

# SOUTH DAKOTA

Association of Rural Water Systems

# Quality On Tap!

October 2018 | Volume 14, Issue 2

## THE STATE OF OUR WATERS

*PROTECTING WATER QUALITY  
WITH BIOREACTORS*

*HOME WATER SOFTENING  
WHAT YOU NEED TO KNOW*

ATC AWARD NOMINATIONS DUE OCTOBER 26TH

## A MESSAGE FROM THE PRESIDENT OF THE BOARD

Ron Gillen, President  
South Dakota Association of Rural Water Systems



### 2019 RURAL WATER RALLY

South Dakota Rural Water does many things, and one of the most important benefit to our rural water membership relates to our legislative efforts. Every year the National Rural Water Association hosts a Rural Water Rally in Washington D.C. to further the work of providing drinking water and wastewater services to rural communities. Rural Water professionals, leaders and customers from every state attend the rally to thank their Senators and Representatives for their support and encourage them to further support the goals and needs of the Rural Water Industry. The Rally provides your Association the opportunity to meet directly with our congressional delegation one-on-one to discuss concerns of SDARWS members and other systems, as well as with their staffers, and USDA.

We invite you to join us February 4-6, 2019 at the Hyatt Regency on Capitol Hill. For more information, visit NRWA's Rally page at: [nrwa.org/rally](http://nrwa.org/rally). Room reservations can be made at the Hyatt Regency by calling 202-737-1234. If you have any questions about attending this year's event, please call the SDARWS office at 605-556-7219. We would love to have you join us on the Hill!

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**Class B West River**  
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February  
4-6, 2019  
Washington, DC

*Let Your Voice Be Heard!*

The Rural Water Rally provides an opportunity for supporters of our industry to make their case directly to their elected officials. Rural Water Associations in each state schedule meetings with Representatives, Senators and their staff, so that they can share the Rural Water success story, answer questions and build important relationships. Attending the Rural Water Rally also provides a unique opportunity to meet with association leaders and watch the Great American Taste Test in person.

For more information, visit:  
[nrwa.org/rally](http://nrwa.org/rally)

Hyatt Regency Capitol Hill  
800-332-8715



RALLY



## FROM THE EXECUTIVE DIRECTOR

Kurt Pfeifle, Executive Director  
South Dakota Association of Rural Water Systems

***“I’m from the government, and I’m here to help.”***  
**– President Ronald Reagan**

When President Reagan uttered those words, he stated they are the nine most terrifying words in the English language. While there are likely plenty of instances where governmental forces swooped in and tried to help, only to make things worse, it’s equally as likely you’ll find that is also true across a broad spectrum of companies, services, and products. Sometimes, however, offers to help are genuine and sincere, and meet the intention of actually helping. We should never become so tunnel-visioned that we fail to recognize the authenticity of assistance when offered.

Recently, I had the opportunity to participate in meetings with some very dedicated public servants at the Environmental Protection Agency (EPA), Region 8 in Denver (Region 8 covers the States of: SD, ND, MT, UT, WY & CO along with 27 Tribal Nations). The Rural Water Association Executive Directors from these states were able to talk to EPA about Rural Water Circuit Rider programs for water and wastewater, our Source Water Protection activities as well as Tribal assistance and interactions. We engaged in conversation about water

security and Water/Wastewater Agency Response Networks (WARN), we spoke about the Region 8 Finance Center as well. I came away from those meetings having learned quite a bit about EPA, their people, and their mission(s). I am certain the good folks at EPA learned something about the efforts of rural water as well.

South Dakota has a unique relationship with EPA as our state is a “primacy state.” It may be an over-simplistic explanation but being a primacy state means that the State of South Dakota is the governmental entity that directly oversees the protection of our environmental and natural resources and enforces regulations. The EPA, in turn, provides oversight and assistance for the work South Dakota does as a primacy state. The South Dakota Department of Environment & Natural Resources (DENR) is the state entity charged with primacy responsibilities for the protection of our environmental and natural resources. DENR works in close contact and in consultation with the US EPA. Together these governmental forces truly are here to help, and South Dakota Rural Water works cooperatively with both EPA and DENR to help them succeed in their missions.



**L to R: Dale Pierson (UT-ED), Eric Volk (ND-ED), Kurt Pfeifle (SD-ED), Doug Benevento (EPA-RA), Vern Steel (UT-DED), Mark Pepper (WY-ED), Steve Harper (CO-ED).**

# Events Calendar

## SEPTEMBER

### 25-27 – INTERMEDIATE WATER TREATMENT

#### **Spearfish Holiday Inn**

#### **305 N. 27th Street • Spearfish, SD**

This course covers the Association of Boards of Certification “Need to Know” requirements for the Class II & III Water Treatment Exams. Class begins each morning at 8:00 a.m. local time and wraps up around 4:30 p.m. on Tuesday and Wednesday and approximately 11:30 a.m. on Thursday.

## OCTOBER

### 16 – BASIC WASTEWATER TREATMENT

#### **Rapid City Ramkota**

#### **2111 N. LaCrosse Street • Rapid City, SD**

This course covers the Association of Boards of Certification “Need to Know” requirements for the Class I & II Wastewater Treatment Exams. This course does not cover the material included in the Stabilization Pond Exam. Operators who will be attempting the Stabilization Pond exam should consider the Stabilization Pond Workshops. Class begins each morning at 8:00 a.m. local time and wraps up around 4:30 p.m. on Tuesday and Wednesday and approximately 11:30 a.m. on Thursday.

### 30 – STABILIZATION POND WORKSHOP

#### **Aberdeen Ramkota**

#### **1400 8th Avenue NW • Aberdeen, SD**

This course covers the material on the Association of Boards of Certification Stabilization Pond Exams. It does not cover material on Class I or higher Wastewater Treatment Exams. This is a single day workshop starting at 8:30 a.m. local time and wrapping up around 4:30 p.m.

## NOVEMBER

### 1 – STABILIZATION POND WORKSHOP

#### **Highland Conference Center**

#### **2000 Highland Way • Mitchell, SD**

This course covers the material on the Association of Boards of Certification Stabilization Pond Exams. It does not cover material on Class I or higher Wastewater Treatment Exams. This is a single day workshop starting at 8:30 a.m. local time and wrapping up around 4:30 p.m.

### 13-15 – WATER DISTRIBUTION

#### **Sioux Falls Ramkota**

#### **3200 W Maple Street • Sioux Falls, SD**

This course covers the Association of Boards of Certification “Need to Know” requirements for the Class I through III Water Distribution Exams. This course only covers the material for Water Distribution. Operations Specialists who wish to attempt a Wastewater Collection Exam should attend the Wastewater Collection Course. Class begins each morning at 8:00 a.m. local time and wraps up around 4:30 p.m. on Tuesday and Wednesday and approximately 11:30 a.m. on Thursday.

