

**BROWN  
DAY  
MARSHALL**  
Rural Water System, Inc.



# Quality On Tap!

July 2018 | Volume 14, Issue 1

**SYSTEM SPOTLIGHT:**  
BROOKINGS-DEUEL  
RURAL WATER SYSTEM

**STATEWIDE  
GROUND WATER  
QUALITY  
MONITORING  
NETWORK**

**WELL.... WHAT DO WE HAVE HERE?**  
DEALING WITH ABANDONED WELLS

**ANNUAL MEETING RECAP | RIPARIAN BUFFER TAX INCENTIVES**

# FROM THE MANAGER

Rodney Kappes  
Manager, BDM Rural Water System, Inc.



## Greetings from the Team at BDM:

We ended 2017 on a very positive note and are well into the 2018 season. This year will be a year of continued investment and upgrades to your system. Our engineering team from AE2S presented their first analysis of the hydraulic study on the area from Britton, west to Hecla and south to Groton. Several infrastructure options are being considered to deal with the peak water demand issues in the Groton area. The team will be working with the engineers and develop a final plan. Then the board will decide the options to finance this project. The spraying creates this spike in demand over our standard run rate. Remember to have at least a couple days of spraying needs in on-farm storage. Our primary responsibility is for human and livestock consumption. If the weather provides several hot days at the same time conditions are ideal for spraying, we may need to curtail spraying usage until the reservoirs can recover.

We also have a project with PKG Contracting to remove/replace some of the piping in the water treatment plant and some of the reservoirs. This project will also be replacing meters which are no longer functioning. By changing some of the piping, we will reduce pressure loss that is occurring in the existing piping, and this will, in turn, increase the amount of water that we can move in those areas. The project at the water treatment plant will also decrease the amount of water line breaks we are experiencing on that line.

The replacement of the 75HP motors with 100HP motors, at the water treatment plant, is also in process. This project will reduce line pressure while at the same time increase our ability to push an additional 100 gallons per minute east if we need to.

The initial onsite study by AE2S to  
...continued on page 15



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## Holiday Closings

The BDM Rural Water System offices will be closed on the following dates:

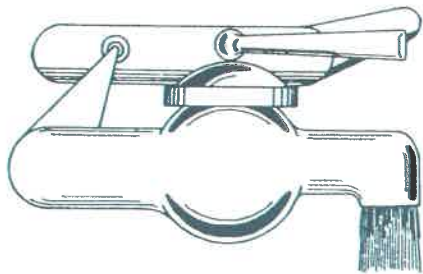
**WEDNESDAY, JULY 4<sup>TH</sup> – INDEPENDENCE DAY**

**MONDAY, SEPTEMBER 3<sup>RD</sup> – LABOR DAY**

As always, if you have an emergency, please call the office at 605-448-5417 or toll free at 1-800-448-9236. You will then receive a message with the telephone number of the employee on call. Please call that person for assistance in an emergency only.

## IMPORTANT PAYMENT REMINDER:

When remitting your water bill payment, please be sure to include the payment stub with your check, even if you have a cellular-read meter. If you have a cellular meter, please leave the meter reading boxes blank; they will be filled in at the office. Payment stubs help ensure that payments are posted to the correct account. We appreciate your cooperation!



## Our Mission

is to ensure our members have quality water at a reasonable price for household, livestock and commercial use for generations to come.

## BDM RURAL WATER SYSTEM, INC. RATE SCHEDULE (Effective July 2017)

### General User Rates:

Debt Service monthly payment: \$35.00 per hookup per month for member-read meters, \$36.00 for cellular meters

\$6.50 per thousand gallons for the first 2,000 gallons used per month

\$5.50 per thousand gallons for the next 5,000 gallons used per month

\$4.50 per thousand gallons for the next 8,000 gallons used per month

\$3.50 per thousand gallons for over 15,000 gallons used per month

\*\*\*Add \$1.00 to the Monthly Totals Below if Hookup has a Cellular Meter\*\*\*

Gallons Used Per Month	Monthly Total	Gallons Used Per Month	Monthly Total
1000	41.50	25000	146.50
2000	48.00	30000	164.00
3000	53.50	35000	181.50
4000	59.00	40000	199.00
5000	64.50	45000	216.50
6000	70.00	50000	234.00
7000	75.50	55000	251.50
8000	80.00	60000	269.00
9000	84.50	65000	286.50
10000	89.00	70000	304.00
11000	93.50	75000	321.50
12000	98.00	80000	339.00
13000	102.50	85000	356.50
14000	107.00	90000	374.00
15000	111.50	95000	391.50
16000	115.00	100000	409.00
17000	118.50	125000	496.50
18000	122.00	150000	584.00
19000	125.50	175000	671.50
20000	129.00	200000	759.00

### Lake User Rates:

Debt Service monthly payment...\$28.00 per hookup per month for member-read meters, \$29.00 for cellular meters

\$6.50 per thousand gallons of all water used per month.

### All Users:

No water is included in the debt service payment. All water used is in addition to the monthly debt service payment. Payments are due by the 10th of the month. A \$10.00 fee applies to all payments received after that date. Service is subject to disconnection if payment is not received by the 15th.

### AFTER HOURS & WEEKENDS WATER EMERGENCIES:

Please call the BDM Office at 605-448-5417 or 1-800-448-9236 & a message will direct you to the employee on call.



