Our Water Future:

Water Supply Alternatives Plan

City Council
October 24, 2023

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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.

Key Considerations Guiding the Project

- 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?

Study

- Which mix(es) of options will best help us meet our supply resiliency goal?

Portfolios

- What is the most reasonable and adaptive path forward?

Plan

Project Overview

ENGAGE STAKEHOLDERS

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

SET OBJECTIVES

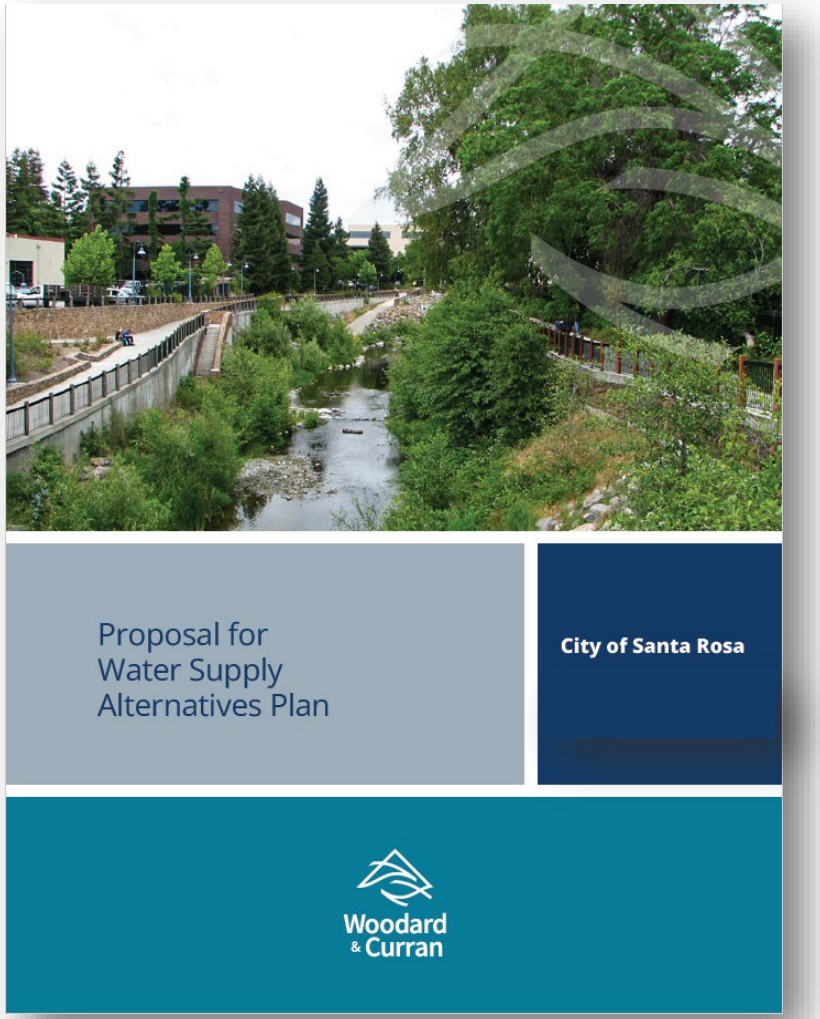
- ✓ Set water supply goals, identify potential supply options, establish criteria and study methods.