## DECEMBER

### 4-6 – WASTEWATER COLLECTION

#### **Sioux Falls Ramkota**

#### **3200 W Maple Street • Sioux Falls, SD**

This course covers the Association of Boards of Certification “Need to Know” requirements for the Class I through III Wastewater Distribution Collection Exams. This course only covers the material for Wastewater Collection. Operations Specialists who wish to attempt a Water Distribution Exam should attend the Water Distribution Course. Class begins each morning at 8:00 a.m. local time and wraps up around 4:30 p.m. on Tuesday and Wednesday and approximately 11:30 a.m. on Thursday.

## JANUARY

### 4-6 – WASTEWATER COLLECTION

#### **Sioux Falls Ramkota**

#### **3200 W Maple Street • Sioux Falls, SD**

This course covers the Association of Boards of Certification “Need to Know” requirements for the Class I through III Wastewater Distribution Collection Exams. This course only covers the material for Wastewater Collection. Operations Specialists who wish to attempt a Water Distribution Exam should attend the Water Distribution Course. Class begins each morning at 8:00 a.m. local time and wraps up around 4:30 p.m. on Tuesday and Wednesday and approximately 11:30 a.m. on Thursday.

## FEBRUARY

### 5-7 – BASIC WASTEWATER TREATMENT

#### **Sioux Falls Ramkota**

#### **3200 W Maple Street • Sioux Falls, SD**

This course covers the Association of Boards of Certification “Need to Know” requirements for the Class I & II Wastewater Treatment Exams. This course does not cover the material included in the Stabilization Pond Exam. Operators who will be attempting the Stabilization Pond exam should consider the Stabilization Pond Workshops. Class begins each morning at 8:00 a.m. local time and wraps up around 4:30 p.m. on Tuesday and Wednesday and approximately 11:30 a.m. on Thursday.

# HOME WATER SOFTENING: WHAT YOU NEED TO KNOW

## What is soft water?

Water naturally has a variety of minerals such as calcium and magnesium. Whether a water supply is considered “hard” or “soft” depends on how much of these minerals are in your water. Soft water contains lower levels of calcium and/or magnesium than hard water.

## Do I need to soften my water?

There is no requirement to soften your water. The decision to soften is a personal choice that can affect your home and the environment. If your water’s hardness is greater than 7 grains per gallon or 120 mg/L, then you might need a water softener to ensure your appliances run well and to improve aesthetic considerations.

## Understand the hardness of your water

To decide if you need a home water softener, learn about the hardness of your home’s water. You can measure the hardness of your water using a test kit or an independent laboratory. Search for labs at Environmental Laboratory Accreditation Program. If you get your water from a community water system, you can contact them directly for information about your water’s hardness.

## How do home softeners work?

Home water softeners, also called ion exchange units, are appliances that remove calcium and magnesium in

water. Resin beads inside the softener trap the calcium and magnesium and exchange them for sodium or potassium. Once the resin beads become full of calcium and magnesium, a highly-concentrated salt or potassium solution removes the calcium and magnesium from the beads. After passing through the beads, the resulting chloride solution becomes a waste stream that goes down the drain and ultimately into the environment.

## ADVANTAGES OF HOME WATER SOFTENING

- Prevents build-up of minerals (scale) on the inside of pipes, fixtures, and hot water heaters.
- Lengthens the life of some appliances.
- Reduces or prevents mineral spots on glassware.
- Prevents or reduces soap films and detergent curds in sinks, bathtubs, and washing machines.

## DISADVANTAGES OF HOME WATER SOFTENING

- Can corrode your pipes. The corroded metal ions from the pipes can end up in your water.
- Potential health implications from additional sodium from water softening.
- Regular testing of the water and maintenance of the softener is necessary to make sure the softener is working properly.
- Negative impacts to the environment from salt use.
- Water waste: The water used to regenerate the softener beads ends up as waste.

## What are the health effects of home softening?

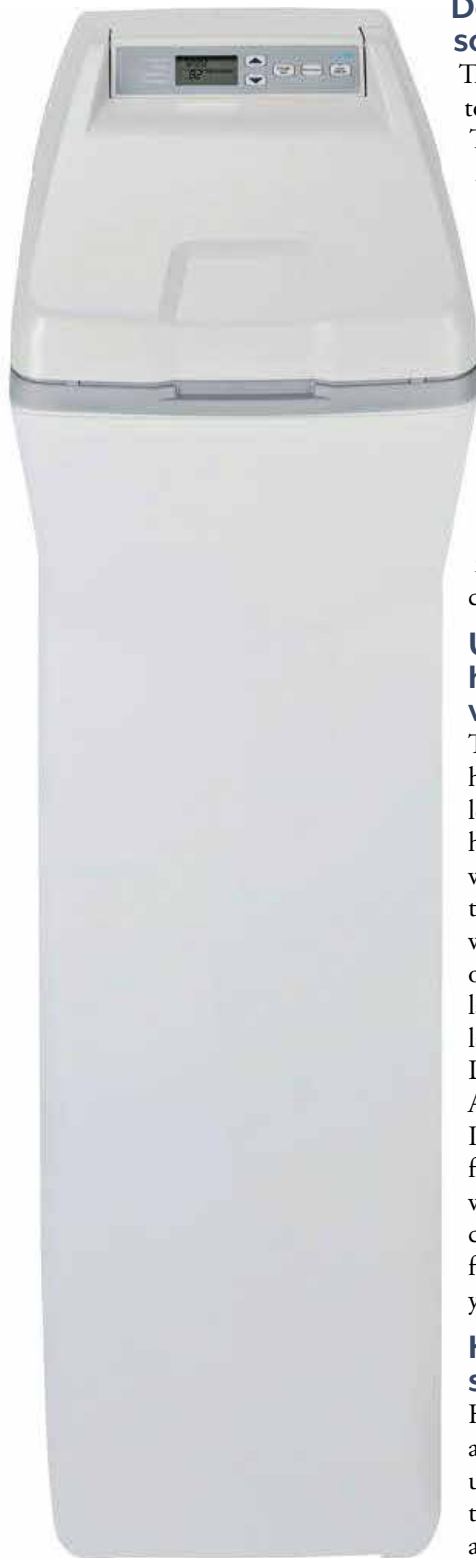
- A water softener that uses sodium chloride (salt) increases the amount of sodium in the water you drink at home. Consider the following if you have a home softener: If you or someone in your home has a history of high blood pressure, consult a doctor about drinking softened water.
- You can decrease the amount of sodium you drink:
  - ◆ Have an un-softened tap for cooking and drinking.
  - ◆ Regenerate your softener with potassium chloride instead of sodium chloride (salt). Potassium chloride is available at most stores that sell softener salt.

