

CITY OF SANTA ROSA  
CITY COUNCIL

TO: MAYOR AND CITY COUNCIL  
FROM: JENNIFER BURKE, DIRECTOR, SANTA ROSA WATER  
SUBJECT: INITIAL STUDY RESULTS FOR WATER SUPPLY ALTERNATIVES  
PLAN

AGENDA ACTION: STUDY SESSION

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RECOMMENDATION

It is recommended by Santa Rosa Water that the City Council hold a Study Session to receive information, discuss, and provide input on the initial water supply analysis and portfolio options prior to development of the Water Supply Alternatives Plan.

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EXECUTIVE SUMMARY

The City of Santa Rosa (City) wishes to diversify and increase its potable urban water supply portfolio to enhance its resiliency to climate change, droughts, or Sonoma Water service interruptions that could occur in catastrophic events. As a result, Santa Rosa Water launched the Our Water Future project in May of 2022 and undertook development of a Water Supply Alternatives Plan (WSAP) in September 2022 to identify an adaptive approach to diversifying Santa Rosa's water supply portfolio and production capacity over time. This project has included significant efforts to engage and solicit input from a wide range of stakeholders throughout the effort, including an interdisciplinary team of Water staff, an external Stakeholder Group comprised of leaders from a wide range of local organizations and agencies, the community, and the Board of Public Utilities (BPU). After working with stakeholders to establish a resiliency goal and list of potential supply options, a feasibility analysis of 18 water supply sources was completed. Four portfolios (mixes) of the most feasible water supply options were developed with stakeholder input to propose alternative strategies for increasing water supply resiliency. Staff and the consulting team will present project background, purpose, goals, study approach, initial findings, and the draft portfolios to the Council for input. By planning for water supply reliability and resiliency to mitigate the impacts of climate change and catastrophic events, this project advances Council Goal #5 *Build and Maintain Sustainable Infrastructure* and Council Goal #7 *Address Climate Change*.

BACKGROUND

Santa Rosa can meet approximately seven percent of its annual urban demand for potable water using city wells and recycled water and relies on Sonoma Water, our water wholesaler, to provide the remaining 93 percent of potable supply for urban customers. As a result of this dependency, if Sonoma Water has a supply shortage or an interruption in service, Santa Rosa's public water system will have a water supply shortage.

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In the past 20 years the region has experienced three droughts, and each time Santa Rosa has declared a water shortage and required its customers to reduce potable water use by 20 percent. Climate change models predict regional droughts will become more severe (hotter, drier, longer) and/or occur with more frequency. Given these realities, Santa Rosa Water wishes to increase both the diversity and production capacity of its urban potable water supply portfolio.

As a result, Santa Rosa Water launched the Our Water Future project in May of 2022 and undertook development of a Water Supply Alternatives Plan (WSAP) in September 2022 to identify an adaptive approach to diversifying Santa Rosa's water supply portfolio and production capacity over time. The WSAP will provide a variety of water supply portfolios for the City to consider when planning future strategic investments and projects for increasing water supply resiliency and reliability. The WSAP will not be a prescriptive document, but rather an adaptive guide for Santa Rosa Water to use for water supply resiliency and infrastructure planning for Santa Rosa's future.

#### PRIOR CITY COUNCIL REVIEW

Not applicable.

#### ANALYSIS

The purpose of the Our Water Future effort is to improve water supply reliability to reduce the impacts of severe droughts, climate change, and catastrophic events that could interrupt service delivery from Sonoma Water. The project scope of work includes engaging input from a wide range of interests, setting study objectives, studying water supply options, developing portfolios (mixes) of feasible water supply options, and developing an adaptive plan for achieving the water supply resiliency goal.

#### **Community Engagement**

This project has included significant efforts to engage and solicit input from a wide range of stakeholders, including an interdisciplinary team of Water staff (Water Team), an external Stakeholder Group representing a wide range of local interests, the community, and the BPU.

The external Stakeholder Group included leaders of organizations and agencies from the following sectors: business and economy, climate change and environmental protection, community service and social justice, natural resources, and regional recycled water users. The Stakeholder Group participated in 4 three-hour working sessions to learn about the project concept, purpose, scope of work, timeline, and progress, and to provide input on the water supply resiliency goal, water supply options, evaluation criteria, initial study analysis, four draft portfolios, and an early review draft of the Water Supply Alternatives Plan. One of the participants, local dairy farmer and recycled water user Doug Beretta, published an article about his experience participating as a member of the Stakeholder Group (see Attachment 3).

