NLC DELIVERS

ARPA Drinking Water Infrastructure Fact Sheet

The American Rescue Plan Act (ARPA), signed into law by President Biden on March 11, 2021, provided $350 billion in Coronavirus State and Local Fiscal Recovery Funds to state, local, territorial and Tribal governments. Water and sewer infrastructure investments marked one of the six ways that funds could be used for recovery and to address climate change impacts. The U.S. Department of Treasury's ARPA Interim Final Rule, issued on May 10, 2021, identified drinking water infrastructure projects as eligible if they met the U.S. Environmental Protection Agency's (EPA) Drinking Water State Revolving Fund (DWSRF) projects eligibility criteria.

The DWSRF identifies six project categories:

1. ***Treatment:*** projects to install and upgrade facilities to improve drinking water quality
2. ***Transmission and Distribution***: projects to rehab, replace, or install pipes to improve water pressure to safe levels or to prevent contamination caused by leaky or broken pipes
3. ***Consolidation***: projects to connect 2+ water systems
4. ***Storage***: projects to install or upgrade finished water storage tanks to prevent contamination from entering distribution systems
5. ***Source***: projects to rehab wells or develop eligible sources to replace contaminated sources
6. ***Creation of New System***: projects to construct a new system to serve homes with contaminated individual wells or consolidate existing systems into a new regional water system

This fact sheet highlights major U.S. challenges in drinking water infrastructure, the DWSRF program, available GIS tools to meet ARPA's DWSRF criteria, highlighted cases and helpful resources.

Major Drinking Water Challenges

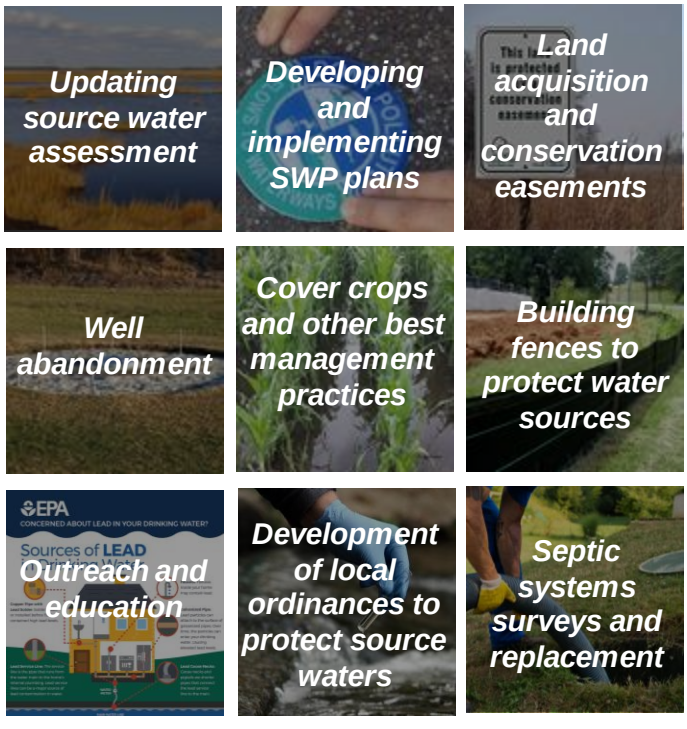
Lead in Drinking Water

Lead enters drinking water most notably from corroded lead piping, such as lead service lines, faucets and fixtures. Lead piping is prominently found in older cities where homes were built before 1986. DWSRF guidance highly recommends service line replacements as a mitigating measure to drinking water contamination. The National League of Cities (NLC) and the Lead Service Line Replacement Collaborative (LSLRC) collaborated to help municipal leaders identify opportunities to reduce exposure to lead in drinking water and replace lead service lines. A three-part tele-town halls series hosted by the organizations delved deeper into EPA's Lead and Copper Rule, shared best practices among local government peers and offered expert Q&As. The series can be viewed here.

Contamination Protection for Source Water

Source water regards water that is provided to public water supplies, as well as private wells that were sourced directly from the water bodies (e.g., rivers, streams, lakes, etc.). Protecting source water is essential to prevent contamination and preserve water supplies. Contamination to source water requires higher water treatment, subsequently associated with high costs. The DWSRF program covers a wide variety of source water protection (SWP) initiatives.

Examples of SWP Actions



Water Conservation and Reuse

Water recycling, or water reuse, acts as an alternative to drawing upon the existing water supply. Reclaimed water can be used for water systems' treatment, transmission and distribution. Water reuse can occur in two ways:

- Unplanned regards claiming water that already incurs used water (e.g., a river that receives treated wastewater discharges).
- Planned water reuse requires water systems to integrate infrastructure that is compatible with hosting recycled water (e.g., reclaimed wastewater effluent systems, filter backwash recycling and any projects that replace potable water with non-potable sources).

