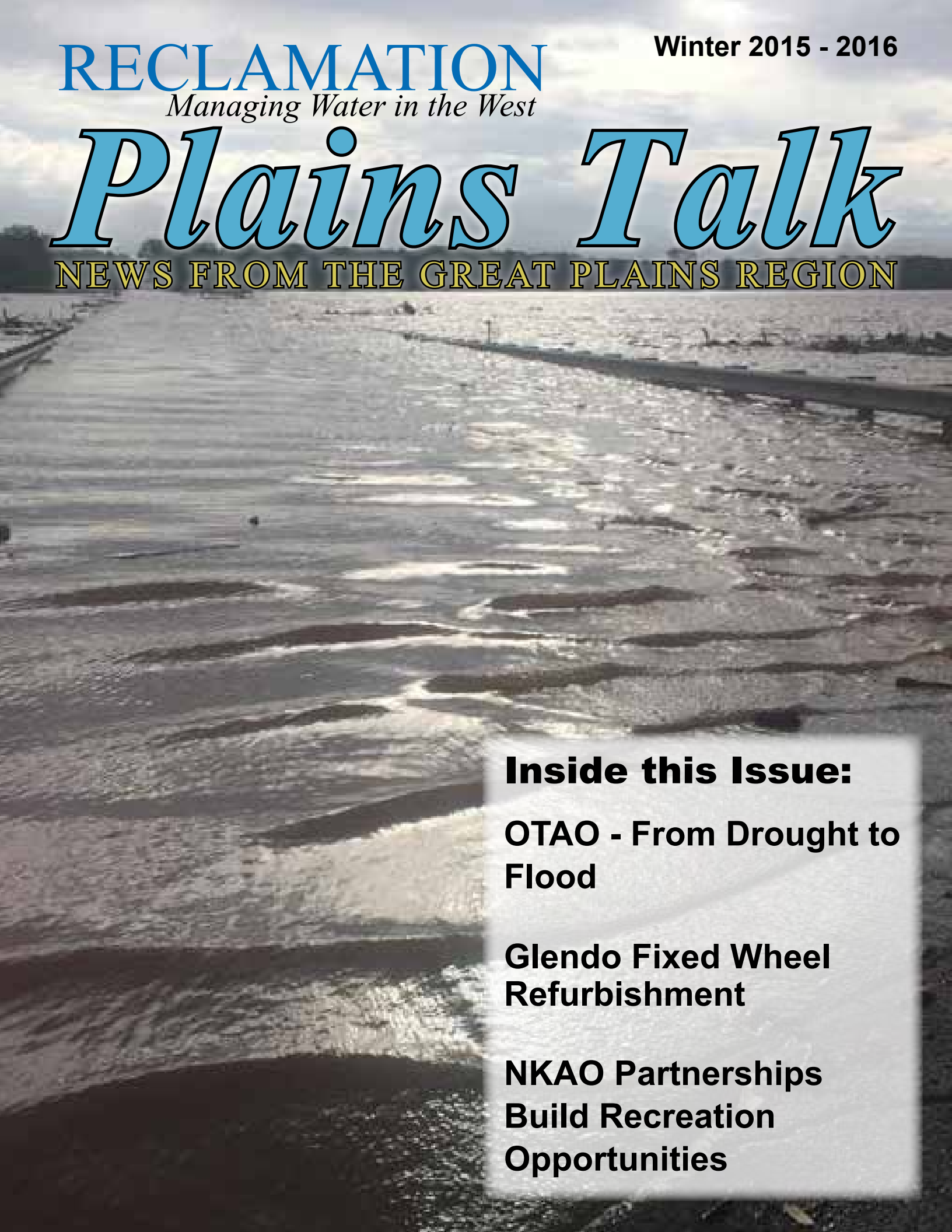
RECLAMATION
Managing Water in the West

Winter 2015 - 2016

Plains Talk

NEWS FROM THE GREAT PLAINS REGION



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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.

Cover: Bridge crossing at Lake Thunderbird, Oklahoma, after 2015 flooding.

contents

Buffalo Bill, p. 4

SD National Guard, p. 14

Glendo Refurbishment, p. 20

NKAO Parternships, p. 26

contents

OTAO: From Drought to Flood

(Left) Lake Thunderbird Sailing Club Boat House during normal operations. (Right) Lake Thunderbird Sailing Club Boat House flooded by rising waters.

By Kim Parish, OTAO

After suffering through four years of near record drought, May 2015 turned things around in a big way by being the wettest month on record for Oklahoma.

Heavy rain continued through June and July, resulting in rainfall totalling more than 40 inches in central and eastern areas of the state.

Overall, normal precipitation rates across the state were exceeded by as much as 200 percent.

Reclamation's Norman Dam, Arbuckle Dam and McGee Creek Dam all ended up in surcharge on multiple occasions, with other dams operating in the upper levels of the flood control pools.

Emergency Action Plan response levels were initiated and maintained through much of this period, including Memorial Day and Independence Day weekends, significantly impacting recreation opportunities. This event was the first time Norman Dam has operated within the surcharge pool.

On May 24th, inflows into Lake Thunderbird peaked around 60,000 cfs causing water to inundate Alameda's Twin Bridges. As designed, releases began to occur through the morning glory spillway as the reservoir crested at elevation 1053.2.

Aerial view of Quartz Mountain Arts and Conference Center Observation Walkway.

Total releases through the spillway and outlet works peaked at around 8,000 cfs. Because the downstream safe channel capacity was only 1,200 cfs, downstream flooding was inevitable. Due to the record high reservoir elevation, first filling criteria were met and additional performance monitoring at the dam was required.

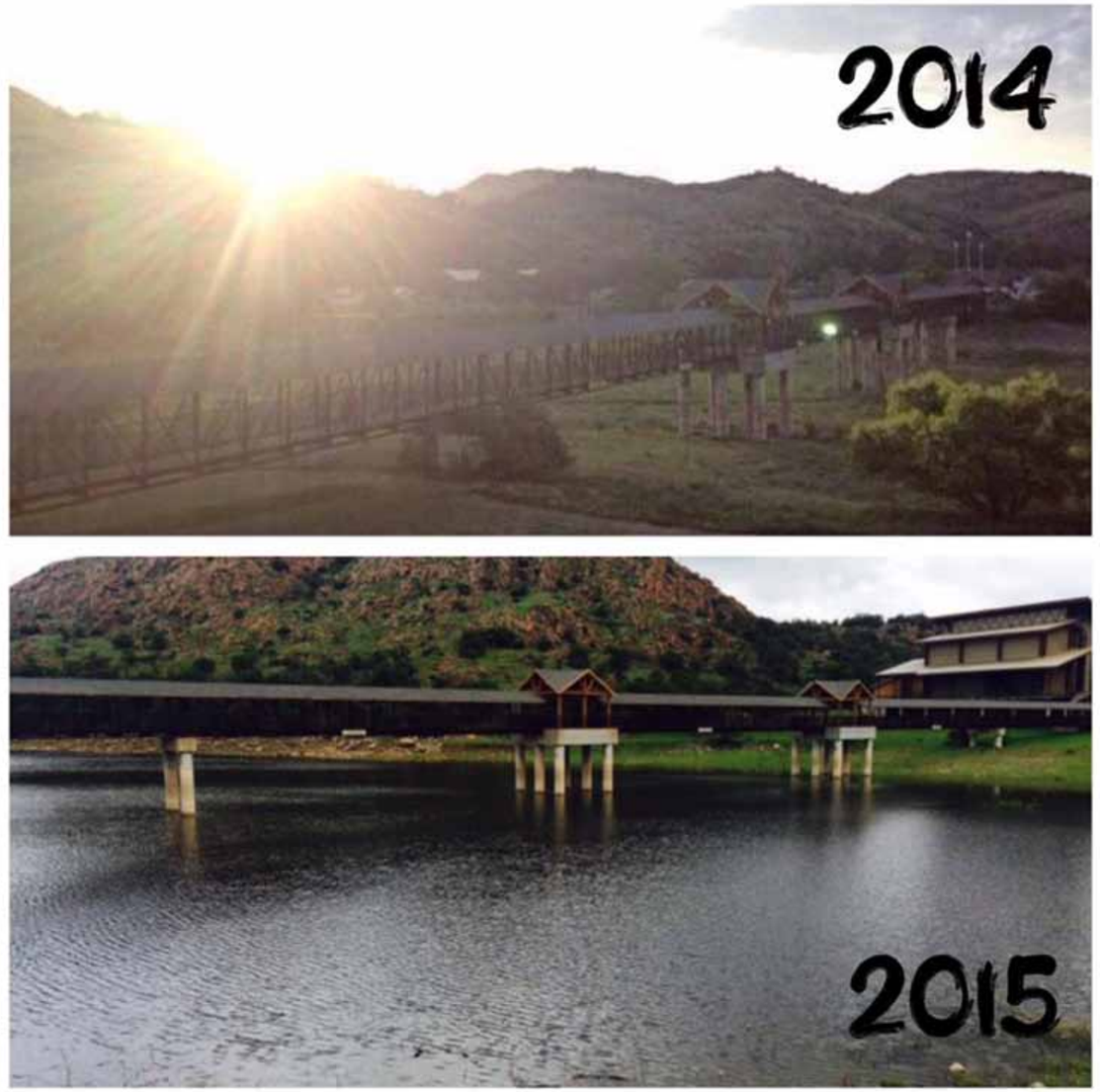
The rain was no less brutal at McGee Creek. Rainfall resulted in a reservoir elevation increase of 30 feet. Releases through the outlet works were staged to full open, and although the reservoir was within inches of the earthen spillway crest, no releases were ever made through the spillway. Most recreation facilities were closed due to the high water.