The list of participating agencies and organizations include the following:

1. Calpine
2. Community Action Partnership
3. Los Cien Sonoma County
4. NAACP Santa Rosa
5. North Bay Black Chamber of Commerce
6. North Coast Builders Exchange
7. Recycled Water User – Agriculture
8. Recycled Water User – Municipal

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| 9. RED Housing Fund                          | 14. Santa Rosa Plain Groundwater Sustainability Agency  |
| 10. Regional Climate Protection Authority    | 15. Santa Rosa Subregional Technical Advisory Committee |
| 11. Russian River Watershed Association      | 16. Sonoma Clean Power                                  |
| 12. Russian River Water Protection Committee | 17. Sonoma County Alliance                              |
| 13. Santa Rosa Metro Chamber of Commerce     | 18. Sonoma Resource Conservation District               |
|  | 19. Sonoma Water  |

The community was invited to participate in 4 two-hour interactive community meetings held via Zoom from November of 2022 through August of 2023. The meetings were promoted with bill inserts to water customers, announcements in the City's electronic newsletter, public meetings, City webpage ([srcity.org/OurWaterFuture](http://srcity.org/OurWaterFuture)), and presentations at community organizations and events. The community had opportunities to ask questions and provide feedback on the water supply resiliency goal, list of water supply options, evaluation criteria, feasibility analysis, and the draft portfolios.

From October of 2022 through September of 2023, staff solicited additional public input through presentations at General Plan open house events, Subregional Technical Advisory Committee meetings, committee and general membership meetings of the Sonoma County Alliance, Advocacy Committee meeting of the Santa Rosa Metro Chamber, the Advisory Committee of the Santa Rosa Plain Groundwater Sustainability Agency, and presentations to and study sessions with the Board of Public Utilities.

### Objectives

Goal: The first step was to establish a water supply resiliency and reliability goal for Santa Rosa's future. Discussions with the Water Team, Stakeholder Group, community, and BPU yielded the goal of diversifying and increasing Santa Rosa's potable water supplies to reduce dependence on Sonoma Water to mitigate the impacts of supply shortages due to droughts or disruptions in service. New supplies would augment existing City groundwater production capacity to achieve these targets:

### Water Supply Resiliency Targets

Mitigating Droughts	Mitigating Natural Disasters & Catastrophic Events	Mitigating Peak Day Demand
<p>Meet 30% of City's water demand with municipal supplies to mitigate impacts of Russian River supply shortages (e.g., due to prolonged and/or severe drought).</p> <p>Based on current City demand projections, the volume of water required to meet this is 7,500 acre-feet per year (AFY) by 2045.</p>	<p>Provide 50% of normal domestic/indoor demand for potable water with municipal supplies during Russian River supply disruption.</p> <p>Based on current City demand projections, the volume of water required to meet this is 9 million gallons per day (MGD) by 2045.</p>	<p>Meet 30 percent of peak month average day demand for potable water with municipal supplies.</p> <p>Based on current City demand projections, the volume of water required to meet this is 9 MGD by 2045.</p>

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Water Supply Options: A list of 18 water supply options was compiled based on input from the Water Team, Stakeholder Group, community, and BPU. The final list of supply options includes a range of water sources and strategies for sustainably producing water from groundwater, purified recycled water, non-potable recycled water, desalinated water, stormwater, and aggressive water efficiency programs. The list of 18 options is briefly summarized below.

### Water Supply Options

Supply Type	Supply Option Name
Groundwater	GW-1: Construct Additional Groundwater Extraction Wells GW-2: Convert Emergency Wells to Production Wells GW-3: Construct Aquifer Storage and Recovery (ASR) Wells GW-4: Construct Regional Groundwater Extraction Wells GW-5: Construct Regional ASR Wells
Purified Recycled Water	PR-1: Direct Potable Reuse (DPR) with Advanced Water Purification Facility (AWPF) at Laguna Treatment Plant (LTP) PR-2: Satellite DPR with AWPF PR-3a: Indirect Potable Reuse (IPR) with AWPF LTP into Groundwater Basin PR-3b: IPR with AWPF LTP into Lake Ralphine PR-3c: IPR with AWPF at LTP into Lake Sonoma PR-4: Regional DPR with AWPF at LTP
Recycled Water	RW-1: Expand City's Urban Non-Potable Recycled Water System
Desalination	DE-1: Regional Brackish Desalination DE-2: Ocean Desalination
Stormwater	SW-1: Stormwater Treatment and Storage in Aquifer SW-2: Stormwater Storage in Lake Ralphine with Treatment SW-3: Regional Stormwater
Efficiency Programs	E-1: Efficiency Programs for ultra-high efficiency toilets and transforming ornamental turf into low-water use landscapes

Evaluation Metrics: The criteria for assessing the water supply options were identified and defined with input from the Water Team, Stakeholder Group, community, and BPU. A brief summary is provided below.

