

# Public Health Benefits of the Green Project Reserve

## Factsheet Purpose and GPR Overview

This factsheet documents the public health benefits of typical Green Project Reserve (GPR) projects, discussing key lessons learned from the American Recovery and Reinvestment Act (Recovery Act) of 2009.

The GPR was established under the Environmental Protection Agency’s water provisions of the Recovery Act as part of the Drinking Water State Revolving Fund (DWSRF) program. While energy efficiency, water efficiency, green infrastructure and environmentally innovative projects have always been eligible under the DWSRF program, the GPR dedicates funding for these types of projects. In most cases, these GPR projects have the dual benefit of simultaneously improving public health protection and enhancing the long-term sustainability of the system.

## How Do GPR Projects Create Public Health Benefits?

GPR projects can have immediate and direct public health benefits by helping systems **improve** drinking water quality. Additionally, GPR projects can have a longer-term benefit of helping systems **protect** drinking water quality. For example, at least 264 GPR projects funded under the Recovery Act were intended to **improve** water systems’ abilities to **maintain or achieve compliance with current or future regulations**, which are designed to minimize adverse effect on public health.

GPR projects funded under the Recovery Act were designed to **protect** drinking water quality by **improving a system’s long-term capacity and sustainability**. The Safe Drinking Water Act—which focuses on public health protection—emphasizes that systems with technical, managerial and financial capacity are better able to plan for, achieve and maintain compliance with applicable drinking water regulations.

GPR projects can create important cost savings by shifting systems towards using resources more efficiently and reducing water losses and energy use. GPR costs savings are particularly important because systems can utilize the savings now or in the future for other high priority investments that directly maximize public health protection.



### GPR Projects Can Improve Water System Capacity

**Improved financial stability** resulting from reduced energy or operational costs

**Improved source water adequacy** resulting from reduced demand on existing sources

**More informed operating or rate setting decisions** resulting from more accurate or detailed system data

## Direct Public Health Benefits From Improved Water Quality

Many GPR projects ***maintain and enhance drinking water quality***. These projects may focus on source water protection or improvements to distribution systems and treatment processes. In particular, these common GPR projects promote public health protection by helping systems ***achieve or maintain compliance with current or future regulations***.

The following examples show how select GPR-qualified projects may directly support Safe Drinking Water Act ***public health protection goals***. Each description illustrates the specific ways seen under the Recovery Act that GPR projects may ***improve water quality*** and the number of GPR projects that included the described project component.



### Pipeline replacement (extreme cases of leakage) - Approx. 250 projects

- Reducing leaks improves water pressure, ***reducing the likelihood of pathogen or contaminant intrusion***.
- Less corroded pipes have less biofilm growth and ***improve the effectiveness of chemical disinfectants***.

### Treatment process selection - Approx. 150 projects

- Treatment processes that reduce water use allow systems to ***avoid the need for sourcing from lesser quality water supplies***.
- Enhanced or optimized treatment reduces the wastewater and sludge generated during treatment and ***minimizes disposal and recycling issues that create public health challenges***.

### Pump and/or motor replacement - Approx. 150 projects

- Well-maintained pumps are better at ***maintaining water pressure and preventing water shortages***.
- Optimized pump operation for feeding chemicals, pumping sludge and cleaning filters ***improves consistency of water treatment and water quality***.

### Storage tank replacement - Approx. 100 projects

- Improved storage capacity ***provides an adequate supply of treated water*** and ***improves water pressure*** throughout the distribution system.
- New storage tanks have less corrosion and opportunities for biofilm growth and ***improve the effectiveness of chemical disinfectants***.
- Properly sized storage tanks with shorter hydraulic residence times ***reduce stagnant water***. Stagnant water increases disinfection byproducts which may adversely affect public health.

### Storage tank solar powered mixers - Approx. 20 projects

- Solar powered mixers improve water circulation in storage tanks, ***reducing the likelihood of stagnant water***.
- Improved mixing in a storage tank reduces the chance of short-circuiting water through the tank, which is especially important if the tank is being used ***in the disinfection process***.

### On-site hydroelectric power - Approx. 7 projects

- Hydroelectric power generators capture energy from pipe flow or from water coming out of storage. Generators that replace pressure reducing valves more effectively maintain water system pressure and thereby ***reduce the risk of pathogen or contaminant intrusion***.

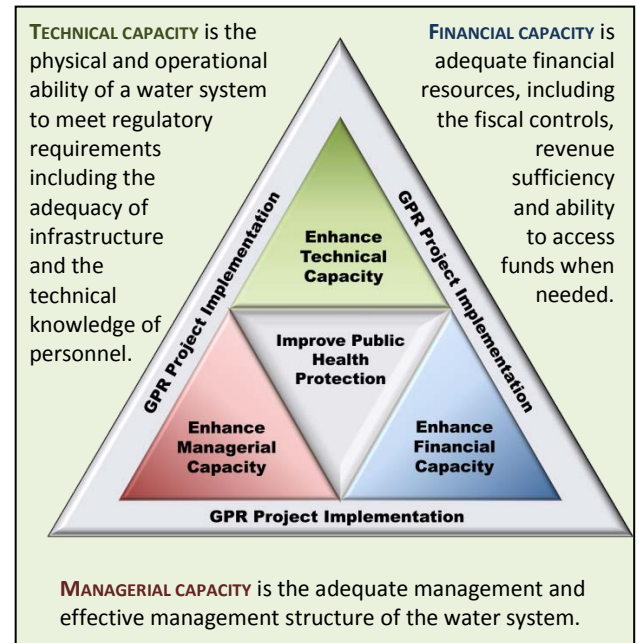
### Source water protection - Unknown

- Source water protection reduces contamination at the source, which both ***improves water quality and reduces need for treatment***.
- Less pollution at the source ***improves the performance and longevity of filters and other equipment***.

