VOLUME XXI, ISSUE 3

Fall 2007

COLORADO DIVISION OF WATER RESOURCES
DEPARTMENT OF NATURAL RESOURCES

StreamLines

Quarterly Newsletter of the Office of the State Engineer

Animas-La Project—Ridges Basin Topping-Out Ceremony

Jeff Titus, Division 7, Animas River Water Commissioner

The Animas–La Plata Project is being constructed to fulfill the water rights settlement of two Indian tribes that live in Colorado – the Ute Mountain Tribe and the Southern Ute Indian Tribe whose water rights date back to 1868. Fulfillment of the settlement will provide southwest Colorado certainty to the continued, historical use of water.

Construction of the project began in 2002. When completed, Ridges Basin Reservoir will store approximately 120,000 acre-feet of water with a surface area of 1,490 acres and will be more than three miles long. The project consists of three major components – Ridges Basin Dam, the intake structure, and the outlet works.

The water delivery system and outlet works will be capable of delivering up to 200 cfs water downstream of Ridges Basin Dam and consists of a 55.5-foot high intake structure, a 72.5-foot long by 7.5-foot diameter concrete conduit, 659 feet of 7.5-foot diameter upstream concrete lined tunnel, a 25-foot diameter by 41.5-foot high concrete-lined gate chamber with a 4-foot by 6-foot guard gate, 682 feet of 11-foot diameter downstream concrete-lined tunnel, 752 feet of 66-inch steel discharge pipe located in the downstream half of the tunnel, a 45-foot by 50-foot by 32-foot high concrete control building housing, a 60-inch jet flow gate for emergency releases, and a 48-inch sleeve valve for making releases down Basin Creek to the Animas River.

The intake structure is located on the Animas River and has a capacity to pump 280 cfs. When completed, the Durango Pumping Plant's eight pumps, ranging from 14 cfs to 56 cfs, will fill Ridges Basin Reservoir via 2.1 miles of 72-inch steel pipeline with a static lift of 500 feet.

Ridges Basin Dam is 270 feet high with a crest length of 1,640 feet. Ridges Basin Dam is located off-stream with a limited drainage area and has no spillway. Accord-

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Animas La Plata Project *(cont.)*

ing to the U.S. Bureau of Reclamation, Ridges Basin Dam is the largest earthen structure of its kind currently under construction in the United States. The dam is a zoned earth-fill dam composed of six distinct earth material types totaling approximately 5.25 million cubic yards of material. The amount of material used to construct the dam would be enough to cover a two- lane highway from Los Angeles to Salt Lake City with one foot of earth.

On November 9, 2007, a topping-out ceremony was held at Ridges Basin Dam and the ceremonial last load of material was placed on the dam. The filling of Ridges Basin Reservoir could start as early as 2008 and it is estimated it will take 18 months to fill.

Governor's South Platte River Task Force—From Origin to Recommendations

Marta Ahrens, Public Information Officer

On June 8, 2007, Governor Bill Ritter issued an Executive Order creating the South Platte River Basin Task Force to examine water issues and recommend possible solutions to challenges facing water users in the northeast Colorado basin. Governor Ritter created the Task Force, consisting of 23 voting members, after visiting Wiggins earlier this year to hear first-hand about the water crisis along the South Platte. This crisis was precipitated by, among other factors, the 2002 drought, which was one of the worst droughts in Colorado's history and had dramatic effects on water users in the South Platte River Basin. These effects included increased scrutiny of Water Court cases by other water users, increased water rights administration in the non-irrigation season because of reservoir calls, and increased cost and decreased availability of augmentation water. Those effects are among the many factors that have made it more difficult for some junior ground water users to be able to pump water.

The Task Force was charged with articulating the problems faced by water users in the South Platte River Basin, consider whether there are any changes to current water law or policy that will provide relief to junior water users without injuring senior water right holders, and recommending potential solutions in a final report due to Governor Ritter, Legislative leaders, and the Chair of the Legislature's Interim Committee on Water Resources by September 30, 2007.

