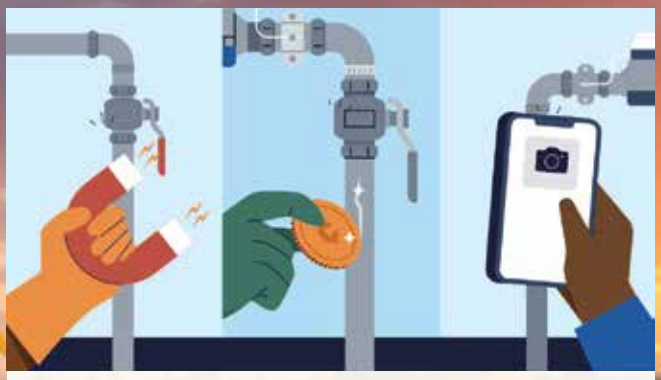
West River/Lyman-Jones
Rural Water Systems Inc.

Quality On Tap!

April 2024 | Volume 19, Issue 4

PURPOSE OF AN ANNUAL MEETING

EFFECTS OF ZEBRA MUSSELS ON RURAL WATER SYSTEMS



COMPLETE & RETURN YOUR LEAD-FREE SURVEY

IT ONLY TAKES 5 MINUTES!

survey.SDWaterPipes.com

SEE PAGE 15 FOR MORE INFO

MANAGER'S REPORT

Jake Fitzgerald
Manager, West River/Lyman-Jones RWS

Contractors will soon ramp up work again on a couple of projects we plan to complete in 2024. WR/LJ will add a 300,000 ground storage reservoir (GSR) near Vivian and replace the existing Creighton GSR with a new 336,000 tank. In addition, 10.5 miles of pipeline will be installed in Haakon and Mellette Counties.

LEAD SERVICE LINE INVENTORY

The Department of Agriculture and Natural Resources (DANR) is requiring all Community Water Systems (CWS) in the State of South Dakota to assist in the Lead Service Line Inventory (LSLI) to identify lead service pipes. This is something our system is required to do, and by not developing and submitting an inventory by the deadline this year, WR/LJ would be out of compliance with the Environmental Protection Agency (EPA).

We are asking our members to assist with the inventory by checking service line information for the first 18" of pipe coming into the home. Livestock taps that do not serve a residence do not need to be included in the inventory. Your participation in this survey is important and beneficial. By providing information about your property's water service lines, you will help WR/LJ fulfill our requirements with this statewide initiative and stay in compliance with safe drinking water standards.

Every WR/LJ member who participates in the survey will be entered into a drawing to win a YETI cooler. In addition, we have decided to also offer all survey participants a $20 credit on their water bill for surveys filled out by May 1, 2024.

WR/LJ members can access the survey by going to survey.sdwaterpipes.com or our system website, wrlj.com. If you prefer a paper copy, please contact our office at 800-851-2349 or print one from our wrlj.com website. If you have any questions or need assistance with the survey, please feel free to contact our office, and a staff member will be happy to assist you.

Visit us online at: www.wrlj.com

West River/ Lyman-Jones Rural Water Systems, Inc.
MNI WICONI WATER SUPPLY PROJECT

BOARD OF DIRECTORS

Dave Fuoss, Draper – President
Richard L. Doud, Midland – Vice President
Dodie Garrity, Hayes – Sec./Treas.
Kirk Cordes, Creighton
Veryl Prokop, Kadoka
Casey Krogman, White River
Brad Smith, Vivian
Dean Nelson, Murdo
Quint Garnos, Presho
Marion Matt, Philip

MURDO PROJECT OFFICE

307 Main Street
PO Box 407
Murdo, SD 57559

Jake Fitzgerald ..... Manager
Amy Kittelson..... Office Manager
Kati Venard ..... Billing Secretary
Brandon Kinsley..... O & M Foreman
Ed Venard..... O & M
Steve Baker..... O & M
Brian Flynn ..... O & M

Ph: 605-669-2931 or 1-800-851-2349
Fax: 605-669-3022
E-Mail Address:
wrlj_ruralwater@goldenwest.net

PHILIP FIELD OFFICE

PO Box 144
Philip, SD 57567

Mike Vetter ..... O & M Foreman
Eddie Dartt..... O & M
John Kramer..... O & M
Nick Konst ..... O & M

Fax: 605-859-2859

2023 WR/LJ Audit

Casey Peterson and Associates of Rapid City, SD were in Murdo on January 22nd and 23rd to perform the 2023 audit of financial records. L to R: Brady Foreman, Deidre Budahl, Caroline Mulder, and Matt Mickley.

