



2018 WATER SUPPLY STRATEGIES ACTION PLAN



**Sonoma
Water**





2018 WATER SUPPLY STRATEGIES ACTION PLAN EXECUTIVE SUMMARY

The Water Supply Strategies Action Plan (WSSAP) is a regional planning document intended to increase water supply system reliability, resiliency and efficiency in the face of limited resources, regulatory constraints and climate change uncertainties within Sonoma County Water Agency (Sonoma Water) service area.

In September 2010, following extensive community outreach and involvement, the Sonoma Water Board of Directors approved nine Water Supply Strategies. These strategies were developed with significant input from the Water Contractors¹ and Marin Municipal Water District.

Under Board direction, the 2010 Water Supply Strategies Action Plan described how each strategy was being carried out through specific actions and projects planned to achieve each action. For each project the parties involved were identified, and the current status and budget information were provided. The Board recognized that the plan was a living document and requested regular updates. The first update was provided in 2011 with an additional update in 2013.

Over the last 5 years, many project activities identified in the 2013 WSSAP have progressed or been completed. The 2018 WSSAP provides a progress report on project activities and identify those that have been completed and reprioritized. The 2018 WSSAP has been reorganized, as necessary, to be consistent with Sonoma Water's internal strategic plan such that the strategies and goals have been modified from earlier versions of the WSSAP.

As in prior plans, the 2018 WSSAP recognizes the importance of specific stakeholder and general community involvement in successfully carrying out the strategies. Stakeholders who are working with Sonoma Water on implementation of a particular action item are specifically mentioned as Involved Parties. Where community involvement is occurring or anticipated during all or part of the process, "community groups" are indicated as Involved Parties. In addition, many Action Plan activities will be reviewed or approved at Water Advisory Committee, Flood Control Zone, Sonoma Water's Board of

¹ Water Contractors include the Cities of Cotati, Petaluma, Rohnert Park, Santa Rosa, and Sonoma; North Marin and Valley of the Moon Water Districts; and the Town of Windsor.

Directors and other public meetings. Members of the general public will have the opportunity to review and comment on the activities at all such forums. Major accomplishments and changes from the 2013 WSSAP are summarized below and in the attached Appendix 1.

Actions Successfully Completed

Several actions described in the 2013 WSSAP have been completed. Details on each of these completed actions can be found in Appendix 1.

- Dry Creek Habitat Enhancement Demonstration Project Miles 1
- 2015 Urban Water Management Plan
- Fish Ladder/ Viewing Gallery
- Tributary Restoration
- Development of Hydrologic Index
- Groundwater Banking Feasibility Study
- Community Choice Aggregation
- Hazard Mitigation Projects:
 - Rodgers Creek Fault Crossing Mitigation
 - Isolation valves
 - River Diversion Structure liquefaction mitigation
- Preventative maintenance projects:
 - In-line meter replacements

Significant Progress

Significant progress was made on several 2013 WSSAP items that will continue to be listed in the 2018 WSSAP, including:

- Formation of Groundwater Sustainability Agencies- Building on the non- regulatory foundation of the Sonoma Valley Groundwater Management Plan, participation and support of the three Groundwater Sustainability Agencies continue as the Groundwater Sustainability Plans are being developed and additional basins are being considered.
- Forecast Informed Reservoir Operations- New science based finding continue to support opportunities to improve reservoir management.
- Storm Water Resource Plans- Successful regional planning has resulted in two SWRP's which increase the regions ability to leverage grant funding and prioritize multi beneficial projects.
- Water Use Efficiency - Following a multi-year drought where water demands were significantly reduced, the region has committed to extend the Sonoma Marin Saving Water Partnership MOU for an additional 10 years.
- Dry Creek Habitat Enhancement – Successful implementation of habitat improvements continue to progress as required by the Biological Opinion.
- Fish Habitat Flows and Water Rights EIR- The Draft EIR was released in 2016, comments are being reviewed and updating project documentation, as appropriate.

Reprioritization

Several items listed in the 2013 WSSAP have been reprioritized, based on changed conditions, funding opportunities or loss, or other circumstances. Projects falling into this category include:

- Dry Creek Habitat Enhancement Miles 4, 5 and 6 was moved to an immediate activity with pre construction engineering and design beginning in 2019.
- Ralphine tanks flow through conversion is substantially designed has been moved to an

immediate activity.

New Actions

Several items were added to the 2018 WSSAP to reflect new Sonoma Water initiatives, areas of focus or funding opportunities, including:

- Advanced Quantitative Precipitation Information- Prop 84 funding for radar units has resulted in a system that can provide critical information on location, timing and intensity of rainfall throughout the Bay Area.
- Upper River Coordination- Increased coordination with Lake Mendocino water users including Potter Valley Project relicensing activities.
- SGMA Implementation- Participation and support of the three GSA's continue as the GSP are being developed and additional basins are being considered.
- Fire Response Actions- Numerous new initiatives have been launched since October 2017 including: evaluation of potential impacts from post-wildfire burn areas, flood warning network to detect flooding conditions, implement FireSmart Lake Sonoma to increase community engagement and watershed resiliency, and facilitating the installation of high-definition cameras to provide early fire detection and situational awareness throughout the region.
- Climate Adaptation Planning- The CAP will identify strategies to address climate risks and vulnerabilities to ensure an increased understanding of water supply reliability impacts.

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This plan used identifies 3 levels of activity:

Immediate Activity: Ongoing or to be initiated within the next year because:

1. Required by regulatory or other deadlines;
2. Other strategies or actions are dependent on outcome;
3. Achievable in the near-term;
4. Funding and resources are available.

Near Term Activity: To be initiated within one to three years because:

1. Anticipated, yet not immediate, deadline;
2. Funding is proposed;
3. Necessary for planning and development of long-term actions.

Long-term Activity: No defined start date for action, likely longer than three years, because:

1. Not enough information to proceed at this time;
2. Lower priority;
3. Funding is not available.

Acronyms Used in Plan

AMP	Adaptive Management Plan
AMI	Advanced Metering Infrastructure
AQPI	Advanced Quantitative Precipitation Information
ASR	Aquifer Storage and Recovery
CASGEM	California Statewide Groundwater Elevation Monitoring
CCA	Community Choice Aggregation
CDFW	California Department of Fish and Wildlife
CIP	Capital Improvement Project
CSD	County Sanitation District
DWR	Department of Water Resources
EIR	Environmental Impact Report
EOP	Emergency Operations Plan
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FIRO	Forecast Informed Reservoir Operations
GCM	Global-Climate Models
GHG	Greenhouse Gas
GI	General Investigation
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan
IRWMP	Integrated Regional Water Management Plan
ISRP	Independent Science Panel
LBNL	Lawrence Berkley National Laboratory
LHMP	Local Hazard Mitigation Plan
MMWD	Marin Municipal Water District
MOU	Memorandum of Understanding
NBCAI	North Bay Climate Adaptation Initiative
NBWRA	North Bay Water Reuse Authority
NEPA	National Environmental Policy Act
NGO	Non-governmental Organization
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NSCAPCD	Northern Sonoma County Air Pollution Control District
NWS	National Weather Service
PG&E	Pacific Gas & Electric
PUC	Public Utilities Commission
PVP	Potter Valley Project
PWRPA	Power and Water Resources Pooling Authority
RCD	Resource Conservation District

RCPA	Regional Climate Protection Authority
RDS	River Diversion Structure
RESCO	Renewable Energy Secure Communities
RFO	Request for Offer
RFP	Request for Proposal
RFQ	Request for Qualifications
RPA	Reasonable and Prudent Alternatives
RRWA	Russian River Watershed Association
RWQCB	Regional Water Quality Control Board
SCADA	Supervisory Control and Data Acquisition
SCP	Sonoma Clean Power
Scripps	Scripps Institute of Oceanography
SGMA	Sustainable Groundwater Management Act
SVCS	Sonoma Valley County Sanitation District
SWRCB	State Water Resources Control Board
SWRP	Storm Water Resource Plan
TAC	Technical Advisory Committee
TCR	The Climate Registry
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
UWMP	Urban Water Management Plan
VOMWD	Valley of the Moon Water District
WAC	Water Advisory Committee
WREGIS	Western Renewable Energy Generation Information System
WSD	Water Smart Development
WSSAP	Water Supply Strategies Action Plan

Strategy 1: Protect drinking water supply and promote water- use efficiency

Action: Increase the water supply reliability of Lake Mendocino and Lake Sonoma

Project: Support Forecast Informed Reservoir Operations (FIRO) research and implementation

Activity: Continue to support FIRO research. As new data becomes available and new science-based findings are documented, Sonoma Water will work to incorporate them into reservoir management in coordination with USACE.

Status: Through the FIRO Steering Committee (a group of state, federal and Sonoma Water representatives), USACE, Scripps, NOAA and other federal agencies are collaborating to evaluate and implement new management tools for Lake Mendocino. These tools would allow decisions about reservoir operations to be based on weather forecasts rather than historic data and rules written when the reservoir was constructed and are called forecast informed reservoir operations. A preliminary viability assessment (PVA) was released in 2017 which demonstrated that changing to forecast-based tools would improve water supply reliability without increasing flood risk to downstream communities. The Steering Committee, co-chaired by Sonoma Water, has submitted a request to USACE to modify the USACE water control manual, written in the 1950s, which governs reservoir operations. The modification (called a “major deviation”) was approved by the USACE and will allow the application of forecast-based tools to supplement USACE reservoir operations for Water Year 2019. The Steering Committee is also currently working on several technical studies identified in the PVA. The studies, combined with the results of operations during at least two major deviations from the water control manual, will form the basis for the final viability assessment, and subsequently may result in a request for a change to the water control manual. In addition, several research projects are underway to develop future tools and improve forecasting skills that can be incorporated into future versions of FIRO.

Involved Parties: USACE, Scripps, NOAA (NWS, NMFS, and Office of Atmospheric Research), USGS, BOR, DWR

Timing: Immediate

Project: Complete and implement actions to establish new hydrologic index

Activity: Adopt a hydrologic index, which informs the water year designation, with assistance from the USACE’s Hydrologic Engineering Center and the Hydrologic Index Technical Advisory Group, comprised of representatives from state and federal agencies.

Status: A new, proposed hydrologic index has been developed as part of the Fish Habitat Flows and Water Rights Project (Fish Flow Project). A draft EIR has been prepared for the Fish Flow Project. Petitions were filed with the SWRCB requesting Sonoma Water’s water rights be amended to include the proposed hydrologic index, as well as proposed new minimum

instream flow requirements; once the EIR is certified and the Fish Flow Project approved by Sonoma Water's Board of Directors, the process will move to SWRCB for approval of the petitions.

Involved Parties: SWRCB, USACE, NMFS, CDFW, North Coast RWQCB

Timing: Immediate

Project: Continue to monitor and evaluate issues related to the reliability of Lake Mendocino

Activity: Facilitate upper river water managers' quarterly meetings to collaborate, share information, and build relationships that may result in water use agreements and regional partnerships.

Status: Ongoing.

Involved Parties: Mendocino County, City of Ukiah, City of Cloverdale, City of Healdsburg, several Mendocino and Sonoma County water districts, agricultural representatives, Farm Bureaus, Russian River water users

Timing: Immediate

Activity: Conduct workshops with land managers to discuss results of drought scenarios and receive feedback on potential mitigation measures developed in partnership with Scripps and USGS.

Status: In partnership with Scripps and USGS, evaluate the Russian River Valley's future risk to drought and make the region more resilient to droughts via studies carried out through funding provided by NOAA. The project has three main tasks: (1) perform analysis to understand how extreme precipitation events and atmospheric rivers will change in the future and their role in ending droughts (2) produce extreme drought scenarios to understand how the urban and natural landscapes will respond; and (3) work with stakeholders to understand drought mitigation measures that are currently being executed and what can be done to make the region more resilient to drought in the future. Scripps, County of Sonoma, and Sonoma Water held workshop with land managers to discuss the results of the drought scenarios and receive feedback on potential mitigation measures. The Final Report is expected in December 2018.

Involved Parties: NOAA, USGS, Water Contractors, County of Sonoma, other stakeholder and community groups

Timing: Immediate

Project: Monitor and participate in PG&E's Potter Valley Project hydroelectric relicensing and Request for Offers (RFO) process

Activity: Engage in PVP re-licensing proceeding.

Status: On January 25, 2019 PG&E notified the Federal Energy Regulatory Commission (FERC) that it was withdrawing its Notice of Intent (NOI) and Preliminary Application Document (PAD) and discontinuing the Integrated Licensing Process initiated to prepare a license application. PG&E also notified FERC that it was terminating its efforts transfer and sell the project. On March 1, 2019 FERC issued a notice soliciting applications from any party interested in filing an application for a new license for the project. The notice set a deadline of 120 days from the date of the notice to file an NOI and PAD. In the event that no other party files an application

for a license by April 14, 2020, PG&E will be provided with written notice that no timely application for the project has been filed and will be required to file a schedule for filing a surrender application for the project within 90 days.

Involved Parties: FERC, PG&E, NMFS, United States Forest Service, United States Fish and Wildlife Service, CDFW, SWRCB, Round Valley Tribes, Wiyot Tribe, Humboldt County, Lake County, Mendocino County, Sonoma County, Water Contractors, Russian River water users, Friends of the Eel River, CalTrout, Trout Unlimited, community groups

Timing: Immediate

Activity: Participate in Congressman Jared Huffman's PVP Ad Hoc Committee through the two working groups that have been established: Fish Passage and Water Supply.

Status: In 2017, Congressman Huffman convened an ad hoc committee of interested parties to work toward a Two-Basin Solution for the future of the PVP that addresses issues and concerns in both the Eel River and Russian River watersheds. Sonoma Water staff are participating in leadership roles for each of the Working Groups. The Fish Passage Working Group will identify existing information and best available science, develop objectives for fish passage and identify viable solutions (near term, longer term). The Water Supply Working Group will identify water supply issues on Eel and Russian Rivers, develop objectives for water supply, identify viable solutions (near term, longer term), and assess consequences, opportunities, and challenges of potential futures for the PVP. Throughout 2018, the Fish Passage and Water Supply Working Groups will examine these issues and then report their findings to the full Ad Hoc Committee for consideration.

