

Attachment to
Response to Grand Jury Report Form
City of Santa Rosa
September 10, 2019

FINDINGS:

Findings F1, F2, F4, F9 and F10 apply to Sonoma County Water Agency (Sonoma Water). The City of Santa Rosa concurs with Sonoma Water's response to these findings.

The City of Santa Rosa agrees with findings F3, F4, F6 – F8 and F11.

FINDING F5

Consistent with FEMA recommendations, residents need to maintain their own emergency source of water to meet their personal needs for more than three days frequently stated by officials.

The City of Santa Rosa partially disagrees with this finding. Currently FEMA emergency preparedness websites such as www.ready.gov and federal publications on disaster readiness still recommend a minimum of three days of water be included in personal disaster kits. The City of Santa Rosa agrees that more public outreach and education regarding emergency preparedness is needed.

RECOMMENDATION R5 (page 14)

Water contractors study options for making local systems more adaptable under emergency conditions – such as dedicated supply loops, digitally monitored metering, or automatic shut-down valves, by December 31, 2019 (F8).

Response: Recommendation R5 has not yet been implemented, but will be implemented in the future. Key regional elements will be implemented by Spring 2020. Local efforts to study options for additional system resiliency are anticipated to be complete by December 31, 2019.

Local System Integration with Regional Wholesaler

The City of Santa Rosa fully supports the Grand Jury's recommendation to study options for making our local public water supply system more adaptable for emergency conditions. Although the water systems of Sonoma Water and its retail customers are already inter-connected, integration improvements are possible, especially in times of water shortage. By leveraging the collective water resources and infrastructure of Sonoma Water and its nine retail customers, there could be opportunities to improve water supply reliability and resiliency through better integrated water resources planning and management.

To this end, the City of Santa Rosa and the eight other retail water contractors are funding a Regional Water Supply Reliability Study ("Regional Reliability Study") coordinated by Sonoma Water. The Regional Reliability Study was initiated in February of this year when Sonoma Water engaged the services of Jacobs Engineering Group to evaluate strategies and water supply projects to improve integrated water resources management and make the service area more resilient to potential short term (e.g., earthquakes) and long-term (e.g. sustained drought) water shortages.

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The Regional Reliability Study will identify opportunities to enhance coordination and partnerships between the City of Santa Rosa, Sonoma Water and the eight other water contractors for improved regional integrated water supply emergency planning. It is anticipated that this work will be completed by Spring 2020.

Local System Resiliency

In addition to purchasing wholesale water from Sonoma Water, the City of Santa Rosa has local water supplies that are used to meet the demands of our customers and operates a water system that is substantially looped and incorporates a high level of resiliency and redundancy.

There has been a concentrated effort through asset management, capital improvement projects, operations activities, and coordination with private development to create a water distribution system that is adaptable under emergency conditions and will continue to provide water to Santa Rosa after an emergency event.

Loop-fed Water Distribution System

- A substantial portion of the City's distribution system is already loop-fed, which allows for water to flow from more than one direction providing operational redundancy. There are some portions of the system with dead-end mains, mostly located in cul-de-sacs or in proximity of a planned development. The City loops water mains where feasible.
- Santa Rosa has completed all of the suggested fire flow mitigation recommendations of previous Water Master Plans. Our most recent (2014) Master Plan included only one location that would be a candidate for installing pipe that could create an additional loop feed.

Pump Station Redundancy

- Santa Rosa has created a redundant distribution system by using our water pump stations and reservoirs to move water throughout the distribution system.
- The highest concentration of water pump stations is in the Fountaingrove area. In this area, our water distribution system is capable of feeding ten reservoirs from the three separate locations (the east, west, and south sides of the hill). Santa Rosa can lose a feed from the Sonoma Water Aqueduct at any one of these three locations and still supply water to the entire Fountaingrove area.
- The southern feed/connection to the Fountaingrove area can also be fed by our Farmers Lane production wells. This connection allows us to send water to ten reservoirs in the area, even if the water supply from Sonoma Water is interrupted.
- All of Santa Rosa's pump stations are equipped with stationary generator back up power.
- All pump stations can be operated by portable pumps that are predesigned to connect to our standardized, pre-plumbed connection system.
- Most water pump stations have the ability to operate in "pressure mode" which allows the station to maintain pressure without the use of the reservoir designated for that zone.

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- As water pump stations are improved through our Capital Improvement Program, variable frequency drives and high-flow pumps are incorporated into the system where feasible.

Reservoir Resiliency

- All of Santa Rosa's reservoirs have been seismically evaluated and prioritized for seismic upgrades. These evaluations have resulted in a programmatic approach, which started in 2001, to upgrade the City's reservoirs to meet current seismic standards.
- The necessary upgrades have been completed on 17 of the City's 23 reservoirs. The remaining reservoirs to be upgraded are incorporated into our 5-year Capital Improvement Program.

