North Dakota State Water Commission
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MEMORANDUM

To: Water-Related Topics Overview Committee
From: Todd Sando P. E., State Engineer
Subject: Devils Lake flooding
Date: September 20, 2010

Chairman Fischer and Committee Members:

During your June 14-15, 2010 meeting in Devils Lake you were presented with comprehensive information on flood impacts being suffered around Devils Lake and in its watershed. As a result, your Committee took action requesting the Legislative Council staff prepare a bill draft directing the State Water Commission to construct a control structure on the east end of Devils Lake.

Many things have transpired since your June meeting and most have implications for any potential Devils Lake east end outlet. On a positive note, EPA recently approved changing the sulfate standard above Baldhill Dam from 450 to 750 mg/l sulfate thus allowing the state outlet to operate at 250 cfs. The outlet has been operating under an emergency rule. This EPA action replaces the emergency rule.

A major action was the creation of the White House's Devils Lake interagency working group. This group has worked over the summer months to develop its own set of options that will address the Devils Lake flooding problem. We have provided testimony with several suggestions based on our knowledge of the overall situation at Congressional Hearings conducted by Senator Conrad in July and August. On September 3, a group of North Dakota stakeholders traveled to Washington for a briefing on the working groups progress. This was another opportunity for us to restate the Devils Lake urgent flooding problems and recommend potential actions. We were told the White House working group report would be published on September 20. Unfortunately, we learned late last Friday that the report will be delayed, perhaps until the end of the month.

I believe that recommendations made in the federal working group report will have a significant affect on how state and local officials proceed with solutions to the flood problem. I also believe it is important that we understand what the working group eventually proposes so we might work in harmony with the federal government towards the best solution. While the state has constructed an outlet from the west end that is operating at 250 cfs, federal permit requirements and water quality standards limit how much more the state can accomplish without

federal cooperation. We really have no choice but to wait for the results of the federal working group to determine what options are possible.

We have made a concerted effort to express a sense of urgency to the working group and provided several recommendations we feel need their attention in solving the Devils Lake flooding problem. The following summarizes the points we have been stressing for the past several months.

As a follow-up to the September 3 meeting, we have continued to stress that solutions to the Devils Lake flooding problem must be expedited. Climate and statistical experts agree there is an 8.8% chance of Devils Lake overflowing in the next 20 years. However, by 2013 there is a 3% chance of the lake overflowing. From a practical standpoint the 2010 construction season is behind us. If the 3% chance of an overflow becomes a reality, that leaves two construction seasons to implement the working group's recommendations. While no one knows when or if Devils Lake will spill, we must take every precaution to prevent the current flooding problem from escalating to catastrophic proportions. We have urged the working group to consider recommending advanced measures for emergency response to accelerate implementation of the actions that were requested in June (see Governor Hoeven's letter to the US Army Corps of Engineers which is attached) and those that are expected in the federal working groups final report.

We have suggested several potential federal actions the working group must address in its final report. First and foremost, additional water must be removed from the lake as soon as possible. There are several ways to accomplish this, but the one that best balances cost, timeliness, and downstream water quality impacts is a gravity channel outlet from East Devils Lake to the Sheyenne River across Spirit Lake Reservation. This project would "short circuit" that natural outlet route greatly reducing the risk of an uncontrolled spill of the lake system's poorest quality water from Stump Lake through Tolna Coulee to the Sheyenne River. The sulfate level in East Devils Lake is about 1,000 mg/l sulfate while Stump Lake contains about 2,500 mg/l sulfate.

Even with the better quality water, an East Devils Lake outlet would not be effective with current water quality standards. Preliminary USGS modeling indicates that an East Devils Lake outlet operating at 250 cfs in conjunction with the existing west end outlet would meet a water quality constraint of 750 mg/l below Baldhill Dam. The current sulfate standard below Baldhill Dam is 450 mg/l. The State Health Department is working with EPA to relax the standards during this emergency. We have told the working group that the high potential for an uncontrolled spill of the worst water quality in the lake justifies the temporary modification of standards.

