

2010

DWR Annual Report

Colorado Division of Water Resources State of Colorado 12/31/2010

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FORWARD 2010 *By Dick Wolfe, State Engineer*

This report is a summary of the annual operations of the Division of Water Resources (DWR) and contains a brief synopsis of the purpose and activities of each section. If a more detailed report is available, a reference to that report is included.

Because of an above average snowpack during the months of January through April of 2010,

Colorado experienced a strong spring runoff. The majority of the Front Range reservoirs filled and therefore, municipal supplies continued to be in good shape. During the fall and early winter of 2010, the mountains once again experienced above average snow conditions, adding to the already significant snowpack. However, the eastern plains began to experience long dry spells with little or no snow, raising concerns for dry land farming and early calls on river systems. This placed further demands on storage and water supplies.

As a result of the Supreme Court decision in *Vance v. Wolfe*, 205 P.3d 1165 (Colo. 2009), a well permit is required for the extraction of methane from coal beds. The Supreme Court determined that the ground water developed from such extraction is a beneficial use and therefore a ground water permit from the State Engineer is required. In March 2010, the State Engineer's Office (SEO) completed promulgation of its Rules and Regulations for the Determination of the Nontributary Nature of Ground Water Produced through Wells in Conjunction with the Mining of Minerals (Produced Non-Tributary Rules). The Produced Non-Tributary Rules identified nontributary oil and gas producing areas throughout Colorado and created a public process for the future identification of such areas. Although the Produced Non-Tributary Rules are currently in effect, some water users have filed complaints and the rules are currently under consolidated litigation in Water Division No. 1.

A 32 member advisory committee was appointed in May 2008 to assist the State Engineer in developing the "Irrigation Improvement Rules" in the Arkansas River Basin. The Irrigation Improvement Rules are designed to allow improvements to the efficiency of irrigation systems in the Arkansas River Basin while ensuring compliance with the Arkansas River Compact. Certain improvements to surface water irrigation systems, such as sprinklers and drip systems that replace flood and furrow irrigation or canallining that reduces seepage, have the potential to materially deplete the usable waters of the Arkansas River in violation of the Arkansas River Compact. The Irrigation Improvement Rules optimize use of the waters of the Arkansas River by allowing such improvements in a manner consistent with the terms of the Arkansas River Compact. The Irrigation Improvement Rules were adopted pursuant to the State Engineer's statutory compact rule-making authority and submitted to the Division No. 2 Water Court on September 30, 2009, with an effective date of January 1, 2011. The Irrigation Improvement Rules were approved by the Division No. 2 Water Court in October 2010.

In 2008 and 2009, the State Engineer established a 55 member advisory committee in the San Luis Valley to assist in the development of Rules and Regulations Governing the Diversion and Use of Underground Water Rights in Water Division No. 3 (Groundwater Use Rules). The advisory committee is comprised of many interests in the San Luis Valley and is designed to provide local input to the rulemaking process. In 2010, the advisory committee worked diligently to address specific issues pertaining to the Ground Water Use Rules, including the sustainability of the aquifers, and setting of an irrigation season. It is anticipated that the Ground Water Use Rules will be submitted to the Division No. 3 Water Court in 2011.

The Republican River Compact is the only compact with which Colorado is currently concerned about compliance. The State of Colorado, in cooperation with other entities such as the Republican River Water Conservation District (RRWCD), has implemented several discrete actions that will collectively serve to meet Colorado's obligations under the Republican River Compact. These actions include: (1) promulgation and adoption of rules that require installation of measuring devices on ground water wells; (2) implementation of irrigated land retirement programs; and (3) design of a compact compliance pipeline ("CCP") that will operate in conformance with an augmentation plan approved by the Republican River Compact Administration. Construction on the CCP is anticipated to begin in the fall of 2011.

In 2010, there was a decrease in the total number of well permit applications received and issued by DWR, due in part to the slowing economy. This decrease in workload, as in other areas of state government, was handled by cutting operating expenses, furloughing staff, and holding positions vacant.



WATER SUPPLY BRANCH

The water supply branch provides a variety of services to assist in carrying out the mission of the organization. From substitute supply plan review and analysis to well permitting, the water supply branch is deeply involved in many aspects of water management for the people of Colorado.

Substitute Water Supply Plans

The authority to evaluate and issue Substitute Water Supply Plans (SWSPs) is vested exclusively with the SEO pursuant to section 37-90-137(11), C.R.S. for gravel pits, SWSPs and section 37-92-308, C.R.S. for all other SWSPs. During 2010, the SEO reviewed and acted on 189 general SWSPs (including emergencies) and 54 SWSPs related to gravel pits.

Subdivision Review

Proposed subdivisions throughout Colorado must have a reliable water supply prior to approval at the county level and the water supply branch reviews such supplies pursuant to section 30-28-136(1), C.R.S., in collaboration with county planning offices. During 2010, the SEO received and acted on a total of 114 subdivision referrals. This does not include the numerous comments that the water supply branch provides for non-subdivision referrals.

Designated Ground Water Basins, Colorado Ground Water Commission, and Republican Well Measurement Team

To perform their duties, the designated basins staff [i.e., the personnel of the SEO that acts as staff for the Colorado Ground Water Commission (GWC)] issued 63 final permits, acted on 334 small capacity well permits and 469 large capacity permits and 169 determinations of water rights, 48 change application approvals, three replacement plans, and was involved in several enforcement actions.

The well measurement team continued administration of the well measurement rules and began the field inventory process for 3,733 active and inactive wells located in Republican River Basin. The team processed 445 well meter verification tests, issued 577 notices of rule violation/orders to comply, sent approximately 1,800 notices of annual well pumping reporting requirements, and processed 3,194 annual pumping reports.

Ground Water Well Permitting

The well permitting staff received and acted on 9,329 applications for well permits in 2010. This number is much higher than the trend in recent years due to the submittal and issuance of over 5,000 well permits for oil and gas wells. Of the overall total, 600 were applications for replacement wells. In addition, the well permitting staff processed

monitoring-hole notices (456), changes in ownership/address (7,283), well construction and test reports (2,870), and pump installation reports (1,571).

Other Referrals

The DWR receives referrals from other state and federal agencies including the Colorado Division of Reclamation, Mining and Safety, the Army Corps of Engineers, the Colorado Department of Public Health and Environment, and miscellaneous federal agencies regarding environmental assessments and environmental impact statements. The water supply branch staff acted on 133 referrals from these agencies.

Special Projects

The water supply branch staff was involved in a number of special projects, including:

- Continued involvement with the Governor's Energy Office in assisting with education to remove roadblocks in geothermal development as well as acting in a consulting role in the development of an Memorandum of Understanding with the Federal Energy Regulatory Commission to streamline the development of small hydroelectric projects;
- Presented information on water rights to various groups of real estate agents and appraisers, well contractors, and governmental agencies. In addition, the Water Supply team had presenters at a Colorado Bar Association conference;
- Provided assistance and testimony to the Colorado General Assembly related to developing new legislation including HB-1286, which clarified the legislatures intent in passing earlier legislation related to Oil and Gas well permitting; and
- Issued water well permits for over 5,000 oil and gas wells.

HYDROGEOLOGICAL SERVICES

The hydrogeological services branch provides expertise in the disciplines of geology, hydrogeology, engineering geology, geophysics, well construction, well testing, and satellite-assisted surveying. The hydrogeological services branch responds to requests by internal and external customers for assistance in general investigations, supports the engineering sections in ground water litigation, collects and reports ground water data, and provides technical assistance to the Board of Examiners of Water Well Construction and Pump Installation Contractors (BOE) and to the GWC.

The table below summarizes the work completed by the hydrogeological services branch in 2010.

Hydrogeological Services Branch- 2010 Summary of Work

Well construction variance requests reviewed	110
Geophysical logs evaluated	17
Geophysical log waivers reviewed	67
Oil and Gas injection and cathodic protection well proposals reviewed	32
Nontributary Initial Determinations	5
Well permit evaluation consultations	243
Well abandonment consultations	11
Water levels measured	1335
Phone contacts and general evaluations	620

Branch Highlights

- Coal Bed Methane (CBM) The hydrogeological services branch provided geologic and hydrogeologic information and technical review in response to petitions for determinations of nontributary ground water in relation to the Produced Nontributary Ground Water rulemaking.
- Colorado Geological Survey continued its effort in describing the rocks of the structural Denver Basin that comprise the Denver Basin aquifers by constructing geologic cross sections across the basin and the hydrogeological services branch provided review and comment.
- The hydrogeological services branch collected annual water level data from more than 1,335 wells covering almost 75 percent of the state. Many of these water level measurements are from wells in the Designated Basins. The Denver Basin Bedrock Aquifers Report contained 300 water levels with many new wells reported by cooperating water utilities. Due to budget and travel limitations in 2010, the Lower South Platte Alluvial Aquifer water levels were collected only in the spring of 2010.
- The hydrogeological services branch continues to compile information on the amount of ground water currently permitted for withdrawal from the bedrock aquifers of the Denver Basin. Permitted amounts and producing aquifers have been determined for all non-exempt wells of record. Aquifer identification for more than 40,000 exempt wells in the basin continues. In 2010, 3,411 aquifer evaluations were completed for a total of 18,103 evaluations.