STUDY SUPPLY OPTIONS

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

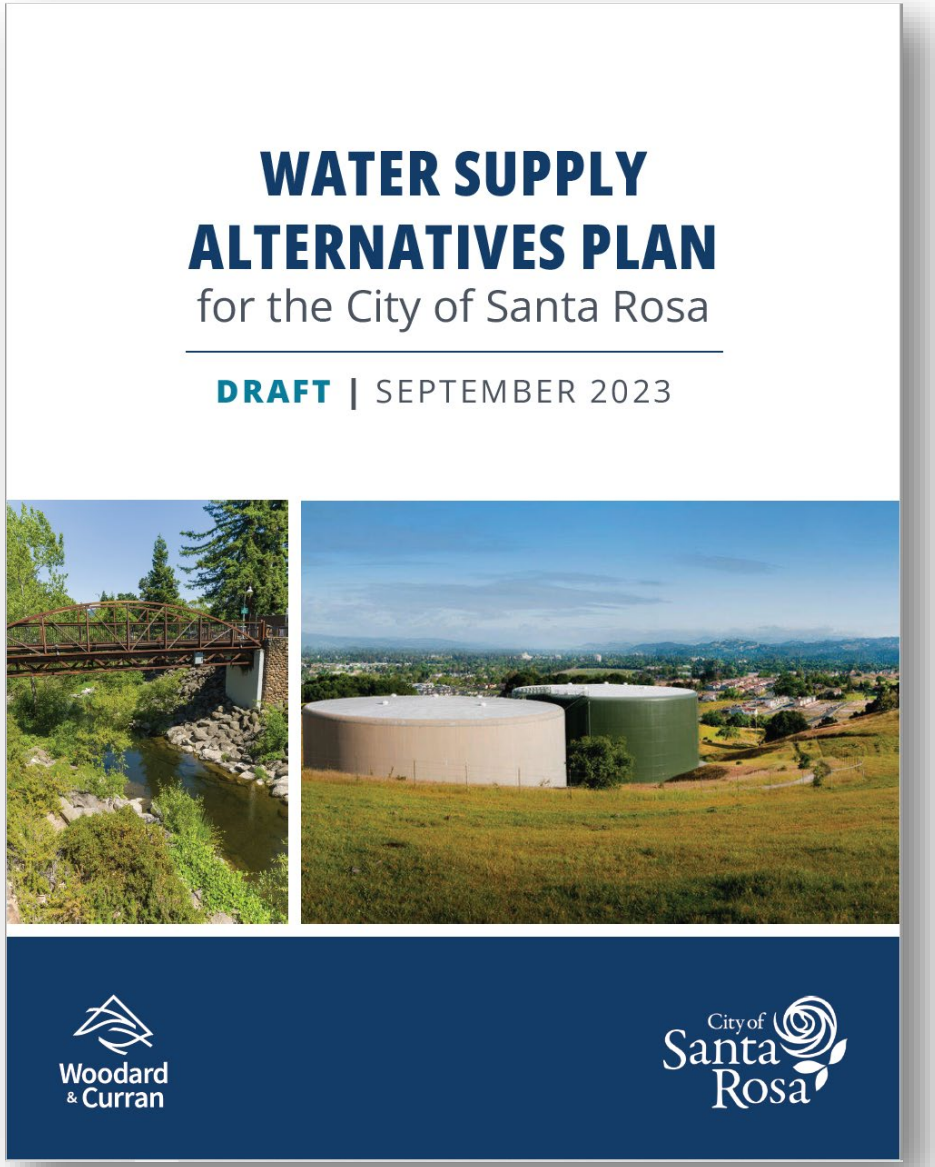
DEVELOP A PLAN

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



Overview of Plan

- Acknowledgements
- Executive Summary
- Ch 1: Introduction
- Ch 2: Approach to Developing the WSAP
- Ch 3: Water Supply Options
- Ch 4: Analysis of Water Supply Options
- Ch 5: Portfolios
- Ch 6: Next Steps
- Appendices



