

ServiceLine


— The Official Publication of the South Dakota Association of Rural Water Systems —

COVID-19 UPDATE

INTRODUCTION TO
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COVID-19 UPDATE

SOUTH DAKOTA WATER AND WASTEWATER UTILITY SYSTEMS,

Effective immediately, South Dakota Association of Rural Water Systems (SDARWS) will be following the National Rural Water Associations' federal guidelines and limiting on-site visits by our field staff. If your system has an emergency, please contact the SDARWS office or field staff immediately. We will evaluate the situation and if deemed necessary a Circuit Rider, Wastewater Technician or other Field Staff will make suitable arrangements to come to your facility and provide hands-on assistance. If it is a non-emergency, you are encouraged to call, we will continue to offer remote assistance and advice.

SDARWS is here for our members during these trying times with the onset of the COVID-19 pandemic. At this time our offices will be closed to the public (doors locked), but still functioning Monday – Friday 8:00 am – 4:30 pm (CDT) we will continue to receive phone calls at 605-556-7219 and to check and respond to emails. We will continue to monitor any changes of the COVID-19 pandemic and adhere to additional federal, state and local directives as they are issued and understood.

If you have any questions, concerns or need further information, please contact the SDARWS office 605-556-7219 or call directly; Kurt Pfeifle, Executive Director 605-204-0125 (cell).

We remind everyone that it is your responsibility to keep your family, neighbors and fellow South Dakotans safe by following all Federal, State and Local guidelines dealing with the COVID-19 pandemic, including the avoidance of group gatherings and the practice of social distancing.

The National Rural Water Association continues to monitor the Coronavirus (COVID-19) outbreak and recommends all water and wastewater utilities review the best and latest information on the following trusted websites:

CDC: www.cdc.gov/coronavirus/2019-ncov/summary.html

OSHA: www.osha.gov/SLTC/covid-19/controlprevention.html#solidwaste

WHO: www.who.int/publications-detail/water-sanitation-hygiene-and-waste-management-for-covid-19

CISA: www.cisa.gov/insights

In addition to the foregoing, NRW has also made available a template for “Continuity of Operations Plan” (COOP) for Water Systems during an Influenza Pandemic. The template is broadly written but contains some good information for systems to study and utilize if it becomes necessary. You can find the COOP template here: <https://nrwa.org/wp-content/uploads/2020/03/Influenza-Pandemic-Continuity-of-Operations-Plan-Template.pdf>

Thank you and stay safe!

Kurt Pfeifle,

SDARWS Executive Director

SDARWS CANCELLATIONS DUE TO COVID-19 PRECAUTIONS

Due to CDC considerations, the following SDARWS classes and/or event have been CANCELED:

RURAL WATER EXPO

April 22-23, 2020 - Rapid City Ramkota

The Rural Water EXPO Steering Committee has made the decision to cancel the 2020 Rural Water EXPO, held at the Rapid City Ramkota due to the unprecedented circumstances with COVID-19. We look forward to working with you on future Rural Water events.

Anyone who has paid for a booth or attendee registration will receive a full refund. If you have made overnight sleeping room accommodations due to this event, please contact your hotel to cancel those reservations. The Rapid City Ramkota's front desk number is: (605) 343-8550.

SDARWS FISHING TOURNAMENT

April 24-25, 2020 - Outpost Lodge, Pierre

The Rural Water Warriors Fishing Tournament committee made the decision to cancel this year's tournament due to the unprecedented circumstances with COVID-19. All paid registrants will receive a full refund. If you have made overnight sleeping room accommodations due to this event, please contact your hotel to cancel those reservations. The Outpost Lodge's front desk number is: 605-264-5450. Questions can be directed to tournament director Mike Moeller at 605-270-4989, or via email at mmoeller@sdarws.com.



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OPERATOR CERTIFICATION TRAINING AND EXAMS

TRAINING CLASS UPDATE

Due to the threat to public health posed by the Coronavirus (COVID-19) it was necessary to cancel/postpone the Basic Wastewater Treatment Course that was to be held in Huron SD on March 24-26. We will try to reschedule that course in June of this year.

As for future certification courses, the decision to cancel will be made the week prior to the exam dates. However, we are working on a system to offer online training. For those individuals who have registered and provided a viable email address, you will receive a notice of how to register for the online class and where you can download the course materials.

The first opportunity to use the online training will be for the Basic Water Treatment Course scheduled to be held April 7-9 if we need

to cancel that course you will be notified. This course is currently scheduled to be held at the Ramkota Inn in Sioux Falls.

Online classes will start at 8:00 a.m. Tuesday through Thursday and end at approximately 4:30 p.m. on Tuesday and Wednesday and noon on Thursday. These online courses will be held on the same dates as the original course.

The email you receive will give you a link that will take you automatically to the website where you will have access to the class. You will most likely have to download an app on your phone or tablet or download the software extension if using a computer.

It is very IMPORTANT that if you want to be included in this online training that you register on our website: sdarws.com and give us a viable email address.

Course	Date	Location
Basic Wastewater Treatment CANCELLED	March 24-26	Huron-Crossroads/Events Center
OpCert Exam CANCELLED	March 26-1:00 pm	Huron-Crossroads/Events Center
Basic Water Treatment	April 7-9	Sioux Falls-Ramkota Inn
OpCert Exam CANCELLED	April 9-1:00 pm	Sioux Falls-Ramkota Inn
OpCert Exam CANCELLED	April 23-12:30 pm	Pierre-Matthew Center
Small Water Treatment System Workshop	April 28	Rapid City-Ramkota
Small Water Treatment System Workshop	April 30	Aberdeen-Ramkota
Stabilization Pond Workshop*	May 6	Huron-Crossroads/Events Center
Advanced Wastewater Treatment	May 19-21	Brookings-Days Inn
OpCert Exam	May 21-1:00 pm	Brookings-Days Inn
Intermediate Water Treatment	June 2-4	Sioux Falls-Ramkota Inn
OpCert Exam	June 4-1:00 pm	Sioux Falls-Ramkota Inn
OpCert Exam	June 9-12:30 pm	Pierre-Matthew Center

*The Stabilization Pond class deals strictly w/ ponds and is the best class for preparing to take the Small Wastewater System exam. The Basic Wastewater Treatment class deals w/ all types of wastewater treatment other than ponds and is the best class for preparing to take the Class I Wastewater Treatment exam. Small systems that use ponds for treatment can come into compliance w/ the OpCert Law by passing either the Class I Wastewater exam or the Small Wastewater System exam.