The audit provides management and the Board of Directors an independent opinion as to the accuracy and accounting compliance of the financial statements. The auditors review financial records, payroll registers, disbursements and bank statements. The results of the audit were presented to the Board of Directors on February 15th.

FREE SERVICE

WR/LJ provides two free trips each calendar year to shut off/ turn on water at locations that will not be in use for a period of time. Please give advance notice by calling the main office in Murdo a couple days prior, so our field staff can make arrangements.

In observance of the following holidays, WR/LJ Rural Water offices will be closed on the following days:

March 29, 2024 (afternoon)
Good Friday

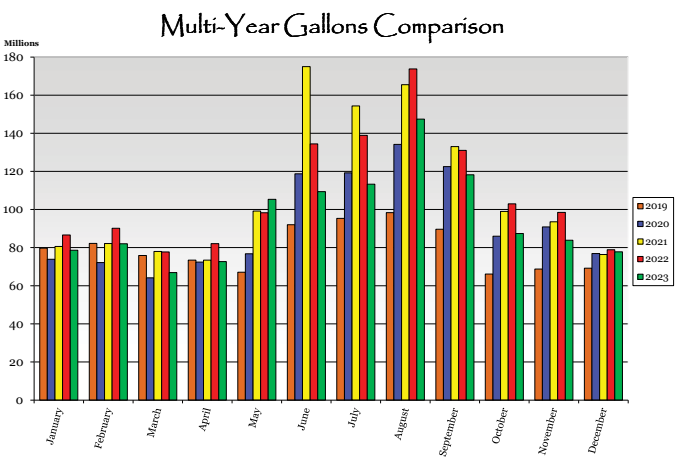
May 27, 2024
Memorial Day

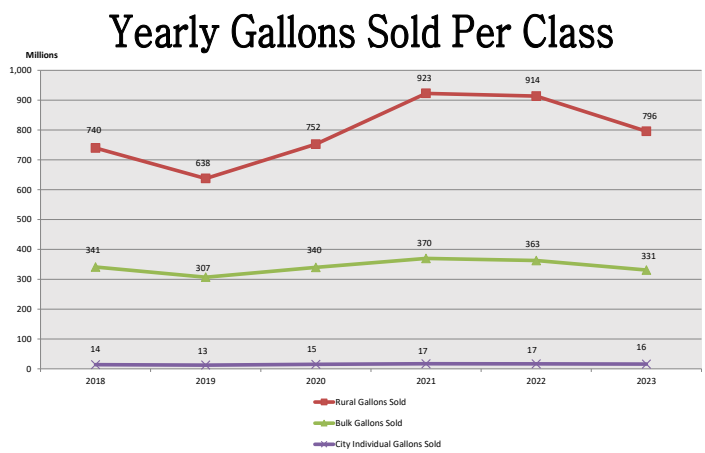
In case of an emergency,
please call the Murdo area at 530-0932
or the Philip area at 530-1136 for assistance.

PAYMENT OPTIONS

1. **Online Payment:** Go to **www.wrlj.com** (accepts Visa, MasterCard, Discover and Electronic Check)
2. **Pay-By-Phone:** Call 1-855-325-8898 to use our automated bill payment option.
3. **Pay-By-Phone:** Call 1-800-851-2349 and a WR/LJ customer representative will take your payment information over the phone.
4. **Electronic Direct Payment:** Your payment is automatically deducted from your checking or savings account on the 10th of each month.
5. **US Mail:** Mail payment along with the bottom portion of your bill.
6. **Pay-in-Person:** During regular business hours you may bring your payment to our office.
7. **24-Hour Drop Box:** Available at the Murdo office near the main entrance.

For forms or more information on these payment options, please call 1-800-851-2349.





