



2016

Concrete is delivered to repair the White Earth Dam.



Concrete is pumped into the side wall of the East Devils Lake Outlet transition structure.

WATER COMMISSION CONSTRUCTION PROJECTS

As winter descends after a long fall, another season of construction has drawn to a close.

The State Water Commission's Construction Crew is primarily involved with assisting dam owners throughout the state in conducting repairs and modifications to existing water facilities. The crew also works with the North Dakota Game and Fish Department (NDGF) to maintain outlet structures and install low-level drawdowns used by the NDGF to manage fisheries. In addition, they are involved in directing emergency actions during major dam incidents, and maintenance work on the Devils Lake outlets.

MAJOR 2016 CONSTRUCTION PROJECTS

Devils Lake East End Outlet (Transition Structure/Rock Filter Wall Repair)

The Devils Lake East End Outlet was constructed in 2012. The transition structure/rock filter is where the outlet transitions from a concrete pipe to a rock filter, before discharging into the Tolna Coulee.

Following the 2014 operation season, damage was noticed on the upstream wall of the rock filter. In some areas, the wear was nearly six inches deep, exposing the reinforcing bars.

The repair involved bolting steel plates to the wall, and filling the space between the plates and the wall with concrete. The steel plates serve two functions; armoring against further abrasion, and as forms for the concrete repair. Steel reinforcing dowels were epoxied into the existing concrete to further anchor the repair to the existing wall.

Devils Lake West End Outlet Canal Maintenance and Standpipe Anti-Foam System

The construction crew, along with the Garrison Diversion Conservancy District, cleaned vegetation and other debris from the canal, which has been in service since 2004. The riprap lining of the canal was maintained by placing or resetting riprap at various points along the canal.

Modifications were also made to the anti-foam system in an effort to keep it from becoming obstructed with vegetation. The system is intended to reduce the foam that forms in the standpipes. It consists of pumps, piping, and nozzles that spray water onto the foam. During the 2016 pumping season, the nozzles frequently became obstructed with vegetation, which prevented the anti-foaming system from doing its job. This allowed foam to build in the standpipes to the point of overflowing out through the air vents at the tops of the standpipes. Work

was done to modify the nozzle sizes and shapes in order to reduce clogging. Additionally, the center column of the Round Lake Standpipe was modified in mid-September as a test solution for foam control. The modification did help to suppress the foam, and additional modifications are planned for both standpipes in the winter to help control foaming issues in the future.

White Earth Dam Secondary Spillway Concrete Repair

White Earth Dam was originally constructed in 1970. The secondary spillway, which is basically a large culvert, or corrugated metal pipe (CMP), was constructed in 1972, and was modified in 1973 with the addition of a concrete floor.

Over time, the concrete floor and CMP became separated due to settlement of the CMP arch. Because of the curved shape of the CMP, the concrete is thinner where it meets the pipe. This made the concrete edge susceptible to breaking off. The resulting space would fill with water when the spillway was active, which would then freeze during the winter, further damaging the slab edge, and creating a void within the slab.

The edges of the concrete slab were cut back approximately one foot. Steel reinforcing dowels were epoxied into the remaining concrete and new concrete was placed. The new concrete was formed in such a way as to avoid the thin edge where it meets the CMP. A cement-like grout was then pumped into the slab to fill the remaining void, and a bituminous sealant was applied at the concrete/CMP transition to further waterproof the joint.



White Earth Dam spillway concrete floor.

Mount Carmel Dam Fall Protection Improvement and Low-level Valve Replacement

Mount Carmel Dam was originally constructed in 1971, and the spillway was replaced in 2004. Project repairs needed to solve two separate problems; the existing fall protection system, and the leaking low-level outlet valve.

The previous fall protection system required a person to climb up or down several rungs of a ladder before hooking into the system. This system was improved to provide much safer conditions.

The original low-level outlet valve is leaking. The low-level outlet consists of an approximately 300-foot conduit laying on the bottom of the reservoir, connected to a valve at the principal spillway. The system is used to draw down the lake when needed, and by the NDGF in order to remove deoxygenated water from the bottom of the lake to improve water quality. To replace the valve, the pipe must be plugged. Typically, this is done by sending divers out into the lake to place a plug over the end of the pipe. An unsuccessful attempt was made to plug the pipe this fall. Because this project was started late in the construction season, the decision was made to halt the project for the winter, and reassess the project following spring runoff.



Construction Crew employee installing fall protection system at Mount Carmel Dam.

US Geological Survey Gaging Stations

The Water Commission also continued its long-standing cooperation with the US Geological Survey (USGS) on the maintenance and improvement of USGS stream gaging sites throughout the state. The gaging network is of vital importance to monitoring conditions on the lakes and rivers in the state, helping to forecast floods and better manage the state's water resources.

PACZKOWSKI TO SERVE AS ASSISTANT STATE ENGINEER



John Paczkowski P.E., Assistant State Engineer

In November, John Paczkowski was promoted to North Dakota's Assistant State Engineer at the State Water Commission. His new role will be comprised of working with various water issues across the state, including appropriation, regulation, and development.

Paczkowski began his career with the State Water Commission in 1991 and has worked in most Divisions within the agency. In 2015, he was named the Director of the Regulatory Division, after serving as the Chief of the Regulatory Section since 2004. The Regulatory Division is responsible for reviewing permit applications for drains, dikes, dams, and sovereign lands; providing technical assistance to water resource district boards; administering North Dakota's Dam Safety Program; guiding the Silver Jacket Project; assisting communities in practicing floodplain management through the National Flood Insurance Program (NFIP); administering FEMA's Map Modernization project; and providing sovereign land management.

"John has demonstrated crucial leadership skills, provided vital knowledge and input on numerous projects, and brings a tremendous amount of experience to his new role," said State Engineer Garland Erbele. "He will be an incredible asset to the people of North Dakota and will continue to provide guidance and proficiency as the Assistant State Engineer."

Paczkowski started his employment with the Water Commission, working as a hydrologist in the Water Appropriation Division. During this seven year stint, he worked closely with the agency's comprehensive water use database, assisted with water permitting issues, and helped to develop technologies for tracking water resources.

In 1998, Paczkowski accepted a position as a water resource engineer with the Water Development Division's Investigations Section. He worked on numerous key projects, such as construction of the West Devils Lake Outlet, the Red River Valley Water Supply Study, Missouri River management, and conducted multiple technical reviews.

John grew up in Kensal, ND and spent many years working at a family-owned business. In 1990, he attended North Dakota State University and earned a Bachelor's degree in Agricultural Engineering. He received a Registered Professional Engineer License in 2001, and acquired a Certified Floodplain Manager designation in 2005. John has been married to his wife, Monica, for 24 years and they have three children, Nicholas, Tyler, and Kylie. He loves camping with family and friends, as well as taking wildlife photography. His photos have been featured in numerous publications throughout the state. He is also an avid sportsman and is extremely passionate about hunting and fishing.

"I look forward to serving the people and state of North Dakota in this new capacity. It's an honor and a privilege to fulfill my duties as Assistant State Engineer," said Paczkowski. "I'm excited to face new challenges, issues, and projects, and will continue to implement and achieve the goals of the State Water Commission and Office of the State Engineer."



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