

PA DEP Small Drinking Water Systems Engineering Services Program (ESP) Case Study

Client Name: Mapleton Municipal Authority
Location: Huntingdon County, Pennsylvania
Project Name: Waterline Replacement Project



Background:

The Mapleton Municipal Authority (MMA) Public Water System (PWS) serves approximately 473 people through 235 service connections to meet average demands of 88,000 gallons per day (gpd). Both groundwater and surface water sources are treated by a slow sand filter with disinfection and chemical treatment. MMA discovered a large leak (up to 29,000 gpd) after completing a PA Rural Water Association (PRWA) leak detection study.

Public Health Challenges:

The leak was potential pathway for contamination into drinking water and part of the service area lost fire protection. The primary section of piping where water loss was occurring was under the dual-track high-speed Norfolk and Southern Railroad leading to great public hazard potential if the leak undermined the track.

Capacity Issues:

Technical – Needed to repair leak on fast-track schedule. Due to the excessively high system water loss (unaccounted for water) the surface water reservoir would be depleted and the pumped groundwater source would be tapped to meet demand. The high loss also resulted in the filtration rates exceeding their PWS permitted rate.

Managerial – Management of water supply and demand was monitored more intensively, especially during dry periods. Filter operations and chemical application rates were monitored. Water conservation notices were posted when required.

Financial – Due to small customer base, the MMA could not afford to complete the project in a cost-efficient manner. Increased O&M costs were observed due to additional water treated.

Actions:

Based on the PRWA leak detection assessment of the railroad crossing water main, the ESP proceeded with design and construction activities to replace a four-inch (4") cast iron pipe with a steel-encased eight-inch (8") ductile iron pipe using a bore and jack installation. The ESP provided the engineering services and the Huntingdon County Planning and Development Department provided construction funds through the Community Development Block Grant Program.

Outcomes:

Construction of the new main has resulted in significant water conservation. Reduction in water loss also allows MMA to meet the permitted filter plant flows. Customers now receive high quality service in this section of the distribution system with improved pressure, fire protection, and flows. Damage to the railroad was prevented. The project benefited the natural resources by reducing the amount of groundwater and stream flow withdrawal.

The project saved 29,000 gpd and achieved a 40 percent reduction in the annual direct treatment operating costs at a savings of \$2,300.00.

