



East Dakota Water Development District
132B Airport Drive
Brookings, SD 57006

605-688-6741

605-688-6744 Fax

MINUTES
November 16, 2017

The Board of Directors of the East Dakota Water Development District (EDWDD) held a regular meeting on November 16, 2017, at the Water Purification Plant, 2100 North Minnesota Avenue, Sioux Falls. Vice-Chairman Anderson called the meeting to order at 9:35 a.m. The following persons attended:

Directors Present

Mark Anderson
Lois Brown
Mary Ellen Connelly
Gary Duffy
Kay Kassube
Dana Loseke
John Moes
Janelle Weatherly

Directors Absent

Martin Jarrett

Staff Present

Barry Berg
Jay Gilbertson
Matt Johnson

Others Present

Scott Anderson, Minnehaha County Planning & Zoning
Andy Berg, City of Sioux Falls Public Works
Mark Bonrud, City of Flandreau
Delvin DeBoer, AE2S
Jessie Evans, SD School of Mines & Technology
John Hult, Argus Leader Media
Derric Iles, SD DENR Geological Survey Program
Ron Koth, Barr Engineering
Lisa Kunza, SD School of Mines & Technology
Kelsey Murray, SD School of Mines & Technology
Jesse Neyens, City of Sioux Falls Public Works
Tim Spade, Flandreau Santee Sioux Tribe Natural Resources
Don Whitman, City of Flandreau

Administrative Items

Approval of Agenda

Motion by Duffy, seconded by Moes to approve the agenda as presented. Motion carried unanimously.

Minutes - The Board reviewed the Minutes of the October 19th, 2017, meeting.

Motion by Weatherly, seconded by Connelly to approve the Minutes of the October 19th, 2017, meeting of the East Dakota Water Development District Board of Directors as presented. Motion carried unanimously.

Financial Reports - The Board reviewed the October 2017 Financial Reports.

Motion by Moes, seconded by Loseke to accept the October 2017 Financial Reports. Motion carried unanimously. Vice-Chairman Anderson then asked that the report be placed in the District files.

Report of Meetings and Conferences - Director Connelly attended the November 13th meeting of the Friends of the Big Sioux River in Sioux Falls.

Director Loseke attended the 2017 Eastern South Dakota Water Conference at South Dakota State University (SDSU) in Brookings on November 8th and Minnehaha County Conservation District Board of Supervisors meeting in Sioux Falls on November 13th.

Director Moes attended the November 15th meeting of the Lake Pelican Water Project District in Watertown.

The Manager briefly commented on the following meetings he attended:

1. **October 24** - Hayti. Hamlin County Commission.
2. **October 25 & 26** - Deadwood. South Dakota Association of Rural Water Systems (SDARWS) Managers Group Meeting.
3. **November 2** - Pipestone, MN. Minnesota River Basins AREA II/Redwood-Cottonwood Rivers Control Area Legislative Gathering.
4. **November 6** - Sioux Falls. USDA Regional Conservation Partnership Program field tour.
5. **November 8** - Brookings. 2017 Eastern South Dakota Water Conference.
6. **November 9** - Brookings DDN site. SD Board of Water and Natural Resources meeting.
7. **November 13** - Tea. Smart Wellfield presentation to rural water system managers.

Upcoming Meetings -

1. **November 21st - 9:30 a.m.** - Brookings. Brookings County Commission - drainage issues discussion with Representative Hawley.
2. **November 30th & December 1st** - Alexandria, MN. 2017 Minnesota Association of Watershed Districts Annual Meeting.
3. **December 6th & 7th** - Matthews Training Center, Pierre. South Dakota Water Management Board.
4. **December 12th - 1:00 p.m.** - Matthews Training Center, Pierre. South Dakota Non-Point Source Task Force.
5. **December 21st - 1:00 p.m.** - EDWDD Office, Brookings. December EDWDD Board of Directors Meeting.

Payment Requests - The Manager presented a payment request from a District-sponsored activity. He noted that the request was in order and consistent with provisions set by the Board at the time of award. He requested Board authorization to make the following payment:

<u>Grant Recipient/Activity</u>	<u>Requested Amount</u>
City of Bryant/Waste water system facility plan development	\$ 1,250.00
SDSU/Conservation drainage to remove NO ³ from drain water (McDaniel)	\$ 362.88
SDSU/Bioreactor impacts on <i>E. coli</i> and antibiotics resistance (McDaniel)	\$ 3,341.13
Total	\$ 4,954.01

Motion by Brown, seconded by Duffy to authorize payments totaling \$4,954.01 as requested. Motion carried unanimously.

Project Assistance Request(s)

City of Flandreau - City of Flandreau Mayor Mark Bonrud, along with Don Whitman, City Administrator, and Ron Koth, Barr Engineering, presented a request for District cost-share assistance. The City is exploring options for the long-term management, future renovations and safety improvements of the community-owned dam on the Big Sioux River. They noted that the dam is an important, long-time part of the community, and a popular site for recreation and fishing. In place since the 1800's, the dam has undergone a number of repairs and re-builds. Unfortunately, the dam has also been the site of human fatalities and near fatalities due to the presence of dangerous recirculating currents found below the structure.

The City has entered into an agreement with Barr Engineering to evaluate options for removing or modifying the dam. Barr's proposed effort includes work to develop a preferred alternative to a thirty percent (30%) level of planning and design, following completion of a community-based process to decide on the most acceptable approach(es) at the site. The total project cost is \$47,500. The City has committed \$12,500 of 2018 funds to the effort, and has received funding commitments from the South Dakota Department of Game, Fish and Parks (\$12,500) and the United States Fish and Wildlife Service (\$10,000). The Mayor requested \$12,500 from the District to round out the funding package.

