Incidents
- Responded to 10 media requests
- Performed 152 Immediate Dam Assessments
- Manned 4 Emergency Operation Centers
- Performed 8 Forensic Investigations
- Organized over 100 engineers to perform 200 emergency inspections
- Set up 3 temporary gages for administration
- Rebuild/repair 23 permanent gages

Swede Ditch SDR – Still Reading!

Flood Damage to Water Measurement and Diversion Infrastructure

Rebuild/repair 23 permanent gages
-Approximately $500,000 in damaged infrastructure
$100,000 in electronics



"What most people probably don't know or don't have the ability to know at least the details of, are all those heroic stories of both private citizens, public employees – just general neighbors that truly accomplished feats of heroism to try to protect other peoples property. I wish there would be some way to just capture all those people on a stage – so that we could give them the accolades of a Superbowl kind of applause, but they're quite content to go about their normal lives." Scott Cuthbertson, Deputy State Engineer

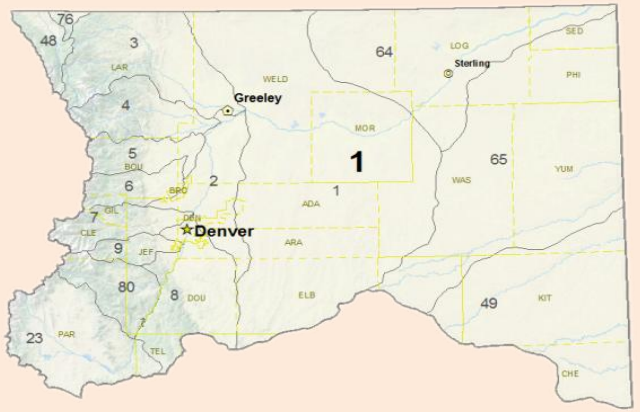
Flood Affected Structures

Diversion Structure Projected Recovery				
Stream Reach	4/1/2014	5/1/2014	6/1/2014	10/31/2014
S.P. - Ker. to NE	90%	98%	98%	100%
S.P. - Den. to Ker.	50%	75%	75%	75%
Poudre	91%	91%	91%	100%
Thompson	50%	53%	53%	53%
St. Vrain	43%	43%	51%	57%
Boulder Creek	86%	86%	86%	95%
Clear Creek	20%	100%	100%	100%
All	64%	72%	74%	78%

South Platte River Basin, Water Division 1

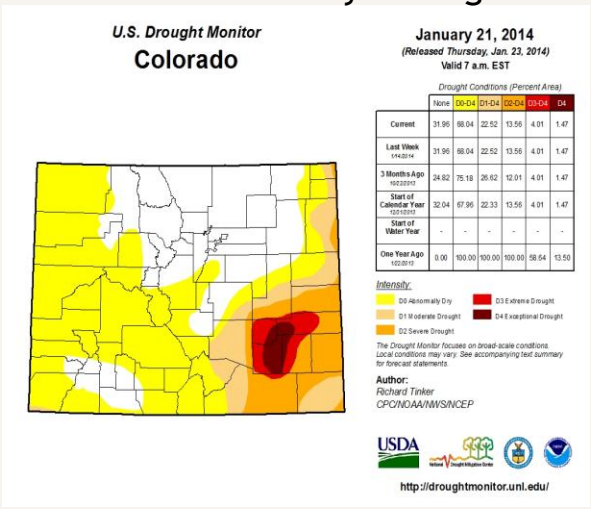
- Dryer than average to flows to start the year with flows remaining below average through August 2013 (29% of Average at Kersey and 8% of average at Julesburg).
- Overall reservoir storage through the end of July was at 67% of capacity.
- From September 9 through 16, 2013, 2 to 15 inches of precipitation fell in many areas of South Platte Basin
- Catastrophic damage to homes, businesses, roads as well as water diversion structures and stream flow gages.
- 221 diversion structures, 27 dams and 29 stream gage stations damaged or destroyed.
- Recovery effort will result in the majority of water related structures being operational by June 1, 2014.