The calcium and magnesium removed by softening are not harmful and may be beneficial sources of essential elements needed by the body. Removing them from your water may mean you will have to get more of them from your diet.

## What are the environmental impacts of home softening?

In some communities, home water softeners drain to municipal wastewater treatment plants, which are not designed to remove chlorides. The chloride passes through the treatment plant and ends up in our lakes and streams. In homes with private wells and home softeners, chloride drains to the home’s septic system and may end up in lakes and streams.

*Content provided by the Minnesota Department of Health.*  
[www.health.state.mn.us/divs/eh/eater/factsheet/softening.html](http://www.health.state.mn.us/divs/eh/eater/factsheet/softening.html)



# PROTECTING WATER QUALITY WITH BIOREACTORS

*John McMaine, Ph.D., Assistant Professor & South Dakota State University Extension Water Management Engineer*

Nitrogen is one of the building blocks of life, but too much nitrogen can lead to unwanted consequences for drinking water and aquatic ecosystems. For example, babies and toddlers that consume water with a high nitrate level are at risk for methemoglobinemia, more commonly known as blue baby syndrome. High nitrate decreases the ability of blood to carry oxygen which can be fatal to infants. Blue baby syndrome has resulted in a national drinking water standard, that nitrate concentrations must be lower than 10 parts per million. For reference, 10 parts per million is approximately equivalent to 10 drops in a 1,000 gallon tank. Nitrate (or any excess nutrients) are also a concern for water ecosystems. Excess nutrients can cause algae to bloom, or grow at a high rate. Besides being a nuisance for swimming, boating, and other recreation, algae blooms can also impact aquatic ecosystems. As the algae grows and dies, it uses oxygen out of the water until there is not enough dissolved oxygen for fish to survive. One of the more famous hypoxic zones, or water bodies with very little dissolved oxygen, is in the Gulf of Mexico near the coast of Louisiana and Texas. In 2017, the Gulf of Mexico hypoxic zone measured over 8,700 square miles (about 380 million acres or the size of New Jersey). Groups across the Mississippi River basin are working together to develop and implement practices and technology to reduce the size of the hypoxic zone through reducing nutrient losses from the Mississippi River basin.

## So what can we do?

We do have tools in our toolbox to limit the loss of nitrogen and other nutrients into streams, rivers, and lakes including in-field best management practices such as soil testing, precision application of fertilizer, cover crops, and edge-of-field

**Bioreactors are underground trenches on the edge of farm fields, filled with wood chips (or some other carbon source), that use bacteria to remove nitrate from subsurface drainage (tile) water by converting it into nitrogen gas.**

practices such as bioreactors, saturated buffers, drainage water recycling, and constructed wetlands. Bioreactors are an edge-of-field practice that has gained in popularity throughout Midwestern states over the last decade. Bioreactors are underground trenches on the edge of farm fields, filled with wood chips (or some other carbon source), that use bacteria to remove nitrate from subsurface drainage (tile) water by converting it into nitrogen gas. Some advantages of bioreactors are that they do not take much (if any) land out of production, they can be retrofitted into existing drainage systems, and they require little maintenance (changing levels in control structures a few times each year). Research has shown that bioreactors can reduce nitrate levels by 30% to 70%.

## How do bioreactors work?

Nitrate can be converted to harmless nitrogen gas through a process called denitrification. In conditions where there is a carbon source (typically woodchips in bioreactors) and no oxygen, bacteria can transform the nitrate compounds into harmless nitrogen gas. Water levels are set at the inlet and outlet of a bioreactor

to maintain saturated conditions which turn anaerobic (no oxygen present). Eventually the bacteria use up all the carbon present in the woodchips and the woodchips must be replaced. Some studies in Iowa have indicated that the woodchips in bioreactors need to be replaced after about 15 years.



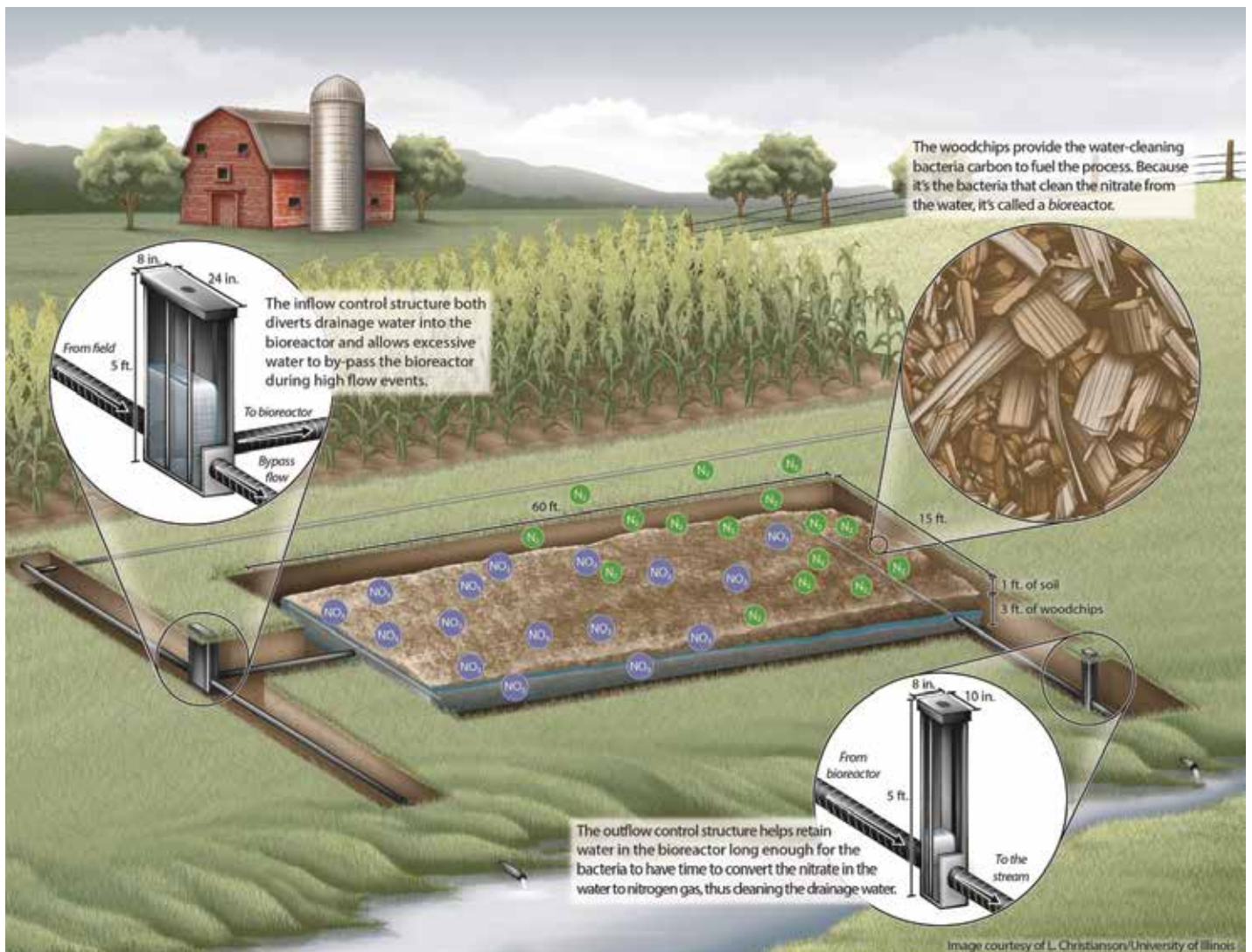
*Bioreactor dug, lined, and ready to be filled with woodchips. Image by Chris Hay.*