Mayor Bonrud, along with Mr. Whitman and Mr. Koth, answered Board questions about the effort.

Motion by Moes, seconded by Kassube to provide District cost-share assistance to the City of Flandreau to cover twenty-six and one-half percent (26.5%) of the proposed project costs, up to a maximum of \$12,500. Motion carried unanimously.

Pathogenicity Potential of the Bacteria in Selected Locations of the Big Sioux River and Skunk Creek

Dr. Kelsey Murray, of the South Dakota School of Mines and Technology (SDSM&T), presented the results of District-funded research into the "Pathogenicity Potential of the Bacteria in Selected Locations of the Big Sioux River and Skunk Creek." She noted that the Big Sioux River has long been polluted by bacteria, but not all strains of bacteria are harmful. The overall goal of her research was to get a better handle on how much of the bacteria is potentially pathogenic. The Board awarded SDSM&T grants in April 2015 and March 2016 for this effort, involving field work between April 2015 and March 2017, evaluating samples collected from two locations on Skunk Creek in Minnehaha County, and four sites on the Big Sioux River in and around Sioux Falls. The effort sought to create a novel molecular water

quality monitoring metric that accounts for the pathogenic potential of various aquatic environments. It applied common molecular biology techniques to assess the potential of organisms in both fecally-impaired and unimpaired areas of the Big Sioux River in eastern South Dakota to acquire genetic material that could transform them from harmless to severely disease-causing.

The research created a monitoring metric that assays for the presence (or absence) of approximately 20 known virulent genes within the bacteria samples collected. These tests allowed for an extensive characterization of the resident bacterial population. The tests noted only the presence/absence of a particular genetic material, but not overall concentrations. Dr. Murray reported that they were able to detect the presence of multiple disease-producing genetic characteristics, such as the ability to produce Shiga toxins. The presence of these particular genetic materials, even at very low concentrations, has been known to trigger adverse health impacts. The presence of multiple potentially pathogenic genes increases the likelihood of problems. She noted that while the numbers fluctuated from month to month, they found Shiga toxin genes that cause mild to moderate diarrhea in 34 to 50 percent of the water sampled in total, and genes linked with a risk to intestinal lesions in 72 percent.

Other genes connected to more serious health problems, such as *eaeA* and *stx₂*, were found in between 11 and 22 percent of samples. The researchers also found bacteria that had more than one of the pathogenic genes, suggesting that the genes are being swapped between organisms. She stated that while total *E. coli* does provide a baseline to assess the risk of the recreational use of the water, virulent gene profiling is the next step in establishing a more defined risk of using our waters.

Another line of future investigation would be assessing the origin of cases of Shiga-toxin *E. coli* (STEC) reported to the South Dakota Department of Health. There were 80 cases reported in South Dakota last year, 16 of which were in the Sioux Falls metropolitan area, but the source of those STEC infections is unclear. The infections could be related to food contamination and not from contact with contaminated river water.

Examination of Isotopes in Selected Waters in Eastern South Dakota

Derric Iles, State Geologist with the SD DENR Geological Survey Program, described a recent effort to better understand and define the glacial aquifers in eastern South Dakota. He summarized **Report of Investigations 118, “Examination of Isotopes in Selected Waters in Eastern South Dakota,”** released in September 2017, which describes the results and preliminary interpretations of isotopic analyses of water samples collected from a range of water resources. Like water levels, drilling or other chemical tests, isotopic analysis is a tool to help better understand and interpret South Dakota’s aquifers. The presence and/or concentrations of certain isotopes of hydrogen, oxygen and carbon can be used to better define the nature and characteristics of ground water resources in the State. The nature of certain stable isotopes (ones that do not change over time) in water samples can provide a glimpse of the conditions that existed at the time the water entered the aquifer. Unstable isotopes (ones that decay over time at a fixed rate) can be used to estimate the “age” of the water sample. A program of sampling rainfall, lakes, wetlands, streams, glacial outwash, and bedrock aquifers for isotopes of hydrogen, oxygen, and carbon was undertaken in 2015 and 2016. Data gathered in this

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effort were combined, and collectively analyzed with, similar isotopic data collected by the Geological Survey Program in earlier studies.

Data from samples collected from surface water sources, along with a limited number of shallow (surface) aquifers, indicate that the water within these units is predominantly modern, exhibiting characteristics similar to rainfall samples. Water that was thought, on the basis of geologic and hydrologic criteria, to be connate (old), or dominantly connate, glacial water was sampled from buried glacial aquifers and analyzed. In some instances, the results confirmed the expectations, with water samples interpreted as having been in place since glacial times (> 10,000 years ago). Other buried units yielded results that suggested a degree of mixing has occurred, with blending of modern and connate waters. Samples collected from buried bedrock aquifers were found to contain predominantly connate water.

Mr. Iles noted that the results of this study affirm that each aquifer of glacial or bedrock origin must be evaluated individually in the context of its own hydrogeologic framework, hydrogeologic history, and water chemistry. Often, the information needed to make such evaluations is insufficient or non-existent. It is his recommendation that to the extent that budgets allow, that analyses of water be regularly performed in the future for relevant isotopic content in addition to the traditional analyses for common inorganic constituents. The routine addition of isotopic information into ground-water studies will lead to a better understanding of South Dakota's aquifers, more informed interpretations on sustainable water availability from those aquifers, and a better probability that South Dakota's ground-water resources will be available for future generations.

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Adjournment

There being no further District business, Vice-Chairman Anderson declared the meeting adjourned at 12:05 p.m.

John Moes, Secretary