Larimer and Weld Headgate

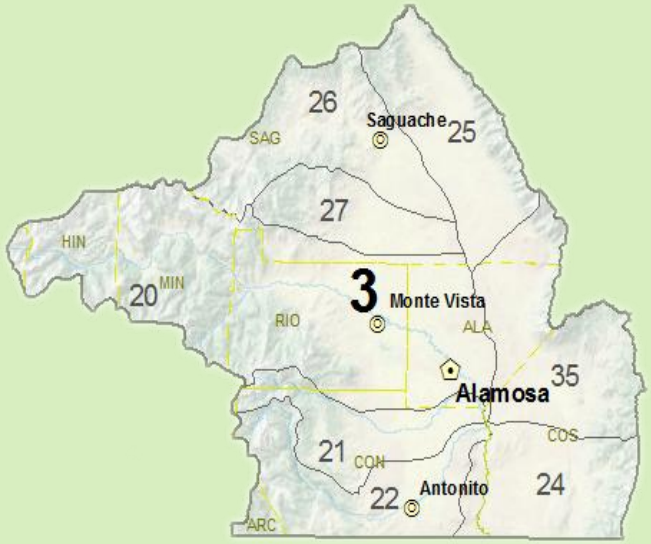


Arkansas River Basin, Water Division No. 2

- Using the combined flows of the Arkansas River measured below Pueblo, Fountain Creek at Pueblo and the Purgatoire River near Las Animas, 2013 was the second driest year since 1950, surpassed only by 2002.
- Winter storage accumulation at the end of the Pueblo Winter Storage Program storage period on March 14, 2013 was only 53% of that stored the previous year and 48% of the previous 20 year average.
- Irrigation well pumping in 2013 was by far the lowest year since Colorado's Amended Use Rules for well pumping went into effect in 1996 (57% of the prior low of 2004, 39,419 af 2004 – 22,575 af 2013).
- The series of storms which occurred in September were less catastrophic than in the South Platte. Two small dams failed on the south slope of Pikes Peak and several days of high flows were experienced along Fountain Creek.
- Despite these storms, portions of the Arkansas remain is severe drought.
- Colorado remains in compliance with Arkansas River Compact (58,708 a.f. acreation)



The Rio Grande, Water Division No. 3



West Fork Complex Fire

- The Basin faced below average snowpack and streamflow conditions for the fifth year in a row.
- 2013 experienced the lowest snowpack since 2003 with a peak of only 70% of average.
- As a whole, Colorado was close on its Rio Grande Compact delivery obligations for 2013, with a credit of 5,300 acre-feet at the end of the year.
- For the calendar year the unconfined aquifer of the closed basin lost approximately 50,000 acre-feet. Of storage, bringing the aquifer to new lows (1,250,000 a.f. less water at the end of 2013 than in 1976) .
- The West Fork fire resulted in total burned area in excess of 110,000 acres in the Upper Rio Grande. This was the second largest wildfire in Colorado history.
- Drafting Rules and regulations concerning the use of ground water in Division 3 continued with the assistance of a 55 member advisory committee.
- Texas v. New Mexico and Colorado (Original #141) continues before the US Supreme Court. Issues center around groundwater pumping below Elephant Butte Reservoir.
- The Fish and Wildlife Service designated critical habitat for the Southwestern Willow Flycatcher in 2013. This designated habitat area includes portions of the Rio Grande and Conejos river in Colorado.

The Gunnison River Basin, Water Division No. 4

•Snowpack peaked at approximately 78% of the thirty year average.

•Monsoon rainfall last week of July and first 2 weeks of August 2013, coupled with historic rainfall in September, assisted in increasing flows to normal or above for remainder of 2013.

•Inflow to the Aspinall Unit (Blue Mesa, Morrow Point and Crystal Reservoirs) improved from 32% of normal (2012, second lowest inflow of record) to 52% of normal.