The Task Force consisted of Co-Chairs John Stulp, Colorado Commissioner of Agriculture, and Harris Sherman, Executive Director of the Department of Natural Resources; water users Harold Evans of Greeley, Arnie Good of Fort Morgan, Harold Griffith of Fort Morgan, Joe Kiolbasa of Sterling, Randy Knutson of Platteville, Manual Montoya of Brighton, Brad Stromberger of Iliff, Jim Yahn of Sterling; former State Engineer Hal Simpson of Centennial; Assistant State Engineer Dick Wolfe; former Colorado Supreme Court Justice Rebecca Love Kourlis; State Senators Greg Brophy, Ted Harvey, Jim Isgar; Brandon Shaffer; State Representatives Kathleen Curry, Cory Gardner, Mary Hodge, Frank McNulty, Jack Pommer, Jerry Sonnenberg; attorneys Jim Lochhead and Anne Castle; Jim Hall, Division 1 Engineer, Marta Ahrens, Public Information Officer, of the Division of Water Resources; Jim Miller and Jenifer Gurr, of the Department of Agriculture.

The Task Force conducted two meetings to gather public comment, perception, and information regarding the well issues facing water users in the South Platte River Basin and to gather suggestions for potential solutions. Those meetings were held in two different locations within the South Platte River Basin in order to bring stakeholders together from around the Basin and to ensure that the public had an opportunity to provide input to the Task Force.

Following the public meetings, the Task Force conducted four meetings during which they discussed and considered the information gathered

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South Platte Task Force *(cont.)*

during the public meetings, and deliberated over the issues and a range of proposed recommendations. Materials provided to and reviewed by the Task Force were contemporaneously posted on a Task force web page on the Colorado Department of Agriculture web site allowing all interested members of the public access to the documents. The Members worked hard and diligently to discuss potential solutions in their effort to achieve the objectives set forth in the Executive Order.

The Task Force agreed to ten recommendations out of more than 20 suggested. These are incremental but important recommendations that cumulatively may provide some relief to some well users and may help improve Colorado's water allocation and distribution system.

On September 30, 2007, Director Sherman and Commissioner Stulp, on behalf of the South Platte River Task Force members, made its recommendations to Governor Ritter, the President of the Senate, the Speaker of the House of Representatives, and the Chair of the Interim Committee on Water Resources. The following recommendations were made by the Task Force:

1. New water storage is a necessary and essential component of resolving the water crisis on the South Platte River. Therefore, the South Platte Task Force recommends the support of the expansion and dredging of existing reservoirs and the construction of new reservoirs including underground storage.
2. The Task Force recommends that continued funding be provided to ensure completion of the South Platte Decision Support System as soon as possible.
3. The Task Force recommends that the South Platte Decision Support System team continue its comprehensive study to evaluate the limits of current science and technology to accurately quantify the amount and timing of well pumping depletions to the river, with appropriate peer review, so as to ensure that policy and law is created on the basis of the best modeling possible.
4. The Task Force recommends that the Legislature enact legislation that would provide more flexibility for the use of excess augmentation credits, only for replacement of current year depletions caused by past well pumping, with the notice and comment process and expedited review set forth in Section 37-83-105, C.R.S. This includes, but is not limited to, looking at the water loan statute (Section 37-83-105, C.R.S.) as an appropriate statute within which provide this flexibility.
5. The Task Force recognizes that there is increasing pressure being applied to the Water Courts in the State, due to competition for water, recent case law and evolving technology. The Task Force has also received testimony from a number of individuals that the Water Court process is cumbersome, time-consuming and can be extremely expensive. The Task Force recommends that the Governor and/or the General Assembly request the Colorado Supreme Court to undertake and complete within six months a study of the Water Courts in the State and identify possible ways to achieve efficiencies, while still protecting quality outcomes.
6. The Task Force recommends that the Legislature and/or Department of Natural Resources support any South Platte water entity in pursuing a CREP and EQIP program to the same extent that the State has supported other entities, such as the Republican River Water Conservation District, in pursuing CREPs or EQIP in other parts of the state and the Task Force supports encouraging the Colorado Delegation to support amendments to the 2007 Farm Bill to allow use of these programs in the South Platte River Basin.
7. Because the South Platte well rules did not go into effect until 1974 and, therefore, well pumping prior to 1974 did not requirement augmentation, the Task Force recommends that the Legislature enact legislation providing that augmentation is not required for current depletions caused by pumping prior to 1974.
8. The Task Force recommends that the Governor and the Department of Natural Resources encourage Colorado's Congressional Delegation to encourage federal funding of the study to reallocate space in Chatfield Reservoir to allow more storage.
9. The Task Force recommends that the Legislature consider legislation that would expand provisions under the water banking act to allow sources of water other than stored water (e.g. changed water rights, underground storage, trans-mountain water) to be put into a water bank and applied to other decreed augmentation plans as an additional water supply.
10. The Task Force recommends that the Legislature continue to support the Senate Bill 07-122 study regarding "alternative to dry up" of agricultural land for banking, fallowing, interruptible supply, and alternative crops which allows partial dry up.