**Water systems serving less than 500 people that use wells can come into compliance by passing the Small Water Treatment exam. Larger systems must pass the Class I Water Treatment exam.

All dates are tentative based on number of applicants. Certification exam applications must be submitted for ALL exams including retakes. Applications MUST be received by the Department of Environment and Natural Resources (DENR) at least two weeks before the exam date, as required by the Operator Certification Rules (ARSD 74:21:02:40). Applicants will receive a confirmation of their exam receipt by the Department. Applications will be accepted via fax at 773-5286. Check or money orders made out to "DENR-Operator Certification" are required. Applications must be filled out completely as they are the sole source of information used to determine operator eligibility to take an exam.

For Study materials, visit: www.abccert.org/testing_services/ExamReferences.asp

For more information contact SDARWS Trainer Jim Zeck: 605-201-9568 or jzeck@sdarws.com

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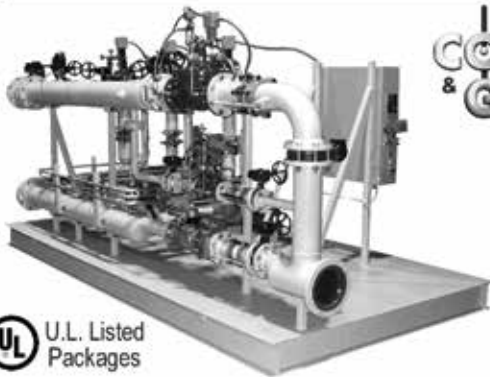
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COVID-19

CORONAVIRUS

SUSTAINING OPERATIONS

Water and wastewater operators are essential personnel and should be prepared to address potential impacts to supply due to personnel interruptions tied to COVID-19. Water systems play a vital role in public health and the South Dakota Association of Rural Water Systems are here to help systems put measures in place that ensure seamless operations during the Coronavirus/COVID-19 pandemic.

CRITICAL OPERATIONS PREPAREDNESS

- Identify essential employees required to maintain continuous operation and designate an emergency backup for these employees in the case they cannot report to work.
- Strategize implementation of an ancillary workforce (e.g. neighboring water systems, contractors, employees in other job titles/descriptions, retirees) to operate utilities on emergency basis.
- Stay stocked on chemical supplies and order products ahead of schedule to avoid delays from understaffed chemical suppliers.
- Generate back-up supplier contact list for essential chemical and operation needs.
- Update/create detailed written instructions for crucial operations (i.e. shutdown, water quality sampling, public notification).
- Review/update emergency response plan and contacts. Identify key customers—hospitals or care facilities—with special needs.
- Discuss cyber security precautions when using remote

access. Back-up critical files frequently as a prevention measure to restore data.

- Consider emergency food and overnight necessities at 24-hr facilities for personnel working long shifts.
- Encourage personnel to stay home when they are sick. Provide work-from-home or sick leave options. Discuss backup or alternative shift rotations for personnel that need to stay home to care for themselves and/or loved ones.
- If possible, make a plan with your family and any groups that you lead in case of have school/work closures.
- Limit meetings, gatherings and travel. Encourage personnel to postpone all non-essential travel especially to areas affected by COVID-19.

Public water/wastewater systems are expected to continue to monitor water quality and provide sample results to regulators during the COVID-19 epidemic.

There may be systems, that due to an outbreak of COVID-19, require operational assistance. The South Dakota Association of Rural Water Systems and the South Dakota Wastewater Agency Response Network (SDWARN) is compiling a pool of certified water and wastewater operators who might be available to provide emergency on-site assistance to other systems. You do not need to be a member of this network and we encourage you to participate with this effort. Contact South Dakota Association of Rural Water Systems for more information and assistance, or see page 35 of this issue of *ServiceLine*. ♦



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USDA RURAL DEVELOPMENT INCREASED RURAL POPULATION LIMITS TO 50,000 FOR SOME LOAN GUARANTEE PROGRAMS

Julie Gross, State Director, USDA Rural Development

The U.S. Department of Agriculture (USDA) Deputy Under Secretary for Rural Development Donald “DJ” LaVoy announced in October of 2019 that in accordance with the 2018 Farm Bill, USDA’s Rural Housing and Utilities Service will change rural population limits, fees and funding priorities for some loan guarantee programs administered through the Rural Housing Service and the Rural Utilities Service. The changes went into effect December 2, 2019.

USDA increased the rural population eligibility limit to 50,000 residents for the Community Facilities Guaranteed Loan Program (CF) and the Guaranteed Water and Waste Disposal Loan Program (WEP).

For fiscal year 2020, projects financed through the Community Facilities Guaranteed Loan Program will still receive priority in rural areas of 20,000 or fewer residents. Projects financed through the Water and Waste Disposal Guaranteed Loan Program will receive priority in rural areas of 10,000 or fewer residents.

USDA increased the Community Facilities Guaranteed Loan Program’s one-time guarantee fee from 1 percent to 1.5 percent. The Agency also established an annual renewal fee of 0.5 percent of the loan’s principal balance each year. There are no changes to the Water Waste Disposal Guaranteed

Loan Program fee rates. For additional information, see page 52869 of the Oct. 3, 2019, Federal Register.

This provides new funding opportunities for communities over 10,000 and less than 50,000 including the communities of Aberdeen, Brookings, Watertown, Mitchell, Yankton, Pierre, Huron, Spearfish, Vermillion and Brandon.

Eligible applicants for CF include public bodies, community-based non-profit corporations, and federally recognized tribes. Eligible applicants for WEP include most state and local government entities, nonprofit organizations, and federally recognized tribes. For both CF and WEP, the maximum guarantee is typically 90 percent of the loan amount, one-time guarantee fee, interest rates may be fixed or variable as negotiated between the lender and the borrower and subject to USDA approval, and up to 40-year payback period,

Applications may be filed with the USDA Rural Development Area Office serving the county where the applicant is located. For information about either the CF or WEP, contact USDA Rural Development field staff in the Area Offices - Aberdeen contact Valerie Jensen at (605) 824-3624; Mitchell contact Austin Claeys (605) 299-3349; Pierre contact Brian Ring (605) 301-3411; Sioux Falls contact Diane Sieperda (605) 937-4773; and Rapid City contact Dylan Tramp (605) 858-6679 or Katie Hammer (605) 858-6703. ♦

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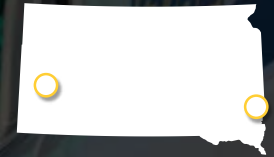
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USDA RURAL DEVELOPMENT – EMERGENCY COMMUNITY WATER ASSISTANCE GRANT FUNDS AVAILABLE TO ELIGIBLE COMMUNITIES

By Julie Gross, State Director, USDA Rural Development

The effects of heavy snow and rain have influenced water resources throughout the state of South Dakota, especially during the past two years.