Involved Parties: PG&E, CalTrout, Potter Valley Irrigation District, City of Ukiah, Round Valley Indian Tribes, Congressman Jared Huffman's Office, Russian Riverkeeper, Coyote Valley Band of Pomo Indians, County of Sonoma, Friends of the Eel River, Humboldt County, SWRCB, Lake County, Trout Unlimited, Mendocino County, U.S. Fish and Wildlife Service, NMFS, U.S. Forest Service, Pacific Coast Federation of Fishermen's Association, Wiyot Tribe, CDFW, SWRCB

Timing: Immediate

Project: Continue quagga mussel quarantine program and pursue funding for monitoring

Activity: Pursue funding to support mussel inspections at Lake Sonoma and Lake Mendocino.

Status: In September 2018, SB 790 passed, which allows entities other than USACE to apply for and receive grant funding to prevent the spread of invasive quagga and zebra mussels. The USACE manages recreation at both lakes and is responsible for implementing mandatory inspections. Sonoma Water has invested in annual voluntary inspections using mussel dogs at each lake. Sonoma Water intends to apply to the Department of Boating and Waterways for grant funds as they become available in 2019.

Involved Parties: USACE, CA Department of Boating and Waterways

Timing: Immediate

Action: Ensure compliance with the Russian River Biological Opinion

Project: Estuary Adaptive Management

Activity: Modify Sonoma Water’s Russian River estuary management program as required by the Biological Opinion, including managing the estuary as a summer lagoon for steelhead rearing habitat between May 15 and October 15.

Status: The Jetty Study, required by RPA 2 in the Biological Opinion, was completed in March 2017. Sonoma Water staff completed annual updates to the Russian River Estuary Management Project Outlet Adaptive Management Plan, as well as annual biological and water quality monitoring in the estuary. Staff will continue to prepare annual updates to the Plan through the term of the Biological Opinion. Sonoma Water staff will began a flood risk feasibility study effort required by RPA 2 in 2018 with work continuing into 2019. Sonoma Water received funding from the NOAA Habitat Blueprint for salmonid habitat water quality modeling in the Russian River estuary and to evaluate changes to coastal storm and sea level rise on the Sonoma Coast and in the estuary.

Involved Parties: NMFS, CDFW, North Coast RWQCB, UC Davis Bodega Marine Lab, NOAA agencies, Stewards of the Coast and Redwoods, California State Parks, University of Washington

Timing: Immediate

Project: Habitat Enhancement Resulting in Adequate Dry Creek Flows

Activity: Construct Miles Two and Three of Dry Creek Habitat Enhancement by 2018, as required by the Biological Opinion.

Status: A total of 3.14 miles of habitat enhancement have been constructed from 2012 to 2018. As of November 2018, Sonoma Water and the Army Corps have led 2.51 and 0.63 miles of construction respectively. Most recently, the Army Corps successfully completed the Dry Creek Continuing Authorities Program Section 1135 (CAP 1135) project. Monitoring per the Dry Creek Adaptive Management Plan (AMP) is ongoing. Actions to repair two sites damaged in high winter flows between December 2016 and February 2017 were implemented during summer 2017 and are performing well.

Involved Parties: Dry Creek property owners, NMFS, CDFW, USACE, Dry Creek Tribe of Pomo Indians

Timing: Immediate

Activity: Construct Miles Four, Five and Six of Dry Creek Habitat Enhancement, as required by the Biological Opinion.

Status: Sonoma Water is coordinating with USACE for funding of miles four, five, and six through the USACE Ecosystem Restoration General Investigation (GI) process. The GI feasibility study is nearing completion and the project is advancing to the Preconstruction Engineering and Design (PED) phase in early 2019. In support of the GI process, Sonoma Water is reaching out to landowners and working with consultants to develop project designs. Project construction is being planned in three phases from 2021-2023.

Involved Parties: Dry Creek property owners, NMFS, USACE, CDFW, Dry Creek Tribe of Pomo Indians

Timing: Immediate

Project: Fish Habitat Flows and Water Rights Project EIR

Activity: Prepare EIR to modify Decision 1610 minimum instream flow requirements as required in the Russian River Biological Opinion. The proposed Fish Flow Project also includes technical water rights adjustments, including a proposed new hydrologic index, extension of time to use existing water rights to the year 2040, and additional points of diversion.

Status: The Draft EIR was released for public review in 2016. Sonoma Water staff are reviewing comments received and updating project documentation as appropriate.

Involved Parties: Water Contractors, MMWD, SWRCB, USACE, NMFS, CDFW, North Coast RWQCB, community groups

Timing: Immediate

Project: Continue to implement the Reasonable and Prudent Alternatives for the Russian River Biological Opinion

Activity: Develop contingency plan for funding and construction of Dry Creek bypass pipeline if, contrary to expectations, habitat enhancement efforts fail.

Status: A feasibility study for the bypass pipeline study was completed in 2011. The need for further budget, environmental impact analysis, and design development will be evaluated following completion of habitat enhancement efforts. Monitoring results of habitat work are completed along with the completion of construction activities in 2018 are anticipated to result in a letter of support from NMFS to continue enhancement work on miles 4, 5, and 6 projects. Successful implementation of habitat enhancement efforts have resulted in the bypass pipeline being a low priority.

Involved Parties: NMFS, USACE, CDFW, Water Contractors, MMWD

Timing: Near Term

Activity: If habitat enhancement efforts are unsuccessful, build Dry Creek bypass pipeline.

A. Project: Conduct necessary financial and environmental studies and identify timing of projects

Status: To be determined.

B. Project: Construct bypass pipeline

Status: To be determined.

Involved Parties (A and B): NMFS, USACE, CDFW, Water Contractors, MMWD, community groups

Timing: Long Term

Action: Support science-based management of groundwater and surface water resources

Project: Support the implementation of the Sustainable Groundwater Management Act

Activity: Participate in and support Sonoma Valley GSA

Status: The basin is being managed by the Sonoma Valley GSA under SGMA. Activities and information developed as part of the non-regulatory Groundwater Management Plan approved by the Sonoma Water Board of Directors informs the foundation for the

development of the GSA's Groundwater Sustainability Plan (GSP). The Sonoma Valley GSA has contracted with Sonoma Water to provide technical, grant writing, outreach, and administrative support. Work on the GSP is underway, with the financial assistance of \$1 million from DWR, through a competitive Proposition 1 grant.

Involved Parties: Sonoma Valley GSA, Sonoma Valley GSA Advisory Committee, City of Sonoma, VOMWD, North Bay Water District, County of Sonoma, Sonoma RCD, other water purveyors, community stakeholders, private well owners

Timing: Immediate

Activity: Participate in and support Santa Rosa Plain GSA

Status: Activities and information developed as part of the non-regulatory Groundwater Management Plan approved by the Sonoma Water Board of Directors informs the foundation for the development of the GSA's Groundwater Sustainability Plan (GSP). Santa Rosa Plain GSA a public agency was formed to sustainably manage groundwater in the Santa Rosa Plain groundwater basin in June 2017. The Santa Rosa Plain GSA has a Board of Directors, an administrator and an advisory committee. The Santa Rosa Plain GSA has contracted with Sonoma Water to provide technical, grant writing, and outreach. Work on the GSP is underway, with the financial assistance of \$1 million from DWR, through a competitive Proposition 1 grant.

Involved Parties: Santa Rosa Plain GSA, Santa Rosa Plain GSA Advisory Committee, Santa Rosa Water, City of Rohnert Park, City of Cotati, Town of Windsor, Sonoma RCD, Gold Ridge RCD, County of Sonoma, Mutual Water Companies and Investor Owned Utilities, Graton Rancheria Tribe, private well owners, community groups

Timing: Immediate

Activity: Participate in and support Petaluma Valley GSA

Status: Petaluma Valley GSA, a public agency was formed to sustainably manage groundwater in the Petaluma Valley groundwater basin in June 2017. The Petaluma Valley GSA has a Board of Directors, an administrator and an advisory committee. The Petaluma Valley GSA has contracted with Sonoma Water to provide technical, grant writing, outreach, and administrative support. Work on the groundwater sustainability plan is underway, with the financial assistance of \$1 million from DWR, through a competitive Proposition 1 grant.

Involved Parties: Petaluma Valley GSA, Petaluma Valley GSA Advisory Committee, County of Sonoma, City of Petaluma, Sonoma RCD, North Bay Water District and community members

Timing: Immediate

Activity: Implement CASGEM Program

Status: Ongoing. Sonoma Water has coordinated and reported the required monitoring for 13 designated basins in county's 14 basins. Sonoma Water is responsible for two basins and through an agreement with the County is monitoring the 11 basins under County responsibility. The City of Petaluma will remain the reporting agency for the Petaluma Valley basin until the Petaluma Valley GSA assumes responsibility. Semi-annual water level measurements have been collected since fall 2011, and will be an ongoing activity. For the

basins required to comply with SGMA the CASGEM program will transition to the GSP monitoring program following development of GSPs.

Involved Parties: County of Sonoma, cities, RCDs, GSAs, community groups

Timing: Immediate

Project: Support the continued evaluation of conjunctive water use

Activity: Implement Aquifer Storage and Recovery Pilot Studies. Based on the results of the Groundwater Banking Feasibility Study, Sonoma Water and City of Sonoma initiated an ASR Pilot Study in the City of Sonoma in 2018.

Status: The ASR Pilot Study was initiated in March 2018 following permitting by the San Francisco Bay RWQCB and involves the recharge, storage and recovery of approximately 12 acre-feet of Russian River drinking water through a test well in the City of Sonoma. The results of the pilot study will provide: (1) information on the technical feasibility for ASR in the region to other local agencies, including Sonoma Water’s contractors and the GSAs (2) could be used to inform site selection and implement other pilot studies and (3) to complete environmental documentation and design for a full scale or permanent ASR project in the region.

Involved Parties: City of Sonoma, Sonoma Valley GSA, community groups

Timing: Immediate

Activity: Work with interested parties to share information and coordinate activities upstream of the confluence of Dry Creek and the Russian River

Status: Russian River Science Forum, begun May 2018, hosts science related information exchange twice a year. The objectives of the Forum are to continue to coordinate on the various science and monitoring activities in the watershed and help inform and reduce data gaps identified in the Independent Science Review Panel. Topics include: hydrometeorology and climate change, surface water hydrology, groundwater, habitat and restoration, monitoring.

Involved Parties: California Land Stewardship Institute, Sonoma County Agricultural Preservation & Open Space District, Fish Friendly Farming, NMFS, resource agencies, community groups

Timing: Immediate

Project: Continue to evaluate the capacity and performance of the riverbank filtration system

Activity: Research on surface water/groundwater interaction.

Status: Continue studies and modeling of surface water/groundwater interactions in collaboration with LBNL, USGS and other research institutions to better understand flow mechanics and natural filtration processes as they relate to production and water quality at Sonoma Water’s riverbank filtration facilities. Recent research activities include evaluation of potential impacts from post-wildfire burn areas. Recent work was presented by Sonoma Water staff and partners at various conferences and periodically publish results of research in peer-reviewed journals.

Involved Parties: Water Contractors, LBNL, USGS

Timing: Immediate

Action: Monitor and protect Sonoma Water's water rights

Project: Maintain reliability of Sonoma Water's water rights

Activity: Submit annual Temporary Urgency Change Petitions to the SWRCB as required by the Biological Opinion. Upon SWRCB approval, compliance with orders approving the petitions requires monitoring and reporting.

Status: Since 2010, Sonoma Water has petitioned the SWRCB for temporary changes in minimum instream flow requirements on the Russian River during the salmon rearing season, as required by the Russian River Biological Opinion. In several years, Sonoma Water has petitioned for temporary urgency changes due to drought conditions (2013-2015). The orders approving the petitions require monitoring and reporting on a variety of items including water quality in the Russian River, fisheries monitoring and water conservation activities.

Involved Parties: SWRCB, Water Contractors, MMWD, NMFS, CDFW, Russian River water users, community groups

Timing: Immediate

Activity: Prepare annual water rights reports, detailing total water use including local supplies, water conservation savings and recycled water which offsets Russian River supplies.

Status: Sonoma Water submitted its annual water rights permit progress and licensee reports for each Water Year.

Involved Parties: Water Contractors, MMWD, SWRCB, other Russian River water users under contract with Sonoma Water

Timing: Immediate

Project: Continue monitoring water rights-related activities in the watershed that could affect Sonoma Water's water rights

Activity: Actively participate in water right filings with the SWRCB in the Russian River Watershed to ensure Sonoma Water's water rights are protected.

Status: Ongoing. Amended rights Request terms be added to new and amended rights in the Russian River Watershed.

Involved Parties: SWRCB

Timing: Immediate

Action: Improve the efficient use of water in Sonoma Water's service area

Project: Increase recycled water storage, distribution, and use

Activity: Pursue expansion of recycled water projects involving Sonoma Water including Windsor and Santa Rosa (Airport Service Area) and Sonoma Valley (Sonoma Valley County Sanitation District)

Status: Windsor and Sonoma Water are working on prioritizing users and determining how to proceed with determining the most cost effective way to supply recycled water to the Airport

Service Areas currently relying on potable water from Windsor. Santa Rosa Water, working with Town of Windsor and Sonoma Water, is evaluating options for maximizing recycled water in the Airport Service Area. Other reuse opportunities are being considered, in addition to, the collaborations with Santa Rosa and Windsor.

In Sonoma Valley, SVCSD constructed pipeline and storage facilities to offset potable water use with recycled water based on current inflows. As effluent flows increase over time, SVCSD will evaluate the potential to expand the recycled water system. Recycled water may play a role in complying with the requirements of SGMA in the Sonoma Valley (and other basins required to implement SGMA).

Involved Parties: In Airport area: Windsor, Santa Rosa Water. In Sonoma Valley: City of Sonoma, NBWRA, SVCSD, VOMWD, Sonoma Valley GSA, and community groups

Timing: Immediate

Project: Monitor and prevent water loss

Activity: Evaluate the development of an operational tool to assess near real time meter zone water balance for AMI meters.

