



PNWS-AWWA
Water 2024
Spokane, WA • May 1-3

Evaluating Water Quality and Enhancing Operations Management: Leveraging an EPS Calibrated Model

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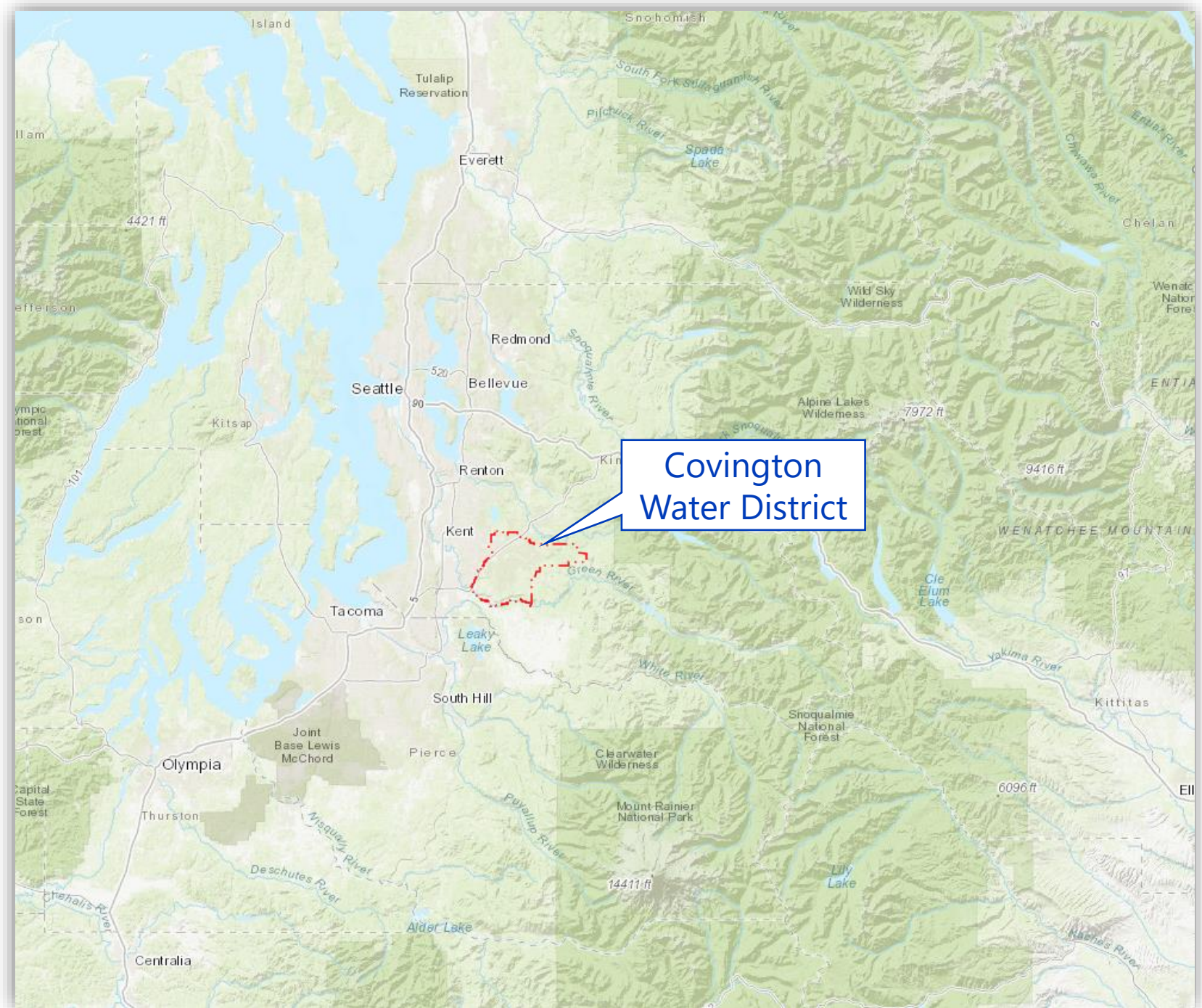
Friday May 3 – Distribution



— Agenda

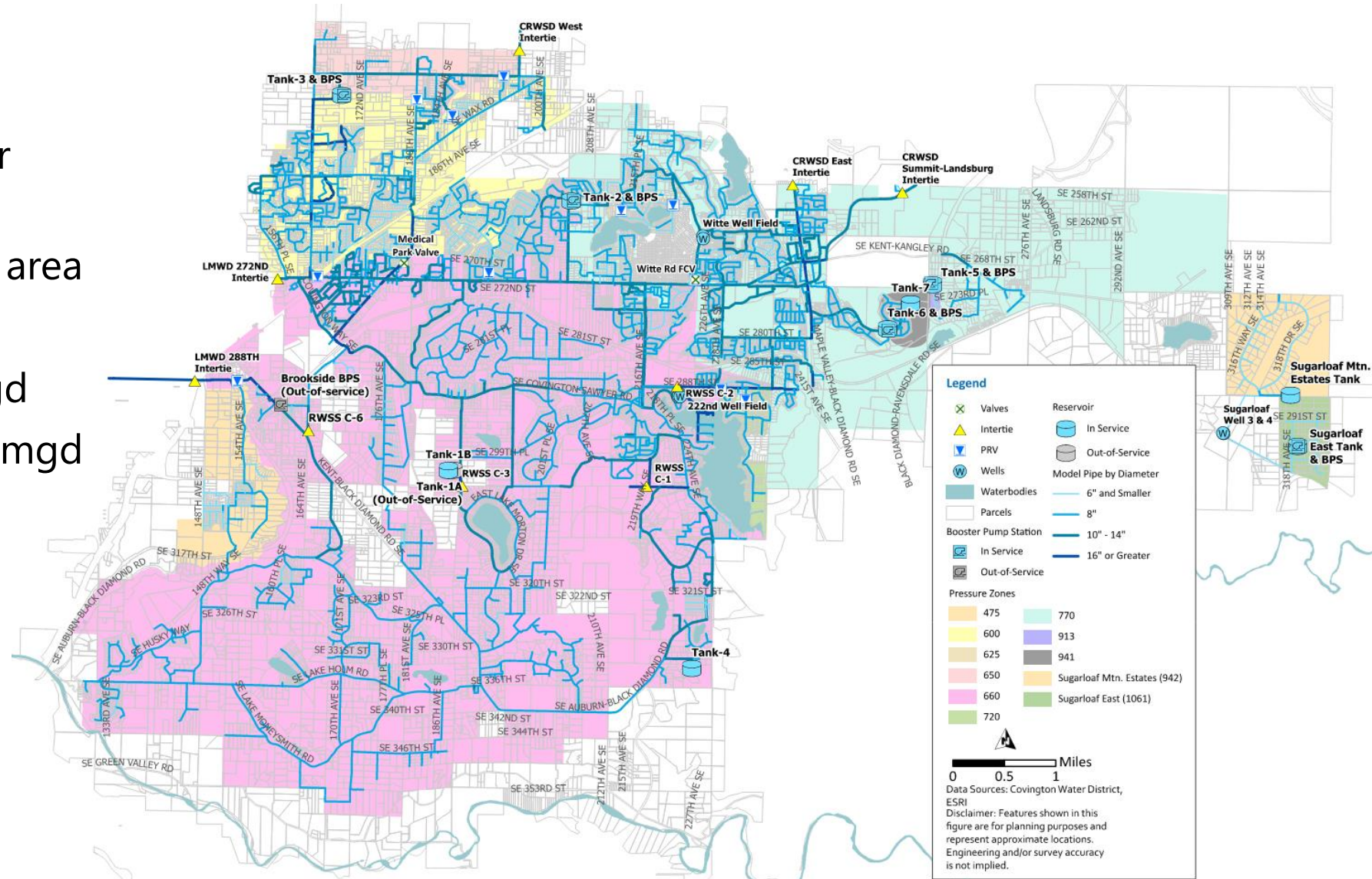
- Covington Water District overview
- Hydraulic model calibration
- Model analyses examples
- How CWD uses the model

Where is CWD?