• Staff worked with the Ground Water Measurement Managers group to coordinate Recertification and New Well Testers training classes and provided groundwater hydrology expertise for the Well Tester Certification training statewide.

• Board of Examiners (BOE) - The hydrogeological

services branch staff investigated 52 new complaints filed with the BOE in 2010 and 28 complaints were resolved. The BOE licensed 225 contractors, including six new

contractors. Twenty-nine contractors did not renew in 2010. The Continuing Education Committee and BOE accepted 28 courses or functions for a total of 143 accredited hours of continuing education and the hydrogeological services branch processed 110 requests for variance from the well construction rules during the year.

• Well Inspection Program - The well inspectors conducted more than 1,237 inspections in 2010. As in previous years, over half of the inspections were conducted in Division No. 3.

HYDROGRAPHIC AND SATELLITE MONITORING BRANCH

The primary mission of the hydrographic and satellite monitoring branch is to collect, analyze, and present accurate, high quality 'real time' flow and content data in Colorado rivers, streams, creeks, canals, ditches and reservoirs to support the water rights administration mission of the DWR. Hydrographers around the state operate and maintain a system of over 500 gaging stations on these watercourses and water bodies; perform streamflow measurements to maintain stage-discharge relationships at gaging stations; and maintain satellite monitoring equipment with goals of improving the quantity and quality of data used to manage and administer water throughout Colorado. The hydrographic and satellite monitoring branch develops historic streamflow records at a subset of stream gage locations in coordination with other state and federal entities and the water user community.

Branch Highlights

- The Satellite Monitoring System (SMS) provides the DWR, other state and federal entities, and the water user community, with access to real-time streamflow and content data from gaging stations across Colorado. These data and software systems provide for more effective and efficient water rights administration, water resource management, computerized hydrologic record development, and high (flood) and low flow alerts.
- At the end of the 2010 water year (WY), a total of 309 gaging stations were monitored by Division No. 1, up from 283 last year. The main source of growth has been the increase of gages on the cooperative flow program (SDR/cell phone telemetry), which are now 84 sites up from 69 last year.
- The hydrographic and satellite monitoring branch prepared a total of 243 streamflow records for publication in the DWR Annual Streamflow Publication for WY 2010. Of these, 11 records were published by the USGS Colorado Water Science Center in their annual streamflow data report for WY 2010 and the New Mexico office of the USGS published four. A total of 62 WY 2009 streamflow records (26% of those prepared for publication in WY 2009) underwent a quality assurance/quality control review. Fifteen were reviewed by the USGS and 47 were reviewed by the hydrographic and satellite monitoring branch staff.

- Hydrographers and water commissioners across Colorado made over 3,376 measurements in 2010 in streams, rivers, canals, and ditches. These measurements were made to calibrate stage-discharge relationships at streamgaging stations, in canals and ditches in support of real-time water administration decision-making, and in support of historic streamflow record development.
- Several new gaging stations were added to the SMS in 2010. Typically, new gages are added as the result of the identification of a critical water administration need. Existing gaging stations, not previously on the SMS, are also often candidates for adding satellite equipment where water administration needs have increased. Gage cooperators pay the capital costs associated with these new or upgraded stations. Annual maintenance agreements with cooperators on these gages are also developed.
- The hydrographic and satellite monitoring branch continues to refurbish and maintain our existing streamgaging network sites as well as flood hardening of gaging stations with funds received from the Colorado Water Conservation Board (CWCB).
- The high data rate data collection platform upgrade project continued. Upgrades result in satellite transmissions once every hour at 300 bits per second bps compared to the older equipment which transmitted once every four hours at 100 bps. As of the end of 2010, all DWR data collection platforms have been upgraded to high data rate. Less than 10 privately owned data collection platforms remain to be upgrade to high data rate.
- The DWR Flow Alert System compares measured data (gage height, discharge, or any other parameter) from remote gaging sites against alert criteria (threshold values) set up by DWR/CWCB users. Alert criteria choices include high flow alarm, low flow alarm, or rate of change alarm. The system can be configured to contact users of a current alarm via e-mail, phone, or pager. There are currently over 50 users with 425 different alert criteria programmed. Users continue to be satisfied with the system and its functionalities.
- The hydrographic and satellite monitoring branch staff coordinate activities with the United States Bureau of Reclamation (USBR), including stream gage operation and maintenance on the Colorado Big Thompson Project (Division Nos. 1 and 5), the Fryingpan-Arkansas Project (Division Nos. 2 and 5), the Closed Basin Project (Division No. 3), and the San Juan-Chama Project (Division No. 7). The hydrographic and satellite monitoring branch staff continued to conduct snow surveys around Colorado in support of the NRCS (Natural Resource Conservation Service) and other agencies. The sites generally are surveyed the last day of each month from January through April. The data are collected and disseminated by NRCS and published on



their website for water users. The DWR staff currently measure 16 sites across Colorado.

DAM SAFETY BRANCH

A comprehensive 2010 report for the dam safety branch is available via LaserFiche at: <u>http://www.water.state.co.us</u>.

The mission of the dam safety branch is to prevent the loss of life and property damage and protect against the loss of water supplies due to the failure of dams in Colorado. The dam safety branch accomplishes that mission primarily through the Safety Evaluations of Existing Dams program tool to determine the safe storage levels of reservoirs within the state. Additional program tools include a comprehensive set of regulations, policies, and



procedures for the design, construction, and maintenance of dams; the safe operation of reservoirs; and emergency preparedness planning.

The dam safety branch oversees over 2,900 dams with 1,937 being dams of jurisdictional size. Of these, about 1,819 are non-federal dams. Of the non-federal dams, 621 (318 high hazard and 303 significant hazard), or about 34 percent of the total non-federal dams are classified as dams that, in the event of a failure, would be expected to cause loss of life and/or significant property damage within the flood plain areas below the dams.

Branch Highlights

- Several near-failure incidents were acted upon in time to diffuse potentially dangerous situations and possible loss of life. As a direct result of these actions, no loss of life or significant property damage occurred in Colorado in WY 2009-10.
- During WY 2009-10, the SEO approved one plan for a new dam and 33 plans for alteration, modification, or enlargement of existing dams. Hydrology studies for seven dams were also approved for determination of the inflow design flood for spillway adequacy or design. The estimated cost of construction for the submitted plans was over \$35.9 million.
- A total of 513 dam safety inspections and 180 construction inspections were conducted by dam safety engineers, for a total of 693 inspections. In addition, 99 follow-up inspections were performed. At the end of WY 2009-2010 a total of 176 dams remained restricted from full storage due to inadequate spillways and various structural deficiencies such as significant leakage, cracking and sliding of embankments. The restrictions provide risk reduction for the public and environment

until the deficiencies identified are corrected. Although many dams were repaired and removed from the restricted list within the last year, a number of dams were also added to the restricted list. More specifically, three high hazard; three significant hazard; 10 low hazard structures dams were restricted amounting to a total of 2,602 acre-feet of storage restricted. This reporting period showed a slight increase in the number of dams on the restricted list and the storage volume of the restrictions increased by approximately 1,455 acre-feet.

- A total of 11 dam incidents occurred this reporting period requiring emergency responses and investigations by the dam safety branch.
- Currently all high hazard dams and 98 percent of significant hazard dams have emergency actions plans in place.
- A "Guidelines for Dam Breach Analysis" was developed and adopted on February 10, 2010. This is a guidance document for engineers working on dam safety issues in Colorado.
- The "Guidelines for Hazard Classification" was developed and adopted on November 15, 2010.

DECISION SUPPORT SYSTEMS AND MODELING BRANCH

The decision support systems and modeling branch provides:

- Technical expertise to DWR and other agencies through review, development, analysis and execution of complex hydrologic computer models, and geographic information system (GIS) tools.
- Expert testimony before the GWC and water courts, including providing recommendations for water use plans and development within Colorado through analysis by computer modeling.
- Partnership with the CWCB in developing, managing and enhancing Decision Support System (DSS) tools and models for the major river basins in Colorado. Colorado's Decision Support Systems (CDSS) is a data-centered, water management system funded through CWCB with technical support from both CWCB and DWR staff. The goal of this system is to assist in making informed decisions regarding historic and future use of water.
- In collaboration with the CWCB, a ground truth crop type data collection effort began to supplement the Statewide Irrigated Parcel data refresh for the 2010 growing season. Over 100 square mile sections were distributed to water commissioners throughout the state to collect crop types for remote sensing analysis to produce new irrigated parcel data for 2010. This project has two goals; to produce a master irrigated parcel file for each water division, and to produce a 2010 snapshot of irrigated parcels in Colorado. These projects will continue in 2011.

