

The Oxbow

FROM THE NORTH DAKOTA STATE WATER COMMISSION

Emergency action plans needed for dams

By Jason Boyle

Do you know if your home will be flooded if the dam upstream from you breaks? Will you get any advance notification? Who is responsible for tending the dam and informing you of a dam break? These are questions that can be answered by referring to an Emergency Action Plan.

An Emergency Action Plan (EAP) is a formal document that spells out necessary courses of action to be followed in the event of a dam break or major flooding event. EAPs should identify potential emergency conditions at a dam and identify the downstream areas that will be inundated with water. The primary purpose of the EAP is to save lives and to minimize property damage.

North Dakota Administrative Code requires that all operators of dams that store more than 1,000 acre-feet of water (325 million gallons) submit an operation plan annually to the State Engineer. This operation plan should include details on how the dam will be operated in the upcoming year, maintenance procedures, and an EAP. It has been proposed that low hazard potential dams that store more than 1,000 acre-feet will no longer be required to submit an EAP as part of the operation plan, since by definition, low hazard dams cause little damage downstream should they fail.

Although the rules may get more lenient for low hazard dams, they

will probably get more stringent for medium and high hazard dams. It is likely that all dams whose failure may cause the loss of life will be required to have an EAP, regardless of whether or not they store more

than 1,000 acre-feet. This would make North Dakota compliant with Federal Emergency Management Agency recommendations, that all dams which pose a significant or high hazard potential have EAPs. The ND State Water Commission is developing detailed guidelines to determine which dams require EAPs.

All federal high hazard dams in North Dakota have Emergency Action Plans. For example, if Garrison Dam was to break or a large flooding event was to occur, inundation maps and contact lists are already in place. Although all federal high hazard dams have EAPs, most non-federal high hazard dams do not have these plans in place. Reasons for the lack of EAPs on non-federal dams include lack of awareness of the guidelines and a lack of



Baldhill Dam, north of Valley City, is one of the state's ten largest dams.



North Dakota State Water Commission
Dale L. Frink, Interim State Engineer
900 East Boulevard • Bismarck, ND 58505 • (701)328-2750
<http://www.swc.state.nd.us/>

Patrick Fridgen, Editor

The State Water Commission does not discriminate on the basis of race, color, national origin, sex, age, or disability in employment or the provision of services.

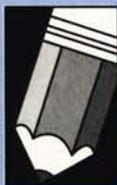
resources to complete the plans among dam owners. An encouraging note is that the ten largest dams in North Dakota already have EAPs in place.

Important parts of the EAP include technical information on the dam, a dam breach inundation map, a list of contacts for emergency situations, responsibilities of all parties involved with the EAP, and a description of events that may constitute an emergency response. The North Dakota State Water Commission staff has developed an EAP template that will be distributed to all dam owners who need to develop an EAP. This template should make the process of writing an EAP less laborious.

To develop an EAP, the owner of a dam must work in conjunction with local emergency management officials and the ND State Water Commission. Local emergency managers will be able to provide public notification procedures and incorporate the EAP into their Local Emergency Operation Plan. Determining the inundation area downstream of the dam may require the services of a registered professional engineer.

Since the process is just getting started and new guidelines are being implemented, it is not expected that dam owners must immediately prepare EAPs. The process of developing a workable EAP may take from six months to a year, especially when an inundation map needs to be developed.

There have been instances where large dams have failed in North Dakota. However, with careful planning and Emergency Action Plans in place, it is likely that the impacts of a dam failure can be greatly minimized, giving the thousands of North Dakotans that live downstream from these structures peace of mind. ■



COMMISSION MEETING MINUTES

By Patrick Fridgen

The North Dakota State Water Commission (Commission), chaired by Governor John Hoeven, held a telephone conference call meeting in the Governor's conference room, March 6, 2001 at the State Capitol in Bismarck.

The first items for discussion were in regards to the Southwest Pipeline Project (SWPP). At its December 8, 2000 meeting, the Commission authorized project officers identified in the SWPP water development revenue bonds documents to sign all USDA rural development documents in the loan and grant assistance application process except the sale of bonds. Until the bonds are approved for sale and closed, the Commission has no obligation to repay them. The impetus behind conducting the application process in this manor is to make the process more efficient. With the application process now complete, the 2001 Series A Bonds were approved by the Commission to be allocated in the amount of \$500,000 for the Coffin Buttes Service Area of the SWPP.