Arbuckle Dam, operating at record low reservoir elevations in March, entered the surcharge pool on three separate occasions in May, June, and July. A new record high reservoir elevation was set in June, which required additional performance monitoring at the dam. Releases were made through the outlet works and the morning glory spillway.

Visitors at the state parks were evacuated in some instances. Several of the fishing docks and camping sites were heavily damaged or completely immersed in flood water.

Since flood waters have receded and lake levels are back to normal, repair has begun to restore the parks to their former beauty.

Dock repairs and campground maintenance are taking place to ensure the public has a safe place to enjoy the great outdoors. Dam inspections were performed by Reclamation at all these facilities during and after surcharge operations to ensure continued safe operation.



Gangway leading to courtesy fishing dock at McGee Creek.

Lewis & Clark Regional Water System Celebrates 25 Years

Dave Rosenkrance (front), Dakotas Area Manager, and Arden Freitag, Dakotas Deputy Area Manager, tour a Lewis and Clark Regional Water System project construction site.

By DKAO Staff

The silver anniversary celebration for the Lewis and Clark Regional Water System was held during the System's annual membership meeting in Tea, South Dakota. Nearly 130 people from all phases of the System's 25-year history attended the celebration.

Lewis and Clark Regional Water System holds several notable places in Reclamation history to include service area and volume of water delivered.

The project, located in southeast South Dakota, Minnesota, and Iowa, is the first Reclamation funded project to deliver water outside of Reclamation's 17 Western United States.

At 23.5 million gallons of water per day (MGD), Lewis and Clark Regional Water System is the largest, by volume, rural water system that has been authorized by Congress, and for which Reclamation is responsible for oversight.

Lewis and Clark started as the Southeast South Dakota Water Supply System in April 1990, with anticipated service to 27 communities and 16 rural water systems. This 72-MGD system had an estimated cost of $500-million.

A few years later, Lewis and Clark Rural Water System had a new name, and had 47 members. The system anticipated withdrawing water from Lewis & Clark Lake and treating raw water at four treatment plants spread throughout the system at a cost of $660-million.

By the time the project was authorized in 2000, Lewis and Clark had been reformulated to a 23.5-MGD system of 22 members. The system was designed to withdraw water from the aquifers downstream of Gavins Point Dam south of Vermillion, South Dakota.

In August of 2003, the first official construction using federal funding began, and in August 2012, a ribbon cutting ceremony was held for the beginning of operations at the system's water treatment plant.

When completed, the system will eventually serve more than 300,000 people in South Dakota, Minnesota, and Iowa.

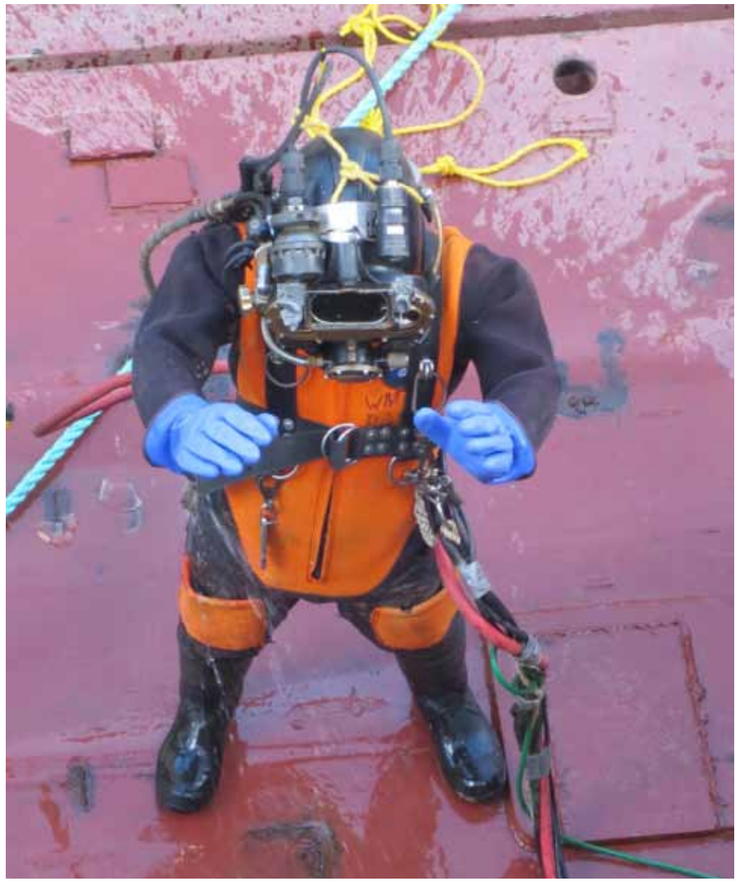
The project has a Federal/ non-Federal cost share of 80/20 percent, respectively. Lewis and Clark will have received $102-million in Federal funds and most of its non-Federal funds, with expected completion in 2025.

(L to R) Arden Freitag, Ted Hall (ret.), former lead engineer for the project, David Rosenkrance and Dean Karsky tour the Lewis and Clark Regional Water System water treatment plant.

25 Years of Milestones

Late 1988	Discussions begin on need for a regional water system
Jan 1990	Articles of Incorporation signed for Southeastern South Dakota Water Supply System
April 1990	First board meeting (56 Members)
April 1991	Initial feasibility evaluation completed
June 1991	Name changed to "Lewis and Clark"
March 1993	Commitment Agreement signed by 22 members
May 1994	First authorizing legislation introduced in Congress
March 1995	Future use water permit approved by the State of SD
Sept 1996	First congressional hearing held on Lewis and Clark
July 2000	Congressional authorization signed into law
Aug 2001	First test well drilled
May 2002	Final Engineering Report completed
Aug 2003	First official construction using federal funding
Aug 2003	Groundbreaking ceremony held
Oct 2003	First production well drilled
June 2004	First section of raw water pipeline installed
June 2005	First section of treated water pipeline installed
March 2006	New Commitment Agreement signed by 20 members
May 2008	Valve turning ceremony for Hull emergency connection
Sept 2008	Valve turning ceremony for Tea & Harrisburg emergency connections
Sept 2008	Construction begins on the treatment plant
Oct 2009	Construction begins on 85th Street water tower
Nov 2009	Construction begins on reservoirs near Tea
May 2010	Construction begins on pump station near Tea
July 2012	Treatment plant begins operation ~11 members receive water
Aug 2012	Ribbon cutting ceremony held for treatment plant
May 2015	25th Annual Membership Meeting

Buffalo Bill Tailrace Repair



An Advanced American Construction Diver checks the hot water flow to his wet suit before entering the water.

By Jay Dallman, WYAO

Buffalo Bill Power Plant on the Shoshone River near Cody, Wyo., was first brought on-line in 1992 as part of the Buffalo Bill Dam Modification which included raising the dam by 25 feet and adding 25.5 Megawatts of generating capacity.

In 2004, diving inspections of the power plant tailrace area revealed holes and other damage to the concrete.