Decision Support Systems (DSS)

• Rio Grande Decision Support System (RGDSS)

In 2010, decision support systems and modeling branch work on the RGDSS was focused primarily on enhancements to the RGDSS Groundwater Model. The decision support systems and modeling branch staff continued to coordinate with the RGDSS peer review team in the refinement of the ground water model in preparation for the promulgation of Ground Water Use Rules in Water Division No. 3; these efforts will continue into 2011. Enhancement efforts were completed by Division No. 3 staff, the decision support systems and modeling branch staff, and peer review team consultants.

Division No. 3 made significant progress in updating the well database with accurate location, depth, screen interval information, use types, and yields. Annual meter records for 2009, the first year of published meter records, have been added to HydroBase. These enhanced data have been incorporated into the modeling efforts.

The decision support systems and modeling branch staff has taken the lead in



coordinating the peer review team efforts and making refinements to:

• Extend the modeling study period through 2009;

• Incorporate the 2005 irrigated acreage assessment;

- Refine the municipal and industrial well lists and demand calculations; and
- Utilize 2009 well meter records.

• South Platte Decision Support System (SPDSS)

The decision support systems and modeling branch staff continued to coordinate with CWCB staff and the SPDSS Ground Water Model Contractor to refine and calibrate the SPDSS Ground Water Model. This included improvements to the StatePP, a CDSS tool to upload data into the modeling software.

Work continued on the application of the state's surface water model, StateMod, to the Lower South Platte from Kearsey to the Stateline to verify the SPDSS enhancements required to simulate water transfers, augmentation plans, recharge pits and reuse of return flows in the South Platte River. In coordination with State IT personnel, HydroBase, the CDSS database was refreshed to include 2010 data, aquifer parameters, and water level data collected under SPDSS. • Arkansas Decision Support System (ArkDSS)

Work on the ArkDSS Feasibility study was initiated in 2010. The objective of this study is to determine the feasibility of developing a DSS for the Arkansas River Basin using standards similar to the DSS developed for the Colorado River and Rio Grande Basins, as well as criteria being developed for the South Platte River. For this study the scope, functions, elements, data needs, cost, and schedule will be documented so that a DSS for the Arkansas River Basin can be developed. The decision support systems and modeling branch and CWCB staff comprised the project management team and as such, conducted reviews of draft documents and attended advisory committee meetings. Additionally, a key goal of the decision support systems and modeling branch staff is to assure that Division No. 2 administrative needs and input are incorporated into the final work product.

Kansas v Colorado Litigation Support

Colorado continued to work with Kansas to assure that the Arkansas River Compact is properly administered. Major tasks that were accomplished in 2010 include:

- Colorado has proceeded with the implementation of the final judgment and decree in the case to ensure continued compliance with the Arkansas River Compact. This includes the annual update of data used in the Hydrologic-Institutional (H-I) Model and determination of annual compact compliance using the H-I Model. In 2010, it was determined that Colorado was in compliance with the Arkansas River Compact for the period 2000 through 2009. During 2010, Colorado's modeling experts evaluated a proposal by Kansas to modify the H-I Model to account for improvements in the efficiency of the use of ground water to irrigate crops in the Arkansas River Basin of Colorado. Colorado's experts also initiated a joint review with the Kansas experts of the operation of the Offset Account in John Martin Reservoir.
- The project to design, build, and operate two large lysimeters at Rocky Ford, Colorado continued in 2010. The first (3m x 3m) lysimeter, having been completed in April 2007, has been used to collect evapotranspiration (ET) data for alfalfa for three full growing seasons (2008, 2009, and 2010). Water budgets for all three years have been completed and the measured ET for alfalfa has been compared with the alfalfa reference ET predicted by the ASCE Standardized Penman-Monteith equation to produce crop coefficients for alfalfa grown in the Arkansas River Basin of Colorado. Several posters and conference papers have been presented at various national and international conferences to begin the scientific review of the data obtained to this point. The second, smaller (1.5m x 1.5m) lysimeter, was completed in 2009 and was used in 2010 to collect ET data for winter wheat. Alfalfa was planted on the smaller lysimeter in late 2010 so that alfalfa can be simultaneously evaluated on both lysimeters for two years, beginning in 2011.

• The decision support systems and modeling branch provided modeling support for the effort to complete the Irrigation Improvement Rules in the Colorado Arkansas River Basin. This effort included using the H-I Model to determine the impact of improvements to surface water irrigation systems, supporting the development of an Irrigation System Analysis Model for use in the implementation of the Irrigation Improvement Rules, and the preparation of several expert witness reports.

LITIGATION

Litigation continues to consume a significant amount of time and effort for DWR. The following table describes the number of water court applications filed in 2010 and formal Statements of Opposition (including Motions to Intervene) filed on behalf of DWR:

		Statements of	
	Applications and	Opposition and	Percent
Division	Amendments	Interventions	Opposed
1	320	10	3.1%
2	99	15	15.2%
3	39	3	7.7%
4	211	3	1.4%
5	278	17	6.1%
6	80	9	11.3%
7	100	13	13.0 %
Total	1127	70	6.2%

2010 Court Applications and Interventions

Div	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Average
1	346	441	527	468	394	350	388	239	225	320	364
2	151	189	119	148	113	138	146	123	150	99	143
3	45	61	60	41	25	36	63	27	34	39	44
4	318	349	345	236	314	280	235	79	190	211	260
5	443	510	443	345	362	319	295	206	196	278	343
6	146	143	132	67	83	99	135	37	75	80	100
7	121	138	129	118	108	140	115	94	97	100	116
Total	1570	1831	1755	1423	1399	1362	1377	805	967	1127	1369

Long Term Trends in Water Court Applications

- In January 2010, following several weeks of hearings, the State Engineer adopted Produced Nontributary Rules consistent with legislation passed by the Colorado General Assembly to assist with his administration of over 40,000 oil and gas wells within the water rights system.
- In May 2010, the Colorado Supreme Court announced its decision in the Upper Eagle Regional matters (Case Nos. 09SA168 and 09SA169). In this decision, the Colorado Supreme Court agreed with the State Engineer's position that a water court may invoke its retained jurisdiction over water augmentation plans to prevent both threatened and actual injury to vested water rights. As result of this decision, the State Engineer and the Upper Eagle Regional Water Authority settled a long-standing dispute regarding replacement of the Authority's out-of-priority depletions to the Eagle River.
- In June 2010, the Colorado Supreme Court announced its decision in the V-Bar Ranch matter (Case No. 09SA191). In this decision, the Supreme Court affirmed the State Engineer's position that the use of water rights for such wells is limited to the locations of use contemplated at the time of the appropriation of such rights. This decision provides important precedent regarding administration of thousands of wells in Water Division No. 3.
- In June 2010, the Colorado Supreme Court announced its decision in the *Englewood v. Burlington Ditch* matter (Case No. 09SA75). In this decision, the Supreme Court affirmed the State Engineer's position regarding a no-call agreement between Burlington Ditch and Denver allowing Denver's upstream junior rights to divert in priority. The Supreme Court found this agreement was not a subordination or against public policy.
- In September 2010, the Colorado Supreme Court announced its decision in the Broomfield matter (Case No. 09SA269). In this decision, the Supreme Court affirmed the State Engineer's position regarding the constitutionality of awarding costs to the prevailing party in a water right matter.
- In November 2010, the Division No. 1 Water Court announced its decision in the Leadville matter (Case No. 07CW251). In this decision, the Division No. 1 water court dismissed a claim for a nontributary ground water right for water discharging from an old mine portal as "dangerous" and "unsupported." In addition, the Division No. 1 Water Court awarded attorney fees to the objectors based on the applicant's reliance on unsupported engineering claims. This decision clarifies the standards governing nontributary ground water claims.

ABANDONMENT LIST

The table below depicts the number of water rights, by water division, placed on the 2010 abandonment list as required pursuant to section 37-92-402, C.R.S.

