City of Iona Drinking Water Project
SRF Loan #DW 1805 (pop. 1,803)
$1,133,250

Preliminary Green Project Reserve Justification

Business Case GPR Documentation

1. **INSTALLS SCADA FOR REMOTE MONITORING** (Energy Efficiency). GPR Business Case per 3.5-7: automated and remote control systems (SCADA) that achieve substantial energy savings. ($xxxx).

2. **INSTALLS ADVANCED FLUORESCENT LIGHTING** (Energy Efficiency). GPR Business Case per 3.5-6: Upgrade of lighting to energy efficient sources (such as compact fluorescent, light emitting (LED) diode, etc.). ($xxxx)

3. **INSTALLS PREMIUM ENERGY EFFICIENT MOTOR/VFD CONTROLLER FOR NEW WELL** (Energy Efficiency). Business Case GPR per 3.5-1: Energy efficient...new pumping systems...including VFDs ($xxxxx).

The State of Idaho SRF Loan Program
February 2018

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1 The loan recipient will update all information, including data in red font, in the GPR Technical Memorandum submission.
1. SCADA CONTROL TECHNOLOGY

Summary
- Energy efficiency from the installation of a SCADA system for remote electronic sensing of the water storage tank and pumping system.
- Loan amount = $1,133,250
- Estimated energy efficiency (green) portion of loan = x% ($xxx) (conceptual estimate)
- Estimated annual energy and labor savings = $xxxx per year.

Background/ Results
- The SCADA system is part of the project at the well site pump house building.

Energy Efficiency Improvements
- Remote SCADA monitoring saves labor costs = x people y hour per day = $xxxx/yr in labor costs.

Conclusion
- Total SCADA savings would be approximately $xxxx per year in labor costs = payback of z years, therefore SCADA costs are GPR-eligible.
- **GPR Costs:**
  \[
  \text{SCADA} = \$xxxx \\
  \text{Total} = \$xxxx
  \]
- **GPR Justification:** SCADA system costs are GPR-eligible by a Business Case per 3.5-7:\textit{ automated and remote control systems (SCADA) that achieve substantial energy savings.}

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\(^2\) 6-22-15 Correspondence with Project Manager

\(^3\) Attachment 1, April 21, 2012 EPA Guidance for Determining Project Eligibility
Summary

- Energy efficiency from the installation of advanced fluorescent lighting in the interior of the well site pump house building.

- Energy efficiency from the installation of light emitting diode (LED) lighting at the exterior of the well site pump house building.

- Loan amount = $1,133,250

- Estimated energy efficiency (green) portion of loan = x% ($xxxx) (conceptual estimate)

- Estimated annual energy savings = $xxx per year.

Background/ Results

- The lighting system is part of the project at the well site pump house building.

Energy Efficiency Improvements

- Energy efficient T-8 magnetic fluorescent lighting is approximately 28% more energy efficient than standard T-12 magnetic fluorescent lighting for relatively the same light output.4

- LED lighting is approximately 58% more energy efficient than typical high pressure sodium lighting for relatively the same light output.4

Conclusion

- **GPR Costs:**
  
  Advanced Fluorescent Lighting = $xxx
  
  LED Lighting = $xxxx
  
  Total = $xxxx

- **GPR Justification:** Advanced fluorescent lighting and LED lighting is GPR-eligible by a Business Case per 3.5-75: Upgrade of Control Building lighting to energy efficient sources such as......compact fluorescent, light emitting diode (LED).
3. **ENERGY-EFFICIENT PUMP/ VFD**

### Summary
- The City will purchase and install premium energy-efficient vertical turbine pump in the new well and a variable frequency drives (VFDs).
- Loan amount = $1,133,250
- Estimated energy efficiency (green) portion of loan = x% ($xxxx) (conceptual estimate)

### Background
- Provision of VFD on the pump will provide a much tighter range for pressure fluctuation. The VFD will save energy by assisting in maintaining constant system pressure; it will also reduce electrical consumption at times of pump start-up.

### GPR Justification

**Motors/VFDs:**
The Baseline Standard Practice for comparison is a standard Epact motor that is not controlled by a VFD\(^5\). Published operating curves by the pump manufacturer provided VFD efficiency data:

- **Proposed Pump - no VFD, standard Epact efficiency motor**
  - Type: Vertical Turbine Hollow Shaft
  - Efficiency 82%; Flow 1,400 gpm; 2.02 mgd; Head 265 ft.
  - Motor rating = 125 hp; Motor type = standard efficiency (93.0% assumed at 75% of full load\(^6\)); existing avg. flow = 115 hp
  - % operation = 33% (average day flow/pump output)
  - % Annual Usage = 50% (average daily operation throughout the year)
  - Energy usage = xxxxxx kW-hr

- **Proposed Pump - no VFD, with premium efficiency motor**
  - (95.4% assumed at 75% of full load); existing avg. flow = 112.24 hp
  - % operation = 33% (average day flow/pump output)
  - % Annual Usage = 50% (average daily operation throughout the year)
  - Energy usage = xxxxxx kW-hr

- **Proposed Pumps - VFD operation with premium efficiency motor**
  - Efficiency 82%; Head 230 ft; Motor rating = 125 hp; Motor type = standard efficiency (95.4% assumed at 75% of full load); BHP, existing avg flow = 90.75 hp
  - % operation = 33% (average day flow/pump output)
  - % Annual Usage = 50% (average daily operation throughout the year)
  - Energy usage = xxxxxx kW-hr

### Conclusion
- By installing a premium pump/VFD in the new well, the City can save up to $xxxx/yr. in energy costs
- The VFDs are cost effective as the payback period is less than the life of the equipment.
- **GPR Costs:** VFD = $xxxxx
- **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.

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\(^6\) http://www.copper.org/environment/sustainable-energy/electric-motors/education/motor_text.html

\(^7\) 2012 EPA Guidelines for Determining Project GPR-Eligibility. Attachment 2