# OUT AND ABOUT

## JULY

### **JUNE 30 - JULY 1 - THE GREAT OUTDOOR FESTIVAL, PIERRE**

As a host city for the Bassmaster Elite Series, Pierre will also host a free festival in conjunction with the weigh-ins at Steamboat Park. The Great Outdoors Festival will be held 11 a.m.-5 p.m. on Saturday, June 30, and Sunday, July 1, in Steamboat Park. Activities will include kayaking, paddleboard contests, backyard bass, fly tying, touch tanks, inflatables, Wii ski and aquarium. There will be delicious food from local restaurants, a beverage tent and local entertainment. Fun for all ages! <http://business.pierre.org/events/details/the-great-outdoor-festival-24713>

### **JULY 1-3 - 1880 TRAIN WILD WEST SHOOTOUT, KEYSTONE**

Experience an old west shootout aboard the 1880 Train this summer. Dates are June 21 and 28, July 1, 2, 3, 5, 12, 19 and 26, and August 16 (3:45 p.m. departure). The shootout begins at the Hill City Station where a few of the bad guys board the train and hide their treasure. The train is stopped by cowboys and "held up" halfway between Keystone and Hill City. It's a good thing the sheriff is in town! To experience the shootout, you must ride the 6:45 p.m. Hill City to Keystone departure. [www.1880train.com/old-west-shootout.html](http://www.1880train.com/old-west-shootout.html). Admission fees.

### **1-3 - BADLANDS ASTRONOMY FESTIVAL**

The festival brings together space science professionals, amateur astronomers, educators and visitors for a three-day celebration. Attendees will enjoy spectacular dark night skies at public star parties. During the day, a variety of family-friendly events will provide opportunities to learn about the night sky, the sun and space exploration. Special guest speakers, stargazing activities, solar observing opportunities, and more will take place at the Visitor Center and Cedar Pass Amphitheater. Festival is free, but park admission fees are required. <https://www.nps.gov/badl/planyourvisit/night-sky-program.htm>

### **19-22 - DANISH DAYS, VIBORG**

Danish Days in Viborg has a long and rich history dating back to Viborg's earliest days. Originally celebrated on June 5th to coincide with Denmark's independence day, the celebration has been moved to the third weekend in July. Although the dates have changed, the spirit has remained the same. We still host many of the same events that our founding fathers did such as a parade, community worship service, ball tournaments, dances, and ethnic food. We invite you to come be a "Dane for a Day!" [www.viborgsd.org](http://www.viborgsd.org)

### **20-21 - RAVINE LAKE SUMMER FESTIVAL, HURON**

Join us in Huron, on the beautiful shores of Ravine Lake, on Friday, July 20 (4-9 p.m.), and Saturday, July 21 (9 a.m.-5 p.m.) for two days of fun for the whole family. The fifth annual Ravine Lake Summer Festival will feature a great variety of arts and craft vendors, food vendors and activities. [www.ravinelakesummerfestival.com](http://www.ravinelakesummerfestival.com)

## AUGUST

### **4-5 - RIVERSIDE PARK DAYS, FLANDREAU**

Riverside Park Days is an annual, two-day festival held on the banks of the Big Sioux River. During Park Days, the city park is filled with craft and food vendors, hours of musical entertainment, children's activities and various adult activities including a softball tournament and bean bag tournament. The festival celebrates all there is to love about a small town in the summertime and we hope you'll join us! Hours: Sat - 10-5, Sun, 11-3. Team of Angels does begin breakfast at 7:00am Sunday in conjunction with a church service.

### **18-19 - 30TH ANNUAL ROSHOLT THRESHING BEE**

The Rosholt Area Threshermen's Association was founded in 1988. Since then, men and women from the tri-state area have gotten together every summer to bring yesterday's memories to the present. Each annual Threshing Bee is full of old fashioned fun for the whole family. Events include threshing demonstrations, a parade, a car show, a horse show, a craft show, kids activities, music and food. The schedule runs 10 a.m.-4 p.m. on Saturday and 9 a.m.-5 p.m. on Sunday. The 30th year features Ford. \$7 entry donation for the weekend, children 12 and under are free. [www.rosholtthreshingbee.com](http://www.rosholtthreshingbee.com).

### **23-26 - HUGH GLASS RENDEZVOUS, LEMMON**

The 4th Annual Hugh Glass Rendezvous celebrates the history of frontiersman and fur trader Hugh Glass, who is known far and wide for surviving a grizzly attack at the forks of the Grand River in 1823. Step back in history nearly two centuries and walk upon the site where history was made, where the man became a legend on the banks of the Grand River and Shadepill Reservoir, at Hugh Glass Park. Events include the Rendezvous, a Plein Air Paintout, guided hikes, vendors of period goods and more. Free will donation. [www.hughglassrendezvous.com](http://www.hughglassrendezvous.com)

### **23-26 - PRAIRIE VILLAGE ANNUAL STEAM THRESHING JAMBOREE, MADISON**

The 56th Annual Prairie Village Steam Threshing Jamboree is four days of fun. The 2018 event will feature the Minneapolis Moline National Show. Additional activities include steam and horse threshing, parades, machinery demonstrations, flea market vendors, tractor pulls, musical entertainment, and train and carousel rides. There is a dinner train Friday evening. \$10 for adults (\$12 on Saturday), \$2 for children (ages 6-12) and free for ages 5 and under. A four-day pass is \$30. [www.prairievillage.org/jamboree](http://www.prairievillage.org/jamboree)

### **25-26 - FALL RIVER HOT AIR BALLOON FESTIVAL, HOT SPRINGS**

Join us in Hot Springs in the southern Black Hills for two days of hot air balloon fun. Balloon launches are scheduled for both days about 6:15 a.m. from the Hot Springs Municipal Airport. On Saturday, August 25, there will be static displays and glider rides at the airport, a Night Glow at the Southern Hills Golf Course, and an Art Walk & Chalk in downtown Hot Springs. Refreshments will be available. Events are dependent on weather. Free Admission. [www.hot-springs-sd.com/events/frhab](http://www.hot-springs-sd.com/events/frhab)

*If you would like your event featured in the October 2018 issue of Quality On Tap!, please email your event description to: [info@sdarws.com](mailto:info@sdarws.com). October's issue will cover events taking place October - December 2018. Event listings are subject to approval by the QOT Editorial Board.*



# WHAT IS SOIL HEALTH AND WHY SHOULD YOU CARE?

Soil health is “the capacity of a soil to function” (Doran and Parkin 1993). How well is your soil functioning to infiltrate water and cycle nutrients to water and feed growing plants?