Status: Utilizing software currently available and operational data to construct a daily water balance tool.

Involved Parties: Internal

Timing: Immediate

Activity: Support Water Contractors in implementation of Water Loss Management Reporting.

Status: Monitor, collect and disseminate system data for Water Contractors required annual water loss reporting.

Involved Parties: Water Contractors, MMWD

Timing: Immediate

Activity: Track state regulations for wholesaler water supplier water loss reporting.

Status: SWRCB is developing and enacting water loss reporting requirements for wholesale water suppliers. Sonoma Water staff are providing feedback to the SWRCB on the methodology and will continue to voluntarily report on water loss.

Involved Parties: Water Contractors

Timing: Near Term

Project: Continue to promote water-use efficiency and the Sonoma-Marín Saving Water Partnership through outreach and education

Activity: Encourage water use efficiency through outreach and education while supporting the Partners through grant submittals, regional program implementation, tracking of impactful legislation, and influencing state framework standards. Ensure engagement with the community and water contractors to reduce demands through long term conservation strategies.

Status: Ongoing. In June 2018 the Sonoma Marin Saving Water Partnership MOU was extended for 10 additional years to assist the Partners in meeting statewide efficiency targets,

ensure the region continues to increase water awareness and pursue demand reduction opportunities that are cost effective.

Involved Parties: Water Contractors, MMWD, community groups

Timing: Immediate

Strategy 2: Maintain and improve the reliability of the Water Transmission System

Action: Assess, maintain and upgrade Water Transmission System infrastructure

Project: Assessment of collector well capacities

Activity: Evaluate the performance and condition of collector wells under standardized hydrologic and operational conditions, and if needed, develop a plan to increase reliability of these facilities.

Status: Ongoing. Collector capacity program started in 2008 and is ongoing. Collector wells 3, 4, and 5 have had two rounds of analysis utilizing standardized conditions. Collector wells 1, 2, and 6 had the second round of analysis completed in October 2018.

Involved Parties: Water Contractors, MMWD

Timing: Immediate

Project: Evaluate condition of Water Transmission System aqueducts particularly in areas with limited accessibility

Activity: Develop an implementation plan for pipeline assessment.

Status: An RFQ will be issued in 2018 to develop an implementation plan to assess the condition of the transmission system pipelines.

Involved Parties: Internal

Timing: Immediate

Activity: Implement condition assessment on priority pipelines based on implementation plan.

Status: Pending development on implementation plan.

Involved Parties: Internal

Timing: Near Term

Project: Develop a plan and schedule for replacing inflatable rubber dam

Activity: Replace inflatable rubber dam.

Status: Inflatable dam replacement is currently being designed with 60% design completed. Construction scheduled for completion in 2020.

Involved Parties: Water Contractors, MMWD

Timing: Immediate

Project: Identify and replace obsolete Water Transmission System equipment, hardware, and software

Activity: Continue planning new Water Transmission System projects to increase reliability of existing system.

Status: Develop scope, cost, and schedule of transmission system projects required to meet Sonoma Water's portion of UWMP-identified projected demands through the Urban Water

Management planning horizon. Projects identified using Sonoma Water's transmission system hydraulic model.

Involved Parties: Water Contractors, MMWD

Timing: Immediate

Activity: SCADA upgrade

Status: New SCADA software has been selected and training has been provided to appropriate staff. A pilot project is in development utilizing the new software prior to any production implementation.

Involved Parties: Water Contractors, MMWD

Timing: Immediate

Activity: Develop and maintain a prioritized Water Transmission System equipment replacement/upgrade list and a CIP priority list to inform the Long Range Financial Plan.

Status: Appendix 3 contains the current projects in the Long Range Financial Plan.

Involved Parties: Water Contractors, MMWD

Timing: Immediate

Project: Evaluate and construct operational reliability and preventative maintenance projects

Activity: Reservoir Recoat Program

Status: System-wide assessment of all tanks was completed Fall 2018 to determine the priority reservoirs for recoating. Forestville and Kastania tanks are the top priorities, followed by Cotati Tank 3. Forestville and Kastania are scheduled for 2019 and 2020, respectively.

Timing: Immediate

Activity: Petaluma Aqueduct Cathodic Protection Upgrade

Status: In construction, scheduled completion Fall 2018.

Timing: Immediate

Activity: Santa Rosa Aqueduct Cathodic Protection Upgrade

Status: Design in progress. Phase 1 construction anticipated in 2019.

Timing: Immediate

Activity: Upgrade Sonoma Booster Pump Station

Status: Design in progress with construction in Fall 2019.

Timing: Immediate

Activity: Wilfred Booster Station Electrical Upgrade

Status: Design in progress

Timing: Immediate

Activity: Mirabel Infiltration Pond Fishery Improvements

Status: Grade Ponds 2 and 3 at a slant to provide a refuge for fish captured in ponds during extreme high flow events.

Timing: Immediate

Activity: Mirabel Infiltration Ponds Rehabilitation

Status: Springtime pond prep is conducted each year in Pond 2 and 3 to ensure productive infiltration.

Timing: Immediate

Activity: Ralphine Tanks flow-through conversion

Status: The Ralphine Tanks Flow-Through Conversion was substantially designed but is now being further evaluated for the WQ benefits. Currently conducting water quality modeling.

Timing: Immediate

Project: Improve efficiency in managing the water metering system including full implementation of advanced metering infrastructure (AMI)

Activity: Implement AMI

Status: Over 110 billing meters have been converted to AMI reading. A new billing software program has been developed to interface with the AMI system. Sonoma Water is waiting on the availability of County of Sonoma Sheriff's Telecommunication Division to assist in the deployment of a fourth base station. This will allow the conversion of all but the most remote meters to AMI. A radio path study or alternate technology may be necessary for those remaining 10 remote meters.

Involved Parties: County of Sonoma

Timing: Immediate

Activity: Develop Water Transmission System Monitoring Master Plan

Status: Evaluate the existing monitoring network and develop guidelines for design, operation and maintenance of the equipment in the monitoring network. The master plan would assess how operations are monitored at production facilities, pipelines, turnouts, booster stations, valve stations, and potable storage tanks.

Involved Parties: Internal

Timing: Immediate

Project: Evaluate opportunities at Mirabel/Wohler facility to develop additional diversion facilities on existing footprint that increases and provides greater flexibility to divert water

Activity: Evaluate opportunities to increase efficiency of diversions.

Status: Due to the reduction in demands, alternate diversion systems are not needed in the near future. Initial planning for refined hydrogeologic characterization/modeling is the first phase to evaluate where opportunities exist to increase the efficiency of diversions within the existing footprint of Wohler/Mirabel.

Involved Parties: Internal only

Timing: Near Term

Action: Plan for funding improvements to ensure Water Transmission System is maintained and reliable

Project: Develop Asset Management Program

Activity: Develop an asset management program to manage facility infrastructure and provide document control functions related to asset management.

Status: Sonoma Water currently uses Maximo to track preventative/ corrective maintenance within Sonoma Water's water transmission, wastewater, fleet, facilities, and hydroelectric enterprises. Initial planning/scoping for a comprehensive asset management process is anticipated by the end of 2019. Mobile tracking pilot began Fall 2018 to facilitate preventative/ corrective maintenance in the field.

Involved Parties: Internal

Timing: Immediate

Project: Continued Refinement of Long Term Financial Plan to Support Water Supply Planning and Budgeting

Activity: Update and utilize of the Water Transmission System Long Range Financial Plan to inform the budget process each budget cycle.

Status: The Water Transmission System Long Range Financial Plan model is designed to allow scenarios - combinations of 1) delivery levels, 2) capacity projects, 3) hazard mitigation projects, 4) large non-recurring maintenance projects and 5) Biological Opinion implementation projects and their associated costs - to be analyzed and optimized. It accounts for bond-financing, rising construction costs, and operations and maintenance costs. The timeframe is from the current fiscal year to up to 30 years in the future. The basis for all calculations is the Restructured Agreement for Water Supply between Sonoma Water and its contractors. Sonoma Water staff will continue using model on an annual basis to conduct long-term financial analysis to support evaluation and development of water supply, conservation, demand management, and recycled water projects and programs.

Involved Parties: Water Contractors

Timing: Immediate

Strategy 3: Utilize regional planning to increase water supply resiliency

Action: Strengthen an integrated watershed management approach

Project: Update and maintain Integrated Regional Water Management Plans (IRWMP)

Activity: Actively participate in programming, policy development, funding, and planning of the two regional IRWMPs: North Coast Resource Partnership and Bay Area Integrated Regional Water Management Program.

Status: Implementation of several funded projects and programs from both IRWMPs is ongoing.

Involved Parties: Water Contractors, MMWD, DWR

Timing: Immediate

Project: Update and maintain the Urban Water Management Plans (UWMP)

Activity: Prepare an UWMP every 5 years.

Status: Urban Water Management Plans (UWMPs) are prepared by urban water suppliers every 5 years. Sonoma Water and most of the Water Contractors prepare UWMPs. These plans support the suppliers' long-term resource planning to ensure that adequate water supplies are available to meet existing and future water needs. The UWMP assess the reliability of water sources over a 20-year planning time frame, describes demand management measures and water shortage contingency plans, and discusses the use and planned use of recycled water. The 2015 UWMP was developed, submitted and deemed accepted by DWR. The 2020 UWMP is due July 1, 2021.

Involved Parties: Water Contractors, MMWD, DWR

Timing: Near Term

Project: Support implementation of the Sustainable Groundwater Management Agencies (SGMA)

Activity: Support administration of existing Sonoma County GSAs and development of GSPs. Provide support for the administration of the three GSAs formed in Sonoma County in 2017 and lead development of GSPs.

Status: Sonoma Water is providing administrative services to the GSAs through service agreements with Petaluma Valley GSA and Sonoma Valley GSA. Sonoma Water is also providing community engagement, grant writing and management, and technical services for development of GSPs through service agreements with all three GSA. (Related work in Strategy 1.)

Involved Parties: GSAs, GSA-member agencies, community groups

Timing: Immediate

Activity: Actively participate in the DWR Draft 2018 Basin Prioritization, which identifies three new basins as medium priority basins which, if finalized, will be required to comply with SGMA.

Status: Sonoma Water coordinated with GSAs, the County, cities and other potentially impacted entities related to the potential reprioritization of the Alexander Area, Healdsburg Area and Wilson Grove Formation Highlands basins/subbasins, including evaluating DWRs ranking methodology, developing comments, and evaluating options. DWR finalized prioritization of Alexander Area and Healdsburg Area as 'low priority' and it is anticipated that DWR will release the final reprioritization for Wilson Grove in spring 2019. Once the Basin Prioritization is final, Sonoma Water will coordinate with other agencies to evaluate next steps and approaches for complying with SGMA in any newly-added basins.

Involved Parties: DWR, GSAs, GSA-member agencies, community groups

Timing: Immediate

Activity: Participate in Technical Advisory Committee to Ukiah Valley GSA. The Ukiah Valley GSA formed in 2017 to manage the Ukiah Valley Groundwater Basin in compliance with SGMA.

Status: Sonoma Water is responsible for making releases from Coyote Valley Dam to meet minimum instream flow requirements and downstream demands in the Russian River which flows through the Ukiah Valley, significantly interacting with the groundwater basin. Consequently, Sonoma Water is coordinating with the Ukiah Valley GSA and is participating in the TAC through an MOU. In this role Sonoma Water will advise the GSA on technical matters related to development of the GSP for the Ukiah Valley Groundwater Basin to foster the sustainable management of surface water and groundwater resources.

Involved Parties: Ukiah Valley GSA, Mendocino RCD, California Land Stewardship Institute, community groups

Timing: Immediate

Project: Support and strengthen partnerships with Water Contractors and community

Activity: Continue ongoing collaboration and input from the Water Contractors and the community.

Status: Ongoing collaboration through Water Supply Coordinating Council, Water Operations Regional Team meetings, UWMP, IRWMP, Regional Resiliency Study, TAC/WAC, SGMA, and other regional collaborations.

Involved Parties: Water Contractors, MMWD, community groups

Timing: Immediate

Activity: Negotiate and develop a new Agreement for Water Supply between Sonoma Water and the Water Contractors to reflect current conditions and identify future transmission system improvements.

Status: To be determined.

Involved Parties: Water Contractors

Timing: Long Term

Project: Continue to collaborate on Russian River Integrated Watershed Modeling

Activity: Participate in the development of an integrated surface water-groundwater model (GSFlow) coupled with a water demand/reservoir routing model (MODSIM).

Status: Serve as local sponsor for the development of an integrated surface water-groundwater model (GSFlow) coupled with a water demand/reservoir routing model (MODSIM). This model will support several planning and assessment activities including SGMA, PVP relicensing, and climate change.

Involved Parties: USGS, SWRCB, Mendocino County, City of Ukiah, Russian River Flood Control District

Timing: Immediate

Project: Work with Water Contractors to reduce peak demand on transmission system via conservation, groundwater banking, local supply, and recycled water

Activity: Implement programs to reduce peak demand.

Status: Peak demand reduction is an ongoing activity for the Sonoma-Marín Saving Water Partnership and the water use efficiency team.

Involved Parties: Water Contractors, MMWD

Timing: Immediate

Activity: Local supply provided by the Water Contractors is a regional solution to reducing peak demand on the Water Transmission System.

Status: Appendix 4 contains the Water Contractor local supply projects are currently underway.

Involved Parties: Water Contractors, MMWD

Timing:

Activity: Recycled water projects which offset potable demand, specifically irrigation projects, alleviate peak demand on the Water Transmission System.

Status: Appendix 4 contains the Water Contractor recycled water projects are currently underway.

Involved Parties: Water Contractors, MMWD, land use planning entities, sanitation districts

Timing: Immediate

Project: Develop a water shortage resiliency plan

Activity: Update the Water Shortage Allocation methodology.

