

RECLAMATION
Managing Water in the West

Spring 2015

Plains Talk

NEWS FROM THE GREAT PLAINS REGION

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Director Gary
Campbell Reflects on
33 Years of Federal
Service***

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New Communication
Tower***



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Plains Talk is an employee publication devoted to the interests of Reclamation's Great Plains Region. *Plains Talk* is published from the Great Plains Office of Public Affairs. To be added to the *Plains Talk* mailing list, submit your name and mailing address:

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Submission Guidelines:

Articles and other materials for publication should be sent to the Great Plains Public Affairs Office, Attn: Plains Talk Editor, GP-1240, or email to bfeist@usbr.gov.

Plains Talk encourages employee submissions, and assists with developing ideas. Questions about stories or photographic essays should be directed to the *Plains Talk* editor, at 406-247-7610.

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DRD Gary Campbell Retires

After more than 33 years of federal service, Deputy Regional Director Gary Campbell retired in March 2015. He spent the last nine and a half years with Reclamation's Great Plains Region, and Plains Talk sat down to ask him some final thoughts.



Do you have any career advice?

Everyone is in charge of their own career. You should be looking for opportunities. Bottom line: You need to open your own doors – and by that, I mean I was taking on extra duties as opportunities would arise and that helped my career.

Traveling around is important. I know that's tough with two income families and kids, but it's a good way to gain new skills. From the office perspective, it is good to have people bring new points of view and ways of doing business. We tend to get stuck in a rut, but there have to be ways out there to become more efficient. But the bottom line is, you have to look for these opportunities and take the initiative to build your own path.

What would you change in your career?

One thing I would change is that I would never use the term, "I will never do ___, again."

I said I would never go to D.C. but guess what? You learn after a while to just not say such things. Going to Washington D.C. was beneficial for me. I learned a lot and loved the job. The commute, traffic and crowds - not so much - but I got to see a lot of the country. My wife is the one that really had to make some sacrifices with moving around, but she was always able to find a job in the teaching field and that was helpful. We lived in Wyoming, California, Nevada, Utah, Virginia and then here in Billings. We made friends in all those places and plan to visit them in retirement. Would I change anything? I don't think so.

What about your time here at Reclamation?

I like my job. I like what I do. I like the

people that work for me and those at the Area Offices. I don't really get to make a lot of decisions. People think that is what a Deputy Regional Director does, but it just doesn't happen. The best decisions are those pushed to the lowest level possible on the ground. People there make the most informed decisions and are accountable for the results. My biggest influence is to offer advice and provide tools and any sideboards needed to keep us on track.

What is the key to your success?

I try to treat people the way I want to be treated. We can disagree on things, but still have that personal relationship needed to get things done. One example is the Republican River Compact. For the that past four or five years the compact has had states at each other's throats, and it is personal. Over the last year, things have really changed and the three states are talking. Reclamation is there with them. People with competing interests are calling each other on the phone and trying to solve problems.

Another example is the Platte River Recovery Program with the groundwater pumpers, surface water irrigators, environmental community, three states and the executive director and his staff working to resolve issues.

Quite truthfully this is one of the best parts of my job because we are talking with each other and have a level of trust that allows us to work through issues. Communication is key. Part of that is getting to know people as individuals and having a personal relationship.

What is the biggest challenge we have?

Everybody recognizes we are understaffed and that positions are hard to get filled. We have too much stuff on our plate and something needs to drop off. We are seeking efficiencies in how we do



Regional Director Mike Ryan presents Gary Campbell with his Career Service Certificate during a retirement gathering at the Regional Office.

business. As an example, our leadership training course candidates are looking at why we have to do "Report A," and have four or five people sign it several times a year with all the hours that takes? We are picking new people up, but still have retirements and such, and under FERS people are more mobile without losing their Social Security.

What is future role in providing water and power?

As water supplies shrink, especially with the groundwater pumping versus surface water irrigation, conflicts are coming to a head in many states. The drought in California is a big wakeup call for many people and we have the same potential in our region.

Our core mission will remain the same. I don't see a bunch of new developments coming online anytime soon, especially with a new administration coming. It doesn't matter if it is Republican or Democrat, there will be few big construction projects. Congress has bootstrapped itself by eliminating earmarks. We will see continued emphasis on O&M activities and just maintaining what we currently operate.

What do you see as your legacy for Reclamation?

Mike Ferguson, Supervisory General Engineer, GPRO, and I spent a lot of time in getting our power customer's off-budget financing increased. A lot of time and energy was spent with those folks to make us more accountable in spending their money. When I first got here, the most we could get was two or three million dollars – and that was written in the power customer's charter. Over time, we put emphasis on delivering our projects on time and within cost and scope to establish trust. Now we have a big rehabilitation project coming at Mount Elbert in 2017, and although we have not totally agreed on the scope of that project, they have bought into it and prefunded \$20 million in advance. They have also prefunded all the work on the Yellowtail rewind to the tune of some \$45 - 50 million. That is a big improvement for us, and enables us to use our budgeted authority more efficiently. We can't give up the federal decision-making authority, but working through the surrounding issues with our partners allows us to do a whole lot more.



Take 'em if you see 'em!

**Share Your Vision
of the
Great Plains Region!**

2015 Photo Contest

June 1 to Sept. 30

**For more information
and contest rules visit
the GP Intranet site in
May.**

WYAO Upgrades Casper Mountain West Communications Tower

By Jay Dallman, WYAO

Reclamation recently replaced the microwave communications tower at Casper Mountain West, south of Casper, Wyo.

The tower provides communications between the control center in Mills, and remotely located WYAO dams and power plants, as well as Yellowtail Power Plant in Montana.

In 2006, the Telecommunication Industry Association released a new standard that applies to new tower construction and existing modification for antenna-bearing communication towers.

The standard specifically addresses wind and ice loads. Reclamation's old tower was a 130-foot-tall, self-supporting steel structure with a 14-foot base



width and a 90 MPH wind rating. The new tower is a 132-foot-tall, self-supporting steel structure with a 17-foot base width and a 125 mph wind rating.

The larger, stronger tower is designed to better withstand the high winds and heavy winter ice loads



Workers placed concrete to prepare the Casper Mountain West site for a larger communications tower rated to withstand 125 mph winds.

routinely experienced at the mountaintop location.

The larger footprint and stronger design of the tower provides greater stability and improved signal reliability in severe weather conditions.

Flake Towers, LLC, of Clarksville, Tennessee, dismantled and delivered the existing tower to Mills, where it will be surplus for reuse.

High Country Crane Service of Bar Nunn, Wyo., supplied a mobile crane for the tower removal. The anchor bolts were removed and the crane picked up the old tower in one piece and placed it on its side to facilitate antenna removal and disassembly of the old tower.

A new concrete foundation with a significantly larger footprint and stronger support piers was constructed, and new perimeter grounding and bonding conductors were installed to protect against lightning strikes.

After the tower was assembled, eight antennae, ranging from four to twelve feet in diameter, were transferred from the old tower to the new tower.

After the antennae were secured, the tower was lifted into position by Globalized Specialized Services of Casper, and bolted into place on the support piers. Grounding leads were attached, and antennae adjusted for optimum signal strength.

A wave guide - a hollow conductive metal pipe used to carry high frequency radio waves - was connected to each antenna and routed down the tower to the communication building. Once the connections were made, the radios were tested for proper signal strength.

The successful installation of the redesigned microwave communications tower at Casper Mountain West was completed a week ahead of schedule.

The new tower will ensure that the WYAO has reliable communications with remotely controlled and monitored facilities for years to come.



(Top) The new microwave tower is lifted into place. (Bottom) A stronger foundation and support piers are installed at the site.

ECAO Creates Partnership for Proactive Fire Management

By Kara Lamb, ECAO

It was spring 2012 and the foothills and canyons in Colorado were already on fire.

Patrick McCusker, Natural Resource Specialist with the Eastern Colorado Area Office, remembers it clearly.

“That year was especially rough,” he said. “We started with the Hewlett Gulch Fire in April, and then the High Park Fire in June.”