Miscellaneous Areas of Redundancy

- Santa Rosa's distribution system includes pressure reducing valves that connect all pressure zones to neighboring zones. These valves allow a zone to be fed by a neighboring zone should a pump station fail, or if the main feed to that zone experiences some type of interruption.
- Many of our pressure zones have isolation valves incorporated into the system that allow connection from one zone to the next. These valves are located at a point of matching pressure for both zones and can be manually opened when needed. Opening these valves will fill the connected zone at the same pressure it would be fed from its designated pump station, using the pressure created by the neighboring pump station/reservoir.
- Santa Rosa has 83 pumper connections throughout its 39 pressure zones that allow operators to quickly supply water from neighboring zones with portable pumps. These pumper connections include the three connections at Summerfield Road and Sonoma Avenue that allow water to be supplied from both sides of the City by using a portable pump. The connections at this location also allow water to be moved throughout the City from the available storage in Sonoma Water's Lake Raphine tanks.
- Santa Rosa has created the "City of Santa Rosa Water Field Operations Guide" to allow operators to quickly determine the best location in the distribution system to feed a neighboring zone. This guide includes color coded maps that show operators how to feed the system at multiple locations for each pressure zone. This allows operators to feed the entire neighboring zone, or an isolated portion.

Opportunities for Additional Resiliency

In January of 2018, following the October 2017 Tubbs Fire, the City of Santa Rosa contracted with an engineering consulting firm, Black & Veatch Corporation ("B&V"), to perform a focused evaluation of the City's water system. The initial, focused evaluation was undertaken to better understand how the City's water system, specifically within the Fountaingrove Area, responded during the Tubbs Fire. This evaluation is titled: "Evaluation of the Water System's Response in Fountaingrove to the October 2017 Fire," referred to as the "2018 B&V Report." The 2018 B&V Report concluded that "Evaluations showed that the distribution system serving the Fountaingrove area could provide sufficient and reliable fire protection under typical conditions. However, the timing, intensity, rapid

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spread, and destruction of the Tubbs Fire created atypical conditions and overwhelmed the system. Fires or emergencies of this magnitude are typically beyond the emergency planning criteria used by U.S. water agencies.” Based on interviews and evaluation of the City’s system, the following recommendations for improvements were included in the 2018 B&V Report:

- Investigate ways to increase pumping reliability in upper pressure zones in the case of an outage or major line break
- Examine installing additional interconnections and pressure regulating valves to improve pressure between zones and system reliability
- Study technology, equipment, and software that can be incorporated with Advanced Metering Infrastructure (AMI), such as high flow detectors, and automatic shut-off valves, that offer the ability to prevent openly flowing appurtenances, with a focus on large customers or lines for fire suppression systems.
- Study the feasibility, cost, and impact of providing off-line storage to mitigate the damage of widespread fire events such as the Tubbs fire.
- Review and conduct additional system modeling to analyze the feasibility of replacing small diameter dead-end pipes with larger diameter pipes, or provide looping in such areas, to bolster fire flow availability in those areas.
- Study the potential for SCADA system reliability and redundancy improvements in the case of an emergency event.
- Perform an evaluation similar to this study for the Coffey Park area of the system which is not exclusively controlled by City pumping and storage facilities.
- Migrate from natural gas to diesel generators to increase generator reliability during fire or other emergency events such as an earthquake.
- Update relevant sections of the City’s Water Master Plan by incorporating the lessons learned from this study of the Tubbs fire, and implement all recommendations.
- Include resiliency planning tasks in future master planning efforts and associated projects.
- Differentiate fire flow goals based on land-use, zoning, structure-type, and Fire Codes and develop system improvements based on results of evaluations using these goals.
- Formalize and document the communication structure between the Water Department and Fire Department during red flag conditions to adequately prepare for large spread fire events.
- Investigate, in coordination with the Fire Department, developing defined procedures that identify:
 - Available flows and pressures in various areas of the city.
 - Emergency operating plans for critical facilities.
 - Communication protocols.
 - A mobilization plan during fire events to turn off openly flowing appurtenances to minimize water loss and stabilize the water system.

In October of 2018, the City issued a Request for Proposals (“RFP”) for a Water System Resiliency Study that would evaluate the feasibility of the recommendations from the 2018 B&V Report. B&V

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was selected as the most qualified consultant for the project and in March of 2019, the City entered into an agreement with B&V for the 2019 Water System Resiliency Study referred to as the “2019 B&V Study”.

The purpose of the 2019 B&V Study is to expand on the 2018 B&V Report and take a more in-depth look at the performance, reliability, resiliency, and redundancy of the City’s entire water supply infrastructure and communication systems as outlined in the Recommendations Section of the 2018 B&V Report. B&V will utilize the findings and recommendations of both studies to update the City’s Water Master Plan and the City will implement improvements as ultimately recommended and incorporated into the City’s Water Master Plan. The Study is anticipated to be completed by December of 2019.

Advanced Metering Infrastructure (“AMI”) Implementation

The City of Santa Rosa is currently in the process of implementing AMI citywide. The AMI system provides recordation of near real-time water use, two-way communication with water meters, and alerts the City of on-going leaks and spikes in water use due to unusually large volumes of water passing through the meter in a short period of time. Meter data management software, which supplies the alerts to staff has been fully installed and operational for two years. This software is used to analyze the data to determine if meters are performing properly and if there are water use issues on-site. This functionality allowed Santa Rosa to be notified of openly-flowing service lines during the Tubbs fire.

The AMI network consists of five collector units, cellular communication on each collector, water meters with reading devices and data collection software. The collectors communicate through cellular modems and have back up batteries that will provide power for up to two days. The system allows for redundancy on the majority of the meters in the system, therefore, if a collector is non-operational, another collector will provide the data, alerts, and communication with the meters.

Santa Rosa has approximately 53,000 water meters and will be installing AMI functionality on all of them. As of August 2019, a total of 43,902 have been upgraded to AMI. The project is anticipated to be complete in mid-2021.