Soil is a living factory of macroscopic and microscopic workers who need food to eat and places to live to do their work. There are more individual organisms in a teaspoon of soil than there are people on earth; thus, the soil is controlled by these organisms.

Tillage, fertilizer, livestock, pesticides, and other management tools can be used to improve soil health, or they can significantly damage soil health if not applied correctly.

Managing for soil health (improved soil function) is mostly a matter of maintaining suitable habitat for the myriad of creatures that comprise the soil food web.

Managing for soil health can be accomplished by disturbing the soil as little as possible, growing as many different species of plants as practical, keeping living plants in the soil as often as possible, and keeping the soil covered all the time.

## MANAGE MORE BY DISTURBING SOIL LESS

Tilling the soil is the equivalent of an earthquake, hurricane, tornado, and forest fire occurring simultaneously to the world of soil organisms. Simply stated, tillage is bad for the soil.

Physical soil disturbance, such as tillage with a plow, disk, or chisel plow, that results in bare or compacted soil is destructive and disruptive to soil microbes and creates a hostile, instead of hospitable, place for them to live and work.

The soil may also be disturbed chemically or biologically through the misuse of inputs, such as fertilizers and pesticides. This disrupts the symbiotic relationship between fungi, microorganisms and crop roots.

By reducing nutrient inputs, we can take advantage of the nutrient cycles in the soil to supply crop nutrients and allow plants to make essential associations with soil organisms.

## DIVERSITY WITH CROP DIVERSITY

Sugars made by plants are released from their roots into the soil and traded to soil microbes for nutrients to support plant growth. The key to improving soil health is assuring that the food and energy chains and webs includes as many different plants or animals as practical.

Biodiversity will ultimately be the key to success of any agricultural system. Lack of biodiversity severely limits the potential of any cropping system and disease and pest problems are increased.

A diverse and fully functioning soil food web provides for nutrient, energy, and water cycling that allows a soil to express its full potential.

## GROW LIVING ROOTS THROUGHOUT THE YEAR

There are many sources of food in the soil that feed the soil food web, but there is no better food than the sugar exuded by living roots.

Soil organisms feed on sugar from living plant roots first. Next, they feed on dead plant roots, followed by above-ground crop residues, such as straw, chaff, husks, stalks, flowers, and leaves. Lastly, they feed on the humic organic matter in the soil.

Healthy soil is dependent upon how well the soil food web is fed. Providing plenty of easily accessible food to soil microbes helps them cycle nutrients that plants need to grow.

## KEEP THE SOIL COVERED AS MUCH AS POSSIBLE

Soil should always be covered by growing plants and/or their residues, and soil should rarely be visible from above. This is true regardless of land use (cropland, hayland, pasture, or range). Soil cover protects soil aggregates from ‘taking a beating’ from the force of falling raindrops. Even a healthy soil with water-stable aggregates (held together by biological glues) that can withstand wetting by the rain may not be able to withstand a ‘pounding’ from raindrops.

A mulch of crop residues on the soil surface suppresses weeds early in the growing season giving the intended crop an advantage. They also keep the soil cool and moist which provides favorable habitat for many organisms that begin residue decomposition by shredding residues into smaller pieces.

MANAGING FOR  
SOIL HEALTH  
MUST BEGIN  
BY CHANGING  
THE WAY YOU  
THINK ABOUT SOIL

## SOIL HEALTH FOR YOUR FARM, RANCH... FOR YOU!

Soil health is improved by disturbing the soil less, growing the greatest diversity of crops (in rotation and as diverse mixtures of cover crops), maintaining living roots in the soil as much as possible (with crops and cover crops), and keeping the soil covered with residue at all times. Drills, planters, seed, fertilizer, pesticides, livestock, fences, water, farm implements, etc. are all tools that can be used to manage the soil habitat for the benefit of living members of the soil food web.

Many soils have a water infiltration problem that causes a water runoff problem. If soil health is improved, the structure of the soil results in greater water infiltration, less runoff, less or no erosion, and reduced incidence of flooding and sedimentation.

*Content provided by the South Dakota Natural Resources Conservation Service (NRCS). For more information on soil health, visit [www.nrcs.usda.gov/wps/portal/nrcs/main/sd/soils/health/](http://www.nrcs.usda.gov/wps/portal/nrcs/main/sd/soils/health/)*

# Well... WHAT DO WE HAVE HERE?



Abandoned wells exist throughout South Dakota and tap into every principle aquifer in the state. These are the same aquifers that we rely on today for much of the drinking water used in South Dakota. While the actual number of abandoned wells is not known, it is possible to make some reasonable estimates of the number of abandoned wells. In 1910, South Dakota had approximately 78,000 farms which reached a maximum of 84,300 farms in 1932. Since that time, farm numbers have declined steadily to about 31,700 today. Therefore, South Dakota has lost approximately 52,600 farms that likely had at least one well which may now be abandoned.