Acknowledgements

- Water Team
- Stakeholder Group
- Community

STAKEHOLDER GROUP

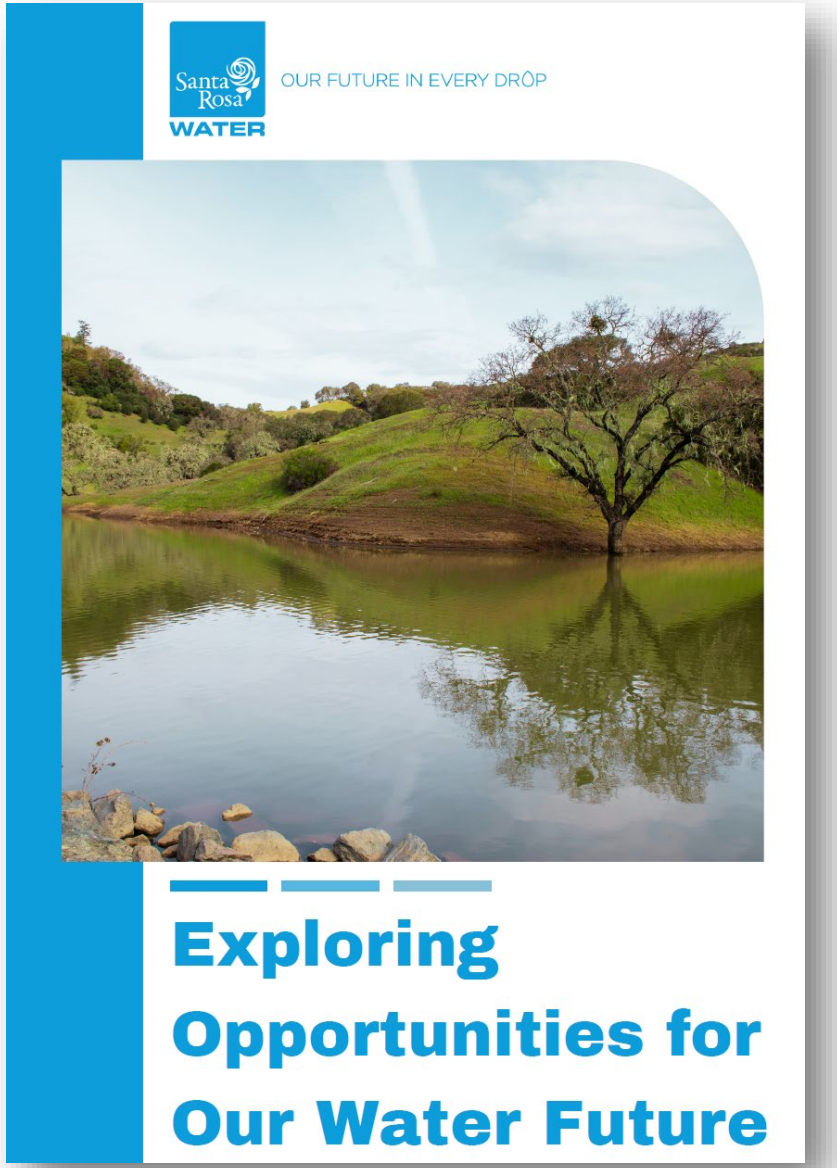
1. Calpine
2. Community Action Partnership
3. Los Cien Sonoma County
4. NAACP Santa Rosa
5. North Bay Black Chamber of Commerce
6. North Coast Builders Exchange
7. Recycled Water User – Ag
8. Recycled Water User – Urban
9. RED Housing Fund
10. Regional Climate Protection Authority
11. Russian River Watershed 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

Chapter 1: Background, Purpose, Plan Organization

- Santa Rosa currently receives 93% of its annual potable water supply from Sonoma Water, which relies on the Russian River system for 95-99% of its supply.
- 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

- Stakeholder engagement
- Goal and volumetric targets
- Study methodology



Stakeholder Engagement

Water Team

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

Stakeholder Group

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

Community

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

Board of Public Utilities

- Updates, study sessions, review of Plan.
- Input on study parameters, results, portfolios, & Plan.

Water Supply Goal and Targets

***GOAL**: Diversify and increase city supplies to reduce dependence on Sonoma Water, particularly during Sonoma Water supply shortages or disruption in delivery*

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

Groundwater

GW-1 Additional groundwater extraction wells
GW-2 Conversion of emergency wells to production
GW-3 Aquifer Storage and Recovery (ASR) wells
GW-4 Regional groundwater extraction wells
GW-5 Regional Aquifer Storage and Recovery wells

Purified Recycled Water

PR-1 Produce at LTP for direct potable reuse (DPR)
PR-2 Produce at a satellite location (DPR)
PR-3a Produce at LTP and inject into groundwater via ASR wells for indirect potable reuse (IPR)
PR-3b Produce at LTP and add to Lake Ralphine before use (IPR)
PR-3c Produce at LTP and add to Lake Sonoma (or alternate) before use (IPR)
PR-4 Regional purified recycled water (DPR)

Nonpotable Recycled

RW-1 Expand Nonpotable Recycled Water Service (City)

Desalination

DE-1 Brackish desalination (likely Regional)
DE-2 Ocean desalination (Santa Rosa or Regional)

