TORRINGTON WATER SYSTEM

The City of Torrington (pop. ~5,700) is located in east-central Wyoming along the North Platte River valley, about seven miles west of the Nebraska border. The city's water department has 8 certified operators maintaining the water systems and approximately 2700 customer taps.

The department is directed by Tom Troxel; along with Foreman Chris Powell, Senior Operator Jeff Craig, Operators Rusty Gurney, Dave Burt, Matt Heilbrun, Dale Radford and Eric Stiles. DEQ Certifications for all four areas (Level 4 Water, Level 2 Wastewater, Level 2 Distribution and Level 2 Collections) are held by most of the operators. Several of the operators are also ASSE Certified Backflow Device Testers & Surveyors.

Ground water treatment for high nitrate levels began in 2000 with the implementation of Reverse Osmosis (RO) treatment technology; starting with RO Units located at individual well sites, eventually moving the units to a new Central Treatment plant completed in 2007. Torrington's water production capabilities exceed 10mgd; however typical summertime uses average approximately 4.5mgd.

The State of Wyoming's newly constructed Medium Correctional Facility located NE of Torrington utilizes Reverse Osmosis treatment in the water plant located at the facility, which is also operated by Torrington water department personnel.

Operational design of the central water treatment plant included complete SCADA control and monitoring systems, performing functions from chemical dose pacing via process analyzers, valve modulation, to calculating well field pumping speeds for precise blending rates with RO product waters to meet target water quality parameters. The operators were heavily involved with the operational design of the SCADA control system in developing an industry first incorporation of a full Permeate Flush protocol for the RO's after production runs, which has expanded the life of the RO membranes from needing replacement every two years to five. Savings on membrane replacement costs have been monumental. Other cost saving design features in the water treatment plant included incorporation of variable frequency drives (VFD) on the RO Units, which previously had used throttled valves to control flow rates.

Prior to the construction of the central water plant and new well field, the water quality from existing wells required a 50% blend ratio (with RO permeate) to meet SDWA MCL limits; now the blend ratio is closer to 23% permeate which equates to production cost savings. Even greater savings were achieved with respect to lesser concentrate (RO waste stream) discharges at a lower blend ratio; annual concentrate discharges (to the sanitary sewer system) were once over 178 million gallons – while today those discharges are at about 50 million gallons annually.

Many obstacles jumped into the pathway of the water treatment plant & well field construction progress – from dozens of yards of sand & gravel somehow mysteriously finding their way into the new 24" transmission water main (and consequently into the new treatment plant at startup); to the discovery that all three of the new 100hp submersible pump motors were not compatible with the variable frequency drives and subsequently destroyed themselves shortly after startup. Since overcoming those major hurdles, the entire water system has been performing very well. Completion of those projects came in within 5% of the original budget due to careful design input from the operators which helped to eliminate all but a few change orders.

Each day over 500 points of data are checked and entered into the database both for production recording and for performance trending by the operators; who are continually looking for ways to improve performance and find problems before they become big ones. All systems monitored and controlled by the SCADA system are enabled to send alarm text messages and emails to the operators for immediate response. Even the un-interrupted power supply's serving the 15 separate telemetry radio sites alert the operators if they are experiencing power problems. Both water treatment plants can be remotely monitored and fully controlled via desktop PC's at the water department office.

The city contracts with GE Water to provide consumables and technical services for the RO systems; for several years the relationship with GE has grown into a great partnership geared to better performance along with operational cost savings. Reverse Osmosis training for the operators has been provided by GE and David H Paul training; however most of the operational knowledge gained by the operators has come from hands on, learn-as-you-go hard knocks training.

Over the years the Torrington water system has been a model for other municipalities and water systems investigating the membrane filtration treatment field; from those encounters Torrington has received several letters of recognition for the assistance and insight into their quest. Other awards received: Wyoming Water Quality & Pollution Control Association's (WWQ-PCA) 2003 Good housekeeping award, 2004 Best Tasting Water award and 2009 Dr. Robert Champlain award for outstanding water treatment plant operation. 2009 Wyoming Rural Water Best Tasting Water in the State award, and 2012 AWWA Rocky Mountain Sector Outstanding Water Treatment Plant award. The treatment plant is also host to annual visits by county 5th graders in their "Ecology Day" training.