Division 2 Fall Tour

Mark Perry, P.E., Division 2 Lead Hydrographer

Early on the morning of September 26, 18 adventurous Division 2 staff embarked on a field trip into the far reaches of the Arkansas River basin with the goal of learning about the region and the water that is administered. Fueled by donuts and coffee, the group departed Pueblo around 6:30 a.m. and drove west on Route 50 toward the Upper Arkansas River basin. Those who weren't asleep saw Colorado's state animal in aptly named Bighorn Sheep Canyon.

The first stop was in Salida at the headquarters of the Upper Arkansas Water Conservancy District (http://www.uawcd.com/). After more donuts and coffee, Terry Scanga, General Manager of UAWCD addressed the group. Mr. Scanga reported that UAWCD's mission is to safeguard the Upper Arkansas's water supply and to secure and increase water rights to provide augmentation. The District stores augmentation water in Turquoise Reservoir, Twin Lakes, Lake Pueblo, Cottonwood Lake, Rainbow Lake, and North Fork Reservoir. Division 2 Dam Safety Engineer, Mike Graber, oversaw recent improvements made at the remote North Fork Reservoir, located high in the Collegiate Peaks. UAWCD's base unit for augmentation water is 1/10 acre-feet and allows normal household use and irrigation of 1,400 square feet of lawn. The initial fee is around $3,500. Division 2 Well Permitting Technician, Janet Kuzmiak, and Augmentation Coordinators, Kalsoum Abbasi and Bill Richie, work closely with the District on well permits and augmentation plans.

After a break for more coffee and donuts, Division 2 staff heard from Rob White, Park Manager of the Arkansas Headwaters Recreation Area (AHRA). Mr. White touted the benefits of the AHRA to the Upper Arkansas region. The park supports fishing, climbing, biking, hiking, camping and wildlife. Commercial rafting on the Upper Arkansas dwarfs all other rivers in Colorado with over 237,000 user days in 2006, generating over $64 million from rafting alone! Mr. White said all the park's activities are made possible by one thing….*water; a*nd another thing ….*cooperation*. Numerous agencies are signatories to a Voluntary Flow Management Program MOU (VFMP) that manages flows to support the fishery and recreation while meeting the water needs of consumers. Flows for the VFMP are measured at the Wellsville gage (ARKWELCO). DWR's electronics specialist, David Hutchens, recently installed a new technology gage at Wellsville in hopes of keeping it operable through the long hard winters.

Grabbing more donuts for the road, Division 2 staff drove north to the Bureau of Reclamation's Turquoise Lake, located five miles west of Leadville. It is an impressive sight at nearly 10,000-foot elevation with Sugarloaf Mountain and fourteeners Mt. Elbert and Massive in the background. Tom Musgrove, head of the Bureau's Pueblo Office, met the group there. He reported that Sugarloaf Lake was originally built by Colorado Fuel and Iron of Pueblo. The Bureau purchased it and enlarged the reservoir as part of its Fryingpan-Arkansas Project.

