City of St. Helena
Water and Wastewater Advisory Committee Regular Meeting
Thursday, August 13, 2026 @ 10:30 AM
City Hall Main Conference Room
1088 College Avenue, St. Helena CA

PLEASE NOTE: Any person who wishes to speak regarding an item on the agenda or make a comment under the "Oral Communication" portion of the agenda may do so, but please observe the time limit of four minutes.

Members of the public and other parties are welcome to email their comments to the Staff Liaison at rwhite@cityofsthelena.gov. All public comments must be received three hours prior to the meeting. Public comments received after the deadline will be attached to the item the next business day or soon thereafter. Public comments will not be read out loud but will be publicly available and attached to the online agenda.

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1. CALL TO ORDER

2. ROLL CALL

   Chair: Brent Randol Vice Chair: Garry Rose Committee Members: Jay Kouba, Mario Trinchero, Peter White
   Alternate Member: Carl Myers
   Staff Liaison: Joe Leach, Assistant City Manager/Director of Public Works/City Engineer

3. PUBLIC FORUM

   An opportunity for the public to directly address the Committee on items of interest to the public that are not listed on the agenda. Any person addressing the Committee should provide his or her name and address, and limit comments to four minutes. Because of restrictions imposed by the Brown Act, the Committee may not engage in substantive discussion, nor take action on matters not described on the agenda.

4. REPORTS BY STAFF/COMMITTEE

   Reports by staff and/or committee on items of general interest. Brief questions for clarification may be posed and answered, and Committee may request that items be placed on a future agenda. Except under certain circumstances, the Brown Act prohibits any other discussion or action by the Water and Wastewater Advisory Committee.

   4.1. Water/Wastewater Operations Update

   Prepared By: Michele Ferrell, CPO - Water, Carlos Uribe, Assistant Operations Manager

5. CONSENT ITEMS

   5.1. Water and Wastewater Advisory Committee Meeting Minutes of July 9, 2026

6. OLD BUSINESS

7. NEW BUSINESS

7.1. St. Helena Community Forest Easement Proposal

Prepared By: Paul Asmuth

7.2. Review and Discussion of Water Management Plan Draft Chapters 5 & 6

Prepared By: Monique Day, West Yost

7.3. Review and Evaluation of Monthly Water Report Frequency

Prepared By: Ian Dale, Environmental Serv Tech

8. SUBCOMMITTEE UPDATES

8.1. Water Quality

Prepared By: Jay Kouba & Peter White

8.2. Water Security

Prepared By: Jay Kouba

8.3. Preparation of Water & Wastewater Rate Study

Prepared By: Garry Rose & Mario Trinchero

9. FUTURE AGENDA ITEMS

9.1. Discussion of Decommissioning of Lower Reservoir

9.2. Discussion of Alternate Energy Options at Water and Wastewater Facilities

9.3. Review of Water and Wastewater Enterprise Budgets

9.4. Water Management Plan Chapter Reviews (September Meeting)

10. ADJOURNMENT

The next Regular Water and Wastewater Advisory Committee meeting is scheduled for September 10, 2026.

This agenda was posted at City Hall, 1088 College Avenue, St. Helena on August 10, 2026.

Rebecca White, Administrative Assistant

In Compliance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please call the City Clerk's Office (707) 967-2792. Notification 72 hours prior to the meeting as required by Section 202 of the Americans with Disabilities Act will enable the City to make reasonable arrangements to ensure accessibility to this meeting.

MINUTES
City of St. Helena
Regular Water and Wastewater Advisory Committee Meeting
Thursday, July 9, 2026 @ 10:30 AM
City Hall Main Conference Room
1088 College Avenue, St. Helena CA

1. CALL TO ORDER

   Vice Chair Rose called the meeting to order at 10:30a.m.

2. ROLL CALL

   Present: Vice Chair Garry Rose, Member Jay Kouba, Member Mario Trinchero, Member Peter White
   Absent: Chair Brent Randol, Alternate Member Carl Myer

3. PUBLIC FORUM
   An opportunity for the public to directly address the Committee on items of interest to the public that are not listed on the agenda. Any person addressing the Committee should provide his or her name and address, and limit comments to four minutes. Because of restrictions imposed by the Brown Act, the Committee may not engage in substantive discussion, nor take action on matters not described on the agenda.
   Public comment was opened and no comments were received. Public comment was closed.

4. REPORTS BY STAFF/COMMITTEE
   Reports by staff and/or committee on items of general interest. Brief questions for clarification may be posed and answered, and Committee may request that items be placed on a future agenda. Except under certain circumstances, the Brown Act prohibits any other discussion or action by the Water and Wastewater Advisory Committee.

4.1. Water/Wastewater Operations Update

Prepared by: Michele Ferrell, CPO & Carlos Uribe, Interim Operations Manager

Carlos Uribe provided an overview about maintenance performed at the Water & Wastewater Treatment Plants, an inspection from DSOD at the Bell Canyon Reservoir, and the repair of a water distribution line.

5. CONSENT ITEMS

5.1. Special Water and Wastewater Advisory Committee Meeting Minutes of June 18, 2026

Member Kouba moved to approve the minutes of the June 18, 2026 Special Water & Wastewater Advisory committee meeting.
Vice Chair Rose seconded the motion.
All voted in favor of the motion.

6. OLD BUSINESS

7. NEW BUSINESS

7.1. Geotechnical Exploration Proposal for Division of Safety of Dams

Prepared By: Scott Alman, Haley & Aldrich

Scott Alman from Haley & Aldrich presented to the committee about the Geotechnical Exploration project at Bell Canyon Reservoir for the Division of Safety of Dams. The committee discussed coordination between this project with the SCADA implementation contractor.
Public comment was opened. Comments were received from Tom Belt and Kelly Wheaton.

7.2. Review and Discussion of Draft Water Management Plan Chapters 2 & 4

Prepared By: Monique Day, West Yost

Monique Day from West Yost presented Draft Chapters 2 & 4 for the Water Management Plan.

7.3. Review of the High-Velocity Water Main Flushing Pilot Program

Prepared By: Bruce Zaeni, Project Manager

Project Manager Bruce Zaeni provided on update on the water main flushing pilot program and discussed next steps for flushing the remaining water mains throughout the City.
Public comment was opened, and Kelly Wheaton provided comments. Public comment was closed.

7.4. Review of Napa County Civil Grand Jury's Report on City of St. Helena Water Quality

Prepared by: Joe Leach

Public Works Director Joe Leach presented an overview of the Napa County's Civil Grand Jury Report and discussed the next steps for preparing a response. The committee discussed the report and possible approaches for responding to its findings.
Public comment was opened and comments were received from Kelly Wheaton. Public comment was closed.

8. SUBCOMMITTEE UPDATES

8.1. Water Quality

Prepared By: Jay Kouba & Peter White

The subcommittee did not have an update.

8.2. Water Security

Prepared By: Jay Kouba

The subcommittee did not have an update.

8.3. Preparation of Water and Wastewater Rate Study

Prepared By: Garry Rose & Mario Trinchero

This item was heard out of order after Public Forum. Member Trinchero provided a report on his meeting with Vice Chair Rose and the consultant from Raftelis and the discussion about the rate model used as part of the previous rate study.

9. FUTURE AGENDA ITEMS

9.1. Discussion of Decommissioning of Lower Reservoir

9.2. Discussion of Alternate Energy Options at Water and Wastewater Facilities

9.3. Water Management Plan Chapter Reviews (August 2026 Meeting)

9.4. St. Helena Community Forest Discussion (August 2026 Meeting)

10. ADJOURNMENT

The next Regular Water and Wastewater Advisory Committee meeting is scheduled for August, 13, 2026.
Vice Chair Rose adjourned the meeting at 12:35p.m.

APPROVED:	**ATTEST:**
______________________________	______________________________
Brent Randol, Chair	Joe Leach, PE, Staff Liasion

The St. Helena Community Forest

St. Helena, California

Frequently Asked Questions

Water and Wastewater Advisory Committee
August 13, 2026

Overview

In 2011, Mayor Dell Britton authorized the planting of an experimental timber forest of coast redwood trees on unused City of St. Helena land in the County, south of the wastewater treatment facilities off Chaix Lane. Over the past fourteen years, this work has grown into The St. Helena Community Forest—an ecological, educational, and community resource managed by Sustainable St. Helena an Environmental Alliance. The Community Forest currently hosts over 2,000 coast redwoods, 80 dawn redwoods, and 200 valley and coast live oak trees.

Sustainable St. Helena now requests:

1. Authorization of a Conservation Easement (CE) with the Land Trust of Napa County, permanently protecting the Community Forest acreage; and
2. Approval to expand the forest from 16 to 37 acres on fallow, non-developable City-owned floodway land not used for WWTP operations.

This proposal protects City-owned floodway land that is not needed for wastewater treatment operations, preserves future operational flexibility through a carefully drafted conservation easement, and converts underutilized acreage into a long-term community asset at no cost to the City.

See Appendix A for maps showing the current 16-acre forest and Appendix B for the proposed 37-acre expansion.

Why a Conservation Easement Is Needed Now

- Permanently protects the land from future development.
- Formalizes fourteen years of City-supported, community-funded work.
- Provides long-term ecological, recreational, educational, and climate benefits.
- Ensures land remains dedicated to habitat restoration and community use.
- Creates eligibility for regional and state climate funding.
- Recent upgrades at the wastewater facility to tertiary treatment levels have reduced the City's reliance on the southern portion of the land.

Conservation Easement 101

- The City retains full ownership of the land.
- A legal agreement between a property owner and the proposed holder that restricts and/or prohibits specific development rights.
- Perpetual in duration, under California Civil Code 815.
- Crafted specifically for the property, based on current and planned uses.
- Preserves the conservation intent of the property owner in the face of external pressures or threats.
- Annual monitoring by CE holder to ensure compliance.
- Land Trust of Napa County current portfolio of 161 conservation easements, including 2 on City of St. Helena property and 16 other government-owned properties.
- The proposed conservation easement will be drafted to preserve all existing and reasonably foreseeable wastewater treatment, reclamation, monitoring, and access rights necessary for WWTP operations.

Financial Commitment and Community Investment

Sustainable St. Helena has raised over $200,000 to plant, irrigate, and manage the existing forest—at no cost to the City. This demonstrates strong local support, stewardship capacity, and long-term investment.

Sustainable St. Helena plans to continue fundraising efforts for long-term stewardship and management of the Community Forest, including monitoring costs for the conservation easement. The only financial costs to the City for the conservation easement include: staff/counsel review of negotiation documents; and staff time to confer access for annual Land Trust monitoring visits.

How the Community Forest Supports the Napa County Regional Climate Action Plan (RCAAP)

The draft Napa County RCAAP requires each municipality to increase tree canopy above 2019 levels. The St. Helena Community Forest is the largest single contributor to St. Helena's canopy growth:

- Over 2,000 new trees have been planted since 2019.
- An additional 4,000 trees are possible with the 21-acre expansion.
- Supports the Urban Forestry & Nature-Based Carbon Sequestration strategies outlined in the RCAAP.

Alignment with the St. Helena Master Walking Path Plan

The forest lies along the alignment of the City's Master Walking Path Plan.

- Creates a continuous public walking and nature trail.
- Connects to the proposed Napa River Trail.
- Provides community recreation, wellness, and open space benefits.
- RLS and Calistoga Middle Schools and Montessori High School students' forestry curriculum

Accomplishments to Date

- 16 acres planted with over 2,500 trees including redwoods, oaks, ash, and buckeyes.
- 160 additional trees and pollinator shrubs planted in partnership with NRCS and Napa RCD.
- Drip irrigation was installed to prevent effluent drift.
- Maintenance supported by Silverado Farming and community volunteers.
- Forestry oversight is provided by three Registered Professional Foresters.

Environmental Benefits

The St. Helena Community Forest provides significant environmental benefits that expand meaningfully with the proposed 21-acre expansion:

- Carbon sequestration: approximately 250 tons of CO_2 removed annually at maturity.
- Long-term carbon storage exceeding 4,410 tons across the expanded forest.
- Floodway enhancement: improved water infiltration, lower runoff velocity, and strengthened Napa River corridor function.
- Biodiversity: enhanced habitat for birds, pollinators, and native species, including occasional sandhill cranes and egrets.
- Air quality and heat-island mitigation: shade canopy lowers temperatures and improves local air quality.
- Soil improvement: redwood and oak litter builds organic matter and improves soil structure.

The expanded forest strengthens climate resilience, improves watershed health, and supports long-term ecological stability within the Napa River system.

Why Redwoods?

- Ideal soil and climate conditions.
- Strong health observed among redwoods planted over 30 years ago.
- High fire and climate resilience. Drought-hardy species.
- Excellent carbon sequestration capacity.
- Regenerate naturally after harvest; no replanting required.
- Tolerant of treated effluent in well-drained soils.
- Native to Napa County.

Carbon Sequestration Benefits

A sustainably managed redwood forest with an average age of 20 years stores approximately 210 tons of carbon per acre. The 21-acre expansion would provide:

- 4,410 tons of carbon stored in a steady state.
- Approximately 250 tons of CO_2 removed annually once fully established.

Challenges

- Seedling stress due to heat, frost, wildlife, and competition.
- Treated effluent availability is limited to 3 times per week.
- Some native species are salt intolerant, but redwoods and oaks perform well.

Project Leadership

Project Director Paul Asmuth holds a Master of Science in Forestry and manages operations alongside three Registered Professional Foresters:

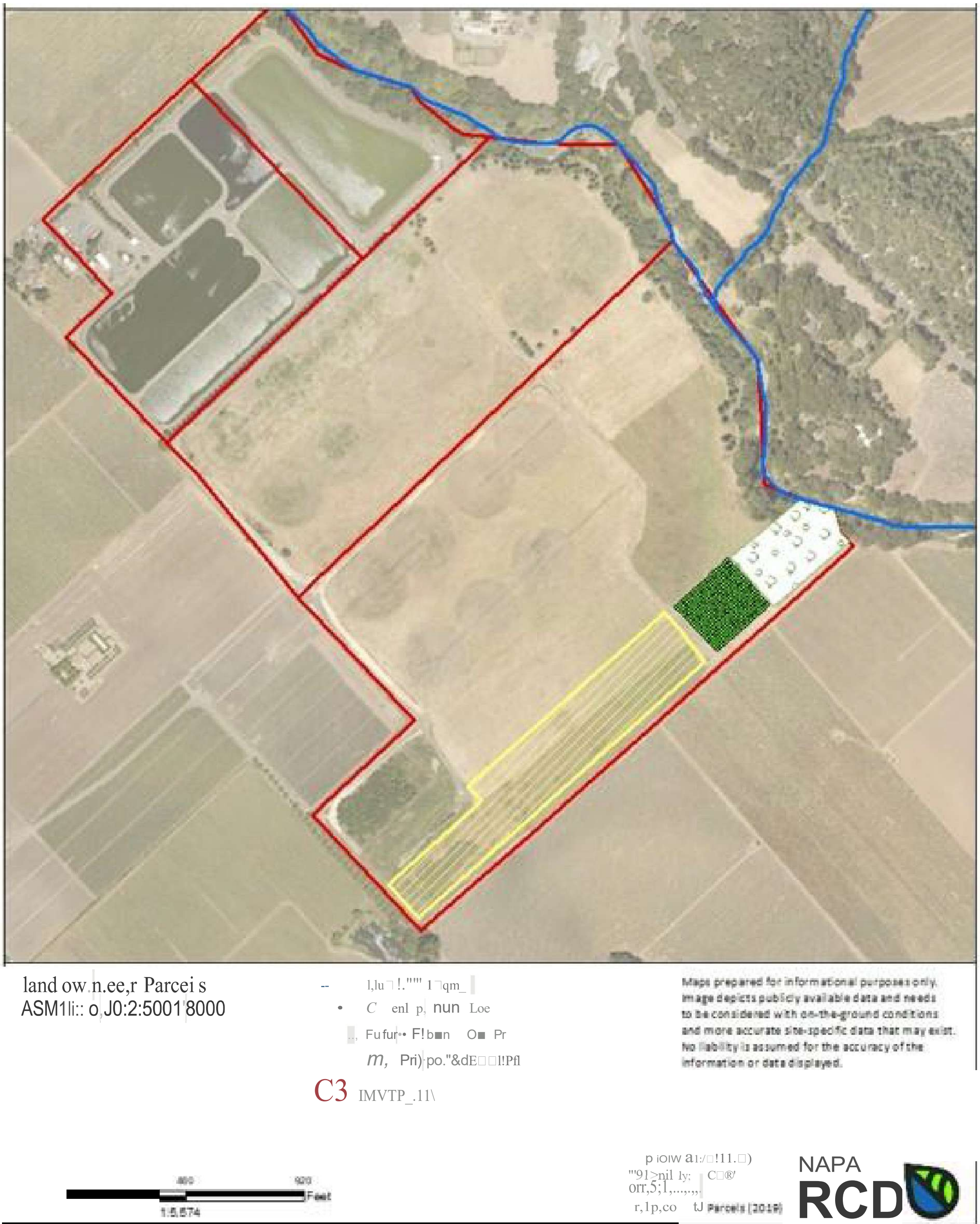
• Nicholas Kent (Cal Fire)
• John Henshaw, RPF
• Andy Armstrong, RPF

Lena Pollastro is the Conservation Director for the Land Trust of Napa County, on staff for over 18 years. She supervises all new conservation acquisitions, as well as the organization's monitoring and compliance program.

Summary Request

- Authorize a Conservation Easement with the Land Trust of Napa County.
- Approve expansion of The St. Helena Community Forest from 16 to 37 acres.
- Secure permanent open space, climate resilience, and community benefits with no additional City staffing.

Appendix A – Current 16-Acre Planted Area



Appendix B – Proposed 37-Acre Expansion

6


Existing
Proposed Expansion
Napa River
Napa River
Google
100%
Data attribution
older–8/30/2020

THE ST. HELENA COMMUNITY FOREST

Conservation Easement and Expansion Proposal
City of St. Helena Water and Wastewater Advisory Committee
August 13, 2026

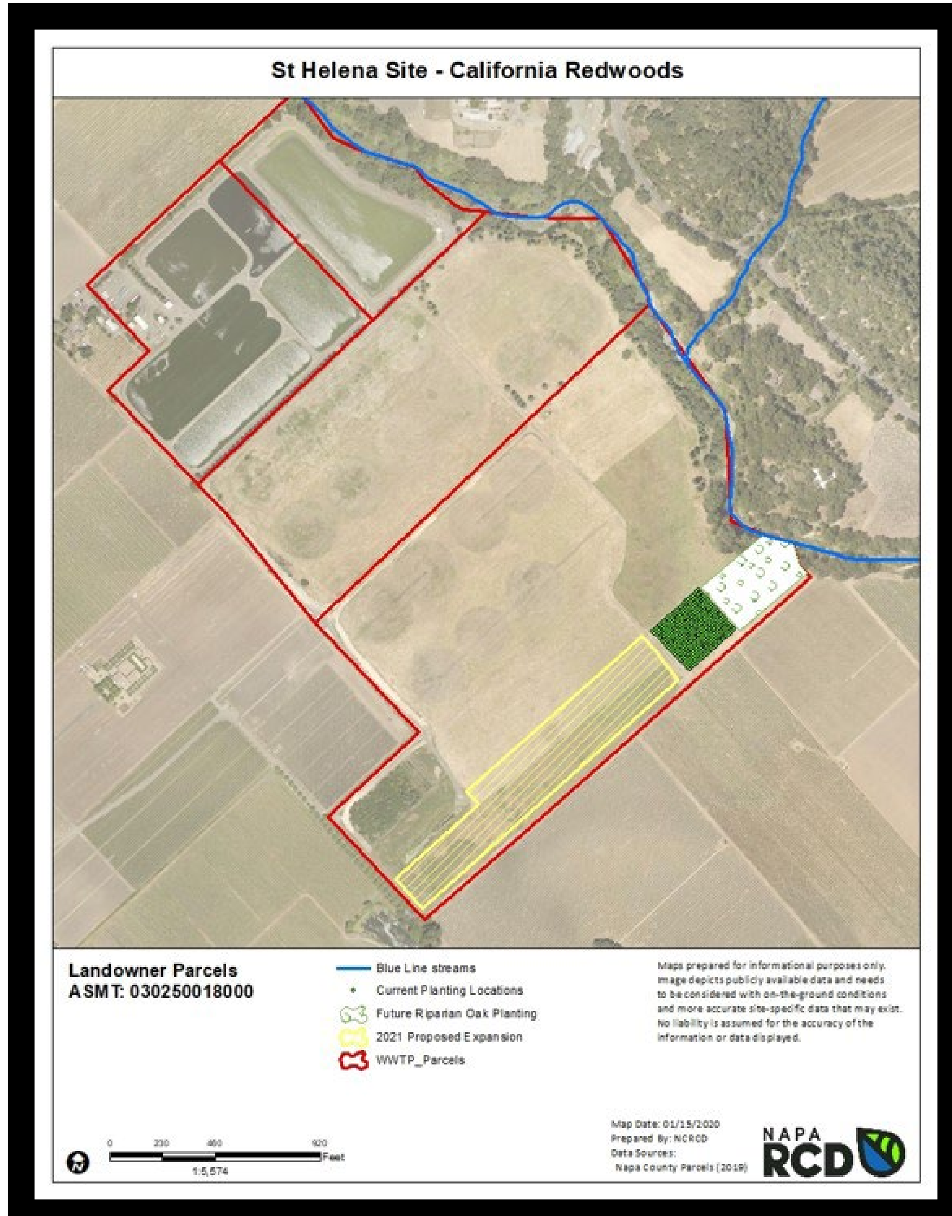
Paul Asmuth, MS Forestry
Lena Pollastro, Land Trust of Napa County

What is The St. Helena Community Forest?

A 16-acre redwood and native oak community forest planted on City-owned land and irrigated with reclaimed water.