### Evaluation Metrics

Criterion	Proposed Evaluation Metric
Cost effectiveness	Quantitative calculation of life-cycle costs, based on the baseline scenario per the project goals (e.g., five-year drought occurring on average every 10 years).
Scalability	Qualitative assessment of ability to provide sufficient supply to satisfy goals, i.e., achieve desired level of service for each scenario; secondarily, ability to scale further to address future uncertainty.
Resiliency	Qualitative assessment of performance in the face of future uncertainty; for example, future regulations, energy costs, hydrology. The best options will suffer only modest degradation of performance if future conditions are worse than anticipated while inferior options will show marked degradation if planning assumptions aren't met.
Equity	Qualitative assessment of any disproportionate impacts on vulnerable communities.

Criterion	Proposed Evaluation Metric
Environmental performance	Qualitative assessment of potential environmental impacts not already included in permitting/regulatory compliance (e.g., level of GHG emissions).
Legal, permitting, and regulatory	Qualitative assessment of complexity/effort to address legal issues (e.g., water rights), obtain necessary permits, and comply with regulations
City control and interagency coordination	Qualitative assessment of level of City control and coordination with potential partner agencies, if any (e.g., agreements needed for regional projects).
Multi-benefit	Qualitative assessment of benefits provided in addition to water supply.

## Study

To determine the most feasible water supplies from the list of 18 options, a study of potential water sources was conducted from January through May 2023. The overall process for assessing and narrowing the water supply options is illustrated below.

### Analysis Methodology Flowchart



Based on the pre-screening process, five options did not advance to the screening process. Three of these options (GW-4, GW-5, SW-3) were set aside because regional efforts that include City involvement are already underway in these areas. The City is committed to continuing to participate in existing regional water supply resiliency and groundwater sustainability efforts and exploring regional projects that advance these efforts. Two options (PR-3b and SW-2) were set aside because Lake Ralphine would not be able to function effectively for storage.

The remaining thirteen options underwent the screening process that included high level cost estimates and assessment of scalability (volume of water that could be produced under a range of scenarios) and other considerations. Six of these options (PR-1, PR-3a, PR-4, RW-1, DE-1, and DE-2) did not advance for reasons briefly summarized below. In addition, based on feedback and direction from the BPU, an appendix is included with the Study Technical Memorandum to provide more discussion about why desalination did not advance and the types of changing circumstances (new technology, funding, regulations, regional partnerships) that could trigger reassessing this option in the future.

### Supply Options Removed During the Screening Analysis

Category	Supply Option	Reason for Removal
Purified Recycled Water	PR-1: DPR AWPf at LTP	Not cost-effective based on Santa Rosa's current and projected water supply needs.
	PR3a: IPR AWPf at LTP via Delta Pond	Not cost-effective based on Santa Rosa's current and projected water supply needs.
	PR-3c: IPR AWPf at LTP via Lake Sonoma	Not cost-effective based on Santa Rosa's current and projected water supply needs. Additionally, it does not reduce Santa Rosa's reliance on Sonoma Water.
Non-potable Recycled Water	RW-1: Expand City's existing non-potable recycled water system	Not cost-effective based on City's current needs and does not increase the City's potable water supplies to mitigate drought, water shortages, and catastrophic supply interruptions.
Desalination	DE-1: Regional brackish desalination	Not cost-effective based on City's current needs and does not reduce reliance on Sonoma Water (in the event of a catastrophic supply interruption) as it relies on water transfer between agencies rather than providing new water supply within the City. Implementation is contingent upon substantial involvement of partners, permitting obstacles, and significant regulatory challenges.
	DE-2: Ocean desalination	Not cost-effective based on City's current needs. The required pipeline from the ocean to Santa Rosa's service area contributes significantly to the capital and O&M costs. Also, this option faces significant permitting obstacles and regulatory challenges.

The remaining seven options listed below advanced to undergo a further feasibility analysis. These options were further analyzed and scored based on a list of defined evaluation criteria that had been previously established based on input from the Water Team, Stakeholder Group, community, and BPU. A numeric score was assigned for each criterion using a 3-point scale from 0 to 2, with 2 being the most favorable. The raw score for each criterion was then weighted (multiplied by 5, 3, or 1) based on its level of importance as determined with input from the various stakeholders (with 5 being highest).