Turquoise Lake has a storage capacity of 129,440 acre-feet, with storage owned by Colorado Springs Utilities (CSU), Pueblo Board of Water Works (PBWW), Aurora and the Homestake Project (operated jointly by Colorado Springs and Aurora). Transmountain water is diverted to Turquoise through three tunnels: Charles H. Boustead (Bureau), Homestake (CSU and Aurora), and Busk-Ivanhoe (PBWW). The western slope collection consists of an impressive system of tunnels and diversion structures. Interested readers can read more at www.secwcd.com/collection.htm.

Due to the diurnal effect of snowmelt and the time lag through the tunnel, peak flows from the Western slope to arrive at the Boustead gage (BOUTUNCO) overnight. Division 2 hydrographers have a tradition of measuring peak flows at night under portable lights. This past June, hydrographer Lou Schultz measured 910 cfs through the 15-foot Parshall Flume at 11:00 p.m.!

Back in the caravan of white SUVs, the group drove south parallel to the 90-inch diameter, 10.7- mile long Mt. Elbert Conduit, which pipes water

from Turquoise Reservoir to Twin Lakes, via the Mt. Elbert Forebay. A brief stop at the forebay divulged that it supplies the 200 MW Mt. Elbert pumped storage hydroelectric power plant. The plant is located on the north shore of scenic Twin Lakes, where the staff had lunch. Twin Lakes was originally developed by the Twin Lakes Company, but is now owned and operated by the Bureau as part of the Fry-Ark Project. It has a storage capacity of approximately 141,000 acre-feet. Along with water from the Mt. Elbert Conduit, it stores transmountain water diverted from the Roaring Fork drainage (Division 5), via Twin Lakes Tunnel.

Water is piped from Twin Lakes Reservoir to the Otero Pump Station, the next stop on the tour. The Otero

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Division 2 Fall Tour *(cont.)*

Pump Station is the next link in CSU and Aurora's Homestake Project. Completed in 1967. It lifts water 575 vertical feet over Trout Creek Pass (Elev. 9,346 ft.) to Spinney Mountain Reservoir in South Park via the 50-mile long, 66-inch diameter Otero Pipeline. Aurora's water is diverted into the reservoir, which is in the South Platte basin (Division 1), while CSU's water continues through another 26-mile pipeline en route to Rampart Reservoir, northwest of Colorado Springs.

Otero Pump Station was possibly the highlight of an already great trip. The equipment and facilities captured the imagination of everyone who would like to have a big rig truck, snow cat, front-end loader, backhoe, snowmobiles, bass boat, and ATVs, as well as the shops and know-how to repair and rebuild any of them. The operation is virtually self-contained in the mountains outside Buena Vista. It is charged with the critical task of maintaining the entire length of the Otero pipeline. The station's supervisor, Tom Vidmar, provided a tour of the facility and showed the 4,500-horsepower pumps with capacity to push 104 million gallons per day (~ 161 cfs) over the pass.

Before heading back to Pueblo, quick stops were made at Spinney Mountain Reservoir and CSU's Twin Rocks Pump Station. Abby Ortega of CSU showed these facilities. Twelve hours later, staff arrived back at the Division 2 office. The tour was a reminder of how precious a resource water is and what great efforts are made to deliver and administer it for the benefit of Coloradoans. Many thanks to Division 2's Wendy Bogard and Steve Witte for planning the trip and to all of the terrific tour guides.

AquaMap—DWR's New Mapping Tool

Clayton Kimmi, P.E., Water Resource Engineer, Team 237

The Division has developed a new mapping tool called AquaMap to assist in the issuance of well permits. The AquaMap project arose from the Water Supply Branch's need to provide rudimentary GIS capabilities to the entire staff. Permit evaluators in the Division offices can now view the same information and maps that the Denver permit evaluators see. Information drawn in AquaMap is instantly available to all Division staff with access to AquaMap. If a permit is issued by staff, the location of that permit will appear in AquaMap the day after the permit has been issued.