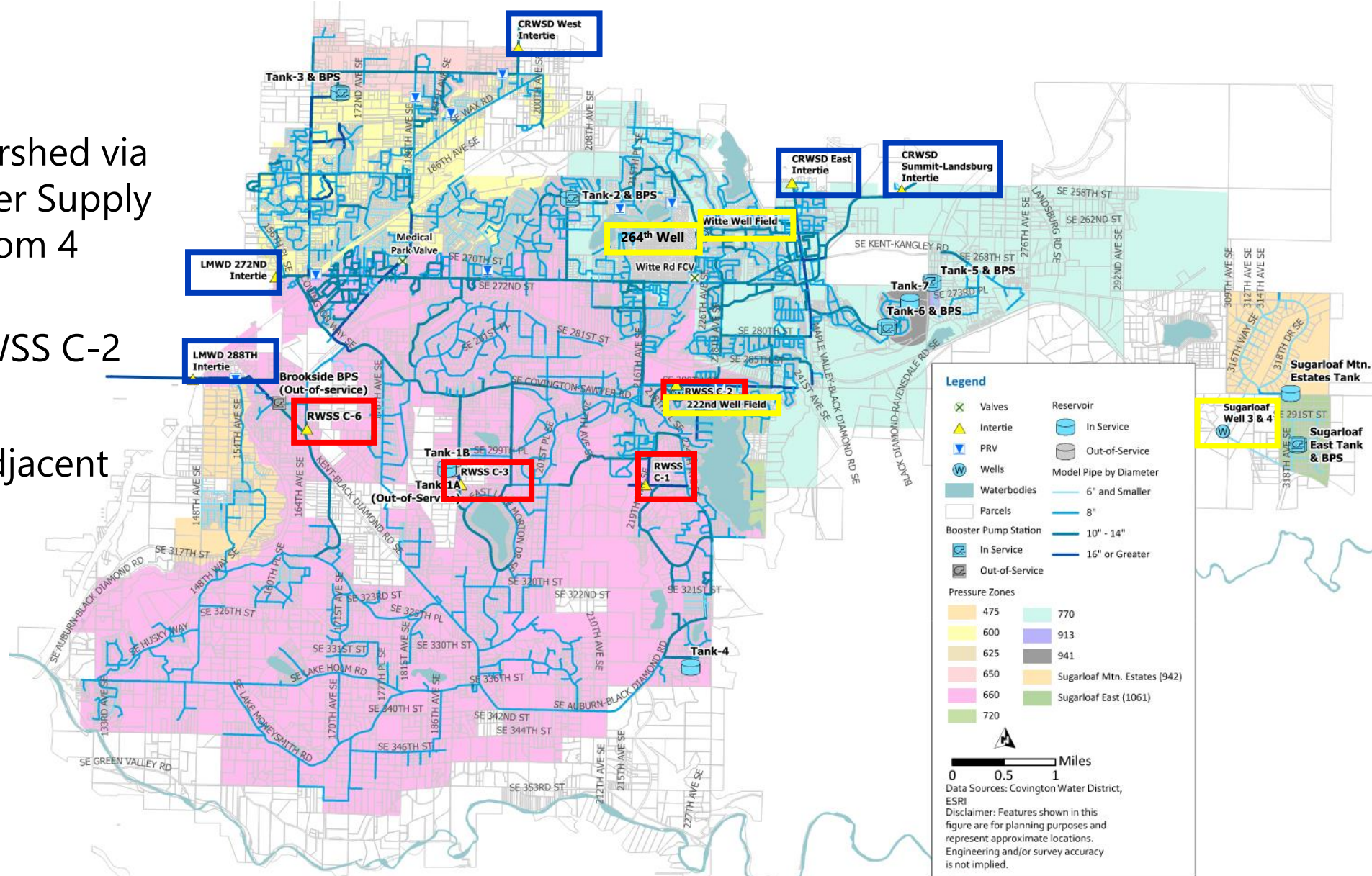
Customer overview

- 19,000 water service connections serve over 50,000 people
- 55 square mile service area
- Typical demands:
 - Average day: 5 mgd
 - Maximum day: 12 mgd



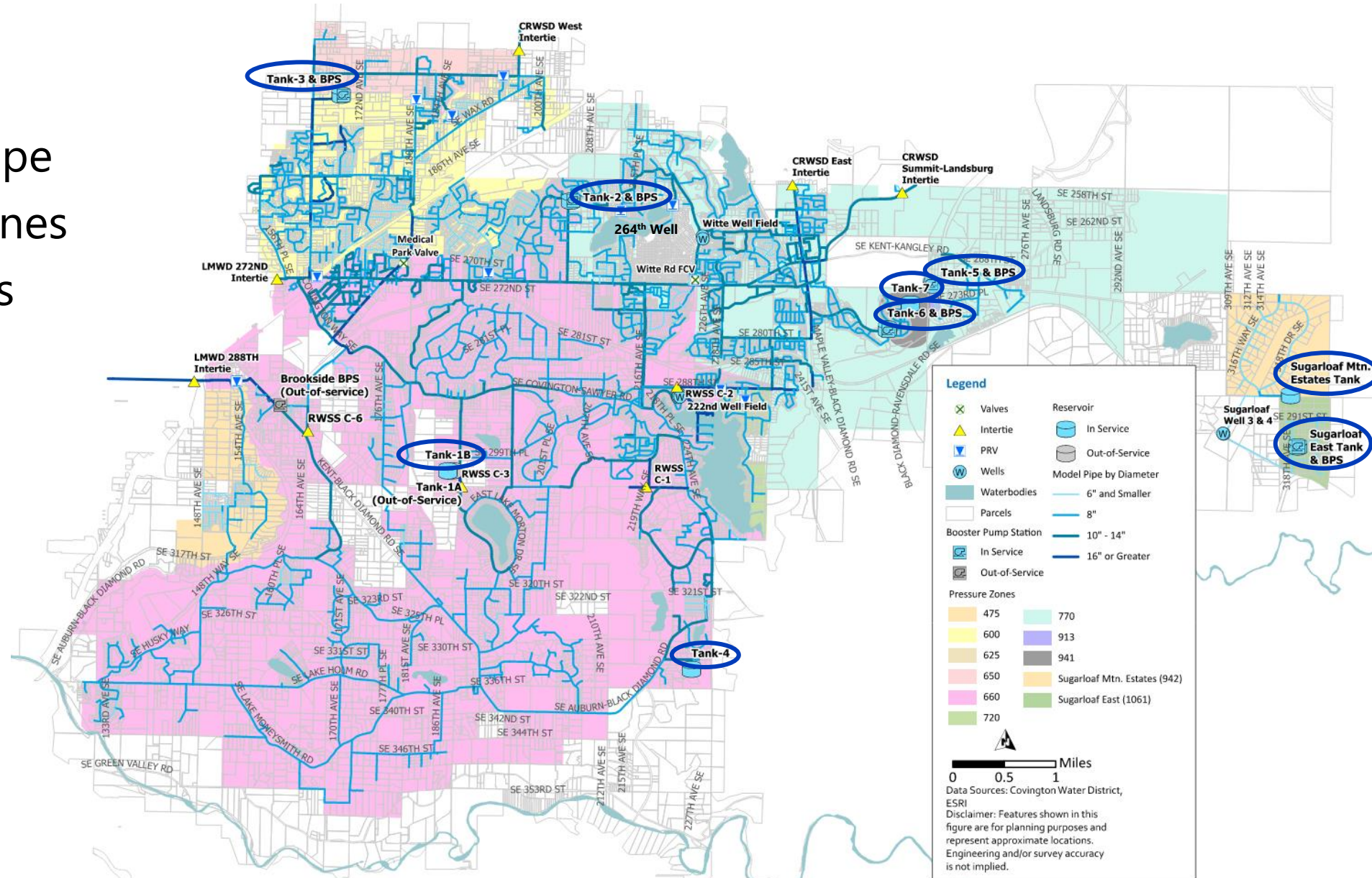
Supply sources

- Green River Watershed via the Regional Water Supply System (RWSS) from 4 individual taps
 - Turbine at RWSS C-2
- 4 wells/wellfields
- Interties with 2 adjacent utilities