Eastern Colorado Area Manager, Jaci Gould, agreed.: “The High Park Fire kicked off a lot of conversation with our partners,” she said.

“It was clear something was going to have to change. With continuing drought and high temperatures, we all felt a more proactive approach to protecting resources was necessary.

For Reclamation and our partners that meant protecting water projects.

ECAO began working with its partners on the Colorado-Big Thompson Project. C-BT spans north-central to northeastern Colorado, bringing water from the mountains to the plains.

Reclamation owns and operates the water project, diverting and storing water supplies, and generating hydroelectric power.

The Northern Colorado Water Conservancy District serves as Reclamation’s operating partner, delivering water to users in northeastern Colorado.

The USDA Forest Service manages the Arapaho National Recreation Area and manages National Forest System lands surrounding C-BT collection, conveyance and storage facilities in Grand County and on the Front Range.

Colorado State Forest Service is the lead state agency for providing forest stewardship, fuels reduction and wildfire mitigation assistance to private landowners.



In July 2014, a year after the WWEP signing, ECAO Area Manager Jaci Gould and then-Commissioner Mike Connor join the Colorado State Forest Service and U.S.D.A. Forest Service on a tour of the fire treatment area around Horsetooth Reservoir.



The 2012 High Park Fire was the impetus for the Colorado-Big Thompson Headwaters Partnership.

“We asked one another what each agency was doing in light of the increasing threat of fire,” Gould said. “No single agency had enough resources to solve the problem of proactive protection and reactive treatment. But partnership makes it possible for everyone to do a part.”

So, a new partnership began. Working closely with Northern Water, the Colorado State Forest Service and the Arapaho-Roosevelt National Forest, ECAO put together a plan for sharing resources and problem solving in a cooperative fashion.

The partnership team was named after the C-BT project and the headwaters which feed the overall system.

“And the Colorado-Big Thompson Headwaters Partnership was born,” said McCusker.

Using Memorandum of Understanding templates from the Forest Service, the Headwaters Partnership drafted an overarching document describing the goals and needs of the emerging collaboration. Using the example of Reclamation’s interagency agreements, the group then drafted basic action plans describing each agency’s role.

Work addressing the pine-beetle epidemic around the C-BT’s collection system in Grand County began even before the MOU for the Headwaters Partnership was signed in December 2012.

It could not have been more timely. By March 2013, the foothills along the eastern portion of the C-BT were on fire. In one area, the Galena fire burned to the shoreline of Horsetooth Reservoir.



Debris booms in Soldier Creek: After the High Park Fire, debris booms were placed along Soldier Creek, which drains into the north end of Horsetooth Reservoir, to catch ash and other fire sediment that might wash into the waterway during storms and snow melt.

News outlets warned of longer fire seasons starting before mountain snow melted in the spring, and lingering through summer well into late fall.

In June of the same year, even President Obama addressed the issue as he began rolling out his Climate Action Plan.



July 2013: DOI Secretary Sally Jewell and USDA Secretary Tom Vilsack sign the Western Watershed Enhancement Partnership at Horsetooth Reservoir.



“Firefighters are braving longer wildfire seasons and states and federal governments have to figure out how to budget for that,” President Obama told students of Climate Change at Georgetown University.

“I had to sit in on a meeting with the Department of the Interior and Agriculture and some of the rest of my team just to figure out how we’re going to pay for more and more expensive fire seasons,” the President said.

The Departments of the Interior and Agriculture came to similar conclusions as the water project partners in northern Colorado.

In July, the Secretary of the Interior, Sally Jewell, and Secretary of Agriculture Tom Vilsack, traveled to Horsetooth Reservoir to sign the new Western Watershed Enhancement Partnership, a new feature under the President’s Climate Action Plan.

Working together with local water users, the Western Watershed Enhancement Project identifies and mitigates risks of wildfire to watersheds and facilitates activities such as wildfire risk reduction through forest thinning, prescribed fire and other forest health treatments, minimizing post-wildfire erosion and sedimentation, and restoring areas recovering from past wildfires.

At the signing ceremony, the Colorado-Big Thompson Headwaters Partnership was heralded as the prototype for the WWEP and as its first pilot program.

On the first anniversary of the WWEP’s signing, Deputy Secretary of the Interior, Mike Connor, visited Horsetooth to see some of the recent accomplishments under the C-BT Headwaters Partnership.



In 2013, sediment dams were placed in Soldier Canyon, upstream of Horsetooth Reservoir.



Waddles in action after a rain storm.

“The progress made here on the ground to reduce the presence of hazardous fuels and proactively protect the water supply sets a strong example for the West when it comes to establishing effective partnerships and protecting watersheds in the face of increasingly destructive wildfire seasons,” Mr.

Connor told the media, as they overlooked portions of the High Park and Galena fire scars above the reservoir.

Seeing no reason to limit the program, staff at ECAO expanded the C-BT Headwaters Partnership to include Green Mountain Reservoir, the western edge of the



Patrick McCusker, Natural Resource Specialist from ECAO, checks the sediment dam in Soldier Canyon a week before Deputy Secretary Mike Connor’s visit.

C-BT, and the entire Fryingpan-Arkansas Project.

In August and October 2014, a new MOU was signed with Region 2 of the Forest Service, the Colorado State Forest Service, and Reclamation’s partner on the Fry-Ark, the Southeastern Colorado Water Conservancy District.

Work has already begun on beetle-kill pine around Turquoise Reservoir, Fire Management Plans, and related environmental compliance efforts.

“We’re starting to see some results from all our work,” said McCusker. “We’ve reduced impacts to Horsetooth Reservoir and have proactively cleared a lot of wild fire susceptible material along the C-BT’s collection system.”

“We set an example and we’re

getting results,” said Gould. “We leveraged a lot of resources to build a better program and it’s

working” she said. The partnership has achieved results.



Waddles slowing spring runoff in 2013.



DKAO Awarded for Innovation



Aerial view of Lewis & Clark Water Treatment Plant, South Dakota.



By DKAO Staff

The Dakotas Area Office was recognized by the Upper Missouri Water Users Association for their contributions within the state of South Dakota. Each year the Upper Missouri Water Users Association honors agencies or individuals for their efforts and accomplishments in the world of water. Reclamation projects in South Dakota are managed by the Dakotas Area Office with employees located in Bismarck, Pierre and Rapid City.

The award commended Reclamation for development and management of numerous water projects in South Dakota, providing quality drinking water, irrigation, flood control, and recreation benefits beginning with the Belle Fourche Project in 1904.

Reclamation provides the engineering and technical expertise to operate and maintain five major

dams in South Dakota, plus Keyhole Dam in northeastern Wyoming. Reclamation operates these facilities either directly or through assistance to managing partners and irrigation districts. These dams and reservoirs have prevented over \$3-million in cumulative flood damages from 2009 to 2014; and over \$20 million in cumulative flood damages since the projects were completed. Other benefits include more than 68,000 acre-feet of water delivered for both irrigation and M&I needs from 2009 to 2013. In addition, recreation and tourism generate several million dollars in annual economic benefits for local communities. Reclamation also partnered with irrigation districts on water conservation projects between 2009 and 2014, providing over 16,000 acre-feet of water conserved on an annual basis.

Reclamation became involved

in rural water in 1980, when Congress authorized the WEB project in South Dakota. Subsequent projects include the Mid-Dakota Rural Water System, Perkins County Rural Water System, Lewis & Clark Regional Water System, and the Mni Wiconi Rural Water Project. These projects provide quality reliable potable water supplies to numerous rural residents and communities in South Dakota, serving over 300,000 people in the state. Reclamation has provided the funding, construction oversight and technical assistance to develop these projects that comprise an investment of over \$1 billion in infrastructure in South Dakota. Reclamation also provides ongoing operation and maintenance funding and technical assistance to the Oglala, Rosebud and Lower Brule Sioux tribal rural water systems.