Rural communities whose water supply is being impacted may find assistance through USDA Rural Development's Emergency Community Water Assistance Grant (ECWAG) program.

This program provides funds to assist rural communities that have experienced a significant decline in quantity or quality of water, or in which such a decline is considered imminent. Funds may be used for several purposes related to water supply issues caused by an emergency. Some examples are waterline extensions, repairs related to an emergency, construction of new wells or other permanent water sources, provision of a temporary water source in certain circumstances, equipment replacement, and related project fees such as engineering or legal.

Under the ECWAG program, funds may be used in incorporated communities of less than 10,000 residents or any unincorporated area. Eligible applicants include public bodies, private nonprofit corporations, and Federally recognized Indian tribes.

Applicants must possess the legal authority to own and operate the water facility and must document the emergency that caused the problem. Examples of emergencies include, but are not limited to, drought; earthquake; flood; tornado; hurricane; disease outbreak; or chemical spill, leakage, or seepage. A disaster designation is not required.

The maximum grant is \$150,000 for repairs, partial replacement, or significant maintenance on an established

system, or \$1,000,000 to alleviate a significant decline in quantity or quality of water that occurred within two years of filing an ECWAG application, or to attempt to avoid a significant decline that is expected to occur during the 12-month period following the filing of an application.

Applications must demonstrate need for the grant based on median household income and repayment ability and are subject to environmental review. ECWAG funds may be used in conjunction with other sources of funds.

Applications may be filed with the USDA Rural Development Area Office serving the county where the applicant is located. For more information about the ECWAG program visit www.rd.usda.gov/sd or contact USDA Rural Development field staff in the Area Offices - Aberdeen contact Valerie Jensen at (605) 824-3624; Mitchell contact Austin Claeys (605) 299-3349; Pierre contact Brian Ring (605) 301-3411; Sioux Falls contact Diane Sieperda (605) 937-4773; and Rapid City contact Dylan Tramp (605) 858-6679 or Katie Hammer (605) 858-6703.

We understand the importance modern and reliable water systems have in helping rural communities thrive. From economic opportunity to public health and the environment, modern infrastructure, including water infrastructure, is a foundation for enhanced quality of life and prosperity in rural America.

Rural Development also provides loans and grants to help expand economic opportunity and create jobs in rural areas. This assistance supports infrastructure improvements; business development; housing; community facilities such as schools, public safety and health care; and high-speed internet access in rural areas. 💧

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SPECIAL REPORT:

Circuit Riders – The Origin and Mission

by Kalli Forshee, National Rural Water Association

Initially, Circuit Riders were clergy assigned to travel around specific geographic territories and deliver a sermon or religious address to settlers and organize congregations in the earliest years of the United States.

The National Rural Water Association (NRWA) pioneered the concept of a “Circuit Rider” for the water industry in 1980 in cooperation with the Farmers Home Administration, now Rural Development, Rural Utilities Service. The program was the result of congressional actions and appropriations advocated by NRWA to directly assist rural and small communities. NRWA was formed in 1976 as a utility membership association representing the water and wastewater industry in small and rural communities. The original goals and mission of funding and providing resources to assist rural and small utilities continue today. These small and rural utilities include most of the community water supplies in the nation. In fact, 91% of the 49,731 community water supplies serve less than 10,000 population, 26% serve 3,300 or less and 54% serve 500 or less.

The Circuit Rider Program was institutionalized into law on September 24, 1980 with the passage of the Rural Development Policy Act of 1980. The authorization of the Circuit Rider Program was created by Congress with this clear mission stating,

“through the Farmers Home Administration for planning and technical assistance and for the establishment of a circuit-rider program to facilitate the delivery of Federal programs to rural areas. It also provides for dissemination of more information to the rural public about the availability of these programs. This bill will improve the Federal Government’s capacity to meet the needs of our small towns and country areas. It will move us from a protracted period of analysis to a program of active involvement in rural and small-community development...”

Presidential Remarks on the passage of the Rural Development Policy Act of 1980:

“Senator Leahy and Congressman Wes Watkins, Congressman Nolan and others who are assembled here, ladies and gentlemen who are interested in the future of rural America—future of America... This legislation will enable the Farmers Home Administration to assist small communities in establishing circuit-rider programs to provide assistance in economic and community development. I’m today directing the Farmers Home Administration to act promptly to make funding immediately available for these circuit riders, who will go into a community, assess what can be done, that the initiative be from the local people, but provide counsel and assistance as necessary.”





Since 1980, this bi-partisan program has been the mainstay of viability for the nation's rural and small community water and wastewater utilities. The value cannot be understated and is documented by the record of small utilities in compliance with the Safe Drinking Water Act, economic development in rural areas, and a delinquency rate on repayment of government debt to the Rural Utilities Service, which is consistently less than one-half of one percent.

The NRWA Circuit Rider Team is made up of 132 full-time professional men and women located throughout every state and territory. They provide a pool of expanded skills, knowledge and expertise that is usually unavailable to many small and rural communities. These technicians are uniquely qualified with a skillset that cannot be duplicated. Circuit Riders are practitioners who have actual hands-on experience managing and operating systems, a bank of knowledge gathered from working with systems across their respective states, possess a variety of license and are Utility Management Certified. Since 1980, they have developed operational knowledge and built trusting relationships with staff, governing officials and local leaders. These relationships allow Circuit Riders the ability to effectively communicate and improve all facets of their utility, governance, management operations, finances and sustainable actions for the future. In addition, this relationship allows for critical issues and actions to bypass local politics and receive unbiased information and advice from a trusted source.