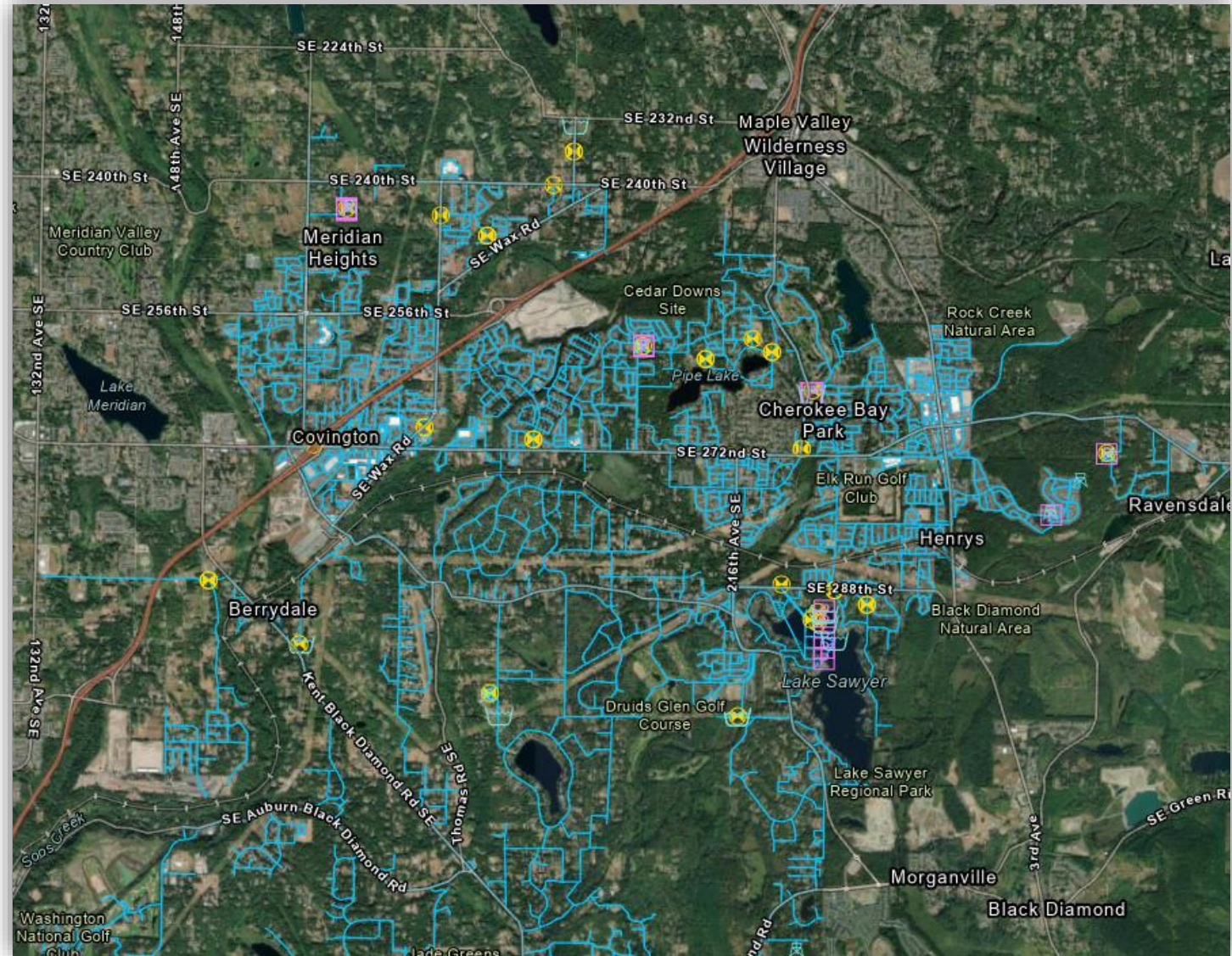
Infrastructure

- 290 miles of pipe
- 11 pressure zones
- 8 storage tanks

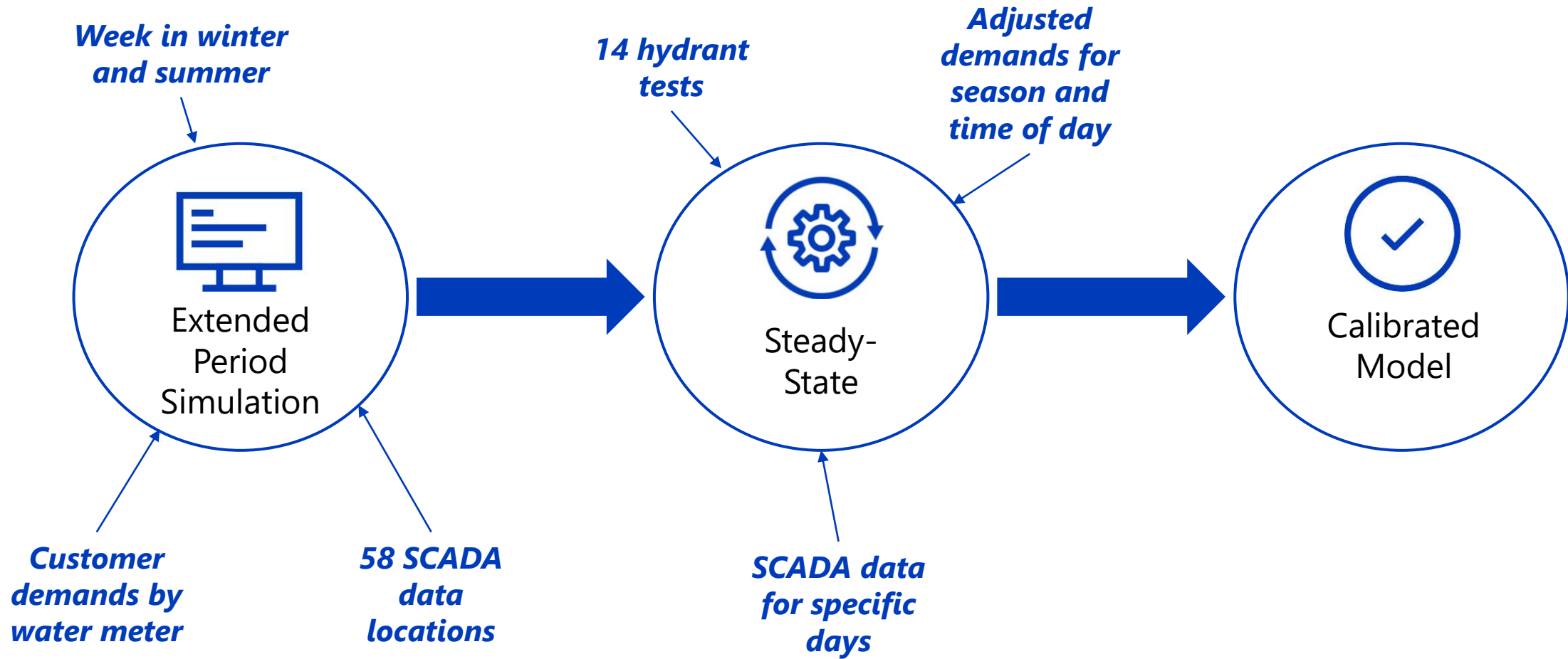


Hydraulic model overview

- InfoWater Pro model
 - Version: 2024.0 March 2023
- All-pipe model:
 - 3,800 pipe segments
- Runs in extended period simulation (EPS) and steady-state
- CWD maintains model in house