GP's Score Jumps 7% on 2014 Employee Viewpoint Survey

By Buck Feist, GPRO

In 2014, the Great Plains Region increased the overall cumulative positive score on OPM's Employee Viewpoint Survey by nearly seven points, to 62.17 percent from 55.30 percent in 2012.

"I am buoyed by the positive attitude of the employees in the Great Plains Region," said Mike Ryan, Regional Director.

"We've faced a tough climate as federal employees, but you see within the Great Plains Region that the can-do spirit of Reclamation remains strong."

Last year marked some significant changes in the way OPM administers the EVS.

The survey is conducted annually, and results are broken down to units with as few as 10 employees.

In the Great Plains Region, the Regional Leadership Board opted to break-out the results by Area Office, Regional Office, and Region, in order to provide a large enough sample size to ensure anonymity for survey takers.

"One of the concerns for the RLB and the Take Action Team was to make sure that folks felt comfortable taking the survey," said Ryan. "We are looking for honest feedback to use to guide our programs and management strategy moving forward."

The EVS results are used for a number of purposes, ranging from

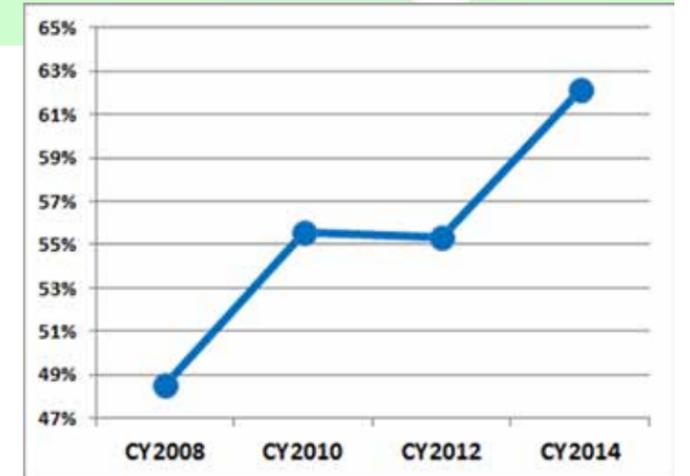
improving organizational communication, to highlighting existing career opportunities and focusing on areas of employee concern.

"A good example of how the EVS effected change in the Great Plains Region is our performance appraisals," said Ryan. "Back in 2006, we analyzed the results of the survey

and saw that our employees felt their appraisals weren't a fair reflection of their efforts, and that there was not as much communication as there should be between supervisors and employees," Ryan said.

"Based on those results, we analyzed our performance appraisals against the rest of Reclamation, and against some other agencies, and as a management team, we agreed that our scores did not seem to accurately reflect the excellence of employees," Ryan said.

Performance appraisals were



The Great Plains Region increased positives responses nearly 15 points between 2008 and 2014.

one of the first areas that the Take Action Team focused on improving. From there, the team has branched out to training, awards, and events like Public Service Recognition Week, held each year in May.

The Region continues to see improvements in employee morale and workplace satisfaction.

"Ensuring our folks are engaged is an on-going process," said Ryan. "But I'm encouraged that we've continued to make steady upward progress for nearly a decade."



Lake Thunderbird Serves Up Perfect Conditions for 2014 CAST



Captain Jason and Raegan are ready to go fishing.

By Kim Parish, OTAO

It was another great year for CAST and Let's Move Outside Event held at Lake Thunderbird in Norman, Okla. on Sept. 20, 2014. Hurricane Odile threatened to provide a very wet Saturday, but, as luck would have it, clouds moved out late Friday evening and it was a beautiful September morning.

Volunteers began arriving, eager to get the day started. Breakfast snacks such as fruit, yogurt and juice were made available as well as some much needed hot coffee. Of course, you couldn't start the day without a Krispy Kreme or two as well!

Participants and their families began to arrive around 8 am for registration. Volunteers handed out shirts, hats, fishing rods/reels and tackle boxes with bait. Art Pasley, CAST for Kids Director, gave a



Brian shows off his plaque and new backpack.

quick briefing to previous and new captains, and then it was time to partner up the kids with a boat captain.

Photos for the award plaques were taken, boats were loaded by 9 am, and fishermen and children were on their way out on Lake Thunderbird for an exciting morning of fishing.

All of the boaters returned by 11:45 am and lunch was served by President of the Lake Thunderbird Educational Foundation, Roger Elliott, and his team. Most of the food prepared was donated by Homeland Foods. The awards ceremony commenced after lunch and as always the kids had a great time. They received a plaque with a picture of them and their boat captain and a prize of their choice.

This event provides families with a great opportunity to get out of what is usually the day to day routine, and experience what the great outdoors has to offer.

Thanks to all of the volunteers and those who support this worthwhile event.



Captain Jason shows off Ethan and Raegan's catch of the day.



(Above) E-Man, Jalonie and Duante enjoy the day with Captain Jerry. (Below) Nicholas and his father enjoy some breakfast.



Boysen Spillway Gate Put to the Test

By Jay Dallman, WYAO

Full travel gate tests were recently completed at Boysen Dam Spillway by Wyoming Area Office personnel.

Boysen Dam on the Wind River in Wyoming is a zoned earthen dam which impounds about 740,000 acre-feet of water when the reservoir is at the normal full operating level, and can impound an additional 150,000 acre-feet in the exclusive flood pool.

The spillway consists of a concrete weir controlled by two 25-foot-high by 30-foot-wide steel radial gates, each situated in a concrete gate bay.

Reclamation requires that spillway gates associated with continuously high reservoirs, like Boysen, be operated through their full range of travel at least once every six years to ensure the



Ron Spangler, WYAO O&M Division Chief, and Mike Bradford, WYAO Safety Officer, observe spillway gate hoist gears in operation.

gates will operate correctly when needed.

Under normal reservoir surface elevations, installation of the spillway gate stop logs is required in

order to operate the gates without releasing water. A stop log is a modular type bulkhead that is lowered into guide slots. The stop logs are stacked one on top of another in order to shut off water flow to the gate. Stop logs are commonly used at most Reclamation dams for testing and maintenance of spillway and outlet gates.

Placement of large spillway gate stop logs is a labor intensive process. Extensive pre-job planning and job hazard analysis was employed, with a focus on safely completing the testing.

At Boysen, it was first necessary to remove concrete blocks which protect the guide slots for the bulkheads. The guide slots run about 58 feet from the floor of the spillway to the top of the dam. The blocks are about three feet tall and weigh 700 pounds each. The concrete blocks which were



William Newman, WYAO Rope Team Member and Electrical Engineer, rigs a concrete guide slot block for removal at Boysen Dam Spillway.

above the water surface had to be removed using the WYAO mobile crane, with the assistance of the WYAO Rope Team. Removal of these blocks was accomplished in April, 2014, and required about 1 ½ weeks to complete. During the week of October 6, the blocks below the water surface were removed using the mobile crane and divers, then steel guides designed to hold the stop logs in position were installed in the opening of the Gate 2 bay.

On October 20, a contract crane and divers were on-site to begin installation of the stop logs. The stop logs had to be transported from their storage site at the Boysen warehouse using a low-boy trailer, three at a time. The Stop Logs were unloaded from the truck utilizing a lifting fixture and maneuvered into position. A stop log with the lifting fixture

attached weighs approximately 17,000 lbs. The distance from the centerline of the Gate 2 bay to the centerline of the crane is 85 feet. It takes a very large mobile crane to be able to lift that amount of weight out to that distance. The placement of the 10 stop logs was completed late in the day.

On Tuesday, October 21, Gate 2 was operated thru full travel without encountering problems. After the successful test, the stop logs were removed from the Gate 2 Bay. Divers were required to position the lifting fixture to the top of the stop log and attach it. The stop logs were removed and temporarily stored on top of the dam. The metal guides were then moved from the Gate 2 bay to the Gate 1 bay. Once this was complete, the stop logs were installed. Gate 1 was then successfully operated through full travel.



A large mobile crane prepares to set a Stop Log in the Boysen Dam Spillway Gate 1 Bay.



