Water Supply Alternatives Plan

Board of Public Utilities
October 5, 2023

Colin Close
Senior Water Resources Planner

Santa Rosa WATER

Water Supply Alternatives Plan

Purpose

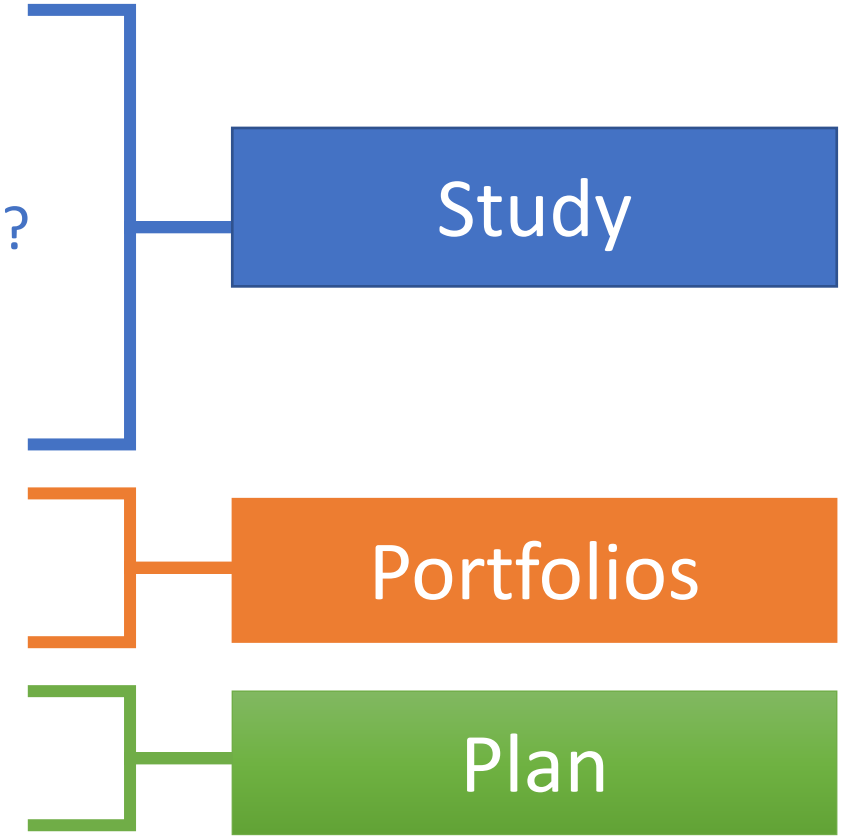
Enhance Santa Rosa's water supply resiliency and reliability to mitigate impacts of shortages due to severe droughts and emergencies.

Approach

Assess the feasibility of new water supply options and develop a plan for increasing resiliency.

Questions the Project Will Address

- How much new water supply is optimal to mitigate the risk of shortages?
- Which supply options should be studied?
- What criteria should be used to assess each supply option?
- Which mix(es) of options will best help us meet our supply resiliency goal?
- What is the most reasonable and adaptive path forward?



Project Overview

ENGAGE STAKEHOLDERS

- ✓ Get input from a wide range of stakeholders, including our community.