Surface/Stormwater

SW-1 Capture excess winter flows from Santa Rosa Creek/Laguna de Santa Rosa, store in aquifer for later withdrawal
SW-2 Store excess winter flows from Santa Rosa Creek/Laguna de Santa Rosa, store in enlarged Lake Ralphine, construct water treatment plant to withdraw from Lake Ralphine
SW-3 Regional Stormwater

Efficiency Programs

E-1 Aggressive incentives for toilets & turf replacement

Chapter 4: Analysis of Water Supply Options

Pre-screening process

– 5 options did not advance
- Regional groundwater extraction
- Regional ASR
- IPR into Lake Ralphine
- Stormwater storage in Lake Ralphine
- Regional stormwater

Screening process

– 6 options did not advance
- DPR AWPF at LTP
- IPR AWPF at LTP via Delta Pond
- IPR AWPF at LTP via Lake Sonoma
- Expand City's existing non-potable recycled water system
- Regional brackish desalination
- Ocean desalination

7 Options Underwent Further Analysis

- Add Extraction Wells
- Convert Emergency Wells to Production Wells
- Add Aquifer Storage & Recovery Wells
- Satellite Direct Potable Reuse
- Regional Direct Potable Reuse at Laguna Treatment Plant
- Stormwater Storage in Aquifer
- Efficiency Programs

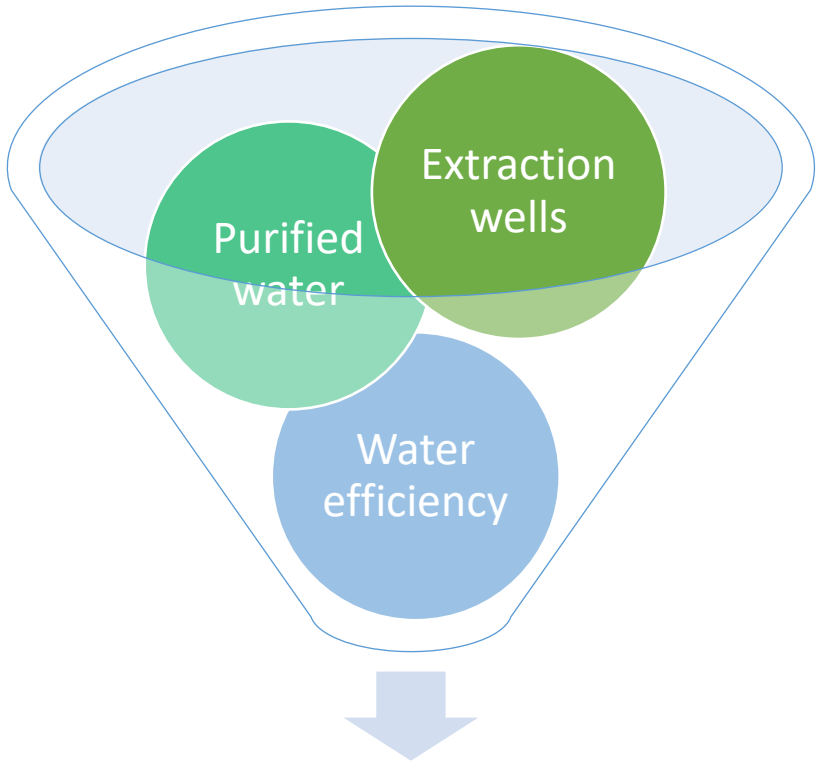
Santa Rosa WATER

Feasibility Analysis Results (Higher Score is Better)

Criterion	Groundwater			Purified Recycled Water		Stormwater	Efficiency Programs
	Add Extraction Wells	Convert Emergency Wells	Add City ASR Wells	City Direct Potable Reuse	Regional Direct Potable Reuse	Stormwater Storage in Aquifer	
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

- 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?