GET THE LEAD OUT

Drinking water is free of lead when it leaves the water treatment plant—however, water can absorb lead if it travels through lead pipes on its way to your faucet. The majority of South Dakota water pipes are free of lead, but we need to find where lead lines still exist so they can be removed.

As a part of a nationwide initiative, we are asking everyone to check their pipes and report their results, regardless of what they find. If your home was built after 1987, when the lead ban took effect here in South Dakota, you do not have a lead service line and you may not be asked to provide further information. However, if your home was built around or before 1987, we are looking to you. Knowing where the lead lines are is just as important as knowing where they are not.

Please take a quick survey to see if your home's water pipe contains lead.

You just need five minutes, a coin, a magnet, and a smartphone to test your pipe and help your community. We encourage you to try out the electronic survey, but a paper copy is available upon request. Ask your grandkids, a neighbor, or a friend to help.

Visit **survey.sdwaterpipes.com** to take this step-by-step survey to identify and record the material of the water pipe coming into your home.

You'll be asked to follow these three simple steps:

1. Scratch the water pipe with a coin or tool to see if the scraped area is silver-colored and shiny.
2. Check to see if a magnet sticks to the pipe – any magnet will do!
3. Report your results at **survey.sdwaterpipes.com**. Don't forget to snap a photo of the pipe, and you're done.

Documenting your pipe helps your family, your neighborhood, and your water provider. It's a simple process that only takes a few minutes, but it can have a huge impact on community health and safety.

For more information and to get started on your survey, visit survey.sdwaterpipes.com

By providing this information yourself, you are contributing to our efficiency and keeping our costs down. By donating five minutes of your time, you are saving 30-60 minutes that it will take our staff to visit your home to complete the inventory of your water service line. Which, in turn, helps to keep your costs from increasing. You are making a huge impact! Thank you!

ZEBRA MUSSELS INVADE SOUTH DAKOTA WATERWAYS

Tanner Davis, Aquatic Invasive Species Coordinator
South Dakota Game, Fish and Parks

Zebra mussels are a small invasive mollusk (clam) that originated in Eastern Europe and first arrived in the U.S. in the mid-1980s. Zebra mussels were first found in the Lake St. Clair near Detroit, MI and since have spread throughout the Mississippi River drainage (Missouri, Arkansas, Tennessee, and Ohio Rivers). Populations also exist in the Western U.S.. Adults range in size, anywhere between ½ inch to 2 inches and can rapidly spread under the right conditions. Larval zebra mussels, called veligers, can spread by water transfer and veligers are so small they are invisible to the naked eye which adds to their invasiveness and ease of incidental transfer. Adults will attach to hardy surfaces and vegetation and for this reason, South Dakota Game, Fish & Parks enforces recreationalists to stay Clean. Drain. Dry. between waterbodies to help slow the spread. Always make sure to pull all plugs on your watercraft and don't transport any water, vegetation, mud or other organic matter from one body of water to the next. Below are the list of impacted waters in South Dakota.

History of initial positive detections of Zebra Mussel

2014 **Lewis and Clark Lake**

2015 **Missouri River below Gavins Point Dam**

2015 **McCook Lake**

2018 **Lake Yankton**

2019 **Lakes Sharpe and Francis Case**

2020 **Lake Cochrane, Kampeska, Pickerel and Dahme Quarry**

2021 **Lake Mitchell**

2022 **Enemy Swim, Blue Dog, Clear Lake, South Rush and Pactola Reservoir**

2023 **James River/Sand Lake Refuge, Roy Lake, Big Sioux River, Bigstone Lake, Lake Oahe**

Please visit **sdleastwanted.sd.gov** for more information regarding AIS regulations, news/updates, maps, frequently asked questions, media gallery of AIS, and to report any potential AIS you may have found on our citizen monitoring page.