## Are there any bioreactors in South Dakota?

South Dakota State University has installed and monitored four bioreactors in eastern South Dakota with the first being installed in July, 2012. These bioreactors have been monitored for nitrate reduction and results show load reductions ranged from 12% to 40%. The Baltic bioreactor cost approximately \$8,800 (with almost \$4,000 from woodchips) and treated 40 acres. The Montrose bioreactor cost \$10,400 (with \$4,500 from woodchips) and treated 35 acres. The bioreactors are designed to have a hydraulic retention time (time it takes water to move from the inlet to the outlet) of 4-8 hours.



**Bioreactor filled with woodchips, geotextile is being laid on top and topsoil is being backfilled onto geotextile. Image by Chris Hay.**



**Bioreactor conceptual drawing. Diagram courtesy of Matt Helmers and Laura Christianson, Iowa State University and University of Illinois Urbana Champagne. Illustration by John Peterson.**



# THE STATE OF *Our Waters*

***By Jay Gilbertson, East Dakota Water Development District***

Every year, the people of South Dakota, along with thousands of visitors, make use of the many and varied water resources of the state. Rivers and lakes are tapped by public water suppliers and private citizens for drinking water; irrigation provides water to crops and lawns to augment natural precipitation; anglers scour our lakes and streams in search of fish, and young and old enjoy a quick dip to escape the heat of summer. All of these activities are things we take for granted, but how do we know that the water on which we depend is really up to the task?

The South Dakota Department of Environment and Natural Resources (DENR), in cooperation with the United States Environmental Protection Agency (EPA), have identified a number of general classes of activities, known as beneficial uses, for the waters of the state. These are:

- (1) Domestic water supply;
- (2) Coldwater permanent fish life propagation;
- (3) Coldwater marginal fish life propagation;
- (4) Warmwater permanent fish life propagation;
- (5) Warmwater semipermanent fish life propagation;
- (6) Warmwater marginal fish life propagation;
- (7) Immersion recreation (swimming);
- (8) Limited contact recreation (boating and fishing);
- (9) Fish and wildlife propagation, recreation, and stock watering;
- (10) Irrigation; and
- (11) Commerce and industry.

All rivers and streams in South Dakota are assigned the beneficial uses (9) and (10) unless otherwise stated in the Administrative Rules of South Dakota (ARSD) Chapter 74:51:03. Lakes listed

in ARSD Chapter 74:51:02 are assigned the beneficial uses of (7), (8) and (9) unless otherwise specified. These water bodies may also be assigned additional beneficial uses depending on local conditions.

For each beneficial use, DENR and EPA have established measurable standards (numeric criteria) to determine if the use can be safely met. For example, if the intended use is Immersion Recreation (swimming), bacteria counts in the water must be below a certain level, and dissolved oxygen must be over a particular level. If the water body is to be used as a domestic water supply, concentrations of nitrate, sulfate, total dissolved solids, and other constituents cannot exceed specific levels. Temperature and suspended solids are the primary criteria used to evaluate suitability for the fisheries classifications, (2) through (6).

If most of the analyses from a particular water body meets the numeric criteria, then the resource is considered fully supporting of the designated use. It should be noted that a “fully supporting” designation does not necessarily mean that there were no problems found. It just means that if they were, they were few and far between, and not considered a serious risk to human health and safety. However, if violations of the numeric criteria are frequent and/or severe, then the water body is considered impaired, and not supporting one or more of its intended uses.

Every two years, DENR assembles water quality information on the rivers, lakes, and streams of the state. The purpose of this report is to assess the water quality of South Dakota’s water resources and to identify the impaired water bodies. This report meets the requirements of Sections 305(b), 303(d), and 314 of the federal Clean Water Act, which mandates a biennial report on state water quality to Congress. This report is also intended to inform the citizens of South Dakota on the status of the quality of their water resources. Finally, it serves as the basis for management decisions by natural resource agencies and interested



stakeholders to plan and prioritize water pollution control activities. The report is published in even-numbered years. The 2018 South Dakota Integrated Report for Surface Water Quality Assessment was completed earlier this year and is available on the DENR website, <http://denr.sd.gov/documents/18irfinal.pdf>.

The Integrated Report breaks the State into fourteen major watersheds. It shows the name and location (county) of each lake and river/stream segment for which information is available. Each specific beneficial use is listed, along with whether or not it is meeting the intended use. In some cases, most often for immersion and/or limited contact recreation, there is insufficient information on which to determine if the use is supported or not. If an impairment exists, the cause is given, and where possible, potential sources of the problem are listed.

In the 2018 Integrated Report, excessive amounts of bacteria (primarily from livestock) and total suspended solids (agricultural and natural sources) were the most common sources of impairments to recreational, and fisheries/aquatic life uses respectively. Another significant impairment is mercury found in fish flesh, although as this is mostly attributed to atmospheric deposition from out-of-state sources, local corrective measures are problematic.