Aside from the reduction in the number of farmsteads, other factors have also contributed to the creation of abandoned wells. Rural electrification provided power to farmsteads that may have allowed access and pumping from more reliable, but deeper, aquifers. Similarly, regional rural water systems provided access to consistent and reliable water supplies, replacing, or at least supplanting on-site farm wells. Abandoned wells are not only a problem on farmsteads. Municipalities have also hooked up to rural water systems or constructed replacement wells and may not have appropriately plugged their old wells, which gradually fall into disrepair. Surprisingly, there remain a large number of private wells in many communities, even when there is a municipal water source.

Many people have good intentions to maintain an old well as a backup or standby well, but frequently these wells are sparingly if ever, used, and ultimately fall into disrepair. Many are forgotten over time. When this occurs, the old well becomes both a potential pollution source to everyone using the aquifer and as well as a possible physical safety liability to the property owner. Whoever owns the property on which the abandoned well is located is deemed to be the well owner, even if nobody knew of its existence.

## LOCATING ABANDONED WELLS

Abandoned wells may be located anywhere, but there are some obvious indicators if you look carefully. On abandoned farmsteads, the presence of former wells may be marked by relic windmills or hand pumps, or a simple pipe sticking out of the ground. Wells were often drilled near outbuildings/barns, as hauling water to the livestock was more work than hauling water to the house. Large diameter, or bored, wells may have collapsed slowly over time, leaving a circular depression, with or without some other evidence of a well. Similar evidence would apply to locating old wells on existing farmsteads now served by alternate sources.

In many parts of South Dakota, early residents tapped into flowing artesian aquifers, which provided water without the need to pump it out of the ground. However, the quality of this water was not always the best, and as higher quality sources became available, many of these wells were also abandoned. Over time, the corrosive nature of this water can eat away at the well materials, degrading if not completely destroying the original structure. Old flowing well sites are often marked by low depressions supporting aquatic vegetation, such as cattails, in areas that are otherwise dry. If remnants of the original wells remain, water may be seen spraying into the air.



## SAFETY HAZARDS

Many abandoned wells are not marked or covered. In some instances, the well casing, or a pit in which the well is located, is large enough for a person or animal to fall into and become seriously injured or killed. While the existence of such a threat to physical safety might be known by property owners familiar with the lay of the land, visiting friends and family may not know places to avoid. Fortunately, these types of accidents are entirely preventable with proper plugging of the well.

## PROPERTY OWNER RESPONSIBILITIES

The owner of a property on which an abandoned well is located is deemed to be the owner of the abandoned well. Consequently, the owner is also responsible for plugging the abandoned well, or wells, as required by South Dakota Codified Law (SDCL) 46-6-18 and 46-6-27. There are many reasons for the owner to properly plug an abandoned well, aside from the legal requirement to complete the plugging. These wells also pose environmental and safety hazards resulting in potential legal liabilities. A list of abandoned well hazards is as follows:

- Contamination of aquifers by allowing surface runoff carrying pollutants to enter the ground water;
- Cross-contamination of aquifers by the well passing through more than one aquifer;
- Reducing artesian head pressure which may affect other wells in the same aquifer;
- Safety hazards to people and animals.

The plugging of an abandoned well needs to meet requirements outlined in the South Dakota Well Construction Standards, which can be found in the Administrative Rules of South Dakota Sections 74:02:04:67 and 74:02:04:69. These rules specify how to plug a well depending on the type of well construction, the kind of aquifer or aquifers which the well penetrates, and the materials to be used to plug the well. Even though the owner of an abandoned well may plug the well, we strongly suggest that a South Dakota licensed well driller perform the work. In some instances, complications may arise that benefit from a little practical experience. If a well is not plugged correctly, safety and ground water contamination threats may remain, and it is much more difficult and expensive to correct the improper plugging of an abandoned well.

If you have questions or need more information, please contact the Water Rights Program at 605-773-3352. Information is also available online at: [denr.sd.gov/des/wr/abandonedwell.aspx](http://denr.sd.gov/des/wr/abandonedwell.aspx).

**Acknowledgment:** Most of this abandoned well information consists of excerpts from a publication (FS 891 - October 1993) entitled, "Plugging Abandoned Water Wells" prepared in cooperation with the South Dakota State University Cooperative Extension Service, East Dakota Water Development District, and the Water Rights Program of the Department of Environment and Natural Resources.





# Statewide Ground Water Quality MONITORING NETWORK



aquifers in South Dakota for non-point sources of contamination and long-term trends in water quality.

Attached is a map of South Dakota on which the locations of the monitored aquifers are plotted. Note that, due to limited information in many areas, the aquifer boundaries shown on this map are very approximate and should only be used for purposes other than general discussion.

The Network was designed to examine nonpoint-source pollution and ambient ground water quality. The goal of the statewide ground water quality monitoring effort is to maintain and modify as necessary ground water quality monitoring activities that regularly and systematically assess the present water quality, impact of agricultural chemicals on ground water, and long-term trends in water quality in sensitive aquifers.

The aquifers being monitored cover much of South Dakota and are among the most likely to be impacted by human activities because of their near-surface occurrence combined with overlying land use. Emphasis is placed on monitoring for health-related aspects of water quality and monitoring for non-point sources

Many public water supplies, along with thousands of private individuals, across South Dakota, draw water from wells in shallow aquifers. In most instances, there is little more than a few feet of soil separating these aquifers from the land surface. Whenever it rains, or winter snows melt, water enters and recharges these aquifers. Unfortunately, this same process can carry pollutants into the ground water, which may require treatment before distribution and use for human consumption. Public water suppliers regularly monitor the condition of the water they provide, but their focus is just on their own particular source.