The tailrace is the rock and concrete lined channel that carries water away from the power plant after it powers the turbines and passes through the draft tubes.

The tailrace is part of the river channel adjacent to the powerplant. Subsequent inspections of the tailrace indicated that the damage was becoming progressively worse over time. The damage was projected to become so severe that it would eventually limit the ability to generate power or perform maintenance activities.

When Buffalo Bill Power Plant was constructed, the tailrace area was constructed at an elevation that was below the Shoshone River bed, similar to a bathtub. This area was armored with large granite rip-rap. Over time, power plant operations combined with high flows from Buffalo Bill Dam spillway gate and outlet works dislodged some of the rocks and they migrated to the lowest level of the tailrace near the stop log sills. Due to constant water flow, the rocks *ball milled* or rolled around resulting in significant damage to the concrete.

In attempting to obtain a clear definition of the damage, the Wyoming Area Office sought the help of Technical Service Center engineers to create a digital map of the tailrace area and pinpoint areas of damage. The digital map was created using sonar scanning and sophisticated computer software to create a *Point Cloud Survey.*

Based on the information from the point cloud surveys, TSC Engineers were able to design the concrete repairs, stainless steel armoring plates to prevent further concrete damage, and a barrier fence to prevent the migration of the rocks down into the draft tube area of the tail race.

The length and height of an upstream deflection dike was also increased as part of the design repairs in an effort to deflect high upstream river flows away from the tail race.

A Technical Proposal Evaluation Committee (TPEC) was used to review the contractor proposals that were submitted under the TPEC Process used for this project, potential bidders were supplied with the Design Package and Specifications. How they accomplished the work was up to each bidder.

There were several options that could potentially be used to make the repairs, including performing all of the work underwater using divers; constructing a coffer dam to divert the Shoshone River, using pumps to de-water the entire tailrace area and completing the work under

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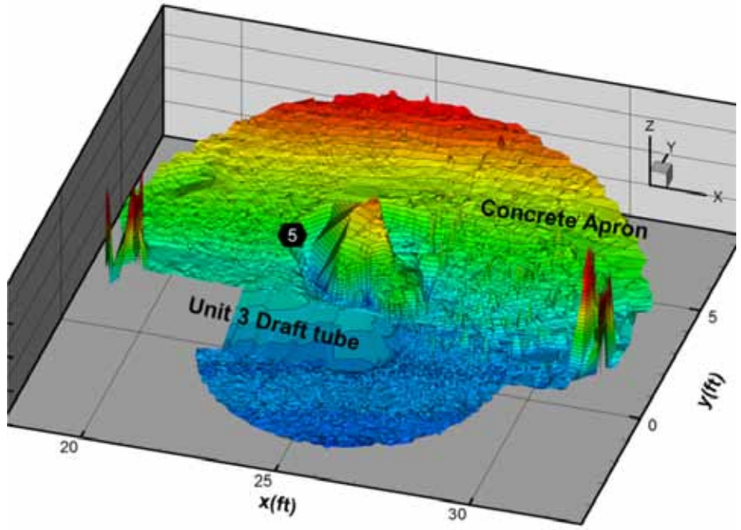

Point Cloud or 3D view of BB Unit 3 Draft Tube and Tailrace Bathymetry. Damage Area 5 is shown with two rocks lodged in the hole.

An excavator is lowered to the work platform for transport to the upstream deflection dike.

Buffalo Bill Power Plant during construction. The large amount of rock placed in the tailrace area can be clearly seen.

dry conditions; or a combination of the two.

After the TPEC completed a thorough review of the bids that were received, the committee made a recommendation to the Contracting Officer and the contract was awarded to Advanced American Construction (AAC) from Portland, Oregon.

AAC elected to complete the work underwater using divers. Construction started in November, 2014. AAC's first action was to install a floating barge/work platform which was put together using modular sections, pinned together into one large unit.

Once the platform was complete, AAC placed numerous pieces of equipment on the barge in order to support their work activities including air compressors, hot water heaters for divers, diving control building, and grout pump.

Over the course of the next five months, AAC Divers installed the stainless steel armoring plates adjacent to the draft tube area, grout in areas of damaged concrete, and install a stainless steel barrier fence. The size of the upstream deflection dike was also increased with the installation of very large granite rock.

This project involved a large number of high consequence crane lifts and countless underwater dives.

AAC was one of those contractors that truly opearting with safety as their number one priority.

They worked very closely with Buffalo Bill Operations and Maintenance Personnel as well as the on-site Reclamation Construction Inspector to plan and coordinate the work to ensure that it was completed safely and as planned. This coordinated effort resulted in a project that was completed on-scope, on-schedule, and on-budget, and without any safety incidents.

A work platform module is lowered into place in the Buffalo Bill Power Plant Tailrace Area.

St. Mary Aging Water Works Tour

The St. Mary rehab tour begins with a group orientation of the project and water features.

By Jack Conner, MTAO

Located in the northern reaches of Montana, just a stone's throw from Canada, the St. Mary River flows out of beautiful Glacier National Park, through the Blackfeet Reservation and then into Canada.

As part of the Milk River Project, the St. Mary Diversion Dam, located just north of Lower St. Mary Lake, was built to start water running on a course through a 29 mile canal system, and finally into the North Fork of the Milk River where it continues through Canada for approximately 220 miles before it flows back in into the United States.

The Milk River Project was authorized in 1903 as one of the first of five projects ever authorized by Congress for Reclamation to design and build.

St. Mary was authorized as a single purpose project for the purpose of water supply. This project provides benefits for tribal nations, farmers, municipalities, flood control, fish and wildlife, and recreation.

The diversion dam, head gates, drops, canals and other man-made water control features have helped support irrigation needs of farms and ranches since the early 1900s.

Irrigation for crops such as hay and wheat ensure the importance of water from St. Mary River Project as a very valuable resource to the sustainability of Montana's agricultural based economy.

The St. Mary Diversion Dam headworks and other features have reached their expected design life over the last 100 years, requiring mostly replacement of concrete structures exposed to the weather conditions Montana has to offer, and the pressure and friction of flowing water.

Significant repairs, and in some cases replacement, is needed to prevent further degradation of the St. Mary diversion works.

The Montana Area Office, which provides management of this project, has been heavily involved with the Lt. Governor's St. Mary Rehabilitation Working Group (SMRWG), and Milk River Joint Board of Control (MRJBOC) for several years attempting to develop solutions for funding of the initial estimated $40 million dollars to replace the diversion dam.

Milk River water users pay almost 74 percent to operate, maintain and replace these structures.

The SMRWG is made up of stakeholders, Federal and State agency officials, and was organized for the purpose of strategizing the means to fund the initial and long term phases of this project.

Also of importance is the role St. Mary River plays in the sustainability of native fish populations.

The St. Mary Diversion Dam

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inhibits the migration of the endangered bull trout which inhabits the St. Mary River system. To enable the species to proliferate within its natural range, measures need to be implemented to allow the fish to get over the diversion dam structure and into natural spawning habitat.

Also, with no current barriers to the irrigation canal, fish have the ability to swim into the canal and become entrained, which could cause some mortality to the species after dewatering the canal system. Constructing fish screens as part of the replacement of the dam structure will help ensure that fish entrainment will no longer be an issue.

The SMRWG and MRJBOC, along with Montana's Lieutenant Governor Angela McLean, and Congressional representatives, toured the Project on October 14.

Having these officials present provided them an opportunity to observe the decaying water structures first hand.

"The governor's office understands the direct and indirect effect of the St. Mary Rehabilitation Project on the local economy," said Lt. Governor McLean.

Seeing first-hand the complexity of this irrigation project helps us understand what is needed to keep this infrastructure functioning. Our Montana economy was founded on agriculture and remains a critical component of that economy".

The Milk River Joint Board of Control is an organization of eight

Workers completing concrete repairs on St. Mary's Diversion Dam.

irrigation districts representing the Milk River Project, working together with Reclamation to effectively manage resources.

Jennifer Patrick, Project Manager for the MRJBOC stated, "We talk about how the Milk River being the 'Lifeline of the Hi-Line,' but until you are living it every day you really don't understand what that actually means.

"To the Milk River irrigators, in dry years, ninety percent of their water supply comes from the St. Mary Project. Without such diversions, the Milk River Basin would become strictly dryland farming.

