

Drinking Water State Revolving Fund Green Project Reserve
- Final -



City of Dietrich Drinking Water Project
SRF Loan #DW1209
\$1,330,000

Final Green Project Reserve Justification
Categorical GPR Documentation

1. REPLACING 102 EXISTING MALFUNCTIONING WATER METERS WITH AMR SYSTEMS & REPLACING EXISTING MALFUNCTIONING WELL PRODUCTION WATER METER WITH NEW HIGH ACCURACY PRODUCTION WATER METER (Water Efficiency). Categorical GPR per 2.2-3a: *...replacing existing malfunctioning water meters with Automatic Meter Reading (AMR) systems*; also 2.2-9: *Projects that result from a water efficiency assessment such as water audits.* (\$55,000).

Business Case GPR Documentation

2. INSTALLS VFD CONTROLLERS FOR NEW WELL PUMP #2, EXISTING WELL #1 REPLACEMENT PUMP, AND CHLORINE DOSING PUMP (Energy Efficiency). Business Case GPR per 3.5-1: *Energy efficient ...new pumping systems...including VFDs* (\$22,500).

Approved by the State of Idaho SRF Loan Program
July 2013

1. EXISTING WATER METER REPLACEMENT¹

Summary

- Replacing 102 malfunctioning water meters with high accuracy IPEARL Sensus meter with an Automatic Meter-Reading system (AMR). In addition, the City is going to upgrade the entire meter read system from manual read to a radio read system which also will result in labor and resource efficiencies. Replace existing malfunctioning well production meter with new high accuracy meter.
- Loan amount = \$1,330,000
- GPR portion of loan (AMR) = 4% (\$55,000)

Background

- The water system serves 200 people and has approximately 98 residential connections. Total annual water use is 19.4 million gallons or 54 thousand gallons per day (MGD)².
- The existing water meters are approximately 20 years old, are not radio-read, are malfunctioning, and cannot be recalibrated.
- Increased water loss, due to leaks and inaccurate meter readings, are partly attributed to the old meters. The Idaho Department of Water Resources has documented that the existing well production meter under-reads actual well production by approximately 12%.

Results

- A 2010 water audit conducted by the City indicated³ the water meters may be one source of the 15% water leakage measured in the audit. The existing meters are not of an automatic meter-reading type.
- The audit indicated the meters were not properly accounting for flows and that this type of meter is out-dated.
- The Facilities Planning Study² recommended the replacement of the meters with an AMR system.
- The new AMR system will include built-in leak detection and backflow detection.

Other Benefits

- Replacing the old meters will increase water efficiency by decreasing the amount of water lost and by providing more accurate water-use information to customers and the system.
- Decreasing the amount of water lost will save on water pumping and treatment costs.

Conclusion

- Accurate metering of water consumption is an important conservation measure because providing more accurate water bills sends a strong price signal to customers and will result in more efficient consumption.
- Water leakage and inaccuracy increases with water meter age; therefore, an investment in water meters today will lead to additional water and dollar savings over time. Also, the water savings from the meter replacement will extend the life of the water supply and delay capital expansion projects.
- **GPR Costs:** Replacing malfunctioning water meter with AMR meters and replacing the malfunctioning well production meter = \$55,000
- **GPR Justification:**
 - The project is Categorical GPR-eligible (Water Efficiency) per Section 2.2-3a: *replacing existing malfunctioning water meters with Automatic Meter Reading (AMR) systems;*
 - Also GPR-eligible per Section 2.2-9: *projects that result from a water efficiency assessment*

¹ J. Walker P.E. Project Manager, Keller Associates July, 2013

² City of Dietrich 2011 Water Facilities Master Planning and Study, Keller Associates, Inc.

³ 2010 City of Dietrich Water Audit

2. PUMPING SYSTEM VFDs

Business Case

Summary

- Large-scale water system upgrade project includes premium energy efficient motors for well pumps.
- Estimated loan amount = \$1,330,000
- \$53,000 pump and motor replacement.
- Estimated energy efficiency (green) portion of loan = 6% (\$82,500)

Background

- The existing Well #1 vertical turbine pump and motor were installed in 1993. Since then, motor technology has experienced significant advancement and motors are more efficient now.
- The new well pump station will pump 250 GPM of water approximately 360' out of the ground.
- In addition, a backup well pump is being constructed.
- A controller is installed on the chlorine dosing pump such that it is flow paced rather than constant speed.

GPR Justification

- VFDs:**
- The Baseline Standard Practice for comparison is a standard Epact motor that is not controlled by a VFD⁵.
 - VFD efficiency data were calculated using the WEG Electric Corp Energy Savings Estimator and the Baldor Adjustable Speed Drive Energy Savings Calculator⁶.
 - The combined annual energy savings for utilizing VFDs is estimated to be 142,000kWh/year per pump/VFD system - corresponding to a cost savings of \$24,249/year (at an energy cost of 0.1\$/kWh) when compared to the Baseline Standard Practice.
 - With an estimated incremental cost increase of \$10,000 per unit the simple payback is approximately 6 months per VFD.

Conclusion

- The project would result in a more energy efficient operation as the new systems result in increased efficiency over the system to be replaced.
- **GPR Costs:** New pump VFD Systems = 2 @ \$10,000 = \$20,000
Chlorine Dosing Pump Controller = \$2,500
Total = \$22,500
- **GPR Justification:**
 - The VFD systems are Business Case GPR-eligible, qualifying per Sect. 3.5-1 (Energy Efficiency)⁷: “Energy efficient... new pumping systems... (including variable frequency drives (VFDs)” which are cost-effective.

⁴ 2012 EPA Guidelines for Determining Project GPR-Eligibility. Attachment 2.

⁵ NYS Energy Research and Development Authority, Energy Evaluation Memorandum, Village of Greenport WWTP Upgrade 8-2009

⁶ [http://www.baldor.com/support/software_download.asp?type=BE\\$T+Energy+Savings+Tool](http://www.baldor.com/support/software_download.asp?type=BE$T+Energy+Savings+Tool)

⁷ 2012 EPA Guidelines for Determining Project GPR-Eligibility. Attachment 2