SET OBJECTIVES

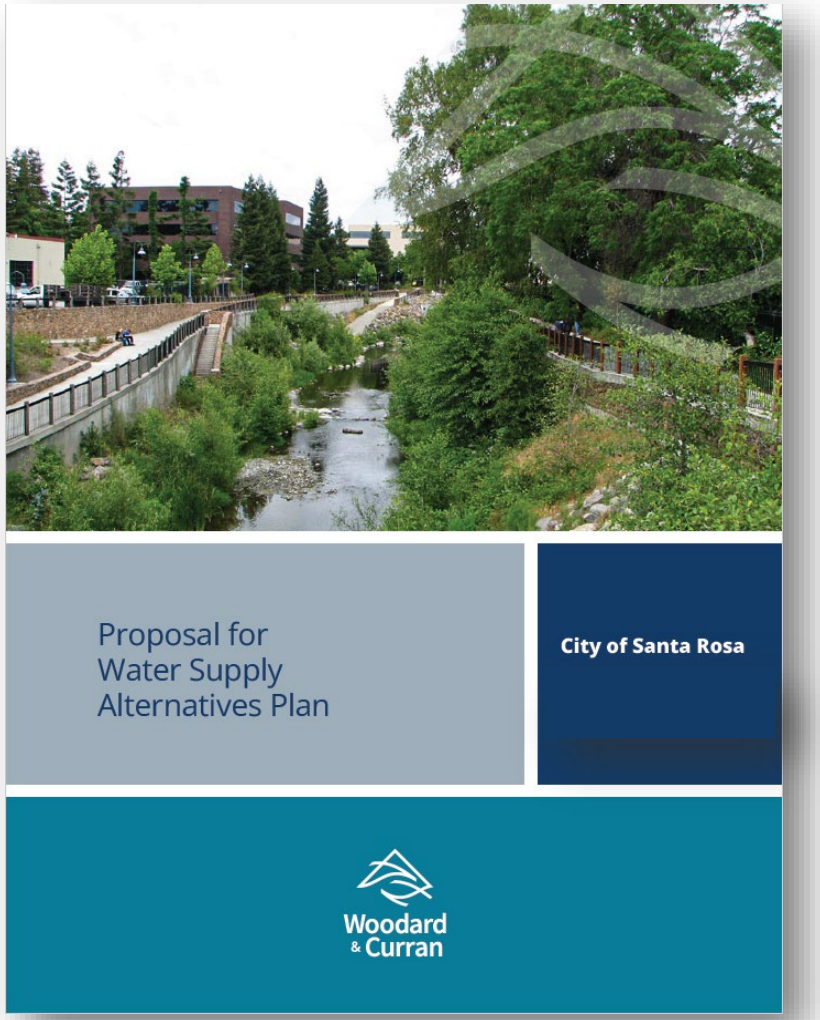
- ✓ Set water supply goals, identify potential supply options, establish criteria and study methods.

STUDY SUPPLY OPTIONS

- ✓ Study feasibility of potential water supply options.
- ✓ Develop and assess portfolios of feasible options.

DEVELOP A PLAN

- ➢ Develop long-term plan for achieving supply goals.



Water Team

Director Burke
Deputy Directors & Staff

- ✓ Engineering Services
- ✓ Environmental Services
- ✓ Local Operations
- ✓ Regional Operations
- ✓ Water Resources

Stakeholder Group

Held 4 three-hour working sessions to gather input on:

- Goals, supply options, study methodology
- Study results and draft portfolios
- Early draft of plan