Increasing

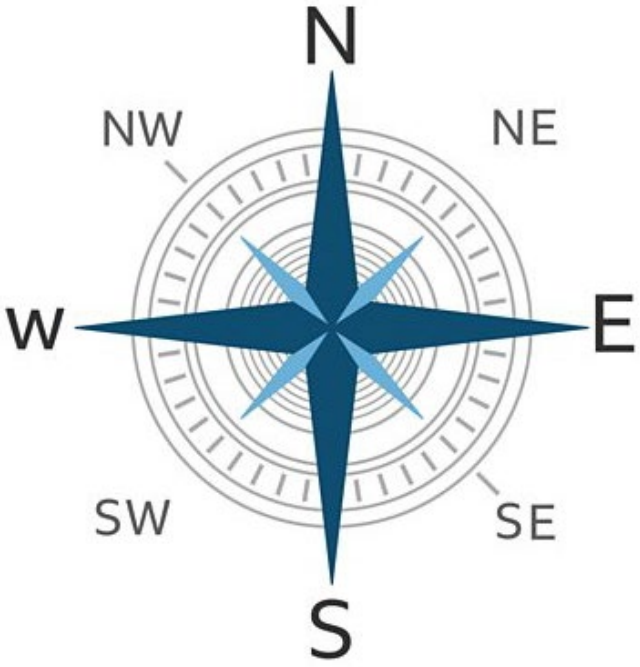
resiliency & reliability

Portfolios

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

Chapter 6: Next Steps

- Identify funding opportunities for initial steps.
- Plan for Phase 1 of efficiency programs.
- Begin hydrogeologic studies and CEQA pathway for groundwater options.
- Prepare siting study for groundwater options.
- Track changes in regulations, technology, funding opportunities, and regional opportunities.
- Initiate planning studies for additional supply options as needed.
- Reconsider desalination at key decision points.



Appendices

A: Feasibility Analysis Technical Memorandum

B: Links to Recorded Meetings

C: Portfolio 1 Example Schedule

D: Portfolio 2 Example Schedule

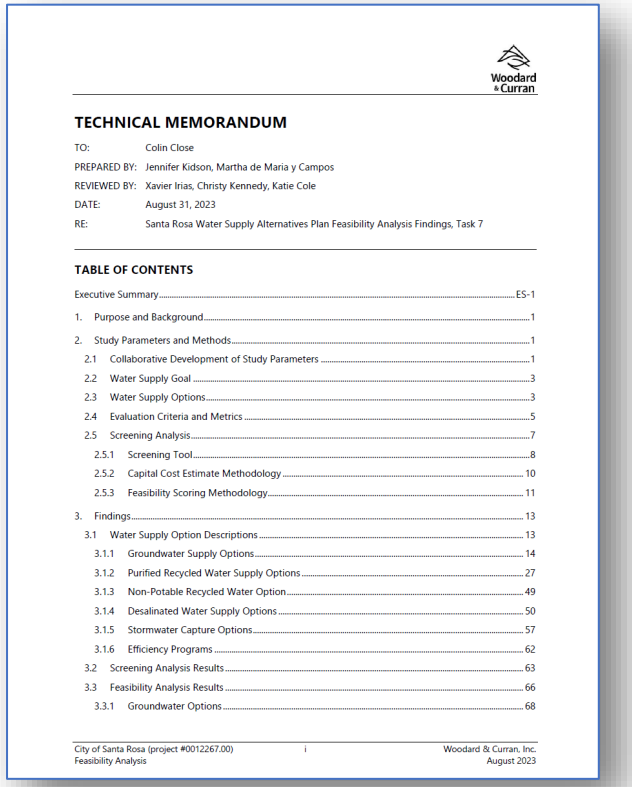
E: Portfolio 3 Example Schedule

F: Portfolio 4 Example Schedule (Baseline Scenario)

G: Portfolio 4 Example Schedule (Alternative Scenario)