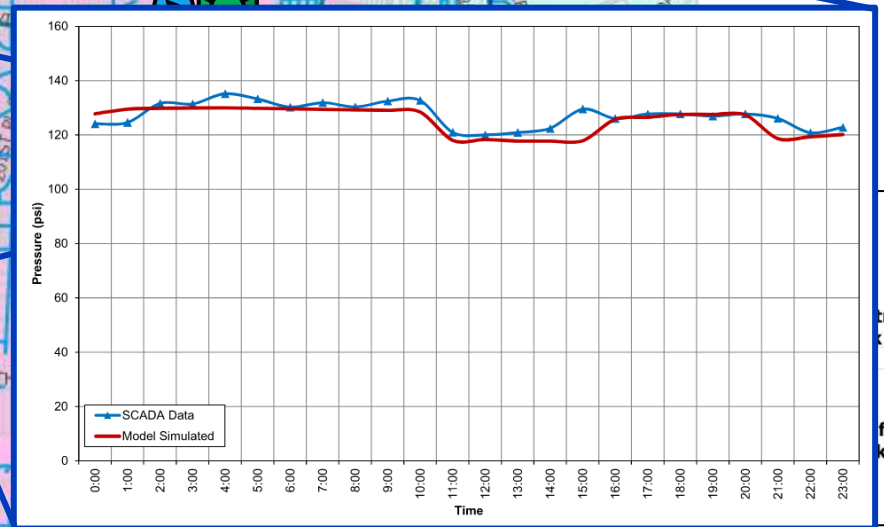
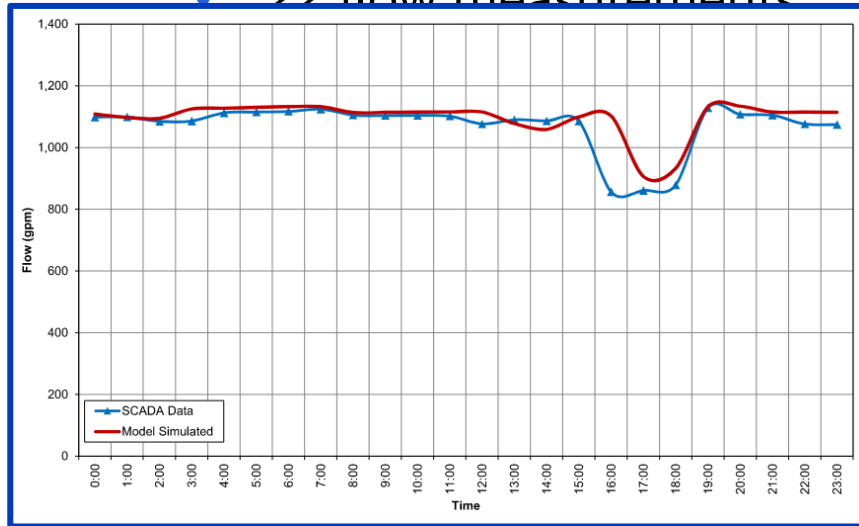
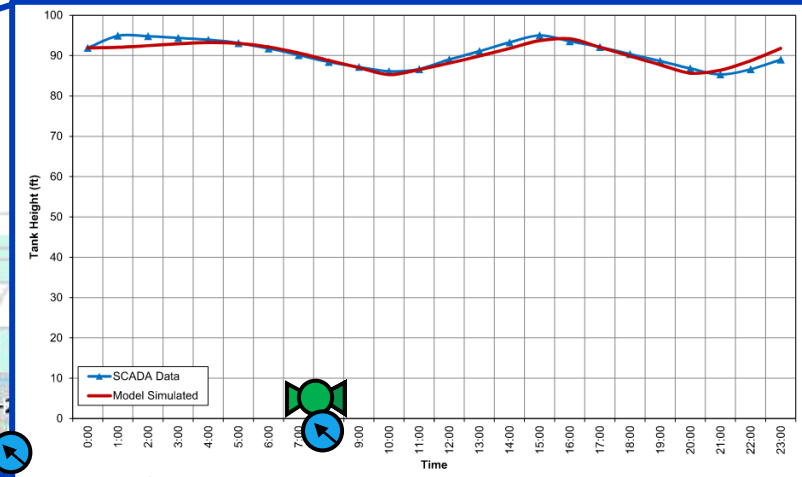
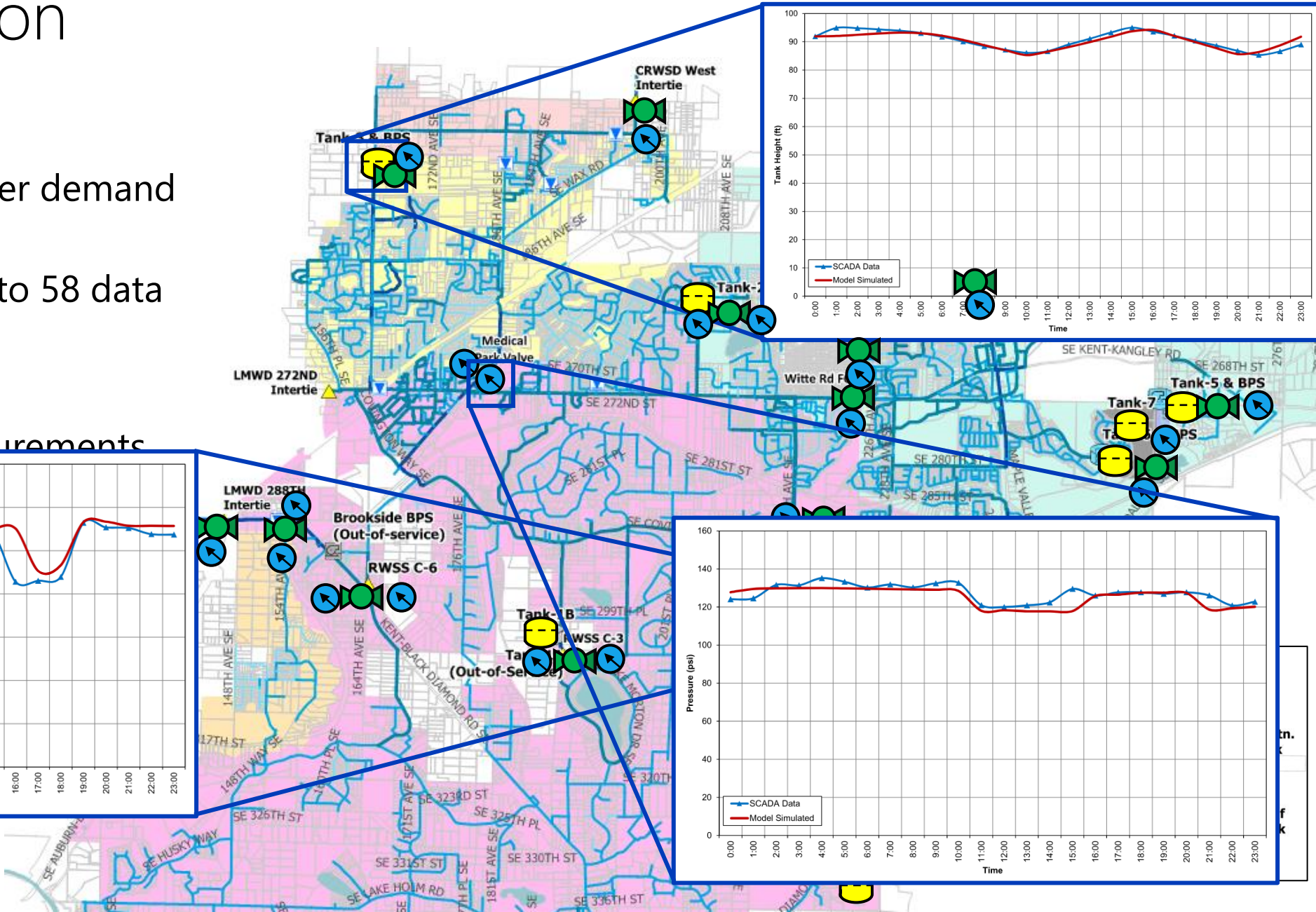