Photo By: Sam Stukel

THE EFFECTS OF ZEBRA MUSSELS ON RURAL WATER SYSTEMS

Zebra mussels (Dreissena polymorpha) 1st discovered in South Dakota in Lewis & Clark Reservoir in 2015 are invasive freshwater mollusks that have spread rapidly across various water bodies. Zebra mussels have been found in many bodies of water in South Dakota, such as the Missouri River, Big Sioux River, Blue Dog Lake, Lake Mitchell, Sand Lake National Refuge on the Jim River, Pactola Lake, and many more. Zebra mussels are small, fingernail-sized mollusks with distinctive zigzag stripes on their shells. They are highly adaptable and can thrive in a wide range of environmental conditions, making them formidable invaders. Zebra mussels are filter feeders, extracting phytoplankton and other particles from the water column, which can lead to competition with native species for resources. The spread of zebra mussels is facilitated by their ability to attach to various structures, including boats, docks, and water intake structures. Once established in a water body, they reproduce prolifically, with each female capable of producing hundreds of thousands of eggs per year. Their larvae, called veligers, can be transported over long distances by water currents.

Zebra mussels have had profound ecological impacts on invaded ecosystems. Their dense colonies can outcompete native species for food and space, leading to declines in native mussel populations. The increased water clarity resulting from their filter feeding can promote the growth of harmful algae, negatively affecting fish populations and disrupting food webs.

The economic consequences of zebra mussel invasions are significant. They can clog water intake pipes, leading to increased maintenance costs for industries and municipalities. Furthermore, the decline in native fisheries and alteration of ecosystems can have long-lasting economic repercussions.

Several strategies have been employed to control and manage zebra mussel populations. Physical methods, such as the use of barriers and underwater mats, aim to prevent the attachment of zebra mussels to structures. Chemical methods, including the use of molluscicides, have been employed, but their environmental impact raises concerns.

These infestations can cause significant problems in water systems, including clogging water intake pipes. Chemical treatment is one of the methods used to control zebra mussels in water intakes. Several chemicals can be effective in treating water to prevent or mitigate zebra mussel infestations. It's important to note that chemical treatment should be done carefully, considering potential environmental impacts and the safety of other aquatic life.

Here are some chemicals commonly used for the chemical treatment of water intakes for zebra mussels:

CHLORINE: Chlorine is a powerful disinfectant and is often used for controlling zebra mussels. It can be applied as a gas or in various chemical formulations. However, its use requires careful monitoring to prevent harm to non-target organisms and ecosystems.

QUATERNARY AMMONIUM COMPOUNDS (QACS): QACs, such as polyquat or benzalkonium chloride, are chemicals that disrupt the membranes of zebra mussels, leading to their mortality. These compounds are often used as part of a rotation strategy to prevent resistance.

COPPER-BASED COMPOUNDS: Copper is toxic to zebra mussels and is commonly used in antifouling coatings on boat hulls and water pump intake screens. Copper sulfate is a chemical option for treating water intakes, but its use needs to be carefully managed due to potential environmental concerns.

POTASSIUM-BASED COMPOUNDS: Potassium-based chemicals, such as potassium chloride, can be effective against zebra mussels.

PEROXIDE-BASED COMPOUNDS: Hydrogen peroxide is an oxidizing agent that can be used to control zebra mussels. It is generally considered less harmful to the environment than some other chemicals, but its effectiveness may vary.

It's crucial to consult with experts, environmental agencies, and follow state regulations before implementing any chemical treatment. Additionally, regular monitoring is essential to assess the effectiveness of the treatment and minimize potential negative impacts on non-target species and the overall ecosystem. Integrated pest management approaches, combining chemical treatment with physical methods and other control strategies, may provide more sustainable solutions for zebra mussel control in water intakes.

According to Matt Hansen of Hawkins Chemical. "Earthtec QZ is what the majority of water plants/dams are using on the Missouri River. It is the only approved molluscicide in the state of South Dakota and on the Missouri River. It is also NSF 60 certified, and EPA registered. Plants are feeding 1 PPM dose using peristaltic/ diaphragm pumps on manual mode or connected to SCADA. Plants have been feeding out of drums/totes and bulk tanks. Tubing is usually run by a diver from the intake building, down to the intake through PVC pipe to keep weighted to the ground in front of the intake screen. Based on management plan, some plants feed EarthTec QZ year around, turning down the dose in the wintertime to .5 PPM for a maintenance dose. When the water temp drops below 40 degrees Fahrenheit, it discourages colonization."

Zebra mussels cling to an intake valve from a water system in South Dakota.