So, what happens when an impairment is found? Once a water body is determined to be impaired, DENR is required to conduct a more thorough investigation to better identify the source(s) of the impairment(s). Although the State maintains a network of over 150 surface water monitoring locations on rivers and streams, and annually samples over 60 lakes, their efforts are designed to function largely as screening tools. Rarely does this system provide sufficient information so that a particular problem can be effectively identified and treated.

These detailed investigations result in the development of something called a total maximum daily load, or TMDL. A TMDL represents the amount of a particular contaminant that can enter a water body in a given day without the beneficial use being impaired. A comparison of the actual pollutant load and the TMDL can give a pretty good idea of the amount of effort needed to correct the problem(s). A TMDL report will include recommendations for what actions may be necessary to address the problem(s) and to reduce the pollutant loadings.

In most cases, non-point source (NPS) pollution sources are responsible for identified impairments. NPS pollution, as its name implies, results from the cumulative impact of many small activities across a watershed, as opposed to emanating from a single, readily identifiable location (point source). In South Dakota, where agriculture dominates the economy, it is no surprise that a significant amount of the NPS pollution is agriculture-related. However, municipalities and commercial and residential areas can be significant contributors as well. In some instances, natural, or background, sources have caused impairments.

Once a TMDL report has been prepared, DENR works with interested local natural resource agencies and others to develop a project to address the problems. Referred to as watershed implementation projects, they utilize local, state and federal fiscal and technical resources to put into place voluntary changes to problematic land use practices. The changes, or best management

practices (BMPs), are designed to allow the landowner to continue to use their property in a manner they desire, while also eliminating, or at least minimizing, adverse impacts on the public water bodies. In most cases, adoption of BMPs results in improved efficiency and productivity, as well as reducing pollution potential. However, in recognition of the genuine public benefit derived from BMP implementation, projects provide cost-share assistance of up to seventy-five percent (75%) to willing landowners.

The BMPs that may be promoted by a particular project can vary depending on the type(s) of impairment(s) and the likelihood of adoption. After all, the best solution is no good unless someone is interested in putting it into practice. Examples of BMPs supported by watershed implementation projects around the state include: upgrading animal waste management systems, installing terraces and grassed waterways, irrigation system upgrades, river bank and shoreline stabilization, long-term or permanent easements along rivers and streams, and public awareness and education. Most projects also have a water quality monitoring component to measure impacts on impaired waters.

Unfortunately, there is rarely a single action, or a small set of changes, that can alter the status of a water body. NPS pollution comes from many places over a large area, and so “fixing” such problems involves implementing many BMPs across the watershed. As a result, watershed restoration projects may need to put in place hundreds of BMPs to affect change. The problems they are seeking to correct developed over many years - fixing them can also be a long-term, and costly, commitment.

Efforts to address known water quality impairments are currently active in nearly every major watershed in South Dakota. The Big Sioux River Watershed Project has developed innovative riparian buffer activities that are having a demonstrable impact on water quality in the most heavily used watershed in the state. The Belle Fourche River Partnership is working to improve irrigation efficiency and a subsequent reduction in field runoff. The South Central Watershed Project provides guidance and assistance to landowners in the Vermillion and lower James River basins, along with the watershed of Lewis & Clark Lake, spanning territory from Clearfield to Canova. These are just a few of the efforts underway.

Where do things go from here? DENR, the East Dakota Water Development District and other natural resource agencies continue to monitor the status of our water bodies. For the most part, the problems that have been identified, while real and requiring corrective efforts, do not represent significant threats to human health and safety, provided a little common sense is exercised. Drinking water impairments are rare, and with the ever increasing improvements in treatment technology, public water supplies are unlikely to be seriously harmed. (Provided we are prepared to pay treatment costs.)

What can you do? As noted above, most of the problems arise from NPS pollution. Every one of us is or can be a source of pollution, so we should all take a look at what we are doing and take steps to make things better. Never has the old adage, “an ounce of prevention is worth a pound of cure,” been more relevant.

## KINGBROOK RURAL WATER SYSTEM

In 1974, a steering committee looked into the feasibility of developing a rural water system to serve portions of Brookings, Kingsbury, Lake and Miner Counties. DeWild Grant Reckert and Associates Company (DGR) completed the preliminary engineering report and, upon approval by the committee, the report was forwarded to the Farmers Home Administration (FmHA) for funding consideration.

With more than 1,500 water users signed up and an estimated project cost of \$8 million, Kingbrook Rural Water System was formed. Of particular interest was the farsighted approach of Kingbrook's early directors when they teamed with Brookings-Deuel Rural Water in a joint venture to build Kingbrook's first treatment plant. The plant was constructed four miles north of Bruce and has served both systems since the late 1970s. Two additional treatment plants, one north of DeSmet and the other northwest of Chester, were constructed and became the foundation for later Kingbrook expansion.

Kingbrook soon became a vast network of pipeline, meters, ground storage reservoirs, filtration plants, and supply wells. Additional members joined the system during the planning and construction stages, bringing the total number of service connections to nearly 2,200 when construction was completed in 1981 at a total cost of \$12.4 million.

### Growth in the 1990s and Beyond

With increasing demand from current users, as well as interest from many rural residents needing a safe source of drinking water free of nitrates and other harmful chemicals, Kingbrook's Board of Directors recognized a need to improve and expand the system in the early 1990s.

Improvements were made to the DeSmet, Bruce and Chester treatment plants; additional wells were constructed and water storage reservoirs added to improve capacity, and a concerted effort was made to accommodate small towns who wanted to join the system. Growth was rapid and expanded Kingbrook's service area from the original four counties to the eleven counties it serves today.

Over the years, these projects enabled Kingbrook to meet the increasing demands of its customers which now include many Concentrated Animal Feeding Operations including cattle feedlots, large hog confinement units and dairies. The latest expansion project, currently in the construction phase, is scheduled to be completed in 2019. When completed it will have added 20 miles of 12 inch to 16 inch diameter mainline, 165 miles of rural distribution pipeline water, service to approximately 255 new customers, and a new 600,000 gallon storage tank. The \$12.8 million project was funded with a \$10.8 million low-interest loan and \$1.4 million grant from USDA Rural Development, and \$575,000 of local matching funds.