Division	Water Rights on AL
1	1415
2	350
3	212
4	147
5	87
6	246
7	212
Total	2669



INTERSTATE COMPACTS

Republican River Compact

Numerous actions have been taken by the Colorado State Engineer in the Republican River Basin over the past year to assist Colorado to achieve compliance with her obligations in relation to the Republican River Compact. Principally, Colorado and the RRWCD formally proposed the idea to the State of Kansas and Nebraska of the Colorado Compliance Pipeline (CCP) to pump water to the Republican River near the Colorado Stateline to assist in compact deliveries. In 2009, Colorado twice presented resolutions to the Republican River Compact Administration (RRCA) to accept Colorado's augmentation plan including the CCP and augmentation accounting. The Colorado State Engineer participated in an arbitration hearing on the CCP in July 2010. In October of 2010, an Arbitrator found that Kansas was not un-reasonable in its denial of the resolution; however, she noted that the states needed to work toward a settlement. Nebraska supports approval of the CCP, while Kansas does not. Colorado continues to work with Kansas and Nebraska to develop an amicable resolution for approval of the proposed CCP. The RRWCD completed designs for construction of the CCP, with an anticipated start date of September 2011

Arkansas River Compact

In an effort to avoid potential future violations of the Arkansas River Compact, the State Engineer formed a special advisory committee to assist in developing the Irrigation Improvement Rules. The Irrigation Improvement Rules are designed to allow improvements to the efficiency of irrigation systems in the Arkansas River Basin while ensuring compliance with the Arkansas River Compact. After two years of work by the special advisory committee, the Irrigation Improvement Rules were promulgated and delivered to the water court for review in September 2009. Over 20 objections to the rules were filed; however DWR was able to settle with all the objectors and the Division No. 2 Water Court issued a decree approving the rules in October 2010.

Colorado River Compact(s)

Colorado is subject to the Colorado River Compact and the Upper Colorado River Compact. These compacts allocate a portion of the flows in the Colorado River Basin to Colorado's use. With uncertain climatic conditions and growing demand for water from this system, Colorado is considering how compact deliveries can be made in the event insufficient water is available for all uses. The DWR is working with CWCB to initiate studies to determine current needs and depletions in the Colorado River Basin and to assist in developing strategies for administration on the Colorado River and its tributaries in the event Colorado could not meet its obligations under the compacts.

La Plata River Compact

Hydrologic conditions in the southwest part of the state remained dry during WY 2010. To assure compliance with the La Plata River Compact, DWR supported the La Plata Water Conservancy District, the Southwestern Water Conservancy District, and the Colorado Water Resources Development and Power Authority's



(CWRDPA) construction of the Long Hollow Reservoir, which will include a pool of water to assist Colorado in meeting obligations under the La Plata River Compact. The CWRDPA funded the dam design from set-aside Animas-La Plata settlement funds with the Indian tribes in the area. The Animas-La Plata settlement funds on reserve with the CWRPDA were used to initiate dam design in 2009 and design is on-going. During dry periods in 2010, DWR used Cherry Creek to facilitate deliveries to New Mexico.

Rio Grande Compact

The Rio Grande Compact had a near normal water year in 2010, despite dry late season conditions. Extensive use of recharge was made in the basin to avoid over-delivery of water to downstream states. In the lower part of the Rio Grande Basin, endangered species issues and the Elephant Butte Operating Agreement were the larger issues. The Rio Grande Compact Commission continues to monitor the impact of endangered species on New Mexico's water operations. The Elephant Butte Operating Agreement was developed to incentivize the conservation of water in Elephant Butte Reservoir by allowing the two districts to build carryover pools in the reservoir. Finally, the Rio Grande Compact Commission is discussing salinity studies, via the formation of a salinity group, that can access Army Corps of Engineers, Water Resource Development Act funding, in the lowest part of the upper basin (below Elephant Butte Reservoir to Ft. Quitman, Texas).

RULEMAKING

Division 2

Rules Governing the Arkansas River Water Bank Program, promulgated pursuant to procedures in the State Administrative Procedure Act were approved by the Division No. 2 Water Court on June 30, 2010. The Arkansas River Water Bank Program Rules, which were made effective in 2006, delegate administration and operation of the Water Bank Program to the Upper Arkansas Water Conservancy District. To date, the Upper Arkansas Water Conservancy District has not received any applications to the Water Bank Program.

The Irrigation Improvement Rules were filed in the Division No. 2 Water Court in September 2009. The Irrigation Improvement Rules are designed to allow improvements to the efficiency of surface water irrigation systems while ensuring compliance with the Arkansas River Compact. Examples of such improvements include sprinklers and drip systems that replace flood and furrow irrigation, or lining a canal with concrete to reduce seepage. The Irrigation Improvement Rules were adopted pursuant to the State Engineer's statutory compact rule-making authority and submitted to the Division No. 2 Water Court on September 30, 2009, with an effective date of January 1, 2011. Over 20 objections to the rules were filed; however DWR was able to settle with all the objectors in an unprecedented consensus- building success. The Irrigation Improvement Rules were approved by the Division No. 2 Water Court in October 2010.

Division 3

With the passage of Senate Bill 04-222, the General Assembly recognized the importance of sustainability of ground water aquifers and approved the use of subdistricts in order to allow for localized control of water supplies. For the last several years, the Rio Grande Water Conservation District (RGWCD) has encouraged the formation of ground water subdistricts to attempt to manage portions of the aquifer system. Subdistrict No. 1, a geographic subunit of the RGWCD north of the Rio Grande, was established by the Alamosa County District Court on July 19, 2006. Subdistrict No. 1 elected a Board of Managers, which drafted a plan of water management in October 2007.

After several years of public meetings, comments, and amendments, the Division No. 3 Water Court issued the decree in the case on May 27, 2010. This ruling upheld Subdistrict No. 1's amended plan of water management. The State Engineer re-approved the amended plan of water management and the Division No. 3 Water Court formally approved it on June 29, 2010. The Division No. 3 Water Court's decision is currently on appeal to the Colorado Supreme Court in Colorado Supreme Court Case No. 2010SA224 (consolidated with Case No. 2010CA1411). Subdistrict No.1 will begin collecting assessments (administrative and CREP) via county tax roles in the 2011 and begin replacing depletions starting in 2012. The formation of other subdistricts in the Rio Grande Basin is proceeding. An advisory committee was formed in 2009 to assist the State Engineer in drafting rules to address injurious depletions caused by ground water use, sustainability of aquifers, setting an irrigation season, developing ground water subdistricts and plans of water management to prevent injury to senior water rights, and avoiding interference with the Rio Grande Compact. The Ground Water Use Rules in Water Division No. 3 are anticipated to be completed and submitted to the Water Court in late 2011. Work continues on a CREP application for the Rio Grande Basin for retirement of approximately 40,000 acres in the Subdistrict No.1.

Statewide

In 2009, the Supreme Court issued a decision upholding the Division No. 7 Water Court ruling that water produced in the operation of coal-bed methane wells is a beneficial use and must be brought into the water rights administration system. Subsequently the legislature directed the State Engineer to address the issues of Produced Water (House Bill 09-1303). This action resulted in the State Engineer promulgating rules and regulations to address the issues involved in the development of these types of wells. In March 2010, the SEO completed promulgation of its "Rules and Regulations for the Determination of the Nontributary Nature of Ground Water Produced through Wells in Conjunction with the Mining of Minerals (Produced Non-Tributary Rules)." The Produced Non-Tributary Rules identified nontributary oil and gas producing areas throughout Colorado and created a public process for the future identification of such areas. Although the Produced Non-Tributary Rules are currently in effect, some water users have filed complaints and are currently under consolidated litigation in Water Division No. 1. In 2010, substitute water supply plans were approved to allow operation of the wells tributary to the Pine and Florida Rivers.

WATER ADMINISTRATION TOOL ENHANCEMENTS

Imaging

During 2010, the DWR continued to supplement content in Laserfiche, growing by over 77,436 available documents, or 5.40%. There was also a significant increase in division filings, which now includes data from Divisions 1, 3 and 5.

Software Development/Database Administration

- Modifications were made to the Ground Water Data Management System (GWDMS) to create new compliance reporting for both meter tests and meter inactivations. The meter reading compliance reporting feature was enhanced, additional database functionality was added to aid in the correction of meter reading data, and meter usage calculation scripts were reworked to begin utilizing the concept of meter rollovers and resets.
- Pursuant to the Produced Water legislation, several processes had to be developed, including the methodology to import oil and gas well information in bulk from

spreadsheets; performance of data edits; uploading over 5,000 well applications; permit and well conditions; and assignment of WDIDs to these newly created structures (wells) in HydroBase and WellTools.