Where is the Existing Community Forest

16 acres



Brief History Since 2011

Proposed experimental timber forest on city-owned fallow land

Planted 500 redwoods in 2012

Planted 2,000 coast redwoods and oak trees 2021 – 2023 with Napa RCD and volunteers

Planted 160 trees/shrubs of 14 native pollinator species with 35 volunteers, RCD, and NRCS in June 2025

Benefits and opportunities for education, habitat, climate resilience

What is the community forest purpose?

Excellent use of City-owned fallow land within the FEMA floodplain that offers:

- Environmental protection and climate resilience
- Educational opportunities for local youth and community
- Wildlife habitat through reforestation and protection
- Community benefits of recreation, aesthetic beauty

Environmental Benefits

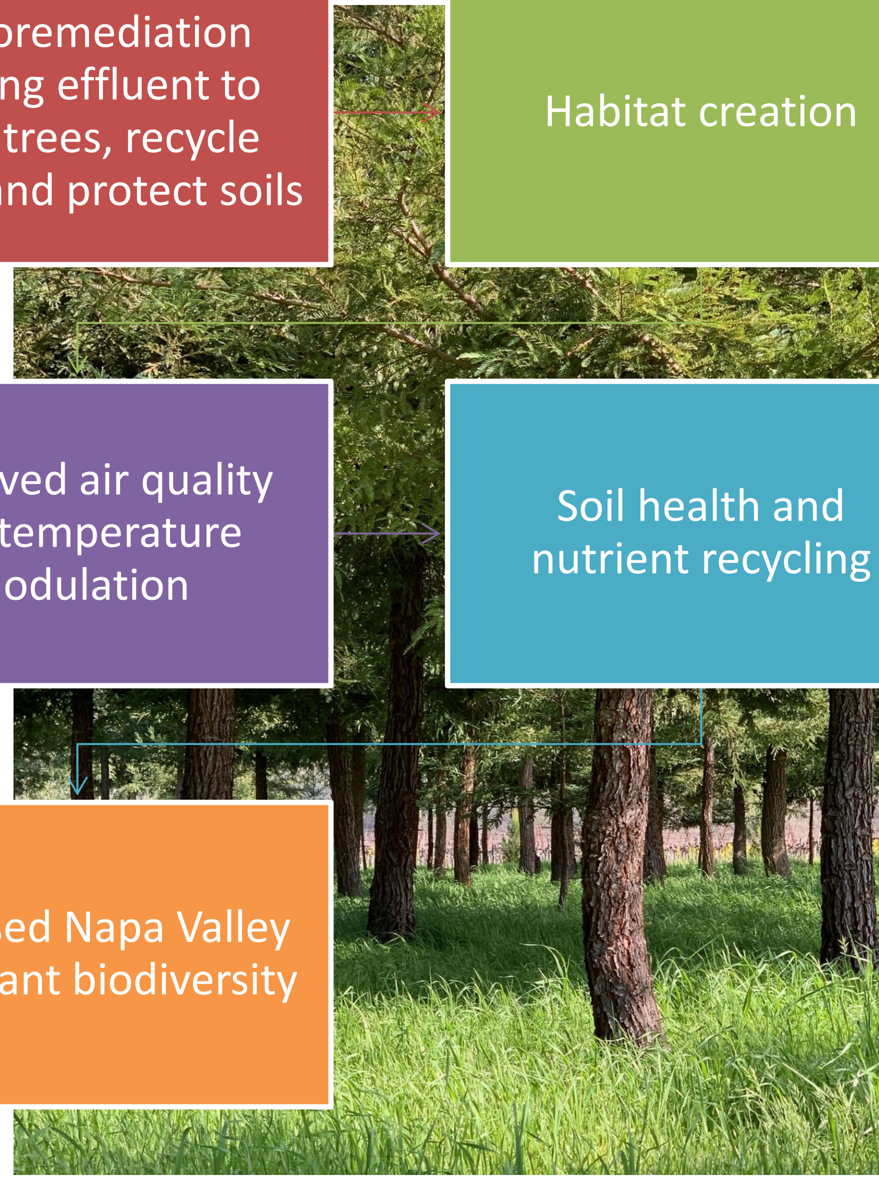
Phytoremediation utilizing effluent to grow trees, recycle water, and protect soils

Habitat creation

Improved air quality and temperature modulation

Soil health and nutrient recycling

Increased Napa Valley floor plant biodiversity



A thriving forest delivering measurable ecological and climate benefits

23 Ecosystem Services Provided by a Coast Redwood Community Forest

Based on the Classification of de Groot et al. (2002)

REGULATION FUNCTIONS (11)

- ✓ 1. Gas regulation
- ✓ 2. Climate regulation
- ✓ 3. Disturbance regulation
- ✓ 4. Water regulation
- ✓ 5. Water supply
- ✓ 6. Erosion regulation
- ✓ 7. Soil formation
- ✓ 8. Nutrient cycling
- ✓ 9. Waste treatment
- ✓ 10. Pollination
- ✓ 11. Biological control

HABITAT FUNCTIONS (2)

- ✓ 12. Habitat / Refugia
- ✕ 13. Nursery population and habitat

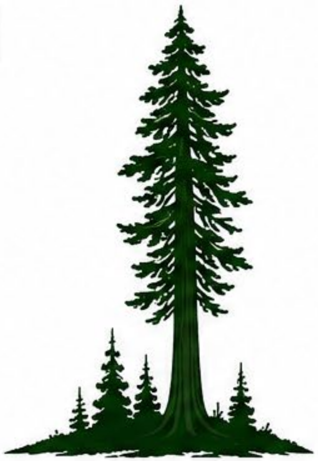
PRODUCTION FUNCTIONS (7)

- ✓ 14. Food production
- ✓ 15. Timber production
- ✓ 16. Fiber production
- ✓ 17. Genetic resources
- ✓ 18. Biochemical resources
- ✓ 19. Fresh water
- ✓ 20. Medicinal resources

INFORMATION FUNCTIONS (3)

- ✓ 21. Ornamental resources
- ✓ 22. Recreation and ecotourism
- ✓ 23. Cultural / Spiritual

Green ✓ = Present in the St. Helena Community Forest ✕ Gray ✕ = Not Applicable



de Groot et al. (2002)
23 Ecosystem Services
(Millennium Ecosystem Assessment)

Why Coast Redwoods?

Sequester carbon faster than other trees

Valuable timber, fast-growing and long-lived (2,500 yrs)

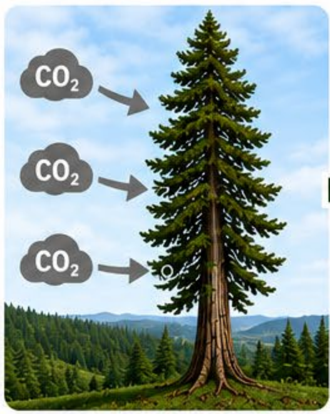
Drought, disease, fire-resilient, and resprout

Napa County native – the oldest known is 800 years old

Coast Redwoods Capture and Store Carbon for Generations

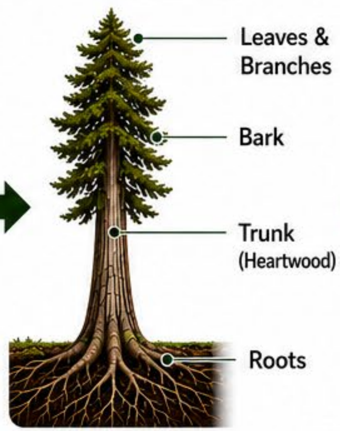
Naturally sequestering carbon today and into the future

1 Carbon from the Atmosphere



Trees absorb CO_2 from the air through photosynthesis.

2 Carbon Stored in the Tree



Carbon is stored in leaves, branches, bark, trunk, and deep in the root system.

3 Harvested into Fence Board

Trees are harvested and made into durable fence board that stores carbon for decades or longer.

4 Nature Regenerates

The stump sprouts new redwoods, continuing the forest cycle.

5 Roots Store Carbon Forever

The deep root system remains, storing carbon underground for generations.

Coast redwood forests are a powerful, natural climate solution:
capturing carbon, storing it in wood and soil, and renewing for generations.

Healthy forests. Strong communities. A cooler future.

St. Helena Community Forest

Working together for people, wildlife, and our planet.

Education Opportunities

- Redwood/Oak plantings
- Forestry curriculum
- Nature experiences
- Local schools and community

2026 Barn owl owlets

Nov 2025 Sandhill cranes

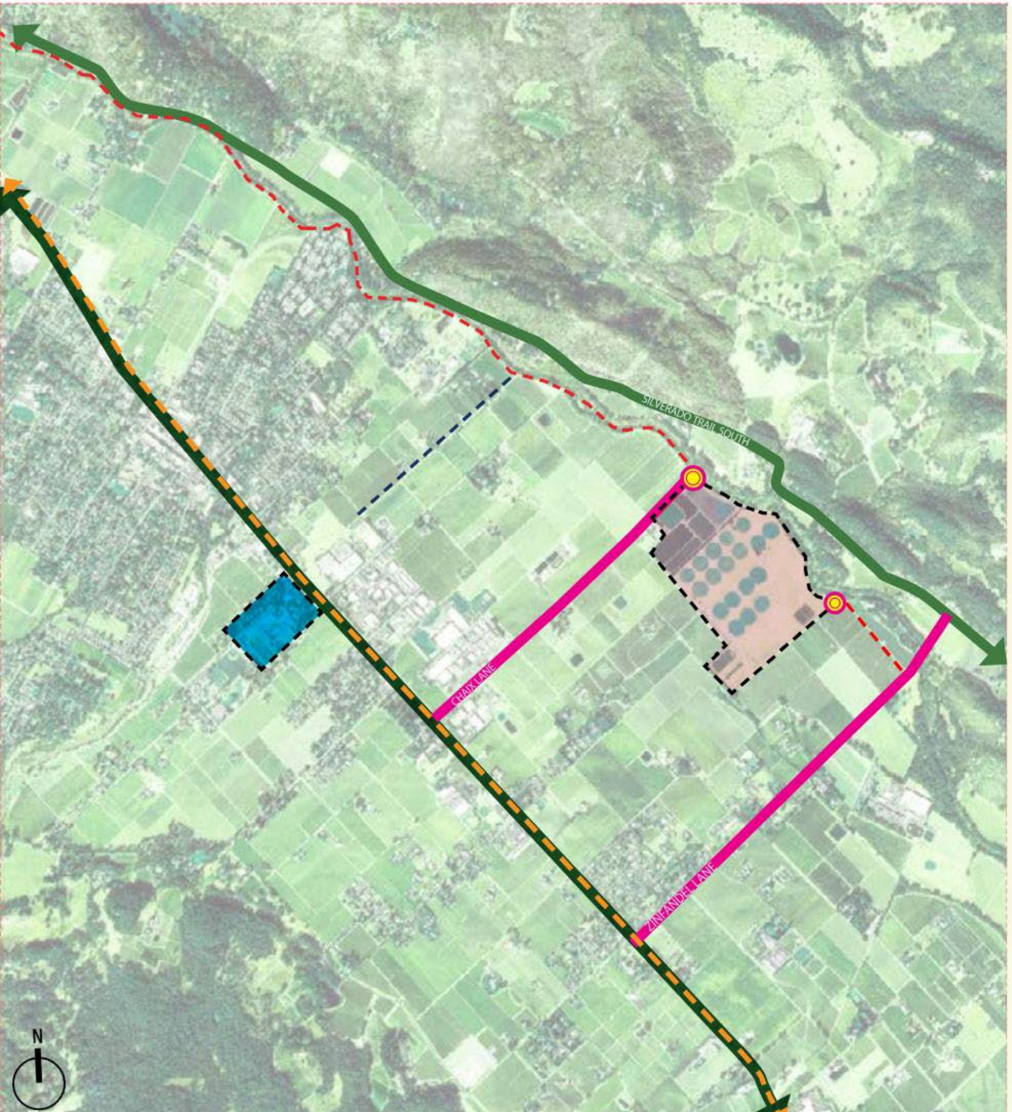
Wildlife Habitat and Protection

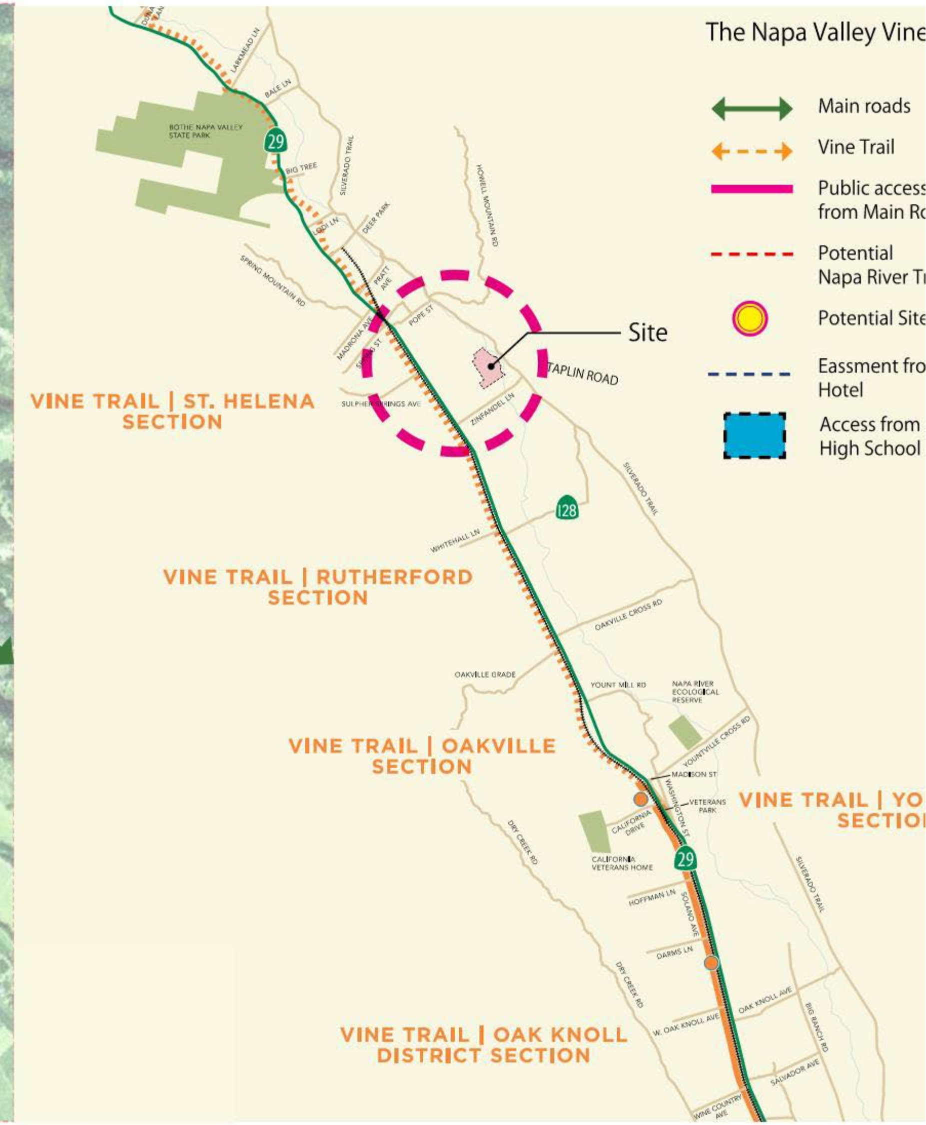
- 31 species observed Jan 2024
- Rare bird sightings
- Barn owls roosting/nesting

Community Benefits

- **Health - Recreation, forest bathing, aesthetic beauty, air quality**
- **Alignment with City of St. Helena Parks and Rec Goals and Walking Master Plan**
- **Leads the way in Napa County climate action goals of the RCAAP**
- **No additional City positions or ongoing City management responsibility; normal WWTP operations are preserved**

Potential Public Access + City Walking Trails





Proposed 37-acre Expansion

Landscape Concept

- **Fallow land**
- **No disruption to WWTP**
- **Floodway**

- - - EXPANDED COMMUNITY FOREST (37 ACRES)

1. PHASE 1 REDWOOD FOREST
2. EXPANDED REDWOOD FOREST
3. EXPANDED OAK FOREST
4. TREATMENT POND - BIRDING TRAIL ON LEVEES
5. WETLAND
6. OPEN WILD FLOWER MEADOW
7. RIVER OVERLOOK
8. PROPOSED NAPA RIVER TRAIL
9. EXISTING SPRAY FIELDS

Napa Valley Community Forest DRAFT 9/18/2025

FEMA Floodway Map

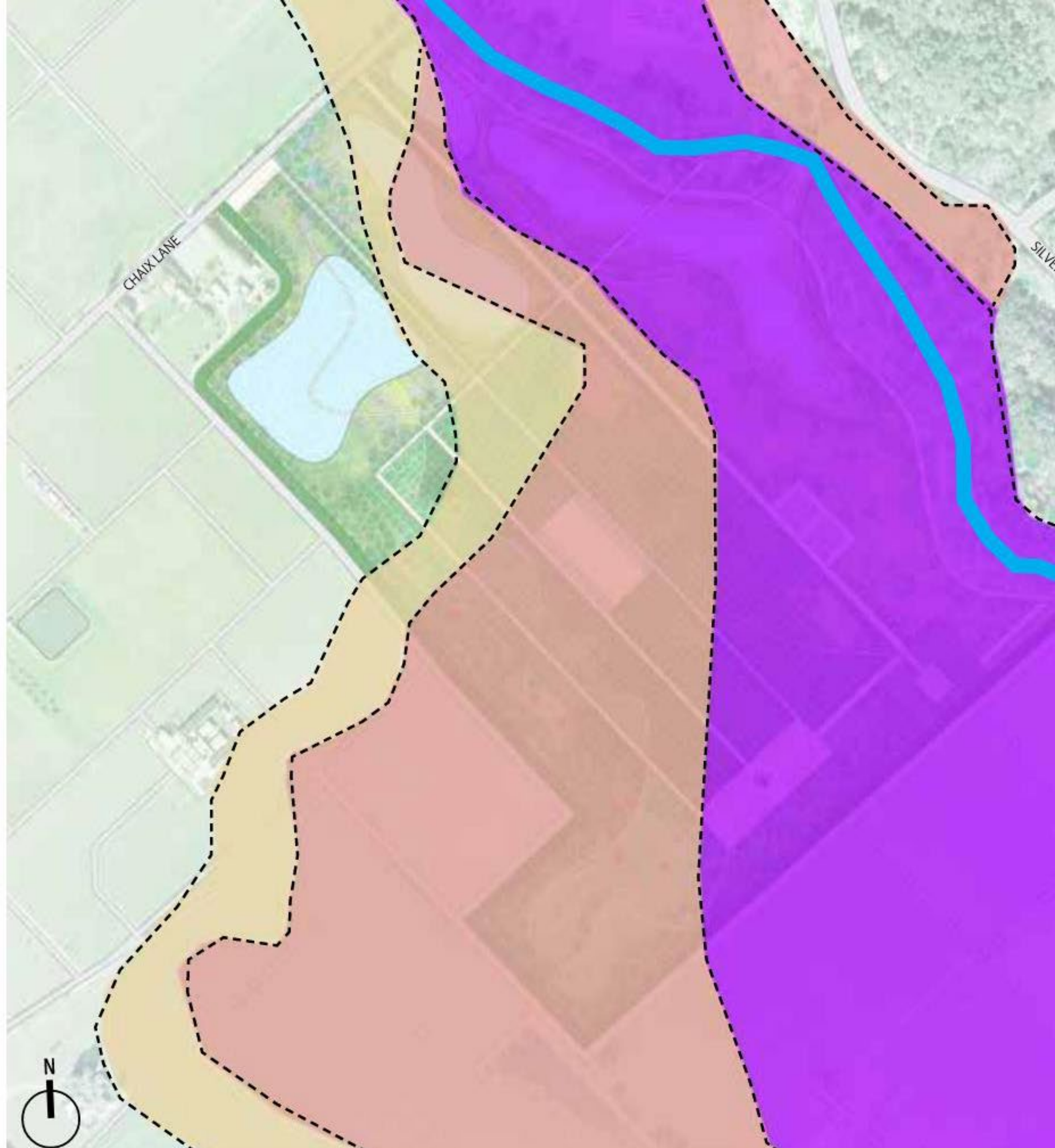
- **Community Forest Area**
- **Highest and Best Use**
- **Land Undevelopable**
- **No Impact to WWTP Operations**

Napa River

Napa River Plain. High Risk for Flood Zone

AE: The base flood plain
Where base flood elevations are provided.

0.2%: Moderate Flood Hazard,
Usually the area between the limits of the 100-year and 500 year floods. Are also used to designate base floodplains of lesser hazards, such as areas protected by levees from 100-year flood, or shallow flooding areas with average depths of less than one foot or drainage areas less than 1 square mile.



This map shows why development is not feasible here. But it is *ideal* for like forest habitat, walking trails, and community recreation.

Conservation Easement (CE)

Land Trust of Napa County

The City retains full ownership of the land.

Land Trust of Napa County ensures compliance and protection with conservation goals of ecology, community benefits, and education.

Development or land uses inconsistent with conservation are prohibited.

The CE increases eligibility for grants and state climate funding.

Ensures land remains protected for habitat restoration and community use.

Project Leadership

Paul Asmuth, Founder, MS Forestry

Marilyn Asmuth, Founder

Nick Kent, RPF, Cal Fire

Andy Armstrong, RPF, North Coast Resource Management

John Henshaw, RPF

William J. Libby, PhD, Professor Emeritus UC Berkeley

Support Team

- Sustainable St. Helena, 501(c)(3) – Nonprofit
- Napa Resource Conservation District
- Natural Resources Conservation Service
- Silverado Farming – Pete Richmond and David McGraw
- City of St. Helena

Summary

We respectfully ask the Water and Wastewater Advisory Committee to endorse expanding the Community Forest from 16 to 37 acres and establishing a conservation easement with the Land Trust of Napa County.