Status: A Water Shortage Allocation methodology, per the Restructured Agreement for Water Supply, has been developed to apportion water during peak demand periods when Water Contractor water demands exceed Sonoma Water's allowable diversions. The methodology has been approved by the WAC to address summer months when diversions from the Russian River may be constrained due to reduced flows or water availability. Water Contractors accepted the methodology in 2014 allowing the model to be in place through 2016. A model needs further update, approval by Water Contractors and Board of Directors approval.

Involved Parties: Water Contractors, MMWD

Timing: Immediate

Project: Conduct assessment of local and sub-regional water supply projects in conjunction with Sonoma Water projects

Activity: Compare actual gross demand, conservation, and source of water use with the UWMP projection to ensure projections represent actual conditions.

Status: Ongoing

Involved Parties: Water Contractors, MMWD, land use planning entities

Timing: Immediate

Project: Participate in integrated, multi-benefit water management plans and projects with conservation partners, including updating and maintaining Storm Water Resource Management Plans

Activity: Prepare and update a comprehensive, watershed based Storm Water Resource Plans (SWRPs) which represents watershed resource planning and storm water runoff management through a collaborative effort with stakeholders and public to address specific needs and issues of effective storm water management, including dry weather runoff.

Two SWRPs have been developed covering the watersheds of Russian River and Southern Sonoma County (Petaluma River and Sonoma Creek). The main purpose of the SWRP is to identify and prioritize storm water and dry weather capture projects using shared data and based on input from water and resource managers and collaborating entities including NGOs and public.

A. Russian River Storm Water Resource Plan

Status: Russian River Storm Water Resources Plan is complete. Proposition 1 Storm Water Implementation funding will be available in early 2019. Sonoma Water will continue to study feasibility of projects for implementation and seek partnerships to implement multiple benefit projects with flood protection and other benefits, as determined. Additional geotechnical field investigations may be performed to determine feasibility.

Involved Parties: RRWA, County of Mendocino, County of Sonoma, Sonoma Water, City of Cloverdale, City of Cotati, City of Healdsburg, City of Rohnert Park, Santa Rosa Water, City of Sebastopol, City of Ukiah, and Town of Windsor, San Francisco Estuary Institute, Sonoma Land Trust, Pepperwood Preserve, LBNL, Laguna de Santa Rosa Foundation, NOAA, Mendocino County Flood Control and Water Conservation Improvement District, North Coast RWQCB, SWRCB and the North Coast Resource Partnership.

B. Southern Sonoma Storm Water Resource Plan

Status: Southern Sonoma County Storm Water Resource Plan Public Draft was issued August 2018. Completed SWRP anticipated December 2018. Proposition 1 Storm Water Implementation funding will be available in early 2019. Sonoma Water will continue to study feasibility of projects for implementation and seek partnerships to implement multiple benefit projects with flood protection and other benefits, as determined. Additional geotechnical field investigations may be performed to determine feasibility.

Involved Parties: County of Sonoma, City of Petaluma, City of Sonoma, VOMWD, Sonoma County Agricultural Preservation & Open Space District, Sonoma RCD, Sonoma Land Trust, LBNL, Sonoma Ecology Center, San Francisco Bay RWQCB, SWRCB, Daily Acts, private landowners

Timing (Both A and B): Immediate

Activity: Maintain and operate the installed flood warning network to assist County of Sonoma and NWS in detecting flooding conditions.

Status: A complete ALERT2™ flood warning network was designed and installed from the ground-up to assist County of Sonoma and NWS in detecting flooding conditions following the October 2017 fires. OneRain, a new fully functional ALERT2™ flood warning network was operational by the end of February 2018 providing real-time rainfall, river-stream and reservoir data.

Involved Parties: NWS, County of Sonoma, County of Napa

Timing: Immediate

Project: Integrate flood protection and storm water management strategies with sustainable groundwater management plans and low impact development standards

Activity: Improve hydrometeorologic forecasting

Status: A collaborative effort with state, federal agencies and Scripps to improve drought/flood prediction and response strategies for our local communities with decision support tools, monitoring networks, and early warning systems. Various projects with NOAA, DWR and Scripps are focused on improved observational networks and modeling capabilities to improve reservoir operations and drought/flood response and planning.

Involved Parties: NOAA (NWS and Office of Atmospheric Research), Scripps, USGS, and DWR

Timing: Immediate

Activity: Maintain the Storm Water Resource Plans and conduct storm water management/groundwater recharge feasibility studies in the three groundwater basins: Santa Rosa Plain, Sonoma Valley, and Petaluma Valley.

Status: Coordination with the GSAs and Storm Water Resource Plans will continue to identify projects and seek partnerships to implement multiple benefit projects with flood protection and other benefits, as determined. Additional geotechnical field investigations may be performed to determine feasibility.

Involved Parties: Government agencies and municipalities, RRWA, GSAs, community groups, land use planning entities

Timing: Immediate

Strategy 4: Respond and adapt to climate change

Action: Invest in climate science and technology

Project: Work with federal and state partners such as the United States Geological Survey, Scripps Institution of Oceanography, and National Oceanic and Atmospheric Administration to develop climate models for floods and droughts

Activity: Support development of Hydrometeorology Test bed for the Russian River basin.

Status: This demonstration project will enhance precipitation monitoring and forecasting through data collected by deploying additional on-the-ground weather stations soil moisture probes, and other observational equipment. It will also improve temperature forecasting in Alexander Valley by improving NOAA's models. NOAA and Sonoma Water are working on the demonstration program. Current activities primarily consist of operations and maintenance of equipment that was installed under previous phases of the project.

Involved Parties: NOAA, USACE, USGS, NWS

Timing: Immediate

Project: Incorporate downscale climate models into surface and groundwater models

Activity: Develop a predictive model for Sonoma Valley and Russian River watersheds to downscale large climate models to local watershed scale. Model to provide hydrology input to Sonoma Water's model (ResSim) and to Sonoma Valley and Santa Rosa Plain groundwater models.

Status: Downscaled global-climate models (GCMs) developed by the USGS have been incorporated into future scenarios modeled by integrated surface water/groundwater flow models developed for the Sonoma Valley and Santa Rosa Plain. Twenty GCM scenarios are being incorporated into the Russian River ResSim model to evaluate potential impacts of climate change to the water supply reliability of Lake Mendocino and Lake Sonoma. Analysis of model results will be incorporated in the climate vulnerability assessment and climate adaptation plan that is currently being prepared. As new GCMs are developed they will be incorporated into the scenarios modeled by integrated surface water/groundwater flow models developed for the Sonoma Valley and Santa Rosa Plain.

Involved Parties: USGS

Timing: Immediate

Project: Assess potential impacts to water quality and hydrology from wildfires in the Russian River Watershed

Activity: In coordination with USGS, participate in quantifying watershed response to wildfires.

Status: Partnering with the County, the Open Space District, Pepperwood Foundation, and United States Geological Survey to conduct soil hazard analysis and mapping, and measure watershed response to fire-damaged landscapes to help public agencies plan ongoing recovery efforts.

Involved Parties: County of Sonoma, Pepperwood Preserve, Sonoma County Agricultural Preservation & Open Space District, USGS

Timing: Immediate

Activity: Implement FireSmart Lake Sonoma to address climate adaptation, community and watershed resiliency.

Status: Activities include community engagement workshops and planning to build community resilience around fire hazards, fire protection and adapting climate change. PG&E funded capacity building grant, led by Ag Innovations, with Sonoma Water as a partner.

Involved Parties: Ag Innovations, PG&E, USACE, CalFire and local Fire Districts, County of Sonoma, Sonoma County Agricultural Preservation & Open Space District, UCCE, Sonoma and Mendocino County RCDs, NSCAPCD, NGOs, Yorkville Community Benefit Association, landowners

Timing: Immediate

Action: Evaluate climate risk and vulnerabilities to our operations and infrastructure

Project: Assess regional opportunities to increase resiliency

Activity: Facilitate construction of a network of high-definition cameras that will provide early fire detection and situational awareness to protect the region's key water source from the threat of wildfire.

Status: An eight-camera network of high-definition pan-tilt-zoom cameras for early fire detection of the Lake Sonoma watershed is underway. The state-of-the-art system uses near-infrared technology for night vision, and allows fire officials to take over control of the fire cameras during wildfire emergencies to monitor fire and weather activity.

Involved Parties: County of Sonoma, Pepperwood Preserve, Fairfield Osborn Preserve, Sonoma State University, The Regents of the University of California, Scripps, County of Lake, County of Mendocino, County of Marin and the AlertWildfire consortium of universities

Timing: Immediate

Activity: Evaluate Water Contractor's water supply and distribution systems in conjunction with Sonoma Water's diversion and transmission system to prepare a workplan for developing a Decision Support Tool for regional planning of the interconnected water supply systems.

Status: A Regional Resiliency Study will be developed; a consulting firm was selected through an RFP process in summer 2018. A workplan is anticipated to be completed by early 2019. Upon completion of the work plan, it is anticipated that the Decision Support Tool will be developed and used evaluate both operational improvements and capital projects to improve the reliability of the water supply regionally.

Involved Parties: Water Contractors, MMWD

Timing: Immediate

Project: Assess climate risks/vulnerabilities and identify adaptation strategies

Activity: Develop a Climate Adaptation Plan.

Status: Climate Adaptation Plan is in development to address climate change impacts on water supply reliability based on advances in scientific understanding of climate processes and predictive modeling. The Plan is anticipated to be complete by mid 2019.

Involved Parties: USGS, USACE, RCPA, County of Sonoma, Water Contractors, CalFire, community groups

Timing: Immediate

Action: Implement climate adaptation strategies

Project: Incorporate climate adaptation projects into LHMP

Activity: Ensure the Climate Adaptation Plan initiatives are incorporated into the LHMP.

Status: 2018 update to LHMP is complete and was adopted by the Board of Directors in October 2018.

Involved Parties: Water Contractors, County of Sonoma, FEMA

Timing: Immediate

Action: Participate in and form collaborative partnerships focused on climate science and adaptation

Project: Continue to participate in the North Bay Climate Ready Program and NBCAI and coordinate with RCPA

Activity: Solicit input from key partners are on the Climate Adaptation Plan.

Status: Collaboration with key partners is ongoing. Input was received for Climate Adaptation Plan results, NBCAI provided peer review, while RCPA acted as an information sharing platform.

Involved Parties: RCPA, County of Sonoma, Pepperwood Preserve, NBCAI

Timing: Immediate

Project: Continue to participate in the Partnership for Resilience and Preparedness

Activity: Develop a Sonoma County Climate Resiliency Dashboard to explain the impacts of climate change in the North Bay Region to decision makers and the public.

Status: With the support of several federal agencies and the White House Office of Science, Technology, and Policy, a beta-version dashboard was developed and profiled in September 2016 at the UN Climate Week in New York City. Due to the change in the White House administration, this project has been delayed. An evaluation of options for business models is ongoing and anticipated to be complete by early-mid 2019. Being able to communicate the impacts of increased weather variability to the broader community is critically important as both extreme wet years and extreme dry years are likely to become more frequent.

Involved Parties: RCPA, Pepperwood Preserve, USGS, Earth Knowledge, NBCAI

Timing: Immediate

Project: Work with Groundwater Sustainability Agencies to evaluate climate change impacts to groundwater

Activity: Incorporate future climate projections into Groundwater Sustainability Plans. Incorporate downscaled Global-Climate Models (GCMs) into model simulations for GSPs.

Status: In development. Downscaled GCMs will be incorporated into model simulations performed for evaluating the water budget and potential projects and actions as part of the development of GSPs in Petaluma Valley, Santa Rosa Plain and Sonoma Valley.

Involved Parties: GSAs, community groups

Timing: Near Term

Strategy 5: Improve the Energy Efficiency of the Water Transmission System and Increase Renewable Power Use

Action: Reduce electricity costs

Project: Procure cost effective carbon free power to meet Sonoma Water electricity needs

Activity: Explore other locally available renewable energy potential including solar, wind, wave, geothermal, solid waste, pyrolysis and biomass.

Status: Ongoing.

Involved Parties: PWPRA, North Coast IRWMP, County of Sonoma, Sonoma County Agricultural Preservation & Open Space District, community groups

Timing: Immediate

Activity: Implement Floating Solar.

Status: Evaluation of 1MW of floating Solar at Oceanview Reservoir to serve 50 Sonoma Water electricity accounts for both recycled water and water accounts is complete. Currently being designed, construction anticipated in 2019. Project requires no capital investment and will result in a reduction in power costs.

Involved Parties: PG&E, PWRPA

Timing: Immediate

Activity: Refine Solar Assets.

Status: Negotiate a mutually beneficial transfer of solar assets to PWRPA to ensure Sonoma Water benefits by both the reduction in costs and PWRPA's increase of their renewable energy portfolio. Contract under consideration by Board of Directors in January 2019.

Involved Parties: PWRPA

Timing: Immediate

Project: Explore energy load shifting and energy storage opportunities to reduce net power consumption and costs

Activity: Load shifting may reduce energy costs through adjusting operations time of use.

Status: PG&E 2019 rate proposal includes this incentive option, upon PUC approval of PG&E rates Sonoma Water will determine if load shifting is feasible.

Involved Parties: PG&E

Timing: Near Term

Activity: Development of additional energy storage.

Status: Developing additional energy storage to allow operations to access a lower energy rate regardless of time of use. PG&E 2019 rate proposal includes this incentive option, upon PUC approval of PG&E rates Sonoma Water will determine if energy storage is feasible.

Involved Parties: PG&E

Timing: Near Term

Action: Pursue regional collaboration to sequester carbon and reduce GHG emissions

Project: Assist Sonoma Clean Power in developing and creating water and energy efficiency and renewable energy programs

Activity: Collaborate with SCP to leverage mutually beneficial water and energy programs.

Status: The Sonoma Marin Saving Water Partnership, Water Education Program and Energy Resources Group collaborate with SCP as new opportunities are deemed feasible.

Involved Parties: Water Contractors, SCP

Timing: Immediate

Project: Partner with local and regional organizations and agencies to implement carbon sequestration through improved land management, restoration, biomass recycling, biochar, and/or other methods and implement feasible projects

Activity: Evaluate the effectiveness of biochar for drought resilience and carbon sequestration.

