

# The Oxbow

FROM THE NORTH DAKOTA STATE WATER COMMISSION

## SWC construction crew has very busy year

By Pat Fridgen and Jason Boyle

The 2004 construction season was an extremely busy year for the State Water Commission's construction crew. The following provides a summary of efforts completed by the crew last summer.

### Arnegard Dam McKenzie County

The old spillway at Arnegard Dam had started to corrode severely, causing the end of the pipe to rot away, creating a severe erosion problem. In addition, the entrance to the spillway was choked with cattails, causing the emergency spillway to flow frequently, which resulted in the erosion of bank materials. As a result, it was determined that a complete relocation of the principal spillway was needed to remedy the situation.

The project included dewatering the reservoir, excavation of the deteriorated corrugated metal pipe (CMP) spillway, and placement of fill to rebuild the embankment near the old CMP. Also, a new 60-inch diameter CMP riser and 48-inch diameter CMP spillway were installed at the middle of the embankment near deeper water. A sand collar and outlet pipe were installed around the new spillway pipe to control any seepage near the pipe. And, the emergency spillway was also reshaped.

Work was completed through a cooperative effort between the State Water Commission, Game and Fish, and the McKenzie County Water Resource District (WRD) in June 2004. The total cost of the project was approximately \$58,000.

### Armourdale Dam SWC Towner County

High flows and undersized riprap had led to erosion of material where the entrance channel met the concrete chute spillway at Armourdale Dam. In response, the State Water Commission, Game and Fish, and Towner County WRD cooperatively pursued a repair project, which included excavation of the entrance channel, placement of a geotextile fabric, and installation of 18 reno mattresses filled with rock riprap.

The project was completed in July 2004, at a cost of approximately \$18,000.

### Sweetbriar Dam Morton County

A group of hired experts from GEI Consultants, Inc. of Denver, Colorado, found evidence of ongoing internal erosion at Sweetbriar Dam following an inspection in October. In response, they recommended several measures to improve the immediate safety of the dam, as the embankment of Sweetbriar Dam is also the roadway embankment for Interstate 94 – just west of Mandan.

These safety measures included installation of four core-hole filters in the spillway floor; excavation of the toe drain channel to allow the toe

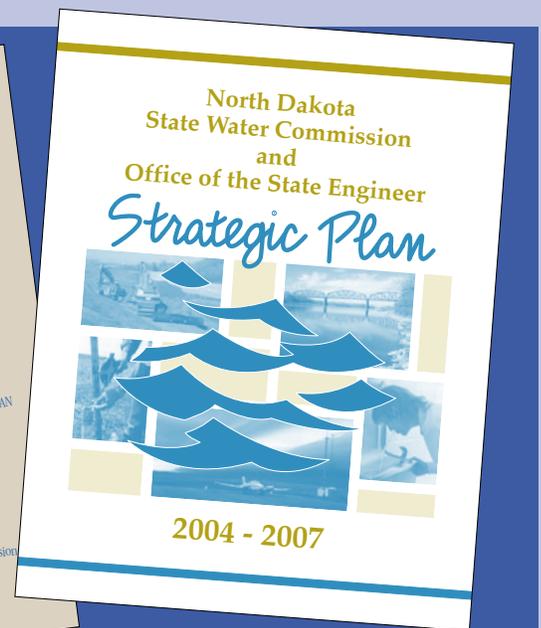
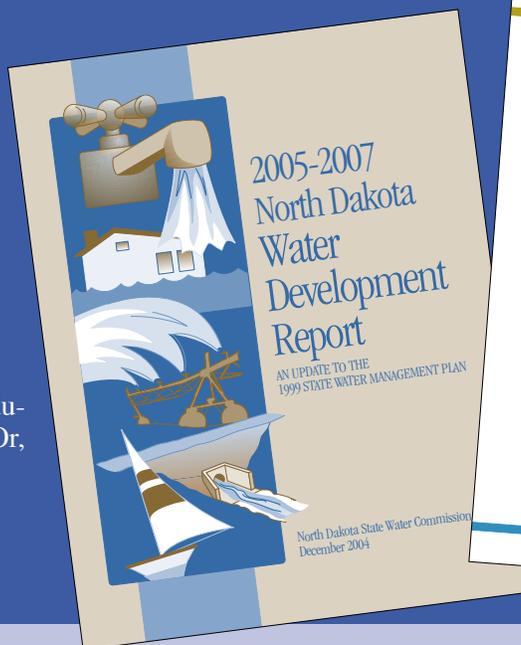


## Notice!

The 2005-2007 North Dakota Water Development Report and the 2004-2007 State Water Commission and Office of the State Engineer Strategic Plan are now available.

For a copy of either document, please contact the Planning and Education Division at 701-328-4989. Or, go to the State Water Commission website:

[www.swc.state.nd.us](http://www.swc.state.nd.us)  
and click on reports.





New 60-inch diameter CMP riser at Arnegard Dam.



Inspection of reno mattresses filled with rock riprap at Armourdale Dam.



Earth-fill cofferdam downstream of the stilling basin at Sweetbriar Dam.

drain to drain; and construction of an earth-fill cofferdam downstream of the stilling basin to raise the tail-water and reduce the hydraulic gradient through the dam.

