



CASE STUDY

Energy Efficiency Profile: Riverton City Water

RIVERTON CITY WATER SAVED OVER \$42,110 PER YEAR IN ENERGY COSTS

Energy represents the largest controllable cost of providing water to the public. Utah water systems are designed, built and operated to ensure water needs are met. The majority of water systems have not been designed with energy efficiency as the main focus. Energy audits, available through Rocky Mountain Power’s (RMP) wattsmart program, are an essential first step towards energy efficiency. Water system operators and managers that haven’t implemented some or all of the energy efficiency measures recommended in an energy audit are probably spending more energy to deliver water to their customers. The money savings achieved by implementing energy efficiency measures can be used for equipment upgrades, meeting new water quality requirements, boosting the salaries of staff, or keeping water rates affordable.

RIVERTON CITY WATER

Riverton City acquires the majority of their water through underground wells. To extend the life of the limited culinary water source, the city installed a secondary water system to use for irrigation purposes. With the secondary water, pumping levels have returned to normal, ensuring that the aquifer is protected for their primary users: residences, Riverton Hospital, schools, and a golf course. The City’s conservation mindset also applies to energy use, as they are also mindful of operating their system as energy efficient as possible. Riverton City has adopted the following strategies to conserve energy and water:

ENERGY EFFICIENCY STRATEGIES

- Utilizing five pressure zones with individual pump stations to minimize the volume of water pumped, and total head on each pump station.
- Monitoring pressure relief valves (PRV) settings to minimize bleeding between pressure zones.
- Delivering source water as high in the system as possible to reduce pumping.
- Increasing the Energy Load Factor (LF) by avoiding pumping at a high capacity for a short period of time; i.e. run pumps at a slower and steady rate for a longer period.
- Installing two pump stations to reduce head and eliminate bleeding.

Service Area
12 square miles

Total Gallons of Storage
6,500,000 Culinary Water
44,000,000 Secondary Water

Total Peak Pumping Capacity GPM
9,065 Culinary Water
23,500 Secondary Water

Total Annual Gallons Pumped
1,367,573,000 Culinary Water
3,080,181,000 Secondary Water

Total Connections or Customers
9,260 Culinary
9,740 Secondary

Annual Cost of Purchased Energy
\$282,751 Culinary (2.5 MM kWh)
\$256,403 Secondary (4.5 MM kWh)

Estimated Annual Savings Attributed to Energy Efficient Strategies (as of 2013)
\$42,110

Energy Audit Partners

Ryan Taylor, PE
Epic Engineering, P.C.

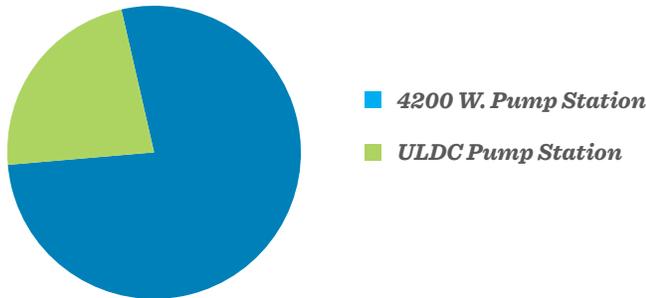
Riverton City Contact

D. Scott Hill,
Director

**PROJECTED ANNUAL ENERGY SAVINGS
OF \$42,110**

Riverton City estimates an annual savings of \$42,110 by replacing the 4200 West Pump Station with the Utah Lake Distribution Canal (ULDC) Pump Station.

Projected Annual Pumping Costs per Pump Station



■ Projected annual power cost to pump: \$60,157

■ Projected annual power cost to pump: \$18,047

The 4200 West Pump Station was more costly to operate than the ULDC Pump Station due to elevation changes and PRV stations.

**USING SECONDARY WATER
FOR IRRIGATION**

It takes a large amount of energy to produce, treat, and transport clean water. Using secondary water for irrigation extends the life of the culinary water source and saves energy. Riverton now operates two wells instead of five, as a result of their conversion to secondary water.

Water Source	Annual Revenue/1000 Gal	Annual Operating Cost/1000 Gal	Annual Surplus/Short- fall
Culinary Water	\$2.90	\$2.70	\$.20
Secondary Water	\$1.20	\$.80	\$.40

Secondary Water Rates	Non-user	User Rate
1/4 Acre and Smaller	\$4.50/month	\$24.36
Up to & Including 1/3 acres	\$4.50/month	\$27.93
Up to & Including 1/2 acres	\$4.50/month	\$33.68
Up to & Including 3/4 acres	\$4.50/month	\$40.11
Up to & Including 1 acres	\$4.50/month	\$45.87
Secondary Senior Rate (Secondary)		\$15.00

OPERATIONAL STRATEGIES

The following changes were implemented by staff at Riverton Water to save money and optimize energy and power savings:

- Sizing storage ponds to meet peak demands instead of pumps to optimize power consumption.
- Reducing leaks by implementing a regular water audit and repair program, including maintaining and replacing PRV's as needed to prevent leaks and short circuiting.
- Utilizing detailed distribution models to identify and correct inefficiencies.
- Utilizing secondary water for irrigation to extend the life of the culinary water source.

DEFINITIONS

Energy Load Factor (LF): LF is a measurement, expressed as a percentage, of the amount of time a facility runs during the billing cycle. A peak power (kw) charge is assessed if a pumping system runs at a high capacity for a short time, as short as 15 minutes. It is less expensive to operate at a lower capacity for a longer period of time, where the same amount of water is pumped during a day or month but the peak power charge is much less. Energy is typically conserved as well because head loss through the distribution piping systems is reduced.