San Jose Water Company

AWWA Distribution System Optimization

Progress Update

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06/04/2014

Background

AWWA Partnership for Safe Water-Distribution System Optimization Program

- Came out of 2007 WRF project
- Provides framework for improvement
- Includes utility benchmarks
- Commitment to quality and organizational improvement

Background

- Four Phase Process
  - Phase I: Commitment

    Utilities commit to engage staff, collect and assess data, and pursue improvement
  - Phase II: Data Collection

    Annual Data submission focusing on disinfectant residuals, pressure data, and main break statistics
  - Phase III: Self-Assessment

    Narrative report analyzing data, and identifying "performance limiting factors"
  - Phase IV: Optimized Performance

    Achieve highest level of optimization

Background

- Prioritize Actions for Optimization
  - Ranked based on "Impact" and "Urgency"
  - Team effort to Improve going forward
  - First Optimization Team Meeting was March, 2014

Optimization Status Summary Table

*prioritization definitions on next sheet

Self-assessment Category	Questions for Gauging Optimization	Response: Not Optimized	Response: Partially Optimized	Response: Optimized and Documented	Performance Limiting Factors Prioritization Screen: Impact Rating*	Performance Limiting Factors Prioritization Screen: Urgency Rank*	Performance Limiting Factors Prioritization Screen: Priority Total	System Performance Results
2.1 Disinfectant Residual	Do the disinfectant residual data meet the performance goals?	X			5	4	9	SJWC does not meet residual performance goals.
	-Disinfectant residual in 95% of monthly routine measurements.							95% of all residual measurements are > 0.21 mg/L total chlorine.
	-Free Chlorine ≥ 0.20 mg/L and ≤ 4.0 mg/L;							The current data set for free chlorine only includes tank and reservoir measurements. 31% of these free chlorine measurements within the target range for free chlorine, but 51% of measurements within tanks and reservoirs were within the target range for EITHER free chlorine or total chlorine.
	-Total Chlorine ≥ 0.50 mg/L and ≤ 4.0 mg/L							81% of measurements taken at distribution system sample taps are within the total chlorine target range. Because SJWC does not have free historical free chlorine data for distribution system sample tap measurements, SJWC cannot definitively say how many samples are within the target range, because it is not clear whether samples have a free or total chlorine residual. However, 13% of all sample tap samples were between 0.2 and 0.5 mg/L, meaning that between 81% and 94% of these measurements were within the target residual range depending on whether the measured residual was free chlorine or chloramines.
	-Chlorine Dioxide ≥ 0.20 mg/L and ≤ 0.80 mg/L							N/A
	The Annual Data Collection spreadsheet is used for this evaluation.							This data spreadsheet was used for the Data Evaluation, but much of the information provided was analyzed independent of the spreadshee due to the blending of residuals in SJWC's system.

Background

- SJWC Completed Distribution Assessment (Phase III) as of December, 2013
  - Reviewed 85 Assessment Categories
  - Recognized performance limiting factors (if any) for each category
  - One of four Director's Award Recipients
  - Currently no Phase IV recipients

Top Priorities

- Review Top Three Priority "Performance Limiting Factors"
  1. Disinfectant Residual
  2. Pressure Monitoring
  3. Nitrification

- For each factor:
  1. Partnership Benchmarks/Recommendations
  2. SJWC Current Status
  3. Potential Steps for Optimization and Improvement