THE PURPOSE OF AN ANNUAL MEETING

Annual meetings are pivotal for Rural Water Systems. These meetings provide the consumers with a time to come together and listen to the system's year in review, hear about future plans and projects, and help make important decisions. These meetings offer transparency, accountability, and communication between the Board of Directors and the customers. The purpose of the meeting is to show financial transparency, strategic decisions, regulatory compliance, and the election of board members.

At the meeting, financial statements for the previous year are presented. This shows the consumers financial responsibility and shows the financial health of the system. Many of the rural water systems have their Auditor, Treasurer or Accountant give a report at the meeting on the financial statements and go over the overall financial status of the water system.

Strategic discussions are also reported on, which can include plans for upcoming projects and potential challenges that may arise. Many times, the system engineer will give updates on the status of the distribution system, current or ongoing construction projects. This keeps the consumers well informed and can let them ask any questions about the direction or goals of the system. This open proactive approach allows for timely investment in the water system, reducing the risk of unexpected breakdowns and service disruptions.

Members of the rural water systems will have the opportunity to vote on the election of board members during the annual meeting. This democratic process allows them to have a say in the governance of the company and ensures leadership aligns with their interests.

Regulation compliance will also be presented at these meetings. These regulations are crucial for the functioning of the system. These will be reviewed, discussed and the consumers will be shown the requirements needed to keep health and safety standards.

Annual meetings are the cornerstone of effective governance and sustainable operations for the rural water system. These gatherings, whether it be an open house, an afternoon or evening meeting in a district of a water system, or a drive through as some had during the pandemic, are mandated by the by-laws of the system. Every water system's annual meeting may look different, but they facilitate community engagement, communication, planning, compliance, and democratic elections of the leaders. By actively participating in annual meetings, you can contribute to the success and longevity of your water systems, ensuring access to clean and safe water for generations to come.

RAPID VALLEY SANITARY DISTRICT/WATER SERVICE

Neslted in the Black Hills of South Dakota, Rapid Valley Sanitary District–Water Service stands as a testament to community vision and dedication. Established in 1962 by local citizens, this organization was born out of the necessity for a safe drinking water supply in an era where many relied on shallow wells.

Early Challenges and Innovations:

The journey began with a humble start, marked by challenges. Initial attempts at well construction faced setbacks due to poor production and high radium content. However, undeterred, the team persevered. In 1990, an underground gallery was installed along Rapid Creek to harness surface water, signaling a commitment to innovation.

The Merger of 1994:

A pivotal moment arrived in 1994 when the Sanitary District and Water Service merged, forming a quasi-governmental entity – Rapid Valley Sanitary District–Water Service. This strategic union aimed at optimizing customer service and operational efficiency.

Infrastructure Growth and Technological Advancements:

Over the years, Rapid Valley has evolved with the times. Infrastructure upgrades, new water and sewer main projects, and the addition of microfiltration units showcased a commitment to staying ahead in the ever-changing water industry.

In 2010, the addition of a third microfiltration unit, along with a Trojan ultra-violet system, catapulted the treatment capacity from two to three million gallons per day. This not only exceeded Environmental Protection Agency standards but also positioned Rapid Valley to serve neighboring districts.

Looking to the Future:

Rapid Valley remains a beacon of forward thinking. In 2009, a 1.85 million-gallon tank was added, and in 2013, a .256 million-gallon Aqua store tank bolstered storage capacity to 3.61 million gallons. Annual project plans ensure continuous improvements, with a booster station added in 2009 for future expansion.

Looking toward sustainability, Rapid Valley is pilot testing ceramic membranes for water treatment. Early results suggest increased production capacity, higher recovery rates, and lower operating costs, paving the way for the long-term success of water treatment initiatives.

Community Collaboration:

Serving approximately 3,900 connections, Rapid Valley is not just a water provider but a vital community partner. Collaborating with the expanding Rapid City, the district emphasizes high-quality service and anticipates the needs of its residents.

For over 60 years, Rapid Valley Sanitary District–Water Service has been a guardian of water quality, adapting to challenges and embracing innovations. As they continue to pilot test new technologies and plan for the future, Rapid Valley remains at the forefront of the water industry, ensuring safe and sustainable water for generations to come.