"This is approximately 820 family farms and over 121,000 acres that would be taken out of irrigation production, sending the local economy and tax assessments into a downward spiral. We are truly at a unique and challenging economic crossroads. The project irrigators are quickly reaching their max ability to pay as they try to tackle the aging infrastructure throughout the Milk River Basin. As the costs continue to rise we continue to get asked by project irrigators how to return our acres. That is something the St. Mary Rehabilitation Working Group and Joint Board of Control are working together on trying to avoid," Patrick said.

The Montana Area Office staff works hard to build and maintain relationships with stakeholders to provide critically needed resources while rehabilitating over 100 year old water structures. Issues such as tribal water rights, international water rights, and working to accommodate endangered species are challenges with complexity. The St. Mary Rehabilitation Project Tour provided MTAO the ability to foster those relationships and build new ones. And finally, allowing our leadership to see the critical need for funding and what is at stake to Milk River Project customers and Montana's economy.

Bureau of Reclamation's Ted Hall Retires

Reprinted from *Explorer*, newsletter of the Lewis & Clark Regional Water System

The completed Lewis & Clark Regional Water System Treatment Plant.

Ted Hall from the Bureau of Reclamation's Pierre office retired on October 3, which also happens to be his birthday, after an over 35 year career with the agency. He has been involved with Lewis & Clark since its incorporation 25 years ago when he reviewed the first needs assessment. Hall has been the point person for Reclamation since 1997, providing engineering and regulatory oversight. This has involved participating in countless meetings and conference calls, reviewing engineering plans and specs, writing many letters and reports, as well as responding to an endless number of e-mails and telephone calls.

Ted has always been a strong advocate for Lewis & Clark behind the scenes. He is incredibly committed to the project and making sure things are done right and that we don't take any shortcuts. When putting in those evening or weekend hours to get something done for us he refers to being "D or D" - that he is either dedicated or dumb. "There is no doubt his dedication has played an important role in bringing Lewis & Clark to where it is today," said Executive Director Troy Larson. Chairman Red Arndt added, "It has been an honor to work with Ted for all these years. Board meetings won't seem the same without him. Our deepest thanks and appreciation to him for all his hard work and our best wishes to him as he enjoys a well-deserved retirement. Hope he gets a fishing line wet as often as he can."

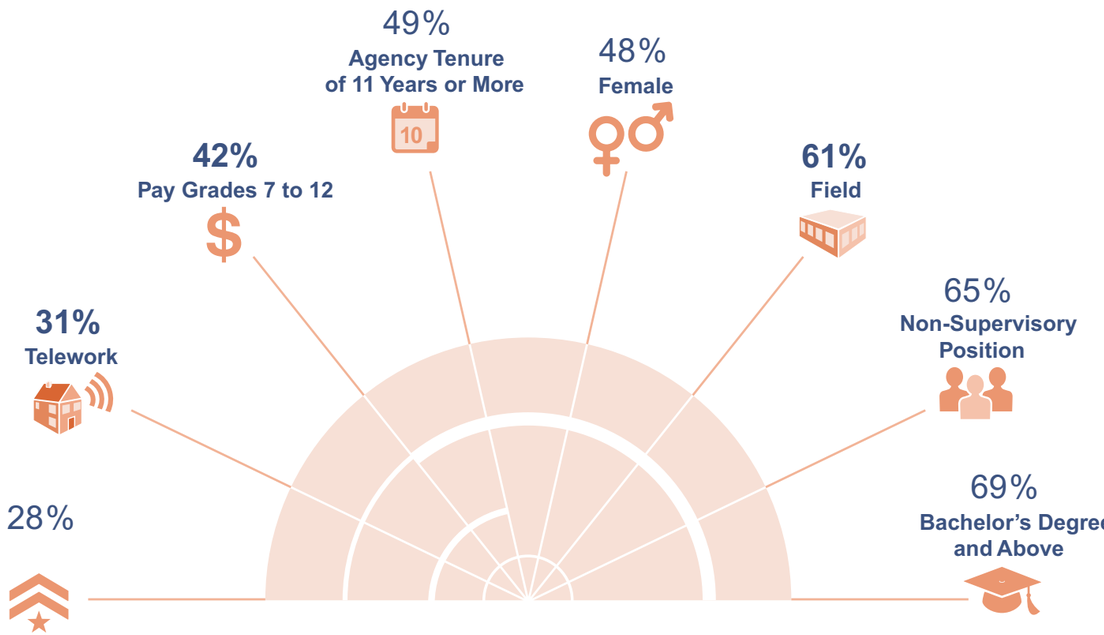
Hall receives an Honor Award for from Regional Director Mike Ryan in 2012.

Among other things, Hall and his wife Sheryl are looking forward to spending more time with and spoiling their two grandchildren and another one due in September. He also hopes to do more volunteering, bicycling, fishing and traveling. Hall remarked, "From the start as the Southeastern South Dakota Water Supply System to the Lewis & Clark Regional Water System, I have received great enjoyment working with a great group of dedicated individuals and organizations to bring an adequate supply of high quality water to the tristate area. I consider it a privilege and honor to have had the opportunity to work with the dedicated staff, consultants and directors associated with Lewis & Clark. I have no doubt that Lewis & Clark will eventually be completed. Keep lookin' up! And have a great day!"

Thank you, Ted!

2015 Employee Viewpoint Survey

A snapshot of survey participants from around the nation



Generations

1%	Traditionalists	(born 1945 or earlier)
49%	Baby Boomers	(born 1946 – 1964)
39%	Generation X	(born 1965 – 1980)
11%	Millennials	(born 1981 or later)

NOTE: The sum of percentages may not add to 100 due to rounding.

Local results are still being analyzed for the 2015 FEVS, but national demographics of survey respondents show that approximately half of respondents are female, the majority are in non-supervisory positions, nearly 70 percent have bachelor's degrees or higher, and more than 60 percent work in the field.

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Get it Right, Everytime!

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By Susan Kendrick, GPRO

Copyright law often evokes confusion and misunderstanding for even the most seasoned employees.

Copyright law is fairly clear and straightforward, yet, there are enough special circumstances that it is easy to get confused about when it's okay to use text or an image in reports, presentations and other products we produce as federal employees.

One thing is clear - as federal employees we are expected to follow the letter of the law and ensure that our products properly attribute and credit the source of any external material.

What Does This Mean to Me?

One thing this means is that when you're putting together a presentation, doing a Google search and selecting any image that "looks right," is not an adequate strategy.

"The best approach is to assume that every document and image on the web is copyright protected," said Buck Feist, Great Plains Regional Editor. "Copyright protection is automatic -- an individual or corporation does not have to take specific steps to register a document or image for copyright, which is different than legal protections such as trademarks or patents," he said.

In general, you have free reign to use any images that are produced by the federal government. Government photographs do not have copyright protection and may be included in both internal and external products. However, it is customary to attribute the image to the appropriate agency whenever feasible.

But what if you found the perfect image that is NOT produced by a federal agency?

"Your best bet is to contact your public affairs office," said Feist. "We are very familiar with securing permission to use photographs, articles and any number of other products that are produced by sources ranging from national newspapers to universities and commercial groups.

"In more than 20 years, I've never had a reprint request denied," Feist said. "Because the federal government is generally using images for educational or informational purposes, the guidelines for copyright give us greater leeway when reprinting materials. In addition, authors, photographers and other organizations are often pleased at the opportunity to have the exposure for their work.

"By properly attributing the source of the material, you provide a benefit to both the originator of the material, as well as to the government," Feist said.

Copyright isn't as confusing or menacing as some employees fear. Most often, a quick call to public affairs will get your questions answered, and ensure that your using materials in a fair and legal manner.

"Following the law is the simplest and quickest way to make sure your work will hold up under scrutiny," Feist said. "As we see too often in the news, changing a few paragraphs or phrases and then claiming someone elses' work as your own can come back to haunt you years -- and sometimes decades -- after the fact.

"It's just not worth it. You've got in-house experts on copyright at your disposal. If you have any questions, just contact public affairs, and we'll make sure you're on safe, legal ground."

2015 PHOTO CONTEST

Historical Wagon on the Oregon Trail travelling across Casper Alcova Irrigation District Lands. Photo by Brad Cannon.

Dave Marsh and Steve Green install a new antenna mount to the tower for the Olympus Dam Early Warning System. Photo by Adam Northrup.

I can see light at the end of the tunnel. Tiber Dam AOW Regulatory Gate Structure. Photo by Michael Hilliard.