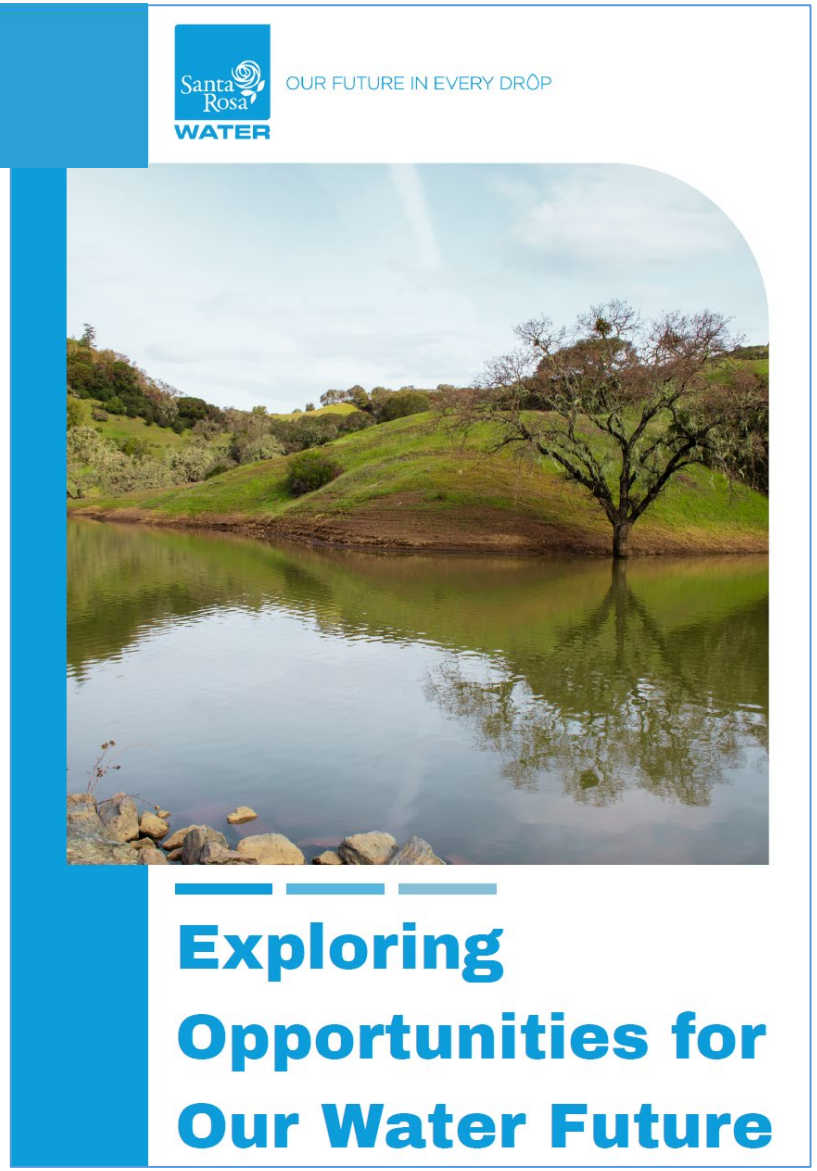
Participants included leaders of organizations in these areas:

- Business & economic interests
- Community & service organizations
- Regional recycled water users
- Environmental & climate interests
- Resources agencies

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 – Ag
8. Recycled Water User – Urban
9. RED Housing Fund
10. Regional Climate Protection Authority
11. Russian River Watershed Association
12. Russian River Water Protection Committee
13. Santa Rosa Metro Chamber of Commerce
14. Santa Rosa Plain Groundwater Sustainability Agency
15. Santa Rosa Subregional TAC
16. Sonoma Clean Power
17. Sonoma County Alliance
18. Sonoma RCD
19. Sonoma Water

Our Water Future Community Meetings

- Held 4 two-hour community meetings (Zoom)
  - Oct 26, Jan 25, Jun 26, Aug 28
- Provided background, scope, timeline, & updates
- Solicited community input:
  - ✓ Goal & targets, potential supply options, criteria for assessing options
  - ✓ Study results & portfolios (mixes of supplies)
- Live Spanish interpretation
- Webpage with recordings, slides, meeting schedule
  - srcity.org/OurWaterFuture



Board of Public Utilities

- Sep. 15, 2022 - BPU received a staff briefing on the project scope, timeline, budget, and team.
- Jan. 19, 2023 - BPU held a study session to receive information and provide input to staff on the water supply goal and targets, list of water supply options for consideration, and criteria and methodology for the feasibility analysis.
- Aug. 17, 2023 - BPU held a study session to receive information and provide input to staff on the supply feasibility analysis and draft portfolios.

Additional Outreach

- Oct. 2022 – Sep. 2023, staff solicited additional public input through presentations at
  - General Plan open house events
  - Santa Rosa Subregional Technical Advisory Committee
  - Sonoma County Alliance – Water Committee and General Membership
  - Santa Rosa Metro Chamber – Advocacy Committee
  - Santa Rosa Plain Groundwater Sustainability Agency – Advisory Committee

