

Green Effort Leads to Lower Water Costs

The Harrisonburg Department of Public Utilities has engaged to meet today's challenge to be financially responsible and to also be an environmental steward by reducing its carbon footprint of tomorrow. Our goal has been set to make strategic improvements in water distribution so that our system assets use less electrical power. In this effort, we have initiated a trend of lowering our operating cost which ultimately trickles down to our consumers in the form of lower water rates. Our strategies target four major areas: reduce the water load, rethink system configuration, optimize the system components efficiencies, and react to the electric rate structure.

The first strategy is load reduction. "Pump no more water than you need to pump." In Harrisonburg's application, the water system has 9 independent zones. Each zone has a unique energy requirement. To reduce the energy load, we have moved some of our customers into a more efficient zone that can provide an appropriate level of service. A profound example of this water load reduction can be found in our western corridor. Not too long ago we operated 12" waterline; it was installed in the 1960's to convey untreated water from Dry River to our Water Treatment Plant. When we constructed a new 30" untreated waterline in a nearby location and route, an opportunity arose to change the 12" untreated waterline to an outgoing treated waterline. This move allowed us to reduce the pumping load on an adjacent 10" treated waterline by approximately 200,000 gallons per day. The run times on the pumps have decreased so there is now substantially less electricity used and the lifespan of the pumps have increased.

The second strategy is system configuration. "Pump against no more resistance that is justifiably necessary". The City's newly constructed Tower Street Tank, located on Vine Street, is a great example of this strategy. Prior to this construction, the City relied on pumps to lift water upward 61 feet into the neighboring Washington Street Tank. The newly constructed tank was designed with efficiency in mind as it maintains a higher water starting elevation and thereby only requires pumping to 6 to 16 feet to reach the same destiny. This new system configuration will reduce the City's use of electricity and support our mission of developing a more ecologically friendly water system.

The third strategy is optimization of component efficiencies. "Shall we say put a round peg in a round hole, but in the concept of pump selection and application". In the case of the new water tank as discussed previously, we have also embarked upon changes to pump and motor units that were affected. The pump impellers were resized to provide a "best fit" condition. In addition, the 25 year old pump motors were replaced with premium efficiency units. With similar result as the previous strategies, this will also reduce the use of electricity for many years to come.

The fourth and final strategy is optimized use within the electrical rate structure. "Shall we say buy when low and refrain when high." Electrical companies provide incentives within their rate structure to encourage more use during the lower demand periods and less use during higher periods. This is a function of their generation and purchasing conditions; if the consumer can operate more in sync with the provider, then better costs and stewardships prevail. Harrisonburg Public Utilities seeks to

capture these opportunities through best management practices and by enhancing the maturity of its computerized “Supervisory Control and Data Acquisition System” (SCADA).

In summary, our Harrisonburg Public Utilities have looked for ways to improve our services through the use of our assets. Although we are long from finished, we have begun to realize benefits through the reduction of electrical consumption. We have shown that our electrical consumption has decreased by 936,771 kilowatt hours per year (or by 21%) during the last 5 years. This reduction is equivalent to an annual savings of approximately \$70,000/year or \$0.035 per 1000 gallons to our customers. The City plans additional efforts to continue this mission in the future.

Water System KW hrs used