- A daily diversion spreadsheet (diversion records standard) has been created as an upgrade to the existing spreadsheets for the new water class standard (SFUTG2O); carry-forward functionality was added to annual data displays; and the ability to override observation codes was added for specific days. Work will continue in early 2011 to include needed code for water class approvals and water class account creation.
- The Abandonment Manager module, in support of the 2010 decennial water rights abandonment process, was written into the HydroBase Editor application. This module includes a certified mailing manager to assist in the printing, mailing and tracking of certified letters and the generation of newspaper publishing reports.
- The version upgrade to Laserfiche 8.1 and the implementation of the RIO licensing model was completed. Additionally, DWR has made progress on a new tool which will allow photos to be imported into Laserfiche from each Division office server. These photos will be associated with a structure so that anyone with a need for the information can get a visual grasp on what the structure components look like.
- Support was provided for the Division No. 3 Modeling efforts. Systems were constructed that built a snapshot of the Division No. 3 wells for use by both internal and external users, mainly in support of subdistricts. In addition to data clean-up efforts, irrigated lands data had to be loaded multiple times.
- HBGuest Web Services were created and released to production in the summer of 2010. These web methods allow vendors, contractors, other divisions or agencies, and general public to "consume" HydroBase data into their own programs.
- Well Permit Search has been renamed from WellViewWeb, due to a trademark infringement controversy. This method of searching online for well permit data has received a great response from both internal and external users.
- The GIS team continued to educate GIS users on the availability of central data web services, such as the ESRI Image Server maintained by the Colorado Geological Survey. The web service streams GIS aerial photography, topographic maps, and shaded relief to various GIS programs through a live internet connection. This method is designed to save DWR from storing



redundant data which multiple agencies access. However, while the data is accessible, users have been plagued by slow response time in west slope division offices and by water commissioners with laptops in the field.

Water Division 1 (South Platte River Basin)

For the full report and data sets related to Water Division 1 please see LaserFishe located at www.water.state.co.us

Surface Water

November 2009 through January 2010 exhibited above average flow conditions along the mainstem and tributaries, with generally more water available than demand on the South Platte River and most tributaries; thus no call on the river. Diversions of water below Denver along the South Platte River were for post-irrigation season storage while diversions upstream of Denver on the mainstem and tributaries were either for storage or for direct flow municipal uses. These diversions were hindered by very cold conditions in December and early January, as well as dam safety construction efforts. Nevertheless, overall storage conditions were better than have existed in 10 years.

February through April saw continued diversions for reservoir storage and municipal use with the first mainstem call (for storage) of the Irrigation Year (IY) occurring February 11. However, all of the reservoirs on the eastern plains were near full by the end of February and the call on the mainstem of the South Platte River was removed March 4, allowing recharge to begin. Though the overall storage levels along the tributaries and mainstem were as high as they have been in forty years, one area of concern was that the snowpack was below average throughout the South Platte Basin. However, the latter part of April included significant snowfall in the mountains and rain on the eastern plains, which caused far above average monthly stream flow throughout the South Platte Basin and virtually eliminated early demand for irrigation. This, in turn, allowed for significant recharge to continue and, since recharge is a key supply of replacement water for out-of-priority irrigation well depletions, the benefits of this recharge will extend well into the future.

May through July water supply conditions remained very positive. Continued rain on the eastern plains and considerable late May snowfall

eliminated most water supply concerns and shifted concern to potential low area flooding. The snowmelt runoff, combined with a significant area wide precipitation event from June 11 through 13, created significant high water in many areas, including flooding issues on the Big Thompson and Cache la Poudre Rivers as well as the South Platte River below Kersey. However, dry July conditions slid everything back to a more "normal" situation. In fact,



by July the mean daily flow at the key mainstem index gage near Kersey was 79% of the historic value.

August through October 2010 marked a significant change in the water supply conditions with a very dry weather pattern settling in. September 2010 ranked one of the top 10 hottest and driest Septembers on record for northeast Colorado, with two major wild fires

in the foothills (the 4 Mile Canyon and Reservoir Road fires). Stream flows also fell to well below normal for this period (the Cache la Poudre River at the canyon mouth approached the all time record low flow on September 27). The only bright spot was that the high reservoir levels due to the previous wet weather provided significant supplemental water, so that most users came through relatively unscathed to the point the end of October reservoir readings were only 3% less than the long term average.

Ground Water

One complaint was filed in 2010 in Division No. 1 Water Court against a well owner for illegal well pumping. The steady decline in complaints continues in large part to a general rise in awareness of well operation requirements throughout the community of well owners. Many small potential violations were seen this year that did not appear to exceed a day or two of pumping, thus not warranting court action. The typical scenario was small use shown through an electric meter only, which means it could have been serving electricity to other things like an electric fence, small heater, or light rather than just measuring well pumping. Water Division No. 1 intends to develop well measurement rules in 2011; once promulgated and in effect, the well measurement rules will assist in determining true well pumping.

In 2010, the well enforcement program, in additional to annual meter reads, focused on visiting each well listed on the 2010 decennial water rights abandonment list. Benefits to conducting the abandonment process included discovering that many wells, once labeled as "Does Not Exist," were found when the well owners showed division staff true locations that differed significantly from decreed locations. Additionally, continuing a trend observed last year, division staff assisted many well owners in downgrading wells that were only being used for exempt purposes from non-exempt to exempt status.

Augmentation Plans

The water accounting group is receiving approximately 270 accounting submissions a month, or about 3,240 per year, from augmentation plan administrators and municipalities. The continued growth of accounting submittals led Division No. 1 to discontinue the augmentation planning website hosted by the Integrated Decisions Support Group at Colorado State University and make the accounting submissions available to the public through the DWR Laserfiche Weblink. Due to the functionality of the Laserfiche Weblink, Division No. 1 is now able to post the complete accounting workbook as submitted in the original spreadsheet format.

A new tool for tracking the timeliness of monthly accounting submissions was developed with the assistance of the accounting coordinator. If a particular plan's accounting is past due, the tool has the capability to send out an email notification alerting the plan administrator. The additional task of tracking gravel pit accounting submissions was also assigned to the accounting coordinator.

The focus of accounting audits in 2010 was on pending water court applications that use a water budget (consumptive use based) methodology instead of flow meter readings

when calculating depletions from well pumping. In particular, three pending water court applicants were informed the water budget methodology would no longer be approved by the SEO as an acceptable method for calculating well depletions in a substitute water supply plan, and these applicants were required to install flow meters by April 1, 2011.

Monitoring the Denver Metro return flows this year showed there were no days in which the river was shorted by the many claims of reusable effluent. In fact, over 30,000 acrefeet of water that was claimed to be reusable was not reused. This large amount of reusable effluent was not captured due to lack of exchange potential and absence of

infrastructure to capture it. This windfall of water to downstream users will be diminishing as reuse projects, such as Aurora's Prairie Waters Project, become operational.

Compact Administration



Division No. 1 continues to administer the South Platte Compact and the Laramie River Decree in

conformance with that compact and decree. The very good flow conditions discussed above resulted in only four days (August 6 through 10) of call under the South Platte Compact in 2010 and all diversions in the Laramie River Basin continued to be in accordance with that decree.

The Republican River Compact continues to be administered by staff in both the Division No. 1 and the Denver office. Much of the work on the Republican River Compact has focused on the proposed CCP with discussions and negotiations between Colorado, Kansas, and Nebraska occurred during all of IR 2010, without a final resolution.

Water Division 2 (Arkansas River Basin)

The Water Division 2 report for the year 2010 can also be found in LaserFishe at the Division's web site located at: www.water.state.co.us

Snow pack in the Arkansas River Basin for 2010 was above average as shown by the comparison graph below:



This graph also illustrates that both the peak and the decline of the snow pack occurred earlier than average. Consequently the peak runoff, as measured at the Wellsville gauge occurred earlier than normal at higher than normal also. The peak daily discharge of 5,110 cubic feet per second (cfs) occurred on June 7, 2010.

The above average snow pack in the Arkansas River Basin was complimented by above average snow pack in the Upper Colorado River Basin, namely the Fryingpan River Basin, where imported transmountain water for the Fryingpan-Arkansas Project is derived. According to the United States Bureau of Reclamation, 56,500 acre-feet were imported, which is 26,200 acre-feet less than in 2009.

Surface Water

Orders were issued to approximately 28 owners of relatively junior "seep" water rights located in Bent and Prowers Counties in December 2009. These orders generally require installation of water measurement and control devices necessary to enforce the priority system. This attempt to uniformly regulate water rights throughout the Arkansas River Basin has resulted in some moderate resistance, manifested primarily through letters written to elected officials and appeals to the press. To the extent that these orders have not been complied with, complaints have been and continue to be drafted by the Attorney General's Office for resolution by the Division No. 2 Water Court.

Ground Water

The 2010-11 Rule 14 Plan approvals for the Arkansas Groundwater Users Association., the Colorado Water Protective and Development Association, and the Lower Arkansas Water Management Association, the three largest associations of well owners in the

Arkansas River Basin, provided for a total estimated pumping of 132,242 acre-feet and corresponding replacements for 46,939 acre-feet.

The actual amount of pumping that occurred during 2010 totaled 107,644 acre-feet, of which 84,658 acre-feet was for irrigation purposes. The actual amount of stream depletions for 2010 was 43,006 acre-feet.

For more information, please refer to the "Annual Report to Kansas – Operation of Rule 14 Replacement Plans, HI Model Year 2010" prepared by Mr. Bill Tyner, Ms. Julie Pearson, and Mr. Justin Zeisler and "Report of the Colorado State Engineer Concerning Accounting of the Operations of an Offset Account in John Martin Reservoir for Colorado Pumping – 2010", prepared by Mr. Bill Tyner.