# Public Health Benefits Resulting From Improved Water System Capacity

GPR projects contribute to sustainable water infrastructure by building technical, managerial and financial capacity, which is critical to **protecting** drinking water quality. Through conservation efforts, leak detection and protection of water sources, GPR projects increase the amount of high quality drinking water available to consumers. Projects that reduce water consumption also reduce wear and tear on water system infrastructure, thereby reducing future maintenance issues and costs. Cost savings may also result from installation of energy efficient devices, pump system optimization and on-site green power generation. These cost savings are available for **achieving and maintaining compliance with applicable drinking water regulations**.

The following examples illustrate the specific ways that **system capacity may be improved** by GPR project components. The number indicates how many GPR projects included the described project component.



## Water meter replacement or metering in previously unmetred areas - Approx. 170 projects

- Meters help inform system operators making decisions on **efficient water management, infrastructure investments and rate setting for revenue sufficiency**. Advanced metering technologies may also **reduce system labor costs** and help systems quickly **identify leaks and water losses**. Customers can use information from meters and rates to make **responsible decisions on the quantity of water they use**. (technical and financial benefits)



## Variable Frequency Drives - Approx. 60 projects

- Variable Frequency Drives (VFDs) reduce electricity use and **provide financial savings that can then be applied to enhancing system capacity and public health protection**. (financial benefits)
- VFDs on pumps provide water more consistently, without the pumps turning on and off as often. This reduces wear and tear on the equipment and may **increase reliability and the life of the equipment**.

## On-site renewable energy - Approx. 50 projects

- Renewable energy—including wind, solar, geothermal and micro-hydroelectric power generation—**reduces a system's energy costs, contributing to a more financially stable system in both the short- and long-term**. (financial benefits)

## SCADA (Supervisory Control and Data Acquisition) - Approx. 20 projects

- Computer systems that monitor and control water system infrastructure (e.g., pumps, wells, surface water intakes, treatment, distribution system) allow systems to more quickly **identify issues that affect water quality** and **adequate supply** and also **inform operating and treatment decisions**. (technical capacity benefits)

#### Leak detection studies and equipment - Approx. 10 projects

- Leak detection equipment informs targeted pipe rehabilitation and replacement plans and reduces management burdens, water loss and treatment demands and improves the consistency of water quality. (managerial and financial capacity benefits)

#### On-site green infrastructure - Approx. 10 projects

- Green infrastructure—including porous pavement, bioretention, trees, green roofs and other practices, including constructed wetlands—**reduces heating and cooling costs and reduce flooding impacts at the facility**, resulting in costs savings and increased property value. (financial benefits)

#### Water efficient devices - Approx. 5 projects

- Efficient end-use devices such as showerheads, toilets and other plumbing fixtures **lessen water use, reduce water treatment demands and result in financial savings**. Reduced demand may also help **conserve existing source waters and limit the need for developing new water sources**. (technical and financial benefits)

#### Reclamation, recycling, and reuse - Approx. 2 projects

- Reclaimed, recycled or reused water is used to **replenish existing source waters or as an alternative source of water to meet existing or future water supply needs**. (technical capacity benefits)

#### Planning for climate change adaptation - Unknown

- Climate change planning **helps water systems identify and prioritize limiting issues** (e.g., components or system operations) which could prevent the system from providing adequate water, both in quantity and quality, on a consistent basis. (technical capacity benefits)

#### Project life cycle cost minimization - Unknown

- By minimizing the capital costs and operating costs over a project's lifetime, water systems **increase investment for other high-priority projects or reduce the need for rate increases**. (financial benefits)

## How Can Water Systems Document and Communicate the Benefits of GPR Projects?

Water systems have documented and shared water quality and public health protection improvements of GPR projects through business cases available on state websites. Sharing these successes with customers builds an understanding of the true value of the service and the resource that the water system is providing through cost-saving and sustainable investments. Some simple ways to explain the benefits of GPR projects include measuring and documenting:

- Improvements in water quality or achieved or sustained compliance with drinking water regulations.
- Energy efficiency gains per unit of water treated or delivered.
- Water efficiency gains comparing water withdrawn from the source per unit of water delivered.
- Reduced cost per million gallon of water treated.

These benefits can be communicated in annual Consumer Confidence Reports (CCRs) and by other means. Systems may also want to communicate the benefits of GPR projects through collaboration with local media and organizations (e.g., radio, newspapers, schools, stores, community groups and social media).

Updates on project progress and benefits can help maintain community interest and support for GPR projects and other infrastructure investments. Water systems can do this by following up on projects and showing that the originally planned benefits of the project are being attained over time.