

Drinking Water State Revolving Fund Green Project Reserve
- Interim -



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/ Results¹

- 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 3.5-7²: *automated and remote-control systems (SCADA) that achieve substantial energy savings.*

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 3.5-7⁵: *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 = \$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 VFD³. 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.

³ NYS Energy Research and Development Authority, Energy Evaluation Memorandum, Village of Greenport WWTP Upgrade 8-2009.

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