But what about the rest of the shallow aquifers? To gain a better understanding of the ambient water quality in shallow aquifers, the Geological Survey Program within the South Dakota Department of Environment and Natural Resources established what is known as the Statewide Ground Water Quality Monitoring Network (Network). The Network currently consists of a total of 144 observation wells spread across 79 locations monitoring conditions in 25 separate aquifers. The statewide ground water quality monitoring effort is an endeavor to monitor sensitive

of ground water contamination. Over the years, analytes have included pesticides, pesticide transformation products, nitrate plus nitrite as nitrogen, common inorganic constituents, volatile organic compounds, radionuclides, cyanide, and trace metals.

## METHODS

Monitoring sites are located away from known point sources of pollution, such as animal feeding areas, septic tanks, and underground storage tanks. Whenever possible, monitoring sites were placed in portions of aquifers that were thick enough to allow for installation of two wells whose screened intervals do not overlap vertically. Prior water quality investigations Geological Survey Program had indicated that water quality varied vertically within shallow aquifers.

Each well in the Network has a dedicated submersible pump used for development and sampling of the well. During a sampling event, water within a monitoring well is evacuated through the pumping system. During the evacuation of wells completed in sediments that are of moderate to high hydraulic





conductivity, temperature, pH, and electrical conductivity are measured until they have stabilized. Wells are considered to have stabilized after three consecutive readings taken 5 minutes apart indicate constant temperature, pH, and electrical conductivity. After stabilization and a minimum of 3 well volumes of water have been evacuated, a sample is collected.

All wells in the statewide ground water quality monitoring network are currently subject to sampling once every other year. An attempt is made to sample each well as close to the same time each year as possible. Samples collected on a biannual basis are analyzed for pesticides and common inorganic parameters. Trace metals, radionuclides, and cyanide analyses are currently performed once every five years. Volatile organic compounds are also analyzed once every five years but in only about 25 percent of the wells in an aquifer.

## RESULTS

It would be hard to summarize all of the data collected over several decades from over a hundred wells in an exhaustive monograph, let alone in a short, two-page article. Interested readers can track down specifics about a particular aquifer or

well at the contacts listed below. However, a few highlights can be discussed.

## METALS

Water samples are tested for a variety of metallic elements, although very few were found present over established limits, or maximum contaminant level (MCL). Selenium exceeded the MCL (50 micrograms per liter) just five (5) times, all in the Cow Creek Aquifer in southern Potter County. Elevated lead (>MCL) was detected in two separate samples from the Big Sioux Aquifer. Elevated arsenic was found in a range of aquifers across the eastern part of the state, exceeding the MCL in 46 of 410 samples tested. None of these detections have been associated with a specific human health problem.

## NITRATES

Elevated nitrate concentrations are a common occurrence in shallow aquifers in South Dakota. Of the twenty (20) east river aquifers in the Network, all but five (5) had at least one sample that exceeded the MCL (10 milligrams per liter). In many instances, levels were detected well more than the MCL, although most of these samples were collected from the shallow/water table well at paired sites. In many cases, rising overall trends in nitrate concentrations have been detected in the Network.

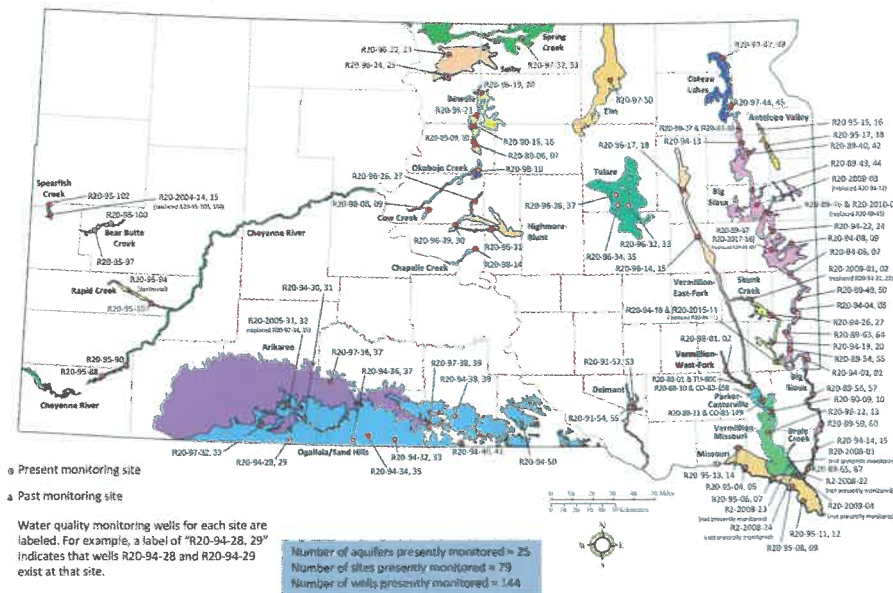
## PESTICIDES

Samples have been analyzed for a wide range of pesticides, and while there are occasional detections, most are below the MCL. Atrazine and degradation product desethyl atrazine have been most frequently detected, occurring in about five percent (5%) of analyses. In most instances, detections have been reasonably transient. Re-sampling a site with a discovery most often results in a non-detect.

## TO LEARN MORE:

The Geological Survey Program maintains a web page dedicated to the Network, which contains maps of the aquifers and well locations, and contact information for the lead investigator. [www.sdgs.usd.edu/currentprojects/sgwqmn.aspx](http://www.sdgs.usd.edu/currentprojects/sgwqmn.aspx)

**Aquifers and Monitoring Sites in the Statewide Ground Water Quality Monitoring Network**





# SYSTEM SPOTLIGHT

## BROOKINGS-DEUEL RURAL WATER SYSTEM

“Rural water is the greatest thing to come along since the Rural electric and telephone.” That’s what one original customer of the Brookings-Deuel Rural Water System said after being hooked up to rural water in the early 1970s.