Annually, Circuit Riders provide more than 50,000 types of technical assistance and support activities to the nation's 45,255 community water supplies that serve 10,000 or less in population. The value of this critical expertise is documented in government reports and more importantly, from the systems and communities they served. Over the course of a year, there are continuous unsolicited appreciation letters received from utilities and local leaders such as:

"During a catastrophic occurrence such as this was, [Circuit Rider's] experience and knowledge of how to handle everything was so appreciated. We think we would have been lost without their direction and guidance." – PWSD #2, Jefferson Missouri

"As a small system on a tight budget we do not always have the funding to hire specialized contractors.... The Rural Water Association [Circuit Riders] provide valuable technical assistance to our system operations that would otherwise be unaffordable." – Public Works Director – Brewster, Washington

"To say that we were in dire straits is an understatement. A value cannot be placed on your Circuit Rider's and training personnel's assistance to all 82 counties in Mississippi." – Poplar Spring Water District, Mendenhall Mississippi

Please visit nrwa.org or sdarws.com website for more information on Circuit Riders. ♠



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Nanostone filtration skid

RAPID VALLEY SANITARY DISTRICT/WATER SERVICE LEADING THE WAY IN WATER FILTRATION TECHNOLOGY

By Mike Moeller, SDARWS Technical Assistance Training Specialist

Rapid Valley Sanitary District/Water Service has been on the leading edge of water filtration technology for a few years now. They were the first water company in the United States to use the Nanostone ceramic filter elements. Rusty Schmidt (Manager) and staff installed the Nanostone filter elements in 2017 on their backwash skid to test their performance. The filter elements performed very well, and in 2018 Rapid Valley installed 36 of them on the main water filtration skid. The skid was run for a year with 36 of them in place, and then in 2019, the remainder of the old filter elements were changed out, bringing the total to 50 new ceramic filtration elements used on the main skid in the water treatment plant. Changing the



Old filtration skid to be replaced with Nanostone ceramic filters

...continued on next page



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RAPID VALLEY: continued from page 21...

filter elements to the new ceramic filters increased the output of the skid from 1MGD to 1.4 MGD without any loss of water quality.

Rapid Valley is now in the process of changing out the filtration elements on their second filtration skid. The task of doing the switch is being completely done by Rapid Valley staff. The old filter elements have to be removed, and all the framework that holds the elements – the headers that supply and discharge the water, and the tanks and pumps – have to be replaced to accommodate the increased flow rates.

As I stated before, the old headers for the inlet and outflow of the skid have to be completely reconfigured to meet the size difference of the filtration elements. The old headers were made from stainless steel, and the new ones will be constructed from HDPE. The framework that holds the headers also has to be reconfigured to allow for the size difference.

The new filter elements will arrive shortly, and the new skid will be test run to work out any possible problems it may have. The start-up of the skid should go smoothly since it will be their second installation. Rusty and his staff will have the second skid operational early this spring. The added water production of the skid will help in the high demand time during the summer months. After this, Rapid Valley will only have one more skid to upgrade – which is scheduled for installation next winter and be in full operation for the summer of 2021. If you happen to be in the Rapid Valley area and would like to see the ceramic filters in person, I'm sure you could stop in, and Rusty would give you a tour of the water treatment plant. 💧



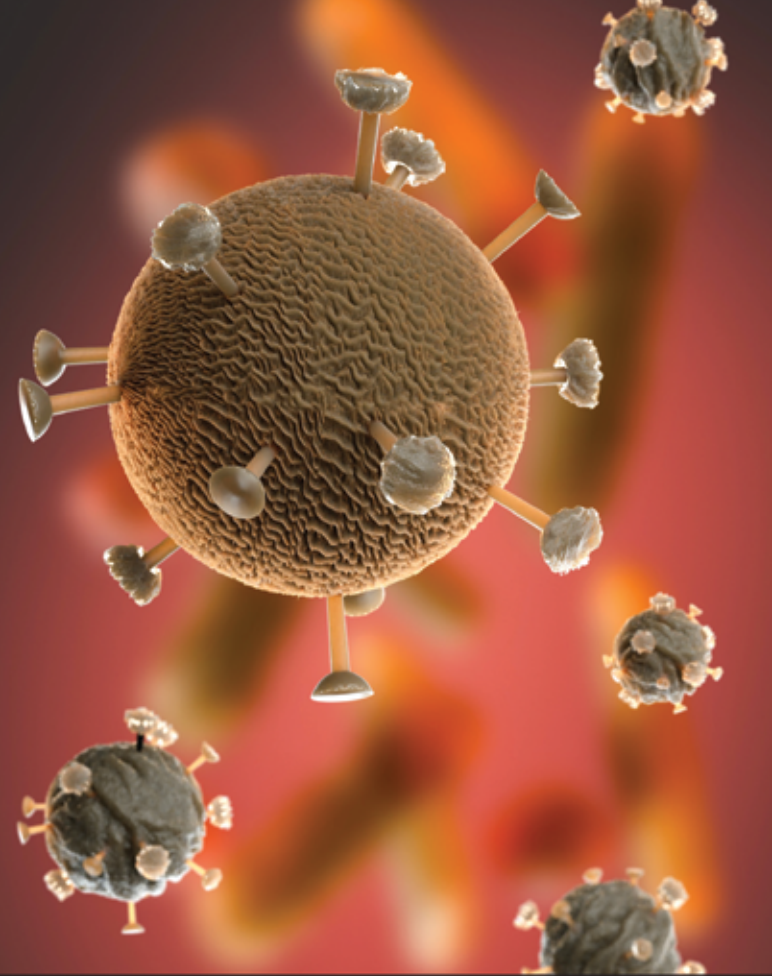
MIKE MOELLER has worked for SDARWS since 2014. He previously worked at Dakota Pump and Control for five years, and served 30 years with the South Dakota National Guard. Mike also holds an Advanced Safety Certificate from the National Safety Council.



FLEET Program

- The National Rural Water Association has created partnerships with motor groups to offer discounts to State Rural Water Associations and their utility system members.
- Member utilities should contact their State Rural Water Association to access the Rural Water Fleet Program.





Introduction to Coronaviruses

The purpose of this article is to provide water and wastewater utilities with a summary of some of the relevant issues related to coronaviruses treatment with considerations and recommendations to water and wastewater treatment practitioners with respect to coronaviruses in general.

- *Fate of coronaviruses in sewage and wastewater treatment plants*
- *Fate of coronaviruses in the aquatic environment*
- *Efficacy of water treatment filtration and disinfection processes for coronaviruses removal and inactivation*

It is important to remember that an extensive body of literature on the effectiveness of water and wastewater treatment processes for coronaviruses is not available, and as always, site-specific water-quality and treatment-plant details may result in variation between full-scale effectiveness and research results found in the laboratory.