Status: Carbon sequestration is a natural or artificial process by which carbon dioxide is removed from the atmosphere and held in solid or liquid form, such as biochar. Sonoma County Biochar Demonstration Project was funded with USDA NRCS for drought resilience and carbon sequestration. The biochar production unit worked well and produced high quality char. Limited field trials were held in three Sonoma County locations where soil type and agricultural production varied using USDA NRCS protocols. Results at one site proved promising with increased plant yield and significant reduction in water needs of the test plots using biochar mixed with compost soil amendment. Cost of labor impacts the feasibility of using this as a commercial enterprise. The unit is ideal for demonstration purposes for study or research, and is highly recommended for use in education of biomass utilization and carbon cycling. Education programs will be ongoing based on additional regional interest.

Involved Parties: Sonoma Ecology Center, Gold Ridge RCD, North Coast Resource Conservation & Development Council, USDA Natural Resources Conservation Service, New England Biochar, Sonoma Biochar Initiative, Sonoma, Mendocino and Napa county communities

Timing: Immediate

Project: Begin exploring what it would take to achieve Carbon Negative Water

Activity: Verify carbon free status and assess opportunities to become Carbon Negative.

Status: Sonoma Water achieved Carbon Free Water in 2015 by cost effectively sourcing power from various sources including hydropower, solar power, geothermal power, and biogas power. Carbon Negative Water would require carbon sequestration efforts such as reforestation or producing biochar. Sonoma Water is exploring carbon sequestration

approaches as part of the climate adaptation plan development. Continue annual voluntarily report carbon emissions to TCR.

Involved Parties: Internal Activity, TCR

Timing: Immediate

Activity: Register Renewable Energy Credits with Western Renewable Energy Generation Information System (WREGIS).

Status: Ongoing, annual reporting

Involved Parties: Internal Activity, WREGIS

Timing: Immediate

Activity: Participate in the development of the Water Energy Nexus Registry.

Status: TCR began working with CalEPA on a 3-year program to develop the voluntary registry and protocols for quantifying GHG emissions related to water management. TCR will be coordinating this work with water agencies and other stakeholders to design the protocols and methodologies, which may then be used to estimate GHG reductions. Registry membership will be open to water agencies and other entities doing business in California. Staff are participating in the Water-Energy Nexus Registry Working Group which will play a key role in shaping the Registry's reporting methodologies by resolving key technical questions, providing detailed feedback on draft protocols and guidance, and helping to frame discussion topics for public stakeholder meetings.

Involved Parties: Internal Activity, TCR

Timing: Immediate

Strategy 6: Increase emergency preparation and improve response to natural disasters

Action: Update or create critical emergency preparedness planning documents

Project: Develop a system to provide critical information on location, timing and intensity of expected rainfall.

Activity: Utilize Advanced Quantitative Precipitation Information system to provide more precise rainfall forecasting for atmospheric rivers which can be coupled with a modeling system that will provide decision support for a variety of stakeholders such as flood control managers, water supply managers, emergency responders, transportation officials, and media outlets by providing more precise information on location, timing and intensity of expected rainfall.

Status: DWR awarded \$19.84 million from Proposition 84 to Sonoma Water for the San Francisco Bay Area AQPI system. Four X-band and one C-band radar units will be installed throughout the Bay Area. The project is currently being implemented. It is anticipated that by late 2019, two X-band radar units will be installed: one in Santa Clara County and one on Sonoma Mountain. An additional mobile X-band unit may be placed in the East Bay by 2019. A temporary c-band radar unit may be placed at a location yet to be determined in the Bay Area with a permanent location anticipated to be installed before December 2021.

Involved Parties: DWR, NOAA, Colorado State University, Scripps, USGS, Cooperative Institute for Research in the Atmosphere, Contra Costa Water District, Contra Costa Flood Control and Water Conservation District, San Francisco Public Utilities Commission, Santa Clara Valley Water District, Zone 7 Sonoma Agency, County of Alameda, County of Santa Cruz, East Bay Municipal Utilities District

Timing: Immediate

Project: Update Emergency Operations Plan (EOP)

Activity: Revise and update Sonoma Water's planned response to all hazards. Implement annual review and revision process following a hazard which triggers the use of the EOP.

Status: Update is 95% complete.

Involved Parties: Internal activity

Timing: Immediate

Project: Update existing emergency response and action plans regarding releases of pollutants into the Russian River that could impact water supply operations

Activity: Develop a Source and Treated Water Contamination Response Plan.

Status: Source and Treated Water Contamination Response Plan was developed to address specific steps that will be taken if pollutants impact water supply operations. The Plan was approved by SWRCB in October 2017. An annual review of the plan will align with SWRCB Reporting.

Involved Parties: SWRCB

Timing: Immediate

Activity: Participate in a collaborative pilot project to refine response actions if a petroleum spill were to occur on the Russian River.

Status: The pilot project will provide a Russian River Geographic Response Plan in 2018 and outcomes will be added to the Source and Treated Water Contamination Response Plan.

Involved Parties: County of Sonoma, Tribes, CDFW, EPA, County of Mendocino, SWRCB

Timing: Immediate

Action: Update Local Hazard Mitigation Plan (LHMP) and implement natural hazard mitigation projects

Project: Regularly update LHMP

Activity: Update and renew the LHMP every five years to understand risks from natural hazards and develop long-term strategies to reduce the impacts of disasters.

Status: FEMA approved Sonoma Water's LHMP update in October 2018. The LHMP provides a comprehensive planning strategy to evaluate feasible projects prior to applying for grant funding.

Involved Parties: Water Contractors, MMWD, County of Sonoma, FEMA

Timing: Immediate

Project: Implement projects to mitigate highest natural hazard risks

A. Activity: Address Wohler/Mirabel Liquefaction Mitigation

Status: The issue of liquefaction at Wohler/ Mirabel is a recognized hazard and should be addressed prior to other site improvements occurring. Consultant analyzed alternatives (infrastructure hardening and ground stabilization) to address vulnerability of the collector wells at Wohler/ Mirabel. The assessment concluded that vulnerability may remain high so alternative paths (emergency response, system redundancy, etc.) should be considered to minimize regional impacts and manage the risks. Seismic ground improvements at the new fish screen/ladder and RDS were completed in 2014.

Timing: Immediate: Develop and implement a seismic risk mitigation strategy for Collectors 3 and 5 to address the liquefaction and lateral spread hazard. Evaluate additional response measures to decrease vulnerability of the collector wells. Long Term: Develop and implement a seismic risk mitigation strategy for Collectors 6 against liquefaction and lateral spread hazard.

B. Activity: Construct Russian River Crossing

Status: In design, waiting for FEMA's completion of NEPA review and obligation of the funds. Pending progress with FEMA construction anticipated 2020.

Timing: Immediate

C. Activity: Construct Santa Rosa Creek Crossing (Santa Rosa Aqueduct)

Status: In design, waiting for FEMA's completion of NEPA review and obligation of the funds. Pending progress with FEMA construction anticipated 2021

Timing: Immediate

D. Activity: Construct Mark West Creek Crossing

Status: In design, waiting for FEMA's completion of NEPA review and obligation of the funds. Pending progress with FEMA construction anticipated 2020.

Timing: Immediate

E. Activity: Construct Bennett Valley Fault Crossing (Sonoma Aqueduct)

Timing: Long Term

F. Activity: Construct Petaluma River Crossing (Petaluma Aqueduct)

Timing: Long Term

G. Activity: Construct Sonoma Creek Crossing (Lawndale/Madrone)

Timing: Long Term

F. Activity: Construct Sonoma Creek Crossing (Verano Ave)

Timing: Long Term

H. Activity: Construct Calabazas Creek Crossing

Timing: Long Term

Action: Improve emergency management implementation skills

Project: Continue multi-agency and multi-jurisdictional planning, outreach and training activities, and include partner agencies in field-level training with water contractors

Activity: Perform emergency drills/ exercises internally, in collaboration with Water Contractors, and other local agencies to improve response and recovery activities.

Status: Collaborative and internal exercises training are held annually. These drills/ exercises identify areas of improvements to the EOP.

Involved Parties: Internal activity, Water Contractors, MMWD and other local agencies, County of Sonoma

Timing: Immediate

Strategy 7: Seek federal and state funding

Action: Proactively pursue sustainable funding to support water supply projects and programs to offset impacts to ratepayers

Project: Implementation of the Sustainable Groundwater Management Act Funding

Activity: Pursue grant funding opportunities to support SGMA implementation.

Status: Ongoing effort. A total of \$3 million in grant funding has been awarded to the three existing GSAs in Sonoma County (\$1 million per GSA) for the development of GSPs through the Proposition 1 Groundwater Sustainability Plans and Projects Solicitation. Additionally, a \$250,000 Stressed Counties Grant under Proposition 1 was awarded to develop a data management system to be applied to each of the three SGMA medium priority basins in Sonoma County and facilitation services for the GSAs have been partially funded through successful applications through DWRs Facilitation Support Services program. Additional opportunities for grant funding will continue to be explored including DWRs Technical Support Services program and other outside funding entities.

Involved Parties: GSAs, State agencies, legislators, North Coast and San Francisco Bay IRWMP, DWR

Timing: Immediate

Activity: Support establishment of fair and equitable funding sources for GSA activities. Identify local funding sources for GSA activities not covered by outside grant funding.

Status: Ongoing effort. The initial two years of GSA activities (FY 17/18 and FY 18/19) have been supported by member agency contributions. Efforts are ongoing to identify local funding sources through establishment of GSPs in 2022. Such efforts have included performance of rate and fee studies to explore options. The Petaluma Valley and Sonoma Valley GSAs have determined to continue member agency contributions through FY 21/22 and the Santa Rosa Plain GSA is exploring options for establishing a broader fee setting mechanism to cover its anticipated costs through FY 21/22.

Involved Parties: GSAs, GSA-member agencies, community groups

Timing: Immediate

Project: Identify and secure federal, state, and grant funding for implementing water use efficiency projects

Activity: Pursue grant funding to offset current regional program as opportunities arise.

Status: Ongoing effort. The following grants are in place, benefiting the region: Prop 84 North Coast Resource Partnership – Drought Round, Prop 84 North Coast Resource Partnership – 2015 Round, and DWR Water/Energy Grant

Involved Parties: State funding agents, federal funding agents, foundation funding, various partners that can leverage matching funds

Timing: Immediate

Project: Procure funding to mitigate highest natural hazard risks, implement water supply operational reliability and preventative maintenance projects

Activity: Advocate for funding of projects and initiatives that improve Sonoma Water’s planning actions, reliability of operations, and aging infrastructure.

Status: Continue to work with partners (DWR, other water agencies, academic institutions) to advocate for funding of projects and initiatives that improve the Sonoma Water’s planning actions and reliability of operations including season to season forecasting research, FIRO, AQPI, seismic and climate risks.

Involved Parties: State funding agents, federal funding agents, foundation funding, various partners that can leverage matching funds

Timing: Immediate

Activity: Advocate and pursue funding of infrastructure projects and initiatives to support Sonoma Water’s LHMP and pre-disaster mitigation.

Status: Continue to apply for grant funding and work with partners to obtain funding for pre-disaster mitigation, LHMP projects and infrastructure improvements.

Involved Parties: State funding agents, federal funding agents, foundation funding, various partners that can leverage matching funds

Timing: Immediate

Activity: Proactively work with Water Contractors to ensure their timely assistance in supporting funding efforts and reporting activities at WAC meetings.

Status: Biannual discussions on legislative activities will be scheduled for WAC and TAC meetings.

Involved Parties: Water Contractors, MMWD

Timing: Immediate

Project: Identify and secure federal, state, and grant funding for implementation of Russian River Biological Opinion

Activity: Pursue funding for studies and projects required by the Biological Opinion in Washington, D.C. and Sacramento.

Status: Funding has been provided for fish screen/ladder/viewing gallery and the Dry Creek Continuing Authorities Program (CAP) restoration project. Federal activities have been focused on USACE funding for Dry Creek habitat enhancement projects. USACE received \$6 million for the CAP project.

Involved Parties: NMFS, USACE, CDFW, Water Contractors, MMWD, community groups

Timing: Immediate

Project: Pursue grant funding for emergency preparedness

Activity: Advocate for emergency preparedness funding in Sacramento and Washington, D.C.

Status: Ongoing

Involved Parties: Water Contractors, MMWD, state/federal agencies, community groups

Timing: Immediate

Appendix 1: 2013 WSSAP Completed Activities

Strategy 1: Protect drinking water supply and promote water-use efficiency

Action: Increase the water supply reliability of Lake Mendocino and Lake Sonoma

Project: Support Forecast Informed Reservoir Operations research and implementation

2013 Immediate Action: Demonstration Project

Frost and Heat Event Forecast Demonstration Project: Provide funding and support to NOAA to develop improved temperature forecast modeling tools. Focus will be on Alexander Valley, with goal of improving forecasts of frost and hot spells. Study will downscale and correct models and integrate weather station data provided by the Winegrape Commission and other parties.

OUTCOME: NOAA developed a regional bias-corrected temperature forecast model that leveraged the 45-50 public and private weather stations in Sonoma and Mendocino counties to supplement the National Weather Service forecast models. These models were bias corrected, meaning that they “learned” by comparing the temperature forecasts to the actual and then correcting the errors in a continual process so that over time the model accuracy improved and was able to provide superior temperature forecasts from 72 hours compared to NWS and other more regional forecasts. The purpose of this pilot project was to determine if leveraging local data to improve regional models in anticipation of frost events and heat waves could: (1) allow farmers to use this information to better coordinate their diversions; and (2) allow Sonoma Water to better anticipate these events and manage reservoir releases to account for the spikes in diversions. NOAA and Sonoma Water provided matching funds. An outgrowth of the project was the installation of meteorological towers (10.7 m poles with temperature sensors) to determine where temperature inversion layers may form, as areas with inversions are prone to experiencing frost events. Although the project was successful, it has been discontinued due to lack of funding to convert it from research to operational.