A community asset for generations

Summary of Terms
St. Helena Community Forest Conservation Easement

Parties

- **Grantor/Owner:** City of St. Helena, a California municipal corporation
- **Grantee/Holder:** Land Trust of Napa County (dba The Land Trust of Napa County), a California nonprofit corporation
- **Third-Party User:** Sustainable St. Helena an Environmental Alliance, Inc. — current occupant managing the community forest operation

Property/Easement Area

- Approximately 16 acres in Napa County, California (APN 032-350-018, portion)
- Located at the City of St. Helena Wastewater Treatment Facility, west of the Napa River between Chaix Lane and Zinfandel Lane
- Consists primarily of native and non-native redwood species and valley oak
- A Baseline Report (date TBD) will be incorporated by reference as the condition benchmark

Easement Type & Duration

- Perpetual conservation easement under California Civil Code §§ 815.1–815.2
- Runs with the land and binds all successors and assigns

Conservation Values Protected: Natural, scenic, open space, and educational values, specifically: native forest habitat, riparian corridor, carbon sequestration potential, wildlife habitat, and viewshed character. Consistent with Napa County General Plan policies (CON-1, CON-9, CON-18), County Code chapters on viewshed and conservation regulations, and City of St. Helena General Plan Open Space policies.

Prohibited Uses

- Subdivision or partition of the Easement Area (though the larger underlying parcel may be separated from the Easement Area with Trust approval)
- Permanent structures, buildings, additional roads, fencing (with limited exceptions), billboards, or other improvements
- Residential uses and appurtenant structures of any kind
- Agricultural uses generally — no vineyards, wineries, livestock for commercial purposes, or permanent pasture
- Industrial uses
- Commercial uses (defined as production of goods or services for sale/trade), except as expressly permitted
- Winery, event venue, or lodging operations
- Hunting, trapping, and fishing (except with Trust approval for pest/disease control or ecological research)

- Off-road motorized vehicles (except for emergency, trail/resource management, or scientific instrument access)
- Dumping, burial, or disposal of waste or hazardous materials
- Grading, discing, or other significant soil disturbance
- Mineral, hydrocarbon, or geothermal extraction
- Separate transfer of water rights
- Use of the easement as mitigation credit for other projects
- Paving roads with impermeable surfaces (unless required by law or Trust-approved)
- Impervious surface coverage exceeding 2% of the property

Permitted Uses (Reserved by Owner)

Use	Conditions
Community forest / merchantable timber harvest	Must comply with California forestry laws and BMPs; native species prioritized; Timber Zone to be identified on Exhibit X
Ecological research & education (Reserve Activities)	Prior written Trust approval if significant alteration or more than negligible sample collection
Low-impact recreation (hiking, birdwatching, bicycling, horseback riding, picnicking on existing trails)	Consistent with easement purpose; prior approval if significant alteration
Future public trails	Must conform to City Parks, Recreation & Trails Master Plan
Grazing livestock for vegetation/fuels management	Short-term only; permanent pasture prohibited
Renewable energy systems	Trust prior approval; must serve only on-Property permitted uses; systems under 200 sq ft and 100 ft tall may proceed with approval
Existing utility maintenance/reconstruction	Existing locations only without approval; expansion/relocation requires Trust approval
Watershed, creek, and aquifer enhancement activities	Requires qualified expert review and Trust approval
Leasing/licensing the Property	Must be consistent with easement terms; Easement must be disclosed to all lessees
Carbon credit establishment	Owner must notify Trust 30 days in advance
Signs	Limited to 36"×48"; identifying permitted uses
Temporary structures for ecological projects or research	Duration limited to project period

Use	Conditions
Perimeter fencing and gates	Permitted; also fencing for restoration, species protection, or scientific instruments

Trust Rights

- Annual monitoring visits with 48-hour notice; may be extended if insufficient time
- Unannounced enforcement entry if violation suspected (24-hour notice attempted but not required)
- Right to erect boundary/identification signage (Trust pays cost)
- Right to use any access easements to reach the property
- Owner assigns access easement rights to Trust irrevocably for monitoring/enforcement

Notice & Approval Process

- **Notice only (30-day):** Owner gives written notice; if Trust does not object within 30 days, activity may proceed
- **Prior written approval (60-day):** Trust must grant or deny within 60 days; silence = denial
- All approvals must be in writing, oral approvals are expressly void and non-binding
- Trust may require Owner to pay consultant/staff costs if review exceeds 10 person-hours
- Trust may require a Management Plan for complex or ongoing activities

Enforcement & Remedies

- Trust may issue notice of violation and demand cure
- Trust may seek injunctive relief (including ex parte), damages, and restoration costs
- Emergency enforcement allowed without notice if immediate action is required to prevent significant damage
- Owner bears all enforcement costs (attorneys' fees, experts, staff time, restoration) unless Owner prevails in judicial action
- Forbearance by Trust does not constitute waiver

Extinguishment & Condemnation

- Extinguishment requires judicial proceedings; Owner pays Trust its proportional fair market value interest at termination
- Trust's property right is immediately vested upon grant
- In condemnation, parties act jointly to recover full value; Trust's share based on its proportional interest
- Economic hardship, climate change, or zoning shifts do not justify extinguishment

Transfer & Amendment

- Trust may assign easement only to another qualified organization
- Owner must give Trust 30 days written notice prior to any transfer; must incorporate easement by reference in all conveyance documents

- Amendments require written consent of both parties, review by the California Attorney General's office, must further conservation purpose and have neutral or beneficial effect on Conservation Values; Owner bears all amendment review costs

Owner Obligations

- Maintain property, pay all taxes and assessments
- Comply with all applicable laws; obtain all permits for permitted activities
- Indemnify Trust against liability arising from Owner's activities or omissions on the Property
- Warrant no known hazardous substance releases; no underground storage tanks
- Disclose easement to all prospective buyers and lessees
- ***Indemnification.*** The City of St. Helena, as Owner, bears full indemnification responsibility for the Land Trust of Napa County and its officials, officers, employees, and agents, covering:
    - All liability, loss, legal expenses, claims, damages, and judgments arising from Owner's activities or those of its employees, agents, invitees, or the public on the Property
    - Any breach of the Easement by Owner
    - Any act or omission by Owner or its representatives
    - Any injury, death, or property damage occurring on or about the Property
    - The sole exception is liability arising from the Trust's own negligence or willful misconduct
- ***Insurance.*** Owner is required to maintain public liability insurance for the full term of the Easement, with the following requirements:
    - Minimum coverage of $1,000,000 per occurrence, subject to increase at the Trust's discretion to account for inflation
    - Policy must reference the Easement and remain current for its full term
    - Trust must receive at least 30 days' notice of cancellation, non-renewal, or material change (reduced to 10 days for non-payment of premium)
    - If required coverage becomes commercially unavailable despite Owner's documented best efforts, the Trust may waive the requirement for the period that such insurance is commercially unavailable, which approval shall not be unreasonably withheld

Dear Members of the St. Helena Water and Wastewater Advisory Board,

On behalf of the Napa County Beekeepers Association (NCBA), I am writing to express our enthusiastic support for the St. Helena Community Forest Project.

The NCBA is dedicated to supporting Napa's beekeeping community through educational outreach, treatment-free honey bee management, and pollinator habitat advocacy throughout the Napa Valley. We recognize the immense ecological and community value that a dedicated municipal forest reserve brings to our regional environment. Native forest conservation and habitat restoration are essential to maintaining biodiversity, improving soil and water quality, and mitigating climate risks such as wildfire and habitat fragmentation. The project's long-term goals will directly support local pollinators for decades to come.

Because the St. Helena Community Forest Project aligns seamlessly with our mission to protect local environmental quality and foster pollinator habitat, we strongly encourage the Board to fully support and approve this project.

The NCBA welcomes opportunities to collaborate on pollinator-friendly planting initiatives, education, or habitat monitoring within the Community Forest as the project progresses.

Thank you for your leadership and dedication to restoring our community's natural resources.

Best regards,

Martin Podell
President, Napa County Beekeepers Association

Chapter 5. Groundwater Evaluation

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LIST OF ACRONYMS AND ABBREVIATIONS

SGMA	Sustainable Groundwater Management Act	5-1
AFY	Acre Feet per Year	5-1
LSCE	Luhdorff & Scalmanini Consulting Engineers	5-1

bgs	Below ground surface	5-2
TDS	Total Dissolved Solids	5-2
GSA	Groundwater Sustainability Agency	5-7
GSP	Napa Valley Subbasin Groundwater Sustainability Plan	5-1
WMP	Water Master Plan	5-1
MCL	Maximum Contaminant Level	5-3
µg/L	Micrograms per Liter	5-2
Subbasin	Napa Valley Subbasin	5-1
gpm	Gallons per minute	5-5

CHAPTER 5
Groundwater Evaluation

The chapter evaluates groundwater-related supply strategies intended to improve long-term water supply reliability while remaining consistent with regional groundwater sustainability goals established under California's Sustainable Groundwater Management Act (SGMA). These strategies include:

- Development of new municipal groundwater wells
- Groundwater offset or in-lieu agreements
- Stormwater recharge of groundwater

Recycled water supply options, including recycled water use that may support groundwater recharge, are evaluated separately in Chapter 6.

This chapter uses the Water Supply Strategy Analyses report prepared by Luhdorff & Scalmanini Consulting Engineers (LSCE), as the primary technical basis for hydrogeologic setting, groundwater conditions, and evaluation of candidate sites for new municipal groundwater wells.[1] Findings from this report are summarized in this chapter, and the full report is included in this Water Management Plan (WMP) as Appendix D.

5.1 GROUNDWATER BACKGROUND

As described in Chapter 2, the City's long-term groundwater supply planning is based on an average annual groundwater production value of approximately 350 acre feet per year (AFY), consistent with the reduced pumping provision in the Napa Valley Subbasin Groundwater Sustainability Plan (GSP). Chapter 2 also describes the City's policy to reduce groundwater use in non-drought years, while allowing groundwater to remain an important component of the City's supply portfolio during drier conditions.

5.1.1 Regional Hydrology of Napa Valley Subbasin

The City lies within the Napa Valley Subbasin (Subbasin), a north-south trending groundwater basin underlain by several distinct geologic formations. The principal geologic units include Quaternary alluvial deposits consisting of unconsolidated gravel, sand, silt, and clay; Sonoma Volcanics composed of volcanic rocks such as lava flows, tuffs, and breccias; and older bedrock formations of the Franciscan Complex and Great Valley Complex.

Among these units, the Quaternary alluvium forms the primary groundwater aquifer in the Subbasin. These sediments have relatively high permeability and storage capacity and therefore provide the most productive groundwater-bearing zones.

In contrast, the Franciscan Complex generally yields only limited groundwater because the rocks are highly consolidated and fractured only locally. The Sonoma Volcanics can yield groundwater where fractured or weathered, but well productivity is often highly variable and difficult to predict (LSCE, 2026).

Geologic cross-sections presented in the LSCE report show substantial variation in the thickness of alluvial deposits beneath the City. Near downtown St. Helena, alluvial deposits may exceed 400 feet in thickness, particularly east of Highway 128/29. These thick alluvial deposits are associated with some of the most

[1] Luhdorff & Scalmanini Consulting Engineers. April 2026. *City of St. Helena Water Supply Strategy Analyses.* Prepared for the City of St. Helena.

productive groundwater zones in the area. Farther south near Crane Park, alluvial thicknesses are generally between 100 and 200 feet. Although groundwater is still available in these areas, sediments tend to be finer grained and may contain fewer thick sand and gravel zones capable of sustaining high-yield wells (LSCE, 2026).

5.1.2 Groundwater Conditions

5.1.2.1 Groundwater Levels and Flow

Groundwater levels throughout the City and the surrounding area are generally shallow. Groundwater depths in most locations, as measured in Spring 2024, range from approximately 10 to 20 feet below ground surface (bgs). Groundwater flow in the Subbasin generally follows the Napa Valley from northwest to southeast, with localized eastward flow toward the Napa River near the City. Long-term monitoring data indicate that groundwater levels have remained relatively stable since monitoring began in approximately 2014. Seasonal fluctuations, however, can be substantial, ranging from 40 to 100 feet depending on well depth and location (LSCE, 2026).

5.1.2.2 Groundwater Quality

Groundwater quality in the City and the surrounding area is generally characterized by low total dissolved solids (TDS), indicating relatively fresh groundwater conditions. However, several naturally occurring constituents commonly exceed drinking water standards.

Elevated arsenic concentrations are a recurring concern in the northern area of the City. Multiple wells have historically exceeded the primary drinking water maximum contaminant level (MCL) of 10 micrograms per liter (µg/L) for arsenic. Arsenic is naturally occurring, and concentrations appear to vary geographically and with depth. Wells south of the City and shallower monitoring wells near Sulphur Creek generally exhibit lower arsenic concentrations.

Elevated levels of iron and manganese are also widespread and naturally occurring in the St. Helena area and are a groundwater quality concern. Numerous wells exhibit concentrations above secondary drinking water standards, particularly in deeper groundwater. These constituents are naturally derived from geologic materials and are common throughout the region's aquifer system.

In contrast to the constituents of concerns described above, other common groundwater constituents of concern in other areas, such as nitrate and chloride, generally have low concentrations throughout the Subbasin area and remain below regulatory thresholds in most wells in the St. Helena area.

5.1.3 Existing Groundwater Supply Wells

As described in Chapter 2, the City currently operates two municipal production wells located adjacent to the Napa River south of Pope Street. Although productive, the wells exhibit recurring elevated manganese concentrations, and Well #2 also shows elevated iron concentrations (LSCE, 2026).

5.1.4 Groundwater and Surface Water Interaction

A central concern with pumping groundwater from City wells is the interaction between pumped groundwater and streamflow in the Napa River, particularly during dry-season low-flow periods. The GSP identifies depletion of interconnected surface water resources, commonly referred to as stream depletion, as one of the most sensitive sustainability indicators in the Subbasin. Because the Napa Valley

Subbasin is relatively small, has shallow groundwater levels, and is drained by the Napa River and its tributaries, groundwater pumping can influence streamflow conditions. The timing and magnitude of these effects vary depending on factors such as the location of pumping relative to streams and the depth from which groundwater is extracted. During the dry season, groundwater discharge to rivers and streams, known as baseflow, represents a substantial component of streamflow in the Napa River system and is important for maintaining low-flow conditions (LSCE, 2026).

To evaluate groundwater-surface water interactions, LSCE used the Napa Valley Integrated Hydrologic Model (NVIHM) to assess the effects of groundwater pumping and alternative water management strategies on Napa River streamflow. Modeling results showed that relocating municipal pumping farther from the Napa River produced modest improvements in low streamflow conditions, while strategies that reduce groundwater pumping or increase groundwater recharge provided greater benefits. The analysis found that recycled water use and managed aquifer recharge can increase groundwater storage and improve streamflow conditions by enhancing groundwater contributions to the Napa River during periods of low streamflow. These findings highlight the importance of managing groundwater and surface water as an interconnected system to support long-term groundwater sustainability in the Napa Valley Subbasin (LSCE, 2026).

5.2 NEW MUNICIPAL GROUNDWATER WELL

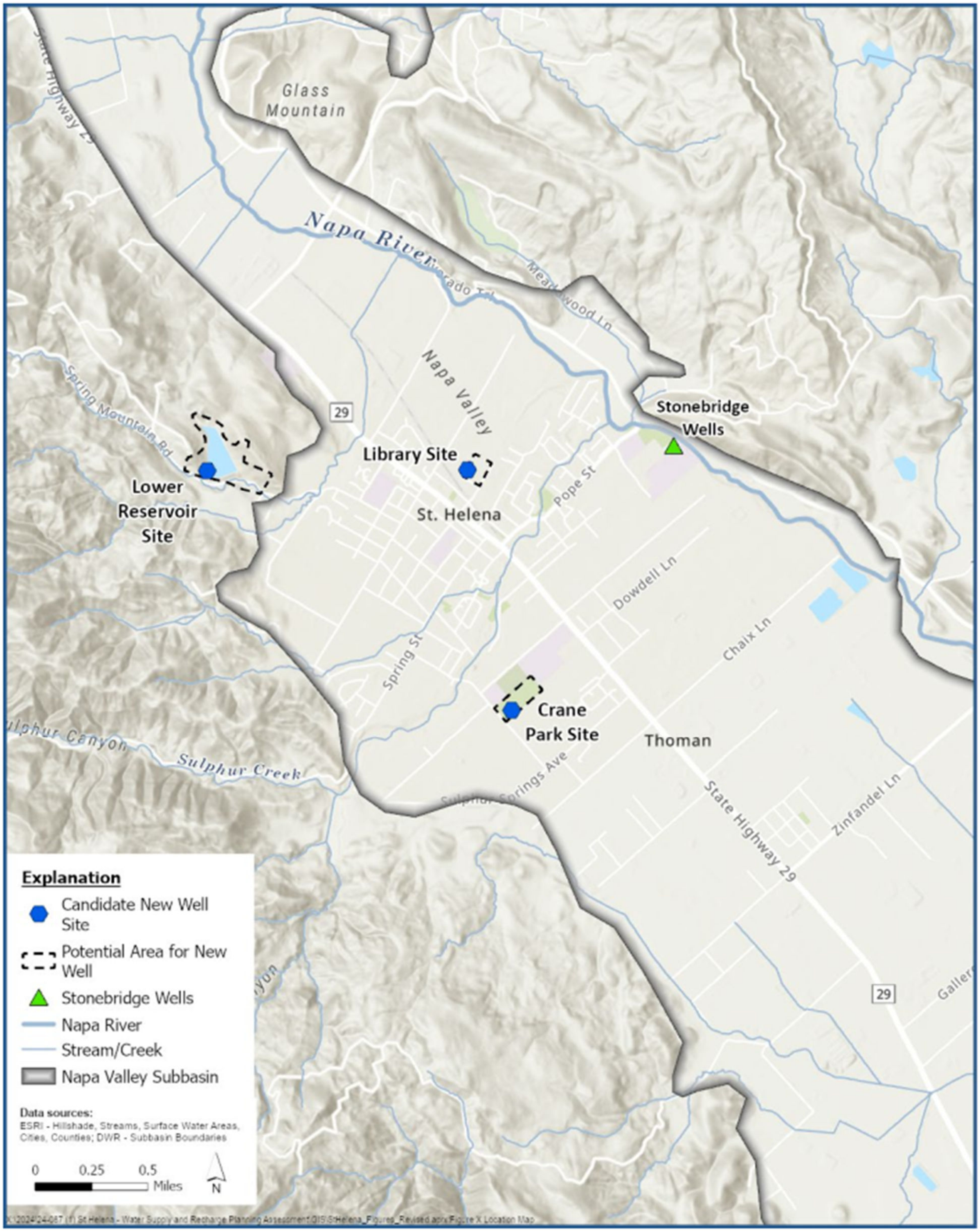
Development of a new groundwater well could reduce the City's reliance on the existing Stonebridge Wells and potentially reduce seasonally localized streamflow impacts. As described in Chapter 4, a new well located within the Subbasin would not increase the City's long-term allowable groundwater availability, as total groundwater pumping would still be constrained by the GSP pumping requirements.

The feasibility of a new municipal groundwater well depends on several site-specific factors, including expected yield, groundwater quality, proximity to the Napa River and significant tributaries, and suitability for construction. These factors influence not only the ability of a well to provide a reliable long-term water supply, but also its potential effects on groundwater sustainability and interconnected surface water resources. Areas with favorable hydrogeologic conditions are more likely to produce sufficient groundwater to meet municipal demands, while groundwater quality affects the need for treatment and associated costs. Proximity to the Napa River and other significant streams is particularly important because groundwater pumping can reduce streamflow through stream depletion, which has been identified as a key sustainability concern in the Napa Valley Subbasin. Site characteristics such as available space, access to existing infrastructure, and permitting constraints also affect the practicality and cost of well construction and operation (LSCE, 2026).

Overall, the goal of the LSCE assessment was to identify locations capable of producing reliable groundwater supplies while minimizing impacts on streamflow and groundwater sustainability.

LSCE evaluated three potential sites for future municipal groundwater wells, which are shown on Figure 5-1:

- Lower Reservoir Site
- Library Site
- Crane Park Site



LSCE. 2026. City of St. Helena Water Supply Strategy Analyses (November 2025, revised April 2026). Prepared for the City of St. Helena.

Figure 5-1. Candidate Well Site Locations

5.2.1 Lower Reservoir Site

The Lower Reservoir Site was evaluated as a potential location for a new municipal groundwater well because it is City-owned and located near existing water storage and conveyance infrastructure, which could reduce integration costs. However, the site is located outside the Subbasin and is underlain primarily by Sonoma Volcanics rather than the more productive alluvial aquifer system found within the Subbasin. Groundwater production in these volcanic rocks depends on fractures and faults, making well yields highly uncertain and less predictable. Nearby high-yield wells suggest that localized faulting may improve groundwater availability, but achieving sufficient production to offset pumping from the City's existing Stonebridge Wells would be uncertain. Furthermore, this site would likely require a deeper well as depth to groundwater in the area is reported to be between 600 and 800 feet below ground surface (LSCE, 2026).

There are also potential groundwater quality concerns with this site, including elevated iron, manganese, and arsenic concentrations that could require treatment. In addition, the site presents several permitting and construction challenges. Because the site is outside the Subbasin, groundwater extraction would be limited by a parcel-specific recharge analysis. The site is also within 1,500 feet of a significant stream, requiring additional analysis and possible mitigation for impacts to streamflow. Overall, the Lower Reservoir Site has substantially greater uncertainty and lower feasibility for development of a reliable municipal supply well compared to the candidate sites located within the Subbasin as will be discussed in the following sections.

5.2.2 Library Site

The Library Site was evaluated as a strong candidate for a new municipal groundwater well because it is located within the Subbasin in an area with thick alluvial deposits that are generally associated with higher groundwater yields. Depth to groundwater is reported to be between 20 and 40 feet below ground surface. Nearby irrigation and public supply wells commonly produce between 50 and 100 gallons per minute (gpm), with some wells yielding more than 100 gpm, suggesting favorable groundwater production potential. The site is also more than 1,500 feet from significant streams, which simplifies permitting requirements related to surface water impacts (LSCE, 2026).

