



**City of Idaho City Drinking Water Project
\$2,354,000**

Categorical & Business Case GPR Documentation

Categorical Case GPR-Water Efficiency 2.4-1; *Projects that result from a water efficiency related assessment such as water audits & Business Case 2.4-4; Proper water infrastructure management should address where water losses could be occurring...fix them...replacing aging infrastructure (\$56,000):*

1. replaces 1,100 feet of 6" diameter C900 PVC distribution piping with new 6" diameter HDPE pipe.

Categorical Case GPR-Water Efficiency 2.4-1; *Projects that result from a water efficiency related assessment such as water audits & Business Case GPR-Energy Efficiency 3.5-1& 3.5-7; energy efficient retrofits (\$115,000):*

2. at the treatment plant, installs a SCADA system and VFDs on two high service pumps.



1. PIPE REPLACEMENT¹

Summary

- Replacement of 1,100 feet of leaking distribution pipe with new 6-inch HDPE pipe to eliminate the loss of 61.5 million gallons of water per year (MGY), equal to 48% of the City's total water production.
- Loan amount = \$2,354,000
- GPR project = \$56,000
- Water saving (green) portion of loan = 2.4%% (\$56,000)
- Annual water savings = 61.5 million gallons (MG)

Background

- The overall project addresses public health concerns associated with high turbidity levels and depressurization, and includes replacement of distribution piping along Placer Street, provision of two new wells for additional source water, construction of two reservoirs to increase storage capacity, and improvements to the treatment plant.
- A water audit² conducted by the City indicated extensive water loss attributed to leaking 65 year old 6" diameter tar wrapped steel distribution pipe along Placer Street. The audit confirmed a loss of over 48% of water entering the distribution system.
- Leaks are due to aging, leaking pipe connections, rock intrusion and poorly bedded pipe.
- The Water Facilities Planning Study recommended the replacement of 1,100 linear feet of 6" diameter PVC distribution pipe along Placer Street with 6" diameter HDPE pipe.

Results

- The project will replace 1,100 feet of 1940's era steel distribution pipe with new 6" HDPE pipe.
- The new 6" HDPE pipe will eliminate 48% of water lost from leaking distribution pipe.

Calculated Water Savings

- The water audit was performed to determine the percent of unaccounted water loss from the beginning of the distribution system to the individual water meters and water service connections. The total amount of water lost in the distribution system was determined using the daily flow records maintained by the City.
- Current water data shows that the City is currently producing 350,000 gpd of drinking water (128MG/yr.).
- From the beginning of the distribution system to the individual water meters, the City is losing 168,000 gpd (48%). The loss is attributed to leakage of water from old and cracked distribution pipe along Placer Street.

Conclusion

- By replacing the 1,100 feet of leaking PVC pipe the City anticipates conserving 61.5 MGY (48% of overall water produced).
- At a cost per unit of consumption of \$0.70 per 100 cubic feet, the cost savings of conserving 61.5 MGY of water is estimated at \$57,554 per year.
- Additional benefits include reductions in unnecessary pumping and operation and maintenance expenditures, and eliminating potential health hazards associated with waterborne pathogens entering the water distribution system.
- The costs of replacing aging and leaking distribution piping are Categorically GPR- eligible by the definition of Water Efficiency 2.4-1: *Projects that result from a water efficiency related assessment such as water audits; and by a Water Efficiency Business Case per 2.4-4: Proper water infrastructure management should address where water losses could be occurring...fix them...replacing aging infrastructure*³.

¹ Idaho City Drinking Water Facility Plan, 2010, Pharmer Engineering

² Water Audit, 2009, Pharmer Engineering

³ Attachment 2. EPA Guidelines for Determining FY11 Project GPR-Eligibility.

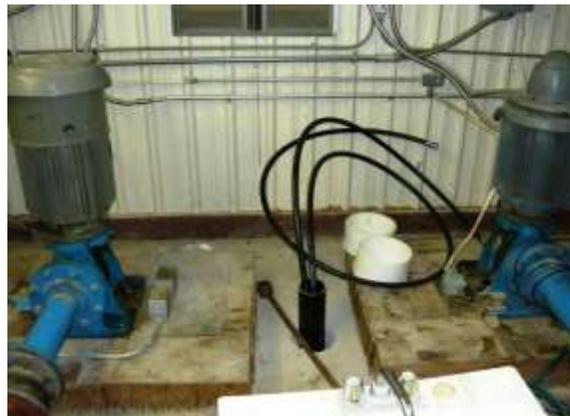
2. TREATMENT PLANT UPGRADE – SCADA SYSTEM & VFDs

Summary⁴

- Treatment Plant renovation includes energy-efficiency upgrades by integrating new VFDs for the two high service pumps at the plant with a new SCADA system.
- Estimated loan amount = \$2,354,000
- GPR project = \$115,000
- Estimated energy and water efficiency (green) portion of loan = 5% (\$115,000)
- Estimated annual energy and water cost savings is \$36,050 per year.

Background⁵

- A Water audit was conducted by Pharmer Engineering in 2009 with available data from 2007 and 2008. The water audit was part of the Water System Planning Document completed in 2010.
- The Idaho City SCADA upgrade is designed to eliminate water losses due to plant inefficiencies.
- The plant produces approximately 350,950 gpd of drinking water and distributes only 277,393 gpd.
- It is estimated that the plant is losing water at a rate of 73,560 gpd or 26.9 MG/yr.
- Cost to run the existing high-service pumps for one year equals approximately \$13,750.



Results⁶

- SCADA automation at the plant will reduce water loss by 95% (= 69,882 gpd).
- The new VFDs at the water plant for the 15 HP motors will result in approximately a 10% cost savings over the power costs of the motors currently installed.

Efficiency Improvements⁷

- SCADA cost savings at the current City water billing rate of \$1.35/1000 gallons = $\$1.35 \times 69,882 = \95 per day (= \$34,675/yr.).
- VFD cost savings = $10\% \times \$13,750/\text{yr.} = \$1,375/\text{yr.}$
- Total annual cost savings due to SCADA and VFDs = $\$34,675 + \$1,375 = \$36,050/\text{yr.}$
- Total cost of the treatment plant upgrade = SCADA + VFDs = \$75,000 + \$40,000 dollars = \$115,000.

Conclusion

- By upgrading the motor VFDs in the high-service pump station and adding SCADA, energy use will be reduced while conserving water at an annual rate of approximately 25.5 MGY.
- Payback on water treatment plant energy efficiency improvements = $\$115,000 \div \$36,050/\text{year} = 3.19$ years.
- The costs of installing VFDs and SCADA are Categorically GPR- eligible by the definition of Water Efficiency 2.4-1: *Projects that result from a water efficiency related assessment such as water audits*; and by an Energy Efficiency Business Case per 3.5-1: *Energy efficient retrofits...(VFDs)* & 3.5-7 ... *(SCADA) that achieve*

⁴ 3/17/11 Correspondence with Josh Reed, Design Engineer, Pharmer Engineering

⁵ Idaho City Drinking Water Facility Plan, Pharmer Engineers, 2010

⁶ 10/25/11 Memo to DEQ, Pharmer Engineering

*substantial energy savings.*⁷

⁷ Attachment 2. EPA Guidelines for Determining FY11 Project GPR-Eligibility p.20