SANTA ROSA FORWARD
Plan Our Future Together

Sonoma County Alliance

SANTA ROSA METROCHAMBER

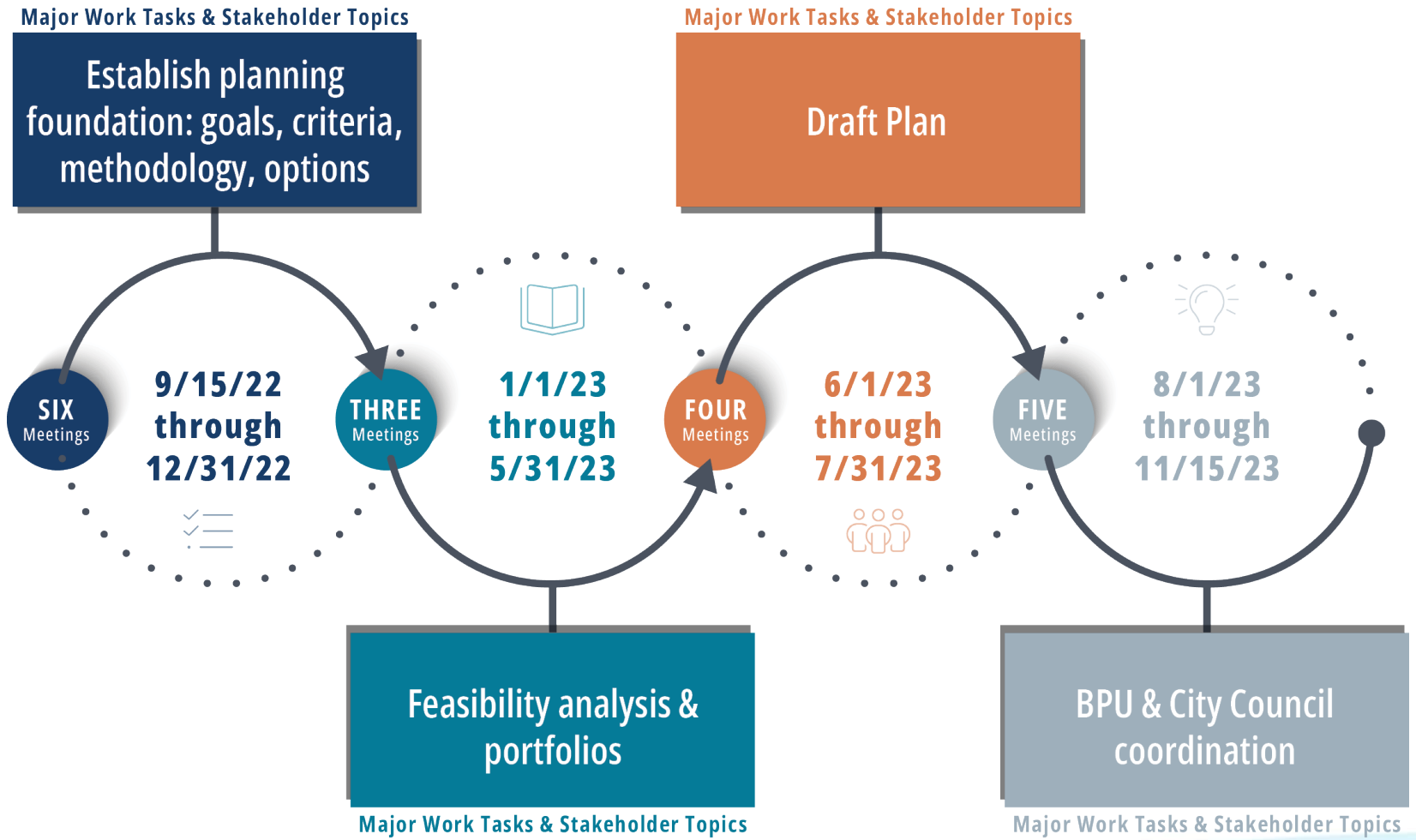
SANTA ROSA PLAIN GROUNDWATER SUSTAINABILITY AGENCY

Work Completed to Date

Understand the foundational work to build the plan

Katie Cole, Woodard & Curran

Project Timeline



We are here!

Project Work Update

Water Team

- 5 working sessions (Oct, Dec, May, Jul, Aug).
- Input on study parameters, results, portfolios, & Plan.

Community

- 4 community webinars (Oct, Jan, Jun, Aug).
- Input on study parameters, study results, portfolios, & Plan.

Stakeholder Group

- 4 working sessions (Nov, Dec, May, July).
- Input on study parameters, results, portfolios, & Plan.

Woodard & Curran

- Stakeholder engagement.
- Preparation of deliverables.