Groundwater quality data from nearby wells indicate the potential for elevated iron, manganese, and arsenic concentrations. In addition, hydrologic modeling shows that relocating pumping from the Stonebridge Wells to the Library Site would provide relatively limited benefit to Napa River seasonal streamflow conditions because the existing site is closer in proximity to the river and tributary streams. Overall, the Library Site offers relatively favorable well-yield potential and strong construction feasibility, but somewhat lower groundwater sustainability benefits compared to the Crane Park Site as discussed in the next section (LSCE, 2026).

5.2.3 Crane Park Site

The Crane Park Site was identified as the strongest overall candidate for development of a new municipal groundwater well compared to the other candidate sites. The site is underlain by approximately 100 to 200 feet of alluvial deposits and is located more than 1,500 feet from significant streams, reducing potential permitting constraints related to streamflow depletion (LSCE, 2026). Existing wells in the area generally exhibit low groundwater yields (between approximately 20 and 50 gpm), and the site provides adequate space and infrastructure access for well construction and operation. Depth to groundwater is reported to be between 20 and 40 feet below ground surface (LSCE, 2026).

Groundwater quality data suggests that iron and manganese treatment would likely still be needed, but arsenic concentrations in the vicinity of Crane Park appear to be lower than in areas farther north near the Library Site. Hydrologic modeling shows that relocating municipal pumping to the Crane Park Site would provide the greatest benefit to Napa River low-flow conditions among the candidate sites and would avoid reductions in upstream streamflow. Overall, according to the LSCE report, the Crane Park Site offers the best balance between groundwater production potential, groundwater quality, streamflow protection, permitting feasibility, and overall groundwater sustainability (LSCE, 2026).

5.2.4 New Well Site Assessment Summary

The LSCE well site assessment concluded that the candidate sites considered within the Subbasin, particularly the Crane Park Site, offer the most feasible opportunities for development of new municipal groundwater supply wells that support both water supply reliability and groundwater sustainability goals. While the Library Site may have somewhat greater groundwater yield potential because of thicker alluvial deposits, the Crane Park Site was identified as providing the greatest benefit to Napa River streamflow conditions and the lowest potential for arsenic-related water quality concerns.

In contrast, the Lower Reservoir Site outside the Subbasin was found to have substantially greater uncertainty related to groundwater yield, groundwater quality, permitting requirements, and construction feasibility due to its volcanic hydrogeologic setting and proximity to significant streams. Table 5-1 offers a comparison of the potential sites considered.

Table 5-1. Summary of New Well Site Assessment Results

New Well Site	Yield Suitability	Water Quality	Benefit to Napa River Flow	Suitability for Construction
Lower Reservoir	Low to Moderate	Low to Moderate	Moderate	Low to Moderate: • No site contamination • Access to water distribution system and fluids disposal • Sufficient sewer setback
Library	Moderate to High	Low to Moderate	Low	High: • No site contamination • Access to water distribution system and fluids disposal • Sufficient sewer setback
Crane Park	Moderate	Moderate to High	High	High: • No site contamination • Access to water distribution system • Only storm sewer for fluids disposal • Sufficient sewer setback

Source: LSCE, 2026. City of St. Helena Water Supply Strategy Analysis.

It is unlikely a single new well at any of the candidate sites would fully replace production from the City's existing Stonebridge Wells. As a result, additional investigation, including test drilling and groundwater quality evaluation, is recommended at the Crane Park and Library sites to further evaluate production potential (LSCE, 2026).

5.3 GROUNDWATER OFFSET AND IN-LIEU AGREEMENTS

Groundwater offset and in-lieu agreements represent a potential long-term water supply strategy that could allow the City to increase municipal groundwater production while maintaining or improving overall groundwater sustainability within the Napa Valley Subbasin. Under this approach, the City would collaborate with the Napa County Groundwater Sustainability Agency (GSA) to implement projects that reduce groundwater pumping elsewhere in the basin. The resulting groundwater savings would be quantified and credited, at least in part, to the City, allowing a corresponding increase in municipal groundwater extraction without increasing net groundwater demand at the subbasin scale.

One potential implementation pathway would involve the use of recycled water for agricultural irrigation. The City could provide recycled water to agricultural users that currently rely on groundwater supplies, thereby reducing agricultural groundwater pumping. This option involving recycled water is explored further in Chapter 6.

A second implementation pathway could involve funding water conservation and efficiency projects for rural residential water users served by private wells. The City could provide financial assistance to the Napa County GSA to implement voluntary measures such as leak detection and repair, replacement of inefficient plumbing fixtures, irrigation efficiency improvements, smart irrigation controllers, and other water conservation programs. The City could also support private well improvements that reduce water losses or improve system performance. While individual projects may generate relatively small groundwater savings, a coordinated program implemented across a large number of properties could produce measurable reductions in groundwater demand and provide a source of groundwater offset credits.

From a planning perspective, groundwater offset and in-lieu agreements offer several potential advantages. The strategy may be more cost-effective and environmentally sustainable than developing entirely new water supplies because it leverages existing water conservation opportunities and promotes efficient use of available resources. The approach also allows offset projects to be implemented incrementally as additional water supply is needed. Furthermore, the strategy aligns with the objectives of SGMA by encouraging basin-wide groundwater demand reduction and promoting collaborative management among local agencies and water users.

There are also examples of where in-lieu recharge programs are being evaluated and/or implemented by other water agencies in California under SGMA that provide alternative water supplies to reduce groundwater pumping, groundwater allocation and credit trading systems, and incentive-based conservation programs that generate measurable groundwater benefits. Examples include the Fox Canyon Groundwater Management Agency's in-lieu water supply program in Ventura County, groundwater credit and trading frameworks under development in the Modesto and other San Joaquin Valley subbasins, and groundwater recharge incentive programs that compensate landowners for actions that improve basin conditions. Although the specific mechanisms for generating and transferring credits vary among basins, these examples demonstrate that groundwater savings and recharge benefits can be quantified and incorporated into groundwater management programs.

While a promising concept, several challenges and uncertainties would need to be addressed before this strategy could become a reliable component of the City's future water supply portfolio. The primary challenge is the development of a transparent, scientifically defensible, and GSA-approved methodology for quantifying groundwater savings and converting those savings into transferable pumping credits. The hydrogeologic feasibility of this alternative would also need to be studied further – such as timing of when the “credits” could be used and the location of groundwater pumping reductions compared to the location of city pumping. Any offset program would require rigorous monitoring, verification, and accounting procedures to ensure that groundwater reductions are real, measurable, durable, and not double counted. In addition, implementation would depend on the willingness of agricultural and rural residential users to participate voluntarily in offset programs and on the availability of funding to support projects. Future policies adopted by the Napa County GSA may also influence the feasibility and extent to which groundwater offsets can be recognized as a water supply source.

Overall, groundwater offset and in-lieu agreements have the potential to provide a flexible and locally controlled water supply option for the City while maintaining groundwater sustainability objectives. Although the strategy remains dependent on future institutional and regulatory developments as well as legal review (i.e. funding strategies/improvements outside of the City’s service area), it warrants further evaluation as a potentially important component of the City’s long-term water supply portfolio. If a groundwater crediting framework is established by the Napa County GSA, this approach could provide a cost-effective means of additional water supply for the City while maintaining sustainable groundwater management within the Napa Valley Subbasin.

5.4 STORMWATER RECHARGE OF GROUNDWATER

Using stormwater to recharge the underlying groundwater basin would not directly provide the City with a potable water supply, but could potentially provide an indirect potable supply benefit if the recharged water increases groundwater available for later pumping. At this planning level, stormwater recharge should not be assumed to provide a firm potable supply yield. Similar to the groundwater offset and in-lieu agreements, any future potable supply credit to the City would require a transparent, defensible, and GSA-approved methodology for quantifying recharge and identifying the availability of that volume for the City’s use.

Because rainfall and runoff occur primarily during the wet season, while groundwater pumping demands are often more significant during the dry season, the timing and persistence of recharge benefits would be a key consideration for all stormwater recharge alternatives. This timing mismatch is especially important for evaluating whether stormwater recharge could provide an indirect potable supply benefit. Recharge that supports short-term groundwater levels or nearby streamflow during and shortly after storm events may still provide a groundwater management benefit, but would not necessarily create recoverable groundwater storage that the City could later pump during dry periods.

As described in Chapter 4, the City’s storm drainage system is currently designed primarily for flood control and urban runoff management. Stormwater runoff is generally conveyed to Sulphur Springs Creek, York Creek, and the Napa River, and the City does not currently capture and use stormwater as a water supply source. Therefore, the groundwater benefit of stormwater recharge would depend on whether existing or future stormwater facilities could be operated, modified, or located to detain water long enough for significant infiltration to occur without compromising flood-control functions.

The potential recharge value of stormwater facilities is highly site-specific. Key factors include soil permeability, depth to groundwater, available storage volume, stormwater quality, distance from the Napa River and significant tributaries, groundwater flow direction, and the relationship between recharge locations and municipal pumping locations. The Napa Valley Subbasin GSP recognizes managed aquifer recharge as a groundwater management strategy, including the potential use of unallocated winter streamflow and runoff generated within the Subbasin.[2] However, the GSP's modeled flood managed aquifer recharge results also indicate that benefits may be greatest during and shortly after recharge events and may decay substantially within months. Should stormwater recharge be considered, this GSP modeling supports the need to evaluate whether stormwater recharge would create durable recoverable groundwater storage, or whether much of the benefit would only occur as short-term support for groundwater levels and interconnected surface water conditions.

LSCE's Water Supply Strategy Analyses report provides additional context for evaluating recharge concepts, although its recharge modeling focused on recycled water (discussed in Chapter 6) rather than stormwater. LSCE's analysis indicates that recharge location can noticeably affect where groundwater and streamflow benefits occur, and that recharge benefits may differ depending on the relationship between a recharge site, nearby waterways, and future pumping locations. These findings should be used as general planning context only.

5.4.1 Existing Detention Basin

As described in Section 4.5.2, the City's existing detention basin is located along the Napa River near the northeastern boundary of the City. The basin is designed and operated with the primary purpose of flood control and directing runoff into the Napa River during storms. It is not designed to hold stormwater for a long period of time or to function as a groundwater recharge facility.

Because of its design and location, the existing detention basin is not expected to provide meaningful groundwater recharge benefits. Any infiltration would occur close to the Napa River and is expected to return to the river rather than remain in local groundwater storage for later City use. Modifying the basin to retain stormwater longer could also reduce flood-control capacity or interfere with its intended operation. For these reasons, the existing detention basin is not recommended for further evaluation as a stormwater recharge alternative.

5.4.2 Proposed Downtown Specific Plan / Sulphur Springs Creek Detention Basin

The proposed detention basin concept associated with the Downtown Specific Plan and Sulphur Springs Creek may provide a better opportunity for stormwater recharge than the existing detention basin. As described in Chapter 4, a detention basin along Sulphur Springs Creek upstream of the City could potentially reduce floodplain impacts in the Downtown Specific Plan area by capturing excess storm flows and slowly releasing them back to the creek.

If designed with groundwater recharge as a secondary objective, the proposed Sulphur Springs Creek detention basin could provide groundwater benefits by retaining a portion of stormwater long enough to infiltrate into the underlying basin. Recharge features could potentially be incorporated in the design of the basin while still maintaining sufficient flood control volume.

The potential groundwater benefit would need to be confirmed through site-specific investigation and stormwater-specific hydrologic analysis. This evaluation would be needed to estimate how much water

[2] Napa County. January 2022. *Napa Valley Subbasin Groundwater Sustainability Plan.* Section 11.

could realistically infiltrate, how often recharge would occur, and whether infiltrated water would remain in the groundwater basin long enough to support later pumping.

The proposed Sulphur Springs Creek detention basin should therefore be considered a potential multi-benefit project rather than a stand-alone potable supply project. Its primary benefit would remain flood-risk reduction. A secondary groundwater recharge benefit may be possible if site conditions are favorable and if recharge can be incorporated without compromising flood-control performance. Any indirect potable supply benefit would depend on future recharge accounting, monitoring, and GSA coordination demonstrating that the recharge provides recoverable groundwater available for later City pumping. It is not recommended that this alternative be further evaluated in this WMP, but rather that design of the detention basin consider features that may improve recharge for the general benefit of the Napa Valley Subbasin.

5.4.3 Future Stormwater Recharge Facilities

New stormwater recharge facilities could include infiltration basins, injection wells, bioretention areas, or modified detention basins designed specifically to promote recharge. In concept, these facilities could capture urban runoff and allow it to infiltrate into the groundwater basin, potentially supporting groundwater conditions and, if supported by future accounting and GSA coordination, a limited indirect potable supply benefit through later City groundwater pumping. However, the feasibility of new stormwater recharge facilities in the City is likely constrained by the seasonal timing of rainfall, available land, and the relatively small drainage areas available for some potential sites.

Chapter 4 considered the concept of a new retention pond or similar facility, such as at Wappo Park (i.e. should it be viable outside of the designated “no excavation” area per the City’s agreement with a local Tribe), and concluded that this type of facility is unlikely to provide a significant water supply benefit. Retention ponds typically provide limited infiltration over time because fine sediment and organic material can accumulate on the pond bottom and reduce infiltration rates. They may provide water quality, habitat, or aesthetic benefits, but they are generally less effective as groundwater recharge facilities unless they are specifically designed and maintained for infiltration.

Dedicated infiltration facilities may be more effective than a traditional retention pond, but they would require careful siting and design. Suitable locations would need permeable soils, sufficient contributing drainage area, adequate pretreatment, and enough land to detain runoff without affecting adjacent properties or infrastructure. Facilities would also need long-term maintenance to manage sediment accumulation, trash, and other urban runoff pollutants that could reduce infiltration performance or create water quality concerns.

LSCE also evaluated a hypothetical recharge basin near the Robert Louis Stevenson Museum as part of its recycled water recharge analysis, which is discussed in Chapter 6. Although the site was specifically evaluated for recycled water recharge, it could also be a site considered for stormwater recharge. If the City evaluates new stormwater recharge facilities in the future, the Robert Louis Stevenson Museum area or other northern recharge opportunity areas could be screened alongside other potential sites, but only if stormwater can feasibly be routed to the site and site-specific investigations confirm suitable conditions.

At this planning level, new stormwater recharge facilities appear to have uncertain and likely limited potable supply value compared to other groundwater strategies evaluated in this chapter, and are not recommended to be carried forward for additional evaluation. Similar to the proposed Sulphur Springs Creek Detention Basin, the best approach may be to incorporate recharge features into stormwater or flood-control projects that are already being considered for other purposes, rather than developing new stand-alone stormwater recharge projects solely for potable supply.

5.4.4 Stormwater Recharge Summary

Stormwater recharge is not recommended as a stand-alone potable supply alternative for further evaluation. It may provide localized groundwater or streamflow benefits, particularly if incorporated into a future multi-benefit stormwater or flood-control project, and may support Napa Valley GSP implementation. However, any potable supply benefit would be indirect and would require site-specific analysis, recharge accounting, monitoring, and coordination with the Napa County GSA before the City could rely on recharge as a basis for later groundwater pumping.

5.5 SUMMARY OF GROUNDWATER SUPPLY OPTIONS

Table 5-2 summarizes the groundwater supply options discussed in this chapter and whether they will be evaluated further in this WMP, or if they are not viable and do not warrant further evaluation.

Table 5-2. Summary of Future Groundwater Supply Options

Groundwater Supply Option	Warrants Further Evaluation
New Well Development	
New Well Outside the Napa Valley Subbasin	No
New Well Within the Napa Valley Subbasin	Yes
In-Lieu Agreements	
Voluntary Conservation for In-Lieu Groundwater Credit	Yes
Stormwater	
Groundwater Recharge Via Existing Stormwater Facilities	No
Groundwater Recharge Via Future Stormwater Facilities (including the Downtown Specific Plan and Sulphur Springs Creek detention basin)	No

5.6 REFERENCES

Luhdorff & Scalmanini Consulting Engineers. April 2026. *City of St. Helena Water Supply Strategy Analyses*. Prepared for the City of St. Helena.

CHAPTER 6
Recycled Water Evaluation

This chapter explores the City's opportunities to integrate recycled water into its long-term water supply strategy. With recent upgrades to its WWTP, the City now produces disinfected tertiary recycled water which could be used to offset demands on the City's potable water supply and improve water supply reliability. Multiple beneficial reuse options for recycled water supply are described in this chapter, including their potential benefits and implementation considerations. The chapter is organized into the following sections:

- Recycled Water Supply
- Regional Recycled Water Use
- Non-Potable Reuse Options
- Indirect Potable Reuse Options
- Direct Potable Reuse
- Summary of Recycled Water Options

6.1 RECYCLED WATER SUPPLY

The City's existing recycled water facilities, operations, and production trends are described in the following sections.

6.1.1 Existing Facilities and Operations

The City owns and operates a WWTP that produces disinfected tertiary recycled water. Treated effluent from the WWTP is currently discharged to on-site agricultural spray fields (growing native grasses) and, when necessary, to the Napa River. Approximately 2 percent of the treated effluent is also used for irrigation of a small redwood tree farm and for mosquito fish ponds, which are shown on Figure 6-1.[1]

The City completed upgrades to its WWTP in 2026, including the addition of a membrane biological reactor (MBR) facility. At the time of this WMP, the City has completed performance testing for the upgraded facilities. The City's WWTP now produces effluent that is expected to be considered disinfected tertiary treated recycled water that meets State standards for non-potable reuse applications. Disinfected tertiary recycled water is the highest level of treatment for non-potable recycled water - meeting the filtration and disinfection requirements defined in California Code of Regulations (CCR) Title 22, §60301.230. The current treatment process includes a headworks facility, a flow equalization pond, an MBR system for secondary and tertiary treatment, and ultraviolet light (UV) disinfection. After tertiary treatment, the effluent is pumped to a storage pond before being discharged to either the spray fields or Napa River.[1] The WWTP retains the ability to chlorinate effluent if supplemental disinfection is needed, but this is no longer a regular part of the treatment process.

[1] City of St. Helena, California Regional Water Quality Control Board San Francisco Bay Region. April 2021. *NPDES Permit CA0038016.*

Source: NPDES Permit CA0038016

Figure 6-1. Overview of Existing Effluent Application Sites

The City's WWTP operates under permits issued by the San Francisco Bay Regional Water Quality Control Board (Regional Water Board). These permits include Water Reclamation Requirements Order No. 87-090 for effluent discharge to land and National Pollutant Discharge Elimination System (NPDES) Permit CA0038016 for discharge to the Napa River. Discharge to the Napa River is generally prohibited from June 1 through October 31 of each year.[2,3]

6.1.2 Wastewater Flows

The volume of recycled water available for customer use depends on treated wastewater flows as well as the capacity of future recycled water infrastructure. To assess the City's future recycled water supply potential, recent wastewater flow data from the WWTP was reviewed.

Because historical effluent flow data was not available, influent flow data from 2021 through 2023 was used to estimate effluent flows. A five percent loss factor was applied to the influent flow to approximate effluent flows. Data from January through April 2024 was not available due to issues with the influent pump flow meters; therefore, 2024 data was excluded.

Figure 6-2 shows the average monthly influent flows in million gallons per day (mgd) compared to the average annual flowrate of 0.45 mgd. Wastewater flows fluctuate seasonally, with peak flows generally occurring between November and April. This trend reflects increased inflow and infiltration into the wastewater collection system during wetter months. It should be noted that the average February flow appears lower than expected due to drier than normal conditions during the month of February from 2021 through 2023.

Table 6-1 summarizes the influent and effluent flow conditions from 2021 through 2023. Since most recycled water demand occurs during the dry season due to irrigation demand, the effluent average dry weather flow (ADWF) was calculated to provide a more representative estimate of supply capacity. The ADWF was calculated based on the three consecutive driest months of each year, typically July through September. The resulting effluent ADWF is 0.29 mgd (325 AFY).

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[2] Per the NPDES permit, the City can discharge to the Napa River during this period only when effluent flow exceeds the capacity of influent storage and the capacity of the recycled water distribution and storage system to meet recycled water demand. Discharge shall not arise as a result of the Discharger's failure to produce, use, or supply recycled water. If there is discharge during the dry season, the Discharger shall describe the reasons for the discharge in the transmittal letter of its next self-monitoring report.

[3] In anticipation of the expiration of NPDES Permit CA0038016 on May 30, 2026, the City submitted a Report of Waste Discharge (ROWD) to the Regional Water Board on August 29, 2025. This ROWD submission is the first step in the City's permit renewal process. The City is currently waiting for the Regional Water Board to issue a new permit which will hopefully address the City's request for changes to river dilution requirements and how the new recycled water supply can be used. Until a new permit is issued, the existing permit remains in effect.