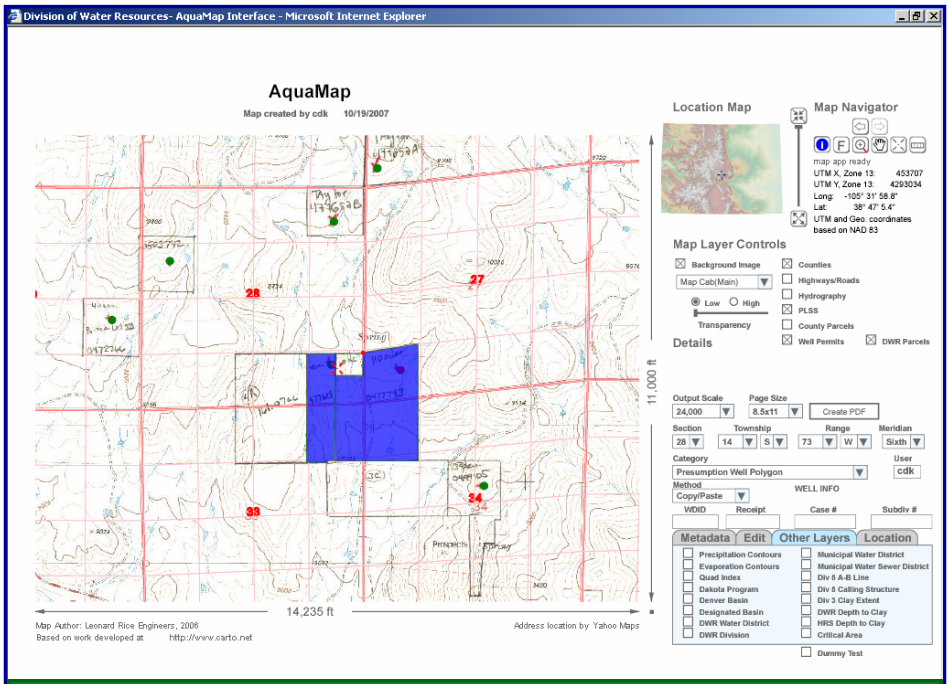

Figure 1: Screenshot showing the AquaMap interface. The background image is the historic topographic maps used in Denver showing parcel data and well data. Well permit information is shown as green or red dots. Parcel data is shown as a blue polygon. Other data that can be activated is shown in the lower right corner of the screenshot.

In addition to drawing capabilities, staff has the ability to view aerial photography (2005 color photos and 1980's era black and white photos), the Denver Basin Atlases, and Denver's historic maps showing parcel and well data. AquaMap can be used to turn on and off other informational layers such as hydrology, roads, municipal water and sewer districts, DWR division and district boundaries, parcels tied to well permits, and a variety of Division specific data such as the Division 3 depth to clay and Divisions 6 and 7 water critical areas.

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Aqua Map (cont.)

Staff can enter parcel data in three different ways. Metes and bounds data can be entered through a custom spreadsheet that imports a shapefile into AquaMap. Parcels can be copied from existing county parcel information. Parcels can be digitized using a free-hand or heads-up digitizing method.

AquaMap has a built-in PLSS converter that will convert NAD83 UTM coordinates to distances from section lines, section, township, range, and principal meridian. Traditional PLSS information can also be converted to NAD83 UTM coordinates. The converter will convert NAD83 latitude/longitude to NAD83 UTM coordinates. For the portion of the state located in Zone 12, the converter will convert NAD83 Zone 12 coordinates to NAD83 Zone 13 coordinates. Once the data has been converted to NAD83 UTM coordinates, the user can choose to zoom to that location and turn on/off the background and data layers to obtain the desired information.

