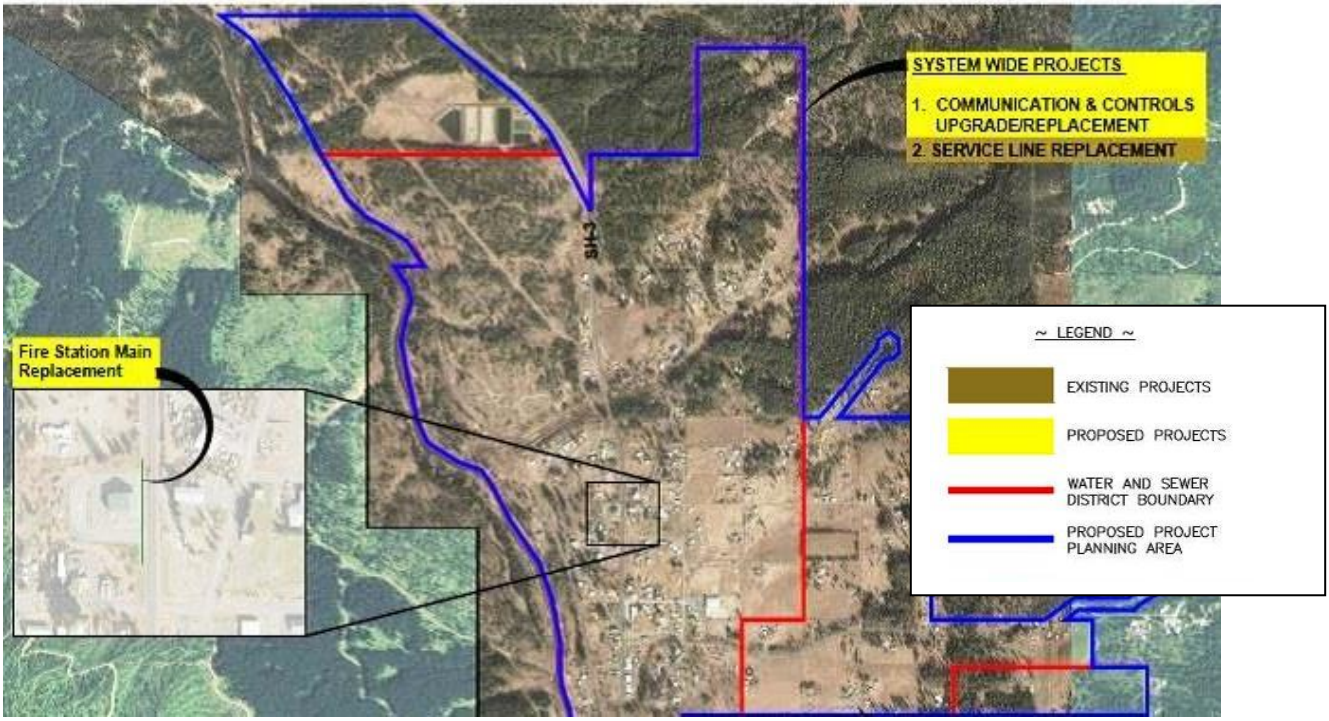

Fernwood W&SD FY14 Water System Project
SRF Loan #DW1212 Amendment 1
$272,334

Interim Green Project Reserve Justification

Business Case GPR Documentation

1. INSTALLS 250 LINEAL FEET OF NEW PVC C-900 WATER DISTRIBUTION SYSTEM PIPING (Water Efficiency). Business Case GPR per the criteria requirements 2.4-1…*reducing water consumption*; also per 2.4-4: *Proper water infrastructure management should address where water losses could be occurring in the system and fix or avert them;* also per 2.5-2: *Distribution pipe replacement …to reduce water loss and prevent water main breaks* ($42,285).

2. INSTALLS A SCADA SYSTEM (Energy Efficiency). Business Case per 3.5-7: *automated and remote control systems (SCADA) that achieve substantial energy savings* ($75,000).