The project was completed in December 2004 through a cooperative effort between the State Water Commission, Game and Fish, and the Morton County Park Board. The total cost of the project was approximately \$7,000.

### **Dam Inspections by GEI Consultants, Inc.**

Sweetbriar, Epping, and Big Coulee Dams were also inspected by GEI Consultants, Inc. at the request of the State Water Commission. These three dams were designed similar to Mount Carmel Dam, which failed in 2003. To make the inspections more thorough, the construction crew pumped out the stilling basins at each dam. Fine materials were found at Sweetbriar Dam which would not have been found without the stilling basin being pumped out. Further investigation will be required at the three dams in 2005.

### **USGS Cooperative Efforts Various Locations**

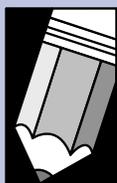
The Water Commission's construction crew repaired several United States Geological Survey gauging stations throughout North Dakota. The work involved installation of orifice lines, installation of staff gauges, and repairs to sheet pile control sections.

The construction crew also installed orifice line and water quality monitoring gauges above and below the Devils Lake outlet on the Sheyenne River. In addition, they installed an acoustic velocity meter and water quality gauge in Fargo, on the Red River; and a radar gauge in Watford City, on the Little Missouri River.

# State Engineer reports 2004 as “Year of Great Progress”

By Pat Fridgen

At the 41<sup>st</sup> annual North Dakota Water Convention and Irrigation Expo, State Engineer, Dale Frink, gave his state of water address to a crowd of more than 300. Appropriately, the title of the presentation was “A Year of Great Progress,” as 2004 has been an extremely busy time for the Water Commission, with many projects moving forward, and others seeing completion.



## COMMISSION MEETING MINUTES

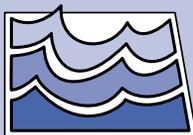
At the December 10, 2004, meeting in Bismarck, the North Dakota State Water Commission (Commission) heard updates on several ongoing water projects and took action on several others. In action items, the Commission:

- Approved the 2005-2007 North Dakota Water Development Report;
- Approved cost-share in the amount of \$34,394 for the Cooper Drain #3 construction project;
- Approved cost-share for the Lower Swan Creek channel improvement project in the amount of \$140,000;
- Approved cost-share in the amount of \$17,103 for the North Dakota Natural Resources Trust;
- Approved cost-share not to exceed \$19,500 for the North Dakota Water Resource Research Institute;
- Approved cost-share of no more than \$60,000 for a Sheyenne River snagging and clearing project;
- Approved cost-share in the amount of \$23,338 for the Silver Lake bank stabilization project;
- Approved cost-share not to exceed \$50,000 for the Red River Basin Commission;
- Approved cost-share to as-

As State Engineer Frink began his talk, he pointed out that 2004 was indeed a year of great progress, but it also represented a time of great challenges. He reported that in the west, North Dakota saw record low levels on the Missouri River system, and in the east, record flood levels at Devils Lake. But, despite these obstacles, as Frink put it, 2004 was still one of the North Dakota’s most successful and productive years in water management.

sist with the publication of “North Dakota Water: A Century of Challenge,” in the amount of \$48,800;

- Approved the Southwest Pipeline Project capital repayment and REM rates for 2005;
- Approved cost-share for a Devils Lake Outlet Awareness Project Manager, and a Devils Lake Basin Joint Water Resource Board Manager;
- Approved a grant for the City of Carrington in the amount of \$27,625 to conduct a well study and feasibility study;
- Approved a grant of up to \$275,800 for the North Valley Water District to add capacity for Pembina;
- Approved a grant for NAWS Minot Component in the amount of \$2,648,000;
- Approved the Release of Easement and Dedication for the easement at Gaines Dam/Center Dam; and
- Approved resolutions of appreciation for Maryanne Bach of the U.S. Bureau of Reclamation, and Richard Oppen of the Missouri River Basin Association.



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Regarding water supply efforts across the state, Frink reported that the original Southwest Pipeline project had been completed with the connection of Beach. He also reported that progress continued on the Northwest Area Water Supply project, where approximately 30 miles of main transmission pipeline have been installed between Minot and the Missouri River, with 14.4 miles installed during the 2004 construction season.

In response to the Devils Lake region’s flooding problems, Frink reported that the state-sponsored emergency outlet from Devils Lake to the Sheyenne River was approximately 80 percent complete. And, he went on to say that the remainder of the construction contracts will be completed in the spring of 2005, with operation of the outlet scheduled for Summer 2005.

In other flood control efforts across the state, Frink commended the sponsors of the Maple River Dam project, which is finally underway after decades of work and preparation. In addition, he reported on progress being made in Grand Forks, where they are nearing completion of several extensive flood control efforts.

In other points of interest, Frink also reported progress on smaller regional and rural water systems, irrigation development, and the completion of a new spillway at Mount Carmel Dam. In addition, Frink outlined his water project funding priorities for the 2005-2007 biennium. And, he discussed the new 2004-2007 State Water Commission and Office of the State Engineer Strategic Plan.