Billy Bright, Chief WYAO Mechanical Engineering Branch (in white hardhat), observes divers assisting with installation of a concrete guide slot block.

On the third day of the project, October 22, the stop logs were removed and transported back to the warehouse for long-term storage. The metal guides were also removed. The concrete blocks located below the water surface were then installed with the assistance of the divers. The concrete blocks above the water surface were placed using a specially designed quick release mechanism. This device allowed the safe installation of the blocks without the use of the rope team resulting in significant cost savings and a shorter project schedule.

The Spillway Gate Full Travel Testing was completed without incident and ahead of schedule.

Dam operators can rest assured that the gates have been tested and are ready for service if the need arises.



Crew prepares concrete guide slot blocks.

A Recap of 2014 GP Events

★★ PUBLIC SERVICE ★★ Recognition Week May 3-9, 2015

Celebrated the first week of May since 1985, Public Service Recognition Week (PSRW) honors the men and women who serve our nation as federal, state, county and local government employees.

The theme for PSRW 2015 is *Government Works*. Public servants do amazing things across our great nation, around the world, and in our hometowns. Public Service Recognition Week showcases their accomplishments and recognizes the significant challenges they take on each and every day.

Events are planned to tell stories of how government

works for the American people and about the types of work agencies do.

Throughout the country, mayors, governors, agency leaders, communities and public service organizations participate in PSRW by issuing proclamations; hosting award ceremonies and special tribute events; and delivering messages about the value of public service. For suggestions and resources to participate in Public Service Recognition Week in your office or community, contact the GP Public Affairs Office or visit the Celebration Toolkit page at www.publicservicerecognitionweek.org.

A note from Regional Director, Mike Ryan:

Reclamation, when we do our job well, is almost invisible. But I know what we accomplish and recognize what it takes to get the job done. Public Service Recognition Week provides an opportunity to highlight the water and power benefits we provide and how we accomplish it. Recognizing achievements at any time during the year is appropriate, but PSRW serves as a special reminder.

Remember our partners are also overlooked when everything goes well. Consider thanking them for their service. Together we provide the Great Plains states with much more than water and power; we have a huge impact on the quality of life.

Thanks to all of you for making it possible.

Mike



C-BT Recovery: Dille Diversion Dam Bridge Placement



The bridge being delivered to the canyon the morning of October 22.

First Milestone Toward Recovery

By Kara Lamb, ECAO

In September 2013, the Big Thompson River flooded, along with most of the South Platte River Basin in northern Colorado. During the flood, the Big Thompson Canyon was severely impacted, including Reclamation's Dille Diversion Dam, near the mouth of the canyon.

The small diversion dam, designed to pass up to 1300 cubic-feet-per second over its spillway, withstood a range of flow somewhere between 15,000-24,000 cfs at the flood's peak. Flood waters ripped a small gauging house from the top of the dam, washed away the pedestrian bridge, and tore away the state highway along the dam's left abutment.

Colorado Department of Transportation has since rebuilt the highway. Reclamation has spent the past year clearing



The contractor worked with Colorado Department of Transportation to control canyon traffic while the new bridge was placed.



View of Dille Dam before placement of the pedestrian bridge.



The 2013 Flood washed away the pedestrian bridge the used to span Dille Dam. Colorado Department of Transportation placed a temporary bridge during repairs along the highway.

the diversion dam of debris, running a temporary source of power to the facility, and designing repairs. Before any of the repair work could begin, the new bridge had to be installed.

That milestone was accomplished on October 22, 2014. The new bridge, which provides access across the 90-foot long crest of the dam, weighs approximately 9500 lbs, and replaces the temporary bridge that will soon be removed.



A crane swings the bridge into position.



The bridge being carefully aligned before placement across Dille Diversion Dam.



Water for the West

Fort Peck / Dry Prairie Rural Water Project



By Susan Kendrick, GPRO

The Bureau of Reclamation is no stranger to helping rural communities with water issues.

For more than a century, Reclamation has been enabling communities throughout the West to flourish.

Most recently, Reclamation, the Assiniboine and Sioux Tribes of the Fort Peck Reservation and the Dry Prairie Rural Water Association reached a three party agreement to deliver water from the Tribes' intake and treatment facilities near Wolf Point, Mont., to Dry Prairie customers throughout Montana's northeastern corner.



Great Plains Deputy Regional Director John Soucy speaks at the dedication of the Wambdi Wahachanka Water Treatment Plant.

"This historical agreement is an exceptional example of the federal government working the Fort Peck Reservation and Dry Prairie Rural Water Association to improve the quality of life to north eastern Montana," said Great Plains Regional Director Mike Ryan.

Reclamation recognizes the compelling need for potable water in rural communities, and has moved to address the serious public health and safety issues that result from unreliable water sources.

Rural communities have often sought Reclamation's assistance in meeting potable water supplies.

Prior to 1980, Reclamation's participation was generally limited to providing technical assistance in the scoping and development of water projects intended to solely provide potable water supplies for rural communities. Since then, Reclamation's role has evolved into the design and construction of these projects.

There has been a special trust relationship between the Secretary of the Interior and Native American communities across the West. The economic, public health and safety conditions on some reservations gives special consideration to projects that serve those communities.

"The special trust with our Na-

tive American communities have afforded us the opportunity to play a significant role in getting these kinds of projects constructed," said Deputy Regional Director John Soucy, who oversees the Region's Rural Water Program.

Reclamation's involvement in rural communities located in the 17 western states confirms Congress' commitment by authorizing Reclamation to undertake these projects

Congress enacted the Fort Peck Reservation Rural Water System Act in October 2000, directing the Secretary to enter into a cooperative agreement with Dry Prairie Rural Water Association for the planning and construction of the Dry Prairie Rural Water System in Roosevelt, Sheridan, Daniels, and Valley Counties, outside the Fort Peck Indian Reservation.

Through the American Recovery and Reinvestment Act, the Fort Peck Reservation/Dry Prairie Rural Water System received \$47.4 million in funding.

The Reservation has a total population of approximately 10,700 people, of which approximately 5,800 are members of the Assiniboine and Sioux Tribes.

The water system serves Reservation populations in or around the towns of Wolf Point, Poplar, Brockton, Fort Kipp, Oswego, and Frazer.



In 2015, the project agreement will supply the eastern connection, allowing Dry Prairie to immediately serve 700 rural customers, as well as the communities of Bainville, Froid, Medicine Lake, Plentywood, Antelope and Culbertson.

In addition to the eastern connection, the Tribes and Dry Prairie hope to also establish a connection between the two systems near Nashua in the upcoming year.

This western connection will allow Dry Prairie to deliver water



The area of the water treatment plant used to handle chemicals critical to the treatment process.

from the Tribes' facilities to customers west of the reservation.

A third connection is planned along the northern boundary of the Reservation, near HWY 251.

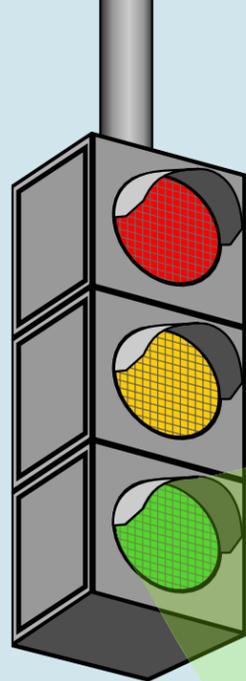
Eventually, the combined rural water systems will consist of 3,000 miles of water pipeline, servicing approximately 30,000 residents throughout the eastern half of Valley County and all of Rossevelt, Sheridan and Daniels Counties.

As we move into the 21st Century, water is at a premium, and

Reclamation will continue to assist communities like the Fort Peck Reservation and the Dry Prairie Rural Water Association to address their needs, and the needs of our growing nation to deliver water supplies to rural communities in the Western United States.