BPU Study Session on the Feasibly Study Analysis

- BPU reviewed study results and portfolios on Aug 17, 2023, and requested more information about desalination and stormwater options that did not advance.

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

Changes to Feasibility Study Analysis and Draft Plan

- Study includes updated equity scoring to address comments received.
- Study has Appendix with analysis and discussion of desalination water supply options.
- Plan clarifies that City intends to achieve, not exceed the targets.
  - While three portfolios have potential to far exceed the numeric targets, the City's goal did not change.
- Plan clarifies that any expansion of groundwater use would align with sustainability metrics in Santa Rosa Plain Groundwater Sustainability Agency's *Groundwater Sustainability Plan.*
- Plan includes more discussion about challenges of using stormwater as a water supply option.
- Portfolio 4 has been updated in the Plan, to identify when and why the City would reconsider desalination as a potential supply source in the future.

Draft Plan includes additional information about surface water/stormwater capture and use.

- Two of three stormwater options did not advance to detailed analysis:
  - SW-2 – Lake Ralphine not adequate for storage.
  - SW-3 – Regional efforts moving forward with City involvement.
  - Cost – Stormwater options would require construction of a treatment plant to ensure water meets regulatory requirements for aquifer storage and recovery and for drinking water use.
  - Scalability – Amount of available stormwater is unknown and should be confirmed before committing costs to a treatment facility.

Santa Rosa WATER

Draft Plan includes Desalination Appendix

More information provided about why DE-1 and DE-2 did not advance, in addition to cost:

- Significant permitting and environmental challenges
- Turndown capacity is not ideal for Santa Rosa's use case
- Regional brackish facility does not reduce reliance on Sonoma Water
- Ocean desalination requires extensive infrastructure construction and maintenance (pipeline to Santa Rosa)

Scoring completed.

Scored 13, below scores of seven options included in portfolios (19-32).

Triggers for reconsidering desalination in future identified.

- Technology that reduces baseline operating costs (improved turndown capacity)
- Less expensive energy prices which reduces operating costs
- Project configuration that yields direct water to Santa Rosa
- Technology that improves water recovery

Santa Rosa WATER

Draft Water Supply Alternatives Plan

Walk through of draft Water Supply Alternatives Plan

Katie Cole, Woodard & Curran

Table of Contents

New Material
1. Introduction

Synthesized from TM
2. Approach to Developing the WSAP
3. Water Supply Options
4. Analysis of Water Supply Options

New Material
5. Portfolios
6. Next Steps

Chapter 1: Introduction

Background, Purpose, and Plan Organization

Background, Purpose, Plan Organization

- Santa Rosa currently receives 93% of its annual potable water supply from Sonoma Water
- Santa Rosa Water is looking to expand and diversify its potable water supply portfolio to enhance its resiliency to mitigate the potential impacts of future Sonoma Water supply shortages or catastrophic service interruptions
- The WSAP is organized into six chapters as well as an acknowledgments section, executive summary, and seven appendices

Chapter 2: Approach to Developing Water Supply Alternatives Plan

Goals and Methodology

Water Supply Goals

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

Analysis Methodology

Three stage evaluation of water supply options:

1. Pre-Screening to eliminate infeasible options and those substantially similar to other proposed or existing projects.
2. Screening Analysis based on cost-effectiveness and scalability under a range of operating assumptions.
3. Feasibility Analysis to evaluate and score remaining options across a range of criteria reflective of community priorities.

Chapter 3: Water Supply Options

A brief overview and description of the 18 water supply options

Water Supply Options

Supply Type	Supply Option Name
Groundwater	GW-1: Additional Groundwater Extraction Wells GW-2: Convert Emergency Wells to Production Wells GW-3: Aquifer Storage and Recovery (ASR) Wells GW-4: Regional ASR Wells GW-5: Regional Groundwater Extraction Wells
Purified Recycled Water	PR-1: Direct Potable Reuse (DPR) at Laguna Treatment Plant (LTP) PR-2: DPR at Satellite Location PR-3a: Indirect Potable Reuse (IPR) into Groundwater Basin PR-3b: IPR into Lake Ralphine PR-3c: IPR into Lake Sonoma PR-4: Regional DPR at LTP
Recycled Water	RW-1: Expand City's 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