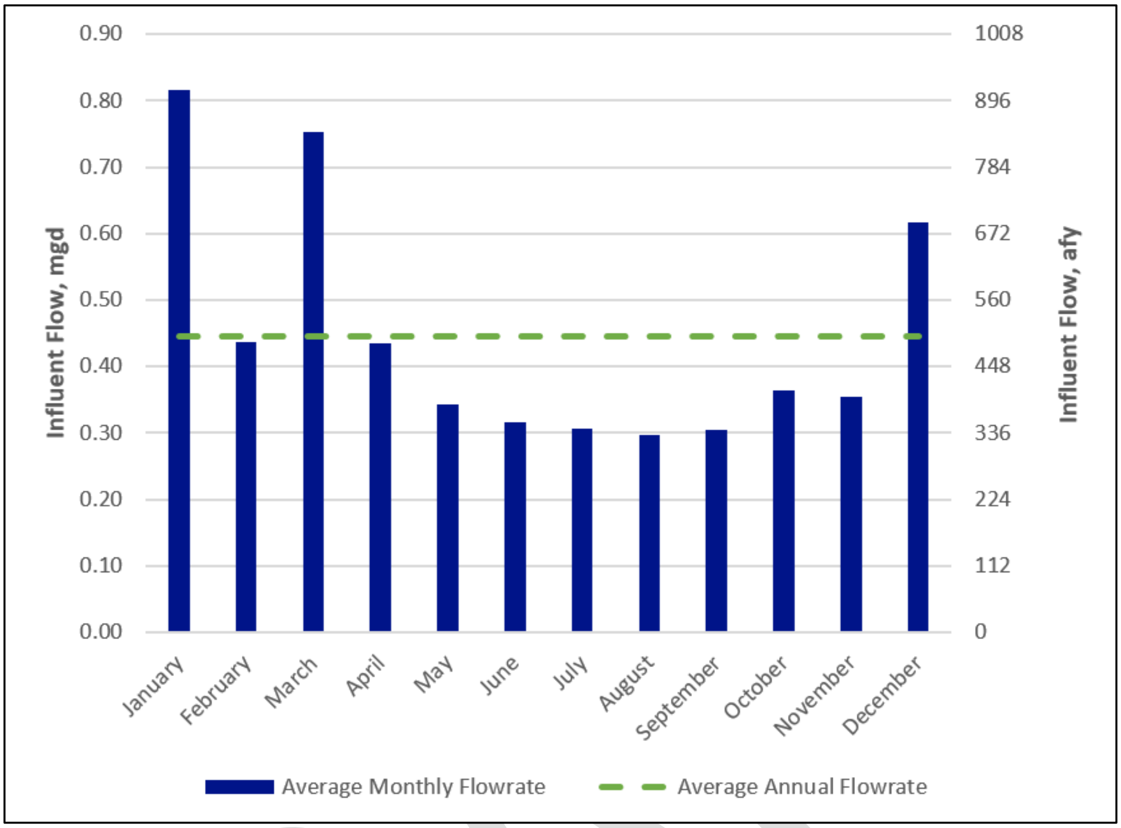


Figure 6-2. Wastewater Influent Flow Trends, 2021 through 2023

Table 6-1. Existing Influent and Effluent Flow Conditions, 2021 through 2023

Statistic	Measured Influent Flow[(a)]		Estimated Effluent Flow[(b)]	
	mgd	AFY	mgd	AFY
Average Flows				
Average	0.45	504	0.43	479
Average Dry Weather Flow[(c)]	0.30	337	0.29	320
Average Minimum Flows				
Minimum Month	0.30	336	0.29	319
Minimum Day[(d)]	0.20	229	0.19	217
Average Maximum Flows				
Maximum Month	1.01	1,131	0.96	1,075
Maximum Day[(d)]	2.37	2,649	2.25	2,517

(a) Source for influent flow is from “Copy of WWTP Daily Workbook” Excel spreadsheet provided by the City on January 24, 2025. Data from 2024 was excluded as data was not available from January 2024 through April 2024 due to influent pump meter outage.

(b) As measured effluent flow data was unavailable, the effluent flow was estimated based on the measured influent flow and an assumed loss factor of 5 percent.

(c) Average dry weather flow (ADWF) is calculated for each year as the average flow for the three consecutive driest months (typically, July through September). The overall ADWF shown is the average of ADWF values for the individual years, which had relatively limited variation from 0.29 to 0.32 mgd.

(d) To avoid data outliers, the minimum day and maximum day influent flowrate is based on the 1st percentile and 99th percentile of the daily flowrates from 2021 through 2023, respectively.

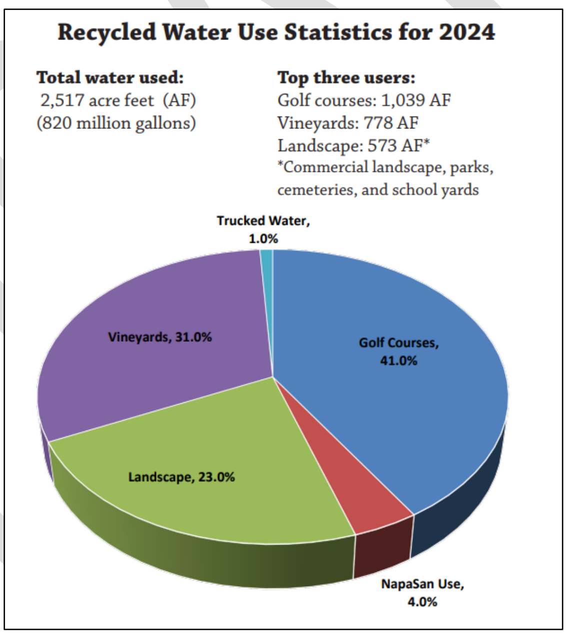
6.2 REGIONAL RECYCLED WATER USE

This section offers a brief overview of recycled water providers in nearby cities, including Napa Sanitation District (NapaSan) and the cities of Calistoga and American Canyon, to provide context for current recycled water program implementation in Napa County.

6.2.1 Napa Sanitation District

NapaSan is the largest provider of recycled water in Napa County, serving customers in parts of the City of Napa, City of American Canyon, Town of Yountville, Los Carneros Water District, and surrounding unincorporated areas. NapaSan produces disinfected tertiary recycled water from its Soscol Water Recycling Facility (SWRF) and distributes it for irrigation of landscaping, parks, golf courses, pasture lands, vineyards, and cemeteries. For customers not connected to a recycled water pipeline, NapaSan operates two recycled water fill stations where recycled water can be hauled by truck.[4]

Most recycled water is delivered from May 1 to October 31 to meet irrigation demands. From July 1 through September 30, NapaSan is prohibited from discharging treated effluent to the Napa River and must store it in treatment ponds at the SWRF or distribute it to customers as recycled water.[5] During the wet season, from November 1 through April 30, when irrigation demand is low, treated effluent is discharged into the Napa River. As shown on Figure 6-3, NapaSan's largest recycled water users in 2024 were golf courses and vineyards, with landscape irrigation also accounting for a significant share. Trucked or hauled water only comprised one percent of their annual use.



Source: NapaSan. March 2025. 2024 Recycled Water Annual Report.

Figure 6-3. Napa Sanitation District Recycled Water Use Statistics for 2024

[4] Bay Area Clean Water Agencies. September 2021. *Recycled Water Commercial Truck Fill Guide.*

[5] NapaSan. *NPDES Permit.* Accessed at: https://www.napasan.com/205/NPDES-Permit

NapaSan successfully promoted the use of recycled water for vineyard irrigation by addressing grower concerns, primarily those related to water quality. NapaSan sponsored a University of California study in 2006 that evaluated the long-term impacts of recycled water on vineyards.[6] The study, published in the peer-reviewed journal *California Agriculture*, found that NapaSan's recycled water is suitable for vineyard irrigation and does not pose salinity or toxicity risks when managed properly.

6.2.2 City of Calistoga

The City of Calistoga produces disinfected tertiary recycled water at its Dunaweal WWTP. Each year, approximately 250 AF to 360 AF of recycled water is used, primarily for landscape irrigation. Users include the Calistoga fairgrounds, schools, City-owned lands, a golf course, parks, a multi-family apartment complex, churches, and several hotels. The City of Calistoga also has a construction water fill station located at its WWTP for hauling recycled water. Due to elevated boron concentration in the effluent, the recycled water is limited to boron-tolerant crops such as turf grasses and is not suitable for vineyard irrigation.[7]

6.2.3 City of American Canyon

The City of American Canyon produces disinfected tertiary recycled water at its American Canyon Water Reclamation Facility. As part of its Recycled Water Program, the City operates a fill station for residential and commercial non-potable uses. Additionally, some customers in the northern part of the City's water service area receive recycled water through NapaSan's distribution system.[8] Per the City's 2040 General Plan, it is a priority for the City to expand its recycled water infrastructure and increase access and usage.[9]

6.3 NON-POTABLE REUSE OPTIONS

Potential non-potable reuse options for the City are described in the following sections, along with relevant regulatory requirements. The use of recycled water for non-potable purposes within the City or the Napa Valley Subbasin can result in a reduced demand for potable water. The sale of recycled water to non-potable use customers could also help offset some of the City's wastewater treatment and recycled water distribution costs. Potential non-potable reuse options include:

- Landscape irrigation and industrial use within City limits
- Agricultural irrigation within and/or outside of City limits
- Storage in Lower Reservoir for non-potable reuse
- Recycled water fill station
- In-lieu groundwater recharge

[6] University of California, prepared for the Napa Sanitation District. March 2006. *Suitability Study of Napa Sanitation District Recycled Water for Vineyard Irrigation.*

[7] City of Calistoga. May 2020. *City of Calistoga General Plan Infrastructure Element 2020 Update*.

[8] City of American Canyon. *Recycled Water Program.* Accessed at: https://www.americancanyon.gov/Live/Utilities-Services/Water/Recycled-Water-Program

[9] City of American Canyon. September 2024. *2040 General Plan Policy Document Public Review Draft.*

6.3.1 Non-Potable Reuse Regulations

Recycled water use in California is defined under Title 22 of the CCR and is overseen by the State Water Resources Control Board (State Water Board). The State Water Board is responsible for permitting recycled water projects, developing uniform water recycling criteria, and reviewing and approving Title 22 Engineering Reports. Recycled water standards are regulated by the 1969 Porter-Cologne Water Quality Control Act, the State Water Board's 2016 Water Reclamation Requirements for Recycled Water Use (General Order 2016), and the 2019 Water Quality Control Policy for Recycled Water.

Title 22 specifies allowable uses of recycled water based on its treatment level. For non-potable applications, the treatment levels include, listed in the order of increasing treatment level:

- Undisinfected secondary recycled water
- Disinfected secondary-23 recycled water
- Disinfected secondary-2.2 recycled water
- Disinfected tertiary recycled water

As noted in Section 6.1, the City produces disinfected tertiary recycled water. Title 22 permits forty specific uses for disinfected tertiary recycled water, including irrigation of food crops, parks, school yards, and use as industrial process water (CCR Title 22 §60304). A summary table of allowable recycled water uses is provided in Appendix E.

The State of California Water Recycling Criteria requires development of a Title 22 Engineering Report in accordance with Title 22, §60323 prior to implementation of a recycled water project. The Title 22 Engineering Report would outline how the City would administer the project and comply with the State's recycled water and cross connection control regulations and is required to be submitted to the Division of Drinking Water and the Regional Water Board for approval. The State Water Board provides a framework for the preparation of the Title 22 Engineering Report in its guidebook *Guidelines for the Preparation of an Engineering Report for the Production, Distribution and Use of Recycled Water*.

6.3.2 Landscape Irrigation and Industrial Use within City Limits

The City has plans to use recycled water for landscape irrigation and industrial uses within City limits as a supplement to its potable water supply. Implementation would require construction of a recycled water pump station and distribution pipelines to convey recycled water from the WWTP to customers within the City. This option would allow the City to offset some potable water demands, particularly for locations with high irrigation demands such as parks and schools. In 2023 the City contracted with West Yost to prepare a Recycled Water Facilities Plan to assess various scenarios of recycled water use within and outside of the City limits. However, efforts on this plan were paused in early 2024 while the City decided to focus on the bigger picture Water Management Plan has a first priority.

6.3.2.1 Demand Estimates

Prior to the Recycled Water Facilities Plan pause however, a preliminary demand assessment was conducted for non-potable recycled water. This effort included identifying potential existing and future recycled water use sites in the vicinity of the City's WWTP, and then expanding into adjacent areas within City limits. The assessment focused on existing large landscape areas that could be converted to recycled water irrigation as well as future planned development landscape areas. As part of the assessment, the

City identified three high-priority sites to be served by the proposed recycled water distribution system shown on Figure 6-4:

- Crane Park
- The Farmstead development
- The Fountain Street development

Crane Park is currently the only City park irrigated with potable water; other parks use raw groundwater from non-potable wells. The Farmstead development is a planned 6.1-acre hotel project that will have an additional 3.9 acres reserved for a fruit and vegetable farm. The Farmstead developer has an agreement with the City to offset Crane Park's potable water use with recycled water, in accordance with the City's Water Neutrality Policy. The Fountain Street development is a planned 1.75-acre low-income apartment complex adjacent to the Farmstead development.

The City's planned approach for developing a recycled water distribution system would be to first serve these three high-priority sites and then expand infrastructure over time to serve other nearby customers. Two pipeline alternatives are being considered to serve the high-priority sites (Base Pipeline 1 and Base Pipeline 2), as shown on Figure 6-4. Additional "Potential Future Phase Pipelines" would branch off the "Base Pipelines" to serve other landscape irrigation, industrial, and agricultural customers. Agricultural customers are discussed separately in Section 6.3.3.

As shown in Table 6-2, the estimated annual recycled water demand for potential landscape irrigation and industrial customers could reach up to 65 AFY or 72 AFY with the required pipelines, depending on the selected Base Pipeline option. If all potential future phase pipelines are constructed, total annual demands could reach up to 138 AFY or 140 AFY. These demand estimates are based on serving all potential customers; actual demands will be based on the extent of the distribution system constructed. Demand estimates are categorized into the following customer types:

- High-priority sites, as discussed previously,
- Landscape customers currently equipped with separate irrigation meters that could be converted to receive recycled water, and
- Landscape and industrial users that do not currently have separate irrigation or process water meters but could be converted to have a separate irrigation or process water service.

Demand estimates were based on available irrigation meter data between 2020 and 2022. For sites without irrigation meter data, a water use factor of 4.09 AFY/acre was used based on the State of California's MWELO standards for turf grass irrigated with recycled water.

Based on the recycled water supply capacity of 0.29 mgd (see Section 6.1.2) and the assumption that most recycled water demand occurs from May 1 through October 31, similar to NapaSan's recycled water deliveries, the maximum annual supply available is approximately 180 AFY. This amount is slightly higher than the maximum potential demand with all future phase pipelines constructed (138 AF to 140 AF). This finding indicates that potential pipeline routes may need to be extended to additional parcels with water demands, such as agricultural parcels, to fully utilize the City's recycled water supply.

Table 6-2. Landscape Irrigation and Industrial Recycled Water Demand Estimate		
Potential Customer Type	Estimated Annual Demand, AF	
	Base Pipeline 1	Base Pipeline 2
Base and Required Pipelines Only		
High Priority[a,b]	24	24
Landscape (With Irrigation Meter Data)	<1	5
Landscape (Without Meter Data)	10	12
Industrial (Without Meter Data)	31	31
Subtotal Demand (Base Pipeline Only)	**65**	**72**
All Future Phase Pipelines		
Landscape (With Irrigation Meter Data)	15	
Landscape (Without Meter Data)	58	53
Industrial (Without Meter Data)	0	
Subtotal Demand (All Future Phase Pipelines Only)	**73**	**68**
Total Demand (Buildout with All Phases)	**138**	**140**

AF = acre-feet

(a) The high priority sites and projected future recycled water demands include Crane Park (4.6 AFY), the Farmstead development (19.2 AFY), and the Fountain Street development (0.05 AFY).

(b) The Farmstead Development has both agricultural and landscape irrigation future recycled water demands. Since it is considered a high-priority site, all demands associated with the Farmstead Development are included in this table.

6.3.2.2 Implementation Considerations

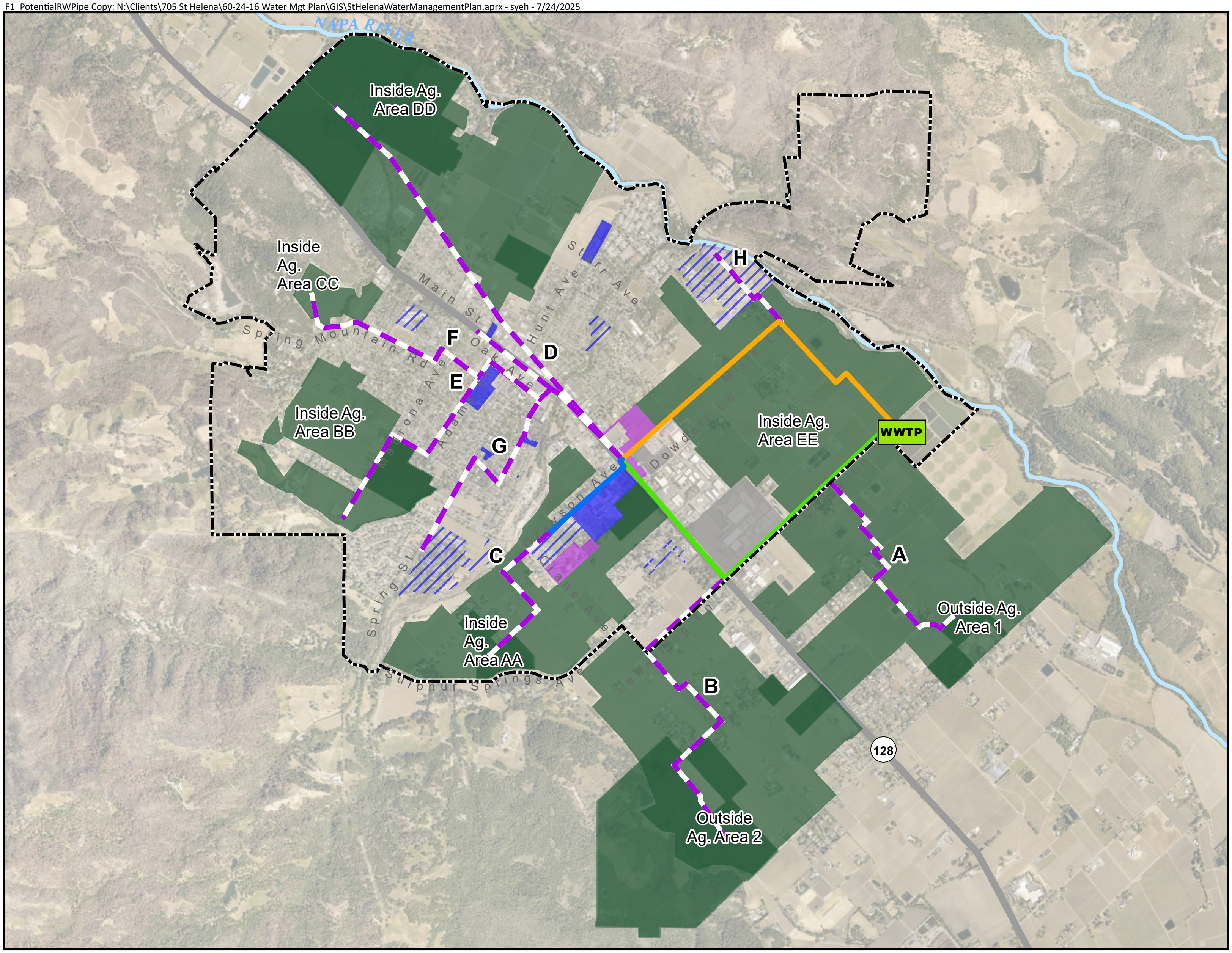
To establish a recycled water program and begin serving irrigation and industrial customers, the City will continue development of its Recycled Water System Master Plan Update (Capital Improvement Program (CIP) No. S24-04). The City has retained West Yost to complete this master plan update once the Water Management Plan is adopted and it has been determined that the City should proceed with planning a recycled water program to serve particular irrigation and industrial customers. This master plan would identify CIP projects required to implement the recycled water program, as well as additional requirements for implementing and operating a recycled water program (e.g., Title 22 Engineering Report and conducting cross-connection control inspections). Strong stakeholder engagement will be essential in implementing the program to identify customers and explore partnership opportunities. As part of this effort, the City should also complete an updated market assessment of customer demands to confirm adequate facility sizing.

In support of this non-potable recycled water approach, the City has already included two recycled water infrastructure projects in its Five-Year CIP for fiscal year (FY) 2024-25 to FY 2028-29: [10]

- **Project No. S21-01, WWTP Recycled Pipeline and Pump Station**: Construct a pump station to distribute recycled water to the WWTP spray fields and provide recycled water to City customers via recycled water pipelines.
- **Project No. S23-01, Crane Park Irrigation Infrastructure**: Construct pipelines to deliver recycled water to Crane Park's irrigation system.

Due to the geographic distribution of customers throughout the City, phased construction of the recycled water pipelines is recommended. Construction should start with the pipelines required to serve the three high-priority parcels and expand over time in coordination with other capital improvement projects and as funding is available. Similarly, the recycled water pump station could be constructed in phases by sizing the major hydraulic components (e.g., suction and discharge pipelines) and the electrical infrastructure to accommodate the pump station's projected buildout capacity. Pumps could then be added incrementally as demand increases with new customer connections. The City would also need to assess if existing storage facilities at the WWTP would be sufficient for the recycled water distribution system, or if an additional storage tank would be necessary. If additional storage is needed, this may be located at the WWTP or at another location closer to potential customers.

[10] The City's Five-Year CIP is a planning and forecasting tool that identifies anticipated capital improvements and their funding sources and does not represent a financial commitment by City Council.



WWTP Wastewater Treatment Plant

City Limits

Potential Customer Type

- High Priority
- Landscape (w/ Irrigation Meter)
- Landscape (w/o Meter)
- Industrial
- Agriculture

Recycled Water Pipeline Alternatives

- Base Pipeline Option 1
- Base Pipeline Option 2
- Required Pipeline
- Potential Future Phases

Notes:

1. Potential recycled water customers and pipeline alternatives were developed as part of the City's on-going Recycled Water Facilities Plan.
2. High priority recycled water customers are the Farmstead Development, Crane Park, and Fountain Street Development.
3. All areas within the potential agriculture areas are assumed to be potential recycled water customers.

Prepared by:

WEST YOST

0 1,500 3,000 Feet

N

Prepared for:

City of St. Helena
Water Management Plan

CITY OF ST. HELENA

Potential Recycled Water Customers and Pipeline Alternatives

DRAFT **Figure 6-4**

6.3.3 Agricultural Irrigation within and/or Outside of City Limits

Another non-potable reuse option is to supply disinfected tertiary recycled water to agricultural properties for irrigation, both within and beyond City limits. As shown on Figure 6-4, agricultural areas in and around the City were identified as potential recycled water customers in the preliminary demand assessment. All identified agricultural areas are vineyards. Serving agricultural properties, in addition to landscape irrigation and industrial customers, would increase the amount of recycled water used per length of pipeline compared with serving only one type of customer. Furthermore, some of the potential agricultural use customers are within the City limits and along the required and base pipeline alignments.