Between 1980 and 2007, Congress directed Reclamation to undertake 11 rural water supply projects. Six projects have been completed:

- 1) Web Project in South Dakota (authorized in 1980, completed in 1995)
- 2) Mid Dakota Project in South Dakota (authorized in 1992, completed in 2006)
- 3) Fort Peck County in Montana (authorized in 1996, completed in 2003)
- 4) Fall River in South Dakota (authorized in 1998, completed in 2010)
- 5) Perkins County Rural Water Supply Project in South Dakota (authorized in 1999, completed in 2011)
- 6) Mni Wiconi Rural Water Supply Project in South Dakota (authorized in 1988, Federal portion completed in 2014)

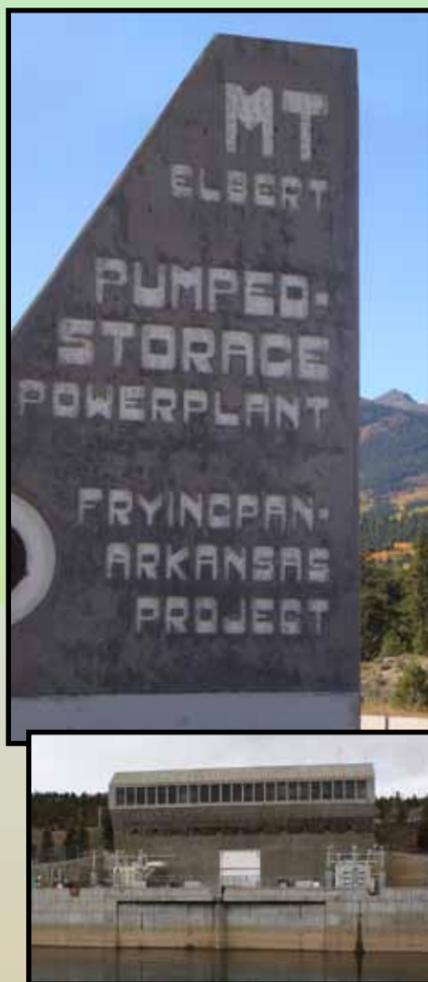


GP's POWER SCORECARD

GETTING TO GREEN

Reclamation's Power Scorecard uses metrics to identify critical areas of performance in the bureau's Power O&M Program. They are rated as green, yellow and red - indicating increasing levels of concern.

Regions, in collaboration with the Power Resources Office and industry professionals, are taking action to improve performance and the resulting scorecard indicators. The Great Plains emphasis has been placed on cooperating with power customers to identify opportunities for improved maintenance activities.



"When I moved here some nine years ago there was little trust between GP power customers and Reclamation," said Deputy Regional Director Gary Campbell. "It took time to establish a positive relationship and to improve our performance. That is being reflected in our region going green." (For more from Gary see *Campbell Retires* on page 1.)

Four areas of measurement are used in the scorecard: Category 1 Recommendations; Category 2 Recommendations; Category 2 Planning; and Potential Compliance Violations.

Category 1 items encompass imminent threats to safety and/or potential catastrophic damage to equipment and the resulting loss of

generating capacity. More routine maintenance items are considered Category 2, but can become more serious if postponed or ignored. Category 2 recommendations are evaluated for completion and for planning status for future accomplishment.

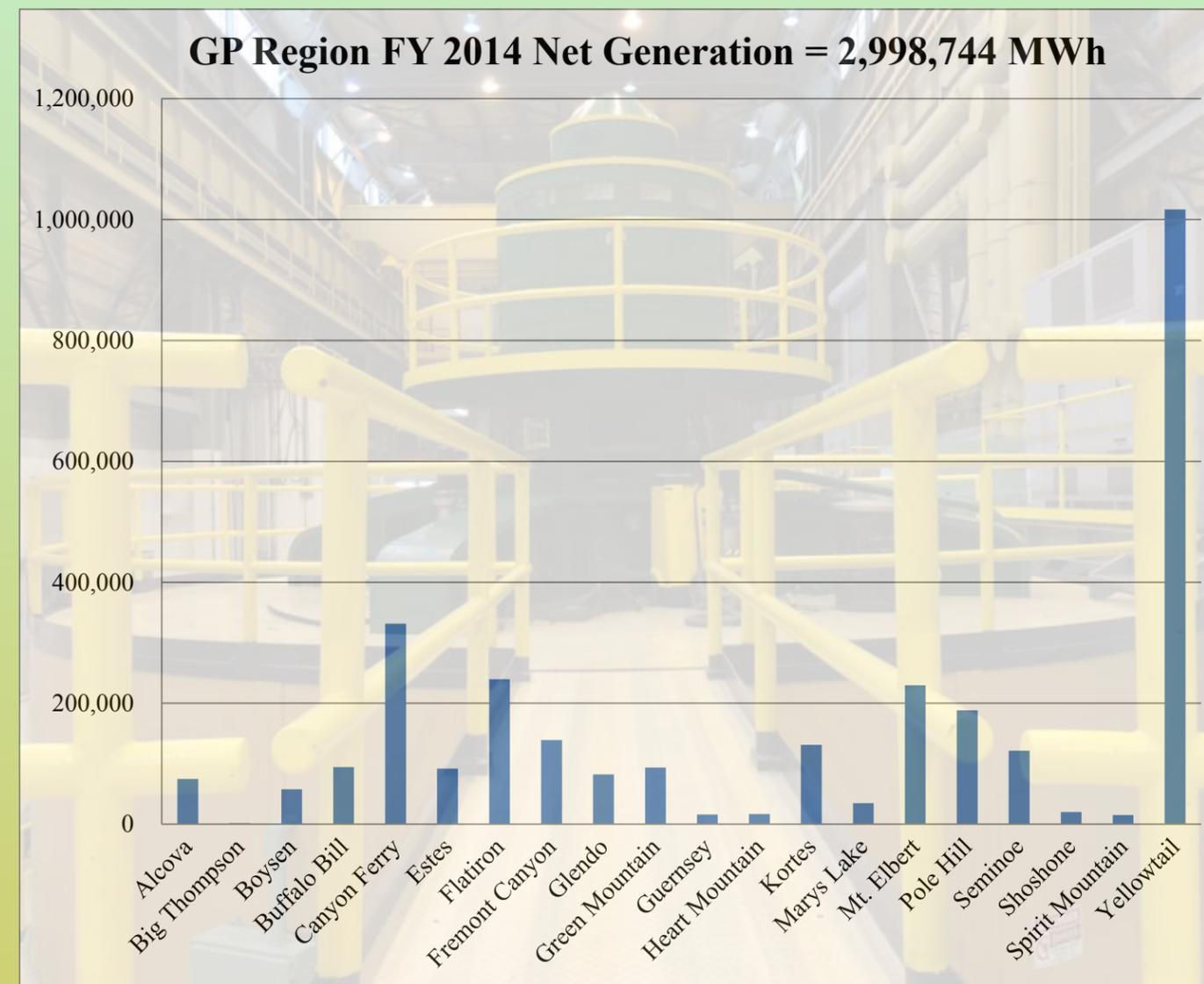
For 2014, Great Plains had zero Category 1 Recommendations, and 1423 Category 2 items tracked by the scorecard. In July 2014, 61 percent of GP's incomplete Category 2 items were greater than 5 years old. The Region had

already focused on completion and had done so with 180 recommendations since April. The October Scorecard indicated GP's Category 2 Incomplete had dropped to 7 percent - putting the region in the green.

In July, 41 percent of the incomplete Category 2 Recommendations were planned for completion in 2014 - 2018. By October that percentage had grown to 98 percent - putting GP in the green.

Keeping GP in the green requires constant effort. Each month a new scorecard is issued and the measure of recommendations shifts as power maintenance needs change. When that happens, GP will continue to emphasize getting to green.

In a related effort, the Region's staff worked diligently throughout the year to obtain and maintain compliance with the nation's power system reliability standards.



Great Plains Region Power Operations & Maintenance Dashboard

	Category 1 Recommendations	Incomplete Category 2 Recommendations	Category 2 Planning	Potential Compliance Violations
July 2014	● (Green)	● (Red)	● (Red)	● (Yellow)
October 2014	● (Green)	● (Green)	● (Green)	● (Green)

Great Plains 2014 Photo Contest

The 2014 GP Photo Contest produced 68 photo entries showing the diverse activities, facilities, people, and wildlife in the Great Plains Region. Over 150 votes were cast, but top honors go to three photographers and their great images.