Fostering Overall Resilience

ARPA's water and sewer infrastructure goals aim to not only address outdated systems but also to cultivate resilience to the effects of climate change. The DWSRF identifies three resilience criteria that project planning or design could address:

1. Natural or human-created vulnerabilities to water systems and their safe water delivery capacity
2. Recovery abilities from disruptions to safe water delivery
3. Natural disaster and other disruption events (e.g., flooding, droughts and earthquakes)

Drought

Drought events have continued to increase in the U.S., particularly in the west and southwest regions. These events are also more severe and longer over time, influencing water availability and quality. Drought events can hinder drinking water systems through lacking system pressure, pipe breakage from soil shrinkage and loss of recharge capability or capacity for recovery. The DWSRF identifies several project categories to mitigate water loss, such as:

- **Intakes:** reposition, relocation, elevation, alternative, backup
- **Interconnection** to other water systems
- **Source water protection:** purchase recharge area, implementation of protective measures, including permeable surfaces
- **Water recycling and water reuse:** replace potable sources with non-potable sources, reclaimed wastewater effluent systems (treatment, distribution, and storage), filter backwash recycling
- **Wells:** additional, replacement, deepening, and rehabilitation; new pumps for deeper wells

Drinking Water Cybersecurity

Water treatment plants are experiencing growing hacking threats to water facilities. A hacker attempted to poison part of the San Francisco Bay Area water supply in January 2021[1]. The hacker was able to enter the system by acquiring the login credentials of a former employee delete several programs used to treat drinking water. The breach was not discovered until the next day, but before poison was released. In other cases, however, hacks were not found until after a release. A hacker increased the water lye presence by a factor of 100 in Oldsmar, Florida. This level could have not only poisoned residents but also corroded the pipes. The Oldsmar facility, and countless other treatment facilities, only host one IT staff member, who is responsible for managing a wide variety of IT tasks from infrastructure to the acquisition of technology. Mounting cybersecurity concerns coupled with limited IT staff dedicated solely teo cybersecurity monitoring illustrate a critical threat. The DWSRF highlights three main cybersecurity measures to promote resilience against attacks:

- **Risk and Resilience Assessments**
  - Analyze the security of the electronic, computer or other automated systems used for water systems.
  - Create, update and maintain emergency preparedness plans for water systems.
- **Training**
  - Facilitate sessions on cybersecurity awareness, preparedness and response.
  - Develop cybersecurity policies and procedures
  - Perform tabletop exercises and full-scale emergency scenarios
- **Equipment and Infrastructure**
  - Upgrade equipment and infrastructure to meet water systems cybersecurity needs

1 Collier, Kevin (2021, June 17). "A Hacker Tried to Poison a Calif. Water Supply. It Was as Easy as Entering a Password." *NBC News*, nbcnews.to/3duc49q

Leveraging Esri GIS Products for Resilience & Efficiency

Esri is creating products to support local leaders' water resilience and cybersecurity measures. Guidance and tools are available on using GIS products to manage drinking water, wastewater, stormwater and small/rural systems. Highlighted tools include:

- **Arc Hydro**: a mapping tool to visualize and analyze topographic, hydrographic and hydrologic data. Users can assess water quality, estimate water availability, plan for flood prevention, learn about the natural environment in their region and manage water resources.
- **ArcGIS Utility Network**: a comprehensive mapping tool to manage utility networks. Real-world assets (e.g., connectivity, containment, and structural attachments) can be modeled for an accurate representation of the network system. Network diagrams can also create multilevel representations of the network. Users can create, configure, analyze and edit their local utility network. Users can also easily and securely share information with others.
- **Digital Twins**: a virtual representation of real-world physical objects, processes, relationships or behaviors. In a GIS context, digital twins are typically virtual models of real-world assets or natural systems, along with the information models, data, reports, analyses and user experiences intended to capture the current state, monitor performance and predict future outcomes.
- **ArcGIS Pro**: supports data visualization, advanced analysis, and authoritative data maintenance in 2D, 3D and 4D. It supports data sharing across a suite of ArcGIS products, and enables users to work across the ArcGIS system through Web GIS.
- **ArcGIS Solutions**: the starting place to implement a software as a service (SaaS) or utility network-based water distribution mapping and data management system. Add additional capabilities to your implementation, such as optimizing water main break response and informing stakeholders about lead service pipes.

EPA developed an online mapping tool called the Drinking Water Mapping Application to Protect Source Waters (DWMAPS) to support government and utility water professionals in protecting drinking water. The tool allows users to pinpoint potential contamination sources, find data for water assessments, evaluate spills and releases, and promote drinking water protection activities.

Denver Water's Lead Reduction Program

Denver Water, the City of Denver's water utility company, launched the Lead Reduction Program in 2020. The program aims to identify, inventory and remove between 64,000 to 84,000 lead service lines in the next 15 years. The team's GIS staff built a records inventory in Esri ArcGIS Pro through compiling locations from the utility billing database, a utility employee's handwritten records on lead lines and information about construction permits issued by the city and county. The team then collaborated with Esri staff and an environmental consulting firm for additional records on lead service lines and to migrate data from ArcGIS Desktop into ArcGIS Pro. Leveraging GIS products and collaborating with Esri staff allowed Denver Water to have a master spatial representation of all service lines that would need replacing, how to undertake the replacing of lead service lines and visualization that could easily be shared with necessary collaborators. The program is expected to save the City of Denver $50 million in the 15-year program period.