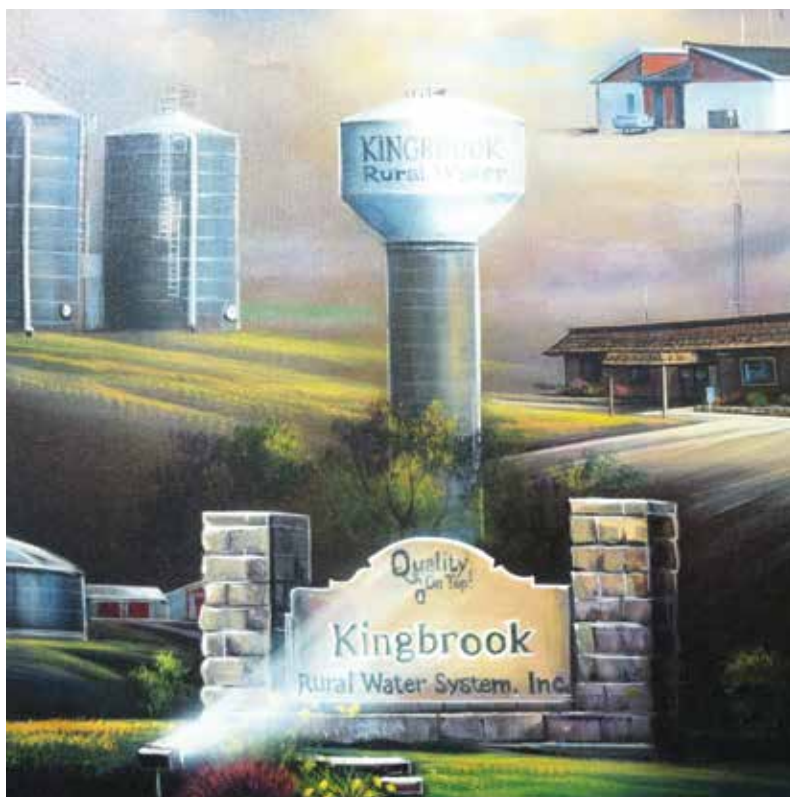
# KINGBROOK RURAL WATER SYSTEM



Upon completion of Kingbrook's original construction, the system had 2,200 customers. Today, that number has expanded to over 4,900 individual service connections and provides bulk service to nine municipalities, individual service to 12 small communities and has more than 2,400 miles of pipe in the ground. Storage capacity has reached 5.6 million gallons and total annual sales exceed 700 million gallons.

With its source of water coming from wells located adjacent to the three treatment plants, Kingbrook aggressively implemented wellhead protection measures to protect its source water. These measures culminated in the recent purchase of land surrounding the well fields to ensure a safe and reliable water source well into the future.

Kingbrook Rural Water System's office is located in Arlington. The system initially served an area approximately 2,000 square miles, from Montrose north to Hayti, and from Bruce west to Manchester. The system has expanded to cover roughly 2,600 square miles and has grown east to west, spanning from Brookings (Interstate 29) to Iroquois.



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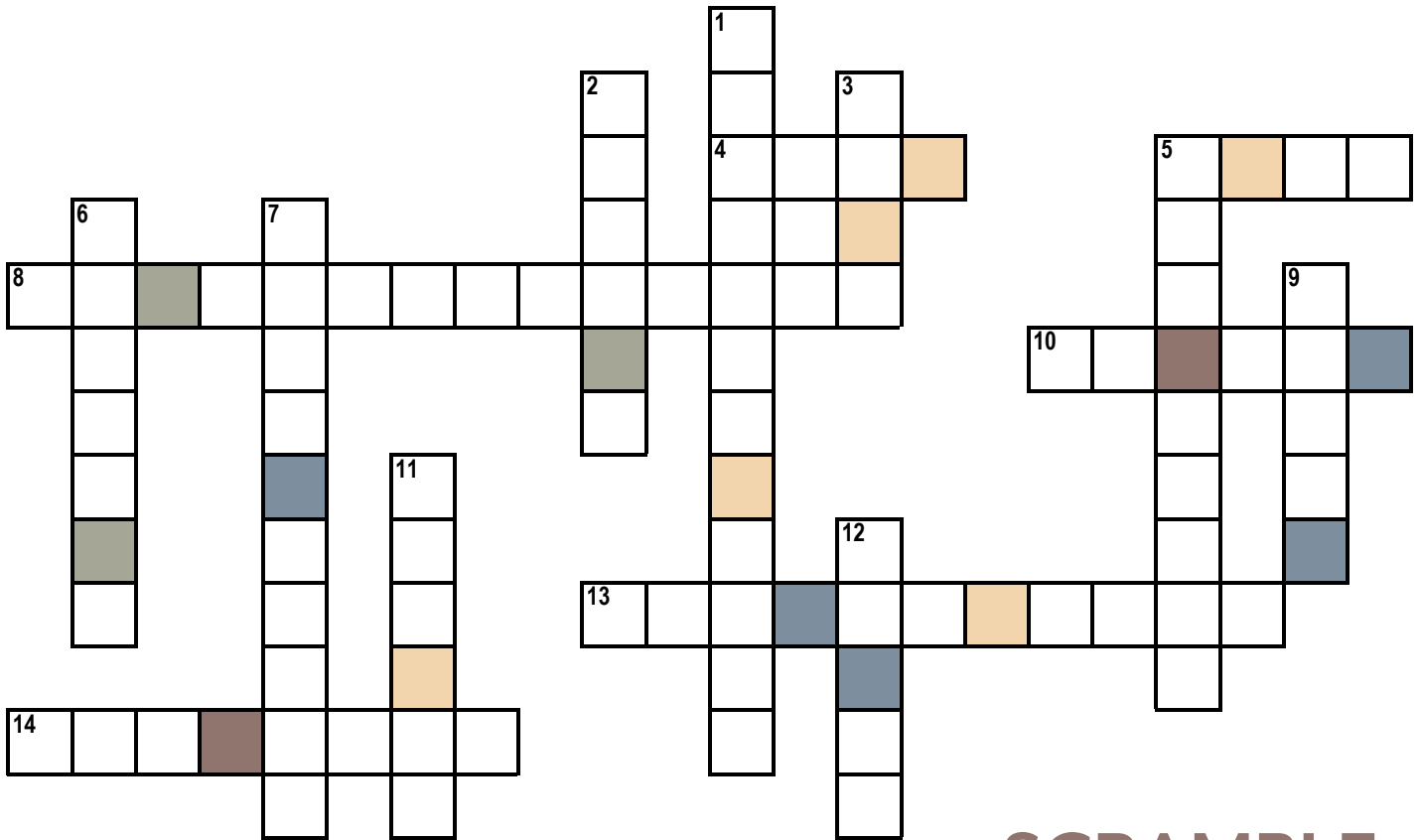
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**Danielle Zeeck**, Billing Clerk  
**Tabitha Petersen**, Accounting Clerk  
**Jenna Lundquist**, Accounting/  
Customer Service Assistant