James E. Thornburg, Civil Engineering Technician (DKAO), wins first place with his photo *Fire and Ice*, showing a sunburst over frozen Lake Sakakawea, as seen from Snake Creek Pumping Plant. Michael Mangum, Electrician (WYAO), earns second place with his beautiful *Good Morning at Seminoe Reservoir*. Monica Griffitt, General Engineer (ECAO), takes third place with her photo *Reflection in Lake Sherburne, Glacier National Park*.

Keep an eye out for all photo contest images in a variety of Reclamation publications, including the 2015 GP Region Calendar, Plains Talk Magazine, presentations, and in our multimedia gallery on the Internet at www.usbr.gov/gp/multimedia.

Thank you photographers for the great images! And thank you everyone who took the time to view the photos and vote.



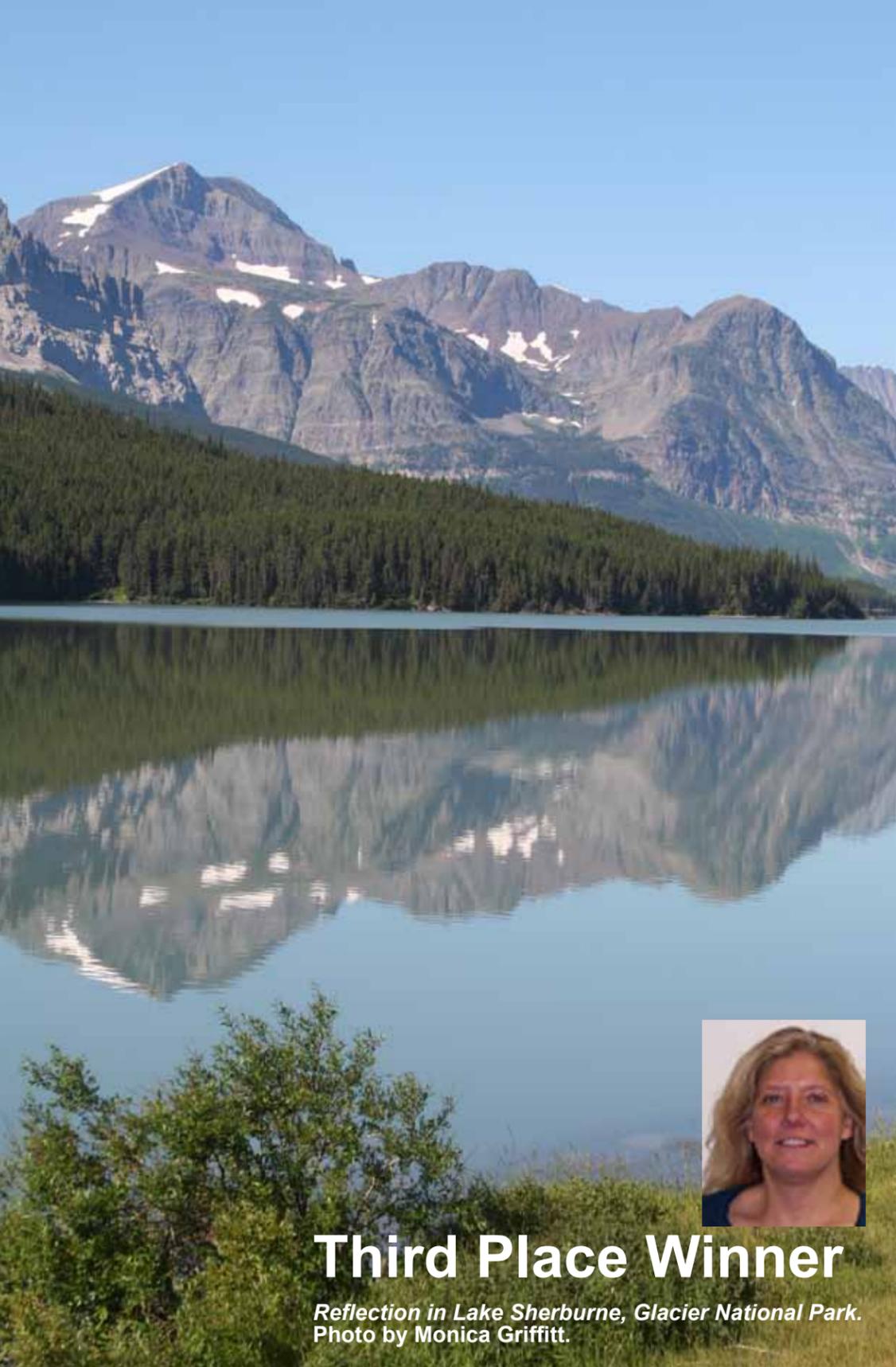
First Place Winner

Fire and Ice, a sunburst over frozen Lake Sakakawea, North Dakota, as seen from Snake Creek Pumping Plant. Photo by James E. Thornburg.



Second Place Winner

Good Morning at Seminoe Reservoir. Photo by Michael Mangum.



Third Place Winner

Reflection in Lake Sherburne, Glacier National Park. Photo by Monica Griffitt.



(Left) Travis Buttelman water skiing in the sunset on Canyon Ferry Lake. Photo by Tina Buttelman.

(Bottom Right) The outlet works were de-watered for a Comprehensive Review. Karl Thiel (ECAO) and Gerry Stallman (GPRO) in photo. Photo by Adam Northrup.

(Bottom Far Right) A Beautiful day on Pathfinder Reservoir (a rare day with NO wind). Photo by Kim Korkow.



Glen Elder Spillway and Fort Randall Dam Get Patched Up



View of repair work for the inlet apron slabs on the upstream side of Glen Elder Dam spillway. There is no water in contact with the spillway unless the reservoir is in the flood pool.

By Clinton Powell and Bob Schieffer, NKAO

In 1944, the U.S. government instituted a comprehensive plan for the conservation, control, and use of water resources in the entire Missouri River Basin in the central U.S.

The legislation resulted in the construction of numerous dams and reservoirs on the Missouri River and its tributaries. This article highlights two unique concrete repairs of the associated spillway structures.

Completed in 1969, the Glen Elder Dam is located at the confluence of the North and South Forks of the Solomon River in north-central Kansas, near Glen Elder. These streams are part of the Missouri River tributary system, as the Solomon flows into the Kansas River, which in turn feeds into the Missouri River near downtown Kansas City.

The Glen Elder Dam comprises an earth embankment and a concrete spillway. The spillway inlet apron slab underwent significant renovation in early 2010.

Completed in 1952, the Corps of Engineers' Fort Randall Dam is located on the Missouri River in southeast South Dakota, near Pickstown. Also comprising an earth embankment with concrete spillway and apron systems, the dam suffered major damage during historic flooding in the spring and summer of 2011. The spillway outlet apron slab underwent significant renovation in 2013 and 2014.



Inlet apron slab concrete in some areas could be excavated with a shovel as seen in this photo taken prior to the repair.

Glen Elder Dam Spillway Structure Concrete Repair

Glen Elder Dam's spillway includes twelve, 50 ft. wide by 22 ft. high radial gates seated on top of a concrete ogee crest. The spillway is founded on layers of fragmented limestone, shale, and the occasional clay seam. Due to concern of lateral shifting across the clay seams when the spillway is under full reservoir conditions, a couple thousand foundation anchors were grouted into the foundation to provide sliding stability.

Damage evaluation

Petrographic evaluations of concrete cores indicated that cracking induced by cycles of freezing-and-thawing in saturated conditions was the primary source of deterioration. The cracks allowed water to flow more easily through the concrete which led to further damage by alkali-silica reaction. Depths of deterioration ranged from 0-14 in. As the concrete began to deteriorate, especially near contraction joints,

the deteriorated areas were capable of holding water, causing an exponential rate of deterioration during freeze thaw cycles. Some of the deteriorated areas could be excavated with a shovel.