Highlighted DW Cases

Emergency Management Tabletop Exercise *(Maine)*

The Maine Rural Water Association, DWSRF staff, Maine Emergency Management Agency and Maine Department of Environmental Protection collaborated to enact a tabletop exercise. In tabletop exercises, in which team members discuss their roles in an emergency, the Maine team performed the scenario of a rolled tanker truck with contamination impacts to a nearby river. The scenario concluded with the team learning it had information gaps on how to respond to the situation and a framework to mitigate similar risks. The team committed to performing additional tabletop exercises from seeing its value in identifying gaps and better responses to emergency situations.

Water Meter Installation *(Sacramento, CA)*

The City of Sacramento installed 40,000 water meters throughout the city to better understand and meet growing water demand. The effort supported customer-level water conservation and allowed the local utility to more efficiently pinpoint leaks and areas of system water loss. The project enabled the city to meet the compliance standards of the California Water Measurement Law and achieve goals outlined in the city's Sustainability Master Plan.

Water Reuse Feasibility Study *(Lawton, OK)*

Water usage restrictions were enforced to address growing drought concerns in the City of Lawton, OK. Understanding that this was not a long-term solution, the Lawton Water Authority conducted a study to evaluate the feasibility of water reuse viability. Aquifer storage recharge, direct potable reuse and indirect potable reuse were evaluated as options.

States & Local Governments Proposing Initiatives

Several states and local governments are currently performing resident engagement, community and stakeholder meetings and studies to determine how to spend the ARPA funding, in what areas and on what types of projects. The following highlights a few cases:

- ***Flagler County, FL***: Flagler County plans to spend 54% of the first half of its approximate $22 million of ARPA funds on water and sewer infrastructure projects, including expanding water infrastructure access to neighborhoods of low-income and creating a stormwater plan.
- ***Vermont***: Governor Phil Scott released a proposal that allocated $170 million for water and sewer over three years of 2023-2025. The funding would cover stormwater retrofits, water/wastewater/pretreatment, combined sewer overflow abatement/elimination, dam safety, and residential water infrastructure upgrades.
- ***City of Jackson, MS***: the City of Jackson is expected to receive $47 million in ARPA funding and use a portion of it to address its outdated water system. The city was unable to supply safe drinking water for over a month after an extreme freeze in February 2021. City officials are seeking to raise $1 billion to overhaul the system for the necessary upgrades.

Helpful Resources

NLC staff provides guidance and support on how to approach local water infrastructure priorities. NLC's COVID-19 Pandemic Response & Relief Hub offers articles, recorded webinars, fact sheets and other resources for local governments on using ARPA funds. The **Local COVID-19 Action Tracker** is a searchable dashboard of how cities are spending their ARPA State and Local Fiscal Recovery Funds. NLC also partners with expert organizations that can provide support on navigating drinking water infrastructure goals.

- **WaterNow Alliance** is a network of local water leaders advancing sustainable, affordable, equitable and climate resilient water strategies in their communities.
- **Association of State Drinking Water Administrators** is the professional association serving state drinking water programs.
- **US Water Alliance** brings together stakeholders to co-create and leverage solutions to advance policies and programs that build a sustainable water future for all.

See the following resources for more information on DWSRF background and the ARPA guidance on approaching drinking water infrastructure.

ARPA

- U.S. Department of Treasury's "FACT SHEET: The Coronavirus State and Local Fiscal Recovery Funds Will Deliver $350 Billion for State, Local, Territorial, and Tribal Governments to Respond to the COVID-19 Emergency and Bring Back Jobs" (March 10, 2021)
- U.S. Department of Treasury's "Coronavirus State and Local Fiscal Recovery Funds Frequently Asked Questions" (2021)
- U.S. Department of Treasury's, "Interim Final Rule: Coronavirus State and Local Fiscal Recovery Funds" (May 17, 2021)

EPA

- DWSRF Eligibility Handbook (2017)
- Technical Brief: Drought Resilience and Water Conservation Efforts (2016)
- Fact Sheet: Supporting Cybersecurity Measures with the Clean Water State Revolving Fund (2019)
- Fact Sheet: Protecting Source Water with the Drinking Water State Revolving Fund Set-Asides (2019)
- Fact Sheet: Addressing Water Reuse with the Drinking Water State Revolving Fund (2020)
- Water Infrastructure and Resiliency Finance Center is an information and assistance center, identifying water infrastructure financing approaches that help communities reach their public health and environmental goals.

If you have general questions about the Coronavirus State and Local Fiscal Recovery Funds, please email the U.S. Department of Treasury at SLFRP@treasury.gov or call 844-529-9527.

The information contained here is not legal advice. It will be subject to change based on updates from the U.S. Department of the Treasury, and any recipients should confirm applicability to their specific situation.