- GW-1: Add Extraction Wells
- GW-2: Convert Emergency Wells
- GW-3: City ASR Wells
- PR-2: Satellite DPR
- PR-4: Regional DPR
- SW-1: Stormwater Storage in Aquifer
- E-1: Efficiency Programs

The feasibility analysis also considered each supply option's performance under a range of future conditions beyond the baseline scenario. Performance of the options was examined under varying future hydrologic conditions and varying Sonoma Water dry-year allocations. In general, as future conditions become less favorable, supplemental water supply source(s) would need to be used more often and would become more cost-effective.

In separate in-person working sessions, the Water Team and the Stakeholder Group reviewed and provided input on the feasibility analysis in May 2023. After revising the study with input from both groups, the project team presented the updated findings and draft portfolios to the Water Team, Stakeholder group, community, and the BPU in separate meetings and sought

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their input in June, July, and August 2023. In response to the questions, comments, and suggestions, the project team produced a technical memorandum (see Attachment 1: Study Technical Memorandum).

### Portfolios

Next, four potential portfolio alternatives (mixes of water supply options) were developed based on the results of the feasibility analysis in July 2023 (Attachment 2: Draft Portfolio Narratives). Each portfolio was developed focused on a specific metric: affordability, implementation speed, volume of water, and adaptability. The narrative in Attachment 2 provides a description of each of the four portfolios as presented to the Stakeholder Group, Water Team, community, and BPU. The table below briefly summarizes the composition of the draft portfolios.

**Draft Portfolio Compositions**

Option	Description	Portfolio 1 Most Economical	Portfolio 2 Fastest to Implement	Portfolio 3 Most Water Capacity	Portfolio 4 Most Adaptive
GW-1	Extraction Wells (Up to 12)		X	X	X
GW-2	Emergency Wells Converted to Production Wells	X	X	X	X
GW-3	Aquifer Storage & Recovery Wells				Consider
PR-2	Satellite Direct Potable Reuse			X	Consider
PR-4	Regional Direct Potable Reuse at Laguna Treatment Plant				Consider
SW-1	Stormwater Storage in Aquifer			Consider	Consider
E-1	Efficiency Programs	X	X	X	X

### Water Supply Alternatives Plan

Based on the study results, the project team is currently developing the Water Supply Alternatives Plan (WSAP) to provide a range of pathways forward for the City to achieve its water supply resiliency goal and targets. The Water Team, Stakeholder Group, and community have provided input on an early review draft of the WSAP. After integrating their input and direction from the BPU and Council from study sessions, the WSAP that will be presented to the BPU and Council in October 2023.

### FISCAL IMPACT

The Study Session is for information only, and no City Council action is being taken. There is no fiscal impact from this Study Session.

### ENVIRONMENTAL IMPACT

The project has been reviewed in compliance with the California Environmental Quality Act and qualifies for a Class 6, Section 15306, Informational Collection categorical exemption. Class 6 consists of basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource. These may be strictly for information gathering purposes, or as part of a study leading to an action which a public agency has not yet approved, adopted, or funded.

Further, the project is statutorily exempt under Title 14 § 15262 of the California Code of Regulations because it involves only feasibility or planning studies for possible future actions which the agency, board, or commission has not approved, adopted, or funded. As such, the study parameters for this project do not require the preparation of an EIR or negative declaration but do require consideration of environmental factors, which have been included in the criteria and study methodology.

### BOARD/COMMISSION/COMMITTEE REVIEW AND RECOMMENDATIONS

On April 28, 2022, the City Council/Board of Public Utilities Liaison Subcommittee, by motion, approved the staff recommendation to (1) solicit proposals and have the BPU award a contract, (2) conduct a study and prepare a plan, (3) have the BPU review the plan, and (4) execute the plan over time and report progress to the BPU periodically.

On May 19, 2022, the BPU approved the issuance of a Request for Proposals (RFP) to solicit proposals from qualified consultants to complete a study of water supply sources and develop a Water Supply Alternatives Plan for increasing the City's water supply resiliency and reliability.

On September 15, 2022, the BPU received a staff briefing on the project, including information about the consultant selection process, scope of work, timeline and milestones, deliverables, plan for engaging the public and a stakeholder group, and next steps.

On January 19, 2023, the BPU held a study session on the water supply feasibility study parameters and provided input to staff.

On August 17, 2023, the BPU held a study session on the water supply feasibility study results and draft portfolios and provided input to staff.

### NOTIFICATION

Not applicable.

### ATTACHMENTS

- Attachment 1: Study Technical Memorandum
- Attachment 2: Draft Portfolio Narratives
- Attachment 3: Farm Bureau Article, Water Future by Doug Beretta

### PRESENTER

Colin Close, Senior Water Resources Planner