Compact Issues

Approximately 39,600 acre-feet was stored as compact water in John Martin Reservoir during the period November 1, 2009 to March 31, 2010, approximately 178% of the historical period 1950-1975. There were no other opportunities to increase conservation storage throughout the summer storage season. Colorado continued to work toward resolution of a variety of operational issues that have been raised by Kansas, through the Special Engineering Committee created by the Arkansas River Compact Administration. For more detailed information, please refer to the "Annual Report of the Operations Secretary Concerning the Operation of John Martin Reservoir- Compact Year 2010" prepared by Mr. Steve Witte.

On July 22, 2010, the Kansas Chief Engineer proposed a change to the H-I Model to recognize improvements to irrigation systems, such as sprinklers and drip systems, supplied by ground water. The proposed change would be implemented for the 2011 update. This issue was presented as a substantive, non-fast track issue. Colorado's experts, Mr. Dale Straw and Mr. Bill Tyner, filed a response in January 2011 accepting the proposed change but with a proposed modification to utilize available pumping data to compute modified weighted maximum farm efficiencies rather than acreage data as proposed by Kansas.

According to the accounting prescribed in the United States Supreme Court decision in *Kansas v. Colorado,* for the period 2000-2009 the final net accretion to usable stateline flow associated with replacements made to prevent depletions caused by post-Arkansas River Compact well pumping in Colorado was determined to be 34,059 acre-feet.

Colorado and Kansas initiated a five-year review of the Offset Account Resolution and the Offset Account Crediting Agreement required by amended Appendix A.4 to the decree entered in *Kansas v. Colorado (U.S. Sup. Ct., No. 105, Original),* in September 2010. This report must be submitted to the Arkansas River Compact Administration in December 2012.

Water Division 3 (Rio Grande Basin)

The Water Division 3 report for the year 2010 can also be found in LaserFishe at the Division's web site located at: <u>www.water.state.co.us</u>

Surface Water

Snowpack during the winter of 2009-2010 followed closely to the average throughout much of the season. At its peak, the snowpack was at approximately 110% of the average. Even with the higher peak snowpack, the yearly streamflow amounts for most Division No. 3 streams ended up slightly below normal. However, the timing of those flows was far below normal. As with 2009, the combination of early warm temperatures and dust-on-snow effects caused the snowpack to melt earlier and caused the peak flows

on most streams and rivers to occur earlier than normal. The peak of the runoff was also much sharper and higher than normal, but the runoff itself did not last as long. The impact of this change on the runoff was both positive and negative for water users in Division No. 3. On the positive side, the higher peak allowed many junior ditches that may not have otherwise gotten into priority to run water early in the season. The earlier runoff wetted up the systems and kickstarted the return flow patterns on many rivers before many of the ditches were even ready to turn on.



On the negative side, just when everyone started to think that the earlier streamflow forecasts may have been too low, the runoff season ended and the river flows plummeted. In mid-June, when the rivers and streams should have been experiencing flows near the peak for the year, the snowpack disappeared along with the water in the streams. Many ditches with mid-level priorities were turned off earlier in the season than they might otherwise have been.

The 2010 water year was the first in which the State Engineer's irrigation season policy was in effect. This policy, signed by the State Engineer on April 14, 2010, set in place the presumptive irrigation season dates of April 1 through November 1 of each year, but also set certain criteria that could be looked at to adjust these dates. Diversions for irrigation on the Rio Grande mainstem were curtailed as of November 2. Irrigation diversions on most other streams within Division 3 were shut off on November 10. However, because it appeared that the Conejos system would over-deliver on its compact obligation, irrigators in this area were allowed to divert until December 15. Colorado hit its Rio Grande Compact delivery obligations nearly perfectly this year with 400 acre-feet of credit from the Rio Grande and 1,600 acre-feet of credit on the Conejos system, of which 1,100 acre-feet was relinquished to account for inadvertent storage in Platoro Reservoir.

For the first time in five years, the area involved in the "Rio Grande Water Conservation District Unconfined Aquifer of the Closed Basin Change in Storage Study" lost water in 2010. This loss was fairly significant as the aquifer dropped by over 100,000 acre-feet, ending at near 800,000 acre-feet below the 1976 levels.

Stream administration in Division No. 3 during 2010 was somewhat challenging due to the large and early peak runoff that occurred on most of the streams in the San Luis Valley, and the dry summer that followed. The NRCS forecasts for Rio Grande Basin yields were generally slightly higher than what actually occurred. The high peak runoffs initially caused sufficient water to pass through the Conejos system such that no Rio Grande Compact curtailment was necessary. The prospect of higher annual flows than predicted early in the summer led to the re-establishment of the curtailment on the Conejos system on June 20. On July 21 due to the very dry summer, the curtailments were taken off of both rivers. Compact curtailment on the Rio Grande reached a peak of 11% at times during the spring, but there was only compact curtailment of any amount on the Rio Grande for a total of 107 days. A 13% curtailment was the highest that the Conejos system experienced in 2010 However, there were only 31 days where there was any compact curtailment at all on the Conejos system, a fairly remarkable number given that most years have curtailments at all times throughout the irrigation season.

Ground Water

DWR administration of the Well Measurement Rules in Division No. 3 is working well, as compliance and submittal timelines by water users continued to improve in 2010. Despite the improved cooperation, Division No. 3 still mailed approximately 200 violation orders. Continued success with compliance efforts has minimized the need for services of the Attorney General's Office regarding water users that do not comply with Well Measurement Rules. There were no letters of intent to file lawsuits mailed in 2010.

During the implementation of the well measurement program, hundreds of wells were identified as potential water rights to be abandoned. Significant efforts were made in 2009 to research and prioritize wells associated with water rights that will be included in the 2010 decennial water rights abandonment process. The decennial abandonment process is currently underway for approximately 180 wells.

Highlights

An Irrigation Season Policy was established in consultation with the San Luis Valley Rules Advisory Committee. The Policy sets a presumptive irrigation season from April 1 to November 1 with the allowance for different seasons to be developed based on factors at work in different areas of the San Luis Valley. These presumptive season dates can be changed or adjusted based on a list of criteria that include temperature, weather patterns, compact obligations, soil moisture, and other factors.

The Division No. 3 Division Engineer is required to meet with water user groups at the beginning and end of the irrigation season to discuss the season dates and the list of

criteria, and then make determinations as to the timing of the season. The decisions are then published in a newspaper of general circulation.

Historically, the irrigation season applied only to surface water rights. However, under the new Irrigation Season Policy both surface and ground water rights are included within the policy. The first test of the Irrigation Season Policy occurred after the fall of 2010 turn-off date. There were some questions regarding different end dates in different areas within the San Luis Valley and whether wells should be allowed to pump after the end date to irrigate crops in need or moisture.

Water Division 4 (Gunnison River Basin)

The Water Division 4 report for the year 2010 can also be found in LaserFishe at the Division's web site located at: <u>www.water.state.co.us</u>

Surface Water

The 2010 WY was 96 percent of average for snowpack conditions as of April 1st for the Gunnison River Basin. Runoff conditions were similar to 2009, in that they were adversely affected by dust on snow effect with runoff a week earlier than average and ending three weeks earlier than average. A graph showing 2010 snow conditions (green line) compared to the previous two years, as well as the 2002 spring runoff, and the 30-year average is shown below.



In contrast to the previous two WYs, which experienced very dry conditions in the monsoon months July to October, the Gunnison River Basin received much needed rainfall for a few weeks the end of July and beginning of August. Full reservoirs at the beginning of the irrigation season and the subsequent monsoon rains helped to prevent river calls on the Gunnison River main stem. As it was, the usual dry summer conditions

with good irrigation supply resulted in very good hay crops and haying conditions throughout the basin.

District 40 was tightly administered, with the call season beginning early spring before runoff, free water during the runoff, and then back on call in July. Most areas of District 40 depend heavily on storage water in Grand Mesa reservoirs, Paonia Reservoir, and Overland Reservoir to sustain the mid and late-summer irrigation. There was ample spring runoff to entirely fill every reservoir in District 40, especially since the carryover all reservoirs was still good from last fall. Reservoir water from the Grand Mesa was needed for irrigation demands early in July because of the dry conditions in early summer. The monsoon season in late July and early August helped to replenish reservoir levels and natural stream flow sufficient to temporarily shut off river calls in various systems throughout the basin. Again, carryover storage going into the 2010 irrigation season was above normal, for the fifth year in a row.

