



Addressing Nitrate in Drinking Water with the Drinking Water State Revolving Fund

Communities may use the Drinking Water State Revolving Fund (DWSRF) to address nitrate contamination in drinking water systems.

BACKGROUND

Nutrient pollution can negatively impact vital drinking water sources. Fertilizer is a primary source of nitrogen and phosphorus and often reaches surface and groundwater systems through farm or urban/suburban runoff or infiltration. Other sources of nitrate in drinking water include leaking septic tanks or sewage and erosion of natural deposits.

Infants below the age of six months who drink water containing nitrate in excess of the maximum contaminant level (10 mg/L) could become seriously ill and, if untreated, may die.

NITRATE TREATMENT TECHNOLOGIES

There are several effective treatment technologies available for nitrate removal in drinking water including ion exchange, reverse osmosis, and electro dialysis.

Ion exchange resins are like tiny magnets that attract and hold the nitrate from passing through the water treatment system. Reverse osmosis is a water purification method that forces the nitrate-contaminated water through a semi-permeable membrane that nitrate cannot pass through. Electrodialysis uses a direct electric current to migrate ions through membranes, where it traps the nitrate.

DWSRF ASSISTANCE

The DWSRF can provide financial assistance to publicly owned and privately owned community water systems, as well as non-profit non-community water systems, for drinking water infrastructure projects. Projects must either facilitate the system's compliance with national primary drinking water regulations or significantly further the health protection objectives of the SDWA.

Each of the 50 states and Puerto Rico operates its own DWSRF program. They receive annual capitalization grants from the U.S. Environmental Protection Agency (EPA), which in turn provide low-interest loans and other types of assistance to water systems. Repayments of DWSRF loans begin up to 18 months after project completion, with loan terms up to 30 years for most communities, or up to 40 years for disadvantaged communities.

Additional Resources on Nitrate in Drinking Water:

EPA's Nutrient Pollution page: [epa.gov/nutrientpollution](https://www.epa.gov/nutrientpollution)

Nitrate Maximum Contaminant Level: [epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations](https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations)



Additionally, states may use a portion of their capitalization grant from the EPA as “set-asides” to help communities build the technical, managerial, and financial capacities of their water systems. With an emphasis on small systems, these funds help ensure sustainable infrastructure and public health investments.

Planning and Optimization

States can use DWSRF set-asides to help water systems conduct studies and evaluations to determine the best approach for addressing nitrate. One example of these studies and evaluations includes pilot testing for treatment alternatives. Since these evaluations are likely to result in a capital improvement project, assistance can also be provided from the loan fund. DWSRF set-asides, or loans, can also be used for planning and design of infrastructure projects that address nitrate.

Treatment

DWSRF assistance can be used to upgrade treatment technologies, like building a new treatment plant or expanding an existing facility to add nitrate removal capability. DWSRF set-asides can be used for laboratory or testing equipment for research or contamination prevention.



Source

For some communities, finding a new source of drinking water might be a cost-effective solution if their current drinking water source is contaminated with nitrate. DWSRF assistance can be used to locate and establish a new drinking water source, like drilling a new groundwater well. The set-asides can be used for evaluation of alternative sources, special testing of the new drinking water source or legal fees associated with finding a new source.

Partnerships

Consolidation and restructuring of water systems can be a cost-effective alternative to treatment, particularly for small systems, where the quality of water has deteriorated, or a water system is unable to maintain compliance for technical, managerial, or financial reasons. Costs associated with consolidation efforts or infrastructure required to connect two or more water systems are eligible DWSRF projects, including creating consecutive systems.



Outreach and Training

Although routine/compliance monitoring is not eligible for DWSRF funding, outreach and training for water system operators is an eligible set-aside activity. This can include one-time monitoring at a system to show operators how to conduct the monitoring themselves. States can also use DWSRF set-aside funds to present workshops, seminars, and other training events that provide operators with ongoing educational opportunities.

LEARN MORE ABOUT FUNDING

DWSRF assistance is distributed directly from state agencies. Each state has its own procedure. Contact information for each state is posted at <https://www.epa.gov/drinkingwatersrf/state-dwsrf-website-and-contacts>.





DWSRF Case Studies: Nitrate in Drinking Water

How communities are using the Drinking Water State Revolving Fund (DWSRF) to address nitrate contamination in drinking water systems.