Considerations for Water and Wastewater Treatment

Infectious human coronaviruses may be present in raw wastewater that is collected from a population where an infection is occurring. About 20-40% of SARS-CoV infections presented symptoms of diarrhea and the virus is capable of binding to receptors in the intestines as well as in the lungs (Leung et al. 2003). These viruses may be detected in urine and stools from infected individuals for more than 100 days after initial infection (Liu et al., 2003). The persistence of coronaviruses in hospital wastewater and domestic sewage is estimated to be 2-3 days (Wang et al., 2005).

Wastewater treatment plants that are receiving sewage from hospitals and isolation centers treating patients for coronaviruses may have elevated concentrations of viruses in the wastewater influent. Further, if wastewater treatment is insufficient to remove or inactivate coronaviruses, or combined sewer overflows/bypasses

Common disinfection methods used in water and wastewater treatment are expected to be effective for inactivation of coronaviruses when executed properly

The recent outbreak of novel coronaviruses (COVID-19) in Wuhan City, Hubei Province, China is being closely monitored as it causes acute respiratory illness and has the potential to be fatal (CDC, 2020). The COVID-19 and the 2002 SARS-CoV (severe acute respiratory syndrome coronaviruses) are recent examples of how some coronaviruses that infect animals can evolve to infect humans.

Investigations into the COVID-19 outbreak are ongoing, and the information that we have right now may change as we learn more about this virus (WHO, 2020). As water treatment professionals, we want to inform stakeholders of the current state of knowledge on coronaviruses as it relates to our practice.

are operational, the viruses may be released into the environment (Casanova et al., 2009).

Coronaviruses have not been found to be more resistant to water treatment than other microorganisms such as E. coli, phage, or human viruses such as poliovirus, which are commonly used as surrogates for treatment performance evaluations (Gundy et al., 2009). Results from bench-scale studies suggest that the survival of coronaviruses is temperature dependent; with greater survival at lower temperatures. Therefore, the persistence of coronaviruses are expected to be reduced in raw wastewater and surface waters in warmer seasons.

Wastewater Treatment

In general, secondary wastewater treatment may be credited with removing 1 log (90%) of viruses, though broad studies suggest the level of virus removal is highly variable between insignificant removal to greater than 2 log removal (99%) (Hewitt et al., 2011; USEPA, 1986). Because of this variability, the primary process for the inactivation of viruses in wastewater treatment is chemical disinfection (i.e. chlorination) and/or disinfection by ultraviolet (UV) light.

The efficacy of chlorination for inactivating viruses in wastewater is dependent upon numerous water quality factors. Of particular importance is the presence of disinfectant-demanding substances and in particular, ammonia, which reacts with chlorine to form chloramines. In general, chloramines are much poorer virucides as compared to free available chlorine. Thus, it is important to consider the level of ammonia before the disinfection process to adequately determine its virucidal efficiency. Chemical disinfection of wastewater with free available chlorine is expected to be effective for coronaviruses when applied at adequate levels. In one published research study, chlorination of domestic wastewater using a dose of 10 mg/L sodium hypochlorite, a contact time of 30 minutes, and a free chlorine residual of >0.4 mg/L was found to inactivate 5 log of coronaviruses (Wang et al., 2005). This level of chlorination is often applied in full-scale WWTPs. For example, the Ontario (Canada) Ministry of the Environment typically requires WWTPs to have a free chlorine residual of 0.5 mg/L after 30 minutes of contact time at the design average daily flow (Ministry of the Environment, 2008). The efficacy of UV disinfection of viruses in wastewater is highly dependent upon the fluence achieved by a particular system and it is, therefore, not possible to estimate for general systems. For UV disinfection systems that were not designed specifically for virus inactivation, only low-levels of coronaviruses inactivation are expected.

Sludge Management

The survival of coronaviruses in wastewater sludge has not been reported but is expected to vary significantly depending on site-

specific sludge handling and treatment procedures. Based on a study examining survival of coronaviruses in water and wastewater (Gundy et al., 2009), coronaviruses survival in primary wastewater effluent at temperatures greater than 20°C is expected to be very low - within a period of 4 days. However, this same study reported that the survival time increases (e.g. more than 4 weeks)

at cold temperatures (near 4°C) in clean water. At all temperatures studied, coronaviruses showed lower survival rates in wastewater than other viruses. Sludge handling and disposal practices should be reviewed on a case-by-case basis to prevent contamination of ground and surface waters.

The U.S. Environmental Protection Agency's (EPA's) Part 503 rule provides comprehensive requirements for the management of biosolids generated during the process of treating municipal wastewater.

Operators of Wastewater Treatment

Respiratory illnesses can be spread by contact with aerosols and by hand-to-mouth transmission. Therefore, it is recommended that wastewater treatment operators and sludge handlers use barriers such as face masks and disposable gloves to prevent exposure to aerosols. Further, strict sanitation practices should be implemented to encourage frequent handwashing, the separation of eating areas from work areas, and minimization of contact between hands and face. Communications should be sent to plant operators and staff to inform them of best sanitation practices.

Do's and Don'ts of general sanitation practices that prevent the spread of respiratory viruses are listed below.

Do's:

- ***Do wash hand with soap and water for at least 20 seconds, especially after using the bathroom, before eating, after blowing your nose, coughing or sneezing.***
- ***Do stay home when you are ill.***
- ***Do cover your cough or sneeze with a tissue and dispose of the tissue in the trash.***
- ***Do disinfect frequently touched objects and surfaces such as door knobs.***

Don'ts:

- ***Don't touch your eyes, nose and mouth with unwashed hands.***
- ***Don't have close contact with people who are ill.***
- ***CDC does not recommend the use of facemasks for the general public to prevent the spread of COVID-19 as close person-to-person contact is currently considered the greatest risk for transmission, and transmission in general population areas has not been observed.***

Drinking Water Treatment

Surface water treatment plants with upstream wastewater impacts are the most susceptible to having coronaviruses contamination in the raw water supply during, and after, an outbreak. Conventional treatment with free available chlorine designed to provide 0.5 log inactivation of *Giardia* can achieve at

least 8 log inactivation of viruses in general (Health Canada, 2019a). Note that it is important to ensure that disinfection performance is continuously monitored (e.g. turbidity, disinfectant dose, residual, pH, temperature, and flow). Optimized conventional filtration can

achieve 2 (99%) log virus removal (Health Canada, 2019b). A UV fluence of 44 mJ/cm² can achieve up to 3 log (99.9%) inactivation of poliovirus 1 and rotaviruses, while a dose of 40-199 mJ/cm² can inactivate up to 3 log (99.9%) of adenoviruses; the most UV resistant viruses (Health Canada, 2019b; USEPA 2006). Based on published research, water treatment processes that meet virus removal/inactivation regulations are expected to be effective for coronaviruses control. Further details of the efficacy of various treatment processes for the removal/inactivation of human viruses was recently updated in the Guidelines for Canadian Drinking Water Quality (Health Canada, 2019b).

