



SWC has busy 2005 construction season

By Jason Boyle

The Water Commission's construction crew had another busy season, making repairs and modifications to Walsh County Drain No. 25 in Walsh County, Crown Butte Dam in Morton County, Mount Carmel Dam in Cavalier County, Sweetbriar Creek Dam in Morton County, Colt Dam in Mercer County, Tioga Dam in Williams County, and Northgate Dam in Burke County.

In addition to those efforts, the construction crew spent a considerable amount of time working on the Devils Lake Emergency Outlet Project, and constructed, modified, and repaired water-recording gages throughout the state in cooperation with the U.S. Geological Survey.

The construction crew includes Project Manager Darron Nichols, Dan Bahm, and John Edwards.

Walsh County Drain No. 25

The Walsh County Drain No. 25 outfall is located just west of Park River in northeast North Dakota. The outfall consists of a steep pipe buried in a large embankment, which takes water from the drain into the Park River. Two large sinkholes had formed on the downstream side of the outfall embankment. The sinkholes were excavated and inspected for larger voids and for any signs of material piping through the embankment. Upon finding no problems, the holes were backfilled and compacted. The work was completed in May, at a cost of approximately \$3,000, which will be shared between the Water Commission and Walsh County.

Crown Butte Dam, Morton County

The Water Commission cooperated with other local and state agencies to complete several needed repairs and modifications to Crown Butte Dam, where Interstate 94 serves as the embankment of the dam, ten miles west of Mandan.

In December 2004, State Water Commission and Department of Transportation (DOT) staff inspected Crown Butte Dam and determined that a number of repairs were necessary. Specifically, it was found that the spillway pipe had settled unevenly, which caused fill material to seep through joints where the spillway pipe sections had been connected. In addition, several sinkholes were identified on both sides of the embankment. And, it was determined that there were problems with the low-level drawdown valve, as well as the toe drains.

The low-level drawdown valve can be used to lower the reservoir for various reasons, including to provide increased flows downstream. The toe drain simply collects seepage coming through the dam and disperses it downstream in a more controlled manner.

It was agreed that the best method to make the repairs was to include the work into the reconstruction of Interstate 94, which was already scheduled for completion during the summer.

With Northern Improvement of Bismarck already reconstructing the west bound lanes of I 94, they were allowed to sublet the work on Crown Butte Dam to Weisz and Sons, Inc. of Bismarck. Work completed included

the installation of a new concrete drop inlet, 28 feet of spillway pipe, a vent pipe, and a portion of a new low-level drawdown system. The Water Commission's construction crew completed the installation of the low-level drawdown, sealed off the old low-level drawdown, installed a new sand collar near the downstream end of the spillway pipe, and repaired the toe drain.

The Morton County Park Board is the owner of Crown Butte Dam, so they agreed to supply the materials for the vent pipe, the low-level drawdown, and the downstream work.

The DOT has not closed out the road contract so the costs of the project have not been finalized. It is estimated that the work by Weisz and Sons will cost nearly \$160,000 and the Water Commission work will cost nearly \$35,000, for a total project cost of approximately \$195,000.

Mount Carmel Dam, Cavalier County

Mount Carmel Dam is located in northeast North Dakota, about 20 miles north of Langdon. Work performed by the construction crew in September included installation of a low-level outlet stop-log structure and assistance with inspection of the drain system and stilling basin. Project costs totaled about \$2,500.

Sweetbriar Creek Dam, Morton County

This dam is located on Interstate 94 west of Bismarck. The construction crew rebuilt the downstream cofferdam and installed a culvert in September at a cost of nearly \$2,500.

Colt Dam, Mercer County

Colt Dam is a concrete channel dam on the Knife River near Beulah. Severe erosion occurred in July around the north abutment, causing the dam to fail. In November, the construction crew began work to remove the concrete dam and repair the north abutment erosion. Project costs are estimated at \$75,000, and will be shared between the Water Commis-



The stop-log structure that was installed in the Mount Carmel Dam spillway. Enough stop-logs can be removed to lower the reservoir up to 6 feet if necessary.

failures. To alleviate this problem, the construction crew pumped the pipe full of grout to take it out of service. Cost-share partners on the project included the State Water Commission, the Game and Fish Department, the City of Tioga, and the Williams County Water Resource District. Some minor problems were encountered during the initial grouting attempt; therefore, the pipe had to be flushed and was successfully grouted shut on the second attempt. The cost of the project was approximately \$7,500 and it was completed in September.

Northgate Dam, Burke County

Repairs were made to the wet-well intake system, and the 48-inch spillway pipe that was leaking at Northgate Dam. The Water Commission, Game and Fish Department, and Burke County Water Resource District shared costs in the \$5,000 project, which wrapped up in September.