2013 Immediate Action: Water Supply Reliability Analysis

Conduct water supply reliability analysis of the upper Russian River. Evaluate existing information regarding demand/use; gather new information from users; update demand analysis; model possible future scenarios; and evaluate impacts on reliability of Lake Mendocino

OUTCOME: Submitted the Lake Mendocino Water Supply Reliability Evaluation Report the SWRCB with the 2015 Temporary Urgency Change Order (Order 5/1/2015) reporting. The Reliability Study evaluated the long-term reliability of Lake Mendocino to meet water supply and environmental water demands, including informed perspectives on how Lake Mendocino is affected by climate change and PVP operations.

2013 Immediate Action: Formation of Science Panel

Work with interested parties to form an independent science review panel to evaluate existing data and develop a conceptual model regarding the hydrologic system upstream of the confluence of Dry Creek and the Russian River

OUTCOME: The Russian River Independent Science Panel (ISRP) was formed in collaboration with California Land Stewardship Institute, NMFS, Alexander Valley agriculture (RR Water Conservation Council), and the Mendocino Farm Bureau. ISRP held several meetings and produced a comprehensive report providing a conceptual model for surface and groundwater flow and interactions and the influence and impacts on habitat. The ISRP led to the formation of the Russian River Science Forum.

Action: Ensure compliance with the Russian River Biological Opinion

Project: Habitat Enhancement Resulting in Adequate Dry Creek Flows

2013 Immediate Action: Demonstration project

Build Mile One of Dry Creek habitat enhancement by 2014.

OUTCOME: Construction occurred over three construction seasons in 2012, 2013, and 2014.

2013 Immediate Action: Development of success measures

Develop criteria for measuring success of Dry Creek habitat enhancement program.

OUTCOME: The Dry Creek Adaptive Management Plan (AMP) was finalized in 2014. Creation of the AMP was a facilitated process to develop and implement specific success criteria for the Dry Creek habitat enhancement efforts.

2013 Immediate Action: Tributary Restoration

Construct Grape Creek, Willow Creek and Wallace Creek fish passage projects and tributary Grape Creek and Crane Creek restoration projects.

OUTCOME: Construction is complete for these five tributary restoration projects required under the Biological Opinion. The Grape Creek Habitat Improvement Project was constructed in 2009 and 2010. The Willow Creek Passage Enhancement Project was constructed in 2011. The Crane Creek Passage Project was constructed in 2011. The Grape Creek Passage Project was constructed in 2012. The fifth project was going to be the Wallace Creek Passage Project; however, due to the inability to secure the necessary right-of-way from the private property owners in the project area, Sonoma Water refocused the effort. Instead, with the permission of NMFS and CDFW, Sonoma Water contributed funding towards the Mill Creek Passage Project as the fifth tributary project. The Mill Creek Passage Project was constructed in 2016. The monitoring of the tributary restoration projects began in 2011.

2013 Immediate Action: Build enhanced fish barrier passage facilities at intake for infiltration ponds

Design and construct enhanced fish barrier passage facilities, including new screens at intake, fish ladder and viewing gallery at inflatable dam.

OUTCOME: Construction of new screens, fish ladder, and viewing gallery at the Mirabel rubber dam was completed in 2016. Grant funding from CDFW was received to fund portions of the project.

Action: Support science-based management of groundwater and surface water resources

Project: Support the implementation of the Sustainable Groundwater Management Act

2013 Immediate Action: Continue with Sonoma Valley program and initiate program in Santa Rosa Plain.

Develop non-regulatory AB 3030/SB1938 management plans that emphasize local control. Emphasize development of diversified water supply “portfolios” for each basin.

A. Implement Sonoma Valley groundwater management plan.

OUTCOME: Implementation of the non-regulatory Sonoma Valley Groundwater Management Plan has ceased, as the basin is now being managed by the Sonoma Valley Groundwater Sustainability Agency under SGMA. Activities and information developed as part of the non-regulatory GMP will form the foundation for development of the GSP being developed by the Sonoma Valley GSA.

B. Develop groundwater management plan for the Santa Rosa Plain.

OUTCOME: A non-regulatory groundwater management plan for the Santa Rosa Plain was developed in 2014, which will form the foundation for development of the GSP being developed by the Santa Rosa Plain GSA.

Project: Support the continued evaluation of conjunctive water use

2013 Immediate Action: Storage - Groundwater Banking Feasibility Study

Develop Phase 1 regional study and Phase 2 site-specific work plans to implement pilot studies for each Water Contractor.

OUTCOME: The Regional Groundwater Banking Feasibility Study was completed in 2013 and provided an evaluation of the regional needs and benefits, source water availability and quality, regional hydrogeological conditions, and alternatives for groundwater banking. The study recommended the performance of Aquifer Storage and Recovery Pilot studies to further assess the feasibility and support design of future projects. Pilot project is underway in collaboration with the City of Sonoma.

Action: Improve the efficient use of water in Sonoma Water's service area

Project: Monitor and prevent water loss

2013 Immediate Action: Leak detection

Conduct research in development of advanced analytics tool to evaluate the system flow and pressure monitoring data to help detect leaks in transmission and distribution systems.

OUTCOME: The pressure management component of the project was completed in August 2012. IBM developed a web-based application tool for balancing pressures and minimizing pressure spikes. VOMWD has incorporated the pressure recommendations into its operational decision making, and has found significant benefits (including a reduction in pipe breaks).

2013 Immediate Action: Demonstration project - collaboration platform

Develop systems using advance technology to improve the interoperability and transparency of data between Sonoma Water and Contractors, with the goal of improving operations and planning.

OUTCOME: The start-up phase of the project was completed in summer 2012 in collaboration with IBM and three Water Contractors. This project was discontinued after the pilot was developed and operated on a trial basis, due to lack of funding.

2013 Near Term Action: Extend Automated Meter Infrastructure demonstration project and collaboration platform to other Water Contractors

The initial pilot project intended to integrated monitoring capabilities of SCADA systems for Cotati, Santa Rosa, Rohnert Park and Sonoma Water to improve communications, increase water and power efficiencies.

OUTCOME: Pilot demonstration was deemed not cost effective and is no longer being pursued.

Strategy 2: Maintain and improve the reliability of the Water Transmission System

Action: Assess, maintain and upgrade Water Transmission System infrastructure

Project: Evaluate and construct operational reliability and preventative maintenance projects

2013 Immediate Action: In consultation with Water Contractors, develop plan to provide consistent funding for natural hazard and operational reliability capital projects.

A. System wide in-line meter replacements

OUTCOME: Meter replacement will be complete in 2018.

Action: Plan for funding improvements to ensure Water Transmission System is maintained and reliable

2013 Immediate Action: Consult with Water Contractors to evaluate feasibility of base demand system instead of continued peak summer demand system.

Specific project was dependent on implementation of peak reduction measures such as conservation, reuse, local supplies and groundwater banking. Financial implications of base demand system will be evaluated as part of long-term financial modeling and rate study.

OUTCOME: Initial phases of study were completed, but subsequent phases have been put on hold due to the decline of annual and peak demands over past several years.

2013 Immediate Action: Evaluate alternative rate strategies

Evaluate alternative revenue models such as seasonal rates and fixed versus variable costs.

OUTCOME: A technical memo prepared and presented to TAC in 2013 outlining the alternative rate strategies based on interviews with the TAC ad hoc. Rate calculations are specified in the

Restructured Agreement for Water Supply, changes to the rate calculations may be included in a Restructured Agreement Update.

Strategy 3: Utilize regional planning to increase water supply resiliency

Action: Strengthen an integrated watershed management approach

Project: Integrate flood protection and storm water management strategies with sustainable groundwater management plans and low impact development standards

2013 Immediate Action: Develop countywide guidance manual and support the development of individual Water Smart Development (WSD) standards.

The goal of the countywide guidebook was to manage storm water quantity and quality while reducing potable water required by new development. The guidebook also partially addressed requirements of storm water permit jointly held by Sonoma Water, Sonoma County, and Santa Rosa.

A. Complete Countywide manual

OUTCOME: The Water Smart Development Guidebook was published in December 2013 covered three primary components: water conservation, water reuse and storm water management. The Guidebook was a reference to avoid and minimize potential water resource impacts from new development.

B. Support the development of WSD into local jurisdiction plans

OUTCOME: WSD Guidebook was developed and presented to local jurisdictions for their consideration. Project was terminated due to lack of interest by Sonoma County land use planning entities.

Project: Participate in integrated, multi-benefit water management plans and projects with conservation partners, including Storm Water Resource Management Plans

2013 Immediate Action: Identify projects that reduce flooding and increase groundwater recharge.

Determine appropriate projects in the Flood Control Zones to reduce flooding and increase groundwater recharge.

A. Scoping and Feasibility Studies

OUTCOME: Scoping studies were completed and stakeholder meetings were held to develop flood control project concepts to reduce flooding and increase groundwater recharge. This work led to the development of the Storm Water Resource Plans.

B. Seek funding for implementation of projects

OUTCOME: Following the development of project concepts, there was a successful grant application for the design of two detention basins. One located in Petaluma and the other in Rohnert Park.

2013 Near Term Action: Initiate efforts to obtain property rights for project sites identified in immediate actions.

Project Implementation

OUTCOME: Project partners were secured for design and construction of a detention basin in Rohnert Park and in Petaluma.

2013 Long Term Action: Design and construct multipurpose storm water detention facilities.

Design and Construction

OUTCOME: The Petaluma project is anticipated for completion in 2020. The Rohnert Park project reached 90% design and a construction date has not been set.

Strategy 5: Improve the Energy Efficiency of the Water Transmission System and Increase Renewable Power Use

Action: Reduce electricity costs

Project: Procure cost effective carbon free power to meet Sonoma Water electricity needs

2013 Immediate Action: Implement Farms to Fuels project.

Develop and implement Sonoma Water renewable energy generation projects.

OUTCOME: Project was deemed not cost effective and is no longer feasible.

2013 Immediate Action: Implement Sonoma County Efficiency Financing (SCEF) program to audit Sonoma Water pumping operations, wastewater treatment operations, and facilities for inefficiencies.

Develop and implement Sonoma Water energy efficiency projects.

OUTCOME: Audits occurred at Sonoma Water facilities in 2012 and findings deemed the project was not cost effective.

Action: Pursue regional collaboration to sequester carbon and reduce GHG emissions

Partner with local and regional organizations and agencies to implement carbon sequestration through improved land management, restoration, biochar, and/or other methods and implement feasible projects

2013 Immediate Action: Implement Sonoma Water's Energy Policy regarding development of programs and projects of regional benefit.

A. Community Choice Aggregation

OUTCOME: Sonoma Clean Power launched in 2014 providing clean energy from renewable resources—geothermal, water, wind, solar, and biomass—to residents and businesses throughout Sonoma and Mendocino counties.

B. Renewable Energy Secure Communities (RESCO)

OUTCOME: RESCO project developed a renewable energy portfolio for Sonoma County provided valuable information which assisted in the creation of Sonoma Clean Power.

C. Sonoma County Efficiency Financing (SCEF)

OUTCOME: SCEF, a program designed to bundle large energy efficiency projects for local governments and non-profits, was evaluated for our region and it was determined there was not enough interest to launch program.

D. Solar at Sonoma County Airport

OUTCOME: An airport solar project was deemed not cost effective.

E. Sonoma County Energy Independence Program (SCEIP)

OUTCOME: Successful launch and implementation of SCEIP resulted in a County program which continues to reduce energy and water use.

Strategy 6: Increase emergency preparation and improve response to natural disasters

Action: Update Local Hazard Mitigation Plan (LHMP) and implement natural hazard mitigation projects

Project: Implement projects to mitigate highest natural hazard risks

2013 Immediate Action: In consultation with Water Contractors, develop plan to provide consistent funding for natural hazard and operational reliability capital projects.

A. Rodgers Creek Fault crossing mitigation

OUTCOME: Project was successfully completed in 2013.

B. Isolation valves

OUTCOME: The highest priority valves were replaced utilizing FEMA funding with completion in 2018.

C. River Diversion System liquefaction mitigation

OUTCOME: Seismic ground improvements at the RDS and fish screen/ladder were completed in 2014.

Action: Improve emergency management implementation skills

Project: Continue multi-agency and multi-jurisdictional planning, outreach and training activities, and include partner agencies in field-level training with water contractors

2013 Immediate Action: Pursue ISO 9000 and 14000 certification

ISO 9001 and 14001 was pursued to assure a program of constant improvement in Sonoma Water's quality of work and environmental management.

OUTCOME: Pursuit of ISO certification lead to an updated and revised emergency disaster preparedness program. The draft Emergency Response Plan is due for completion in early 2019.