Model calibration process



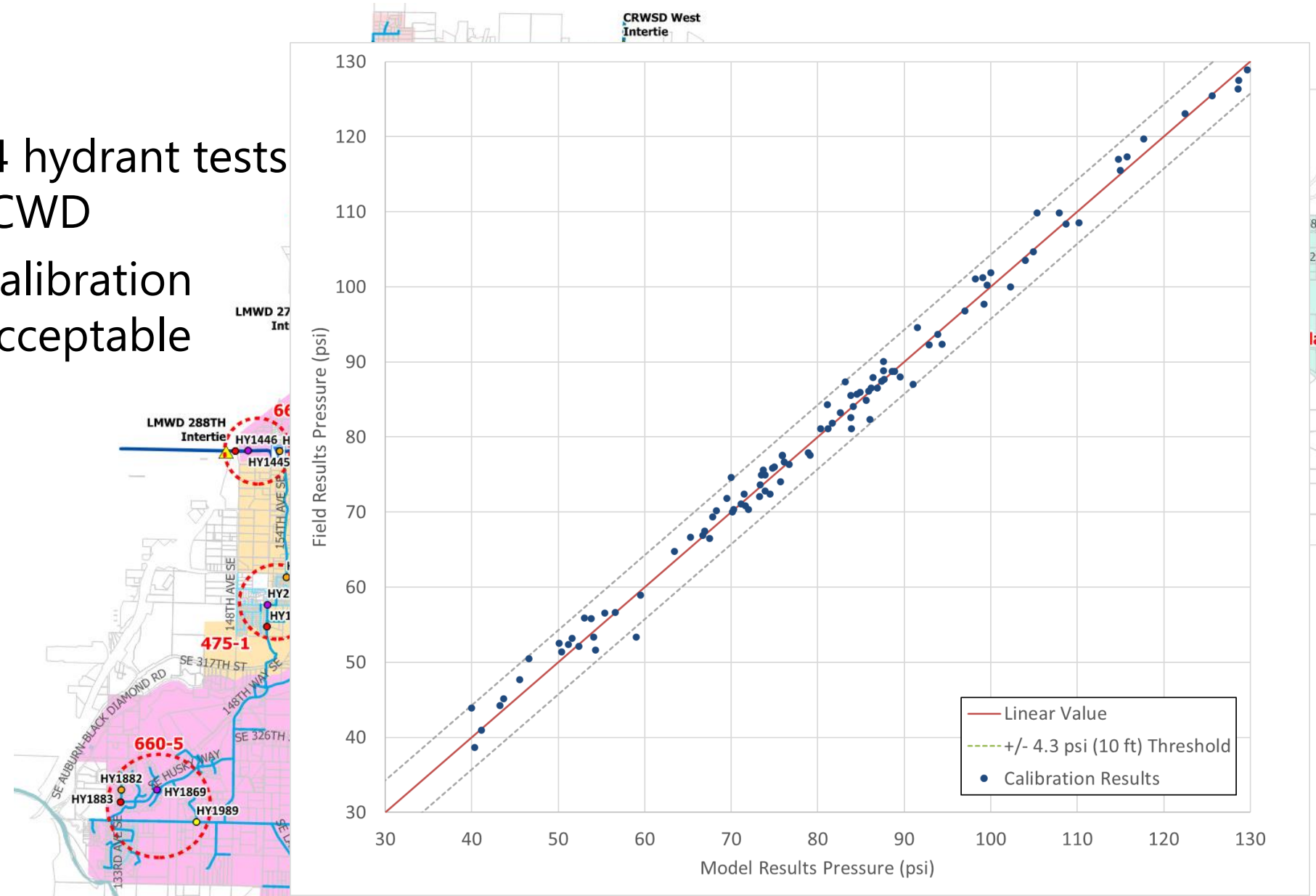
EPS Calibration

- Summer and winter demand scenarios
- Model calibrated to 58 data points
 - 9 tank levels
 - 22 flow measurements



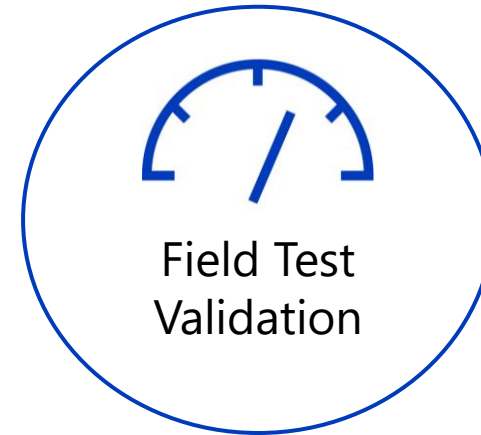
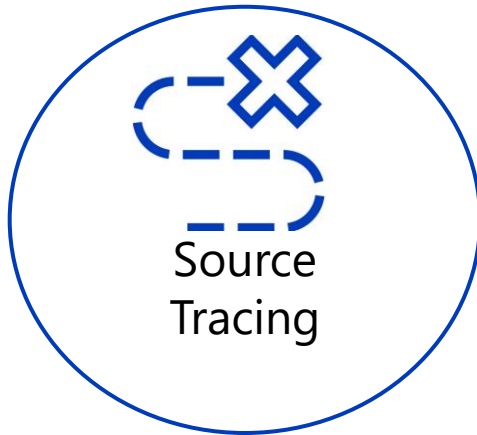
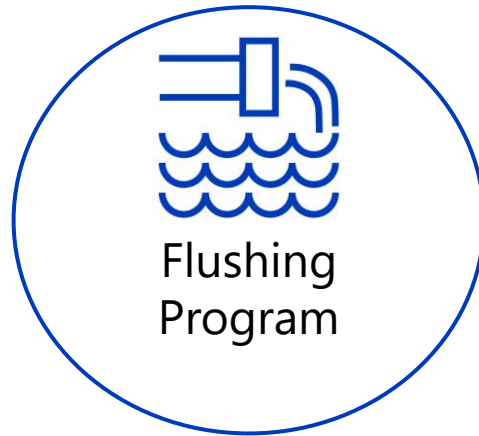
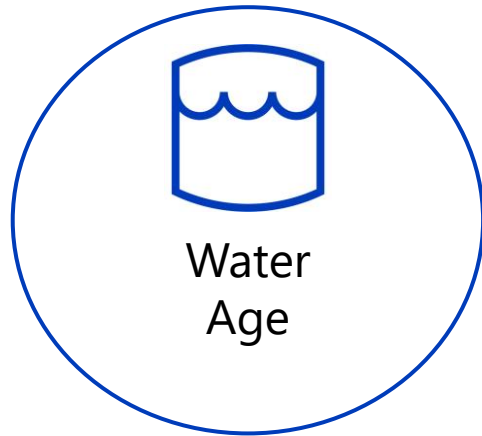
Steady state calibration

- Results from 14 hydrant tests performed by CWD
- 97 percent of calibration points within acceptable range



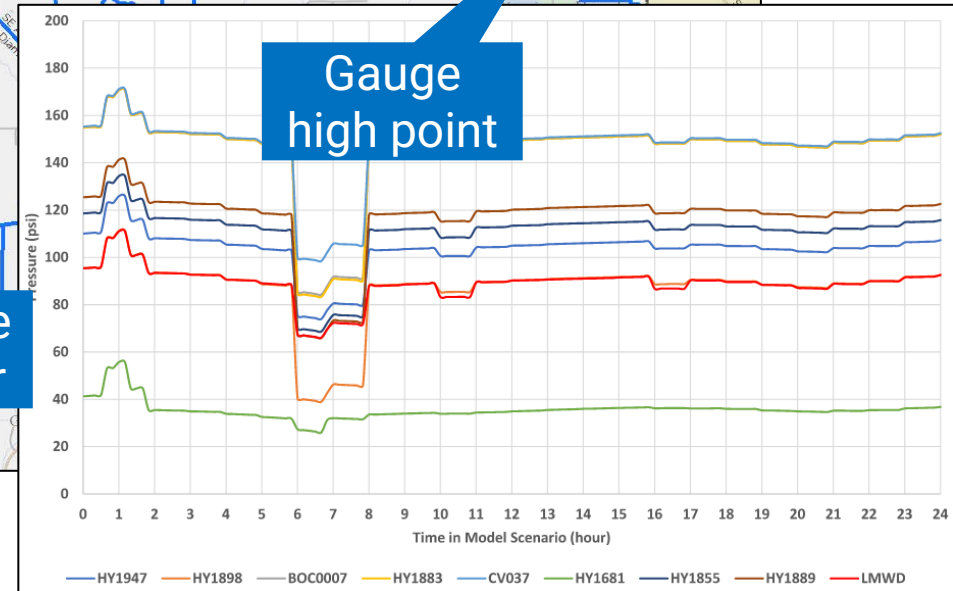
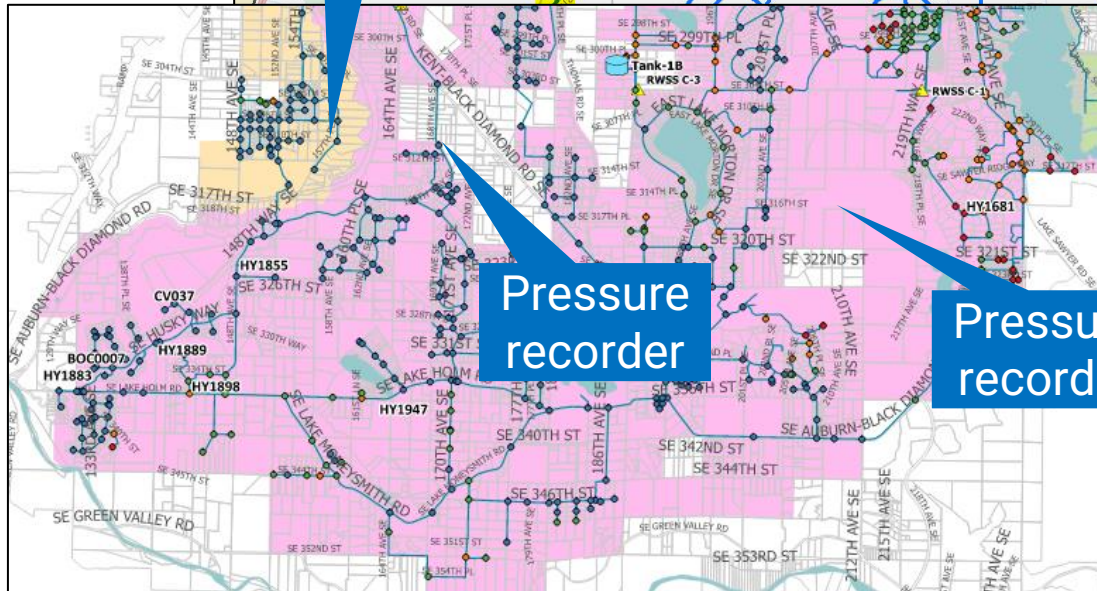
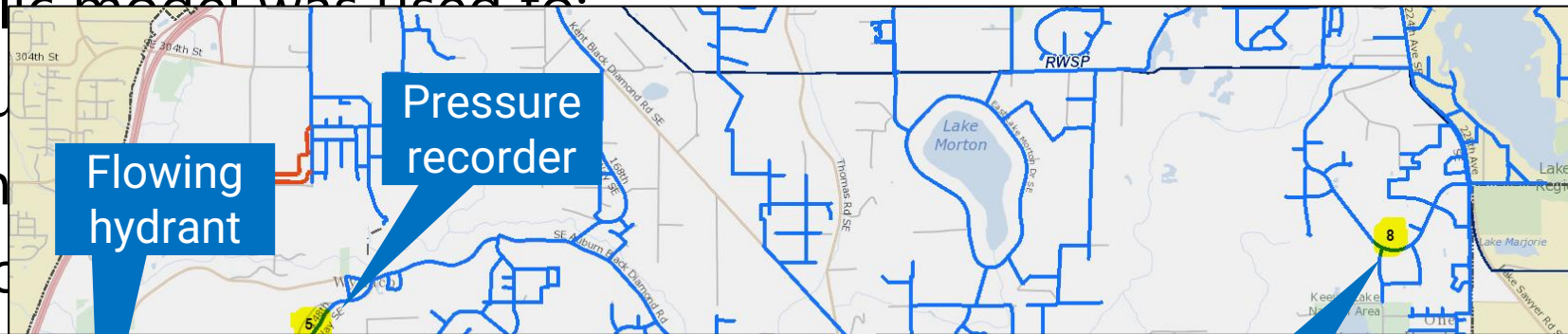
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Wide range of analyses can be performed with a calibrated model