## STATISTICS:

**Hookups:** 4,900+  
**Miles of Pipeline:** 2,400+  
**Water Source:** Wells  
**Counties Served:** Portions of Beadle, Brookings, Clark, Kingsbury, Lake, McCook, Minnehaha, Miner, Moody, Hamlin, and Sanborn  
**Towns Served Individual:** Erwin, Franklin, Hetland, Junius, Manchester, Unityville, Vilas, Carthage, Oseola, Winfred, Sinai  
**Towns Served Bulk:** Arlington, Bancroft, Badger, Howard, Iroquois, Lake Preston, Montrose, Oldham, Ramona

# RURAL WATER CROSSWORD & WORD SCRAMBLE CONTEST

## Household Water Usage



### ACROSS

4. Outdoor place to make a splash
5. Kitchen basin
8. It'll take a load (2 words)
10. The British call it a loo
13. Need for a hot bath (2 words)
14. Increases sudsing power

### DOWN

1. Sewage holder
2. Sink's water controller
3. Sprinkler attachment
5. Lawn watering device
6. Site for a soak
7. Sink and sponge alternative
9. Measures water usage
11. Bath alternative
12. Sink outlet

## SCRAMBLE ANSWER



**RULES:** Use the colored squares in the puzzle to solve the word scramble above. Call your Rural Water System (See page 2 for contact information) or enter online at [www.sdarws.com/crossword.html](http://www.sdarws.com/crossword.html) with the correct phrase by October XXth, 2018 to be entered into the \$100 drawing.

Only one entry allowed per address/household. You must be a member of a participating rural water system to be eligible for the prize. Your information will only be used to notify the winner, and will not be shared or sold.

Congratulations to Matt Cavenee who had the correct phrase of "Without water living is impossible" for July 2018.

# RURAL WATER

## ACROSS SOUTH DAKOTA

### KINGBROOK CONSTRUCTION PROJECT UNDERWAY

**A**fter years of planning, Kingbrook's \$12 million systemwide improvements and expansion project is under construction. Pipeline work was awarded to Halme Inc. from the Bryant area and includes installing over 200 miles of mainline pipe and adding more than 250 new customers throughout Kingbrook's eleven county service area. The project also includes the addition of a 600,000-gallon storage tank at the DeSmet treatment plant that was awarded to Tank Connection from Parsons, Kansas. With nearly 5,000 current system customer accounts, this project will expand Kingbrook's customer base by 5%, while providing critical infrastructure improvements to major sections of the system.

Kingbrook customers are served by groundwater treated at three treatment plants. These plants, located northwest of Chester, north of DeSmet and north of Bruce, pump over 700,000,000 gallons of water each year. Over 15 years ago, Kingbrook's Board

executed a long-range strategic plan to tie these three water sources together using large diameter mainlines. Due to the significant cost to complete this effort, it required completing the work in phases, and each subsequent project has included portions of the long-range plan. The current construction project will complete approximately 20 miles of the strategic plan and will complete the connection between the Bruce plant and the DeSmet plant service area. Upon project completion, these two facilities will provide backup service to the other, to increase reliability by supplying additional water during periods of high demand.

The 600,000-gallon storage tank was completed this summer in time to help manage the typical July 4th increased demands, and the pipe portion of the project is scheduled for completion next year.



*Pouring concrete floor slab for recently completed 600,000 gallon glass lined storage tank at the 1.6 million gallons per day (gpd) DeSmet treatment plant.*



*Installing over 200 miles of project mainline pipe using plowing technology.*



*12-inch diameter pipeline installation.*

# South Dakota Rural Water AWARD NOMINATIONS

Do you know someone who is doing a great job? Goes above and beyond the call of duty? Has your water system achieved excellence this year – or has overcome some amazing challenges?

Give recognition where it is due by completing our Awards Nomination Form. Awards will be presented at the Awards Brunch at the ATC – January 10, 2019. **Application deadline is October 26, 2018.** Eligible nominees must be affiliated with a system member in good standing. The online form can be found at [www.surveymonkey.com/r/ATCAwards](http://www.surveymonkey.com/r/ATCAwards), or through a link on our website at: [www.sdarws.com/annual-conference.html](http://www.sdarws.com/annual-conference.html).

## WE ARE ACCEPTING NOMINATIONS FOR THE FOLLOWING CATEGORIES:

**RURAL WATER SYSTEM OF THE YEAR:** a member system who puts forth exceptional efforts to properly manage, operate, and maintain their drinking water system.

**RURAL WATER MANAGER OF THE YEAR:** Recognition for a manager of a Rural Water System for outstanding performance in operating a Rural Water System.

**RURAL WATER OFFICE PERSON OF THE YEAR:** Recognition for an administrative employee of a Rural Water System for outstanding performance in office management and procedures.

**RURAL WATER SYSTEM OPERATIONS SUPERVISOR OF THE YEAR:** Recognition for a State of South Dakota Certified Operator who is actively working a supervisory role for a Rural Water System, and has demonstrated outstanding leadership ability and/or accomplishments in drinking water.

**RURAL WATER SYSTEM OPERATIONS SPECIALIST OF THE YEAR:** Recognition for a State of South Dakota Certified Operator who is actively working for a Rural Water System with outstanding leadership ability and/or accomplishments in drinking water.

**MUNICIPAL WATER/WASTEWATER SYSTEM OF THE YEAR:** a municipality who puts forth exceptional efforts to properly manage, operate, and maintain their drinking water and wastewater system.

**MUNICIPAL MANAGER OF THE YEAR:** Recognition for a municipal manager for outstanding performance in managing a municipality.

**MUNICIPAL OFFICE PERSON OF THE YEAR:** Recognition for an administrative employee of a municipality (i.e. clerk, finance officer, etc.) for outstanding performance in office management and procedures.

**MUNICIPAL OPERATIONS SPECIALIST OF THE YEAR:** Recognition for a State of South Dakota Certified Operator who is actively working for a municipality with outstanding leadership ability/accomplishments in water.

**CARROLL ANDERSON MEMORIAL:** The Carroll Anderson Memorial Award is a tribute to the exemplary work of Carroll Anderson who gave generously of his time, talents, and efforts to the Kingbrook Rural Water System and the South Dakota Association of Rural Water Systems. This award recognizes an individual's outstanding voluntary contributions to the advancement of rural community water systems in South Dakota, and is the greatest tribute the Association can bestow recognizing an individual's contributions to both the member system and to SDARWS.

**FRIEND OF RURAL WATER:** This distinguished honor is awarded to agencies, organizations, or individuals who have lent a hand in supporting this fantastic phenomenon we call Rural Water. The ability to provide life's essential need, water, to all the citizens of South Dakota was not done by one person or organization; it is a collective effort encompassing many.