Appendix 2: Summary of Completed, Immediate, and Near Term Activities

Strategy 1: Protect drinking water supply and promote water-use efficiency							
Action	Project	Activity	Completed	Ongoing	Reprioritized	New	
Increase the water supply reliability of Lake Mendocino and Lake Sonoma	Support Forecast Informed Reservoir Operations research and implementation	FIRO technical studies, final viability assessment, major deviation demonstrations		X			
		Frost and Heat Event Forecast Demonstration Project	X				
		Water Supply Reliability Analysis	X				
		Formation of a Science Panel	X				
	Complete and implement actions to establish new hydrologic index	Modeling and development of new hydrologic index	X				
		Implement new hydrologic index with Fish Flow Project		X			
	Continue to monitor and evaluate issues related to the reliability of Lake Mendocino	Facilitate quarterly upper river water managers meeting			X		X
		Evaluate and publish the Russian River Valley's future risk to drought					X
	Monitor and participate in PG&E's PVP hydroelectric relicensing process	Engage in PVP re-licensing proceeding			X		
		Participate in PVP Ad Hoc Committee					X
	Continue quagga mussel quarantine program and pursue funding for monitoring	Pursue funding for ongoing inspections at Lake Sonoma and Lake Mendocino			X		X
	Ensure compliance with the Russian River Biological Opinion	Estuary Adaptive Management	Modify estuary management program		X		
Habitat Enhancement Resulting in Adequate Dry Creek Flows		Mile 1 of Dry Creek Demonstration Project	X				
		Development of success measures	X				
		Tributary Restoration	X				
		Build enhanced fish barrier passage facilities at intake for infiltration ponds	X				
		Construct Miles Two and Three of Dry Creek Habitat enhancement			X		
		Construct Miles Four, Five and Six of Dry Creek Habitat enhancement				X	
Fish Habitat Flows and Water Rights Project EIR		Prepare EIR to modify Decision 1610			X		
Continue to implement the RPA for the Russian River Biological Opinion		Develop contingency plan for funding and construction of Dry Creek bypass pipeline			X		
	Conduct engineering and water quality analysis for Dry Creek bypass pipeline						

Strategy 1: Protect drinking water supply and promote water-use efficiency

Action	Project	Activity	Completed	Ongoing	Reprioritized	New
Support science-based management of groundwater and surface water resources	Support the implementation of the Sustainable Groundwater Management Act	Implement Sonoma Valley Groundwater Management Plan	X			
		Develop groundwater management plan for the Santa Rosa Plain	X			
		Participate in and support Sonoma Valley GSA		X		X
		Participate in and support Santa Rosa Plain GSA		X		X
		Participate in and support Petaluma Valley GSA		X		X
		Implement CASGEM program		X		
	Support the continued evaluation of conjunctive water use	Groundwater Banking Feasibility Study	X			
		Implement Aquifer Storage and Recovery Pilot Studies		X		X
		Russian River Science Forum		X		X
		Continue to evaluate the capacity and performance of the riverbank filtration system	Research surface water/groundwater interaction		X	
Monitor and protect Sonoma Water's water rights	Maintain reliability of Sonoma Water's water rights	Submit annual interim change petitions		X		
		Prepare annual water rights reports		X		
	Continue monitoring water rights-related activities in the watershed that could affect Sonoma Water's water rights	Monitor and track water right holders on the Russian River		X		
Improve the efficient use of water in Sonoma Water's service area	Increase recycled water storage, distribution, and use	Pursue expansion of recycled water		X		
	Monitor and prevent water loss	Leak detection pilot w/ IBM	X			
		Extension of AMI demonstration project	X			
		Operational tool to assess near real time meter zone water balance		X		X
		Support Water Contractors in implementation of Water Loss Management Reporting		X		X
		Track state regulations for wholesaler water supplier water loss reporting		X		X
	Continue to promote water-use efficiency and the Sonoma-Marin Saving Water Partnership through outreach and education	Outreach and Education		X		

Strategy 2: Maintain and improve the reliability of the Water Transmission System

Action	Project	Activity	Completed	Ongoing	Reprioritized	New	
Assess, maintain and upgrade Water Transmission System infrastructure	Assessment of our collector well capacities	Evaluate performance and condition of collector wells		X			
	Evaluate condition of Water Transmission system aqueducts particularly in areas with limited accessibility	Develop implementation plan for pipeline assessment		X			
		Implement condition assessment			X		X
	Develop a plan and schedule for replacing inflatable rubber dam	Mirabel dam bladder replacement		X			
	Identify and replace obsolete water transmission system equipment, hardware, and software	Continue planning new transmission system projects			X		
		SCADA upgrade			X		X
		Develop and maintain a prioritized system equipment replacement/ upgrade list, 5-yr CIP priority list and the LRFP			X		X
	Evaluate and construct operational reliability and preventative maintenance projects	System wide in-line meter replacements		X			
		Reservoir Recoat Program			X		
		Petaluma Aqueduct Cathodic Protection Upgrade			X		
		Santa Rosa Aqueduct Cathodic Protection Upgrade			X		
		Upgrade Sonoma Booster Pump Station			X		
		Wilfred Booster Station Electrical Upgrade			X		X
		Mirabel Infiltration Pond Fishery Improvements			X		X
		Mirabel Infiltration Ponds Rehabilitation			X		
	Improve efficiency in managing the water metering system including full implementation of AMI	Ralphine Tanks flow-through conversion			X	X	
		Implement AMI			X		
Evaluate opportunities at Mirabel/Wohler facility to develop alternate diversion system on existing footprint that provides greater flexibility to divert	Develop Meter Master Plan			X		X	
	Initial planning for refined hydrogeologic characterization/modeling			X			
Plan for funding improvements to ensure Water Transmission System is maintained and reliable	Develop Asset Management Program	Develop an asset management program to manage facility infrastructure and document control		X		X	
	Continued Refinement of Long Term Financial Plan to Support Water Supply Planning and Budgeting	Evaluate alternative rate strategies	X				
		Evaluate feasibility of base demand system	X				
	Conduct long-term financial analysis			X			

Strategy 3: Utilize regional planning to increase water supply resiliency

Action	Project	Activity	Completed	Ongoing	Reprioritized	New	
Strengthen an integrated watershed management approach	Update and maintain Integrated Regional Water Management Plans (IRWMP)	Participate in two regional IRWMPs		X			
	Update and maintain the Urban Water Management Plans (UWMP)	Prepare UWMP every 5 years		X			
	Support implementation of the Sustainable Groundwater Management Agencies (SGMA)		Support administration of GSAs and development of GSPs		X		X
			Comply with SGMA in three new basins if finalized		X		X
			Participate in TAC to Ukiah Valley GSA		X		X
	Support and strengthen partnerships with Water Contractors and community		Continue ongoing collaboration and input		X		
	Continue to collaborate on Russian River Integrated Watershed Modeling		Develop integrated surface water- groundwater model coupled with water demand/ reservoir routing model		X		
	Work with Water Contractors to reduce peak demand on transmission system via conservation, groundwater banking, local supply, and recycled water		Reduction of peak demand		X		
			Local supply projects provided by the Water Contractors		X		X
			Recycled water projects provided by the Water Contractors		X		X
	Develop a water shortage resiliency plan		Update Water Shortage Allocation methodology		X		
	Conduct assessment of local and sub-regional projects in conjunction with Sonoma Water projects		Compare actual gross demand with UWMP		X		
	Participate in integrated, multi-benefit water management plans and projects with conservation partners, including Storm Water Resource Management Plans		Identify projects that reduce flooding and increase groundwater recharge	X			
			Initiate efforts to obtain property rights for project sites	X			
			Design and construct multipurpose storm water detention facilities	X			
			Maintain website providing real-time rainfall, river-stream and reservoir data.		X		X
			Storm Water Management Plans (SWRPs)		X		X
	Integrate flood protection and storm water management strategies with sustainable groundwater management plans and low impact development standards		Countywide manual	X			
			Local jurisdiction plans	X			
			Improve hydrometeorological forecasting		X		
Coordinate GSAs and Storm Water Resource Plans				X			

Strategy 4: Respond and adapt to climate change

Action	Project	Activity	Completed	Ongoing	Reprioritized	New
Invest in climate science and technology	Work with federal and state partners such as the United States Geological Survey, Scripps Institution of Oceanography, and National Oceanic and Atmospheric Administration to develop climate models for floods and droughts	Support development of Hydrometeorology Test bed for the Russian River basin		X		
	Incorporate downscaled climate models into surface and groundwater models	Incorporate predictive model with ResSim and to Sonoma Valley and Santa Rosa Plain groundwater models		X		
	Assess potential impacts to water quality and hydrology from wildfires in the Russian River Watershed	Quantify watershed response to wildfires		X		X
		FireSmart Lake Sonoma		X		X
Evaluate climate risk and vulnerabilities to our operations and infrastructure	Asses regional opportunities to increase resiliency	Develop a decision support tool for regional planning of interconnected water systems				X
		Facilitate construction of a network of high-definition wildfire cameras		X		X
	Assess climate risks/vulnerabilities and identify adaptation strategies	Climate Adaptation Plan		X		X
Implement climate adaptation strategies	Incorporate climate adaptation projects into LHMP	Incorporate Climate Adaptation Plan initiatives into LHMP		X		X
Participate in and form collaborative partnerships focused on climate science and adaptation	Continue to participate in the North Bay Climate Ready Program and NBCAI and coordinate with RCPA	Ongoing collaboration		X		X
	Continue to participate in the Partnership for Resilience and Preparedness	Refine Sonoma County Climate Resiliency Dashboard		X		X
	Work with Groundwater Sustainability Agencies to evaluate climate change impacts to groundwater	Incorporate downscaled Global-climate models (GCMs) into model simulations for GSPs		X		

Strategy 5: Improve the Energy Efficiency of the Water Transmission System and Increase Renewable Power Use

Action	Project	Activity	Completed	Ongoing	Reprioritized	New
Reduce electricity costs	Procure cost effective carbon free power to meet Sonoma Water electricity needs	Implement Sonoma County Efficiency Financing (SCEF) program	X			
		Implement Farms to Fuels project	X			
		Explore other locally available renewable energy potential		X		
		Implement Floating Solar				X
		Refine Solar Assets				X
	Explore energy load shifting and energy storage opportunities to reduce net power consumption and costs	Load Shifting				X
		Energy Storage				X
Pursue regional collaboration to sequester carbon and reduce GHG emissions	Assist Sonoma Clean Power in developing and creating water and energy efficiency and renewable energy programs	SMSWP, Water Ed and Energy Resources collaborate with SCP		X		X
	Partner with local and regional organizations and agencies to implement carbon sequestration through improved land management, restoration, biochar, and/or other methods and implement feasible projects	Implement Community Choice Aggregation	X			
		Implement Renewable Energy Secure Communities	X			
		Implement Sonoma County Efficiency Financing (SCEF) program	X			
		Solar at Sonoma County Airport	X			
		SCEIP Support	X			
		Sonoma County Biochar Demonstration Project				X
	Begin exploring what it would take to achieve Carbon Negative Water	Voluntarily report carbon emissions to TCR			X	
		Register Renewable Energy Credits with WREGIS			X	
		Participate in the development of the Water Energy Nexus Registry				X

Strategy 6: Increase emergency preparation and improve response to natural disasters

Action	Project	Activity	Completed	Ongoing	Reprioritized	New	
Update or create critical emergency preparedness planning documents	Develop a system to provide critical information on location, timing and intensity of expected rainfall.	Advanced Quantitative Precipitation Information system (AQPI) Implementation		X		X	
	Update Emergency Operations Plan (EOP)	Revise and update planned response to all hazards		X			
	Update existing emergency response and action plans regarding releases of pollutants into the Russian River that could impact water supply operations	Source and Treated Water Contamination Response Plan			X		
		Participate in collaborative petroleum response pilot project					X
Update Local Hazard Mitigation Plan (LHMP) and implement natural hazard mitigation projects	Regularly update LHMP	5-year LHMP Update		X			
	Implement projects to mitigate highest natural hazard risks	Isolation valves		X			
		River Diversion System liquefaction mitigation		X			
		Rodgers Creek Fault crossing mitigation		X			
		Wohler/Mirabel Liquefaction Mitigation			X		
		Russian River Crossing			X		
		Santa Rosa Creek Crossing (Santa Rosa Aqueduct)			X		
		Mark West Creek Crossing			X		
		Bennett Valley Fault Crossing (Sonoma Aqueduct)			X		
		Petaluma River Crossing (Petaluma Aqueduct)			X		
		Sonoma Creek Crossing (Lawndale/Madrone)			X		
		Sonoma Creek Crossing (Verano Ave)			X		
		Calabastas Creek Crossing			X		
Improve emergency management implementation skills	Continue multi-agency and multi-jurisdictional planning, outreach and training activities, and include partner agencies in field-level training with water contractors	Pursue ISO 9000 and 14000 certification	X				
		Annual emergency drills and exercises		X			

Strategy 7: Seek federal and state funding

Action	Project	Activity	Completed	Ongoing	Reprioritized	New
Proactively pursue sustainable funding to support water supply projects and programs to offset impacts to ratepayers	Implementation of the Sustainable Groundwater Management Act Funding	Pursue SGMA implementation grant funding		X		
		Support establishment of fair and equitable funding sources for GSA activities		X		
	Identify and secure federal, state, and grant funding for implementing water use efficiency projects	Pursue grant funding to offset current regional SMSWP programs		X		
	Procure funding to mitigate highest natural hazard risks, implement water supply operational reliability and preventative maintenance projects	Advocate for funding of projects and initiatives that improve planning and reliability		X		
		Advocate for infrastructure projects, LHMP and pre- disaster mitigation funding		X		
		Biannual discussions on legislative activities at WAC and Tac meetings		X		
	Identify and secure federal, state, and grant funding for implementation of Russian River Biological Opinion	Pursue funding for studies and projects required by the Biological Opinion		X		
	Pursue grant funding for emergency preparedness	Advocate for emergency preparedness funding		X		