Repair

At first glance, a complete replacement of the inlet slabs seemed to be the appropriate method for restoring the sliding stability of the structure.

However, after looking into the difficulty of not deforming or damaging the roughly 760 foundation anchors in the demolition process, it was determined that other alternatives should be evaluated. Life cycle costs were developed for several alternatives, including installing new foundation anchors, partial repairs, and full replacement.

The most economical option was to selectively remove deteriorated concrete using hydrodemolition, and place concrete patches back to the original lines and grades.

Hydrodemolition is commonly used by road departments to remove and roughen the top inch or two of concrete bridge decks to facilitate good bonding for overlays.

In the case of Glen Elder Dam, the



Placing concrete back to the original lines and grades.



Inlet slabs and spillway structure ready to be placed back with fresh concrete. Foundation anchors are the curved #11 rebars that tie into the top mat of rebar.

excavation depths were going to be highly variable, from a minimum of 6-18 in.

The concept behind hydrodemolition is that a high pressure water jet (20,000 psi +/-) will continue to take out deteriorated and cracked concrete until it runs into good quality concrete. The benefits of hydrodemolition include fast removal, a demoed surface is three dimensional and provides maximum potential for bonding, cleans rebar of all rust, eliminates micro-cracking typically associated with jack hammers.

The drawbacks are few, unless the project is not large enough to overcome the higher mobilization cost, or unless you like to run jack hammers in the summer heat!

Using hydrodemolition with such a large variation in depth of removal is not a common application, which resulted in some apprehension in moving forward with this repair method. At the preconstruction meeting, the hydrodemolition foreman indicated he had been demolishing concrete for 17 years and never

seen a project like this before, which did not lift the spirits of the project delivery team.

After several iterations of equipment calibrations, which involves adjustments to the number of nozzle revolutions as well as revolution speed to facilitate the removal of poor quality concrete while leaving high quality concrete in-place, the hydrodemolition process was dialed in and proved successful.

After hydrodemolition minor sawcutting, jack hammer work was required to prepare the slabs for placement.

Restrained shrinkage cracking proved to be a challenge for the relatively large slab sizes. The mix design was adjusted to include more coarse aggregate along with water reducing admixtures, with minimal success.

An experimental shrinkage reducing/shrinkage compensating admixture, which is now marketed as Prevent-C®, was tried at different doses and eventually resulted in reducing the restrained shrinkage cracking by 90 percent relative to control mixtures. In hindsight, requiring the shrinkage reducing / shrinkage com-



(Left) Delamination at a depth of 6-10 inches of the Fort Randall Dam spillway visible after initial removal (photo, U.S. Army Corps of Engineers, June 16, 2014). (Right) Hydrodemolition of the upper expansion joint at the Fort Randall Dam spillway (photo, U.S. Army Corps of Engineers, Oct. 2013).

compensating admixture to be part of the initial mix design, along with several trial batches to dial in the changes to other admixtures needed, would have been beneficial. This approach was utilized during the Ft. Randall spillway repairs to eliminate frustration associated with mix design development while trying to maintain full production placement rates.

Following the repair contract, structural sliding stability for the Glen Elder Dam spillway was restored. This project demonstrated that hydrodemolition could be an economical means to selectively demo deteriorated concrete at variable depths. Additionally admixture and design criteria were developed to help minimize restrained shrinkage cracking.

Fort Randall Dam

During the flooding of 2011, the Fort Randall Dam spillway was subjected to a record flow of 143,000 ft³/second (4049 m³/second). To put this into historical context, the average discharge from the Fort Randall Dam control structure is 29,000 ft³/second (821 m³/second). The extensive water flow caused damage to many of the Dam's structures, including the spillway slab.

Damage evaluation

During the initial assessment of the spillway damage, ground penetrating radar was used to estimate the required scope of repairs.

While the radar results showed extensive anomalies indicative of delamination along both spillway walls and the expansion joint between the slab and the gate structure, the designers chose to discount a majority of the anomalies as false returns and identified only 40,000 square ft of the in need of repair. This decision was ill founded, however, as nearly 130,000 square ft of delamination repairs were ultimately found to be required.

Repair

Hydrodemolition was specified for rehabilitation of the spillway slab. The average calibration required water delivered at 20,000 psi (138 MPa) at a rate of 90 gal/minute (341 L/minute) for five machine revolutions was necessary to achieve a 6 in. (152 mm) minimum removal depth in one pass. Total removal depth varied from 6 in. (152 mm) to 18 in. (457 mm) to remove delamination.

In addition to the concrete removal, the hydrodemolition process did an exceptional job of removing rust, scale, and concrete

from the bars in the slabs. While it was observed that No. 4 reinforcing bars present in the slabs were deformed during the hydrodemolition process, the more prevalent No. 6 and No. 9 were not affected by the impact of the water jets at this calibration.

After the hydrodemolition was completed, the contractor manually removed shadowing unsound concrete that was shielded by the reinforcement with a 15 lb (7 kg) chipping hammer. Demolition also occurred in small areas with a 30 lb. (14 kg) hammer. The larger hammer results in significantly greater microfracturing as seen in tests conducted per ASTM C1583-04, Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method).

The 18 in. (457 mm) thick spillway slab panels were 25 x 25 ft. (7.62 x 7.62 m) in plan and were constructed with only a single mat of reinforcement at a depth of 9 in. (229 mm). The panels exhibited significant thermal cracking, and some of the cracks extended to mid-depth of the slabs. Because the panels were highly restrained by the spillway wall and gate structures, the repair mixture was designed to have mini-

mal shrinkage. The selected mixture had a 4500 psi compressive strength and comprised 1-1/2 in. (37.5 mm) maximum size aggregate (MSA), with at least 2 percent exceeding 1 in. (25.0 mm) size; polypropylene macro fiber; and a shrinkage reducing/compensating admixture.

The large aggregate size was selected over a more typical 3/4 in. (19.0 mm) MSA because it would reduce the paste content in the mixture and thus provide about a 40 percent reduction in shrinkage cracking.

Forta-Ferro® was utilized as the polypropylene macro fiber because it combines fibrillated polypropylene fibers with twisted bundle monofilament fibers.

The fiber was anticipated to reduce shrinkage cracking, increase residual strengths, and enhance bond to the existing concrete. The designers also strove to choose a dosage that would provide significant residual strength per ASTM C1399/C1399M, Standard Test Method for Obtaining Average Residual-Strength of Fiber-Reinforced Concrete, yet that would also not be detrimental to the compressive strength. A dosage rate of 5 lb./yd³ (2.97 kg/m³) was selected for the repair mixture.

Based on data previously obtained

for the Glen Elder Dam repair project, PREVent-C® was approved as the shrinkage reducing, shrinkage compensating admixture. The prevention of shrinkage cracking was a key to long-term durability of the repair, given the extreme temperature extremes, as well as the consistent presence of seepage water subject to freeze-thaw.

Utilizing the shrinkage reducing / shrinkage compensating admixture in conjunction with the macro polypropylene fibers and large aggregate has resulted in negligible visible shrinkage cracking in a harsh environment.

After placement of the overlay, tensile strength of the repairs and underlying substrate were determined per ASTM C1583-04, Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method).

Based on testing in undisturbed, undamaged locations of the spillway prior to construction it was determined that the average tensile strength of the slab was approximately 258 psi. The specifications required that all repairs exceed this average tensile strength to

ensure that a quality bond between the repair and the substrate concrete. The average tensile strength of the repairs conducted was 262 psi.

Following the repair contract, the critical areas of spillway delamination at Fort Randall Dam were repaired. This project further demonstrated the economic viability of large-scale variable depth removal of concrete with hydrodemolition.

Additionally through the use of a high performance mix design, shrinkage cracking was minimized while also meeting the high tensile strengths required by such a unique structure.