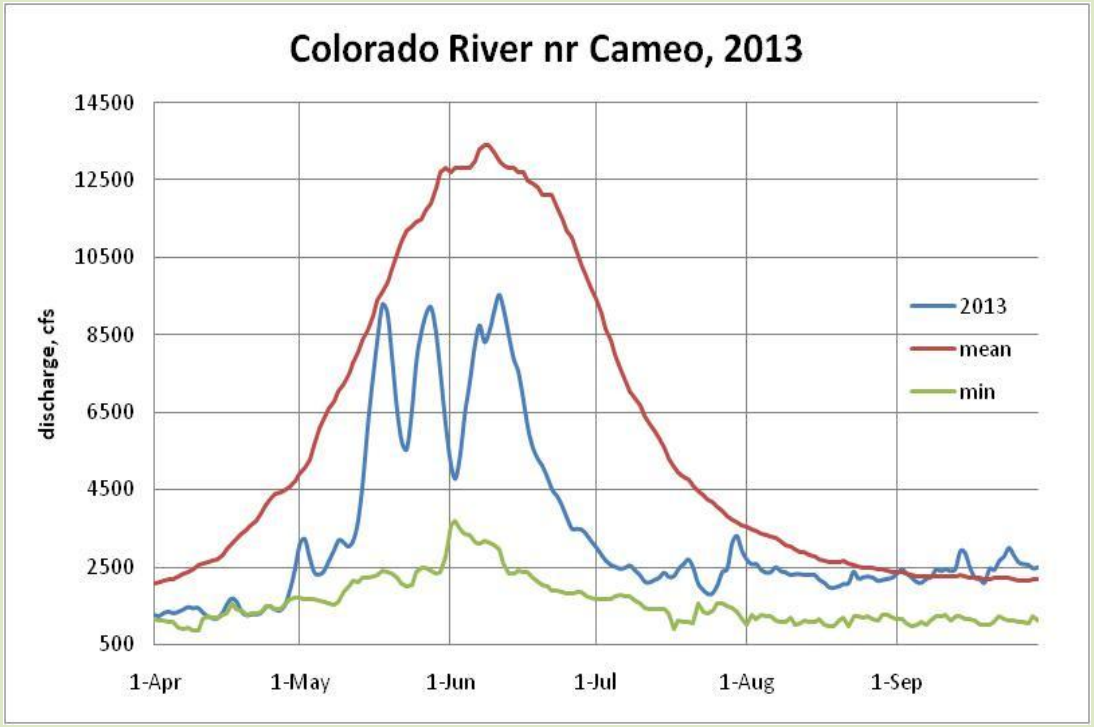
South-Canal Hydroelectric Project

•Numerous meetings were held with government agencies and water users to deal with drought conditions.