RAPID VALLEY
SANITARY DISTRICT
WATER-SERVICE

DIRECTORS:

Chairman – Andy Fitzgerald

Vice Chairman – Bob Phillips

Secretary – Connie Olson

Treasurer – Diana Nelson

Director – Shirley Haines

Director – Jennifer Battles

Director – Carrie Wheeler

Director – Eric Krebs

STAFF:

General Manager – Rusty Schmidt

Field Operations Supervisor – David Flint

Office Team Lead – Sara Bender

Administrative Clerk – Kathy Graff

Administrative Clerk – Samantha Faatz

Service Technician – Mike Chrobak

Service Technician – Nate Broom

Service Technician – Tyler Volk

Service Technician – Garret Whipple

STATISTICS:

Hookups: 3,771

Miles of Pipeline: 70

Water Source: Rapid Creek,
Interconnection with Rapid City

Counties Served: Pennington

RURAL WATER CROSSWORD & WORD SCRAMBLE CONTEST

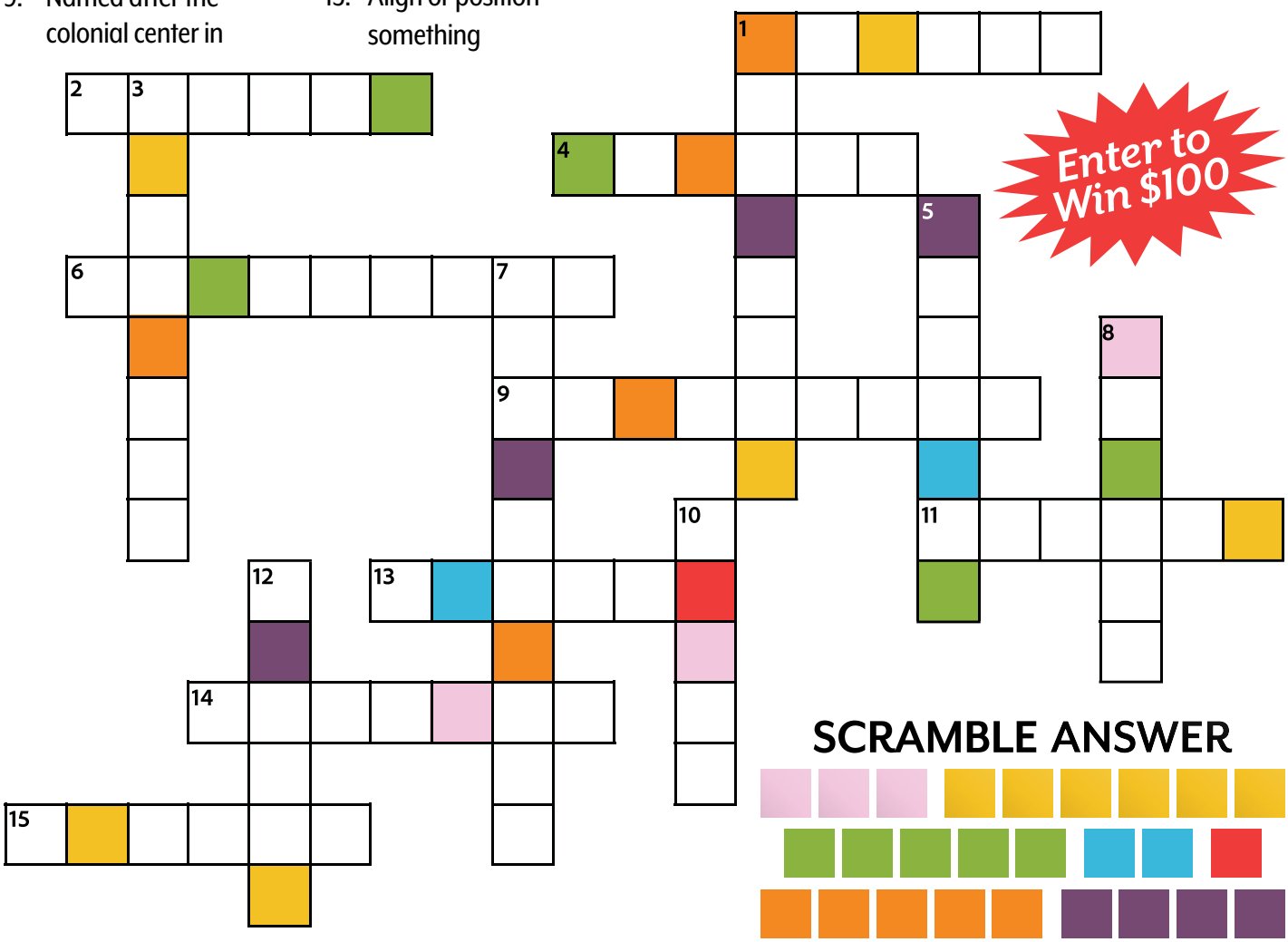
SMALL TOWNS OF SOUTH DAKOTA

Across

1. Pinnacle or peak
2. Thieves
4. Beverly Cleary heroine
6. British director of classic thrillers
9. Named after the colonial center in Virgina
11. Named after a much larger city in Texas
13. Named after Austrian capitol
14. Stackable canned chip
15. Align or position something

Down

1. Highlander country
3. Dependence on or trust in someone or something
5. Similar name to Black Panther kingdom
7. German head of government
8. Chief manservant
10. George Michael Song
12. Ring around the sun



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** with the correct phrase by April 15, 2024 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 Don & Lura Kirkpatric with West River/Lyman-Jones who had the correct phrase of "Everything Comes Back to You" for January 2024.

AQUATIC INSECTS

Are you ready to explore the amazing aquatic insects that call South Dakota home? Grab your virtual magnifying glass, and let's dive into the fascinating world beneath the surface of the state's ponds, rivers, and streams!

1. WATER STRIDERS - THE POND SKATERS:

Imagine gliding effortlessly on the water's surface like a tiny superhero. That's exactly what water striders do! These insects have long legs that help them skate on ponds and streams. They use the surface tension of the water to stay on top and even catch prey like mosquitoes with lightning-fast reflexes.

2. DRAGONFLIES - THE AERIAL ACROBATS:

Meet the daredevils of the insect world - dragonflies! These colorful acrobats zip and zoom through the air, performing incredible mid-air stunts. But did you know they spend most of their life underwater as nymphs before transforming into the dazzling flyers we see above the water?

