City of Iona Drinking Water Project  
SRF Loan #DW 1805 (pop. 1803)  
$3,900,000

Interim 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. ($52,309).

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). ($5,000)

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 ($38,000).
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 = $3,900,000
- Estimated energy efficiency (green) portion of loan = 1.3% ($52,309) (design estimate)
- Estimated annual energy and labor savings = $9,500 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 = 1 person 1 hour per day = $9,500/yr in labor costs.

**Conclusion**
- Total SCADA savings would be approximately $9,500 per year in labor costs = payback of 5.3 years, therefore SCADA costs are GPR-eligible.
- **GPR Costs:**
  - SCADA = $52,309
  - Total = $52,309
- **GPR Justification:** SCADA system costs are GPR-eligible by a Business Case per 3.5-7: *automated and remote-control systems (SCADA) that achieve substantial energy savings.*

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1 6-22-15 Correspondence with Project Manager
2 Attachment 1, April 21, 2012 EPA Guidance for Determining Project Eligibility
2. Energy Efficient Lighting

Summary
- Energy efficiency from the installation of light emitting diode (LED) lighting at the interior and exterior of the well site pump house building.
- Energy efficiency from the installation of occupancy sensors both interior and exterior of the well site pump house building.
- Loan amount = $3,900,000
- Estimated energy efficiency (green) portion of loan = 0.1% ($5,000) (design estimate)

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

Energy Efficiency Improvements
- Occupancy sensors improve efficiency by approximately 91% over no sensors.
- LED lighting is approximately 58% more energy efficient than typical high-pressure sodium lighting for relatively the same light output.

Conclusion
- GPR Costs:
  - Occupancy Sensors = $500
  - LED Lighting = $4,500
  - Total = $5,000
- GPR Justification: Advanced fluorescent lighting and LED lighting is GPR-eligible by a Business Case per 3.5-7: Upgrade of Control Building lighting to energy efficient sources such as......compact fluorescent, light emitting diode (LED).
Business Case

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 = $3,900,000
- Estimated energy efficiency (green) portion of loan = 0.9% ($38,000) (design estimate)

Background

- The City requires an additional well to meet City water demands. This will require a new 1,375 gpm vertical turbine well pump.
- 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\(^3\). Published operating curves by the pump manufacturer provided VFD efficiency data:

- **Proposed Pump - no VFD, standard Epact efficiency motor**
  - Type: Vertical Turbine Hollow Shaft
  - Motor rating = 125 hp; Motor type = standard efficiency. Motor efficiency of 70%
  - Energy usage = 136,833 kW-hr

- **Proposed Pump - no VFD, with premium efficiency motor**
  - Motor rating = 125 hp; Motor type = premium efficiency. Motor efficiency of 95.4%
  - Energy usage = 81,749 kW-hr

- **Proposed Pumps - VFD operation with premium efficiency motor**
The combined annual energy savings for utilizing a VFD with a premium motor is estimated to be 26,158 KWH per year @ $0.08/KWH = cost savings of $2,090 per year. This equates to an energy reduction of 36%.

Conclusion

- By installing a premium pump/VFD in the new well, and at $0.08/KWH the City can save up to $4,500/yr. in energy costs.
- Based on the savings in energy costs the payback period would be 8.4 years therefore the VFD and premium pumps are GPR eligible.
- **GPR Costs**: VFD = $38,000
- **GPR Justification**: The VFD systems are Business Case GPR-eligible, qualifying per Sect. 3.5-1 (Energy Efficiency)\(^4\): “Energy efficient... new pumping systems... (including variable frequency drives (VFDs))” which are cost-effective.

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\(^4\) 2012 EPA Guidelines for Determining Project GPR-Eligibility. Attachment 2