

# WATER SYSTEM MODEL AND GIS MAPPING BELLOWS FALLS , VERMONT



**Bellows Falls Water Model with Reduced Orthophotography Background**

As part of a comprehensive Water System Master Plan, Dufresne Group (DG) developed a computer water model of the Bellows Falls water system using the Town's GIS database, record information and system maps. DG calibrated the model using field data collected during fire flow and C-value testing and verified the model using pressure data recorded over a multi-day period at several locations across the water system.

Dufresne Group utilized the completed model to simulate numerous system conditions to identify deficiencies including inadequate pressures, high velocity and high headloss. Locations within the water distribution system that represent customers above the dependable hydraulic gradeline, with undesirable low pressure, were identified.

Using the model, DG evaluated alternative improvements to resolve the deficiencies. As part of this process, a new source control vault was sited to allow water to be drawn from the previously inactive Cedar Crest water storage tank, to result in frequent tank turnover and more favorable water quality. Model scenarios also included the simulated loss of a redundant river crossing near the extremity of the water system to assess impacts on available fire flow at the High School.

## KEY FEATURES

- WaterGEMS® with CAD and GIS interface, utilizing existing reduced orthophotogrammetry.
- Two foot interval contour data used to automatically assign elevations to pipe junctions.
- Model calibration to match actual field conditions during fire flow and C-value testing.
- The survey of tank overflow and floor elevations was used to correct SCADA programming and reporting functions.
- Water modeling results of system upgrades form the basis for a multiphase Capital Improvements Plan.