Devils Lake Emergency Outlet, Benson County

The Devils Lake Emergency Outlet Project is a system of canals, pipelines, siphons, and pump stations on the southwest side of Devils Lake. The construction crew was utilized to perform work on the project not included in the project contracts, such as installing siphons, culverts, field drains, an intermediate aggregate filter, and erosion protection. This



sion, the Game and Fish Department, and the City of Beulah.

Tioga Dam, Williams County

Tioga Dam is located just north of the city of Tioga. This high hazard dam was designed with a valve on the downstream end of the 12-inch diameter low-level outlet, which current dam design practices discourage, as it keeps the pipe under pressure and has been known to lead to dam



These two images show Colt Dam before its failure this past summer and after. The Water Commission's construction crew is currently in the process of removing the entire dam from the river channel.

work was instrumental in getting the project ready to operate, which it did in August. Total work by the crew amounted to about \$45,000.

USGS Gaging Stations, Statewide

The Water Commission's construction crew repaired several U.S. Geological Survey gaging stations throughout North Dakota. The work involved installation of orifice lines and staff gages, removal of gage houses, installation of gage houses, and repairs to sheet pile control sections.



Removal of the Devils Lake Outlet Project intake pipe at the Round Lake pumping station.

Commission endorses McClusky Canal to Sheyenne River option

At a Nov. 1 audio conference call held in the Governor's Conference Room, the State Water Commission endorsed the McClusky Canal to the Sheyenne River option as their preferred alternative for the Red River Valley Water Supply Project.

As a bit of background, in 2002, the Garrison Diversion Conservancy District (District) and the U.S. Bureau of Reclamation (Reclamation) began the process of developing an Environmental Impact Statement (EIS) for the Red River Valley Water Supply Project. Simultaneously, the District

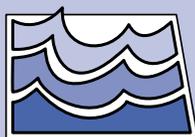
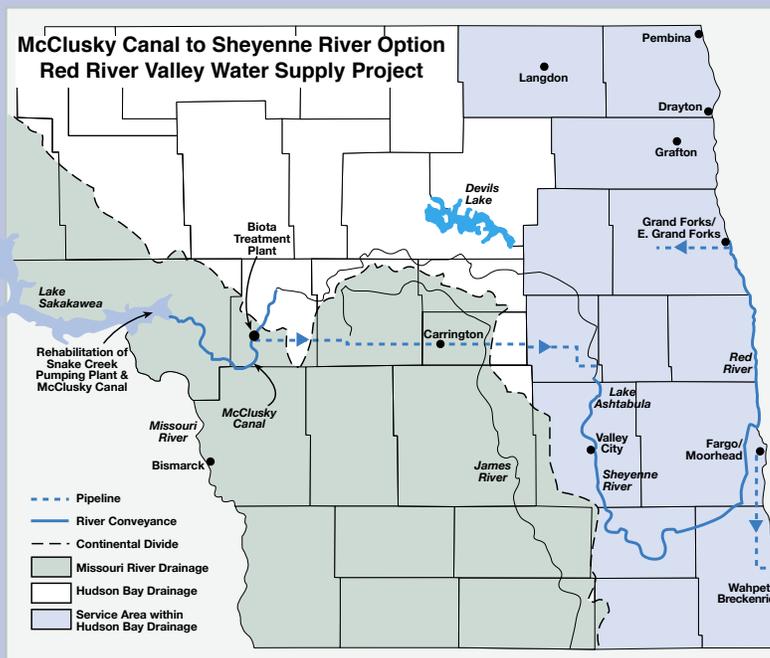
and Reclamation developed a Needs and Options Report to identify potential sources of quality water to supply homes, businesses, industries, wildlife, and recreation in the Red River Valley with enough water through at least the next five decades.

With the draft EIS scheduled for release in December, the District was interested in disclosing a state-preferred alternative in the report. As a result, the State Water Commission was briefed in late October, on the various alternatives under consideration to meet the future water needs in eastern North Dakota. Then, at the Nov. 1 meeting, the decision was made to back the McClusky to Sheyenne alternative.

In a letter to the Water Commission, State Engineer and Secretary, Dale L. Frink, recommended the McClusky to Sheyenne option because he felt it was an alternative that gives North Dakota the most flexibility with the lowest cost of implementation.

Prior to the Water Commission meeting, the Lake Agassiz Water Authority and the District had already gone on record as supporting the McClusky Canal to the Sheyenne River option as their preferred alternative. With these two entities and the Commission in agreement, the McClusky to Sheyenne option will become the state-endorsed alternative.

Preliminary cost estimates of the McClusky to Sheyenne alternative are in the neighborhood of half a billion dollars.



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