

## Clean Water State Revolving Fund FY12 Green Project Reserve



### **City of Cascade FY12 Wastewater System Project \$3,200,000**

#### **Preliminary Categorical GPR Justification**

RENOVATION OF GRAVITY WASTEWATER COLLECTION SYSTEM EXPERIENCING EXCESSIVE INFLOW AND INFILTRATION (I/I). Categorical Case GPR per 3.2-2 (Energy Efficiency): *Projects that achieve a 20% reduction in energy consumption.* (\$2,231,455)

# 1. RENOVATION OF GRAVITY WASTEWATER COLLECTION SYSTEM<sup>1</sup>

## Summary

- Estimated project costs for renovation of the City's gravity wastewater collection system to reduce excessive inflow and infiltration (I/I) and Lift Station replacement are as follows:
  - Total Project Costs = \$3,200,000
  - SRF loan amount = \$2,231,455
  - Estimated energy efficient (green) portion of loan = (98%) \$2,187,155 (Based on construction low bid)

## Background

- The groundwater level in the study area ranges from 1' to 4' below the ground surface for approximately 4 months, from March 1 through June 30, as measured by City staff at groundwater monitoring wells at the wastewater treatment plant.
- During this period the City's wastewater treatment plant pumps a daily average influent flow of approximately 0.46 MGD as measured by City staff on a daily basis from pump flow meter records.
- The plant measures a dry weather daily average wastewater flow of 0.2 MGD as measured by City staff on a daily basis from pump flow meter records.

## Results

- A study of the City's wastewater system resulted in the development of a Facility Planning Study (FPS), which prioritized improvements to reduce the greatest amount of I/I, thereby minimizing system energy use and improving efficiency.
- The FPS recommended replacement of 32,500 lineal feet of dilapidated gravity mains. The funding presently available to the project will limit gravity main replacement to approximately 24,000 lineal feet of the most dilapidated sections of the gravity main within the system.

## Conclusion

- The majority of the initial phase improvements were complete by November of 2012. October and November 2012 experienced unusually high precipitation. The combination of high precipitation and reduced flow into the wastewater treatment system from the sewer improvements yielded I/I reduction results for the project that are likely artificially high. The conclusions in this GPR provide a conservative range of results.
- I/I between 2006 and 2009 averaged 75 MG annually<sup>2</sup>. Using actual wastewater flows as measured by City staff, in combination with precipitation data in October and November 2012, I/I will most likely be reduced between 22 to 53 million gallons annually or 30% to 70% from the pre-project conditions.
- After all of the improvements are constructed in the fall of 2013, additional data to quantify the I/I reductions will become available. Reviewing I/I during high precipitation and high groundwater conditions in the spring of 2014 will provide a sound measure for the actual I/I reduction.
- Since a lift station is required to transfer the wastewater from the gravity collection system to the treatment plant, reducing system I/I between 30% and 70% results in a direct reduction in energy consumption of 30% to 70%.
- The significant reduction in the quantity of wastewater resulting from the elimination of I/I in the collection system will result in a direct concurrent reduction in downstream wastewater treatment energy costs and reduced treatment plant expansion costs.
- **GPR Costs:** Replacing 24,000 feet of gravity sewer = \$3,200,000; GPR-eligible SRF loan = \$2,187,155 (low-bid price).
- **GPR Justification:** The prioritized replacement of gravity sewer lines by the City as recommended in the FPS is Categorically GPR per 3.2-2: *Projects that achieve a 20% reduction in energy consumption.*

<sup>1</sup> 12-7-12 Correspondence with M. Neukom, PE, Project Manager, Horrocks Engineers

<sup>2</sup> Facility Planning Study, Keller Engineers, page 21