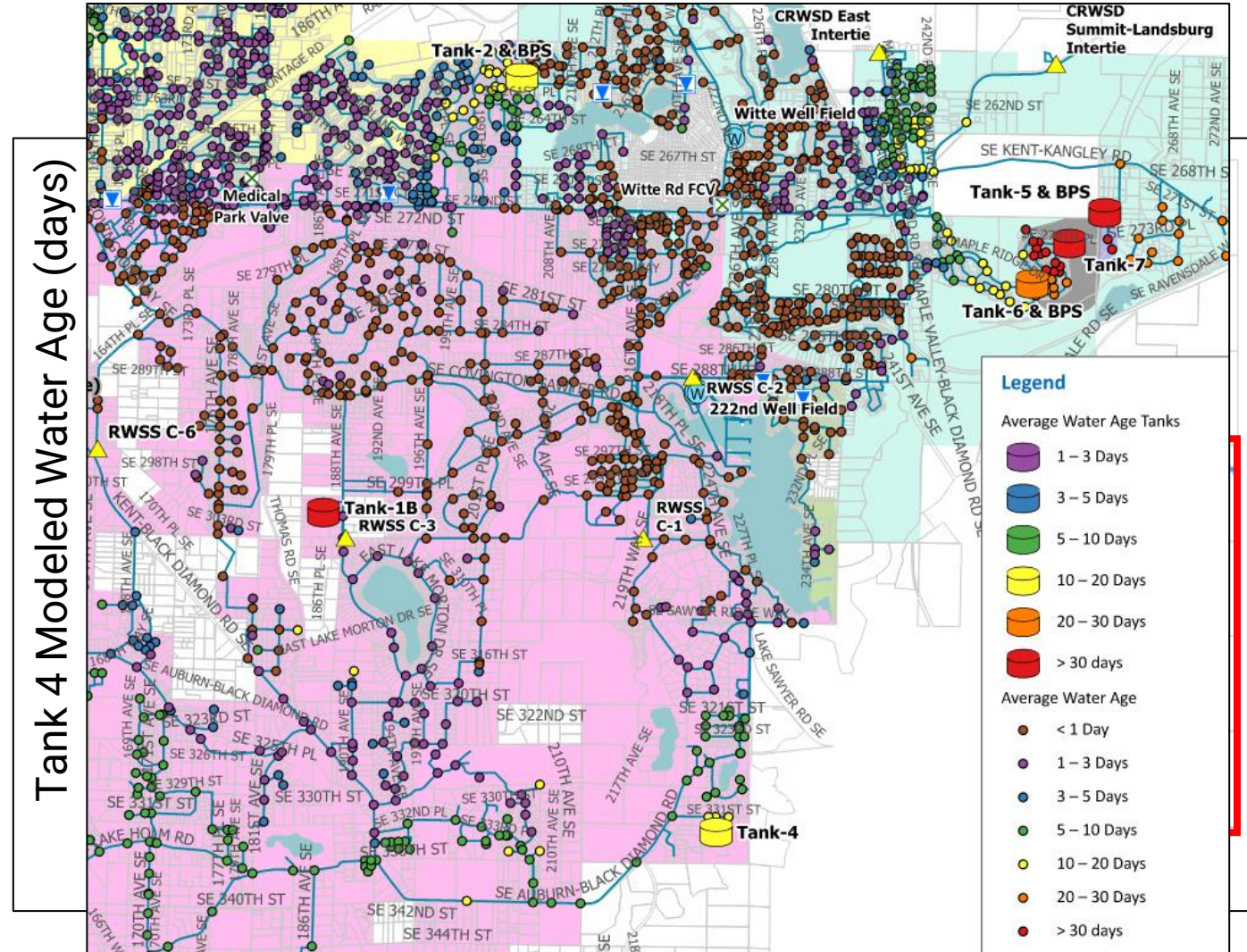
Field testing preparations for stress test

- CWD developed plan for hydrant testing
- Hydraulic model was used to:
 - Adjust
 - Identify
 - Record