Potential Response Actions

Here are some response actions to potential risks from coronaviruses in water and wastewater treatment:

Critical Control Point	Potential Risk	Risk Response
Wastewater treatment - open basins	<i>Aerosols created during wastewater treatment process</i>	<ul style="list-style-type: none"> Communicate risks, provide signage, and PPE barriers to wastewater treatment operators regarding the potential transmission of coronaviruses and precautionary sanitation practices
Wastewater disinfection	<i>Infectious coronaviruses persisting in domestic sewage</i>	<ul style="list-style-type: none"> Ensure optimal contact time for chemical disinfection
Drinking water treatment	<i>Infectious coronaviruses in water supplies impacted by wastewater effluent</i>	<ul style="list-style-type: none"> Ensure continuous monitoring and performance of drinking water disinfection processes for systems with upstream wastewater impacts during, and after, and outbreak

The World Health Organization has found that risk communication and community engagement (RCCE) has been integral to the success of response to health emergencies.

RCCE action items related to coronaviruses include communicating about preparedness measures at all levels and establishing a system for listening to public perceptions to prevent misinformation.

Further Reading:

1. **Centers for Disease Control Updates:**
<https://www.cdc.gov/coronaviruses/index.html>
2. **World Health Organization Updates:**
<https://www.who.int/emergencies/diseases/novelcoronaviruses-2019>
3. **WHO Risk Communication and Community Engagement (RCCE) Readiness and Response to COVID-19:**
[https://www.who.int/publications-detail/risk-communication-and-community-engagement-readiness-and-initial-response-for-novelcoronaviruses-\(ncov\)](https://www.who.int/publications-detail/risk-communication-and-community-engagement-readiness-and-initial-response-for-novelcoronaviruses-(ncov))
4. **USEPA Surface Water Treatment Rules:**
<https://www.epa.gov/dwreginfo/surface-water-treatment-rules>
5. **Health Canada – Guidelines for Canadian Drinking Water Quality – Enteric Viruses:**
<https://www.canada.ca/en/health-canada/services/publications/healthy-living/guidelines-canadian-drinking-water-quality-guidelinetechnical-document-enteric-viruses.html>

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- USEPA. (2006). *UV Disinfection Guidance Manual for the Final Long Term 2 Enhanced Surface Water Treatment Rule*. Federal Register.
- USEPA. (1986). *Design Manual: Municipal Wastewater Disinfection*. Office of Research and Development.
- Wang, et al. (2005). Study on the resistance of severe acute respiratory syndrome-associated coronaviruses. *Journal of Virological Methods*, 126(1-2), 171-177.
- WHO. (2020). *Novel Coronavirus 2019*. World Health Organization. Accessed on February 4, 2020 at <<https://www.who.int/emergencies/diseases/novel-coronaviruses-2019>>.

Contact Us

Stantec is pleased to provide this information on coronaviruses as it relates to water treatment. We can be reached at your convenience to answer questions. We hope this factual content will assist with the communication of risk within your organization.

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This document is continually being updated. Please visit <https://ideas.stantec.com/water/considerations-for-water-and-wastewater-treatment-related-to-the-recent-outbreak-covid-19> for the most current information.

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CERTIFICATION PRACTICE QUESTIONS

1. WHICH OF THE FOLLOWING ARE DISINFECTION BY-PRODUCTS

- a. Chloroform
- b. HAA5
- c. TTHM
- d. All of the Above

2. TTHM STANDS FOR

- a. Total Tri-halomethane
- b. Typical Tri-halomethane
- c. Triple Tri-halomethane
- d. None of the above

3. HAA STANDS FOR

- a. High Acetic Acid
- b. Halo Acetate Acid
- c. Halo Acetic Acid
- d. Tri-Halomethane

4. DISINFECTION BY-PRODUCTS FORM WHEN WHAT REACTS?

- a. Disinfectants and Water
- b. Disinfectants and Soap
- c. Disinfectants and Organic Matter
- d. Ozone and Chlorine

5. HOW MANY TTHM SPECIES ARE THERE?

- a. 3
- b. 4
- c. 5
- d. 10

6. HOW MANY HAA5 SPECIES ARE THERE?

- a. 3
- b. 4
- c. 5
- d. 10

7. THE MCL FOR TTHM IS

- a. 40 ug/L
- b. 50 ug/L
- c. 80 mg/L
- d. 0.08 mg/L

8. THE MCL FOR HAA5 IS

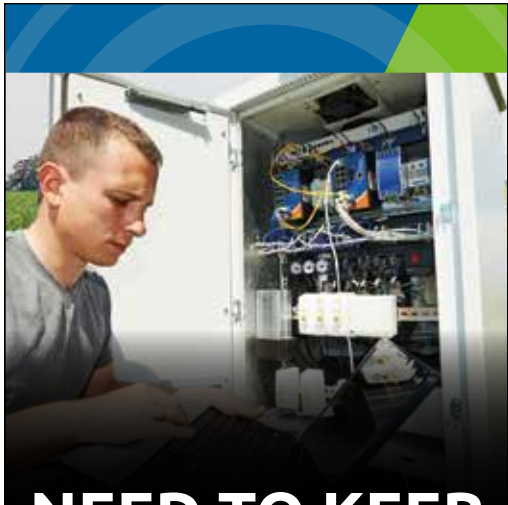
- a. 30 mg/L
- b. 30 ug/L
- c. 60 ug/L
- d. 60 mg/L

9. ACCORDING TO THE CLEAN WATER ACT, SECONDARY TREATMENT IS DEFINED AS A WASTEWATER PLANT ACHIEVING AT LEAST _____ % REMOVAL FOR BOD AND TSS.

