Addressing Water System Resiliency with the Drinking Water State Revolving Fund

Communities may use the Drinking Water State Revolving Fund (DWSRF) to address resiliency for their drinking water systems.

BACKGROUND

Drinking water resiliency refers to the ability of water infrastructure systems to withstand and recover from natural and man-made disturbances. Resilient infrastructure systems are flexible, agile, and able to recover after unanticipated disruption. There are several ways DWSRF funding can be used to address resilient infrastructure. While the information provided below is not exhaustive, it will equip decision makers with some best practices and implementable ideas for how to incorporate resiliency into drinking water project planning.

Incorporating resiliency into drinking water infrastructure projects is not a new concept for water systems. When planning new projects, it is standard practice for water systems to perform analyses to support well-informed decisions that lead to smart, sustainable projects. Water systems can also be forward-looking, since the lifespan of many types of infrastructure can be 50 to 100 years.

For example, prior to funding a project, water systems could assess the potential for changes in water resources and population trends, as well as the occurrence of man-made and natural hazards. This type of assessment can help to ensure that the project fulfills its mission over the design life. Resiliency should be incorporated upfront in the planning and design of every project.

Additional EPA Water Resiliency Resources:

Drinking Water Contaminant Human Health Effects Information website:
https://www.epa.gov/sdwa/drinking-water-contaminant-human-health-effects-information

Drinking Water and Wastewater Resilience website:
https://www.epa.gov/waterresilience

OFFICE OF GROUND WATER AND DRINKING WATER

DWSRF ASSISTANCE

The DWSRF can provide financial assistance to publicly-owned and privately-owned community water systems and 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 Safe Drinking Water Act (SDWA).

Each of the 50 states and Puerto Rico operates its own DWSRF program. They receive annual capitalization grants from EPA, which they use to 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.

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

Infrastructure Improvements

DWSRF assistance can be used to construct resiliency-related infrastructure improvements, including but not limited to backup generators, physical flood barriers, redundant equipment and infrastructure, telemetry systems for remote operation, and saltwater-resistant equipment. Existing facilities can be modified or relocated (e.g., moving a treatment plant out of the floodplain or deepening existing wells). Equipment can be physically hardened against hazards by waterproofing electrical components, sealing structures to prevent floodwater penetration, and adding wind-resistant features. Overall, capital projects undertaken to incorporate new technologies and/or upgrade infrastructure to enhance resiliency can be funded by the DWSRF.

Adaptation and Mitigation Planning

DWSRF assistance, either through the loan fund or the set-asides, can be used for adaptation and mitigation planning to address extreme weather events such as droughts, floods, tornadoes, and forest fires. Other examples include developing integrated water resource management plans, vulnerability assessments, and statewide extreme weather models, as well as conducting water and energy audits.

Risk and Resilience Assessments

The SDWA requires community water systems serving more than 3,300 persons to conduct a risk and resilience assessment of their water systems. Following the completion of the assessment, water systems must develop or update their emergency response plans (ERPs). DWSRF set-asides may be used to assist water systems with developing assessments and ERPs. Eligible infrastructure improvements identified by the assessments may be funded through the loan fund. More information on the SDWA risk and resilience assessment requirements can be found at https://www.epa.gov/waterresilience.

Training and Technical Assistance

States can use set-asides to provide technical assistance and trainings for water utilities to bolster their resilience. Assistance could be provided to plan and adapt to extreme weather, prepare for emergencies and disasters, set-up Water/Wastewater Agency Response Networks (WARNs), and prepare for and participate in tabletop or field exercises.

LEARN MORE ABOUT FUNDING

APPLY FOR FUNDING: Water systems receive DWSRF assistance directly from state agencies. Each state has its own application procedure. Contact information for each state is posted at https://www.epa.gov/dwsrf/statedwsrf-website-and-contacts.

