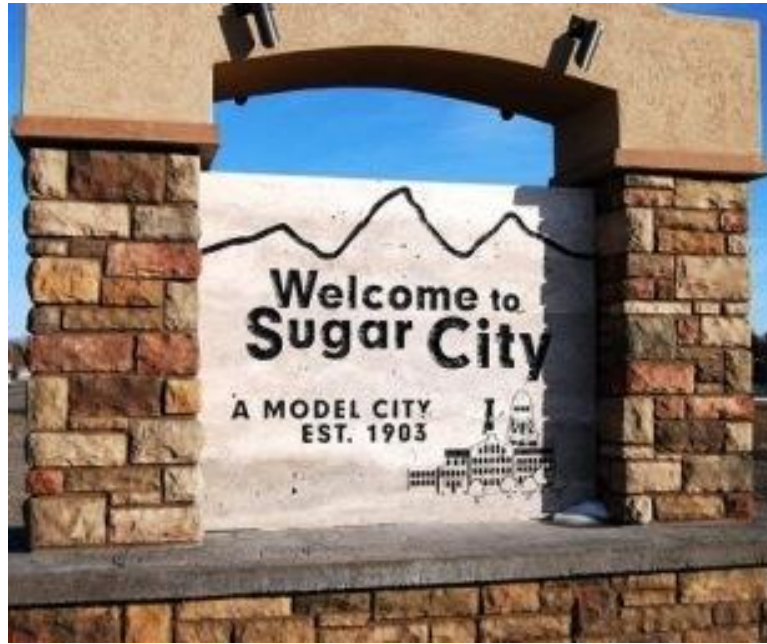


# Drinking Water State Revolving Fund Green Project Reserve

- Preliminary -



## Sugar City Drinking Water Project

SRF Loan #DW 1806 (pop. 3,977)

\$3,700,000

### Preliminary Green Project Reserve Justification<sup>1</sup>

#### 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 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).
3. INSTALLS RADIO-READ CAPABILITY ON EXISTING WATER METERS (Water Efficiency) Categorically GPR-eligible per Section 2.2-4: *Retrofitting/adding AMR capabilities or leak equipment to existing meters* (\$ xxxxx)

The State of Idaho SRF Loan Program  
March 2018

<sup>1</sup> The loan recipient will update all information, including data in red font, in the GPR Technical Memorandum

# 1. SCADA CONTROL TECHNOLOGY

## Summary

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- Energy efficiency from the installation of a SCADA system for remote electronic sensing of the water storage tank and pumping system.
- Loan amount = \$3,700,000
- Estimated energy efficiency (green) portion of loan = **x%** (**\$xxx**) (conceptual estimate)
- Estimated annual energy and labor savings = **\$xxxx** per year.

## Background/ Results

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

## Energy Efficiency Improvements

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

## Conclusion

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- Total SCADA savings would be approximately **\$xxxx** per year in labor costs = payback of **z** years, therefore SCADA costs are GPR-eligible.
- **GPR Costs:**  
SCADA = **\$xxxx**  
Total = **\$xxxx**
- **GPR Justification:** SCADA system costs are GPR-eligible by a Business Case per 3.5-7<sup>2</sup>: *automated and remote control systems (SCADA) that achieve substantial energy savings.*

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<sup>2</sup> Attachment 1, April 21, 2012 EPA Guidance for Determining Project Eligibility

## 2. ENERGY-EFFICIENT PUMP/ VFD

### Summary

- The City will purchase and install a premium energy-efficient booster pump with a variable frequency drive (VFD).
- Loan amount = \$3,700,000
- Estimated energy efficiency (green) portion of loan = x% (\$xxxx) (conceptual estimate)

### Background

- The City requires an additional storage tank to provide the storage capacity required for current demand. A booster pump will be provided with the new well and storage tank.
- 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

The Baseline Standard Practice for comparison is a standard Epact motor that is not controlled by a VFD<sup>3</sup>. Published operating curves by the pump manufacturer provided VFD efficiency data:

- **Premium Efficiency Motors**
  - The **vertical turbine pump** has a premium efficiency **75 hp motor (95.4% efficient)** at an additional cost of approximately **\$850**. Standard efficiency motors are typically 15 to 30 percent lower in cost than premium efficient motors<sup>4</sup>.
  - A standard efficiency **75 hp motor** has an efficiency of approximately **92%** at **75%** full load.
  - If the booster pump runs for **3,864** hours per year at **\$0.08/KWH**, an energy savings of approximately **6,245 KWH** per year will be realized = a cost savings of **\$500** per year.
  - At **\$500** per year of energy savings using a premium efficiency motor, the payback period for the cost differential between a standard and premium efficiency motor (**\$850**) is **1.7** years, which is less than the 20-year useful life of the pump/motor.
- **Variable Frequency Drive (VFD)**
  - The combined annual energy savings for utilizing a VFD with a premium motor is estimated to be **53,152 KWH** per year, @ **\$0.08/KWH** = cost savings of **\$4,242** per year. This equates to an energy reduction of **30%**. This assumes that the average pumping rate with a VFD will be reduced from the peak rate of **940 gpm** for the pump to an average of **660 gpm**.



### Conclusion

- The premium efficiency motor and VFD for the reuse pump station is GPR-eligible since the motor payback period (**1.7** years) is less than the useful life of the pump/motor (20 years) and the combined premium efficiency motor and VFD achieve greater than 20% reduction in energy consumption.
- **GRP Costs Identified:** New premium energy efficient pump/motor and VFD = **\$87,546**.
- **GPR Justification:** Categorical and Business Case per GPR 3.2-2 & 3.4.1: *projects that achieve a 20% reduction in energy consumption; if there is less than a 20% reduction in energy efficiency, then it may be justified using a business case; energy savings and payback ... [must] not exceed the useful life of the asset; also, per 3.5-9: VFDs can be justified based upon substantial energy savings (\$87,546).*

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

<sup>4</sup> Page V. Energy Efficient Motor Selection Handbook, Washington State Energy Office

### 3. UPGRADE WATER METERS

#### Summary

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- Installation of radio-read capability on all previously installed metered water service connections. In addition to the new water meter radio-read component, the overall project also includes a new groundwater well, booster pump, storage tank and distribution piping.
- Loan amount = \$3,700,000
- GPR portion of FY15 Amendment (AMR) = 7.4% (\$50,960)

#### Background

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- The City currently sets utility rates based on metered flows and is in the process of increasing rates to cover operating and capital costs, including this project.
- In order to better manage the system and possibly conserve water, this project proposes to install radio read units at all meters so that they can be read more regularly and leakage can be detected and addressed more rapidly.

#### Recommendations

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- The installation of radio reading equipment on the existing meters is intended to improve the City's ability to recover cost of water use by improving accuracy and frequency of meter reading.

#### Conclusion

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- Metering of water consumption is an important conservation measure because providing a structured water rate based on usage will provide an incentive for system users to conserve water.
- Installing radio-read capability on water meters will allow the Water District to more accurately track water loss and leakage.
- **GPR Costs:** Installing radio-read capability on all water meters = \$50,960
- **GPR Justification:** The project is Categorically GPR-eligible (Water Efficiency) per Section 2.2-4: *Retrofitting/adding AMR capabilities or leak equipment to existing meters* (\$xxxx)<sup>5</sup>.

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<sup>5</sup> April 21, 2010 EPA Guidance for Determining Project GPR-Eligibility, Attachment 2, p. 7