Appendix 3: Long Range Financial Plan Project List FY 18-19

Project Name	Category	% of Project	Total Project Cost (2018 Dollars)						Project Cost	Construc - tion	Active
			Common	Storage	Santa Rosa	Petaluma	Sonoma	North Marin	Totals	FY Start	
Petaluma Aqueduct Cathodic Protection - O&M	Haz Mitigation / Reliability	100.00%	1,670,000	0	0	0	0	0	1,670,000	2018	Yes
System-wide Meter Replacements - O&M	Regulatory	100.00%	230,000	0	0	0	0	0	230,000	2018	Yes
Mirabel Chlorine Lines Replacement		100.00%	360,000	0	0	0	0	0	360,000	2018	Yes
Wohler Motor Replacements (Collectors 1&2)		100.00%	1,000,000	0	0	0	0	0	1,000,000	2018	Yes
Local Hazard Mitigation (LHM) Program Design - Common	Haz Mitigation / Reliability	100.00%	100,000	0	0	0	0	0	100,000	2018	Yes
Local Hazard Mitigation (LHM) Program Design - Storage	Haz Mitigation / Reliability	100.00%	0	50,000	0	0	0	0	50,000	2018	Yes
Local Hazard Mitigation (LHM) Program Design - SR Aq	Haz Mitigation / Reliability	100.00%	0	0	120,000	0	0	0	120,000	2018	Yes
Local Hazard Mitigation (LHM) Program Design - Pet. Aq	Haz Mitigation / Reliability	100.00%	0	0	0	160,000	0	0	160,000	2018	Yes
Local Hazard Mitigation (LHM) Program Design - Son. Aq	Haz Mitigation / Reliability	100.00%	0	0	0	0	170,000	0	170,000	2018	Yes
Russian River Embankment Repair (Riverfront Park)		100.00%	1,360,000	0	0	0	0	0	1,360,000	2018	Yes
Wohler Access Road Retaining Wall		100.00%	285,000	0	0	0	0	0	285,000	2018	Yes
WTS Equipment Storage Building	Haz Mitigation / Reliability	100.00%	378,500	0	0	0	0	0	378,500	2018	Yes
Russian River Crossing - net of \$2.9 from FEMA	Haz Mitigation / Reliability	0.00%	3,725,700	0	0	0	0	0	3,725,700	2019	Yes
Mark West Creek Crossing - net \$2.8 from FEMA	Haz Mitigation / Reliability	0.00%	1,785,375	0	0	0	0	0	1,785,375	2019	Yes
Ralphine Tanks - Flow Thru Conversion	Haz Mitigation / Reliability	0.00%	0	1,483,790	0	0	0	0	1,483,790	2019	Yes
Forestville Tanks - Exterior Recoat - O&M	Haz Mitigation / Reliability	23.02%	1,125,000	0	0	0	0	0	1,125,000	2019	Yes
Ely BPS Flood Control and Electrical Upgrade	Haz Mitigation / Reliability	82.76%	0	0	580,000	0	0	0	580,000	2019	Yes
SCADA software and hardware		47.73%	750,000	0	0	0	0	0	750,000	2019	Yes
SCADA Upgrade		50.00%	1,250,000	0	0	0	0	0	1,250,000	2019	Yes
Caisson 5 Motor & Discharge Head Replacements		0.00%	500,000	0	0	0	0	0	500,000	2019	Yes
Mirabel Chlorine Building Water Line		40.00%	250,000	0	0	0	0	0	250,000	2019	Yes
Mirabel Dam Bladder Replacement		89.41%	4,734,576	0	0	0	0	0	4,734,576	2019	Yes
pH Pump Replacement		100.00%	305,000	0	0	0	0	0	305,000	2019	Yes
RDS Pump Replacement		36.56%	506,000	0	0	0	0	0	506,000	2019	Yes
RDS MCC Replacement		82.71%	538,000	0	0	0	0	0	538,000	2019	Yes
Warm Springs Dam Hydroturbine Retrofit	Efficiency	65.08%	1,790,000	0	0	0	0	0	1,790,000	2019	Yes
Wilfred Booster Station		92.62%	0	0	0	745,000	0	0	745,000	2019	Yes
Santa Rosa Creek Crossing - net of \$3M FEMA grant (pending)	Haz Mitigation / Reliability	76.27%	0	0	4,853,923	0	0	0	4,853,923	2020	Yes
Sonoma Booster Pump Station Upgrade	Haz Mitigation / Reliability	82.90%	0	0	0	0	4,704,296	0	4,704,296	2020	Yes
Kastania Tank Recoat - O&M	Haz Mitigation / Reliability	80.18%	3,349,979	0	0	0	0	0	3,349,979	2020	Yes
Mirabel Surge Tanks	Haz Mitigation / Reliability	98.88%	2,543,385	0	0	0	0	0	2,543,385	2020	Yes
Mirabel - River Road Fiber Optic Line	Haz Mitigation / Reliability	29.15%	686,000	0	0	0	0	0	686,000	2020	Yes
Caisson 6 Valve Replacement and Vault		100.00%	305,000	0	0	0	0	0	305,000	2020	Yes
Mirabel Maintenance Building		77.27%	550,000	0	0	0	0	0	550,000	2020	Yes
Non-recurring Maintenance Projects - Phase 1		33.33%	5,306,435	0	0	0	0	0	5,306,435	2020	Yes
Wohler Road Fiber Optic Cable		24.64%	276,000	0	0	0	0	0	276,000	2020	Yes
Santa Rosa/RR-Cotati Aqueducts Cathodic Protection	Haz Mitigation / Reliability	81.84%	5,095,000	0	0	0	0	0	5,095,000	2020	Yes
Mainline Valve at Vinehill Ranch		100.00%	356,000	0	0	0	0	0	356,000	2020	Yes
Wohler-Forestville Pipeline Throttling Valve		100.00%	240,000	0	0	0	0	0	240,000	2020	Yes
Mainline Valve at Jennings		91.67%	600,000	0	0	0	0	0	600,000	2020	Yes
Marin Sonoma Narrows (MSN) Segment C-2		86.21%	0	0	0	5,800,000	0	0	5,800,000	2020	Yes
River Diversion Structure Liquefaction Mitigation - structural	Haz Mitigation / Reliability	84.51%	3,875,091	0	0	0	0	0	3,875,091	2021	Yes
Collectors 3 and 5 Liquefaction Mitigation	Haz Mitigation / Reliability	93.22%	11,795,000	0	0	0	0	0	11,795,000	2021	Yes
Dry Creek Habitat Enhancement (Corps) Mile 4 - net of Corps	Biological Opinion	74.24%	6,075,000	0	0	0	0	0	6,075,000	2021	Yes
Cotati 3 Tank Recoat - O&M	Haz Mitigation / Reliability	95.29%	4,775,000	0	0	0	0	0	4,775,000	2021	Yes

Project Name	Category	% of Project	Total Project Cost (2018 Dollars)						Project Cost	Construction	Active
			Common	Storage	Santa Rosa	Petaluma	Sonoma	North Marin	Totals	FY Start	
Petaluma River Crossing (Petaluma Aq)	Haz Mitigation / Reliability	83.64%	0	0	0	6,080,290	0	0	6,080,290	2022	Yes
Calabasas Creek Crossing	Haz Mitigation / Reliability	78.00%	0	0	0	0	3,266,663	0	3,266,663	2022	Yes
Dry Creek Habitat Enhancement (Corps) Mile 5 - net of Corps	Biological Opinion	79.28%	6,105,000	0	0	0	0	0	6,105,000	2022	Yes
Ralphine Tank 2 Recoat		95.17%	1,760,000	0	0	0	0	0	1,760,000	2022	Yes
Collector 6 Liquefaction Mitigation	Haz Mitigation / Reliability	84.01%	6,315,000	0	0	0	0	0	6,315,000	2023	Yes
Bennett Valley Fault Crossing (Son. Aq - Oakmont Pipe)	Haz Mitigation / Reliability	80.00%		2,444,293	0	0	2,444,293	0	4,888,586	2023	Yes
Dry Creek Habitat Enhancement (Corps) Mile 6 - net of Corps	Biological Opinion	61.94%	4,440,000	0	0	0	0	0	4,440,000	2023	Yes
Tank Recoating Program		100.00%	28,000,000	0	0	0	0	0	28,000,000	2023	Yes
Kawana-Ralphine-SBS Pipeline, Phase 1	Capacity / CIP Planning	90.99%	0	6,105,000	0	0	0	0	6,105,000	2024	Yes
Cotati-Kastania Pipeline Section 1(Cotati to EBS)	Capacity / CIP Planning	90.33%	16,135,485	0	0	26,403,521	0	6,356,404	48,895,410	2024	Yes
Sonoma Creek Crossing (Verano Ave)	Haz Mitigation / Reliability	78.00%	0	0	0	0	3,266,663	0	3,266,663	2024	Yes
Kawana-Ralphine-SBS Pipeline, Phase 2		98.61%		41,040,000	0	0	0	0	41,040,000	2024	Yes
Dry Creek Bypass Pipeline	Capacity / CIP Planning	89.97%	152,098,857	0	0	0	0	26,840,975	178,939,832	2025	No
Russian River Wellfield Upgrade (Optimization)	Capacity / CIP Planning	89.60%	3,589,149	0	0	0	0	683,646	4,272,795	2025	No
Non-recurring Maintenance Projects - Phase 2		20.00%	8,844,058	0	0	0	0	0	8,844,058	2025	Yes
Cotati-Kastania Pipeline Sections 2 (EBS to Kastania)	Capacity / CIP Planning	90.00%	32,771,162	0	0	53,625,538	0	12,909,852	99,306,552	2029	No
Emergency Wells (Hazard Reliability Water Supply)	Haz Mitigation / Reliability	80.00%	5,909,798	0	0	0	0	0	5,909,798	2030	Yes
Water Production Facility (Mirabel/Wohler Wells)	Capacity / CIP Planning	89.44%	13,287,060	0	0	0	0	2,549,722	15,836,782	2030	No
Non-recurring Maintenance Projects - Phase 3		20.00%	8,844,058	0	0	0	0	0	8,844,058	2030	Yes
Non-recurring Maintenance Projects - Phase 4		20.00%	8,844,058	0	0	0	0	0	8,844,058	2035	Yes
Central Reliability Booster Pump Station (Design TDH: 35')	Capacity / CIP Planning	3.05%	0	3,423,463	0	0	0	0	3,423,463	2040	No
Santa Rosa Aqueduct Replacement		TBD			TBD				TBD	TBD	No
Petaluma Aqueduct Replacement		TBD				TBD		TBD	TBD	TBD	No
Sonoma Aqueduct Replacement		TBD					TBD		TBD	TBD	No
Local Hazard Mitigation Projects	Haz Mitigation / Reliability	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No
			365,414,726	54,546,546	4,973,923	93,394,349	15,811,91	49,340,599	583,482,056		

Appendix 4: Water Contractor Local Supply and Recycled Water Projects

Entity	Project	Status	Initiated	Estimated Completion	Water Supply?	Reliability?	Notes	Potential Constraints
Rohnert Park	Groundwater Wells Replacement and Upgrade	Conceptual	2013	2035		Yes		Funding
Rohnert Park	Groundwater Banking	Conceptual	2011	TBD			Requires GSA leadership	Technical Feasibility
Rohnert Park	Recycled Water System Expansion	Design/Construction	2012	2030	Yes	Yes	System transferred from Santa Rosa to Rohnert Park in 2015. Extensions to serve University District and Southeast SPA complete	Timing of Development
Rohnert Park	Gravity Water Tank 8	Design/Construction	2016	2019		Yes	In construction	None
Rohnert Park	Gravity Water Tank 9	Conceptual	2022	2025		Yes	Shares site with Tank 8	Timing of Development
Rohnert Park	Multi-Benefit Stormwater Basin - Copeland Watershed	Design/Construction	2010	2022	Yes	Yes	Completed DWR grant funded study with Agency. Design optimization underway	Financial Feasibility
Rohnert Park	Multi-Benefit Stormwater Basin - Hinebaugh/Crane Watersheds	Conceptual	2020	2035	Yes	Yes	Supports Northeast SPA	Technical and Financial Feasibility
Windsor	Off River Wells Water Supply Phase 1	Feasibility	2014	2020	Yes	Yes		Funding
Windsor	Off River Wells Water Supply Phase 2	Conceptual	2014	2024	Yes	Yes		Funding
Windsor	Recycled Water Expansion	Conceptual	2011	2025	Yes	Yes		Funding
Santa Rosa	Phase 1 West Recycled Water Project	Feasibility	2020	2025	Yes			Financial
North Marin	AMI Full Scale Deployment	Design/Construction	2017	2019	Yes			None
North Marin	Stafford Lake Sediment Survey	Feasibility	2021	2022	Yes	Yes		Financing
North Marin	Aqueduct Energy Efficiency Project	Design/Construction	2011	2015		Yes		Financing/Caltrans
North Marin	Central Recycled Water Project	Design/Construction	2017	2018	Yes	Yes		
Cotati	Well 4	Conceptual	2011	2035	Yes	Yes		None
Cotati	Cypress Storage tank and Booster Station	Design/Construction	2011	2022		Yes		None
Cotati	Recycled Water to Thomas Page School	Conceptual	2012	2026	Yes	Yes		None
Cotati	Groundwater Banking Project	Feasibility	2010	2030	Yes	Yes		Feasibility
Marin Municipal	33 San Pablo Recycled Water Project	Design/Construction	2008	2012				None
Marin Municipal	Las Gallinas RW Facility Expansion	Design/Construction	2016	2020	Yes	Yes		None
Petaluma	Recycled Water Area A			2015				None
Petaluma	Recycled Water Area C			TBD				None
Petaluma	Recycled Water Area E			TBD				None
Petaluma	Recycled Water Area G			TBD				None
City of Sonoma	SDC Conjunctive Use	Feasibility	2017	2025	Yes	Yes		Agreement
City of Sonoma	SCWA Russian River Water Rights Diversion Increase	Feasibility	2015	2035	Yes	Yes		Environmental
City of Sonoma	Groundwater Well #9 (replacement of existing well)	Conceptual	2024	2027		Yes		CEQA and Financial
City of Sonoma	Groundwater Well #10 (replacement of existing well)	Conceptual	2026	2029		Yes		CEQA and Financial
City of Sonoma	Sonoma Valley Recycled Water Project		2025	2035	Yes	Yes		
City of Sonoma	Advanced Metering Infrastructure	Feasibility	2018	2021	Yes	Yes		
VOMWD	SDC Conjunctive Use	Feasibility	2017	2025	Yes	Yes		Agreement
VOMWD	Additional Ground Water Wells	Design/Construction	2017	2020	Yes	Yes		Feasibility

Entity	Project	Status	Initiated	Estimated Completion	Water Supply?	Reliability?	Notes	Potential Constraints
VOMWD	Work with GSA to get nearby vineyards on Recycled Water	Conceptual	2016	2035	Yes	Yes		Feasibility
VOMWD	SCWA Russian River Water Rights Diversion Increase	Feasibility	2015	2035	Yes	Yes		Environmental
VOMWD	Advanced Metering Infrastructure and consumer Engagement Portal	Design/Construction	2015	2020	Yes	No		
VOMWD	Additional Storage In Glen Ellen	Feasibility	2020	2025		Yes		CEQA and Financial
VOMWD	Emergency Backup Generators	Design/Construction	2018	2020		Yes		