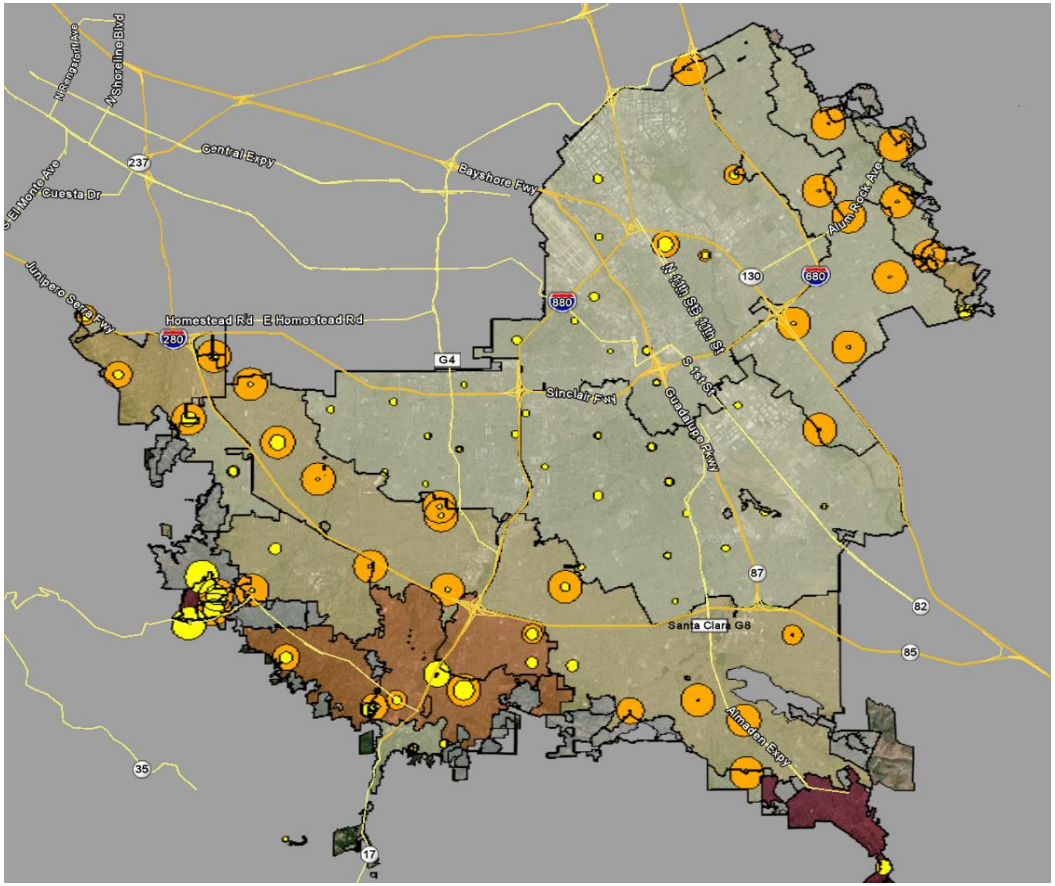
Priority 1: Disinfectant Residual

Partnership Recommendations/Targets

- 95% of monthly routine residual measurements above target levels
- Free Chlorine Residuals ≥ 0.20 mg/L
- Total Chlorine Residuals ≥ 0.50 mg/L

Priority 1: Disinfectant Residual

Analyze which zones meet residual targets with what frequency. Target 95% of samples or better



Steps to improve residuals:

- SCADA WQ function
- Targeted DS dosing systems (piloting)
- Minimize blending

Priority 2: Pressure Monitoring

Assessment Targets

- 20 psi minimum in 99.5% daily minimum measurements
- 125 psi maximum in 95% of measurements
- Daily pressure fluctuations do not exceed 125 psi in 95% of measurements
- Pressure collected at a minimum of two critical sites in each pressure zone

Priority 2: Pressure Monitoring

Optimization Steps

- Online pressure analyzers at critical points
- Pressure data analytics and alarms

  Use to:
  - Change Zone boundaries
  - Change reservoir set points
  - Install regulators
  - Install SCADA controlled Operational Valves
  - Manage for leak reduction and energy savings

Priority 3: Nitrification

Assessment Recommendations

- Monitoring of free ammonia, nitrite, HPC, ATP
- Established Action Levels
- Total Chlorine residual maintained > 0.5 mg/L
- Storage tank turnover monitoring

Priority 3: Nitrification

- Tentative Action Level for Nitrite (0.2 mg/L-N)
- Identifying residuals loss locations
- Identifying Critical Threshold residuals
- Modeling water age

Tank Shark

Phase IV

- No current Guidance manual for phase IV
- SJWC potential pilot group for guidance development

Questions?

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