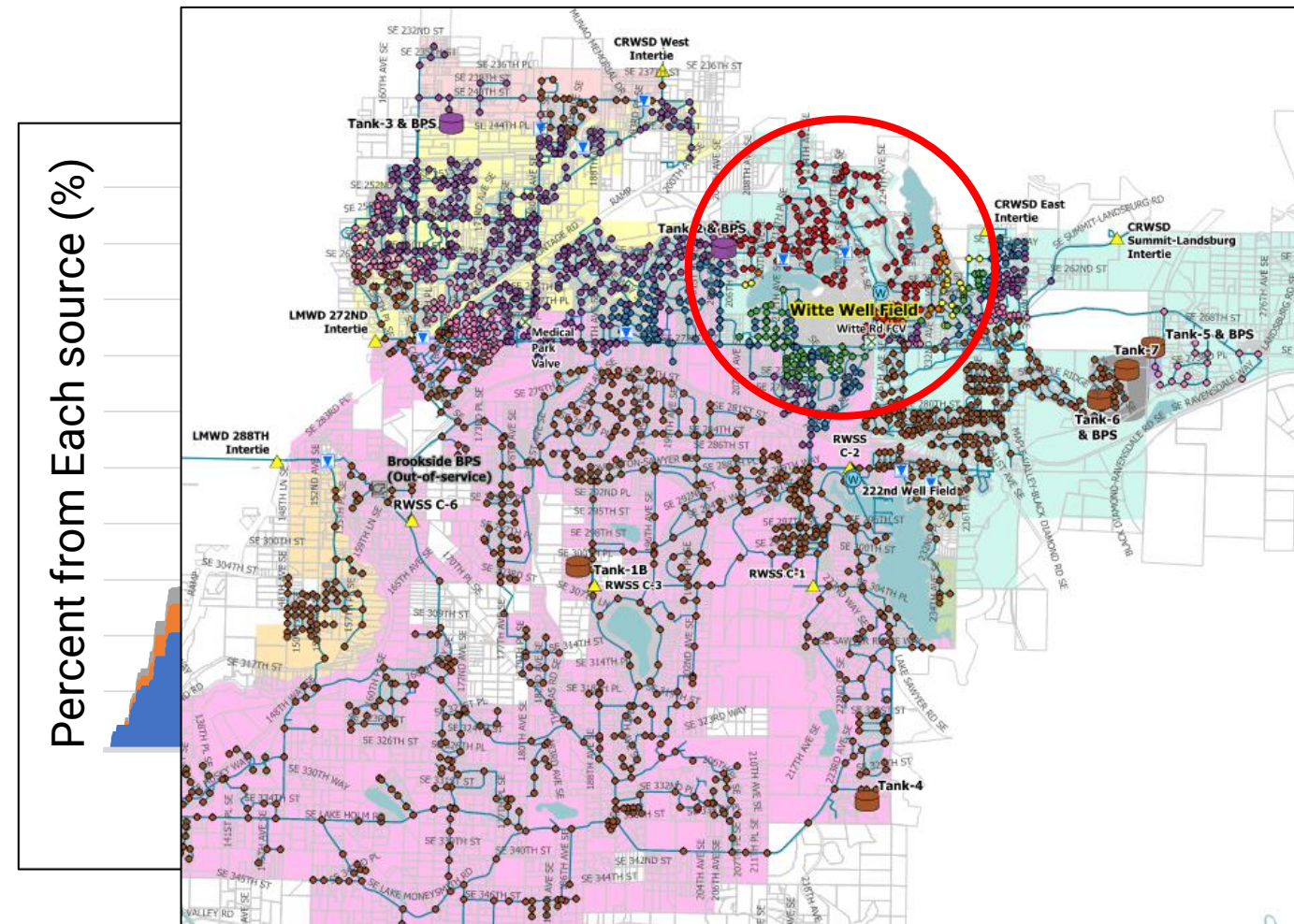
Water age modeling

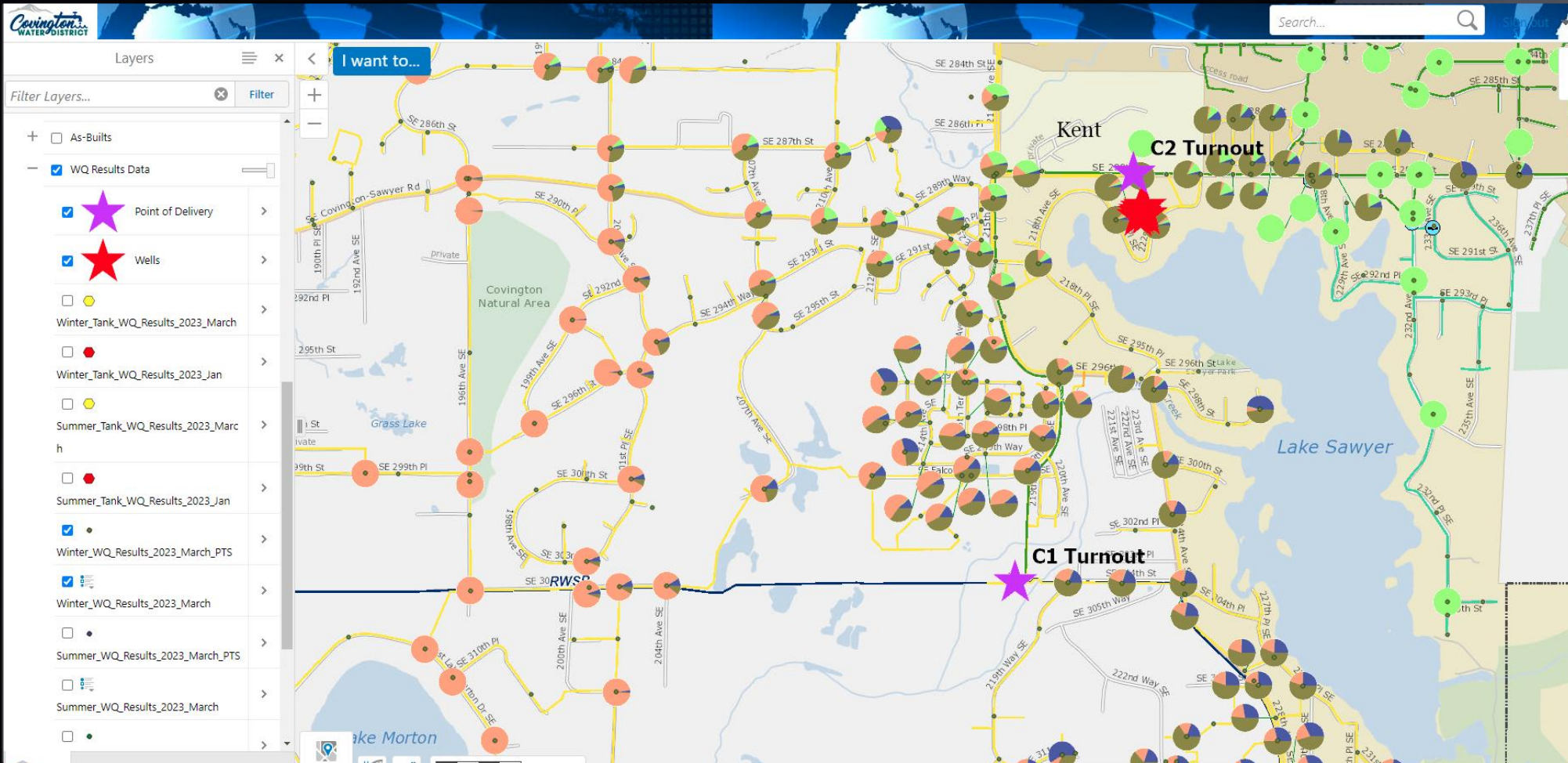
- Multi-day, extended period water age simulation
- Summer and winter scenarios
- Ran model until equilibrium point reached
- Results from last seven days of model run show modeled water age:
 - ✓ At each demand junction
 - ✓ In each tank