Nearly 90 photos were submitted for the 2015 Photo Contest. The quality of photos has gotten better each year of the contest. Of the photos submitted, 78 met contest rules and were put on the GP Intranet site for voting. Voting ended on November 27 and the winners will be announced in the next issue of Plains Talk. Please enjoy this random selection of photos until then.

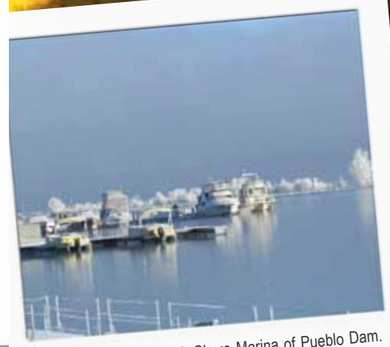
Gate Valve at South Cunningham Diversion Dam on the West Slope Collection System of the Fryingpan-Arkansas project, Colorado. Photo by David Hartman.

Baby owls at Glendo. Photo by Ray Farrar.

Steve Darlinton and Gary Bone during 2015 Bridge Inspection Program. Photo by Gary Grassel.

Tulips and early morning dew basking in the spring sunrise in Fort Smith at Yellowtail Dam. Photo by Michael Ebert.

Evening boat ride and a beautiful sunset near Snake Creek Pumping Plant on Lake Sakakawea. Photo by Marty Malachowski.



Cold Morning at the South Shore Marina of Pueblo Dam. Photo by Roy Vaughan.

Of course that is Green Mountain Power Plant at the end of the Rainbow! Photo by Charles Young.

SD National Guard Constructs Road at Belle Fourche for Yearly Training

Sgt. 1st Class Rob Carr, of Lead, SD, with the South Dakota National Guard, watches as a wheel tractor-scraper makes a turn during construction of a dirt road next to Belle Fourche Reservoir.

Reprinted with author's permission: Nathan Ellenbecker, Rapid City Journal.

Sgt. Gordon Mullen stood out among the 3,000 or so military personnel swarming the Black Hills these early weeks in June.

For one thing, he was recognized immediately by South Dakota National Guard soldiers because, as a member of the British Army, he had been here before for the annual training exercise known as the Golden Coyote.

Then there are his thick Scottish accent and his fast talking.

"Yeah, yeah," he said on Tuesday, laughing. "I feel very welcome here."

Mullen and four other 71 Engineer Regiment soldiers are camped with almost 100 South Dakota National Guard soldiers at the Belle Fourche Reservoir until June 20. There are about 70 total from his regiment scattered around the Black Hills.

It's the third straight year of partnership between the South Dakota National Guard and his unit.

"The U.S. soldiers have always looked after us," Mullen said. "They're excellent. First class."

The South Dakota Army National Guard began its 31st Operation Golden Coyote training exercises Sunday. It is one of the largest National Guard exercises in the United States, according to Maj. Travis Eastman, Golden Coyote coordinator.

This year about 3,000 service members are working at five separate forward operating bases. The South Dakota National Guard teams with forces from allied nations and other states.

Each base has its own objective that is a training program for future missions and real-world skills. The jobs focus on improving local communities.

The 2015 objective in Belle Fourche is to construct, for the U.S. Bureau of Reclamation, a mile of a new Bird Island View Road on the reservoir's southeast corner.

"We want them to do projects that they're confident in starting and finishing," said Jay Leasure, a natural resource specialist in the Reclamations's Rapid City office. "The road will take campers right to ideal spots on the reservoir."

Some concerns for the project are time and weather. Operation Golden Coyote is two weeks every June. If it rains, work on the road is suspended.

"We have to have a good shape of the road by the end of the day," said Sgt. Robert Carr of the 842nd Engineering Company of the National Guard. "We're trying to complete chunks of road each day."

'It's all about partnerships with us'

The South Dakota National Guard has a loyal customer in the Bureau of Reclamation.

"We've entered into a special use permit allowing them the bivouac and to do other training," Leasure said. "In return, they do some heavy maintenance and projects for us."

Oh, and the price is right.

"This is probably a $300,000 project if we contracted it out, and here we're not paying anything," he said, pointing at the Bird Island View Road construction.

The bureau and the Guard began working together in the mid-2000s.

Carr said working with the bureau is great because the projects directly benefit local recreational areas and challenge his young soldiers.

"It gives them some field experience, some training experience. It's free for them. It's on the job. They get paid to do it," he said emphatically. "You don't get this training anywhere else."

This year, units from Denmark, Great Britain and Canada all came to South Dakota for training. The Canadian Brigade Group is even operating its own base operation for Operation Golden Coyote.

"It's all about partnerships with us," Carr said.

With the potential that National Guard units and allied-country units will team up abroad, Operation Golden Coyote is an opportunity for the soldiers to gain leadership and learning from international perspectives.

"I'm learning something too," Mullen said. "I hope it's not the last time I'm here."

Staff Sgt. Jeff Sorenson, of Wall, with the South Dakota National Guard, watches soldiers of the 842nd Engineer Company and the British Army build a road next to Belle Fourche Reservoir during the annual Golden Coyote training exercise.

The scene and the road

For the soldiers, calm water and a gentle breeze created an ideal summer day along the reservoir.

Many of the workers are locals from Belle Fourche, Spearfish or elsewhere in the Black Hills. Maybe someday they will get to admire their work while taking a trip to the reservoir.

Tuesday was not that day.

The Guard's vehicles churned up soil until it created a base for the road. The 842nd needed the top soil moved so excavators could begin cutting and shaping the road.

The work has to be completed in chunks because of a wetland area that will require culverts in the middle of the road.

"The cutting and the filling is the long part of the project," Carr said.

Over the next three years, the National Guard will complete the 3-mile Bird Island View Road for the Bureau of Reclamation.

For now, the 1-mile will link Arpan Road to shady areas along the reservoir's banks.

"This is going to give people a good all-weather access road to some of the popular areas along the water," Leasure said. "We're going to try to keep people on the roads rather than off-roading on the prairie."

Bastrop C.A.S.T. Event Thrills in 2015

Participants and volunteers of 2015 Lake Bastrop C.A.S.T. event.

By Kim Parish, OTAO

The Oklahoma Texas Area Office has the unique pleasure of being able to host two Catch A Special Thrill (C.A.S.T.) events annually. The first is held at Lake Bastrop in Bastrop, Texas and the second is held at Lake Thunderbird in Norman, Okla.

These events provide an opportunity for special needs children and their families to enjoy fishing in the great outdoors for absolutely no cost.

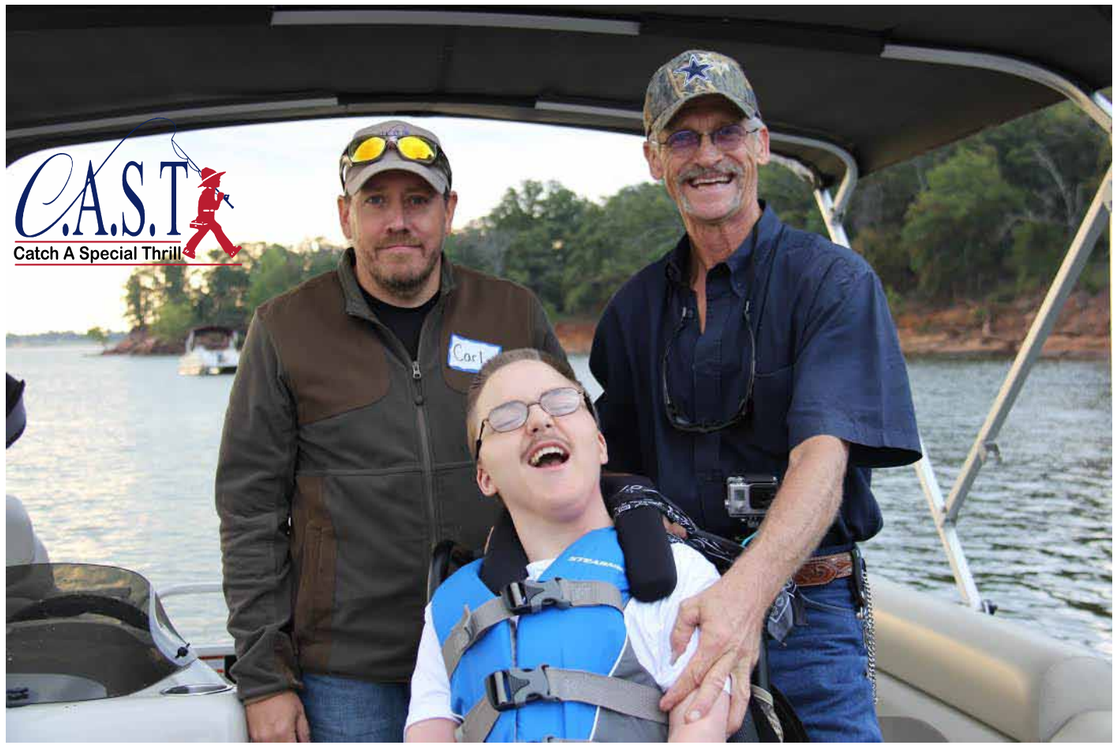
The generosity of the volunteers makes this event a huge success. Many offer their time and their boats to take these youngsters out on the lake and make it a priority to show them a great time and find the lake's best fishing hole. Others offer their cooking abilities and provide a fantastic lunch for everyone involved in the event.