Recycled water could also potentially be used for vineyard frost protection, providing additional agricultural demand beyond irrigation. Water-based frost protection is an established practice in vineyards, and other recycled water programs in the region have authorized recycled water for this purpose. Because frost protection generally occurs during the winter and spring months, when irrigation demands are relatively low, this use could improve seasonal utilization of the recycled water supply. In the Napa River watershed, frost-protection diversions from the Napa River between March 15 and May 15 are subject to a water distribution program. Therefore, use of recycled water could provide an alternative to surface water diversions during this period.[11] The City's disinfected tertiary recycled water meets the Title 22 treatment level required for surface irrigation of food crops where the water may contact the edible portion of the crop.

Many vineyards in the area in and around the City have access to private groundwater wells and/or senior surface water rights but may still be interested in supplementing their water supply with recycled water, especially during drought conditions due to surface water curtailment and lowered groundwater levels. Additionally, the Napa County GSP's Management Actions may also lead to a greater demand for recycled water as major water users, like vineyards, are working to reduce their groundwater pumping by ten percent of historical use to support sustainable groundwater management. Furthermore, starting in July 2026 groundwater users will have fees due to Napa County, thus increasing the cost of groundwater to growers. The fee is calculated per planted acre, and users who constantly irrigate with groundwater will be charged an additional rate per acre.[12]

As these agricultural properties do not use water from the City's potable water system for irrigation, supplying recycled water would not directly offset the City's water demands. For this approach to benefit the City's water supply portfolio, the City would need to establish agreements with agricultural users that, in exchange for recycled water, they would agree to reduce their groundwater extraction by an equivalent, or at least fractional, amount. This agreement from agricultural users to reduce their groundwater pumping may allow the City to pump an equivalent or fractional amount of groundwater for municipal use.

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[11] State Water Resources Control Board. March 2026. *Frost Protection Regulation: Napa River Watershed.* Accessed at https://www.waterboards.ca.gov/waterrights/water_issues/programs/napa_river_frost/ on August 7, 2026.

[12] Napa County. December 2025. *Resolution No. 2025-05 of the Napa County Groundwater Sustainability Agency Adopting a Groundwater Sustainability Fee in the Napa Valley Subbasin*. Accessed at https://www.napacounty.gov/3983/Groundwater-Sustainability-Fee#docaccess-8f0bbb938e74698584f72b6cb57ed213f53c91a53ebeb6af41fddf2e1620f4bb

Implementing this proposed arrangement would require significant coordination and negotiation between the City, agricultural users, and the NCGSA (as mentioned in Section 4.3), as well as a regulatory framework established by the NCGSA or a similar entity to support the agreements and provide ongoing compliance monitoring. No such framework currently exists and development of this type of framework is not actively planned by the NCGSA. However, should a framework be developed, this approach would provide dual benefits by increasing the beneficial reuse of recycled water while reducing dependence on groundwater resources. Because agricultural irrigation represents one of the largest groundwater demands within the Subbasin, targeted recycled water substitution projects could potentially generate meaningful groundwater offsets.

If the City is not able to establish agreements and a regulatory framework allowing it to pump additional groundwater in exchange for supplying recycled water for agricultural use, supplying recycled water to agricultural parcels would still have other regional benefits. These regional benefits include:

- Offsetting existing agricultural groundwater pumping, thereby providing in-lieu groundwater recharge to the underlying groundwater basin and potentially reducing streamflow depletion within the City near significant agricultural wells;
- Providing an additional reliable source of water supply to agricultural users, providing more stability as local groundwater and surface water may become less reliable; and
- Improving relationships between the agricultural community, NCGSA, and the City.

6.3.3.1 Demand Estimates

Similar to the estimates for landscape irrigation and industrial water use, agricultural irrigation estimates are based on the City's preliminary demand assessment. As shown in Table 6-3, recycled water demands from these agricultural properties could reach up to 285 AFY or 349 AFY, depending on the selected Base Pipeline option. If all potential future phase pipelines are constructed, total demands could reach up to 1,316 AFY or 1,380 AFY. These estimates represent the maximum potential demand. Actual usage is expected to be lower, as many vineyards may choose to use recycled water for only a supplemental portion of their water supply or may choose not to utilize recycled water at all.

These estimates are based on the following assumptions:

- An estimated vineyard water use factor of 1 AFY/acre.[13]
  - This water use factor includes recycled water used for vineyard irrigation, as well as for other agricultural purposes such as frost protection and heat protection. These estimates exclude non-agricultural uses such as winery process water or landscaping.[13]
- 100 percent of irrigation demands for the identified agricultural properties would be met by recycled water.
- All Potential Future Phase pipelines shown on Figure 6-4 would be constructed in the "Buildout with All Phases" scenario.

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[13] Napa County. May 2015. *Water Availability Analysis (WAA) – Guidance Document. Table 2A: Water Use Criteria.* Accessed at https://www.countyofnapa.org/DocumentCenter/View/25903/Water-Availability-Analysis-Adopted-Policy---12-May-2015 on July 23, 2025.

Table 6-3. Agricultural Irrigation Recycled Water Demand Estimate[a]

	Estimated Annual Demand, AF	
	Base Pipeline 1	Base Pipeline 2
Agricultural Demand (Base and Required Pipelines Only)	285	349
Agricultural Demand (Future Phase Pipelines)	1,031	
Total Agricultural Demand (Buildout with All Phases)	1,316	1,380

AF = acre-feet

(a) While demands may reach 1,380 AFY, recycled water supply capacity is limited during the irrigation season to approximately 180 AFY.

Based on the recycled water supply capacity of 0.29 mgd, or 325 AFY, (see Section 6.1.2) and assuming irrigation occurs from May 1 through October 31, similar to NapaSan's recycled water delivery schedule, the maximum annual supply available for irrigation is approximately 180 AFY. This supply is significantly less than the potential agricultural demand for recycled water. While agricultural users may not replace 100 percent of their irrigation water with recycled water, it is evident from the data shown in Table 6-3 that agricultural irrigation could likely fully utilize the City's recycled water supply during the irrigation season, even with only a base and required pipeline constructed. Available supply for irrigation use would also be reduced by any landscape irrigation and industrial demands served by the same recycled water supply.

6.3.3.2 Implementation Considerations

To implement a recycled water program serving agricultural users, it is recommended that the City incorporate potential agricultural use into its Recycled Water System Master Plan Update and Title 22 Engineering Report, as described in Section 6.3.2.2. Many implementation considerations that apply to landscape irrigation and industrial use, such as project phasing and cross-connection control, would apply to agricultural irrigation use as well.

Additional considerations specific to agricultural use include:

- Use area requirements,
- Storage requirements, and
- Water quality testing.

The City, as the recycled water supplier, would need to comply with the use area requirements for irrigation, along with the agricultural customers. Irrigation with disinfected tertiary recycled water must occur greater than 50 feet from any domestic water supply well, unless additional investigation and well construction requirements are met (Title 22, §60310(a)). Additionally, disinfected tertiary recycled water cannot be impounded (stored) within 100 feet of a domestic water supply well (Title 22, §60310(b)). The City's Title 22 Engineering Report would need to define containment measures for use areas and include maps showing the required setback distances for all recycled water customers.

Irrigation time restrictions can create high-peak pumping if the daily demand must be delivered in an 8- to 12-hour period. It is expected that participating agricultural users would store recycled water on-site using privately owned ponds or tanks filled from the City's distribution system. This on-site operational storage would help balance the City's recycled water supply with the peak demands of individual agricultural users, thereby reducing the required size of the City's recycled water pipelines, pumping and storage facilities.

To encourage agricultural use, it is recommended that the City evaluate the suitability of the water quality of its recycled water for agricultural irrigation. To do this, the City could assess its existing water quality data as well as conduct additional water quality sampling of its recycled water to test for constituents beyond standard, State-required testing. Crops can be sensitive to Total Dissolved Solids (TDS), and although the City's average TDS is suitable for agricultural irrigation, the City should continue to monitor its TDS levels to determine if seasonal fluctuations may have impacts on crops considered for irrigation. Vineyards are also sensitive to certain water quality constituents, and the viability of the City's recycled water as an agricultural supply may be limited by water quality. For example, the City of Calistoga does not provide recycled water for agricultural irrigation due to the elevated levels of boron in its recycled water and limits its recycled water use to boron-tolerant crops like turf grasses.[14,15] Salinity is also critical to consider when determining recycled water's suitability for vineyard irrigation, as salts can accumulate in soil and reduce grapevine growth and production. As discussed in Section 6.2.1, NapaSan conducted a peer-reviewed Suitability Study to evaluate the long-term impacts of recycled water on vineyards. The study concluded that, when properly managed, recycled water is suitable for vineyard irrigation and does not pose salinity or toxicity risks.

The Suitability Study included weekly sampling during the dry season for the following constituents[16]:

- pH,
- Salinity and related measurements,
- Alkalinity and related measurements,
- Turbidity,
- Heavy metals, and
- Specific ions or elements, such as sodium, chloride, boron, nitrogen, phosphorous, etc.

It is recommended for the City to conduct similar water quality testing if it wants to serve recycled water to agricultural users. Future monitoring of these water quality constituents would also be recommended to track any changes in recycled water quality over time.

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[14] City of Calistoga. May 2020. *General Plan Infrastructure Element 2020 Update.*

[15] While boron is an essential element for crops at low concentrations, concentrations exceeding 1 mg/L may reduce grapevine growth and damage leaves per NapaSan's Suitability Study.

[16] Additional detail regarding NapaSan's water quality testing and study methodology can be found in NapaSan's Suitability Study.

6.3.4 Storage in Lower Reservoir for Non-Potable Reuse

The potential for non-potable reuse of disinfected tertiary treated recycled water through discharge and storage in the Lower Reservoir was briefly considered in this WMP. This approach would involve constructing a recycled water pipeline and a pump station to convey water from the WWTP to the Lower Reservoir. A benefit of this approach would be the ability to store recycled water that is not immediately needed for future non-potable uses and to consolidate such activities at a single storage location (e.g., having a single fill station at the Lower Reservoir providing non-potable water).

As described in Chapter 4, the City supplies untreated (raw) water from the Lower Reservoir for various non-potable uses, including grading, dust control, and other construction activities, as well as for vineyard irrigation under raw water agreements. The Lower Reservoir has a total storage capacity of 230 AF, but its current operational volume is limited to approximately 105 AF due to permitting restrictions imposed by Division of Safety of Dams (DSOD), pending required facility improvements. The City claims a pre-1914 water right to store up to 160 AFY in the Lower Reservoir.

Recycled water can be stored in a landscape impoundment, such as the Lower Reservoir, if it meets disinfected secondary-23 recycled water standards, which the City's recycled water quality exceeds.[17] A landscape impoundment is defined under Title 22 regulations as an impoundment in which recycled water is stored or used for aesthetic enjoyment or landscape irrigation, where public contact is not intended.[17]

Implementing this alternative may require changes to the City's WWTP NPDES permit (e.g., recycled water discharge location and monitoring requirements). It should also be noted that disinfected tertiary recycled water cannot be stored within 100 feet of any domestic water supply well.[18] While no publicly reported domestic wells are currently known to exist within this distance of the Lower Reservoir, this determination would need to be confirmed before proceeding with this storage option.

Implementing this concept would require approximately 3.6 miles of new recycled water pipeline from the WWTP to Lower Reservoir, crossing through urban areas across much of the City limits. Additionally, significant pumping capacity would be needed to overcome the approximately 220-foot elevation gain between the WWTP and the Lower Reservoir.

Currently, the raw water supply from the Lower Reservoir is not overutilized and is sufficient to meet the City's current raw water agreements. The City's annual metered non-potable demands were approximately 25 AF and 12 AF in 2023 and 2024, respectively, which is much less than the Lower Reservoir's current maximum operational volume of 105 AF.[19] Given the adequate raw water supply and the significant infrastructure needed to convey recycled water to the reservoir, this approach is not recommended. If recycled water storage is needed in the future to balance recycled water distribution system operations, it would be more practical to develop storage facilities closer to the WWTP or near the adjacent spray fields to minimize pipeline construction and associated costs.

[17] California Code of Regulations, Title 22, Division 4, Chapter 3, § 60301.550 – Landscape Impoundment.

[18] California Code of Regulations, Title 22, Division 4, Chapter 3, Article 4, §60310 - Use Area Requirements.

[19] Source: 'Copy of Non Potable Water Demand' spreadsheet provided by the City in 2025. Spreadsheets provide monthly metered data for non-potable demand.

6.3.5 Recycled Water Fill Station

Many water and wastewater utilities that produce recycled water operate recycled water fill stations to support non-potable commercial or irrigation uses, including the Napa County recycled water suppliers described in Section 6.2. These fill stations, typically located at a utility's WWTP, typically allow only commercial users to haul recycled water for construction and other commercial uses such as dust control, soil compaction, and mixing concrete.

Most fill stations provide disinfected tertiary recycled water, though some may also use disinfected secondary-23 or disinfected secondary-2.2 recycled water, depending on the allowable uses and applicable permit requirements. While less common, some agencies provide recycled water fill stations for residential users for use on their landscaping. These residential fill stations provide water that meets disinfected tertiary recycled water standards.

In all cases, the agency supplying recycled water is responsible for training the commercial or residential water users on the appropriate uses of the recycled water. Typically, the agency requires recycled water users to attend a brief training session and obtain a permit to use the fill station.

As discussed in Section 6.3.4, the City has an existing raw water fill station supplied from the Lower Reservoir that serves customers for non-potable use. The City also requires construction projects to use non-potable water, rather than potable water (SHMC §13.04.221.B.7). Under current conditions, this non-potable construction water would primarily be supplied from the Lower Reservoir fill station. This supply source is not currently fully utilized and is sufficient to meet the City's current raw water agreements and construction uses.

A recycled water fill station could also provide a supplemental non-potable water source for certain firefighting support uses. The City's tertiary treated recycled water meets California Title 22 treatment requirements for firefighting uses (Appendix E). In some wildfire events, firefighting activities have used water from the City's potable water system. If a recycled water fill station or hydrant were readily accessible to fire response vehicles and accepted by local and regional fire agencies, it could reduce reliance on potable water during some fire events. However, this potential benefit is difficult to quantify as a reliable annual potable water offset because fire-related water demands vary substantially from year to year.

Given the adequate supply from the raw water fill station and the additional permitting, training, and operation and maintenance requirements of a recycled water fill station, it is not currently recommended that the City develop a recycled water fill station for the purpose of offsetting potable water demand. Because the City has an existing non-potable fill station, operating a new recycled water fill station is unlikely to offset additional potable water use that could not already be offset by water from Lower Reservoir. This alternative could be reconsidered in the future if demand for hauled non-potable water increases beyond the available Lower Reservoir supply, if fire response agencies identify a clear use for recycled water supply, or if a recycled water fill station is desired to improve accessibility or service for construction and other approved non-potable uses.

6.3.6 In-Lieu Groundwater Recharge

The City of St. Helena commissioned the Water Supply Strategy Analyses (LSCE, 2026) to evaluate opportunities for improving groundwater sustainability. The evaluation examined how recycled water reuse could reduce groundwater pumping and improve groundwater and surface water conditions within the Napa Valley Subbasin. The study used the Napa Valley Integrated Hydrologic Model to simulate the effects of recycled water use on groundwater resources and streamflow in the Napa River under several water management scenarios. One of the primary strategies evaluated was in-lieu recharge, in which recycled water is used to replace groundwater currently pumped for landscape and agricultural irrigation.

To evaluate the groundwater sustainability benefits of recycled water reuse, the LSCE report modeled the use of recycled water to offset groundwater pumping for landscape and agricultural irrigation. This approach preserves groundwater in the aquifer by replacing groundwater withdrawals with recycled water. Three scenarios were modeled that progressively expanded recycled water use from City-owned landscaping to private landscaped areas and surrounding agricultural lands. The three scenarios were the following:

- Irrigation of landscaping on key City property
- Irrigation of landscaping on key City and private properties within City limits/service area
- Irrigation of landscaping on key City and private property within the City limits/service area and agricultural irrigation of vineyards surrounding the City

The modeling results showed that increasing the use of recycled water in place of groundwater pumping improved low-flow conditions in the Napa River, with the greatest benefits occurring in the third scenario, irrigation of landscaping on key City and private property within the City limits/service area and agricultural irrigation of vineyards surrounding the City. This scenario produced simulated increases in monthly mean low flows ranging between 0.13 to 0.20 cubic feet per second at the streamflow analysis point (Analysis Point) on the Napa River, which is at the confluence of the Napa River with Bella Oaks Creek. The report concluded that the use of recycled water in lieu of groundwater pumping could increase streamflow during low-flow periods and provide considerable benefits to streamflow conditions in the Napa Valley (LSCE, 2026).

6.4 INDIRECT POTABLE REUSE OPTIONS

Potential indirect potable reuse (IPR) options for the City are described in the following sections, along with relevant regulatory requirements. IPR is the use of recycled water to replenish drinking water supplies through a suitable environmental buffer, such as a groundwater aquifer or surface water body, before treatment at a drinking water treatment plant. IPR offers a safe and effective method to replenish drinking water supplies.

IPR regulations are discussed in the section below followed by evaluations of three potential IPR implementation options in subsequent sections. The IPR options evaluated include:

- Groundwater replenishment via surface application (i.e., recharge basins)
- Groundwater replenishment via subsurface application (i.e., direct injection)
- Surface water augmentation of Bell Canyon Reservoir

6.4.1 Indirect Potable Reuse Regulations

Standards for IPR are defined in CCR Title 22 Chapter 3 – Water Recycling Criteria and are more stringent than standards for non-potable reuse. Table 6-4 summarizes the three major types of IPR projects and their treatment requirements.

Groundwater replenishment via surface application must meet disinfected tertiary recycled water standards as well as other specific requirements detailed in Title 22's Water Recycling Criteria. Surface water augmentation and groundwater replenishment via subsurface application require more stringent treatment requirements—specifically, full advanced treatment, which uses reverse osmosis and an oxidation treatment process. While the City has recently upgraded its WWTP to meet disinfected tertiary recycled water standards, achieving full advanced treatment requirements would require additional significant and costly capital improvements. These upgrades would include a full-stream reverse osmosis (RO) treatment system followed by an ultraviolet light and advanced oxidation process (UV/AOP). These advanced treatment processes have high capital costs, high energy usage, require specialized operator expertise, and present challenges for managing RO brine waste.

Table 6-4. Overview of Indirect Potable Reuse Treatment Regulations

Type of IPR Project	Description	Level of Treatment Required	Requirements Met by Current City Facilities?	Relevant Standards
Groundwater replenishment via surface application	Use of recycled municipal wastewater to replenish a groundwater basin designated for municipal and domestic use, in which the recharge water is applied to a spreading area.	Disinfected Tertiary Recycled Water	Requires Further Evaluation/ Performance Testing[(a)]	CCR Title 22, Division 4, Chapter 3 – Water Recycling Criteria, Article 5.1
Groundwater replenishment via subsurface application	Use of recycled municipal wastewater to replenish a groundwater basin designated for municipal and domestic use, in which the recharge water is applied by other means (e.g., injection).	Full Advanced Treated Recycled Water	No	CCR Title 22, Division 4, Chapter 3 – Water Recycling Criteria, Article 5.2
Surface water augmentation	Introduction of recycled municipal wastewater into a surface water reservoir that is used for domestic drinking water supply, for the purpose of supplementing the reservoir.	Full Advanced Treated Recycled Water	No	CCR Title 22, Division 4, Chapter 3 – Water Recycling Criteria, Article 5.3

(a) At the time of this report, the City is undergoing performance testing of its recent facility upgrades. Further evaluation is needed to confirm whether the upgraded facilities meet the more stringent IPR requirements for groundwater replenishment via surface application.

6.4.2 Groundwater Replenishment via Surface Application

In its 2026 Water Supply Strategy Analyses, LSCE evaluated the possibility of groundwater recharge using surface spreading in dedicated recharge ponds (Appendix D). Further evaluation would be needed, as well as coordination with the NCGSA, to determine the extent to which the City could access the recharged groundwater for potable use. As stated in Section 5.4 of this WMP, benefits of groundwater replenishment via surface application may be greatest during and shortly after recharge events and may decay substantially within months.

Under the surface application approach, treated recycled water (up to 350,000 gallons per day) would be applied to surface infiltration ponds where it would percolate through the soil and recharge the underlying aquifer. The hypothetical ponds, for modeling purposes, were assumed to be located at the Robert Louis Stevenson Museum or near the wastewater treatment plant spray fields. These modeled scenarios also incorporate groundwater pumping from Stonebridge Well #2 and a new well at Crane Park as simulated in the Crane Park well site assessment scenario. Under this scenario, the ponds would be used while continuing operation of City municipal supply wells to meet current demands (LSCE, 2026).

Results from the Robert Louis Stevenson Museum scenario show an increase in monthly mean flow ranging between 0.18 and 0.32 cfs at the Analysis Point on the Napa River. Results from the spray fields scenario show an increase in monthly mean flow ranging between 0.17 and 0.33 cfs at the Analysis Point (LSCE, 2026). These results indicate that direct recharge could increase groundwater storage, enhance groundwater contributions to streamflow, and improve low-flow conditions in the Napa River. The location of recharge facilities was found to influence where streamflow benefits occurred, highlighting the importance of site selection when implementing groundwater replenishment projects. (LSCE, 2026).