**SPIRIT OF RURAL WATER:** This award is presented to an individual, business or group that goes above and beyond for a rural water system or rural water cause. South Dakota Rural Water wants to recognize exceptional rural water advocates that stand out from the pack because of their commitment to rural water issues and/or their passion for the job. Eligible candidates include rural and community water consumers, employees, directors, as well as lawmakers, businesses, or any person or group that puts forth a noble effort to advance rural water.

**DONALD B. POSPISHIL:** This award honors the work of Don Pospishil who dedicated many years of his life to helping small water systems across South Dakota. The Donald B. Pospishil Award is awarded to individuals who demonstrate leadership abilities in the water supply field, provide quality services to consumers, and exhibits professionalism and dedication while operating and maintaining a small water system.

# South Dakota Rural Water 2018 AWARDS NOMINATION FORM

This form is also available online at: [www.surveymonkey.com/r/ATCawards](http://www.surveymonkey.com/r/ATCawards)  
or through a link on our website at: [www.sdarws.com/annual-conference.html](http://www.sdarws.com/annual-conference.html)

Name of Nominee \_\_\_\_\_ Title \_\_\_\_\_

Employer \_\_\_\_\_ Years with System \_\_\_\_\_

Name of person making nomination \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zipcode \_\_\_\_\_

## PLEASE INDICATE AWARD:

- |  |  |
|--|--|
| <input type="checkbox"/> Rural Water System of the Year                | <input type="checkbox"/> Municipal Office Person of the Year         |
| <input type="checkbox"/> Rural Water Manager of the Year               | <input type="checkbox"/> Municipal Operations Specialist of the Year |
| <input type="checkbox"/> Rural Water Office Person of the Year         | <input type="checkbox"/> Carroll Anderson Memorial                   |
| <input type="checkbox"/> Rural Water Operations Supervisor of the Year | <input type="checkbox"/> Friend of Rural Water                       |
| <input type="checkbox"/> Rural Water Operations Specialist of the Year | <input type="checkbox"/> Spirit of Rural Water                       |
| <input type="checkbox"/> Municipal Water/Wastewater System of the Year | <input type="checkbox"/> Donald B. Pospishil                         |
| <input type="checkbox"/> Municipal Manager of the Year                 |  |

**SUPPORTING INFORMATION:** Please provide a narrative for why this nominee deserves the award. (Outstanding accomplishments, contributions to system and state association, certifications, awards, exemplary work on legislative Issues, leadership, civic activities, etc.) Feel free to add additional pages if needed.

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### DEADLINE TO APPLY IS OCTOBER 26, 2018

Please complete this entry form and mail to:  
SDARWS | Attn: Jeremiah | PO Box 287 | Madison, SD 57042  
or scan and email to [atc@sdarws.com](mailto:atc@sdarws.com)

Form is also available online at: [www.surveymonkey.com/r/ATCawards](http://www.surveymonkey.com/r/ATCawards)  
or on our website at: [www.sdarws.com/annual-conference.html](http://www.sdarws.com/annual-conference.html)

# WATER MATTERS

## Nitrates in Well Water (part 2)

Nitrate is a common contaminant found in many wells in South Dakota. Too much nitrate in drinking water can cause serious health problems for young infants. This is the second of a series of reports on nitrates in well water, intended to provide a basic explanation of nitrate in wells and gives steps that you as a well owner can take to protect your family and visitors from illness.

### WHAT ARE THE HEALTH RISKS OF NITRATE IN WELL WATER?

Too much nitrate in drinking water poses a risk to infants under six months of age. If an infant is fed water or formula made with water that is high in nitrate, a condition called "blue baby syndrome" (or "methemoglobinemia") can develop. Bacteria which are present in an infant's stomach can convert nitrate to nitrite (NO<sub>2</sub>), a chemical which can interfere with the ability of the infant's blood to carry oxygen. As the condition worsens, the baby's skin turns a bluish color, particularly around the eyes and mouth. If nitrate levels in the water are high enough and prompt medical attention is not received, death can result.

### WHY ARE YOUNG INFANTS MORE SUSCEPTIBLE?

As an infant ages, its stomach acidity increases, reducing the numbers of nitrite-producing bacteria. After about six months, the conversion of nitrate to nitrite in the stomach no longer

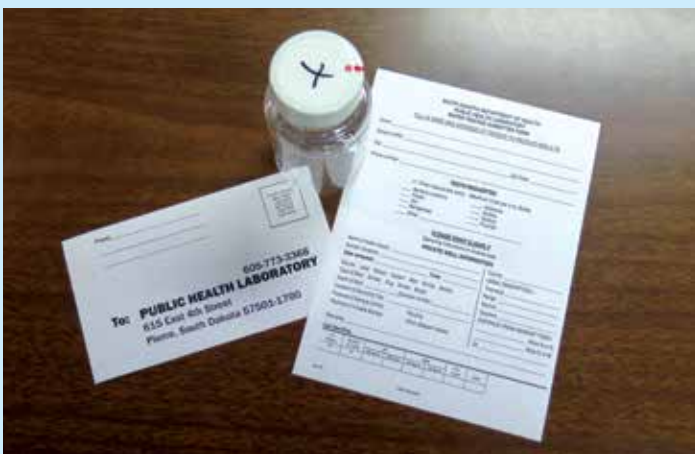
occurs. Most adults can consume a fair amount of nitrate with no ill effects. In fact, the average adult in the United States consumes about 20-25 milligrams of nitrate-nitrogen every day in food, largely from vegetables.

Pregnant women, people with reduced stomach acidity, and people with certain blood disorders may also be susceptible to nitrate-induced methemoglobinemia. Some research has suggested that nitrate may also play a role in the development of some cancers. However, at this time there is no clear evidence that nitrate ingestion results in an increased cancer risk.

### WHAT IF HIGH NITRATE IS FOUND IN MY WATER?

If the nitrate-nitrogen concentration exceeds the health limit of 10 mg/L, do not give the water to any infant under six months of age, either directly or in formula. Infants should be provided with water from a source which has been tested and shown to be low in nitrate and bacterially safe. As noted above, elevated nitrates will not necessarily cause serious problems for older children or adults, but if levels are really high, you should consider finding a new water source.

**NOTE:** While boiling is often recommended when water supplies are compromised, this does not help with nitrates. In fact, nitrate is concentrated as it remains behind while 'clean' water evaporates.



**Back page content provided by:**  
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(605) 688-6741 • <http://eastdakota.org>