Chapter 4: Analysis of Water Supply Options

Pre-Screening Outcome, Screening Analysis Results, Feasibility Analysis Results

Pre-Screening Outcome - 5 options did not advance

Category	Supply Option	Reason for Removal
Groundwater	GW-4: Regional groundwater extraction	GW-4 would likely require a recharge element, which overlaps substantially with local and regional ASR supply options.
	GW-5: Regional ASR	GW-5 has substantial overlap with the local ASR supply option (GW-3) and the City would be part of any future regional ASR projects implemented by Sonoma Water or the GSA by default.
Purified Recycled Water	PR-3b: IPR into Lake Ralphine	Lake Ralphine lacks sufficient capacity to store purified water for the minimum required 2-month retention period. Expansion of Lake Ralphine is infeasible.
Stormwater	SW-2: Stormwater storage in Lake Ralphine	Lake Ralphine lacks sufficient capacity to store captured stormwater. Expansion of Lake Ralphine is infeasible. Likewise, prior City review has failed to identify a suitable alternative surface water site.
	SW-3: Regional stormwater	SW-3 would have substantial overlap with the local stormwater options and there is a high likelihood the City will participate in future regional stormwater projects implemented by Sonoma Water.

Screening Analysis Results - 6 options did not advance

Category	Supply Option	Reason for Removal
Purified Recycled Water	PR-1: DPR AWPF at LTP	Not cost-effective based on Santa Rosa's projected water supply needs.
	PR3a: IPR AWPF at LTP via Delta Pond	Not cost-effective based on Santa Rosa's projected water supply needs.
	PR-3c: IPR AWPF at LTP via Lake Sonoma	Not cost-effective based on Santa Rosa's projected water supply needs. 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	Does not provide Santa Rosa with potable water. Not cost-effective based on Santa Rosa's projected water supply needs.
Desalination	DE-1: Regional brackish desalination	Not cost-effective based on Santa Rosa's projected water supply needs. Does not reduce Santa Rosa's reliance on Sonoma Water. Implementation contingent upon partner involvement.
	DE-2: Ocean desalination	Not cost-effective based on Santa Rosa's projected water supply needs. Pipeline from ocean to service area a significant cost.

7 Options Underwent Further Analysis

- GW-1: Add Extraction Wells
- GW-2: Convert Emergency Wells to Production Wells
- GW-3: Add Aquifer Storage & Recovery Wells
- PR-2: Satellite Direct Potable Reuse
- PR-4: Regional Direct Potable Reuse at Laguna Treatment Plant
- SW-1: Stormwater Storage in Aquifer
- E-1: Efficiency Programs

Santa Rosa WATER

Feasibility Analysis Results (Higher Score is Better)

Criterion	Groundwater			Purified Recycled Water		Stormwater	
	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
Cost effectiveness	2	2	2	0	0	0	1
Scalability	2	0	1	2	2	1	1
Resiliency	1	1	2	2	2	1	1
Equity	1	1	1	1	1	1	2
Environmental performance	1	2	1	0	1	1	2
Legal, permitting, & regulatory	1	2	0	0	0	1	2
City control & interagency coord	2	2	1	2	0	2	2
Multi-benefit	0	0	1	0	0	2	1
Total Unweighted	***10***	***10***	***9***	***7***	***6***	***9***	***12***
Total Weighted	***32***	***26***	***29***	***21***	***22***	***19***	***30***

Chapter 5: Portfolios

Review included portfolio information and discuss updates to Portfolio 4

Portfolio Narratives

- Portfolio composition – what is in the portfolio?
- Rationale – why build a portfolio like this?
- Cost and yield performance – how does the portfolio perform financially and against our water supply goals?
- Implementation timeline – how might we implement this portfolio? When and in what order would portfolio elements be completed?