The need for a better water supply was first discussed around kitchen tables of local farmers – people working together to solve a common problem: a lack of quality water in area wells. Many wells were very high in iron (causing rust stains in laundry and sinks), manganese (causing dark stains), and nitrates from fertilizers and septic systems. It was very common on farms and in towns for people to have a cistern and pay to have water hauled in to fill them.

Brookings-Deuel started as a steering committee in 1972. In 1973, DeWild Grant Reckert and Associates (DGR) was hired as Brookings-Deuel’s engineering firm, and the company still serves the system today. Brookings-Deuel RWS was incorporated in 1974, and a 16 member board was created. Today the system has a seven-member board. The original system was built in two phases – Phase I was the south end of the system, constructed in 1976, and Phase II was the north end of the system, constructed in 1977. 1978 marked the first year of full production.

The original system consisted of about 1,000 hook-ups and 800 miles of pipeline. There was 150,000 gallons of storage. Over the years, system growth has been steady. The system now serves 2,600 customers, maintains 1,500 miles of pipeline and has 2.7 million gallons of water storage in tanks and towers throughout the system. All 13 towns located within the system’s borders are now hooked up to Brookings-Deuel. Water systems were installed in Goodwin, Altamont and Labolt as part of Phase II construction, and the rest of the towns have hooked on one at a time, with Astoria being the last town to hook up in 2006. Livestock demand has always been an important part of the system. Rural water has allowed many livestock operations to grow with the access to more volume. Besides normal livestock usage, Brookings-Deuel RWS also serves eight commercial dairies and two colonies that have turkey and swine operations. With the exception of normal ongoing expansion, there were larger user expansion projects in 1982, 1984, 1992 and 2006.

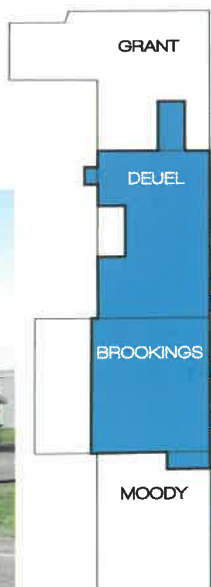
Brookings-Deuel RWS has two well fields. One is the Clear Lake plant north of Clear Lake, and the other is the Joint Wellfield north of Bruce. Generally, the Clear Lake plant serves the north half of the system and the Joint Wellfield serves the south half





# BROOKINGS-DEUEL RURAL WATER SYSTEM

of the system. Both plants have pressure filters for removal of iron and manganese. The Clear Lake plant's maximum capacity is 1.6 million gallons per day (MGD) and the Joint Wellfield's capacity is 3.8MGD. The Joint Wellfield is unique in the fact that Brookings-Deuel RWS owns it jointly with Kingbrook RWS. Both systems were being constructed around the same time and the partnership has been in place since day one. The Joint Wellfield is a separate entity and has its own board of directors consisting of three directors from each system. Brookings-Deuel administers the day-to-day operations at the Joint Wellfield.



## DIRECTORS:

- Doug Feten, Chairman
- Clark Rogness, Vice Chairman
- Scott Brandenburger, Secretary
- Harold Haber, Treasurer
- Gary Johnson, SA Director

## STAFF:

- Gene Wilts, Manager
- Lenny Faehnrich, Operator II
- Jesse Christianson, Operator II
- Joshua Rogness, Operator II
- Lyle Skorseth, Operator II

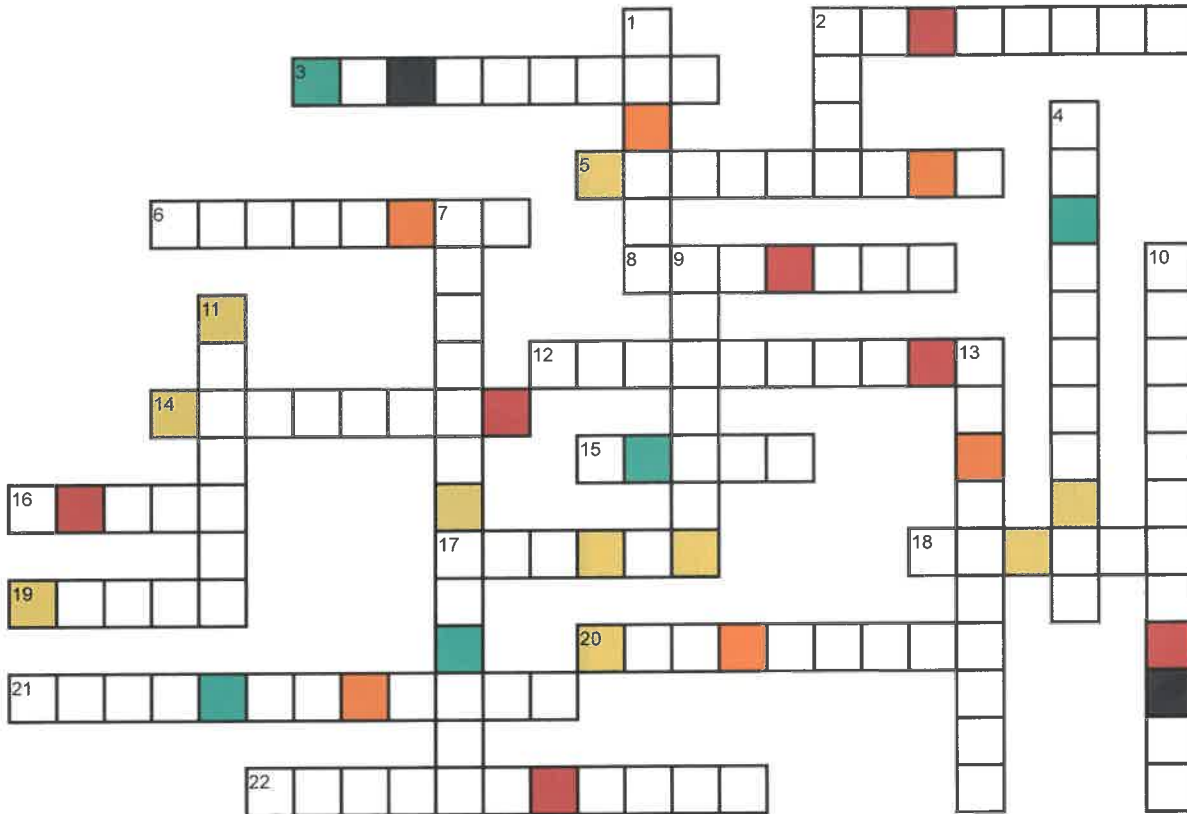
## STATISTICS:

- Hookups: 2,550
- Miles of Pipeline: 1,500
- Water Source: Wells
- Counties Served: Brookings, Deuel, and portions of Grant, Moody, and Lincoln (MN)
- Towns Served Individual: Revillo, Brandt, Astoria, Toronto, LaBolt, Bruce, Goodwin, Altamont, Bushnell
- Towns Served Bulk: White, Elkton, Gary, Clear Lake



# RURAL WATER CROSSWORD & WORD SCRAMBLE CONTEST

## Earth's Fresh Water



### WORD BANK

- brackish
- condensation
- confluence
- divide
- estuary
- evaporation
- floods
- ground water
- hydrologic
- limnology
- marshes
- mouth
- permeability
- ponds
- porosity
- reservoir
- rivers
- streams
- sublimate
- swamp
- well
- wetlands
- transpiration

#### ACROSS

2. Lands that are wet for significant periods of time
3. A storage location for water such as an ocean, glacier, pond
5. The study of bodies of fresh water and the organisms that live there
6. Amount of space between grains
8. Where the stream meets the ocean or lake
12. The cycle of water movement around Earth's surface
14. Water that has more salt than fresh water but less than sea water
15. A wetland with lush trees and vines found in a low-laying area beside slow-moving rivers
16. Point at which a stream comes into a large body of water
17. The largest types of streams
18. Usually occurs when precipitation falls more quickly than water can be absorbed into the ground or carried away by rivers or streams
19. Small bodies of fresh water that usually have no outlet
20. Solid changing directly into gas
21. Ability of water to flow through the pores
22. The largest reservoir of liquid fresh water on Earth

#### DOWN

1. A topographically high area that separates different water basins
2. Created by digging or drilling to reach groundwater
4. Change from a liquid to a gas
7. Process in which plants release large amounts of water into the air.
9. Bodies of water that have a current and are in constant motion
10. Change from a gas into a liquid
11. Shallow wetlands around lakes, streams, or the ocean where grasses and reeds are common
13. Where two streams come together

#### 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 July 13th, 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 Neal McIntyre who had the correct phrase of "ONLY FOOLS RUSH IN" for April 2018.



# RURAL WATER

## ACROSS SOUTH DAKOTA

### SDARWS HIRES NEW EXECUTIVE DIRECTOR



**KURT PFEIFLE**  
*SDARWS Executive Director*

**T**he Board of Directors for the South Dakota Association of Rural Water Systems welcomes Kurt Pfeifle as its new Executive Director. He replaces Dennis Davis who retired this past April after 39 years with the Association.

Pfeifle comes to the Association with 31 years of water management experience. He was the manager of the West-River Lyman/Jones Rural Water System from 1986 to 1991, after which he managed the Mid-Dakota Rural Water System for the past 25 years.

“Kurt’s background and familiarity with the key functions of the SDARWS mission will have an immediate impact on the service we provide to all of the rural water users in South Dakota, said Ron Gillen, SDARWS Board Chairman. “I look forward to helping him as we keep moving forward. He truly is an asset we should build on.”

After attending business school for one year at National College of Business, Pfeifle received his degree from Mitchell Technical Institute. Throughout his tenure, he has been a member of the South Dakota National Guard (13 years), Murdo City Council, and Miller School Board. Pfeifle was appointed and served five years on the Board of Commissioners for the South Dakota Housing Development Authority, and served on the South Dakota One Call Board as a representative for rural water systems.

The South Dakota Association of Rural Water Systems is a membership organization headquartered in Madison, SD with a satellite office in Spearfish. For over 40 years, SDARWS has been well-respected for the high-quality training, services, publications and advocacy they provide their water and wastewater members in South Dakota. The association employs 12 individuals and trains hundreds of individuals in all aspects of water and wastewater management through workshops, training classes, and conferences. SDARWS also produce the consumer magazine, *Quality on Tap!* which is a cooperative effort between 17 rural water systems and the Association and reaches over 38,000 rural water households throughout the state. They also support research programs like the Regional Water Research Consortium and the Water & Environmental Engineering Research Center and are committed to the long-term sustainability of rural water systems. They have also lobbied successfully against sales taxes on water and other pertinent issues while also supporting issues that are important to rural water systems such as the railroad bill, battling the Corps of Engineers over water rights, and supporting continued funding of the state Water Omnibus bill.





## BDM RURAL WATER SYSTEM, INC. 38TH ANNUAL MEETING RECAP

**B**DM held its 38th annual meeting on Monday, March 26th, 2018 at 6:00 pm in the BDM building in Britton. There were 32 voting members present, and 19 other guests.

Board Chairman Torre Raap called the meeting to order and presented the Board Report. General Manager Rodney Kappes gave the Manager's Report and the Auditor's Report.