- a. 15%
- b. 85%
- c. 60%
- d. 40%





10. PRIMARY EFFLUENT MIXED WITH RETURN ACTIVATED SLUDGE IS CALLED?

- a. Mixed liquor
- b. Activated sludge
- c. Waste activated sludge
- d. Return activated sludge



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1. D; 2. A; 3. C; 4. C; 5. B; 6. C; 7. D; 8. C; 9. C; 10. A



CROSS-CONNECTIONS “The Bad and the Good”

By **Nick Jackson, SDARWS Circuit Rider**

Civilizations have grown where drinking water has been abundant, starting from prehistoric times to the present. When populations could not live directly adjacent to the drinking water supply, such as rivers and lakes, it became necessary to transport this essential water to the people for drinking purposes. Early forms of water transportation started with clay jars, animal skins, and the such. Early civilizations such as the Romans developed a network of aqueducts to carry the water for drinking, bathing, and the sewer systems to carry away the waste. Perhaps the proximity of the drinking water system and the waste system could have been interconnected inappropriately, constituting one of the earliest forms of a cross-connection. The first municipal water utility in the United States was established in 1652 in Boston, Massachusetts, to provide domestic water for usage and fire protection utilizing fabricated hollowed-out logs for the distribution system. As technology and time went by, and then, in the early 1900's, the New England Water Works Association met and discussed the many cases of secondary water supplies contaminated the water distribution system. Something needed to be done to prevent cross-connections.

Plumbing cross-connections are defined as actual or potential connections between a potable and non-potable water supply, which can constitute a serious public health hazard. There are numerous, well-documented cases where cross-connections have been responsible for the contamination of drinking water and have resulted in the spread of disease. The problem is a dynamic one because piping systems are continually being installed, altered, or extended.

Control of cross-connections is possible, but only through thorough knowledge and vigilance. Education is essential, for even those who are experienced in piping installations fail to recognize cross-connection possibilities and dangers. All

municipalities and rural water systems with public water supply systems should have cross-connection control programs. Those responsible for institutional or private water supplies should also be familiar with the dangers of cross-connections and should exercise careful surveillance of their systems.

Cross-connections are the links through which it is possible for contaminating materials to enter a potable water supply. The contaminate enters the potable water system when the pressure of the polluted source exceeds the pressure of the potable source. This action may be called back-siphonage or backflow. Essentially it is the reversal of the hydraulic gradient that can be produced by a variety of circumstances – such as a heated garden hose, low pressure caused by a water break, etc. – basically anything where the out-side pressure supersedes the internal water pressure.

Several years ago, in Spearfish, carbonated water contaminated the drinking water within a restaurant through the soda fountain dispenser. Over in Europe, a pub was replumbing and managed to pump beer into the adjacent apartment complex, finally figuring out something was wrong when water came out of the beer taps. SD DENR asked to share this most recent cross-connection where a malfunction caused red wine to flow from faucets in an Italian town! Who wouldn't love it if red wine started flowing from their kitchen sink?

According to an article on CNN: (<https://www.cnn.com/travel/article/italy-lambrusco-wine-from-faucet-castelvetro-trnd/index.html>) For a few hours on Wednesday, March 4th, residents of the northern Italian town of Castelvetro realized they could have their Lambrusco not just from bottles – but also from their faucets and showerheads.

A malfunction at a local winery caused 1,000 liters of ready-to-bottle wine to leak into the water pipes.

The glitch lasted about three hours and impacted about 20 homes,

said Giorgia Mezzacqui, deputy mayor of Castelvetro, about 10 miles south of Modena.

The local government posted on its Facebook page that the leak didn't pose any health risks.

The incident provided a moment of levity to the town that's during the Coronavirus crisis—which has hit northern Italy the hardest.

"At a time where we have very little to smile about, I'm glad we brought some levity to others," Mezzacqui told CNN.

"Hopefully someday they'll remember us and will want to come visit us."

What happened? According to the Cantina Settecani winery, the malfunction was caused by a faulty valve in the washing circuit within the bottling line. Lambrusco Grasparossa, a local specialty, seeped through the town's water lines due to its pressure, the winery said in a statement obtained by CNN.

Fabrizio Amorotti, commercial manager at Cantina Settecani, said the malfunction "was appreciated by many. Some clients in the areas called us to warn us about it, and to share they were bottling the wine!"

So there are some "good" cross-connections, but most are bad! 💧



NICK JACKSON joined the SDRWS staff on 2001. He previously worked for seven years at the City of Custer Supervisor for the Water Department. Nick holds a Class II Water Distribution, Class II Water Treatment, Class II Wastewater Collection, Class II Wastewater Treatment and Stabilization Pond certifications. He is a certified instructor in First Aid, CPR, and AED instructor through the American Heart Association and the National Safety Council, and a certified South Dakota Restricted Plumbing Contractor since 2004. Nick also served 14 years in the United States Marine Corps, and then served 25 years in the South Dakota Army National Guard. Nick also volunteers with small Ambulance Services in southwestern South Dakota.

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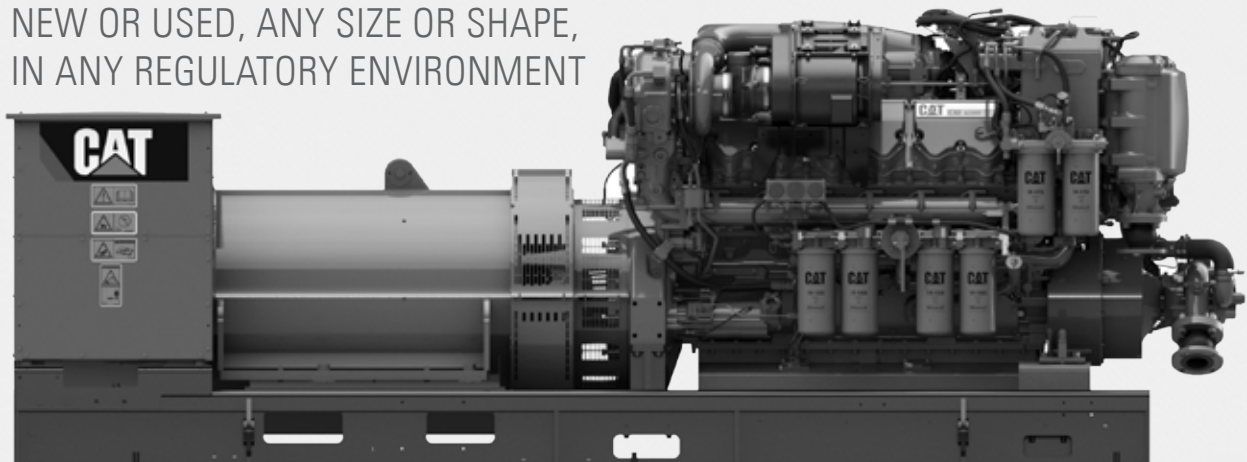
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Don't let there be **HAZARDS** with **COMMUNICATION** of dangerous chemicals in the workplace

By **Steve Attema, SDARWS Safety Trainer**

We are all exposed to chemicals in our daily and work life. It may be in the air we breathe, food we eat or what we drink. Depending on the quantity and type of chemical we are exposed to these may become hazardous to our health. In our daily life each person needs to be diligent in preventing exposure to chemical hazards and workplaces need standards in place to protect their workers.