3. DAMSELFLIES - GRACEFUL FLYERS OF THE WATERWAYS:

Damselflies are like the ballerinas of the insect world. With their delicate bodies and graceful flight, these colorful insects add a touch of beauty to South Dakota's ponds and marshes. They spend their youth as nimble nymphs in the water, and when ready, transform into stunning aerial acrobats.

4. MAYFLIES - THE SHORT-LIVED BEAUTIES:

Mayflies might not have a long life, but they sure know how to make it count! These delicate insects are famous for their short adult stage, sometimes lasting only a day or two. They dance in the air, showcasing their stunning colors before leaving their eggs in the water, starting the cycle all over again.

5. CADDISFLIES - NATURE'S ENGINEERS:

Caddisfly larvae are like little architects of the water. They collect tiny pebbles, bits of plants, and even pieces of wood to create protective cases around themselves. These cases act like underwater homes, keeping them safe until they transform into graceful adults.

6. BACKSWIMMERS - THE UPSIDE-DOWN SWIMMERS:

Backswimmers are like the gymnasts of the insect world. They swim upside-down, using their long legs to paddle through the water. These clever insects are skilled hunters, preying on other smaller aquatic creatures. Watch out for their shiny bodies as they zip around in search of their next meal!

WHY ARE THEY IMPORTANT?

Aquatic macroinvertebrates are like water detectives. Scientists use them to investigate the health of lakes and streams. Different types of these tiny creatures can tolerate various conditions, such as water temperature and pollution levels. By studying which macroinvertebrates are present, scientists can determine if the water is clean and healthy or if there might be some issues that need attention.

These little creatures are also the favorite snacks of fish! Fish rely on aquatic macroinvertebrates as an important part of their diet. So, not only do these tiny heroes keep our waters in check, but they also provide a tasty treat for our finned friends.

Next time you're near a stream or pond in South Dakota, take a moment to appreciate the incredible world of aquatic macroinvertebrates. They may be small, but they play a big role in keeping our waterways healthy and vibrant. Happy exploring, young scientists!