Total assets as of December 31, 2017 totaled \$22,510,732.02. Total liabilities were \$8,986,922.97. Water sales for 2017 were \$2,859,344.24.

Director Elections for Districts One and Seven were held. Torre Raap was re-elected to District One for a third term. Kevin Deutsch was re-elected to District Seven for his second term.

BDM employees were introduced to the members and drawings were held for cash and other door prizes. Following the meeting, BDM employees served a supper to those attending.

If you have any questions or comments regarding this year's annual meeting, please feel free to visit with General Manager Kappes or any of the Board members. We appreciate your input.





# APPLICATIONS OPEN FOR BUFFER STRIP TAX INCENTIVES

South Dakota property owners with eligible riparian buffer strips have until October 15, 2018 to apply for a property tax incentive.

As a result of 2017's Senate Bill 66, landowners may receive a reduction in property value of 40 percent of any eligible riparian buffer strip. The bill specifies 575 lake listings and 11,000 miles of streams that are eligible.

## To be eligible, applicants must meet the following requirements:

- Only land that adjoins qualified lakes and streams is eligible to be enrolled in the program. Maps of all qualified lakes and streams for every county may be accessed at <http://denr.sd.gov/datagis.aspx>.
- The land must consist of existing or planted perennial vegetation.

- The buffer strip has to be a minimum of 50 feet wide and can be a maximum of 120 feet wide. The measurement starts at the top of the bank or where the vegetation starts – whichever is closest to the water.
- The vegetation cannot be harvested or mowed before July 10. A minimum of 4 inches of vegetation must be maintained at all times.
- The land may not be grazed from May through September.

Applications are to be submitted to the Director of Equalization in the county where the property is located. Eligible applicants will receive tax relief for their 2018 assessment – taxes payable 2019.

For more information, visit <http://dor.sd.gov/bufferstrips.aspx>



## Manager: continued from page 2

evaluate the SCADA system has been completed. Over the next several months AE2S will present their findings to the board. Ultimately a replacement plan will be adopted, with a possible replacement of that system being completed starting late this fall through the winter.

The projects listed above are scheduled to minimize any customer impact. In most instances, we can run in a bypass situation or isolate the area we're working on while continuing to have another pump running. As with any situation, it's the unexpected that can cause issues. However, the team works very hard to minimize any customer impact.

You can see by the list of projects above we will be scrambling to get all this accomplished in 2018. In addition, the operators run water tests and make adjustments at the water treatment plant daily, follow up on service requests daily, continue to replace

remote read meters as time allows and fix leaks. Leaks have been very challenging so far in 2018. As of this writing, we've repaired 14 leaks in 2018 and have another five known leaks to be fixed this week, with another two known but not located. This number is more than twice the leaks we had by this time of the year for 2016 or 2017.

We are excited to have Jared Marzolf join our team. Jared is originally from the Redfield area and has been recently working in Aberdeen. Jared will bring our operations team back to four, with Darin, Jim, and Ryan. These gentlemen, Shannon and Mark give their all every day, to keep uninterrupted water available to all of our great customers.

From the Board and BDM Team, we thank you for your patronage.

Have a safe and prosperous summer, God Bless.





# WATER MATTERS



## Nitrates in Well Water (part 1)

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 article is the first of a series of reports on nitrates in well water, intended to provide a basic explanation of nitrate in wells and give steps that well owners can take to protect your family and visitors from illness.

### WHAT IS NITRATE?

Nitrate ( $\text{NO}_3$ ) is a naturally occurring chemical made of nitrogen and oxygen. Nitrate is found in air, soil, water, and plants. Much of the nitrate in our environment comes from decomposition of plants and animal wastes. People also add nitrate to the environment in the form of fertilizers.

### HOW DOES NITRATE GET INTO WELL WATER?

Natural levels of nitrate in South Dakota ground water are usually quite low (less than 1 milligram per liter [mg/L] of nitrate-nitrogen). However, where sources of nitrate such as fertilizers, animal wastes, or human sewage are concentrated near the ground surface, nitrate may seep down and contaminate the ground water. Nitrate is highly soluble (it dissolves readily in water), so it

tends to move with water flowing through the ground.

Wells most vulnerable to nitrate contamination include wells in shallow aquifers, dug wells with a casing which is not watertight, and wells with damaged, leaking casing or fittings. Presence of nitrate contamination of a well is often regarded as the first sign of deteriorating ground water quality.

### HOW MUCH NITRATE IS TOO MUCH?

The federal drinking water standard for nitrate is 10 mg/L of nitrate-nitrogen, which provides newborns with reasonable protection against blue baby syndrome. This level is mandatory for all public water systems and strongly recommended for private wells.

### HOW DO I KNOW IF MY WELL WATER HAS NITRATE?

Nitrate is tasteless, odorless, and colorless. To find out if there is nitrate in your water, have it tested by a qualified laboratory. Sampling material can be obtained from the South Dakota Department of Health at the following website: <https://doh.sd.gov/lab/environmental/privatew.aspx>

### HOW OFTEN SHOULD I HAVE MY WELL TESTED FOR NITRATE?

If you have a non-public water supply, it's a good idea to have a routine nitrate test every two or three years, more frequently if nitrate has been detected in the previous sampling. State regulations require well drillers or owners to have a water sample tested for nitrate (and other things) when they construct a new well. After that, owners of private wells must arrange for their own water testing. You should also have your water tested for nitrate if you are a woman planning on becoming pregnant or if infants will be using the water.

**Back page content provided by:**  
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132B Airport Drive • Brookings, SD, 57006  
(605) 688-6741 • <http://eastdakota.org>