Natural stream flow diminished rapidly throughout the basin until mid to late July. The Gunnison Tunnel kept running at maximum capacity, and there was enough flow down the Uncompahgre River to meet the rest of the water users' needs. Yet, at the Whitewater Gage on the Lower Gunnison River, conditions were approaching the possibility of the Redlands Water and Power Co. placing a valid call on the Gunnison River Basin. As monsoon rains began in late July, river conditions improved, thus alleviating a potential basin call. The Uncompahgre Valley Water Users Association and Tri-County Water Conservancy District management and employees deserve credit for their water management assistance in optimizing water use in the Uncompahgre Valley. The DWR works in collaboration with these agencies to meet the demands of water users in the Uncompahgre River watershed, which is comprised of over 85,000 acres of irrigated lands.

Similarly, dry conditions early in the irrigation season on the San Miguel River and its tributaries in District 60. However, the monsoon rains in July and August replenished the natural stream flows to the extent a river call from the Highline Canal was not made until early September, lasting only two weeks. The summer typically produces intense and localized thunderstorms in this part of the basin helping to satisfy senior water rights and reduce the level of river calls.

Groundwater

The well permitting program in Division No. 4 continues to provide timely issuance of exempt well permits. There were 197 well permits issued within Division No. 4 during 2010, a decrease from the 230 permits issued the previous year and a continued indicator of the overall trend in well permitting activity. The decreasing trend is likely due to the slowing of development and growth in the local economy and real estate market. The Division No. 4 well commissioner issued 160 of the total 197 permits exempt well permits. The remaining 37 non-exempt permits were issued by the 456 Team staff in Denver in 2010.

Highlights

• Established in 1988, the Upper Colorado River Endangered Fish Recovery Program is a partnership of public and private organizations working to recover four endangered species of fish (the Colorado Pikeminnow, Razorback Sucker, Humpback Chub and Bonytail) that once thrived in the Colorado River system, while allowing continued and future water development. Essentially, the effort is in response to Endangered Species Act requirements to address and mitigate the impacts that USBR projects may have on the survival of these species.

At the time of this report, the Final EIS has been issued and a Programmatic Biological Opinion (PBO) has been completed by the US Fish and Wildlife Service. The EIS preferred alternative calls for higher spring flows and moderate base flows with a peak flow target at Whitewater based on the April to July forecasted inflow to Blue Mesa Reservoir. The PBO concludes existing depletions and elevated selenium levels are adversely affecting endangered fish. However, the reoperation of Aspinall Unit and implementation of a Selenium Management Program (SMP) will allow the

Bureau of Reclamation to achieve Endangered Species Act compliance for new Aspinall Unit operations, existing depletions, and limited new depletions.

The SMP is cooperative effort to reduce selenium loading to Gunnison River. While selenium is a trace mineral essential to life, elevated concentrations of soluble selenium are deleterious to development and reproduction of fish and water fowl. Most of the selenium



loading in the lower Colorado originates from irrigated lands in the Uncompany Valley, lands irrigated by project water stored in the Aspinall Unit and Ridgeway Reservoir.

• The Gunnison Basin Roundtable continued to make steady progress in 2010 working on the first three parts of the basin-wide assessments in parallel. The Gunnison Basin Roundtable is receiving technical assistance in the completion of part one and part two of the assessment. Colorado received funding in 2007 and contracted out the water availability study work in 2008 to a water resources consulting firm, CDM. CDM has packaged the work in the form of several milestones or tasks, which they

intended on completing in the form of a final report by the end of Colorado's Fiscal Year 2010. The milestones or tasks identify and quantify the needs or work product described as follows: Municipal and Industrial Demands, Non-Consumptive Needs, Agricultural Needs,



Consumptive Gap Analysis, Basin Roundtable Support, and a Final Report.

In addition, the various basin roundtables forged some new ground in 2010 by participating in joint roundtable meetings. Specifically, the Gunnison River Basin Roundtable met in a joint meeting with the Arkansas River Basin Roundtable, to initiate discussions on how Blue Mesa Reservoir can be used to help better meet the needs of both basins. One concept is the water banking idea that would credit consumptive use of certain pre-1922 water rights in a pool allocation in Blue Mesa Reservoir. Such a pool would help lessen the effect of a Colorado River Compact call should the event occur in the future. These ideas are still being explored at this time.

Water Division 5 (Colorado River Basin)

The Water Division 5 report for the year 2010 can also be found in LaserFishe at the Division's web site located at: <u>www.water.state.co.us</u>

Surface Water

The Colorado River Basin wide precipitation for the 2010 IY was 90% of average, while April 1st snowpack was 76% of average. The snowpack was the lowest in six years and the fourth lowest in the previous 30 years. Above average precipitation in April and average precipitation in May improved runoff conditions, but could not overcome the deficit. The timing of the runoff was impacted by above average temperatures in May and extreme dust storms throughout the late winter and spring. The combination of warm weather and dust on snow created high peak flows in spite of well below average snowpack and below average precipitation. The most extreme example was on the Eagle River where at Gypsum 7,240 cfs was recorded, making it the highest flow at the station in 64 years of record. Reservoir storage continued the year-to-year improvement since the drought of 2002-2004, with a 14% increase in carryover storage from 2009.

- Although runoff was below average, mainstem calls for 2010 totaled only 58 days at the Shoshone Power Plant in Glenwood Canyon and eight days at Cameo. The Shoshone Power Plant was offline much of the year due to both scheduled and unscheduled maintenance and repairs. The 58 calls days all occurred between November 1, 2009 and February 25, 2010. After February 25th the Shoshone Power Plant either operated at diminished capacity was out of service or river flows exceeded capacity. In Early September, Colorado River flows did dropped low enough to implement a Cameo Call. However, the call lasted only from September 3-10, 2010.
- On April 26, 2010, the Interim Policy for the 2010 Green Mountain Reservoir fill season was issued. In spite of less than desirable runoff conditions, the 2010 Green Mountain Reservoir SEO Interim Fill Policy had no practical impact on the manner of filling the reservoir or any rights upstream and subject to a call by Green Mountain.

- The Shoshone Power Plant is the key calling structure on the mainstem of the Colorado River, historically controlling the priority administration eight to ten months a year. The aging facilities have left Shoshone Power Plant off line with greater frequency in recent years. This year was no exception. From February 25, 2010 through the end of the 2010 irrigation season the Shoshone Power Plant was either completely offline or operating at half capacity. From Granby to Grand Junction, the rafting industry, individual recreationists, endangered fish, and and agricultural producers depend on the benefits of a 1,250 cfs to 1,408 cfs call at Shoshone Power Plant. The water dilutes salinity and other pollutants helping communities that draw drinking water from the river. Beginning with the penstock failure in 2007, major upstream water users have operated a voluntary outage protocol that is coordinated by the Division No. 5 office. Except for traditional scheduled maintenance, at time the power plant is off line or at diminished capacity the outage protocol provides for reservoir releases to mimic river flows as if the Shoshone Power Plant is operating and calling out junior water rights. Reservoir releases under the protocol must be made for decreed purposes of the reservoir, such as discretionary power at the reservoir or to the endangered fish; otherwise the reservoir will not be allowed to fill that space with its decreed rights in the following storage season.
- The high carryover reservoir storage at 116% of average for our major reservoirs in the Colorado River Basin allowed all but Granby Reservoir to fill and spill. As a result, Coordinated Reservoir Reoperations for the Endangered Fish Recovery Program were conducted, providing 73,971 acre-feet between May 14 and May 26, 2010 to enhance the peak flows in the 15 mile reach, below the Grand Valley Canal at Palisade.
- With full reservoirs, the Endangered Fish Recovery Program's pools for late summer augmentation to the flows in the 15 mile reach were also full. The pools total 37,650 acre-feet in Ruedi, Wolford, and Williams Fork Reservoirs. All but 3,000 acre-feet were released from these pools in 2010. On August 18, 2010 a surplus in the Green Mountain HUP was declared and 57,813 acre-feet was released from pool as "HUP surplus" for the endangered fish. Other was made available in 2010 to the 15 mile reach includes, 5,114 acre-feet from Granby Reservoir from the Middle Park Water Conservancy District pool of Windy Gap water, and 14,125 acre-feet from the Grand Valley Water Management Project via the Palisade Pipeline. With transit losses 102,465 acre-feet was delivered to the 15 mile reach. The target flows for the 15 mile reach ranged from 1,240 cfs in mid-summer to 1,000 cfs in the fall.

Groundwater

The total number of permit applications for Division No. 5 received and issued by the DWR continued to drop in 2010. The decrease has persisted since the late 1990's. Initially, the decrease was related to changes in the water court process for conditional water rights and diligence on those rights. Later, a large increase in fees for well permits, limited new applications to wells that would be drilled prior to expiration. However, the

continued decrease in permits is related to fewer exempt permits for both new 35 acre tracts and lots created by exemption from subdivision. Additionally, beginning in 2008 the economic downturn has all but eliminated demand for new development and the demand for either exempt or non-exempt wells. During calendar year 2010, a total of 462 permits were approved for Division No. 5 - a decrease of 5% from 2009. This compares to over 1,200 well permits issued for Division No. 5 in 1998.