WR/LJ EMPLOYEES & DIRECTOR HONORED FOR YEARS OF SERVICE

WR/LJ Employees Brian Flynn (15 Years), Kati Venard (10 Years), and Jake Fitzgerald (25 Years)

West River/Lyman-Jones Rural Water would like to recognize the following employees and director for years of service. We thank them for their dedication to the rural water system.

25 Years

Jake Fitzgerald, Manager

10 Years

Kati Venard, Billing Secretary

15 Years

Brian Flynn, Murdo O&M

5 Years

Quint Garnos, Director Representing Rural Lyman County east of Township line between Range 75W and 76W

Quint Garnos (5 years)

Lead-Free SD

(Take the survey now—it could pay off!)

Have you completed your water line survey?
Drinking water is free of lead when it leaves the water treatment plant—however, water can absorb lead if it travels through lead pipes on its way to your faucet. The majority of South Dakota water pipes are free of lead, but we need to find where lead pipes still exist so they can be removed.

We need YOU to help us find the lead pipes.
That's where the survey comes in.

It only takes a few minutes.

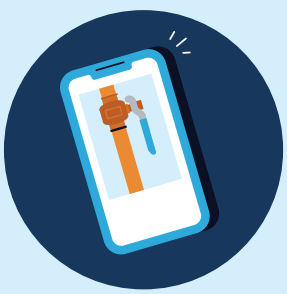
To complete your quick water line survey, go to **survey.SDWaterPipes.com** and grab the following:

A coin or key to scratch the pipe

Lead pipes are shiny silver color when scratched.

Any magnet you have handy

Magnets don't stick to lead pipes.



And (of course) your phone

Finish up by snapping a picture of your pipe and uploading it to the survey site.

Another good reason to complete the survey . . .

One last chance to be entered into a drawing to win a YETI cooler for those that participate in the survey by May 1, 2024. You will also receive a $20 credit on your water bill.

If you need a paper copy, please contact us at 800-851-2349 or print one off our website at www.wrlj.com.

Open the camera app on your smartphone, hover over the QR code below, and tap the link to get to the survey.

West River/Lyman-Jones
Rural Water Systems Inc.
PO Box 407
Murdo, SD 57559

605-669-2931 • www.wrlj.com

WATER MATTERS

HOW WATERFALLS WORK

According to the dictionary, a waterfall is "a cascade of water falling from a height, formed when a river or stream flows over a precipice or steep incline." Such a dry, academic description might well provide a workable technical definition, but it does little to convey the beauty of such features that have drawn the attention of people for ages. Waterfalls, both large and small, are the focal points of many national, state and local parks and scenic areas, ranging from the massive Niagara Falls along the St. Lawrence River to the modest Minnewissa Falls at the Pipestone National Monument 50 miles northeast of Sioux Falls.

In many cases, waterfalls form when fast-moving water passes over hard, resistant rock that transitions into softer, more easily eroded material. The harder capping rock is preserved (or eroded much more slowly), while the softer rock is quickly worn away. As a result, a step (geologists call it a nick point) develops in the river or stream, over which the water "falls." Over time, the harder rock will also be eroded, and the waterfall moves slowly upstream. Chunks of the more resistant cap rock are often visible at the base of the waterfall. Roughlock Falls and Spearfish Falls along Little Spearfish Creek in the Black Hills are two good South Dakota examples of this type.

In other cases, the ledge over which the water "falls" is the result of a break in otherwise fairly uniform rock. Over millions of years, forces within the earth have created faults and fractures in the Sioux Quartzite, which is found across parts of southeastern South Dakota. These breaks have left behind a fairly irregular surface on the quartzite. When modern day rivers and streams flow across this surface, waterfalls and cascades develop where there are sharp transitions. The Falls of the Big Sioux River are an example, and led to the development of our states largest community. Rock Rapids, Iowa, got its name in a similar manner.

Next time you come across a waterfall, see if you can figure out just why it is there, but only after admiring what is taking place.

BACK PAGE CONTENT PROVIDED BY:

EAST DAKOTA WATER DEVELOPMENT DISTRICT

132B Airport Avenue
Brookings, SD 57006
605-688-6741
eastdakota.org