At the time of this WMP preparation, the City is finalizing punch list items related to its recent wastewater treatment facility upgrades. Further evaluation is needed to confirm whether the upgraded facilities meet the more stringent IPR requirements for groundwater replenishment via surface application. Similar to groundwater recharge using stormwater discussed in Section 5.4, due to the uncertainty of recharge accounting, monitoring, and GSA coordination, groundwater replenishment via surface application is not recommended at this time and does not warrant additional evaluation.

6.4.3 Groundwater Replenishment via Subsurface Application by Managed Aquifer Recharge

Groundwater replenishment via direct injection is discussed in Section 11 of the Napa Valley Subbasin GSP as a strategy to increase groundwater storage and support long-term groundwater sustainability. Further evaluation would be needed, as well as coordination with the NCGSA, to determine the extent to which the City could access the recharged groundwater for potable use. Modeling conducted for the GSP found that managed aquifer recharge through active approaches such as injection wells could increase groundwater storage and improve streamflow conditions in interconnected surface waters. The effectiveness of these projects depends on the availability of surplus water, suitable site conditions, and participation by willing landowners (LSCE, 2022).

As described in Section 6.4.1, subsurface application requires full advanced treatment of recycled water before it can be considered a potable water source.[21] Due to the substantial treatment upgrades required, groundwater replenishment via subsurface application is not recommended at this time and does not warrant additional evaluation. This alternative may be reconsidered in the future, beyond the timeframe of this WMP, if RO and UV/AOP treatment technologies become more cost effective and easier to implement.

6.4.4 Surface Water Augmentation of Bell Canyon Reservoir

Surface water augmentation of Bell Canyon Reservoir using advanced treated recycled water was briefly evaluated in this WMP. This approach would require developing additional treatment facilities to meet advanced water treatment requirements for surface water augmentation. The purified water would then be pumped from the WWTP to Bell Canyon Reservoir via a new or existing rehabilitated transmission pipeline.

Although the State Water Board finalized surface water augmentation standards in 2018, this form of IPR has not yet been widely implemented. Where it is being implemented, it is typically by large utilities with substantial financial and operational capacity, such as the City of San Diego and the Los Angeles Department of Water and Power.[20]

As described in Section 6.4.1, surface water augmentation requires full advanced treatment of recycled water before it can be delivered to a reservoir utilized for potable water supply source water.[21] Due to the substantial treatment upgrades required, surface water augmentation of Bell Canyon Reservoir is not recommended at this time and does not warrant additional evaluation. This alternative may be reconsidered in the future, beyond the timeframe of this WMP, if RO and UV/AOP treatment technologies become more cost effective and easier to implement.

6.5 DIRECT POTABLE REUSE

Direct Potable Reuse (DPR) refers to the process of treating recycled wastewater to drinking water standards and introducing it directly into a public water system or into the untreated water supply immediately upstream of a drinking water treatment plant. A key difference between DPR and IPR is that DPR projects do not include a significant environmental buffer (e.g., groundwater aquifer or reservoir). The State Water Board adopted comprehensive regulations for DPR in December 2023, which became effective on October 1, 2024.[22] These regulations require significantly more stringent treatment and additional requirements beyond IPR applications.

The City of Napa and NapaSan completed a Purified Water Feasibility Study in 2024 that evaluated the feasibility of constructing and operating an advanced water purification facility that would treat NapaSan SWRF effluent to the advanced standards required for DPR, before delivering it through the City of Napa's Jamieson Canyon Water Treatment Plant.[23] The study found that, due to the high costs identified, the City of Napa and NapaSan are unlikely to pursue DPR at this time. DPR is expected to be reconsidered in the future if more affordable water supply sources become unavailable, or there are significant local or regional changes that instigate a reevaluation of DPR. It is expected that DPR would similarly be cost-prohibitive for the City of St. Helena at this time and is therefore not evaluated in this WMP.

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[20] State Water Board Division of Water Quality. December 2023. *Water Supply Strategy Implementation Planned Recycled Water Projects.* Accessed at: https://www.waterboards.ca.gov/water_issues/programs/recycled_water/docs/2024/planned-rw-projects.pdf

[21] California Code of Regulations Title 22 Article 5.3 Indirect Potable Reuse: Surface Water Augmentation Section 60320.

[22] Direct potable use regulations are defined in California Code of Regulations Title 22, Division 4, Chapter 17 Surface Water Treatment, Article 10 Direct Potable Reuse.

[23] Carollo. March 2024. *Napa Purified Water Feasibility Study.* Prepared for City of Napa and NapaSan.

6.6 SUMMARY OF RECYCLED WATER OPTIONS

Table 6-5 summarizes the future recycled water supply options discussed in this chapter and whether they will be evaluated further in Chapter 7 of this WMP, or if they do not warrant further evaluation.

Table 6-5. Summary of Future Recycled Water Supply Options

Recycled Water Supply Option	Warrants Further Evaluation in this WMP?
Non-Potable Reuse	
Landscape Irrigation and Industrial Use within City Limits	Yes
Agricultural Irrigation	Yes
Storage in Lower Reservoir for Non-Potable Use	No
Recycled Water Fill Station[a]	No
In-Lieu Groundwater Recharge	No
Indirect Potable Reuse	
Groundwater Replenishment – Surface Application	No
Groundwater Replenishment – Subsurface Application	No
Surface Water Augmentation of Bell Canyon Reservoir	No
Direct Potable Reuse	
Direct Potable Reuse	No

(a) A recycled water fill station may be considered by the City for operational, logistical, or emergency preparedness purposes. However, this alternative is not evaluated further in this WMP because it is not expected to provide a significant or reliable potable water supply benefit.

6.7 REFERENCES

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NapaSan. *NPDES Permit.* Accessed at: https://www.napasan.com/205/NPDES-Permit on July 17, 2025.

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State Water Board Division of Water Quality. December 2023. *Water Supply Strategy Implementation Planned Recycled Water Projects.* Accessed at: https://www.waterboards.ca.gov/water_issues/programs/recycled_water/docs/2024/planned-rw-projects.pdf on July 23, 2025.

University of California, Napa Sanitation District. March 2006. *Suitability Study of Napa Sanitation District Recycled Water for Vineyard Irrigation.*

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CITY OF ST. HELENA
MONTHLY WATER REPORT

June 1-30, 2026

	LOUIS STRALLA WATER PLANT	STONEBRIDGE POTABLE WELLS	SBW IRRIGATION WATER	NAPA WATER	TK #1 & #2 ADJUST
AMOUNT PRODUCED in AF	34.08	36.77	0.89	54.68	-0.44
AMOUNT PRODUCED in MG	11.10	11.98	0.29	17.81	-0.14
PERCENT	**27.2%**	**29.4%**		**43.7%**	-0.3%

WATER PRODUCED ~~DELIVERY~~ (AGGREGATE)

	THIS YEAR	LAST YEAR
TOTAL PRODUCED THIS PERIOD	40.89 **MG**	37.67 **MG**
MAXIMUM DAILY PRODUCED	n/a **MG**	n/a **MG**
MINIMUM DAILY PRODUCED	n/a **MG**	n/a **MG**
AVERAGE DAILY PRODUCED	1.36 **MG**	1.25 **MG**

WATER BILLED

	THIS YEAR	LAST YEAR
TOTAL BILLED THIS PERIOD	37.96 **MG**	26.08 **MG**

WATER YEAR TOTALS

	THIS FISCAL YEAR	%	LAST FISCAL YEAR	%
LOUIS STRALLA WATER PLANT	355.06 **AF**	32.3%	297.85 **AF**	25.7%
	115.65 **MG**		97.02 **MG**	
NAPA WATER	493.86 **AF**	44.9%	540.57 **AF**	46.6%
	160.87 **MG**		176.08 **MG**	
STONEBRIDGE POTABLE WELLS	250.78 **AF**	22.8%	320.60 **AF**	27.7%
	81.69 **MG**		104.43 **MG**	
TOTAL WATER PRODUCED ~~DELIVERY~~ (ALL)	**1099.70 AF**	**100.0%**	**1159.02 AF**	**100.0%**
TOTAL WATER BILLED	**966.43 AF**		**987.92 AF**	

SBW IRRIGATION WATER

	THIS MONTH	THIS MONTH, LAST YR.
STONEBRIDGE APARTMENTS	0.22 **MG/Jun. 1 -30**	0.17 **MG/Jun. 1-30**
NAPA VALLEY COLLEGE	0.07 **MG/Jun. 1 -30**	NA **MG/Jun. 1-30**

WATER ELEVATION, CAPACITY & RAINFALL

	THIS FISCAL YEAR	LAST FISCAL YEAR
ELEVATION BELL CANYON RESERVOIR	419.07 **FT.**	419.62 **FT.**
MONTHLY RISE OR DROP	-0.55 **FT.**	-1.25 **FT.**
CAPACITY AT END OF PERIOD	2163.35 **AF**	2204.00 **AF**
PERCENT OF FULL CAPACITY	90.8 **%**	92.5 **%**
RAINFALL IN THIS PERIOD	0.10 **IN**	0.00 **IN**
TOTAL RAINFALL SEASON TO DATE	54.24 **IN**	48.18 **IN**

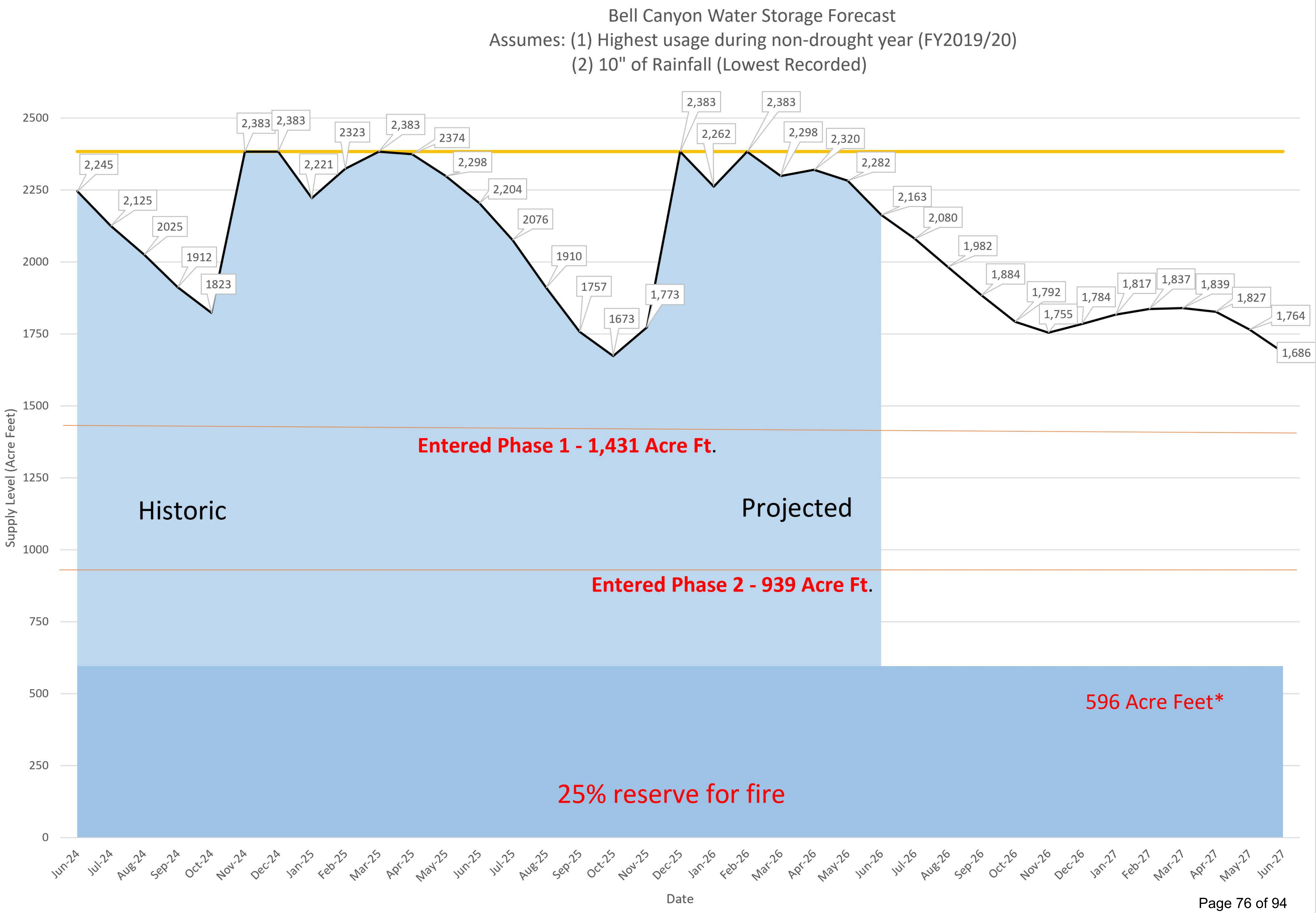
TEMPERATURES

	THIS MONTH, THIS YEAR	THIS MONTH, LAST YR.
DEGREES IN FAHRENHEIT	50.3-101.8	49.8-97.8
AVERAGE	76.05	73.8

REMARKS

City of Napa Water Delivery: RPS producing an average of 0.59 MG/day during June 2026.
DISCLAIMER: The data presented in this report is approximate and for informational purposes only.

Updates will be provided if any errors are identified.


Bell Canyon Water Storage Forecast
Assumes: (1) Highest usage during non-drought year (FY2019/20)
(2) 10" of Rainfall (Lowest Recorded)
Supply Level (Acre Feet)
Date
Historic
Projected
Entered Phase 1 - 1,431 Acre Ft.
Entered Phase 2 - 939 Acre Ft.
596 Acre Feet*
25% reserve for fire
2,245
2,125
2025
1912
1823
2,383
2,383
2,221
2323
2,383
2374
2,298
2,204
2076
1910
1757
1673
1,773
2,383
2,262
2,383
2,298
2,320
2,282
2,163
2,080
1,982
1,884
1,792
1,755
1,784
1,817
1,837
1,839
1,827
1,764
1,686
Jun-24
Jul-24
Aug-24
Sep-24
Oct-24
Nov-24
Dec-24
Jan-25
Feb-25
Mar-25
Apr-25
May-25
Jun-25
Jul-25
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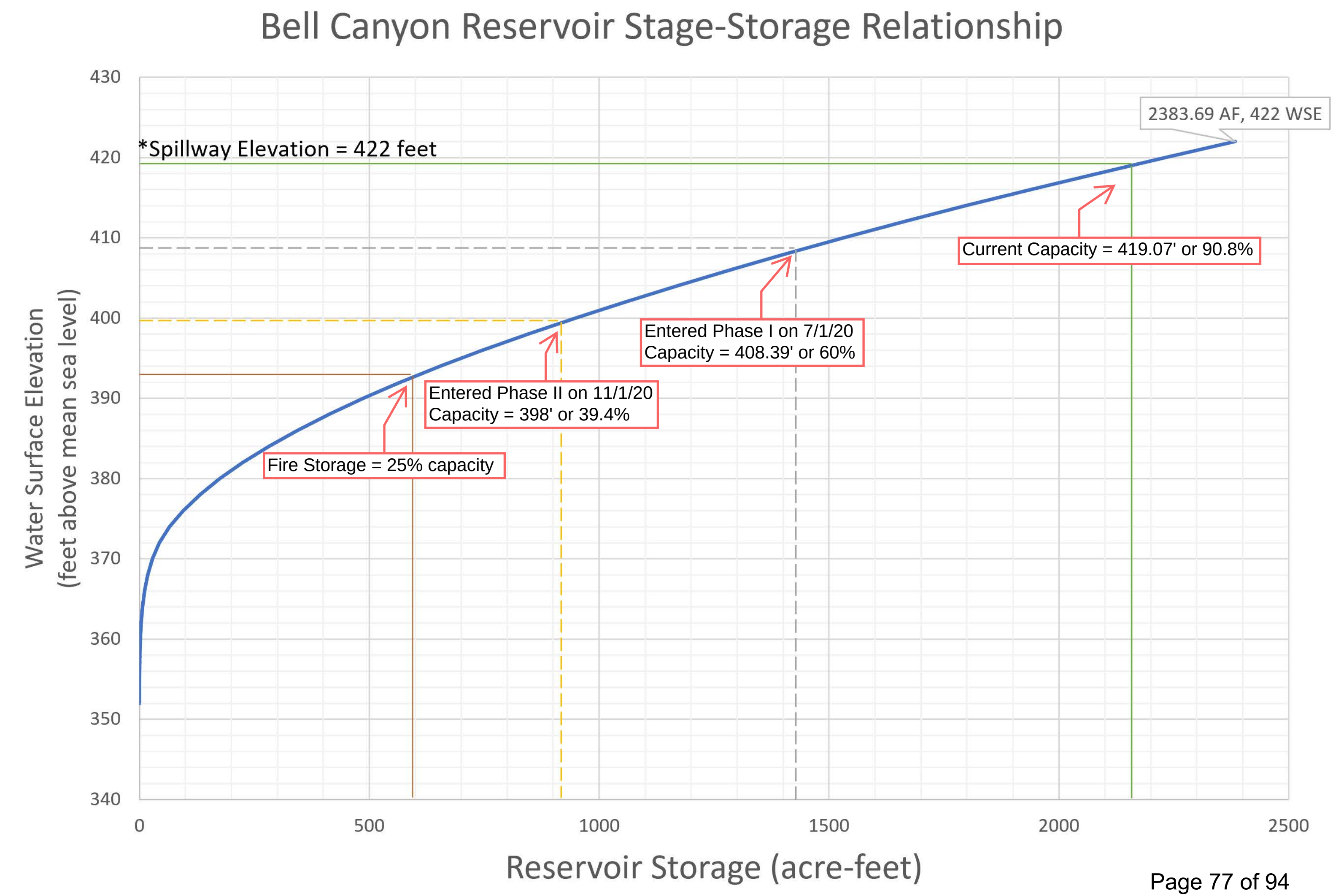
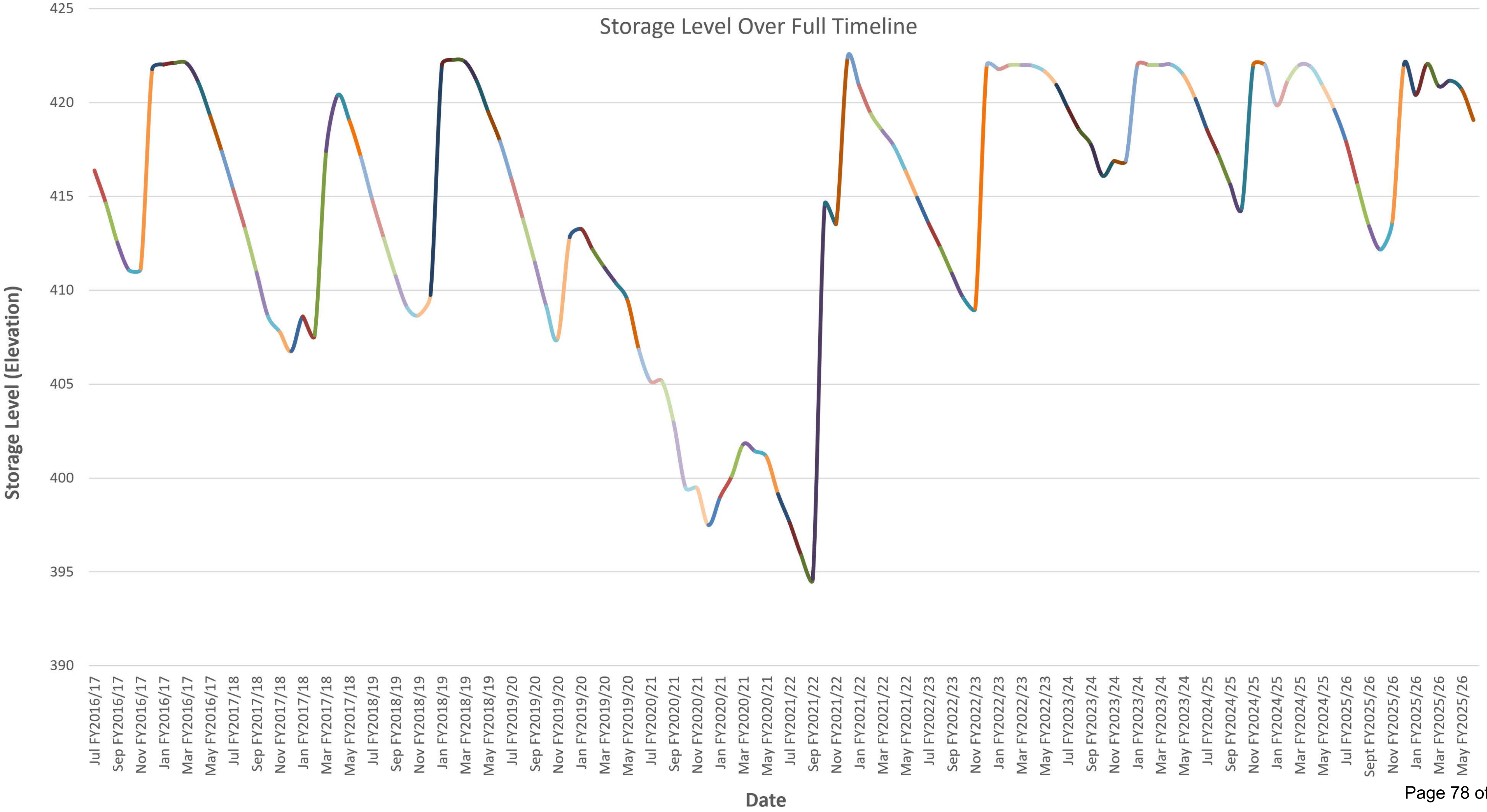
Apr-27
May-27
Jun-27


Bell Canyon Reservoir Stage-Storage Relationship
2383.69 AF, 422 WSE
*Spillway Elevation = 422 feet
Current Capacity = 419.07' or 90.8%
Entered Phase I on 7/1/20
Capacity = 408.39' or 60%
Entered Phase II on 11/1/20
Capacity = 398' or 39.4%
Fire Storage = 25% capacity
Water Surface Elevation
(feet above mean sea level)
430
420
410
400
390
380
370
360
350
340
0
500
1000
1500
2000
2500
Reservoir Storage (acre-feet)