THE ROUTES OF EXPOSURE OF CHEMICALS CAN INCLUDE:

- Inhalation
- Ingestion
- Absorption
- Injection

To protect workers from the dangers posed by hazardous chemicals in the workplace the Hazard Communication (HazCom) Standard was put into law in 1994 and updated in 2012. These standards were put in place so employees know and understand the hazards of chemicals they work with.

As it stands today employers need to do five main things to be in compliance with the current HazCom Standard.

1. Create a Hazardous Chemical Inventory

- All hazardous chemical on or off site. There may be some exclusions for chemicals bought at a local store that the general public would be able to buy.

2. Ensure Chemicals Have a Proper Safety Data Sheet (SDS).

- Needs to have the standard 16 sections as defined by the Globally Harmonized System (GHS). The company you get chemicals from should supply you with this.

3. Ensure a proper GHS style label is on every container with a hazardous chemical.

- This includes chemicals transferred to smaller containers (unless it is used explicitly by the individual that made the transfer during that work shift/day).

4. Implement an Employee HazCom Safety Training Program.

5. Develop a Written Hazard Communication Program.

Each and every one of these items needs to be done to ensure employee safety.

Water and wastewater utility workers may deal with a number of different chemicals but some common ones are chlorine (gas, liquid or granular), ammonia, acids/bases for pH neutralization and polymers just name a few. Every chemical used poses unique hazards and every employee handling those chemicals needs to know which ones are used at their workplace, the dangers of those chemicals, and how to protect themselves.

If you need more information regarding hazard communication visit <https://www.osha.gov/dsg/hazcom/>.



STEVE ATTEMA Steve Attema joined SDARWS in May 2014 as a Training Specialist. He previously worked for six years in industrial wastewater, and three years at Bolton & Menk, Inc. as an Environmental Engineer. Steve has a Bachelor of Science degree in Civil and Environmental Engineering (CEE) from South Dakota State University. He also holds a Class III Wastewater Treatment Certification, is an FAA certified Remote Pilot SUAS and holds Utility Management Certification with the NRWA. As a Safety Trainer, Steve holds an Advanced Safety Certificate from the National Safety Council, completion of OSHA's 30-hour General Industry Training Course and certified with the Board of Certified Safety Professionals as an Associate Safety Professional.



FROM THE EXECUTIVE DIRECTOR

KURT PFEIFLE, EXECUTIVE DIRECTOR

“Often when you think you're at the end of something, you're at the beginning of something else.”

– Fred Rogers

South Dakota Association of Rural Water Systems (SDARWS) is taking some tentative steps towards the area of Workforce Development. Most people in the water/wastewater industry are aware of the so-called “Silver Tsunami” bearing down on water and wastewater utilities. The average age of an Operator in the water utility business is in their late 40's. This means that within the next 15 years a lot of institutional knowledge will be retiring and walking out the door. We are beginning to see this happening in South Dakota. The outlook for new employees entering the industry is not encouraging. It is imperative that we do what we can now to reverse this trend. SDARWS's first foray into Workforce Development will be the implementation of a Youth Outreach program. The program will target young people 16 to 22 years old (high school and postsecondary). SDARWS is actively seeking out Job Fairs, Career Days, and similar events to attend and set up an information and display booth.

SDARWS is actively searching for creative and fun ideas, in the way of information and activities to incorporate in our booth and display. Brochures, pamphlets, and posters are a good source for information, but they're not particularly effective for stimulating the imagination. It would be nice to incorporate a few “hands-on” activities for those who might visit our booth. Suggestions and ideas have ranged from having a Programmable Logic Controller (PLC) on site where a visitor to the booth could flip switches and see what happens, or allowing attendees to test their skills “driving” a sewer camera through a section of pipe. We are considering setting up a monitor and running a few videos that are appropriate for the water/wastewater industry (EPA, NRW, and others already

have some of these videos). And of course, there is always the option of some free stuff to give away to visitors to the booth aka... “SCHWAG” or “SWAG” (Stuff We All Get).

The Youth Outreach effort may ultimately be a catalyst for launching an Apprenticeship program in South Dakota. However, for now, SDARWS is only looking to start with a Youth Outreach Program. There are many questions and obstacles to overcome to put into place a full-fledged Apprenticeship



program, not the least of which is whether such program is wanted and would work in our state.

SDARWS welcomes ideas and input from our member systems. If you have a suggestion for some information or activity at our booth, let us know. If you're aware of a Job Fair or Career Day in your area that we should check out, again, we welcome your input.💧



WATER / WASTEWATER AGENCY RESPONSE NETWORK

ATTENTION ALL SOUTH DAKOTA WATER & WASTEWATER UTILITIES

The current state of response to the COVID-19 virus means that water and wastewater systems must commit themselves as first responders to the protection of the public's health. The uninterrupted continuation of water and wastewater service within all communities and regional providers is vital.

There may be systems, that due to an outbreak of COVID-19 require operational assistance. Accordingly, South Dakota Association of Rural Water Systems (SDARWS) and South Dakota Water/Wastewater Agency Response Network (SDWARN) is compiling a pool (list of volunteers) of certified water and wastewater operators who might be available to provide emergency on-site assistance to other systems.

This assistance could require the responder to relocate to the requesting system for up to 14 days. Water/Wastewater systems and the responding operator should be prepared to keep detailed records of their response for reimbursement either through the requesting system or other available funding.

SDWARN is administered through the South Dakota Association of Rural Water Systems (SDARWS). Communications regarding this matter should therefore be through the SDARWS office. Your system need not be a member of SDWARN nor SDARWS to respond to this message. However, if activated, the system making the request and the systems responding to the request would need to become members of SDWARN as their mutual aid agreement would become the governing documents.

If an operator is available for this effort their name, certifications and certification levels along with contact information should be sent by email to Greg Gross at ggross@sdarws.com. There is no requirement that you respond if you reply to this request.

Thank you for your attention and assistance!



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