On December 13, 2000, bids were opened for the SWPP contract 7-6B, Coffin Buttes Service Area. There were five bids received for the contract. Northern Improvement Company of Bismarck submitted the lowest bid in the amount of \$1,897,782.20. The Commission awarded Northern Improvement the contract contingent upon the successful closing of the 2001 Series A Bonds.

Also with the SWPP, the Commission ceased granting the City of

Dickinson debt service credits for its bascule gate payments to the Bureau of Reclamation. And, the Commission approved the reimbursement of \$13,098.08 from the Reserve Fund for Replacement and Extraordinary Maintenance to the Southwest Water Authority for the replacement of blowoff valves. The valves are being replaced because they are prone to leaking and some cannot be closed. One of two valves associated with each blowoff will be relocated in manholes for ease of future maintenance or replacement.

As part of its Red River Basin water planning process, the Red River Basin Board requested \$20,000 to conduct a basin-wide needs assessment. The needs assessment will include at least seven public meetings to identify water and land resource needs throughout the Red River Basin. The Commission approved the \$20,000 request, but asked the Red River Basin Board to compile and distribute a summary report, contingent upon the availability of funds.

The Burleigh, Oliver, Morton, Mercer and McLean (BOMMM) Joint Board's vision group indicated to the Commission that further work is needed for their Missouri River (Garrison Dam to Bismarck reach) comprehensive planning efforts. In response, the BOMMM Joint Board requested, and was approved to receive 50 percent of non-federal costs in the amount of \$60,000 from the State Water Commission. The remaining two-thirds of project costs will be assumed by the BOMMM Joint Board and the EPA.

In its final item of business, the Commission approved 50 percent cost-share of non-federal costs not to exceed \$178,525 for Cavalier and Pembina County Drains #2 and #3. The funding is contingent upon receiving satisfactory agreements with Manitoba and the availability of funds. ■



THE WATER PRIMER

What “100-Year Flood” really means

The Phrase “100-year flood” still seems to cause some confusion among the public, lenders, and insurers. Many continue to believe it is a description of a flood that occurs once every 100 years. In fact, “100-year flood” is an abbreviated way of describing the magnitude of a rainfall and subsequent flood event that has a 1-percent chance of occurring. It is important to note that the same statistical chances apply at any time in any year.

Floods are classified according to their frequency and depth. For instance, there are 10-year, 25-year, 50-year, 100-year, and 500-year (or 10 percent, 4 percent, 2 percent, 1 percent, and 0.2 percent) floods. A 100-year flood occurs less frequently than a 10-year flood, but because it has larger volume and greater depth of water, is far more destructive and damaging, and is a more serious threat to human safety and infrastructure.

The National Flood Insurance Program adopted as a national standard a “100-year floodplain” to describe flood hazard areas. Due to

the confusion it created, use of the term “100-year floodplain” has been replaced with the newer designation of “base flood.” Base Flood Elevations (BFE) are listed on Flood

Buildings located in 100-year flood areas are required to have flood insurance as a condition of receiving a federally-backed mortgage loan or home equity loan.



Grand Forks 1997 flood.

Given that many mortgages have a repayment period of 30 years, buildings in areas subject to a 100-year flood have a 26 percent chance of experiencing that type of flood during the life of the loan. It is interesting to note, that during that same period of time, there is only a 4 percent chance of a fire, yet no homeowner goes without fire insurance.

So, the next time someone who lives in a 100-year floodplain tells you “we just had a 100-year flood four years ago, so

we don’t have to worry about another one for 96 years.” Remind them they have a 1 percent chance of experiencing that type of flood any given year and refer them to this information to explain the real meaning of a 100-year flood. ■

Information taken from Water Talk, Summer 1999 - Original source: FEMA National Flood Insurance Program newsletter, WATERMARK.

FLOOD EVENT PROBABILITIES OVER TIME

PERIOD OF TIME	10-YEAR FLOOD	25-YEAR FLOOD	50-YEAR FLOOD	100-YEAR FLOOD
1 year	10%	4%	2%	1%
10 years	65%	34%	18%	10%
20 years	88%	56%	33%	18%
30 years	96%	71%	45%	26%
50 years	99%	87%	64%	39%

Insurance Rate Maps (FIRMS) and are used to indicate the expected depth of water should a flood occur. New buildings constructed below the BFE are required to have their lowest floors at or above the BFE listed for that location on the current FIRM. The chart in this article shows the statistical chances of various flood events occurring in one of these higher risk areas over different periods of time.