Augmentation Plan and Municipal Water Rights Administration

Accomplishments in 2010 included the development of spreadsheets to aid water commissioners in the administration of augmentation plans and diversion record accounting. Efforts continue to amend existing user supplied accounting for ease of migration into the DWR's published diversion records

Highlights

Since 2005, west slope interests have negotiated with Denver Water on Denver's Moffat Firming Project and with Northern Colorado Water Conservancy District on Northern's Subdistrict Project Windy Gap Firming. At about the time, these negotiations commenced all parties ceased discussion with the DWR and Attorney General's Office,

and the Federal Government, USBR and Department of Justice. Negotiations for Moffat Firming were deemed the "Global Settlement Negotiations." In February of 2010, the parties negotiating the Global Settlement presented a "White Paper" outlining their proposed resolution of the Blue River Decree as a part of the Global Settlement Negotiations and gave the parties 45



days to accept it under a deadline offered by the United States Magistrate for the Blue River Decree. None of the parties found the proposal completely acceptable and bimonthly meetings followed to modify the document.

Prior to the end of August 2010, DWR was brought into the negotiation of the Global Settlement, which was broken into separate series of meetings; Grand and Summit County Water Supply, Grand County Environmental Flows, Shoshone Outage Protocol, and the Blue River Decree. The Global Settlement Negotiations included many concerns, but the most difficult were the many undecreed changes of water rights. At the end of 2010, proposals were being developed to deal with the substantial issues that eventually resulted in the "Colorado River Cooperative Agreement", which was unveiled in the spring of 2011.

Water Division 6 (Yampa/White River Basins)

The Water Division 6 report for the year 2010 can also be found in LaserFishe at the Division's web site located at: <u>www.water.state.co.us</u>

Surface Water

Despite the fact that the snow pack throughout the winter season of 2010 was grim, precipitation in the months of April, May and June helped relieve some concerns of a busy summer of administration. Precipitation for the month of June, as measured at the SNOTEL sites operated by the NRCS, was reported at approximately 105% of average for the Yampa/White River Basins and 109% of average for the North Platte River Basin. Precipitation for the combined Yampa, White, and North Platte River Basins was up to 95% of average for the WY 2010, through the end of June. However, the remaining snowpack at the NRCS SNOTEL sites were mostly melted by the end of June and actual runoff ended up being near or above average depending on the basin as a result of the substantial precipitation in the months of April, May and June.

Water administration in WY2010 was normal with the Bear River, Middle Hunt Creek, South Hunt Creek, Little Bear Creek, Talamantes Creek, Trout Creek and Soda Creek going under administration. In addition to these standard calls, there were a handful of other calls, the most significant of which was a call on the Elk River by the CWCB for their minimum instream flow water right. The one system that typically goes under administration, but did not in 2010, was Piceance Creek.

Administration on Talamantes Creek presented a substantial amount of problems and required a lot of time to administer. Division No. 6 eventually developed guidelines for future administration on Talamantes Creek to ease the efforts of administration. Additionally, a new gauging station was recently installed that will hopefully reduce the amount of time invested in administering a stream system that has few water users.

Administration of the Elk River call presented difficulties as well. The call was the first on the system that required actual on the ground administration. This system does not have any area wide augmentation water and very few people have obtained augmentation water to protect the uses of their water rights.

After the call was placed and honored by this office, it was recommended to the State Engineer that the Elk River basin in its entirety be designated as critical. A report supporting and justifying such designation was submitted to the State Engineer and was ultimately confirmed. As of January 1, 2011, the basin has been considered critical.

As in years past, releases were made from Elkhead Creek Reservoir. Releases were made in accordance with the Upper Colorado River Endangered Fish Recovery Implementation Program (Recovery Program) as a result of flows in the Yampa River at the Maybell gage station dropping to as low as 160 cfs in August and 88 cfs in September.

The Upper Yampa Water Conservancy District began construction of a four foot raise to the spillway of Stagecoach Reservoir in September 2010. Prior to beginning construction, the Upper Yampa Water Conservancy District had to lower the water level in the reservoir to 15-feet below the original spillway elevation. The storage capacity of the reservoir prior to construction was 33,275 acre-feet and after construction it is approximately 36,460 acre-feet

Groundwater

There were no significant administrative ground water issues in 2010. The designation of the Elk River as a critical stream system did result in the Division No. 6 office receiving over 30 new well permit applications in the month of December 2010. When a stream system is considered to be critical, the well permitting processes changes triggers the need for augmentation water in many cases.

Highlights

The Division No. 6 office continued the operation and maintenance of the lysimeter program, which consists of two sites. Each site is equipped with two lysimeter plots

which contain grass on top of soil and a layer of gravel. Measured amounts of water are added to the plots once or twice a month in a manner that prevents drought stress to the grass. Precipitation gages and temperature recorders exist at each site, and there is an evaporation pan at the CYCC site. An evaporation pan also exists about 10 miles north of the ANWR site near Walden, which is also maintained by Division No. 6 staff.



In June 2010, DWR entered into a contract to evaluate data collected and determine its accuracy and validity. Based on the observations and analysis presented, it was concluded that the monthly crop coefficients from the Division No. 6 lysimeter program conducted at the CYCC site are questionable, especially for the months of May, June, and July, while the observations from the ANWR site appear to be more consistent with measurements from previous studies. Despite this analysis, it is still believed that these studies have produced a valuable database of temperatures and precipitation that could be used in recalibrating the existing results.

As a result of the outcome of this evaluation, the Division No. 6 office teamed up with the Colorado Climate Center to submit a grant application to the Yampa/White Roundtable for funds, in the amount of approximately \$20,000, to install new lysimeter plots and a weather station. The grant application was approved and installation of the plots and weather station will occur in the summer of 2011. The lysimeter plots and weather station are to be located on the Carpenter Ranch owned by The Nature Conservancy, and is located just east of the Town of Hayden along the Yampa River.

Water Division 7 (Animas and La Plata River Basins)

The Water Division 7 report for the year 2010 can also be found in LaserFishe at the Division's web site located at: <u>www.water.state.co.us</u>

Surface Water

WY 2010 started out with the dry conditions of the WY 2009 carrying forward. Precipitation was relatively normal until the end of June and then only 2.60 inches of precipitation fell through October.

The impact of the low precipitation was felt throughout Division No.7. Reservoirs were drawn down to their lowest levels since the record drought years of 2002 and 2003, and streamflows ended WY 2010 running below 50% of normal. For the WY, Durango received 21.69 inches of precipitation, eleven percent above its normal of 19.60 inches.

Areas in Division No. 7 that do not have a large reservoir to rely on for irrigation depend on snowpack. The lack of precipitation and near normal temperatures resulted in a significant drop in the average snowpack throughout the Animas and La Plata River Basin, which averaged 73% of the snow-water equivalent compared to the 30 year average for the end of April. Dry conditions continued through the month of May. Durango recorded the driest May since 2004 with only 0.02 inches of rain, a paltry 1.8% of the 30-year average. With near normal temperatures, basin snowpack fell dramatically to 20% of average.

For those with access to stored water, reservoir contents were near or above normal for the date. At the end of May, Vallecito Reservoir contained 112,940 acre-feet compared to its average content of 88,166 acre-feet (128% of average), McPhee Reservoir was up to 381,429 acre-feet compared to its average content of 325,289 (117% of average), while Lemon Reservoir was up to 31,810 acre-feet as compared to its average content of 30,816 acre-feet (105% of average).

Across Division No. 7, many of the irrigators on rivers and tributaries were forced to make calls much earlier than normal and due to the lack of monsoon rains, many calls continued until the end of the irrigation season. As is the norm, the La Plata Compact was not without challenges and included a period from July 12 to 15 when the number one water right in Colorado was shut down to meet New Mexico's Compact call.

Highlights

Construction on the project continued with an estimated 76% completed including the Navajo Nation Municipal Pipeline. The pumping plant started diverting on April 17, 2009, and water from the natural drainage (Basin Creek) started to fill Lake Nighthorse. By October 2010, approximately 76,500 acre-feet were stored in the 120,000 acre-foot reservoir. During the summer of 2010, drafting of the protocol to administer the project water was initiated.

The River Protection Workgroup Process is the result of the Government to Government round table meetings that concluded in 2008. Sponsored and funded primarily by the CWCB, Southwest Water Conservation Board, San Juan Citizens Alliance, Trout

Unlimited, and the Southern Ute Indian Tribe, this process elicits local involvement to look at ways to protect the values of several streams in Southwest Colorado while allowing for further water development. The DWR involvement in this process has been as a resource to assist with water rights identification and mapping.

The DWR, Power Development Authority, and the La Plata Water Resources Conservancy District selected GEI Consultants to provide engineering services for the planning and design of Long Hollow Dam. A design package was submitted to the SEO in February of 2011. Approval of the proposed design is pending review by the SEO.