Drinking Water State Revolving Fund Case Studies: Resiliency in Action

How communities are using the Drinking Water State Revolving Fund to address resiliency in their drinking water systems.

TOBIAS, NE

In 2014, the Village of Tobias, Nebraska, hired a consulting engineer to complete a preliminary engineering report to evaluate the Village's water system needs. Previously, the Village's public water system consisted of a single municipal well, an elevated 40,000-gallon water storage tower, and a distribution system. The Village's primary well had a capacity of 150 gallons per minute and was in operable condition upon evaluation. However, static water levels in the well had dropped nearly 10 feet, which was likely due to the ongoing drought in the area. The engineer recommended a new well to establish a backup supply for the water system and lowering the pump in the existing well to extend its operational capacity. This project also included adding valves and water meters, as well as upgrading existing well controls. The Village, with just over 100 people, utilized approximately $315,000 in DWSRF assistance to complete this project.

GOLD HILL, OR

The City of Gold Hill, Oregon, used DWSRF assistance to hire a professional engineering firm to complete a Seismic Risk Assessment and Mitigation Plan. The City developed this plan to meet a new state requirement for affected water systems in earthquake zones. This plan included the identification of critical water supply locations and infrastructure, identification of potential seismic geohazards, and a preliminary assessment of facility risk. Additionally, the plan included an evaluation of pipeline fragility, a seismic resilience evaluation report section, and recommendations for Capital Improvement Plan projects and/or operational changes. This project is a best practice example of how DWSRF assistance can be used to evaluate long-term resiliency. The total project assistance provided by the DWSRF was $20,000. The project will benefit 1,254 people.

BIG BEND, NV

Big Bend Water District (BBWD) in Nevada installed a well, located adjacent to the Colorado River, on property which currently houses the District's river intake pumping system. This well was built to employ riverbank filtration (RBF), a natural process that removes various contaminants as the river water is naturally filtered by the geologic material and recharges groundwater.

Climate change has caused variable water quality in the Colorado River in recent years. Specifically, the BBWD has been operating close to the limits of the Stage 2 Disinfectants and Disinfection Byproducts Rule for trihalomethanes, as well as exceeding turbidity limits of the Long-Term Enhanced Surface Water Treatment Rule. This has caused the BBWD to issue a boil water notice in the past. RBF will provide long-term resiliency for the Big Bend Water System by avoiding potential future water quality crises. Approximately 9,000 people will be served by this project. The total DWSRF assistance was $500,000.

WALLKILL, NY

The Wallkill Consolidated Water District, New York, serving 12,800 people, received DWSRF assistance to install a supervisory, control, and data acquisition (SCADA) wireless radio communications system for all water facilities within the District. During emergency situations, the SCADA system will provide critical facility information to water system operators, allowing for a faster response time and remote automation. Additionally, this project funded the installation of backup power supplies. The total project assistance was approximately $3,000,000.

BATESVILLE, IN

In November 2019, the City of Batesville, Indiana, received DWSRF assistance to develop an alternate source of water that was not rainfall-dependent in order to improve the security and resiliency of the City's water supply. The Batesville Water Supply Treatment and Water Transmission Main Project included the construction of a new water supply well field with three new wells, a new water softening treatment plant including chemical feed components, and all necessary site work. Additionally, 16 miles of new raw water transmission mains were installed from the wellfield to the water treatment plant. The total project assistance was $18,770,000.

OAK BEACH, NY

The Oak Beach area of New York was without electricity for 30 days due to Superstorm Sandy, resulting in a loss of drinking water supply for three privately-owned public water systems serving 120 people. This $1,200,000 mitigation project consolidated these three water systems and built new resilient infrastructure. The project included the construction of a new water treatment plant, pump station, storage tanks, and backup power source. It also modified existing wells and upgraded the distribution system including the installation of new transmission mains, new distribution mains, and new service lines. Critical components within this project were elevated above flood level to prevent potential damage during extreme weather events.