

Memo

To: Krishna Kumar, General Manager
From: Joe DeMorett, Water Supply Manager
Date: 9/3/2021

RE: Operational Resiliency Projects

In the past, we have experienced a limited supply of water in certain areas of our distribution system. These areas are typically located at the far ends of the system, and because of pressure differentials, it is difficult to get sufficient water to them. We have labeled these situations “pinch points.”

As we discussed recently, there are three different approaches we could take to enhance MWU’s current supply pinch points:

1. Install new wells on the far west and east sides of Madison. (Areas of higher topography)
2. Enact conservation practices to reduce demand.
3. Create transfer points between distribution zones.

The third option is relatively inexpensive and could be accomplished in a fairly short period of time. Creating or enhancing transfer points would allow us to utilize surplus water within our system, directing it to areas where it is needed. I have identified four different areas in our water supply system where the transfer of water between pressure zones would help alleviate supply deficits, greatly enhancing its overall operation. The following is a summary of projects we could undertake.

1. UW 12 booster upgrade and PRV Install (Region C <--> D)

The UW 12 well site has the ability to pump into Regions C and D. The booster pump here can be directed to pump into either Region C at 2100 gpm (3.0 mgpd) or into Region D at 900 gpm (1.2 mgpd). This pump was designed for the lower pressures of Region C and therefore unable to pump as much when directed into the higher pressures of Region D. It is the original pump and motor from when the site was constructed in 1959.

This booster and motor could be replaced with a larger one designed to increase the amount of water it could pump into Zone 8. We could potentially increase the daily yield here by 1.8 mgpd (from 1.2 to 3.0 mgd.) This would involve the purchase of a new pump, motor, and VFD. It would also require some modifications with the pad and piping. The equipment could be reused if the site was ever reconstructed. It is estimated that this would cost approximately \$150,000.

Installation of a SCADA controlled Pressure Reducing Valve (PRV) at this site would allow us to transfer water from Region D into Region C by gravity. The piping for this zonal transfer was recently installed but

falls short of the building. MWU crews could extend the piping to and into the building. Cost of the valve and crew to complete the pipework would likely be around \$100,000.

2. UW 9 PRV Install (Region A --> B)

The booster pump at UW 9 was recently connected to Pressure Zone 6E, allowing us to pump water from Region B into Region A. A SCADA controlled PRV could be installed at this site to allow water to be transferred from the other direction by gravity when needed. This project would involve some piping work, some pit modifications, valve installation, and SCADA hookups. Costs would likely be close to \$100,000.

3. East Washington Avenue and Yahara River Crossing PRV Install (Region A --> C)

There currently is a valve within a pit located along the boundary of Region A and C. This valve could be fitted with an electronic actuator and flowmeter enabling it to be controlled through SCADA. When opened, water would flow via gravity from Region A to C. Costs estimated to be \$75,000.

4. Whitney Way and Old Middleton Road PRV Install (Inner Region C transfer)

Installation of a SCADA controlled PRV near the intersection of Whitney Way and Old Middleton Road would allow the transfer of water from Pressure Zone 7 into 6E. These two pressure zones are located within Region C. This would help the far western part of Zone 6E which is fed primarily by UW 14. Costs estimated to be \$100,000.

Project 1 is probably the most beneficial enhancement at this time. If so desired, we could put a plan together for this work and come up with a more accurate estimate of costs and time to accomplish.