H: Santa Rosa Water's Recent Budgets for Operations and Capital Projects

I: Memorandum on Desalination Supply Options



Woodard & Curran

TECHNICAL MEMORANDUM

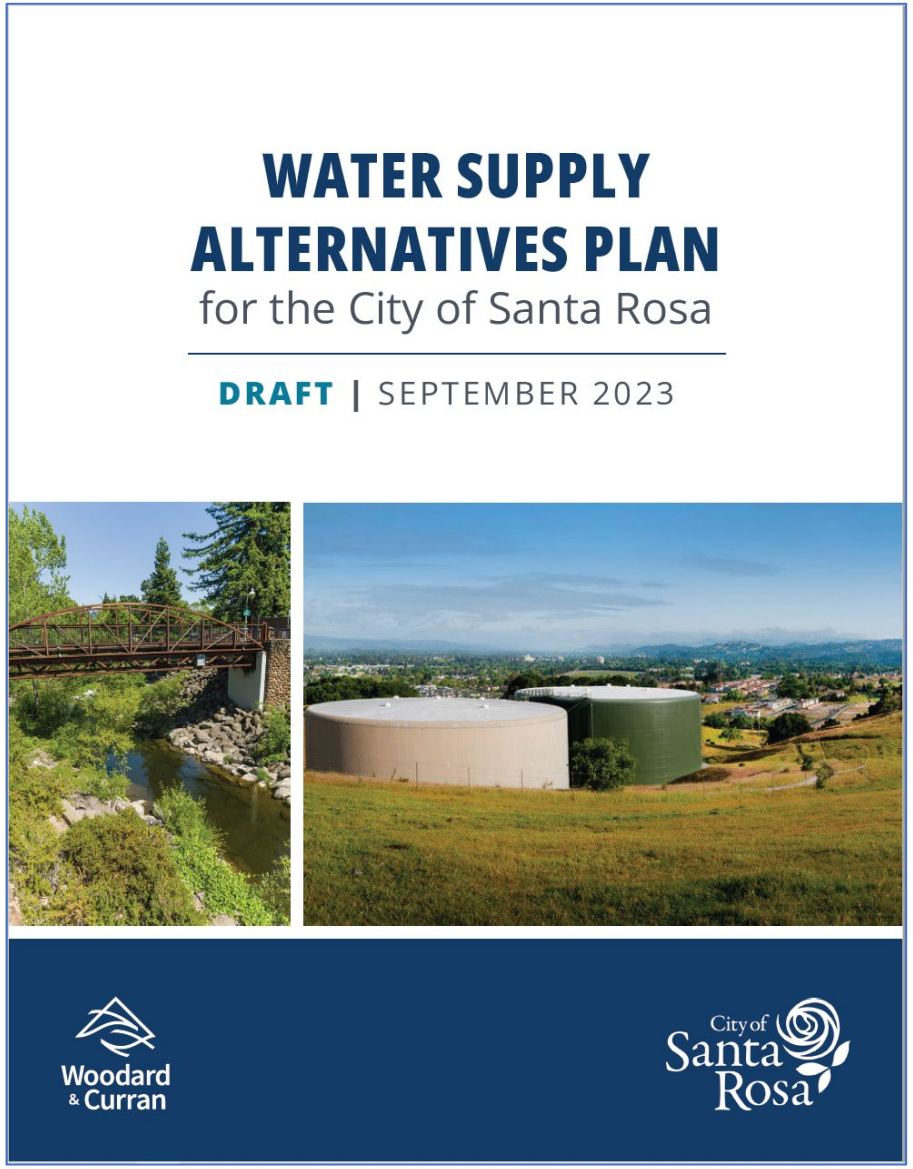
TO: Colin Close
PREPARED BY: Jennifer Kidson, Martha de Maria y Campos
REVIEWED BY: Xavier Irias, Christy Kennedy, Katie Cole
DATE: August 31, 2023
RE: Santa Rosa Water Supply Alternatives Plan Feasibility Analysis Findings, Task 7

TABLE OF CONTENTS

Executive Summary ES-1
1. Purpose and Background 1
2. Study Parameters and Methods 1
2.1 Collaborative Development of Study Parameters 1
2.2 Water Supply Goal 3
2.3 Water Supply Options 3
2.4 Evaluation Criteria and Metrics 5
2.5 Screening Analysis 7
2.5.1 Screening Tool 8
2.5.2 Capital Cost Estimate Methodology 10
2.5.3 Feasibility Scoring Methodology 11
3. Findings 13
3.1 Water Supply Option Descriptions 13
3.1.1 Groundwater Supply Options 14
3.1.2 Purified Recycled Water Supply Options 27
3.1.3 Non-Potable Recycled Water Option 49
3.1.4 Desalinated Water Supply Options 50
3.1.5 Stormwater Capture Options 57
3.1.6 Efficiency Programs 62
3.2 Screening Analysis Results 63
3.3 Feasibility Analysis Results 66
3.3.1 Groundwater Options 68

Recommendation

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



Questions?