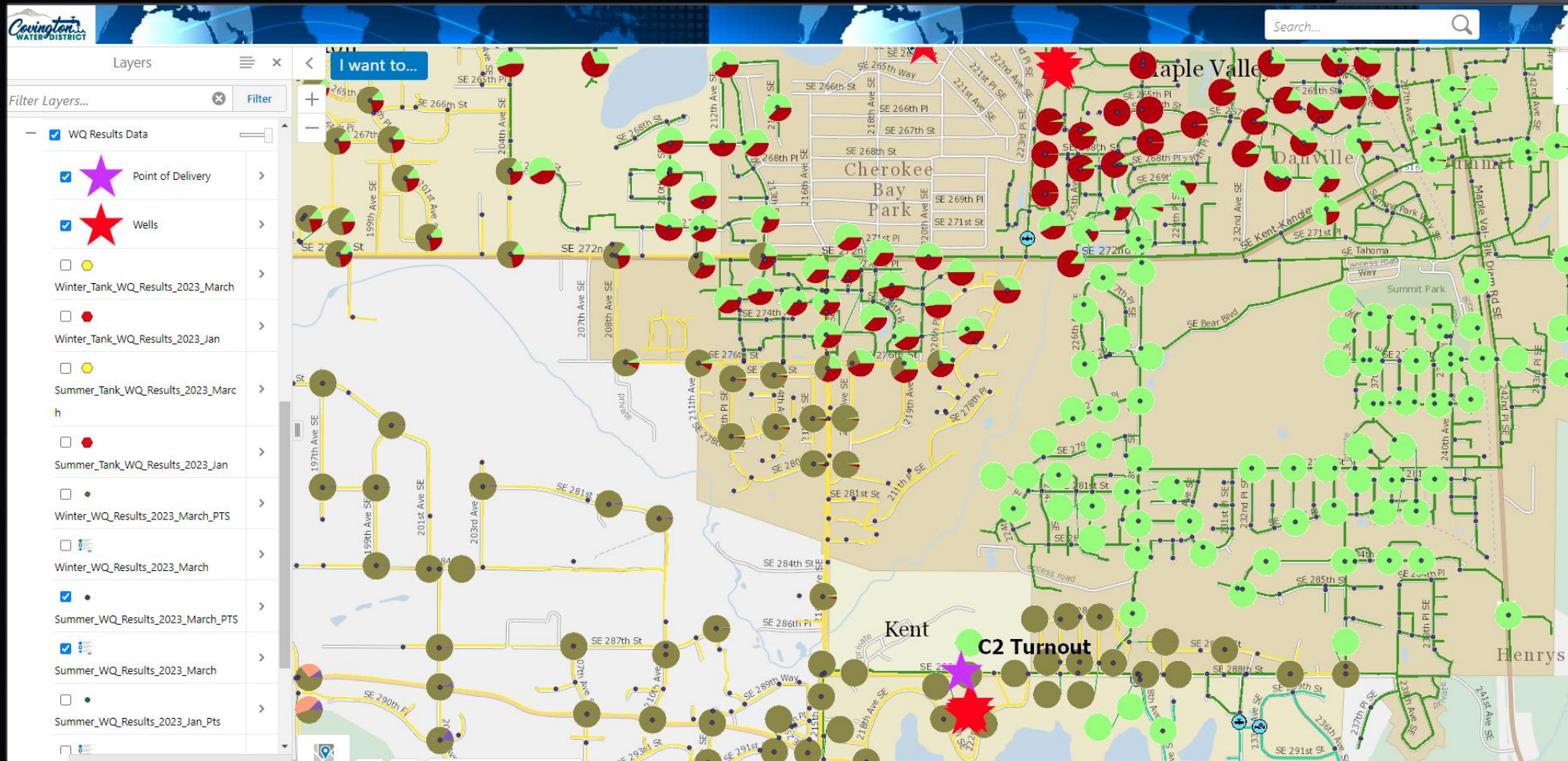


Source trace modeling

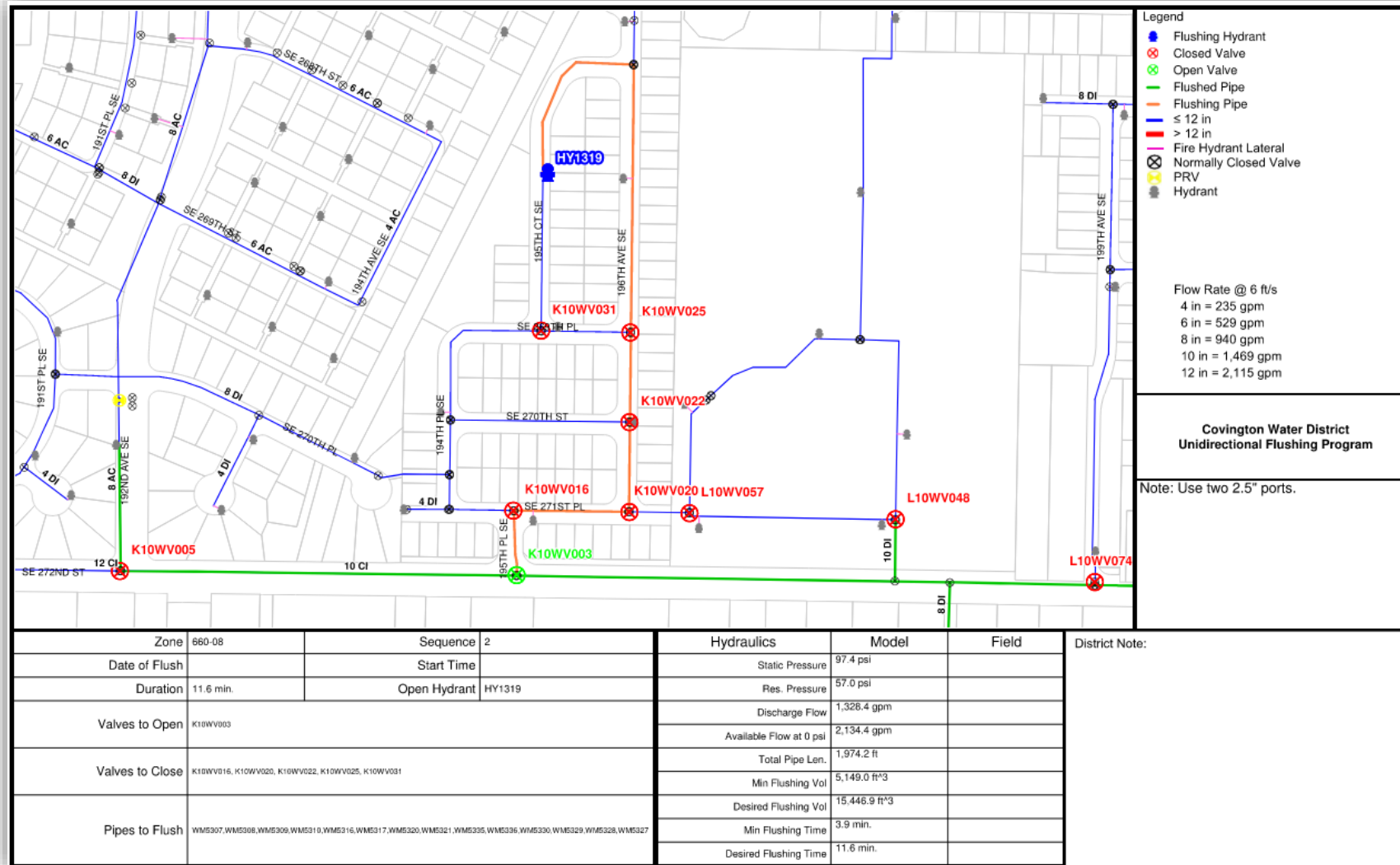
- Results represent the source percent contributing:
 - ✓ At each demand junction
 - ✓ In each tank
- Understand zone of influence for each supply based on demands and operations
- Results can guide CWD in a contamination event or other water quality concern by targeting specific areas for communication





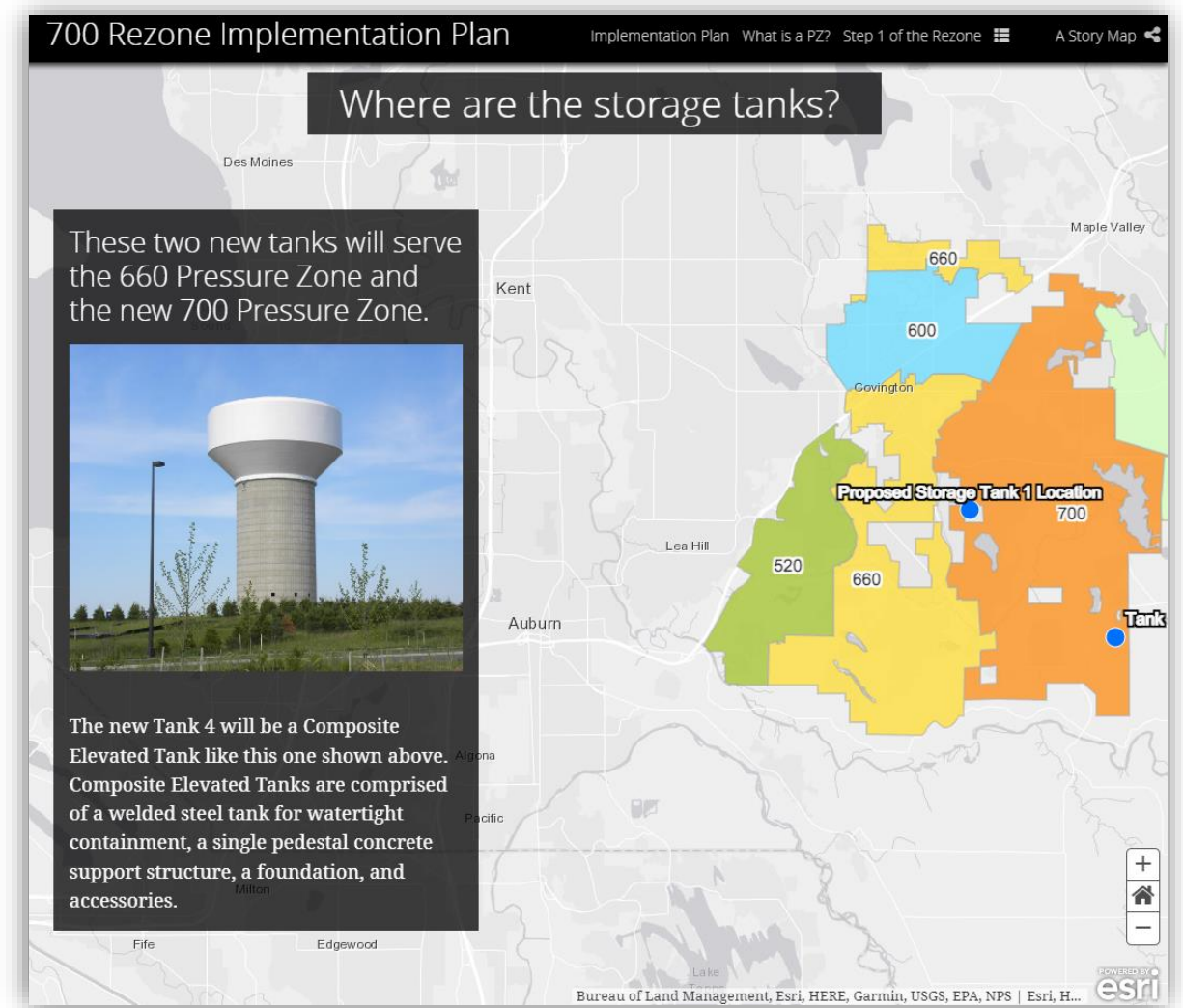


CWD Pilot UDF using model: 660 Zone



What now?

- Annual model input to active assets
- 2024 water system plan modeling with future demand projections
- Major capital improvement program projects including future 700 zone separation



Questions?



Thank you!!





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