1. Distribution System Upgrade[1]

Summary

- Approximately 250 feet of undersized leaking water main will be replaced with properly sized new water pipe.
- Estimated loan amount = $272,334
- Estimated energy efficient (green) portion of loan = $42,285 (15.5%) (bid price)

Background[2]

- The existing water main was a 6-inch diameter asbestos cement line constructed in 1966.
- Approximately 250 lineal feet of the water main was leaking at a rate of 3-5 gpm; in addition, the asphalt roadway was failing at the location of the leak.
- The leaking pipe was replaced with 250LF of 10-inch diameter C900 PVC pipe and two isolation valves.

Results

Replacing the failing water line with a new, properly sized line will result in:

- saving water as the leak will be repaired;
- saving energy through reduced pumping costs for less water, along with less energy to pump through a properly sized line (reduced friction factor); and
- fix a public safety hazard (failing roadway).

Conclusion

- The replacement of undersized leaking water distribution pipe with properly sized new water pipe saves water, increases water flow, and saves resources by reducing treated water consumption.
- **GPR Costs**: Distribution System Piping Upgrades = $42,285[3] (contractor bid price)
- **GPR Justification**[4]: Business Case GPR (Water Efficiency) per the criteria requirements 2.4-1 …*reducing water consumption*; also per 2.4-4: *Proper water infrastructure management should address where water losses could be occurring in the system and fix or avert them;* also per 2.5-2: *Distribution pipe replacement…to reduce water loss and prevent water main breaks* ($42,285).

[1] June 30, 2014 email Stuart Hurley P.E., Mountain Waterworks, LLC
[2] Fernwood Water System Preliminary Engineering Report. Mountain Waterworks. June 2014
[3] October 16, 2014 email Stuart Hurley P.E., Mountain Waterworks, LLC
[4] Attachment 1, April 21, 2012 EPA Guidance for Determining Project Eligibility

2. SCADA Control Technology

Summary

- Energy efficiency from the installation of a SCADA system for remote electronic sensing of the water storage tank and well pump.
- Loan amount = $272,334
- Estimated energy efficiency (green) portion of loan = 28%1% ($75,000) (bid price)
- Estimated annual energy and labor savings = $12,000 per year.

Background/ Results[5]

- The current radio-based communications system is insufficient to meet the monitoring and operational requirements of the water system. New instrumentation and controls will increase system efficiency by reducing power usage (less well pumping) and reducing water usage.
- This project includes new radios, input/output (I/O) capabilities, new programmable logic controllers (PLCs), human-machine interface (HMI) screen, and auto dialer system to make the system function properly

Energy Efficiency Improvements

- The highest priority for the communication and control system is upgrading the equipment in Crystal Peak Reservoir so that Well No. 3 can be operated by the water level in the reservoir. This will include a tank level transducer and a radio transmitter
- The well house will be updated to receive the radio signal and instruct the well pump to operate. The well house improvements will include a radio receiver and a PLC with an HMI screen.
- Upgrading the radio transmitter at the Finn Creek Reservoir and the communication equipment at the District office will occur as the budget permits. These upgrades include a new radio, auto dialer system, and a PLC with an HMI screen. These upgrades will allow the entire system to be monitored and operated from the District office.
- Remote SCADA monitoring saves labor costs =2 people 1 hour per day=$12,000/yr. in labor costs[1].

Conclusion

- Total SCADA savings would be approximately $12,000 per year in labor costs = payback of 6.3 years, therefore SCADA costs are GPR-eligible by 3.5-7.
- **GPR Costs**:

  SCADA = $75,000 (based on contractor's bid price)
- **GPR Justification**: SCADA system costs are GPR-eligible by a Business Case per 3.5-7[2]: *automated and remote control systems (SCADA) that achieve substantial energy savings.*

[5] From similar project: 12/03/13 Correspondence with Sheila Gormley, City Clerk, West Bonner Water & Sewer District
[2] Attachment 1, April 21, 2012 EPA Guidance for Determining Project Eligibility