Storage Level Over Full Timeline
Storage Level (Elevation)
425
420
415
410
405
400
395
390
Date
Jul FY2016/17
Sep FY2016/17
Nov FY2016/17
Jan FY2016/17
Mar FY2016/17
May FY2016/17
Jul FY2017/18
Sep FY2017/18
Nov FY2017/18
Jan FY2017/18
Mar FY2017/18
May FY2017/18
Jul FY2018/19
Sep FY2018/19
Nov FY2018/19
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May FY2020/21
Jul FY2021/22
Sep FY2021/22
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May FY2021/22
Jul FY2022/23
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Nov FY2024/25
Jan FY2024/25
Mar FY2024/25
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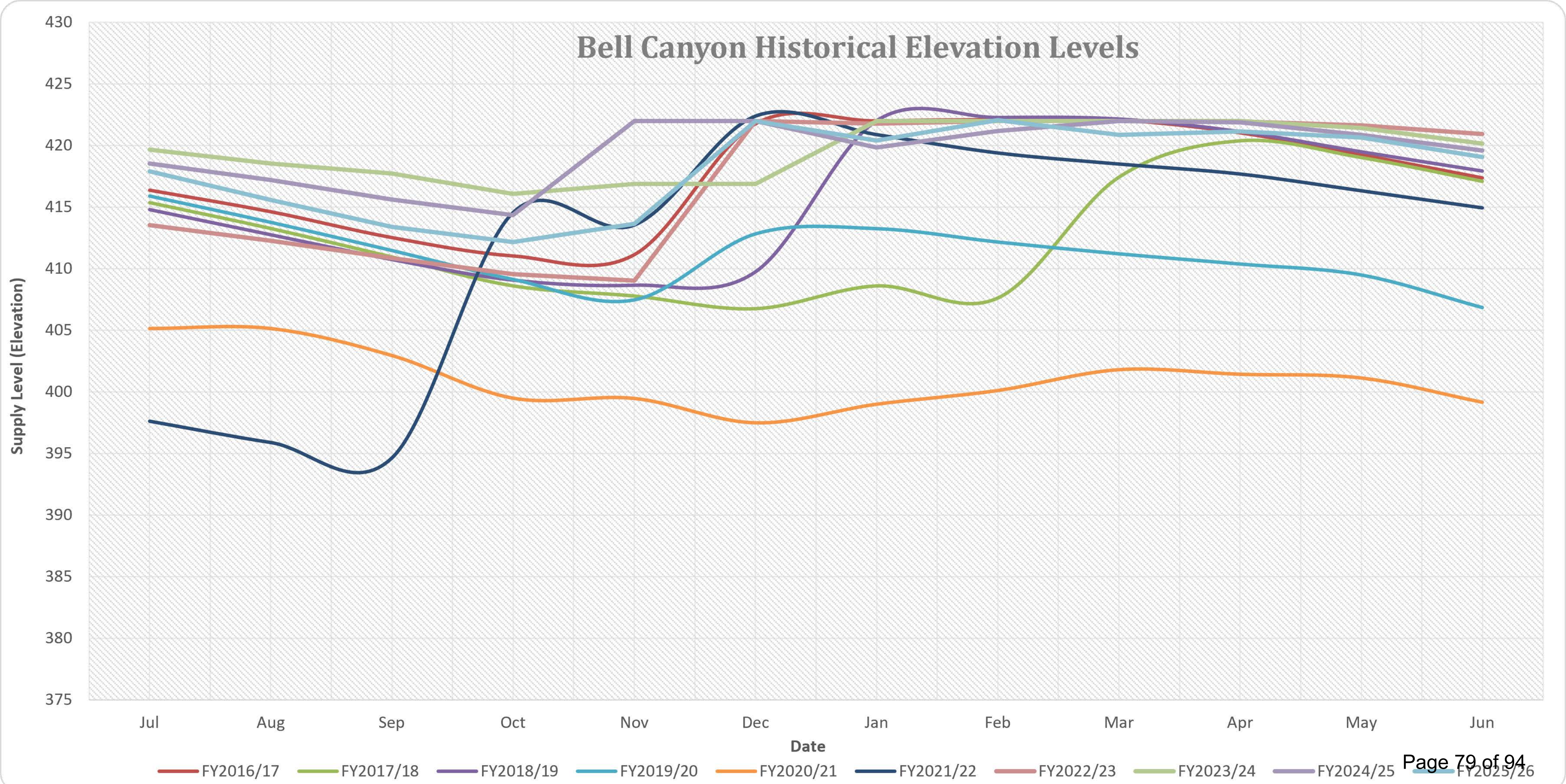
Mar FY2025/26
May FY2025/26


Bell Canyon Historical Elevation Levels
Supply Level (Elevation)
430
425
420
415
410
405
400
395
390
385
380
375
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Date
FY2016/17
FY2017/18
FY2018/19
FY2019/20
FY2020/21
FY2021/22
FY2022/23
FY2023/24
FY2024/25
FY2025/26

Water Security

Water/Wastewater Advisory Committee

August 6, 2026

Terminology

Safe Yield is the volume of water that can be reliably supplied each year, including dry years without imposing undue hardship to customers

Net Water Demand = Production - Non-Revenue Water

Net Water Demand

- Provided to customers
- Generates revenue

Non-Revenue Water (System Losses)

- Distribution leakage
- Flushing
- Metering errors

Production

- Released from treatment at Bell Canyon, Stonebridge or Rutherford

Supply

- Potential for production

Safe Yield Assumptions

	2011 (MG) Safe Yield	2025 (MG) Safe Yield	2040 (MG) Safe Yield	2040 (MG) WMS
Production				
Bell Canyon	228	168		
Stonebridge	147	114		
Napa	261	261		
Total	**636**	**543**	**543**	**543**
Non-Revenue Water	**95**	**98**	**98**	**98**
Safe Yield	**541**	**445**	**445**	**445**
Demand Estimate	**473**	**346**	**409 (+18%)**	**365 (+5%)**
Surplus	**68**	**99**	**36**	**80**
Population (City)	5814	5194		

Practical Implementation of the Safe Yield Analysis

Net Water Demand = Production - Non-Revenue Water

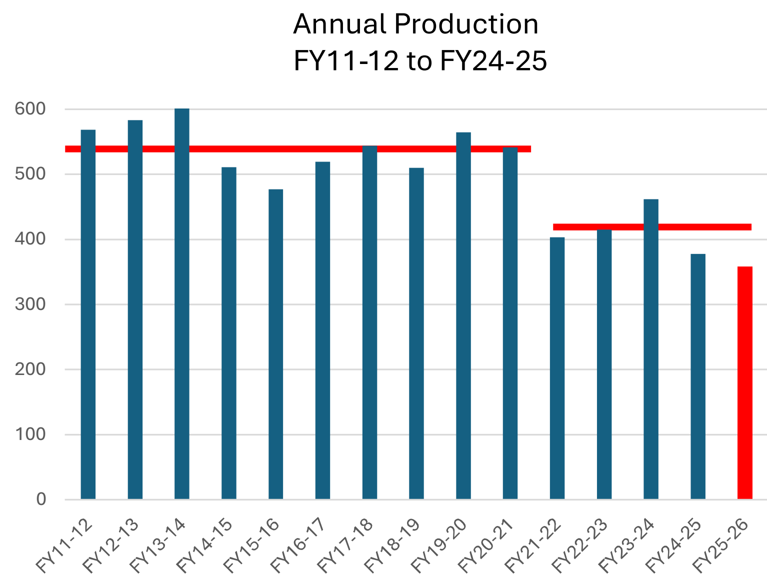
Future Demand

Must reflect permanent demand reduction from 2019-2021 water emergency
Corrected in Water Management Study
High uncertainty – Pick a 2040 target to work towards

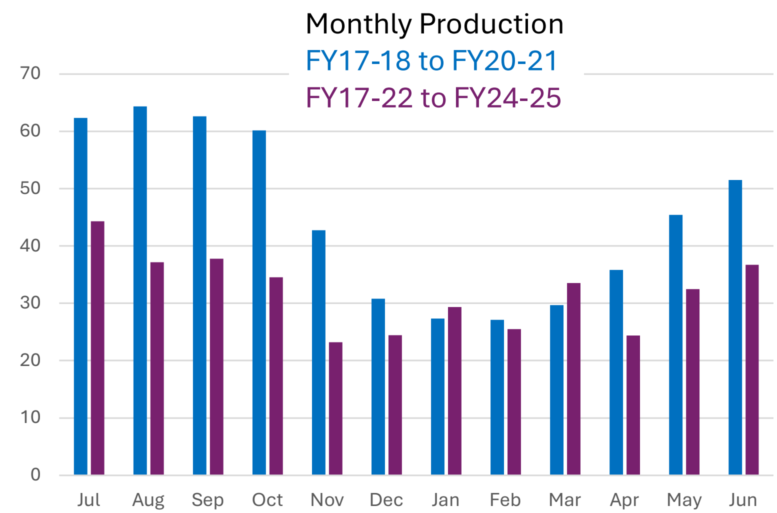
Non-Revenue Water

Likely overestimated at 18% of production

Water Emergency Resulted in Permanent Decline of Final Demand and Production



Response: 24% demand reduction



Likely due to decline in irrigation

Non-Revenue Water Estimate

Non-Revenue Water = Water Billed / Water Produced

CITY OF ST. HELENA
MONTHLY WATER REPORT

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June 1-30, 2026

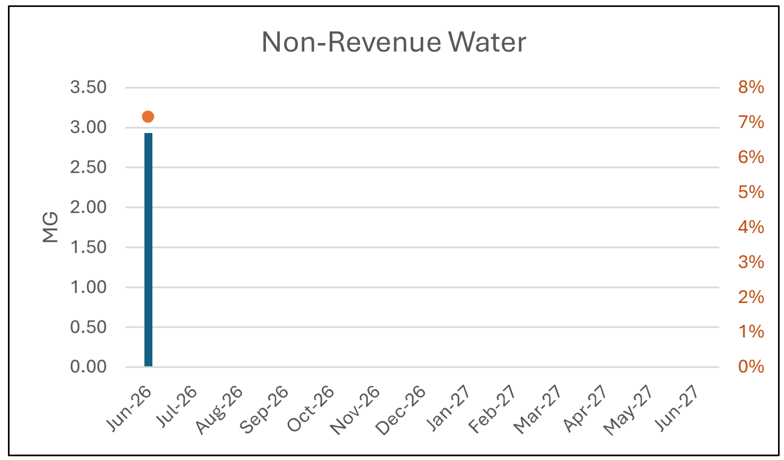
	LOUIS STRALLA WATER PLANT	STONEBRIDGE POTABLE WELLS	SBW IRRIGATION WATER	NAPA WATER	TK #1 & #2 ADJUST
AMOUNT PRODUCED in AF	34.08	36.77	0.89	54.68	-0.44
AMOUNT PRODUCED in MG	11.10	11.98	0.29	17.81	-0.14
PERCENT	**27.2%**	**29.4%**		**43.7%**	-0.3%

WATER PRODUCED ~~DELIVERY~~ (AGGREGATE)

	THIS YEAR	LAST YEAR
TOTAL PRODUCED THIS PERIOD	40.89 MG	37.67 MG
MAXIMUM DAILY PRODUCED	n/a MG	n/a MG
MINIMUM DAILY PRODUCED	n/a MG	n/a MG
AVERAGE DAILY PRODUCED	1.36 MG	1.25 MG

WATER BILLED

	THIS YEAR	LAST YEAR
TOTAL BILLED THIS PERIOD	37.96 MG	26.08 MG



Practical Implementation of the Safe Yield Analysis

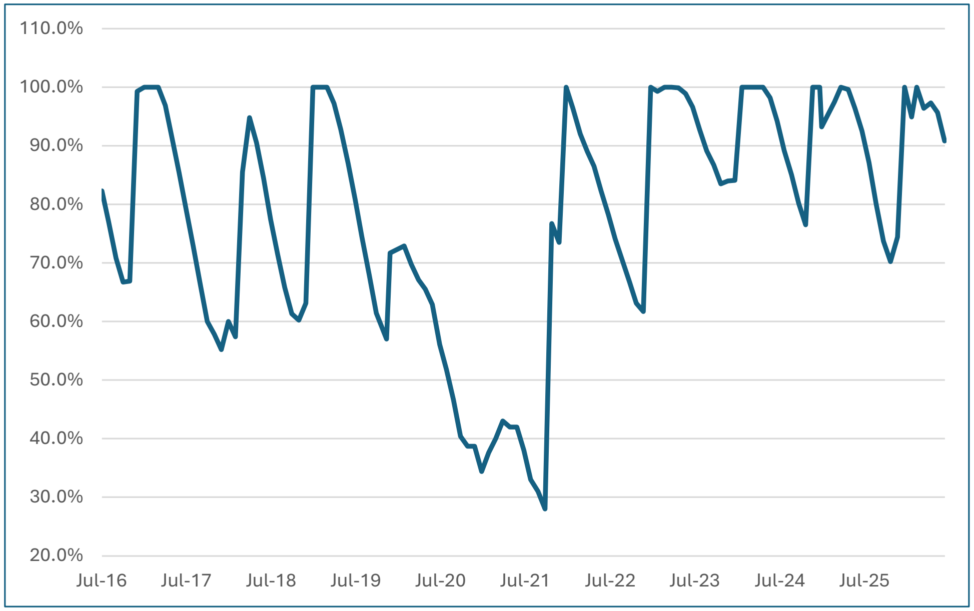
Net Water Demand = Production - Non-Revenue Water

Bell Canyon Production is both Creek Use and from Storage

Production from creek use in wet months and from storage in dry months
Threshold rain (20-25 inches) fills the reservoir and provides high creek use production potenial

Maximize creek usage production
Aim to start the dry season at 85% full
Minimize production from storage
Leakage lowers storage by 10% over the dry months

Seasonal Fill and Spill at Bell Canyon



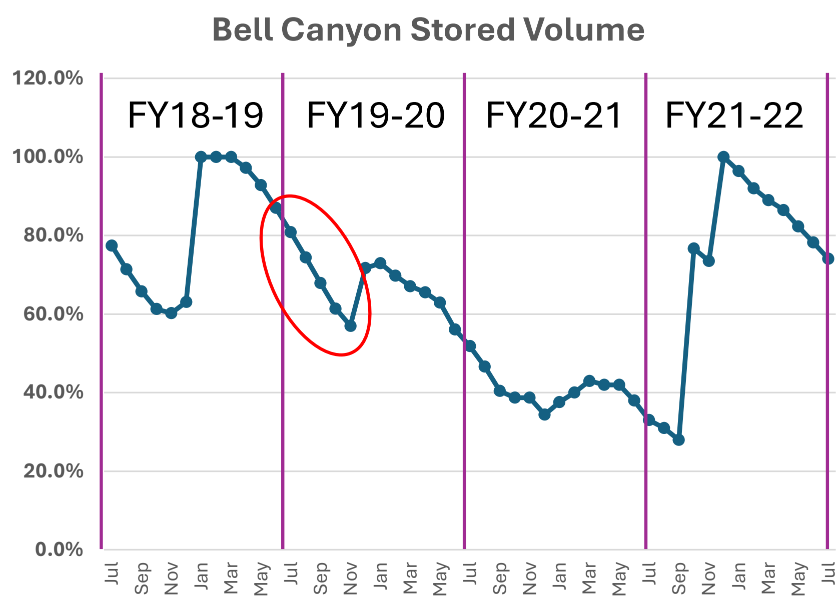
Steady decline in volume in dry season

Production + leakage

Early rain yields small increases

Water fill spikes upon ground saturation

St. Helena Experienced a Water Emergency in 2020-2021



Fiscal Year	Rainfall (inches)
2018-2019	53.77
2019-2020	20.04
2020-2021	13.26
2021-2022	27.39

What did we do in 2019-2021?

	2025 (MG) Safe Yield	FY2018 (MG) Normal Year	FY2020 (MG) Dry	FY2021 (MG) Dry
Production				
Bell Canyon Storage		6 (1%)	232 (30%)	140 (18%)
Bell Creek Use	168	228	11	55
Stonebridge	114	106	118	188
Napa	261	203	204	159
Total	**543**	**537**	**565**	**542**
Non-Revenue Water	**98**	**98**	**98**	**98**
Yield	**445**	**439**	**467**	**444**

Practical Implementation of the Safe Yield Analysis

Net Water Demand = Production - Non-Revenue Water

Napa Contract Volume

Take-or-Pay contract for 600 AF (195 MG)
Additional 200 AF available entirely at Napa's discretion
We are not taking the full take-or-pay volume

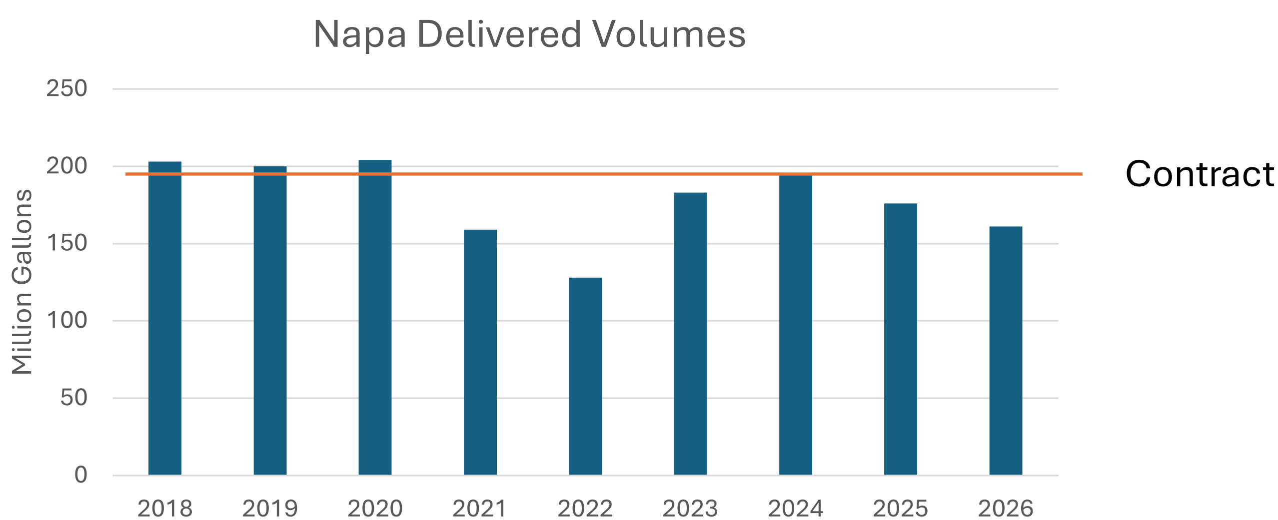
Stonebridge Wells

10% reduction from 2005-14 baseline is 114 MG
Target is to average 114 MG.
In dry years we may want to use as much as 190 MG
In wet years we should target 90 MG (4/5 years)
We should bank low groundwater production years

Napa Contract

Take or Pay contract for 195 million gallons

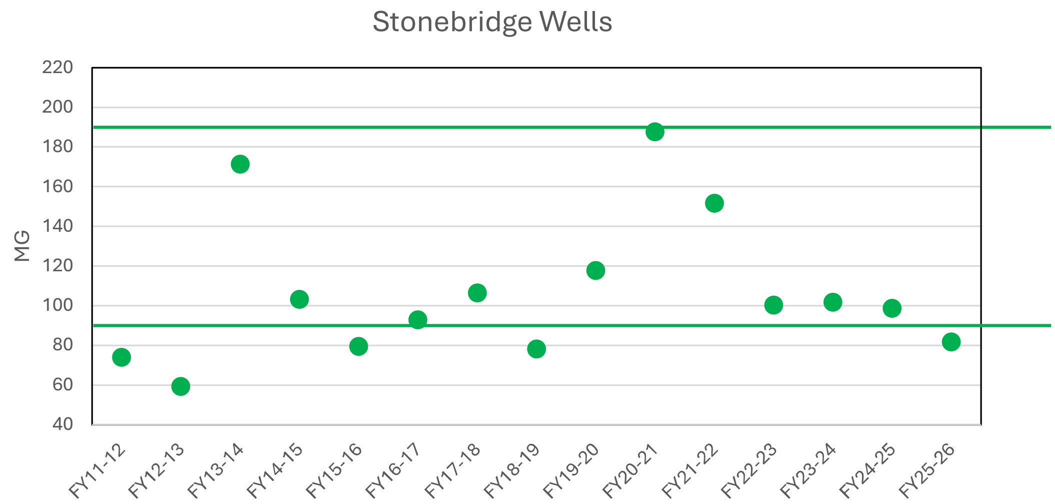
- Insurance for dry-year supply
- We have struggled to consume full volume since 2021 demand decline
- 3% per year price increase until 2032 when realigned with Napa rates
- > 57% price increase in 2032 based on known Napa rate changes



Stonebridge Wells

Incremental Supply after Bell Canyon and Napa

- Bank years of < 90 MG production
- High production only in dry years



A Production Plan for Wet and Dry Years

	2025 (MG) Safe Yield	2027 (MG) Dry Year Plan	2027 (MG) Normal Year Plan
Production			
Bell Canyon Storage		115 (20%)	0
Bell Canyon Use	168	0	215
Stonebridge	114	190	90
Napa	261	180 (550AF)	180 (550AF)
Total	**543**	**485**	**485**
Non-Revenue Water	**98**	**50**	**50**
Yield	**445**	**435**	**435**
Demand Estimate	**346**	**346**	**346**

What can we do now for Supply Security?

Quantify Non-Revenue Water

Dry Season

- Maximize Napa offtake
- Minimize use of storage production at Bell Creek
- Fill in demand with Stonebridge supply

Wet Season

- Fill the reservoir
- Maximize Bell Canyon production if over 85% full
- Use the full Napa contract volume

Monitor Production as the year progresses