It takes an exceptional amount of time and effort to get these events set up. Volunteers being recruiting efforts months before the big day arrives. The photos here accurately reflect the sheer joy that is experienced while attending a C.A.S.T. event.

If you want to make a difference in the life of others and see the results first hand, you are encouraged to volunteer your time or services at a C.A.S.T. event in your local area. If you don't have a local C.A.S.T. event, seek out other opportunities to give back to your community in a way that will not only change other's lives but will also change yours.

(Top) Liliana shows everyone how it is done by reeling in two bass from Lake Bastrop. (Bottom) Capt. Brad presents Eman with his placque. Each participant is given a placque with a photo of themselves and their boat captain together.

(Top left) Tyler checks out Kynlee's new fishing hat. (Right) Ethan and Capt. Rick ready to catch a big one at Lake Thunderbird.



(Bottom) Ryen, Capt. Carl and Ryen's dad are ready to fish Lake Thunderbird.

Photo Q & A: Choosing the Best Memory Card

It's In the Numbers

Professionals Love Compact Flash (CF)

Photographers are a rare breed, demanding fast, reliable gear capable of handling large images. CF cards were the standard for early digital cameras and continue to be used for high-end digital single lens reflex (DSLR) cameras and digital movie or sound equipment.

Two considerations were critical to CF card development: *One*, increasing the speed at which information could be recorded and retrieved; and *Two*, increasing space available for large (and often uncompressed) files that digital devices created. The physically larger card was easier to manufacture, more forgiving when used in extreme cold or heat, and had a reputation for being more durable (and much harder to lose).

CF cards provided an advantage in speed and capacity over competing formats, but smaller and more commonly used cards can match or exceed those capabilities. XQD memory cards are a format recently announced as a potential professional replacement. XQD cards are smaller than CF but slightly larger than SD allowing space for circuitry improvements users demand.

The Rise of Secure Digital (SD) (SDHC) (SDXC) & MicroSD

Secure Digital quickly rose to the top of the heap for consumer products. Demand for high capacities, improved speeds and ever smaller devices drove SD card development. SD progressed to higher capacity SDHC and then to SDXC as cameras and other digital devices expanded in use. This progression added speed and capacity to devices in part by using different file systems.

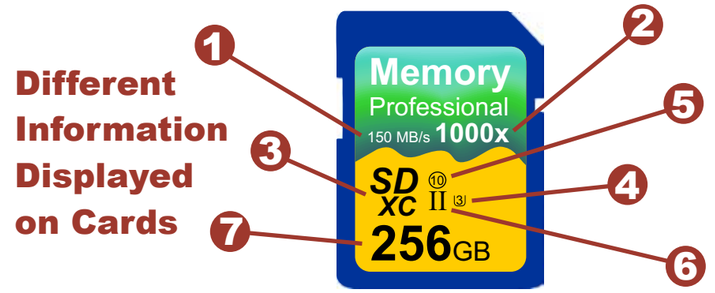
MicroSD cards are essentially miniaturized versions of SD, SDHC and SDXC and share all the same classifications. Typically they are a little slower and available in smaller capacities than full-size SD cards.

Type	*File System*	*Capacity*
SD	FAT16	up to 2GB
SDHC	FAT32	4GB to 32GB
SDXC	exFAT	64GB to 3TB

The original of the image at left is 6,000 by 4,000 pixels (a 24.2 megapixel image). An 8GB SDXC card will hold the following copies:

224 RAW files, or
783 Best JPG setting, or
2,804 Better JPG setting, or
5,027 Medium JPG setting.

Typical compression used by point-and-shoot cameras



1 Maximum Read Speed This is the maximum read speed of the card usually given in megabytes-per-second (MB/s). Note that cards rarely are able to sustain these speeds for long periods of time.

2 Read Speed An older way of expressing the max read speed. It is based on the read speed of audio CDs at 150 KB/s.

3 Type This is the type of card; different card types use different file formats and newer cards won't work in older card readers.

4 UHS Speed Class Rating The number inside a cup is the minimum sustained writing speed of the card; important for video recording. UHS Speed class 3 cards will never write slower than 30 MB/s, UHS Speed class 1 cards never slower than 10 MB/s.

5 Speed-Class Rating This is an older speed-class rating. A class 10 is the fastest and is verified to never write slower than 10 MB/s. A class 4 would never be slower than 4 MB/s.

6 UHS Rating The UHS rating of a card determines the maximum bus speed at which a card can read. Non-UHS cards max out at 25 MB/s, while UHS-I cards support up to 104 MB/s, and UHS-II cards support up to 312 MB/s. Both the card reader and card must support the same standard to benefit from the increased speeds, but UHS cards are backward compatible with older readers—they just won't be as fast in them.

7 Capacity Pick a card that can be used for a prolonged time so you can store many images without removing the card from your camera. Be aware that moving images from the card to your computer using a reader is faster than connecting the camera to your PC.

Notes About Speed

Use memory cards that meet or exceed the recommendations of your camera's manufacturer. Some photographers choose to use only very fast cards that match modern equipment's abilities. They can use the same cards in their older devices and avoid the confusion of mixing cards with varying capabilities. Devices can write data at their rated speed only to a card that meets or exceeds that number. A slower card will result in poorer camera performance.

Remember, higher speed ratings of both camera and card means faster recording of images to the card, increasing the number of images that can be taken simultaneously. This is important when choosing to take a series of high speed photos to freeze motion. It is critical for recording video where recording speeds below the capability of the camera causes dropped frames resulting in stuttering video motion - video is simply a series of images.

Types of Cards

CompactFlash (CF)
Invented by SanDisk Corporation in 1994, CompactFlash cards in the Type 1 or later Type 2 version with increased capacity were adopted for use by many professional equipment manufacturers.

Secure Digital Card (SD card)
In use since 1999, SD Memory Cards are now available in capacities between 16 Megabytes and 1 Gigabyte, and still growing.

MiniSD Card
After the success of the SD Card (Secure Digital Card), the miniSD was developed to meet the demands of the mobile phone market and largely replaced by microSD.

MicroSD
Increasingly used in miniaturized electronics such as GoPros, it is the smallest consumer memory card available.

MultiMediaCard (MMC)
The MultiMediaCard (MMC) standard was introduced by SanDisk and Siemens in 1997 for use in a wide range of products.

Sony Memory Sticks
A proprietary series of formats designed for digital cameras, recorders, and other devices by the same manufacturer.

SmartMedia
Introduced by Toshiba in 1995, these cards are now considered obsolete. Even as an obsolete card, it is still sought after by users of the many older devices which cannot use memory cards larger than 128MB.

xD-Picture Card
Abbreviated as xD (Extreme Digital), the xD-Picture Card is a type of removable flash memory used in many models of digital cameras made by Olympus and Fujifilm.

Glendo Power Plant Fixed Wheel Gate Gets Facelift

By Jay Dallman, WYAO

On October 30, 2013, WYAO mechanical engineers traveled to Glendo Power Plant to assess the condition of the fixed-wheel gate.

This is a single leaf gate which controls flow to the main supply penstock which provides water from Glendo Reservoir to spin the turbines and generate hydroelectric power, and also supplies water to the outlet gates which provide an additional means of releasing water to the river.