BROWN COUNTY, KS

Several drinking water systems in Brown County consistently exceeded the nitrate maximum contaminant level (MCL) for several years. Working together, they formed a Public Wholesale Water Supply District (PWWS) and found a new source of water. This DWSRF project included the construction of wells, a disinfection treatment facility, an elevated storage tank, and connecting transmission mains. The treatment facility was constructed to allow expansion of the treatment process if nitrate removal becomes necessary. The new PWWS provides water below the nitrate MCL for these communities. This regionalization project, completed in December 2017, received \$3.8 million in DWSRF assistance to provide 1,450 residents with a reliable source of safe drinking water. The PWWS is also actively planning to connect other area systems that are trying to resolve nitrate MCL violations.



SANGER UNIFIED SCHOOL DISTRICT, CA

Fairmont Elementary School (located in the Sanger Unified School District) struggled with nitrate contamination issues in its groundwater well for several years. The State of California issued a compliance order in 2009. The District evaluated several alternatives to address the nitrate contamination at the school and determined that consolidation with the nearby Fresno County Service Area #10 was the best alternative. In addition to the necessary distribution mains, this DWSRF project also included some improvements to Fresno County's aging infrastructure, such as a new pump and controls. This project received a total of \$2.4 million from the DWSRF and state Proposition 1 funds and now provides safe drinking water to 640 students and staff of the school.

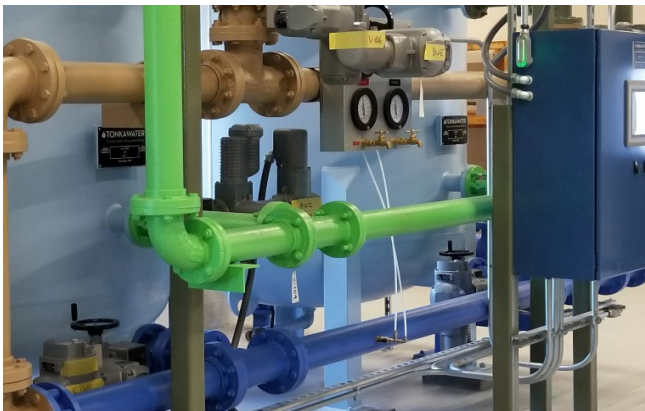
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RANDALL, MN

After several years of increasing nitrate concentrations, a well in the City of Randall exceeded the nitrate MCL and was taken offline in 2015. This left the city with only one well from which to draw its drinking water. The city found a location for a new well with low nitrate, but the water test analysis showed water from this location had higher concentrations of arsenic, iron, and manganese. Therefore, the project consisted of the construction of a new 125 gallon per minute water treatment plant designed to remove arsenic, iron, and manganese, along with the drilling of a new drinking water well. The city determined that arsenic, iron, and manganese treatment was more cost-effective than nitrate treatment and provided better drinking water quality to its 650 customers. Recent sample results for arsenic and nitrate levels leaving the treatment plant are below detection limits, and the city has returned to compliance. This project received \$776,000 in DWSRF assistance and a \$600,000 state grant and was completed in June 2018.



COMMUNITY WATERSHED INTERVENTION, WI

The State of Wisconsin utilizes the Local Assistance (i.e. 15 percent) Set-Aside to implement a community watershed intervention approach to address increasing levels of nitrate in groundwater wells. This program targets water systems in a specific geographic area and helps develop and monitor advanced nitrogen management systems. The goal is to reduce nitrate levels below the MCL. The results of this effort are documented for use in future nitrate intervention programs.



FOREST PARK MOBILE HOME PARK, DE

The Forest Park Mobile Home Park in Millsboro was in violation of drinking water standards, including the nitrate MCL, for several years. The State of Delaware partnered with the Delaware Rural Water Association (DRWA) to provide technical assistance to Forest Park through the DWSRF's Local Assistance (i.e. 15 percent) Set-Aside to help address their nitrate issues, as well as other challenges like timely release of Consumer Confidence Reports. Through this partnership, the DRWA conducted several meetings and trainings with Forest Park. The extensive technical assistance to Forest Park, a community of 46 residents, enabled the community to eventually self-fund the necessary nitrate removal system and upgrades and provide safe drinking water to residents.

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