

## Using SCADA Data, Field Studies, and Real-Time Modeling to Calibrate Flint's Hydraulic Model

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EPA has been providing technical assistance to the City of Flint and the State of Michigan in response to the drinking water lead contamination incident. Responders quickly recognized the need for a water distribution system hydraulic model to provide insight on flow patterns and water quality as well as to evaluate changes being made to the system operation to enhance corrosion control and improve chlorine residuals. EPA partnered with the City of Flint and the Michigan Department of Environmental Quality to update and calibrate an existing hydraulic model. The City provided SCADA data, GIS data, customer billing data, valve status data, design diagrams, and information on operations. Team members visited all facilities and updated pump and valve types, sizes, settings, elevations, and pump discharge curves. Several technologies were used to support this work including the EPANET-RTX based Polaris real-time modeling software, WaterGEMS, ArcGIS, EPANET, and RTX:LINK. Field studies were conducted to collect pressure and flow data from more than 25 locations throughout the distribution system. An assessment of the model performance compared model predictions for flow, pressure, and tank levels to SCADA and field data, resulting in error measurements for each data stream over the time period analyzed. Now, the calibrated model can be used with a known confidence in its performance to evaluate hydraulic and water quality problems, and the model can be easily updated as the Flint water system's source, treatment, and operations continue to change over the next few years.

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