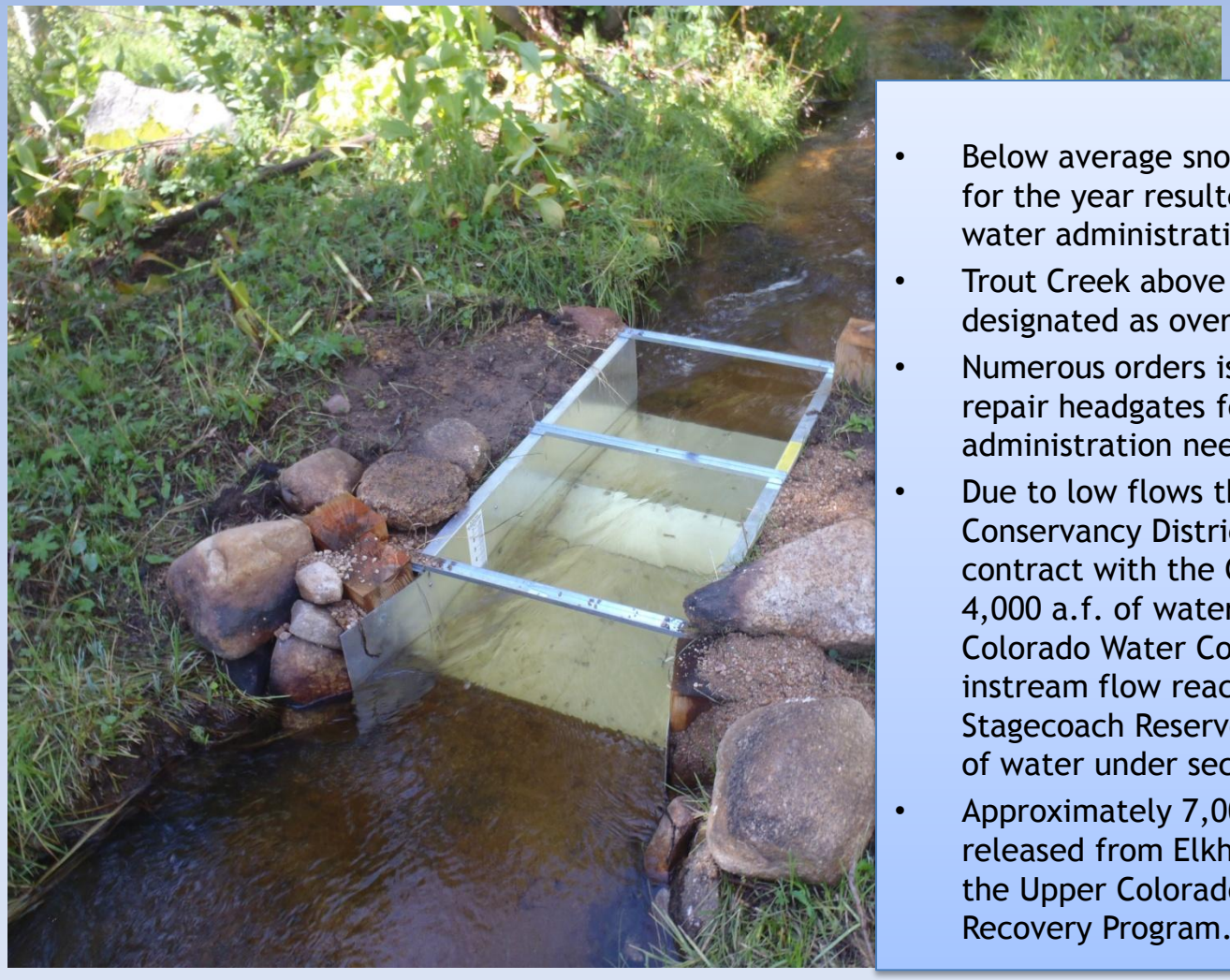
•Two hydroelectric generating stations were installed on the South Canal. The units provide 3.5 and 4 Megawatts. Installation was in cooperation with the Delta-Montrose Electric Association.

The Colorado River Basin, Water Division No. 5

- With early low snowpack rivaling 2002 the total volumetric flow was the 8th lowest of 80 years of record for the Colorado River near Cameo and the 7th lowest of the 72 years of record for the Colorado River Near Dotsero These were just ahead of 2012.
- Gauged flows were 61% of historic average at the Colorado River near Cameo and 63% of average at the Colorado River near Dotsero.
- Coordinated Reservoir Reoperations for Endangered Fish Recovery Program were not conducted in 2013 due to forecasted peak flows at Cameo well below the 12,000 c.f.s. trigger (Cameo peaked on June 11 at 9,540 c.f.s.)
- The historic Colorado River Cooperative Agreement was signed and creates a long-term partnership between Denver Water and 42 entities on the West Slope. The agreement governs future water project construction and management of the Basin's water and establishes a new process for dealing with long-standing east slope vs. west slope disputes.

