



Fernwood W&SD FY12 Water System Project
SRF Loan #DW 1212
\$676,300

Final Green Project Reserve Justification

Categorical & Business Case GPR Documentation

1. RENOVATION OF WATER METERING SYSTEM (Water Efficiency/Energy Efficiency). Categorical GPR per 2.2-3: *Replacing existing malfunctioning water meters*; also a Business Case per 3.5-1: *Energy Efficient retrofits, upgrades* (\$218,800).

Business Case GPR Documentation

2. WATER SYSTEM DISTRIBUTION SYSTEM UPGRADES (Energy Efficiency). Business Case GPR per 3.5-1: *Energy Efficient upgrades* (\$93,800).
3. WATER TANK REHABILITATION (Water Efficiency). GPR-eligible by a Business Case per Sections 2.4-1; 2.4-3; 2.4-4; 2.5-3: 2.4-1 *Water efficiency by reducing water consumption*; 2.4-3 *Energy & Financial Savings*; 2.4-4 *Address where water losses could be occurring in the system and fix them*; 2.5-3 *Storage tank rehabilitation to reduce water loss* (\$50,000).

1. WATER METER RENOVATION¹

Summary

- The District's water metering system must be renovated to reduce excessive water use and to conserve energy².
- Estimated loan amount = \$676,300
- Estimated energy efficient (green) portion of loan = 32% (\$218,800)

Background

- The Fernwood, Idaho water distribution system has water meters that are at the end of their useful life. Many do not work or provide inaccurate flow data.
- Per capita water usage is high and the District has limited resources to quantify excess usage.
- The water meters will be replaced with new meters with integrated backflow prevention devices that will provide accurate flow data such that the District can conduct water usage audits, charge customers on a usage rate structure, and develop water conservation programs.



Results

- Accurate water flow measurement will encourage water conservation by residents.
- Conserving water will also result in conserving energy as less pumping will be required.

Analysis

- An estimated 20% to 25% decrease in water use in the community will be experienced by basing the rate structure on accurate, metered use.
- This decrease in water demand will lead to a corresponding 20% to 25% decrease in pumping costs.

Conclusion

- Replacement of the City's aging and malfunctioning water meters with new meters with integrated backflow prevention devices that will provide the District accurate flow data is Categorically GPR-eligible.
- **GPR Costs:** Replacing the water meters = \$218,800.
- **GPR Justification:** The prioritized replacement of water meters, as recommended in the Capital Improvement Plan, is Categorically GPR-eligible per Section 2.2-3³ (Water Efficient): *Replacing existing malfunctioning water meters; 2.2-3c Can include backflow prevention devices*; also by a Business Case per Section 3.5-1² (Energy Efficient): *Energy Efficient retrofits, upgrades*.

¹ Fernwood Water System Preliminary Engineering Report, Mountain Waterworks, February 2013

² Fernwood District Preliminary Engineering Plan, Welch Comer, December 2011

³ Attachment 2. April 2011 EPA Guidance for Determining GPR Eligibility for FY12 SRF Projects

2. Distribution System Upgrade¹

Summary

- The District's water distribution system requires piping retrofitting and upgrades to reduce existing excessive pumping energy use².
- Estimated loan amount = \$676,300
- Estimated energy efficient (green) portion of loan = 14% (\$93,800)

Background

- Current flow restrictions within the distribution system limit domestic water flow throughout the community and result in approximately 10% of excessive pumping to occur.
- The District presently expends 131,400 KWH/year for pumping, resulting in \$9,200 in annual pumping costs.

Results

- Replacement and upsizing of water distribution system piping to offer efficient flow delivery to the community. Field studies demonstrate the following sections of piping require refurbishment:
 - 1150 feet of 1" galvanized steel pipe along Oak St. must be replaced with 8" PVC @ a cost of \$93,800;
- It is estimated that the District's distribution pipe replacement program will result in a 10% reduction required for power expended for pumping, leading to a \$920/year savings in annual energy costs.
- Payback period for pipe replacement = $\$93,800 \text{ pipe} \div \$920 \text{ annual cost savings} = 102 \text{ years}$.
- Life of installed pipe = 50-100 years.



Conclusion

- The replacement of undersized water distribution pipe with properly sized pipe decreases system friction, increases water flow, and saves energy by considerably reducing the amount of pumping required.
- **GPR Costs:** Distribution System Piping Retrofits and Upgrades = \$93,800.
- **GPR Justification:** The prioritized replacement of undersized water distribution piping as recommended in the Capital Improvement Plan is GPR-eligible by a Business Case per Section 3.5-1³ (Energy Efficient): *Energy efficient upgrades*.

¹ Fernwood Water System Preliminary Engineering Report, Mountain Waterworks, February 2013

² Fernwood District Preliminary Engineering Plan, Welch Comer, December 2011

³ Attachment 2. April 2011 EPA Guidance for Determining GPR Eligibility for FY12 SRF DW Projects

3. WATER TANK REFURBISHMENT¹

Summary

- Renovation of one of the District's water storage reservoirs is required to reduce water leakage.
- Estimated loan amount = \$676,300
- Estimated energy efficient (green) portion of loan = 7% (\$50,000)

Background

- One of the existing water storage reservoirs is leaking, resulting in a significant waste of potable water.

Results

- Refurbishing the storage reservoir will conserve water in the system.
- An estimated 5,500 gpd are leaking from the reservoir, representing 6% of the average daily flow requirements of the community.
- Repairing the reservoir will result in a corresponding 6% decrease in annual pumping costs, thereby saving the district \$552 in energy savings.

Conclusion

- Reducing water usage by fixing the leaking storage tank will reduce system pumping costs, thereby resulting in energy and financial savings, increased water efficiency, and reducing water losses.
- **GPR Costs:**
 - Water Tank Refurbishment = \$50,000.
- **GPR Justification:** Refurbishment of the water tank by the District as recommended in the Capital Improvement Plan is GPR-eligible by a Business Case per Sections 2.4-1, 2.4-3, 2.4-4 & 2.5-3² (Water Efficient): *2.4-1 Water efficiency can be accomplished by reducing water consumption; 2.4-3 Energy & Financial Savings; 2.4-4 address where water losses could be occurring in the system and fix them; 2.5-3 Storage tank replacement/rehabilitation to reduce water loss.*

¹ Fernwood Water System Preliminary Engineering Report, Mountain Waterworks, February 2013

² Attachment 2. April 2011 EPA Guidance for Determining GPR Eligibility for FY12 SRF DW Projects