AquaMap has several tools that will allow the user to search for well permits by UTM location, parcel number, street address, and PLSS location. The street address search is powered by Yahoo Maps and gives only approximate locations. The parcel number search searches the county parcel database for the correct parcel number. The utility of the parcel number search is limited since not every parcel ID in the State is contained within the database.

Future improvements to the AquaMap interface over the next several months which will aid staff includes the addition of the Denver Basin Mylar maps to the background layer and several new data layers. Eventually, a public version of AquaMap will made available on our website. The public version will not allow any drawing or editing of the data. Any proprietary information such as the county parcel data will not be available to the public.

Currently, AquaMap is available to all DWR staff with access to the Intranet site. The public can get assistance from the Records Section in Denver.

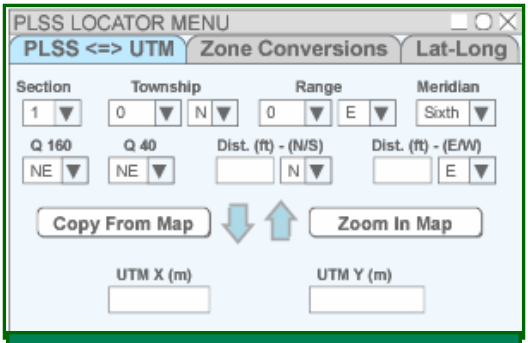

Figure 2: PLSS Converter Tool

Imaging Project Update

Laura Nelsen, Records Manager

Beginning in March 2007, the subdivision files that the Division of Water Resources' (DWR) Records Section maintains were prepared for scanning. There were approximately 20,000 files that were scanned and separated out into approval letters, correspondence, and maps. Indexing was given to each file so they could be located in the Laserfiche Imaging Program by subdivision name, county, and various other search fields. The files were scanned at DWR in Denver, and the maps were outsourced to be scanned. The approximately 33,000 resulting imaged files were quality-checked for indexing errors as well as readability. The project was wrapped up at the end of June 2007.

Over the past year, DWR has chosen a new Document Imaging System called Laserfiche, which is the replacement for Content Manager. DWR IT Staff have been leading the migration to move images from Content Manager into Laserfiche. All of the documents that were in Content Manager in the following Index Classes are in Laserfiche now: Abandonment Lists, Consent Maps, CWCB Well Permits, Dam Construction Drawings, Diversion Records, Livestock Water Tanks and Erosion Control Dams, Map and Filing Statements, Official Tabulations, Pre-SB213 Worksheets, Straight Line Diagrams, Subdivisions, Water Court, Water Court Resumes, and Well Permit Maps. The final category of documents that are being migrated to Laserfiche are the Well Permit Files. The process to move these images is scheduled to begin November 1, 2007. It is unknown how long it will take to move the approximate three million images. One anticipated finding will be that some images need to be re-scanned. Those errors will be directed to the Records Staff to research and resolve.

Other positive changes that have occurred recently include: DWR staff in the seven Division Offices are now able to scan in sets of documents, which will make the records more complete and accessible to all. This year, DWR has begun to offer images by email to customers at $0.50 per page, which is more convenient than some of the other methods. There will also be a feature within Laserfiche that will allow for problem reporting. DWR staff and researchers will be able to identify any errors that they find in the imaging system for a Records Technician to further research and resolve.

HUMAN RESOURCES

New Employees

Brian Epstein joined the Division 5 staff on April 3, 2007 as a Water Commissioner Tech II in the lower end of the Roaring Fork Valley, Water District 38. His education includes a B.S. in Environmental Studies from Michigan State and a Masters in Hydrologic Sciences from the University of Nevada at Reno. Prior to joining DWR, Brian worked as a consulting hydrologist based in the Carbondale area and research assistant in the Reno area for the Desert Research Institute. His interests include anything outdoors with an emphasis on ice-skating!