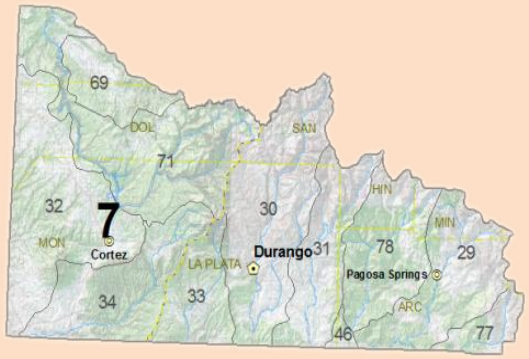


The Yampa and White River Basins, Water Division No. 6



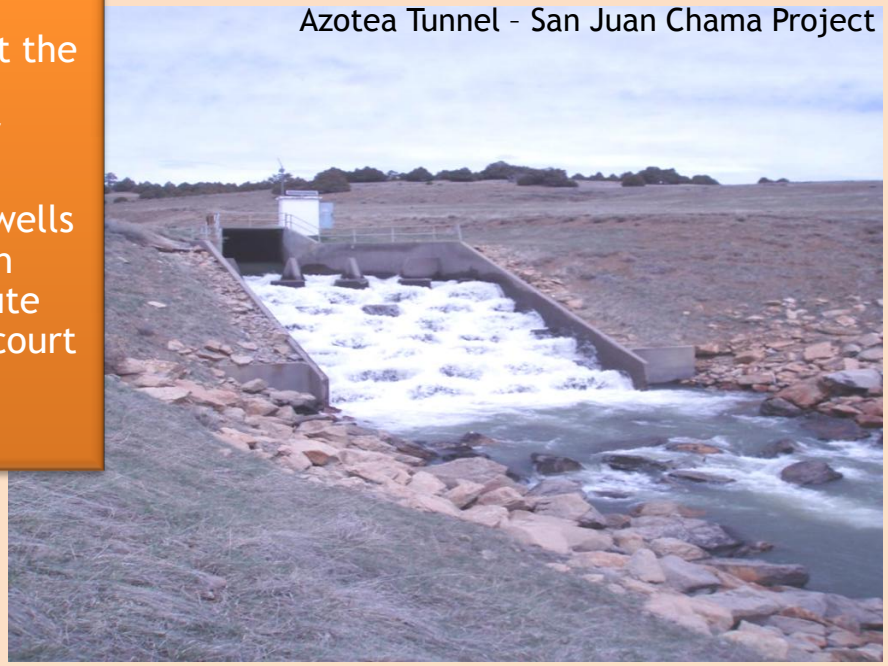
- Below average snow pack and stream flows for the year resulted in higher than normal water administration.
- Trout Creek above the Orno Ditch designated as over-appropriated.
- Numerous orders issued to water users to repair headgates for the heightened administration needs.
- Due to low flows the Upper Yampa Water Conservancy District entered into a contract with the Colorado Water Trust for 4,000 a.f. of water to be used for the Colorado Water Conservation Board's instream flow reach downstream of Stagecoach Reservoir as a temporary loan of water under section 37-83-105, C.R.S.
- Approximately 7,000 a.f. of water was released from Elkhead Creek Reservoir for the Upper Colorado River Endangered Fish Recovery Program.

Animas and La-Plata River Basins
Water Division No. 7



- The Animas La-Plata Project (ALP) is complete with Municipal and Industrial use water avaiable to the association.
- An administration protocol for ALP operations was finalized August 26, 2013, after several years of negotiation.
- Long Hollow Dam 51% complete with planned 5,600 a.f. of storage.
- Long Hollow will help Colorado meet the La-Plata Compact and will provide additional water for Colorado Water users.
- 3,900 permitted Coal Bed Methane wells permitted in the San Juan Basin with many wells operating under Substitute Water Supply Plans, pending water court approval.

Azotea Tunnel – San Juan Chama Project



The Future

Gaging station with radar water level sensor

- Continue to assist in recovery from flooding wherever and whenever possible
- Continue to look for innovative solutions to the myriad of water administration situations
- Diligent protection of Colorado's water under interstate compacts & decrees
- Usher in a new era of conjunctive use & administration in the San Luis Valley through implementation of the new use rules.

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