Portfolios

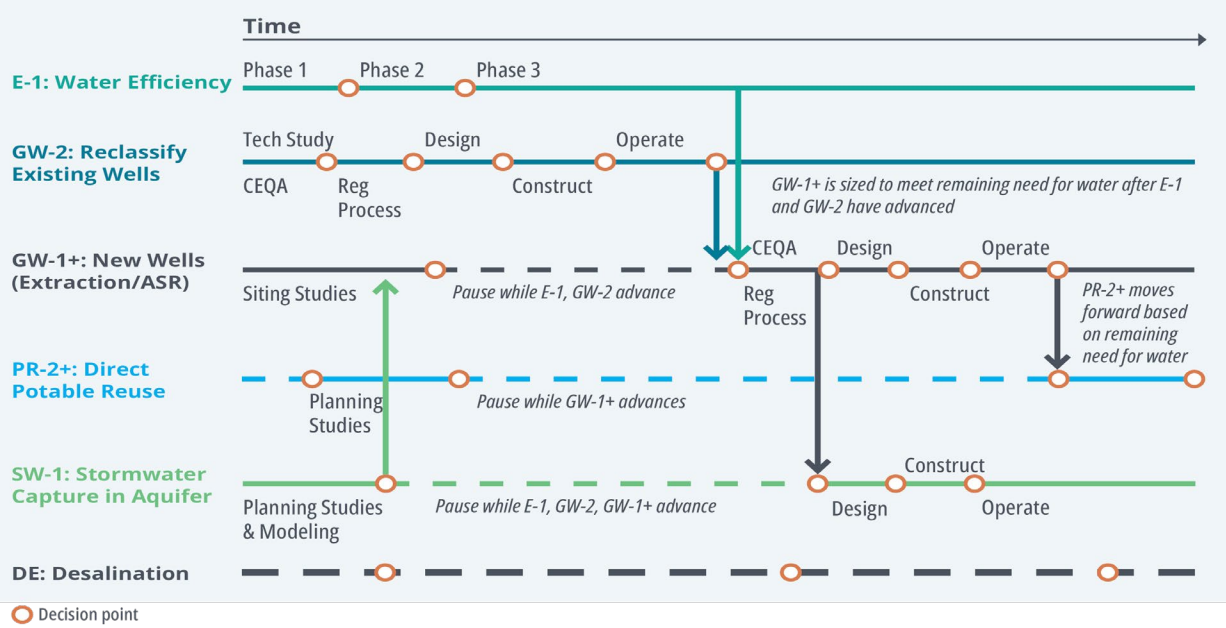
Option	Description	Portfolio 1 Most Economical	Portfolio 2 Fastest	Portfolio 3 Most Water	Portfolio 4 Most Adaptive
GW-1	Add Extraction Wells (Up to 12)		✓	✓	✓
GW-2	Convert Emergency Wells to Production Wells	✓	✓	✓	✓
GW-3	Aquifer Storage & Recovery Wells				**Consider**
PR-2	Satellite Direct Potable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

Chapter 6: Next Steps

Review items included in Next Steps chapter

Next Steps Example:
If the City Implements Portfolio 4…

1. Identify funding
   - Grants/Loans
   - Bonds
   - Connection Fees and Water Rates
2. Plan for Phase 1 of E-1
3. Begin Hydrogeologic studies for GW-2 & determine CEQA pathway
4. Prepare siting study for GW-1+
5. Track DPR regulations and initiate planning studies for PR-2+
6. Conduct modeling and siting study for SW-1



Timeline and Milestones

Review of project timeline and milestones

Colin Close, Santa Rosa Water

Project Timeline and Milestones

WORKING SESSIONS	2022			2023									
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT
Water Team	WT		WT					WT		WT	WT		
Stakeholder Group		SG	SG					SG		SG			
BPU				BPU							BPU		BPU
Council												CC	CC*
Community	Com			Com					Com		Com		
KEY DELIVERABLES	1. Supply goals 2. Supply options 3. Criteria & methods			1. Feasibility study report 2. Synopsis of portfolios						1. Working draft Plan 2. Admin draft Plan 3. Final Plan			

* Oct 24 (after 4:00 pm) - City Council to consider Water Supply Alternatives Plan.

Recommendation

- It is recommended by Santa Rosa Water that the Board of Public Utilities, by motion, recommend that the City Council accept the Water Supply Alternatives Plan.

QUESTIONS and COMMENTS