Bob Hurford started on August 13 as the new Assistant Division Engineer for Division 4. Hurford most recently served as the City of Montrose Public Works Director for two years and the City Engineer for two years. He also worked as an engineer for the State of California's Water Resources Division.

Josh Kasper became a permanent addition to the Division 4 staff on September 5 after working as a temp. He is Water Commissioner for District 40, serving the Crawford area and is following in the long-standing tradition of father-son water commissioner combinations. Josh grew up in the Hotchkiss area and is very familiar with the terrain and the people.

Roberta Hume was hired as a temporary in May to perform water commissioner duties in Water Districts 44, 54, 55, and 56. Because of her obvious passion to learn more about water administration and her enjoyment of the work she was assigned to do, she was hired as a permanent employee in October. Roberta and her twin brother were the first set of twins born in the Craig Memorial Hospital. She was raised on a 2,000-acre ranch east of Craig where her family raised chickens, cattle, and sheep. Her love for water started with helping her father irrigate. Roberta and her husband purchased the property that her grandparents lost during the depression. On this property, they raise mainly cattle but also Jersey milk cows, chickens, pigs, sheep, and goats. Roberta has seven children, all of whom reside in Craig, ten grandchildren and has fostered many other children. The Division 6 staff is very excited to have Roberta Hume as a member of their team.

Tony Arnett was hired as a full time Deputy Well and Surface Water Commissioner for District 8 (Cherry and Plum Creeks) on September 24, 2007. Much of the development that has occurred in this district is based on pumping either Denver Basin or alluvial ground water, so Tony will spend much of his time on ground water issues but will also be involved in surface water administration. Tony has B.S. in Geology from Oregon State University as well as a wide variety of work experience in both the consulting and governmental areas that should prove to be a great asset as he deals with the complex issues in District 8. He has worked for consulting firms in the geotechnical and storm water management areas. Tony has also worked for the Brook Forest Water District and spent 10 years with the USGS doing both surface and ground water work.

Stephanie Hamburg became a full-time Deputy Ground Water Commissioner for Division 1 on September 10, 2007. Stephanie is based in Greeley and will spend her time primarily doing field work on well enforcement and augmentation plan issues. She has a B.S. in Outdoor Recreation from CSU–Pueblo with a Minor in Biology. Stephanie previously spent a little over three years with the USBLM doing Land Health Assessments and about one year with the City of Pueblo as a GIS Technician.

George Roark joined the Division 1 staff as a temporary employee in early May and became a full-time Deputy Ground Water Commissioner based in Greeley on August 29, 2007. George has a B.S. in Geography/GIS from UNC and has experience working on an irrigated sod farm. George's excellent work habits, calm demeanor, and can-do attitude have already proven to be a great asset in the area of ground water administration.

Retired Employees

Carl Hurst retired on October 31 after serving as the District 62 Water Commissioner for over 10 years. He has enjoyed his work and living in the Lake City area. An avid GPS, snowmobile and ATV user, Carl could get to any water structure in his district amidst any weather condition. Carl and his wife are in the process of relocating to Grand Junction.

Clint Oliver is retiring on November 30, 2007. For over 30 years, he has been the Water Commissioner for District 61 serving the Paradox area. Clint has seen everything there is to see during his time as a water commissioner. A farmer and rancher, Oliver enjoys working in the outdoors and dealing with the people in his community.

CALENDAR OF EVENTS

November 14-15	Colorado Water Conservation Board Meeting, Golden, Colorado; for more information, contact Lisa Barr at 303-866-2599
November 16	Colorado Ground Water Commission Meeting, Sheraton Hotel, Colorado Springs,, Colorado; for more information, contact Marta Ahrens at 303-866-3581
December 4	Colorado Board of Examiners of Water Well Construction and Pump Installation Contractors Meeting, Denver, Colorado; for more information, contact Gina DeArcos at 303-866-3581

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***STREAMLINES** is published by the Colorado Division of Water Resources on a quarterly basis. Subscriptions are available for $10 per year to cover the cost of printing and mailing.*