The gate was lifted into the gate chamber by power plant staff. This was completed over the course of a couple weeks by lifting the gate with the hydraulic hoist, hanging the gate, removing a section of gate stem, re-attaching stem sections, and lifting the gate another stem length. A total of five stem sections were removed until the gate was fully up. At this point, the gate leaf was set on beams and could be thoroughly inspected.

The conclusion reached by the Centralized Mechanical Support Branch was that a complete refurbishment of this fixed-wheel gate should proceed. The work would consist of removal of the bulkhead hoist, stem and gate leaf, to perform the surface preparation and painting of the fixed wheel gate, stem and gate hoist. After the inspection, the gate was re-installed into its guides and placed back into service until refurbishment could be scheduled.

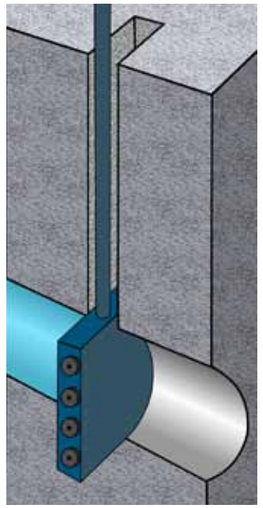
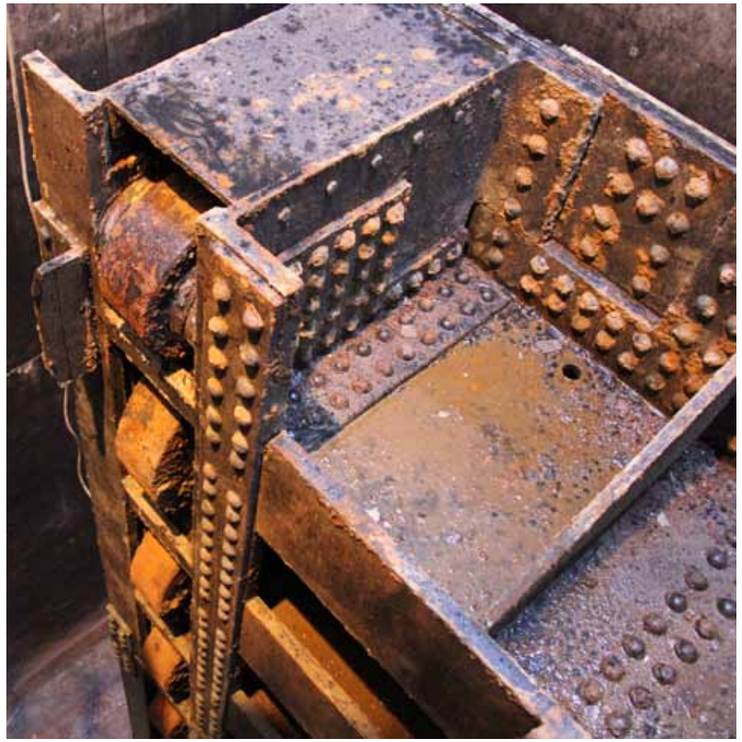


Illustration of fixed wheel gate in penstock.



Fixed wheel gate showing corrosion.

In FY 2014, Reclamation entered into an interagency agreement with Tennessee Valley Authority (TVA) to provide a feasibility level plan that included a cost estimate and schedule for performing the refurbishment.

TVA personnel performed a site visit during the week of February 24, 2014, to finalize project scope details. Reclamation reviewed the cost estimate and schedule provided by TVA and found it to be reasonable and economical and entered into a new interagency agreement to perform the refurbishment work.

Reclamation received upfront power customer funding from Western States Power Corp. (WSPC) which covered the entire cost of the gate refurbishment project. In late October, TVA personnel arrived at the Glendo Fixed-Wheel Gate house and began site preparation and mobilization. A crane from a local crane company was hired to perform all lifting tasks including the gate and all appurtenances. The gate was lifted into the gate chamber and over the next month, the gate was disassembled.

TVA's original plan was to lift the gate as one piece and to refurbish the gate on-site inside of a portable steel garage building. TVA mistakenly believed the gate to be 80,000 lb. (40-tons) but in reality, the weight of the gate is about 160,000 lb. (80-tons). This caused TVA to re-evaluate their plans. It became clear that the crane onsite was not large enough to lift the gate in one piece as planned. TVA also became aware of the difficulties in refurbishing the gate onsite due to local weather conditions. The decision was made to separate the gate into two sections and ship the gate to their facility in Muscle Shoals, Alabama. The gate was split and loaded onto transport trucks and shipped to TVA's power services shop in December.

Crane lifting bottom leaf of fixed wheel gate.

At TVA's facility, the gate halves and all gate components were sand-blasted and recoated with an epoxy coating. All hardware was evaluated for continued service and hardware was replaced as appropriate. New

(Cont. on next page)

Placing gate leaf section on truck for transport to Alabama.

(Above) Refurbished fixed wheel gate ready for re-Installation. (Right) Gate leaf sand-blasted and ready for epoxy coating at TVA Shop

wheels were fabricated as the existing wheels had worn beyond specifications. Other minor machining and welding repairs were made while at the Power Service Shop.

In mid-February, TVA personnel arrived back at Glendo to begin the process of re-installing the gate. The gate halves were hoisted into the fixed-wheel gate chamber and the halves were fitted together. The new wheels were installed into the gate and properly aligned with the gate. New seals were installed on the gate leaf and the hydraulic hoist was re-installed.

On March 19, 2015, the gate was lowered to its final position and was tested. It travelled through its range successfully with no binding or other undesirable issues. By taking advantage of the specialized skills of the TVA, WYAO was able to get a quality product in a reasonable timeframe. Since Glendo is a seasonally operated power plant, Reclamation was able to complete the work over the non-irrigation season without any impacts to power production or water deliveries.

DKAO All Employee Safety training

The Dakotas Area Office Safety Committee hosted an All Employee Safety Training Day at Sleepy Hollow Park in Bismarck, N.D.

The DKAO committee prepares this training annually to foster teamwork while providing information to encourage safe behavior in the workplace and reinforce Reclamation safety procedures for every job.

On the agenda were four breakout sessions: active shooter training; K-9 presentation; and a presentation from the GP Region's Safety Officer.

DKAO Safety and Occupational Health and Security Specialist Steve Parker gave a class on Reclamation's Hierarchy of Controls in Reclamation Safety and Health Standards. Attendees learned about the safety and occupational health program's action plan and the team's recommendations for Reclamation.

Instructors from the General Services Administration gave a hands-on presentation for vehicle safety. Their presentation included proper use of GSA vehicles, what to do in an emergency while using a government vehicle, and a demonstration that covered the procedures and hazards involved with changing a flat tire and roadside emergencies.

BLM Law Enforcement Officer Chuck Houston (left), with his K-9 partner, Hondo, demonstrate some signals and commands on DKAO Administrative Officer Mark Tibor.

Mike Meschke with the North Dakota Safety Council helped participants become familiar with the Globally Harmonized System for Hazard Communication and how to read and interpret a safety data sheet.

In the ATV Safety –Ride Safe-Ride Smart session, Erik Dietrich with North Dakota Parks and Recreation covered safety tips and procedures for the safe operation of all terrain and utility terrain vehicles and proper wear of safety equipment.

Mike Meschke (right) with the North Dakota Safety Council, demonstrates the proper fit and wear of a helmet on PATHWAYS student, Sasha Andrie.

The overall favorite presentation of the day came when BLM Law Enforcement Ranger Chuck Houston introduced us to his K-9 partner and fellow law enforcement officer Hondo! Through an agreement with BLM, Houston provides additional law enforcement services around Belle Fourche Dam and Reservoir in western South Dakota.

With Houston's assistance and DKAOs Administrative Officer Mark Tibor as the volunteer "criminal", K-9 Hondo let us watch him follow commands and signals to demonstrate catching and restraining perpetrators and how he protects Officer Houston when they on patrol.

DKAO hosts this Safety Day annually to foster awareness and adherence to Reclamation's commitment to the safety program and a "safety culture."

New Look, Same Great Information

By Tobias Taylor, GPRO

You may have noticed that Reclamation's Web sites have a new look. Reclamation has moved into the realm of responsive Web site design. Responsive web design allows the user to have a great web experience no matter what device is used to view content, be it a desktop computer, a tablet, a netbook or a smart phone. No more zooming in or out to make the display work correctly on your device.