Obviously, a gravity outlet is cheaper than electricity for pumping and would be preferred. Barring implementation of the gravity outlet mentioned above, another option to remove water from the lake that should be considered is to augment the west end outlet. This outlet upgrade should be designed to operate year-round.

It has been suggested the working group consider a control structure on the Jerusalem channel to meter flows from Devils Lake to Stump Lake. Controlling these flows while allowing the natural outlet to erode would limit the damages downstream without greatly increasing the impacts around the lake.

Some have suggested that the Devils Lake natural outlet should be "hardened" to prevent erosion below the current 1458 ft msl elevation. This has certain benefits downstream that are worth considering but it also has implications for those that are being flooded around Devils Lake. I hope that if this is included in the working groups' recommendations that an analysis of legal and financial implications will be provided.

At the September 3 meeting there was a suggestion that many additional acre-feet of water could be stored in the upper basin, this is not a practical approach to the problem. In addition to the land flooded around the lake, most of the basin is already storing water. We must take reasonable action to alleviate the current flooding problems and keep it from escalating to an uncontrolled spill.

The Devils Lake emergency needs a concerted effort from all levels of government in order to address the ongoing disaster. Our message to the federal working group has been consistent. We must all work in concert, and I recommend that action on any bill draft be coordinated with our recommendation to the federal working group.

State of
North Dakota
Office of the Governor

John Hoeven
Governor

June 10, 2010

Lieutenant General Robert Van Antwerp
Chief of Engineers of the United States Army
Headquarters, US Army Corps of Engineers
441 G Street, NW
Washington, DC 20314-100

Dear Lieutenant General Van Antwerp:

I want to thank you for recently visiting Devils Lake and taking the time to learn about the challenges of the chronic flooding there. Pursuant to our meeting and our request for assistance, we are following up in writing as you further requested. As you saw, the situation is urgent and I ask you to engage the US Army Corps of Engineers' immediate assistance in moving more water to alleviate the flooding in and around Devils Lake.

We request that the Corps of Engineers undertake action to install a control structure and outlet on the east end of Devils Lake (Stump Lake). The objective of this structure would be to relieve pressure from the rising waters of Devils Lake, and to prevent uncontrollable flooding downstream along the Sheyenne River. Additionally, we ask for Corps direct assistance and swift permitting of the expansion of the existing emergency outlet already constructed by the state of North Dakota on the western edge of the lake.

Devils Lake Basin flooding has been ongoing since 1993 and is currently at an elevation of 1,451.7 feet msl, having risen more than 27 feet since 1993. The lake is less than six feet away from a natural overflow through the Tolna Coulee, which occurs at 1,458 feet. The Corps needs to initiate construction of a control structure in this area to alleviate flooding both within and downstream of the basin.

We have worked to address the flooding with a three-pronged effort: protecting the infrastructure; storing more water in the drainage basin; and releasing water in a managed approach. Working with the USACE and other partners, we have been protecting the infrastructure by raising levees, roads, utilities and moving property out of harm's way. Water storage is extensive in the basin. Satellite images indicate that outside of the lake itself, that 231 square miles of land are inundated.

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Clearly to take pressure off of the growing lake, greater volumes of water must be released. To do that, the Corps can help. Soon the emergency outlet will expand to a capacity of 250 cubic feet per second, which can remove 110,000 acre feet or seven inches off of the lake annually. We are designing options to increase the capacity and efficiency of the emergency outlet by discharging water with lower sulfate levels. For this expansion, a 404 Permit may be required and we request your assistance in expediting any necessary regulatory approvals for construction to help relieve the imminent flooding in the area. In addition, the State of North Dakota requests Water Resources Development Act Section 594 or similar cost share funds to expand the outlet to reduce the flood risk.

The State of North Dakota is working to combat the further advance of Devils Lake and we need the US Army Corps of Engineers assistance in moving water. We require this help as expeditiously as possible.

Sincerely

John Hoeven

John Hoeven
Governor

C: Senator Kent Conrad
Senator Byron Dorgan
Representative Earl Pomeroy
Dale Frink, ND State Engineer
MG Michael J. Walsh, Mississippi Valley Division
BG John R. McMahon, Northwestern Division

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