Ongoing Work

A shrinkage reducing/compensating additive - a blend of magnesium oxide and glycol ether-proved to be a good solution for crack mitigation in concrete placed in spillway slab repairs on the Glen Elder Dam and the Fort Randall Dam.

The Army Corps of Engineers in conjunction with the Bureau of Reclamation is currently undergoing additional lab testing and performance field trials of shrinkage reducing admixtures in order to evaluate their effectiveness.



Concrete overlay at 29 days of cure exhibiting no shrinkage cracking on a 25 x 25 ft. monolithic placement (U.S. Army Corps of Engineers, October 11, 2013).



Photo Q & A:

Preserve the original file created by the camera

Why Are Image File Types Important? For the Record!

Photographs are used by every day in meeting Reclamation's mission. Take a moment to consider how images are managed as agency records.

The digital world has enabled everyone to become a photographer and document or illustrate their work. With that comes the responsibility to use images wisely, and preserve them as documentation of our decisions and processes.

The digital world moves rapidly. Federal agencies often struggle to respond, so caution is needed when choosing to archive images. The National Archives and Records Administration (NARA) is quite clear on what files should be saved as an agency record:

1. Any image used in decision making (including those used in documents) should be preserved.
2. The *camera-original* image file, as an unedited JPG or TIF, is the record. The record image is not preserved within any document, but is stored separately, and as safely as possible, to limit the risk of accidental erasure or damage. It is not to be scaled, retouched, cropped or manipulated.
3. A *copy* of the image can be used in documents and presentations. It can be cropped and scaled without damaging the camera-original. Eventually, the record image is sent by the agency to NARA for preservation.



1941 Ansel Adams photograph of Reclamation's Boulder Dam (now Hoover) from NARA archives.

File Types and Uses

Official Reclamation Photographic Record

JPG (or JPEG) is commonly used by digital cameras and the Internet because it uses compression to create of a wide range of possible file sizes and qualities. This saves storage space but limits image quality. The process used to compress them deteriorates the image to greater or lesser degree depending upon the finished file size and as a result is called lossy. Deterioration is magnified as images are repeatedly edited in software. JPGs are limited to 24-bit RGB images and do not support larger color spaces. Only JPGs of modest compression are able to be sent to NARA.

TIF (or TIFF) is short for tagged image file format. TIFs remain the format of choice by service bureaus, photographers and graphic artists demanding the most from their images. TIF compression does not compromise image quality and as a result is termed lossless. This compression does not reduce file size as much as other types but does accommodate a wider range of color spaces.

RAW files are created by many advanced cameras and are more closely related to the film negative than other file types. Instead of the camera processing the sensor data into an image, it simply records the raw (pun intended) information to be "developed" by software later. Upon development, the resulting image has characteristics determined by the user ready and can be saved as a new image. The RAW file can be left untouched for use later like a film negative. The drawbacks to RAW include their proprietary nature requiring either advanced software or offerings from the camera's manufacturer.

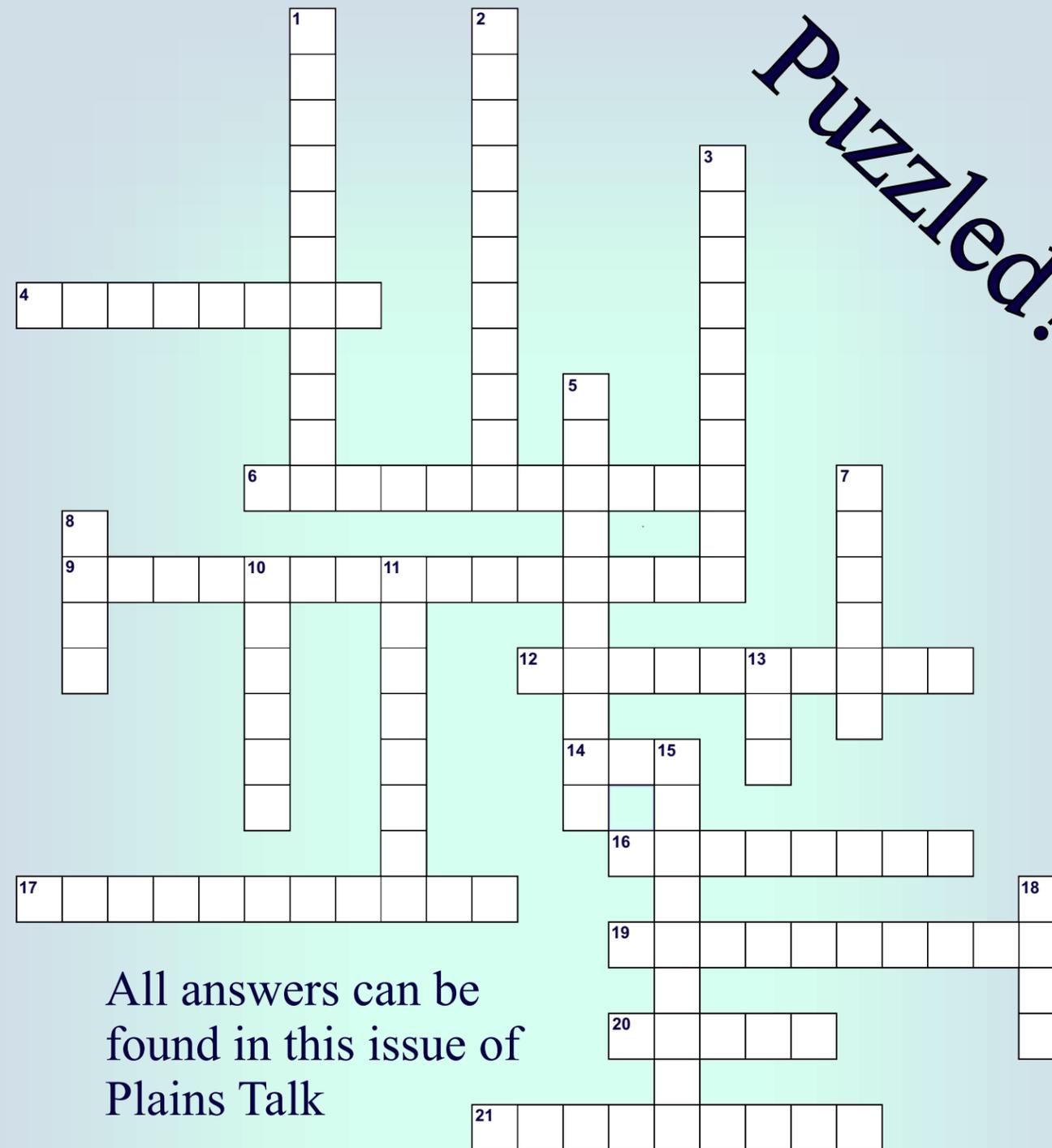
BMP is an older Windows "bitmaps" format that has largely been replaced by JPGs but it is still common for screensaver images.

GIF or *graphics interchange format* exists specifically for the Internet. GIF provides compression designed more for graphics than images. It uses a small palette in order to create very small files and is also capable of simple animation.

PNG or *portable network graphics* is a newer alternative to JPG or GIF files for use on the Internet. PNG has the capability of using graphic shapes to augment bitmaps in order to reduce file size and make images scaleable for different monitor sizes.

PDF is an Adobe Acrobat file that can contain images just like Word or Powerpoint. But remember, document files are not appropriate for archiving Reclamation images.

Used by Reclamation but not as Official Record for transfer to NARA



All answers can be found in this issue of Plains Talk

Across

4. DRD retired
6. PSRW does this
9. tif (three words)
12. first place winner location (two words)
14. OPM survey
16. _____ /Dry Prairie
17. CAST event location
19. biggest 2014 GP generator
20. _____ a Special Thrill
21. new DRD

Down

1. Dille Dam location (two words)
2. who we are
3. fourth in getting to green
5. dog photo location
7. spillway tested at
8. _____ logs
10. GP Rural Water projects (6 completed)
11. Ft. Randall Dam is on this river
13. sister water management agency
15. Power O&M _____
18. geologic concern for dam safety

Reclamation's Mission:

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.



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