The change to responsive design allows the content of Reclamation's Web to be consumed on the user's choice of device. People can more easily access water data while out at the reservoir, check to make sure the boat ramp is accessible before heading over for a day on the lake or sit at home and plan a day's recreation.

The new design allows for better and cleaner access to all of the great information that Reclamation has available. Each main region page has links to the other regions and main Reclamation site, along with quick links to the Projects and Facilities pages for every dam, power plant and project available. Making it easier for the user to get to the heart of the information they are searching for.

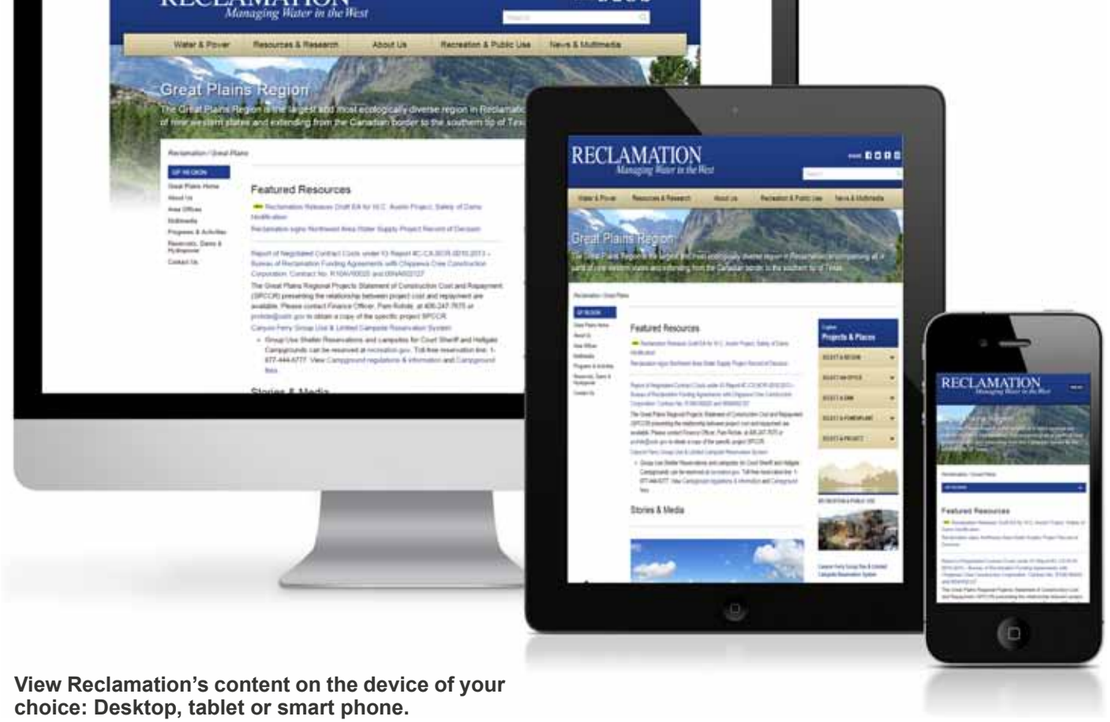
With a few clicks, users can access current news stories, feature articles and the myriad other sections of water information that Reclamation provides. Streamlined to work well with Mobile devices and Wi-Fi-connected hardware, the new design allows users to stay connected to Reclamation even when they are not at home.

> "Content is like Water. You put water into a cup, it becomes the cup. You put water into a bottle, it becomes the bottle. You put it into a teapot, it becomes the teapot."
>
> – Josh Clark, *Seven deadly mobile myths.*

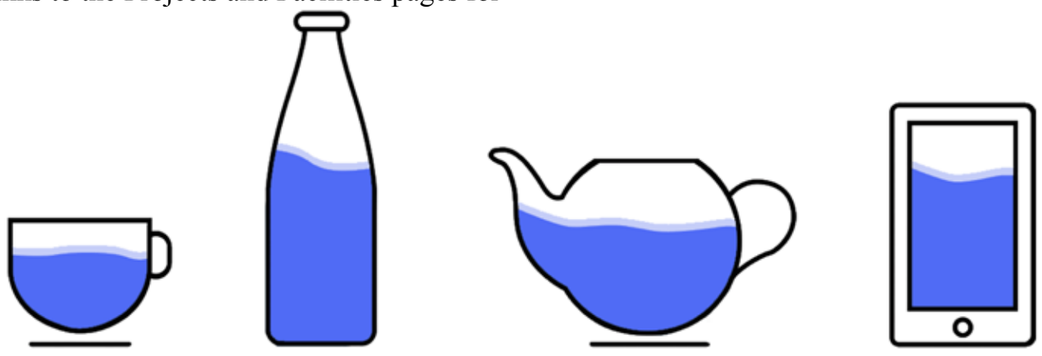
Find the same great water information and data while on the go. Browse the real-time Hydromet station data for streamflow forecasting and current runoff conditions for river and reservoir operations. Check the current reservoir levels to see if conditions allow for the use of boat ramps. Or check the AgriMet system for current site-specific weather data.

Paraphrasing Bruce Lee's famous quote about being like water, Josh Clark summed up the idea of Responsive Design in his Seven deadly mobile myths. "Content is like Water. You put water into a cup, it becomes the cup. You put water into a bottle, it becomes the bottle. You put it into a teapot, it becomes the teapot."

Reclamation's content is the water that flows to fill the device. The user decides which device will display that content, allowing greater freedom on how and when to view the information and data that Reclamation provides.



View Reclamation's content on the device of your choice: Desktop, tablet or smart phone.



NKAO Partnerships Build Recreation Opportunities

Picnic shelter timbers being set by Lower Loup Natural Resource District Staff at the Davis Creek modern campground, Davis Creek Reservoir, Nebraska.

By Nikolaus Johanson, NKAO

One of the ever-increasing challenges Reclamation has in water resource development and management, is managing the public demand for recreational access.

Recognizing the need that facilitates public access and enjoyment in our federal water projects, several federal statutes were enacted that have authorized Reclamation to work with our Managing Partners.

The Federal Water Project Recreation Act, enacted in 1965, authorized Reclamation to enter into Managing Partner Agreements that allows Partners to manage reservoirs for recreation and fish/wildlife, as well as using Title 28 (P.L. 102-575) to leverage funds for recreation/fish and wildlife enhancements.

As an upshot of the Federal Water Project Recreation Act and the demand to work with our partners, since 2013, Reclamation's Nebraska-Kansas Area Office (NKAO) has provided over $1.4 million in cost share funding to the Nebraska Game & Parks Commission (NGPC), Kansas Department of Wildlife, Parks & Tourism (KDWPT), and Lower Loup Natural Resource District (LLNRD.

Linda Lanterman, Director of State Parks with KDWPT, said, "The partnership with BOR and KDWPT has been a positive relationship in providing outdoor recreation opportunities to the citizens of Kansas. BOR's financial support in providing grants to KDWPT has played a vital role in new construction projects that would not have been possible without these much needed financial backings. We look forward to future partnerships in efforts to advance our BOR leased areas."

Reclamation's and our Managing Partners priorities in making these selections consist of many different criteria, but four are of particular importance:

1. Help to increase revenue to sustain park operations (campground utility upgrades, and installation of rental cabins).
2. Provide opportunities for youth activities (kids fishing ponds, fishing access docks, and group shelters for activities).
3. Provide accessible sites and activities to all visitors (restroom installations/modifications, accessible fishing docks, and camping pads).
4. Enhance Fish and Wildlife habitat.

"I want to thank the Bureau of Reclamation on the financial help they have provided us on the Davis Creek Recreational Area. The Title 28 assistance has helped our District accelerate the improvements we have been able to provide the public at this facility. I want to personally thank Nik Johanson, Alisha James, and Lindsey Nafts for their assistance and patients in our making the applications and getting the paperwork in for the project. Our partnership on Davis Creek has been a win-win situation for both our agencies and for the thousands of people that have been able to utilize the facility," Said Leon "Butch" Koehlmoos, General Manager, LLNRD.

TOP: Restroom being lowered into place at the Buffalo Roam Campground at Red Willow Reservoir, Neb. LOWER: ADA accessible dock at the Trail 3 Camping Area at Medicine Creek Reservoir, Neb.

During the September 2013 flood, the Big Thompson Canyon was severely impacted, including the Big Thompson Diversion Structure and Power Plant. The dam was the last major repair completed under a $1.4 million contract .