Clean Water State Revolving Fund Green Project Reserve

- Final -

City of Jerome Wastewater Collection System Upgrade Project "Priority 1" (pop. 10,890)
SRF Loan #WW1403
$1,750,000

Final Green Project Reserve Justification

Business GPR Documentation

UPGRADE WASTEWATER LIFT STATION AND INSTALL NEW ENERGY-EFFICIENT PREMIUM PUMPS. (Energy Efficiency) Categorical per GPR 3.2-2: *projects that achieve a 20% reduction in energy consumption and are cost effective* ($164,400).

State of Idaho SRF Loan Program
August 2018

LIFT STATION UPGRADES/ PREMIUM PUMPS[1]

Summary

- The City of Jerome plans to upgrade lift stations as part of an overall renovation of the City's wastewater collection system.
- One of the lift stations received premium energy-efficient pumps as part of the Priority 1 upgrade project.
- Total Loan amount = $1,750,000
- Estimated Categorical energy efficient (green) portion of loan = 9.4% ($164,400.)
- Pump/VFD efficiency increase = 42%

Background

- The City of Jerome's wastewater collection system has deficiencies that have led to numerous sanitary sewer overflows and permit violations.
- The existing wastewater collection system has ten (10) sewage lift stations which require upgrading. This report only covers the lift station that received Priority 1 pump upgrades.
- An integral part of the lift station upgrades will be the replacement of standard efficiency pumps with premium energy-efficient models and VFDs to conserve energy and enhance the operability of the collection system.

Results

- Table 1 contains the specifications and costs of the pumps purchased for the lift station.

TABLE 1. LIFT STATION DATA

H STREET

Item	Number	Manufacturer	Model	HP	Unit Cost	Total Cost
Pump	4	SULZER	XFP-155J	70	$34,600	$138,400
VFD	4	EATON	SVX9000	-	$6,500	$26,000

Total Cost = $164,400

GPR Analysis

- The Baseline Standard Practice (BSP) for comparison is a standard On/Off motor without a VFD[2].
- VFD efficiency data is calculated using the Pump motor data, energy calculations, and an ABB VFD efficiency calculator.
- The pumps run an average of 12 hours per day; variable flow rates approximate a bell curve over time for an entire year.
- The estimated combined annual energy savings for utilizing VFDs compared to the Baseline Standard Practice for each of the different pieces of equipment is summarized in Table 2. The corresponding cost savings are estimated using an energy cost of 0.075$/kWh.

[1] This analysis has used data related to the actual pumps to be installed.

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

(con't) LIFT STATION UPGRADES

TABLE 2. EFFICIENCY SUMMARY

EQUIPMENT	Energy Cost Savings per Year Pump Only	Energy Cost Savings per Year Pump and VFD Combination	Expected Cost of Operation per Year	Calculated Energy Savings *	Years for Payback
H Street Dry Pit Pumps	$2,796	$8,474	$18,763	42%	2.80

* Based upon Bell Curve Operations of the Lift Pumps

- Pumps in combination with a VFD will realize a > 40% increase in efficiency.
- The Annual Energy savings by using the VFD and high efficiency pumps is around $8,500 per year of normal operation.

Conclusion

- Premium efficiency motors and VFDs in the lift station renovations are GPR-eligible as the equipment is cost effective when compared to the standard efficiency motors with an ON/OFF controller, have a payback period under three years. The combination Pump + VFD also realizes greater than 40% increase in efficiency.
- **GPR Costs:** Pumps + VFDs = $164,400 (purchase cost)
- **GPR Justification:** Business GPR-eligible (Energy Efficiency) per Section 3.2-2[3]: *"projects that achieve a reduction in energy consumption and are cost effective."*

[3] Attachment 2. April 2011 EPA Guidance for Determining Project Eligibility.